

February 2019

No. OCH573
REVISED EDITION-F

TECHNICAL & SERVICE MANUAL

[Model Name]
<Outdoor unit>

MXZ-4C36NAHZ

MXZ-5C42NAHZ

MXZ-8C48NAHZ

MXZ-8C48NA

MXZ-8C60NA

<Branch box>

PAC-MKA50BC

PAC-MKA30BC

PAC-MKA51BC

PAC-MKA31BC

[Service Ref.]

MXZ-4C36NAHZ

MXZ-5C42NAHZ

MXZ-8C48NAHZ

MXZ-8C48NA

MXZ-8C60NA-U1

PAC-MKA50BC

PAC-MKA30BC

PAC-MKA51BC

PAC-MKA31BC

MXZ-4C36NAHZ-U1

MXZ-5C42NAHZ-U1

MXZ-8C48NAHZ-U1

MXZ-8C48NA-U1

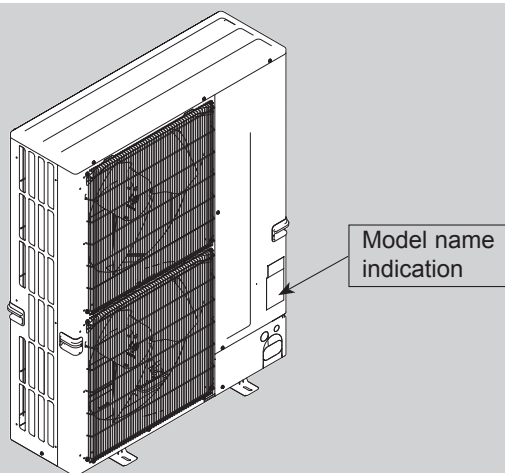
Revision:

- Some descriptions have been modified in REVISED EDITION-F.

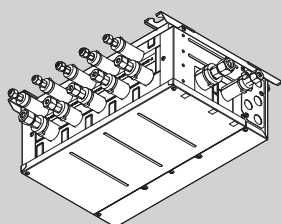
OCH573 REVISED EDITION-E is void.

Notes:

- This service manual describes technical data of outdoor unit and branch box. As for indoor units, refer to its service manual.



OUTDOOR UNIT: MXZ-4C36NAHZ



BRANCH BOX: PAC-MKA51BC

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PARTS CATALOG (OCB573)

TECHNICAL CHANGES

Service ref. have been changed as follows.

MXZ-4C36NAHZ	➔	MXZ-4C36NAHZ-U1
MXZ-5C42NAHZ	➔	MXZ-5C42NAHZ-U1
MXZ-8C48NAHZ	➔	MXZ-8C48NAHZ-U1
MXZ-8C48NA	➔	MXZ-8C48NA-U1

- The shape of piping around a stop valve (T7W E04 410) has been changed.
- The shape of valve bed has been changed.

1-1. ALWAYS OBSERVE FOR SAFETY

Before obtaining access to terminal, all supply circuit must be disconnected.

1-2. CAUTIONS RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R410A

Use new refrigerant pipes.

Make sure that the inside and outside of refrigerant piping is clean and it has no contaminants such as sulfur, oxides, dirt, shaving particles, etc., which are hazard to refrigerant cycle. In addition, use pipes with specified thickness.

Contamination inside refrigerant piping can cause deterioration of refrigerant oil, etc.

Store the piping indoors, and keep both ends of the piping sealed until just before brazing. (Leave elbow joints, etc. in their packaging.)

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

The refrigerant oil applied to flare and flange connections must be ester oil, ether oil or alkylbenzene oil in a small amount.

If large amount of mineral oil enters, that can cause deterioration of refrigerant oil, etc.

Charge refrigerant from liquid phase of gas cylinder.

If the refrigerant is charged from gas phase, composition change may occur in refrigerant and the efficiency will be lowered.

Do not use refrigerant other than R410A.

If other refrigerant (R22, etc.) is used, chlorine in refrigerant can cause deterioration of refrigerant oil, etc.

Use a vacuum pump with a reverse flow check valve.

Vacuum pump oil may flow back into refrigerant cycle and that can cause deterioration of refrigerant oil, etc.

Use the following tools specifically designed for use with R410A refrigerant.

The following tools are necessary to use R410A refrigerant.

Tools for R410A	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

Handle tools with care.

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

Use the specified refrigerant only.

Never use any refrigerant other than that specified.

Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of.

Correct refrigerant is specified in the manuals and on the spec labels provided with our products.

We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

Do not use a charging cylinder.

If a charging cylinder is used, the composition of refrigerant will change and the efficiency will be lowered.

Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.

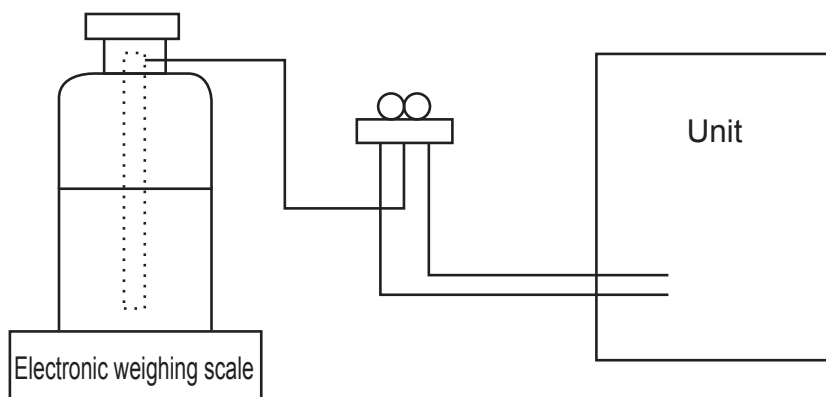
[1] Cautions for service

- (1) Perform service after recovering the refrigerant left in unit completely.
- (2) Do not release refrigerant in the air.
- (3) After completing service, charge the cycle with specified amount of refrigerant.
- (4) If moisture or foreign matter might have entered the refrigerant piping during service, ensure to remove them.

[2] Additional refrigerant charge

When charging directly from cylinder

- (1) Check that cylinder for R410A on the market is a syphon type.
- (2) Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



[3] Service tools

- (1) Use the below service tools as exclusive tools for R410A refrigerant.

No.	Tool name	Specifications
1	Gauge manifold	·Only for R410A ·Use the existing fitting specifications. (UNF1/2) ·Use high-tension side pressure of 768.7 PSIG [5.3 MPaG] or over.
2	Charge hose	·Only for R410A ·Use pressure performance of 738.2 PSIG [5.09MPaG] or over.
3	Electronic weighing scale	—
4	Gas leak detector	·Use the detector for R134a, R407C or R410A.
5	Adaptor for reverse flow check	·Attach on vacuum pump.
6	Refrigerant charge base	—
7	Refrigerant cylinder	·Only for R410A ·Top of cylinder (Pink) ·Cylinder with syphon
8	Refrigerant recovery equipment	—

1-3. Cautions for refrigerant piping work

New refrigerant R410A is adopted for replacement inverter series. Although the refrigerant piping work for R410A is the same as for R22, exclusive tools are necessary so as not to mix with different kind of refrigerant. Furthermore as the working pressure of R410A is 1.6 times higher than that of R22, their sizes of flared sections and flare nuts are different.

① Thickness of pipes

Since the working pressure of R410A is higher compared to R22, be sure to use refrigerant piping with thickness shown below. (Never use pipes of 7/256 in [0.7 mm] or below.)

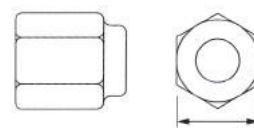
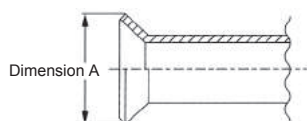
Diagram below: Piping diameter and thickness

Nominal dimensions (inch)	Outside diameter (mm)	Thickness: in [mm]	
		R410A	R22
1/4	6.35	1/32 [0.8]	1/32 [0.8]
3/8	9.52	1/32 [0.8]	1/32 [0.8]
1/2	12.70	1/32 [0.8]	1/32 [0.8]
5/8	15.88	5/128 [1.0]	5/128 [1.0]
3/4	19.05	—	5/128 [1.0]

② Dimensions of flare cutting and flare nut

The component molecules in HFC refrigerant are smaller compared to conventional refrigerants. In addition to that, R410A is a refrigerant, which has higher risk of leakage because its working pressure is higher than that of other refrigerants. Therefore, to enhance airtightness and strength, flare cutting dimension of copper pipe for R410A has been specified separately from the dimensions for other refrigerants as shown below. The dimension B of flare nut for R410A also has partly been changed to increase strength as shown below. Set copper pipe correctly referring to copper pipe flaring dimensions for R410A below. For 1/2 and 5/8 inch pipes, the dimension B changes.

Use torque wrench corresponding to each dimension.



Flare cutting dimensions

Unit: in [mm]

Nominal dimensions (in)	Outside diameter (mm)	Dimension A ^(+0/-0.4)	
		R410A	R22
1/4	6.35	11/32-23/64 [9.1]	9.0
3/8	9.52	1/2-33/64 [13.2]	13.0
1/2	12.70	41/64-21/32 [16.6]	16.2
5/8	15.88	49/64-25/32 [19.7]	19.4
3/4	19.05	—	23.3

Flare nut dimensions

Unit: in [mm]

Nominal dimensions (in)	Outside diameter (mm)	Dimension B	
		R410A	R22
1/4	6.35	43/64 [17.0]	17.0
3/8	9.52	7/8 [22.0]	22.0
1/2	12.70	1-3/64 [26.0]	24.0
5/8	15.88	1-9/64 [29.0]	27.0
3/4	19.05	—	36.0

③ Tools for R410A (The following table shows whether conventional tools can be used or not.)

Tools and materials	Use	R410A tools	Can R22 tools be used?	Can R407C tools be used?
Gauge manifold	Air purge, refrigerant charge and operation check	Tool exclusive for R410A	×	×
Charge hose		Tool exclusive for R410A	×	×
Gas leak detector	Gas leak check	Tool for HFC refrigerant	×	○
Refrigerant recovery equipment	Refrigerant recovery	Tool exclusive for R410A	×	×
Refrigerant cylinder	Refrigerant charge	Tool exclusive for R410A	×	×
Applied oil	Apply to flared section	Ester oil, ether oil and alkylbenzene oil (minimum amount)	×	Ester oil, ether oil: ○ Alkylbenzene oil: minimum amount
Safety charger	Prevent compressor malfunction when charging refrigerant by spraying liquid refrigerant	Tool exclusive for R410A	×	×
Charge valve	Prevent gas from blowing out when detaching charge hose	Tool exclusive for R410A	×	×
Vacuum pump	Vacuum drying and air purge	Tools for other refrigerants can be used if equipped with adopter for reverse flow check	△(Usable if equipped with adopter for reverse flow)	△(Usable if equipped with adopter for reverse flow)
Flare tool	Flaring work of piping	Tools for other refrigerants can be used by adjusting flaring dimension	△(Usable by adjusting flaring dimension)	△(Usable by adjusting flaring dimension)
Bender	Bend the pipes	Tools for other refrigerants can be used	○	○
Pipe cutter	Cut the pipes	Tools for other refrigerants can be used	○	○
Welder and nitrogen gas cylinder	Weld the pipes	Tools for other refrigerants can be used	○	○
Refrigerant charging scale	Refrigerant charge	Tools for other refrigerants can be used	○	○
Vacuum gauge or thermistor vacuum gauge and vacuum valve	Check the degree of vacuum. (Vacuum valve prevents back flow of oil and refrigerant to thermistor vacuum gauge)	Tools for other refrigerants can be used	○	○
Charging cylinder	Refrigerant charge	Tool exclusive for R410A	×	—

×: Prepare a new tool. (Use the new tool as the tool exclusive for R410A.)

△: Tools for other refrigerants can be used under certain conditions.

○: Tools for other refrigerants can be used.

2

OVERVIEW OF UNITS

2-1. SYSTEM CONSTRUCTION

Outdoor unit			MXZ-4C36NAHZ(-U1)	MXZ-5C42NAHZ(-U1)	MXZ-8C48NAHZ(-U1) MXZ-8C48NA(-U1)	MXZ-8C60NA-U1
			4HP	4.5HP	5HP	7HP
Rated capacity (kBtu/h)	Cooling		36	42	48	60
	Heating		45	48	54	66
	Refrigerant		R410A			
Connectable indoor unit	Capacity class		Type 06 to Type 36 Caution: The indoor unit which rated capacity exceeds 36 kBtu/h (Type 36) can NOT be connected.			
	Number of units		2(*1) to 4 units	2(*1) to 5 units	2(*1) to 8 units	2(*1) to 8 units
	Total system wide capacity		33 to 130% of outdoor unit capacity (12 to 46.8 kBtu/h)	29 to 130% of outdoor unit capacity (12 to 54.6 kBtu/h)	25 to 130% of outdoor unit capacity (12 to 62.4 kBtu/h)	20 to 130% of outdoor unit capacity (12 to 78 kBtu/h)
Connectable branch box	Number of units		1 or 2 units			

Connectable indoor unit lineups (Heat pump inverter type)									
Model type	Model name	Capacity class [kBtu/h]							
		06	09	12	15	18	24	30	36
Deluxe Wall-mounted	MSZ-FE09/12/18NA		●	●		●			
	MSZ-FH06/09/12/15NA, 18NA2	●	●	●	●	●			
Designer	MSZ-EF09/12/15/18NA(W/B/S)		●	●	●	●			
Standard Wall-mounted	MSZ-GE06/09/12/15/18/24NA	●	●	●	●	●	●		
	MSZ-GL06/09/12/15/18/24NA	●	●	●	●	●	●		
Low static ducted*3 *4	SEZ-KD09/12/15/18NA		●	●	●	●			
P-series mid static ducted*3 *4	PEAD-A24/30/36AA5						●	●	●
	PEAD-09/12/15/18/24/30/36AA7		●	●	●	●	●	●	●
1-way cassette	MLZ-KP09/12/18NA		●	●		●			
P-series 22*22 4-way cassette	SLZ-KA09/12/15NA		●	●	●				
	SLZ-KF09/12/15NA		●	●	●				
P-series 33*33 4-way cassette	PLA-A12/18/24/30/36BA6			●		●	●	●	●
	PLA-A12/18/24/30/36EA7*5			●		●	●	●	●
Floor standing	MFZ-KA09/12/18NA		●	●		●			
	MFZ-KJ09/12/15/18NA		●	●	●	●			
Standard Multi-position air handler*2	MVZ-A12/18/24/30/36AA4			●		●	●	●	●

Branch box	PAC-MKA50BC	PAC-MKA51BC	PAC-MKA30BC	PAC-MKA31BC
Number of branches (Indoor unit that can be connected)	5 branches (MAX. 5 units)		3 branches (MAX. 3 units)	

Note: A maximum of 2 branch boxes can be connected to 1 outdoor unit.

2- branch pipe (joint): Optional parts			
In case of using 1- branch box	No need		
In case of using 2- branch boxes	Model name	Connection method	Select a model according to the connection method.
	MSDD-50AR-E	flare	
	MSDD-50BR-E	brazing	

Option	Optional accessories for indoor units and outdoor units are available.
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*1 Only one unit connection is possible with ducted unit.

*2 When connecting a multi-position unit(s), set additional constraints as follows. For connections other than those specified below, consult your dealer.

● **Models other than MXZ-8C60NA** (For each connected branch box)

● **MXZ-8C60NA** (For each connected branch box)

Number of connecting multi-position unit	Constraints
2	Any indoor units other than ducted units are not connectable.
1	<ul style="list-style-type: none"> The total system wide capacity should be 130% or below including the ducted unit. Only 1 ducted unit can be included in the connection.

Number of connecting multi-position unit	Constraints
2	Any indoor units other than ducted unit are not connectable.
1	<ul style="list-style-type: none"> The total system wide capacity should be 100% or below including the ducted unit. Only 1 ducted unit can be included in the connection.

*3 For MXZ-8C60NA; When connecting the SEZ and PEAD-series units, the total system wide capacity per 1 branch box should be 100% or below including the ducted units. (Only if connecting to PAC-MKA50/51BC)

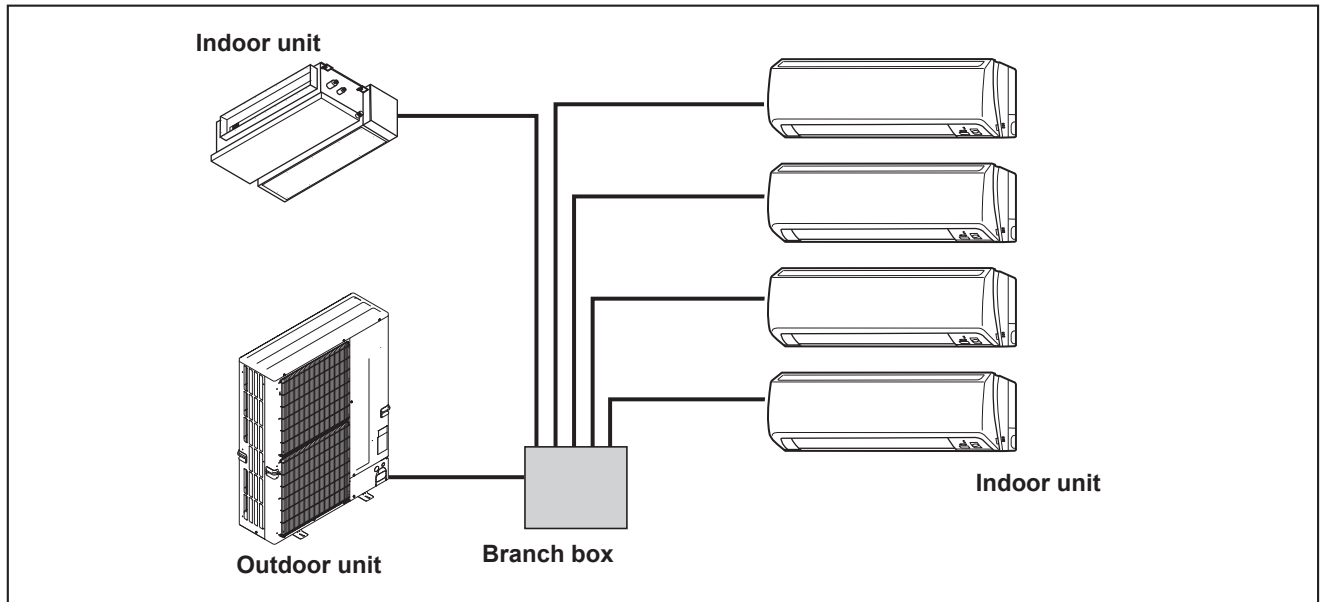
*4 When not outside units 60: A branch box can connect to maximum 3 of the ducted units. When connecting with 3 of the ducted units per 1 branch box, other indoor units cannot be connected.
When outside units 60: A branch box can connect to maximum 2 of the ducted units. When connecting with 1 and over 1 of the ducted units, the total ability including of the ducted units is 100% and below 100%.

*5 When the system includes 1 unit of ducted units, the number of the maximum connectable indoor units is decreased as follows:
3 for MXZ-4C36NAHZ-U1, 4 for MXZ-5C42NAHZ-U1, and 6 for MXZ-8C48NA(HZ)-U1 and MXZ-8C60NA-U1

2-2. SYSTEM OUTLINE

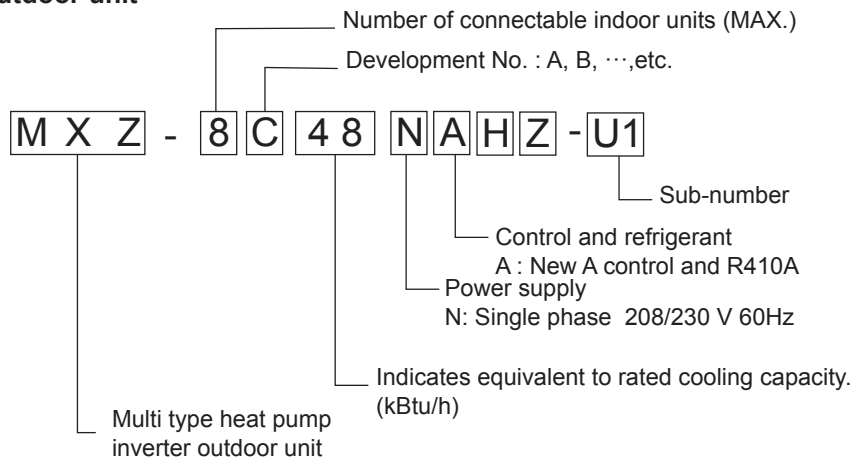
The additional connection of the branch box together with employment of the compact trunk-looking outdoor unit can successfully realize a long distance piping for large houses. Equipped with a microprocessor, the branch box can translate the transmission signal of indoor units to achieve the optimum control.

2-2-1. System example

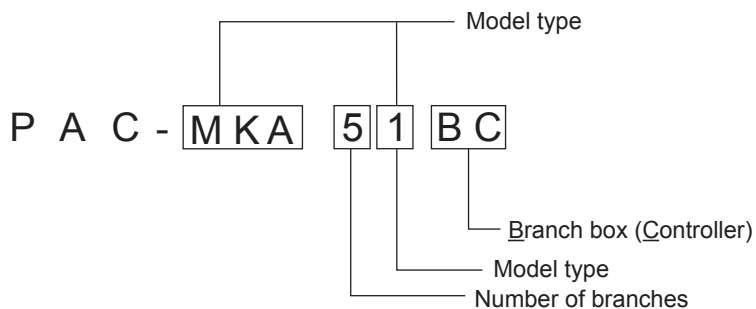


2-2-2. Method for identifying

■ Outdoor unit

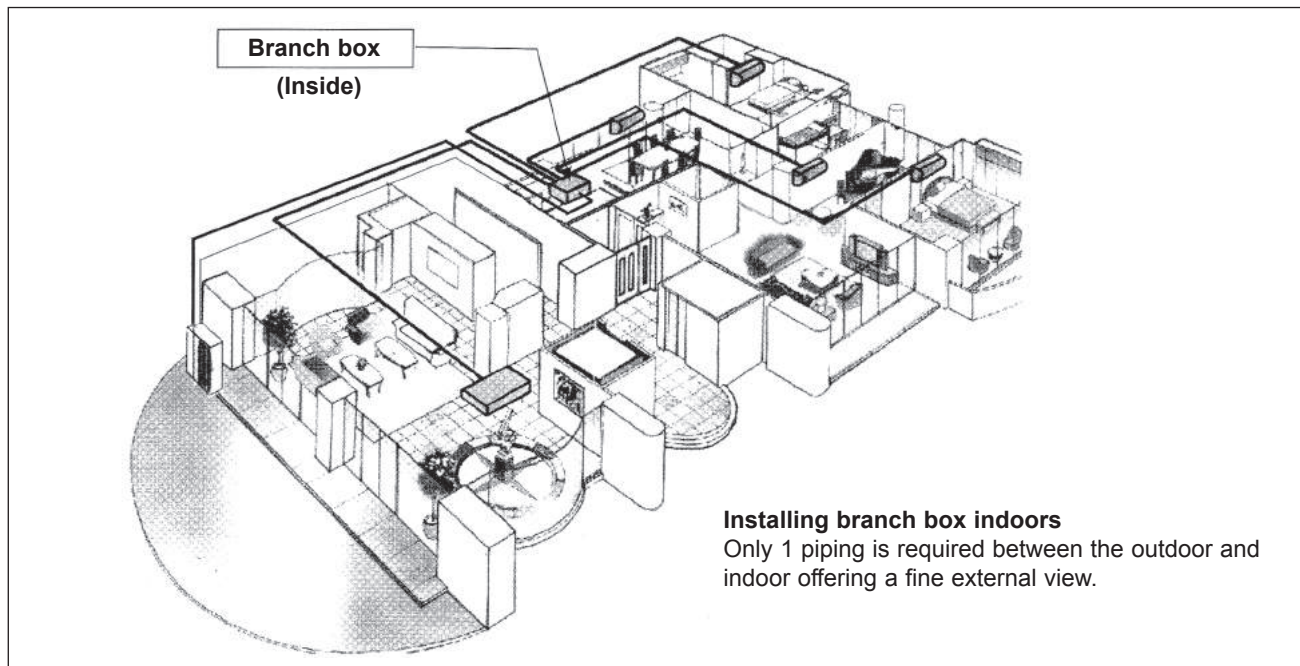


■ Branch box

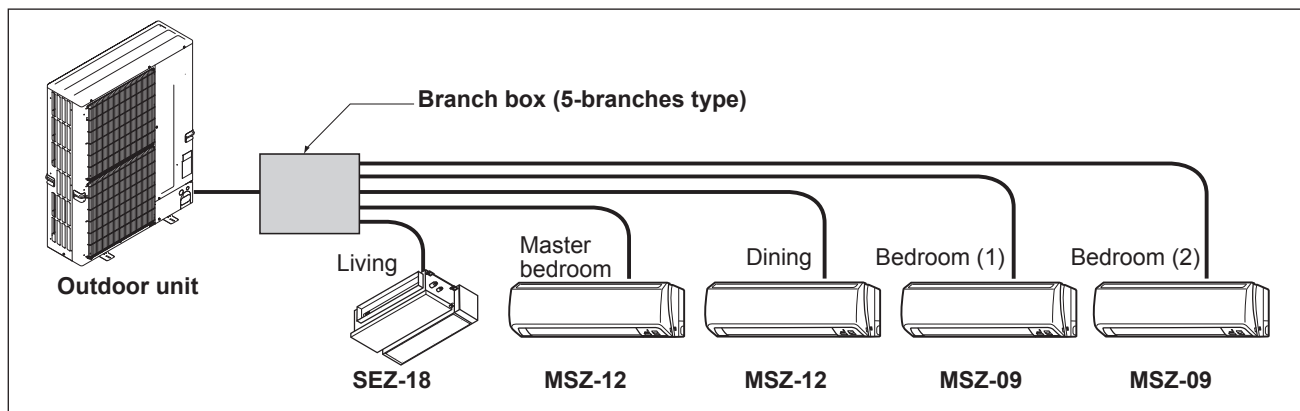


2-3. TYPICAL COMBINATION EXAMPLE

Branch box is located **INSIDE** of condominium



■ System example of 5 indoor units



■ Verification

The rated capacity should be determined by observing the table below. The unit's quantities are limited to 1(*) to 8 units. For the next step, make sure that the selected total rated capacity is 130% or less of outdoor unit capacity. The total indoor unit capacity should be within the outdoor units. (= 100% of outdoor unit capacity is preferred). Combination of excessive indoor units and an outdoor unit may reduce the capacity of each indoor unit.

*Single unit connection is possible only with multi-position unit. Connect 2 or more units for models other than multi-position unit.

Example:

SEZ-18	= 18	Total rated capacity $60 \leq 62.4 \text{ kBtu/h}$
+		
MSZ-12	= 12	
+		
MSZ-12	= 12	
+		
MSZ-09	= 9	
+		
MSZ-09	= 9	

Indoor unit type (capacity class)	06	09	12	15	18	24	30	36
Rated capacity (cooling) (kBtu/h)	6	9	12	15	18	24	30	36

2-4. SIMPLIFIED PIPING SYSTEM

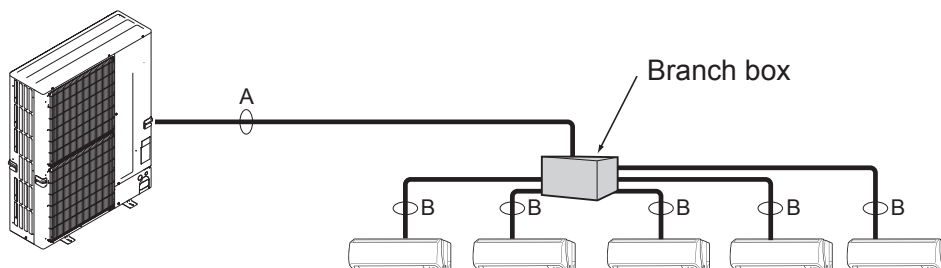
Piping connection size

	A	B
Liquid	ø3/8 inch [9.52 mm]	The piping connection size differs according to the type and capacity of indoor units. Match the piping connection size of branch box with indoor unit. If the piping connection size of branch box does not match the piping connection size of indoor unit, use optional different-diameter (deformed) joints to the branch box side. (Connect deformed joint directly to the branch box side.)
Gas	ø5/8 inch / ø3/4 inch* [15.88 mm] / [19.05 mm]	

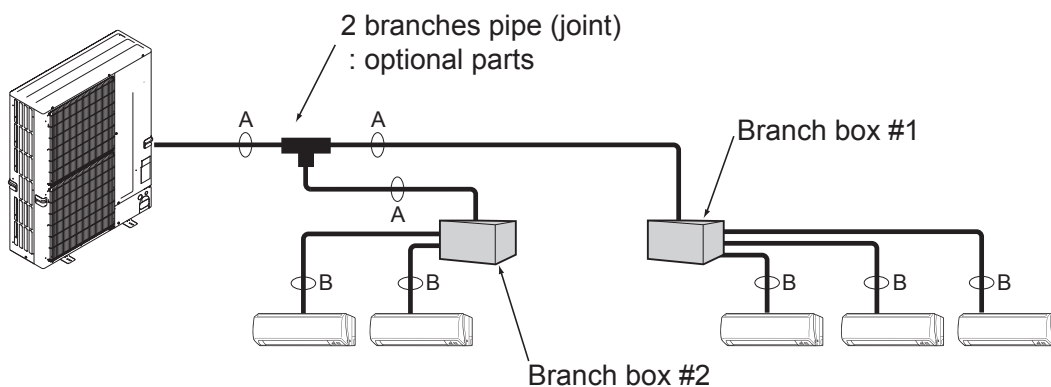
* MXZ-8C60NA only

Flare connection employed. (No brazing!)

- In case of using 1-branch box
Flare connection employed (No brazing)



- In case of using 2-branch boxes



- Installation procedure (2 branches pipe (joint))
Refer to the installation manuals of MSDD-50AR-E and MSDD-50BR-E.

SPECIFICATIONS

3-1. OUTDOOR UNIT:

MXZ-4C36/5C42/8C48NAHZ(-U1), MXZ-8C48NA(-U1), MXZ-8C60NA-U1

Conversion formula:	$\text{kcal/h} = \text{kW} \times 860$ $\text{Btu/h} = \text{kW} \times 3412$ $\text{CFM} = \text{m}^3/\text{min} \times 35.31$
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Service Ref.				MXZ-4C36NAHZ(-U1)			MXZ-5C42NAHZ(-U1)		
Standard performance	Indoor type			Non-Ducted	Mix	Ducted	Non-Ducted	Mix	Ducted
	Cooling	Capacity Rated* ¹	Btu/h	36,000	36,000	36,000	42,000	42,000	42,000
		Rated power consumption* ¹	W	2,570	2,845	3,180	3,130	3,470	3,890
		EER	Btu/Wh	14.00	12.65	11.30	13.40	12.10	10.80
		SEER	Btu/Wh	19.1	17.5	15.8	19.0	17.0	15.0
	Heating	Capacity Rated 47°F* ¹	Btu/h	45,000	45,000	45,000	48,000	48,000	48,000
		Capacity Max. 17°F* ²	Btu/h	45,000	45,000	45,000	48,000	48,000	48,000
		Capacity Max. 5°F	Btu/h	45,000	45,000	45,000	48,000	48,000	48,000
		Rated power consumption 47°F* ¹	W	3,340	3,795	4,250	3,430	3,890	4,350
		COP 47°F* ¹	Btu/Wh	3.95	3.48	3.10	4.10	3.62	3.23
HSPF IV/V		Btu/Wh	11.3/9.2	10.7/8.9	10.1/8.5	11.0/9.1	10.6/9.0	10.1/8.8	
OUTDOOR UNIT	Connectable indoor units (Max.)			4			5		
	Max. Connectable Capacity		Btu/h	46,000			54,000		
	Power supply			1 Phase 208/230 V, 60 Hz					
	Breaker Size/Max. fuse size			50 A/52 A 50 A/50 A (for the models with U1)					
	Min. circuit ampacity			42 A					
	Sound level (Cool/Heat)		dB	49/ 53			50/ 54		
	External finish			Munsell 3Y 7.8/ 1.1					
	Refrigerant control			Linear Expansion Valve					
	Compressor			Hermetic					
		Model		ANB33FJSMT					
		Motor output	kW	2.8			3.0		
		Starting method		Inverter					
	Heat exchanger			Plate fin coil					
	Fan	Fan (drive) × No.		Propeller fan × 2					
		Fan motor output		kW		0.06 + 0.06 0.074 + 0.074 (for the models with U1)			
		Airflow	m³/min (CFM)	110 (3885)					
	Dimensions	Width	in (mm)	41-11/32 (1050)					
		Depth	in (mm)	13+1 (330+25)					
		Height	in (mm)	52-11/16 (1338)					
	Weight		lb (kg)	276 (125)					
	Refrigerant			R410A					
		Charge	lb (kg)	10 lbs. 9 oz.(4.8)					
		Oil volume/Model	oz (L)	78 (2.3)/Ethereal oil (FV50S)					
	Protection de- vices	High pressure protection		HP switch					
		Compressor protection		Compressor thermo, Overcurrent detection					
		Fan motor protection		Overheating/Voltage protection					
	Guaranteed operation range		(cool)	D.B 23 to 115°F [D.B. -5 to 46°C] * ³					
			(heat)	D.B. -13 to 70°F [D.B. -25 to 21°C]					
REFRIGERANT PIPING	Total Piping length (Max.)		ft (m)		492 (150)				
	Farthest		ft (m)		262 (80)				
	Max. Height difference		ft (m)		164 (50)* ⁴				
	Chargeless length		ft (m)		0				
	Piping diameter	Liquid	inch (mm)	ø3/8 (9.52)					
		Gas	inch (mm)	ø5/8 (15.88)					
	Connection method	Indoor side		Flared					
Outdoor side		Flared							

*1 Rating conditions Cooling Indoor : D.B. 80°F/W.B. 67 °F [D.B.26.7°C/W.B. 19.4°C]
Outdoor : D.B. 95°F [D.B. 35.0°C]

Heating Indoor : D.B. 70°F [D.B. 21.1°C]
Outdoor : D.B. 47°F/W.B. 43°F [D.B. 8.3°C/W.B. 6.1°C]

*2 Conditions	Heating	Indoor : D.B. 70°F [D.B. 21.1°C]	Outdoor : D.B. 17°F/W.B. 15°F [D.B. -8.3°C/W.B. -9.4°C]
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*3 D.B. 5 to 115°F [D.B. -15 to 46°C], when an optional Air Outlet Guide is installed.

*4 131 ft [40 m], in case of installing outdoor unit lower than indoor unit.

Note: Refer to the indoor unit's service manual for the indoor units specifications.

Conversion formula:	kcal/h = kW × 860
	Btu/h = kW × 3412
	CFM = m ³ /min × 35.31

Service Ref.			MXZ-8C48NAHZ(-U1)			MXZ-8C48NA(-U1)			
Standard performance	Indoor type		Non-Ducted	Mix	Ducted	Non-Ducted	Mix	Ducted	
	Cooling	Capacity Rated* ¹	Btu/h	48,000	48,000	48,000	48,000	48,000	48,000
		Rated power consumption* ¹	W	4,000	4,465	5,050	4,000	4,465	5,050
		EER	Btu/Wh	12.00	10.75	9.50	12.00	10.75	9.50
		SEER	Btu/Wh	18.9	16.8	14.7	18.9	16.8	14.7
	Heating	Capacity Rated 47°F* ¹	Btu/h	54,000	54,000	54,000	54,000	54,000	54,000
		Capacity 17°F* ²	Btu/h	54,000	54,000	54,000	36,600	36,600	36,600
		Capacity 5°F	Btu/h	54,000	54,000	54,000	32,400	32,400	32,400
		Rated power consumption 47°F* ¹	W	4,220	4,605	4,990	4,220	4,605	4,990
		COP 47°F* ¹	Btu/Wh	3.75	3.44	3.17	3.75	3.44	3.17
HSPF IV/V		Btu/Wh	11.0/9.2	10.5/9.2	10.0/9.2	11.4/8.7	10.8/8.6	10.1/8.4	
OUTDOOR UNIT	Connectable indoor units (Max.)		8						
	Max. Connectable Capacity		Btu/h		62,000				
	Power supply		1 Phase 208/230 V, 60 Hz						
	Breaker Size / Max. fuse size		50 A/ 52 A 50 A/50 A (for the models with U1)			40 A/52 A 40 A/50 A (for the models with U1)			
	Min. circuit ampacity		42 A			37 A			
	Sound level (Cool/Heat)		dB		51/ 54				
	External finish		Munsell 3Y 7.8 / 1.1						
	Refrigerant control		Linear Expansion Valve						
	Compressor		Hermetic						
		Model	ANB33FJSMT			ANB33FNHMT			
		Motor output	kW		3.4				
		Starting method		Inverter					
	Heat exchanger		Plate fin coil						
	Fan	Fan (drive) × No.		Propeller fan × 2					
		Fan motor output		kW		0.06 + 0.06 0.074 + 0.074 (for the models with U1)			
		Airflow		m³/min (CFM)		110 (3885)			
	Dimensions	Width	inch (mm)	41-11/32 (1050)					
		Depth	inch (mm)	13+1 (330+25)					
		Height	inch (mm)	52-11/16 (1338)					
	Weight		lb (kg)		276 (125)		269 (122)		
	Refrigerant		R410A						
		Charge	lb (kg)		10 lbs. 9 oz. (4.8)				
		Oil volume/Model	oz (L)		78 (2.3) / Ethereal oil (FV50S)				
	Protection devices	High pressure protection		HP switch					
		Compressor protection		Compressor thermo, Over current detection					
		Fan motor protection		Overheating/Voltage protection					
	Guaranteed operation range		(cool)		D.B. 23 to 115°F [D.B. -5 to 46°C]* ³				
			(heat)		D.B. -13 to 70°F [D.B. -25 to 21°C]		D.B. -4 to 70°F [D.B. -20 to 21°C]		
REFRIGERANT PIPING	Total Piping length (Max.)		ft (m)		492 (150)				
	Farthest		ft (m)		262 (80)				
	Max. Height difference		ft (m)		164 (50)* ⁴				
	Chargeless length		ft (m)		0				
	Piping diameter	Liquid	inch (mm)		ø3/8 (9.52)				
		Gas	inch (mm)		ø5/8 (15.88)				
	Connection method	Indoor side		Flared					
Outdoor side		Flared							

*¹ Rating conditions Cooling Indoor : D.B. 80°F/W.B. 67°F [D.B. 26.7°C/W.B. 19.4°C]

Outdoor : D.B. 95°F [D.B. 35.0°C]

Heating Indoor : D.B. 70°F [D.B. 21.1°C]

Outdoor : D.B. 47°F/W.B. 43°F [D.B. 8.3°C/W.B. 6.1°C]

*² Conditions Heating Indoor : D.B. 70°F [D.B. 21.1°C]

Outdoor : D.B. 17°F/W.B. 15°F [D.B. -8.3°C/W.B. -9.4°C]

*³ D.B. 5 to 115°F [D.B. -15 to 46°C], when an optional Air Outlet Guide is installed.

*⁴ 131 ft [40 m], in case of installing outdoor unit lower than indoor unit.

Note: Refer to the indoor unit's service manual for the indoor units specifications.

Conversion formula:	$\text{kcal/h} = \text{kW} \times 860$ $\text{Btu/h} = \text{kW} \times 3412$ $\text{CFM} = \text{m}^3/\text{min} \times 35.31$
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Service Ref.				MXZ-8C60NA-U1		
Standard performance	Indoor type			Non-Ducted	Mix	Ducted
	Cooling	Capacity Rated*1	Btu/h	60,000	60,000	60,000
		Rated power consumption*1	W	4,800	5,525	6,250
		EER	Btu/Wh	12.50	11.05	9.60
		SEER	Btu/Wh	17.4	16.3	15.1
	Heating	Capacity Rated 47°F*1	Btu/h	66,000	66,000	66,000
		Capacity Max. 17°F*2	Btu/h	65,000	61,500	58,000
		Capacity Max. 5°F	Btu/h	57,000	49,500	42,000
		Rated power consumption 47°F*1	W	5,670	5,670	5,670
		COP 47°F*1	Btu/Wh	3.40	3.40	3.40
HSPF IV/V		Btu/Wh	10.50/8.50	10.25/8.25	10.00/8.00	
OUTDOOR UNIT	Connectable indoor units (Max.)			8		
	Max. Connectable Capacity		Btu/h	78,000		
	Power supply			1 Phase 208/230 V, 60 Hz		
	Breaker Size/Max. fuse size			50 A/52 A		
	Min. circuit ampacity			46A		
	Sound level (Cool/Heat)		dB	58/59		
	External finish			Munsell 3Y 7.8/ 1.1		
	Refrigerant control			Linear Expansion Valve		
	Compressor			Hermetic		
		Model		ANB66FFZMT		
		Motor output	kW	4.2		
		Starting method		Inverter		
	Heat exchanger			Plate fin coil		
	Fan	Fan (drive) × No.		Propeller fan × 2		
		Fan motor output		kW	0.2 + 0.2	
		Airflow	m³/min (CFM)	138 (4879)		
	Dimensions	Width	in (mm)	41-11/32 (1050)		
		Depth	in (mm)	13+1 (330+25)		
		Height	in (mm)	52-11/16 (1338)		
	Weight		lb (kg)	309 (140)		
	Refrigerant			R410A		
		Charge	lb (kg)	11 lbs. 4 oz.(5.1)		
		Oil volume/Model	oz (L)	78 (2.3)/Ethereal oil (FV50S)		
Protection de- vices	High pressure protection		HP switch			
	Compressor protection		Compressor thermo, Overcurrent detection			
	Fan motor protection		Overheating/Voltage protection			
Guaranteed operation range		(cool)	D.B 23 to 115°F [D.B.-5 to 46°C] *3			
		(heat)	D.B. -4 to 70°F [D.B. -20 to 21°C]			
REFRIGERANT PIPING	Total Piping length (Max.)		ft (m)	492 (150)		
	Farthest		ft (m)	262 (80)		
	Max. Height difference		ft (m)	164 (50)*4		
	Chargeless length		ft (m)	0		
	Piping diameter	Liquid	inch (mm)	ø3/8 (9.52)		
		Gas	inch (mm)	ø3/4 (19.05)		
	Connection method	Indoor side		Flared		
		Outdoor side		Flared		

*1 Rating conditions Cooling Indoor : D.B. 80°F/W.B. 67 °F [D.B.26.7°C/W.B. 19.4°C]

Outdoor : D.B. 95°F [D.B. 35.0°C]

Heating Indoor : D.B. 70°F [D.B. 21.1°C]

Outdoor : D.B. 47°F/W.B. 43°F [D.B. 8.3°C/W.B. 6.1°C]

Heating Indoor : D.B. 70°F [D.B. 21.1°C]

Outdoor : D.B. 17°F/W.B. 15°F [D.B. -8.3°C/W.B. -9.4°C]

*3 D.B. 5 to 115°F [D.B. -15 to 46°C], when an optional Air Outlet Guide is installed.

*4 131 ft [40 m], in case of installing outdoor unit lower than indoor unit.

Note: Refer to the indoor unit's service manual for the indoor units specifications.

3-2. BRANCH BOX: PAC-MKA50BC PAC-MKA51BC PAC-MKA30BC PAC-MKA31BC

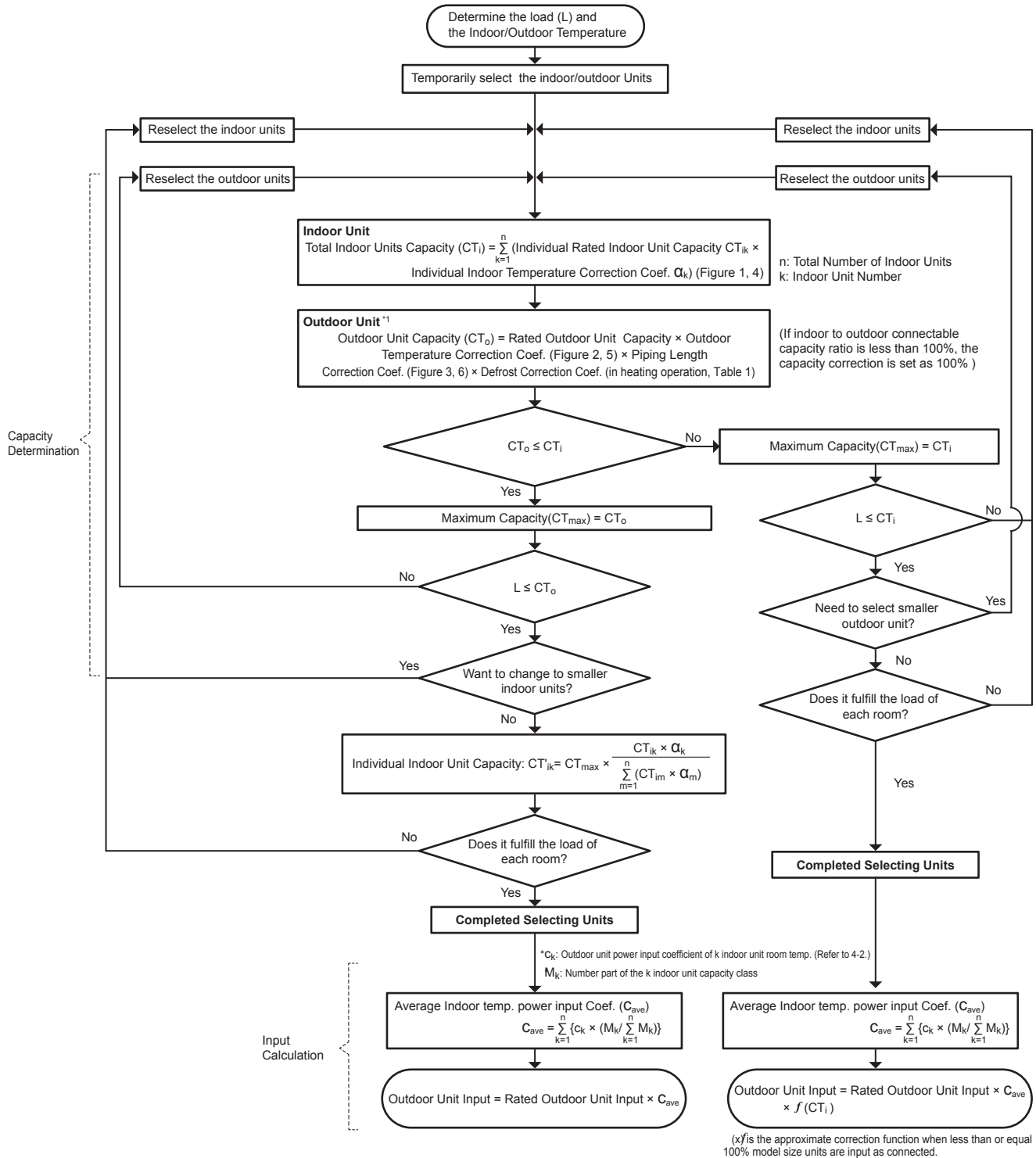
Model name				PAC-MKA50BC PAC-MKA51BC		PAC-MKA30BC PAC-MKA31BC	
Connectable number of indoor units				Maximum 5		Maximum 3	
Power supply				Single phase, 208/230 V, 60 Hz			
Input			kW	0.003			
Running current			A	0.05			
External finish				Galvanized sheets			
Dimensions	Width		inch (mm)	17-23/32 (450)			
	Depth		inch (mm)	11-1/32 (280)			
	Height		inch (mm)	6-11/16 (170)			
Weight			lb (kg)	16 (7.4)		15 (6.7)	
Piping connection (Flare)	Branch (indoor side)*		Liquid	inch (mm)	ø1/4 (6.35) × 5 {A,B,C,D,E}		ø1/4 (6.35) × 3 {A,B,C}
			Gas	inch (mm)	ø3/8 (9.52) × 4 {A,B,C,D}, ø1/2 (12.7) × 1{E}		ø3/8 (9.52) × 3 {A,B,C}
	Main (outdoor side)		Liquid	inch (mm)	ø3/8 (9.52)		
			Gas	inch (mm)	ø5/8 (15.88)		

*The piping connection size differs according to the type and capacity of indoor units. Match the piping connection size for indoor and branch box. If the piping connection size of branch box does not match the piping connection size of indoor units, use optional different-diameter (deformed) joints to the branch box side. (Connect deformed joint directly to the branch box side.)

4-1. SELECTION OF COOLING/HEATING UNITS

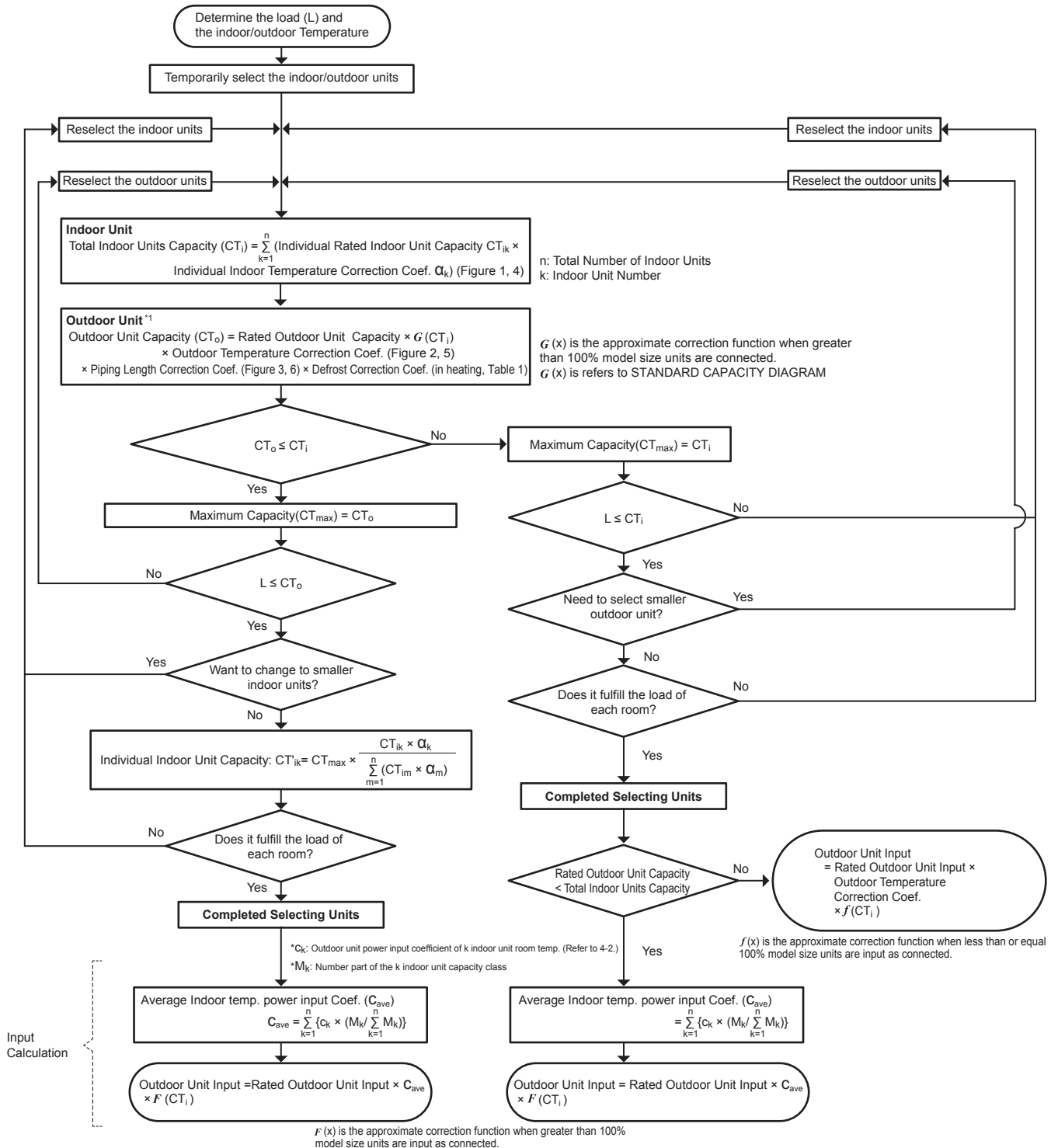
How to determine the capacity when less than or equal 100% indoor model size units are connected in total:

The purpose of this flow chart is to select the indoor and outdoor units. For other purposes, this flow chart is intended only for reference.



How to determine the capacity when greater than 100% indoor model size units are connected in total:

The purpose of this flow chart is to select the indoor and outdoor units. For other purposes, this flow chart is intended only for reference.



<Cooling>

Design Condition	
Outdoor Design Dry Bulb Temperature	98.6°F (37.0°C)
Total Cooling Load	29.6 kBtu/h
Room1	
Indoor Design Dry Bulb Temperature	80.6°F (27.0°C)
Indoor Design Wet Bulb Temperature	68.0°F (20.0°C)
Cooling Load	13.6 kBtu/h
Room2	
Indoor Design Dry Bulb Temperature	75.2°F (24.0°C)
Indoor Design Wet Bulb Temperature	66.2°F (19.0°C)
Cooling Load	16.0 kBtu/h
<Other>	
Indoor/Outdoor Equivalent Piping Length	250 ft

Rated capacity of indoor unit [kBtu/h]

Model name	Capacity class							
	06	09	12	15	18	24	30	36
MVZ	-	-	12.0	-	18.0	24.0	30.0	36.0
SLZ-KF	-	8.4	11.1	15.0	-	-	-	-
SEZ-KD	-	8.1	11.5	14.1	17.2	-	-	-
MFZ-KJ	-	9.0	12.0	15.0	17.0	-	-	-
MLZ-KP	-	9.0	12.0	-	17.2	-	-	-
MSZ-FH	6.0	9.0	12.0	15.0	17.2	-	-	-
MSZ-GL	6.0	9.0	12.0	14.0	17.2	22.5	-	-
PEAD	-	9.0	12.0	15.0	18.0	24.0	30.0	36.0
PLA	-	-	12.0	-	18.0	24.0	30.0	36.0

1. Cooling Calculation

(1) Temporary Selection of Indoor Units

Room1
MSZ-FH15 **15.0 kBtu/h (Rated)**

Room2
MSZ-FH18 **17.2 kBtu/h (Rated)**

(2) Total Indoor Units Capacity

15 + 18 = 33

(3) Selection of Outdoor Unit

The P36 outdoor unit is selected as total indoor units capacity is P33

MXZ-4C36 **36.0 kBtu/h**

(4) Total Indoor Units Capacity Correction Calculation

Room1
Indoor Design Wet Bulb Temperature Correction (68.0°F) 1.02 (Refer to Figure 1)

Room2
Indoor Design Wet Bulb Temperature Correction (66.2°F) 0.98 (Refer to Figure 1)

Total Indoor Units Capacity (CTi)

CTi = Σ (Indoor Unit Rating \times Indoor Design Temperature Correction)

= 15.0 \times 1.02 + 17.2 \times 0.98

= 32.2 kBtu/h

(5) Outdoor Unit Correction Calculation

Outdoor Design Dry Bulb Temperature Correction (98.6°F) 0.98 (Refer to Figure 2)

Piping Length Correction (250 ft) 0.93 (Refer to Figure 3)

Total Outdoor Unit Capacity (CTo)

CTo = Outdoor Rating \times Outdoor Design Temperature Correction \times Piping Length Correction

= 36.0 \times 0.98 \times 0.93

= 32.2 kBtu/h

(6) Determination of Maximum System Capacity

Comparison of Capacity between Total Indoor Units Capacity (CTi) and Total Outdoor Unit Capacity (CTo)

CTi = 32.2 < CTo = 32.8, thus, select CTi.

CTx = CTi = 32.2 kBtu/h

(7) Comparison with Essential Load

Against the essential load 29.6 kBtu/h, the maximum system capacity is 32.2 kBtu/h: Proper outdoor units have been selected.

(8) Calculation of Maximum Indoor Unit Capacity of Each Room

CTx = CTi, thus, calculate by the calculation below

Room1

Indoor Unit Rating \times Indoor Design Temperature Correction

= 15.0 \times 1.02

= 15.3 kBtu/h

OK: fulfills the load 13.6 kBtu/h

Room2

Indoor Unit Rating \times Indoor Design Temperature Correction

= 17.2 \times 0.98

= 16.9 kBtu/h

OK: fulfills the load 16.0 kBtu/h

Go on to the heating trial calculation since the selected units fulfill the cooling loads of Room 1, 2.

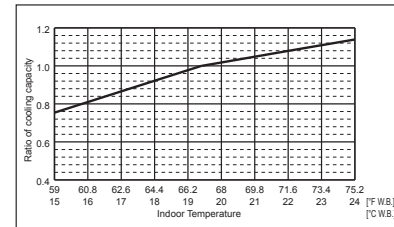


Figure 1 Indoor unit temperature correction
To be used to correct indoor unit only

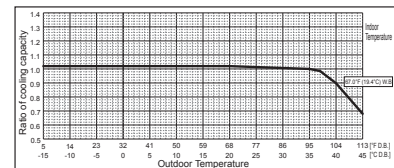


Figure 2 Outdoor unit temperature correction
To be used to correct outdoor unit only

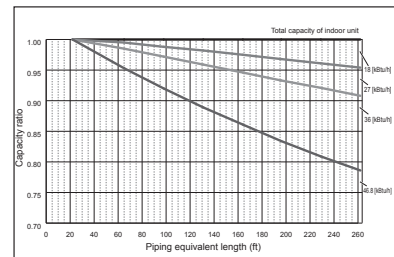


Figure 3 Correction of refrigerant piping length

<Heating>

Design Condition	
Outdoor Design Wet Bulb Temperature	23.0°F (-5.0°C)
Total Heating Load	34.0 kBtu/h
Room1	
Indoor Design Dry Bulb Temperature	69.8°F (21.0°C)
Heating Load	16.3 kBtu/h
Room2	
Indoor Design Dry Bulb Temperature	73.4°F (23.0°C)
Heating Load	17.7 kBtu/h
<Other> Indoor/Outdoor Equivalent Piping Length	230 ft

Rated capacity of indoor unit [kBtu/h]

Model name	Capacity class							
	06	09	12	15	18	24	30	36
MVZ	-	-	12.0	-	18.0	27.0	34.0	40.0
SLZ-KF	-	10.2	13.7	17.1	-	-	-	-
SEZ-KD	-	10.9	13.6	18.0	17.2	-	-	-
MFZ-KJ	-	10.9	13.0	18.0	21.0	-	-	-
MLZ-KP	-	10.9	13.0	-	21.0	-	-	-
MSZ-FH	6.0	10.9	13.6	18.0	20.3	-	-	-
MSZ-GL	6.0	10.9	14.4	18.0	21.6	27.6	-	-
PEAD	-	10.9	13.5	15.7	18.0	26.0	34.0	40.0
PLA	-	-	13.5	-	18.0	26.0	34.0	40.0

2. Heating Calculation

(1) Temporary Selection of Indoor Units

Room1	
MSZ-FH15	18.0 kBtu/h (Rated)
Room2	
MSZ-FH18	20.3 kBtu/h (Rated)

(2) Total Indoor Units Capacity

$$15 + 18 = 33$$

(3) Selection of Outdoor Unit

The P36 outdoor unit is selected as total indoor units capacity is P33

MXZ-4C36	45.0 kBtu/h
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(4) Total Indoor Units Capacity Correction Calculation

Room1	
Indoor Design Dry Bulb Temperature Correction (69.8°F)	1.00 (Refer to Figure 4)
Room2	
Indoor Design Dry Bulb Temperature Correction (73.4°F)	0.92 (Refer to Figure 4)

Total Indoor Units Capacity (CTi)

$$\begin{aligned}
 CTi &= \Sigma (\text{Indoor Unit Rating} \times \text{Indoor Design Temperature Correction}) \\
 &= 18.0 \times 1.00 + 20.3 \times 0.92 \\
 &= 36.7 \text{ kBtu/h}
 \end{aligned}$$

(5) Outdoor Unit Correction Calculation

Outdoor Design Wet Bulb Temperature Correction (23.0°F)	0.85 (Refer to Figure 5)
Piping Length Correction (230 ft)	0.96 (Refer to Figure 6)
Defrost Correction	0.95 (Refer to Table 1)

Total Outdoor Unit Capacity (CTo)

$$\begin{aligned}
 CTo &= \text{Outdoor Unit Rating} \times \text{Outdoor Design Temperature Correction} \times \text{Piping Length Correction} \times \text{Defrost Correction} \\
 &= 45.0 \times 1.0 \times 0.85 \times 0.95 \\
 &= 34.9 \text{ kBtu/h}
 \end{aligned}$$

Table 1 Table of correction factor at frost and defrost

Outdoor Intake temperature <W.B.°F (°C)>	43(6)	37(4)	36(2)	32(0)	28(-2)	25(-4)	21(-6)	18(-8)	14(-10)	5(-15)	-4(-20)	-13(-25)
Correction factor	1.0	0.98	0.89	0.88	0.89	0.9	0.95	0.95	0.95	0.95	0.95	0.95

(6) Determination of Maximum System Capacity

Comparison of Capacity between Total Indoor Units Capacity (CTi) and Total Outdoor Unit Capacity (CTo)

$$CTi = 36.7 > CTo = 34.9, \text{ thus, select } CTo.$$

$$CTx = CTo = 34.9 \text{ kBtu/h}$$

(7) Comparison with Essential Load

Against the essential load 34.0 kBtu/h, the maximum system capacity is 34.9 kBtu/h: Proper outdoor units have been selected.

(8) Calculation of Maximum Indoor Unit Capacity of Each Room

CTx = CTo, thus, calculate by the calculation below

Room1	
Maximum Capacity × Room1 Capacity after the Temperature Correction / (Room1,2 Total Capacity after the Temperature Correction)	
$= 34.9 \times (18.0 \times 1.00) / (18.0 \times 1.00 + 20.3 \times 0.92)$	
$= 17.1 \text{ kBtu/h}$	OK: fulfills the load 16.3 kBtu/h
Room2	
Maximum Capacity × Room1 Capacity after the Temperature Correction / (Room1,2 Total Capacity after the Temperature Correction)	
$= 34.9 \times (20.3 \times 0.92) / (18.0 \times 1.00 + 20.3 \times 0.92)$	
$= 17.8 \text{ kBtu/h}$	OK: fulfills the load 17.7 kBtu/h

$$\begin{aligned}
 &= 34.9 \times (20.3 \times 0.92) / (18.0 \times 1.00 + 20.3 \times 0.92) \\
 &= 17.8 \text{ kBtu/h}
 \end{aligned}$$

Completed selecting units since the selected units fulfill the heating loads of Room 1, 2.

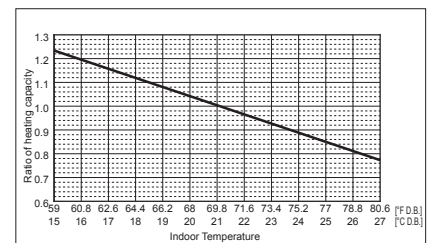


Figure 4 Indoor unit temperature correction
To be used to correct indoor unit only

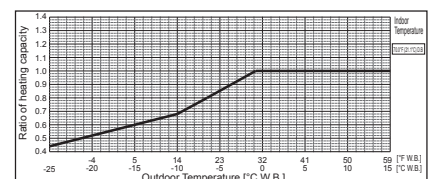


Figure 5 Outdoor unit temperature correction
To be used to correct outdoor unit only

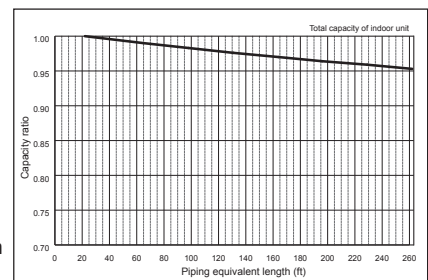


Figure 6 Correction of refrigerant piping length

3. Power input of outdoor unit

Outdoor unit : MXZ-4C36

Indoor unit 1 : MSZ-FH15

Indoor unit 2 : MSZ-FH18

<Cooling>

(1) Rated power input of outdoor unit

2.57 kW

(2) Calculation of the average indoor temperature power input coefficient (Cave)

Coefficient of the outdoor unit for indoor unit 1 (Outdoor temp. 98.6°F [37.0°C] D.B., Indoor temp. 68.0°F [20.0°C] W.B.)

1.04 (Refer to "4-2. CORRECTION BY TEMPERATURE".)

Coefficient of the outdoor unit for indoor unit 2 (Outdoor temp. 98.6°F [37.0°C] D.B., Indoor temp. 66.2°F [19.0°C] W.B.)

1.00 (Refer to "4-2. CORRECTION BY TEMPERATURE".)

$$\text{Average indoor temp. power input coefficient (C}_{ave}\text{)} = \sum_{k=1}^n \{c_k \times (M_k / \sum_{k=1}^n M_k)\}$$

n: Total number of the indoor units

k: Number of the indoor unit

c_k: Outdoor unit power input coefficient of k indoor unit room temp.

M_k: Number part of the k indoor unit capacity class

$$= 1.04 \times 15 / (15 + 18) + 1.00 \times 18 / (15 + 18)$$

$$= 1.02$$

(3) Coefficient of the partial load f(CTi)

Total Indoor units capacity

15 + 18 = 33, thus, f(CTi) = 0.96 (Refer to the tables in "4-4. STANDARD CAPACITY DIAGRAM".)

(4) Outdoor power input (Plo)

Maximum System Capacity (CTx) = Total Indoor unit Capacity (CTi), so use the following formula

Plo = Outdoor unit Cooling Rated Power Input × Correction Coefficient of Indoor temperature (Cave) × f(CTi)

$$= 2.57 \times 1.02 \times 0.96$$

$$= 2.52 \text{ kW}$$

<Heating>

(1) Rated power input of outdoor unit

3.34 kW

(2) Calculation of the average indoor temperature power input coefficient

Coefficient of the outdoor unit for indoor unit 1 (Outdoor temp. 23.0°F [-5.0°C] W.B., Indoor temp. 69.8°F [21.0°C] D.B.)

1.10 (Refer to "4-2. CORRECTION BY TEMPERATURE".)

Coefficient of the outdoor unit for indoor unit 2 (Outdoor temp. 23.0°F [-5.0°C] W.B., Indoor temp. 73.4°F [23.0°C] D.B.)

1.12 (Refer to "4-2. CORRECTION BY TEMPERATURE".)

Average indoor temp. power input coefficient (C_{ave}) = $\sum_{k=1}^n \{c_k \times (M_k / \sum_{k=1}^n M_k)\}$

n: Total number of the indoor units

k: Number of the indoor unit

c_k : Outdoor unit power input coefficient of k indoor unit room temp.

M_k : Number part of the k indoor unit capacity class

$$= 1.10 \times 15 / (15 + 18) + 1.12 \times 18 / (15 + 18)$$

$$= 1.11$$

(3) No need to consider coefficient of partial load f' (CTi)

(4) Outdoor power input (Plo)

Maximum System Capacity (CTx) = Total Outdoor unit Capacity (CTo), so use the following formula

Plo = Outdoor unit Heating Rated Power Input × Correction Coefficient of Indoor temperature × (Cave)

$$= 3.34 \times 1.20 \times 1.11$$

$$= 3.71 \text{ kW}$$

4-2. CORRECTION BY TEMPERATURE

The outdoor units have varied capacity at different designing temperature. Using the nominal cooling/heating capacity value and the ratio below, the capacity can be observed at various temperature.

