

July 2026

OCH855

REVISED EDITION-B

SERVICE MANUAL

<Outdoor unit>

Model name

PUMY-M200YKM
PUMY-M200YKM-ET

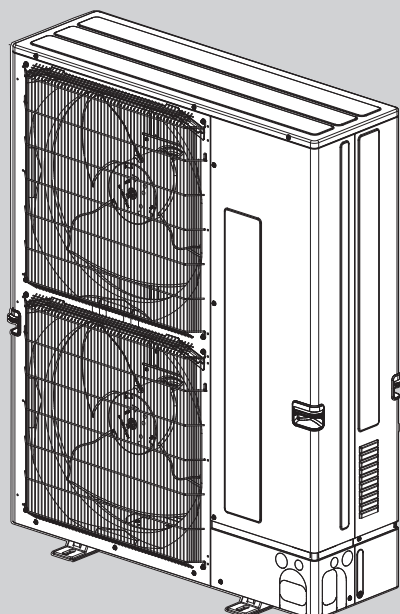
Salt proof model

PUMY-M200YKM-BS
PUMY-M200YKM-ET-BS

Revision:

- Some descriptions have been changed in REVISED EDITION-B.

OCH855A is void.



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Appendix: Installation manual (Excerpt of English Ver.)

PARTS CATALOG (OCB855)

CITY MULTI

1 SERVICE REF.

PUMY-M200YKM.TH
PUMY-M200YKM-ET.TH

PUMY-M200YKM-BS.TH
PUMY-M200YKM-ET-BS.TH

2 SAFETY PRECAUTION

2-1. Always observe for safety

Preparation before the repair service

- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of the air conditioner, turn off the power-supply breaker.
- Discharge the condenser before the work involving the electric parts.

Precautions during the repair service

- Do not perform the work involving the electric parts with wet hands.
- Do not pour water into the electric parts.
- Do not touch the refrigerant.
- Do not touch the hot or cold areas in the refrigerating cycle.
- When the repair or the inspection of the circuit needs to be done without turning off the power, exercise great caution not to touch the live parts.
- When opening or closing the service valve below freezing temperatures, refrigerant may spurt out from the gap between the valve stem and the valve body, resulting in injuries.

2-2. Cautions related to new refrigerant

2-2-1. Cautions for units utilizing refrigerant R32

Use new refrigerant pipes.

- Avoid using thin 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.

Do not use refrigerant other than R32.

- 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 R32 refrigerant.

- The following tools are necessary to use R32 refrigerant.

Tools	
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.
- Servicing shall be performed only as recommended by the manufacturer.

2-2-2. Warning for service

- Do not alter the unit.
- Maintenance, service and repair operations shall be performed by authorized technician with required qualification.
- Servicing shall be performed only by methods recommended by the manufacturer.
- For installation and relocation work, follow the instructions in the Installation Manual and use tools and pipe components specifically made for use with refrigerant specified in the outdoor unit installation manual.
- Ask a dealer or an authorized technician to install, relocate and repair the unit.
- The appliance shall be stored so as to prevent mechanical damage from occurring.
- Be aware that refrigerants might not contain an odour.
- Pipe-work shall be protected from physical damage.
- The installation of pipe-work shall be kept to a minimum.
- Compliance with national gas regulations shall be observed.
- Keep any required ventilation openings clear of obstruction.
- The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- Be sure to have appropriate ventilation in order to prevent ignition. Furthermore, be sure to carry out fire prevention measures that there are no dangerous or flammable objects in the surrounding area.
- Parts shall only be replaced with the one specified by the appliance manufacturer.

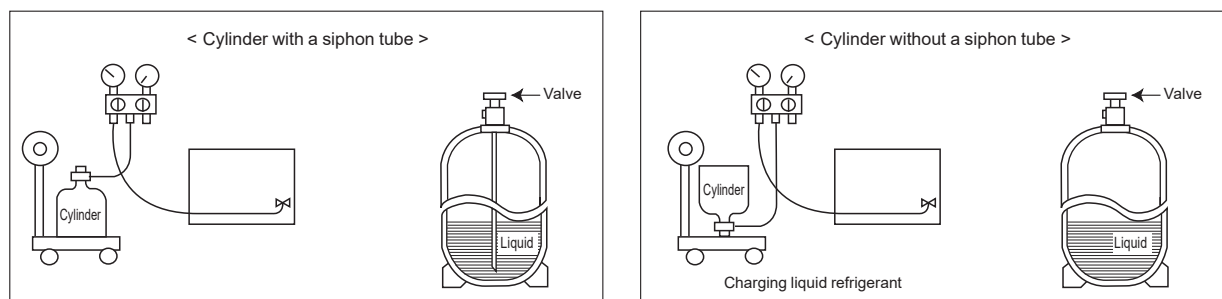
2-2-3. Cautions for service

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

2-2-4. Additional refrigerant charge

When charging directly from cylinder

R32 is a single refrigerant and its composition does not change. Therefore, both liquid charging and gas charging are possible. Liquid charging of refrigerant all at once from the low pressure side may cause the compressor malfunction. Accordingly, make sure that charging is gradual.



2-2-5. Service tools

Use the below service tools as exclusive tools for R32 refrigerant.

No.	Tool name	Specifications
1	Gauge manifold	Only for R32
		Use the existing fitting specifications. (UNF1/2)
		Use high-tension side pressure of 5.3MPa·G or over.
2	Charge hose	Only for R32
		Use pressure performance of 5.09MPa·G or over.
3	Electronic weighing scale	—
4	Gas leak detector	Use the detector for R134a, R407C, R410a or R32.
5	Adaptor for reverse flow check	Attach on vacuum pump.
6	Refrigerant charge base	—
7	Refrigerant cylinder	Only for R32
		Top of cylinder (Pink)
		Cylinder with syphon
8	Refrigerant recovery equipment	—

2-3. Cautions for refrigerant piping work

New refrigerant R32 is adopted for replacement inverter series. Although the refrigerant piping work for R32 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 R32 is 1.6 times higher than that of R22, their sizes of flared sections and flare nuts are different.

■ Thickness of pipes

Because the working pressure of R32 is higher compared to R22, be sure to use refrigerant piping with thickness shown below. (Never use pipes of 0.7 mm or below.)

Piping diameter and thickness

Nominal dimensions (in)	Outside diameter (mm)	Thickness (mm)	
		R32/R410A	R22
1/4	6.35	0.8	0.8
3/8	9.52	0.8	0.8
1/2	12.70	0.8	0.8
5/8	15.88	1.0	1.0
3/4	19.05	—	1.0

■ Dimensions of flare cutting and flare nut

The component molecules in HFC refrigerant are smaller compared to conventional refrigerants. In addition to that, R32 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 R32 has been specified separately from the dimensions for other refrigerants as shown below. The dimension B of flare nut for R32 also has partly been changed to increase strength as shown below. Set copper pipe correctly referring to copper pipe flaring dimensions for R32 below. For 1/2 and 5/8 inch pipes, the dimension B changes. Use torque wrench corresponding to each dimension.



Flare cutting dimensions

Nominal dimensions (in)	Outside diameter (mm)	Dimension A ($\begin{smallmatrix} 0 \\ -0.4 \end{smallmatrix}$) (mm)	
		R32/R410A	R22
1/4	6.35	9.1	9.0
3/8	9.52	13.2	13.0
1/2	12.70	16.6	16.2
5/8	15.88	19.7	19.4
3/4	19.05	—	23.3

Flare nut dimensions

Nominal dimensions (in)	Outside diameter (mm)	Dimension B ($\begin{smallmatrix} 0 \\ -0.4 \end{smallmatrix}$) (mm)	
		R32/R410A	R22
1/4	6.35	17.0	17.0
3/8	9.52	22.0	22.0
1/2	12.70	26.0	24.0
5/8	15.88	29.0	27.0
3/4	19.05	—	36.0

■ Tools for R32 (The following table shows whether conventional tools can be used or not.)

Tools and materials	Use	R32 tools	Can R22 tools be used ?	Can R407C tools be used ?	Can R410A tools be used ?
Gauge manifold	Air purge, refrigerant charge and operation check	Tool exclusive for R32	×	×	○
Charge hose		Tool exclusive for R32	×	×	○
Gas leak detector	Gas leak check	Tool for HFC refrigerant	×	○	○
Refrigerant recovery equipment	Refrigerant recovery	Tool exclusive for R32	×	×	○
Refrigerant cylinder	Refrigerant charge	Tool exclusive for R32	×	×	×
Safety charger	Prevent compressor malfunction when charging refrigerant by spraying liquid refrigerant	Tool exclusive for R32	×	×	○
Charge valve	Prevent gas from blowing out when detaching charge hose	Tool exclusive for R32	×	×	○
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)	△ (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)	△ (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	○	○	○

Tools and materials	Use	R32 tools	Can R22 tools be used ?	Can R407C tools be used ?	Can R410A tools 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 R32	×	–	×

×: Prepare a new tool. (Use the new tool as the tool exclusive for R32.)

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

○: Tools for other refrigerants can be used.

2-4. Cautions for unit using R32 refrigerant

Basic work procedures are the same as those for conventional units using refrigerant R410A. However, pay careful attention to the following points:

1. Information on servicing

1-1. Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating systems, (1-2) to (1-6) shall be completed prior to conducting work on the systems.

1-2. Work procedure

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

1-3. General work area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

1-4. Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

1-5. Presence of fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

1-6. No ignition sources

No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it can lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

1-7. Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

1-8. Checks to the refrigerating equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance. The following checks shall be applied to installations using flammable refrigerants:

- The refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
- The ventilation machinery and outlets are operating adequately and are not obstructed.
- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
- Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which can corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

1-9. Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include that:

- capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- no live electrical components and wiring are exposed while charging, recovering or purging the system;
- there is continuity of earth bonding

2. Sealed electrical components

Sealed electrical components shall not be repaired.

3. Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

4. Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity can be inadequate, or can need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)

Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine can react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to 5. Refrigerant removal and circuit evacuation.

Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0.25 times the maximum allowable pressure. No leak shall be detected.

5. Refrigerant removal and circuit evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose conventional procedures shall be used. However, for flammable refrigerants it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- safely remove refrigerant following local and national regulations
- evacuate
- purge the circuit with inert gas (optional for A2L)
- evacuate (optional for A2L)
- continuously flush with inert gas when using flame to open circuit
- open the circuit

The refrigerant charge shall be recovered into the correct recovery cylinders. The manufacturer shall specify the inert gases that can be used. Compressed air or oxygen shall not be used for purging refrigerant systems.

Purging of the refrigerant circuit shall be achieved by breaking the vacuum in the system with inert gas and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. The system shall be vented down to atmospheric pressure to enable work to take place.

Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

6. Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed:

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already labelled).
- Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leaktested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

7. Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

- Become familiar with the equipment and its operation.
- Isolate system electrically.
- Before attempting the procedure, ensure that:
 - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - all personal protective equipment is available and being used correctly;
 - the recovery process is supervised at all times by a competent person;
 - recovery equipment and cylinders conform to the appropriate standards.
- Pump down refrigerant system, if possible.
- If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- Make sure that cylinder is situated on the scales before recovery takes place.
- Start the recovery machine and operate in accordance with instructions.

- Do not overfill cylinders. (No more than 80 % volume liquid charge).
- Do not exceed the maximum working pressure of the cylinder, even temporarily.
- When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off
- Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

8. Labelling

Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

9. Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is required to follow good practice so that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs. The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. Consult manufacturer if in doubt. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders. If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. Draining of oil from a system shall be carried out safely.

2-5. Precautions for salt-proof type “-BS” model

Although “-BS” model has been designed to be resistant to salt damage, observe the following precautions to maintain the performance of the unit.

- Avoid installing the unit in a location where it will be exposed directly to seawater or sea breeze.
- If the cover panel may become covered with salt, be sure to install the unit in a location where the salt will be washed away by rainwater. (If a sunshade is installed, rainwater may not clean the panel.)
- To ensure that water does not collect in the base of the outdoor unit, make sure that the base is level, not at angle. Water collecting in the base of the outdoor unit could cause rust.
- If the unit is installed in a coastal area, clean the unit with water regularly to remove any salt build-up.
- If the unit is damaged during installation or maintenance, be sure to repair it.
- Be sure to check the condition of the unit regularly.
- Be sure to install the unit in a location with good drainage.

3 OVERVIEW OF UNITS

3-1. System construction

Outdoor unit	Horsepower	8 HP
	Model name	M200
Applicable indoor unit	Capacity class	10 to 140
	Number of units	1 to 12
	Total system capacity range	50 to 130% of outdoor unit capacity

Model name	CMY-Y62-G-E	CMY-Y64-G-E	CMY-Y68-G-E
Number of branches	2	4	8

Connectable indoor unit lineup (Heat pump inverter type)																			
Model type		Model name	Group *		10	15	20	25	32	40	50	63	71	80	100	125	140	200	
			A	B															
Ceiling Cassette	2 by 2	PLFY-MS-VFM-E/ET		✓		●	●	●	●	●	●								
		PLFY-MS-VFM2-E/ET	✓			●	●	●	●	●	●								
	1-way flow	PMFY-MS-VCM-E/ET	✓				●	●	●	●	●								
	4-way flow	PLFY-M-VEM6-E/ET		✓			●	●	●	●	●	●	●	●	●	●			
		PLFY-MS-VEM-E/ET		✓			●	●	●	●	●	●		●	●	●			
		PLFY-MS-VEM2-E/ET	✓				●	●	●	●	●	●		●	●	●			
Ceiling concealed	Low static pressure	PEFY-MS-VMS(L)-A	✓			●	●	●	●	●	●	●							
	Middle static pressure	PEFY-M-VMA(L)-A1(TR)		✓			●	●	●	●	●	●	●	●	●	●	●	●	
		PEFY-MS-VMA(L)-A		✓				●	●	●	●	●	●	●	●	●	●	●	
		PEFY-MS-VMA(L)-A1	✓					●	●	●	●	●	●	●	●	●	●	●	
	High static pressure	PEFY-MS-VMHS-A	✓							●	●	●	●	●	●	●	●	●	
Ceiling suspended		PCFY-MS-VKM-E/ET		✓						●		●			●	●			
		PCFY-MS-VKM2-E/ET	✓							●		●			●	●			
Wall mounted		PKFY-MS-VLM-E/ET		✓	●	●	●	●	●	●	●								
		PKFY-MS-VLM2-E/ET	✓		●	●	●	●	●	●	●								
		PKFY-MS-VKM-E/ET		✓									●			●			
		PKFY-MS-VKM2-E/ET	✓										●			●			

*Group A and Group B indoor units must not be mixed.

*Group B indoor units are not compatible with the functions of automatic address and circuit inspection.

Remote controller	Name	M-NET remote controller	MA remote controller
	Model name	PAR-F27MEA-E, PAR-U02MEDA	PAR-4xMAAB, PAR-4xMAA, PAR-3xMAA ("x" represents 0 or later)
	Functions	- A handy remote controller for use in conjunction with the Melans centralized management system. - Address setting is required.	Address setting is not required.

- Authorized connectable indoor units are as follows;
PEFY-M50VMA-A1 ×4:

3-2. System construction (Branch box system)

Outdoor unit	Horsepower	8 HP
	Model name	M200
Applicable indoor unit	Capacity class	15 to 100
	Number of units	2 to 8
	Total system capacity range	50 to 130% of outdoor unit capacity
		11.2 to 29.1 kW
Branch box that can be connected	Number of units	1 to 2*

* Only 1 unit can be connected to a 6-branch type branch box.

Model	System only				
	Only M, S, P series indoor units (Connection with Branch box)				
	One Branch box		Two Branch boxes		
	4-Branch box × 1	6-Branch box × 1	4-Branch box × 2	4-Branch box × 1 6-Branch box × 1	6-Branch box × 2
PUMY-M200	2-8				Not allowed

Connectable indoor unit lineup (Heat pump inverter type)												
Model type	Model name	15	18	20	22	25	35	42	50	60	71	100
Wall mounted	MSZ-RW-VG(-E1/ER1/ET1)					●	●		●			
	MSZ-RW-VG2					●	●		●			
	MSZ-LN-VG2					●	●		●			
	MSZ-LN-VG3					●	●		●			
	MSZ-AP-VG					●	●	●	●			
	MSZ-AP-VG(K)					●	●	●	●			
	MSZ-AY-VGK(P)					●	●	●	●			
	MSZ-AY-VG(K)(P)2	●		●		●	●	●	●			
	MSZ-EF-VG(-E1/ER1/ET1)		●		●	●	●	●	●			
	MSZ-EF-VG(-E2/ER2/ET2)		●		●	●	●	●	●			
	MSZ-EF-VGK(-E1/ER1/ET1)		●		●	●	●	●	●			
	MSZ-EF-VGK2		●		●	●	●	●	●			
	MSZ-BT-VG(K)			●		●	●					
	MSZ-BT-VG(K)2			●		●	●					
	Compact	MSZ-AP-VG(-E1/ER1/ET1)	●		●							
		MSZ-AP-VG(-E2/ER2/ET2)	●		●							
		MSZ-AP-VGK(-E1/ER1/ET1)	●		●							
Ceiling cassette	1-way flow	MLZ-KY-VG(-E1/ER1/ET1)			●							
		MLZ-KP-VF(-E1/ER1)				●	●		●			
		MLZ-KP-VG				●	●		●			
	2 by 2 type	SLZ-M-FA2(-ET/ER)	●			●	●		●			
		SLZ-M-FA3	●			●	●		●			
	4-way flow	PLA-M-EA2(-ET/ER)					●		●	●	●	●
		PLA-M-EA3					●		●	●	●	●
Ceiling suspended		PCA-M-KA2(-ET/ER)					●		●	●	●	●
		PCA-M-KA3					●		●	●	●	●
Ceiling concealed	Middle static pressure	PEAD-M-JA(L)2(-ET/ER)							●	●	●	●
		PEAD-M-JA(L)3							●	●	●	●
	Compact	SEZ-M-DA(L)2(-ET/ER)					●		●	●	●	
		SEZ-M-DA3					●		●	●	●	

Note:

- The lineup of a connectable indoor unit depends on a district/areas/country.

Branch box	PAC-MMK60BC	PAC-MMK40BC
Number of branches (Connectable indoor unit)	6 (MAX. 6 units)	4 (MAX. 4 units)

Note:

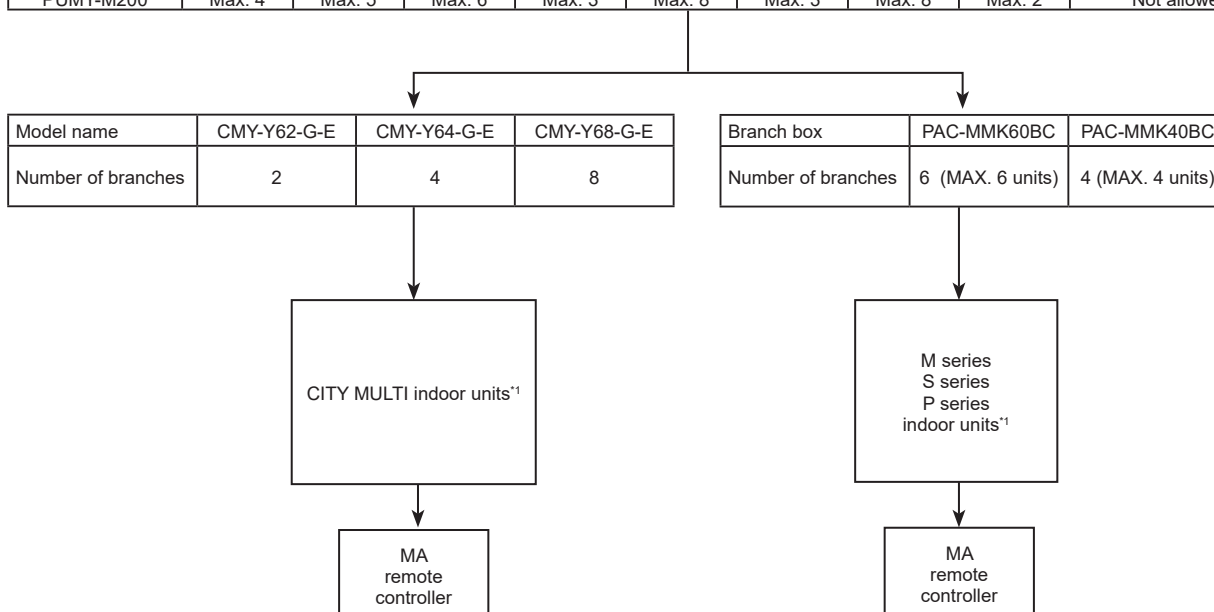
- A maximum of 2 branch boxes can be connected to 1 outdoor unit.

2-branch pipe (joint), optional parts	
Using 1 branch box	Not required
Using 2 branch boxes	Required Connection method: flare (MSDD-50AR2-E) Connection method: brazing (MSDD-50BR-E) Note: Select the appropriate model based on the connection method.
Option	Optional accessories of indoor units and outdoor units are available.

3-3. System construction (Mixed system)

Model	System only
	CITY MULTI indoor units only (Connection without Branch box)
PUMY-M200	1-12

Model	Mixed system									
	One Branch box				Two Branch boxes					
	4-Branch box × 1		6-Branch box × 1		4-Branch box × 2		4-Branch box × 1 6-Branch box × 1		6-Branch box × 2	
	M, S, P	CITY MULTI	M, S, P	CITY MULTI	M, S, P	CITY MULTI	M, S, P	CITY MULTI	M, S, P	CITY MULTI
PUMY-M200	Max. 4	Max. 5	Max. 6	Max. 3	Max. 8	Max. 3	Max. 8	Max. 2	Not allowed	



*1. Refer to "System construction" or "System construction (Branch box system)", for more detail.

3-4. System Specifications

3-4-1. Outdoor Unit

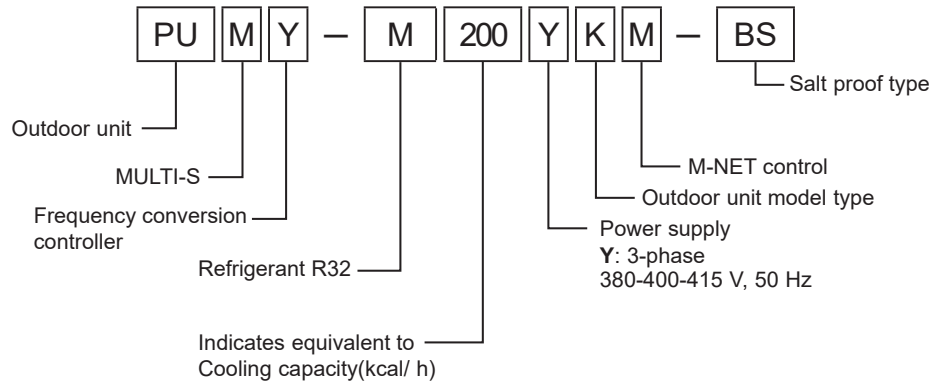
Outdoor unit	Model name	M200
Capacity	Cooling (kW)	22.4
	Heating (kW)	25.0

Cooling/Heating capacity indicates the maximum value at operation under the following condition.

Cooling Indoor: D.B. 27°C/W.B. 19°C
 Outdoor: D.B. 35°C
 Heating Indoor: D.B. 20°C
 Outdoor: D.B. 7°C/W.B. 6°C

3-4-2. Method for identifying MULTI-S model

■ Outdoor unit



3-4-3. Operating temperature range

	Cooling		Heating	
	Branch box (M,S,P series)	CITY MULTI	Branch box (M,S,P series)	CITY MULTI
Indoor intake air temperature	W.B. 15 to 24°C	W.B. 15 to 24°C	D.B. 15 to 27°C	D.B. 15 to 27°C
Outdoor intake air temperature	D.B. 10 to 52°C	D.B. -15 to 52°C *1, *2	D.B. -20 to 21°C W.B. -20 to 15°C	

*1. This is applied when an optional air guide is attached. The guaranteed lowest temperature is normally -5°C.

*2. A guaranteed outdoor lowest temperature is 15°C when the following indoor units are connected: PKFY-*VLM or PKFY-*VKM.