<Cooling>

Figure 7 Indoor unit temperature correction

To be used to correct indoor unit capacity only

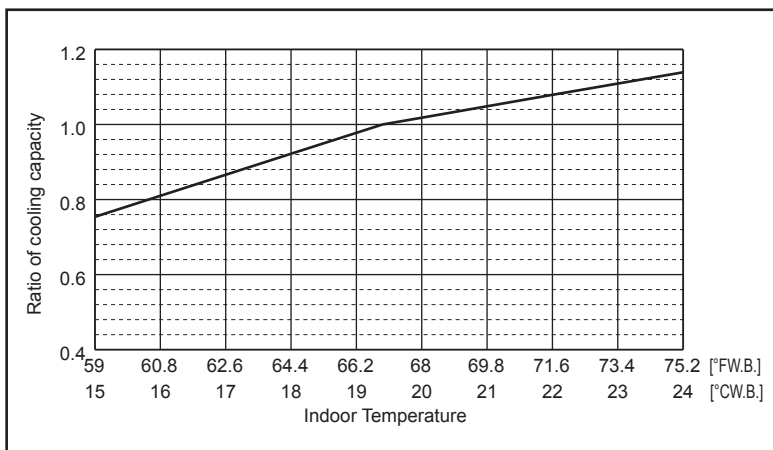
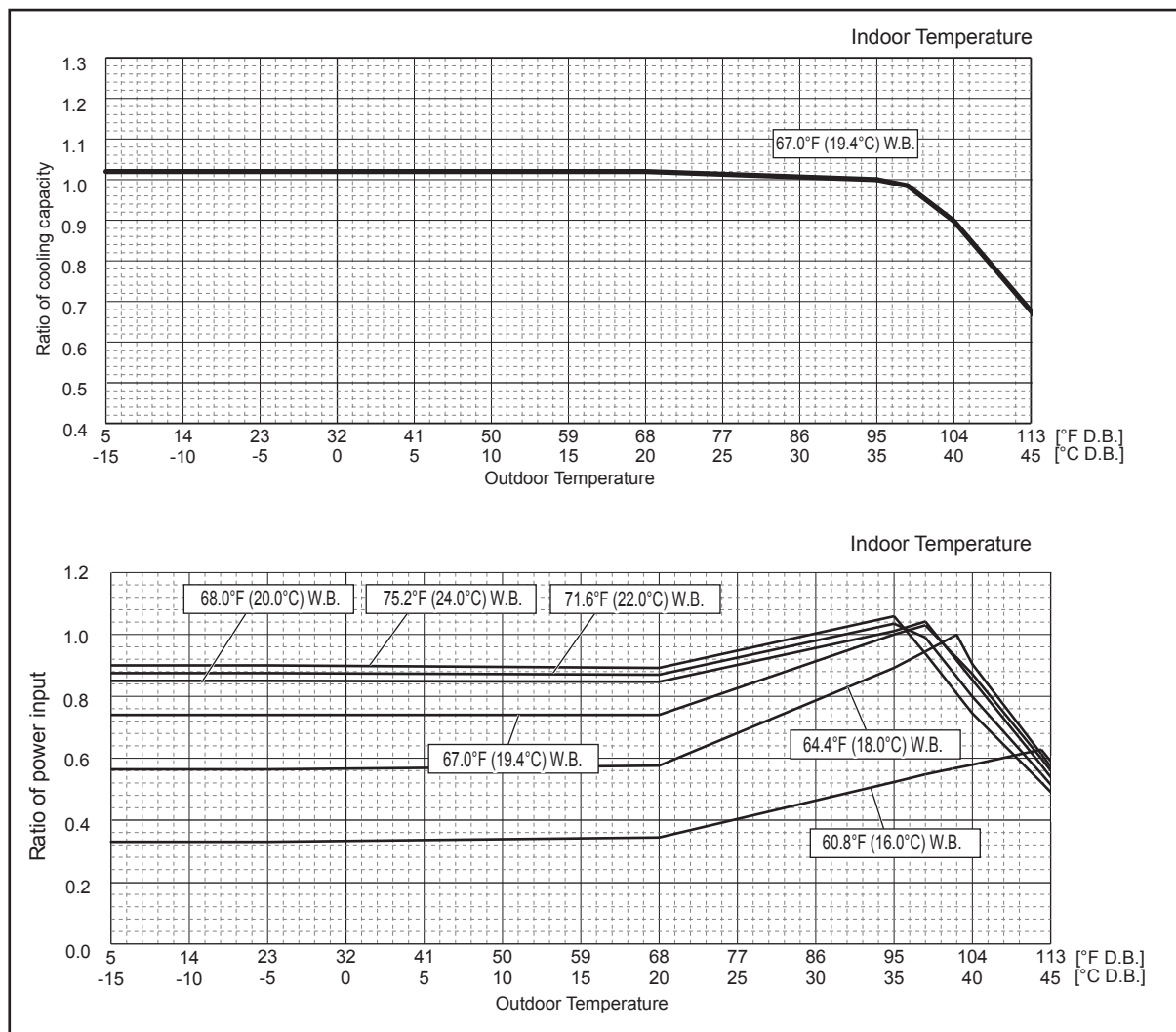


Figure 8 Outdoor unit temperature correction

To be used to correct outdoor unit capacity only



<Heating>

Figure 9 Indoor unit temperature correction
To be used to correct indoor unit capacity only

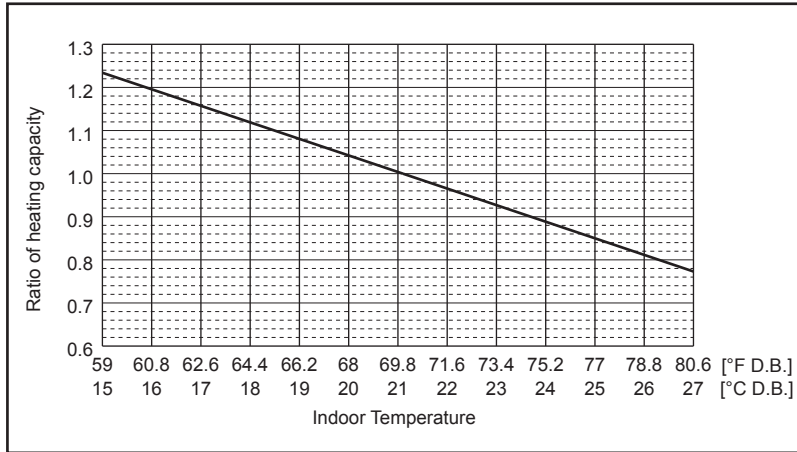
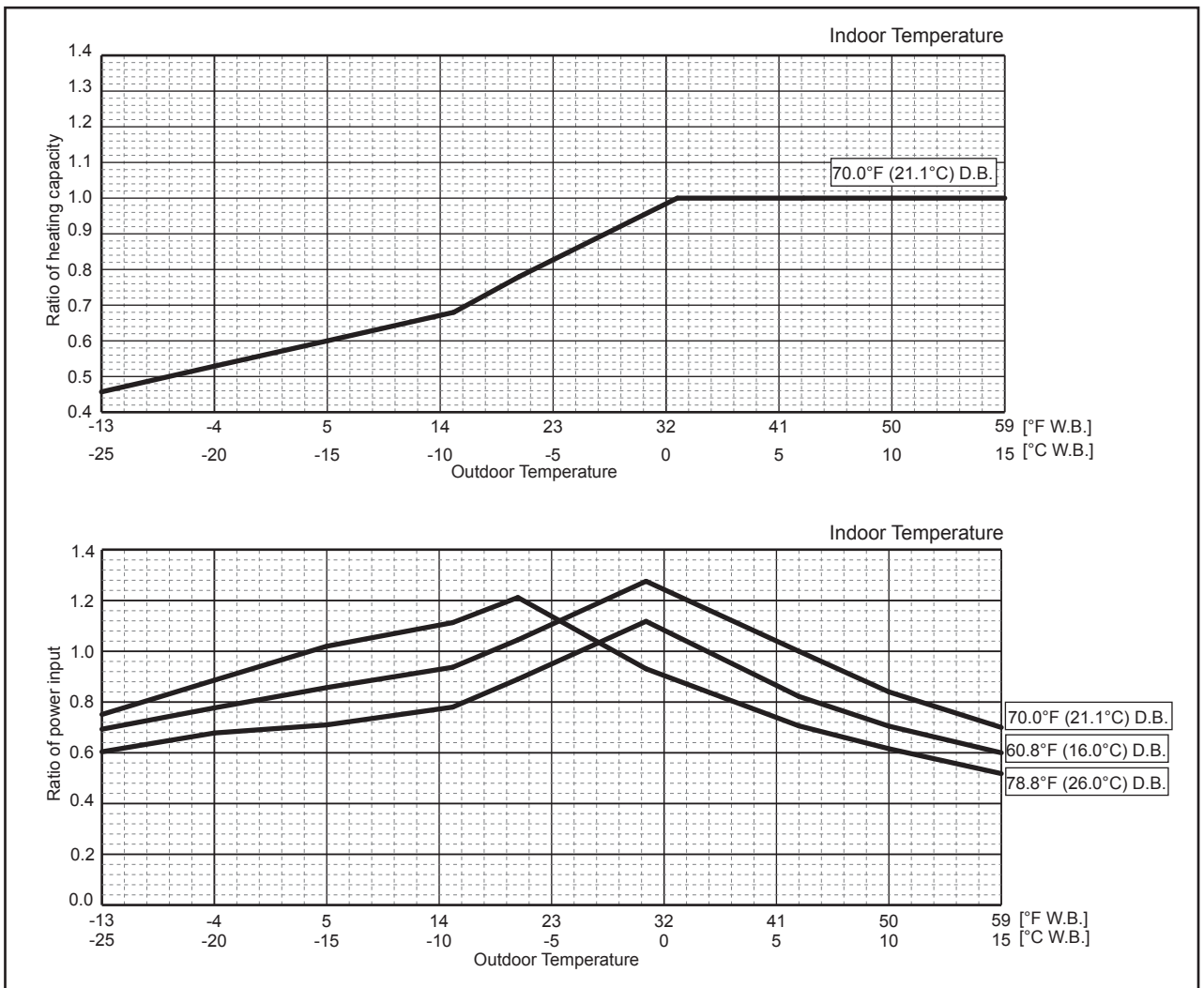


Figure 10 Outdoor unit temperature correction
To be used to correct outdoor unit capacity only



<Heating> (NAHZ)

Figure 11 Indoor unit temperature correction
To be used to correct indoor unit capacity only

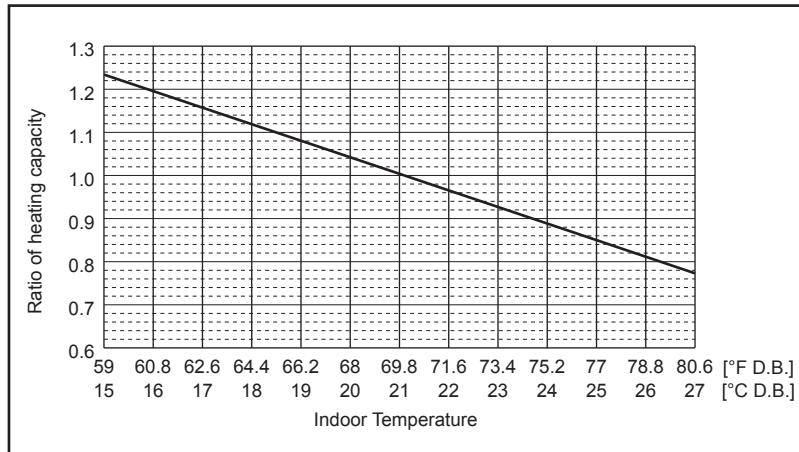
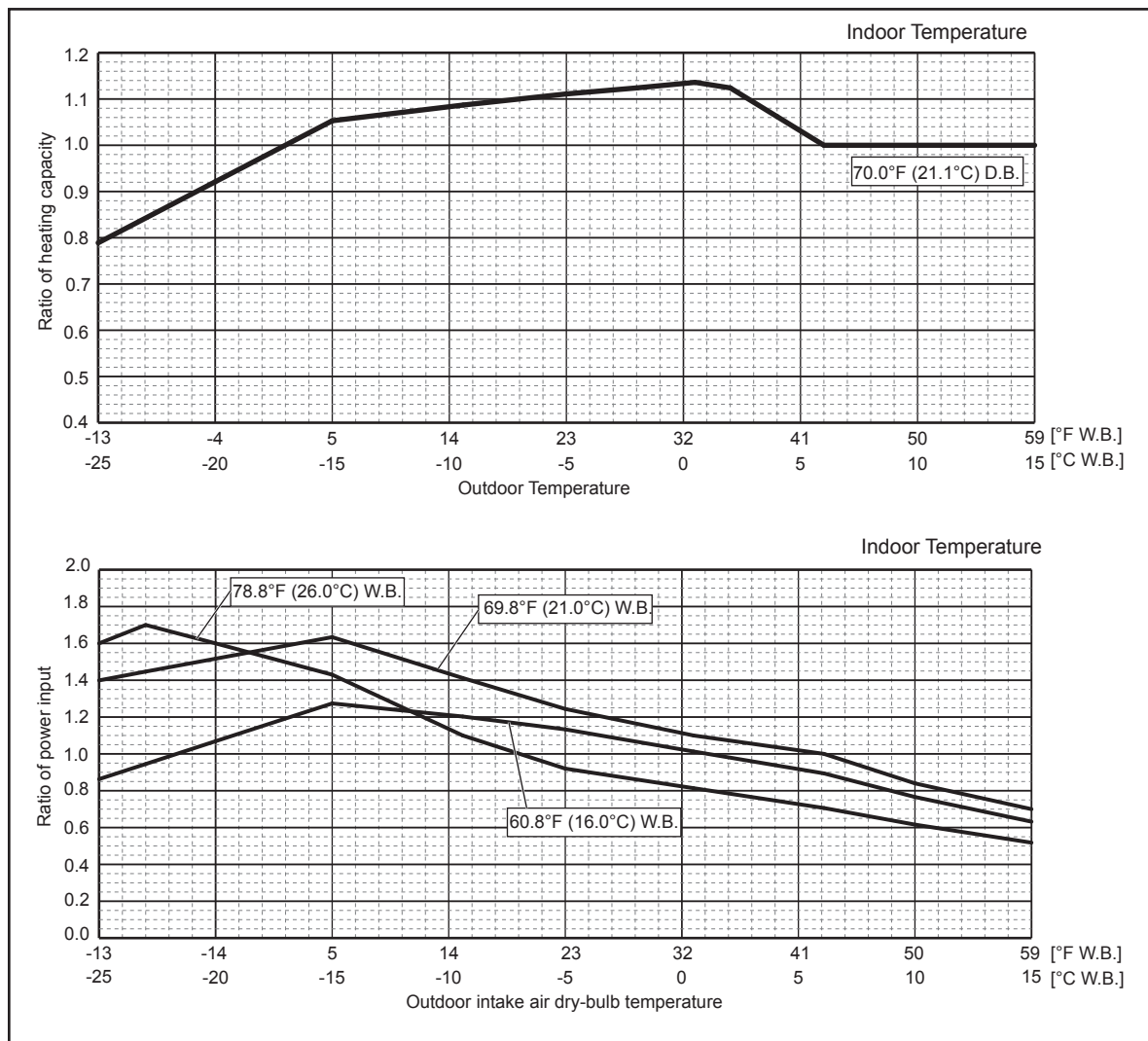


Figure 12 Outdoor unit temperature correction
To be used to correct outdoor unit capacity only



4-3. STANDARD OPERATION DATA (REFERENCE DATA)

Operation				Outdoor unit model			
				MXZ-4C36NAHZ		MXZ-5C42NAHZ	
Operating conditions	Ambient temperature	Indoor	DB/WB	80°F/67°F	70°F/60°F	80°F/67°F	70°F/60°F
		Outdoor		95°F/75°F	47°F/43°F	95°F/75°F	47°F/43°F
	Indoor unit	No. of connected units	Unit	4		4	
		No. of units in operation		4		4	
		Model		09 × 4		09 × 2 + 12 × 2	
	Piping	Main pipe	ft (m)	9.84 (3)		9.84 (3)	
		Branch pipe		14.76 (4.5)		14.76 (4.5)	
		Total pipe length		68.90 (21)		68.90 (21)	
	Fan speed		—	Hi		Hi	
	Amount of refrigerant		lb oz (kg)	17 lb 7 oz (7.9)		17 lb 7 oz (7.9)	
Outdoor unit	Electric current		A	14.1	18.7	17.2	19.1
	Voltage		V	230		230	
	Compressor frequency		Hz	59	74	70	80
LEV opening	Indoor unit		Pulse	112	128	129	128
Pressure	High pressure/Low pressure		MPaG	2.57/0.98	2.78/0.64	2.72/0.80	2.80/0.56
			PSIG	373/142	403/93	395/116	406/81
Temp. of each section	Outdoor unit	Discharge	°F (°C)	143.8 (62.1)	151.5 (66.4)	148.6 (64.8)	145.8 (63.2)
		Heat exchanger outlet		100.8 (38.2)	36.7 (2.6)	101.8 (38.8)	35.6 (2.0)
		Accumulator inlet		50.5 (10.3)	36.1 (2.3)	49.5 (9.7)	34.9 (1.6)
		Compressor inlet		47.1 (8.4)	34.0 (1.1)	45.3 (7.4)	32.7 (0.4)
	Indoor unit	LEV inlet		70.0 (21.1)	103.5 (39.7)	83.7 (28.7)	100.2 (37.9)
		Heat exchanger inlet		54.1 (12.3)	138.9 (59.4)	49.6 (9.8)	132.3 (55.7)

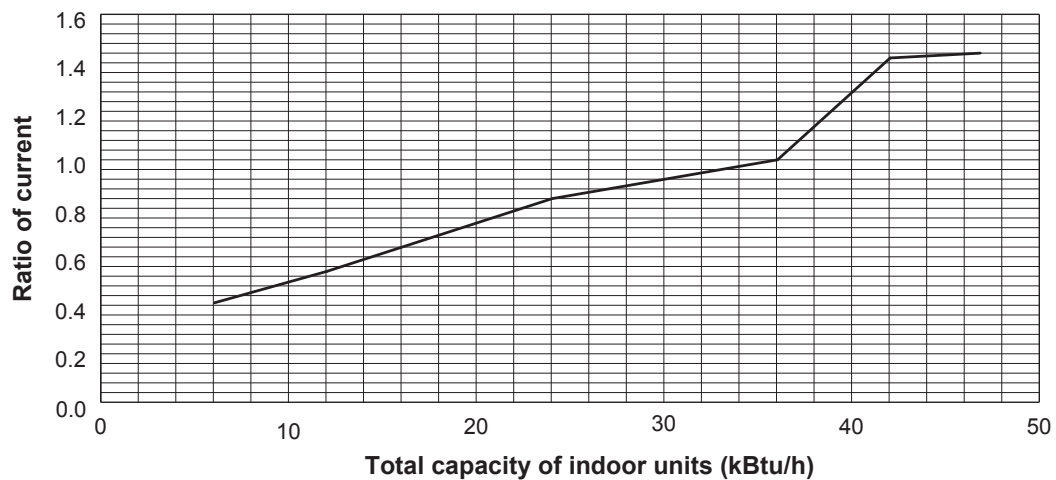
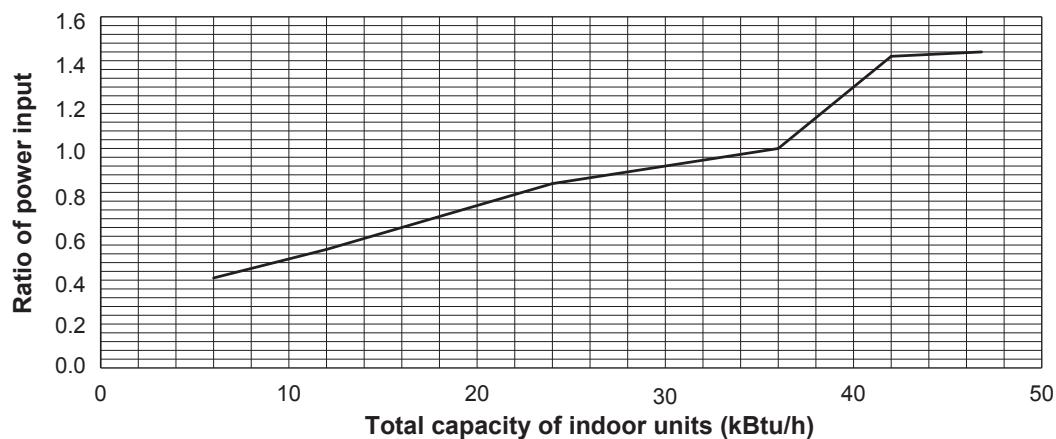
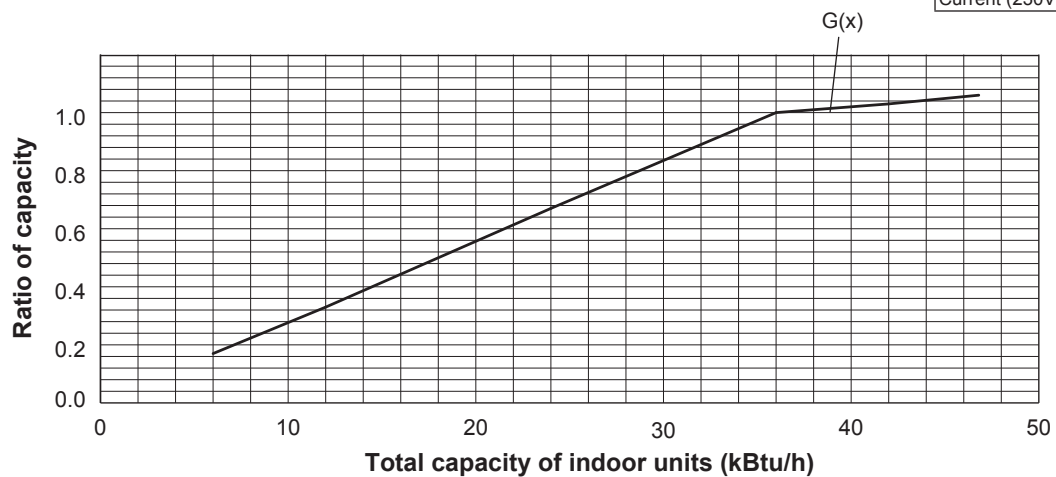
Operation				Outdoor unit model			
				MXZ-8C48NA/NAHZ		MXZ-8C60NA	
Operating conditions	Ambient temperature	Indoor	DB/WB	80°F/67°F	70°F/60°F	80°F/67°F	70°F/60°F
		Outdoor		95°F/75°F	47°F/43°F	95°F/75°F	47°F/43°F
	Indoor unit	No. of connected units	Unit	4		5	
		No. of units in operation		4		5	
		Model		12 × 4		09 × 3 + 15 + 18	
	Piping	Main pipe	ft (m)	9.84 (3)		9.84 (3)	
		Branch pipe		14.76 (4.5)		14.76 (4.5)	
		Total pipe length		68.90 (21)		83.79 (25.5)	
	Fan speed		—	Hi		Hi	
	Amount of refrigerant		lb oz (kg)	17 lb 7 oz (7.9)		20 lb (8.9)	
Outdoor unit	Electric current		A	22.1	21.9	20.4	24.4
	Voltage		V	230		230	
	Compressor frequency		Hz	86	91	45	51
LEV opening	Indoor unit		Pulse	112	132	187	229
Pressure	High pressure/Low pressure		MPaG	2.83/0.77	2.82/0.55	2.84/0.92	2.44/0.672
			PSIG	410/112	409/80	412/134	354/97.5
Temp. of each section	Outdoor unit	Discharge	°F (°C)	157.6 (69.8)	149.2 (65.1)	167 (75.0)	133.9 (56.6)
		Heat exchanger outlet		105.6 (40.9)	34.3 (1.3)	98.8 (37.1)	51.1 (10.2)
		Accumulator inlet		47.1 (8.4)	33.4 (0.8)	49.5 (9.7)	32.4 (0.2)
		Compressor inlet		42.4 (5.8)	30.6 (−0.8)	72.5 (22.5)	31.6 (−0.2)
	Indoor unit	LEV inlet		71.1 (21.7)	98.8 (37.1)	59.7 (15.4)	81.9 (27.7)
		Heat exchanger inlet		47.5 (8.6)	134.6 (57.0)	52.5 (11.4)	104.2 (40.1)

4-4. STANDARD CAPACITY DIAGRAM

Before calculating the sum of total capacity of indoor units, please convert the value into the kW model capacity following the formula on "4-1. Method for obtaining system cooling and heating capacity".

4-4-1. MXZ-4C36NAHZ <cooling>

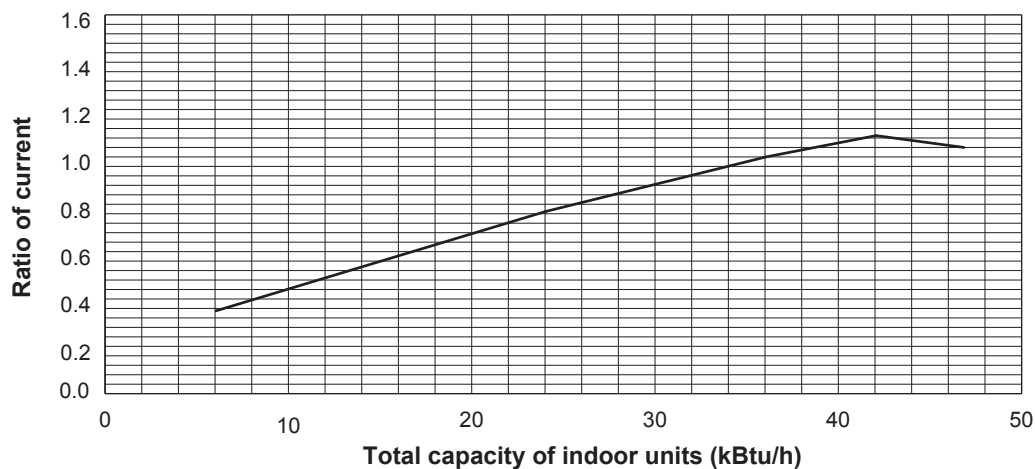
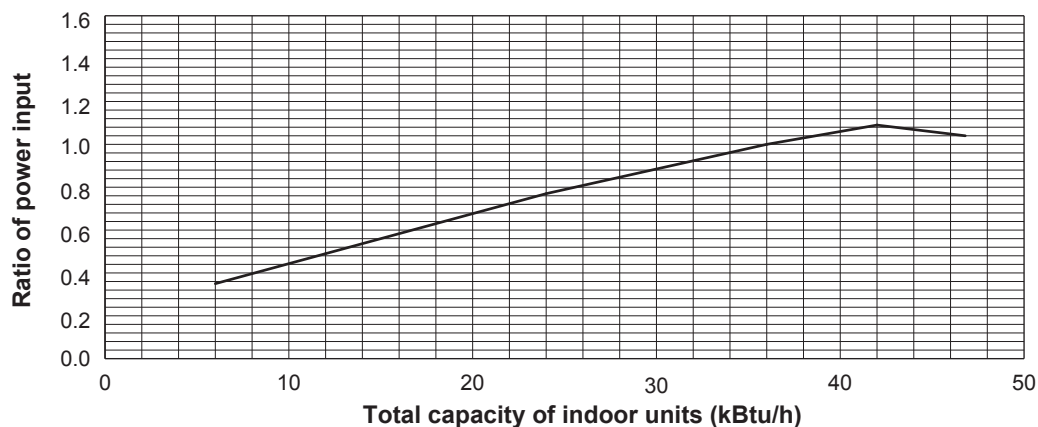
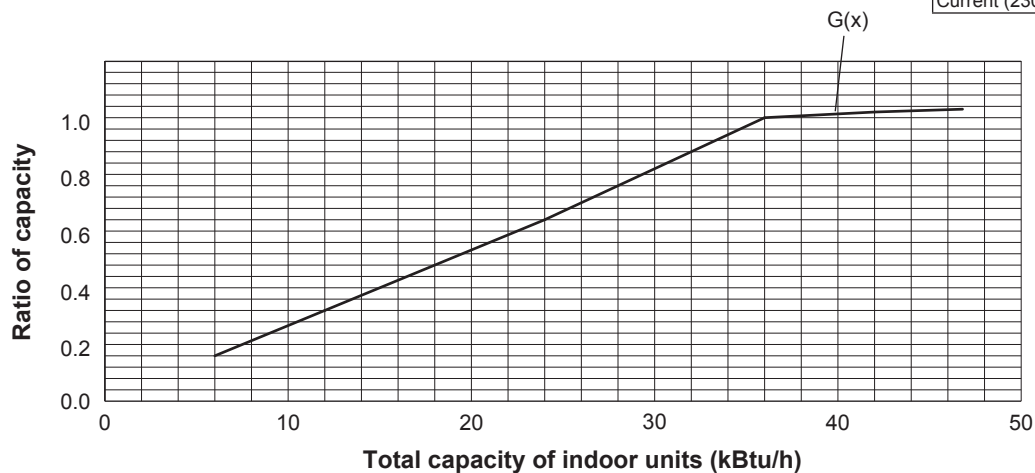
		MXZ
		4C36NAHZ
Nominal cooling capacity	Btu/h	36,000
Input	kW	2.57
Current (208V)	A	12.8
Current (230V)	A	11.6



— 208, 230 V

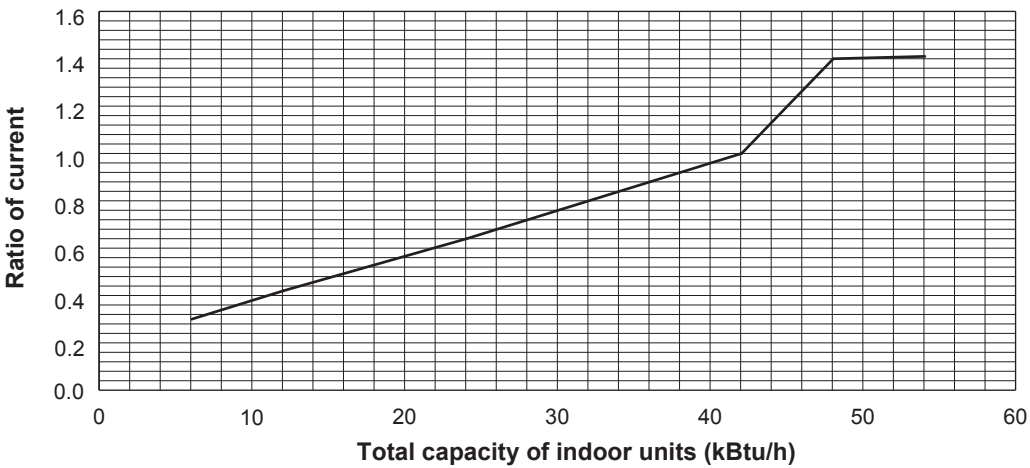
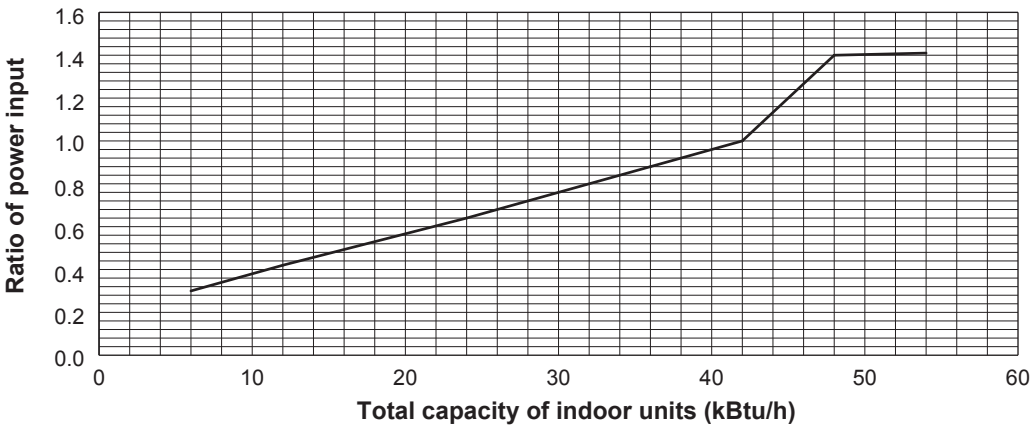
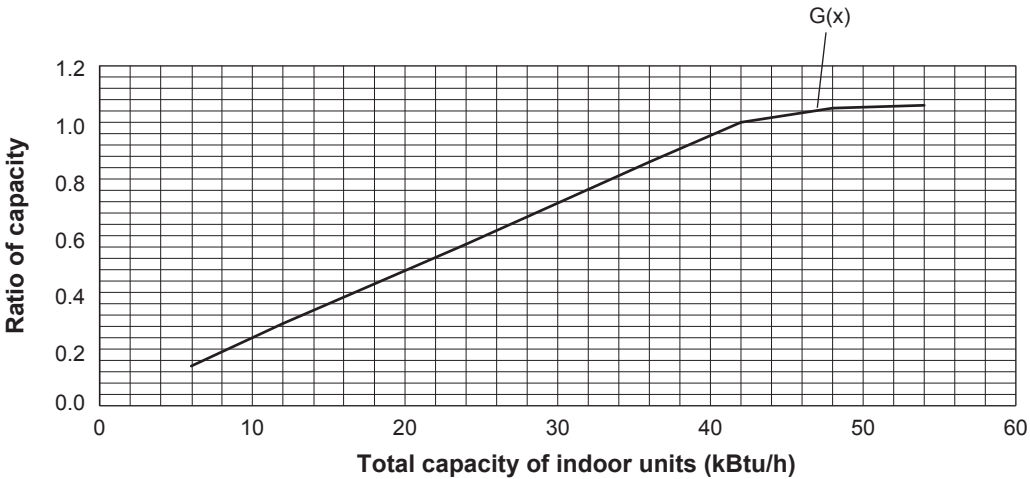
4-4-2. MXZ-4C36NAHZ <heating>

		MXZ
		4C36NAHZ
Nominal heating capacity	Btu/h	45,000
Input	kW	3.34
Current (208V)	A	16.4
Current (230V)	A	14.8



4-4-3. MXZ-5C42NAHZ <cooling>

		MXZ
		5C42NAHZ
Nominal cooling capacity	Btu/h	42,000
Input	kW	3.13
Current (208V)	A	15.4
Current (230V)	A	14.0

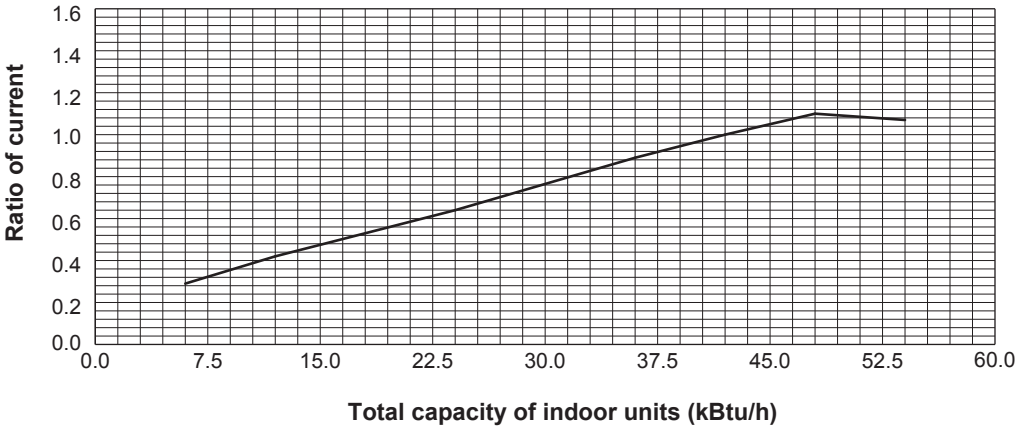
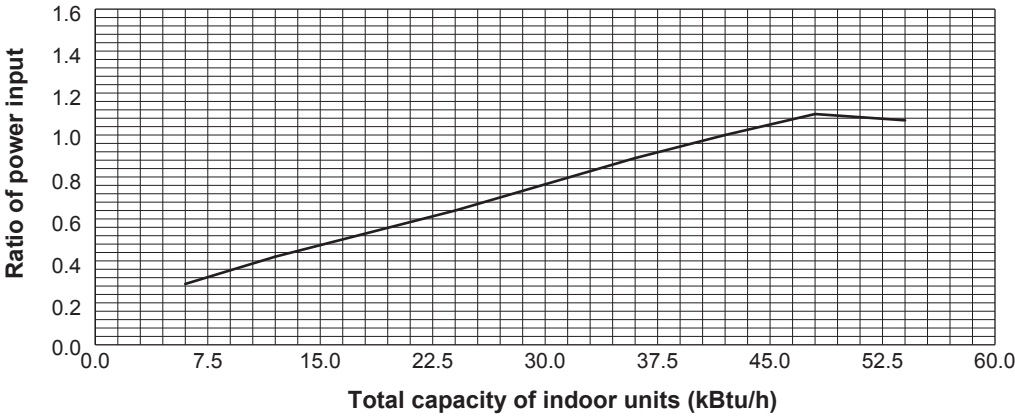
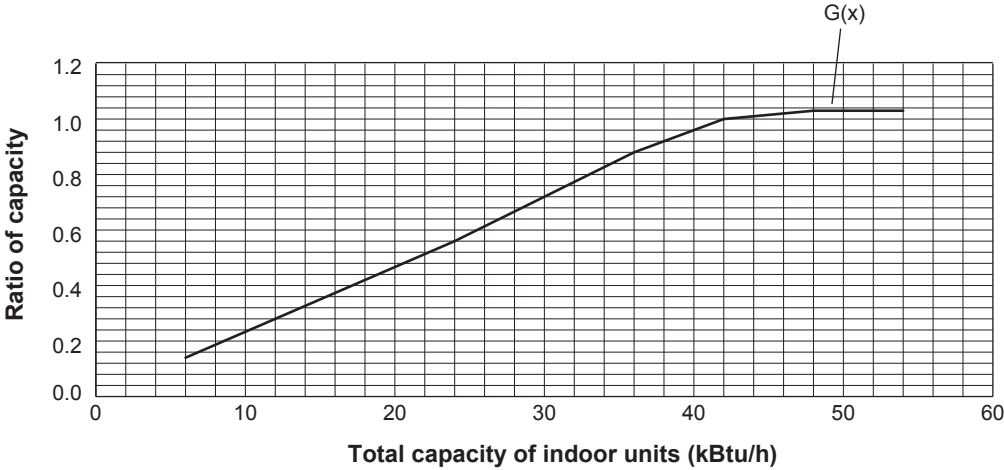


— 208, 230 V



4-4-4. MXZ-5C42NAHZ <heating>

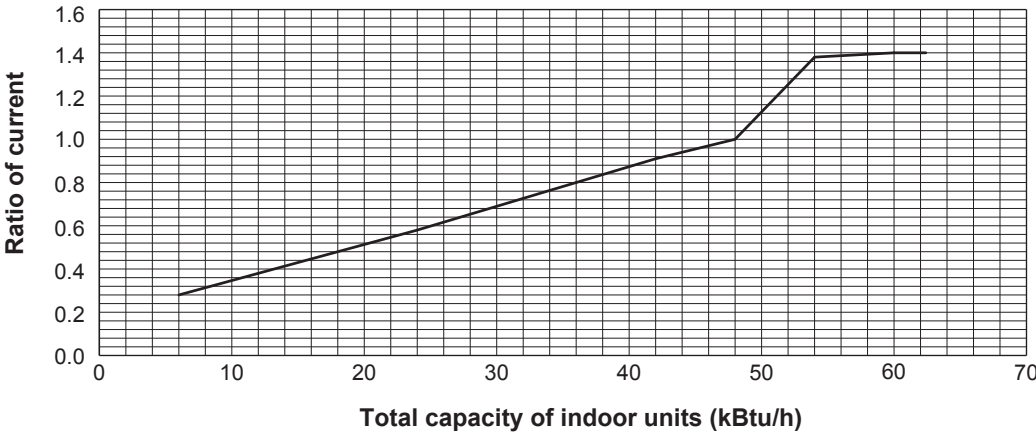
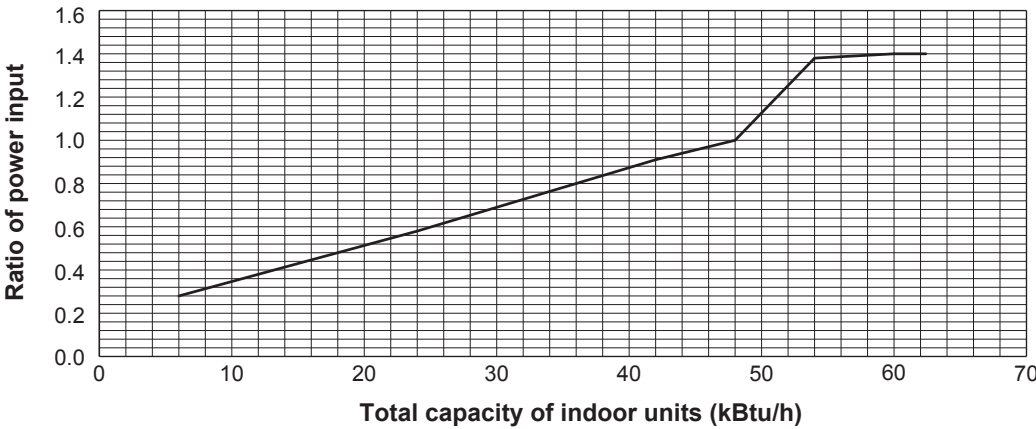
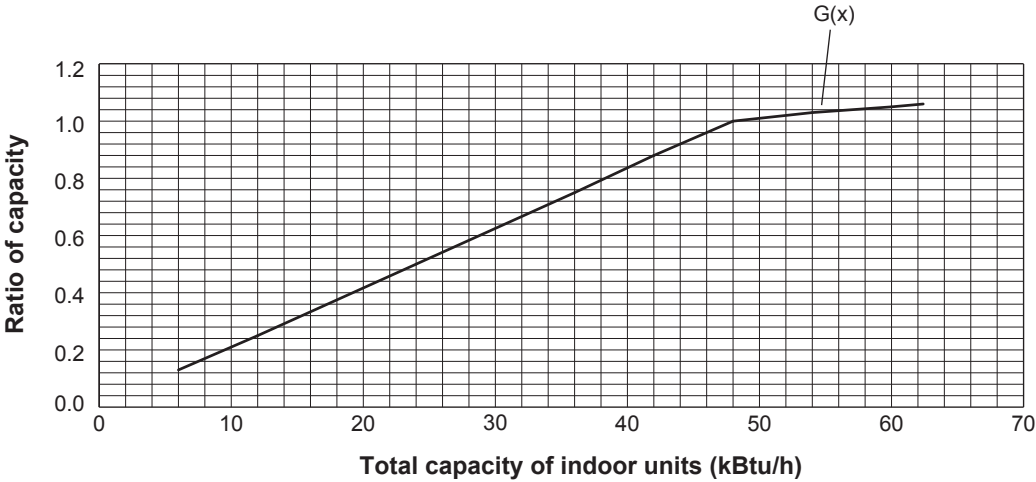
		MXZ
		5C42NAHZ
Nominal heating capacity	Btu/h	48,000
Input	kW	3.43
Current (208V)	A	16.8
Current (230V)	A	15.2



208, 230 V

4-4-5. MXZ-8C48NA MXZ-8C48NAHZ <cooling>

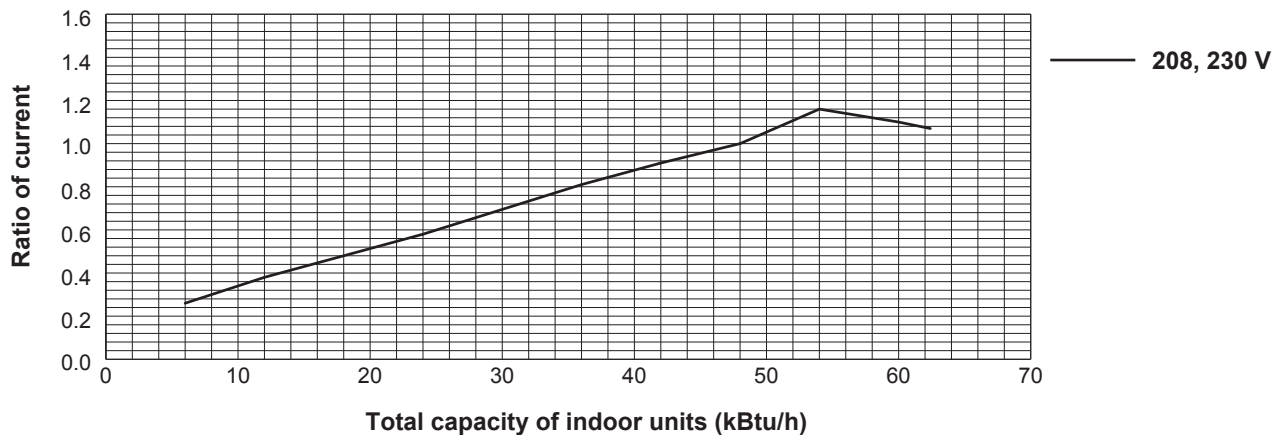
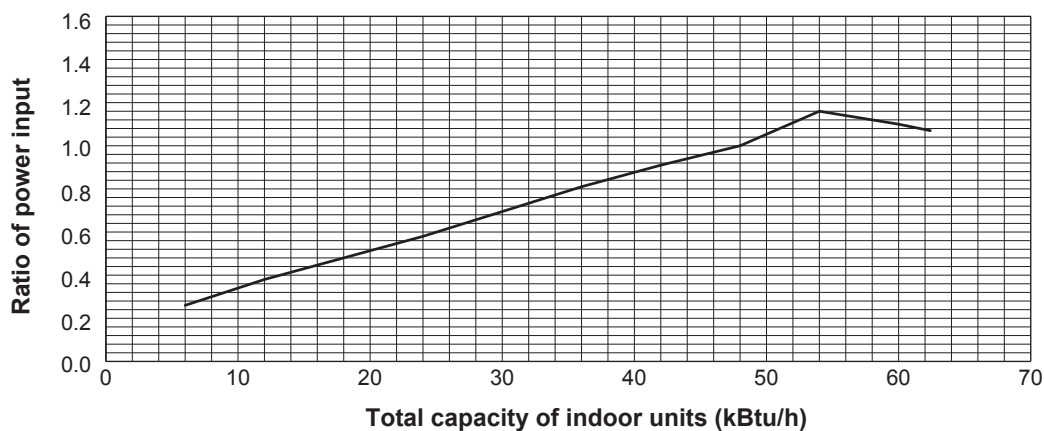
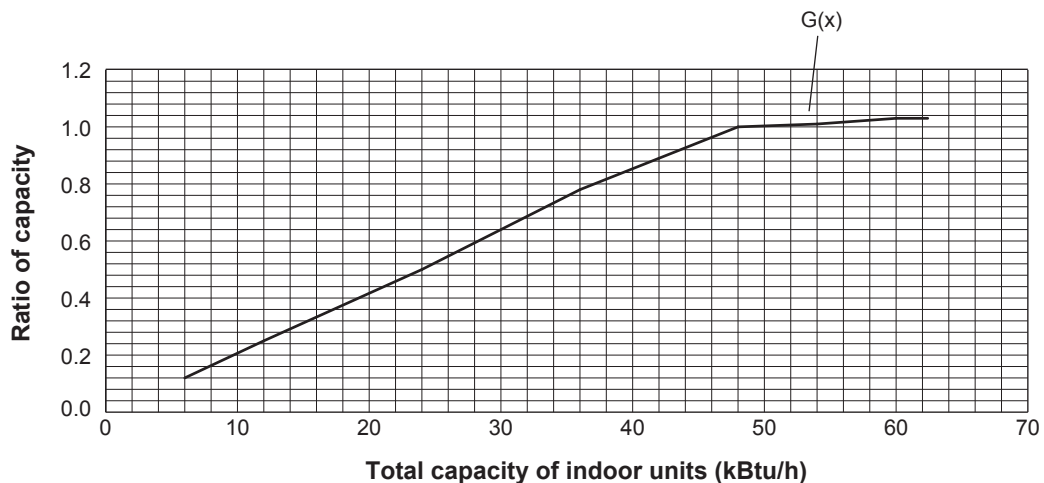
		MXZ
		8C48NAHZ
Nominal cooling capacity	Btu/h	48,000
Input	kW	4.00
Current (208V)	A	19.5
Current (230V)	A	17.6



— 208, 230 V

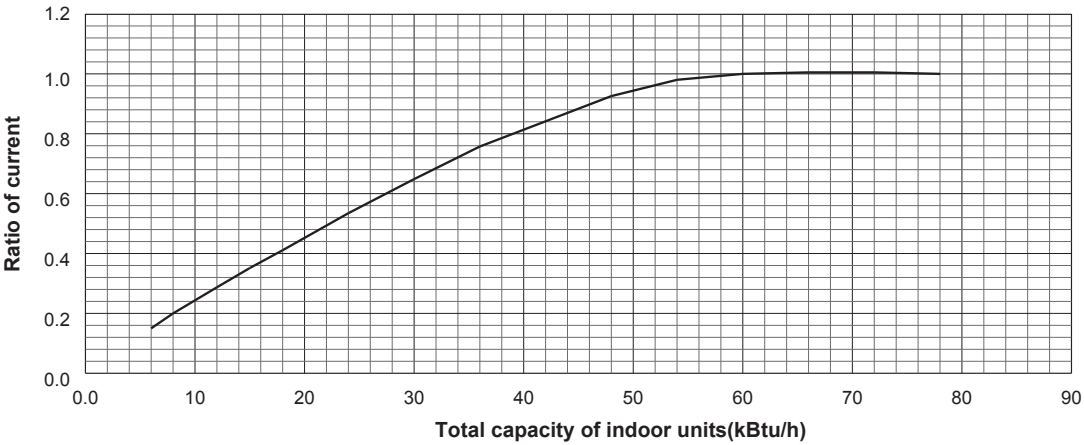
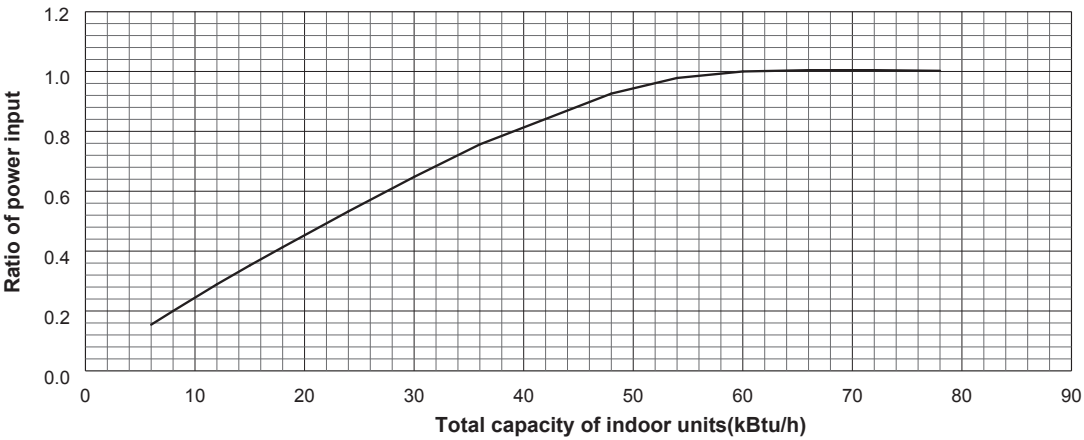
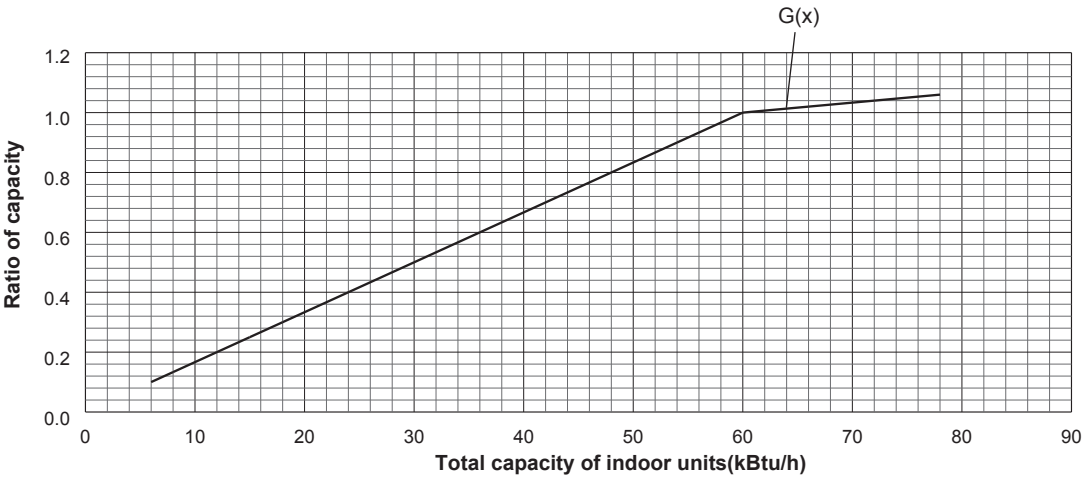
4-4-6. MXZ-8C48NA MXZ-8C48NAHZ <heating>

		MXZ
		8C48NA(HZ)
Nominal heating capacity	Btu/h	54,000
Input	kW	4.22
Current (208V)	A	20.5
Current (230V)	A	18.6



4-4-7. MXZ-8C60NA <cooling>

		MXZ
		8C60NA
Nominal cooling capacity	Btu/h	60,000
Input	kW	4.80
Current (208V)	A	24.1
Current (230V)	A	21.8

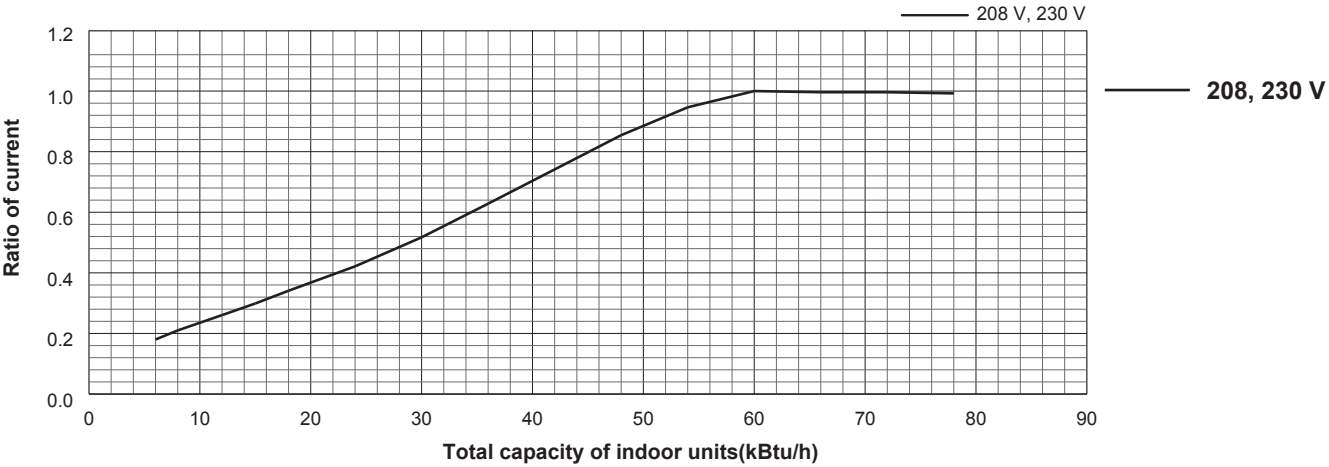
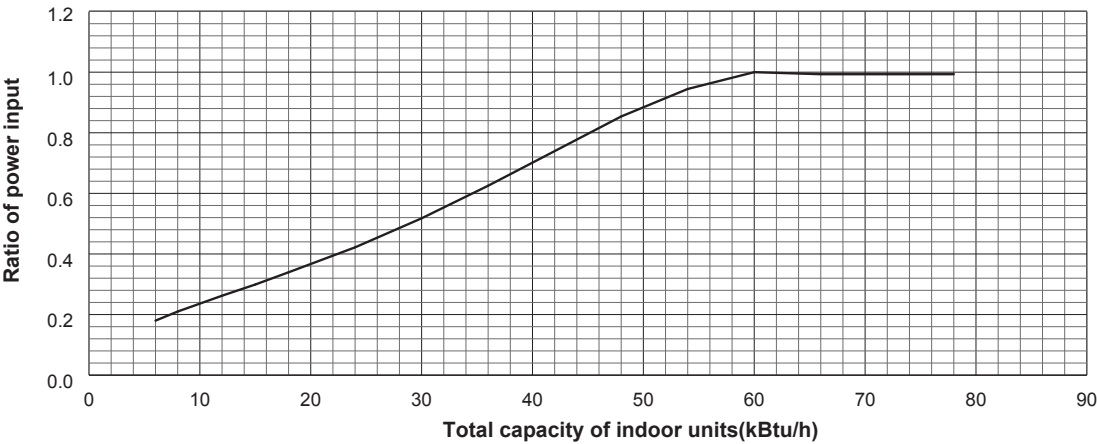


— 208, 230 V



4-4-8. MXZ-8C60NA <heating>

		MXZ
		8C60NA
Nominal heating capacity	Btu/h	66,000
Input	kW	5.67
Current (208V)	A	28.5
Current (230V)	A	25.7



4-5. CORRECTING CAPACITY FOR CHANGES IN THE LENGTH OF REFRIGERANT PIPING

- (1) During cooling, obtain the ratio (and the equivalent piping length) of the outdoor units rated capacity and the total in-use indoor capacity, and find the capacity ratio corresponding to the standard piping length from Figure 13 to 16. Then multiply by the cooling capacity from Figure 7 and 8 in "4-2. CORRECTION BY TEMPERATURE" to obtain the actual capacity.
- (2) During heating, find the equivalent piping length, and find the capacity ratio corresponding to standard piping length from Figure 17 to 18. Then multiply by the heating capacity from Figure 9 to 12 in "4-2. CORRECTION BY TEMPERATURE" to obtain the actual capacity.

(1) Capacity Correction Curve

Figure 13 MXZ-4C36NAHZ <Cooling>

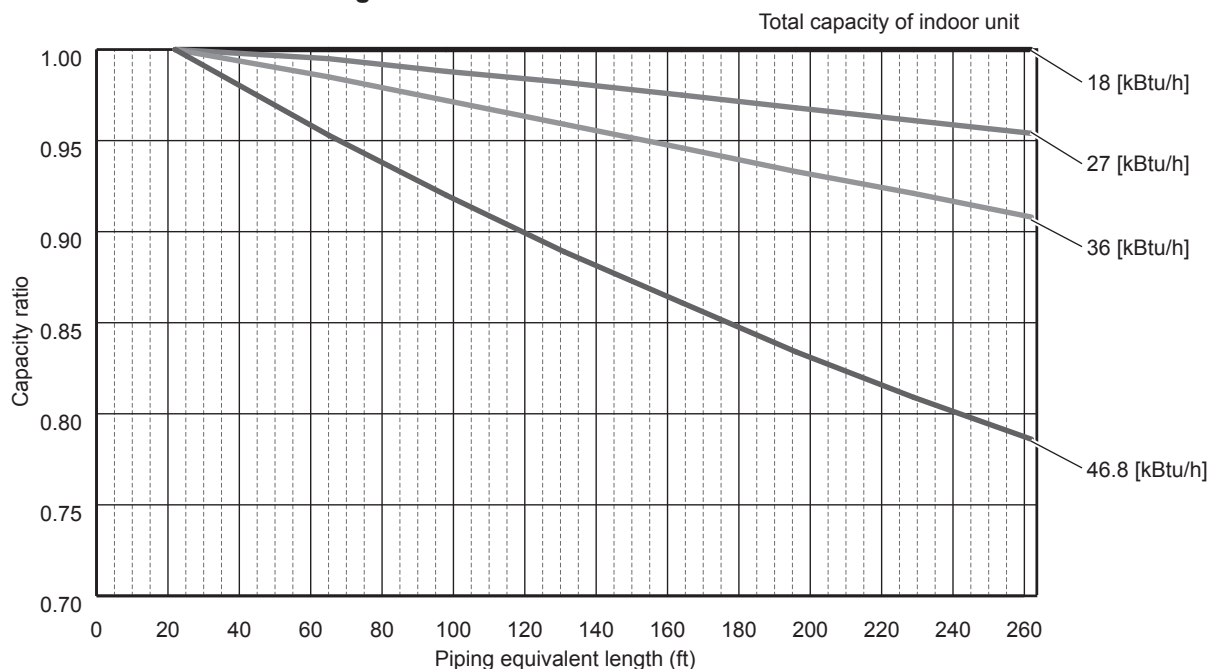


Figure 14 MXZ-5C42NAHZ <Cooling>

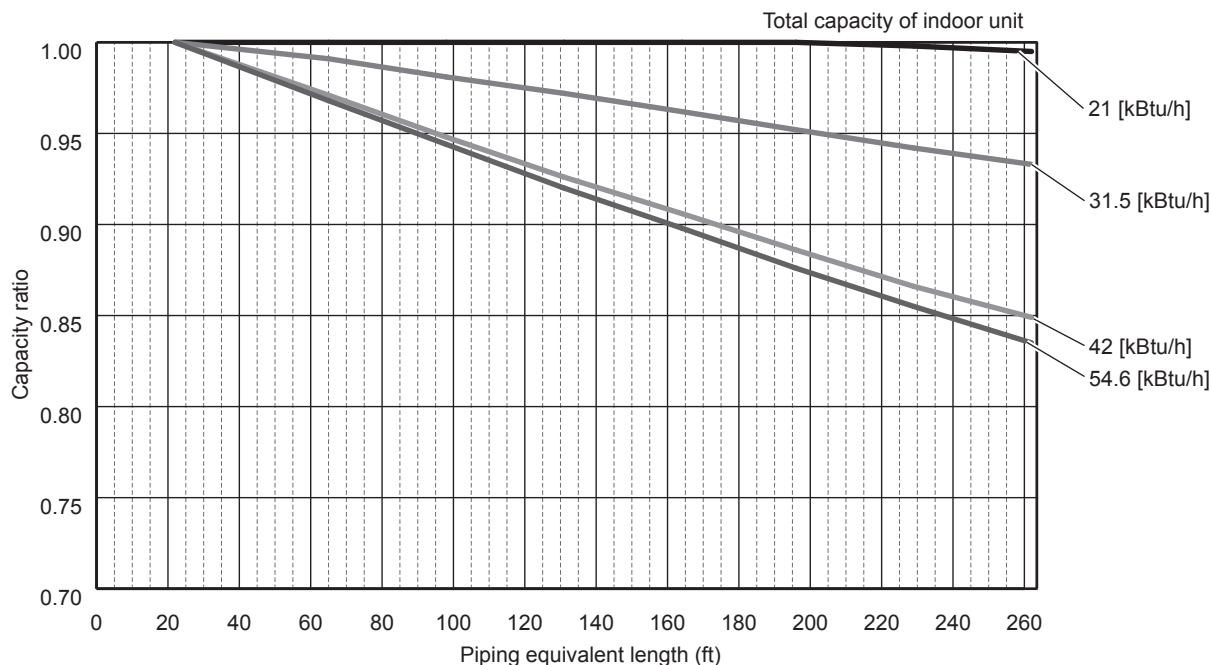


Figure 15 MXZ-8C48NA <Cooling>

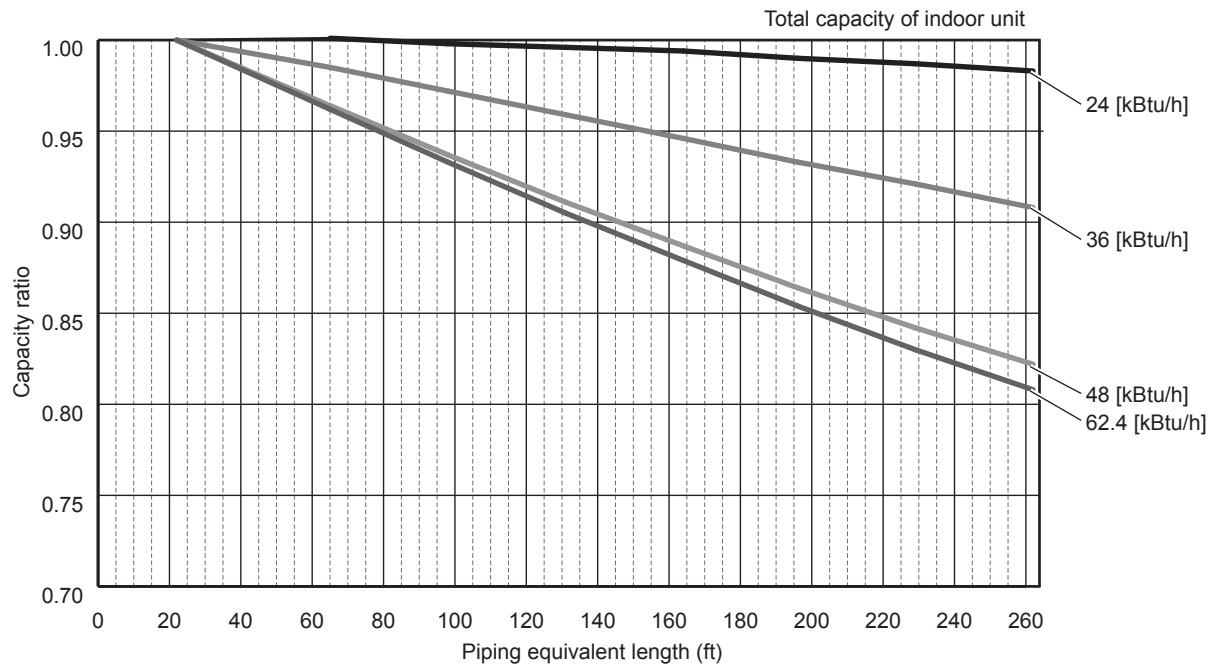


Figure 16 MXZ-8C60NA <Cooling>

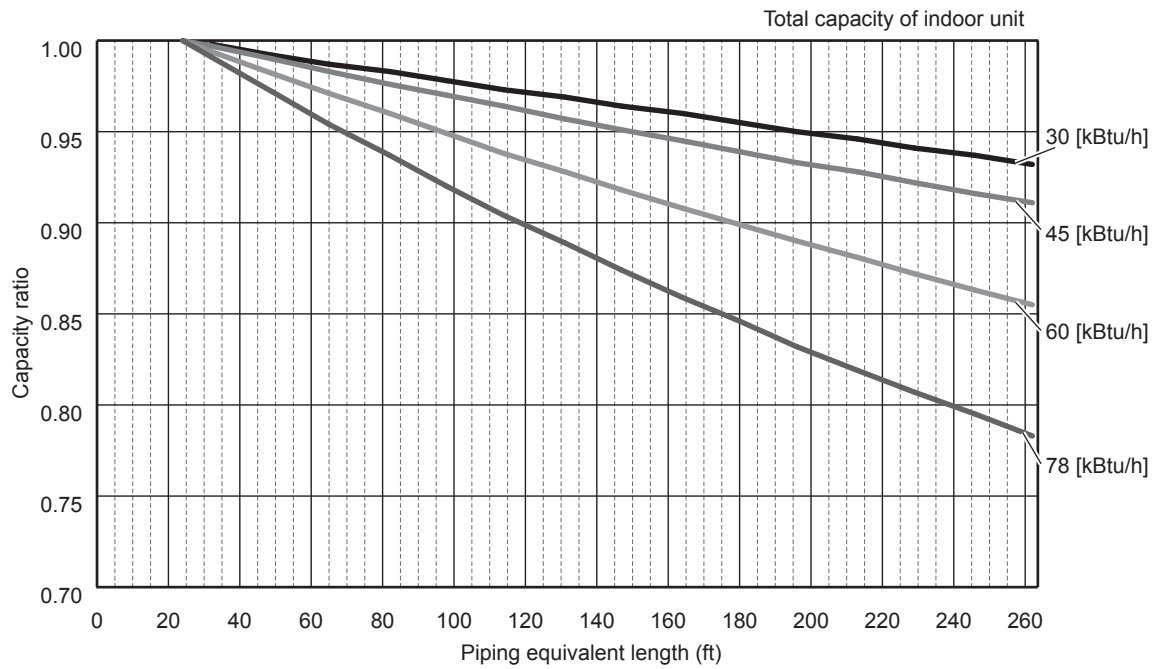


Figure 17 MXZ-4C36NAHZ/5C42NAHZ/8C48NA <Heating>

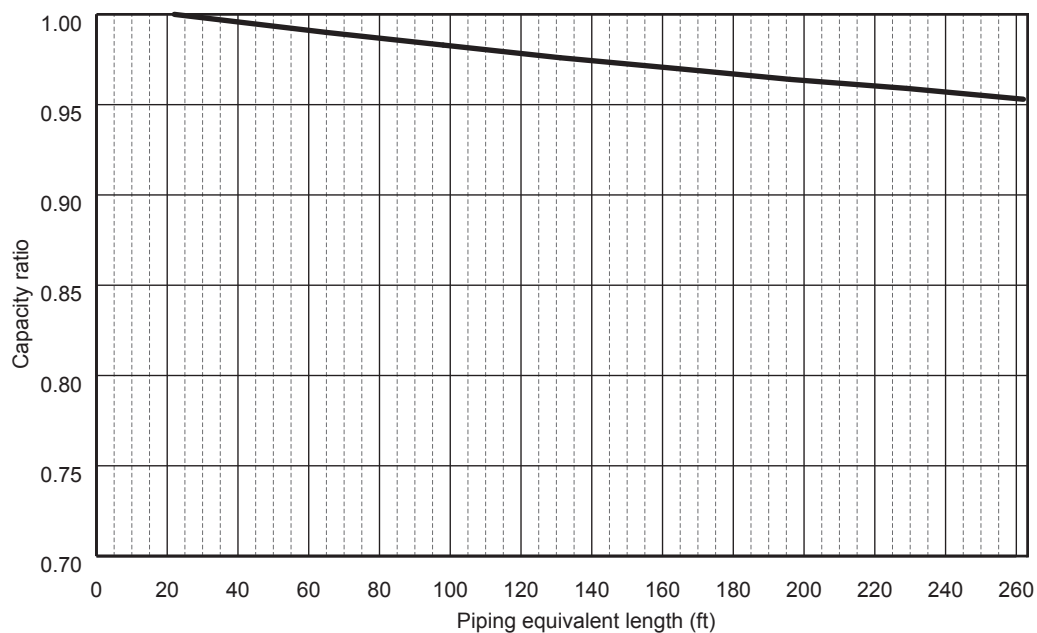
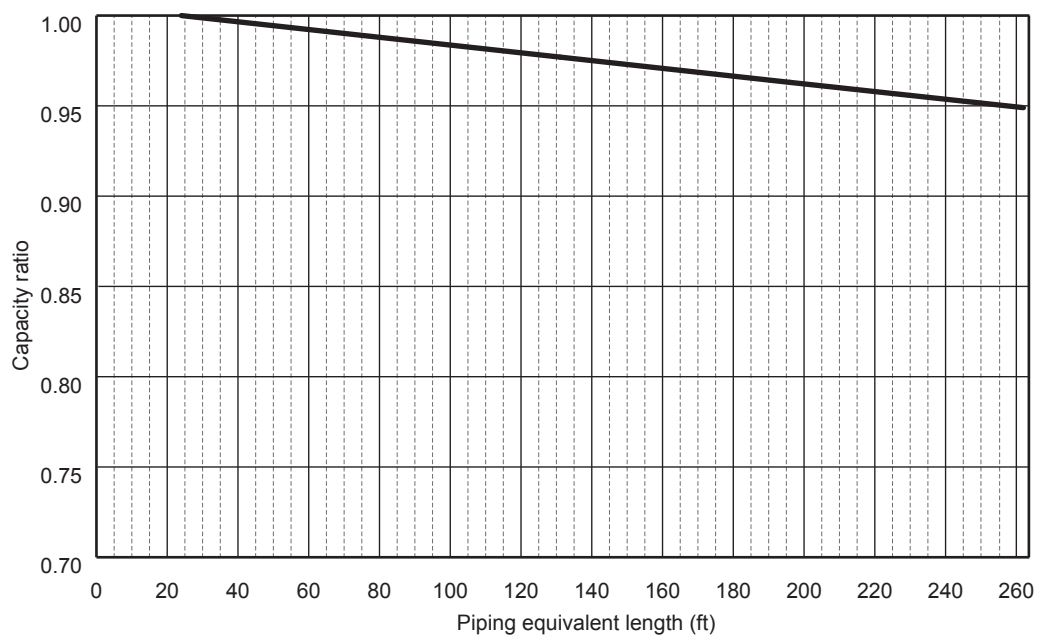


Figure 18 MXZ-8C60NA <Heating>



(2) Method for Obtaining the Equivalent Piping Length

Equivalent length = (length of piping to farthest indoor unit) + (0.3 × number of bends in the piping) (m)

4-5-1. Correction of Heating Capacity for Frost and Defrosting

If heating capacity has been reduced due to frost formation or defrosting, multiply the capacity by the appropriate correction factor from the following table to obtain the actual heating capacity.

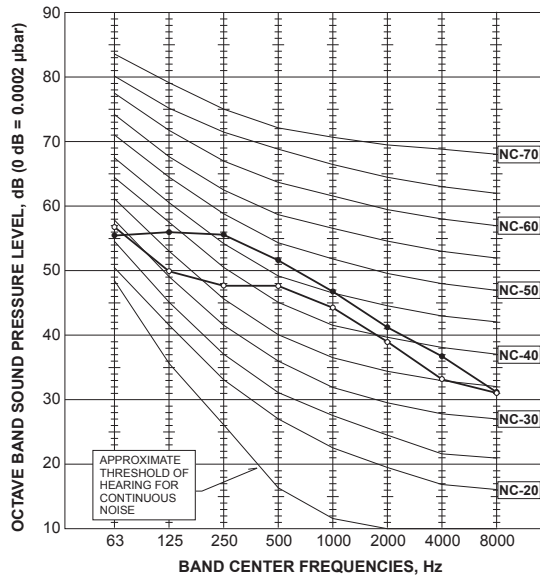
Correction factor diagram

Outdoor Intake temperature <W.B. °F (°C)>	43(6)	39(4)	36(2)	32(0)	28(-2)	25(-4)	21(-6)	18(-8)	14(-10)	5(-15)	-4(-20)	-13(-25)
Correction factor	1.0	0.98	0.89	0.88	0.89	0.9	0.95	0.95	0.95	0.95	0.95	0.95

4-6. NOISE CRITERION CURVES

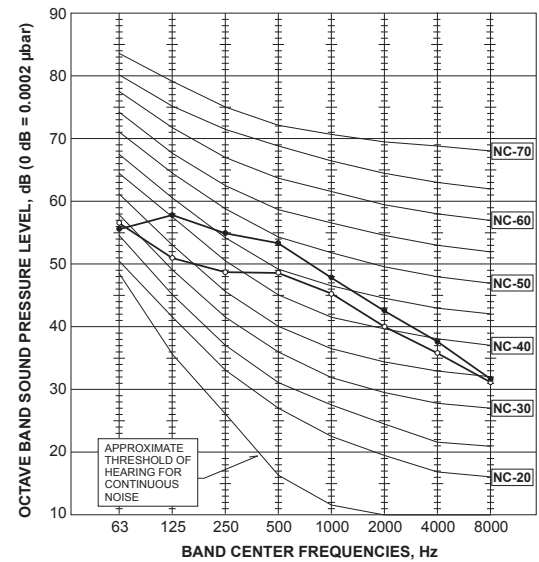
MXZ-4C36NAHZ
MXZ-4C36NAHZ-U1

MODE	SPL(dB)	LINE
COOLING	49	○—○
HEATING	53	●—●



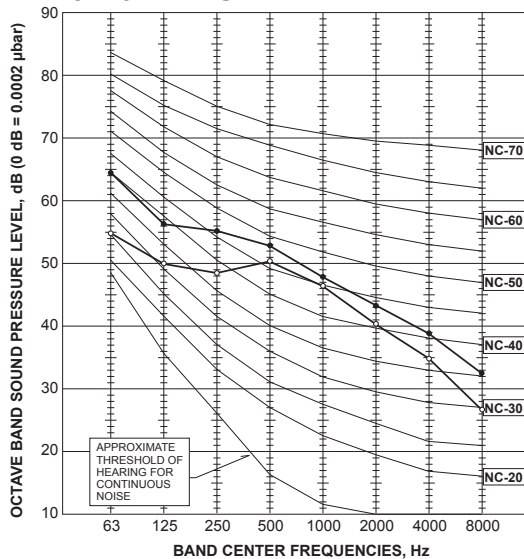
MXZ-5C42NAHZ
MXZ-5C42NAHZ-U1

MODE	SPL(dB)	LINE
COOLING	50	○—○
HEATING	54	●—●



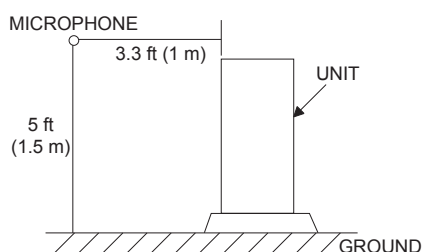
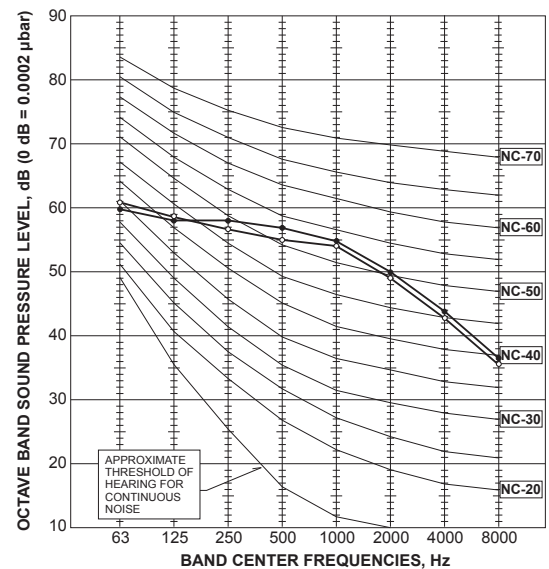
MXZ-8C48NA
MXZ-8C48NA-U1
MXZ-8C48NAHZ
MXZ-8C48NAHZ-U1

MODE	SPL(dB)	LINE
COOLING	51	○—○
HEATING	54	●—●



MXZ-8C60NA-U1

MODE	SPL(dB)	LINE
COOLING	58	○—○
HEATING	59	●—●



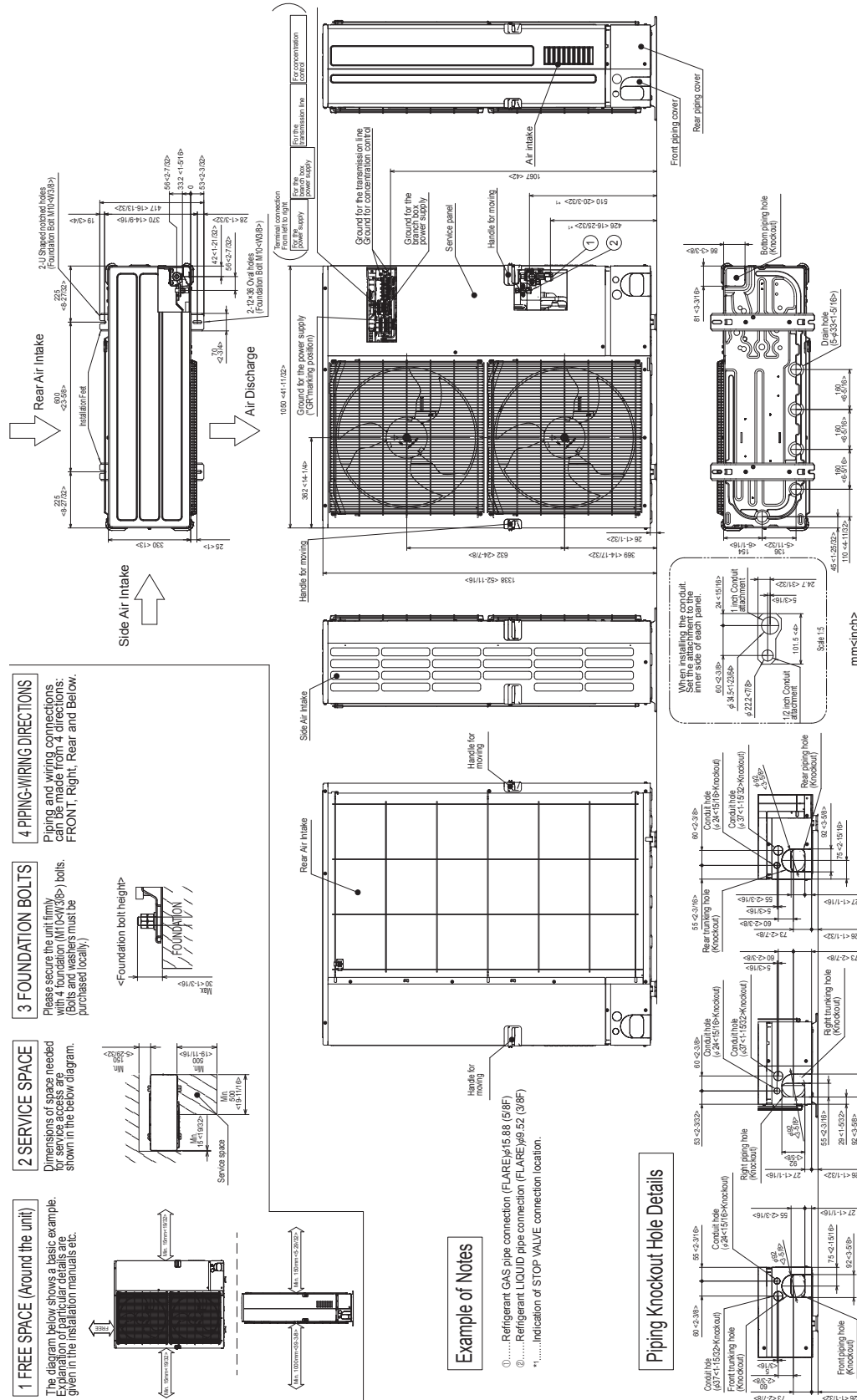
5-1. OUTDOOR UNIT MXZ-4C36NAHZ

MXZ-5C42NAHZ

MXZ-8C48NAHZ

MXZ-8C48NA

Unit: mm <inch>

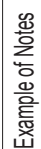


MXZ-8C48NA-U1

OCH573F

OCH573F

38



5-2. BRANCH BOX

PAC-MKA50BC

PAC-MKA51BC

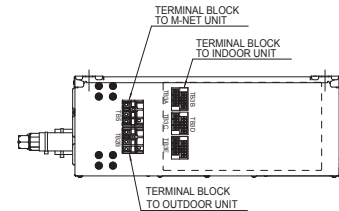
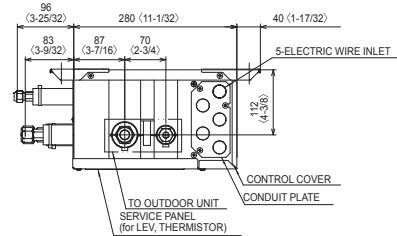
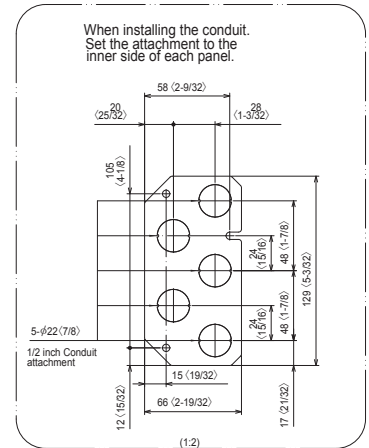
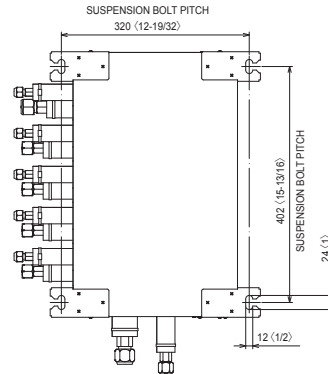
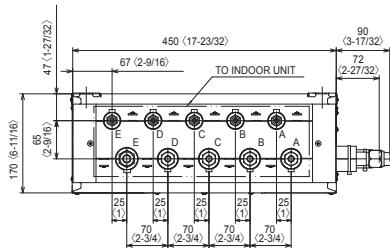
Unit: mm <inch>

SUSPENSION BOLT : W3/8(M10)

REFRIGERANT PIPE FLARED CONNECTION

Unit: inch

	A	B	C	D	E	TO OUTDOOR UNIT
LIQUID PIPE	1/4F	1/4F	1/4F	1/4F	1/4F	3/8F
GAS PIPE	3/8F	3/8F	3/8F	3/8F	1/2F	5/8F



PAC-MKA30BC

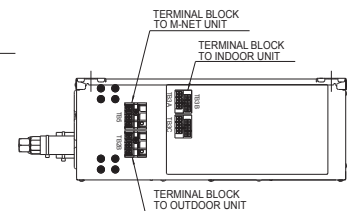
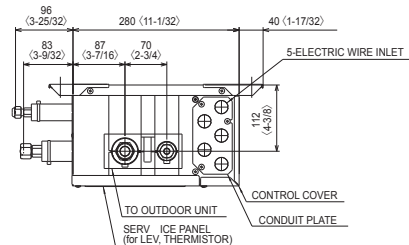
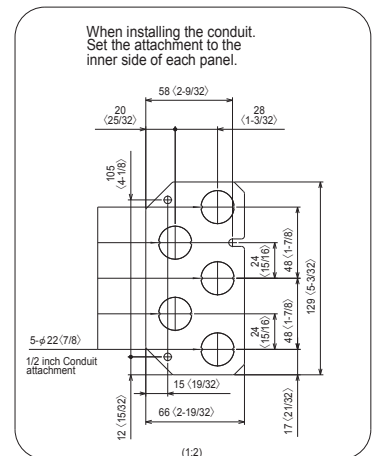
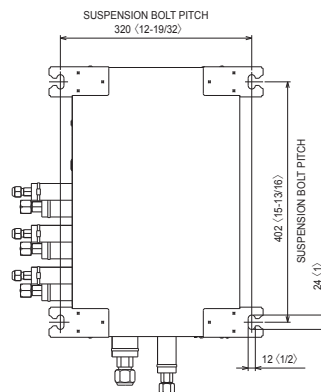
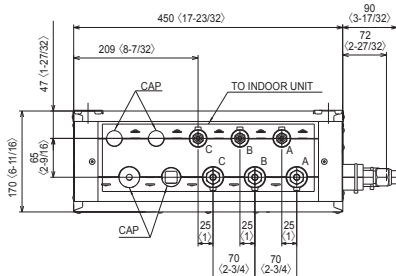
PAC-MKA31BC

SUSPENSION BOLT : W3/8(M10)

REFRIGERANT PIPE FLARED CONNECTION

Unit: inch

	A	B	C	TO OUTDOOR UNIT
LIQUID PIPE	1/4F	1/4F	1/4F	3/8F
GAS PIPE	3/8F	3/8F	3/8F	5/8F

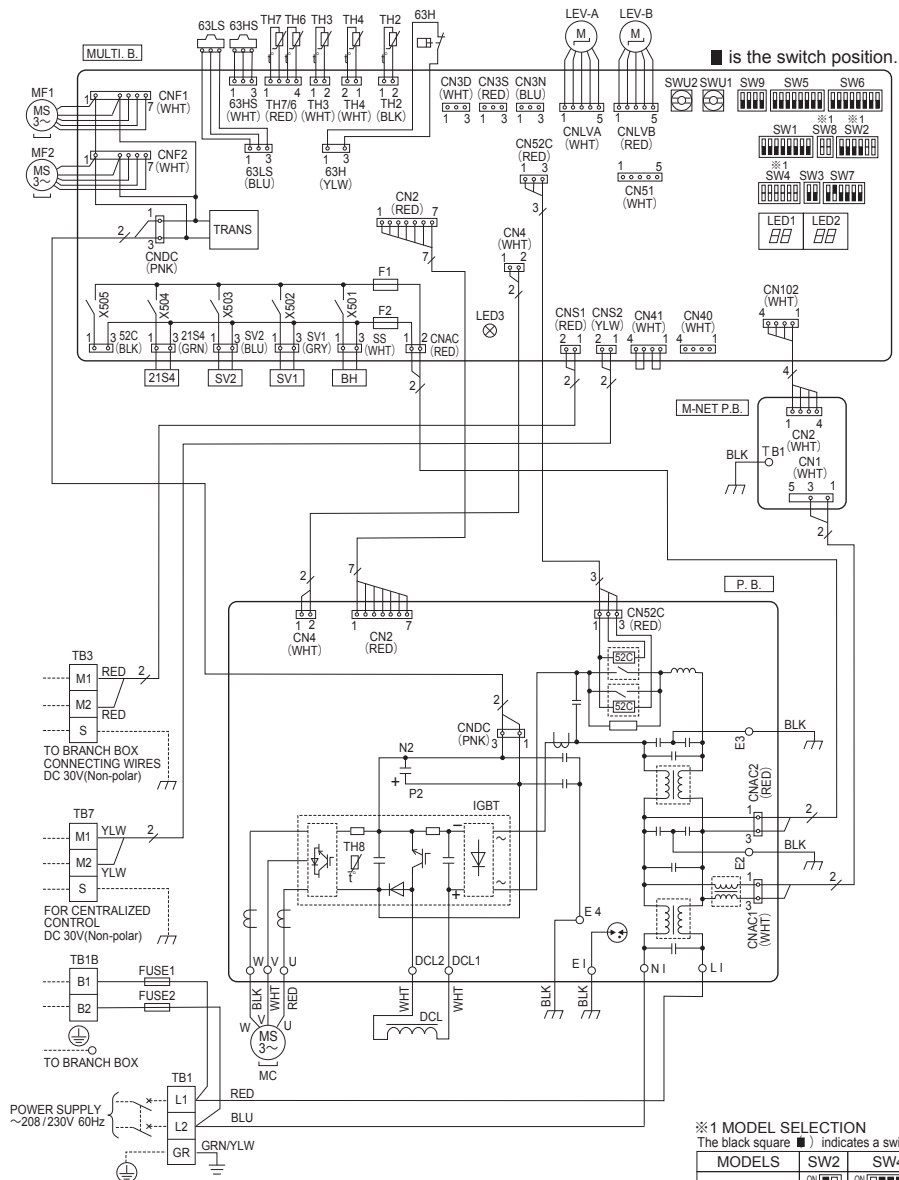


6-1. OUTDOOR UNIT MXZ-4C36NAHZ

MXZ-5C42NAHZ

MXZ-8C48NAHZ

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block (Power Supply)	TH6	Thermistor (Suction Pipe)	SW7	Switch (Function Selection)
TB1B	Terminal Block (Branch Box)	TH7	Thermistor (Ambient)	SW8	Switch (Model Selection)
TB3	Terminal Block (Branch box/Outdoor Transmission Line)	TH8	Thermistor (Heat Sink)	SW9	Switch (Function Selection)
TB7	Terminal Block (Centralized Control Transmission Line)	LEV-A,LEV-B	Electronic Expansion Valve	SWU1	Switch (Unit Address Selection, 1st digit)
FUSE1,FUSE2	Fuse (T20AL250V)	DCL	Reactor	SWU2	Switch (Unit Address Selection, 2nd digit)
MC	Motor For Compressor	P.B.	Power Circuit Board	CNS1	Connector (Branch box/Outdoor Transmission Line)
MF1,MF2	Fan Motor	LI	Connection Terminal (L-Phase)	CNS2	Connector (Centralized Control Transmission Line)
21S4	Solenoid Valve (Four-Way Valve)	NI	Connection Terminal (N-Phase)	SS	Connector (Base heater)
63H	High Pressure Switch	DCL1,DCL2	Connection Terminal (Reactor)	CN3D	Connector (Connection For Option)
63HS	High Pressure Sensor	IGBT	Power Module	CN3S	Connector (Connection For Option)
63LS	Low Pressure Sensor	E1,E2,E3,E4	Connection Terminal (Ground)	CN3N	Connector (Connection For Option)
SV1	Solenoid Valve (Bypass Valve)	MULTI.B.	Controller Circuit Board	CN51	Connector (Connection For Option)
SV2	Solenoid Valve (Switching Valve)	SW1	Switch (Display Selection)	LED1,LED2	LED (Operation Inspection Display)
BH	Base heater	SW2	Switch (Function Selection)	LED3	LED (Power Supply to Main Microcomputer)
TH2	Thermistor (Hic Pipe)	SW3	Switch (Test Run)	F1,F2	Fuse (T6.3AL250V)
TH3	Thermistor (Outdoor Liquid Pipe)	SW4	Switch (Model Selection)	X501~505	Relay
TH4	Thermistor (Compressor)	SW5	Switch (Function Selection)	M-NET P.B.	M-NET Power Circuit Board
		SW6	Switch (Function Selection)	TB1	Connection Terminal (Ground)

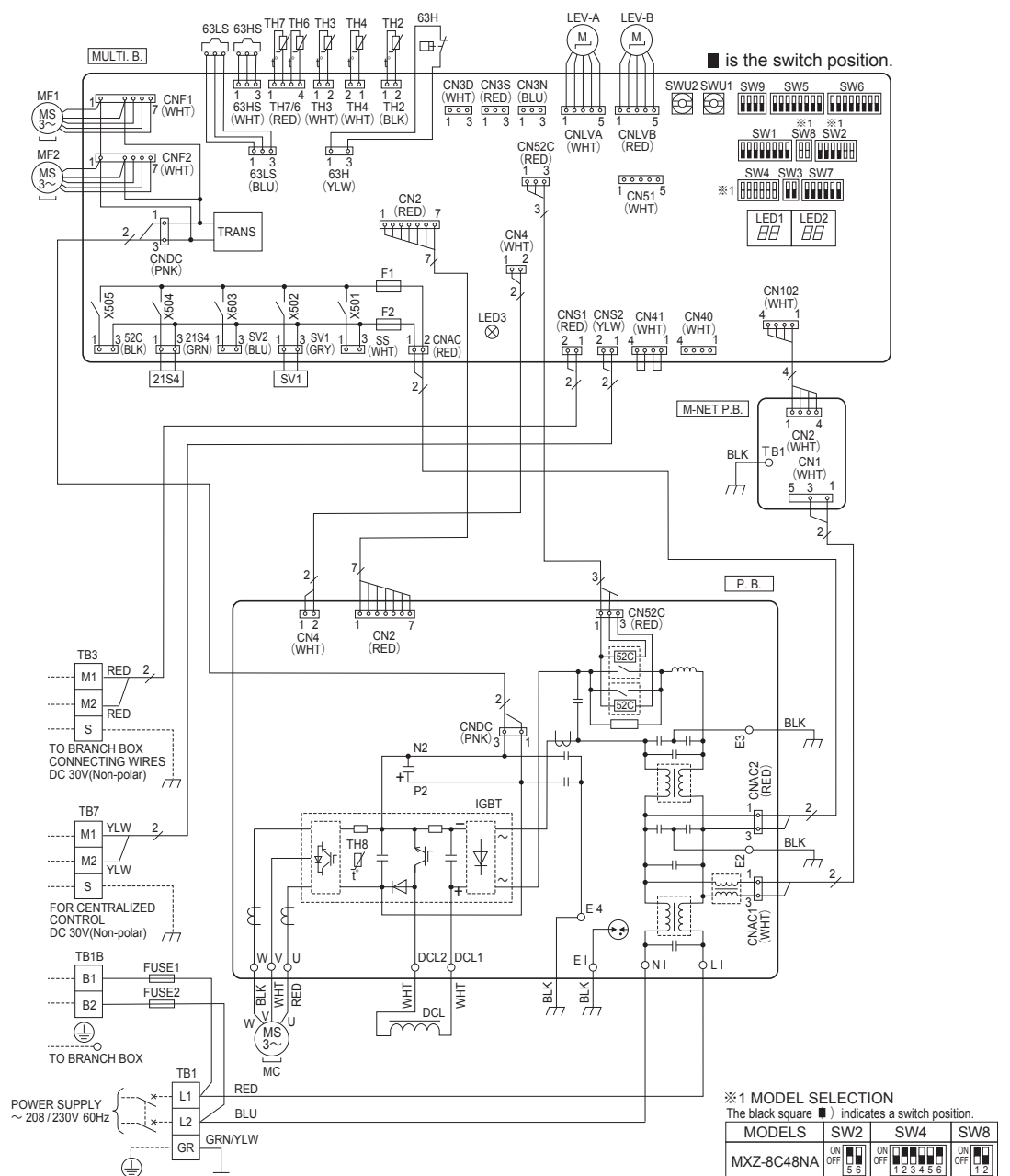


※ 1 MODEL SELECTION
The black square ■ indicates a switch position.

MODELS	SW2	SW4	SW8
MXZ-4C36NAHZ	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6	ON OFF 1 2
MXZ-5C42NAHZ	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6	ON OFF 1 2
MXZ-8C48NAHZ	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6	ON OFF 1 2

MXZ-8C48NA

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block (Power Supply)	TH7	Thermistor (Ambient)	SW7	Switch (Function Selection)
TB1B	Terminal Block (Branch Box)	TH8	Thermistor (Heat Sink)	SW8	Switch (Model Selection)
TB3	Terminal Block (Branch box/Outdoor Transmission Line)	LEV-A,LEV-B	Electronic Expansion Valve	SW9	Switch (Function Selection)
TB7	Terminal Block (Centralized Control Transmission Line)	DCL	Reactor	SWU1	Switch (Unit Address Selection, 1st digit)
FUSE1,FUSE2	Fuse (T20AL250V)	P.B.	Power Circuit Board	SWU2	Switch (Unit Address Selection, 2nd digit)
MC	Motor For Compressor	U/V/W	Connection Terminal (U/V/W-Phase)	CNS1	Connector (Branch box/Outdoor Transmission Line)
MF1,MF2	Fan Motor	LI	Connection Terminal (L-Phase)	CNS2	Connector (Centralized Control Transmission Line)
21S4	Solenoid Valve (Four-Way Valve)	NI	Connection Terminal (N-Phase)	SS	Connector (Connection For Option)
63H	High Pressure Switch	DCL1,DCL2	Connection Terminal (Reactor)	CN3D	Connector (Connection For Option)
63HS	High Pressure Sensor	IGBT	Power Module	CN3S	Connector (Connection For Option)
63LS	Low Pressure Sensor	E1,E2,E3,E4	Connection Terminal (Ground)	CN3N	Connector (Connection For Option)
SV1	Solenoid Valve (Bypass Valve)	MULTI.B.	Controller Circuit Board	CN51	Connector (Connection For Option)
TH2	Thermistor (Hic Pipe)	SW1	Switch (Display Selection)	LED1,LED2	LED (Operation Inspection Display)
TH3	Thermistor (Outdoor Liquid Pipe)	SW2	Switch (Function Selection)	LED3	LED (Power Supply to Main Microcomputer)
TH4	Thermistor (Compressor)	SW3	Switch (Test Run)	F1,F2	Fuse (T6,3AL250V)
TH6	Thermistor (Suction Pipe)	SW4	Switch (Model Selection)	X501~505	Relay
		SW5	Switch (Function Selection)	M-NET P.B.	M-NET Power Circuit Board
		SW6	Switch (Function Selection)	TB1	ConnectionTerminal (Ground)

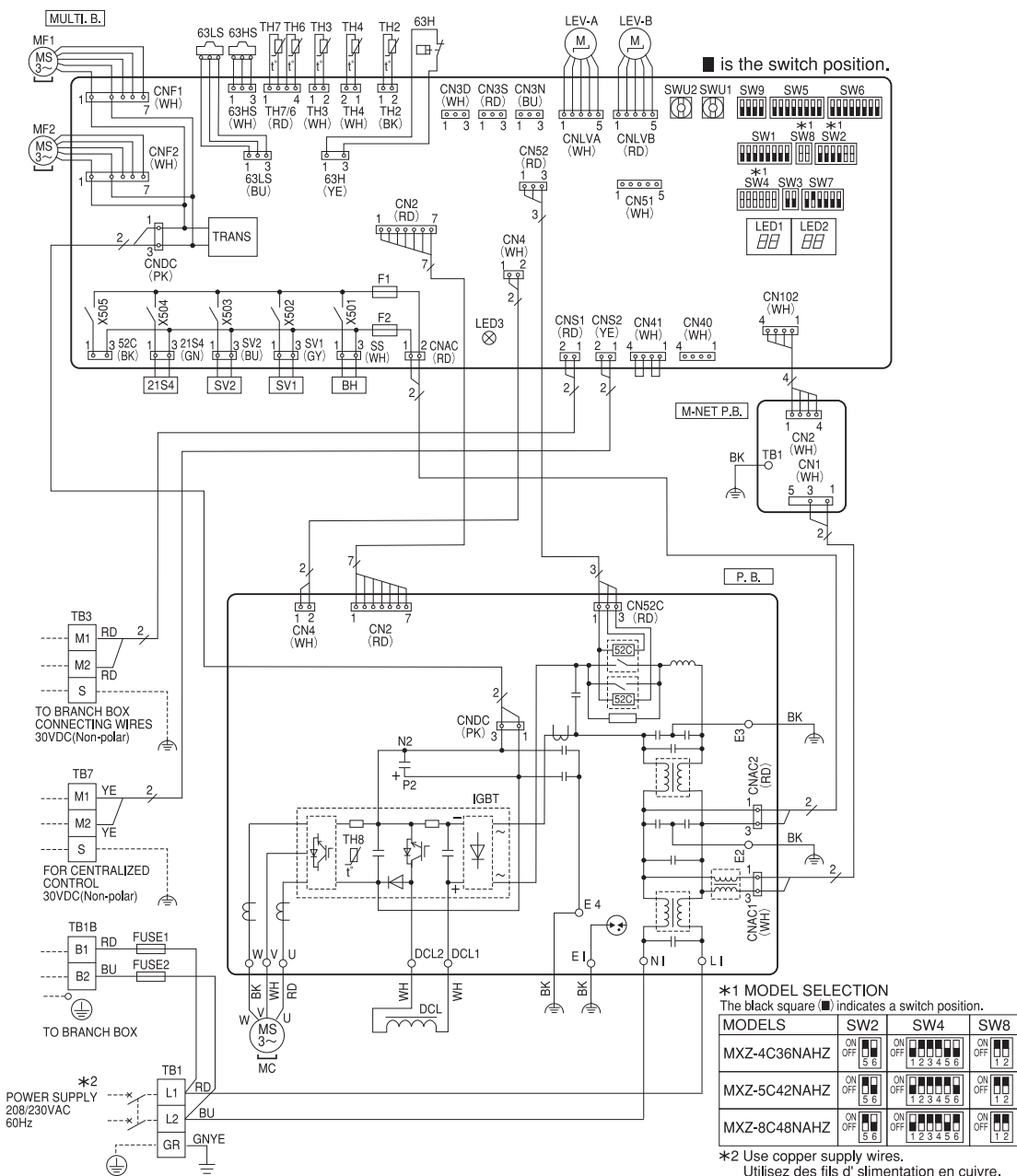


MXZ-4C36NAHZ-U1

MXZ-5C42NAHZ-U1

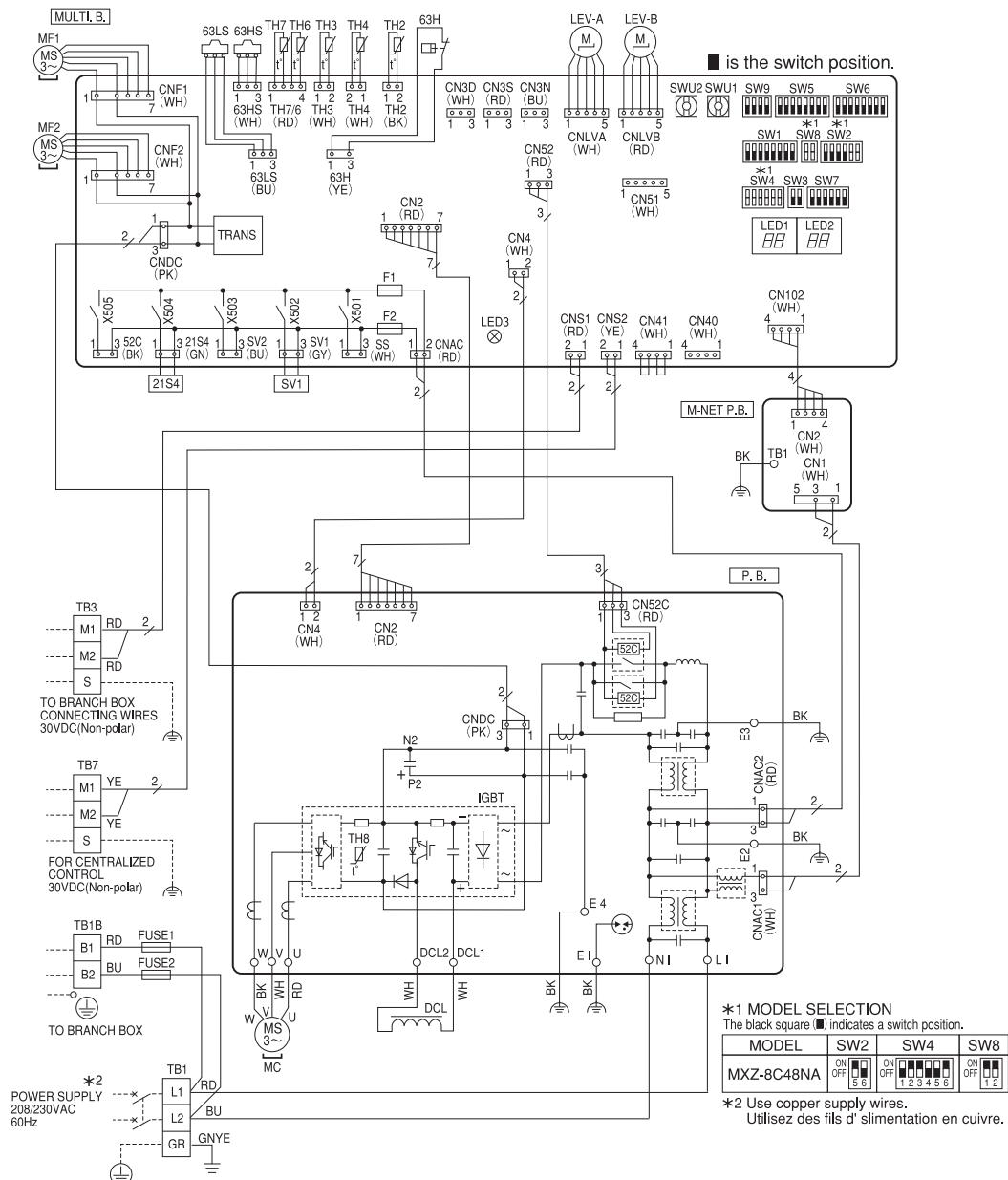
MXZ-8C48NAHZ-U1

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block (Power Supply)	TH7	Thermistor (Ambient)	SW9	Switch (Function Selection)
TB1B	Terminal Block (Branch Box)	TH8	Thermistor (Heat Sink)	SWU1	Switch (Unit Address Selection, ones digit)
TB3	Terminal Block (Branch Box/Outdoor Transmission Line)	LEV-A, LEV-B	Linear Expansion Valve	SWU2	Switch (Unit Address Selection, tens digit)
TB7	Terminal Block (Centralized Control Transmission Line)	DCL	Reactor	CNS1	Connector (Branch Box/Outdoor Transmission Line)
FUSE1, FUSE2	Fuse (T20AL250V)	P.B.	Power Circuit Board	CNS2	Connector (Centralized Control Transmission Line)
MC	Motor For Compressor	U/V/W	Connection Terminal (U/V/W-Phase)	SS	Connector (Connection For Option)
MF1, MF2	Fan Motor	LI	Connection Terminal (L-Phase)	CN3D	Connector (Connection For Option)
21S4	Solenoid Valve Coil (4-Way Valve)	NI	Connection Terminal (N-Phase)	CN3S	Connector (Connection For Option)
63H	High Pressure Switch	DCL1, DCL2	Connection Terminal (Reactor)	CN3N	Connector (Connection For Option)
63HS	High Pressure Sensor	IGBT	Power Module	CN51	Connector (Connection For Option)
63LS	Low Pressure Sensor	E1, E2, E3, E4	Connection Terminal (Electrical Parts Box)	LED1, LED2	LED (Operation Inspection Display)
SV1	Solenoid Valve Coil (Bypass Valve)	MULTI.B.	Multi Controller Circuit Board	LED3	LED (Power Supply to Main Microcomputer)
SV2	Solenoid Valve (Switching Valve)	SW1	Switch (Display Selection)	F1, F2	Fuse (T6.3AL250V)
BH	Base Heater	SW2	Switch (Function Selection)	X501~505	Relay
TH2	Thermistor (Hic Pipe)	SW3	Switch (Test Run)	M-NET P.B.	M-NET Power Circuit Board
TH3	Thermistor (Outdoor Liquid Pipe)	SW4	Switch (Model Selection)	TB1	Connection Terminal (Electrical Parts Box)
TH4	Thermistor (Compressor)	SW5	Switch (Function Selection)		
TH6	Thermistor (Suction Pipe)	SW6	Switch (Function Selection)		
		SW7	Switch (Function Selection)		
		SW8	Switch (Model Selection)		



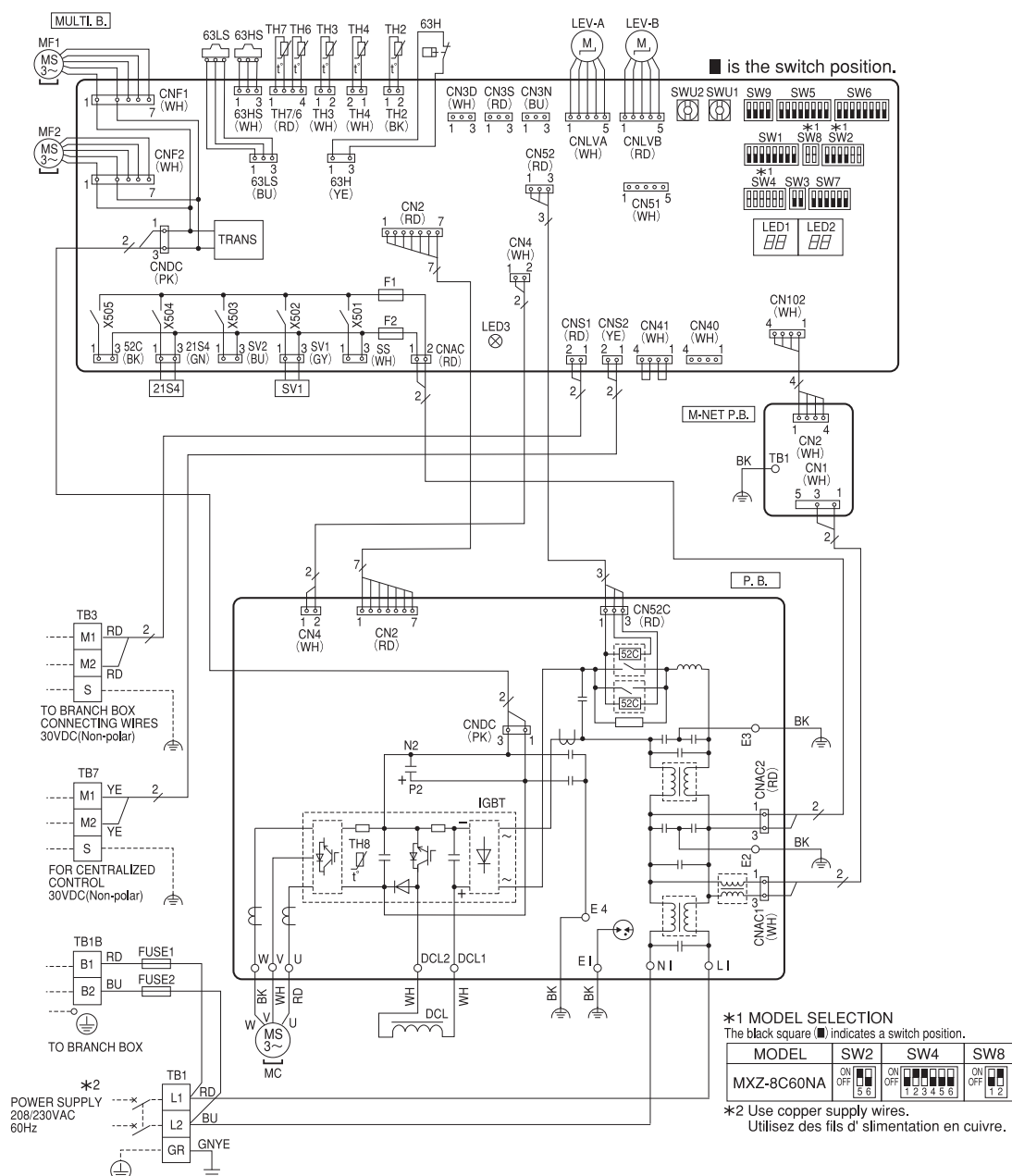
MXZ-8C48NA-U1

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block (Power Supply)	TH8	Thermistor (Heat Sink)	SW9	Switch (Function Selection)
TB1B	Terminal Block (Branch Box)	LEV-A, LEV-B	Linear Expansion Valve	SWU1	Switch (Unit Address Selection, ones digit)
TB3	Terminal Block (Branch Box/Outdoor Transmission Line)	DCL	Reactor	SWU2	Switch (Unit Address Selection, tens digit)
TB7	Terminal Block (Centralized Control Transmission Line)	P.B.	Power Circuit Board	CNS1	Connector (Branch Box/Outdoor Transmission Line)
FUSE1, FUSE2	Fuse (T20AL250V)	U/V/W	Connection Terminal (U/V/W-Phase)	CNS2	Connector (Centralized Control Transmission Line)
MC	Motor For Compressor	LI	Connection Terminal (L-Phase)	SS	Connector (Connection For Option)
MF1, MF2	Fan Motor	NI	Connection Terminal (N-Phase)	CN3D	Connector (Connection For Option)
21S4	Solenoid Valve Coil (4-Way Valve)	DCL1, DCL2	Connection Terminal (Reactor)	CN3S	Connector (Connection For Option)
63H	High Pressure Switch	IGBT	Power Module	CN3N	Connector (Connection For Option)
63HS	High Pressure Sensor	E1, E2, E3, E4	Connection Terminal (Electrical Parts Box)	CN51	Connector (Connection For Option)
63LS	Low Pressure Sensor	MULTI.B.	Multi Controller Circuit Board	LED1, LED2	LED (Operation Inspection Display)
SV1	Solenoid Valve Coil (Bypass Valve)	SW1	Switch (Display Selection)	LED3	LED (Power Supply to Main Microcomputer)
TH2	Thermistor (Hic Pipe)	SW2	Switch (Function Selection)	F1, F2	Fuse (T6.3AL250V)
TH3	Thermistor (Outdoor Liquid Pipe)	SW3	Switch (Test Run)	X501~505	Relay
TH4	Thermistor (Compressor)	SW4	Switch (Model Selection)	M-NET P.B.	M-NET Power Circuit Board
TH6	Thermistor (Suction Pipe)	SW5	Switch (Function Selection)	TB1	Connection Terminal (Electrical Parts Box)
TH7	Thermistor (Ambient)	SW6	Switch (Function Selection)		
		SW7	Switch (Function Selection)		
		SW8	Switch (Model Selection)		



MXZ-8C60NA-U1

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block (Power Supply)	TH8	Thermistor (Heat Sink)	SW9	Switch (Function Selection)
TB1B	Terminal Block (Branch Box)	LEV-A, LEV-B	Linear Expansion Valve	SWU1	Switch (Unit Address Selection, ones digit)
TB3	Terminal Block (Branch Box/Outdoor Transmission Line)	DCL	Reactor	SWU2	Switch (Unit Address Selection, tens digit)
TB7	Terminal Block (Centralized Control Transmission Line)	P.B.	Power Circuit Board	CNS1	Connector (Branch Box/Outdoor Transmission Line)
FUSE1, FUSE2	Fuse (T20AL250V)	U/V/W	Connection Terminal (U/V/W-Phase)	CNS2	Connector (Centralized Control Transmission Line)
MC	Motor For Compressor	LI	Connection Terminal (L-Phase)	SS	Connector (Connection For Option)
MF1, MF2	Fan Motor	NI	Connection Terminal (N-Phase)	CN3D	Connector (Connection For Option)
21S4	Solenoid Valve Coil (4-Way Valve)	DCL1, DCL2	Connection Terminal (Reactor)	CN3S	Connector (Connection For Option)
63H	High Pressure Switch	IGBT	Power Module	CN3N	Connector (Connection For Option)
63HS	High Pressure Sensor	E1, E2, E3, E4	Connection Terminal (Electrical Parts Box)	CN51	Connector (Connection For Option)
63LS	Low Pressure Sensor	MULTI.B.	Multi Controller Circuit Board	LED1, LED2	LED (Operation Inspection Display)
SV1	Solenoid Valve Coil (Bypass Valve)	SW1	Switch (Display Selection)	LED3	LED (Power Supply to Main Microcomputer)
TH2	Thermistor (Hic Pipe)	SW2	Switch (Function Selection)	F1, F2	Fuse (T6.3AL250V)
TH3	Thermistor (Outdoor Liquid Pipe)	SW3	Switch (Test Run)	X501~505	Relay
TH4	Thermistor (Compressor)	SW4	Switch (Model Selection)	M-NET P.B.	M-NET Power Circuit Board
TH6	Thermistor (Suction Pipe)	SW5	Switch (Function Selection)	TB1	Connection Terminal (Electrical Parts Box)
TH7	Thermistor (Ambient)	SW6	Switch (Function Selection)		
		SW7	Switch (Function Selection)		
		SW8	Switch (Model Selection)		



6-2. BRANCH BOX PAC-MKA50BC PAC-MKA30BC

<Note>

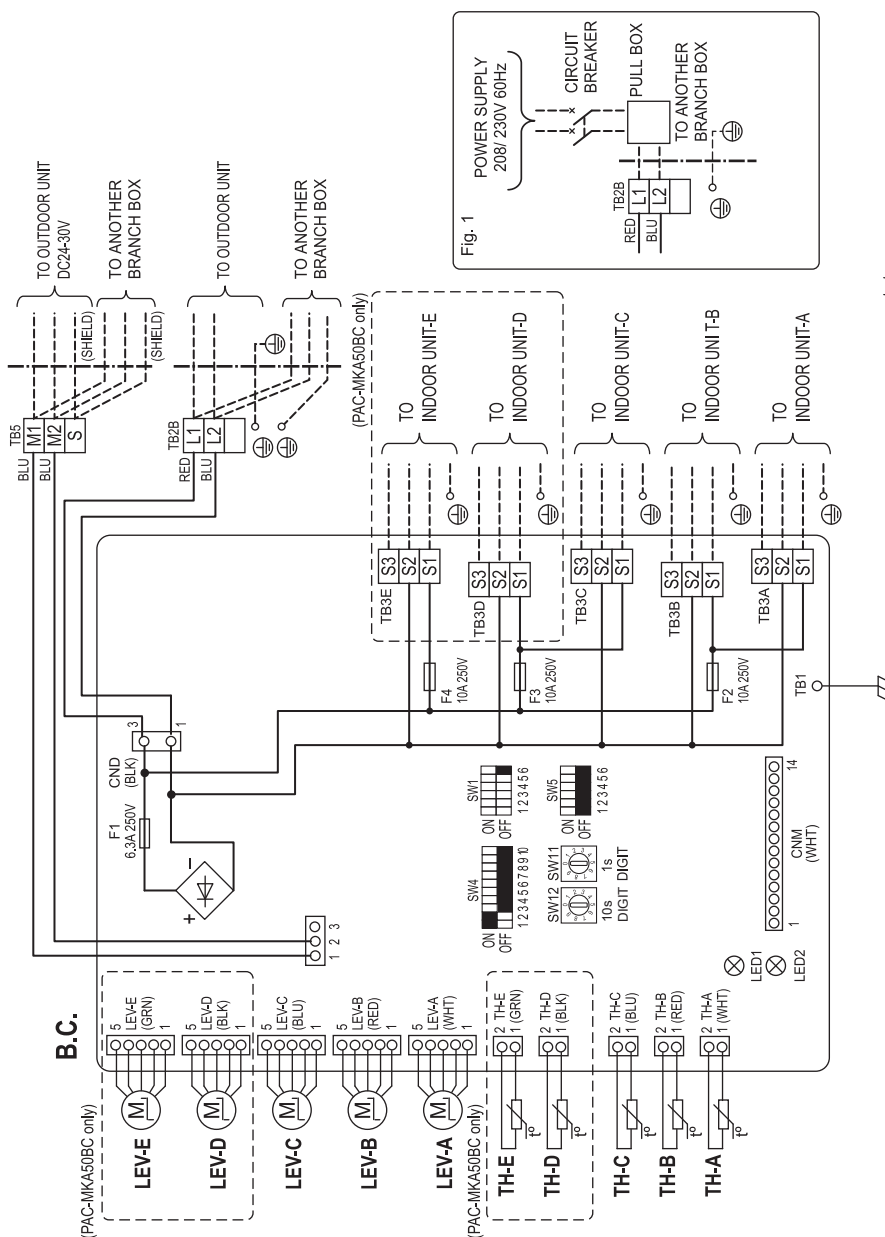
1. At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
2. Caution for electrical work.
 - Use copper supply wires.
3. When work to supply power separately to Branch box and outdoor units are applied, refer to Fig. 1.
4. For the connection method, please refer to the Branch box Installation Manual.

<Remarque>

1. Pour le service de l'unité extérieure, suivez toujours le diagramme de câblage de l'unité extérieure.
2. Précautions relatives aux travaux électriques.
 - Utilisez des câbles d'alimentation en cuivre.
3. Lorsque des travaux pour alimenter séparément le boîtier de dérivation et les unités extérieures sont effectués, reportez-vous à la Fig. 1.
4. Pour la méthode de raccordement, veuillez vous reporter au mode d'emploi du boîtier de dérivation.

<Symbols used in wiring diagram>

 : Terminal block, : Connector
 : Dip switch (■(black square) indicates a switch position)



Mark	Meaning	Function
LED 1	Main power supply	Main power supply (208/230V)
LED 2		Power on → Lamps are lit
Mark	Meaning	Function
LED 1	Main power supply	Lamp is lit
LED 2	Total number of indoor units	Blink depend on the total number <example> The total number is 2 ① Blink 2 times. ② Turn off for three sec. ③ Repeat ① to ②.

SYMBOL	NAME	ON	OFF
SW1-1	INDOOR UNIT-A	NOT CONNECT	CONNECT
SW1-2	INDOOR UNIT-B	NOT CONNECT	CONNECT
SW1-3	INDOOR UNIT-C	NOT CONNECT	CONNECT
SW1-4	INDOOR UNIT-D	NOT CONNECT	CONNECT
SW1-5	INDOOR UNIT-E	NOT CONNECT	CONNECT
SW1-6	NO USE		

After each indoor unit is connected to the outdoor unit, turn on the switch corresponding to each indoor unit. For example, when the indoor units are connected to INDOOR UNIT-A and C, turn SW1-1 and SW1-3 to on.

*1 SW1 setting

*2 LED on Branch box controller board for service

*3 D and E for PAC-MKA50BC only.

SYMBOL	NAME	ON	OFF
B.C.	Branch box controller board		
F1	Fuse 250V 6.3A		
F2-F4	Fuse 250V 10A		
SW1	Switch for indoor unit connection *1		
SW4	Switch for mode selection		
SW5	Not in use		
GND	Connector <Connection for service>		
LED1	Light emitting diode *2		
LED2	Linear expansion valve *3		
TH-A-E	Thermistor <Gas pipe> *3		
TB5	Terminal block <To Power Supply>		
TB2B	Terminal block <Transmission>		
TB3A-E	Terminal block To indoor unit-A-E *3		
SW11	Address Setting 1s DIGIT		
SW12	Address Setting 10ths DIGIT		

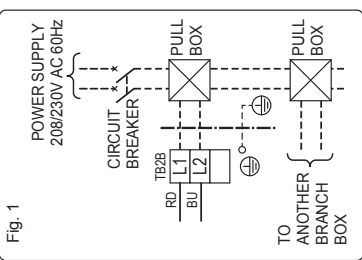
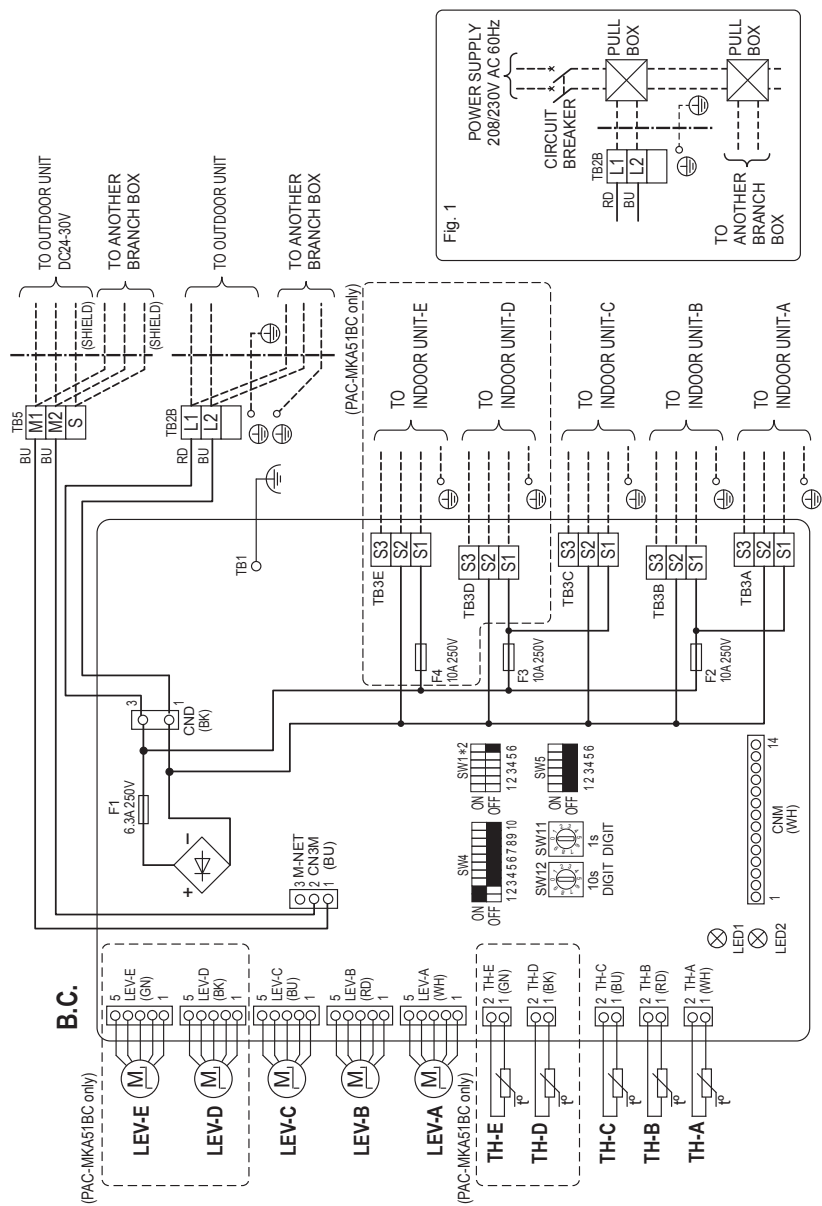
<Combination of indoor units>

Enter the location of combined indoor units with model name in each blank below because it is necessary for service and maintenance.

Indoor unit - A	Indoor unit - B	Indoor unit - C	Indoor unit - D	Indoor unit - E

PAC-MKA51BC PAC-MKA31BC

- <Note>
- At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
 - Caution for electrical work.
 - Use copper supply wires.
 - When work to supply power separately to Branch box and outdoor units are applied, refer to Fig. 1.
 - For the connection method, please refer to the Branch box Installation Manual.
- <Symbols used in wiring diagram>
- Terminal block
 - Connector
 - Dip switch (black square) indicates a switch position



SYMBOL	NAME
B.C.	Branch box controller board
F1	Fuse <UL 6.3A 250V AC>
F2-F4	Fuse <UL 10A 250V AC> *1
SW1	Switch for indoor unit connection *2
SW4	Switch for function selection
SW5	Switch for function selection
CNM	Connector <Connection for service>
LED1,2	Light emitting diode *3
TB3A-E	Terminal block <To Indoor unit-A-E> *4
SW11	Address Setting ones digit
SW12	Address Setting tens digit
LEVA-E	Linear expansion valve *4
THA-E	Thermistor <Gas pipe> *4
TB2B	Terminal block <To Power Supply>
TB5	Transmission line

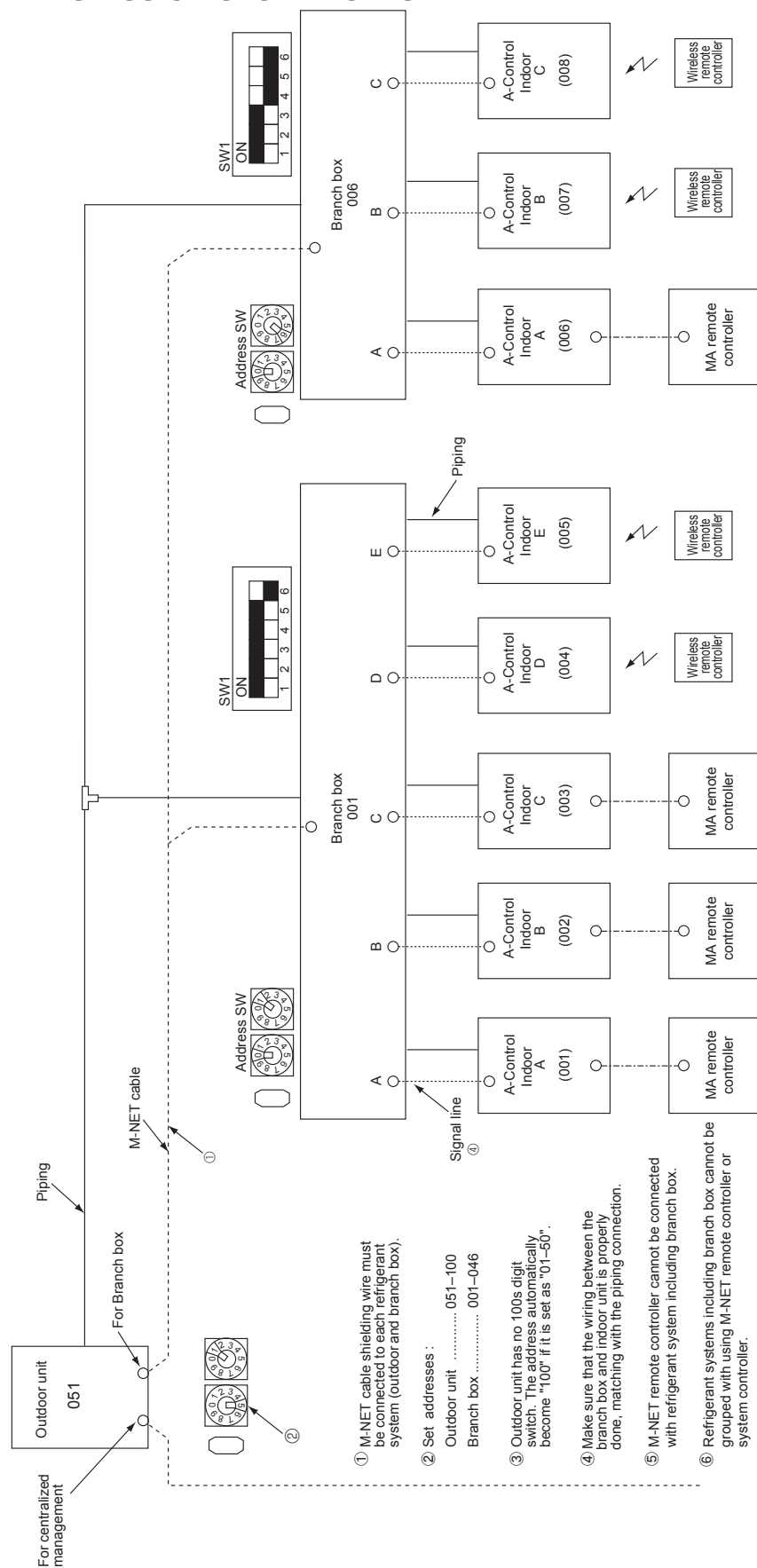
Mark	Meaning	Function
LED 1	Main power supply	Main power supply (208/230V)
LED 2		Power on → Lamps are lit
Mark	Meaning	Function
LED 1	Main power supply	Lamp is lit
LED 2	Total number of indoor units	Blink depends on the total number of indoor units <example> The total number is 2 ① Blink 2 times. ② Turn off for 3 seconds. ③ Repeat ① to ②.

*4 D and E for PAC-MKA51BC only.

<Combination of indoor units>
Enter the location of combined indoor units with model name in each blank below because it is necessary for service and maintenance.

Indoor unit-A	Indoor unit-B	Indoor unit-C	Indoor unit-D	Indoor unit-E

7-1. TRANSMISSION SYSTEM SETUP



7-2. REFRIGERANT SYSTEM DIAGRAM

MXZ-4C36NAHZ

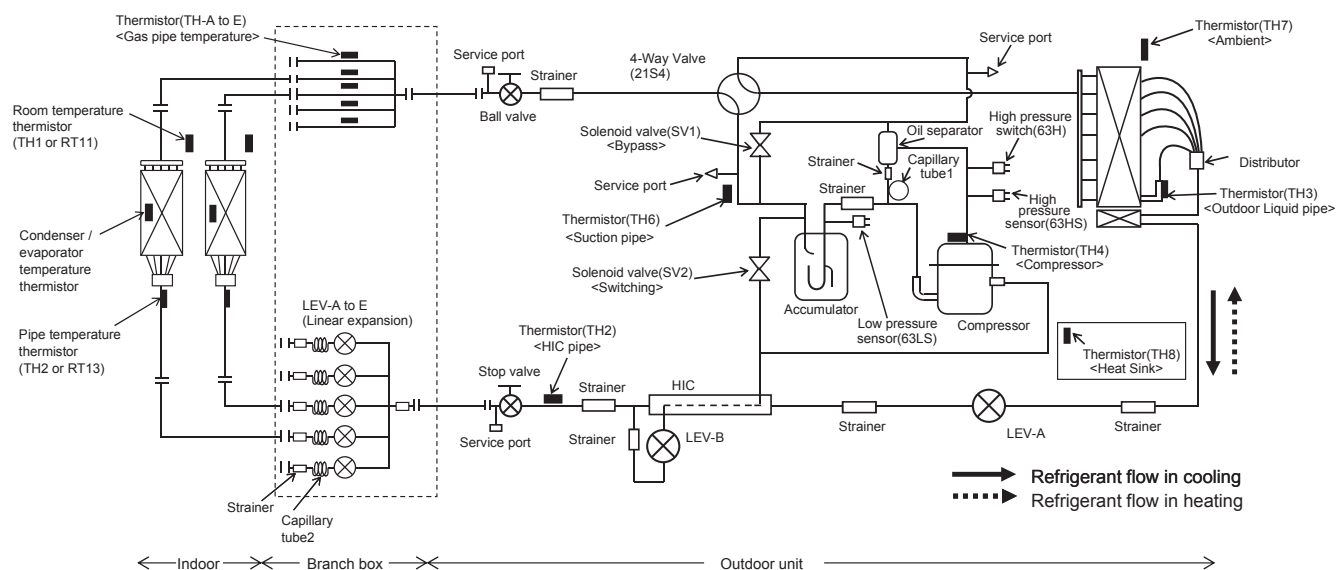
MXZ-5C42NAHZ

MXZ-8C48NAHZ

MXZ-4C36NAHZ-U1

MXZ-5C42NAHZ-U1

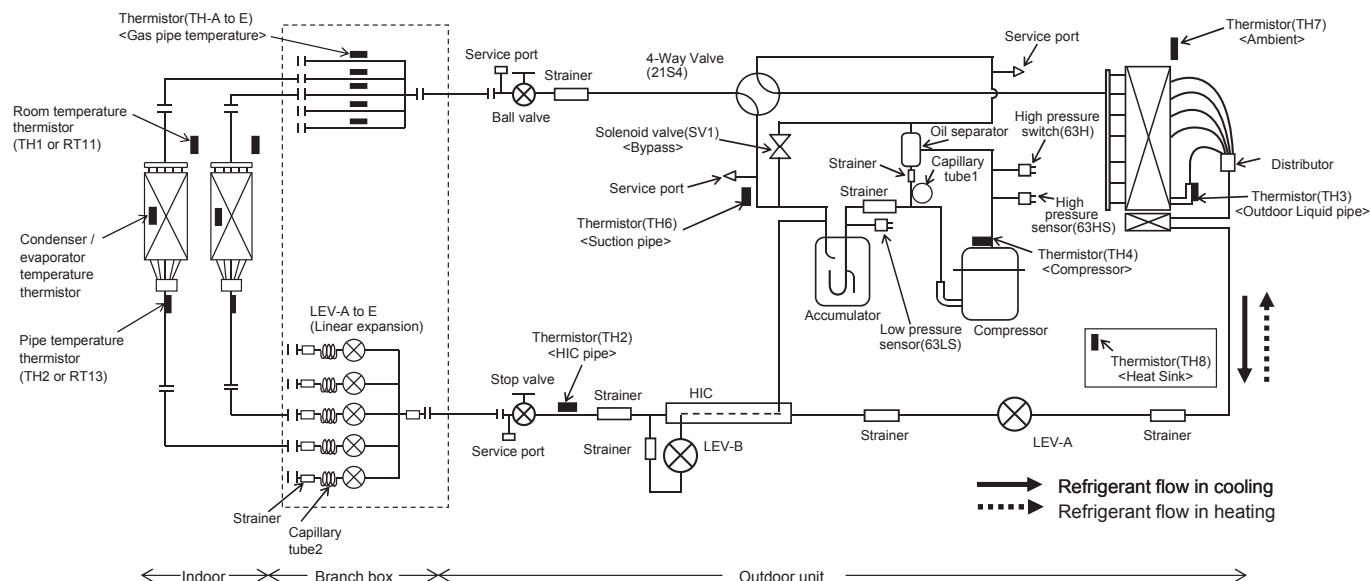
MXZ-8C48NAHZ-U1



		Capillary tube 1 (For return of oil from oil separator)	Capillary tube 2 behind LEV (in cooling mode)
Outdoor unit	MXZ-4C36NAHZ(-U1) MXZ-5C42NAHZ(-U1) MXZ-8C48NAHZ(-U1)	$\phi 0.098 \times \phi 0.031 \times L(39-1/2)$ ($\phi 2.5 \times \phi 0.8 \times L1000$)	—
Branch box	PAC-MKA50BC PAC-MKA51BC	—	$(\phi 0.157 \times \phi 0.117 \times L(5-1/8)) \times 5$ ($(\phi 4.0 \times \phi 3.0 \times L130) \times 5$)
	PAC-MKA30BC PAC-MKA31BC	—	$(\phi 0.157 \times \phi 0.117 \times L(5-1/8)) \times 3$ ($(\phi 4.0 \times \phi 3.0 \times L130) \times 3$)

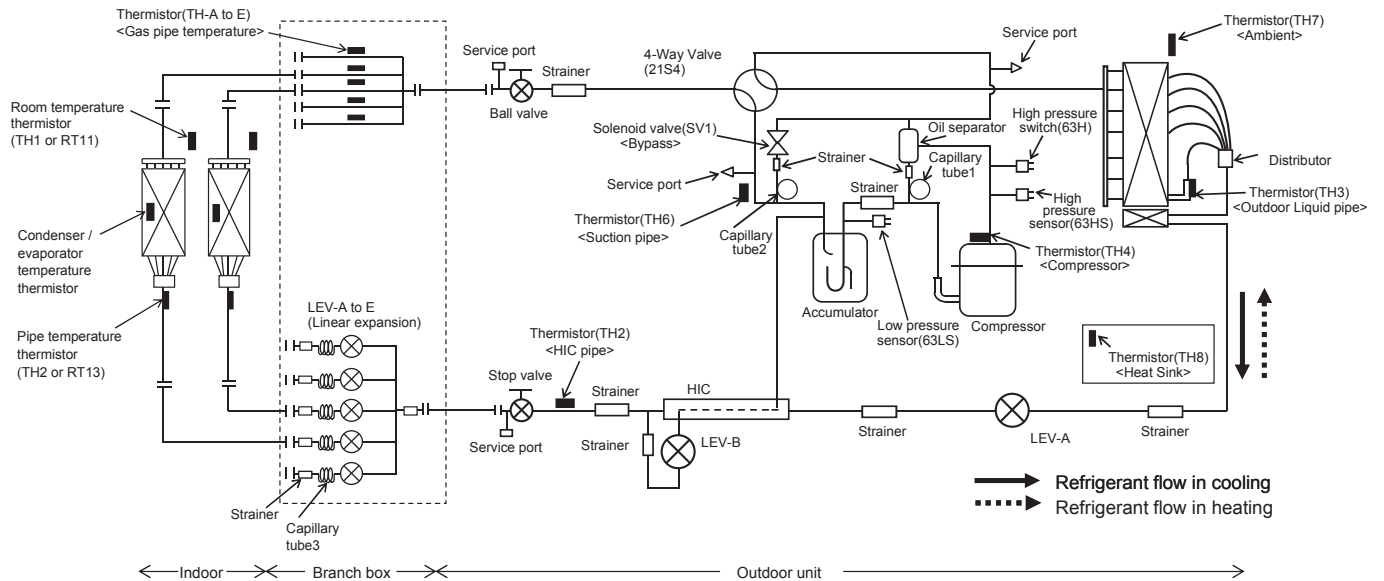
MXZ-8C48NA

MXZ-8C48NA-U1



		Capillary tube 1 (For return of oil from oil separator)	Capillary tube 2 behind LEV (in cooling mode)
Outdoor unit	MXZ-8C48NA(-U1)	$\phi 0.098 \times \phi 0.031 \times L(39-1/2)$ ($\phi 2.5 \times \phi 0.8 \times L1000$)	—
Branch box	PAC-MKA50BC PAC-MKA51BC	—	$(\phi 0.157 \times \phi 0.117 \times L(5-1/8)) \times 5$ ($(\phi 4.0 \times \phi 3.0 \times L130) \times 5$)
	PAC-MKA30BC PAC-MKA31BC	—	$(\phi 0.157 \times \phi 0.117 \times L(5-1/8)) \times 3$ ($(\phi 4.0 \times \phi 3.0 \times L130) \times 3$)

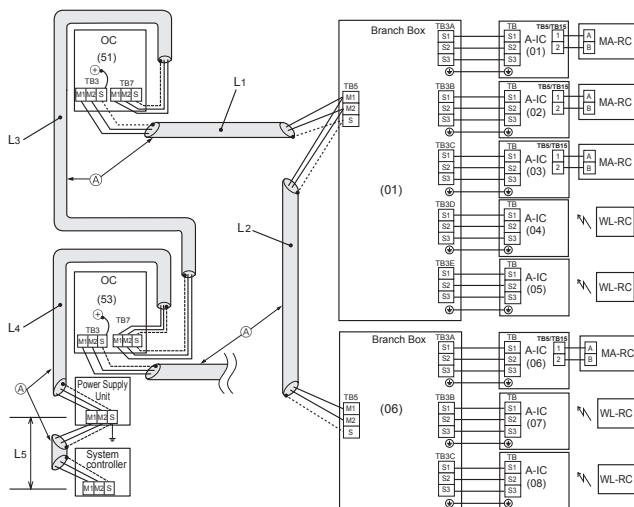
MXZ-8C60NA-U1



Unit: inch (mm)

		Capillary tube 1 (For return of oil from oil separator)	Capillary tube 2 (For solenoid valve (SV1))	Capillary tube 3 behind LEV (in cooling mode)
Outdoor unit	MXZ-8C60NA-U1	$\varnothing 0.098 \times \varnothing 0.031 \times L(39-1/2)$ ($\varnothing 2.5 \times \varnothing 0.8 \times L800$)	$\varnothing 0.157 \times \varnothing 0.117 \times L(19-5/8)$ ($\varnothing 4.0 \times \varnothing 3.0 \times L500$)	—
Branch box	PAC-MKA50BC PAC-MKA51BC	—	—	$(\varnothing 0.157 \times \varnothing 0.117 \times L(5-1/8)) \times 5$ ($(\varnothing 4.0 \times \varnothing 3.0 \times L130) \times 5$)
	PAC-MKA30BC PAC-MKA31BC	—	—	$(\varnothing 0.157 \times \varnothing 0.117 \times L(5-1/8)) \times 3$ ($(\varnothing 4.0 \times \varnothing 3.0 \times L130) \times 3$)

7-3. TYPICAL CONTROL SYSTEM



Longest length via outdoor units:

$L1 + L2 + L3 + L4 + L5 \leq 500 \text{ m (1640 ft.) (1.25 mm}^2 \text{ or more)}$

Longest transmission cable length

$L1 + L2, L3 + L4, L5 \leq 200 \text{ m (656 ft.) (1.25 mm}^2 \text{ or more)}$

Note: M-NET remote controller cannot be connected with a refrigerant system which includes branch box.

(1) Difference between display and operation

- ① When operating the system using the system controller, details of those operations will not appear on the display of the wireless remote controller.
- ② The set temperature range is different in the wireless remote controller that comes with room air conditioner and the system controller. The room air conditioner has a wider range. If the target temperature is set to below 63°F [17°C] or less, or 86°F [30°C] or more by the wireless remote controller that comes with room air conditioner, the temperature displayed on the system controller may be converted to their maximum/minimum set temperature. For instance, when HEAT operation at 61°F [16°C] is set at the room air conditioner, the system controller may display 63°F [17°C].
- ③ When the DRY mode is set with the wireless remote controller, the room air conditioner automatically set the optimum target temperature. The system controller will display the target temperature as a set temperature.
- ④ When the DRY mode is set with the system controller, the room air conditioner performs the DRY mode control operation according to the temperature set with the system controller.

(2) Timer operation

- ① Timer operation should be set using only one controller from the remote controller that comes with the room air conditioner, the system controller or the MA remote controller. If more than one controller is used to set the timer at the same time, the timer will not function properly.
- ② When the timer is set with the wireless remote controller; the system controller will not show the timer display.
- ③ The timer set with the system controller will not be cancelled with the wireless remote controller.

(3) Manual operation prohibition

- ① When the manual operation (ON/OFF, set temperature, or operation mode) is prohibited with the system controller, the command to perform the prohibited operation will not be accepted from the wireless remote controller that comes with the room air conditioner. The operation partially enabled by the system controller can be operated with the wireless remote controller. Regardless of whether the operation is disabled or enabled, 3 short beeps will sound when the signal is sent from the wireless remote controller.

(4) Trouble

- ① If the MA remote controller or the system controller shows the abnormal indication, clear it by stopping the operation with one of the following: the MA remote controller, the system controller, or the wireless remote controller.
(Abnormal indication of the air conditioner could be recovered automatically, but that of the MA remote controller or the system controller cannot be recovered unless the operation is stopped.)



(5) Group setting

① MA group or M-NET group setting cannot be set.

(6) Restricted functions

The following functions of system controller cannot be used.

- DIDO controller (Interlock with the air conditioner)
- Fan control of energy saving control or peak cut control function
- Air conditioning charge [TG-2000A]
- Set temperature range limiting function
- Operation mode changeover limit (season changing) [PAC-SF44SRA]
- Dual set point function
- Setback mode
- Hold function

8-1. TROUBLESHOOTING

<Check code displayed by self-diagnosis and actions to be taken for service (summary)>

Present and past check codes are logged, and they can be displayed on the wired remote controller and multi controller circuit board of outdoor unit. Actions to be taken for service, which depends on whether or not the trouble is reoccurring in the field, are summarized in the table below. Check the contents below before investigating details.

Unit conditions at service	Check code	Actions to be taken for service (summary)
The trouble is reoccurring.	Displayed	Judge the problem and take a corrective action according to "8-3. SELF-DIAGNOSIS ACTION BY FLOWCHART".
	Not displayed	Conduct troubleshooting and ascertain the cause of the trouble according to "8-4. TROUBLESHOOTING BY INFERIOR PHENOMENA".
The trouble is not reoccurring.	Logged	①Consider the temporary defects such as the work of protection devices in the refrigerant circuit including compressor, poor connection of wiring, noise, etc. Re-check the symptom, and check the installation environment, refrigerant amount, weather when the trouble occurred, matters related to wiring, etc. ②Reset check code logs and restart the unit after finishing service. ③There is no abnormality in electrical component, controller board, remote controller, etc.
	Not logged	①Re-check the abnormal symptom. ②Conduct troubleshooting and ascertain the cause of the trouble according to "8-4. TROUBLESHOOTING BY INFERIOR PHENOMENA". ③Continue to operate unit for the time being if the cause is not ascertained. ④There is no abnormality concerning of parts such as electrical component, controller board, remote controller, etc.

8-2. CHECK POINTS FOR TEST RUN

8-2-1. Procedures before test run

- (1) Before a test run, make sure that the following work is completed.
 - Installation related :
Make sure that the panel of cassette type and electrical wiring are done.
Otherwise electrical functions like auto vane will not operate normally.
 - Piping related :
Perform leakage test of refrigerant and drain piping.
Make sure that all joints are perfectly insulated.
Check stop valves on both liquid and gas side for full open.
 - Electrical wiring related :
Check ground wire, transmission cable, remote controller cable, and power supply cable for secure connection.
Make sure that all switch settings of address or adjustments for special specification systems are correctly settled.
- (2) Safety check :
With the insulation tester of 500V, inspect the insulation resistance.
Do not touch the transmission cable and remote controller cable with the tester.
The resistance should be over 1.0 MΩ. Do not proceed inspection if the resistance is less than 1.0 MΩ.
Inspect between the outdoor unit power supply terminal block and ground first, metallic parts like refrigerant pipes or the electrical box next, then inspect all electrical wiring of outdoor unit, indoor unit, and all linked equipment .
- (3) Before operation:
Turn the power supply switch of the outdoor unit to on for compressor protection. For a test run, wait at least 12 hours from this point.
- (4) More than 12 hours later from power supply to the outdoor unit, turn all power switch to on for the test run.
Perform test run according to the "Operation procedure" table of the bottom of this page.
While test running, make test run reports .

8-2-2. Test run

- (1) Using remote controller
Refer to the indoor unit installation manual.

- Be sure to perform the test run individually for each indoor unit. Make sure each indoor unit operates properly following the installation manual attached to the unit.
If you perform the test run for indoor units connected all at once, faulty connections of the refrigerant pipes and cables cannot be detected.
- The compressor operation is not available for 3 minutes at least after the power is supplied.
- The compressor can emit noise just after turn on the power supply or in case of low outside air temperature.

About the restart protective mechanism



Once the compressor stops, the restart preventive device operates so the compressor will not operate for 3 minutes to protect the air conditioner.

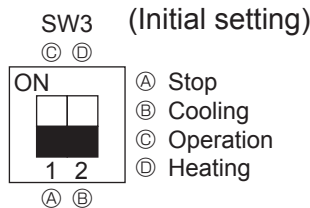
(2) Using SW3 in outdoor unit

In case of the test run from outdoor unit, all indoor units operate. Therefore, you cannot detect any erroneous connection of refrigerant pipes and the connecting wires. If it aims at detection of any erroneous connection, be sure to carry out the test run from remote controller with reference to "(1) Using remote controller."

● **Setting procedure**

The setting of test run (ON/OFF) and its operation mode (cooling/heating) can be set by SW3 on the multi controller circuit board of outdoor unit.

- ① Set operation mode (cooling or heating) by SW3-2.
- ② Start test run by setting SW3-1 to ON () with the indicated operation mode of SW3-2.
- ③ Finish test run by setting SW3-1 to OFF ().
 - Operation mode cannot be changed by SW3-2 during test run.
 - To change the test run operation mode, stop the test run by 3-1, and restart test run by SW3-1 after the mode is changed by SW3-2.
 - Test run automatically stops 2 hours later by 2-hour OFF timer function.
 - Test run can be performed by the remote controller.
 - The remote controller display of test run by outdoor unit is the same as that of test run by remote controller.
 - If test run is set with the outdoor unit, the test run is performed for all indoor units.
 - The remote controller operation becomes unavailable once the test run is set with the outdoor unit.



SW3-1	ON	Cooling operation
SW3-2	OFF	
SW3-1	ON	Heating operation
SW3-2	ON	

Note: After performing the test run, set SW3-1 to OFF.

- A few seconds after the compressor starts, a clanging noise may be heard from the inside of the outdoor unit. The noise is coming from the service port due to the small difference in pressure in the pipes. The unit is not faulty.

When test run is started by "Using SW3 in outdoor unit", even if stop instructions are sent by remote controller, outdoor unit will not stop.

In this case, please set SW3 in outdoor unit to off to end test run.

- After power is supplied or after an operation stops for a while, a small clicking noise may be heard from the inside of the branch box. This is the sound of linear expansion valve's opening and closing and this is not a fault.

Note: Be sure to wait at least 3 minutes after turning on the power supply before setting SW3-1 and SW3-2.
If the DIP switches are set before 3 minutes has elapsed, the test run may not start.

8-2-3. Countermeasures for Error During Test Run

- If a problem occurs during test run, a code number will appear on the remote controller (or LED on the outdoor unit), and the air conditioning system will automatically cease operating.
- Determine the nature of the abnormality and apply corrective measures.