D.B.: Dry Bulb Temperature
 W.B.: Wet Bulb Temperature

4 SPECIFICATIONS

Model					PUMY-M200YKM							
Power source					3-phase 380-400-415 V, 50 Hz;							
Cooling capacity (Nominal) ^{*1}		kW		22.4								
		kcal/h		19,300								
		Btu/h		76,400								
		Power input		kW		7.18						
		Current input		A		11.99		11.39		10.98		
COP		kW/kW		3.12								
Temp. range of cooling		Indoor		W.B.		15 to 24°C ^{*7}						
		Outdoor		D.B.		-5 to 52°C ^{*3}						
Heating capacity (Nominal) ^{*2}		kW		25.0								
		kcal/h		21,500								
		Btu/h		85,300								
		Power input		kW		5.85						
		Current input		A		9.77		9.30		8.95		
COP		kW/kW		4.27								
Temp. range of heating		Indoor		D.B.		17 to 28°C ^{*8}						
		Outdoor		W.B.		-20 to 15°C						
Indoor unit connectable		Total capacity			50 to 130% of outdoor unit capacity							
		Model/ Quantity		CITY MULTI			M/MS10 - M/MS140/12					
				Branch box ^{*4}			M/S/P15 - M/S/P100/8					
				Mixed system		4-Branch box 1 unit		CITY MULTI		M/MMS10-M/MS140/5		
						Branch box		M/S/P15-M/S/P140/4				
						6-Branch box 1 unit		CITY MULTI		M/MS10-M/MS140/3		
				Branch box		M/S/P15-M/S/P140/6						
				4-Branch box 2 unit		CITY MULTI		M/MS10-M/MS140/3				
				Branch box		M/S/P15-M/S/P140/8						
				4-Branch box 1 unit + 6-Branch box 1 unit		CITY MULTI		M/MMS10-M/MS140/2				
Branch box				M/S/P15-M/S/P140/8								
Sound pressure level (SPL) (measured in anechoic room)		dB				Cooling			56			
						Heating		61				
Sound power level (PWL) (measured in anechoic room)		dB				Cooling			74			
						Heating		79				
Refrigerant piping diameter		Liquid pipe		mm (in.)		9.52 (3/8)						
		Gas pipe		mm (in.)		19.05 (3/4)						
Fan		Type × Quantity			Propeller Fan x 2							
		Airflow rate		m³/min		134/135.9						
				L/s		2233/2265						
				cfm		4732/4799						
		Control, Driving mechanism			DC control							
		Motor output		kW		0.20 × 2						
		External static press.			0 Pa							
Compressor		Type × Quantity			Twin rotary hermetic compressor x 1							
		Manufacturer			Mitsubishi Electric Corporation							
		Starting method			Inverter							
		Capacity control		%				Cooling			21 to 100	
								Heating			12 to 100	
		Motor output		kW		5.0						
		Case heater		kW		0						
		Lubricant			FW68CA (1.9 liter)							
External finish					Galvanized Steel Sheet Munsell No. 3Y 7.8/1.1							
External dimension H × W × D		mm		1338 × 1050 × 330 (+40)								
				52-11/16 × 41-11/32 × 13 (+1-10/16)								
Protection devices		High pressure protection			High pressure switch							
		Inverter circuit (COMP/FAN)			Overcurrent detection, Overheat detection (Heat sink thermistor)							
		Compressor			Compressor thermistor, Overcurrent detection							
		Fan motor			Overheating, Voltage protection,							
Refrigerant		Type × original charge			R32 3.0 kg							
		Control			Linear expansion valve							
Net weight		kg (lb)			128 (282) ^{*6}							
Heat exchanger					Cross Fin and Copper tube							
HIC circuit (HIC: Heat Inter-Changer)					HIC circuit							
Defrosting method					Reversed refrigerant circuit							
Standard attachment		Document			Installation Manual							
		Accessory			Grounded lead wire							
Optional parts					Joint: CMY-Y62-G-E, Header: CMY-Y64/68-G-E							

Remarks

- Nominal cooling conditions:
Indoor: 27°C D.B./19°C W.B. [81°F D.B./66°F W.B.]
Outdoor: 35°C D.B. [95°F D.B.]
Pipe length: 7.5 m [24-9/16 ft]
Level difference: 0 m [0 ft]
- Nominal heating conditions:
Indoor: 20°C D.B. [68°F D.B.]
Outdoor: 7°C DB/6°C W.B. [45°F D.B./43°F W.B.]
Pipe length: 7.5 m [24-9/16 ft]
Level difference: 0 m [0 ft]
- 15 to 52°C D.B. [50 to 126°F D.B.], when using an optional air protect guide [PAC-SH95AG-E]
10 to 52°C D.B. when the following indoor units are connected: PCFY or M/S/P series type indoor unit
15 to 52°C D.B. when the following indoor units are connected: PKFY*VLM or PKFY*VKM
- At least two indoor units must be connected when using branch box.
- It is possible to set the external static pressure to 30 Pa by Dip Switch.
- 129 (284), for PUMY-M200YKM-BS
- 15 to 23°C W.B. [59 to 73°F W.B.] when using branch box (M/S/P series)
- 20 to 27°C D.B. [68 to 81°F W.B.] when using branch box (M/S/P series)

Notes:

- Nominal conditions *1, *2 are subject to ISO 15042.
- Due to continuing improvement, above specifications are subject to change without notice.
- See the following for unit conversion: kcal/h = kW × 860, Btu/h = kW × 3,412, cfm = m³/min × 35.31, lb = kg/0.4536
- Above specification data is subject to rounding variation.

5-1. Selection of indoor and outdoor units

5-1-1. Cooling

Design condition		
Outdoor dry bulb temperature		38°C
Total cooling load		19.4 kW
Room 1	Indoor dry bulb temperature	27°C
	Indoor wet bulb temperature	20°C
	Cooling load	9.1 kW
Room 2	Indoor dry bulb temperature	24°C
	Indoor wet bulb temperature	18°C
	Cooling load	10.3 kW
Other	Indoor/Outdoor piping equivalent length	40 m

Capacity of indoor unit

P-FY series	Model class of indoor unit	10	15	—	20	—	25	32	—	40	—	50	—	63	71	80	100	125	140
	Model capacity (kW)	1.2	1.7	—	2.2	—	2.8	3.6	—	4.5	—	5.6	—	7.1	8.0	9.0	11.2	14.0	16.0
M series	Model class of indoor unit	—	15	18	20	22	25	—	35	—	42	50	60	—	71	80	100	—	—
S series	Model capacity (kW)	—	1.5	1.8	2.0	2.2	2.5	—	3.5	—	4.2	5.0	6.0	—	7.1	8.0	10.0	—	—
P series	Model capacity (kW)	—	1.5	1.8	2.0	2.2	2.5	—	3.5	—	4.2	5.0	6.0	—	7.1	8.0	10.0	—	—

■ Cooling calculation

- [illegible]

Note:

- If $CT_x = CT_i$, refer to the calculation formula in "Heating" to calculate the maximum indoor unit capacity of each room.
- Go on to the selection of units for heating after the selection for cooling has successfully completed. If failed, try again until proper units are selected.

5-1-2. Heating

Design condition		
Outdoor wet bulb temperature		2°C
Total heating load		20.4 kW
Room 1	Indoor dry bulb temperature	21°C
	Heating load	9.5 kW
Room 2	Indoor dry bulb temperature	23°C
	Heating load	10.9 kW
Other	Indoor/Outdoor piping equivalent length	40 m

Capacity of indoor unit

P·FY series	Model class of indoor unit	10	15	—	20	—	25	32	—	40	—	50	—	63	71	80	100	125	140
	Model Capacity (kW)	1.4	1.9	—	2.5	—	3.2	4.0	—	5.0	—	6.3	—	8.0	9.0	10.0	12.5	16.0	18.0
M series	Model class of indoor unit	—	15	18	20	22	25	—	35	—	42	50	60	—	71	80	100	—	—
S series	Model Capacity (kW)	—	1.7	2.1	2.3	2.5	2.9	—	4.0	—	4.8	5.7	6.9	—	8.1	9.3	11.2	—	—
P series																			

■ Heating calculation

- Tentative selection of indoor units

Room1: PEFY-P80 10.0 kW (Rated)

Room2: PEFY-P100 12.5 kW (Rated)

In this case, the total capacity is 22.5. (10.0 + 12.5 = 22.5)

- Tentative selection of outdoor unit

Proper outdoor unit in this case is M200 as the total capacity of the indoor units is 22.5.

PUMY-M200 25.0 kW

- Calculation for the corrected capacity of the total indoor units (CTi)

Correction factor for indoor temperature: Room 1 (21°C) 0.96 (Refer to Figure 3.)

Room 2 (23°C) 0.88 (Refer to Figure 3.)

$CTi = \Sigma (\text{Rated capacity of indoor unit} \times \text{Correction factor for indoor temperature})$

$= 10.0 \times 0.96 + 12.5 \times 0.88$

$= 20.6 \text{ kW}$

- Calculation for the corrected capacity of the outdoor unit (CTo)

Correction factor for outdoor temperature (2°C WB) 1.00 (Refer to Figure 4.)

Correction factor for piping length (40 m) 0.98 (Refer to "Correcting Capacity".)

Correction factor for defrosting 0.89 (Refer to Table 1.)

$CTo = \text{Rated capacity of outdoor unit} \times \text{Correction factor for outdoor temperature} \times \text{Correction factor for piping length} \times$

$\text{Correction factor for defrosting}$

$= 25.0 \times 1.00 \times 0.98 \times 0.89$

$= 21.8 \text{ kW}$

Table 1 Table of correction factor for frosting and defrosting

Outdoor inlet air temp. (°C)	6	4	2	0	-2	-4	-6	-8	-10	-15	-20
Correction factor	1.00	0.98	0.89	0.88	0.89	0.90	0.95	0.95	0.95	0.95	0.95

<TA-001F7>

- Determination of maximum system capacity (CTx)

Comparison between CTi and CTo:

$CTi = 20.6 < CTo = 21.8$, thus, select CTi.

$CTx = CTi = 20.6 \text{ kW}$

- Comparison with essential load

Against the essential load 20.4 kW, the maximum system capacity is 20.6 kW: Proper indoor units have been selected.

- Calculation for the maximum indoor unit capacity of each room

When $CTx = CTi$, use the calculation formula below.

Room1: Rated capacity of Indoor unit $\times$ Correction factor for indoor temperature

$= 10.0 \times 0.96$

$= 9.6 \text{ kW}$

The capacity is enough for the heating load of Room 1 (9.5 kW): A proper indoor unit is selected.

Room2: Rated capacity of indoor unit $\times$ Corrected capacity for the indoor design temperature

$= 12.5 \times 0.88$

$= 11.0 \text{ kW}$

The capacity is enough for the heating load of Room 2 (10.9 kW): A proper indoor unit is selected.

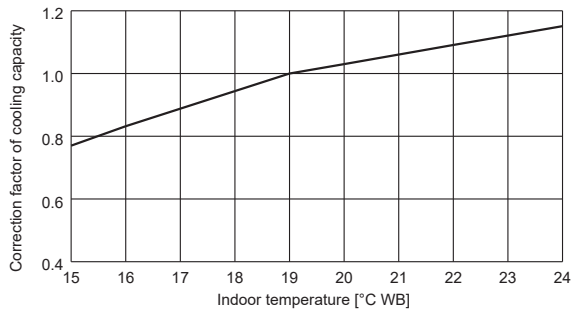
Note:

- If $CTx = CTo$, refer to the calculation formula in "Cooling" to calculate the maximum indoor unit capacity of each room.
- The selection of units is completed when proper units are selected.

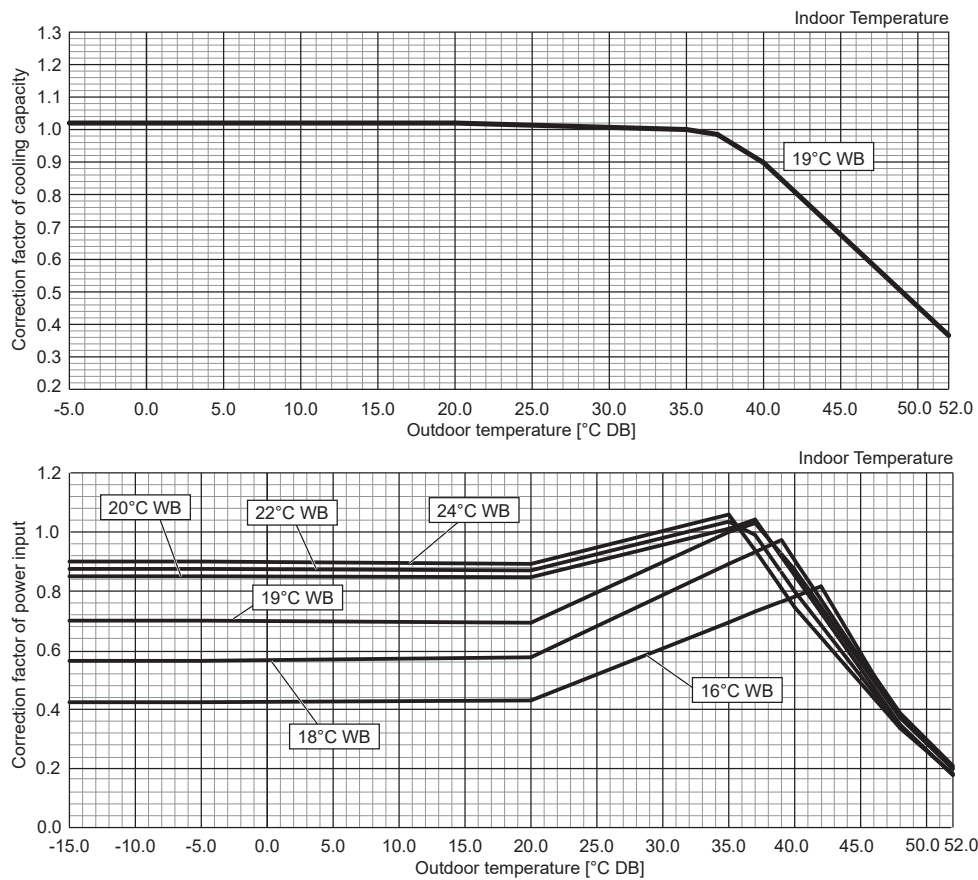
5-2. Correction by temperature

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

5-2-1. Cooling

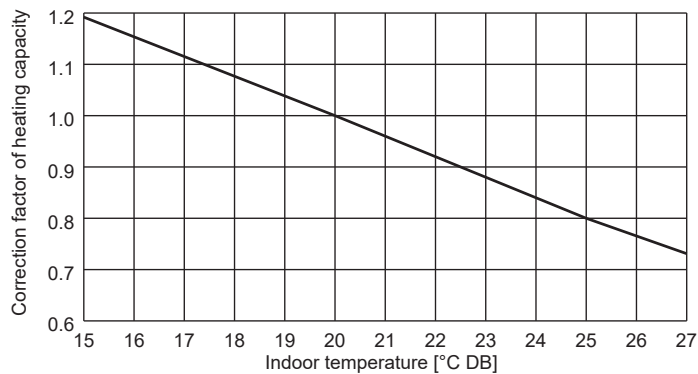


<Figure 1> Indoor unit temperature correction

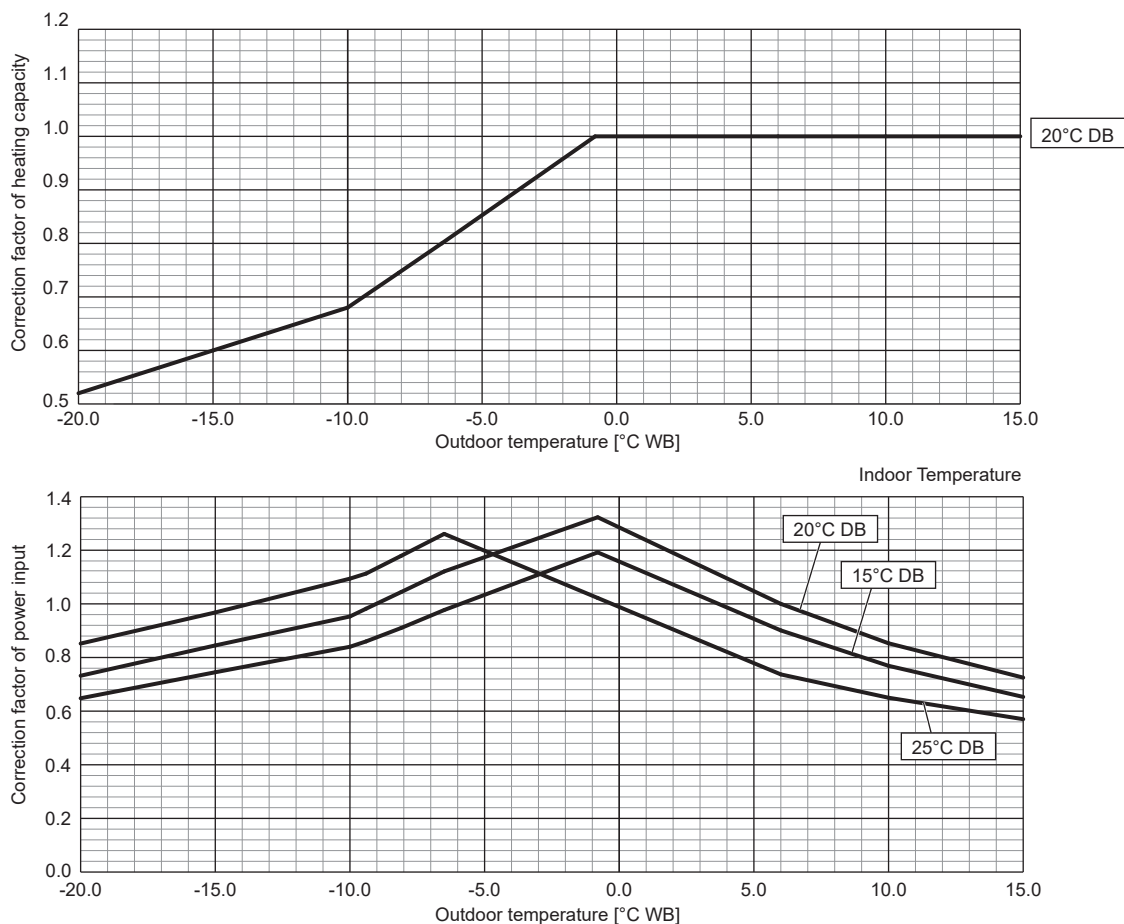


<Figure 2> Outdoor unit temperature correction

5-2-2. Heating



<Figure 3> Indoor unit temperature correction



<Figure 4> Outdoor unit temperature correction

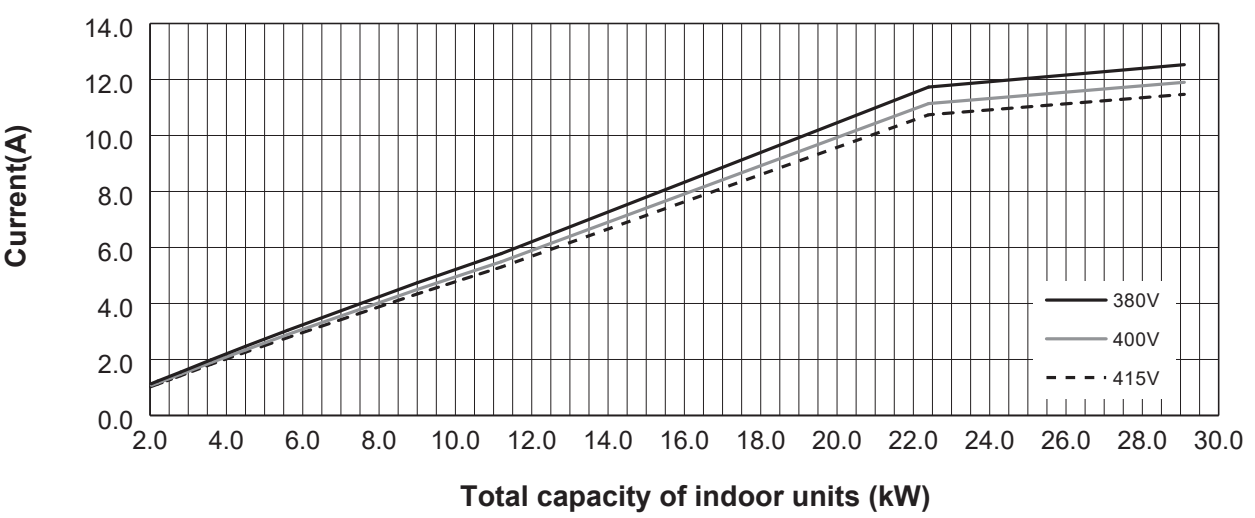
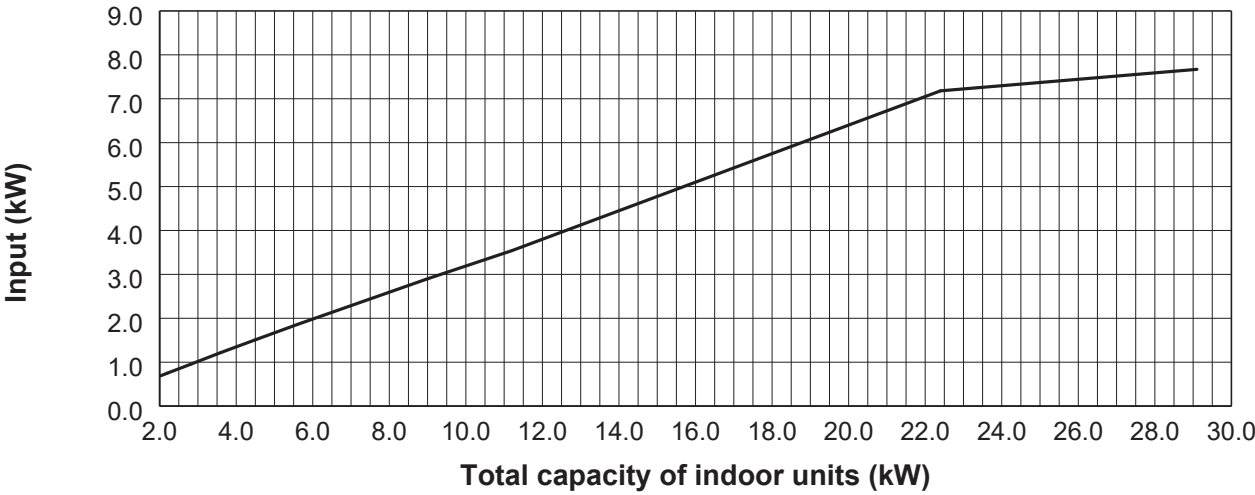
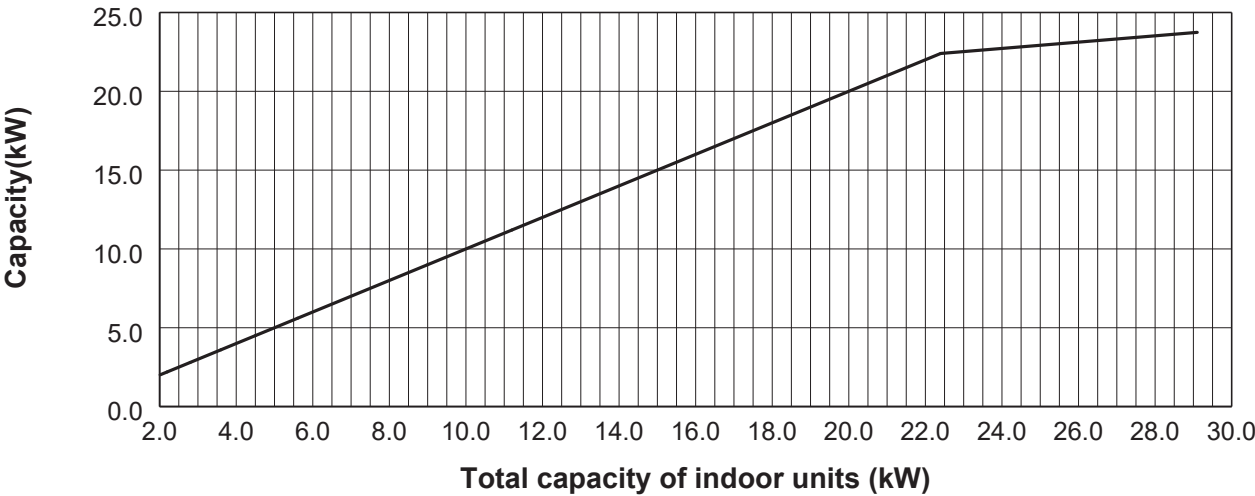
5-3. Standard operation data (Reference data)

Operation				M200	
Operating conditions	Ambient temperature	Indoor	DB/ WB	27°C/19°C	20°C/—
		Outdoor		35°C	7°C/6°C
	Indoor unit	No. of connected units	Unit	4	
		No. of units in operation		4	
		Model	—	50 × 4	
	Piping	Main pipe	m	5	
		Branch pipe		5	
		Total pipe length		25	
Outdoor unit	Fan speed		—	Hi	
	Amount of refrigerant		kg	7.6	
	Electric current		A	11.15	9.08
	Voltage		V	400	
LEV opening	Compressor frequency		Hz	71	78
	Indoor unit		Pulse	236	301
Pressure	High pressure/Low pressure		MPaG	3.40/1.11	2.38/0.78
Temp. of each section	Outdoor unit	Discharge	°C	85.5	50.8
		Heat exchanger outlet		39.2	-0.9
		Accumulator inlet		10.8	-1.5
		Compressor inlet		11.0	-1.3
	Indoor unit	LEV inlet		26.2	25.2
		Heat exchanger inlet		14.1	45.8