Check code (2 digits)	Check code (4 digits)	Trouble	Detected Unit			Remarks
			Indoor	Outdoor	Remote Controller	
Ed	0403	Serial communication error		○		Outdoor unit Multi controller board—Power board communication trouble
U2	1102	Compressor temperature trouble		○		Check delay code 1202
UE	1302	High pressure trouble		○		Check delay code 1402
U7	1500	Superheat due to low discharge temperature trouble		○		Check delay code 1600
U2	1501	Refrigerant shortage trouble		○		Check delay code 1601
		Closed valve in cooling mode		○		Check delay code 1501
P6	1503	Freeze protection of Branch box or Indoor unit	○			
EF	1508	4-way valve trouble in heating mode		○		Check delay code 1608
UF	4100	Compressor current interruption (locked compressor)		○		Check delay code 4350
UP	4210	Compressor overcurrent interruption		○		
U9	4220	Voltage shortage/overvoltage/PAM error/L1 open phase/primary current sensor error/power synchronization signal error		○		Check delay code 4320
U5	4230	Heat sink temperature trouble		○		Check delay code 4330
U6	4250	Power module trouble		○		Check delay code 4350
U8	4400	Fan trouble (Outdoor)		○		Check delay code 4500
U3	5101	Compressor temperature thermistor (TH4) open / short		○		
U4	5102	Suction pipe temperature thermistor (TH6) open / short		○		
U4	5105	Outdoor liquid pipe temperature thermistor (TH3) open/short		○		Check delay code 1205
U4	5106	Ambient temperature thermistor (TH7) open/short		○		Check delay code 1221
U4	5109	HIC pipe temperature thermistor (TH2) open/short		○		Check delay code 1222
U4	5110	Heat sink temperature thermistor (TH8) open/short		○		Check delay code 1214
F5	5201	High pressure sensor (63HS) trouble		○		Check delay code 1402
F3	5202	Low pressure sensor (63LS) trouble		○		Check delay code 1400
UH	5300	Current sensor trouble/Primary current error		○		Check delay code 4310
A0	6600	Duplex address error	○	○	○	Only M-NET Remote controller is detected.
A2	6602	Transmission processor hardware error	○	○	○	Only M-NET Remote controller is detected.
A3	6603	Transmission bus BUSY error	○	○	○	Only M-NET Remote controller is detected.
A6	6606	Signal communication error with transmission processor	○	○	○	Only M-NET Remote controller is detected.
A7	6607	No ACK error	○		○	Only M-NET Remote controller is detected.
A8	6608	No response frame error	○		○	Only M-NET Remote controller is detected.
E0/E4	6831	MA communication receive error	○		○	Only MA Remote controller is detected.
E3/E5	6832	MA communication send error	○		○	Only MA Remote controller is detected.
E3/E5	6833	MA communication send error	○		○	Only MA Remote controller is detected.
E0/E4	6834	MA communication receive error	○		○	Only MA Remote controller is detected.
EF	7100	Total capacity error		○		
EF	7101	Capacity code error	○	○		
EF	7102	Connecting excessive number of units and branch boxes		○		
EF	7105	Address setting error		○		
EF	7130	Incompatible unit combination		○		

NOTES:

- When the outdoor unit detects No ACK error/No response error, an object indoor unit is treated as a stop, and not assumed to be abnormal.
- The check codes displayed on the units may be different between the error source and others. In that case, please refer to the check code of error source by displayed attribute and address.
- Refer to the service manual of indoor unit or remote controller for the detail of error detected in indoor unit or remote controller.

• Self-diagnosis function

The indoor and outdoor units can be diagnosed automatically using the self-diagnosis switch (SW1) and LED indication (LED1, LED2) found on the outdoor multi controller circuit board.
LED indication : Set all contacts of SW1 to OFF.

• During normal operation

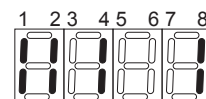
The LED indicates the drive state of the controller in the outdoor unit.

Bit	1	2	3	4	5	6	7	8
Indication	Compressor operated	52C	21S4	SV1	SV2*	—	—	Always lit

*SV2 is not equipped to MXZ-8C48/60NA.

[Example]

When the compressor and SV1 are on during cooling operation.



8-3. SELF-DIAGNOSIS ACTION BY FLOWCHART

Check code	
0403 (Ed)	Serial communication error

Abnormal points and detection methods	Causes and checkpoints
If serial communication between the outdoor controller board and outdoor power board is defective.	① Wire breakage or contact failure of connector CN2 or CN4 ② Malfunction of power board communication circuit on outdoor controller board ③ Malfunction of communication circuit on outdoor power board

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

Diagnosis	Remedy
<p>Check the connection of the communication line (CN2 and CN4) between the outdoor controller board and power board.</p> <p>Are they connected normally?</p> <p>No</p> <p>Yes</p>	<p>Connect the CN2 and CN4 properly. Replace them in case of a breakage.</p> <p>The communication circuit of either the outdoor controller board or power board is defective. If unable to identify the defective circuit; ①Replace the outdoor controller board if it does not recover, ②Replace the outdoor power board.</p>

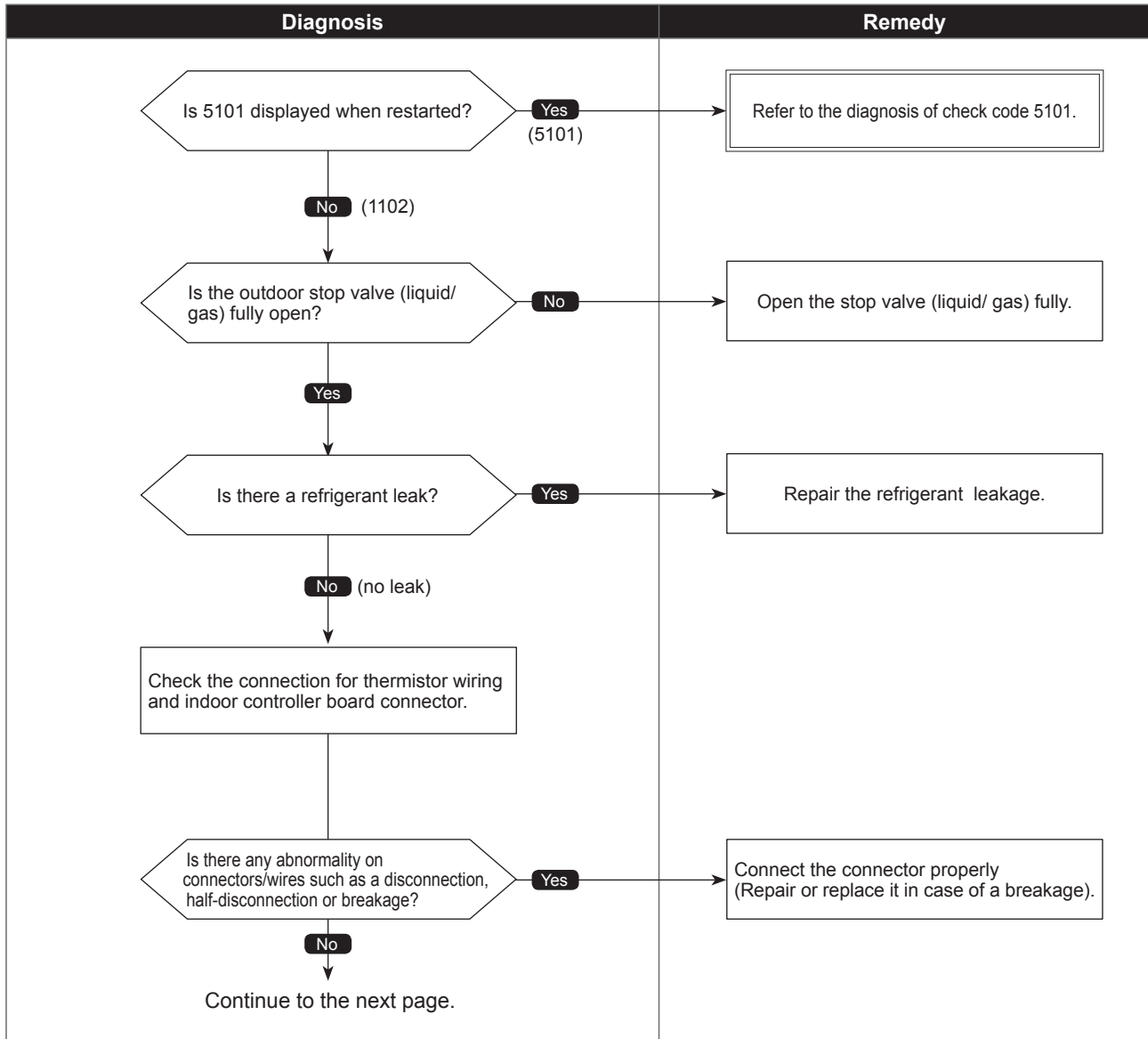
Compressor temperature trouble

Chart 1 of 2

Abnormal points and detection methods	Causes and checkpoints
<p>(1) If TH4 falls into following temperature conditions;</p> <ul style="list-style-type: none"> ●exceeds 230°F [110°C] continuously for 5 minutes ●exceeds 257°F [125°C] <p>(2) If a pressure detected by the high pressure sensor and converted to saturation temperature exceeds 104°F [40°C] during defrosting, and TH4 exceeds 230°F [110°C].</p> <p>TH4: Thermistor <Compressor> LEV: Electronic expansion valve</p>	<p>① Malfunction of stop valve ② Over-heated compressor operation caused by shortage of refrigerant ③ Defective thermistor ④ Defective outdoor controller board ⑤ LEV performance failure ⑥ Defective indoor controller board ⑦ Clogged refrigerant system caused by foreign object ⑧ Refrigerant shortage while in heating operation (Refrigerant liquid accumulation in compressor while indoor unit is OFF/thermo-OFF.)</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

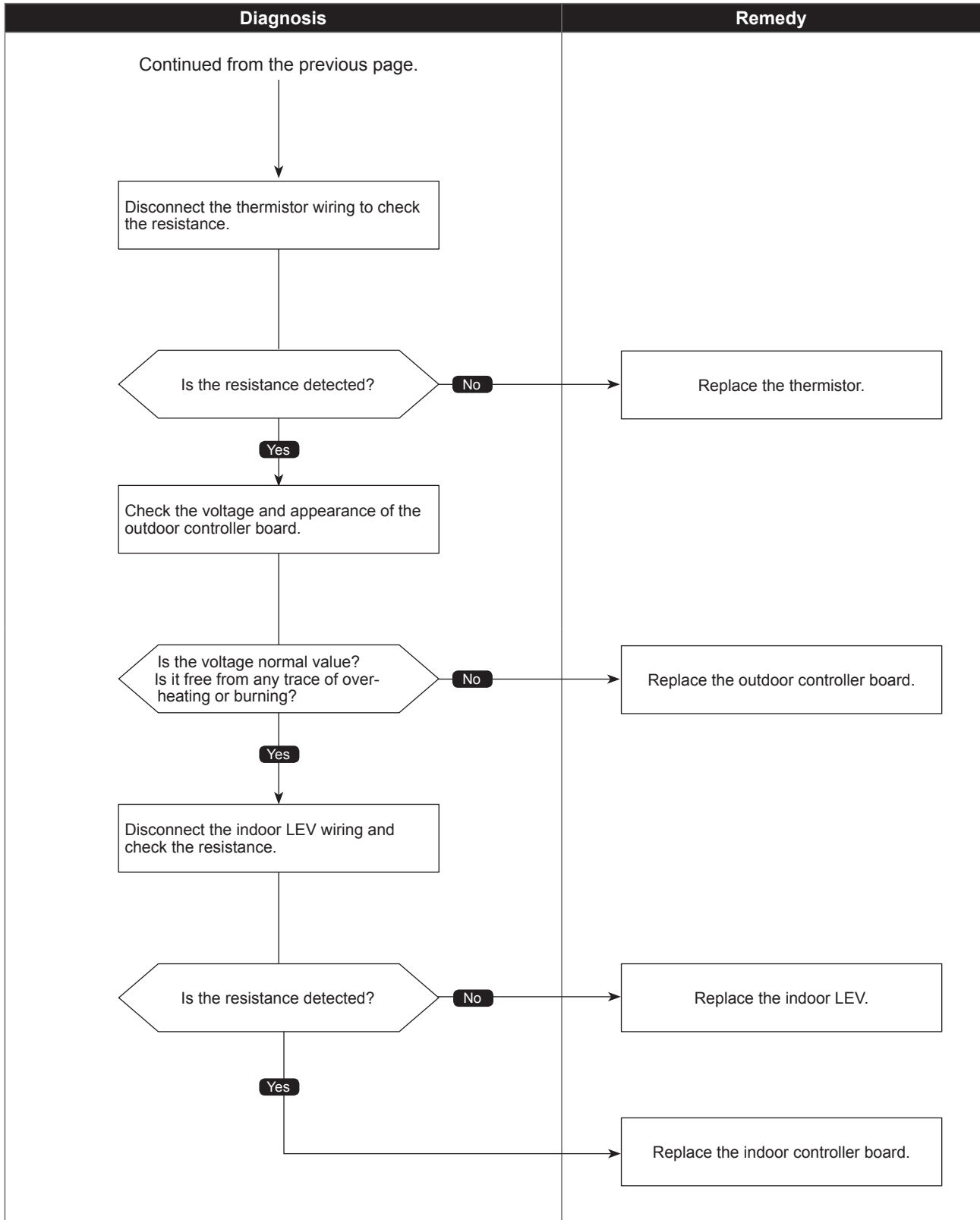


Compressor temperature trouble

Chart 2 of 2

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



High pressure trouble

Chart 1 of 4

Abnormal points and detection methods	Causes and checkpoints
<p>(1) High pressure abnormality (63H operation) Abnormal if 63H operates(*) during compressor operation. (*602 PSIG [4.15 MPaG])</p> <p>(2) High pressure abnormality (63HS detected) 1. If a pressure detected by 63HS exceeds 625 PSIG [4.31 MPaG] or more during compressor operation. 2. If a pressure detected by 63HS exceeds 600 PSIG [4.14 MPaG] or more for 3 minutes during compressor operation.</p> <p>63H : High pressure switch 63HS: High pressure sensor LEV : Electronic expansion valve SV1 : Solenoid valve TH7 : Thermistor <Ambient></p>	<p>① Defective operation of stop valve (not fully open) ② Clogged or broken pipe ③ Malfunction or locked outdoor fan motor ④ Short-cycle of outdoor unit ⑤ Dirt of outdoor heat exchanger ⑥ Remote controller transmitting error caused by noise interference ⑦ Contact failure of the outdoor controller board connector ⑧ Defective outdoor controller board ⑨ Short-cycle of indoor unit ⑩ Decreased airflow, clogged filter, or dirt on indoor unit. ⑪ Malfunction or locked indoor fan motor ⑫ Decreased airflow caused by defective inspection of outdoor temperature thermistor (It detects lower temperature than actual temperature.) ⑬ Indoor LEV performance failure ⑭ Malfunction of fan driving circuit ⑮ SV1 performance failure ⑯ Defective high pressure sensor ⑰ Defective high pressure sensor input circuit on outdoor controller board</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

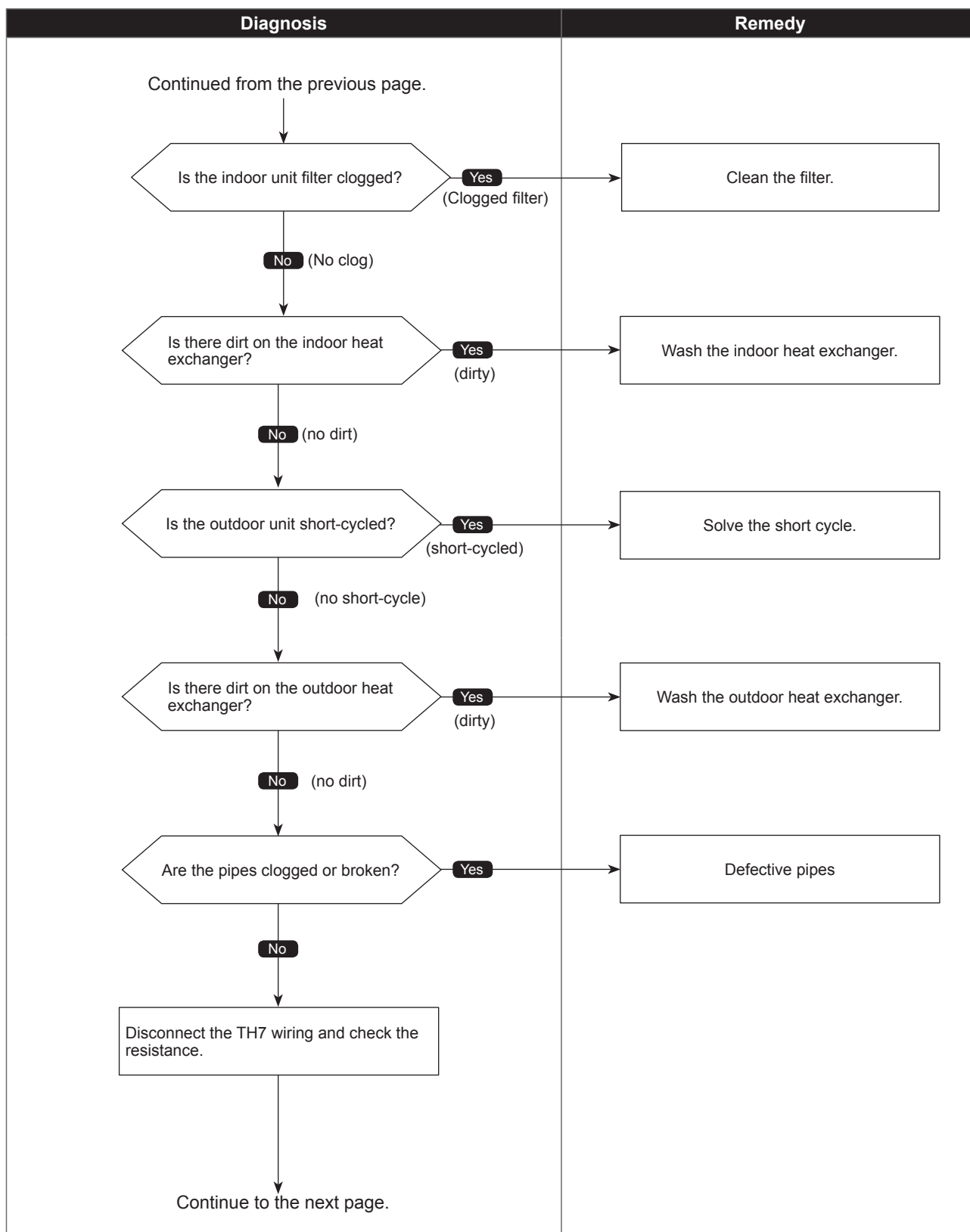
Diagnosis	Remedy
<p>Is 5201 displayed when restarted?</p> <p>Yes (5201)</p> <p>No (1302)</p>	<p>Refer to the diagnosis of check code 5201.</p>
<p>Is the outdoor stop valve (liquid/ gas) fully open?</p> <p>No</p> <p>Yes</p>	<p>Open the stop valve (liquid/ gas) fully.</p>
<p>Does the outdoor fan rotate while the operation?</p> <p>No</p> <p>Yes</p>	<p>Check the outdoor fan motor. Refer to "How to check the parts" on the outdoor unit service manual.</p>
<p>Does the indoor fan rotate while the operation?</p> <p>No</p> <p>Yes</p>	<p>Check the indoor fan motor. Refer to "How to check the parts" on the indoor unit service manual.</p>
<p>Is the indoor unit short-cycled?</p> <p>Yes (short-cycled)</p> <p>No (no short-cycle)</p> <p>Continue to the next page.</p>	<p>Solve the short-cycle.</p>

High pressure trouble

Chart 2 of 4

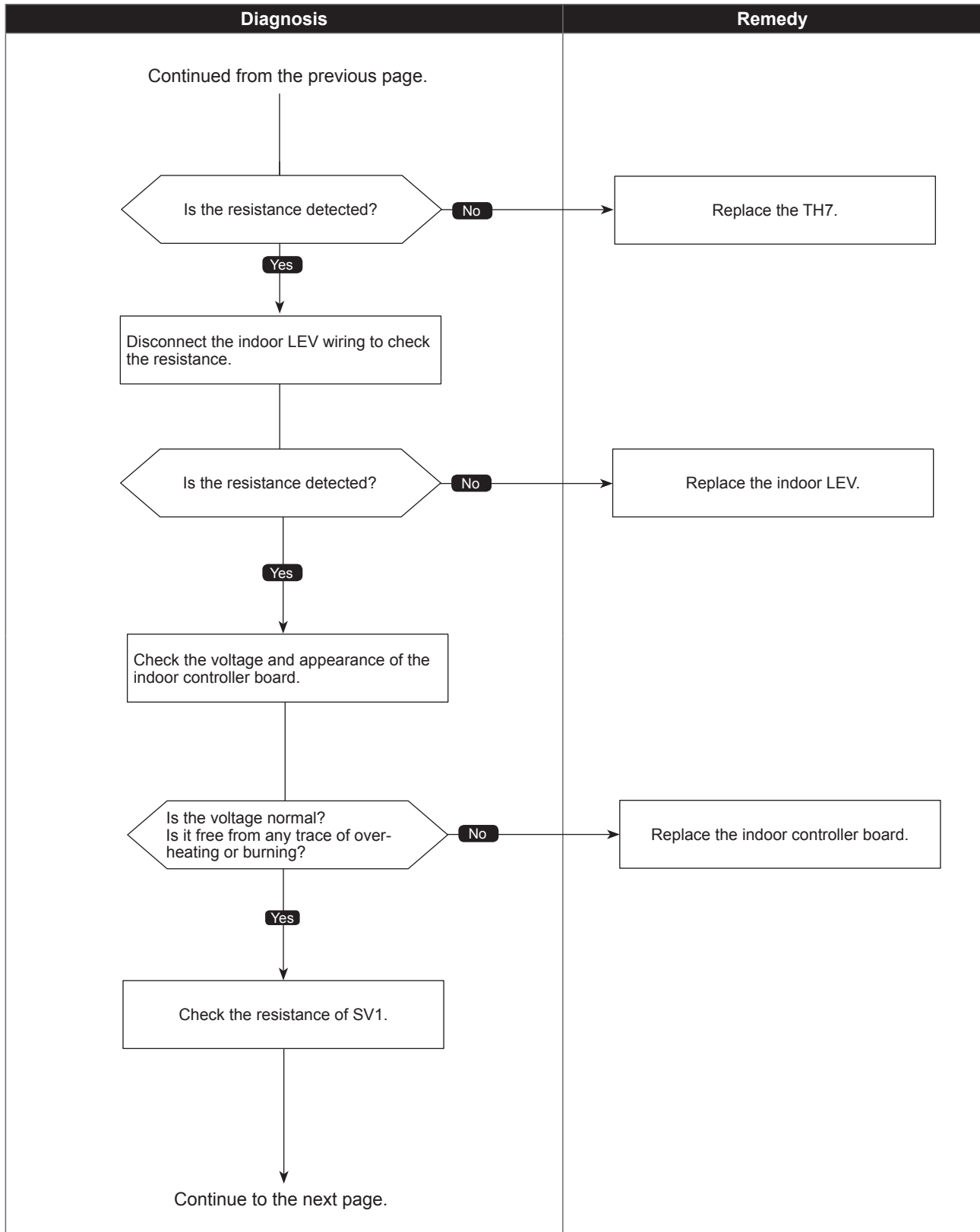
●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



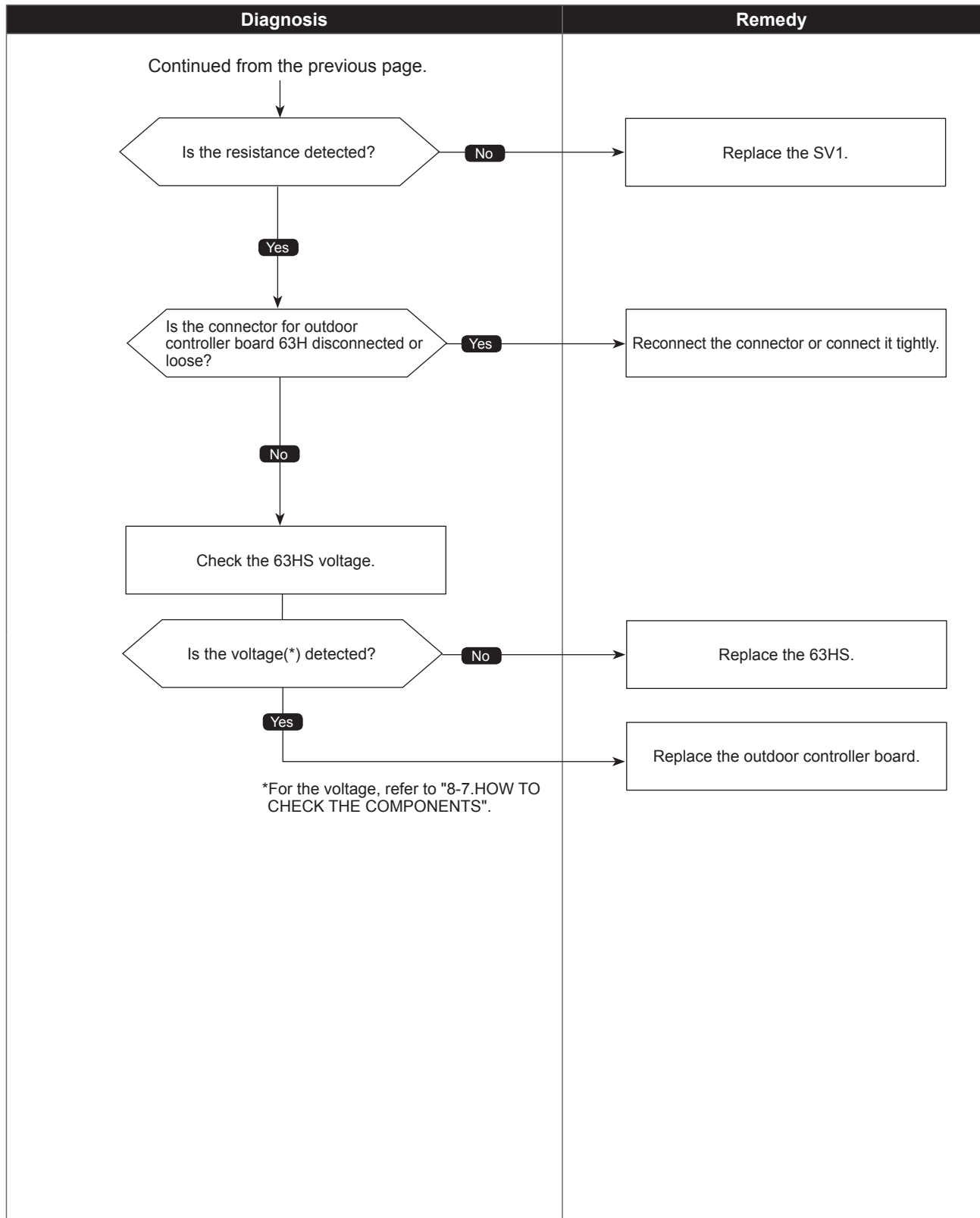
•Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



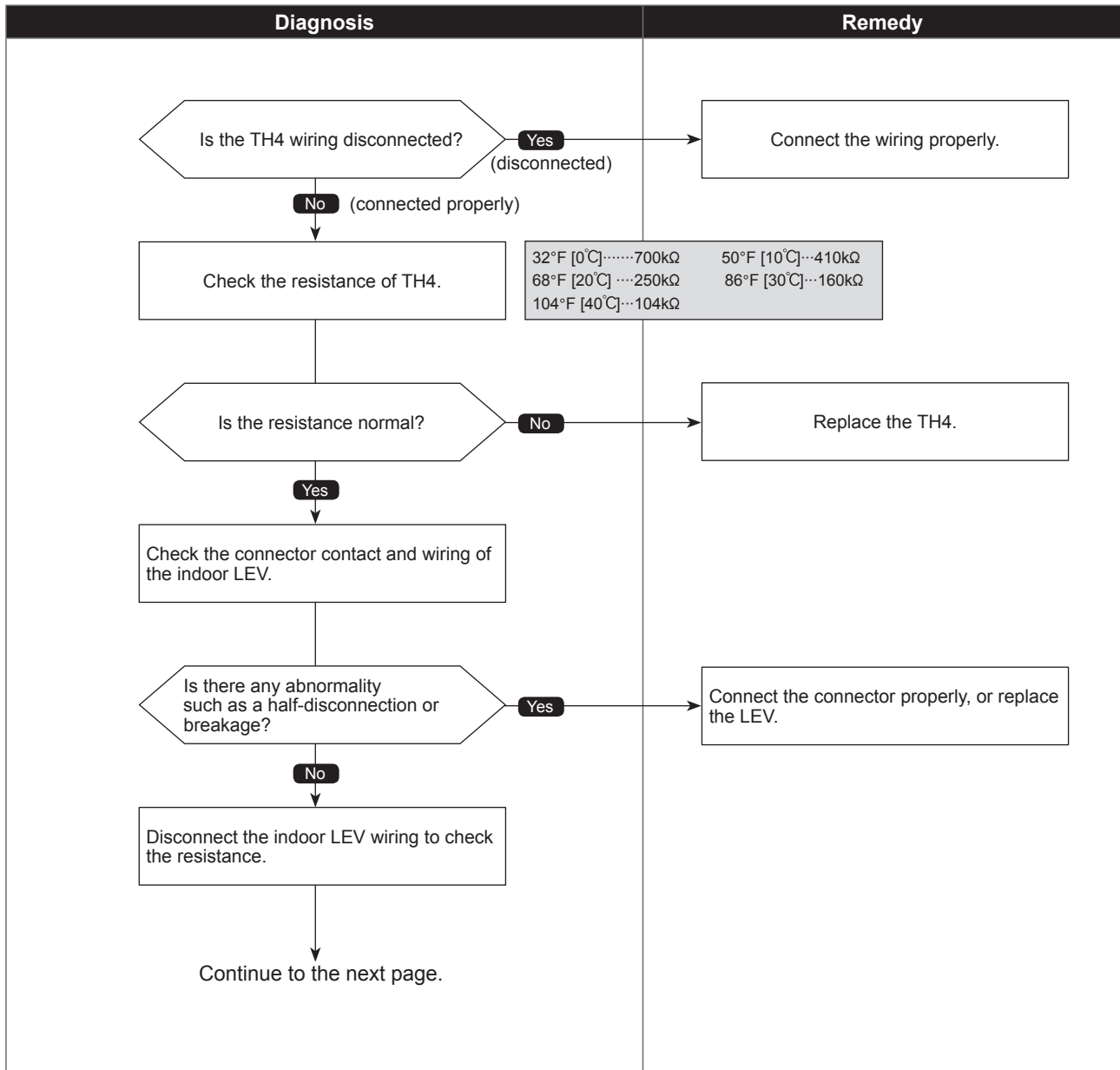
Superheat due to low discharge temperature trouble

Chart 1 of 2

Abnormal points and detection methods	Causes and checkpoints
<p>If the discharge superheat is continuously detected -27°F [-15°C](*) or less for 5 minutes even though the indoor LEV has minimum open pulse after the compressor starts operating for 10 minutes.</p> <p>LEV : Linear expansion valve TH4 : Thermistor <Compressor> 63HS: High pressure sensor</p> <p>*At this temperature, conditions for the abnormality detection will not be satisfied if no abnormality is detected on either TH4 or 63HS.</p>	<p>① Disconnection or loose connection of TH4 ② Defective holder of TH4 ③ Disconnection of LEV coil ④ Disconnection of LEV connector ⑤ LEV performance failure</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

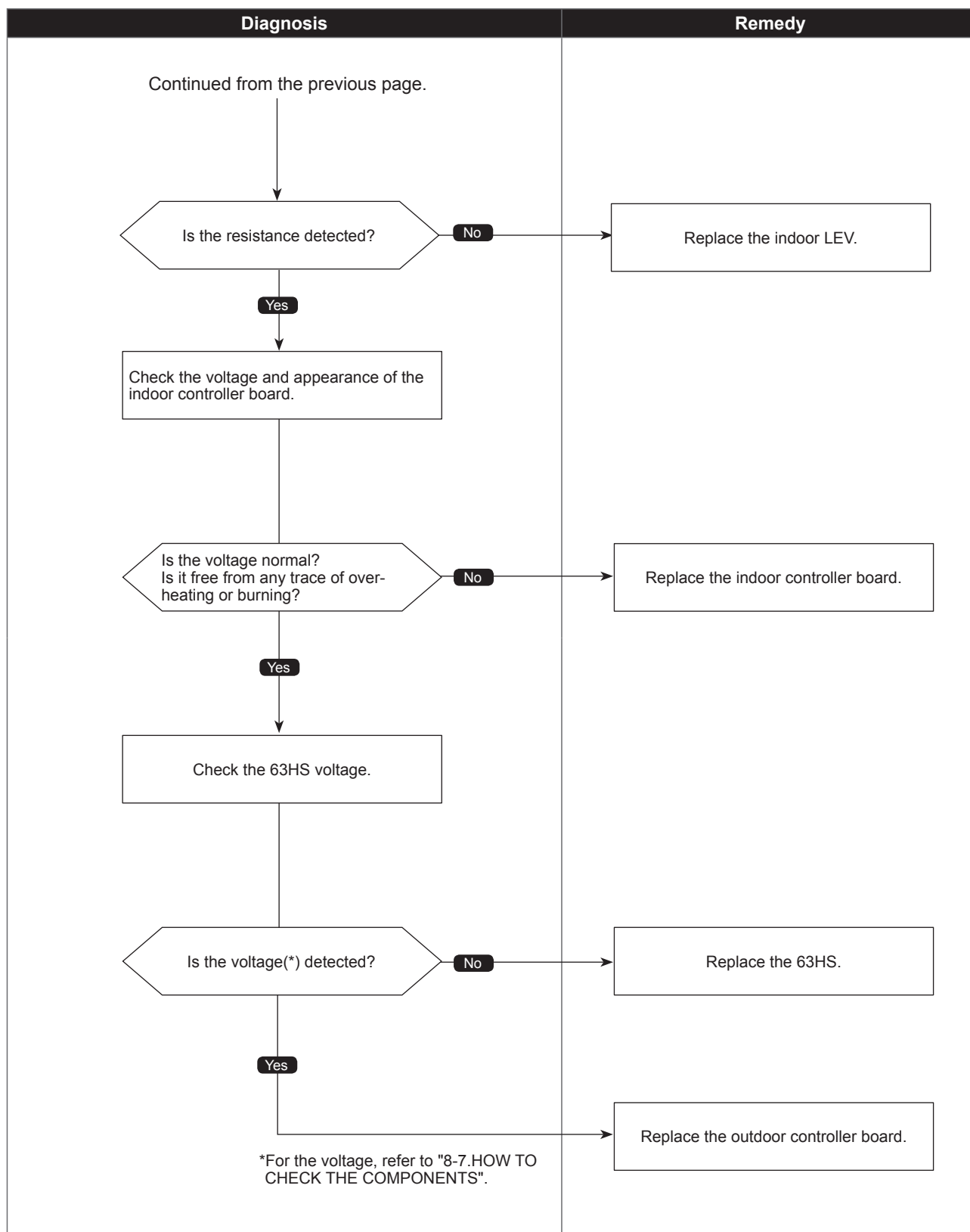


Superheat due to low discharge temperature trouble

Chart 2 of 2

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



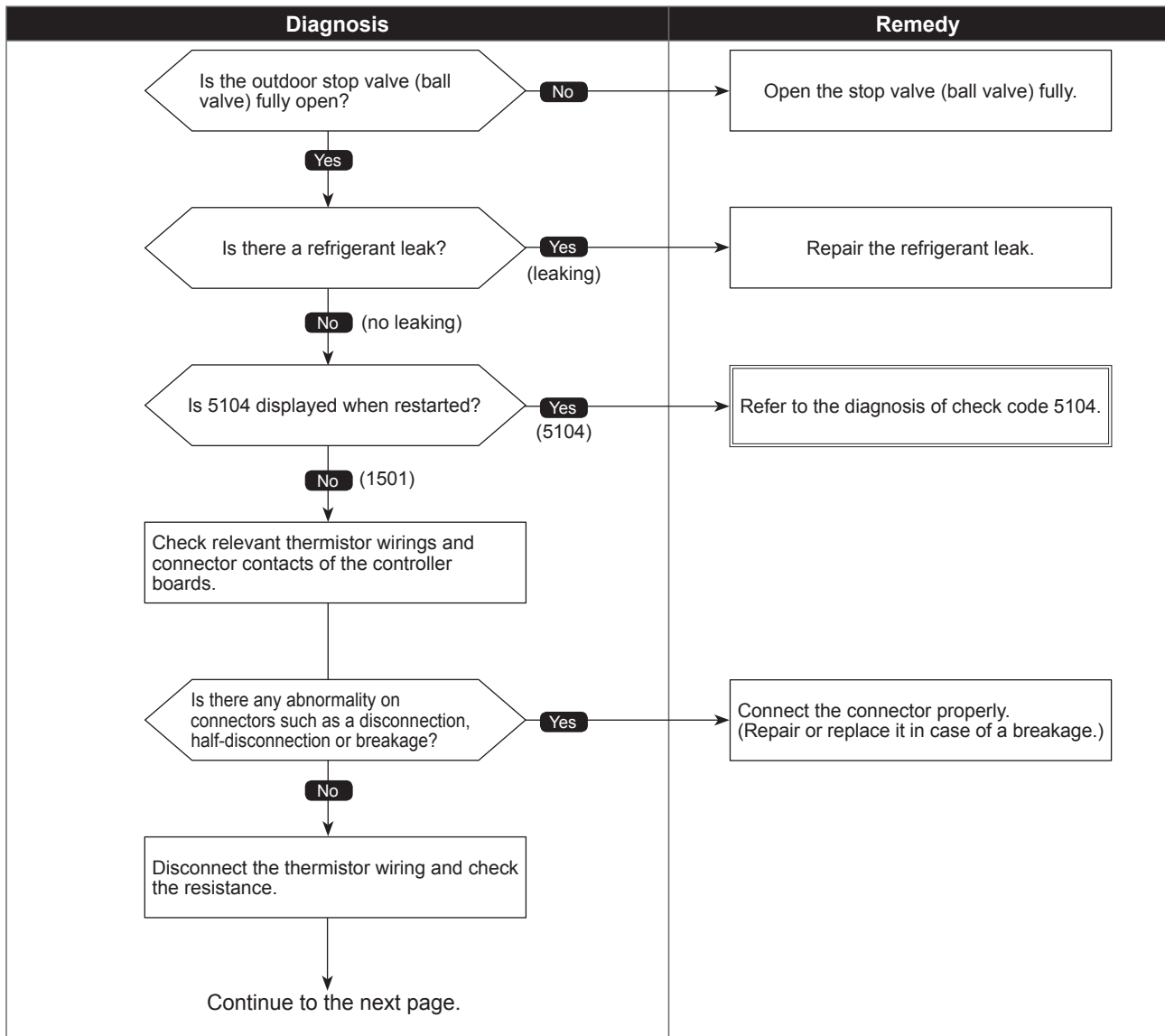
Refrigerant shortage trouble

Chart 1 of 2

Abnormal points and detection methods	Causes and checkpoints
<p>(1) When all of the following conditions are satisfied for 15 consecutive minutes:</p> <ol style="list-style-type: none"> 1. The compressor is operating in HEAT mode. 2. Discharge super heat is 144°F [80°C] or more. 3. Difference between TH7 and the TH3 applies to the formula of $(TH7 - TH3 < 9°F [5°C])$. 4. The saturation temperature converted from a high pressure sensor detects below 95°F [35°C]. <p>(2) When all of the following conditions are satisfied:</p> <ol style="list-style-type: none"> 1. The compressor is in operation. 2. When cooling, discharge superheat is 144°F [80°C] or more, and the saturation temperature converted from a high pressure sensor is over -40°F [-40°C]. 3. When heating, discharge superheat is 162°F [90°C] or more. 	<ol style="list-style-type: none"> ① Defective operation of stop valve (not fully open) ② Defective thermistor ③ Defective outdoor controller board ④ Indoor LEV performance failure ⑤ Gas leakage or shortage ⑥ Defective 63HS <p>TH3 : Thermistor <Outdoor liquid pipe> TH7 : Thermistor <Ambient> LEV : Electronic expansion valve 63HS: High pressure sensor</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

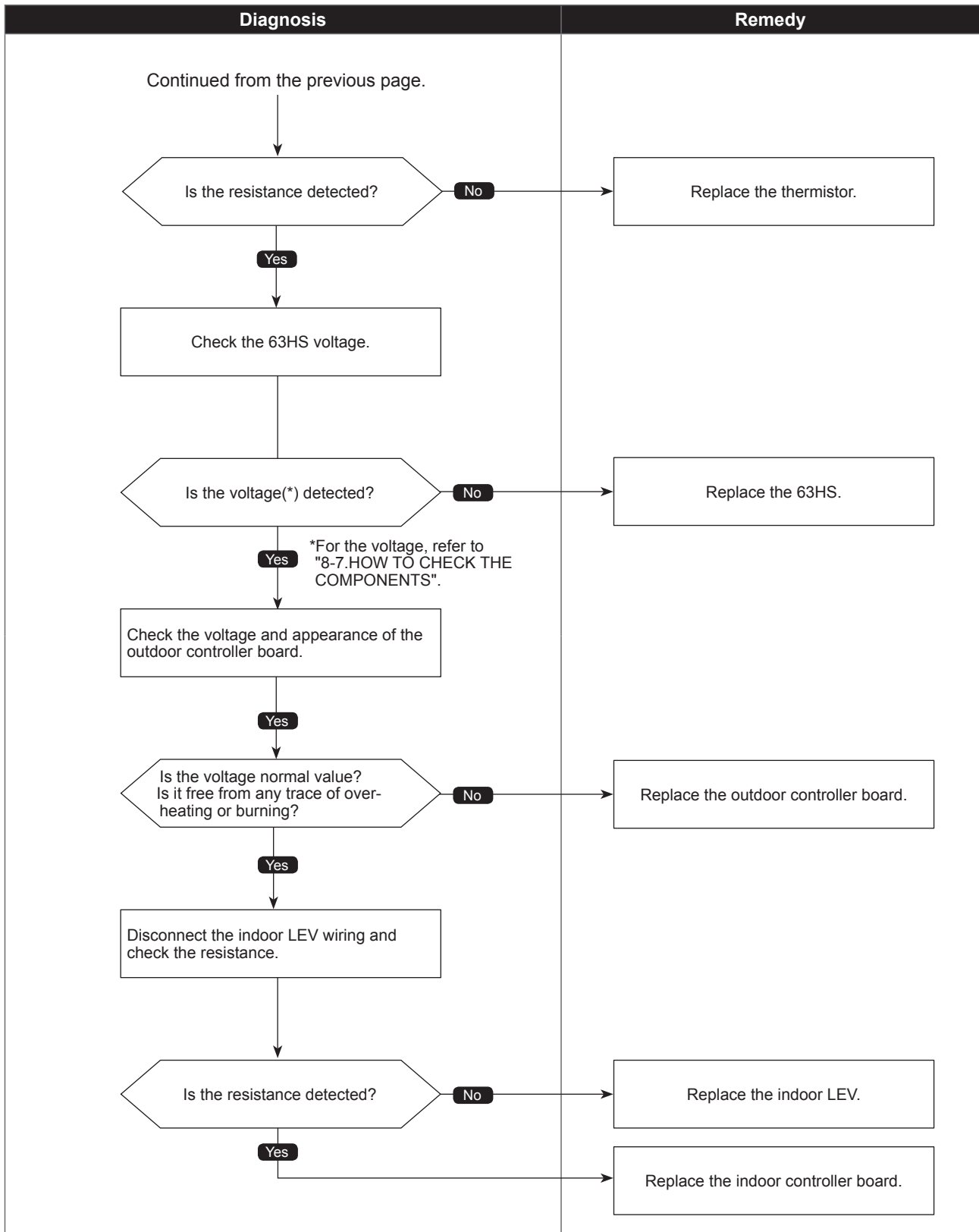


Refrigerant shortage trouble

Chart 2 of 2

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



Closed valve in cooling mode

Abnormal points and detection methods	Causes and checkpoints
<p>If stop valve is closed during cooling operation.</p> <p>When both of the following temperature conditions are satisfied for 20 minutes or more during cooling operation.</p> <ol style="list-style-type: none"> 1. TH22j - TH21j \geq -3.6°F [-2°C] 2. TH23j - TH21j \geq -3.6°F [-2°C] <p>Note: For indoor unit, the abnormality is detected if an operating unit satisfies the condition.</p>	<p>① Outdoor liquid/gas valve is closed. ② Multifunction of outdoor LEV (LEV-A) (blockage)</p> <p>TH21: Indoor intake temperature thermistor (RT11 or TH1) TH22: Indoor liquid pipe temperature thermistor (RT13 or TH2) TH23: Branch box gas pipe temperature thermistor (TH-A to E) LEV: Electronic expansion valve</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

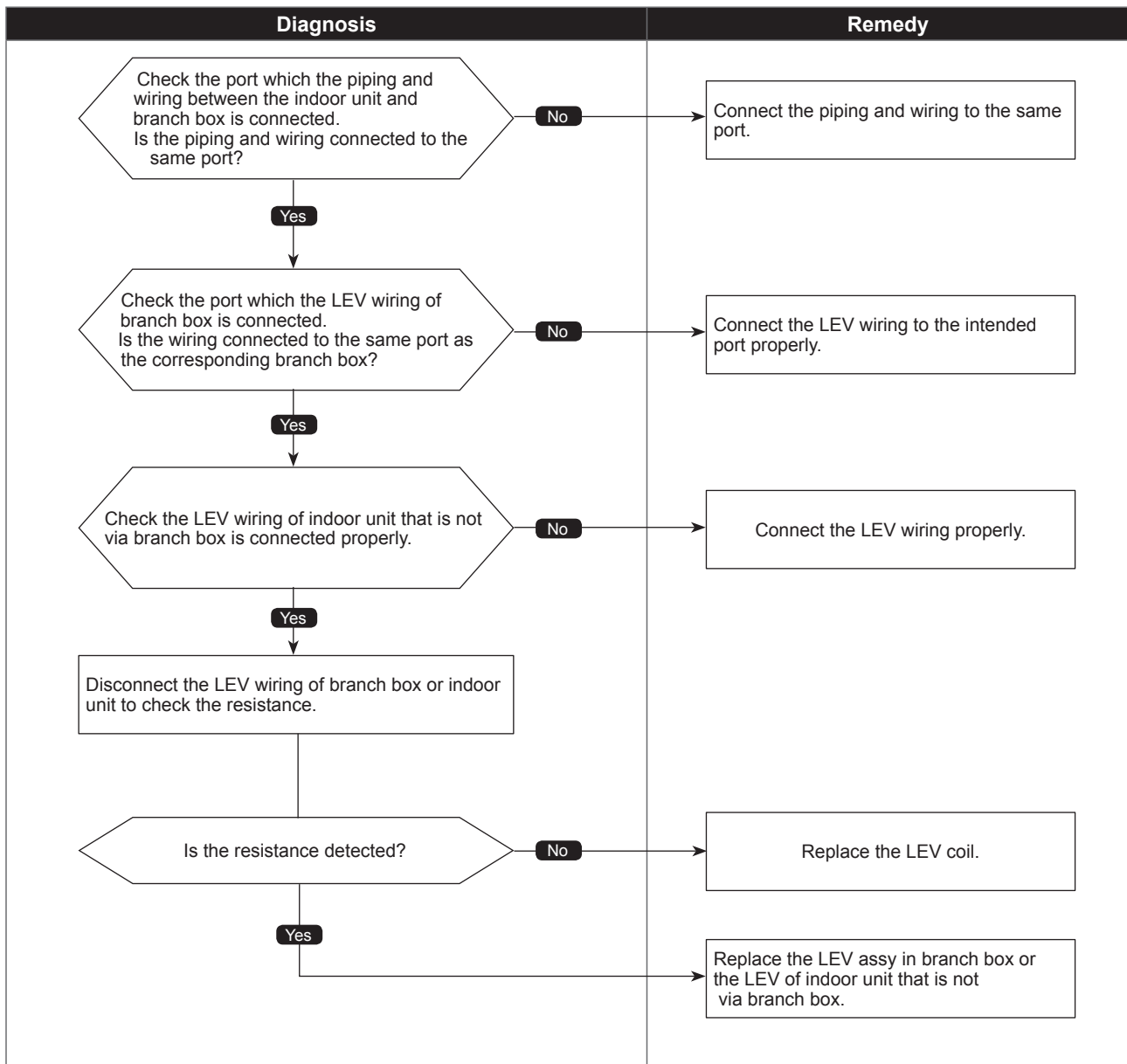
Diagnosis	Remedy
<pre> graph TD Q1{{Is the outdoor stop valve (liquid/gas) fully open?}} Q1 -- No --> R1[Open the outdoor stop valve (liquid/gas) fully.] Q1 -- Yes --> P1[Disconnect the outdoor LEV wiring to check the resistance.] P1 --> Q2{{Is the resistance detected?}} Q2 -- No --> R2[Replace the outdoor LEV.] Q2 -- Yes --> R3[Replace the outdoor controller board.] </pre>	

Freeze protection of Branch box or Indoor unit

Abnormal points and detection methods	Causes and checkpoints
<p>The purpose of the check code is to prevent indoor unit from freezing or dew condensation which is caused when a refrigerant keeps flowing into the unit in STOP.</p> <p>When all of the following conditions are satisfied:</p> <ol style="list-style-type: none"> 1. The compressor is operating in COOL mode. 2. 15 minutes have passed after the startup of the compressor, or the change in the number of operating indoor units is made (including a change by turning thermo-ON/OFF). 3. After the condition 2 above is satisfied, the thermistor of indoor unit in STOP detects TH22j $\leq 23^{\circ}\text{F}$ [-5°C] for 5 consecutive minutes. 	<ol style="list-style-type: none"> ① Wrong piping connection between indoor unit and branch box ② Miswiring between indoor unit and branch box ③ Miswiring of LEV in branch box ④ Malfunction of LEV in branch box

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

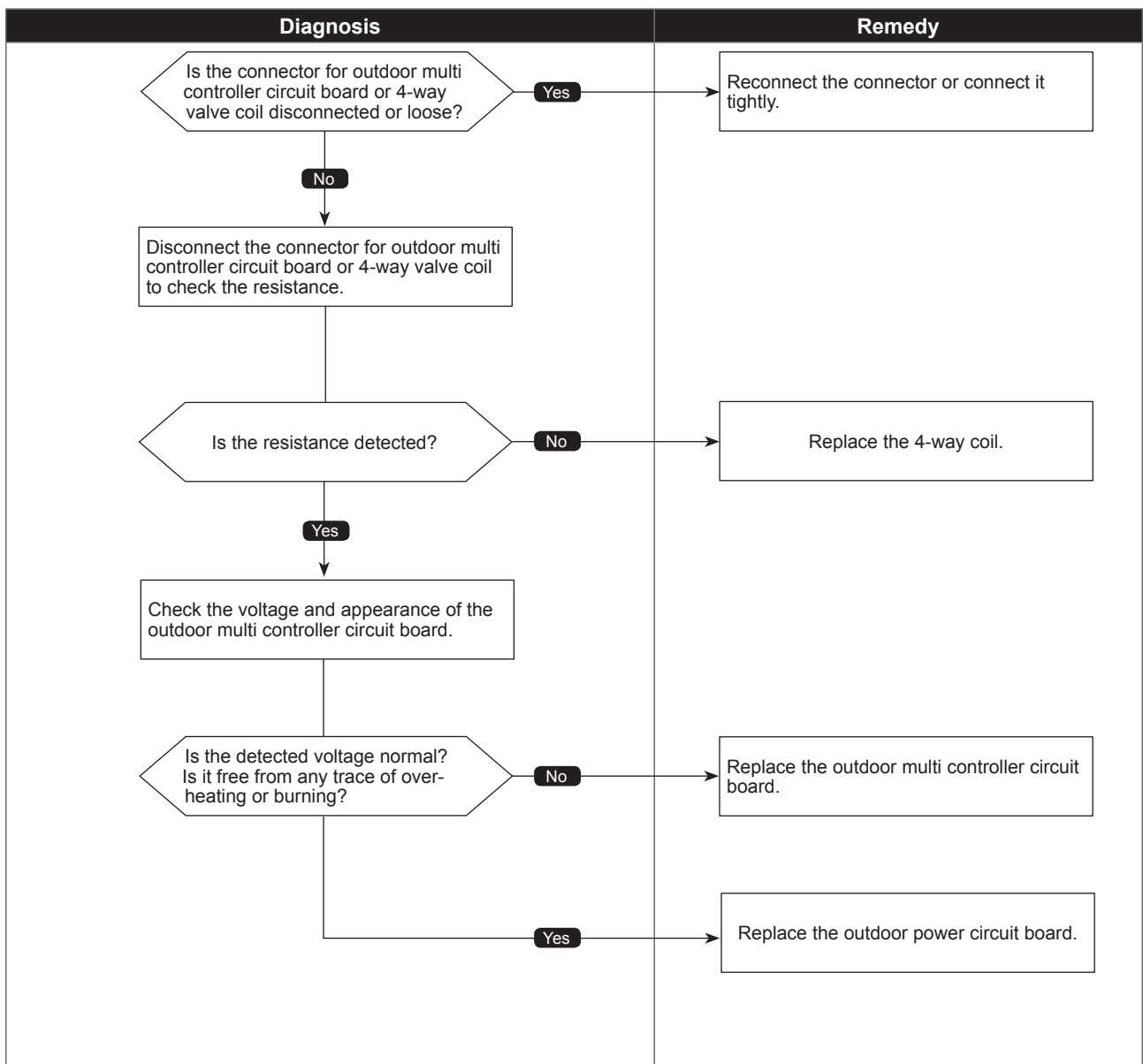


4-way valve trouble in heating mode

Abnormal points and detection methods	Causes and checkpoints
<p>If 4-way valve does not operate during heating operation.</p> <p>When any of the following temperature conditions is satisfied for 3 minutes or more during heating operation</p> <ol style="list-style-type: none"> 1. $TH22j - TH21j \leq -18^{\circ}F [-10^{\circ}C]$ 2. $TH23j - TH21j \leq -18^{\circ}F [-10^{\circ}C]$ 3. $TH22j \leq 37.4^{\circ}F [3^{\circ}C]$ 4. $TH23j \leq 37.4^{\circ}F [3^{\circ}C]$ <p>Note: For indoor unit, the abnormality is detected if an operating unit satisfies the condition.</p>	<ol style="list-style-type: none"> ① 4-way valve failure ② Disconnection or failure of 4-way valve coil ③ Clogged drain pipe ④ Disconnection or loose connection of connectors ⑤ Malfunction of input circuit on outdoor multi controller circuit board ⑥ Defective outdoor power circuit board <p>TH21: Indoor intake temperature thermistor (RT11 or TH1) TH22: Indoor liquid pipe temperature thermistor (RT13 or TH2) TH23: Branch box gas pipe temperature thermistor (TH-A to E)</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



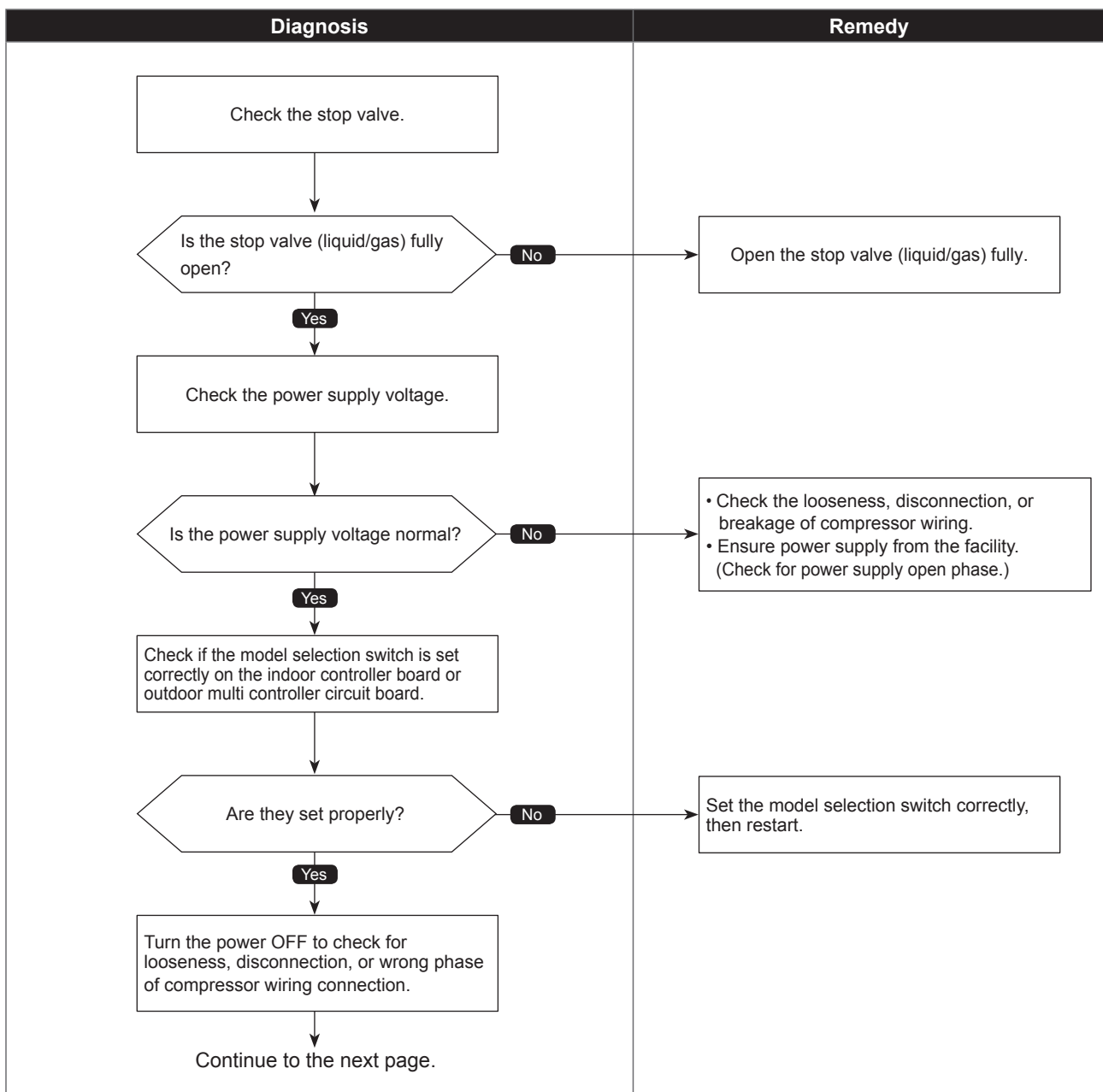
Compressor current interruption (Locked compressor)

Chart 1 of 2

Abnormal points and detection methods	Causes and checkpoints
If overcurrent of DC bus or compressor is detected before 30 seconds after the compressor starts operating.	① Closed stop valve ② Decrease of power supply voltage ③ Looseness, disconnection, or wrong phase of compressor wiring connection ④ Model selection error on indoor controller board or outdoor multi controller circuit board ⑤ Defective compressor ⑥ Defective outdoor power circuit board

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

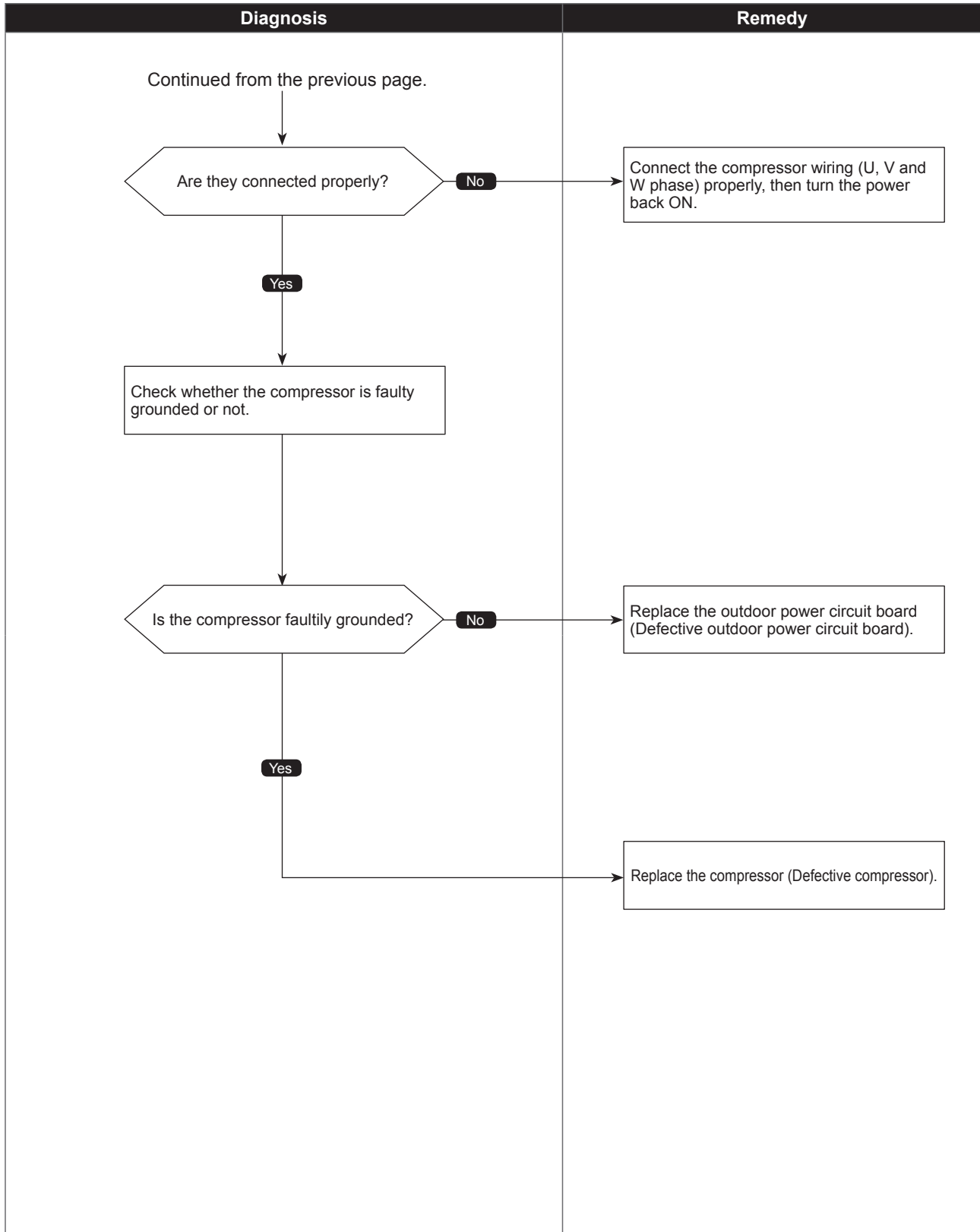


Compressor current interruption (Locked compressor)

Chart 2 of 2

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



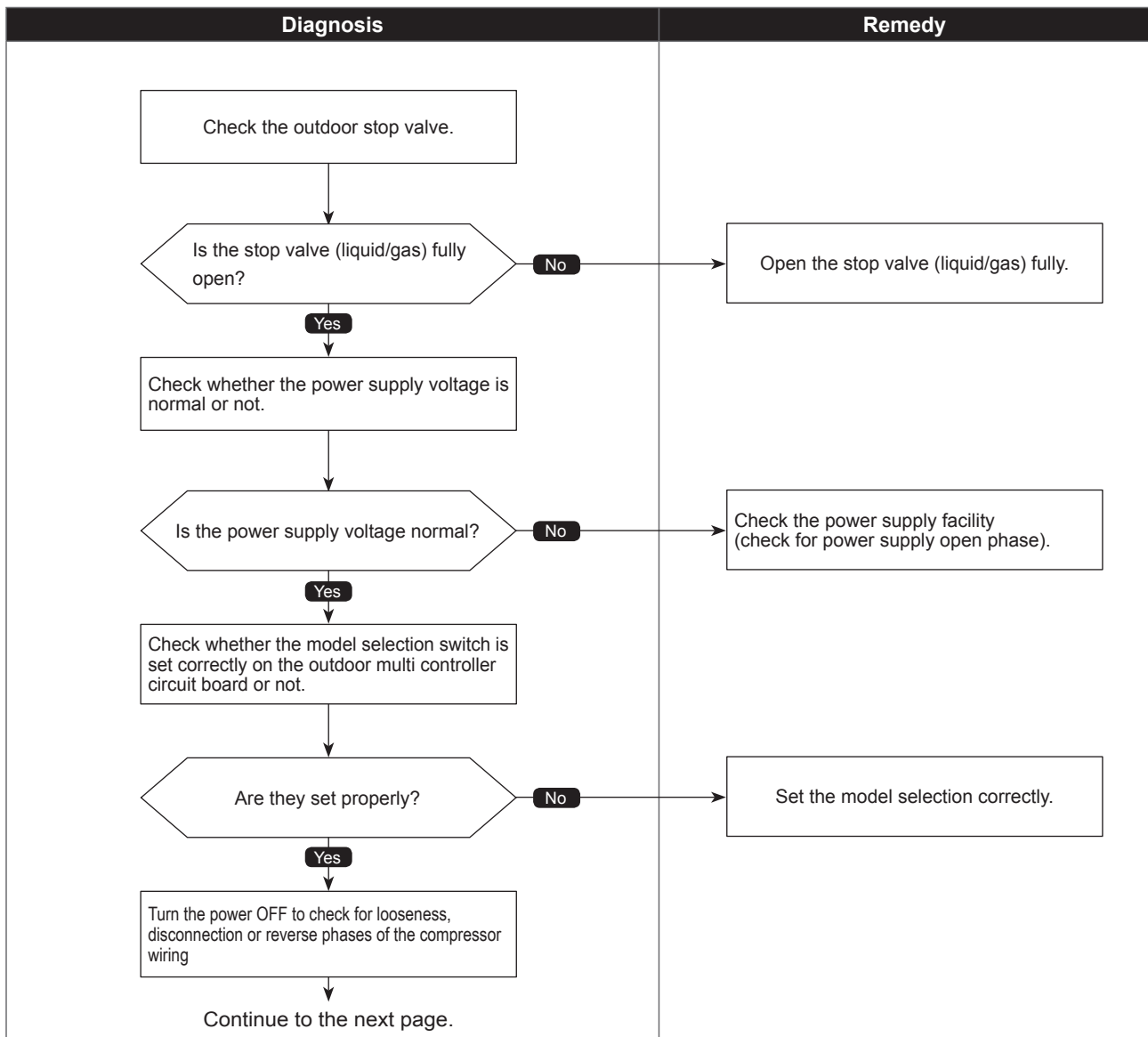
Compressor overcurrent interruption

Chart 1 of 2

Abnormal points and detection methods	Causes and checkpoints
If overcurrent of DC or the compressor is detected after 30 seconds since the compressor starts operating.	① Closed outdoor stop valve ② Decrease of power supply voltage ③ Looseness, disconnection or reverse phase of compressor wiring connection ④ Malfunction of indoor/outdoor fan ⑤ Short-cycle of indoor/outdoor unit ⑥ Model selection error upon replacement of outdoor multi controller circuit board ⑦ Malfunction of input circuit on outdoor multi controller circuit board ⑧ Defective compressor ⑨ Defective outdoor power circuit board

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

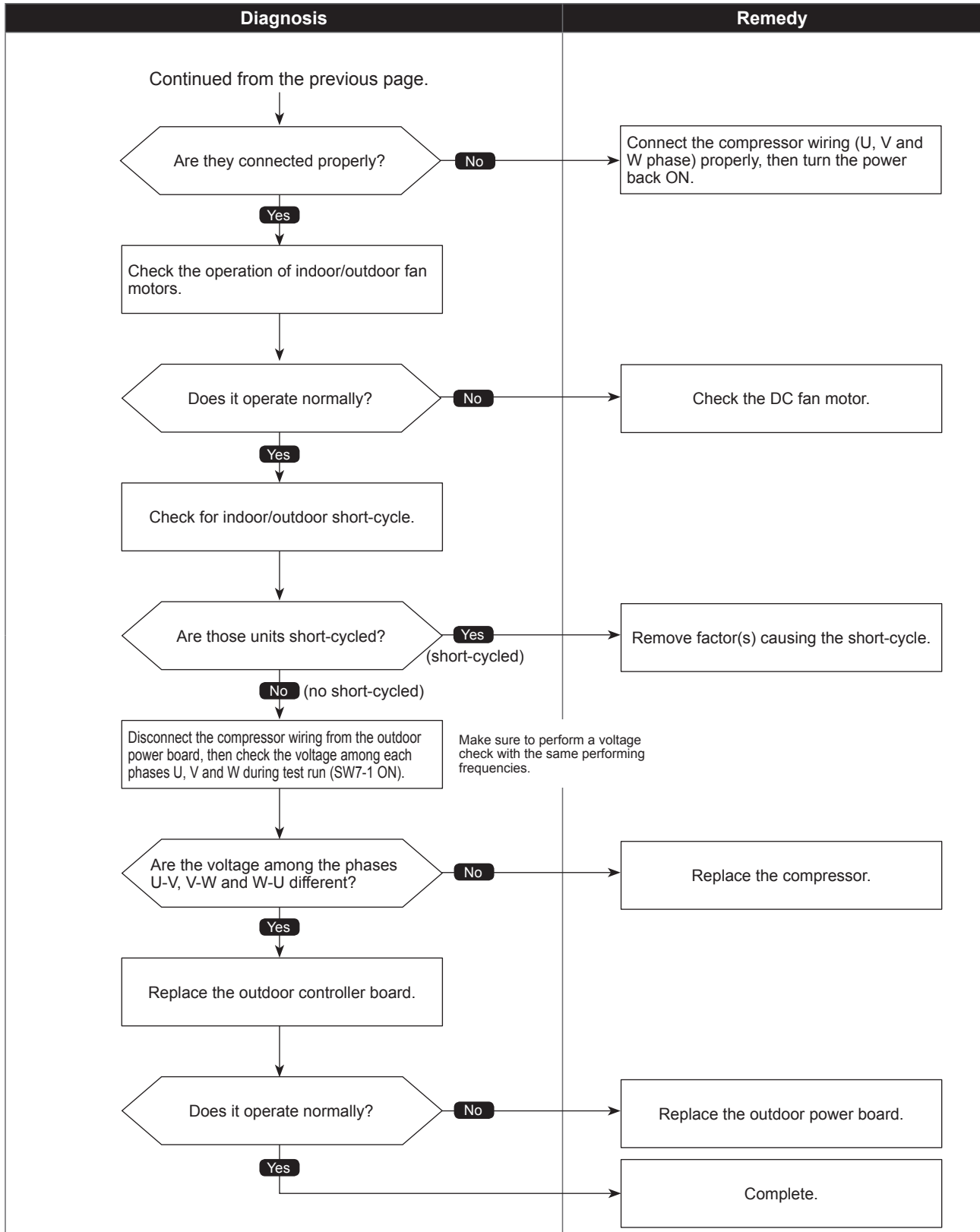


Compressor overcurrent interruption

Chart 2 of 2

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



Voltage shortage /Overvoltage/PAM error/L1 open phase/ Primary current sensor error/Power synchronization signal error

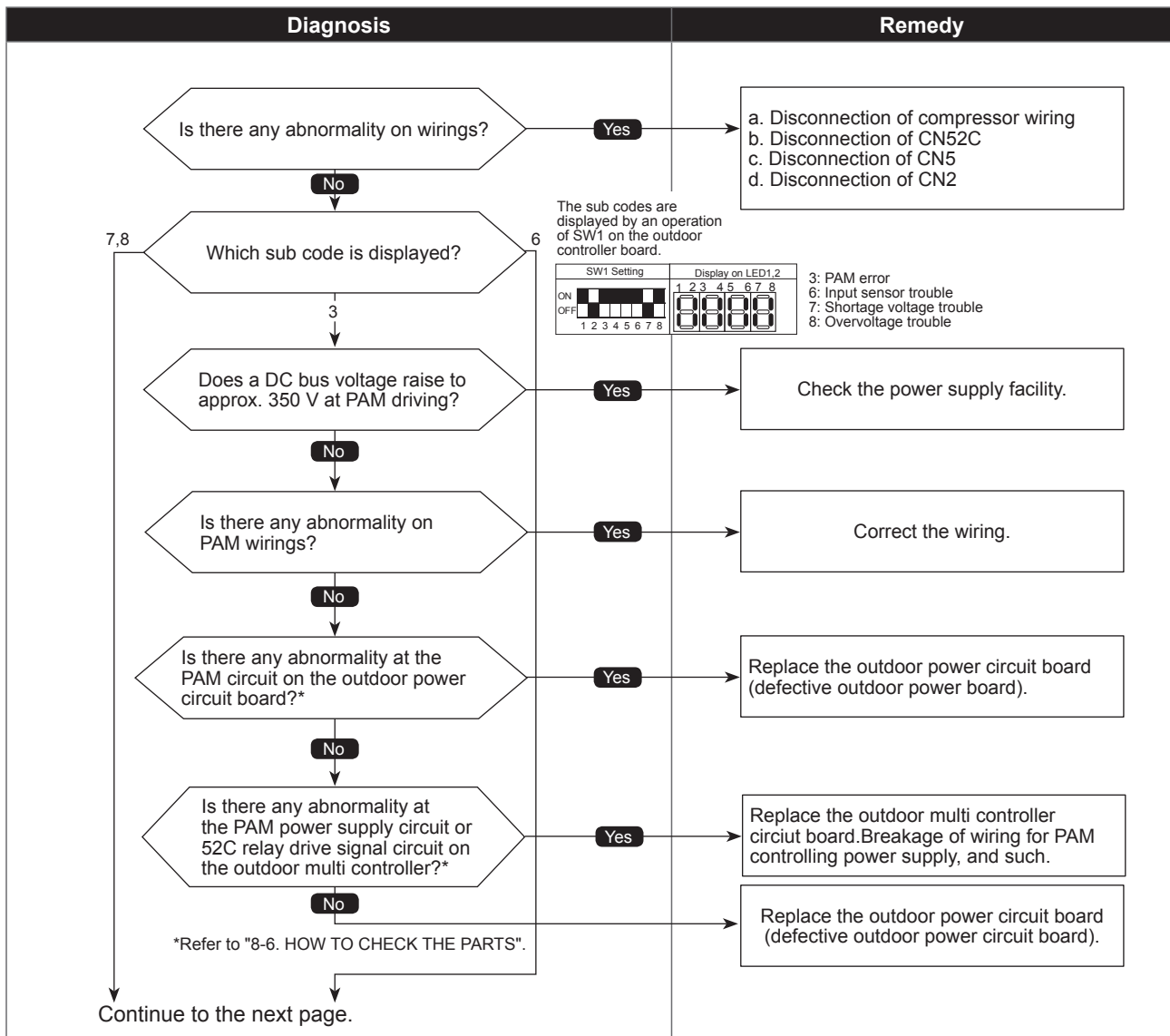
Chart 1 of 2

Abnormal points and detection methods	Causes and checkpoints
<p>If any of following symptoms are detected;</p> <ul style="list-style-type: none"> ●Decrease of DC bus voltage to 200V ●Increase of DC bus voltage to 400V ●DC bus voltage stays at 310V or less for consecutive 30 seconds when the operational frequency is over 20 Hz. ●When any of following conditions is satisfied while the detections value of primary current is 0.1A or less. <ul style="list-style-type: none"> 1. The operational frequency is 40Hz or more. 2. The compressor current is 6A or more. 	<ul style="list-style-type: none"> ① Decrease/increase of power supply voltage ② Primary current sensor failure ③ Disconnection of compressor wiring ④ Malfunction of 52C ⑤ Disconnection or contact failure of CN52C ⑥ Defective outdoor power circuit board ⑦ Malfunction of 52C driving circuit on outdoor multi controller circuit board ⑧ Disconnection of CN5 ⑨ Disconnection of CN2 ⑩ Malfunction of primary current detecting circuit on outdoor power circuit board

Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

The black square (■) indicates a switch position.



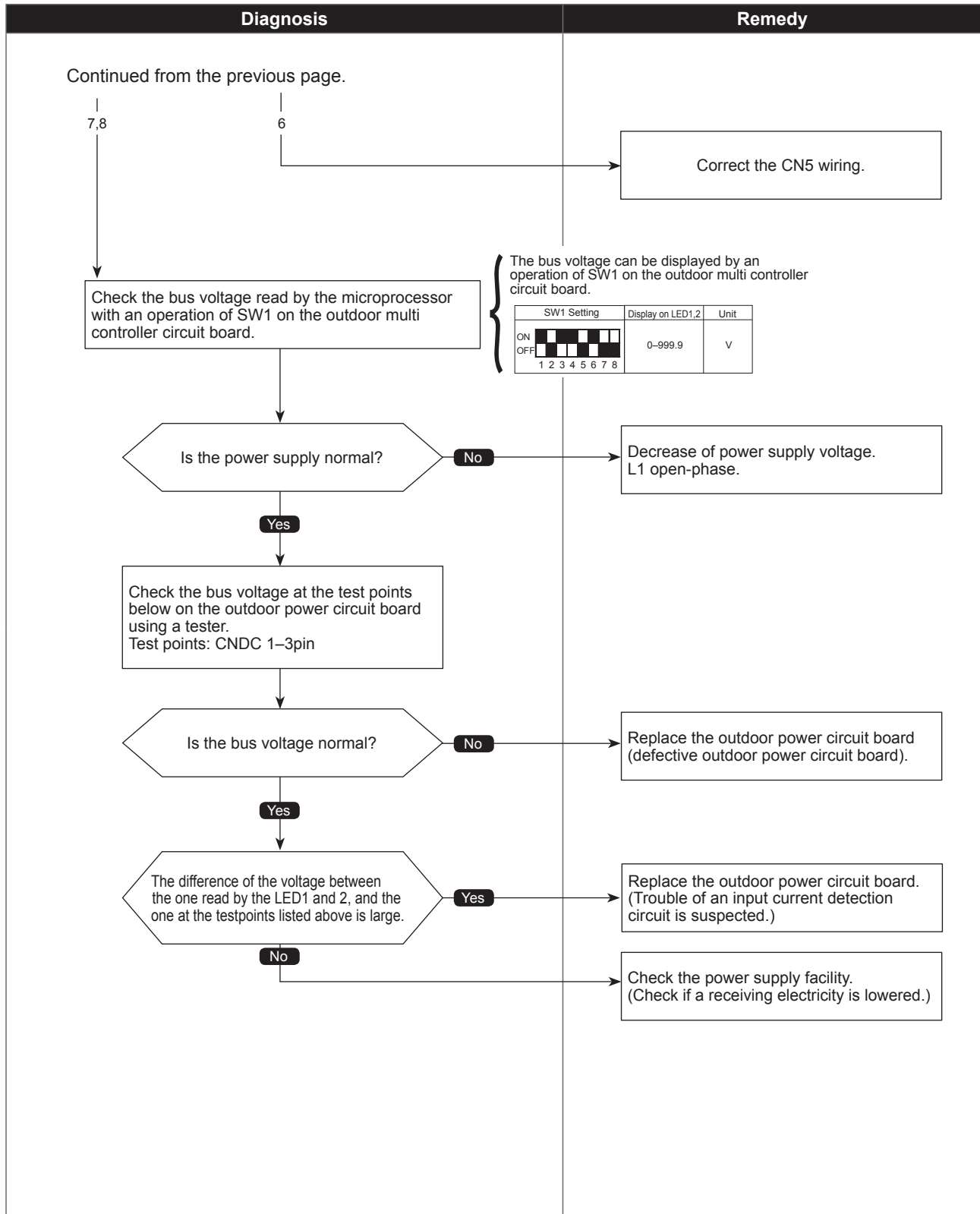
Voltage shortage /Overvoltage/PAM error/L1 open phase/
Primary current sensor error/Power synchronization signal error

Chart 2 of 2

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

The black square (■) indicates a switch position.

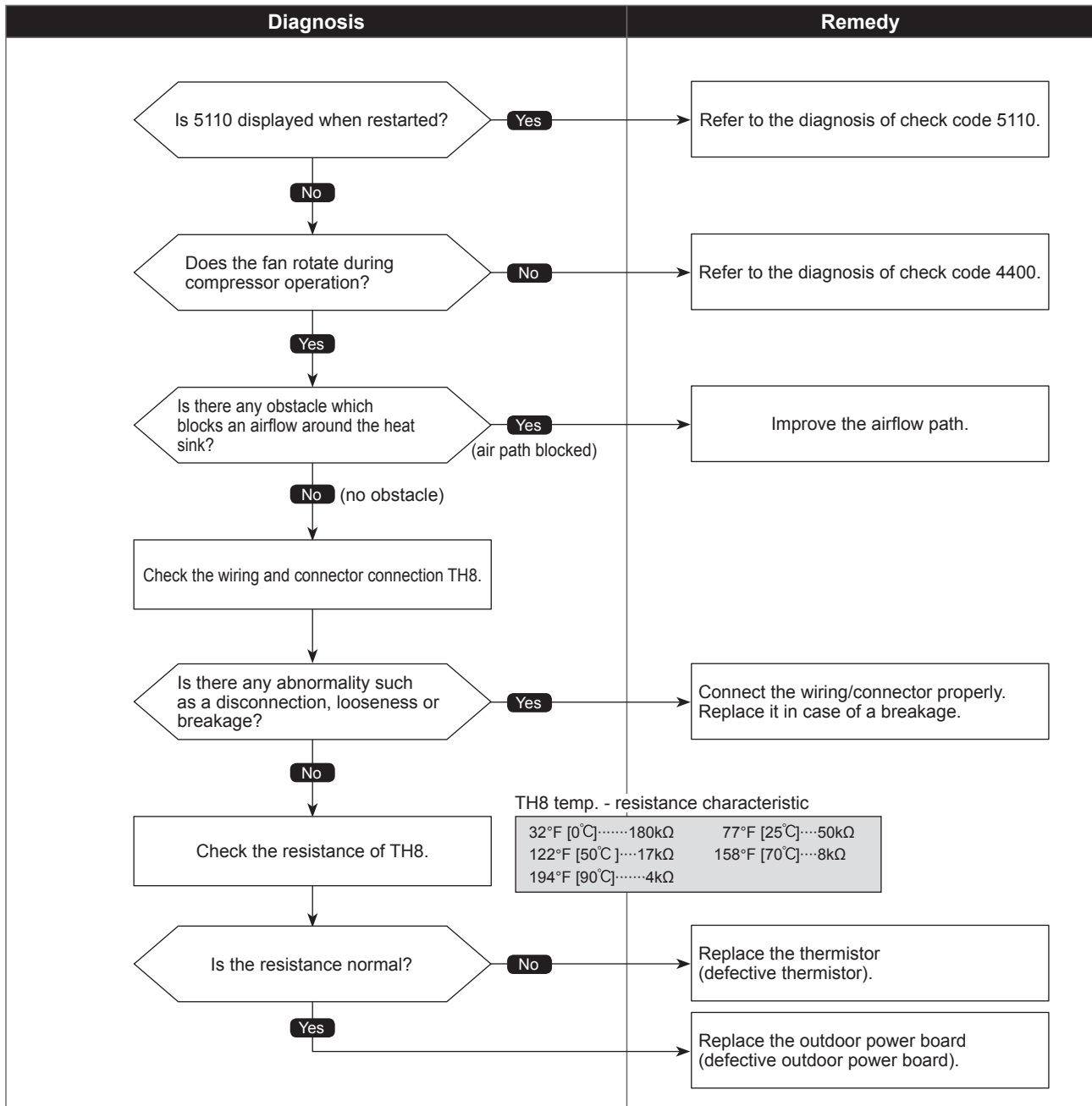


Heat sink temperature trouble

Abnormal points and detection methods	Causes and checkpoints
<p>If TH8 detects a temperature outside the specified range during compressor operation.</p> <p>TH8: Thermistor <Heat sink></p>	<p>① Blocked outdoor fan ② Malfunction of outdoor fan motor ③ Blocked airflow path ④ Rise of ambient temperature ⑤ Characteristic defect of thermistor ⑥ Malfunction of input circuit on outdoor power board ⑦ Malfunction of outdoor fan driving circuit</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



Power module trouble or overcurrent trouble

Abnormal points and detection methods	Causes and checkpoints
<p>If both of the following conditions are satisfied:</p> <ol style="list-style-type: none"> Overcurrent of DC bus or compressor is detected during compressor operation. Inverter power module is determined to be defected. 	<ol style="list-style-type: none"> Short-circuit caused by looseness or disconnection of compressor wiring Defective compressor Defective outdoor power circuit board

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

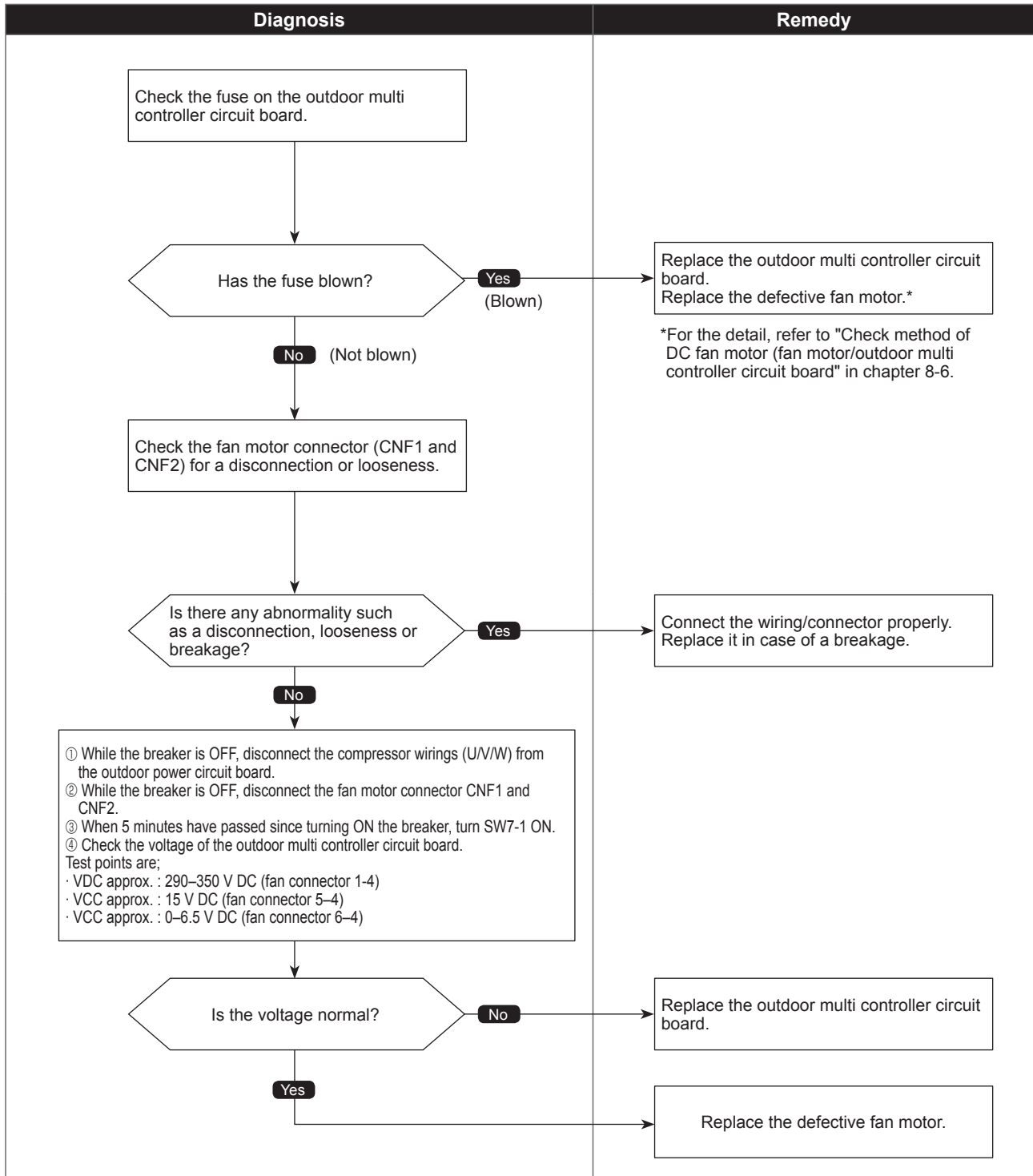
Diagnosis	Remedy
<p>Turn the power OFF to check for looseness or disconnection of the compressor wiring.</p> <p>Are they connected properly?</p> <p>No</p> <p>Connect the compressor wiring (U, V and W phase) properly, then turn the power back ON.</p> <p>Yes</p> <p>① Disconnect the compressor wiring (U-V-W phase). ② Turn ON the SW7-1(*) on the outdoor multi controller circuit board. ③ Operate the unit.</p> <p>* SW7-1 ON: Ignore 5300(UH) error.</p> <p>Is the check code <4250> still displayed?</p> <p>No</p> <p>Replace the compressor (defective compressor).</p> <p>Yes</p> <p>Replace the outdoor power circuit board or the outdoor multi controller circuit board (defective outdoor power circuit board).</p>	

Fan trouble

Abnormal points and detection methods	Causes and checkpoints
If no rotational frequency is detected, or detected a value outside the specified range during fan motor operation.	① Malfunction of fan motor ② Disconnection of CNF connector ③ Defective outdoor multi controller circuit board

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



Note: Set SW7-1 OFF after the troubleshooting completes.

Compressor temperature thermistor (TH4) open/short

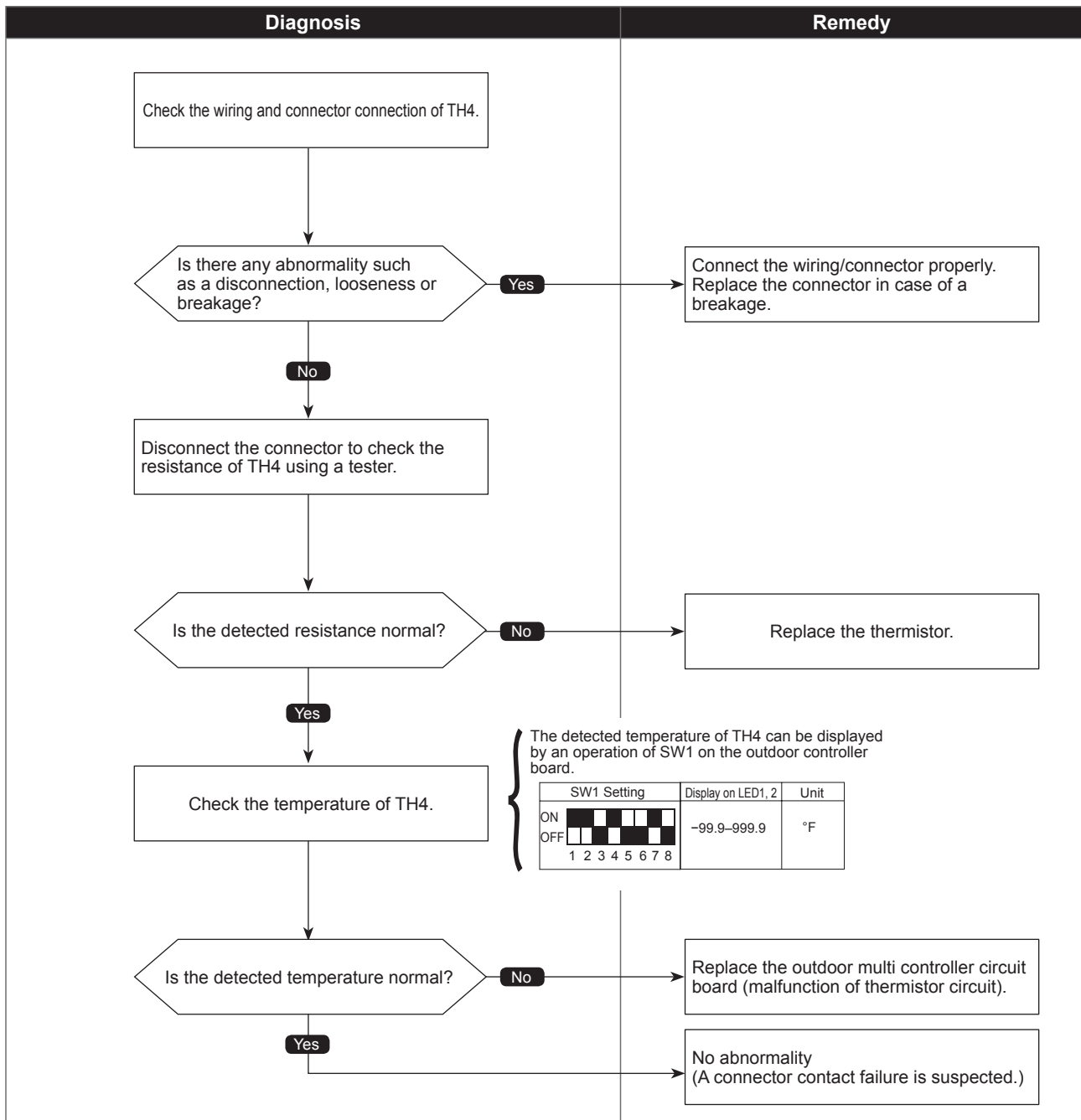
<Detected in outdoor unit>

Abnormal points and detection methods	Causes and checkpoints
<p>If TH4 is detected to be open/short. (The open/short detection is disabled for 10 minutes after compressor starts, during defrosting operation, or for 10 minutes after returning from the defrosting operation.) Open: 37.4°F [3°C] or less Short: 422.6°F [217°C] or more TH4: Thermistor <Compressor></p>	<p>① Disconnection or contact failure of connectors ② Characteristic defect of thermistor ③ Defective outdoor multi controller circuit board</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

The black square (■) indicates a switch position.



Suction pipe temperature thermistor (TH6) open/short

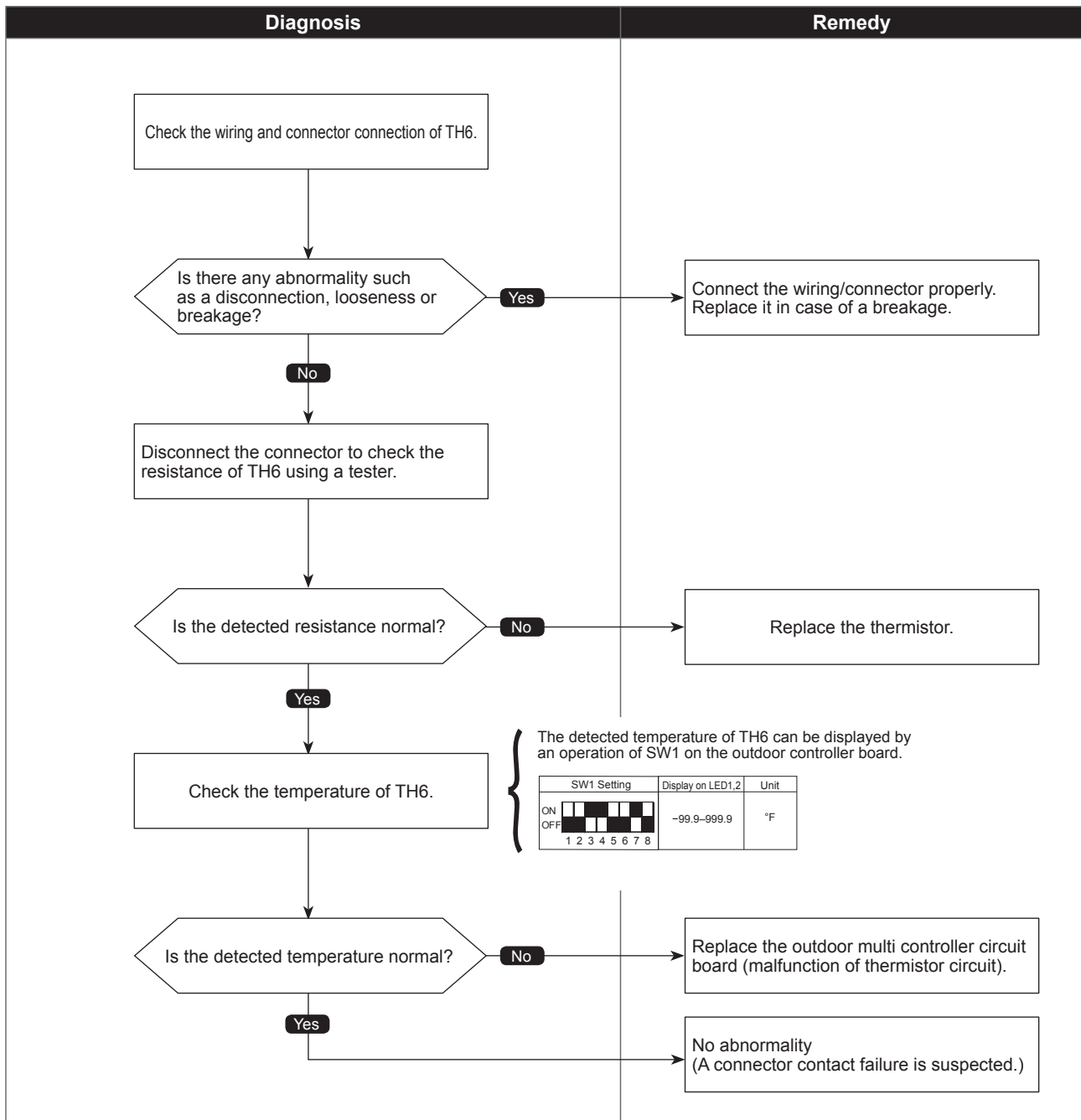
<Detected in outdoor unit>

Abnormal points and detection methods	Causes and checkpoints
<p>If TH6 is detected to be open/short. (The open/short detection is disabled during 10 seconds to 10 minutes. after compressor starts, during defrosting operation, or for 10 minutes after returning from the defrosting operation.) Open: -40°F [-40°C] or less Short: 194°F [90°C] or more TH6: Thermistor <Suction pipe></p>	<p>① Disconnection or contact failure of connectors ② Characteristic defect of thermistor ③ Defective outdoor multi controller circuit board</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting
any connectors, or replacing boards.

The black square (■) indicates a switch position.



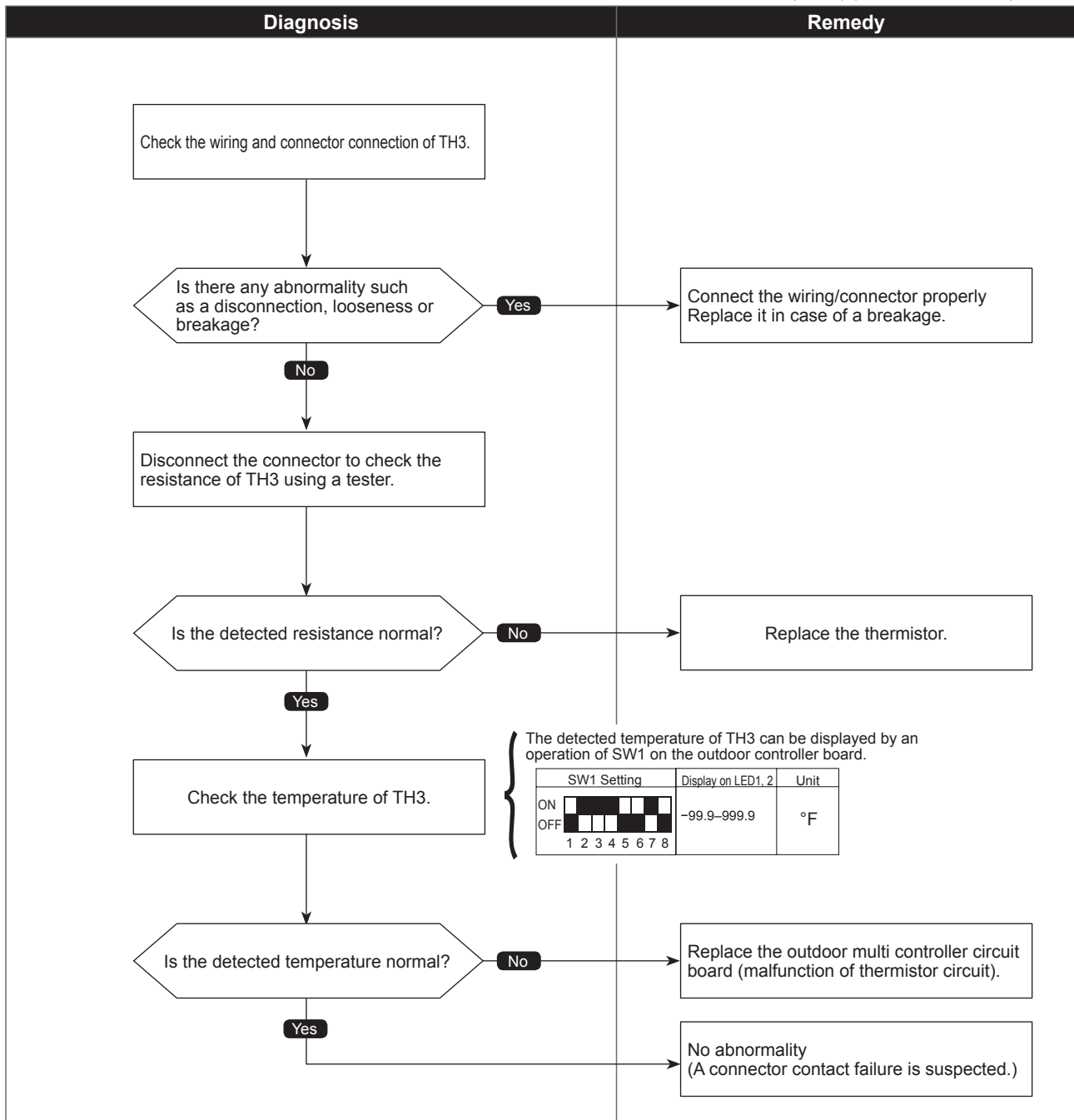
Outdoor liquid pipe temperature thermistor (TH3) open/short

Abnormal points and detection methods	Causes and checkpoints
<p>If TH3 is detected to be open/short. (The open/short detection is disabled during 10 seconds to 10 minutes. after compressor starts, during defrosting operation, or for 10 minutes after returning from the defrosting operation.) Open: -40°F [-40°C] or less Short: 194°F [90°C] or more TH3: Thermistor <Outdoor liquid pipe></p>	<p>① Disconnection or contact failure of connectors ② Characteristic defect of thermistor ③ Defective outdoor multi controller circuit board</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

The black square (■) indicates a switch position.



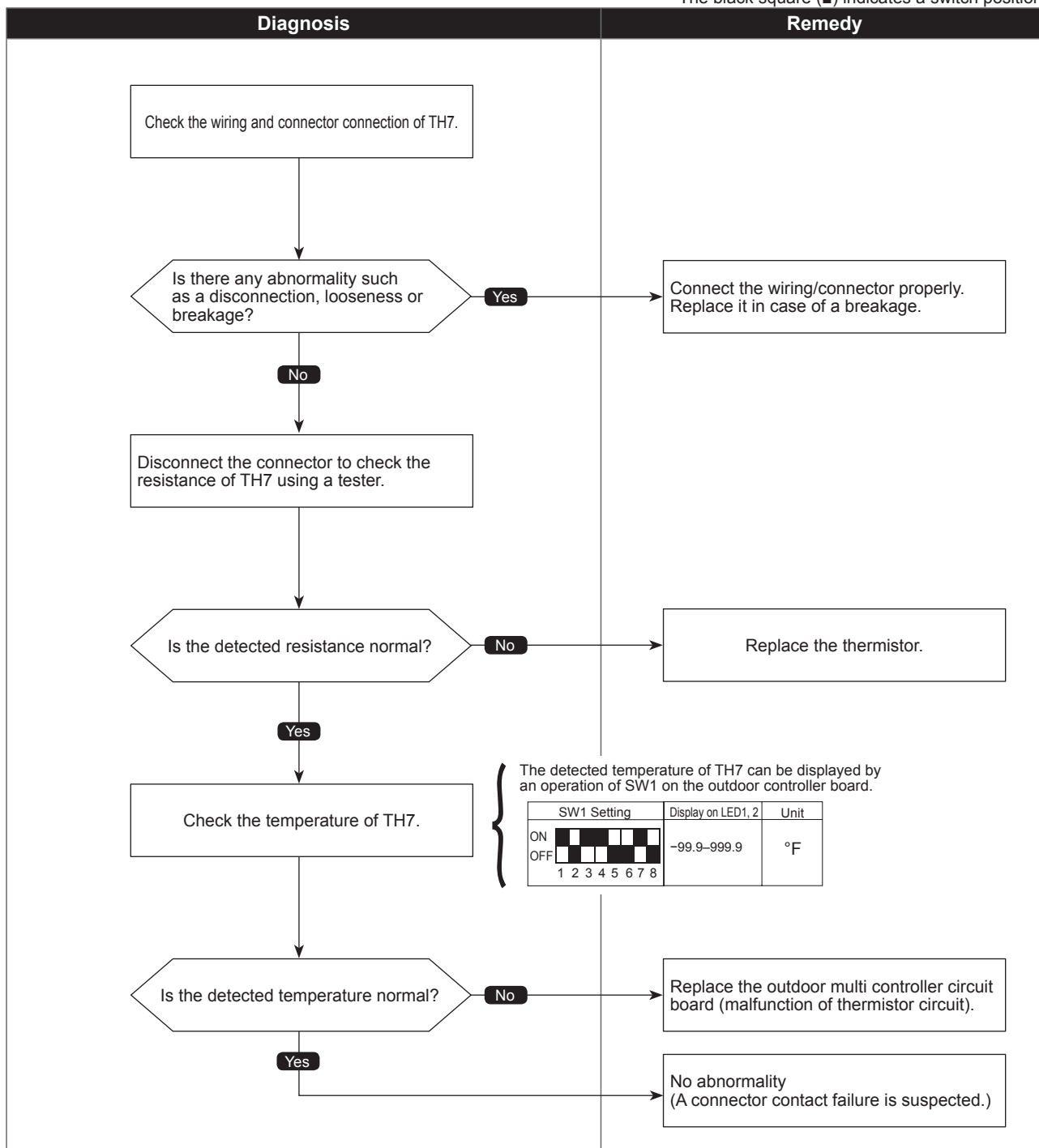
Ambient temperature thermistor (TH7) open/short

Abnormal points and detection methods	Causes and checkpoints
If TH7 is detected to be open/short Open: -40°F [-40°C] or less Short: 194°F [90°C] or more TH7: Thermistor <Ambient>	① Disconnection or contact failure of connectors ② Characteristic defect of thermistor ③ Defective outdoor multi controller circuit board

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

The black square (■) indicates a switch position.



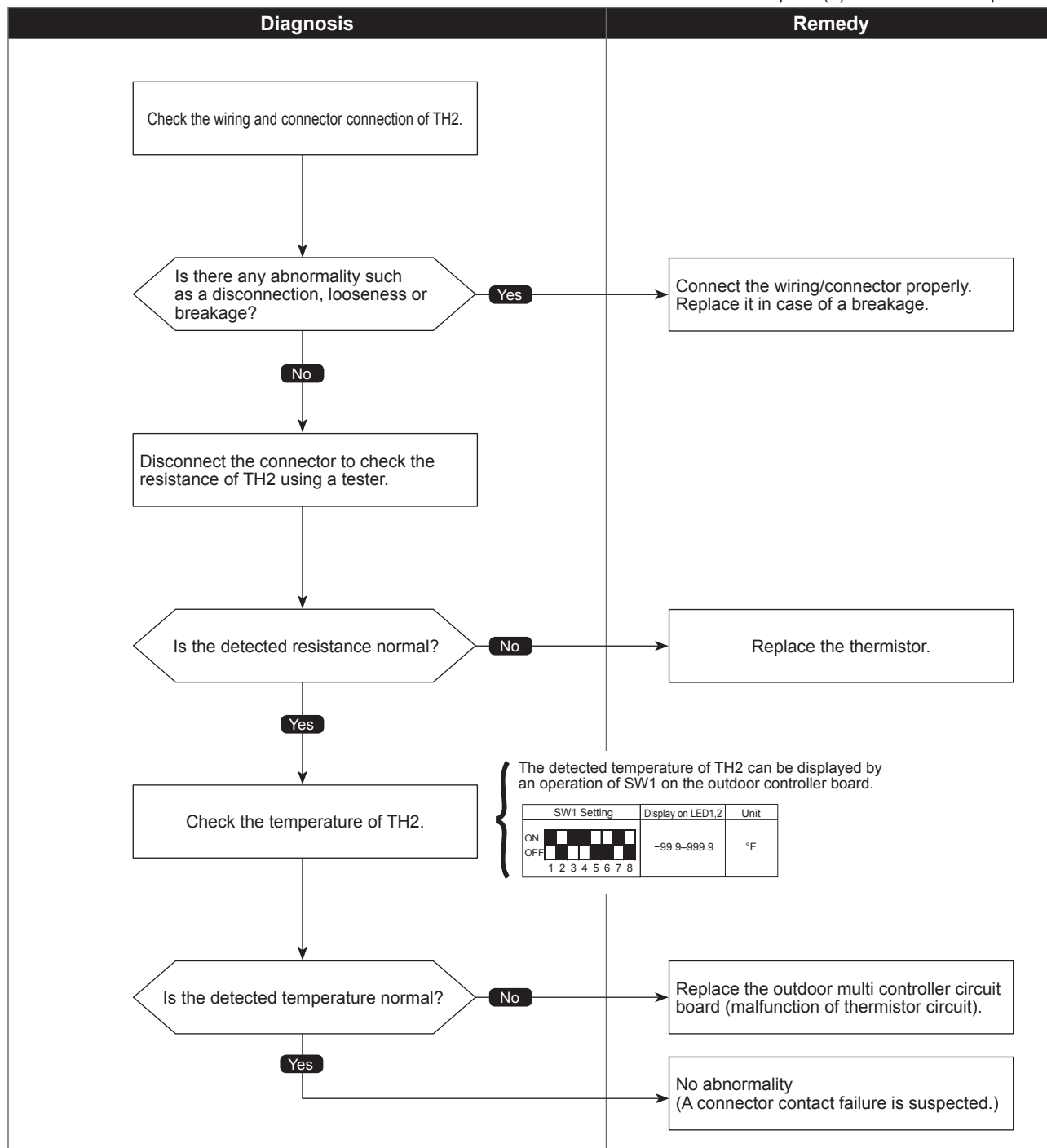
HIC pipe temperature thermistor (TH2) open/short

Abnormal points and detection methods	Causes and checkpoints
If TH2 is detected to be open/short. Open: -40°F [-40°C] or less Short: 194°F [90°C] or more TH2: Thermistor <HIC pipe>	① Disconnection or contact failure of connectors ② Characteristic defect of thermistor ③ Defective outdoor multi controller circuit board

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

The black square (■) indicates a switch position.



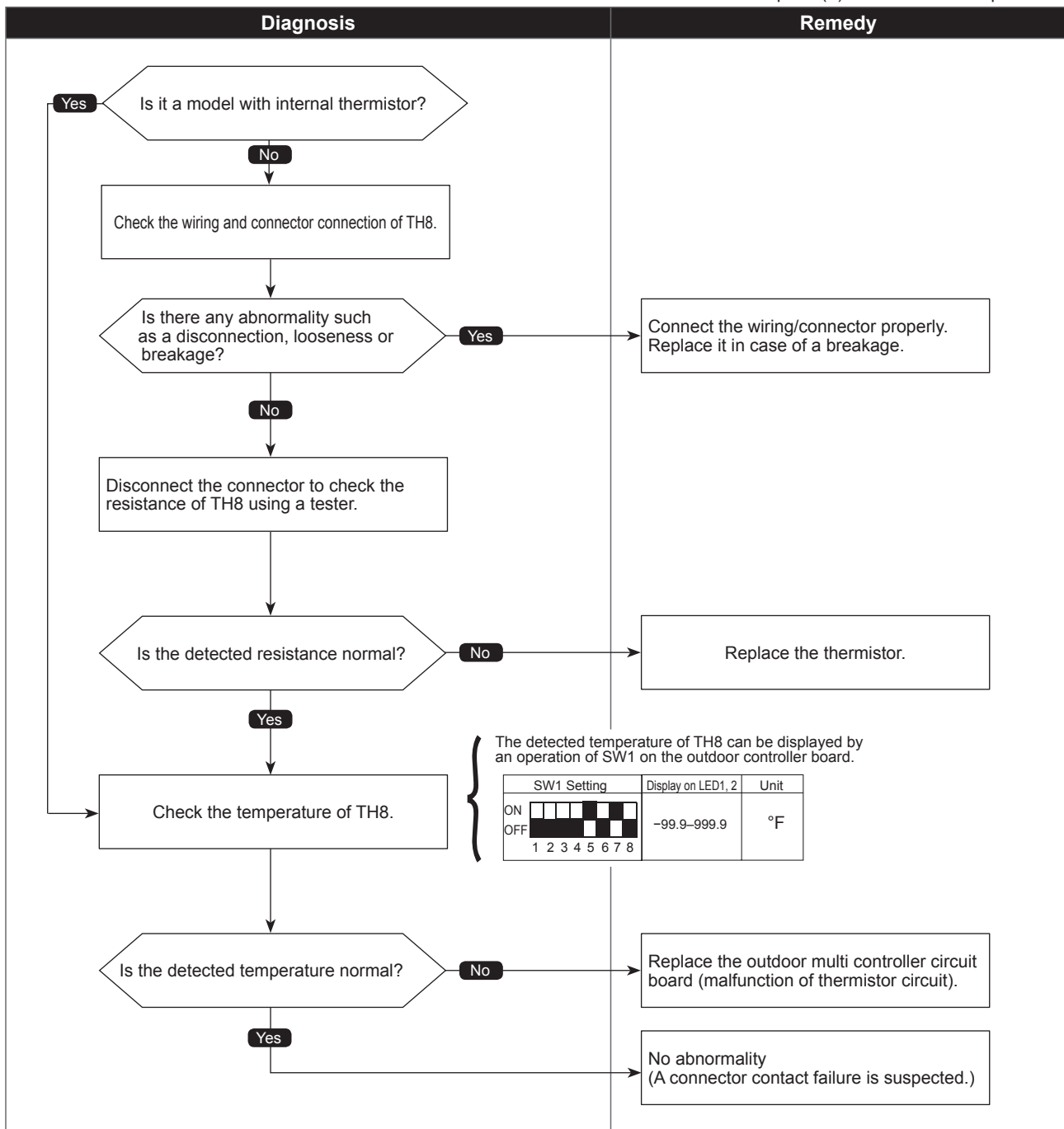
Heat sink temperature thermistor (TH8) open/short

Abnormal points and detection methods	Causes and checkpoints
<p>If TH8 is detected to be open/short. Open: -31.2°F [-35.1°C] or less Short: 338.5°F [170.3°C] or more</p> <p>TH8: Thermistor <Heat sink></p>	<p>① Disconnection or contact failure of connectors ② Characteristic defect of thermistor ③ Defective outdoor multi controller circuit board</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

The black square (■) indicates a switch position.



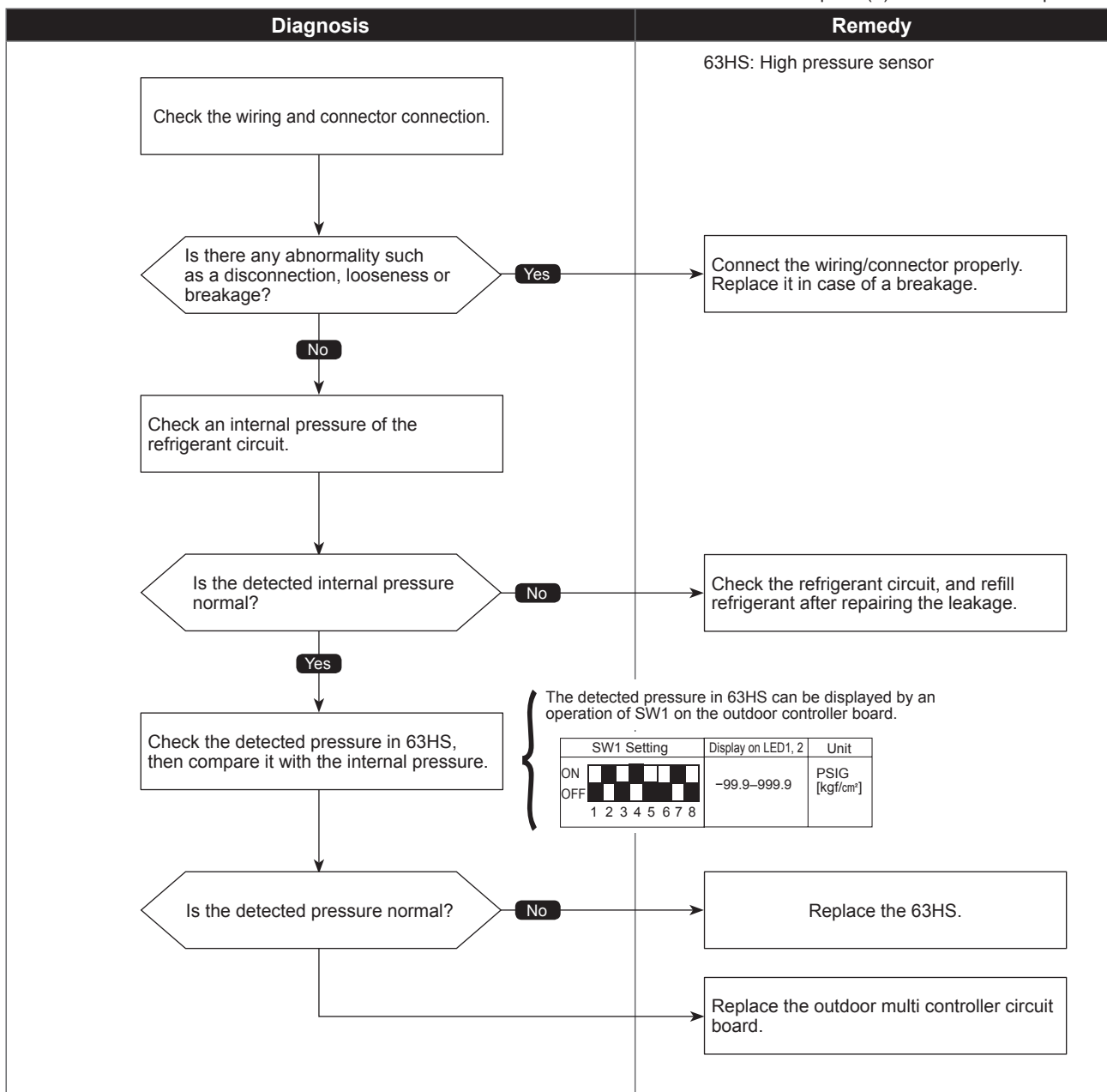
High pressure sensor (63HS) trouble

Abnormal points and detection methods	Causes and checkpoints
<p>① When the detected pressure in the high pressure sensor is 14.2 PSIG [1 kgf/cm²] or less during operation, the compressor stops operation and enters into an anti-restart mode for 3 minutes.</p> <p>② When the detected pressure is 14.2 PSIG [1 kgf/cm²] or less immediately before restarting, the compressor falls into an abnormal stop with a check code <5201>.</p> <p>③ For 3 minutes after compressor restarting, during defrosting operation, and for 3 minutes after returning from defrosting operation, above mentioned symptoms are not determined as abnormal.</p>	<p>① Defective high pressure sensor</p> <p>② Decrease of internal pressure caused by gas leakage</p> <p>③ Disconnection or contact failure of connector</p> <p>④ Malfunction of input circuit on outdoor multi controller circuit board</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

The black square (■) indicates a switch position.



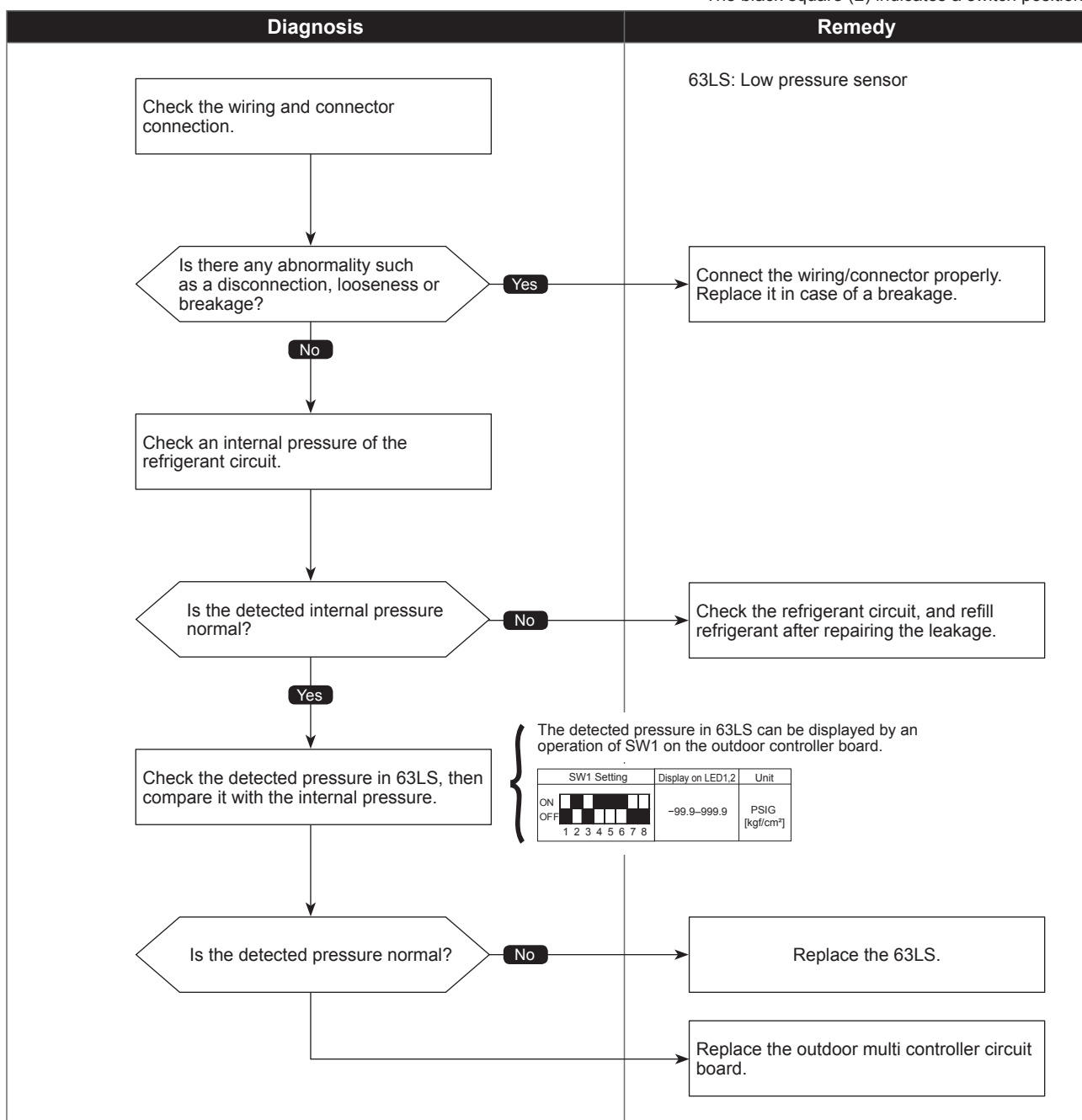
Low pressure sensor (63LS) trouble

Abnormal points and detection methods	Causes and checkpoints
<p>① When the detected pressure in the low pressure sensor is -32.7 PSIG [-2.3kgf/cm^2] or less, or 328.6 PSIG [23.1kgf/cm^2] or more during operation, the compressor stops operation with a check code <5202>.</p> <p>② For 3 minutes after compressor restarting, during defrosting operation, and for 3 minutes after returning from defrosting operation, above mentioned symptoms are not determined as abnormal.</p>	<p>① Defective low pressure sensor</p> <p>② Decrease of internal pressure caused by gas leakage</p> <p>③ Disconnection or contact failure of connector</p> <p>④ Malfunction of input circuit on outdoor multi controller circuit board</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

The black square (■) indicates a switch position.



Current sensor trouble/Primary current error

Abnormal points and detection methods

If any of the following conditions is detected:

- ① Primary current sensor detects any of the following conditions (single phase unit only):

10 consecutive-second detection	One-time detection
34 A	38 A

- ② Secondary current sensor detects 25 A or more.
③ Secondary current sensor detects 1.0 A or less.

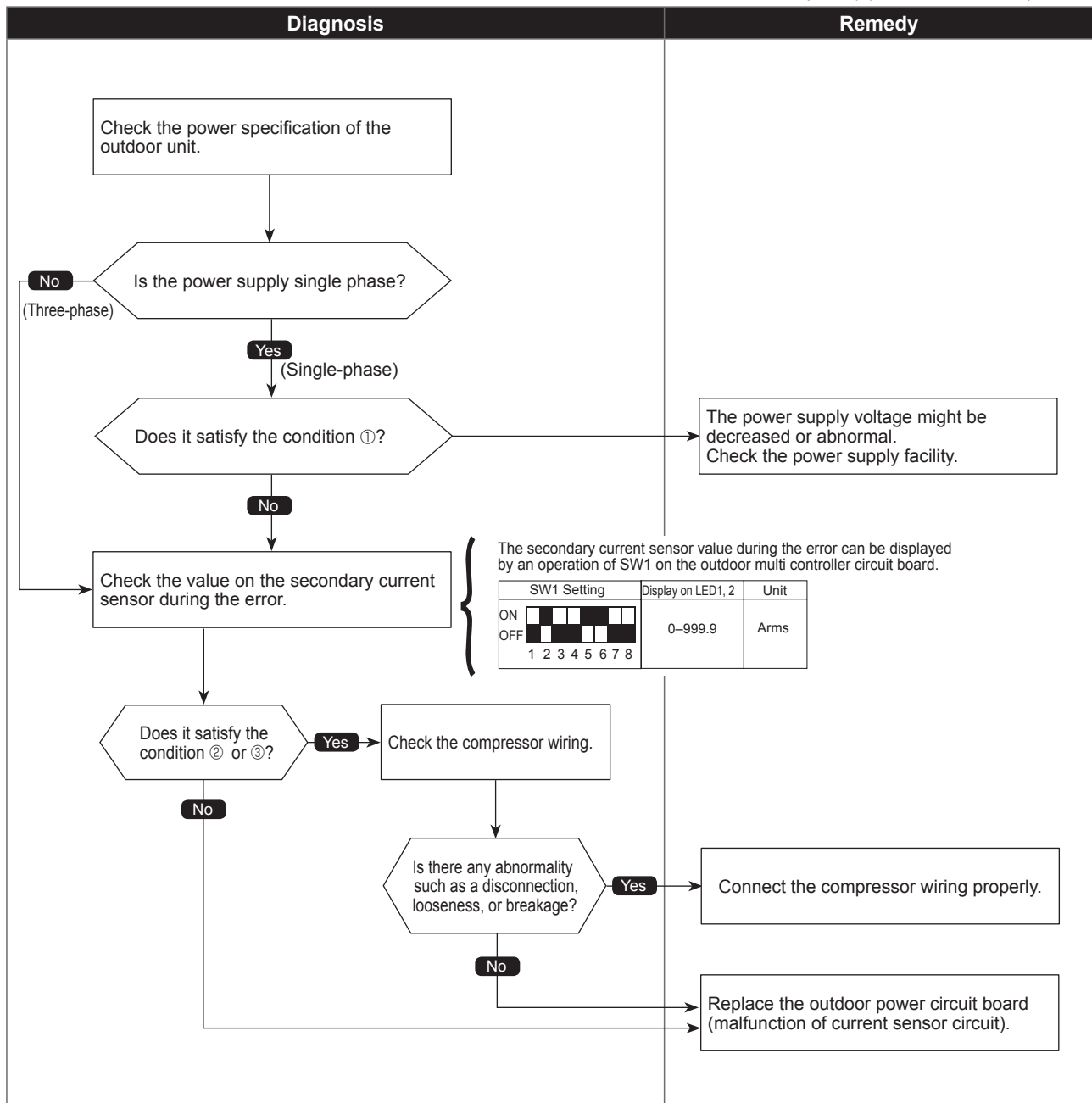
Causes and checkpoints

- ① Decrease/trouble of power supply voltage
② Disconnection of compressor wiring
③ Current sensor trouble on outdoor power circuit board
④ Wiring through current sensor (penetration type) is not done.

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

The black square (■) indicates a switch position.



Duplex address error

Abnormal points and detection methods	Causes and checkpoints
If 2 or more units with the same address are existing.	① There are 2 units or more with the same address in their controller among outdoor unit, indoor unit, Fresh Master, Lossnay or remote controller ② Noise interference on indoor/outdoor connectors

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

Diagnosis	Remedy
<p>Search for a unit with the same address as the source of abnormality.</p> <p>Is there any unit with the same address?</p> <p>Yes</p> <p>No</p> <p>Turn the power back ON.</p> <p>Does it operate normally?</p> <p>No</p> <p>Yes</p>	<p>Correct the address, and turn the power OFF of indoor/outdoor unit, Fresh Master or Lossnay simultaneously for 2 minutes or more, then turn the power back ON.</p> <p>Malfunction of sending/receiving circuit on indoor/outdoor unit is suspected.</p> <p>There is no abnormality on the AC unit. It might be caused by an external noise, so check the transmission line to remove the factor(s).</p>

Transmission processor hardware error

Abnormal points and detection methods	Causes and checkpoints
If the transmission line shows "1" although the transmission processor transmitted "0".	① A transmitting data collision occurred because of a wiring work or polarity change has performed while the power is ON on either of the indoor/outdoor unit, Fresh Master or Lossnay ② Malfunction of transmitting circuit on transmission processor ③ Noise interference on indoor/outdoor connectors

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

Diagnosis	Remedy
<pre> graph TD A{{A wiring work was performed while the power OFF.}} -- No --> B[If the wiring work was performed while the power ON, turn the power OFF of indoor/outdoor unit, Fresh Master or Lossnay simultaneously for 2 minutes or more, then turn the power back ON.] A -- Yes --> C[Turn the power back ON.] C --> D{{Does it operate normally?}} D -- No --> E[Replace the indoor/outdoor controller board.] D -- Yes --> F[There is no abnormality on the AC unit. It might be caused by an external noise, so check the transmission line to remove the factor(s).] </pre>	<div> <p>If the wiring work was performed while the power ON, turn the power OFF of indoor/outdoor unit, Fresh Master or Lossnay simultaneously for 2 minutes or more, then turn the power back ON.</p> </div> <div> <p>Replace the indoor/outdoor controller board.</p> </div> <div> <p>There is no abnormality on the AC unit. It might be caused by an external noise, so check the transmission line to remove the factor(s).</p> </div>

Transmission bus BUSY error

Abnormal points and detection methods	Causes and checkpoints
<p>① An abnormality when no transmission status caused by transmitting data collision continues for 8 to 10 minutes.</p> <p>② An abnormality when data cannot be output on the transmission line consecutively because of noise etc. for 8 to 10 minutes.</p>	<p>① The transmission processor is unable to transmit due to a short-cycle voltage such as noise is mixed on the transmission line.</p> <p>② The transmission processor is unable to transmit due to an increase of transmission data amount caused by a miswiring of the terminal block (transmission line) (TB3) and the terminal block (centralized control line) (TB7) on the outdoor unit.</p> <p>③ The share on transmission line becomes high due to a mixed transmission caused by a malfunction of repeater on the outdoor unit, which is a function to connect/disconnect transmission from/to control system and centralized control system.</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

Diagnosis	Remedy
<p>Check whether the transmission line to the indoor unit, Fresh Master, Lossnay or remote controller is miswired to the terminal block (TB7) on outdoor unit or not.</p> <p>Is the transmission line miswired?</p> <p>Yes (miswired)</p> <p>No (wired correctly)</p> <p>Check whether the transmission line with the other refrigerant system of the indoor unit, Fresh Master or Lossnay is miswired to the terminal block (TB3) on outdoor unit or not.</p> <p>Is the transmission line miswired?</p> <p>Yes (miswired)</p> <p>No (wired correctly)</p> <p>Turn the power back ON.</p> <p>Does it operate normally?</p> <p>No</p> <p>Yes</p>	<p>Correct the wiring, then turn the power back ON.</p> <p>Correct the wiring, then turn the power back ON.</p> <p>Replace the indoor/outdoor controller board.</p> <p>There is no abnormality on the AC unit. It might be caused by an external noise, so check the transmission line to remove the factor(s).</p>

Signal communication error with transmission processor

Abnormal points and detection methods	Causes and checkpoints
① If the data of unit/transmission processor were not normally transmitted. ② If the address transmission from the unit processor was not normally transmitted.	① Accidental disturbance such as noise or lightning surge ② Hardware malfunction of transmission processor

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

Diagnosis	Remedy
<div data-bbox="304 634 730 725" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Turn the power OFF of indoor/outdoor unit, Fresh Master, Lossnay and remote controller simultaneously for 2 minutes or more, then turn the power back ON. </div> <div data-bbox="304 874 730 966" style="border: 1px solid black; padding: 10px; margin-bottom: 10px;"> <div style="display: flex; justify-content: space-between; align-items: center;"> <div>Does it operate normally?</div> <div style="border: 1px solid black; padding: 2px 5px;">No</div> </div> </div> <div data-bbox="485 987 541 1017" style="border: 1px solid black; padding: 2px 5px; margin-bottom: 10px;"> Yes </div>	<div data-bbox="967 874 1393 966" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Replace the controller (defect of error source controller). </div> <div data-bbox="967 1008 1393 1100" style="border: 1px solid black; padding: 5px;"> There is no abnormality on the AC unit. It might be caused by an external noise, so check the transmission line to remove the factor(s). </div>

No ACK error

Chart 1 of 4

Abnormal points and detection methods	Causes and checkpoints
<p>① Represents a common error detection An abnormality detected by the sending side controller when receiving no ACK from the receiving side, though signal was once sent. The sending side searches the error in 30 seconds interval for 6 times continuously.</p>	<p>① The previous address unit does not exist since the address switch was changed while in electric continuity status.</p> <p>② Decline of transmission voltage/signal caused by tolerance over on transmission line ·At the furthest end: 656 ft [200 m] ·On remote controller line: 39 ft [12 m]</p> <p>③ Decline of transmission voltage/ signal due to unmatched transmission line types ·Types for shield line: CVVS, CPEVS ·Line diameter: AWG16 [1.25 mm²] or more</p> <p>④ Decline of transmission voltage/ signal due to excessive number of connected units</p> <p>⑤ Malfunction due to accidental disturbance such as noise or lightning surge</p> <p>⑥ Defect of error source controller</p>
<p>② The cause of displayed address and attribute is on the outdoor unit side An abnormality detected by the indoor unit if receiving no ACK when transmitting signal from the indoor unit to the outdoor unit.</p>	<p>① Contact failure of indoor/outdoor unit transmission line</p> <p>② Disconnection of transmission connector (CN2M) on indoor unit</p> <p>③ Malfunction of sending/receiving circuit on indoor/outdoor unit</p>
<p>③ The cause of displayed address and attribute is on the indoor unit side An abnormality detected by the remote controller if receiving no ACK when sending data from the remote controller to the indoor unit.</p>	<p>① While operating with multi refrigerant system indoor units, an abnormality is detected when the indoor unit transmit signal to the remote controller during the other refrigerant-system outdoor unit is turned OFF, or within 2 minutes after it turned back ON.</p> <p>② Contact failure of indoor unit or remote controller transmission line</p> <p>③ Disconnection of transmission connector (CN2M) on indoor unit</p> <p>④ Malfunction of sending/receiving circuit on indoor unit or remote controller</p>
<p>④ The cause of the displayed address and attribute is on the remote controller side An abnormality detected by the indoor unit if receiving no ACK when transmitting signal from the indoor unit to the remote controller.</p>	<p>① While operating with multi refrigerant system indoor units, an abnormality is detected when the indoor unit transmit signal to the remote controller during the other refrigerant-system outdoor unit is turned OFF, or within 2 minutes after it turned back ON.</p> <p>② Contact failure of indoor unit or remote controller transmission line</p> <p>③ Disconnection of transmission connector (CN2M) on indoor unit</p> <p>④ Malfunction of sending/receiving circuit on indoor unit or remote controller</p>

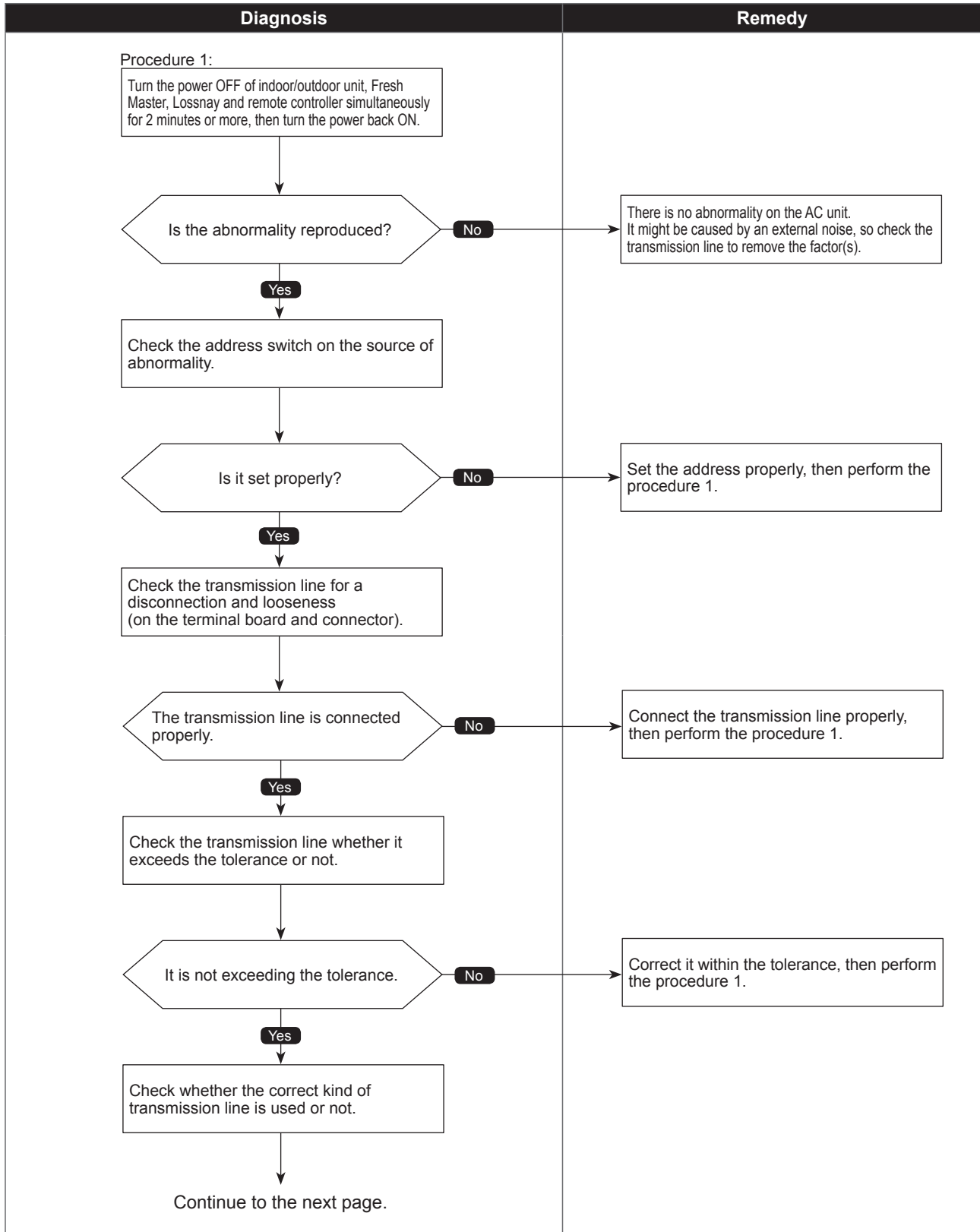
No ACK error

Chart 2 of 4

Abnormal points and detection methods	Causes and checkpoints
<p>⑤ The cause of displayed address and attribute is on the Fresh Master side An abnormality detected by the indoor unit if receiving no ACK when transmitting signal from the indoor unit to the Fresh Master.</p>	<p>① While the indoor unit is operating with multi refrigerant system Fresh Master, an abnormality is detected when the indoor unit transmits signal to the remote controller while the outdoor unit with the same refrigerant system as the Fresh Master is turned OFF, or within 2 minutes after it turned back ON.</p> <p>② Contact failure of indoor unit or Fresh Master transmission line</p> <p>③ Disconnection of transmission connector (CN2M) on indoor unit or Fresh Master</p> <p>④ Malfunction of sending/receiving circuit on indoor unit or Fresh Master</p>
<p>⑥ The cause of displayed address and attribute is on Lossnay side An abnormality detected by the indoor unit if receiving no ACK when the indoor unit transmit signal to the Lossnay.</p>	<p>① An abnormality is detected when the indoor unit transmits signal to Lossnay while the Lossnay is turned OFF.</p> <p>② While the indoor unit is operating with the other refrigerant Lossnay, an abnormality is detected when the indoor unit transmits signal to the Lossnay while the outdoor unit with the same refrigerant system as the Lossnay is turned OFF, or within 2 minutes after it turned back ON.</p> <p>③ Contact failure of indoor unit or Lossnay transmission line</p> <p>④ Disconnection of transmission connector (CN2M) on indoor unit</p> <p>⑤ Malfunction of sending/receiving circuit on indoor unit or Lossnay</p>
<p>⑦ The controller of displayed address and attribute is not recognized.</p>	<p>① The previous address unit does not exist since the address switch was changed while in electric continuity status.</p> <p>② An abnormality detected at transmitting from the indoor unit since the Fresh Master/Lossnay address are changed after synchronized setting of Fresh Master/Lossnay by the remote controller.</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

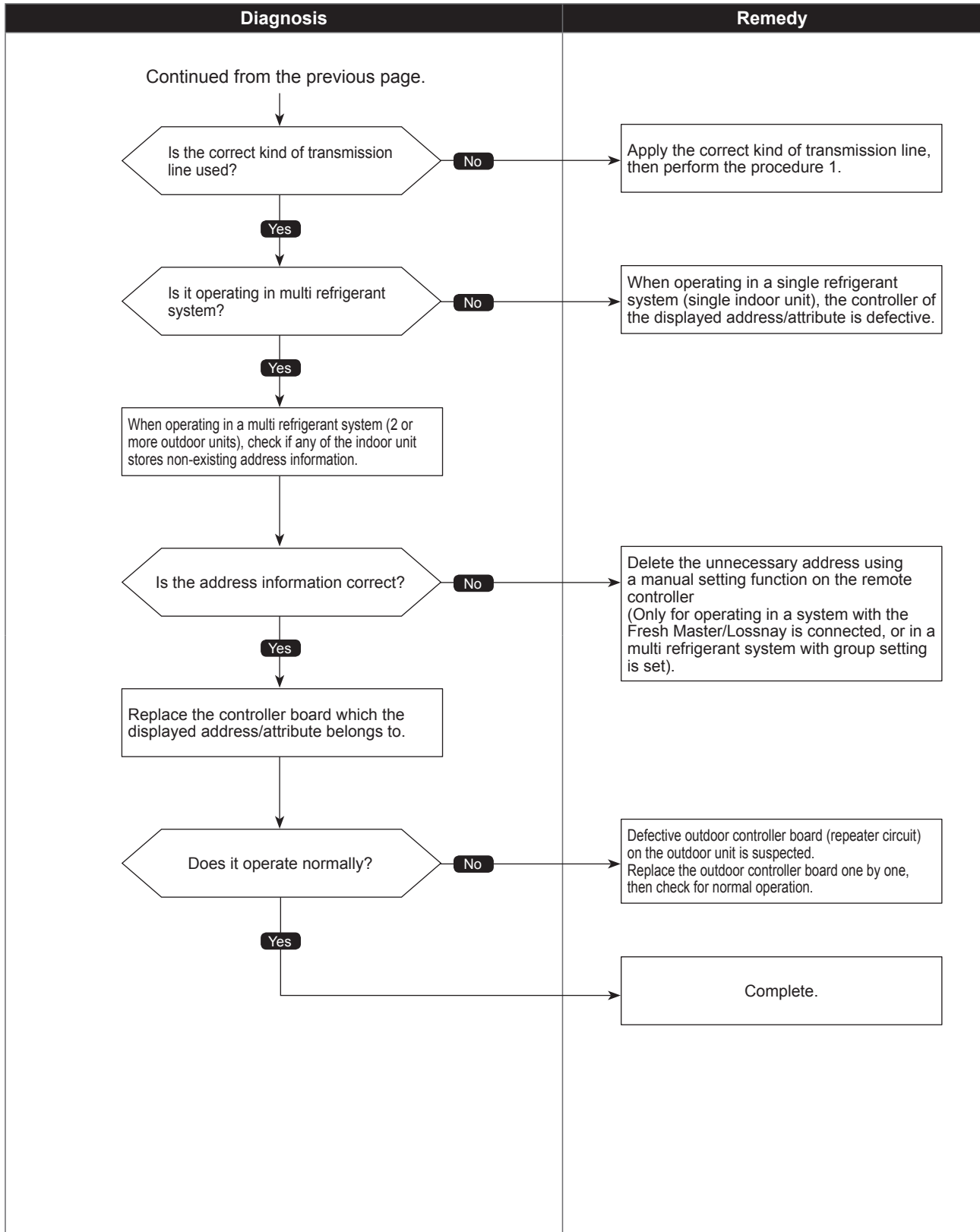


No ACK error

Chart 4 of 4

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



No response frame error

Abnormal points and detection methods	Causes and checkpoints
<p>If receiving no response command while already received ACK. The sending side searches the error in 30 seconds interval for 6 times continuously.</p>	<p>① Continuous failure of transmission due to noise etc ② Decline of transmission voltage/signal caused by tolerance over on transmission line ·At the furthest end: 656 ft [200 m] ·On remote controller line: 39 ft [12 m] ③ Decline of transmission voltage/ signal due to unmatched transmission line types ·Types for shield line: CVVS, CPEVS ·Line diameter: AWG16 [1.25 mm²] or more ④ Accidental malfunction of error source controller</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

Diagnosis	Remedy
<p>Turn the power OFF of indoor/outdoor unit, Fresh Master, Lossnay and remote controller simultaneously for 2 minutes or more, then turn the power back ON.</p> <p>Does it operate normally?</p> <p>No</p> <p>Yes</p> <p>Check the transmission line for a disconnection and looseness (on the terminal board and connector).</p> <p>The transmission line is connected properly.</p> <p>No</p> <p>Yes</p> <p>Check the transmission line whether it exceeds the tolerance or not.</p> <p>It is not exceeding the tolerance.</p> <p>No</p> <p>Yes</p> <p>Check whether the correct kind of transmission line is used or not.</p> <p>Is correct kind of transmission line used?</p> <p>No</p> <p>Yes</p>	<p>Replace the controller board (defect of the controller which the displayed address/attribute belong to).</p> <p>Connect the transmission line properly.</p> <p>Correct it within the tolerance.</p> <p>Replace it with the correct kind of transmission line.</p> <p>There is no abnormality on the AC unit. Check the transmission line for transmission wave and noise.</p>