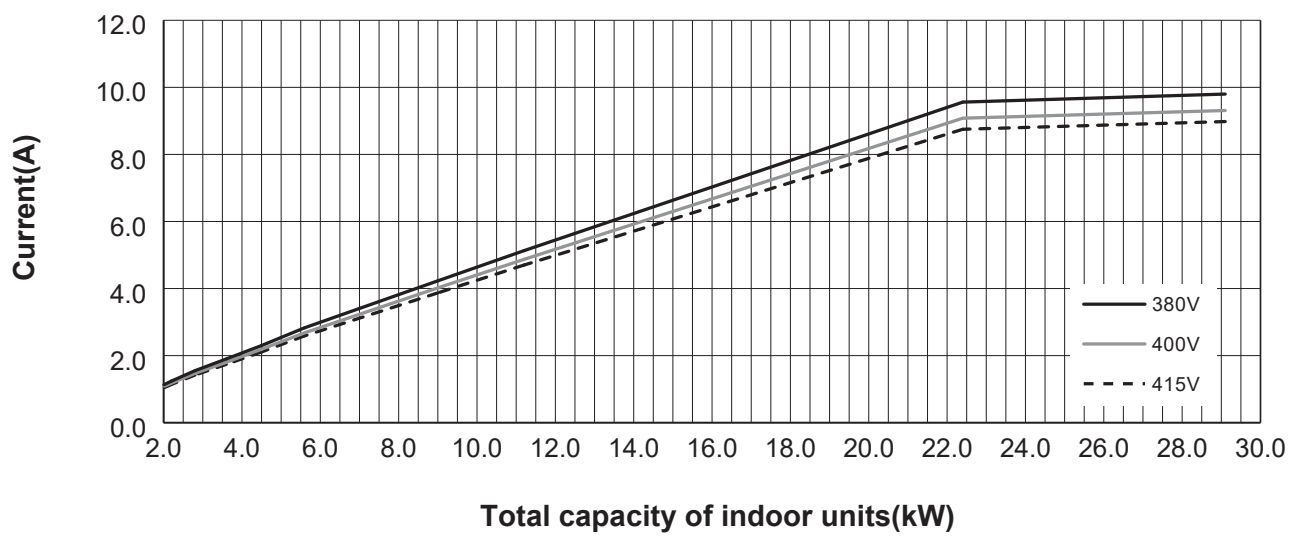
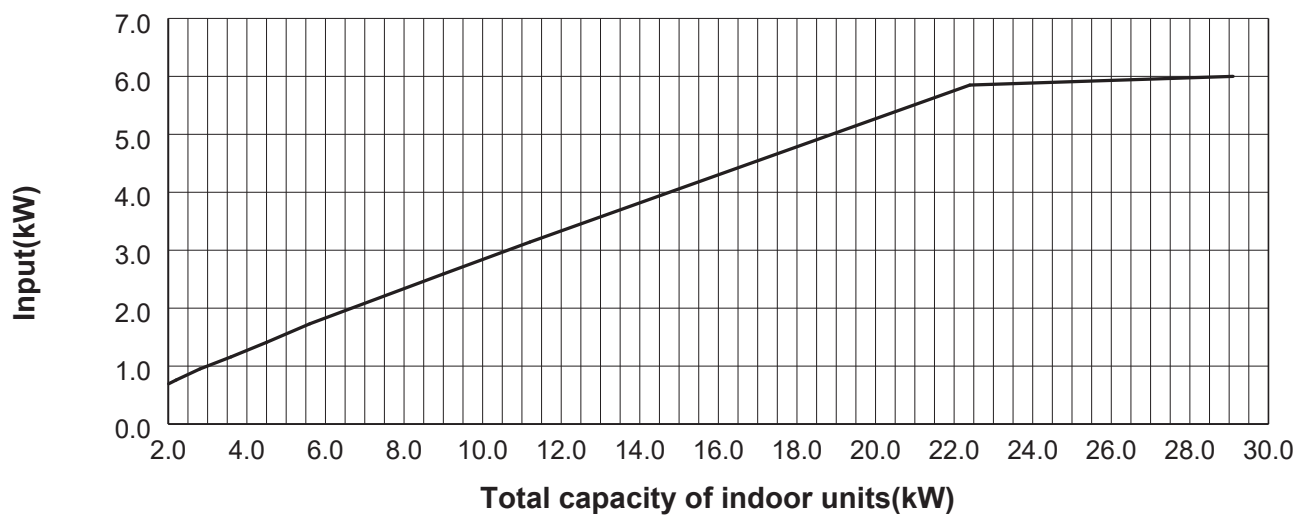
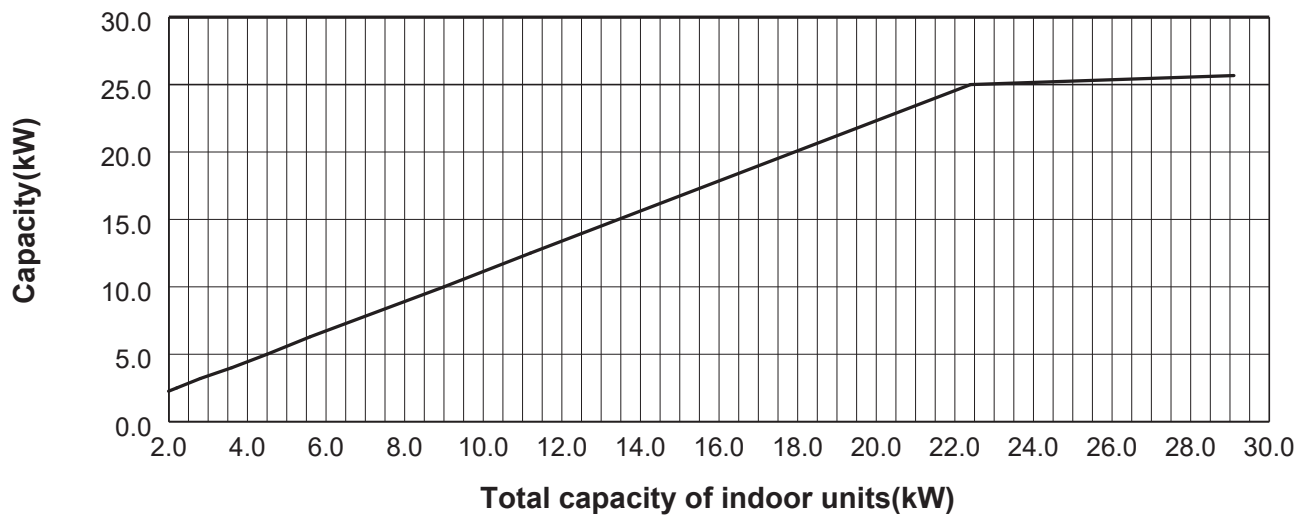
5-4. Standard capacity diagram

Before calculating the sum of total capacity of indoor units, please convert the value into the kW model capacity following the formula on "5-1. Selection of indoor and outdoor units".

■ Cooling



■ Heating

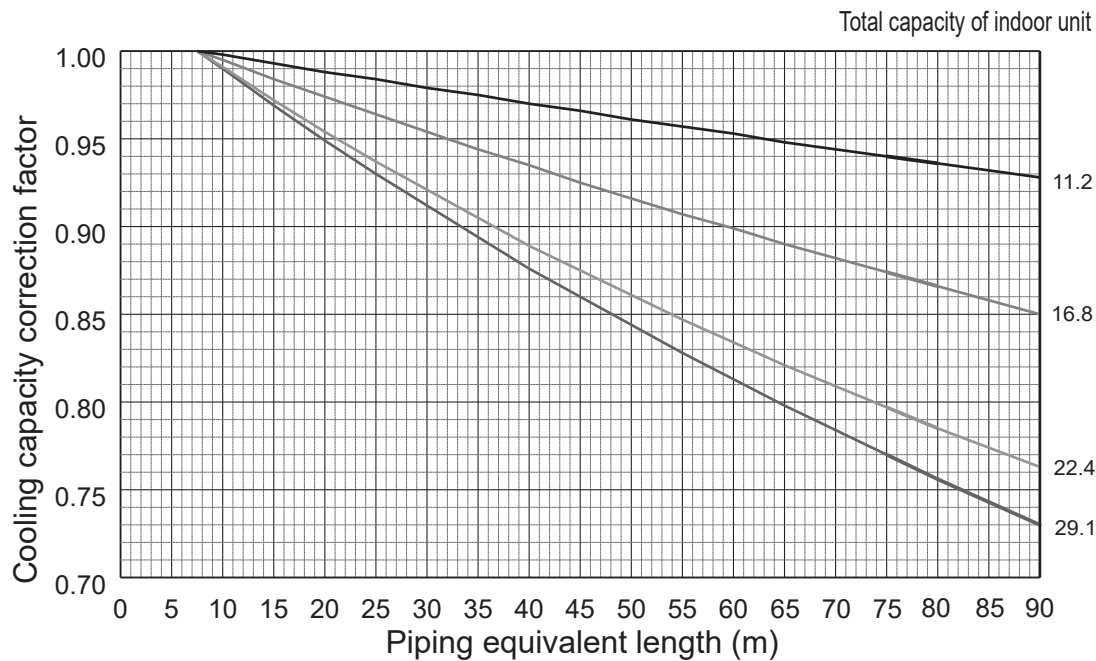


5-5. Correcting capacity for changes in the length of refrigerant piping

During cooling, obtain the ratio (and the piping equivalent 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 5 to 7. Then multiply by the cooling capacity from Figure 1 and 2 in "5-2. Correction by temperature" to obtain the actual capacity. During heating, find the piping equivalent length, and find the capacity ratio corresponding to standard piping length from Figure 8. Then multiply by the heating capacity from Figure 3 and 4 in "5-2. Correction by temperature" to obtain the actual capacity.

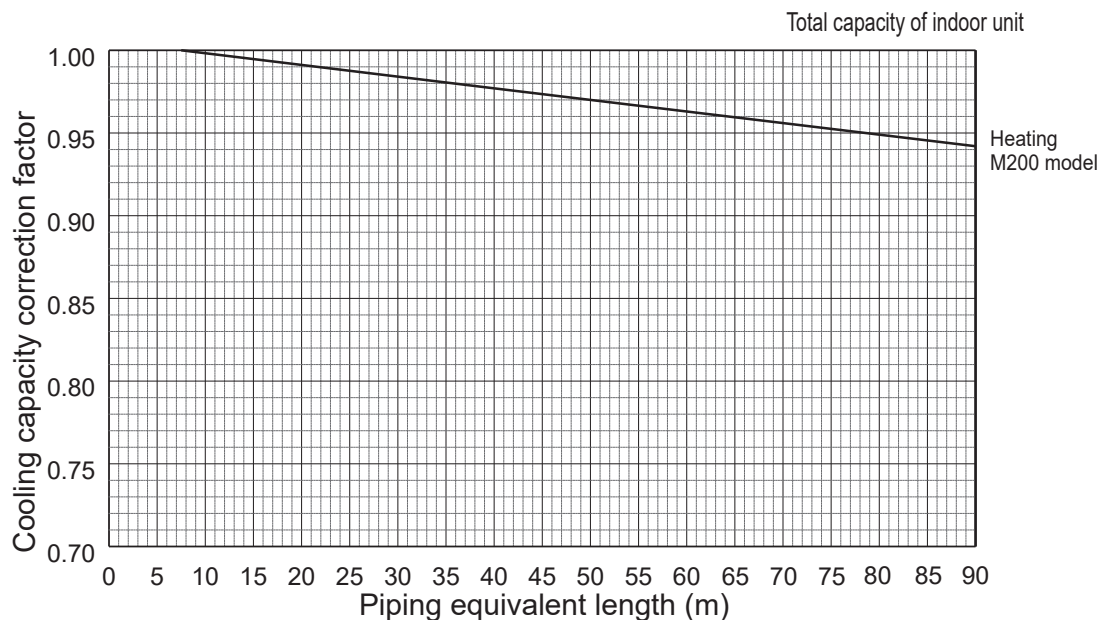
■ Capacity Correction Curve

5-5-1. Cooling



<Figure 5> Correction of refrigerant piping length

5-5-2. Heating



<Figure 6> Correction of refrigerant piping length

■ Method for obtaining the piping equivalent length

Piping equivalent length = piping length to the farthest indoor unit + $0.3 \times$ number of bends in the piping (m)

5-5-3. Correction of heating capacity for frost and defrosting

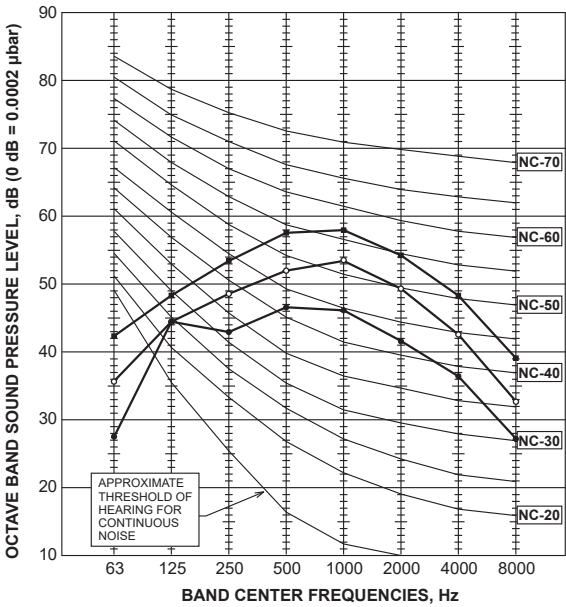
If heating capacity has been reduced due to frost formation or defrosting, multiply the capacity by the appropriate correction factor from the following table to obtain the actual heating capacity.

Correction factor diagram

Outdoor Intake temperature (°C WB)	6	4	2	0	-2	-4	-6	-8	-10	-15	-20
Correction factor	1.00	0.98	0.89	0.88	0.89	0.90	0.95	0.95	0.95	0.95	0.95

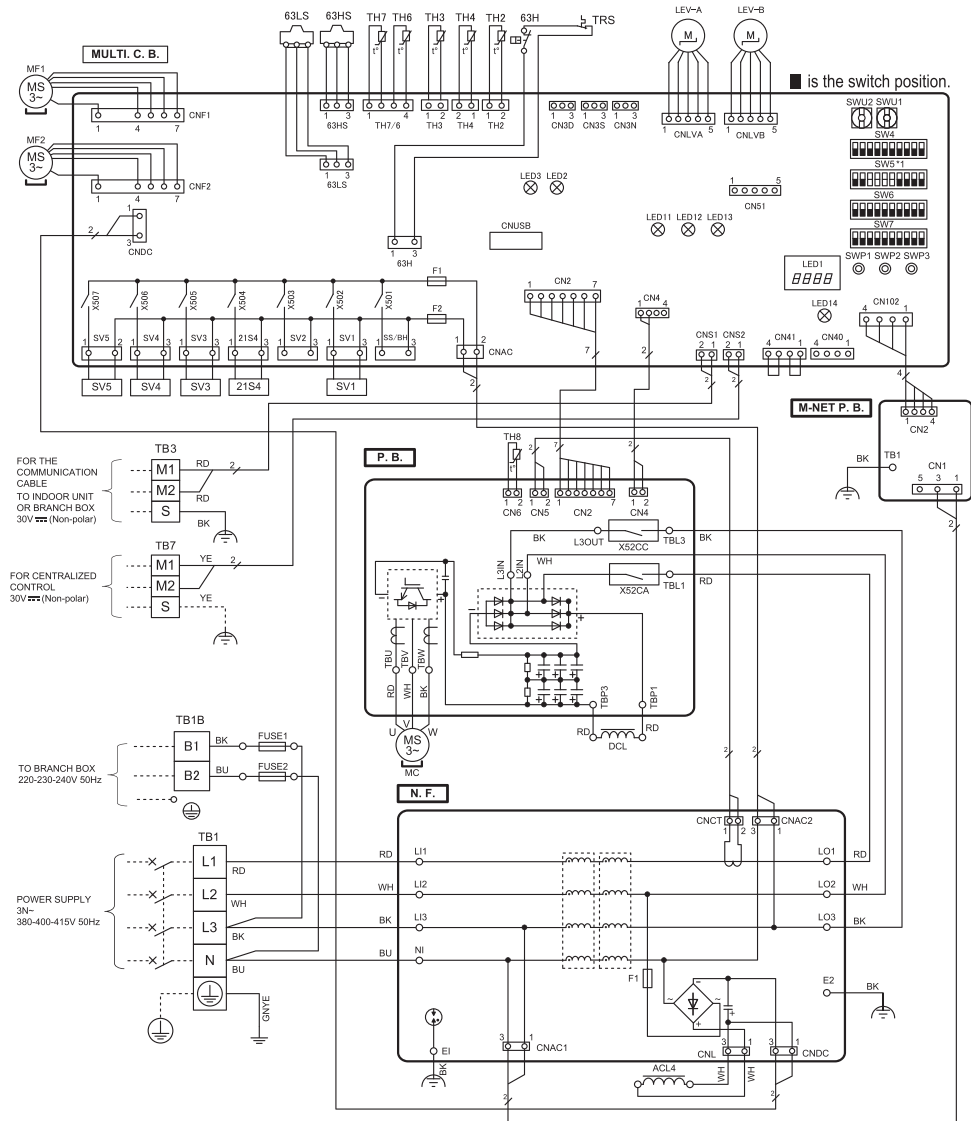
5-6. Noise criterion curves

MODE	SPL(dB)	LINE
HEATING	61	■—■
COOLING	56	○—○
SILENT(Cooling)	53	●—●



7 WIRING DIAGRAM

PUMY-M200YKM



*1 MODEL SELECTION

The black square (■) indicates a switch position.

MODEL	SW5
PUMY-M200YKM	ON OFF

[LEGEND]

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block <Power Supply>	TH7	Thermistor <Ambient>	SWU1	Switch <Unit Address Selection, ones digit>
TB1B	Terminal Block <Branch Box>	TH8	Thermistor <Heat Sink>	SWU2	Switch <Unit Address Selection, tens digit>
TB3	Terminal Block <Indoor/Outdoor, Branch Box/Outdoor Transmission Line>	TRS	Thermal Protector	SWP3	Switch <Function Selection>
TB7	Terminal Block <Centralized Control Transmission Line>	LEV-A, LEV-B	Linear Expansion Valve	SS/BH	Connector <Connection for Option>
FUSE1, FUSE2	Fuse <T20AL250V>	ACL4	Reactor	CN3D	Connector <Connection for Option>
MC	Motor for Compressor	DCL	Reactor	CN3S	Connector <Connection for Option>
MF1, MF2	Fan Motor	P.B.	Power Circuit Board	CN3N	Connector <Connection for Option>
63H	High Pressure Switch	TBU/V/W	Connection Terminal <U/V/W-Phase>	CN51	Connector <Connection for Option>
63HS	High Pressure Sensor	TBL1, L2IN, TBL3	Connection Terminal <L1/L2/L3-Power Supply>	LED1	LED <Operation Inspection Display>
63LS	Low Pressure Sensor	TBP1, TBP3	Connection Terminal	LED11	Normal operation (Lit)/IC Error (Blink)
SV1	Solenoid Valve Coil <Bypass Valve>	X52CA/C	52C Relay	LED12	Normal operation (Lit)/Error (Blink) for central control transmission
SV3	Solenoid Valve Coil <Bypass Valve>	N.F.	Noise Filter Circuit Board	LED13	Normal operation (Lit)/Error (Blink) for indoor / outdoor transmission
SV4	Solenoid Valve Coil <Liquid Shut-off Valve>	LO1/LO2/LO3	Connection Terminal <L1/L2/L3-Power Supply>	LED14	LED <Power Supply to Main Microcomputer>
SV5	Solenoid Valve Coil <Gas Shut-off Valve>	LI1/LI2/LI3/NI	Connection Terminal <L1/L2/L3/N-Power Supply>	F1, F2	Fuse <T6.3AL250V>
21S4	Solenoid Valve Coil <4-Way Valve>	EI, E2	Connection Terminal <Electrical Parts Box>	X501~507	Relay
TH2	Thermistor <HIC Pipe>	F1	Fuse <T6.3AL250V>	CNUSB	USB TYPE A
TH3	Thermistor <Outdoor Liquid Pipe>	MULTI.C.B.	Multi Controller Circuit Board	M-NET P.B.	M-NET Power Circuit Board
TH4	Thermistor <Compressor>	SW4	Switch <Display Selection>	TB1	Connection Terminal <Electrical Parts Box>
TH6	Thermistor <Suction Pipe>	SW5	Switch <Model Selection>		
		SW6	Switch <Function Selection/Test Run>		
		SW7	Switch <Function Selection>		

8 TROUBLESHOOTING

8-1. Checkpoints for test run

8-1-1. Procedures before test run

- Before a test run, make sure that the following work is completed.
 - Installation related:
Make sure that the panel of cassette type is installed and electrical wiring is 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 sides are fully 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 made.
- Safety check:
 - With the insulation multimeter of 500 V, inspect the insulation resistance.
 - Do not touch the transmission cable and remote controller cable with the multimeter.
 - 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.
- Before operation:
 - For compressor protection, turn on the breaker for the outdoor unit and wait at least 12 hours before a test run.
 - Register control systems into remote controller(s). Never touch the on/off switch of the remote controller(s). Refer to "Special function operation setting (for M-NET Remote Controller)" as for settings.
In MA remote controller(s), this registration is unnecessary.
- More than 12 hours later after turning on the power to the outdoor unit, turn on all the power switches for the test run.
Perform test run and make test run reports.

8-1-2. Test run

Refer to "13-4. Test run" for operation procedure.

8-1-3. Error information

Refer to "13-2. Error information" when an error occurs.

8-1-4. Error history

Refer to "13-6. Error history" to check the errors occurred in the past.

8-1-5. Self-diagnosis

Refer to "13-7. Self-diagnosis" to search for the error history.

8-1-6. 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.

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

Error code (2 digits)	Error code (4 digits)	Trouble	Detected Unit			Remarks
			Indoor	Outdoor	Remote Controller	
Ed	0403	Serial communication error/Model selection SW error		O		Outdoor unit outdoor multi controller circuit board – Power circuit board communication trouble, Incorrect setting of model selection
U2	1102	Compressor temperature trouble		O		Check delay code 1202
UL	1300	Low pressure trouble		O		
UE	1302	High pressure trouble or compressor protector / thermal protector trouble		O		Check delay code 1402
U7	1500	Superheat due to low discharge temperature trouble		O		Check delay code 1600
U2	1501	Refrigerant shortage trouble		O		Check delay code 1601
		Closed valve in cooling mode		O		Check delay code 1501
P6	1503	Freeze protection of plate heat exchanger	O			
		Freeze protection of branch box or indoor unit	O			
EF	1508	4-way valve trouble in heating mode		O		Check delay code 1608
FL/EF/FL	1521/1522 /1524	Refrigerant leakage / Refrigerant sensor failure	O	O		The error cannot be canceled by the remote controller after this error detection. The error code may be displayed as EF when the abnormality is re-notified.
L6	2135	Circulation water freeze protection	O			
PA	2500	Water leakage	O			
P5	2502	Drain overflow protection	O			
P4	2503	Drain sensor abnormality	O			
-	3121	Out-of-range outside air temperature		O		
UF	4100	Compressor current interruption (locked compressor)		O		Check delay code 4350
Pb	4114	Fan trouble (Indoor unit)	O			

Error code (2 digits)	Error code (4 digits)	Trouble	Detected Unit			Remarks
			Indoor	Outdoor	Remote Controller	
UP	4210	Compressor overcurrent interruption/Failure in 12 VDC power supply circuit on power circuit board		O		
U9	4220	Voltage shortage/overvoltage/PAM error/L1 open phase/primary current sensor error/power synchronization signal error		O		Check delay code 4320
U5	4230	Heat sink temperature trouble		O		Check delay code 4330
U6	4250	Power module trouble		O		Check delay code 4350
U8	4400	Fan trouble (Outdoor unit)		O		Check delay code 4500
U3	5101	Air inlet thermistor (TH21) open/short	O			
		Compressor temperature thermistor (TH4) open/short		O		Check delay code 1202
U4	5102	Liquid pipe temperature thermistor (TH22) open/short	O			
		Suction pipe temperature thermistor (TH6) open/short		O		Check delay code 1211
U4	5103	Gas pipe temperature thermistor (TH23) open/short	O			
U4	5105	Outdoor liquid pipe temperature thermistor (TH3) open/short		O		Check delay code 1205
U4	5106	Ambient temperature thermistor (TH7) open/short		O		Check delay code 1221
U4	5109	HIC pipe temperature thermistor (TH2) open/short		O		Check delay code 1222
U4	5110	Heat sink temperature thermistor (TH8) open/short		O		Check delay code 1214
F5	5201	High pressure sensor (63HS) trouble		O		Check delay code 1402
F3	5202	Low pressure sensor (63LS) trouble		O		Check delay code 1400
UH	5300	Primary current error		O		Check delay code 4310
FH	5558	Refrigerant sensor error	O	O		
P4	5701	Contact failure of drain float switch	O			
A0	6600	Duplex address error	O	O	O	Only M-NET Remote controller is detected.
A2	6602	Transmission processor hardware error	O	O	O	Only M-NET Remote controller is detected.
A3	6603	Transmission bus BUSY error	O	O	O	Only M-NET Remote controller is detected.
A6	6606	Signal communication error with transmission processor	O	O	O	Only M-NET Remote controller is detected.
A7	6607	No ACK error	O		O	Only M-NET Remote controller is detected.
A8	6608	No response frame error	O		O	Only M-NET Remote controller is detected.
FH	6815	Supervisor mode alarm kit communication error MA supervisor remote controller communication error	O			
E0/E4	6831	MA communication receive error	O		O	Only MA Remote controller is detected.
E4	6831	Sensor and Alarm Kit communication error	O			
E3/E5	6832	MA communication send error	O		O	Only MA Remote controller is detected.
E3/E5	6833	MA communication send error	O		O	Only MA Remote controller is detected.
E0/E4	6834	MA communication receive error	O		O	Only MA Remote controller is detected.
EF	7100	Total capacity error		O		
EF	7101	Capacity code error	O	O		
EF	7102	Connecting excessive number of units and branch boxes		O		
EF	7105	Address setting error		O		
EF	7118	Refrigerant leak detection system error		O		
EF	7121	Power outage detection		O		
EF	7130	Incompatible unit combination		O		

Notes:

- When the outdoor unit detects No ACK error or No response error, the target indoor unit is treated as stopped and not assumed to be abnormal.
- The error codes displayed on the units may be different between the error source and others. In that case, please refer to the error code of error source by displayed attribute and address.
- Refer to the service manual of the indoor unit or the remote controller for details of the errors detected by the indoor unit or the remote controller or any errors not indicated in the table above.

■ Self-diagnosis function

The indoor and outdoor units can be diagnosed automatically using the self-diagnosis switch (SW4) and LED1 (LED indication) found on the outdoor multi controller circuit board.

LED indication: Set all contacts of SW4 to OFF.

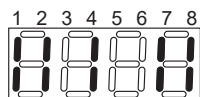
■ During normal operation

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	Always lit	21S4	SV1	SV2	SV3	SV4	SV5

- Example

When the compressor, SV1, SV4, and SV5 are on during cooling operation.



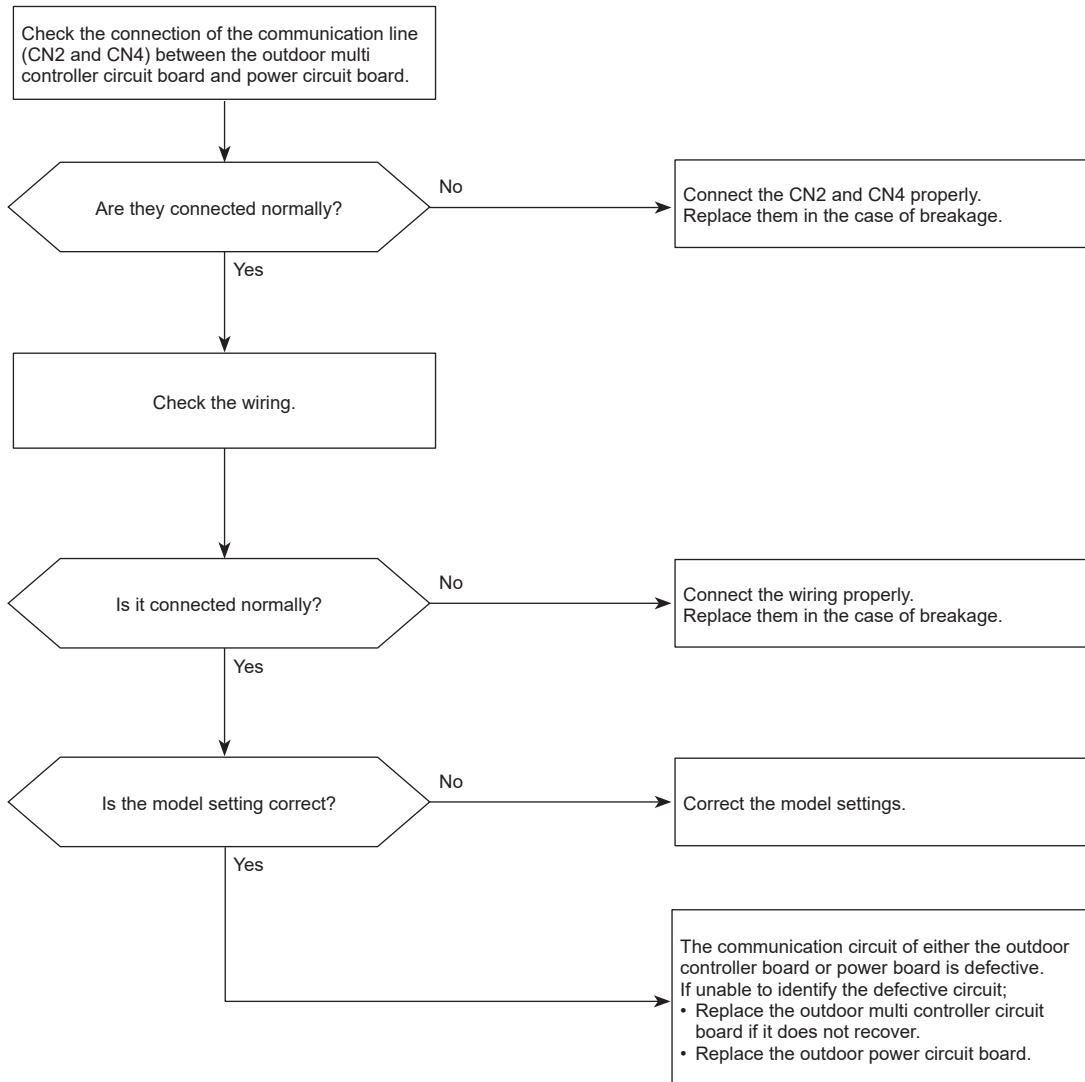
Abnormal points and detection methods

Serial communication between the outdoor multi controller circuit board and outdoor power circuit board is defective.

Causes and checkpoints

- Wire breakage or contact failure of connector CN2 or CN4
- Malfunction of power board communication circuit on outdoor multi controller circuit board
- Malfunction of communication circuit on outdoor power circuit board
- Incorrect setting of model selection

Diagnosis of failure



Abnormal points and detection methods

- TH4 falls into either of the following temperature conditions:
 - over 105°C continuously for 5 minutes
 - over 110°C
- The saturation temperature converted from the pressure detected by the high pressure sensor exceeds 40°C during defrosting, and TH4 exceeds 105°C

TH4:

Thermistor <Compressor>

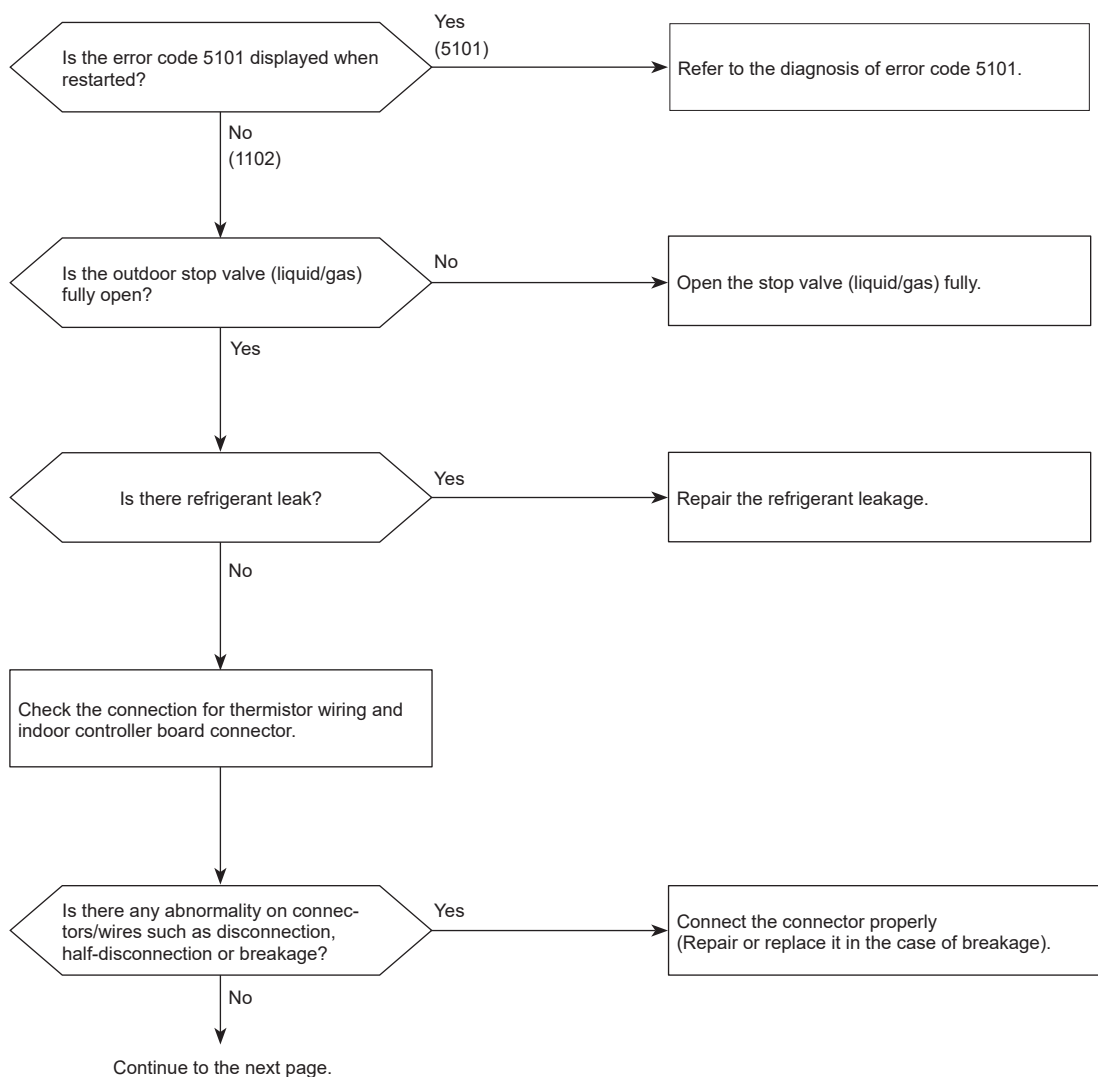
LEV:

Linear expansion valve

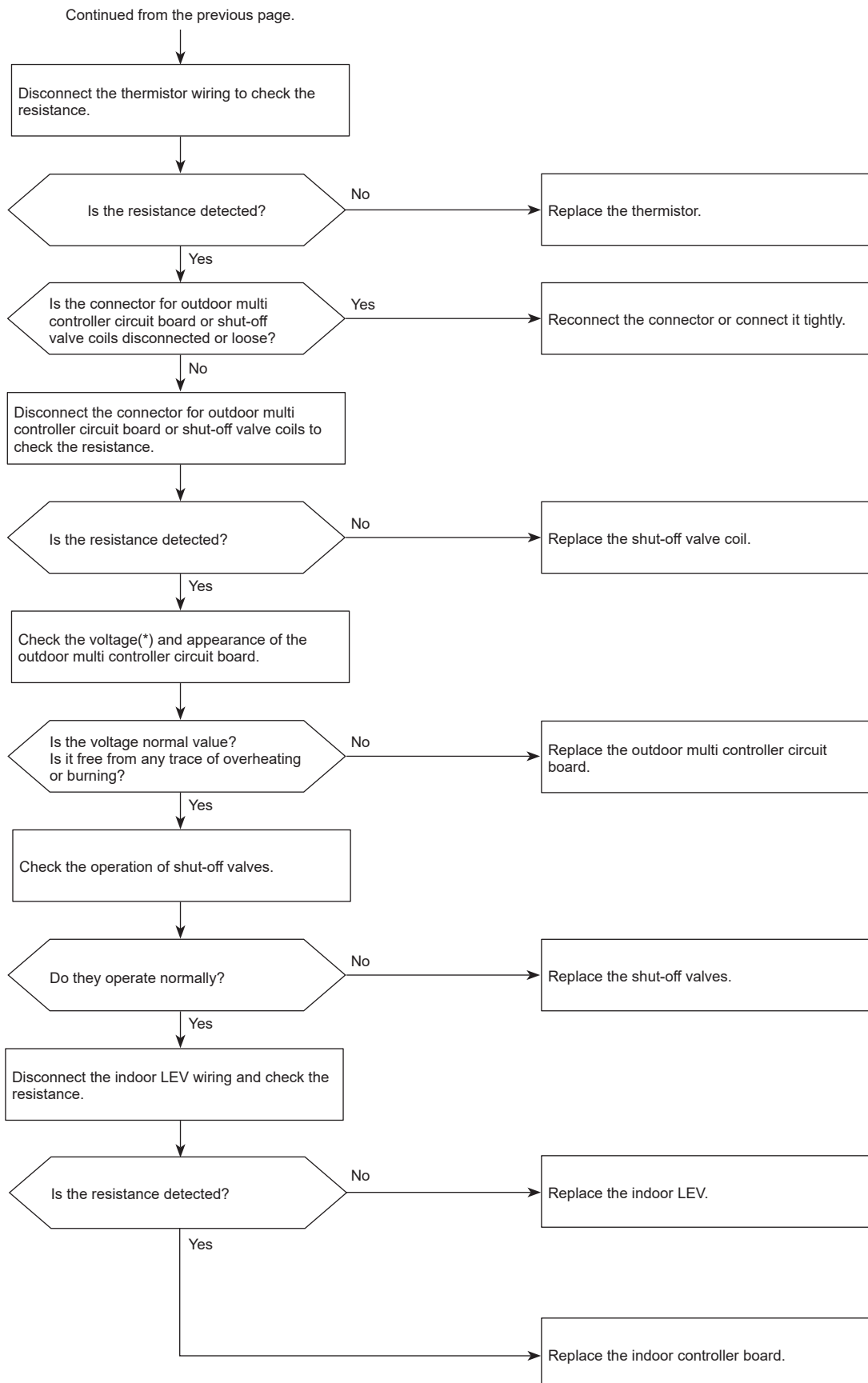
Causes and checkpoints

- Malfunction of stop valve
- Over-heated compressor operation caused by shortage of refrigerant
- Defective thermistor
- Defective outdoor multi controller circuit board
- LEV performance failure
- Defective indoor controller board
- Clogged refrigerant system caused by foreign object
- Refrigerant shortage (Refrigerant liquid accumulation in compressor while indoor unit is OFF/thermo-OFF.)
- Malfunction of shut-off valves

Diagnosis of failure



Diagnosis of failure



*For the voltage, refer to "How to check the components".

Abnormal points and detection methods

63L equipped model

- Low pressure (63L is in operation)
63L operates (under 0.00 MPaG) during compressor operation.

63L:

Low pressure switch

LEV:

Linear expansion valve

TH7:

Thermistor <Ambient>

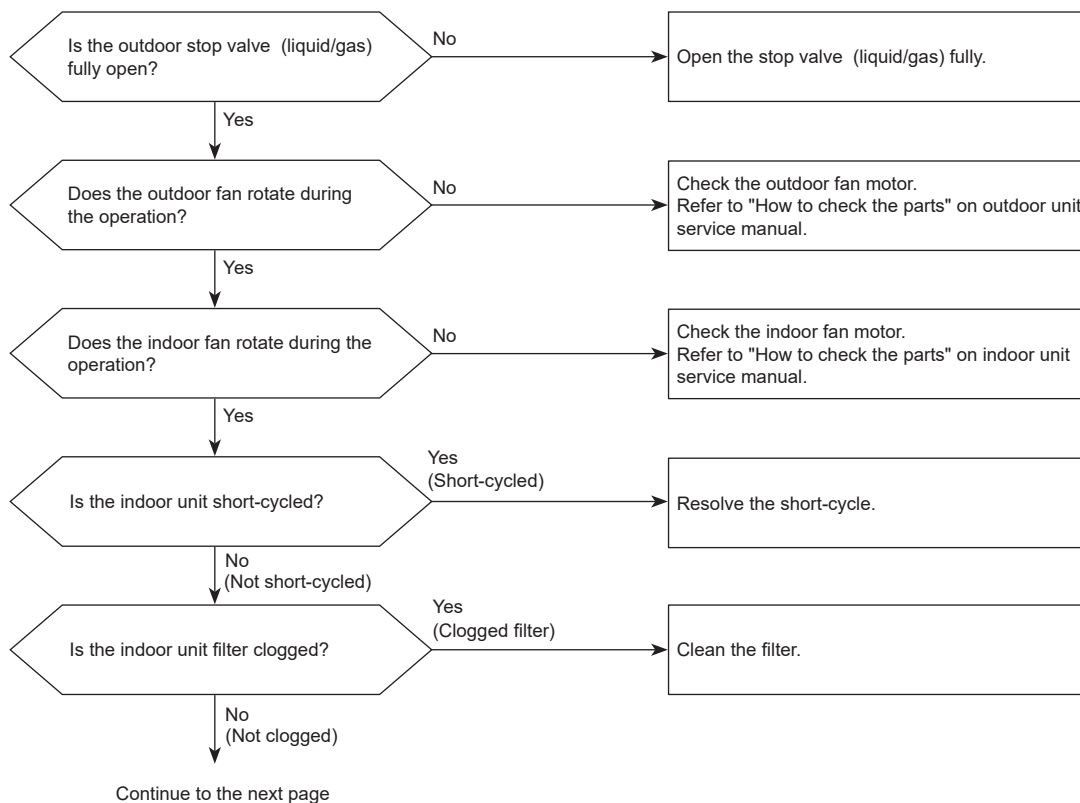
SV1:

Solenoid valve

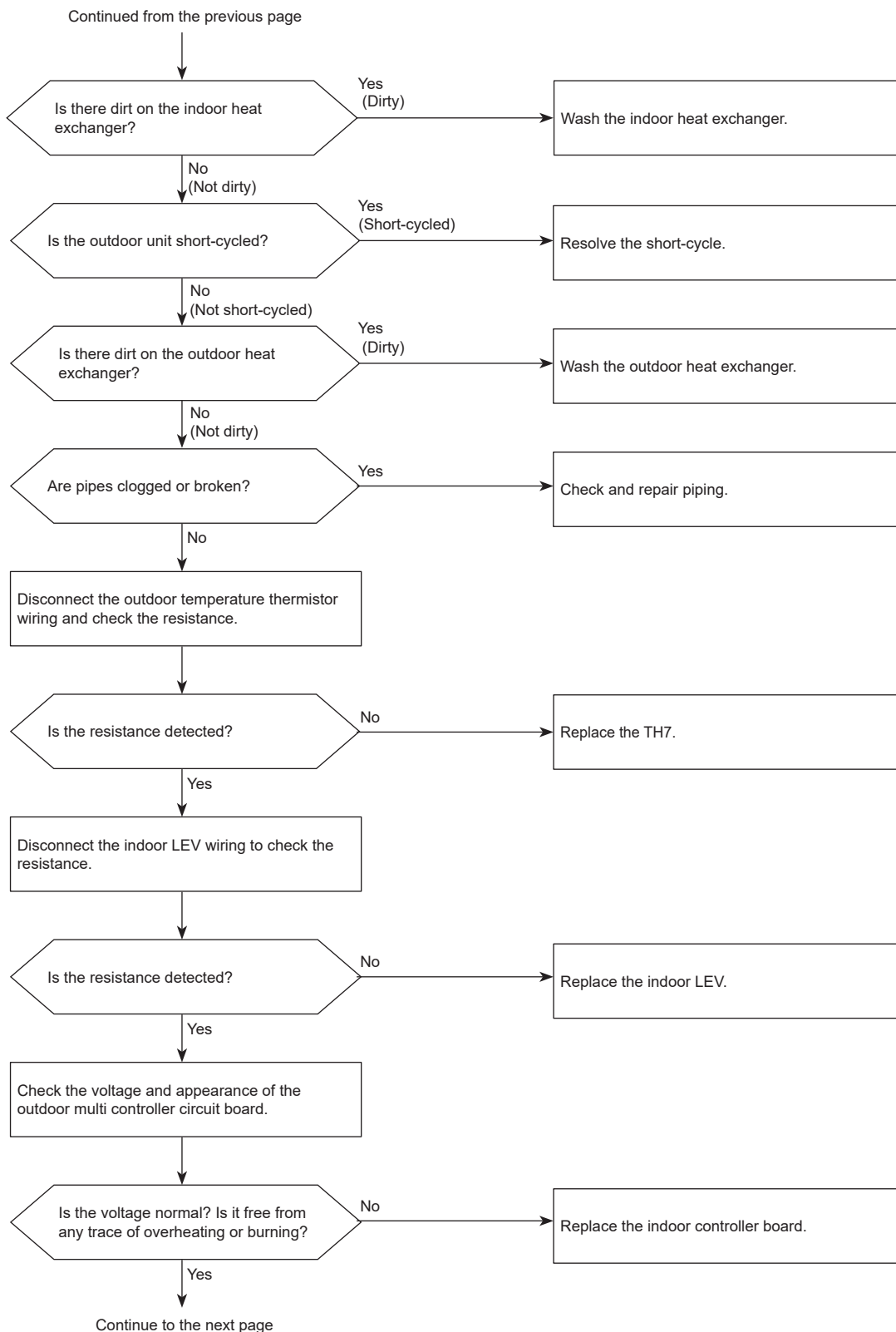
Causes and checkpoints

- Defective operation of stop valve (not fully open)
- Clogged or broken pipe
- Malfunction or locked outdoor fan motor
- Short-cycle of outdoor unit
- Dirt of outdoor heat exchanger
- Remote controller transmitting error caused by noise interference
- Contact failure of outdoor multi controller circuit board connector
- Defective outdoor multi controller circuit board
- Short-cycle of indoor unit
- Decreased airflow, clogged filter, or dirt on indoor unit
- Malfunction or locked indoor fan motor
- Decreased airflow caused by defective inspection of outdoor temperature thermistor (It detects lower temperature than actual temperature.)
- Indoor LEV performance failure
- Malfunction of fan driving circuit
- SV1 performance failure
- Defective low pressure sensor
- Malfunction of low pressure sensor input circuit on outdoor multi controller circuit board

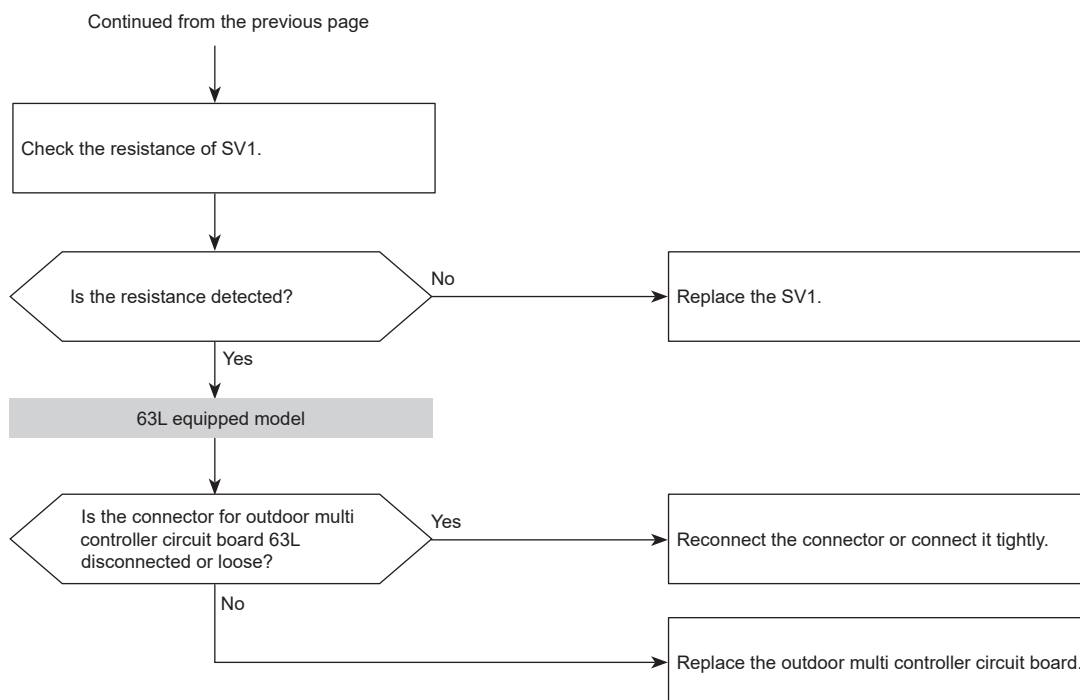
Diagnosis of failure



Diagnosis of failure



Diagnosis of failure



Abnormal points and detection methods

- High pressure abnormality (63H operation)
63H operates(*) during compressor operation.
(* 4.15 MPaG)
- High pressure abnormality (63HS detected)
 - A pressure detected by 63HS is 4.31 MPaG or more during compressor operation.
 - A pressure detected by 63HS is 4.14 MPaG or more for 3 minutes during compressor operation.