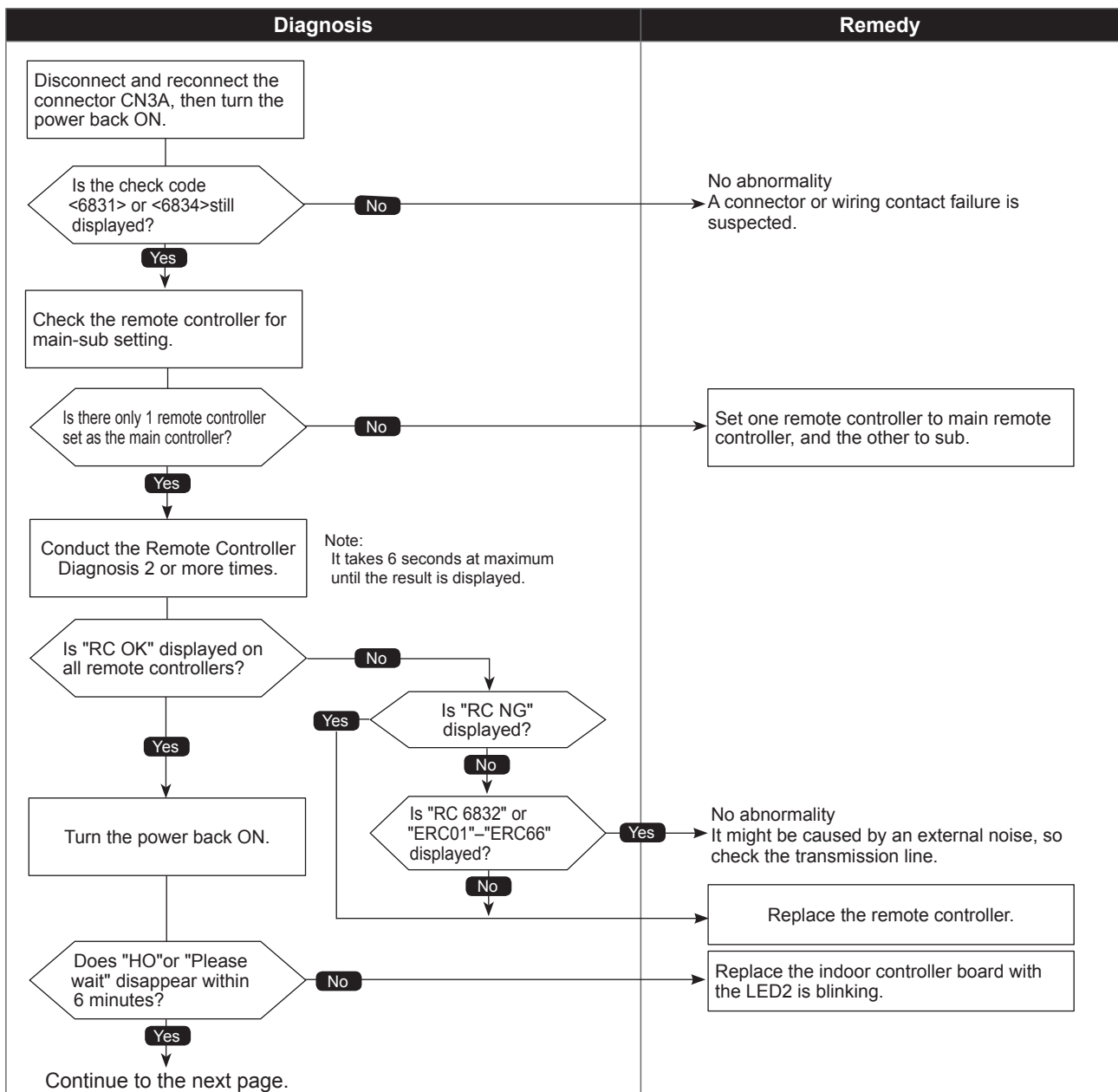
MA communication receive error

Chart 1 of 2

Abnormal points and detection methods	Causes and checkpoints
<p>Detected in remote controller or indoor unit:</p> <p>① When the main or sub remote controller cannot receive signal from indoor unit which has the "0" address.</p> <p>② When the sub remote controller cannot receive signal.</p> <p>③ When the indoor controller board cannot receive signal from remote controller or another indoor unit.</p> <p>④ When the indoor controller board cannot receive signal.</p>	<p>① Contact failure of remote controller wirings</p> <p>② Irregular Wiring (A wiring length, number of connecting remote controllers or indoor units, or a wiring thickness does not meet the conditions specified in the chapter "Electrical Work" in the indoor unit Installation Manual.)</p> <p>③ Malfunction of the remote controller sending/receiving circuit on indoor unit with the LED2 is blinking.</p> <p>④ Malfunction of the remote controller sending/receiving circuit</p> <p>⑤ Remote controller transmitting error caused by noise interference</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

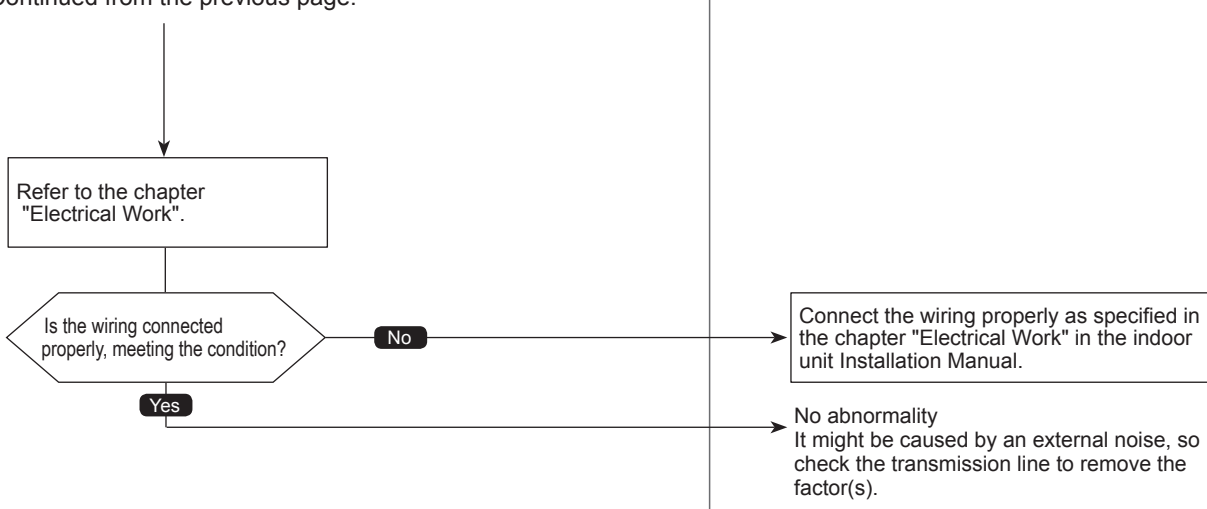


MA communication receive error

Chart 2 of 2

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

Diagnosis	Remedy
Continued from the previous page.	
 <pre>graph TD; A[Refer to the chapter "Electrical Work".] --> B{Is the wiring connected properly, meeting the condition?}; B -- No --> C[Connect the wiring properly as specified in the chapter "Electrical Work" in the indoor unit Installation Manual.]; B -- Yes --> D[No abnormality It might be caused by an external noise, so check the transmission line to remove the factor(s).];</pre>	

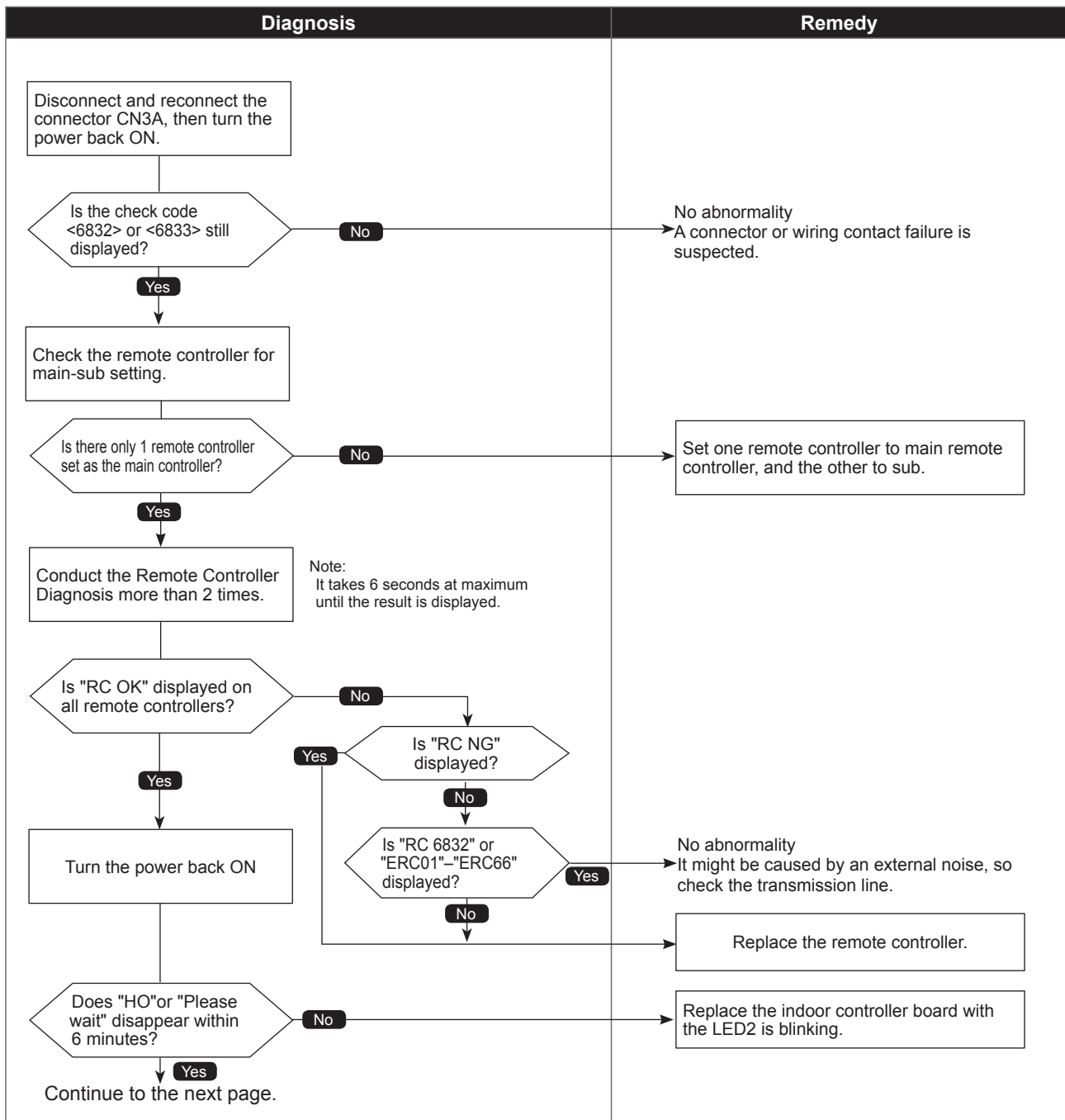
MA communication send error

Chart 1 of 2

Abnormal points and detection methods	Causes and checkpoints
Detected in remote controller or indoor unit.	① There are 2 remote controllers set as main. ② Malfunction of remote controller sending/receiving circuit ③ Malfunction of sending/receiving circuit on indoor controller board ④ Remote controller transmitting error caused by noise interference

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



MA communication send error

Chart 2 of 2

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

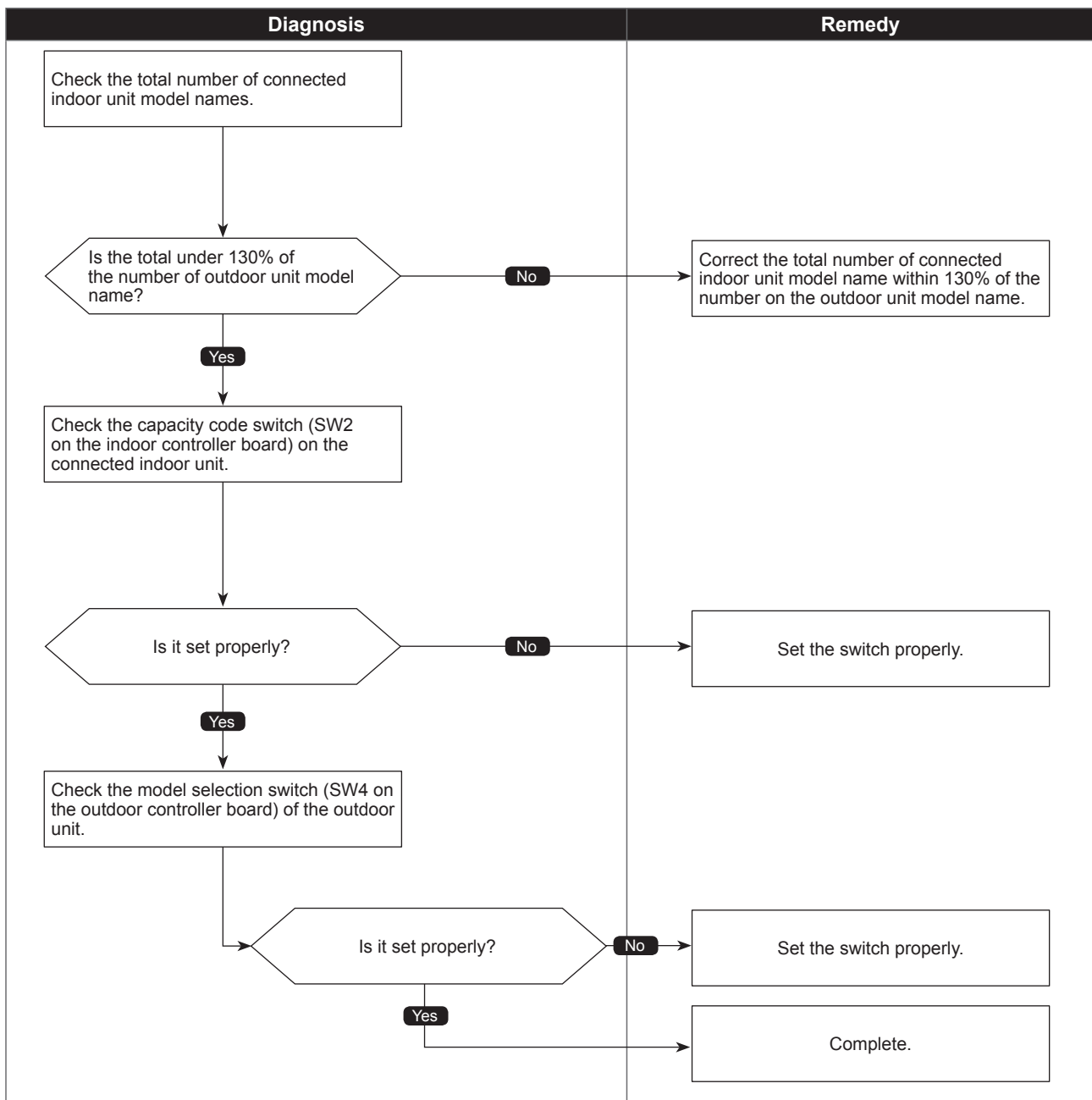
Diagnosis	Remedy
<p>Continued from the previous page.</p> <pre> graph TD Start([Continued from the previous page.]) --> Box[Refer to the chapter "Electrical Work".] Box --> Decision{Is the wiring connected properly, meeting the condition?} Decision -- No --> RemedyBox[Connect the wiring properly as specified in the chapter "Electrical Work" in the indoor unit Installation Manual.] Decision -- Yes --> RemedyText[No abnormality It might be caused by an external noise, so check the transmission line to remove the factor(s).] </pre>	<div data-bbox="963 768 1388 859" style="border: 1px solid black; padding: 5px;"> Connect the wiring properly as specified in the chapter "Electrical Work" in the indoor unit Installation Manual. </div> <p>No abnormality It might be caused by an external noise, so check the transmission line to remove the factor(s).</p>

Total capacity error

Abnormal points and detection methods	Causes and checkpoints
When the total of the number on connected indoor unit model names exceeds the specified capacity level (130% of the number on the outdoor unit model name), a check code <7100> is displayed.	<p>① The total of number on connected indoor unit model names exceeds the specified capacity level:</p> <ul style="list-style-type: none"> · 36: up to code 29 · 42: up to code 35 · 48: up to code 40 · 60: up to code 59 <p>② The model name code of the outdoor unit is registered wrongly.</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.



Check code

7101
(EF)

Capacity code error

Abnormal points and detection methods

When the capacity of connected indoor unit is over, a check code <7101> is displayed.

Causes and checkpoints

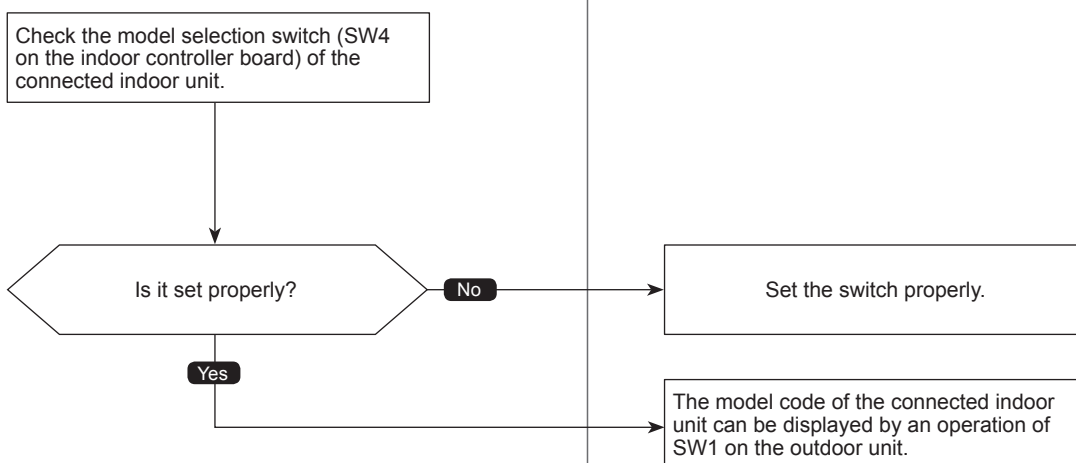
The model name of connected indoor unit (model code) is read as incompatible.

● Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

Diagnosis

Remedy



Connecting excessive number of units and branch boxes

Abnormal points and detection methods	Causes and checkpoints
When the connected indoor units or branch boxes exceed the limit, a check code <7102> is displayed.	<p>Connecting more indoor units and branch boxes than the limit.</p> <p>Abnormal if connecting status does not comply with the following limit;</p> <p>① Outdoor unit's capacity class is:</p> <ul style="list-style-type: none"> ·36: up to 4 indoor units ·42: up to 5 indoor units ·48: up to 8 indoor units ·60: up to 8 indoor units <p>② Connect at least 1 indoor unit (Abnormal if connected none)</p> <p>③ Connectable up to 2 branch boxes</p>

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

Diagnosis	Remedy
<p>Check whether the connecting unit and branch box exceeds the limit or not.</p> <p>Does it exceed the limit?</p> <p>Yes</p> <p>No</p> <p>Check if at least 1 indoor unit is connected.</p> <p>Is an indoor unit connected?</p> <p>No</p> <p>Yes</p>	<p>Connect less number of units and branch boxes than the limit.</p> <p>The model code of the connected indoor unit can be displayed by an operation of SW1 on the outdoor unit.</p> <p>Connect indoor unit.</p> <p>Check whether the M-NET line to the indoor unit is connected or not.</p>

Address setting error

Abnormal points and detection methods	Causes and checkpoints
The address setting of outdoor unit or branch box is wrong.	Wrongly set address of branch box The outdoor unit is not set in 000, or in the range of 51 to 100.

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

Diagnosis	Remedy
<p><Outdoor unit></p> <pre> graph TD A[Check whether the outdoor unit address is set in 000, or in the range of 51 to 100.] --> B{Is the address setting correct?} B -- No --> C[Set the address properly, then turn the power OFF of indoor/outdoor unit, Fresh Master, Lossnay and remote controller simultaneously for 2 minutes or more, and turn the power back ON.] B -- Yes --> D[Replace the outdoor controller board.] </pre>	<p>Set the address properly, then turn the power OFF of indoor/outdoor unit, Fresh Master, Lossnay and remote controller simultaneously for 2 minutes or more, and turn the power back ON.</p> <p>Replace the outdoor controller board.</p>
<p><Branch box></p> <pre> graph TD E[Check whether the branch box address is set in 000, or in the range of 001 to 050.] --> F{Is the address setting correct?} F -- No --> G[Set the address properly, then turn the power OFF of indoor/outdoor unit, branch box, Fresh Master, Lossnay, and remote controller simultaneously for 2 minutes or more, and turn the power back ON.] F -- Yes --> H[Replace the branch box controller board.] </pre>	<p>Set the address properly, then turn the power OFF of indoor/outdoor unit, branch box, Fresh Master, Lossnay, and remote controller simultaneously for 2 minutes or more, and turn the power back ON.</p> <p>Replace the branch box controller board.</p>
<p>Note: Branch box address When setting the address, use a number within the range of 1–50. Ex. The set address is (47) and there are 5 indoor units (A, B, C, D, and E). If A: (47), B: (48), C: (49), D: (50), and E: (51), E is incorrect because it exceeds 50.</p>	

Incompatible unit combination

Abnormal points and detection methods	Causes and checkpoints
When the connected indoor unit is not compatible with the outdoor unit, the outdoor unit detects the error at startup.	Connecting indoor unit(s) which is not authorized to connect to the outdoor unit.

●Diagnosis of defects

Make sure to turn the power OFF before connecting/disconnecting any connectors, or replacing boards.

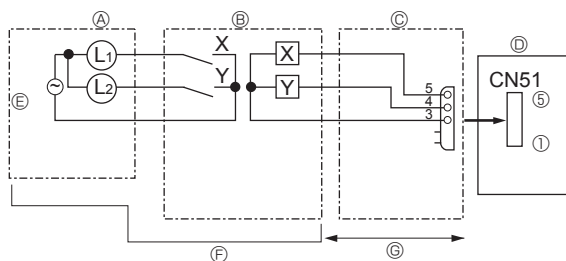
Diagnosis	Remedy
<p>Refer to the service manual of the outdoor unit or the connected indoor unit for the authorized combination.</p> <pre> graph TD A[Refer to the service manual of the outdoor unit or the connected indoor unit for the authorized combination.] --> B{Is the indoor unit authorized to connect with the outdoor unit?} B -- No --> C[Replace the indoor unit(s) to the connectable one.] B -- Yes --> D{Check whether the model selection switch is set correctly. Are they correct?} D -- No --> E[Set the model selection switch correctly, then restart.] D -- Yes --> F[Replace the outdoor controller board.] </pre>	

8-4. TROUBLESHOOTING BY INFERIOR PHENOMENA

Phenomena	Factors	Countermeasures
1. Remote controller display works normally and the unit performs cooling operation, however, the capacity cannot be fully obtained. (The air does not cool well.)	① Refrigerant shortage ② Filter clogging ③ Heat exchanger clogging ④ Air duct short cycle	① If refrigerant leaks, discharging temperature rises and LEV opening increases. Inspect leakage by checking the temperature and opening. Check pipe connections for gas leakage. ② Open intake grille and check the filter. Clean the filter by removing dirt or dust on it. ③ If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure. Clean the heat exchanger. ④ Remove the blockage.
2. Remote controller display works normally and the unit performs heating operation, however, the capacity cannot be fully obtained.	① Linear expansion valve fault Opening cannot be adjusted well due to linear expansion valve fault. ② Refrigerant shortage ③ Lack of insulation for refrigerant piping ④ Filter clogging ⑤ Heat exchanger clogging ⑥ Air duct short cycle ⑦ Bypass circuit of outdoor unit fault	① Discharging temperature and indoor heat exchanger temperature does not rise. Inspect the failure by checking discharging pressure. Replace linear expansion valve. ② If refrigerant leaks, discharging temperature rises and LEV opening increases. Inspect leakage by checking the temperature and opening. Check pipe connections for gas leakage. ③ Check the insulation. ④ Open intake grille and check the filter. Clean the filter by removing dirt or dust on it. ⑤ If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure. Clean the heat exchanger. ⑥ Remove the blockage. ⑦ Check refrigerant system during operation.
3.① For 3 minutes after temperature adjuster turns off, the compressor will not start operating even if temperature adjuster is turned on. ② For 3 minutes after temperature adjuster turns on, the compressor will not stop operating even if temperature adjuster is turned off. (Compressor stops operating immediately when turning off by the remote controller.)	① ② Normal operation (For protection of compressor)	① ② Normal operation
4. The compressor that is running soon after powered on is slow to speed up.	The rate of speed-up is kept at 2 Hz/minute during 4 hours after powered on. This can prevent a compressor failure that occurs when a non-energized compressor speeds up rapidly with refrigerant collected in the compressor.	Normal operation

8-5. OUTDOOR UNIT INPUT/OUTPUT CONNECTOR

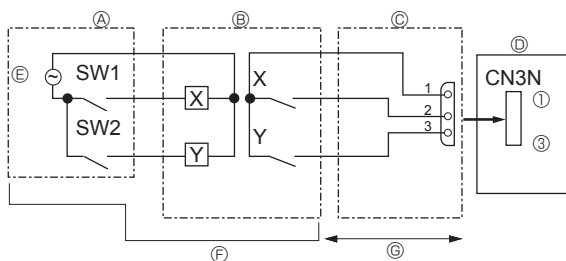
• State (CN51)



- Ⓐ Distant control board
- Ⓑ Relay circuit
- Ⓒ External output adapter (PAC-SA88HA-E)
- Ⓓ Outdoor unit control board
- Ⓔ Lamp power supply
- Ⓕ Procure locally
- Ⓖ Max. 10 m

L1: Error display lamp
 L2: Compressor operation lamp
 X, Y: Relay (Coil standard of 0.9W or less for 12 V DC)
 X, Y: Relay (1mA DC)

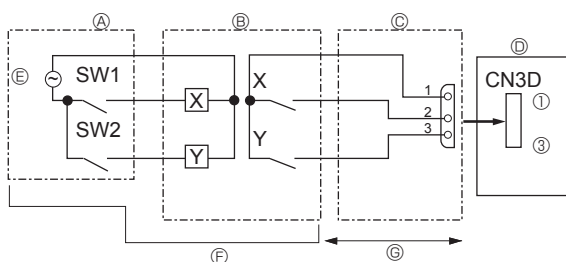
• Auto change over (CN3N)



- Ⓐ Remote control panel
- Ⓑ Relay circuit
- Ⓒ External input adapter (PAC-SC36NA-E)
- Ⓓ Outdoor unit control board
- Ⓔ Relay power supply
- Ⓕ Procure locally
- Ⓖ Max. 10 m

	ON	OFF
SW1	Heating	Cooling
SW2	Validity of SW1	Invalidity of SW1

• Silent Mode / Demand Control (CN3D)



- Ⓐ Remote control panel
- Ⓑ Relay circuit
- Ⓒ External input adapter (PAC-SC36NA-E)
- Ⓓ Outdoor unit control board
- Ⓔ Relay power supply
- Ⓕ Procure locally
- Ⓖ Max. 10 m

The silent mode and the demand control are selected by switching the DIP switch 9-2 on outdoor controller board. It is possible to set it to the following power consumption (compared with ratings) by setting SW1, 2.

	Outdoor controller board DIP SW9-2	SW1	SW2	Function
Silent mode	OFF	ON	—	Silent mode operation
Demand control	ON	OFF	OFF	100% (Normal)
		ON	OFF	75%
		ON	ON	50%
		OFF	ON	0% (Stop)

8-6. HOW TO CHECK THE PARTS

OUTDOOR UNIT:

MXZ-4C36NAHZ

MXZ-5C42NAHZ

MXZ-8C48NAHZ

MXZ-8C48NA

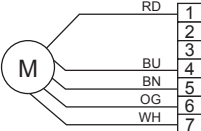
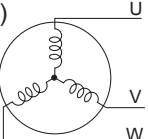
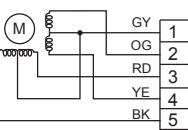
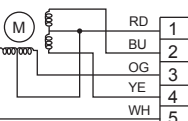
MXZ-4C36NAHZ-U1

MXZ-5C42NAHZ-U1

MXZ-8C48NAHZ-U1

MXZ-8C48NA-U1

MXZ-8C60NA-U1

Parts name	Checkpoints														
Thermistor (TH3) <Outdoor liquid pipe> Thermistor (TH4) <Compressor> Thermistor (TH6) <Suction pipe> Thermistor (TH7) <Ambient> Thermistor (TH8) <Heat Sink>	Disconnect the connector then measure the resistance with a tester. (At the ambient temperature 50 to 80°F [10 to 30 °C]) <table><tr><td></td><td>Normal</td><td colspan="2">Abnormal</td></tr><tr><td>TH4</td><td>160 to 410 kΩ</td><td colspan="2" rowspan="4">Open or short</td></tr><tr><td>TH3</td><td rowspan="3">4.3 to 9.6 kΩ</td></tr><tr><td>TH6</td></tr><tr><td>TH7</td></tr><tr><td>TH8*</td><td>39 to 105 kΩ</td></tr></table> <p>* TH8 is internal thermistor of power module.</p>		Normal	Abnormal		TH4	160 to 410 kΩ	Open or short		TH3	4.3 to 9.6 kΩ	TH6	TH7	TH8*	39 to 105 kΩ
	Normal	Abnormal													
TH4	160 to 410 kΩ	Open or short													
TH3	4.3 to 9.6 kΩ														
TH6															
TH7															
TH8*	39 to 105 kΩ														
Fan motor (MF1, MF2) 	Measure the resistance between the connector pins with a tester. (At the ambient temperature 20°C) <table><tr><td colspan="4">Normal</td><td>Abnormal</td></tr><tr><td>Red - Blue</td><td>Brown - Blue</td><td>Orange - Blue</td><td>White - Blue</td><td rowspan="2">Open or short (Short, for White - Blue)</td></tr><tr><td>1.1 ± 0.05 MΩ</td><td>40 ± 4 kΩ</td><td>220 ± 22 kΩ</td><td>Open</td></tr></table>	Normal				Abnormal	Red - Blue	Brown - Blue	Orange - Blue	White - Blue	Open or short (Short, for White - Blue)	1.1 ± 0.05 MΩ	40 ± 4 kΩ	220 ± 22 kΩ	Open
Normal				Abnormal											
Red - Blue	Brown - Blue	Orange - Blue	White - Blue	Open or short (Short, for White - Blue)											
1.1 ± 0.05 MΩ	40 ± 4 kΩ	220 ± 22 kΩ	Open												
Solenoid valve coil <4-way valve> (21S4)	Measure the resistance between the terminals with a tester. (At the ambient temperature 68°F [20 °C]) <table><tr><td>Normal</td><td>Abnormal</td></tr><tr><td>1567.5 ± 156.8 Ω</td><td>Open or short</td></tr></table>	Normal	Abnormal	1567.5 ± 156.8 Ω	Open or short										
Normal	Abnormal														
1567.5 ± 156.8 Ω	Open or short														
Motor for compressor (MC) 	Measure the resistance between the terminals with a tester. (Winding temperature 68°F [20 °C]) <table><tr><td>Normal</td><td>Abnormal</td></tr><tr><td>0.305 Ω ± 0.015 Ω</td><td>Open or short</td></tr></table>	Normal	Abnormal	0.305 Ω ± 0.015 Ω	Open or short										
Normal	Abnormal														
0.305 Ω ± 0.015 Ω	Open or short														
Solenoid valve coil <Bypass valve> (SV1) <Switching valve> (SV2)**	Measure the resistance between the terminals with a tester. (At the ambient temperature 68°F [20 °C]) <table><tr><td>Normal</td><td>Abnormal</td></tr><tr><td>1197 ± 10 Ω</td><td>Open or short</td></tr></table> <p>SV2 is equipped to **MXZ-NAHZ only.</p>	Normal	Abnormal	1197 ± 10 Ω	Open or short										
Normal	Abnormal														
1197 ± 10 Ω	Open or short														
Linear expansion Valve (LEV-A) 	<table><tr><td colspan="4">Normal</td><td>Abnormal</td></tr><tr><td>Gray - Black</td><td>Gray - Red</td><td>Gray - Yellow</td><td>Gray - Orange</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">46 ± 3 Ω</td></tr></table>	Normal				Abnormal	Gray - Black	Gray - Red	Gray - Yellow	Gray - Orange	Open or short	46 ± 3 Ω			
Normal				Abnormal											
Gray - Black	Gray - Red	Gray - Yellow	Gray - Orange	Open or short											
46 ± 3 Ω															
Linear expansion Valve (LEV-B) 	<table><tr><td colspan="4">Normal</td><td>Abnormal</td></tr><tr><td>Red - White</td><td>Red - Orange</td><td>Red - Yellow</td><td>Red - Blue</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">46 ± 4 Ω</td></tr></table>	Normal				Abnormal	Red - White	Red - Orange	Red - Yellow	Red - Blue	Open or short	46 ± 4 Ω			
Normal				Abnormal											
Red - White	Red - Orange	Red - Yellow	Red - Blue	Open or short											
46 ± 4 Ω															

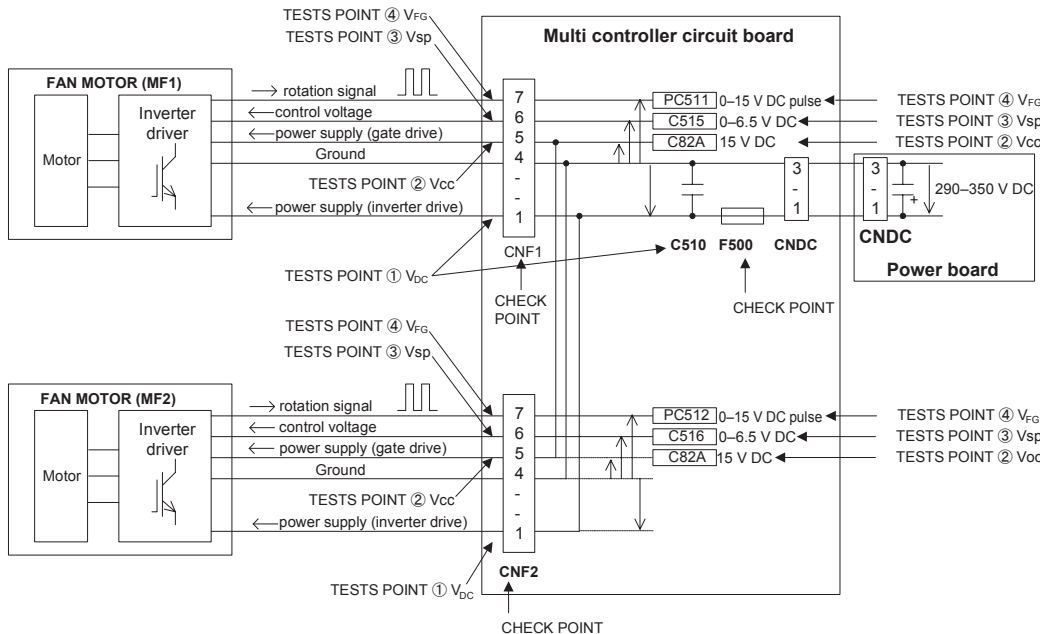
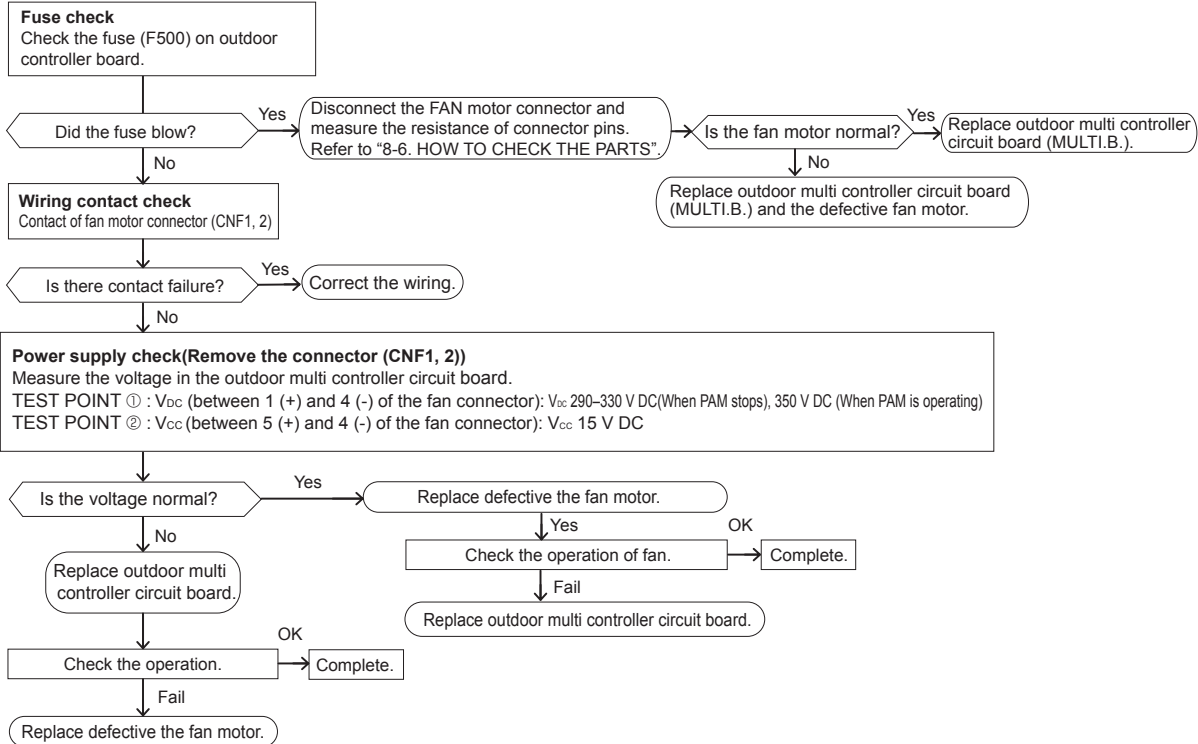
Check method of DC fan motor (fan motor/outdoor multi controller circuit board)

① Notes

1. High voltage is applied to the connector (CNF1, 2) for the fan motor. Pay attention to the service.
2. Do not pull out the connector (CNF1, 2) for the motor with the power supply on.
(It causes trouble of the outdoor multi controller circuit board and fan motor.)

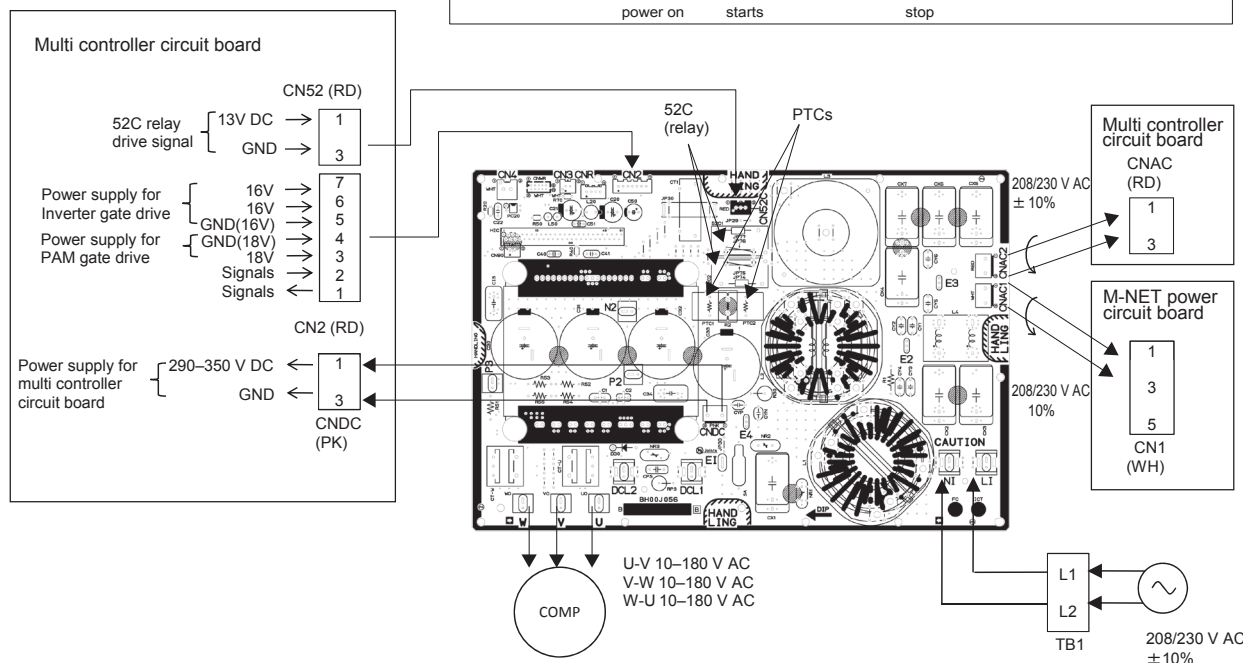
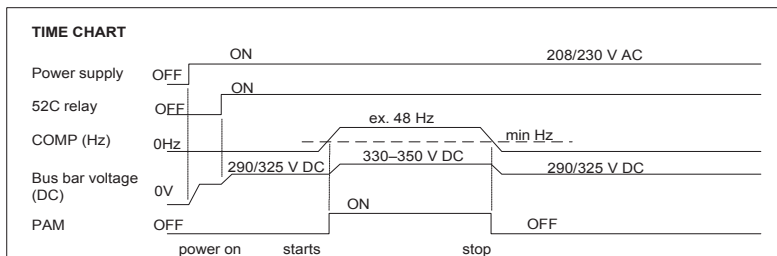
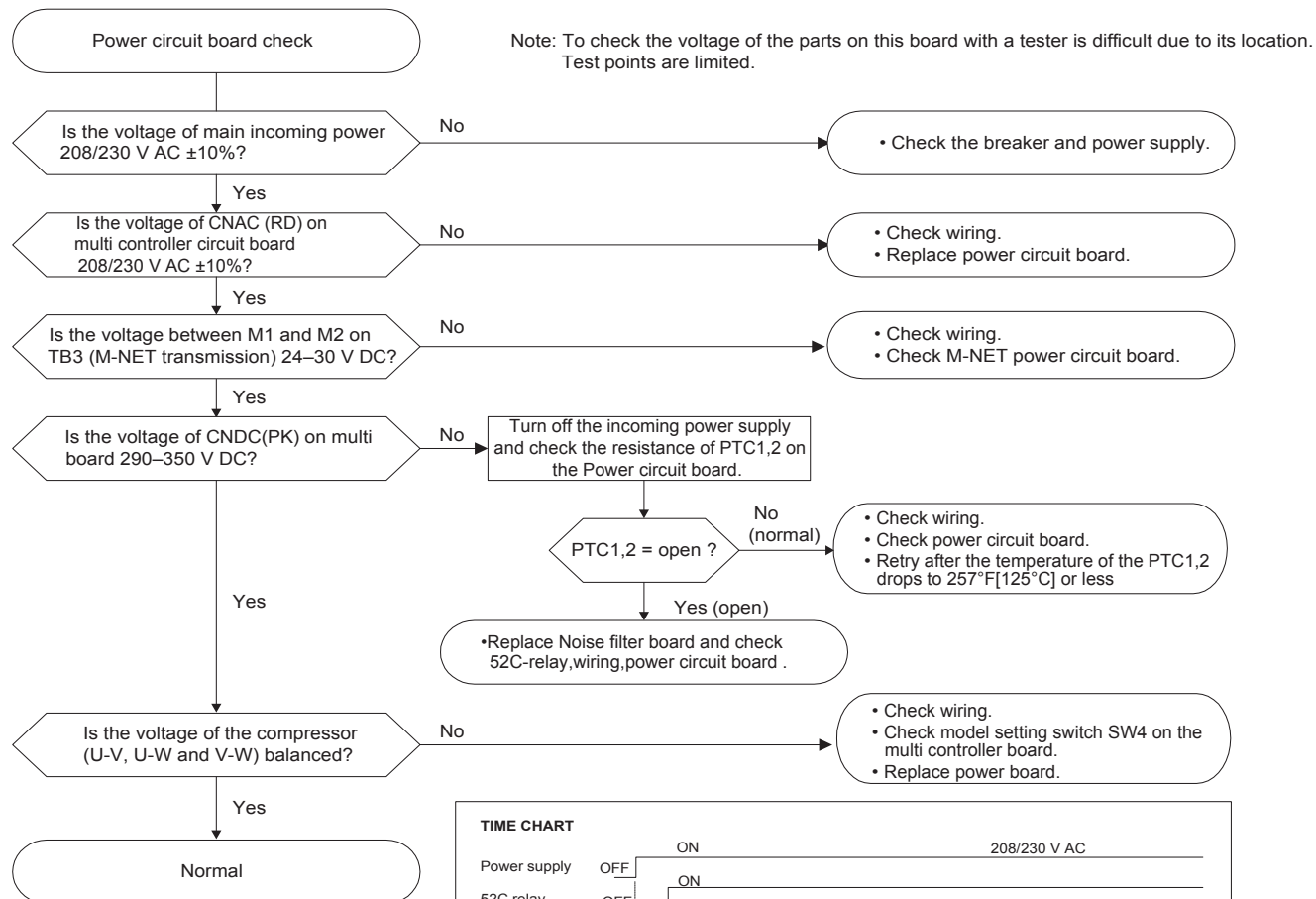
② Self check

Symptom : The outdoor fan cannot rotate.

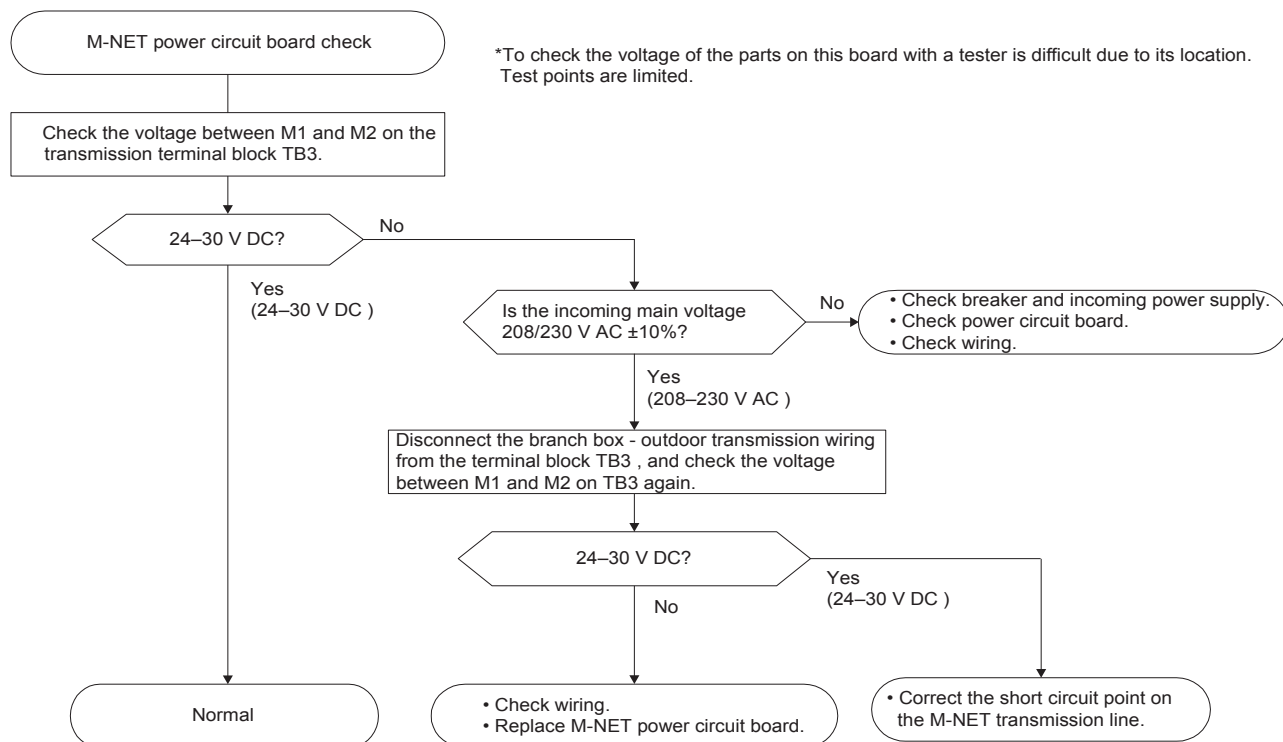


- The inverter control P.C. board is built in the fan motor of this outdoor unit.
- When F500 that is on multi controller board is blown, change the fan motor and multi controller board at the same time (F500 is impossible to change).
- For outdoor unit, there are 2 fan motors (up and down; MF1/MF2), it is possible to connect to either CNF1 or CNF2 on the board.
- It is abnormal when the abnormality is detected from either both or only one motor.

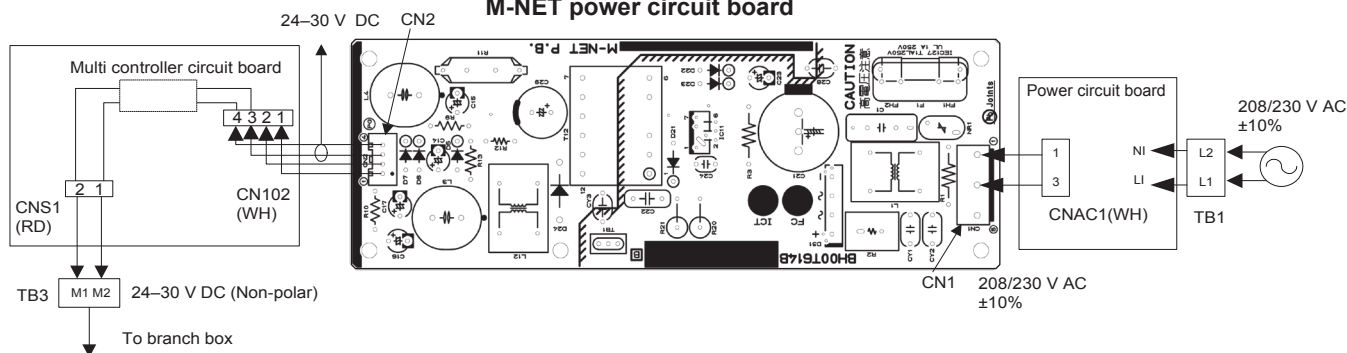
Check method of power circuit board



Check method of M-NET power circuit board



M-NET power circuit board



8-7. HOW TO CHECK THE COMPONENTS

<Thermistor characteristic Graph>

Low temperature thermistors

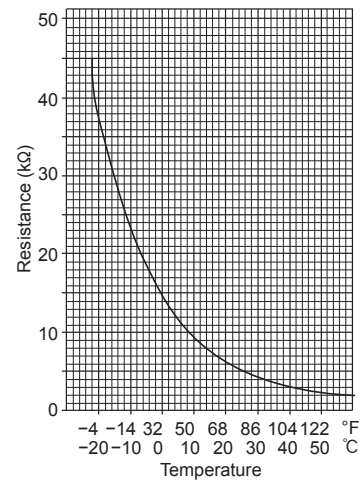
- Thermistor <HIC pipe> (TH2)
- Thermistor <Outdoor liquid pipe> (TH3)
- Thermistor <Suction pipe> (TH6)
- Thermistor <Ambient> (TH7)

Thermistor R0 = 15 kΩ ± 3 %

B constant = 3480 ± 2 %

$$R_t = 15 \exp \left\{ 3480 \left(\frac{1}{273+t} - \frac{1}{273} \right) \right\}$$

32°F [0°C]	15 kΩ	86°F [30°C]	4.3 kΩ
50°F [10°C]	9.6 kΩ	104°F [40°C]	3.0 kΩ
68°F [20°C]	6.3 kΩ		
77°F [25°C]	5.2 kΩ		



Medium temperature thermistor

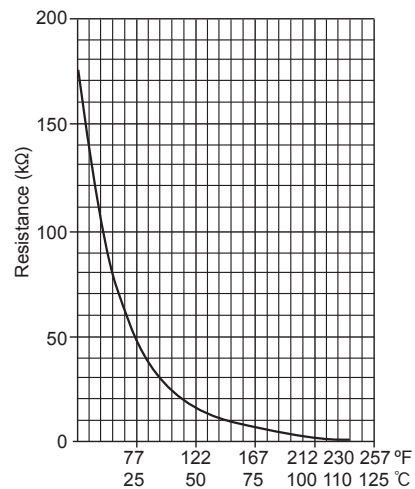
- Thermistor <Heat sink> (TH8)

Thermistor R50 = 17 kΩ ± 2 %

B constant = 4170 ± 3 %

$$R_t = 17 \exp \left\{ 4170 \left(\frac{1}{273+t} - \frac{1}{323} \right) \right\}$$

32°F [0°C]	180 kΩ
77°F [25°C]	50 kΩ
122°F [50°C]	17 kΩ
158°F [70°C]	8 kΩ
194°F [90°C]	4 kΩ



High temperature thermistor

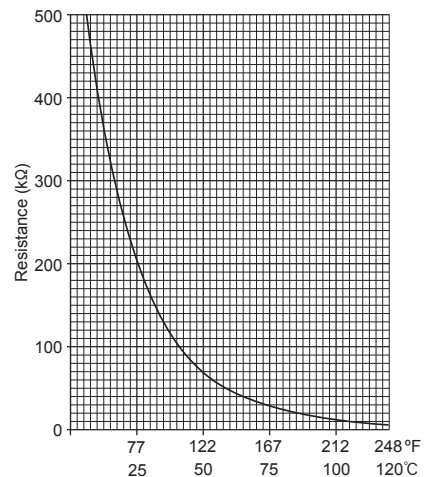
- Thermistor <Compressor> (TH4)

Thermistor R120 = 7.465 kΩ ± 2 %

B constant = 4057 ± 2 %

$$R_t = 7.465 \exp \left\{ 4057 \left(\frac{1}{273+t} - \frac{1}{393} \right) \right\}$$

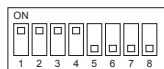
68°F [20°C]	250 kΩ	158°F [70°C]	34 kΩ
86°F [30°C]	160 kΩ	176°F [80°C]	24 kΩ
104°F [40°C]	104 kΩ	194°F [90°C]	17.5 kΩ
122°F [50°C]	70 kΩ	212°F [100°C]	13.0 kΩ
140°F [60°C]	48 kΩ	230°F [110°C]	9.8 kΩ



<HIGH PRESSURE SENSOR>

• Comparing the High Pressure Sensor Measurement and Gauge Pressure

By configuring the digital display setting switch (SW1) as shown in the figure below, the pressure as measured by the high pressure sensor appears on the LED1, 2 on the control board.



The figure at left shows that the switches 1 through 4 are set to ON and 5 through 8 are set to OFF.

(1) While the outdoor unit is stopped, compare the gauge pressure and the pressure displayed on self-diagnosis LED1, 2.

- 1) When the gauge pressure is between 0 and 14 PSIG [0.098 MPaG], internal pressure is caused due to gas leak.
- 2) When the pressure displayed on self-diagnosis LED1, 2 is between 14 PSIG [0.098 MPaG], the connector may be defective or be disconnected. Check the connector and go to (4).
- 3) When the pressure displayed on self-diagnosis LED1, 2 exceeds 725 PSIG [5.0 MPaG], go to (3).
- 4) If other than 1), 2) or 3), compare the pressures while the sensor is running. Go to (2).

(2) Compare the gauge pressure and the pressure displayed on self-diagnosis LED1,2 after 15 minutes have passed since the start of operation. (Compare them by PSIG [MPaG] unit.)

- 1) When the difference between both pressures is within 36 PSIG [0.25 MPaG], both the high pressure sensor and the control board are normal.
- 2) When the difference between both pressures exceeds 36 PSIG [0.25 MPaG], the high pressure sensor has a problem. (performance deterioration)
- 3) When the pressure displayed on self-diagnosis LED1, 2 does not change, the high pressure sensor has a problem.

(3) Remove the high pressure sensor from the control board to check the pressure on the self-diagnosis LED1, 2.

- 1) When the pressure displayed on self-diagnosis LED1, 2 is between 0 and 14 PSIG [0.098 MPaG], the high pressure sensor has a problem.
- 2) When the pressure displayed on self-diagnosis LED1, 2 is approximately 725 PSIG [5.0 MPaG], the control board has a problem.

(4) Remove the high pressure sensor from the control board, and short-circuit between the pin 2 and pin 3 connectors (63HS) to check the pressure with self-diagnosis LED1, 2.

- 1) When the pressure displayed on the self-diagnosis LED1, 2 exceeds 725 PSIG [5.0 MPaG], the high pressure sensor has a problem.
- 2) If other than 1), the control board has a problem.

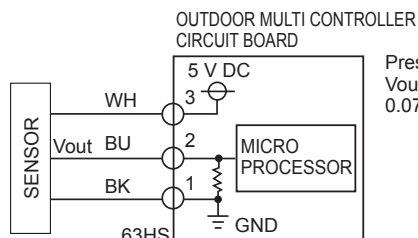
• High Pressure Sensor Configuration (63HS)

The high pressure sensor consists of the circuit shown in the figure below. If 5 V DC is applied between the white and the black wires, voltage corresponding to the pressure between the blue and the black wires will be output, and the value of this voltage will be converted by the microcomputer. The output voltage is 0.078 V per 14 PSIG [0.098 MPaG].

Note:

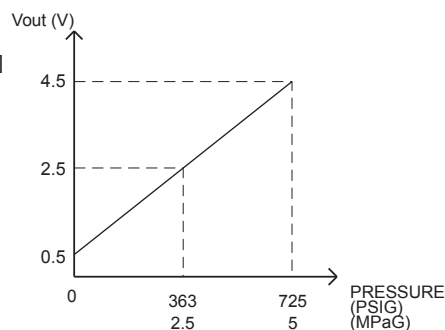
The pressure sensor on the body side is designed to connect to the connector. The connector pin number on the body side is different from that on the control board side.

	Body side	Control board side
Vcc	Pin 1	Pin 3
Vout	Pin 2	Pin 2
GND	Pin 3	Pin 1



- ③—①: 5 V (DC)
②—①: Output Vout (DC)

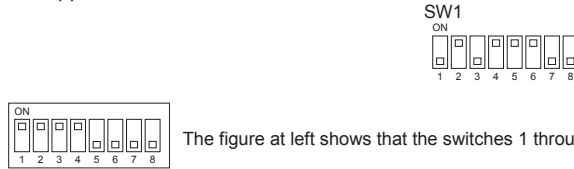
Pressure: 0–725 PSIG [5.0 MPaG]
Vout: 0.5–4.5 V
0.078 V/14 PSIG [0.098 MPaG]



<LOW PRESSURE SENSOR>

• Comparing the Low Pressure Sensor Measurement and Gauge Pressure

By configuring the digital display setting switch (SW1) as shown in the figure below, the pressure as measured by the low pressure sensor appears on the LED1 on the control board.



The figure at left shows that the switches 1 through 4 are set to ON and 5 through 8 are set to OFF.

(1) While the outdoor unit is stopped, compare the gauge pressure and the pressure displayed on self-diagnosis LED1, 2.

- 1) When the gauge pressure is between 0 and 14 PSIG [0.098 MPaG], internal pressure is caused due to gas leak.
- 2) When the pressure displayed on self-diagnosis LED1, 2 is between 0 and 14 PSIG [0.098 MPaG], the connector may be defective or be disconnected. Check the connector and go to (4).
- 3) When the outdoor temperature is 86°F [30°C] or less, and the pressure displayed on self-diagnosis LED1, 2 exceeds 247 PSIG [1.7 MPaG], go to (3).
When the outdoor temperature exceeds 86°F [30°C], and the pressure displayed on self-diagnosis LED1, 2 exceeds 247 PSIG [1.7 MPaG], go to (5).
- 4) If other than 1), 2) or 3), compare the pressures while the sensor is running. Go to (2).

(2) Compare the gauge pressure and the pressure displayed on self-diagnosis LED1, 2 after 15 minutes have passed since the start of operation. (Compare them by PSIG [MPaG] unit.)

- 1) When the difference between both pressures is within 29 PSIG [0.2MPaG], both the low pressure sensor and the control board are normal.
- 2) When the difference between both pressures exceeds 29 PSIG [0.2MPaG], the low pressure sensor has a problem. (performance deterioration)
- 3) When the pressure displayed on the self-diagnosis LED1, 2 does not change, the low pressure sensor has a problem.

(3) Remove the low pressure sensor from the control board to check the pressure with the self-diagnosis LED1, 2 display.

- 1) When the pressure displayed on the self-diagnosis LED1,2 is between 0 and 14 PSIG [0.098 MPaG], the low pressure sensor has a problem.
- 2) When the pressure displayed on self-diagnosis LED1, 2 is approximately 247 PSIG [1.7 MPaG], the control board has a problem.

(4) Remove the low pressure sensor from the control board, and short-circuit between the pin 2 and pin 3 connectors (63LS) to check the pressure with the self-diagnosis LED1, 2.

- 1) When the pressure displayed on the self-diagnosis LED1, 2 exceeds 247 PSIG [1.7 MPaG], the low pressure sensor has a problem.
- 2) If other than 1), the control board has a problem.

(5) Remove the high pressure sensor (63HS) from the control board, and insert it into the connector for the low pressure sensor (63LS) to check the pressure with the self-diagnosis LED1, 2.

- 1) When the pressure displayed on the self-diagnosis LED1, 2 exceeds 247 PSIG [1.7 MPaG], the control board has a problem.
- 2) If other than 1), go to (2).

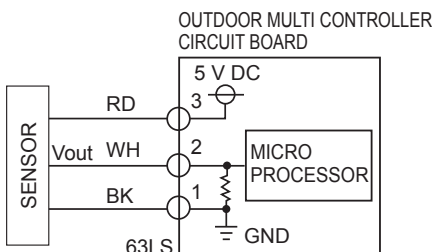
• Low Pressure Sensor Configuration (63LS)

The low pressure sensor consists of the circuit shown in the figure below. If 5 V DC is applied between the red and the black wires, voltage corresponding to the pressure between the white and the black wires will be output, and the value of this voltage will be converted by the microcomputer. The output voltage is 0.173 V per 14 PSIG [0.098 MPaG].

Note:

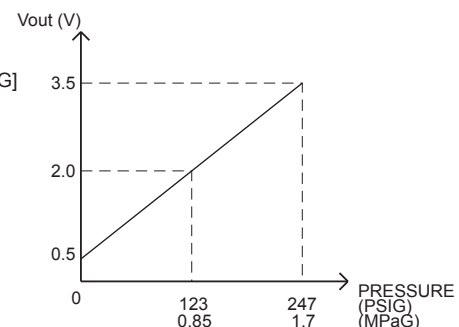
The pressure sensor on the body side is designed to connect to the connector. The connector pin number on the body side is different from that on the control board side.

	Body side	Control board side
Vcc	Pin 1	Pin 3
Vout	Pin 2	Pin 2
GND	Pin 3	Pin 1

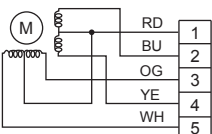


- ③—① : 5 V (DC)
②—① : Output Vout (DC)

Pressure: 0–247 PSIG [1.7 MPaG]
Vout: 0.5–3.5 V
0.173 V/14 PSIG [0.098 MPaG]



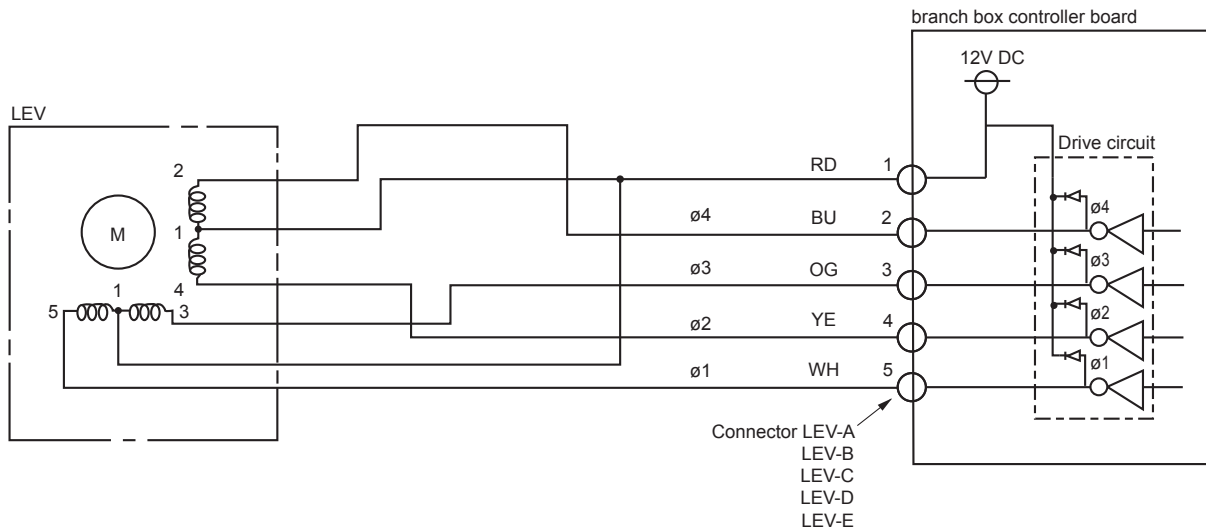
BRANCH BOX: PAC-MKA50BC PAC-MKA51BC PAC-MKA30BC PAC-MKA31BC

Parts name	Checkpoints														
Thermistor (TH-A to E) <Gas pipe>	<div>Disconnect the connector then measure the resistance with a tester. (At the ambient temperature 50 to 86°F [10 to 30°C])</div> <table><tr><td>Normal</td><td>Abnormal</td></tr><tr><td>4.3 to 9.6kΩ</td><td>Open or short</td></tr></table>	Normal	Abnormal	4.3 to 9.6kΩ	Open or short										
Normal	Abnormal														
4.3 to 9.6kΩ	Open or short														
Linear expansion valve (LEV-A to E) <div></div>	<div>Disconnect the connector then measure the resistance with a tester. (Winding temperature 68°F [20°C])</div> <table><tr><td colspan="4">Normal</td><td>Abnormal</td></tr><tr><td>Red - White</td><td>Red - Orange</td><td>Red - Yellow</td><td>Red - Blue</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">46 ± 4Ω</td></tr></table>	Normal				Abnormal	Red - White	Red - Orange	Red - Yellow	Red - Blue	Open or short	46 ± 4Ω			
Normal				Abnormal											
Red - White	Red - Orange	Red - Yellow	Red - Blue	Open or short											
46 ± 4Ω															

Linear expansion valve (LEV) in Branch box

(1) Operation summary of the linear expansion valve

- Linear expansion valve open/close through stepping motor after receiving the pulse signal from the branch box controller board.
 - Valve position can be changed in proportion to the number of pulse signal.
- <Connection between the branch box controller board and the linear expansion valve>



<Output pulse signal and the valve operation>

Output (Phase)	Output							
	1	2	3	4	5	6	7	8
ø1	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
ø2	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
ø3	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
ø4	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

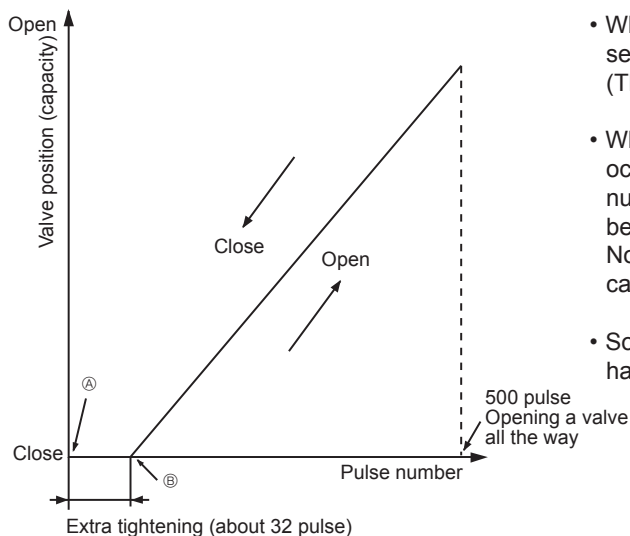
The output pulse shifts in below order.

Opening a valve : 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1 → 8

Closing a valve : 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 1

- When linear expansion valve operation stops, all output phases become OFF.

(2) Linear expansion valve operation

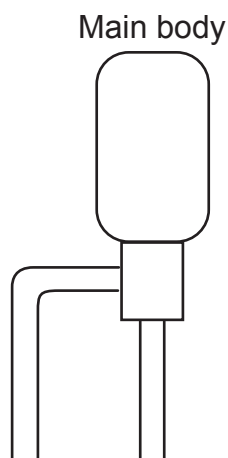
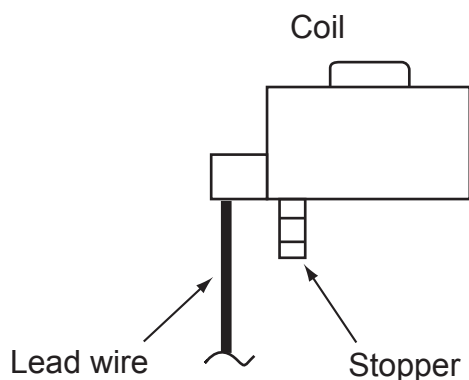


- When the power is turned on, 700 pulse closing valve signal will be sent till it goes to ① point in order to define the valve position. (The pulse signal is being sent for about 20 seconds.)
- When the valve moves smoothly, there is no sound or vibration occurring from the linear expansion valve : however, when the pulse number moves from ② to ① or when the valve is locked, sound can be heard. No sound is heard when the pulse number moves from ② to ① in case coil is burnt out or motor is locked by open-phase.
- Sound can be detected by placing the ear against the screw driver handle while putting the screw driver to the linear expansion valve.

(3) How to attach and detach the coil of linear expansion valve

<Composition>

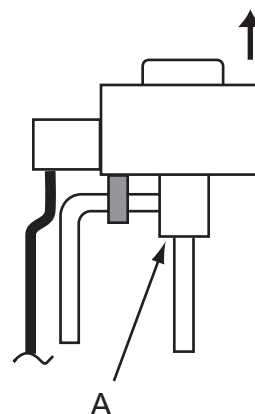
Linear expansion valve is separable into the main body and the coil as shown in the diagram below.



<How to detach the coil>

Hold the lower part of the main body (shown as A) firmly so that the main body does not move and detach the coil by pulling it upward.

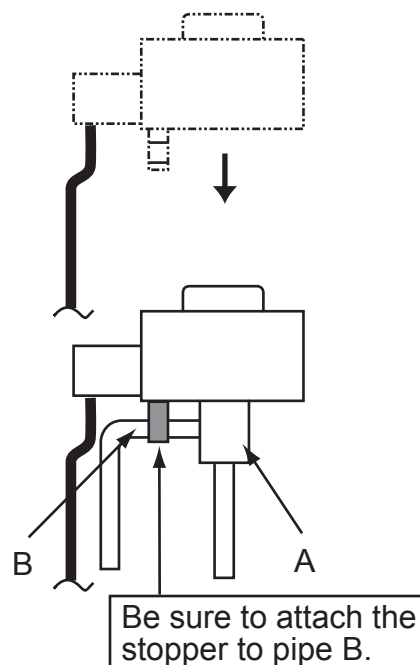
Be sure to detach the coil holding main body firmly. Otherwise pipes can bend due to stress.



<How to attach the coil>

Hold the lower part of the main body (shown as A) firmly so that the main body does not move and attach the coil by inserting it downward into the main body. Then securely attach the coil stopper to pipe B. (At this time, be careful that stress is not added to lead wire and main body is not wound by lead wire.) If the stopper is not firmly attached to pipe B, coil may be detached from the main body and that can cause defective operation of linear expansion valve.

To prevent piping stress, be sure to attach the coil holding the main body of linear expansion valve firmly. Otherwise pipe may break.



Troubleshooting

Problems	Checkpoint	Corrective measures
Locked expansion valve	If the linear expansion valve becomes locked and the motor is still operating, the motor will emit a clicking noise and will not function. This clicking noise indicates an abnormality.	Replace the linear expansion valve.
Short circuit or broken circuit in expansion valve motor coil	Use an all-purpose electrical meter to measure the resistance between the different coils (red-white, red-orange, brown-yellow, brown-blue). Normal resistance is within a range of $46\Omega \pm 4\%$.	Replace the linear expansion valve.
Valve does not close completely.	In order to check the linear expansion valve, operate 1 indoor unit in the fan mode and another in the cooling mode. Then, use the outdoor multi controller board to operate the monitor and check the pipe temperature of the indoor unit. The linear expansion valve should be fully closed when the fan is operating. The temperature measured by the temperature sensor will drop if there is any leakage. If the measured temperature is significantly lower than that on the remote controller, this indicates that the valve is not closed. It is not necessary to replace the linear expansion valve if the leak of refrigerant is small and does not cause a malfunction.	Replace the linear expansion valve if there is a major leak of refrigerant.
Incorrect connection or connection failure	① Check improperly connected connector terminals and the wire colors. ② Remove the connector on the controller board side and check electrical conductance.	Continuity check of wrong part

8-8. TEST POINT DIAGRAM

Outdoor multi controller circuit board

MXZ-4C36NAHZ

MXZ-5C42NAHZ

MXZ-8C48NAHZ

MXZ-8C48NA

MXZ-4C36NAHZ-U1

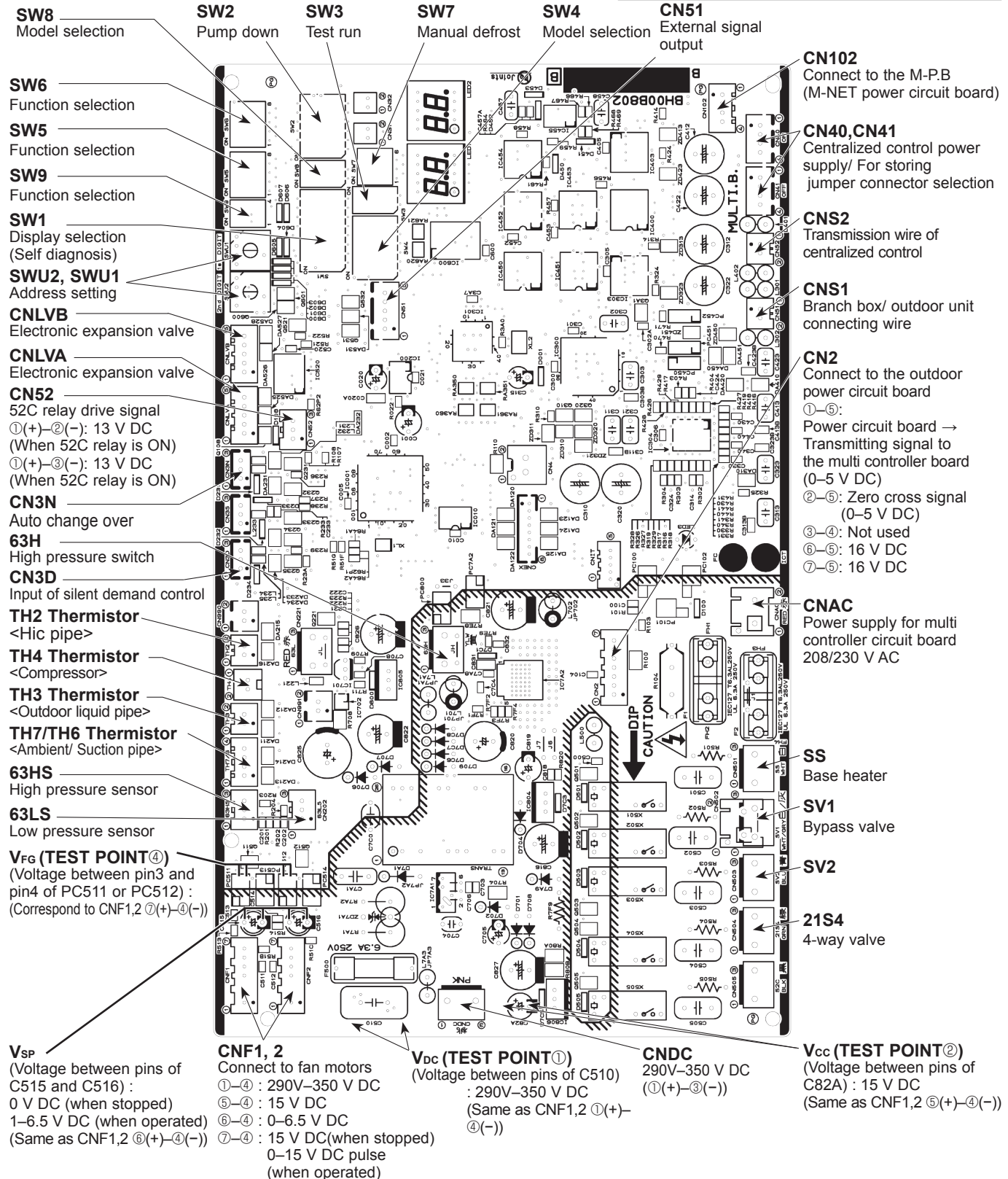
MXZ-5C42NAHZ-U1

MXZ-8C48NAHZ-U1

MXZ-8C48NA-U1

MXZ-8C60NA-U1

<CAUTION> TEST POINT ① is high voltage.