63H:

High pressure switch

63HS:

High pressure sensor

LEV:

Linear expansion valve

SV1:

Solenoid valve

TH7:

Thermistor <Ambient>

TH4:

Thermistor <Compressor>

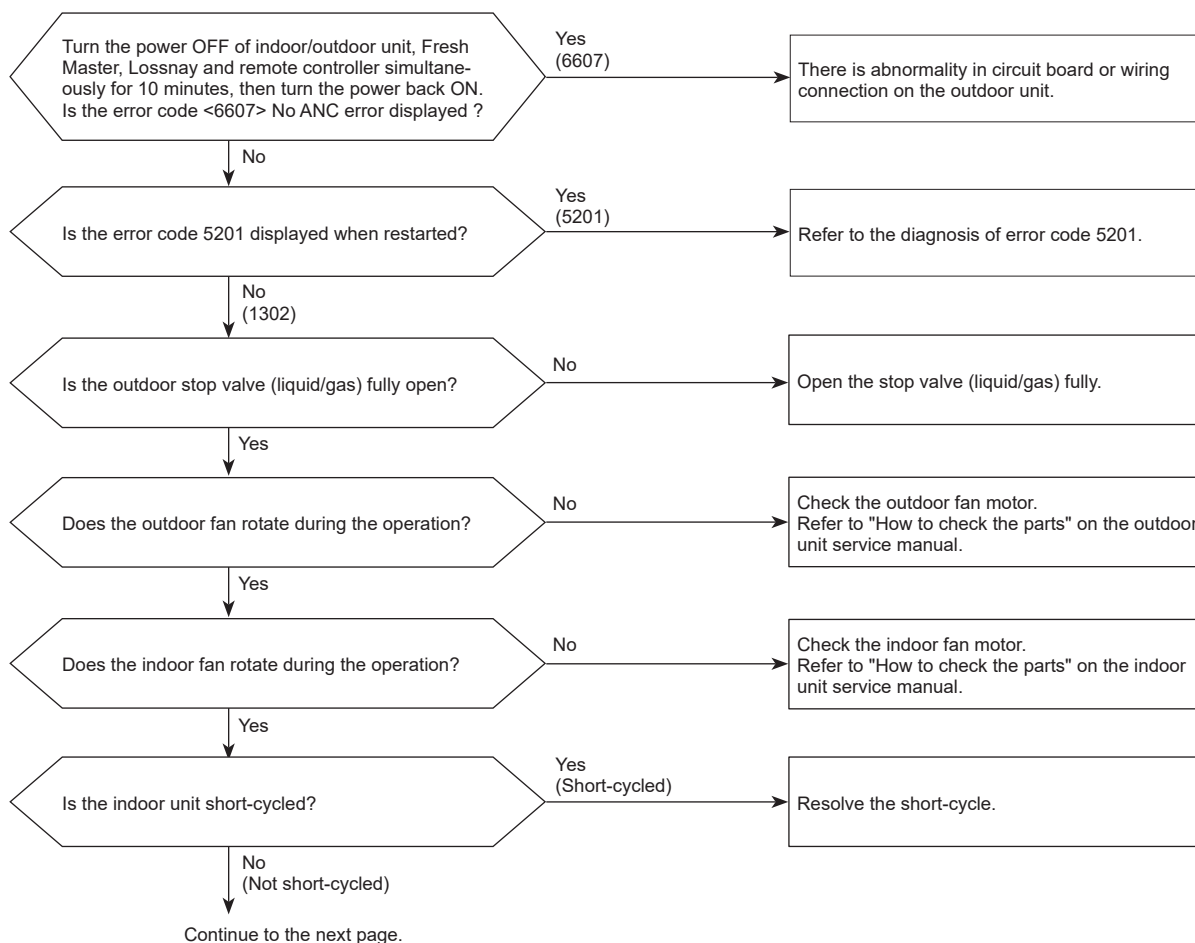
TRS:

Thermal protector

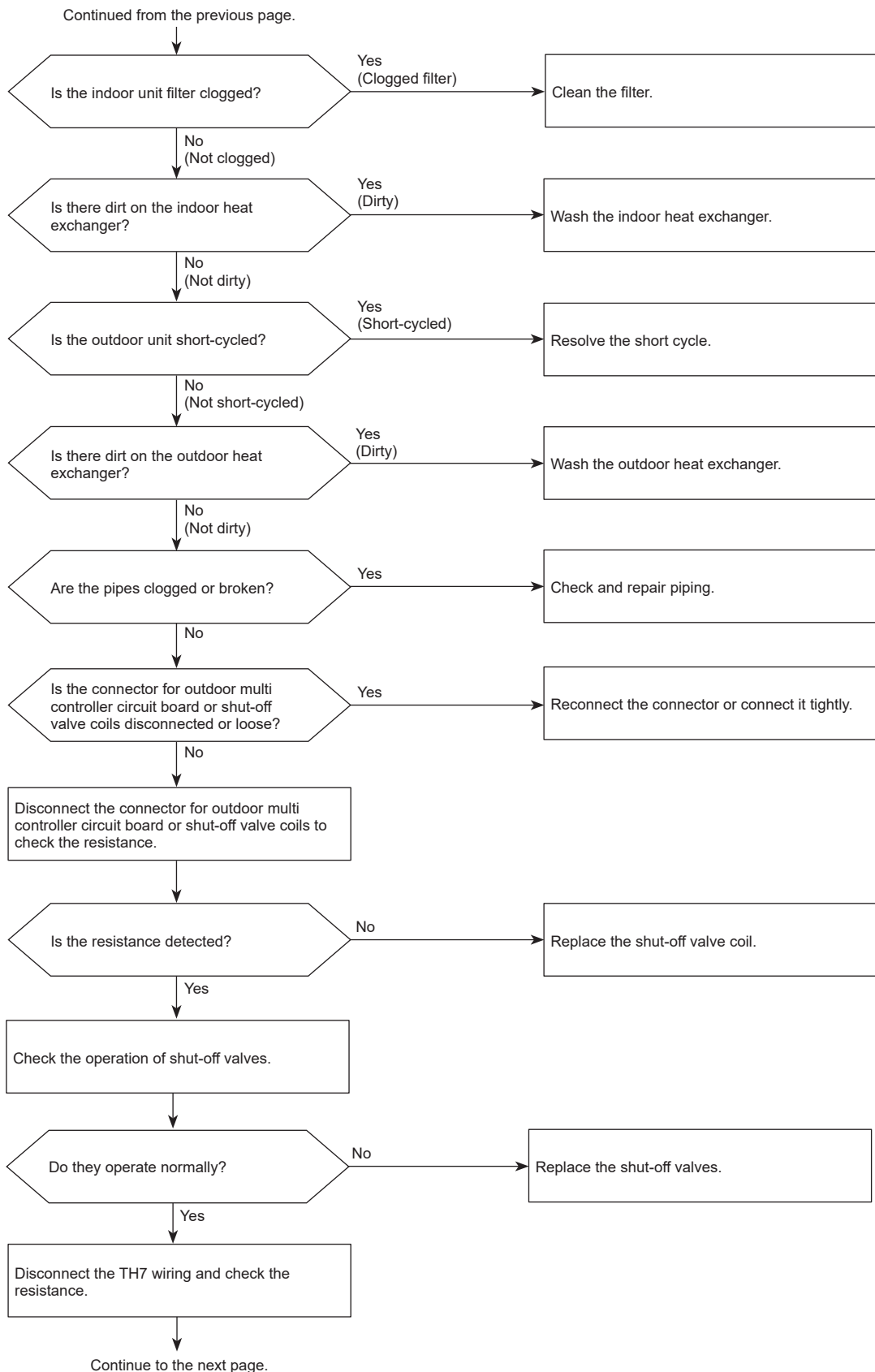
Causes and checkpoints

- Faulty operation of stop valve (not fully open)
- Clogged or broken pipe
- Malfunction or locked outdoor fan motor
- Short-cycle of outdoor unit
- Dirt of outdoor heat exchanger
- Remote controller transmitting error caused by noise interference
- Contact failure of the outdoor multi controller circuit board connector
- Defective outdoor circuit board
- Short-cycle of indoor unit
- Decreased airflow, clogged filter, or dirt on indoor unit
- Malfunction or locked indoor fan motor
- Decreased airflow caused by faulty inspection of outdoor temperature thermistor (It detects lower temperature than actual temperature.)
- Indoor LEV performance failure
- Malfunction of fan driving circuit
- SV1 performance failure
- Defective High pressure sensor
- Defective High pressure sensor input circuit on outdoor multi controller circuit board
- High compressor temperature (Thermal protector TRS operated)
- Malfunction of shut-off valves

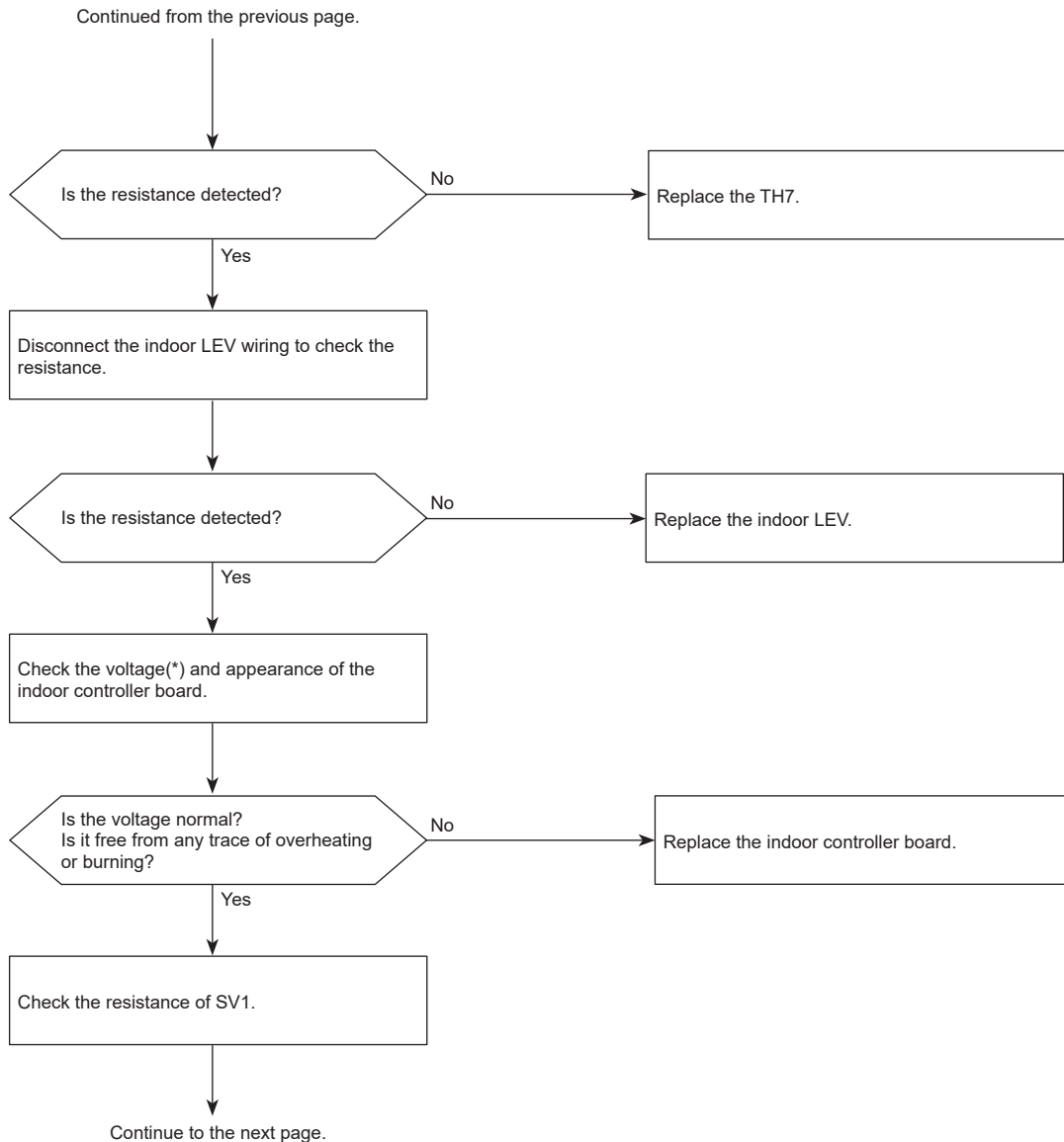
Diagnosis of failure



Diagnosis of failure

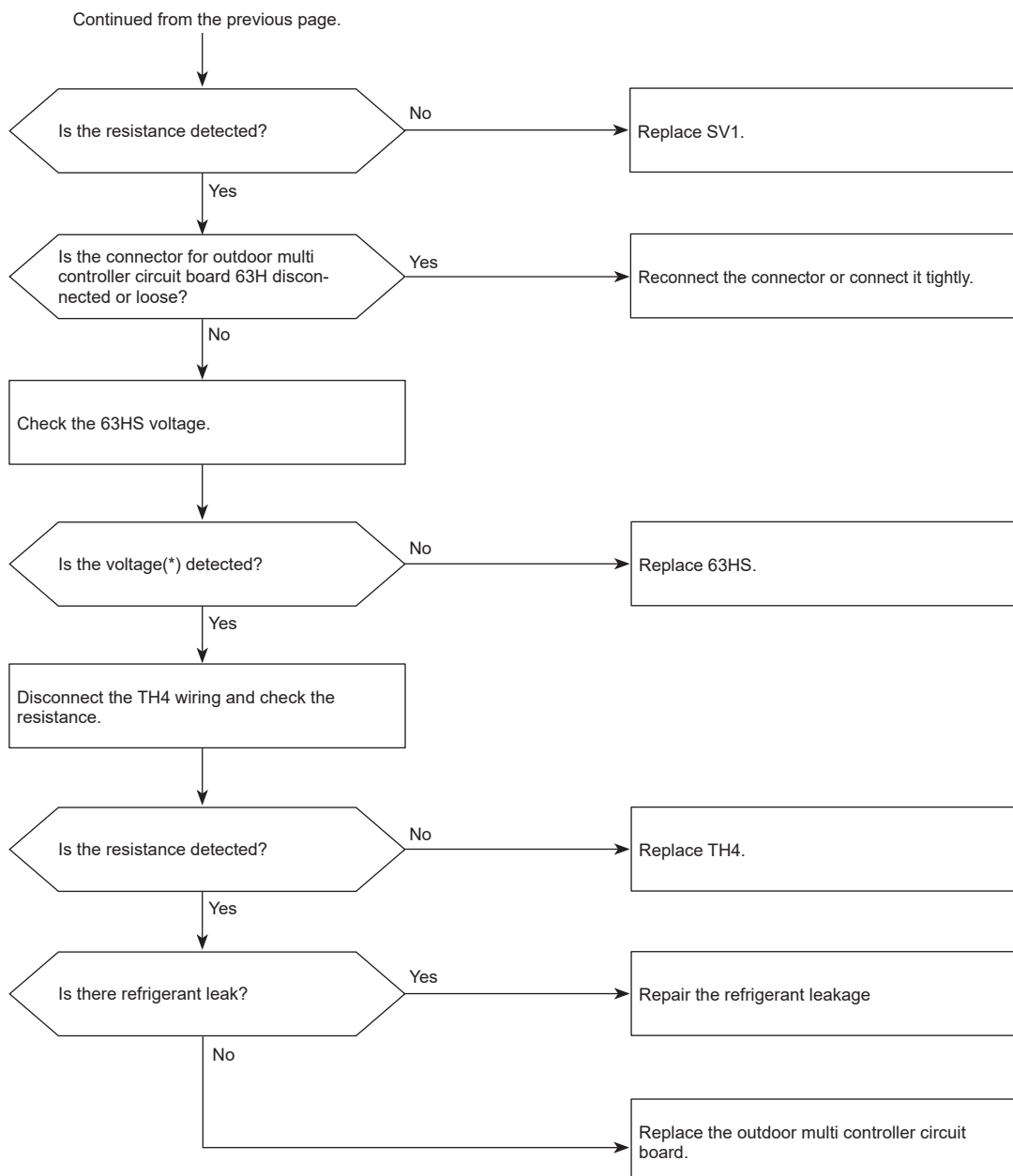


Diagnosis of failure



*For the voltage, refer to "How to check the components".

Diagnosis of failure



*For the voltage, refer to "How to check the components".

Abnormal points and detection methods

10 or more minutes after the compressor starts operation, if a discharge superheat of -15°C^* or less is detected for 5 consecutive minutes even though the indoor LEV has the minimum open pulse.

LEV:

Linear expansion valve

TH4:

Thermistor <Compressor>

63HS:

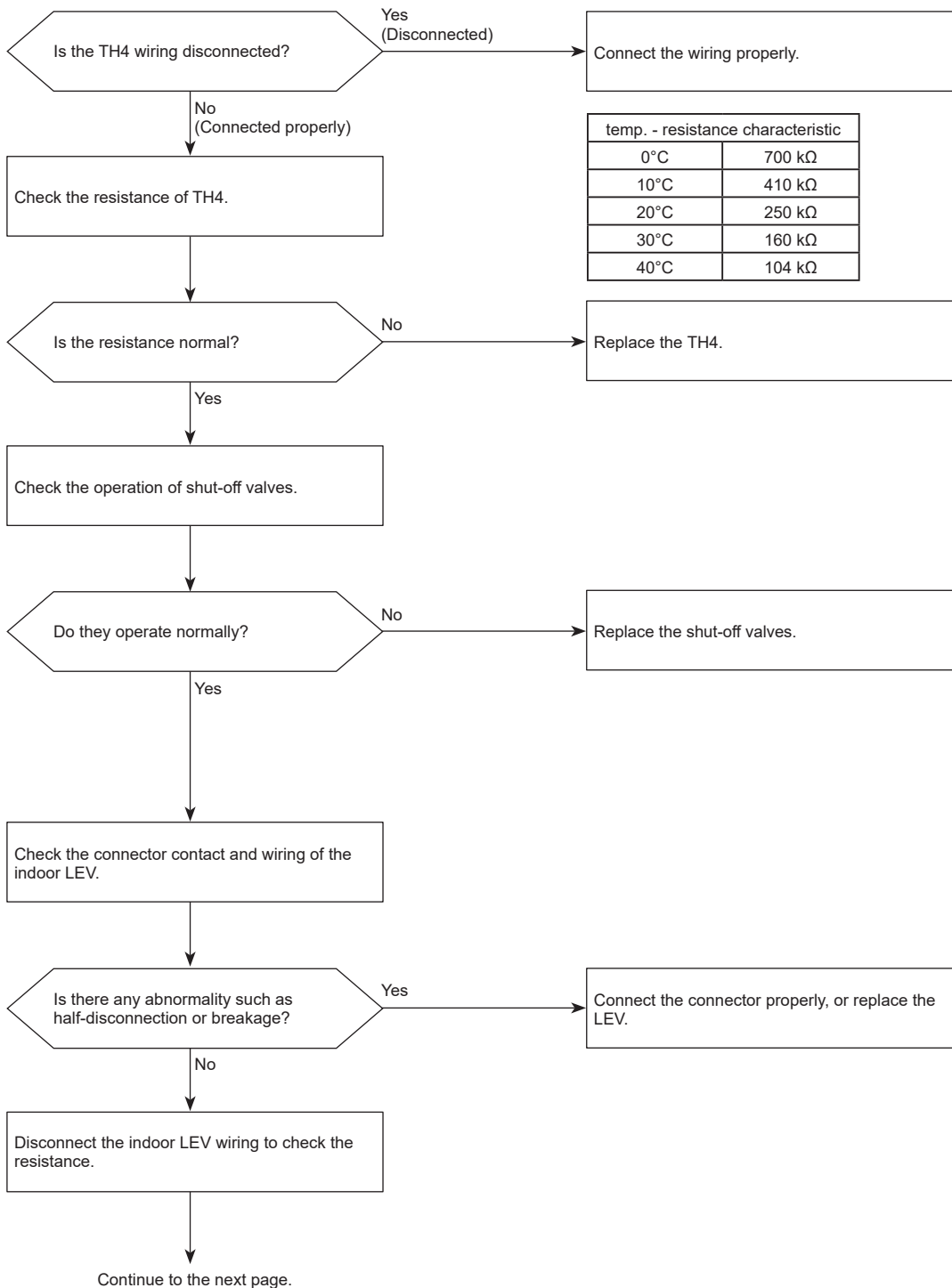
High pressure sensor

* At this temperature, conditions for the abnormality detection will not be satisfied if no abnormality is detected on either TH4 or 63HS.

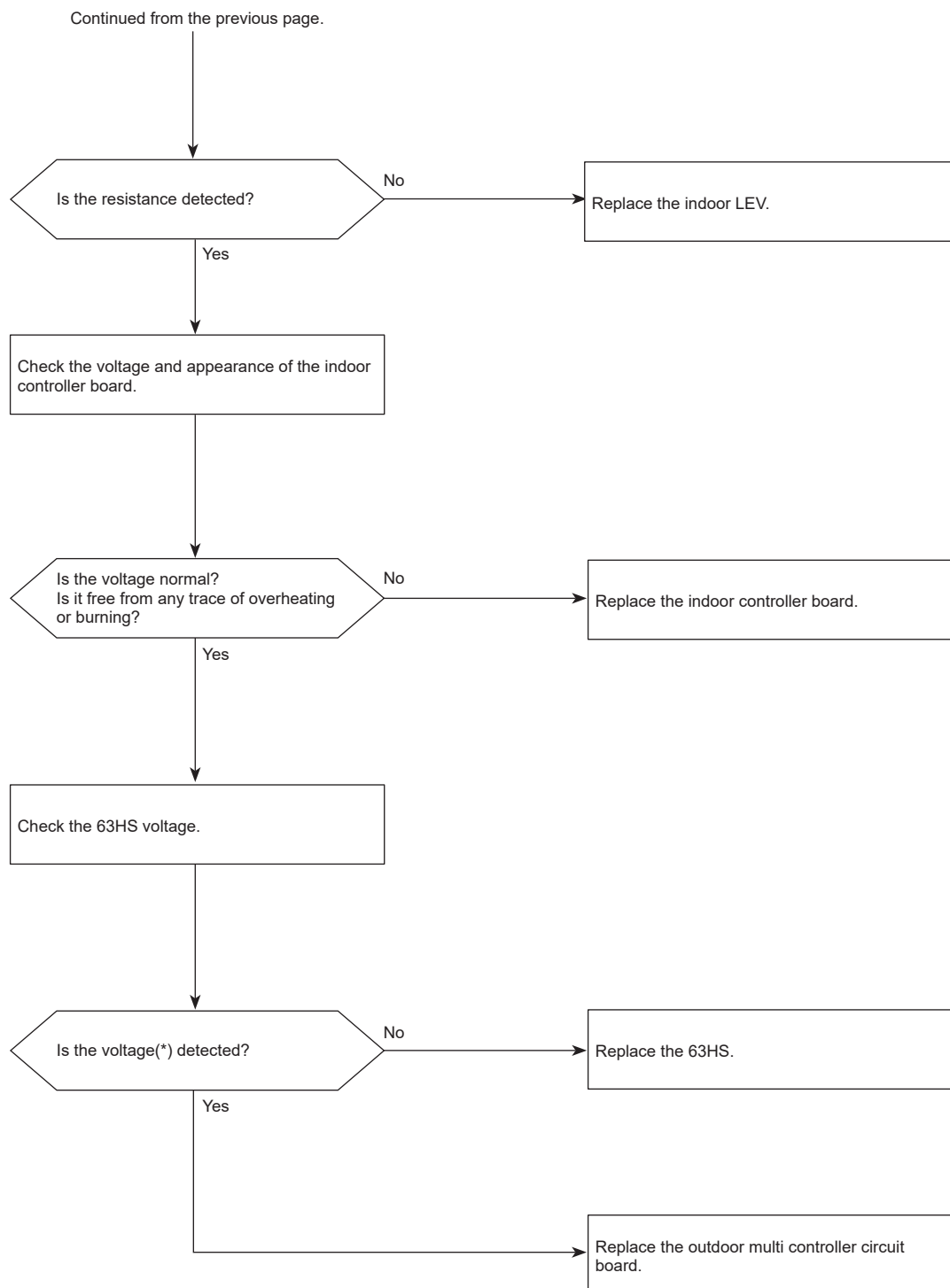
Causes and checkpoints

- Disconnection or loose connection of TH4
- Defective holder of TH4
- Disconnection of LEV coil
- Disconnection of LEV connector
- LEV performance failure
- Malfunction of shut-off valves

Diagnosis of failure



Diagnosis of failure



*For the voltage, refer to "How to check the components".

Abnormal points and detection methods

- All of the following conditions have been satisfied for 15 consecutive minutes:
 - The compressor is operating in HEAT mode.
 - Discharge superheat is 80°C or more.
 - Difference between TH7 and TH3 fits the formula of $TH7 - TH3 < 5^{\circ}C$
 - The saturation temperature converted from the pressure detected by the high pressure sensor is below 35°C.
- All of the following conditions have been satisfied:
 - The compressor is in operation.
 - When cooling, discharge superheat is 80°C or more, and the saturation temperature converted from the pressure detected by the high pressure sensor is over -40°C.
 - When heating, discharge superheat is 90°C or more.

Causes and checkpoints

- Defective operation of stop valve (not fully open)
- Defective thermistor
- Defective outdoor multi controller circuit board
- Indoor LEV performance failure
- Gas leakage or shortage
- Defective 63HS
- Malfunction of shut-off valves

TH3:

Thermistor <Outdoor liquid pipe>

TH7:

Thermistor <Ambient>

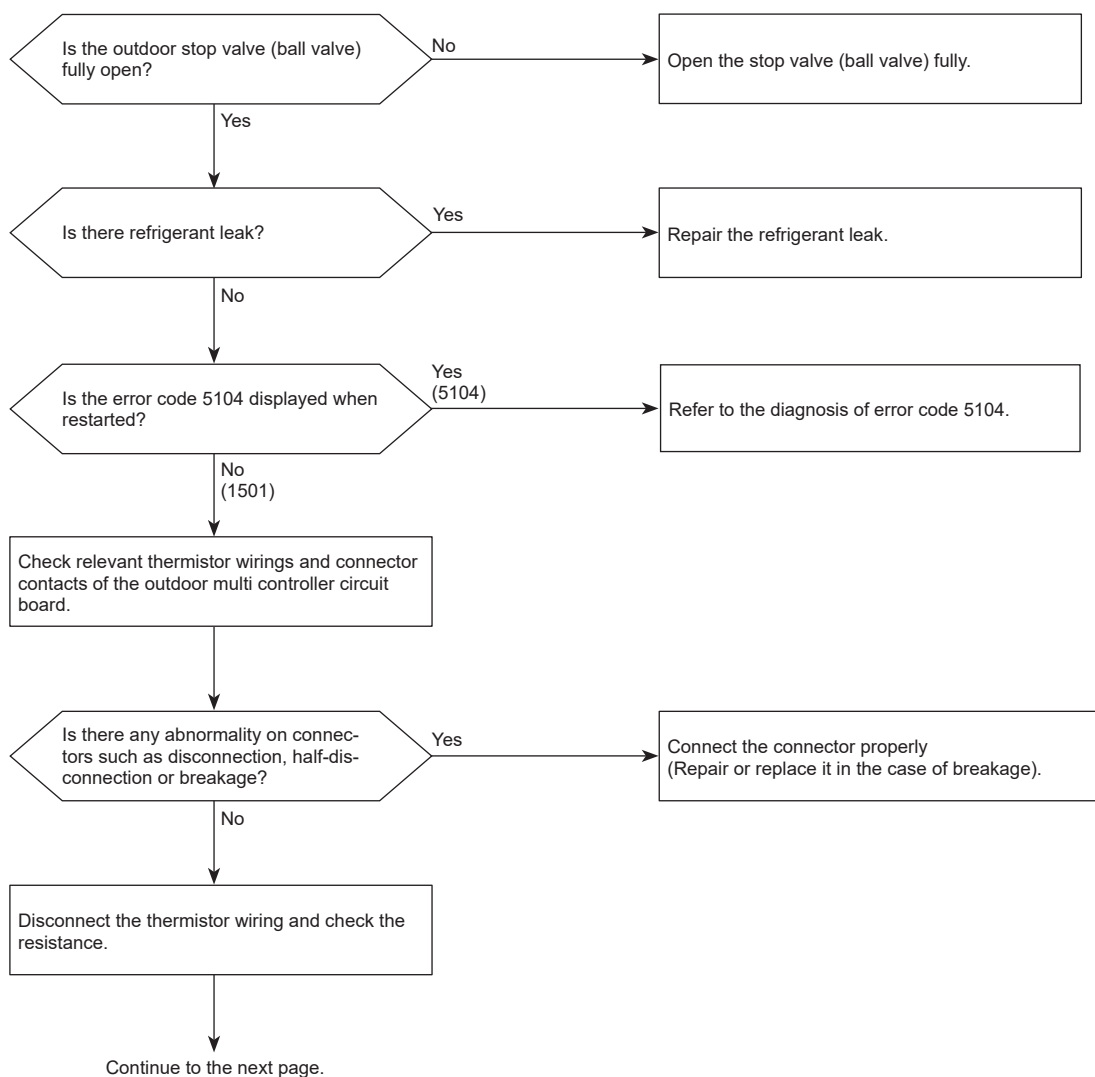
LEV:

Linear expansion valve

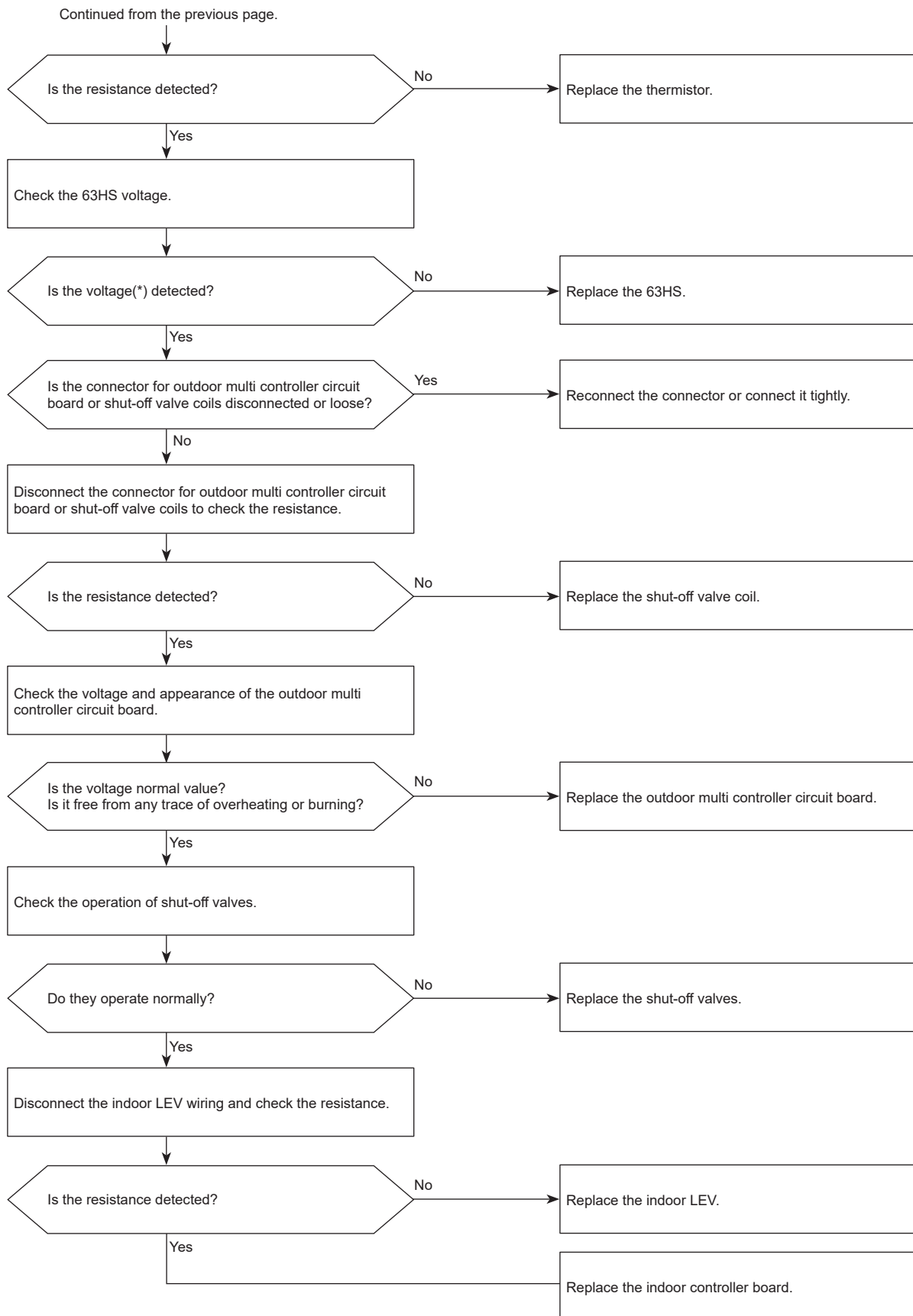
63HS:

High pressure sensor

Diagnosis of failure



Diagnosis of failure



1501 (U2): Closed valve in cooling mode

Abnormal points and detection methods

Stop valve is closed during cooling operation.
Both of the following temperature conditions have been satisfied for 20 minutes or more during cooling operation.

TH22j-TH21j $\geq -2^{\circ}\text{C}$

TH23j-TH21j $\geq -2^{\circ}\text{C}$

Note:

- For indoor unit, the abnormality is detected if an operating unit satisfies the condition.

Causes and checkpoints

- Outdoor liquid/gas valve is closed.
- Malfunction of outdoor LEV (LEV1) (blockage)
- Malfunction of shut-off valves

TH21:

Indoor intake temperature thermistor (RT11 or TH1)

TH22:

Indoor liquid pipe temperature thermistor (RT13 or TH2)

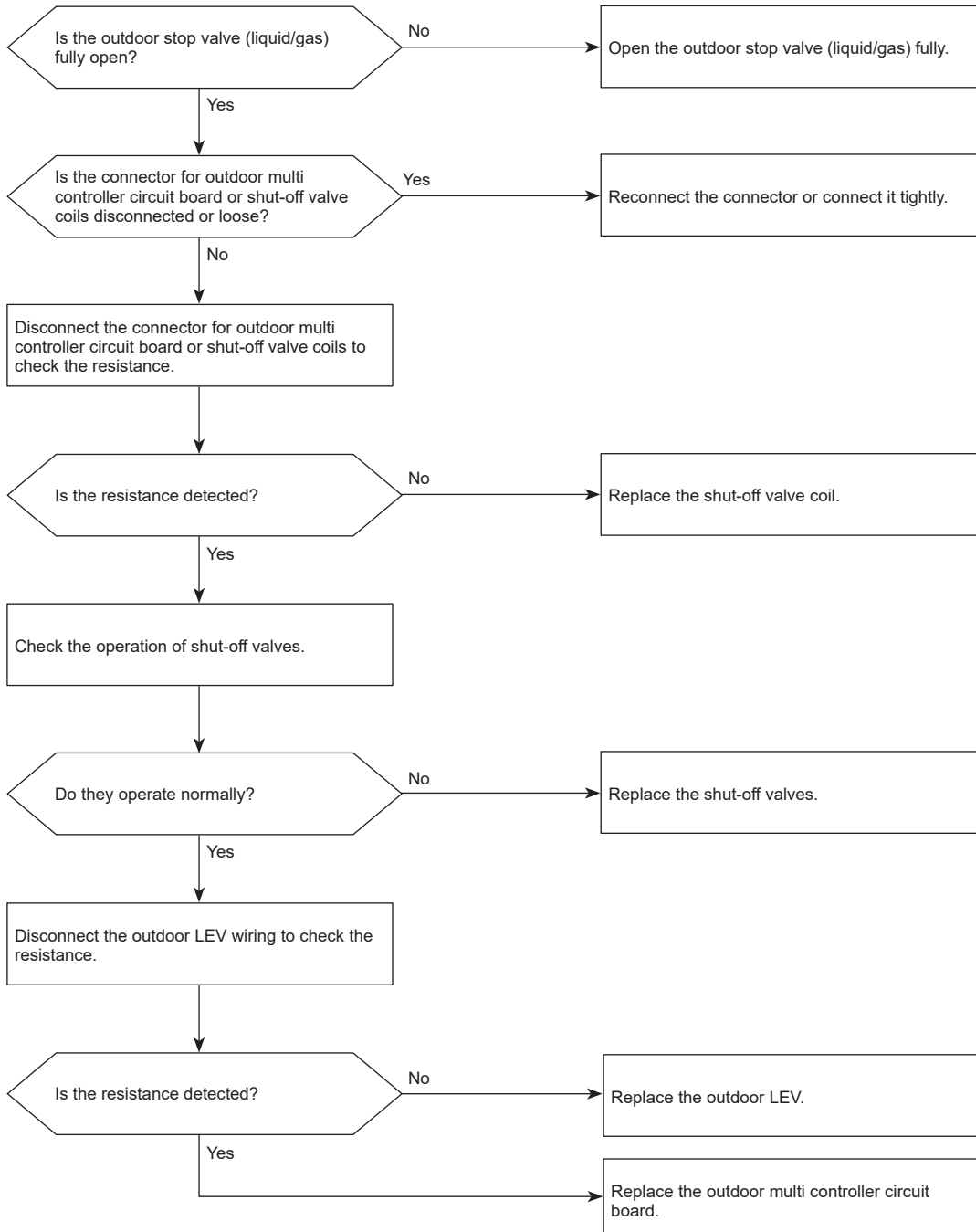
TH23:

Indoor gas pipe temperature thermistor (TH-A to E)

LEV:

Linear expansion valve

Diagnosis of failure



1503 (P6): Freeze protection of plate heat exchanger / Freeze protection of branch box or indoor unit

Abnormal points and detection methods

The purpose of the error code is to prevent indoor unit from freezing or condensation which is caused when a refrigerant keeps flowing into the indoor unit that is not operating.

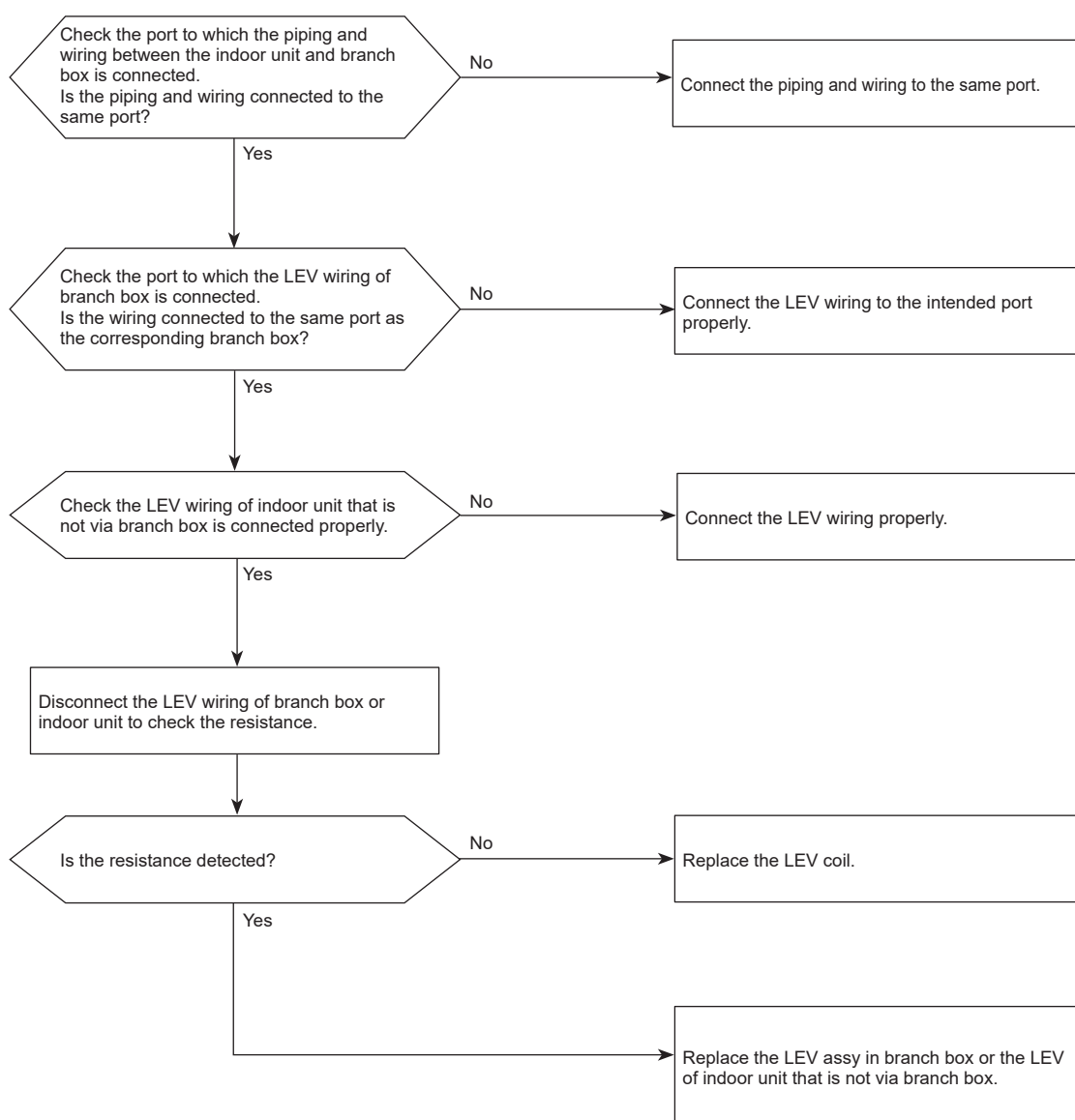
All of the following conditions have been satisfied:

- The compressor is operating in COOL mode.
- 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).
- After the condition 2 above is satisfied, the thermistor of indoor unit in STOP detects $TH22j \leq -5^{\circ}\text{C}$ for 5 consecutive minutes.

Causes and checkpoints

- Wrong piping connection between indoor unit and branch box
- Miswiring between indoor unit and branch box
- Miswiring of LEV in branch box
- Malfunction of LEV in branch box

Diagnosis of failure



1508 (EF): 4-way valve trouble in heating mode

Abnormal points and detection methods

4-way valve does not operate during heating operation.
Any of the following temperature conditions is satisfied for 3 minutes or more during heating operation when the outdoor temperature is -20°C or more:

$\text{TH22j}-\text{TH21j} \leq -10^{\circ}\text{C}$

$\text{TH23j}-\text{TH21j} \leq -10^{\circ}\text{C}$

$\text{TH22j} \leq 3^{\circ}\text{C}$

$\text{TH23j} \leq 3^{\circ}\text{C}$

Note:

- For indoor unit, the abnormality is detected if an operating unit satisfies the condition.

TH21:

Indoor intake temperature thermistor (RT11 or TH1)

TH22:

Indoor liquid pipe temperature thermistor (RT13 or TH2)

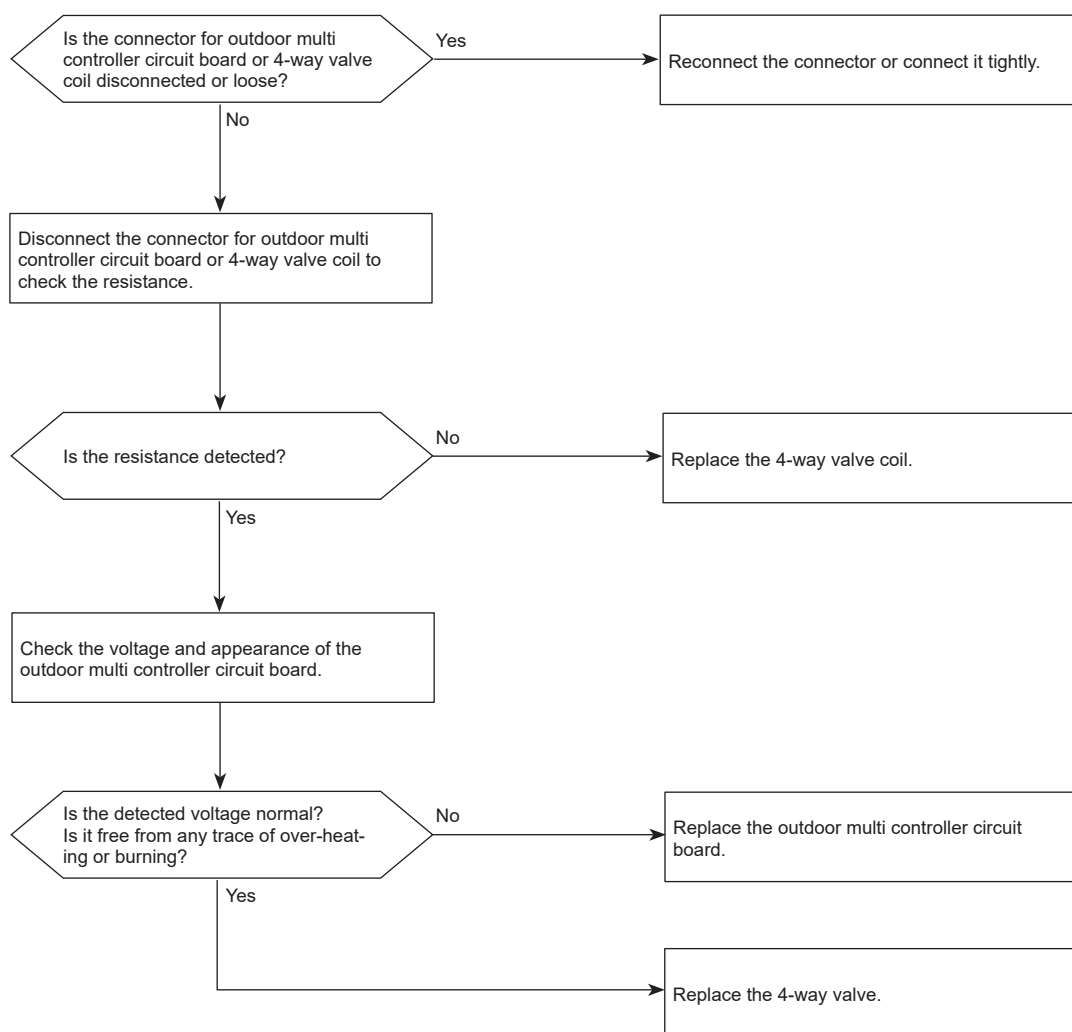
TH23:

Indoor gas pipe temperature thermistor (TH-A to E)

Causes and checkpoints

- 4-way valve failure
- Disconnection or failure of 4-way valve coil
- Clogged drain pipe
- Disconnection or loose connection of connectors
- Malfunction of input circuit on outdoor multi controller circuit board
- Defective outdoor power circuit board

Diagnosis of failure



Refer to "How to check the parts" for ohm values.

1521/1522/1524 (FL/EF): Refrigerant leakage/ Refrigerant sensor failure

Abnormal points and detection methods

Refrigerant is leaking from the air conditioner.
The refrigerant sensor has detected refrigerant leak.
Refrigerant is leaking in the room where the alarm is beeping.
In the case of EN378 system (SW5-7 ON), this error is also caused by a refrigerant sensor failure.

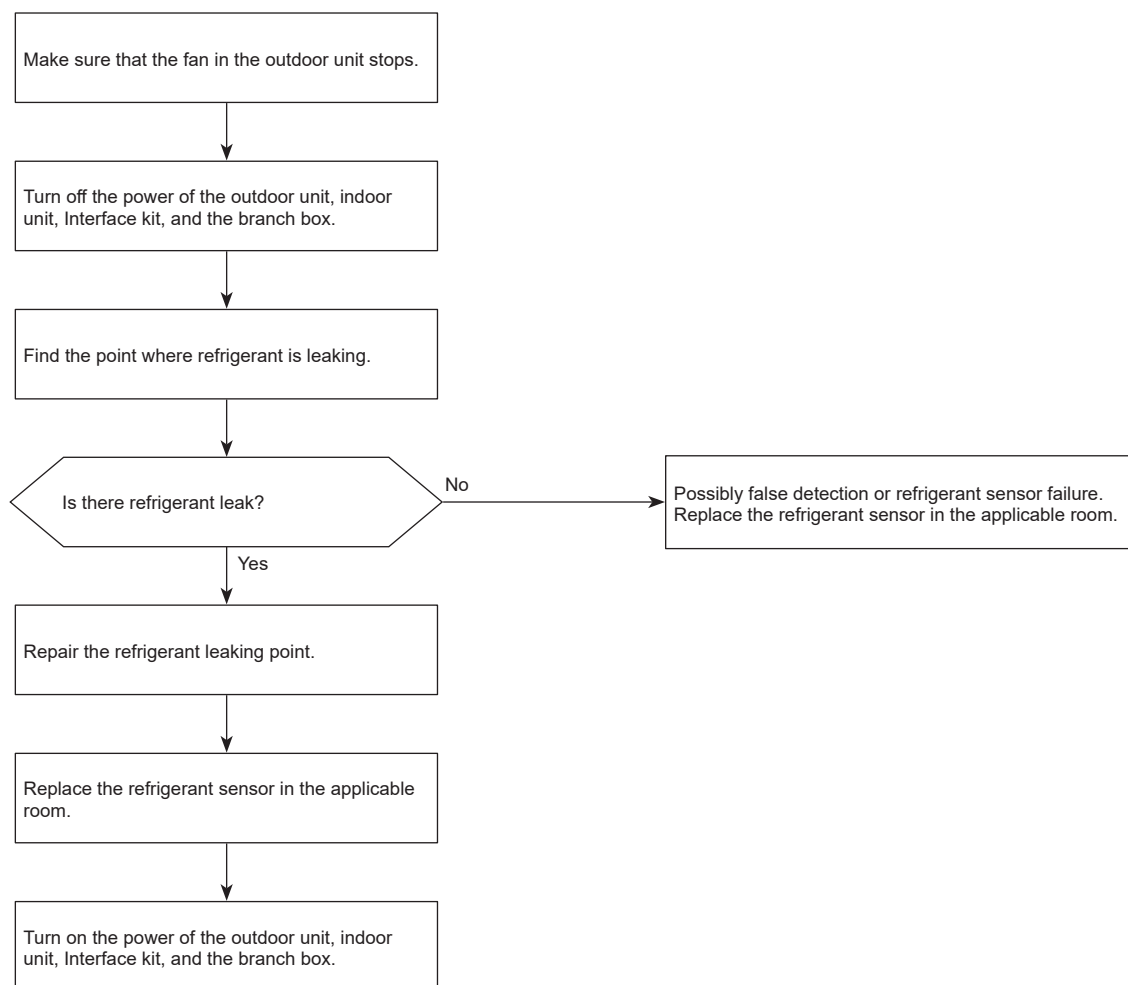
Causes and checkpoints

- Refrigerant leak from air conditioner
- Refrigerant leak from piping
- False detection (The refrigerant sensor reacted to other gas.)
- A refrigerant sensor has failed.

Notes:

- When this error occurs, both the controller in the applicable room and the controller in the supervisor room produce an alarm. Also, the system closes the shut-off valve and performs refrigerant recovery.
- When this error occurs, ventilate the room.
- When this error occurs, do not turn off the power until the fan in the outdoor unit stops.

Diagnosis of failure



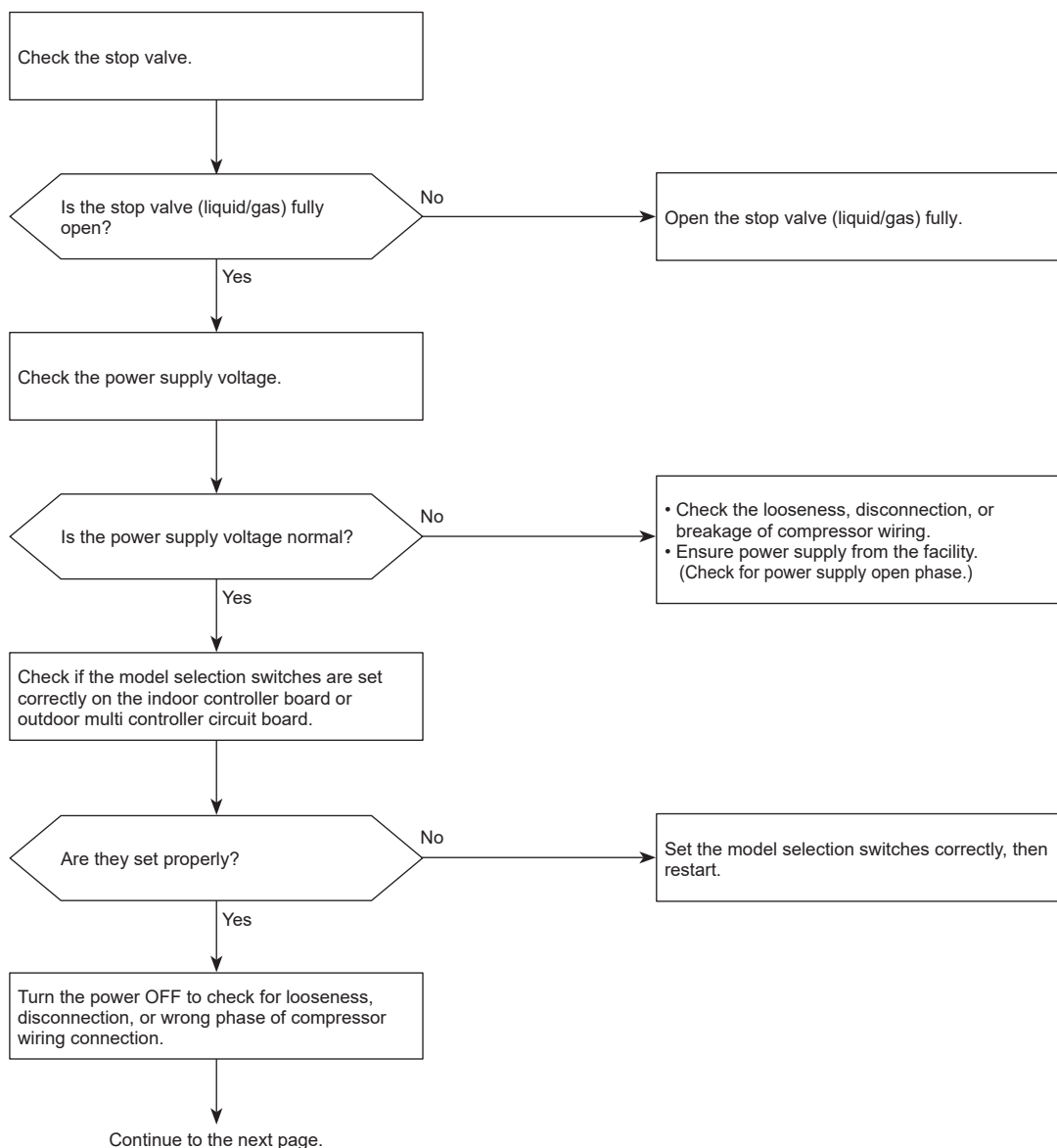
Abnormal points and detection methods

Overcurrent of DC bus or compressor is detected within 30 seconds after the compressor starts the operation.