Outdoor power circuit board

MXZ-4C36NAHZ

MXZ-5C42NAHZ

MXZ-8C48NAHZ

MXZ-8C48NA

MXZ-4C36NAHZ-U1

MXZ-5C42NAHZ-U1

MXZ-8C48NAHZ-U1

MXZ-8C48NA-U1

MXZ-8C60NA-U1

Brief Check of POWER MODULE

If they are short-circuited, it means that they are broken.

Measure the resistance in the following points (connectors, etc.).

1. Check of POWER MODULE

① Check of DIODE circuit

R - **L1**, **S** - **L1**, **R** - **N1**, **S** - **N1**

② Check of IGBT circuit

L2 - **N1**

③ Check of INVERTER circuit

P - **U**, **P** - **V**, **P** - **W**, **N1** - **U**, **N1** - **V**, **N1** - **W**

Note: The marks **R**, **S**, **L1**, **L2**, **P**, **N1**, **U**, **V** and **W** shown in the diagram are not actually printed on the board.

CN2

Connect to the outdoor controller circuit board (CN2)

①—⑤: Transmitting signal to outdoor controller circuit board ((0–5 V DC)

②—⑤: Zero cross signal (0–5 V DC)

③—④: 18 V DC

⑥—⑤: 16 V DC

⑦—⑤: 16 V DC

CN4

Connect to the outdoor controller circuit board (CN4)

CN52C

52C driving signal
Connect to the outdoor controller circuit board (CN52)

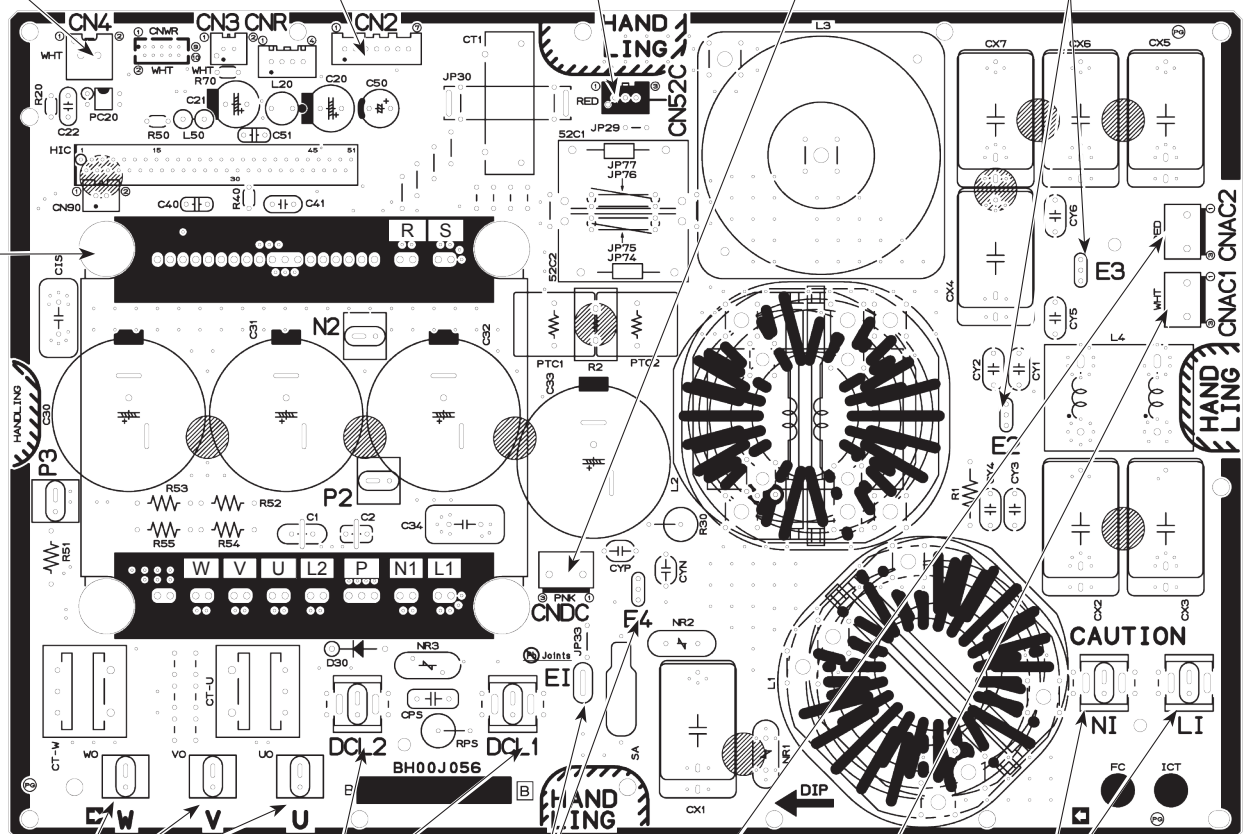
CNDC

290–350 V DC (①+, ③–)
Connect to the outdoor controller circuit board (CNDC)

E2, E3

Connect to the electrical parts box

Power module



U/V/W

Connect to the compressor (MC) Voltage among phases: 10–180 V AC

DCL1, DCL2

Connect to DCL

E1, E4

Connect to the electrical parts box

CNAC2

208/230 V AC
Connect to the outdoor multi controller circuit board (CNAC)

CNAC1

208/230 V AC
Connect to the M-NET power circuit board (CN1)

N1, L1

Voltage of 208/230 V AC is input (Connect to the terminal block (TB1))

M-NET power circuit board

MXZ-4C36NAHZ

MXZ-5C42NAHZ

MXZ-8C48NAHZ

MXZ-8C48NA

MXZ-4C36NAHZ-U1

MXZ-5C42NAHZ-U1

MXZ-8C48NAHZ-U1

MXZ-8C48NA-U1

MXZ-8C60NA-U1

CN2

Connect to the outdoor multi controller circuit board (CN102)

①-②: 24-30 V DC

③-④: 24-30 V DC

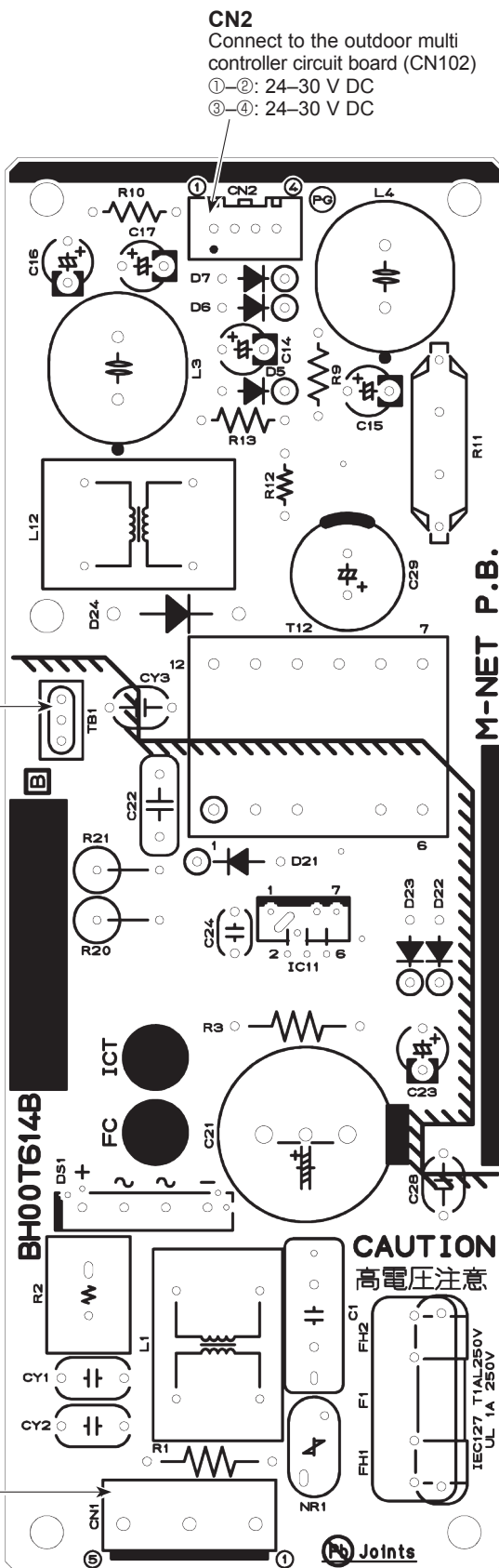
TB1

Connect to the electrical parts box

CN1

Connect to the outdoor power circuit board (CNAC1)

①-③: 220-240 V AC



Branch box controller board

PAC-MKA50BC

PAC-MKA51BC

PAC-MKA30BC

PAC-MKA31BC

TH-A to E

Connect to thermistor-A to E

TH-D and E for PAC-MKA50/51BC only

LEV-A to E

Connect to LEV-A to E

LEV-D and E for PAC-MKA50/51BC only

CN3M

Connected to the terminal block (TB5)

(M-NET transmission connecting wire)

24-30 V DC (non polar)

LED1,LED2

Startup

Main power supply
(208/230 V AC)

Normal operating

LED1:Main power supply

LED2:Blink depend on the
total number of indoor
units.

<Example>

The total number is 2,

①Blink 2 times

②Turn OFF for 3 seconds

③Repeat ①-②

SW4

Mode selection

SW12

Address setting tens DIGIT

SW11

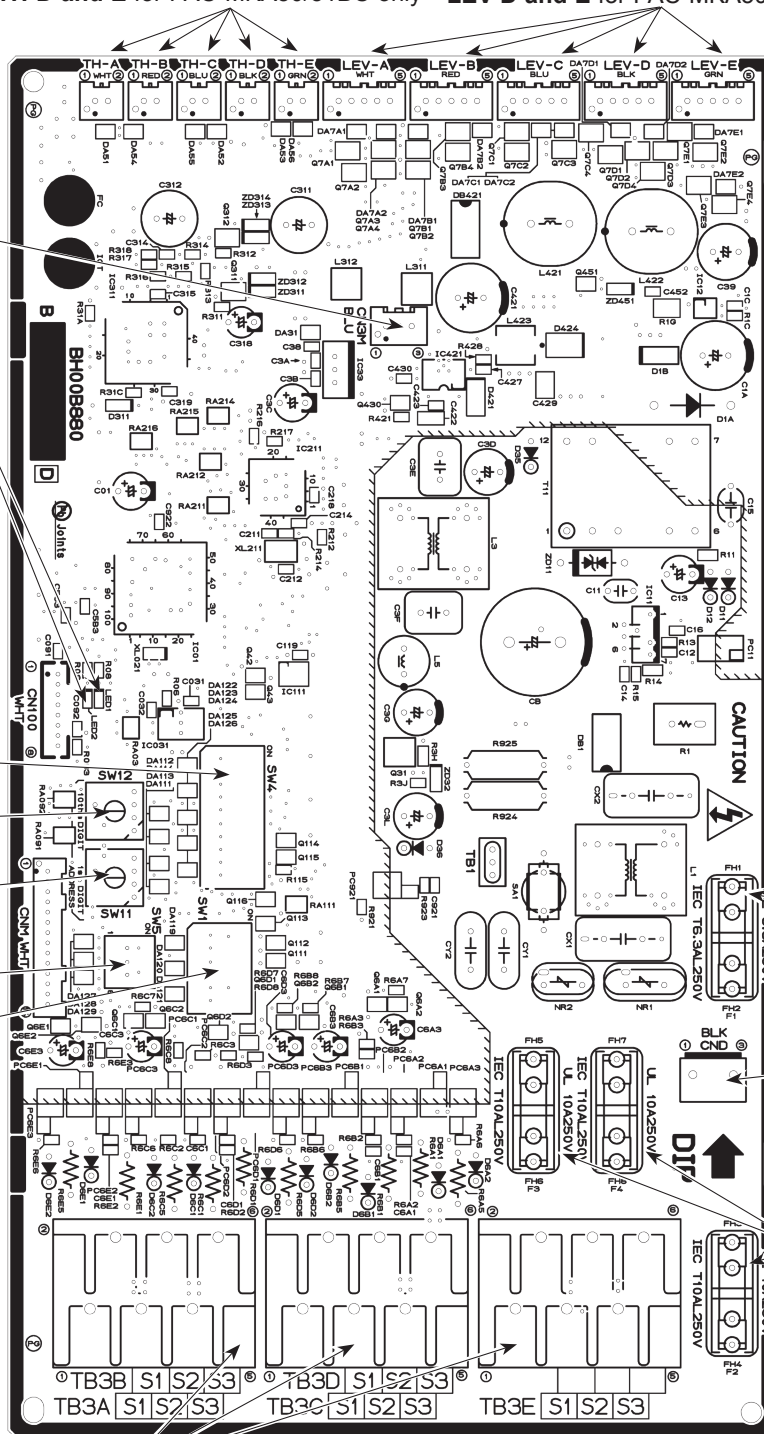
Address setting ones DIGIT

SW5

Service setting

SW1

Indoor unit connection



TB3A to E

Connect to indoor unit

①-③. Power supply

②-④ 208/230 V AC

TB3D and TB3E for PAC-MKA50/51BC only

③-⑤. Transmission

④-⑥ 0-24 V DC

8-9. INTERNAL SWITCH FUNCTION TABLE

(1) Function of switches

MXZ-4C36NAHZ(-U1)



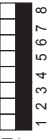


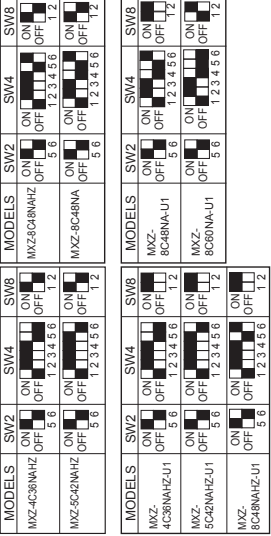
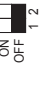
MXZ-5C42NAHZ(-U1)

MXZ-8C48NAHZ(-U1)

MXZ-8C48NA(-U1)

MXZ-8C60NA-U1




The black square (■) indicates a switch position.

Switch	Step	Function	Operation in Each Switch Setting		Remarks	Purpose	Additional Information
			ON	OFF			
SWU1 ones digit SWU2 tens digit	Rotary switch				<Initial settings> 		
			Before turning the power ON				
SW1 Digital Display Switch	1-8				<Initial settings> 		
			Can be set either during operation or not.				
SW2 Function Switch	1	Selects operating system startup	With centralized controller	Without centralized controller	<Initial settings> 	Turn ON when the centralized controller is connected to the outdoor unit.	<ul style="list-style-type: none"> • SW2-1 must be turned ON if a central controller is connected to the system. An example of this would be a TT24, TW-50A, TE50 or TE200. If SW2-1 is not turned on, while using a central controller, in rare circumstances problems may be encountered such as indoor units not responding to group commands. Therefore, turning SW2-1 ON is recommended if a central controller is used. • Group setting of 2 or more A-IC units which is connected to branch box via centralized controller is not allowed.
	2	Connection Information Clear Switch	Clear	Do not clear		When relocating units or connecting additional units.	—
	3	Abnormal data clear switch input	Clear abnormal data	Normal		To delete an error history.	
	4	Pump down	ON	OFF		To facilitate outdoor unit the pumping down operation. Frequency = Fixed to 65 Hz Indoor-electronic expansion valve = Fully open Outdoor fan step = Fixed to 10	Please refer to a section referring to the pumping down on outdoor units Installation Manuals. It might not be possible to collect all the refrigerant if the amount is excessive.
	5	—	—	—			—
	6	—	—	—			—
SW2-5, 6/ SW4/SW8 Model Switch	1-6	MODEL SELECTION 1:ON 0:OFF			<Initial settings> Set for each capacity.		
			Before the power is turned ON.				
SW3 Trial operation	1	ON/OFF from outdoor unit	ON	OFF	<Initial settings> 		—
	2	Mode setting	Heating	Cooling			—

Switch	Step	Function	Operation in Each Switch Setting			Remarks	Purpose	Additional Information
			ON	OFF	When to Set			
SW5 Function switch	1	Demand control setting for Australia	Australia setting	Normal	Can be set when off or during operation		Turn ON to activate the demand control for Australia.	(Do not turn this ON if the unit is in outside Australia)
	2	Change the indoor unit's LEV opening at startup	Enable	Normal			To set the LEV opening at startup higher than usual (+150 pulses). To improve the operation with the LEV almost clogged.	The refrigerant flow noise at startup become louder.
	3	—	—	—	—	<Initial settings> ON OFF 1 2 3 4 5 6 7 8	—	—
	4	—	—	—	—		—	—
	5	Change the indoor unit's LEV opening at defrost	Enable	Normal	Can be set when OFF or during operation		To set the LEV opening higher than usual during defrosting operation. (Only Qj ≤ 10 is valid, + 300 pulses) To avoid the discharge temperature increase and provide efficient defrosting operation.	The refrigerant flow noise during the defrosting operation becomes louder.
	6	Switching the target sub cool (Heating mode)	Enable	Normal			To decrease the target sub cool value. To reduce the discharge temperature decrease due to refrigerant liquid accumulation in the units.	A refrigerant flow noise might be generated if the sub cool value is too small.
	7	During the outdoor unit is in HEAT operation, additionally increase about 50 to 70 pulses of the LEV opening on the indoor unit which is in FAN, STOP, COOL, or thermo-OFF.*1	Active	Inactive	Can be set when OFF or during operation	<Initial settings> ON OFF 1 2 3 4 5 6 7 8	To additionally increase about 50 to 70 pulses of the LEV opening for units other than in HEAT operation. To avoid a refrigerant shortage (less capacity) due to refrigerant liquid accumulation in the units which is not in operation.	A refrigerant flow noise might be generated in units other than the one in operation.
	8	During the outdoor unit is in operation, fully closes the electronic expansion valve on the indoor unit which is in FAN, COOL, STOP, or thermo-OFF.*2	Enable	Normal	Before turning the power ON.		To reduce the room temperature increase by setting the LEV opening lower for the units in thermo-OFF operation.	The refrigerant is more likely to collect in the units with thermo-OFF operation, and causing the units refrigerant shortage. (Results in less capacity and increase of discharge temperature.)
SW6 Function switch	1	—	—	—	—	<Initial settings> ON OFF 1 2 3 4 5 6 7 8	—	—
	2	—	—	—	—		—	—
	3	—	—	—	—		—	—
	4	Change of defrosting control	Enable (For high humidity)	Normal		SW6-6 Target Pdm (kg/cm²) 29.5 31.5	To shorten the defrosting prohibition time in high humidity (or heavy snow) region, in order to reduce malfunctions caused by frost.	The performance of the HEAT operation is somewhat reduced since the defrosting operation is frequently performed.
	5	—	—	—			—	—
	6	Switching the target discharge pressure (Pdm)	Enable	Normal	Can be set when OFF or during operation		To raise the performance by setting the Pdm higher during HEAT operation.	Power consumption is raised due to a higher frequency. (The performance would not be raise at the maximum operating frequency.)
	7	Switching (1) the target evaporation temperature (ETm)	Enable	Normal	SW6-7 SW6-8 Target ETm (°C) 9 11 6 14		To raise/reduce the performance by changing the target ETm during COOL operation. Switch to raise the performance: raises the performance Switch to reduce the performance: prevents dew condensation	Switching it to raise the performance, it raises the power consumption, and produces more dew condensation. Switching it to reduce the performance, it makes the performance insufficient.
	8	Switching (2) the target evaporation temperature (ETm)	Enable	Normal				

*1 SW5-7 Opens the indoor-electronic expansion valve as a countermeasure against the indoor unit in FAN, COOL, STOP, or thermo-OFF operation with refrigerant-shortage status due to an accumulation of liquid refrigerant in the indoor unit.

*2 SW5-8 Countermeasure against room temperature rise for indoor unit in FAN, COOL, and thermo-OFF (heating) mode.

Switch	Step	Function	Operation in Each Switch Setting			Remarks	Purpose	Additional Information
			ON	OFF	When to Set			
SW7 Function switch	1	Ignore current sensor abnormality and rotational frequency abnormality of outdoor fan motor	Enable	Normal	After turning the power ON.	<Initial settings>  MXZ-8C48/60NA ON OFF 1 2 3 4 5 6  MXZ-4C36/5C42/ 8C48NAHZ ON OFF 1 2 3 4 5 6	To perform a test run for electrical parts alone without running the compressor. Also, to perform the troubleshooting of electrical parts without operating the outdoor unit's fan. It reduces snow on the base, even it blows inside the unit, by setting the base heater ON while the HEAT operation is stopped. — To reduce dew condensation on the indoor unit by lowering the frequency. — Turn ON when it is necessary to perform the defrosting operation forcibly. (Effective only at startup, or 10 minutes after the last defrosting operation) Enables the indoor unit with the minimum address to select AUTO mode, and switches the operation mode of the other indoor units to the same mode.	Make sure to connect the connectors to the compressor after checking the electrical parts. Be careful not to get electrical shock while working on electrical parts. Power consumption raises while the operation is stopped. — The performance might be insufficient. — It performs the defrosting operation forcibly. (HEAT operation is stopped temporarily.) Cannot be set when the centralized control is ON. About the Silent mode/Demand control setting, refer to "8-5. OUTDOOR UNIT INPUT/OUTPUT CONNECTOR". — —
	2	Setting to energize the freeze stat heater (optional part)	During heating operation only*3	Include when the heating operation is OFF.*4	Can be set when OFF or during operation			
	3	—	—	—	—			
	4	Maximum frequency down at 1 hour after COOL operation	Enable	Normal	Can be set when OFF or during operation			
	5	—	—	—	—			
	6	Manual defrost	Manual defrost	Normal	During compressor running in HEAT mode.			
SW9 Function Switch	1	Auto change over from remote controller (IC with the minimum address)	Enable	Disable	Before turning the power ON	<Initial settings>  ON OFF 1 2 3 4	About the Silent mode/Demand control setting, refer to "8-5. OUTDOOR UNIT INPUT/OUTPUT CONNECTOR". — — —	— — —
	2	Switching the Silent/ Demand mode	Demand control	Silent mode	Can be set when OFF or during operation			
	3	—	—	—	—			
	4	—	—	—	—			

*3 During heating operation and the ambient temperature is 39°F [4°C] or below, the freeze prevention heater is energized.

*4 During heating mode is OFF (include thermo-OFF in cooling mode), and the ambient temperature is 39°F [4°C] or below, the freeze prevention heater is energized.

PAC-MKA50BC PAC-MKA51BC PAC-MKA30BC PAC-MKA31BC

The black square (■) indicates a switch position.

Switch	Step	Function	Operation in Each Switch Setting		Remarks	Additional Information																																				
			ON	OFF																																						
SWU11 Ones digit address setting SW12 Tens digit address setting	Rotary switch	How to set addresses Example: if address is "3", remain SW12 (for over 10) at "0", and match SW11 (for 1 to 9) with "3".		OFF	Before turning the power ON	<Initial settings> <div><div>SW12</div><div>SW11</div></div> <div>Tens digit Ones digit</div>	—																																			
	1-5	<table><tr><td rowspan="6">SW1</td><td>1</td><td>Indoor unit A</td><td>Not connected</td><td>ON</td></tr><tr><td>2</td><td>Indoor unit B</td><td>Not connected</td><td>Connected</td></tr><tr><td>3</td><td>Indoor unit C</td><td>Not connected</td><td>Connected</td></tr><tr><td>4*</td><td>Indoor unit D</td><td>Not connected</td><td>Connected</td></tr><tr><td>5*</td><td>Indoor unit E</td><td>Not connected</td><td>Connected</td></tr><tr><td>6</td><td>Not used</td><td></td><td></td></tr></table>	SW1	1	Indoor unit A	Not connected	ON	2	Indoor unit B	Not connected	Connected	3	Indoor unit C	Not connected	Connected	4*	Indoor unit D	Not connected	Connected	5*	Indoor unit E	Not connected	Connected	6	Not used				Before turning the power ON	<Initial settings> ON <table><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr></table> OFF							1	2	3	4	5	6
SW1	1	Indoor unit A		Not connected	ON																																					
	2	Indoor unit B		Not connected	Connected																																					
	3	Indoor unit C		Not connected	Connected																																					
	4*	Indoor unit D		Not connected	Connected																																					
	5*	Indoor unit E		Not connected	Connected																																					
	6	Not used																																								
1	2	3	4	5	6																																					
SW4 Mode selection	1	—	—	—	—																																					
	2	Power-supply voltage setting	230 V	208 V	Set at factory only																																					
	3	Change operation if M-NET communication error occurs.	Stop operation	Continued operation	Before turning the power ON	<Initial settings> ON <table><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr></table> OFF							1	2	3	4	5	6	—																							
1	2	3	4	5	6																																					
4	Automatic restoration when the power comes back ON.*2	Inactive	Active																																							
	5-10	—	—	—	—	—																																				
SW5 Service setting	1-3	Change INDOOR UNIT No. for monitoring	Refer to "8-11. BRANCH BOX UNIT OPERATION MONITOR FUNCTION".		<Initial settings> ON <table><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr></table> OFF							1	2	3	4	5	6	—																								
1	2	3	4	5	6																																					

*1 Only for 5-branches model; NOT USED for 3-branches model.

*2 Note that the automatic restoration starts after the unit has stopped once.

8-10. OUTDOOR UNIT FUNCTIONS

SW:setting
0...OFF
1...ON

No.	SW1 setting 12345678	Display mode	Display on the LED1, 2 (display data)								Notes
			1	2	3	4	5	6	7	8	
0	00000000	Relay output display	Compressor operation	52C	21S4	SV1	(SV2)			Always lighting	ON: light on OFF: light off
1	10000000	Check display	0000-9999 (Alternating display of addresses and check code)								•When abnormality occurs, check display.
2	01000000	Indoor unit check status	No.1 unit check	No.2 unit check	No.3 unit check	No.4 unit check	No.5 unit check	No.6 unit check	No.7 unit check	No.8 unit check	Light on at time of abnormality
3	11000000	Protection input	High pressure abnormality	Superheat due to low discharge temperature	Compressor shell temperature abnormality	TH4 abnormality	TH3 abnormality	Outdoor fan rotation frequency abnormality	TH7 abnormality	TH8 abnormality	
4	00100000	Protection input	Heat sink overheating	Compressor over current interception	Voltage abnormality	Insufficient refrigerant amount abnormality	Current sensor/primary current abnormality	63LS abnormality	63HS abnormality	start over current interception abnormality delay	Display detected microprocessor protection or abnormality
5	10100000	Protection input	Abnormality in the number of indoor units	Address double setting abnormality	Indoor unit capacity error	Over capacity	Indoor unit address error	Outdoor unit address error	Current sensor open/short	serial communication abnormality (outdoor unit)	
6	01100000	Abnormality delay display 1	High pressure abnormality delay	Superheat due to low discharge temperature delay	Compressor shell temperature abnormality delay	TH4 abnormality delay	TH3 abnormality delay	Outdoor fan rotation frequency abnormality delay	TH7 abnormality delay	TH8 abnormality delay	Display all abnormalities remaining in abnormality delay
7	11100000	Abnormality delay display 2	Heat sink overheating delay	Compressor over current interception delay	Voltage abnormality delay	Insufficient refrigerant amount abnormality delay	Current sensor/primary current abnormality delay	63LS abnormality delay	63HS abnormality delay	start over current interception abnormality delay	
8	00010000	Abnormality delay display 3	63LS abnormality delay	TH2 abnormality delay	4-way valve abnormality delay	Delay caused by blocked valve in cooling mode	Power module abnormality delay	TH6 abnormality delay	Current sensor open/short delay		
9	10010000	Abnormality delay history 1	High pressure abnormality delay	Superheat due to low discharge temperature delay	Compressor shell temperature abnormality delay	TH4 abnormality delay	TH3 abnormality delay	Outdoor fan rotation frequency abnormality delay	TH7 abnormality delay	TH8 abnormality delay	
10	01010000	Abnormality delay history 2	Heat sink overheating delay	Compressor over current interception delay	Voltage abnormality delay	Insufficient refrigerant amount abnormality delay	Current sensor/primary current abnormality delay	63LS abnormality delay	63HS abnormality delay	start over current interception abnormality delay	Display all abnormalities remaining in abnormality delay
11	11010000	Abnormality delay history 3	63LS abnormality delay	TH2 abnormality delay	4-way valve abnormality delay	Delay caused by blocked valve in cooling mode	Power module abnormality delay	TH6 abnormality delay	Current sensor open/short delay		
12	00110000	Abnormality code history 1 (the latest)	Abnormality code history 1								
13	00110000	Abnormality code history 2	Abnormality code history 2								
14	01110000	Abnormality code history 3	Abnormality code history 3								
15	01110000	Abnormality code history 4	Abnormality code history 4								
16	11110000	Abnormality code history 5	Abnormality code history 5								
17	00001000	Abnormality code history 6	Abnormality code history 6								
18	10001000	Abnormality code history 7	Abnormality code history 7								
19	01001000	Abnormality code history 8	Abnormality code history 8								
20	11001000	Abnormality code history 9	Abnormality code history 9								
21	00101000	Abnormality code history 10 (the oldest)	Abnormality code history 10								
22	10101000	Cumulative time	0-9999 (unit: 1 hour)								
23	01101000	Cumulative time	0-9999 (unit: 10 hour)								
24	11101000	Outdoor unit operation display	Compressor energizing	Compressor operating prohibition	Compressor in operation	Abnormality detection					Display of cumulative compressor operating time
25	00011000	Indoor unit operation mode	No.1 unit mode	No.2 unit mode	No.3 unit mode	No.4 unit mode	No.5 unit mode	No.6 unit mode	No.7 unit mode	No.8 unit mode	Light ON/Light OFF
26	10011000	Indoor unit operation display	No.1 unit operation	No.2 unit operation	No.3 unit operation	No.4 unit operation	No.5 unit operation	No.6 unit operation	No.7 unit operation	No.8 unit operation	Cooling : light on, Heating: light blinking Stop fan: light off Thermo ON : light on Thermo OFF : light off

SW1 setting			Display mode		Display on the LED1, 2 (display data)								Notes		
No.	12345678				1	2	3	4	5	6	7	8			
26	01011000		Capacity code (No. 1 indoor unit)		0-255								•Display of indoor unit capacity code •The No. 1 unit will start from the M-NET address with the lowest number		
27	11011000		Capacity code (No. 2 indoor unit)												
28	00111000		Capacity code (No. 3 indoor unit)												
29	10111000		Capacity code (No. 4 indoor unit)												
30	01111000		Capacity code (No. 5 indoor unit)												
31	11111000		IC1 operation mode		STOP								•Display of indoor unit operating mode		
32	00000100		IC2 operation mode												
33	10000100		IC3 operation mode												
34	01000100		IC4 operation mode												
35	11000100		IC5 operation mode												
36	00100100		OC operation mode		Fan		Cooling thermo-ON		Cooling thermo-OFF		Heating thermo-ON		Heating thermo-OFF		
37	10100100		External connection status		Compressor ON/OFF	Heating/Cooling	CN3N1-2 input	Abnormal/normal	DEFROST/NO	CN3D1-3 input	Refrigerant pull back/no	Excitation current/no	3-minute delay/no	Light on/light off	
38	01100100		Communication demand capacity		0-255 (%)										Display of communication demand capacity
39	11100100		Number of compressor ON/OFF		0000-9999 (unit: x10)										Display a count of compressor operation/stop
40	00010100		Compressor operating current		0-999.9 (Arms)										Display detected current
41	10010100		Input current of outdoor unit		0000-9999 (unit: x10)										Display cumulative time of thermo-ON operation
42	01010100		Thermo-ON operating time		0-255										Display total capacity code of indoor units inthermo-ON
43	11010100		Total capacity of thermo-ON		0-255										Display number of connected indoor units
44	00110100		Number of indoor units		0-999.9 (V)										Display bus voltage
45	10110100		DC bus voltage		0-999.9 (V)										Display active LEV control
46	01110100		State of LEV control		Td over heat prevention	SHd decrease prevention	Min.Sj correction depends on Td	Min.Sj correction depends on Shd	LEV opening correction depends on Pd	LEV opening correction depends on Td	Correction of high compression ratio prevention	Freeze prevention control at the beginning of SHd			
47	11110100		State of compressor frequency control 1		Condensing temperature limit control	Compressor temperature control		Discharge temp. (heating) backup control	Pd abnormality control (heating)	Pd Back up control(heating)					
48	00001100		State of compressor frequency control 2		Heat sink over heat prevention control	Secondary current control	Input current control		Frequency restrain of receipt voltage change	Low pressure decrease prevention	HZ-up inhibit control at the beginning of SHd				
49	10001100		Protection input		63LS abnormality	HIC abnormality		Frozen protection	4-way valve disconnection abnormality	Delay caused by blocked valve in cooling mode	TH6 abnormality	Power module abnormality			
50	01001100		The second current value when microprocessor of POWER BOARD abnormality is detected		0-999.9 [Arms]										Display data at time of abnormality
51	11001100		Head/sink temperature when microprocessor of POWER BOARD abnormality is detected		-99.9-999.9 (°F)										
State of compressor frequency(Hz) control															
Content															
Hz control by pressure limitation															
Hz control by discharge temperature limitation															
Hz control by bypass valve															
Control that restrains abnormal rise of discharge pressure															
Heat sink over heat prevention control															
Secondary current control															
Input current control															
Max.Hz correction control due to voltage decrease															
Max.Hz correction control due to receipt voltage change															

No.	SW1 setting 12345678	Display mode	Display on the LED1, 2 (display data)								Notes
			1	2	3	4	5	6	7	8	
52	00101100	Outdoor LEV-A opening pulse	0-2000 (pulse)								Display of opening pulse of outdoor LEV
53	10101100	Outdoor LEV-A opening pulse abnormality delay									
54	01101100	Outdoor LEV-A opening pulse abnormality									
55	11101100	Outdoor LEV-B opening pulse									
56	00011100	Outdoor LEV-B opening pulse abnormality delay									
57	10011100	Outdoor LEV-B opening pulse abnormality									
58	01011100	63LS (Low pressure)	-99.9-999.9 (PSI(G))								Display of data from sensor and thermistor
59	11011100	63LS abnormality delay									
60	00111100	63 LS abnormality									
61	10111100	TH2 (HIC pipe)	-99.9-999.9 (°F)								
62	01111100	TH2(HIC) abnormality delay									
63	11111100	TH2 (HIC) abnormality	-99.9-999.9 (°F)								
64	00000010	Operational frequency	0-255 (Hz)								Display of actual operating frequency
65	10000010	Target frequency	0-255 (Hz)								Display of target frequency
66	01000010	Outdoor fan control step number	0-15								Display of number of outdoor fan control steps (target)
69	10100010	IC1 LEV Opening pulse	0-2000 (pulse)								Display of opening pulse of indoor LEV
70	01100010	IC2 LEV Opening pulse									
71	11100010	IC3 LEV Opening pulse									
72	00010010	IC4 LEV Opening pulse									
73	10010010	IC5 LEV Opening pulse									
74	01010010	High pressure sensor (Pd)	-99.9-999.9 (PSI(G))								Display detected data of outdoor unit sensors and thermistors
75	11010010	TH4(Compressor/Td) data									
76	00110010	TH6(Suction pipe) (Et) data	-99.9-999.9 (°F)								
77	10110010	TH7(Ambient) data									
78	01110010	TH3(Outdoor liquid pipe) data									
80	00001010	TH8(Heat sink) data									
81	10001010	IC1 TH23 (Gas)	-99.9-999.9 (°F) (When indoor unit is not connected, it is displayed as 0.)								Display detected data of indoor unit thermistor
82	01001010	IC2 TH23 (Gas)									
83	11001010	IC3 TH23 (Gas)									
84	00101010	IC4 TH23 (Gas)									
85	10101010	IC5 TH23 (Gas)									

SW1 setting			Display on the LED1, 2 (display data)								Notes
No.	SW1 setting	Display mode	1	2	3	4	5	6	7	8	
86	01101010	IC1 TH22 (Liquid)	-99.9~999.9 (°F) (When the indoor unit is not connected, it is displayed as 0.)								Display detected data of indoor unit thermistors
87	11101010	IC2 TH22 (Liquid)									
88	00011010	IC3 TH22 (Liquid)									
89	10011010	IC4 TH22 (Liquid)									
90	01011010	IC5 TH22 (Liquid)									
91	11011010	IC1 TH21 (Intake)									
92	00111010	IC2 TH21 (Intake)									
93	10111010	IC3 TH21 (Intake)									
94	01111010	IC4 TH21 (Intake)									
95	11111010	IC5 TH21 (Intake)									
96	00000110	Outdoor SC (cooling)	-99.9~999.9 (degree)								Display of outdoor subcool (SC) data
97	10000110	Target subcool step									
98	01000110	IC1 SC/SH	-99.9~999.9 (degree) during heating: subcool (SC)/during cooling: superheat (SH) (Fixed to "0" during cooling operation)								Display of indoor SC/SH data
99	11000110	IC2 SC/SH									
100	00100110	IC3 SC/SH									
101	10100110	IC4 SC/SH									
102	01100110	IC5 SC/SH									
103	11100110	Discharge superheat (SHd)	-99.9~999.9 (degree)								Display of outdoor discharge superheat (SHd) data
105	10010110	Target Pt display (heating) kg/f									
106	01010110	Target ET display (cooling)									
107	11010110	Target outdoor SC (cooling)									
108	00110110	Target indoor SC/SH (IC1)	SCm/SHm (0.0~20.0) (degree)								Display of all control target data
109	10110110	Target indoor SC/SH (IC2)									
110	01110110	Target indoor SC/SH (IC3)									
111	11110110	Target indoor SC/SH (IC4)									
112	00001110	Target indoor SC/SH (IC5)									
113	10001110	Indoor unitcheck status (IC9~12)	No.9 unit check	No.10 unit check	No.11 unit check	No.12 unit check					Light on at time of abnormality
114	01001110	Indoor unit operation mode (IC9-12)	No.9 unit mode	No.10 unit mode	No.11 unit mode	No.12 unit mode					COOL/DRY: light on HEAT: light blinking FAN/STOP: light off
115	11001110	Indoor unit operation display (IC9-12)	No.9 unit operation	No.10 unit operation	No.11 unit operation	No.12 unit operation					Thermo-ON: light on Thermo-OFF: light off
116	00101110	IC9 operation mode	STOP	Fan	Cooling Thermo-ON	Cooling thermo-OFF	Heating thermo-ON	Heating thermo-OFF			Display of indoor unit operation mode
117	10101110	IC10 operation mode									
118	01101110	IC11 operation mode									
119	11101110	IC12 operation mode									
120	00011110	Target indoor SC/SH (IC9)	SCm/SHm (0.0~20.0) (degree)								Display of all control target data
121	10011110	Target indoor SC/SH (IC10)									
122	01011110	Target indoor SC/SH (IC11)									
123	11011110	Target indoor SC/SH (IC12)									
124	00111110	IC9 LEV opening pulse abnormality delay	0~2000 (pulse)								Display of opening pulse of indoor LEV at time of abnormality delay
125	10111110	IC10 LEV opening pulse abnormality delay									
126	01111110	IC11 LEV opening pulse abnormality delay									
127	11111110	IC12 LEV opening pulse abnormality delay									

No.	SW1 setting	Display mode	Display on the LED1, 2 (display data)								Notes
			1	2	3	4	5	6	7	8	
128	00000001	Actual frequency of abnormality delay	0-255 (Hz)								Display of actual frequency at time of abnormality delay
129	10110001	Fan step number at time of abnormality delay	0-15								Display of fan step number at time of abnormality delay
131	11000001	IC1 LEV opening pulse abnormality delay	0-2000 (pulse)								Delay of opening pulse of indoor LEV at time of abnormality delay
132	00100001	IC2 LEV opening pulse abnormality delay									
133	10100001	IC3 LEV opening pulse abnormality delay									
134	01100001	IC4 LEV opening pulse abnormality delay									
135	11100001	IC5 LEV opening pulse abnormality delay									
136	00010001	High pressure sensor data at time of abnormality delay	-99.9-999.9 (PSIG)								Display of data from High pressure sensor, all thermistors, and SC/SH at time of abnormality delay
137	10010001	TH4 (Compressor) sensor data at time of abnormality delay	-99.9-999.9 (°F)								
138	01010001	TH6 (Suction pipe) sensor data at time of abnormality delay									
139	11010001	TH3 (Outdoor liquid pipe) sensor data at time of abnormality delay									
140	00110001	TH8 (Heat sink) sensor data at time of abnormality delay									
141	10110001	OC SC (cooling) at time of abnormality delay	-99.9-999.9 (degree) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation)								
142	01110001	IC1 SC/SH at time of abnormality delay									
143	11110001	IC2 SC/SH at time of abnormality delay									
144	00001001	IC3 SC/SH at time of abnormality delay									
145	10001001	IC4 SC/SH at time of abnormality delay									
146	01001001	IC5 SC/SH at time of abnormality delay									
147	11001001	IC9 SC/SH at time of abnormality delay									
148	00100001	IC10 SC/SH at time of abnormality delay									
149	10101001	IC11 SC/SH at time of abnormality delay									
150	01101001	IC12 SC/SH at time of abnormality delay									

No.	SW1 setting	Display mode	Display on the LED1, 2 (display data)								Notes
			1	2	3	4	5	6	7	8	
151	11101001	IC9 LEV opening pulse at time of abnormality	0-2000 (pulse)								Display of opening pulse of indoor LEV at time of abnormality
152	00011001	IC10 LEV opening pulse at time of abnormality									
153	10011001	IC11 LEV opening pulse at time of abnormality									
154	01011001	IC12 LEV opening pulse at time of abnormality									
155	11011001	IC9 SC/SH at time of abnormality	-99.9-999.9 (degree) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation)								Display of indoor SC/SH data at time of abnormality
156	00111001	IC10 SC/SH at time of abnormality									
157	10111001	IC11 SC/SH at time of abnormality									
158	01111001	IC12 SC/SH at time of abnormality									
159	11111001	IC9 Capacity code	0-255								Display of indoor unit capacity code The No.1 unit will start from the M-NET address with the lowest number
160	0000101	IC10 Capacity code									
161	1000101	IC11 Capacity code									
162	0100101	IC12 Capacity code									
163	1100101	IC9 SC/SH	-99.9-999.9 (degree) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation)								Display of indoor SC/SH data
164	00100101	IC10 SC/SH									
165	10100101	IC11 SC/SH									
166	01100101	IC12 SC/SH									
170	01010101	ROM version monitor	0.00-99.99 (ver)								Display of version data of ROM
171	11010101	ROM type									Display of ROM type
172	00110101	Check sum mode	0000-FFFF								Display of check sum code of ROM
173	10110101	IC9 TH23 (Gas)	-99.9-999.9 (°F)								Display detected data of indoor unit thermistors
174	01110101	IC10 TH23 (Gas)									
175	11110101	IC11 TH23 (Gas)									
176	00001101	IC12 TH23 (Gas)									
177	10001101	IC9 TH22 (Liquid)									
178	01001101	IC10 TH22 (Liquid)									
179	11001101	IC11 TH22 (Liquid)									
180	00101101	IC12 TH22 (Liquid)									
185	10011101	IC9 TH21 (Intake)									
186	01011101	IC10 TH21 (Intake)									
187	11011101	IC11 TH21 (Intake)									
188	00111101	IC12 TH21 (Intake)									
189	10111101	History of voltage error (U9/4220)	-	-	PAM error	Converter Fault	Power synchronization signal error	L1 open phase error	Under voltage error	Over voltage error	
190	01111101	External connection status at time of abnormality delay	CN3N 1-3 input	CN3N 1-2 input	CN3S 1-2 input	CN3D 1-3 input	CN3D 1-2 input				
191	11111101	External connection status at time of abnormality	CN3N 1-3 input	CN3N 1-2 input	CN3S 1-2 input	CN3D 1-3 input	CN3D 1-2 input				

No.	SW1 setting 12345678	Display mode	Display on the LED1, 2 (display data)								Notes
			1	2	3	4	5	6	7	8	
192	00000011	Actual frequency of abnormality	0-255 (Hz)								Display of actual frequency at time of abnormality
193	10000011	Fan step number at time of abnormality	0-15								Display of fan step number at time of abnormality
195	11000011	IC1 LEV opening pulse at time of abnormality	0-2000 (pulse)								Display of opening pulse of indoor LEV at time of abnormality
196	00100011	IC2 LEV opening pulse at time of abnormality									
197	10100011	IC3 LEV opening pulse at time of abnormality									
198	01100011	IC4 LEV opening pulse at time of abnormality									
199	11100011	IC5 LEV opening pulse at time of abnormality									
200	00010011	High pressure sensor data at time of abnormality	-99.9-999.9 (PSIG)								Display of data from High pressure sensor, and all thermistors, at time of abnormality.
201	10010011	TH4 (Compressor) sensor data at time of abnormality	-99.9-999.9 (°F)								
202	01010011	TH6 (Suction pipe) sensor data at time of abnormality									
203	11010011	TH3 (Outdoor liquid pipe) sensor data at time of abnormality									
204	00110011	TH8 (Heat sink) sensor data at time of abnormality									
205	10110011	OC SC (cooling) at time of abnormality	-99.9-999.9 (degree)								Display of outdoor SC data at time of abnormality
206	01110011	IC1 SC/SH at time of abnormality	-99.9-999.9 (degree) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation)								Display of indoor SC/SH data at time of abnormality
207	11110011	IC2 SC/SH at time of abnormality									
208	00001011	IC3 SC/SH at time of abnormality									
209	10001011	IC4 SC/SH at time of abnormality									
210	01001011	IC5 SC/SH at time of abnormality									
211	11001011	IC6 Capacity code	0-255								Display of indoor unit capacity code The No.1 unit will start from the M-NET address with the lowest number
212	00101011	IC7 Capacity code									
213	10101011	IC8 Capacity code									
214	01101011	IC6 operation mode	STOP	Fan	Cooling thermo-ON	Cooling thermo-OFF	Heating thermo-ON	Heating thermo-OFF		Display of indoor unit operation mode	
215	11101011	IC7 operation mode									
216	00011011	IC8 operation mode									

No.	SW1 setting	Display mode	Display on the LED1, 2 (display data)								Notes
			1	2	3	4	5	6	7	8	
217	10011011	IC6 LEV opening pulse	0-2000 (pulse)								Display of opening pulse of indoor LEV
218	01011001	IC7 LEV opening pulse									
219	11011001	IC8 LEV opening pulse									
220	00111011	IC6 TH23 (Gas)	-99.9-999.9 (°F)								Display detected data of indoor unit thermistor
221	10111011	IC7 TH23 (Gas)									
222	01111011	IC8 TH23 (Gas)									
223	11111011	IC6 TH22 (liquid)									
224	00001111	IC7 TH22 (liquid)									
225	10001111	IC8 TH22 (liquid)									
226	01001111	IC6 TH21 (intake)									
227	11001111	IC7 TH21 (intake)									
228	00100111	IC8 TH21 (intake)	-99.9-999.9 (degree) during heating: subcool (SC)/during cooling: superheat (SH) (Fixed to "0" during cooling operation)								Display of indoor SC/SH data
229	10100111	IC6 SC/SH									
230	01001111	IC7 SC/SH									
231	11001111	IC8 SC/SH	SCm/SHm (0.0-20.0) (degree)								Display of all control target data
232	00010111	Target indoor SC/SH (IC6)									
233	10010111	Target indoor SC/SH (IC7)									
234	01010111	Target indoor SC/SH (IC8)	0-2000 (pulse)								Display of opening pulse of indoor LEV at time of abnormality delay
235	11010111	IC6 LEV opening pulse abnormality delay									
236	00110111	IC7 LEV opening pulse abnormality delay									
237	10110111	IC8 LEV opening pulse abnormality delay	-99.9-999.9 (degree) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation)								Display of indoor SC/SH data at time of abnormality delay
238	01110111	IC6 SC/SH at time of abnormality delay									
239	11110111	IC7 SC/SH at time of abnormality delay									
240	00001111	IC8 SC/SH at time of abnormality delay	0-2000 (pulse)								Display of opening pulse of indoor LEV at time of abnormality
241	10001111	IC6 LEV opening pulse at time of abnormality									
242	01001111	IC7 EV opening pulse at time of abnormality									
243	11001111	IC8 LEV opening pulse at time of abnormality	-99.9-999.9 (degree) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation)								Display of indoor SC/SH data at time of abnormality delay
244	00101111	IC6 SC/SH at time of abnormality									
245	10101111	IC7 SC/SH at time of abnormality									
246	01101111	IC8 SC/SH at time of abnormality	0-2000 (pulse)								Display of opening pulse of indoor LEV
250	01011111	IC9 LEV opening pulse									
251	11011111	IC10 LEV opening pulse									
252	00111111	IC11 LEV opening pulse									
253	10111111	IC12 LEV opening pulse									

8-11. BRANCH BOX UNIT OPERATION MONITOR FUNCTION

[When optional part 'A-Control Service Tool (PAC-SK52ST)' is connected to branch box controller board (CNM)]
Digital indicator LED1 displays 2 digit number or code to inform operation condition and the meaning of check code by controlling DIP SW2 on 'A-Control Service Tool'.

<Table1> SW5 setting The black square (■) indicates a switch position.

SW5 setting	Detail
	Common
	Indoor-A
	Indoor-B
	Indoor-C
	Indoor-D
	Indoor-E

Operation indicator:

- SW2 - Use to set the displayed item
- SW5 - Use to set the displayed unit

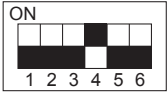
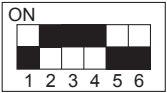
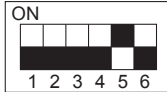
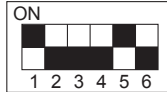


<Table2> Functions

The black square (■) indicates a switch position.

SW2 setting	SW5 setting*1	Display detail	Explanation for display	Unit
	Common	Status of branch box	<p>During startup</p> <p>During error detection Displays a check code, and M-NET address of the unit which the check code was detected.</p> <p>Example: If the check code 2520 is detected in the address3,</p> <p>During no power supply F8</p> <p>Other Displays the number of units in operation. 0 to 5</p>	—
	Individual unit	Status of branch box	<p>During startup</p> <p>During error detection Displays a check code, and M-NET address of the selected unit.</p> <p>During no power supply F8</p> <p>Other Displays an operation mode of the selected unit. 0: Stop C: Cool/Dry H: Heat d: Defrost</p>	—


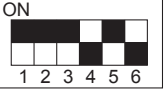
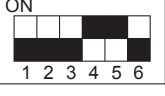
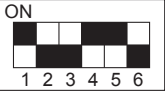
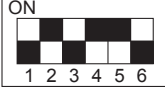


*1 Refer to the <Table 1> for the appropriate setting for the function.

The black square (■) indicates a switch position.

SW2 setting	SW5 setting*1	Display detail	Explanation for display	Unit
	Common	Not used	—	—
	Individual unit	Actual opening pulse of LEV (Direct-operated conversion value) 0 to 500	0 to 500 (When it is 100 pulse or more, it displays a hundredth, tens, and unit digit by turns.) Example: When 150 pulse, <div style="text-align: center;"> 0.5 s 0.5 s 2.0 s □ 1 → 50 → □ □ ↑————— ————— </div>	Pulse
	Common	Not used	—	—
	Individual unit	Error history	Displays a check code, and M-NET address of the unit which the check code was detected. Example: If the check code 2520 is detected in the address3, <div style="text-align: center;"> 0.5 s 0.5 s 0.5 s 2.0 s 03 → 25 → 20 → □ □ ↑————— ————— ————— </div>	Code display
	Common	The number of unit(s) operating in Thermo-ON	0 to 5	Number
	Individual unit	Operating status of unit	83: Abnormal 00: Stop 06: Forced stop 0C: Defrost 29: Hot adjust mode 05: Standby mode 2A: Auxiliary heater is ON. 0A: Thermo-ON 01: In operation	Code display
	Common	The number of indoor unit(s) connected to this branch box.	0 to 5	Number
	Individual unit	M-NET address	00 to FF Displays an M-NET address of the selected unit.	Code display
	Common	Not used	—	—
	Individual unit	Capacity setting in Qj	03 to 50	Code display
	Common	Not used	—	—
	Individual unit	Indoor thermistor <pipe temperature/ liquid> (TH2)	-38 to 190 [-39 to 88] (When the temperature is 0°F or less, "-" and temperature are displayed by turns.) Example: When -5°F, <div style="text-align: center;"> 0.5 s 0.5 s 2.0 s - □ → □ 5 → □ □ ↑————— ————— </div>	°F

*1 Refer to the <Table 1> for the appropriate setting for the function.

The black square (■) indicates a switch position.

SW2 setting	SW5 setting* ¹	Display detail	Explanation for display	Unit
	Common	Not used	—	—
	Individual unit	Indoor thermistor <pipe temperature/ 2-phase> (TH5)	-38 to 190 [-39 to 88] (When the temperature is 0°F or less, "-" and temperature are displayed by turns.) Example: When -5°F, <div style="text-align: center;"> 0.5 s 0.5 s 2.0 s - □ → □ 5 → □ □ ↑ </div>	°F
	Common	Not used	—	—
	Individual unit	Branch box pipe thermistor (TH-A, B, C, D, E)	-43 to 196 [-42 to 91] (When the temperature is 0°F or less, "-" and temperature are displayed by turns.) Example: When -5°F, <div style="text-align: center;"> 0.5 s 0.5 s 2.0 s - □ → □ 5 → □ □ ↑ </div>	°F
	Common	Not used	—	—
	Individual unit	Indoor thermistor <room temperature> (TH1)	43 to 102 [8 to 39]	°F
	Common	Not used	—	—
	Individual unit	Set temperature of indoor unit	61 to 88 [10 to 31]	°F
	Common	S/W version	Displays a S/W version number.	Code display
	Individual unit		Example: If it is a ver. 12.34, <div style="text-align: center;"> 0.5 s 0.5 s 2.0 s 12 → 34 → □ □ ↑ </div>	
	Common	Not used	—	—
	Individual unit	LEV opening pulse (gear operated value)	0 to 2000	Pulse
	Common	S/W ROM check sum	0000 to FFFF	Code display
	Individual unit		Example: If it is 0BC9h, <div style="text-align: center;"> 0.5 s 0.5 s 2.0 s 0b → C9 → □ □ ↑ </div>	

*¹ Refer to the <Table 1> for the appropriate setting for the function.

8-12. SELECTING FUNCTIONS USING THE REMOTE CONTROLLER

Each function can be set as necessary using the remote controller. The setting of function for each unit can only be done by the remote controller. Select function available from the <Table 1> .

(1) Functions available when setting the unit number to 00

Note that the functions in the table below are available only when P-series indoor unit and the wired remote controller is used.

<Table 1> Function selections

Function	Settings	Mode No.	Setting No.	● : Initial setting (when sent from the factory)	Remarks
Power failure automatic recovery	OFF	01	1		The setting can be made to each indoor unit individually.
	ON*		2	●	
Indoor temperature detection	Average data from each indoor unit	02	1	●	
	Data from the indoor unit with remote controller		2		
	Data from main remote controller		3		
LOSSNAY connectivity	Not supported	03	1	●	
	Supported (Indoor unit does not intake outdoor air through LOSSNAY)		2		
	Supported (Indoor unit intakes outdoor air through LOSSNAY)		3		
Power supply voltage	230V	04	1	●	
	208V		2		
Frost prevention temperature	36°F [2°C]	15	1		
	37°F [3°C]		2	●	
Humidifier control	When the compressor operates, the humidifier also operates.	16	1	●	
	When the fan operates, the humidifier also operates.		2		

* After the power supply returns, the indoor unit will not operate for 3 minutes

(Some kind of indoor units operate for 30 seconds, after that, it stops for 3 minutes). This is normal operation.

Meaning of "Function setting"

Mode02:indoor temperature detecting

No.	Indoor temperature(ta)=			
No.1	Average data of the sensor on all the indoor units*	Initial setting	ta=A	ta=A
No.2	The data of the sensor on the indoor unit that is connected with remote controller	Initial setting	ta=A	ta=A
No.3	The data of the sensor on main remote controller	Initial setting	ta=B	ta=B

*Since the setting is applied to each indoor unit while branch box is connected, the indoor unit is controlled based on the sensor data of itself, not the average data.

9 PRECAUTIONS AGAINST REFRIGERANT LEAKAGE

9-1. PRECAUTIONS AGAINST REFRIGERANT LEAKAGE

9-1-1. Introduction

R410A refrigerant of this air conditioner is non-toxic and non-flammable but leaking of large amount from an indoor unit into the room where the unit is installed may be deleterious. To prevent possible injury, the rooms should be large enough to keep the R410A concentration specified by ISO 5149-1 as follows.

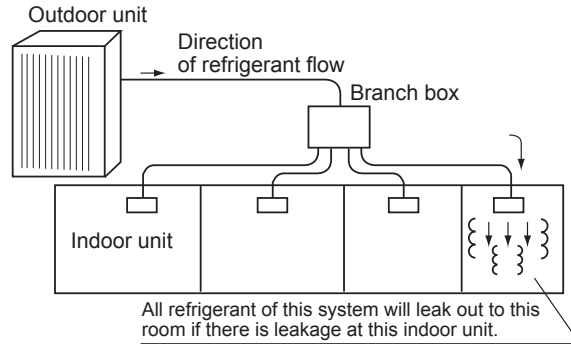
Maximum concentration

Maximum refrigerant concentration of R410A of a room is 0.44kg/m^3 accordance with ISO 5149-1.

To facilitate calculation, the maximum concentration is expressed in units of kg/m^3 (kg of R410A per m^3)

Maximum concentration of R410A: 0.44kg/m^3

(ISO 5149-1)



9-1-2. Confirming procedure of R410A concentration

Follow (1) to (3) to confirm the R410A concentration and take appropriate treatment, if necessary.

(1) Calculate total refrigerant amount by each refrigerant system. Total refrigerant amount is pre-charged refrigerant at ex-factory plus additional charged amount at field installation.

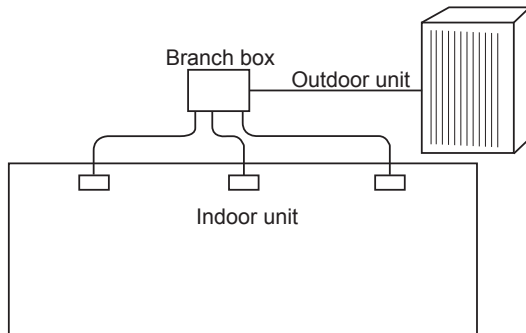
Note:

When the air conditioning system consists of several independent refrigerant system, figure out the total refrigerant amount by each independent refrigerant system.

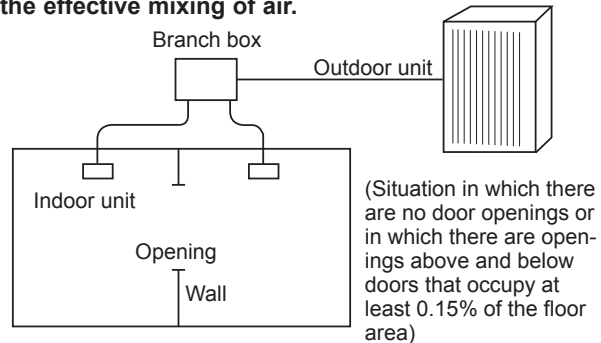
(2) Calculate room volumes (m^3) and find the room with the smallest volume

The part with represents the room with the smallest volume.

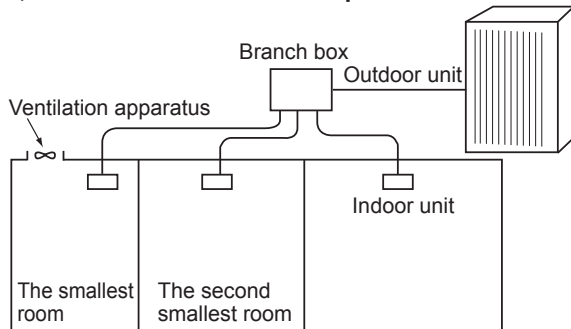
(a) Situation in which there are no partitions



(b) There are partitions, but there are openings that allow the effective mixing of air.



(c) If the smallest room has mechanical ventilation apparatus that is linked to a household gas detection and alarm device, the calculations should be performed for the second smallest room.



(3) Use the results of calculations (1) and (2) to calculate the refrigerant concentration:

$$\frac{\text{Total refrigerant in the refrigerating unit (kg)}}{\text{The smallest room in which an indoor unit has been installed (m}^3\text{)}} \leq \text{Maximum concentration (kg/m}^3\text{)}$$

Maximum concentration of R410A: 0.44kg/m^3

If the calculation results do not exceed the maximum concentration, perform the same calculations for the larger second and third room, etc., until it has been determined that nowhere the maximum concentration will be exceeded.

10-1. OUTDOOR UNIT

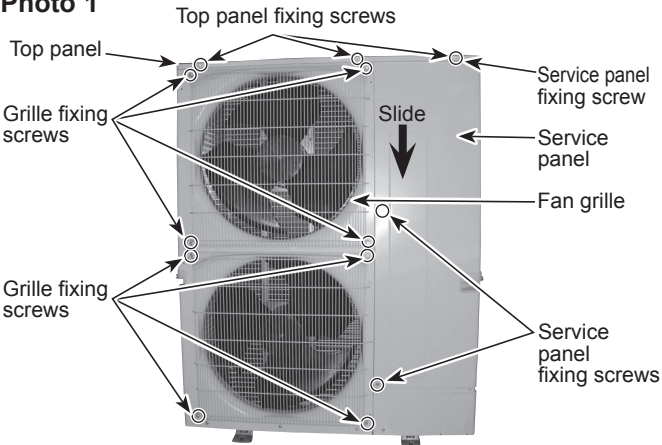
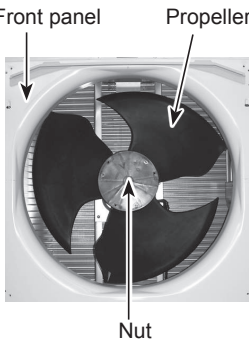
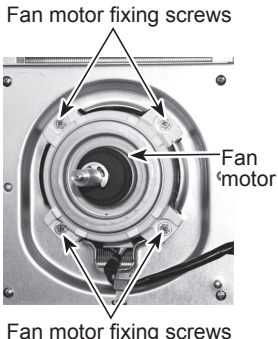
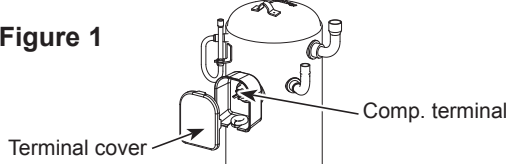
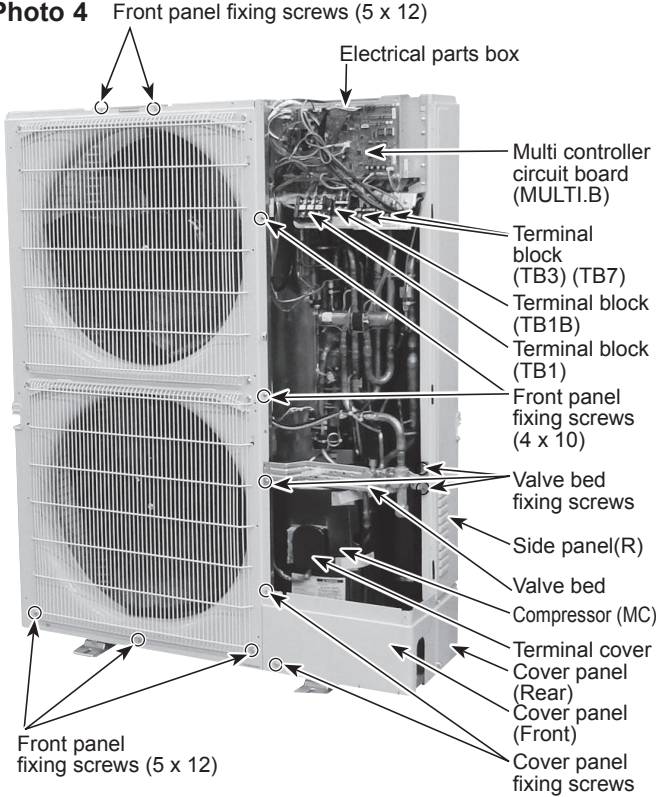
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MXZ-5C42NAHZ(-U1)

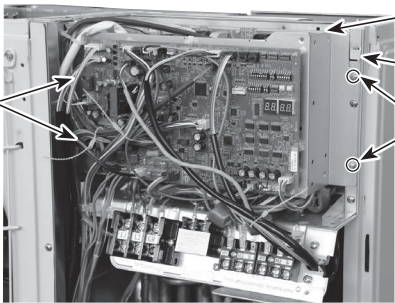
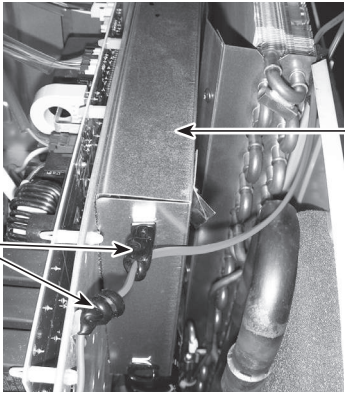
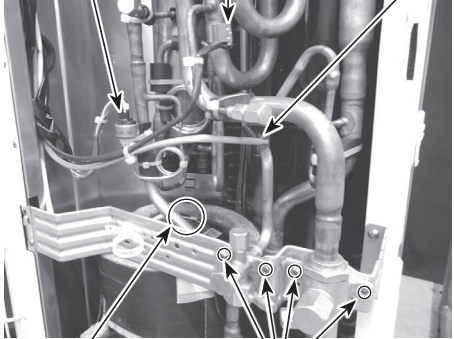
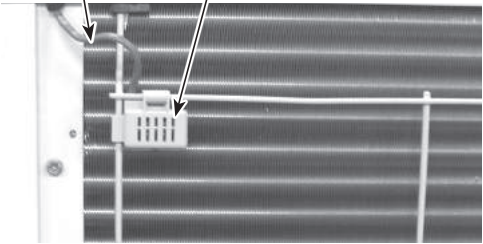
MXZ-8C48NAHZ(-U1)

Note: Turn OFF the power supply before disassembly.

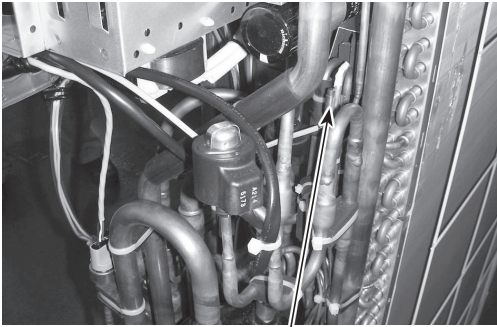
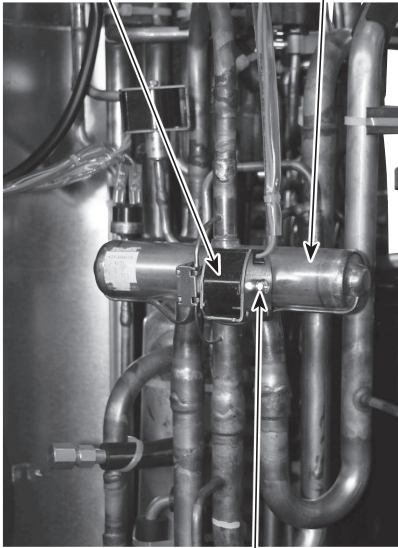
→ : Indicates the visible parts in the photos/figures.

OPERATING PROCEDURE	PHOTOS/FIGURES
<p>1. Removing the service panel and top panel</p> <ol style="list-style-type: none"> (1) Remove 3 service panel fixing screws (5 × 12), then slide the hook on the right downward to remove the service panel. (2) Remove screws (2 for front, 3 for rear/5 × 12) of the top panel and remove it. 	<p>Photo 1</p> 
<p>2. Removing the fan motor (MF1, MF2)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove 4 fan grille fixing screws (5 × 12) to detach the fan grille. (See Photo 1) (4) Remove a nut (for right handed screw of M6) to detach the propeller. (See Photo 2) (5) Disconnect the connectors, CNF1 and CNF2 on the multi controller circuit board in the electrical parts box. (6) Remove 4 fan motor fixing screws (5 × 20) to detach the fan motor. (See Photo 3) <p>Note: Tighten the propeller fan with a torque of $5.7 \pm 0.3 \text{ N}\cdot\text{m}$. [$4.2 \pm 0.2 \text{ ft} \cdot \text{lbs}$]</p>	<p>Photo 2</p>  <p>Photo 3</p> 
<p>3. Removing the electrical parts box</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connecting wire from terminal block. (4) Remove all of the following connectors from multi controller circuit board; <p><Diagram symbol in the connector housing></p> <ul style="list-style-type: none"> • Fan motor (CNF1, CNF2) • Thermistor <HIC pipe> (TH2) • Thermistor <Outdoor liquid pipe> (TH3) • Thermistor <Compressor> (TH4) • Thermistor <Suction pipe/Ambient, Outdoor> (TH7/6) • High pressure switch (63H) • High pressure sensor (63HS) • Low pressure sensor (63LS) • 4-way valve (21S4) • Bypass valve (SV1, SV2) • Electronic expansion valve (LEV-A, LEV-B) • Base heater (SS) <p>Pull out the disconnected wire from the electrical parts box.</p> <ol style="list-style-type: none"> (5) Remove the terminal cover and disconnect the compressor lead wire from the comp. terminal. (See Figure 1) <p>Note: The terminal cover can be easily removed by using a blade of flathead screwdriver.</p> <p>Figure 1</p> 	<p>Photo 4</p> 

From the previous page.

OPERATING PROCEDURE	PHOTOS/FIGURES
<p>(6) Remove 2 electrical parts box fixing screws (4 × 10), then detach the electrical parts box by pulling it upward. The electrical parts box is fixed with 2 hooks on the left and 1 hook on the right.</p>	<p>Photo 5</p>  <p>Electrical parts box Hook Electrical parts box fixing screws Hooks</p>
<p>4. Removing the thermistor <Suction pipe> (TH6)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connector, TH7/6 (red), on the multi controller circuit board in the electrical parts box. (4) Loosen the wire clamps on the side of the electrical parts box, and next to it. (5) Pull out the thermistor <Suction pipe> (TH6) from the sensor holder. <p>Note: When replacing thermistor <Suction pipe> (TH6), replace it together with thermistor <Ambient> (TH7) since they are combined together. Refer to procedure No.5 below to remove thermistor <Ambient> (TH7).</p>	<p>Photo 6</p>  <p>Electrical parts box Clamps</p> <p>Photo 7</p>  <p>High pressure sensor (63HS) Thermistor <Suction pipe> (TH6) Thermistor <HIC pipe> (TH2) Thermistor <Compressor> (TH4) Ball valve and stop valve fixing screws</p>
<p>5. Removing the thermistor <Ambient> (TH7)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connector TH7/6 (red) on the multi controller circuit board in the electrical parts box. (4) Loosen the wire clamps on top of the electrical parts box. (See Photo 6) (5) Pull out the thermistor <Ambient> (TH7) from the sensor holder. <p>Note: When replacing thermistor <Ambient> (TH7), replace it together with thermistor <Suction pipe> (TH6), since they are combined together. Refer to procedure No.4 above to remove thermistor <Suction pipe> (TH6).</p>	<p>Photo 8</p>  <p>Lead wire of thermistor <Ambient> (TH7) Sensor holder</p>



OPERATING PROCEDURE	PHOTOS/FIGURES
<p>6. Removing the thermistor <Outdoor liquid pipe> (TH3) and Photo 9 thermistor <Compressor> (TH4), thermistor <HIC pipe> (TH2)</p> <ol style="list-style-type: none">(1) Remove the service panel. (See Photo 1)(2) Disconnect the connectors, TH3 (white) and TH4 (white), TH2 (black) on the multi controller circuit board in the electrical parts box.(3) Loosen the clamp for the lead wire in the rear of the electrical parts box.(4) Pull out the thermistor <Outdoor liquid pipe> (TH3) and thermistor <Compressor> (TH4) from the sensor holder. (See Photo 7 and 9)	<p>Photo 9</p>  <p>Thermistor <Outdoor liquid pipe> (TH3)</p>
<p>7. Removing the 4-way valve coil (21S4)</p> <ol style="list-style-type: none">(1) Remove the service panel. (See Photo 1) <p>[Removing the 4-way valve coil]</p> <ol style="list-style-type: none">(2) Remove 4-way valve coil fixing screw (M5 × 7).(3) Remove the 4-way valve coil by sliding the coil toward you.(4) Disconnect the connector 21S4 (green) on the multi controller circuit board in the electrical parts box.	<p>Photo 10</p>  <p>4-way valve coil (21S4) 4-way valve</p> <p>4-way valve coil fixing screw</p>
<p>8. Removing the 4-way valve</p> <ol style="list-style-type: none">(1) Remove the service panel. (See Photo 1)(2) Remove the top panel. (See Photo 1)(3) Remove the electrical parts box (See Photo 5)(4) Remove 3 valve bed fixing screws (4 × 10) and 4 ball valve and stop valve fixing screws (5 × 16), then remove the valve bed. (See Photo 4 and 7)(5) Remove 2 cover panel fixing screws (5 × 12), then slide the cover panel (front) upward to remove it. (The cover panel (front) is fixed to the cover panel (rear) with a hook on the rear side. (See Photo 4)(6) Remove the cover panel (rear) fixing screws (2 for right side and 2 for rear/ 5 × 12), then slide the cover panel (rear) upward to remove it. (See Photo 4) (The cover panel (rear) is fixed to the side panel (R) with 2 screws.)(7) Remove 3 side panel (R) fixing screws (5 × 12) in the rear of the unit, then slide the side panel (R) upward to remove it. (The side panel (R) is fixed to the side plate with hooks on the rear side.)(8) Remove the 4-way valve coil. (See Photo 10)(9) Recover refrigerant.(10) Remove the welded part of 4-way valve. <p>Notes:</p> <ol style="list-style-type: none">1. Recover refrigerant without spreading it in the air.2. The welded part can be removed easily by removing the side panel (R).3. When installing the 4-way valve, cover it with a wet cloth to prevent it from heating (248°F [120°C] or more), then braze the pipes so that the inside of pipes are not oxidized.	