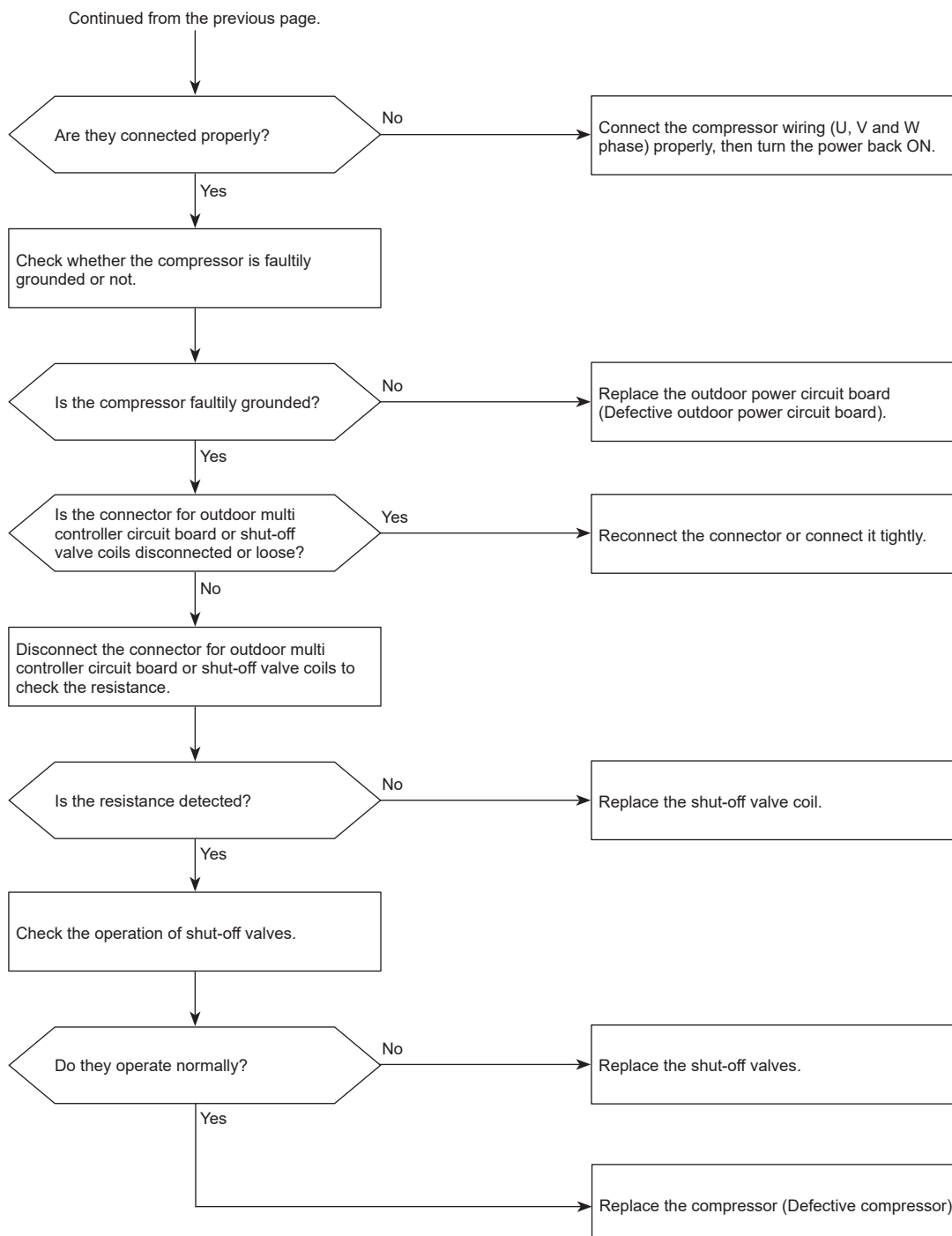
Causes and checkpoints

- Closed stop valve
- Decrease of power supply voltage
- Looseness, disconnection, or wrong phase of compressor wiring connection
- Incorrect DIP-SW setting of model selection on the outdoor controller board
- Defective compressor
- Defective outdoor power circuit board
- Malfunction of shut-off valves

Diagnosis of failure



Diagnosis of failure



4210 (UP): Compressor overcurrent interruption/Failure in 12 VDC power supply circuit on power circuit board

Chart 1 of 2

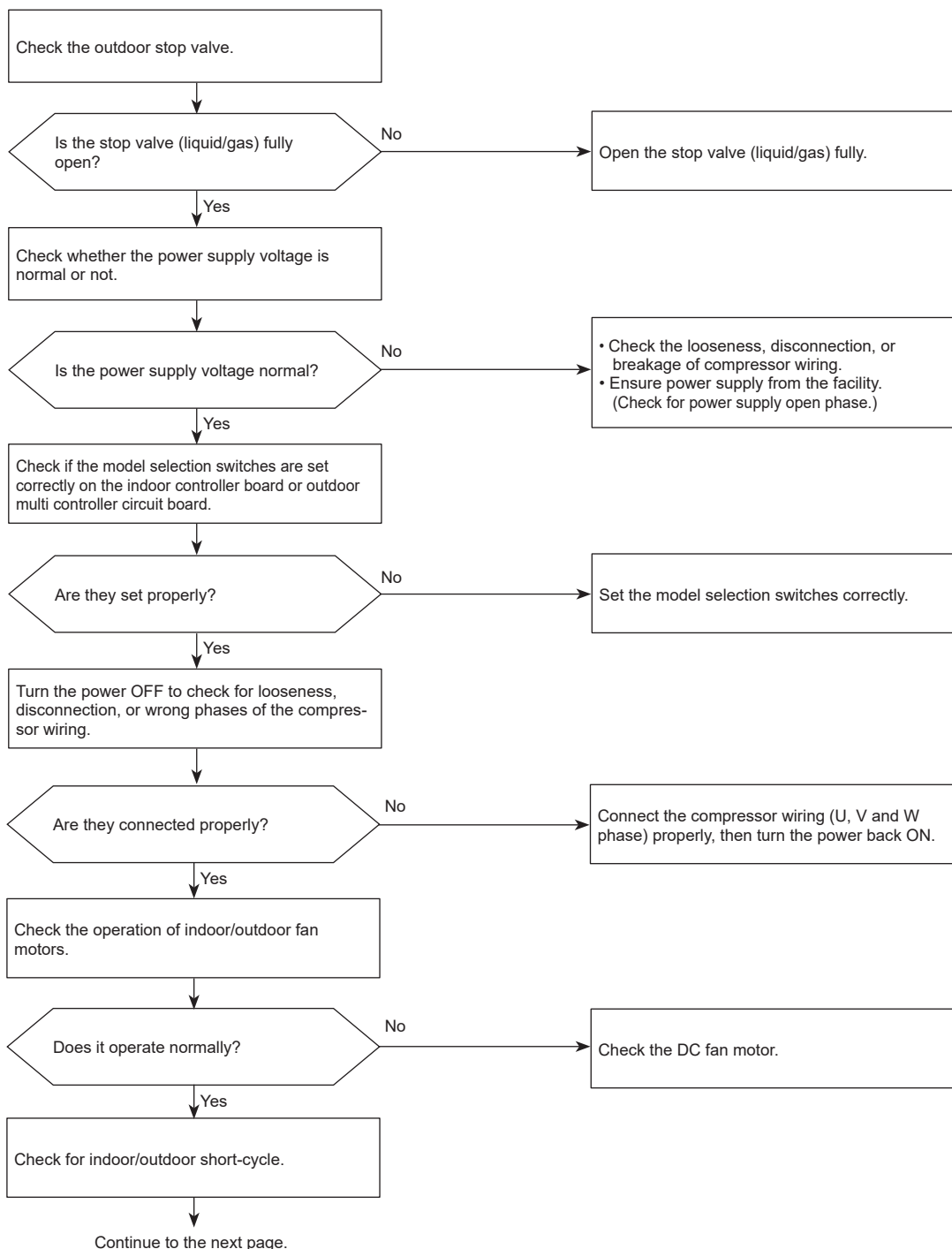
Abnormal points and detection methods

- Overcurrent of DC bus or compressor is detected 30 or more seconds after the compressor starts the operation.
- 12 VDC power is not supplied from the 12 VDC supply circuit on the power circuit board.

Causes and checkpoints

- Closed outdoor stop valve
- Decrease of power supply voltage
- Looseness, disconnection, or wrong phase of compressor wiring connection
- Model selection error on indoor controller board or outdoor multi controller circuit board
- Defective compressor
- Defective outdoor power circuit board
- Defective outdoor multi controller circuit board
- Malfunction of indoor/outdoor unit fan
- Short-cycle of indoor/outdoor unit
- Malfunction of shut-off valves

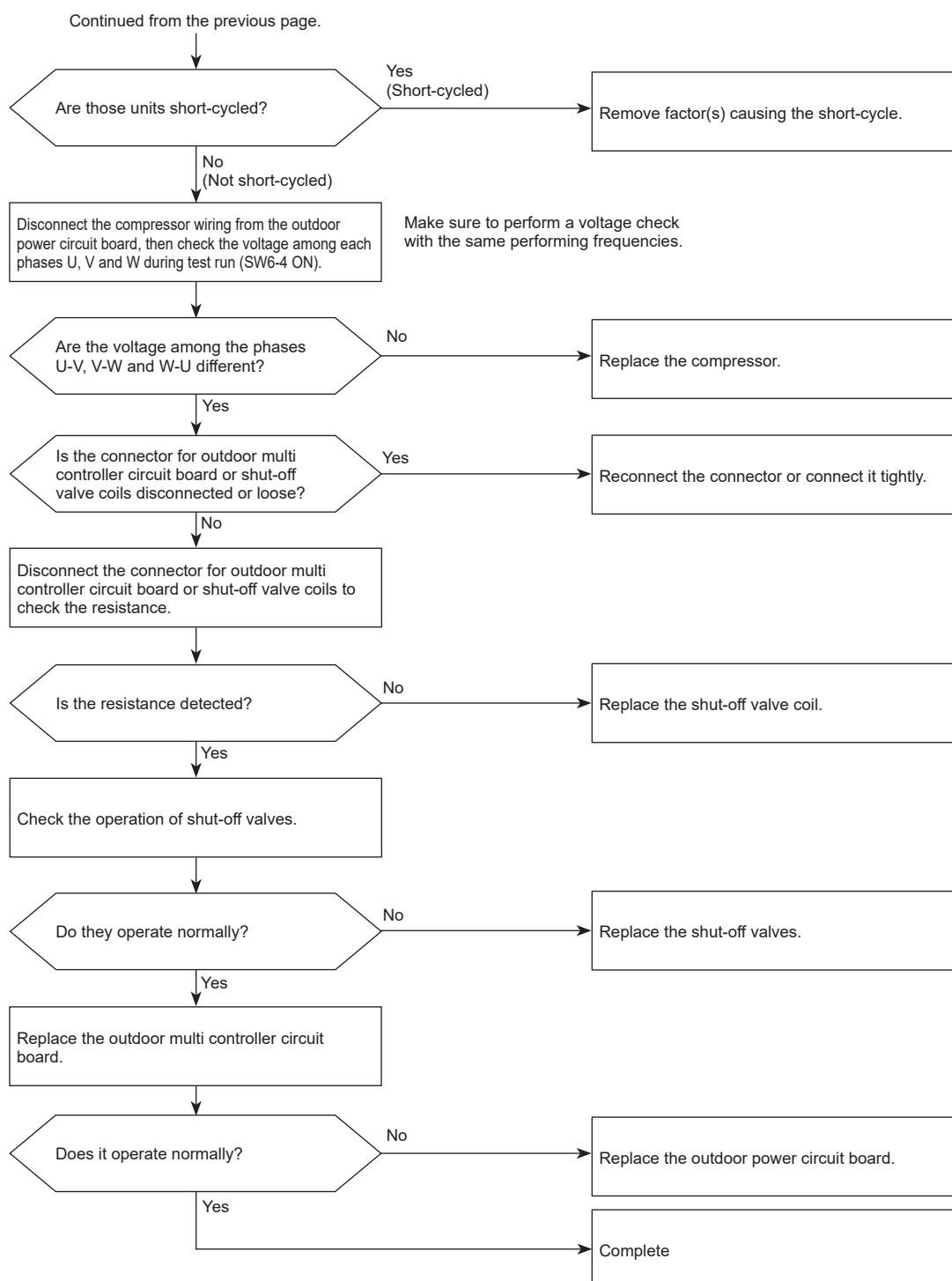
Diagnosis of failure



4210 (UP): Compressor overcurrent interruption/Failure in 12 VDC power supply circuit on power circuit board

Chart 2 of 2

Diagnosis of failure



4220 (U9): 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

Any of the following symptoms are detected;

- Decrease of DC bus voltage to 200 V (1-phase), 350 V (3-phase)
- Increase of DC bus voltage to 400 V (1-phase), 760 V (3-phase)
- DC bus voltage stays at 310 V or less for 30 consecutive seconds when the operational frequency is over 20 Hz.

Any of the following conditions is satisfied while the detections value of primary current is 0.1 A or less.

- The operational frequency is 40 Hz or more.
- The compressor current is 6 A or more.

Causes and checkpoints

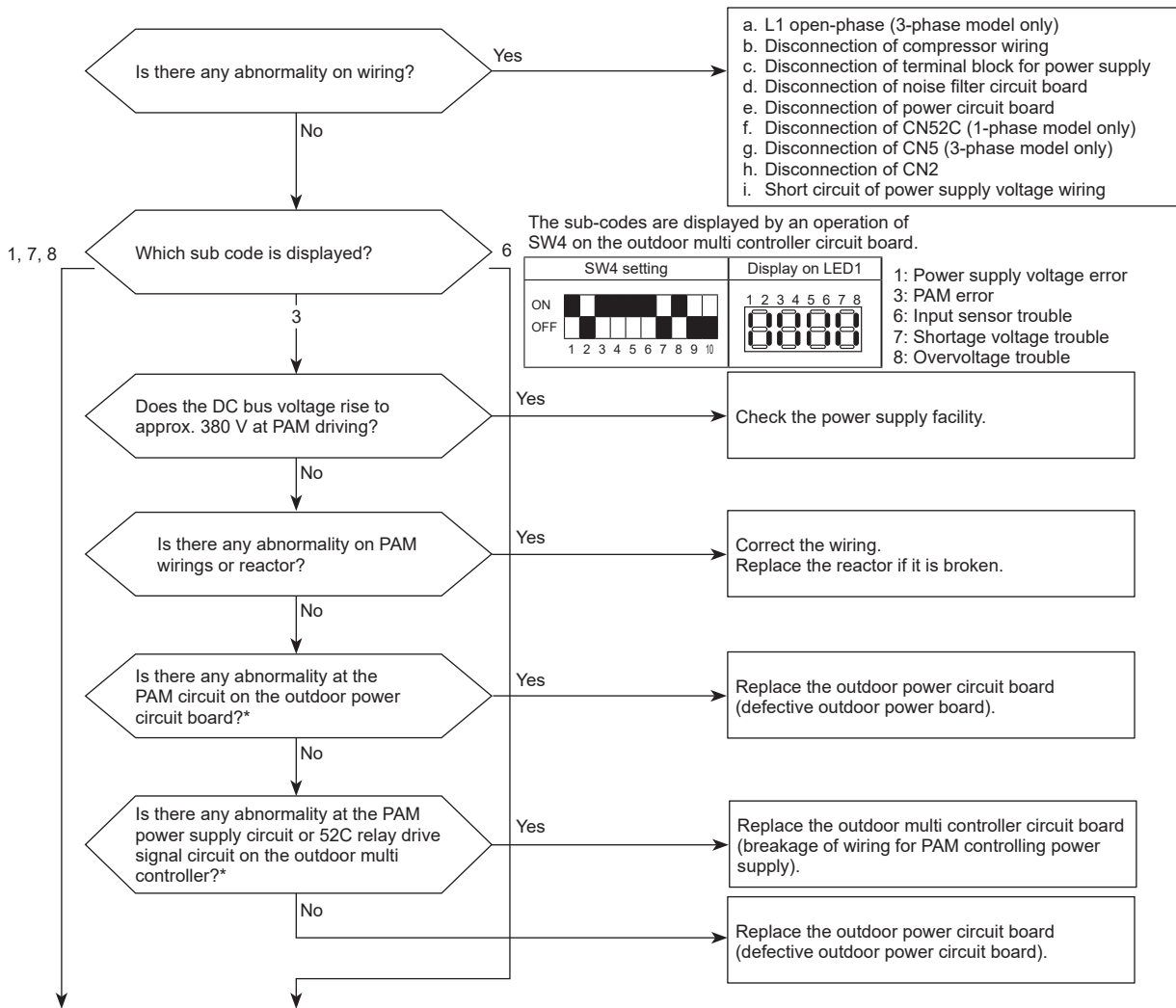
- Decrease/increase of power supply voltage
- L1 open-phase (3-phase only)
- Primary current sensor failure
- Disconnection of compressor wiring
- Malfunction of 52C relay
- Defective outdoor power circuit board
- Malfunction of 52C relay driving circuit on outdoor multi controller circuit board
- Disconnection of CN5 (3-phase only)
- Disconnection of CN2
- Malfunction of primary current detecting circuit on outdoor power circuit board
- Malfunction of resistor connected to 52C relay on outdoor power circuit board (3-phase only)
- Short circuit of power supply voltage wiring

1-phase: 1-phase model

3-phase: 3-phase 3-wire model

The black square (■) indicates a switch position.

Diagnosis of failure



*Refer to "How to check the parts".

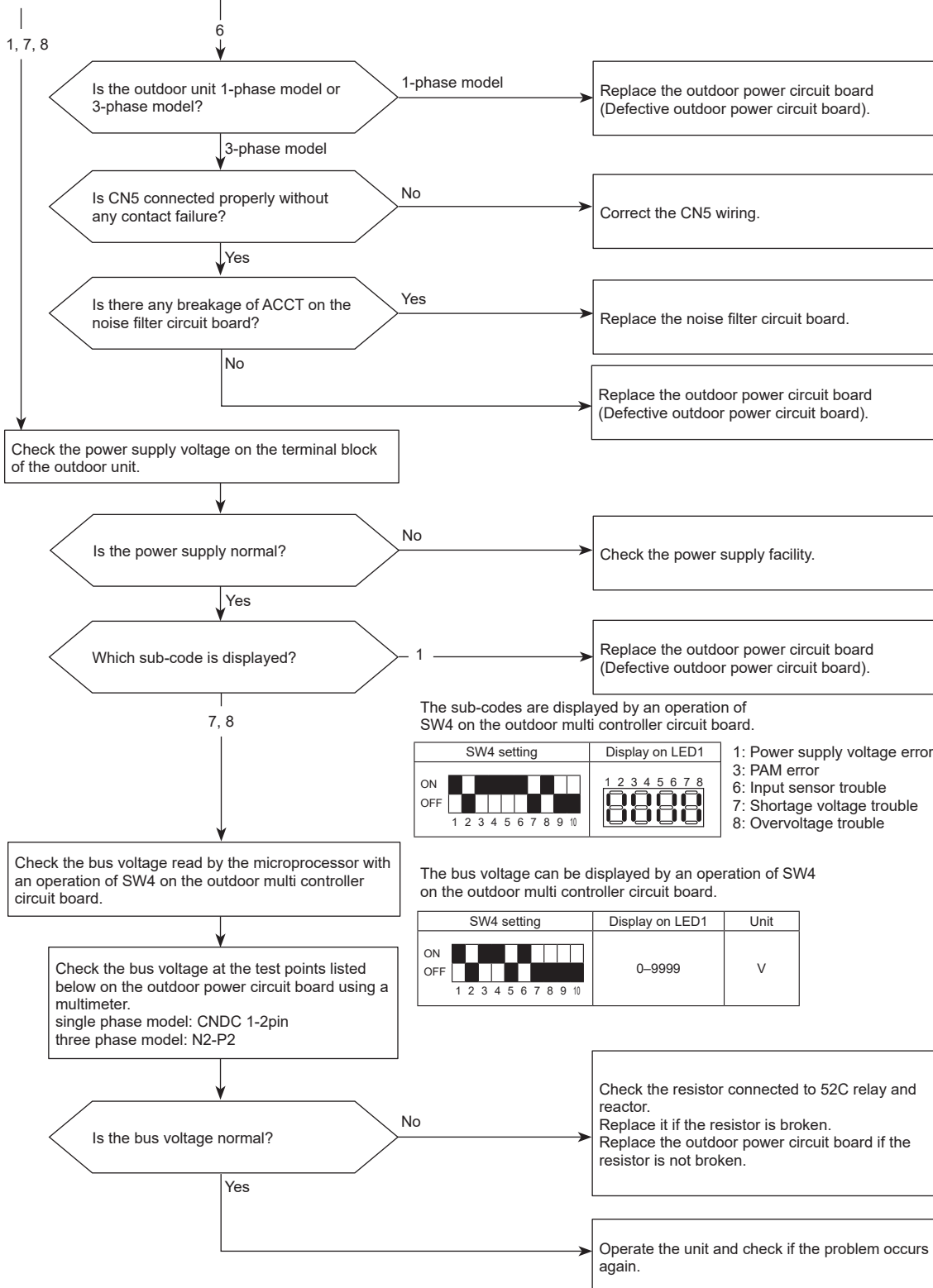
4220 (U9): Voltage shortage/Overvoltage/PAM error/L1 open phase/ Primary current sensor error/Power synchronization signal error

Chart 2 of 2

The black square (■) indicates a switch position.

Diagnosis of failure

Continued from the previous page.



4230 (U5): Heat sink temperature trouble

Abnormal points and detection methods

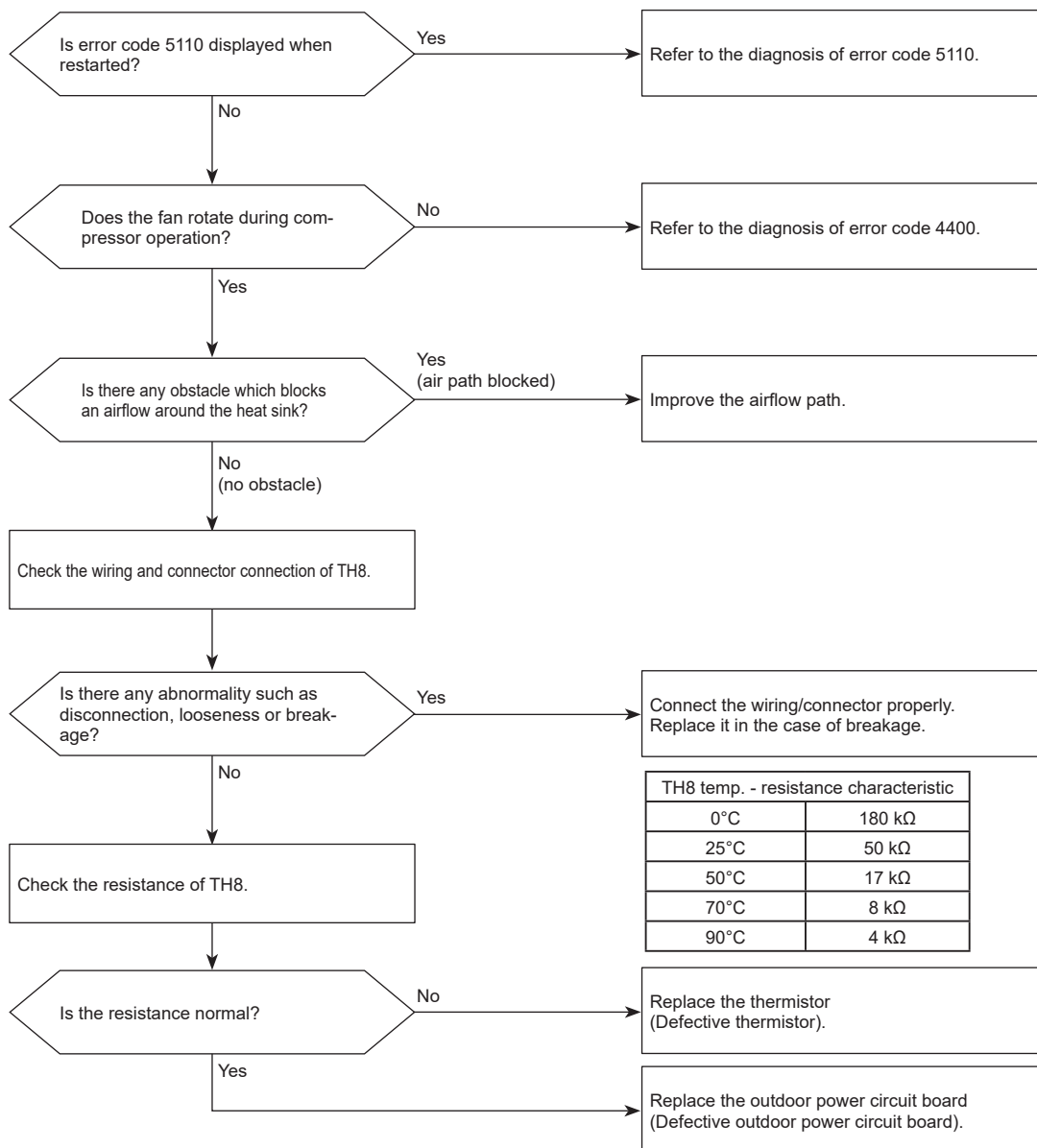
TH8 detects a temperature outside the specified range during compressor operation.