OPERATING PROCEDURE

9. Removing bypass valve coil (SV1, SV2) and bypass valve

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the cover panel (front). (Refer to procedure 8(5))
- (4) Remove the cover panel (rear) (Refer to procedure 8(6))
- (5) Remove the side panel (R). (Refer to procedure 8 (7))
- (6) Remove the bypass valve coil fixing screw (M4 × 6).
- (7) Remove the bypass valve coil by sliding the coil upward.
- (8) Disconnect the connector SV1 (gray) or SV2 (blue) on the multi controller circuit board in the electrical parts box.
- (9) Remove the electrical parts box. (See Photo 5)
- (10) Recover refrigerant.
- (11) Remove the welded part of bypass valve.

Refer to the notes below.

10. Removing the high pressure switch (63H) and high pressure sensor (63HS)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the cover panel (front). (Refer to procedure 8(5))
- (4) Remove the cover panel (rear) (Refer to procedure 8(6))
- (5) Remove the side panel (R). (Refer to procedure 8 (7))
- (6) Pull out the lead wire of high pressure switch and high pressure sensor.
- (7) Remove the electrical parts box. (See Photo 5)
- (8) Recover refrigerant.
- (9) Remove the welded part of high pressure switch and high pressure sensor.

Refer to the notes below.

11. Removing the low pressure sensor (63LS)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the cover panel (front). (Refer to procedure 8(5))
- (4) Remove the cover panel (rear) (Refer to procedure 8(6))
- (5) Remove the side panel (R). (Refer to procedure 8 (7))
- (6) Disconnect the connector 63LS (blue) on the multi controller circuit board in the electrical parts box.
- (7) Remove the electrical parts box. (See Photo 5)
- (8) Recover refrigerant.
- (9) Remove the welded part of low pressure sensor.

Refer to the notes below.

12. Removing electronic expansion valve (LEV-A, LEV-B)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the cover panel (front). (Refer to procedure 8(5))
- (4) Remove the cover panel (rear) (Refer to procedure 8(6))
- (5) Remove the side panel (R). (Refer to procedure 8 (7))
- (6) Remove the electrical expansion valve coil. (See Photo 11,12)
- (7) Remove the electrical parts box. (See Photo 5)
- (8) Recover refrigerant.
- (9) Remove the welded part of electrical expansion valve.

Refer to the notes on the right.

PHOTOS/FIGURES

Photo 11

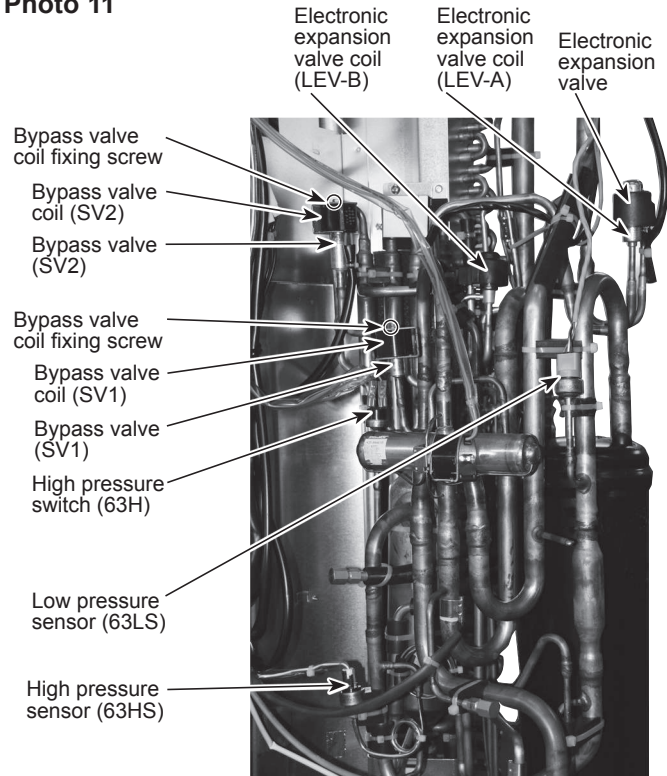
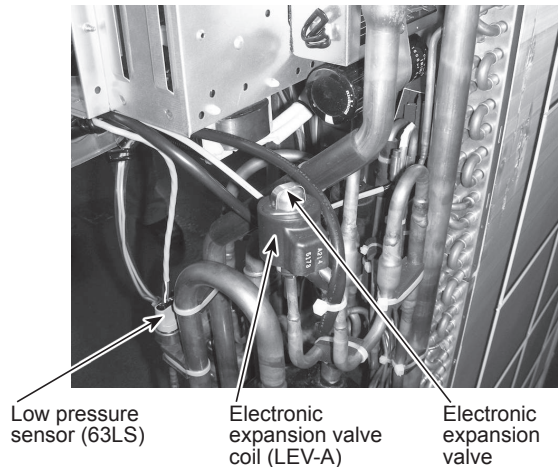


Photo 12



Notes:

1. Recover refrigerant without spreading it in the air.
2. The welded part can be removed easily by removing the side panel (R).
3. When installing the following parts, cover it with a wet cloth to prevent it from heating as the temperature below, then braze the pipes so that the inside of pipes are not oxidized;
 - Bypass valve (procedure 9), 248°F [120°C] or more
 - High pressure switch and high pressure sensor (procedure 10), 212°F [100°C] or more
 - Low pressure sensor (procedure 11), 212°F [100°C] or more
 - LEV (procedure 12), 248°F [120°C] or more

OPERATING PROCEDURE

13. Removing the compressor (MC)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove 2 front cover panel fixing screws (5 × 12) and remove the front cover panel. (See Photo 4)
- (4) Remove front panel fixing screws, 5 (5×12) and 2 (4 × 10) and remove the front panel. (See Photo 4)
- (5) Remove 4 back cover panel fixing screws (5 × 12) and remove the back cover panel.
- (6) Remove the electrical parts box. (See Photo 5)
- (7) Remove the valve bed. (Refer to procedure 8 (4))
- (8) Remove 3 separator fixing screws (4 × 10) and remove the separator. (See Figure 2)
- (9) Recover refrigerant.
- (10) Remove the 3 compressor fixing nuts for motor using spanner or adjustable wrench.
- (11) Remove the welded pipe of motor for compressor inlet and outlet and then remove the compressor.

Note: Recover refrigerant without spreading it in the air.

PHOTOS/FIGURES

Photo 13

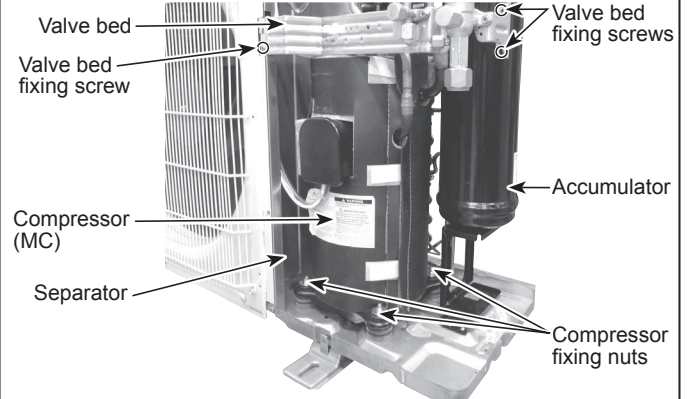
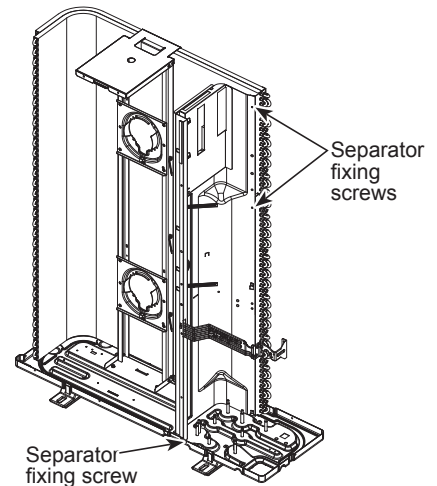


Figure 2



14. Removing the accumulator

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the front cover panel. (Refer to procedure 13 (3))
- (4) Remove the back cover panel. (Refer to procedure 13 (5))
- (5) Remove the side panel (R). (Refer to procedure 8 (7))
- (6) Remove the electrical parts box. (See Photo 5)
- (7) Remove the valve bed. (See procedure 8 (4))
- (8) Recover refrigerant.
- (9) Remove 2 welded pipes of accumulator inlet and outlet.
- (10) Remove 2 accumulator leg fixing screws (4 × 10). (See Photo 15)

Note: Recover refrigerant without spreading it in the air.

Photo 14

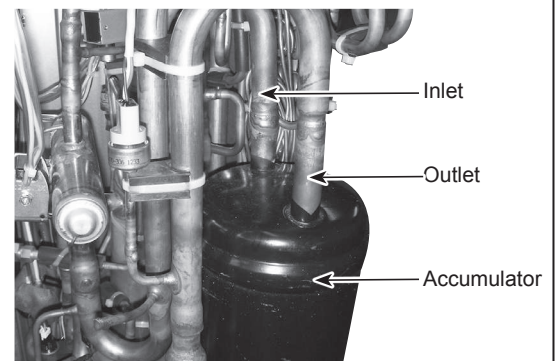
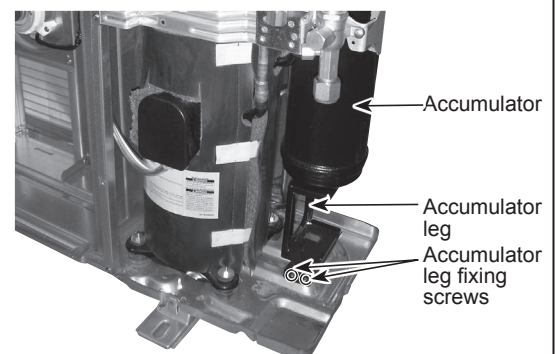
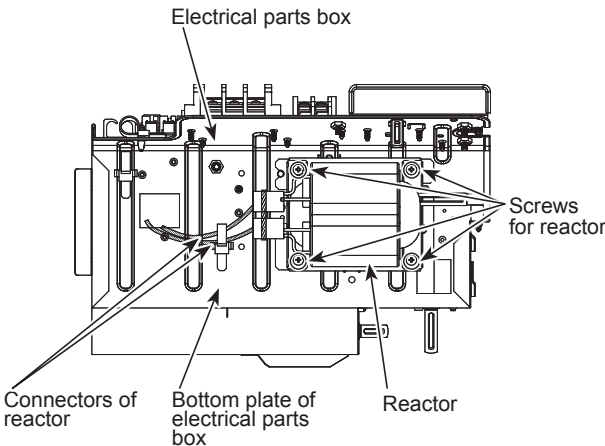
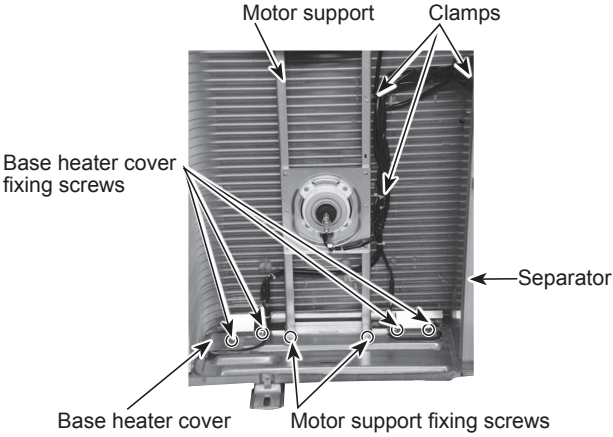
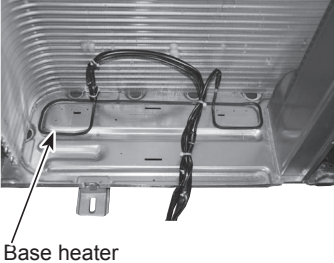


Photo 15



OPERATING PROCEDURE	PHOTOS/FIGURES
<p>15. Removing the reactor (DCL)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the electrical parts box (See Photo 5) (4) Remove 4 screws for reactor (4 x 10) to remove the reactor. (See Figure 3) 	<p>Figure 3</p> 
<p>16. Removing the base heater</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove 4 fan grille fixing screws (5 x 12) to detach the fan grille. (See Photo 1) (4) Remove a nut (for right handed screw of M6) to detach the propeller. (See Photo 2) (5) Remove all of the following connectors from multi controler circuit board; <Diagram symbol in the connector housing> <ul style="list-style-type: none"> • Fan motor (CNF1, CNF2) • Base heater (SS) Pull out the disconnected wire from the electrical parts box. (See Photo 4) (6) Loosen the wire clamps on the side of the motor support and separator. (7) Remove 2 motor support fixing screws (5 x 12), then remove the motor support with fan motor still attached. (See Photo 16) (8) Remove 4 base heater cover fixing screws (4 x 10), then remove the base heater cover. (9) Remove the base heater. (See Photo 17) <p>Notes:</p> <ol style="list-style-type: none"> 1. Tighten the propeller fan with a torque of $5.7 \pm 0.3 \text{ N}\cdot\text{m}$ [$4.2 \pm 0.2 \text{ ft} \cdot \text{lbs}$] 2. Rotate the propeller fan and make sure that the base heater and the lead wires do not interfere with the movement of the propeller fan. 	<p>Photo 16</p>  <p>Photo 17</p> 

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→ : Indicates the visible parts in the photos/figures.

Note: Turn OFF the power supply before disassembly.

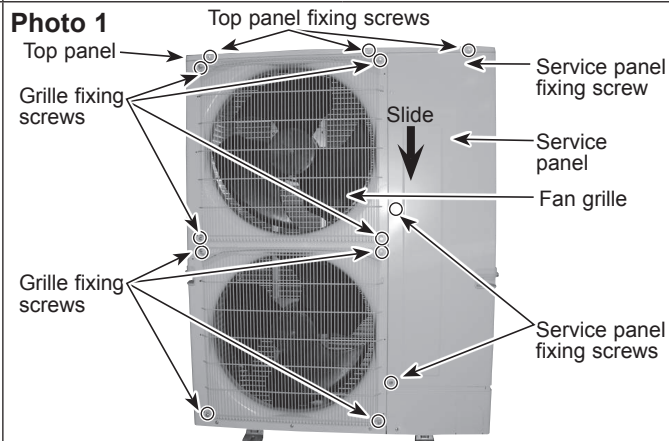
OPERATING PROCEDURE

1. Removing the service panel and top panel

- (1) Remove 3 service panel fixing screws (5 × 12) and slide the hook on the right downward to remove the service panel.
- (2) Remove screws (2 for front, 3 for rear/5 × 12) of the top panel and remove it.

PHOTOS/FIGURES

Photo 1



2. Removing the fan motor (MF1, MF2)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove 4 fan grille fixing screws (5 × 12) to detach the fan grille. (See Photo 1)
- (4) Remove a nut (for right handed screw of M6) to detach the propeller. (See Photo 2)
- (5) Disconnect the connectors, CNF1 and CNF2 on multi controller circuit board in electrical parts box.
- (6) Remove 4 fan motor fixing screws (5 × 20) to detach the fan motor. (See Photo 3)

Note: Tighten the propeller fan with a torque of 5.7 ± 0.3 N·m [4.2 ± 0.2 ft = lbs]

Photo 2

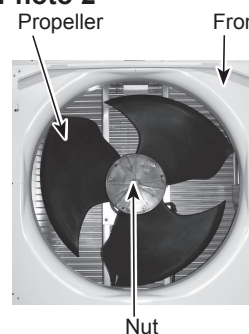
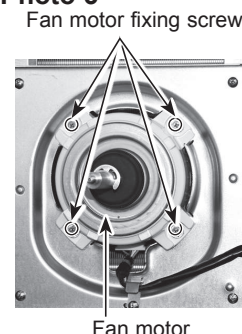


Photo 3



3. Removing the electrical parts box

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Disconnect the connecting wire from terminal block.
- (4) Remove all the following connectors from multi controller circuit board;

<Diagram symbol in the connector housing>

- Fan motor (CNF1, CNF2)
- Thermistor <HIC pipe> (TH2)
- Thermistor <Outdoor liquid pipe> (TH3)
- Thermistor <Compressor> (TH4)
- Thermistor <Suction pipe/Ambient, Outdoor> (TH7/6)
- High pressure switch (63H)
- High pressure sensor (63HS)
- Low pressure sensor (63LS)
- 4-way valve (21S4)
- Bypass valve (SV1)
- Electronic expansion valve (LEV-A, LEV-B)

Pull out the disconnected wire from the electrical parts box.

- (5) Remove the terminal cover and disconnect the compressor lead wire from the comp. terminal. (See Figure 1)

Note: The terminal cover can be easily removed by using a blade of flathead screwdriver.

Figure 1

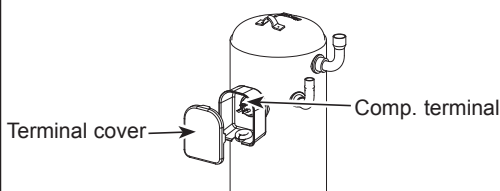
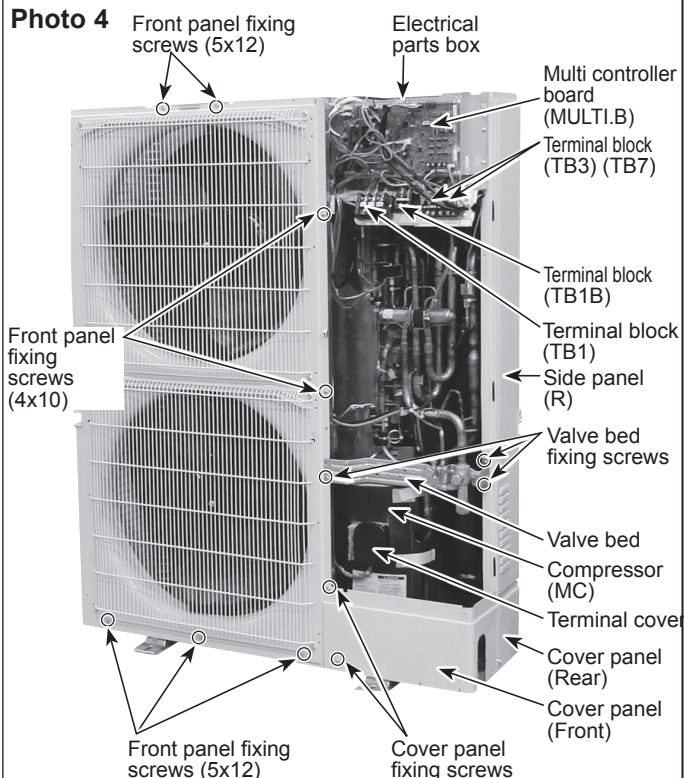
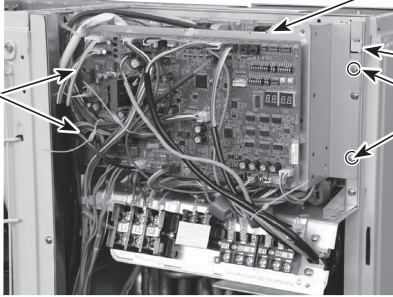
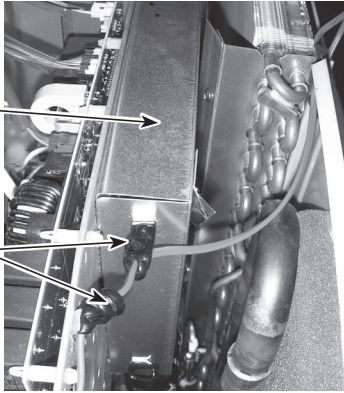
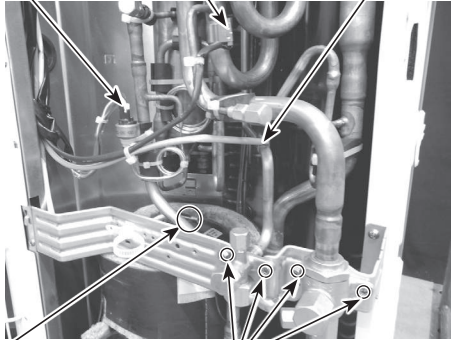
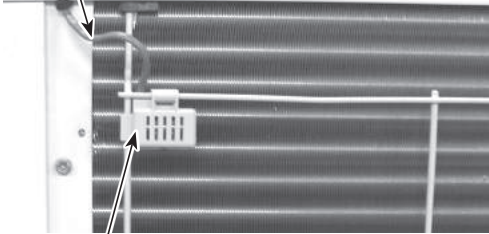


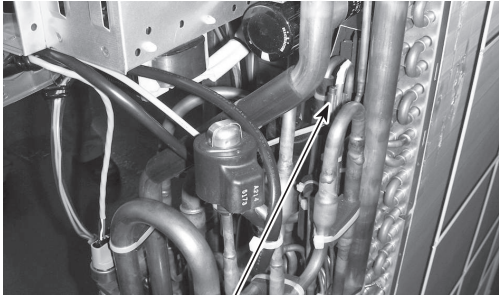
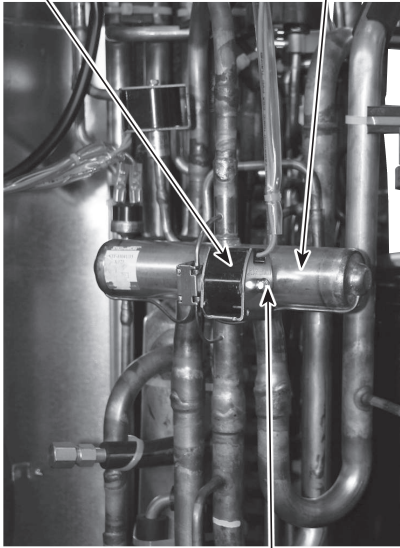
Photo 4

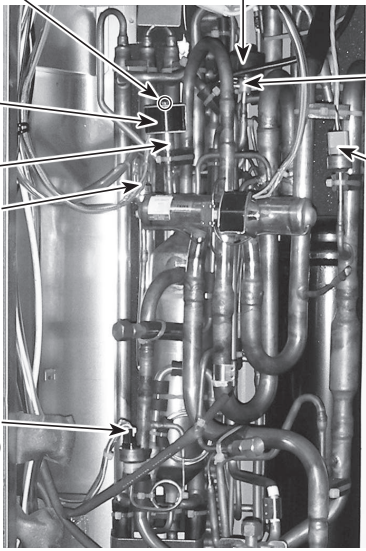
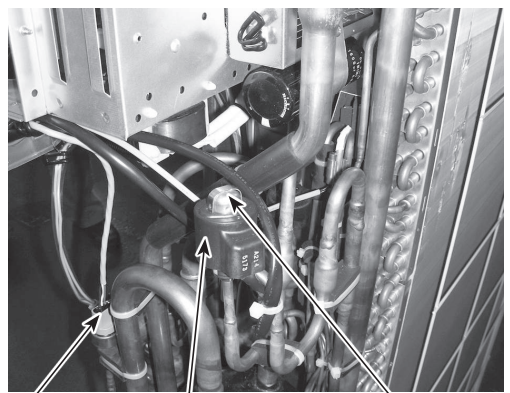


From the previous page.

OPERATING PROCEDURE	PHOTOS/FIGURES
<p>(6) Remove 2 electrical parts box fixing screws (4 × 10) and detach the electrical parts box by pulling it upward. The electrical parts box is fixed with 2 hooks on the left and 1 hook on the right.</p>	<p>Photo 5</p>  <p>Electrical parts box</p> <p>Hook</p> <p>Electrical parts box fixing screws</p> <p>Hooks</p>
<p>4. Removing the thermistor <Suction pipe> (TH6)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connector, TH7/6 (red), on the Multi controller circuit board in the electrical parts box. (4) Loosen the wire clamps on top of the electrical parts box. (5) Pull out the thermistor <Suction pipe> (TH6) from the sensor holder. <p>Note: When replacing thermistor <Suction pipe> (TH6), replace it together with thermistor <Ambient> (TH7) since they are combined together. Refer to procedure No.5 below to remove thermistor <Ambient> (TH7).</p>	<p>Photo 6</p>  <p>Electrical parts box</p> <p>Clamps</p> <p>Photo 7</p>  <p>High pressure sensor (63HS)</p> <p>Thermistor <Suction pipe> (TH6)</p> <p>Thermistor <HIC pipe> (TH2)</p> <p>Thermistor <Compressor> (TH4)</p> <p>Ball valve and stop valve fixing screws</p>
<p>5. Removing the thermistor <Ambient> (TH7)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connector TH7/6 (red) on the multi controller circuit board in the electrical parts box. (4) Loosen the wire clamps on top of the electrical parts box. (See Photo 6) (5) Pull out the thermistor <Ambient> (TH7) from the sensor holder. <p>Note: When replacing thermistor <Ambient> (TH7), replace it together with thermistor <Suction pipe> (TH6), since they are combined together. Refer to procedure No.4 above to remove thermistor <Suction pipe> (TH6).</p>	<p>Photo 8</p>  <p>Lead wire of thermistor <Ambient> (TH7)</p> <p>Sensor holder</p>



OPERATING PROCEDURE	PHOTOS/FIGURES
<p>6. Removing the thermistor <Outdoor liquid pipe> (TH3) and thermistor <Compressor> (TH4), thermistor <HIC pipe> (TH2)</p> <ol style="list-style-type: none">(1) Remove the service panel. (See Photo 1)(2) Disconnect the connectors, TH3 (white) and TH4 (white), TH2 (black) on the multi controller circuit board in the electrical parts box.(3) Loosen the clamp for the lead wire in the rear of the electrical parts box.(4) Pull out the thermistor <Outdoor liquid pipe> (TH3) and thermistor <Compressor> (TH4) from the sensor holder. (See Photo 7 and 9)	<p>Photo 9</p>  <p>Thermistor <Outdoor liquid pipe> (TH3)</p>
<p>7. Removing the 4-way valve coil (21S4)</p> <ol style="list-style-type: none">(1) Remove the service panel. (See Photo 1) <p>[Removing the 4-way valve coil]</p> <ol style="list-style-type: none">(2) Remove 4-way valve coil fixing screw (M5 × 7).(3) Remove the 4-way valve coil by sliding the coil toward you.(4) Disconnect the connector 21S4 (green) on the multi controller circuit board in the electrical parts box.	<p>Photo 10</p>  <p>4-way valve coil (21S4) 4-way valve</p> <p>4-way valve coil fixing screw</p>
<p>8. Removing the 4-way valve</p> <ol style="list-style-type: none">(1) Remove the service panel. (See Photo 1)(2) Remove the top panel. (See Photo 1)(3) Remove the electrical parts box. (See Photo 5)(4) Remove 3 valve bed fixing screws (4 × 10) and 4 ball valve and stop valve fixing screws (5 × 16) and then remove the valve bed. (See Photo 4 and 7)(5) Remove 2 cover panel fixing screws (5 × 12), then slide the cover panel (front) upward to remove it. (The cover panel (front) is fixed to the cover panel (rear) with a hook on the rear side. (See Photo 4)(6) Remove the cover panel (rear) fixing screws (2 for right side and 2 for rear/ 5 × 12), then slide the cover panel (rear) upward to remove it. (See Photo 4) (The cover panel (rear) is fixed to the side panel (R) with 2 screws.)(7) Remove 3 side panel (R) fixing screws (5 × 12) in the rear of the unit, then slide the side panel (R) upward to remove it. (The side panel (R) is fixed to the side plate with hooks on the rear side.)(8) Remove the 4-way valve coil. (See Photo 10)(9) Recover refrigerant.(10) Remove the welded part of 4-way valve. <p>Note:</p> <ol style="list-style-type: none">1. Recover refrigerant without spreading it in the air.2. The welded part can be removed easily by removing the side panel (R).3. When installing the four-way valve, cover it with a wet cloth to prevent it from heating (120°C or more), then braze the pipes so that the inside of pipes are not oxidized.	

OPERATING PROCEDURE	PHOTOS/FIGURES
<p>9. Removing bypass valve coil (SV1) and bypass valve</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the cover panel (front). (Refer to procedure 8 (5)) (4) Remove the cover panel (rear). (Refer to procedure 8 (6)) (5) Remove the side panel (R). (Refer to procedure 8 (7)) (6) Remove the bypass valve coil fixing screw (M4 × 6). (7) Remove the bypass valve coil by sliding the coil upward. (8) Disconnect the connector SV1 (gray) on the multi controller circuit board in the electrical parts box. (9) Remove the electrical parts box. (See Photo 5) (10) Recover refrigerant. (11) Remove the welded part of bypass valve. <p>Refer to the notes below.</p>	<p>Photo 11</p> 
<p>10. Removing the high pressure switch (63H) and high pressure sensor (63HS)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the cover panel (front). (Refer to procedure 8 (5)) (4) Remove the cover panel (rear). (Refer to procedure 8 (6)) (5) Remove the side panel (R). (Refer to procedure 8 (7)) (6) Pull out the lead wire of high pressure switch and high pressure sensor. (7) Remove the electrical parts box. (See Photo 5) (8) Recover refrigerant. (9) Remove the welded part of high pressure switch and high pressure sensor. <p>Refer to the notes below.</p>	<p>Photo 12</p> 
<p>11. Removing the low pressure sensor (63LS)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the cover panel (front). (Refer to procedure 8 (5)) (4) Remove the cover panel (rear). (Refer to procedure 8 (6)) (5) Remove the side panel (R). (Refer to procedure 8 (7)) (6) Disconnect the connector 63LS (blue) on the multi controller circuit board in the electrical parts box. (7) Remove the electrical parts box. (See Photo 5) (8) Recover refrigerant. (9) Remove the welded part of low pressure sensor. <p>Refer to the notes below.</p>	<p>Notes:</p> <ol style="list-style-type: none"> 1. Recover refrigerant without spreading it in the air. 2. The welded part can be removed easily by removing the side panel (R). 3. When installing the following parts, cover it with a wet cloth to prevent it from heating as the temperature below, then braze the pipes so that the inside of pipes are not oxidized; <ul style="list-style-type: none"> • Bypass valve (procedure 9), 248°F [120°C] or more • High pressure switch and high pressure sensor (procedure 10), 212°F [100°C] or more • Low pressure sensor (procedure 11), 212°F [100°C] or more • LEV (procedure 12), 248°F [120°C] or more
<p>12. Removing electrical expansion valve (LEV-A, LEV-B)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the cover panel (front). (Refer to procedure 8 (5)) (4) Remove the cover panel (rear). (Refer to procedure 8 (6)) (5) Remove the side panel (R). (Refer to procedure 8 (7)) (6) Remove the electrical expansion valve coil. (See Photo 11,12) (7) Remove the electrical parts box. (See Photo 5) (8) Recover refrigerant. (9) Remove the welded part of electrical expansion valve. <p>Refer to the notes on the right.</p>	

OPERATING PROCEDURE

13. Removing the compressor (MC)

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove 2 front cover panel fixing screws (5 × 12) and remove the front cover panel. (See Photo 4)
- (4) Remove front panel fixing screws, 5 (5 × 12) and 2 (4 × 10) and remove the front panel. (See Photo 4)
- (5) Remove 4 back cover panel fixing screws (5 × 12) and remove the back cover panel.
- (6) Remove the electrical parts box. (See Photo 5)
- (7) Remove the valve bed. (Refer to procedure 8 (4))
- (8) Remove 3 separator fixing screws (4 × 10) and remove the separator. (See Figure 2)
- (9) Recover refrigerant.
- (10) Remove the 3 compressor fixing nuts for motor using spanner or adjustable wrench.
- (11) Remove the welded pipe of motor for compressor inlet and outlet and then remove the compressor.

Note: Recover refrigerant without spreading it in the air.

PHOTOS/FIGURES

Photo 14

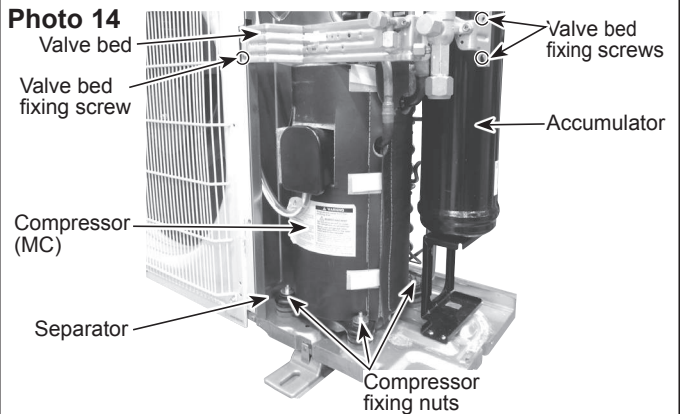
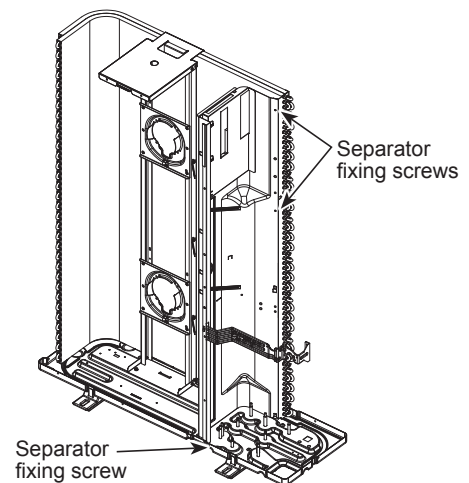


Figure 2



14. Removing the accumulator

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the front cover panel. (Refer to procedure 13 (3))
- (4) Remove the back cover panel. (Refer to procedure 13 (5))
- (5) Remove the side panel (R). (Refer to procedure 8 (7))
- (6) Remove the electrical parts box. (See Photo 5)
- (7) Remove the valve bed. (Refer to procedure 8 (4))
- (8) Recover refrigerant.
- (9) Remove 2 welded pipes of accumulator inlet and outlet.
- (10) Remove 2 accumulator leg fixing screws (4 × 10). (See Photo 16)

Note: Recover refrigerant without spreading it in the air.

Photo 15

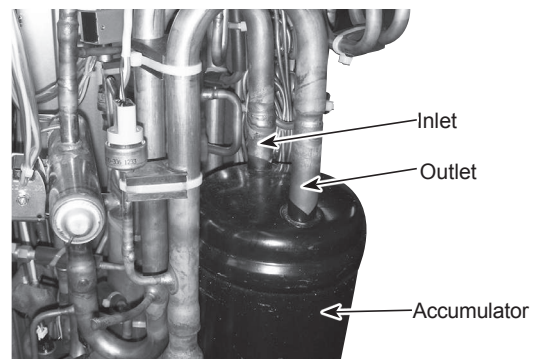
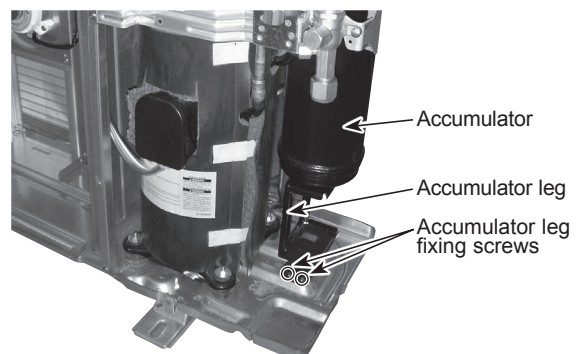
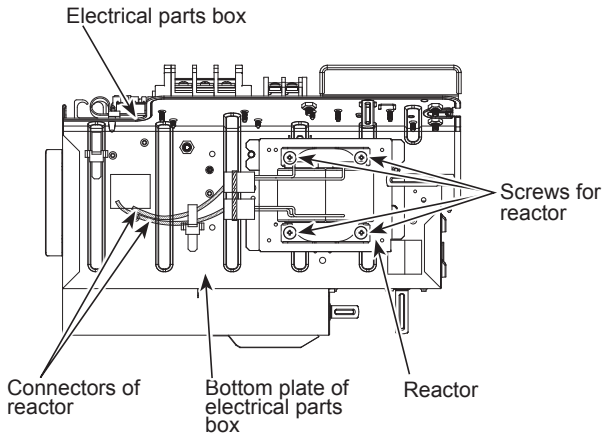


Photo 16



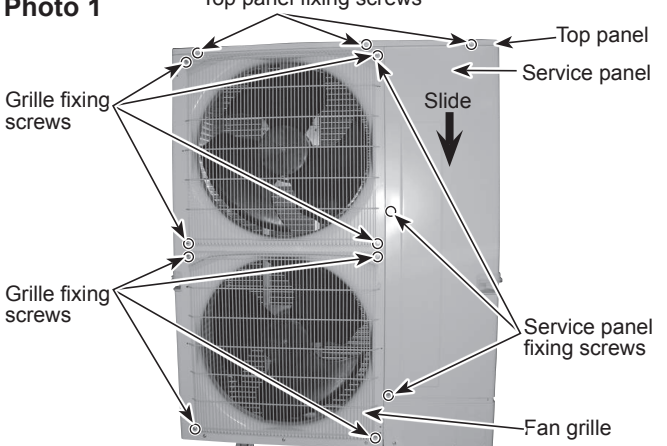
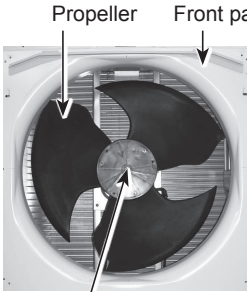
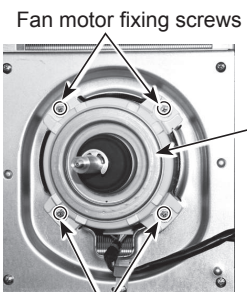
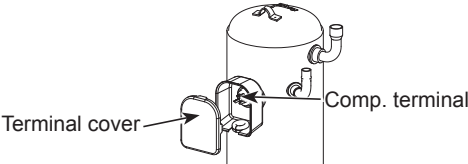
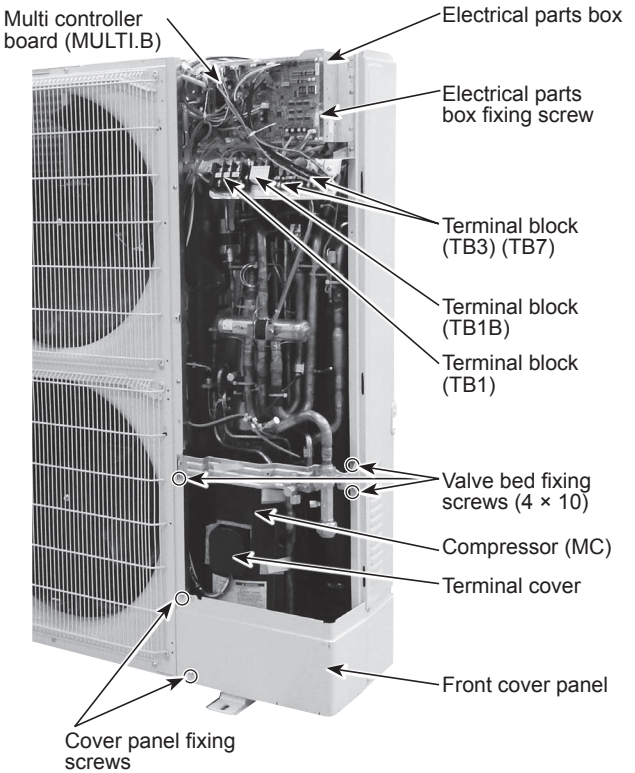


OPERATING PROCEDURE	PHOTOS/FIGURES
<p>15. Removing the reactor (DCL)</p> <ul style="list-style-type: none">(1) Remove the service panel. (See Photo 1)(2) Remove the top panel. (See Photo 1)(3) Remove the electrical parts box (See photo 5)(4) Remove 4 screws for reactor (4 x 10) to remove the reactor. (See Figure 3)	<p>Figure 3</p>  <p>The diagram shows a side view of the reactor assembly. At the top, there is a rectangular 'Electrical parts box'. Below it, on the left, are 'Connectors of reactor'. A 'Bottom plate of electrical parts box' is located at the base of the assembly. The 'Reactor' itself is a large, rectangular component in the center. Four 'Screws for reactor' are shown securing the reactor to the bottom plate. Arrows point from each label to its corresponding part in the diagram.</p>

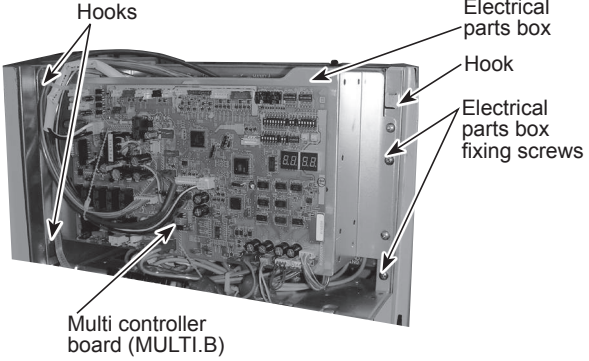
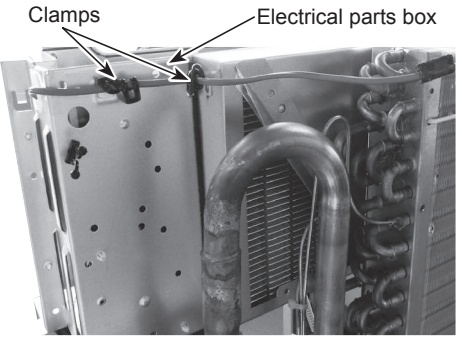
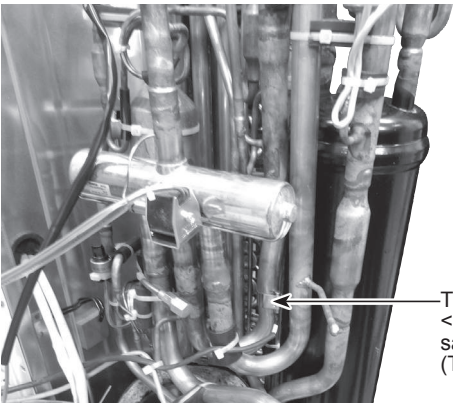
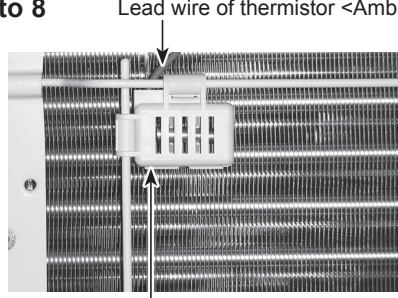
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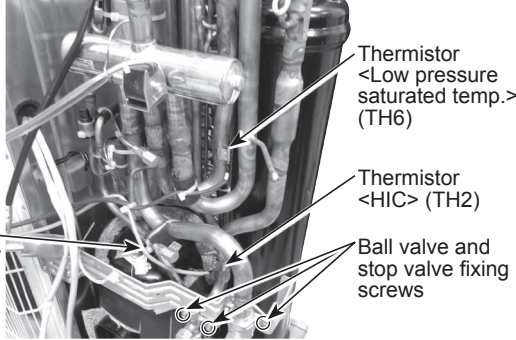
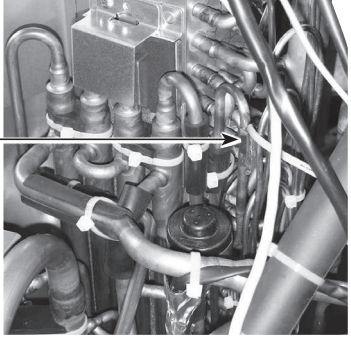
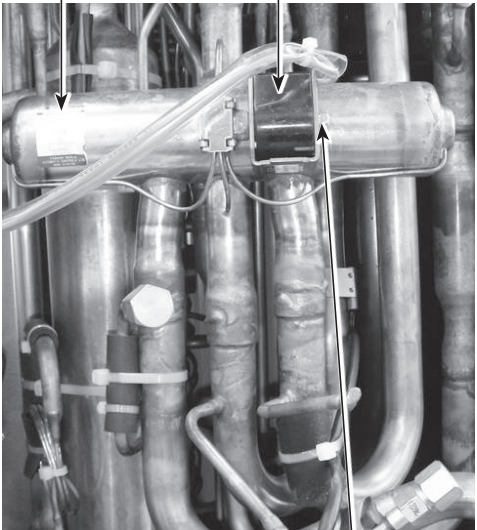
Note: Turn OFF the power supply before disassembly.

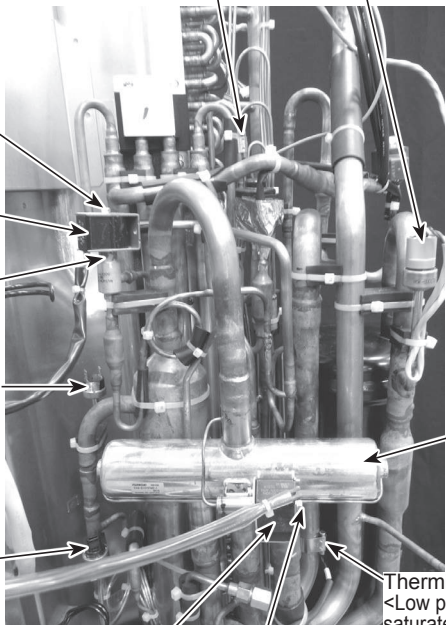
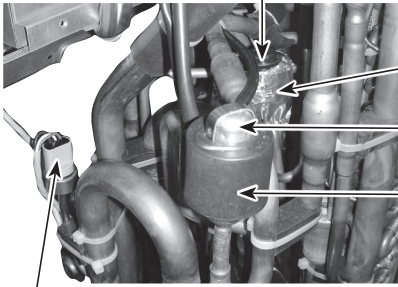
→ : Indicates the visible parts in the photos/figures.

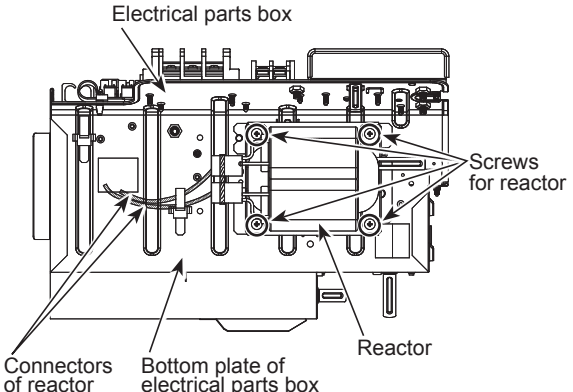
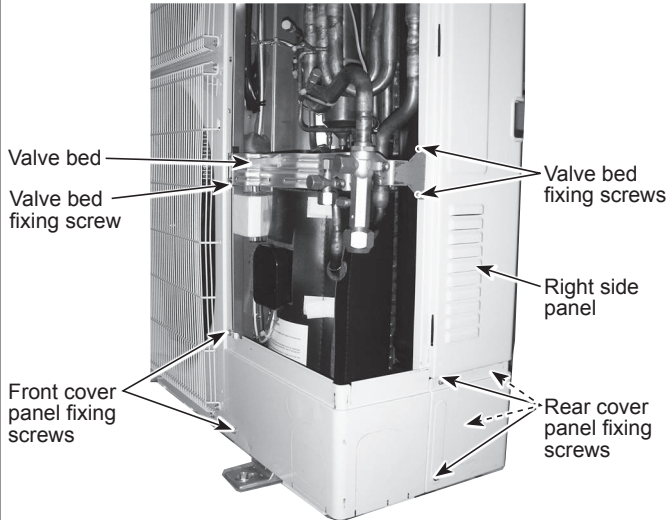
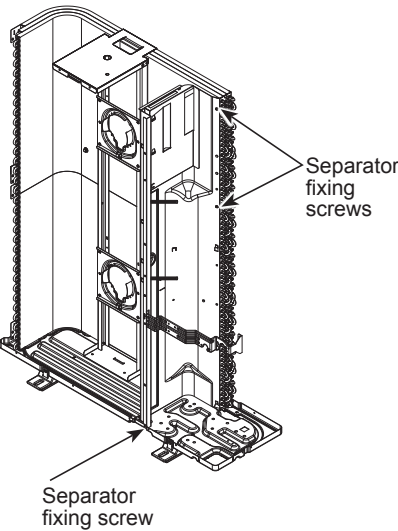
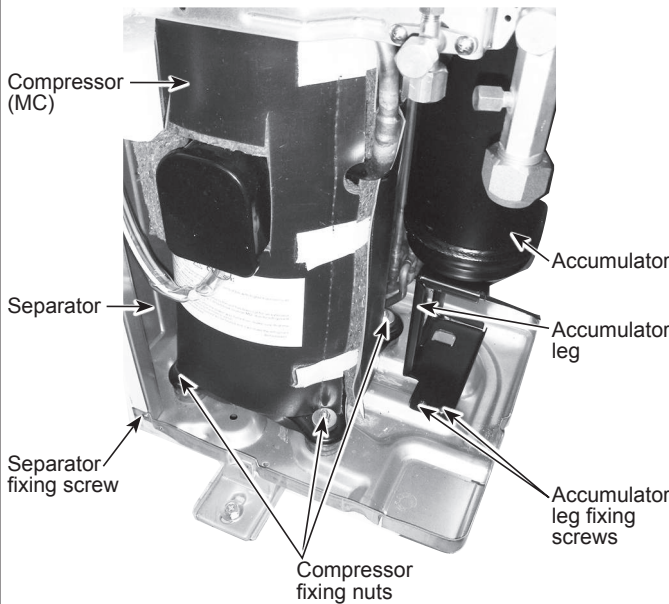
OPERATING PROCEDURE	PHOTOS/FIGURES
<p>1. Removing the service panel and top panel</p> <ol style="list-style-type: none"> (1) Remove 3 service panel fixing screws (5 × 12) and slide the hook on the right downward to remove the service panel. (2) Remove screws (2 for front, 3 for rear/5 × 12) of the top panel and remove it. 	<p>Photo 1</p> 
<p>2. Removing the fan motor (MF1, MF2)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove 4 fan grille fixing screws (5 × 12) to detach the fan grille. (See Photo 1) (3) Remove a nut (for right handed screw of M6) to detach the propeller. (See Photo 2) (4) Disconnect the connectors, CNF1 and CNF2 on multi controller board in electrical parts box. (5) Remove 4 fan motor fixing screws (5 × 20) to detach the fan motor. (See Photo 3) <p>Note: Tighten the propeller fan with a torque of 5.7 ± 0.3 N·m [4.2 ± 0.2 ft = lbs]</p>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="839 778 1141 1134"> <p>Photo 2</p>  </div> <div data-bbox="1141 778 1508 1134"> <p>Photo 3</p>  </div> </div>
<p>3. Removing the electrical parts box</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connecting wire from terminal block. (See Photo 5) (4) Remove all the following connectors from outdoor multi controller circuit board; <Diagram symbol in the connector housing> <ul style="list-style-type: none"> • Fan motor (CNF1, CNF2) • Thermistor <HIC pipe> (TH2) • Thermistor <Outdoor liquid pipe> (TH3) • Thermistor <Compressor> (TH4) • Thermistor <Suction pipe/Ambient, Outdoor> (TH7/6) • High pressure switch (63H) • High pressure sensor (63HS) • Low pressure sensor (63LS) • 4-way valve (21S4) • Bypass valve (SV1) • Electronic expansion valve (CNLVA/CNLVB) (5) Pull out the disconnected wire from the electrical parts box. (5) Remove the terminal cover and disconnect the compressor lead wire. <p>Note: The terminal cover can be easily removed by using a blade of flathead screwdriver.</p> <p>Figure 1</p> 	<p>Photo 4</p> 

From the previous page.

OPERATING PROCEDURE	PHOTOS/FIGURES
<p>(6) Remove 2 electrical parts box fixing screws (4 × 10) then detach the electrical parts box by pulling it upward. The electrical parts box is fixed with 2 hooks on the left and 1 hook on the right.</p>	<p>Photo 5</p>  <p>Hooks</p> <p>Electrical parts box</p> <p>Hook</p> <p>Electrical parts box fixing screws</p> <p>Multi controller board (MULTI.B)</p>
<p>4. Removing the thermistor <Suction pipe> (TH6)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connectors, TH7/6 (red), on the multi controller circuit board in the electrical parts box. (4) Loosen the wire clamps on the back of electrical parts box. (5) Pull out the thermistor <Suction pipe> (TH6) from the sensor holder. <p>Note: When replacing thermistor <Suction pipe> (TH6), replace it together with thermistor <Ambient> (TH7) since they are combined together. Refer to procedure No.5 below to remove thermistor <Ambient> (TH7).</p>	<p>Photo 6</p>  <p>Clamps</p> <p>Electrical parts box</p>
<p>5. Removing the thermistor <Ambient> (TH7)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connector TH7/6 (red) on the multi controller circuit board in the electrical parts box. (4) Loosen the wire clamps on top of the electrical parts box. (See Photo 6.) (5) Pull out the thermistor <Ambient> (TH7) from the sensor holder. <p>Note: When replacing thermistor <Ambient> (TH7), replace it together with thermistor <Suction pipe> (TH6), since they are combined together. Refer to procedure No.4 above to remove thermistor <Suction pipe> (TH6).</p>	<p>Photo 7</p>  <p>Thermistor <Low pressure saturated temp.> (TH6)</p> <p>Photo 8</p>  <p>Lead wire of thermistor <Ambient> (TH7)</p> <p>Sensor holder</p>

OPERATING PROCEDURE	PHOTOS/FIGURES
<p>6. Removing the thermistors</p> <p>Thermistor <HIC> (TH2) and thermistor <Compressor> (TH4)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Disconnect the connectors, TH2 (black) and TH4 (white), on the multi controller board in the electrical parts box. (3) Pull out the thermistor <HIC> (TH2) and thermistor <Compressor> (TH4) from the sensor holder. (See Photo 9-1) <p>Thermistor <Outdoor pipe> (TH3)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Disconnect the connector, TH3 (white), on the Multi controller board in the electrical parts box. (3) Loosen the clamp for the lead wire on the bottom of the electrical parts box. (4) Pull out the thermistor <Outdoor pipe> (TH3) from the sensor holder. (See Photo 9-2) 	<p>Photo 9-1</p>  <p>Photo 9-2</p> 
<p>7. Removing the 4-way valve coil (21S4)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) <p>[Removing the 4-way valve coil]</p> <ol style="list-style-type: none"> (2) Remove 4-way valve coil fixing screw (M4 × 6). (3) Remove the 4-way valve coil by sliding the coil toward you. (4) Disconnect the connector 21S4 (green) on the multi controller circuit board in the electrical parts box. 	<p>Photo 10</p> 
<p>8. Removing the 4-way valve</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the electrical parts box (See Photo 5) (4) Remove 3 valve bed fixing screws (4 × 10) and 4 ball valve and stop valve fixing screws (5 × 16), then remove the valve bed. (See Photo 4) (5) Remove 2 cover panel fixing screws (5 × 12), then slide the cover panel (front) upward to remove it. (The cover panel (front) is fixed to the cover panel (rear) with a hook on the rear side. (See Photo 4)) (6) Remove the cover panel (rear) fixing screws (2 for right side and 2 for rear/ 5 × 12), then slide the cover panel (rear) upward to remove it. (See Photo 4) (The cover panel (rear) is fixed to the side panel (R) with 2 screws.) (7) Remove 3 side panel (R) fixing screws (5 × 12) in the rear of the unit, then slide the side panel (R) upward to remove it. (The side panel (R) is fixed to the side plate with hooks on the rear side.) (8) Remove the 4-way valve coil. (See Photo 10) (9) Recover refrigerant. (10) Remove the welded part of 4-way valve. <ol style="list-style-type: none"> 1. Recover refrigerant without spreading it in the air. 2. The welded part can be removed easily by removing the right side panel. 3. When installing the four-way valve, cover it with a wet cloth to prevent it from heating 248°F (120°C) or more, then braze the pipes so that the inside of pipes are not oxidized. 	

OPERATING PROCEDURE	PHOTOS/FIGURES
<p>9. Removing bypass valve coil (SV1) and bypass valve</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the cover panel (front). (Refer to procedure 8(5)) (4) Remove the cover panel (rear) (Refer to procedure 8(6)) (5) Remove the side panel (R). (Refer to procedure 8 (7)) (6) Remove the bypass valve coil fixing screw (M4 × 6). (7) Remove the bypass valve coil by sliding the coil upward. (8) Disconnect the connector SV1 (gray) on the multi controller circuit board in the electrical parts box. (9) Remove the electrical parts box. (See Photo 5) (10) Recover refrigerant. (11) Remove the welded part of bypass valve. <p>Refer to the notes below.</p>	<p>Photo 11</p> 
<p>10. Removing the high pressure switch (63H) and high pressure sensor (63HS)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the cover panel (front). (Refer to procedure 8(5)) (4) Remove the cover panel (rear) (Refer to procedure 8(6)) (5) Remove the side panel (R). (Refer to procedure 8 (7)) (6) Pull out the lead wire of high pressure switch and high pressure sensor. (7) Remove the electrical parts box. (See Photo 5) (8) Recover refrigerant. (9) Remove the welded part of high pressure switch and high pressure sensor. <p>Refer to the notes below.</p>	<p>Photo 12</p> 
<p>12. Removing electronic expansion valve (LEV-A, LEV-B)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the cover panel (front). (Refer to procedure 8(5)) (4) Remove the cover panel (rear) (Refer to procedure 8(6)) (5) Remove the side panel (R). (Refer to procedure 8 (7)) (6) Remove the electronic expansion valve coil. (See Photo 12) (7) Remove the electrical parts box. (See Photo 5) (8) Recover refrigerant. (9) Remove the welded part of electronic expansion valve. 	<p>Notes:</p> <ol style="list-style-type: none"> 1. Recover refrigerant without spreading it in the air. 2. The welded part can be removed easily by removing the right side panel. 3. When installing the following parts, cover it with a wet cloth to prevent it from heating as the temperature below, then braze the pipes so that the inside of pipes are not oxidized; <ul style="list-style-type: none"> • Bypass valve (procedure 9), 248°F [120°C] or more • High pressure switch and high pressure sensor (procedure 10), 212°F [100°C] or more • Low pressure sensor (procedure 11), 100°C or more • LEV (procedure 12), 248°F [120°C] or more

OPERATING PROCEDURE	PHOTOS/FIGURES
<p>13. Removing the reactor (DCL)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the electrical parts box (See photo 5) (4) Remove 4 screws for reactor (4 x 10) to remove the reactor. (See Figure 2) 	<p>Figure 2</p>  <p>This diagram shows the internal components of the reactor assembly. Labels include: Electrical parts box, Connectors of reactor, Bottom plate of electrical parts box, Reactor, and Screws for reactor. Arrows point to the four screws that hold the reactor in place.</p>
<p>14. Removing the compressor (MC)</p> <ol style="list-style-type: none"> (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the electrical parts box. (See Photo 5) (4) Remove the valve bed. (Refer to procedure 8 (4)) (5) Remove the cover panel (front). (Refer to procedure 8(5)) (6) Remove the cover panel (rear) (Refer to procedure 8(6)) (7) Remove the side panel (R). (Refer to procedure 8 (7)) (8) Remove front panel fixing screws, 5 (5x12) and 2 (4 x 10) and remove the front panel. (See Photo 4) (9) Remove 3 separator fixing screws (4 × 10) and remove the separator. (See Figure 3) (10) Recover refrigerant. (11) Remove the 3 compressor fixing nuts using spanner or adjustable wrench. (12) Remove the welded pipe of motor for compressor inlet and outlet and then remove the compressor. <p>Note: Recover refrigerant without spreading it in the air.</p>	<p>Photo 13</p>  <p>This photograph shows the compressor assembly with several components labeled: Valve bed, Valve bed fixing screw, Valve bed fixing screws, Right side panel, Front cover panel fixing screws, and Rear cover panel fixing screws. Arrows point to each of these components.</p>
<p>Figure 3</p>  <p>This diagram shows the separator assembly. Labels include: Separator fixing screws and Separator fixing screw. Arrows point to the three screws that hold the separator in place.</p>	<p>Photo 14</p>  <p>This photograph shows the compressor and accumulator assembly. Labels include: Compressor (MC), Separator, Separator fixing screw, Compressor fixing nuts, Accumulator, Accumulator leg, Accumulator leg fixing screws, and Accumulator leg. Arrows point to each of these components.</p>

OPERATING PROCEDURE

15. Removing the accumulator

- (1) Remove the service panel. (See Photo 1)
- (2) Remove the top panel. (See Photo 1)
- (3) Remove the electrical parts box. (See Photo 5)
- (4) Remove the valve bed. (See procedure 8 (4))
- (5) Remove the cover panel (front). (Refer to procedure 8(5))
- (6) Remove the cover panel (rear) (Refer to procedure 8(6))
- (7) Remove the side panel (R). (Refer to procedure 8 (7))
- (8) Recover refrigerant.
- (9) Remove 2 welded pipes of accumulator inlet and outlet.
- (10) Remove 2 accumulator leg fixing screws (4 × 10). (See Photo 16)

Note: Recover refrigerant without spreading it in the air.

PHOTOS/FIGURES

Photo 15

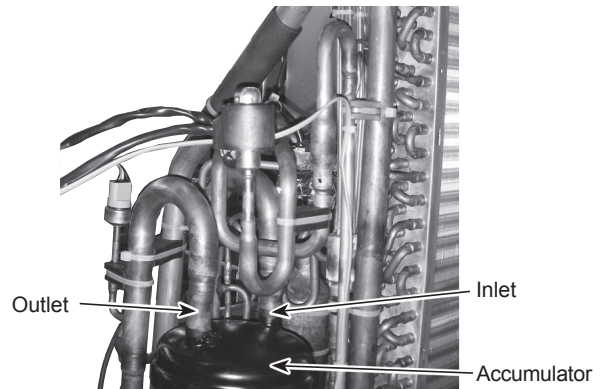
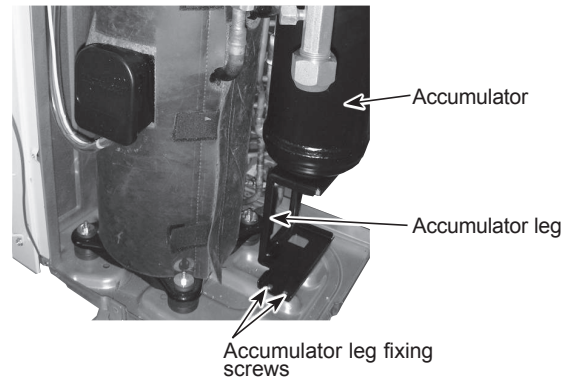


Photo 16



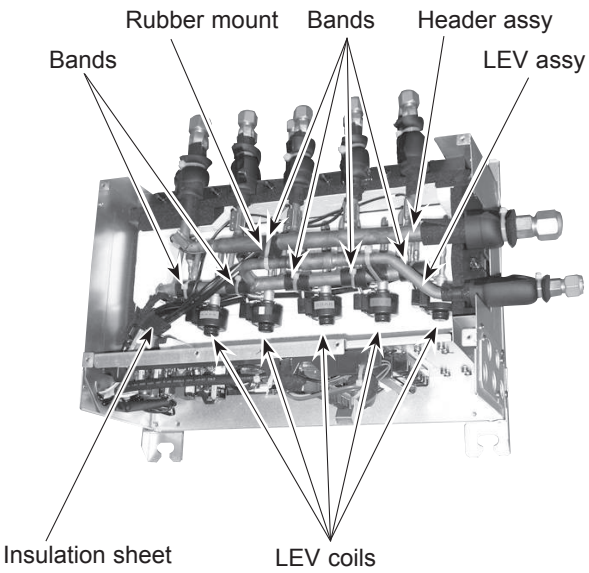
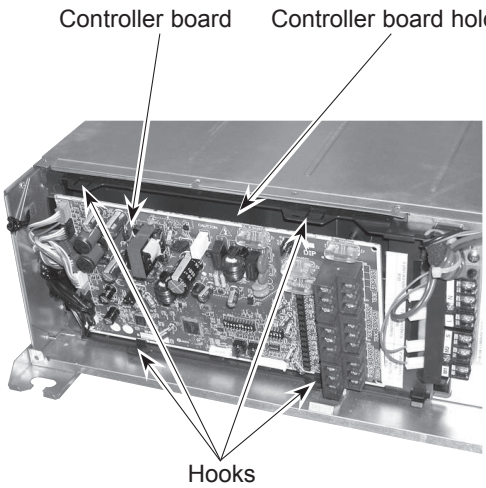
10-2. BRANCH BOX: PAC-MKA50BC PAC-MKA51BC PAC-MKA30BC PAC-MKA31BC

PHOTO: PAC-MKA50/51BC

→ : Indicates the visible parts in the photos/figures.

OPERATING PROCEDURE	PHOTOS/FIGURES
<p>1. Removing the controller cover and under panel</p> <p>(1) Remove 3 controller cover fixing screws (4 × 10) to detach the controller cover. (See Photo 1)</p> <p>(2) Remove 4 under panel fixing screws (4 × 10) to remove the under panel. (See Photo 1)</p>	<p>Photo 1</p>
<p>2. Removing the thermistor (TH-A to E*)</p> <p>(1) Remove the controller cover. (See Photo 1)</p> <p>(2) Remove the under panel. (See Photo 1)</p> <p>(3) Remove 8 insulations, then remove 9 pipe box (under) fixing screws (4 × 10). (See Photo 2-1)</p> <p>(4) Pull out the thermistor(s), TH-A to E, from the sensor holders mounted on the gas pipe. (See Photo 2-2)</p> <p>(5) Loosen the insulation sheet which bundles the thermistor connectors.</p> <p>(6) Loosen the side clamps, then disconnect the connector(s) on the controller board.</p> <p>(7) Pull out the lead wire(s) through the hole to the controller board side.</p> <p>*TH-A to C for PAC-MKA30/31BC. (See Photo 2-3)</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. Attach the insulation sheet to the thermistor(s) and the lead wire(s) of LEV coil after replacing thermistor(s). 2. Install the pipe box not to twine the lead wire(s) and the pipe cover around the pipe box. 	<p>Photo 2-1</p>
<p>Photo 2-3</p>	<p>Photo 2-2</p>



OPERATING PROCEDURE	PHOTOS/FIGURES
<p>3. Removing the LEV coil (LEV-A to E*)</p> <p>(1) Remove the controller cover. (See Photo 1)</p> <p>(2) Remove the under cover. (See Photo 1)</p> <p>(3) Remove 8 insulations, then remove 9 pipe cover fixing screws (4 x 10). (See Photo 2-1)</p> <p>(4) Cut the bands that fixes the lead wire, then pull out the LEV coil(s) (LEV-A to E*). (See Photo 3)</p> <p>(5) Loosen the insulation sheet which bundles the LEV lead wires.</p> <p>(6) Loosen the side clamps, then disconnect the connector(s) on the controller board.</p> <p>(7) Pull out the lead wire(s) through the hole to the pipe box side.</p> <p>(See Photo 2-2 or 2-3)</p> <p>*LEV-A to C for PAC-MKA30/31BC. (See Photo 2-3)</p> <p>Notes:</p> <p>1. Attach the insulation sheet to the thermistor(s) and the lead wire(s) of LEV coil after replacing thermistor(s).</p> <p>2. Install the pipe box not to twine the lead wire(s) and the pipe cover around the pipe box.</p>	<p>Photo 3</p>  <p>Rubber mount Bands Header assy LEV assy</p> <p>Bands</p> <p>Insulation sheet LEV coils</p>
<p>4. Removing the controller board</p> <p>(1) Remove the controller cover. (See Photo 1)</p> <p>(2) Loosen the side clamps, then disconnect the connectors on the controller board.</p> <p>(3) Pick an upper edge of the controller board, then pull forward. The controller board is fixed to the controller board holder with 4 hooks. (See Photo 4)</p> <p>(4) Remove the controller board from the controller board holder.</p>	<p>Photo 4</p>  <p>Controller board Controller board holder</p> <p>Hooks</p>

OPERATING PROCEDURE

5. Removing the LEV assy

- (1) Remove the controller cover. (See Photo 1)
- (2) Remove the under panel. (See Photo 1)
- (3) Remove 8 the insulations, then remove 9 pipe box (under) fixing screws (4 x 10). (See Photo 2-1)
- (4) Loosen the side clamps, then disconnect the LEV and thermistor connectors on the controller board.
- (5) Pull out the lead wires through the hole to the pipe box side.

<Removing the header assy>

- (6) Cut the band which fixes the header assy and LEV assy together, then remove the rubber mount. (See Photo 3)
- (7) Remove the header assy. (See Photo 3)

<Disassembling the pipe box>

- (8) Remove 2 side panel fixing screws (4 x 10). (See Photo 5-1)
- (9) Pull out the pipe box (top) and separate it from the side panel. (See Photo 5-2)
- (10) Turn the pipe box (top) upside down. (See Photo 5-3).
- (11) Remove 5 insulations, then remove 5 pipe box (top) fixing screws (4 x 10).
- (12) Turn the pipe box (top) upside down again, facing the pipe side up.
- (13) Separate the pipe box (center) from the pipe box (top). (See Photo 5-4.)
- (14) Remove the LEV assy.

<Pipe box cap only for PAC-MKA30/31BC>

The pipe box caps are placed in 2 unused pipe holes between the pipe box top, center and under. (See Photo 5-5)

Notes:

1. Attach the insulation sheet to the thermistor(s) and the lead wire(s) of LEV coil after replacing thermistor(s).
2. Install the pipe box not to twine the lead wire(s) and the pipe cover around the pipe box.

Photo 5-4

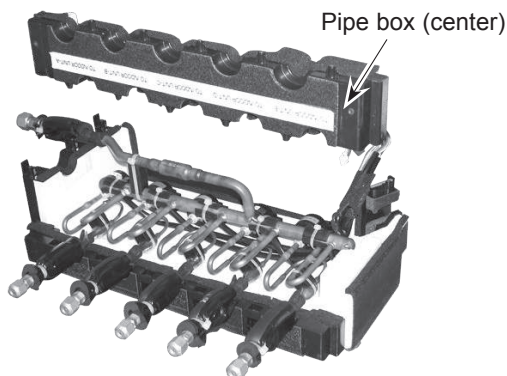
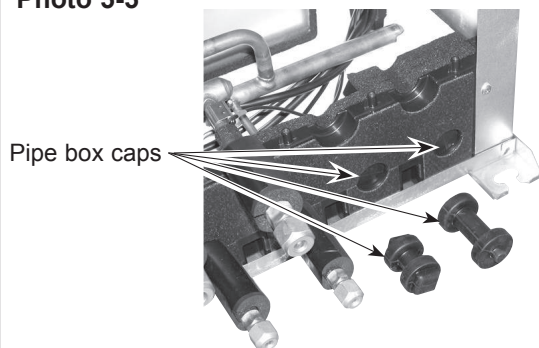


Photo 5-5



PHOTOS/FIGURES

Photo 5-1

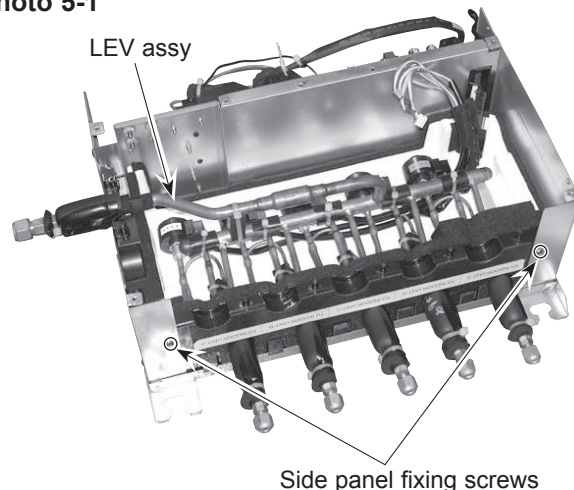


Photo 5-2

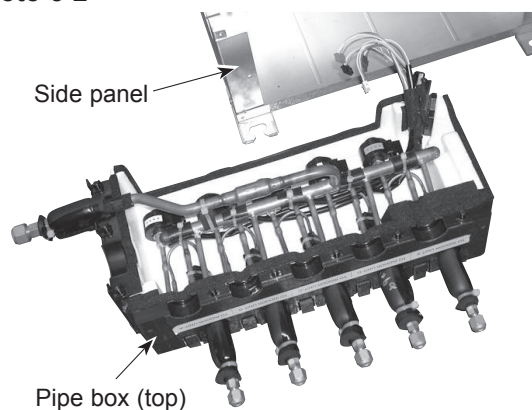
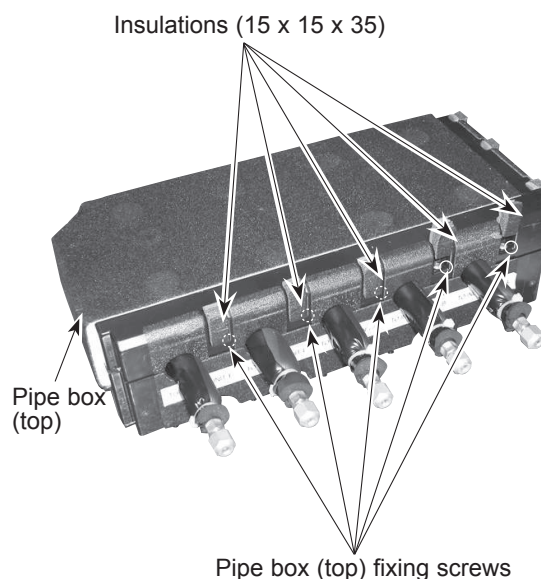


Photo 5-3



mitsubishi ELECTRIC CORPORATION

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