TH8: Thermistor <Heat sink>

Causes and checkpoints

- Blocked outdoor fan
- Malfunction of outdoor fan motor
- Blocked airflow path
- Rise of ambient temperature
- Characteristic defect of thermistor
- Malfunction of input circuit on outdoor power circuit board
- Malfunction of outdoor fan driving circuit

Diagnosis of failure



4250 (U6): Power module trouble

Abnormal points and detection methods

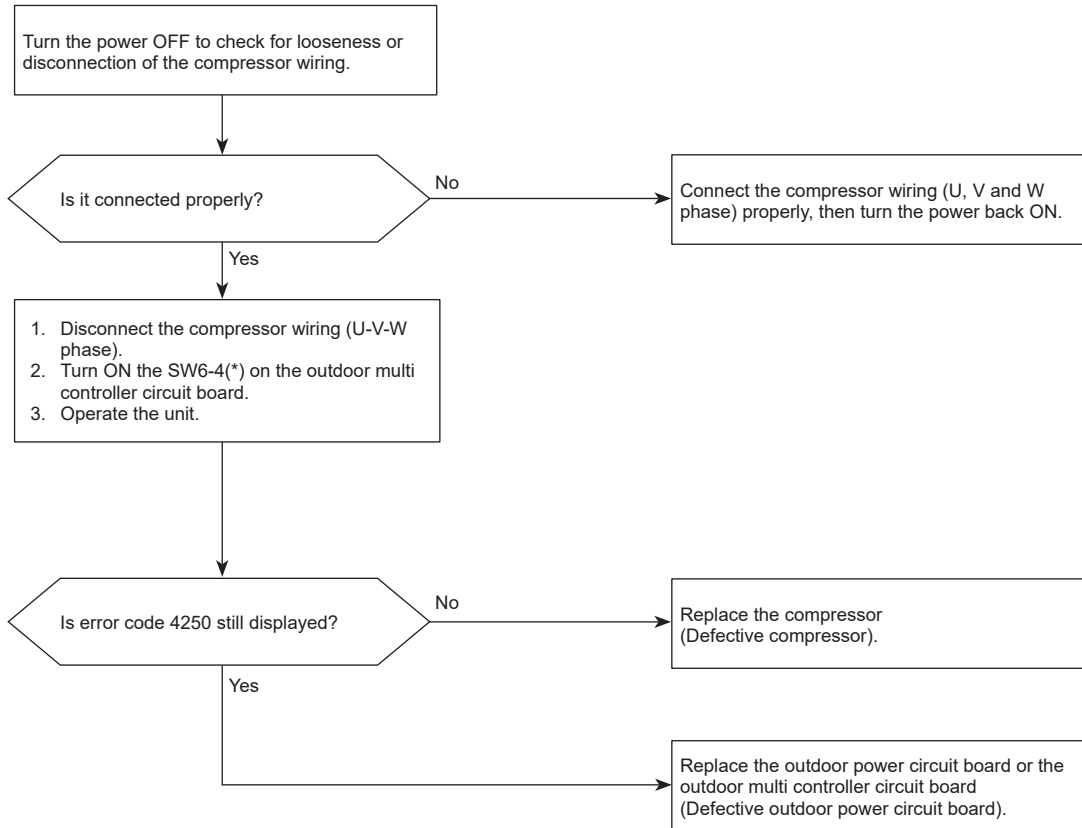
Both of the following conditions have been satisfied:

- Overcurrent of DC bus or compressor is detected during compressor operation.
- Inverter power module is determined to be faulty.

Causes and checkpoints

- Short-circuit caused by looseness or disconnection of compressor wiring
- Defective compressor
- Defective outdoor power circuit board

Diagnosis of failure



* SW6-4 ON: Ignore 5300 (UH) error.

4400 (U8): Fan trouble (Outdoor unit)

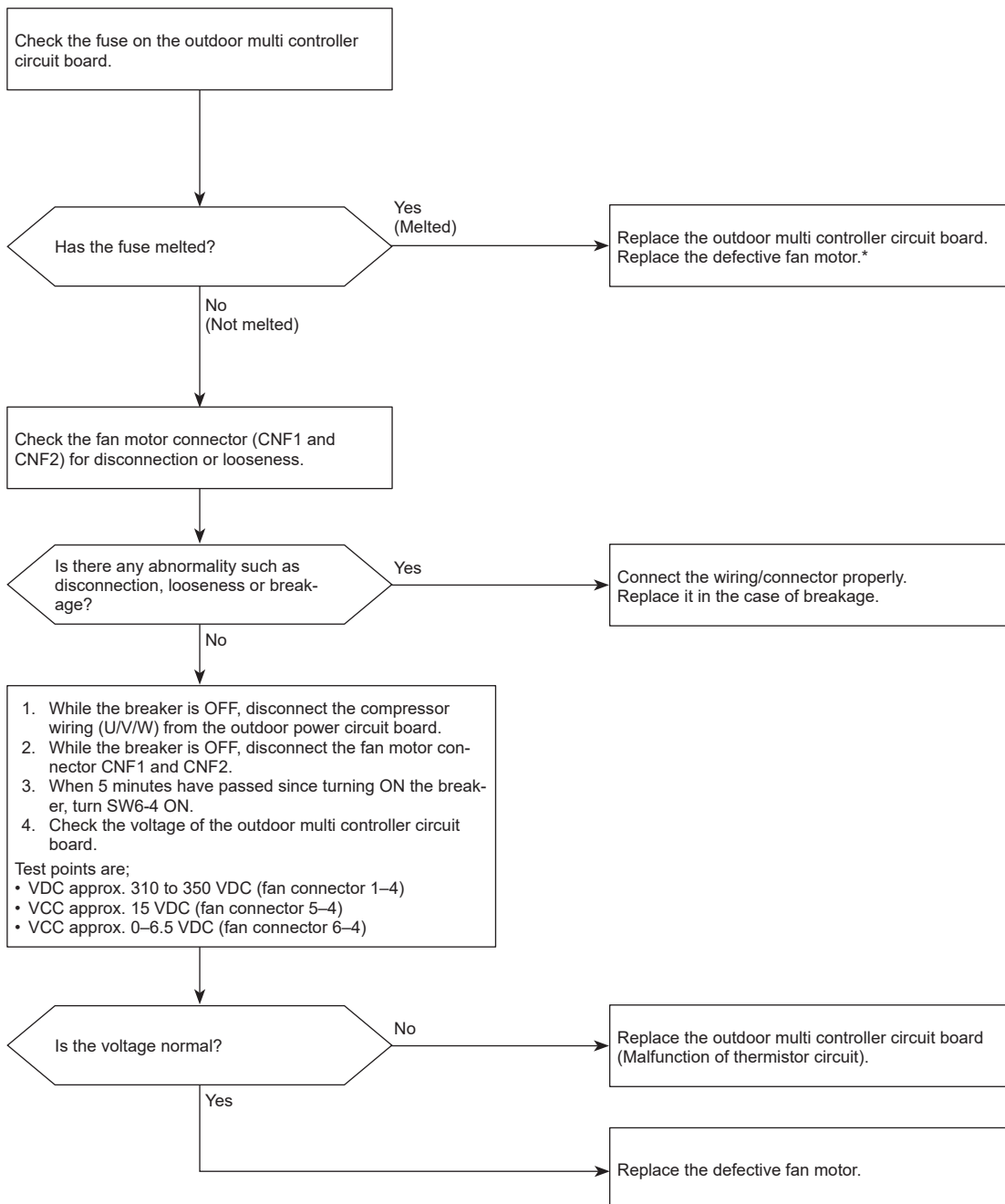
Abnormal points and detection methods

No rotational frequency is detected, a value outside the specified range is detected during fan motor operation.

Causes and checkpoints

- Malfunction of fan motor
- Disconnection of CNF connector
- Defective outdoor multi controller circuit board

Diagnosis of failure



* For the detail, refer to "Check method of DC fan motor (fan motor/outdoor multi controller circuit board)".

Note:

- Set SW6-4 OFF after the troubleshooting completes.
- The fan sometimes starts on-off cycle operation during low-load operation or cooling at low outside temperature. It is not abnormal; the operation ensures reliability of the product.

5101 (U3): Compressor temperature thermistor (TH4) open/short <Detected in outdoor unit>

Abnormal points and detection methods

TH4 is found 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:

3°C or less*

Short:

217°C or more

TH4:

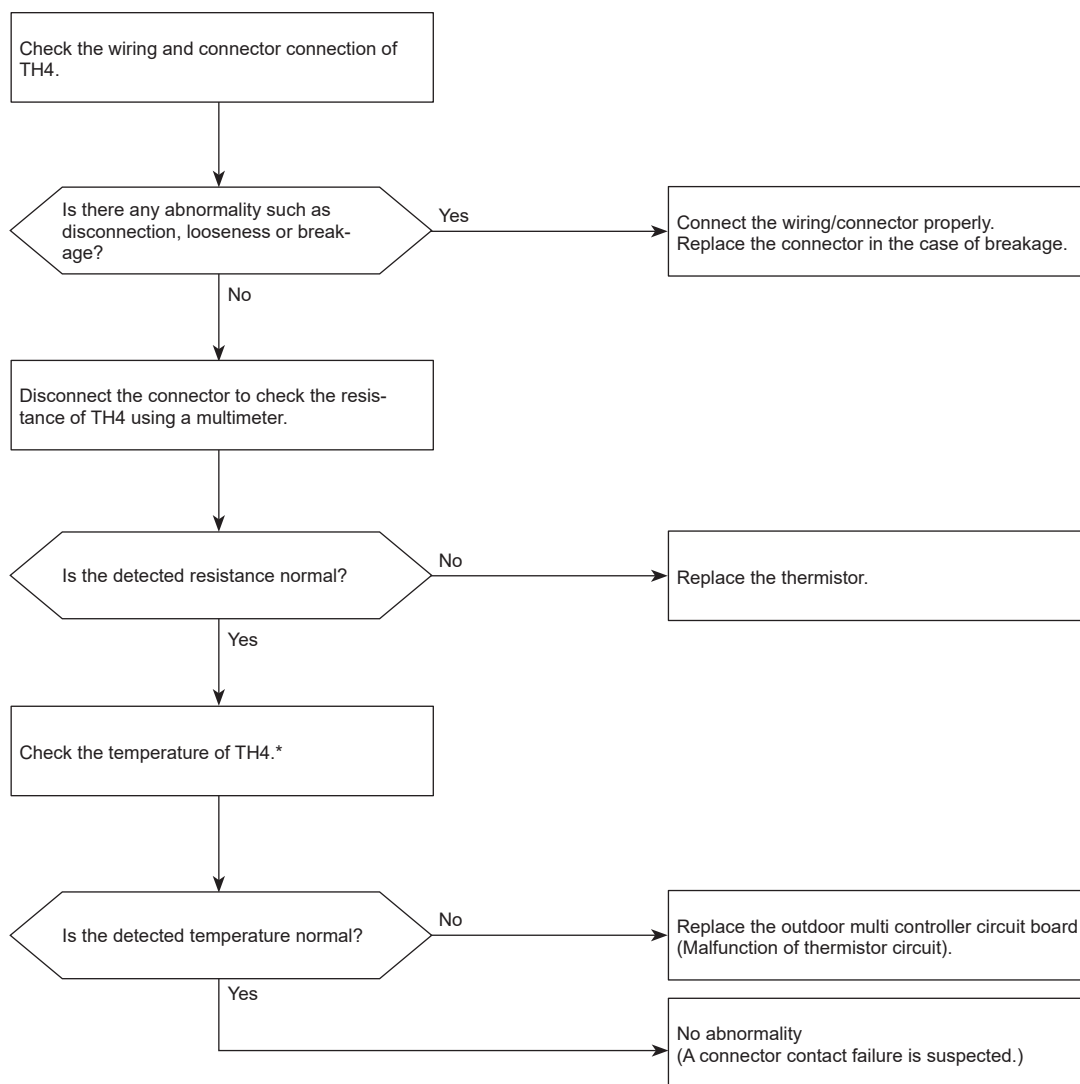
Thermistor <Compressor>

Causes and checkpoints

- Disconnection or contact failure of connectors
- Faulty thermistor
- Defective outdoor multi controller circuit board

The black square (■) indicates a switch position.

Diagnosis of failure



* The detected temperature of TH4 can be displayed by an operation of SW4 on the outdoor multi controller circuit board.

SW4 setting		Display on LED1	Unit
ON	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	-99.9~999.9	°C
OFF	□ □ □ □ □ □ □ □ □ □		
1 2 3 4 5 6 7 8 9 10			

5102 (U4): Suction pipe temperature thermistor (TH6) open/short <Detected in outdoor unit>

Abnormal points and detection methods

TH6 is found to be open/short.
(The open/short detection is disabled for 10 seconds to 10 minutes after compressor starts, during defrosting operation, or for 10 minutes after returning from the defrosting operation.)

Open:

–40°C or less

Short:

90°C or more

TH6:

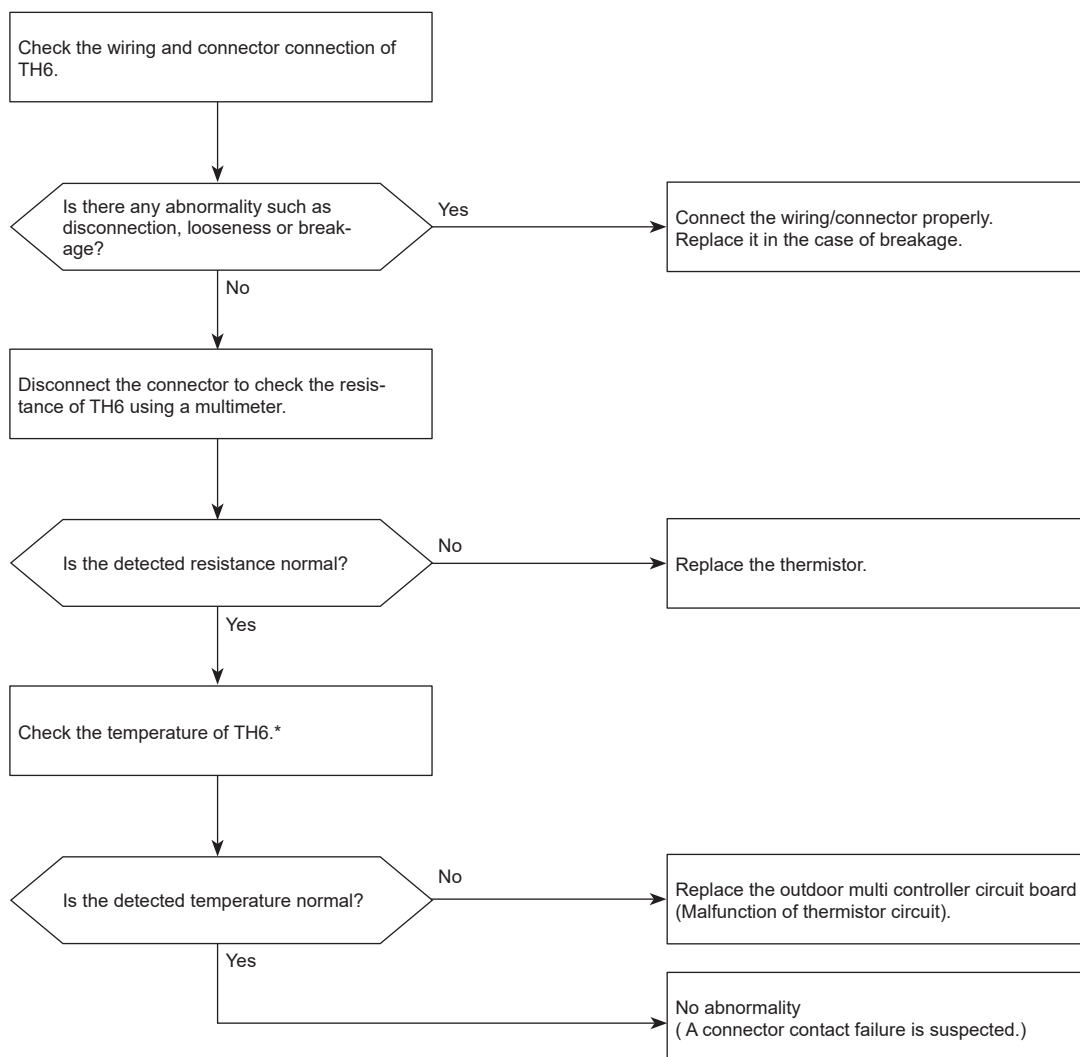
Thermistor <Suction pipe>

Causes and checkpoints

- Disconnection or contact failure of connectors
- Faulty thermistor
- Defective outdoor multi controller circuit board

The black square (■) indicates a switch position.

Diagnosis of failure



* The detected temperature of TH6 can be displayed by an operation of SW4 on the outdoor multi controller circuit board.

SW4 setting		Display on LED1	Unit
ON	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	–99.9–999.9	°C
OFF	□ □ □ □ □ □ □ □ □ □		
	1 2 3 4 5 6 7 8 9 10		

5105 (U4): Outdoor liquid pipe temperature thermistor (TH3) open/short

Abnormal points and detection methods

TH3 is found to be open/short.
(The open/short detection is disabled for 10 seconds to 10 minutes after compressor starts, during defrosting operation, or for 10 minutes after returning from the defrosting operation.)

Open:

–40°C or less

Short:

90°C or more

TH3:

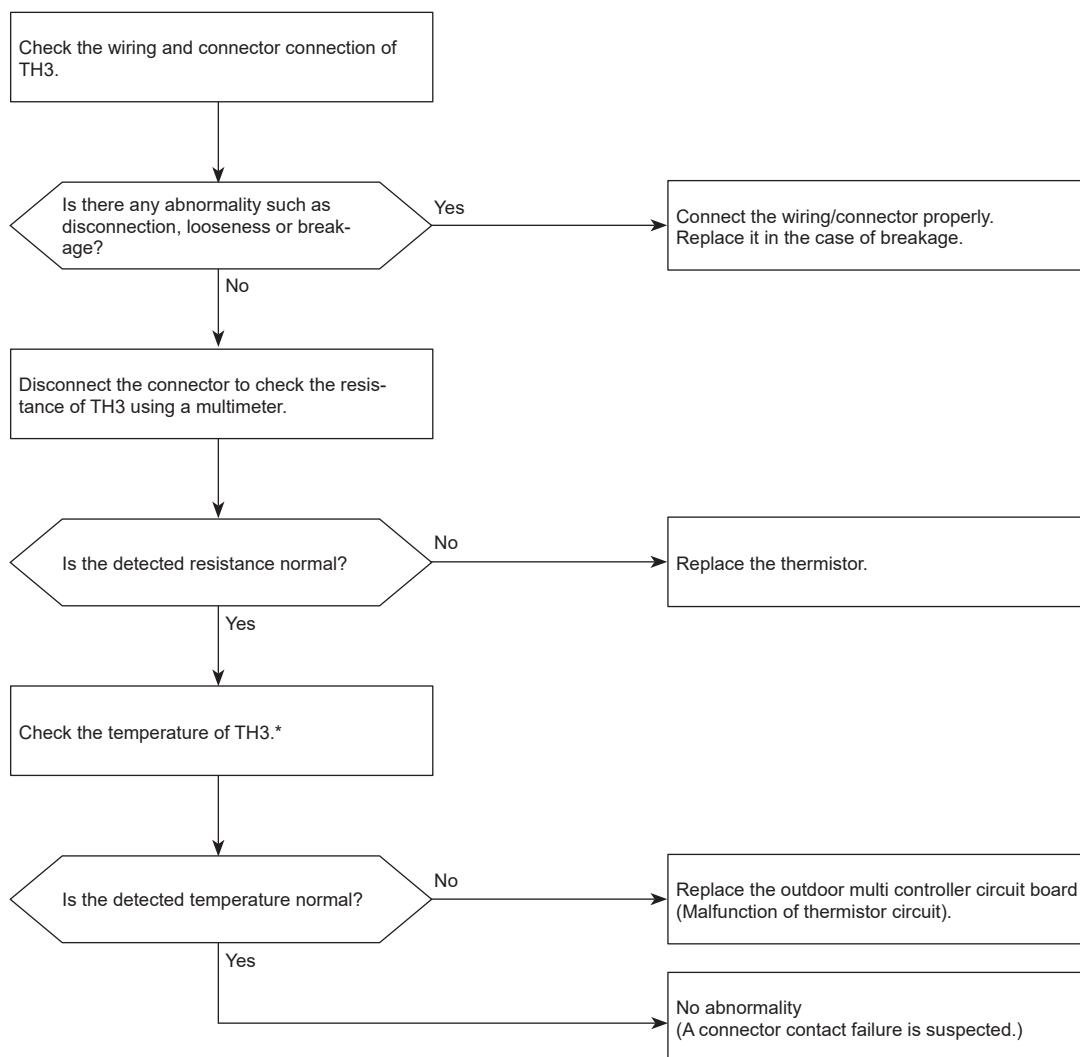
Thermistor <Outdoor liquid pipe>

Causes and checkpoints

- Disconnection or contact failure of connectors
- Faulty thermistor
- Defective outdoor multi controller circuit board

The black square (■) indicates a switch position.

Diagnosis of failure



* The detected temperature of TH3 can be displayed by an operation of SW4 on the outdoor multi controller circuit board.

SW4 setting		Display on LED1	Unit
ON	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	–99.9–999.9	°C
OFF	□ □ □ □ □ □ □ □ □ □		
	1 2 3 4 5 6 7 8 9 10		

5106 (U4): Ambient temperature thermistor (TH7) open/short

Abnormal points and detection methods

TH7 is found to be open/short

Open:

–40°C or less

Short:

90°C or more

TH7:

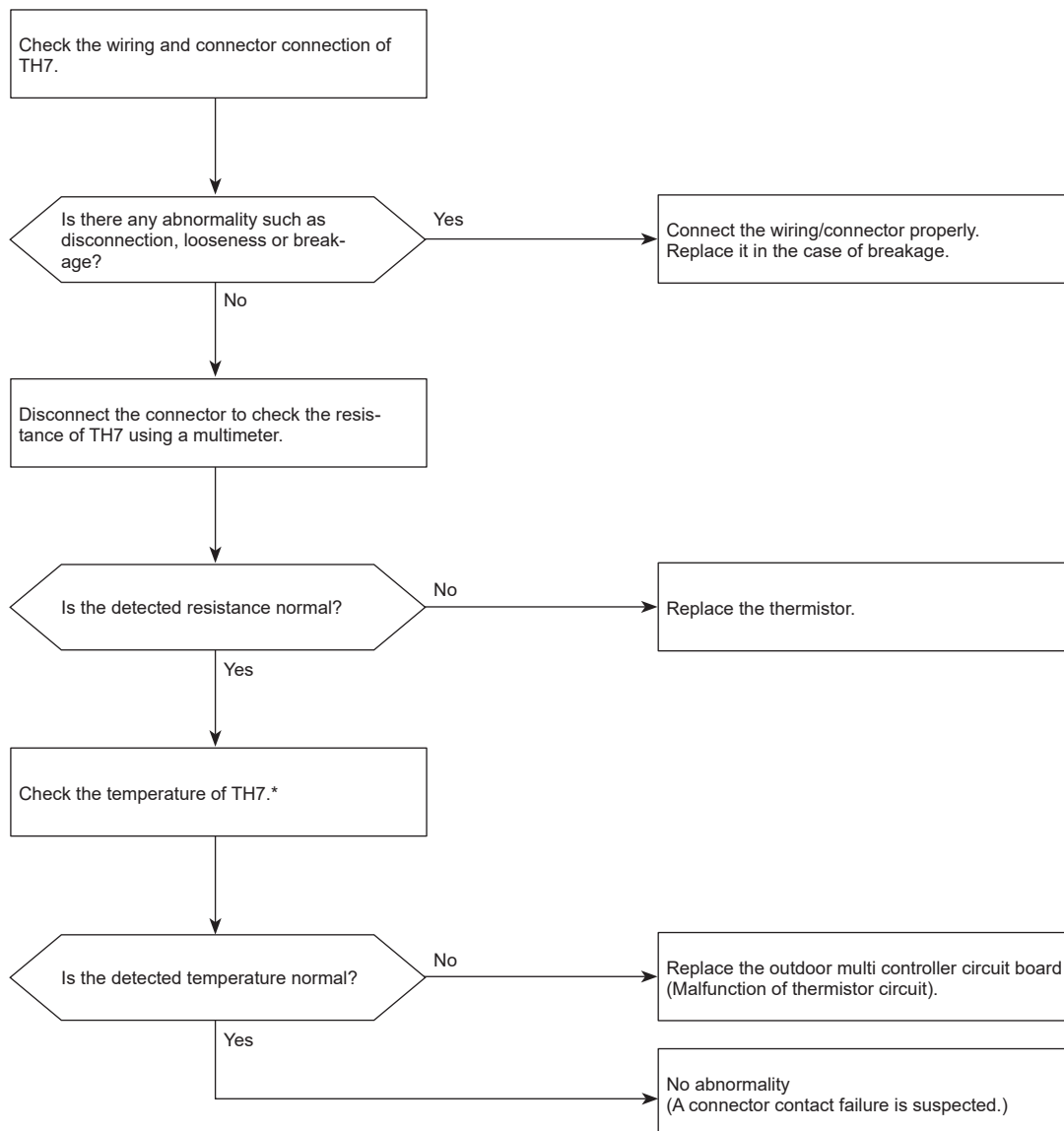
Thermistor <Ambient>

Causes and checkpoints

- Disconnection or contact failure of connectors
- Faulty thermistor
- Defective outdoor multi controller circuit board

The black square (■) indicates a switch position.

Diagnosis of failure



* The detected temperature of TH7 can be displayed by an operation of SW4 on the outdoor multi controller circuit board.

SW4 setting		Display on LED1	Unit
ON	■	-99.9~999.9	°C
OFF	□		
	1 2 3 4 5 6 7 8 9 10		

5109 (U4): HIC pipe temperature thermistor (TH2) open/short

Abnormal points and detection methods

TH2 is found to be open/short.

Open:

–40°C or less

Short:

90°C or more

TH2:

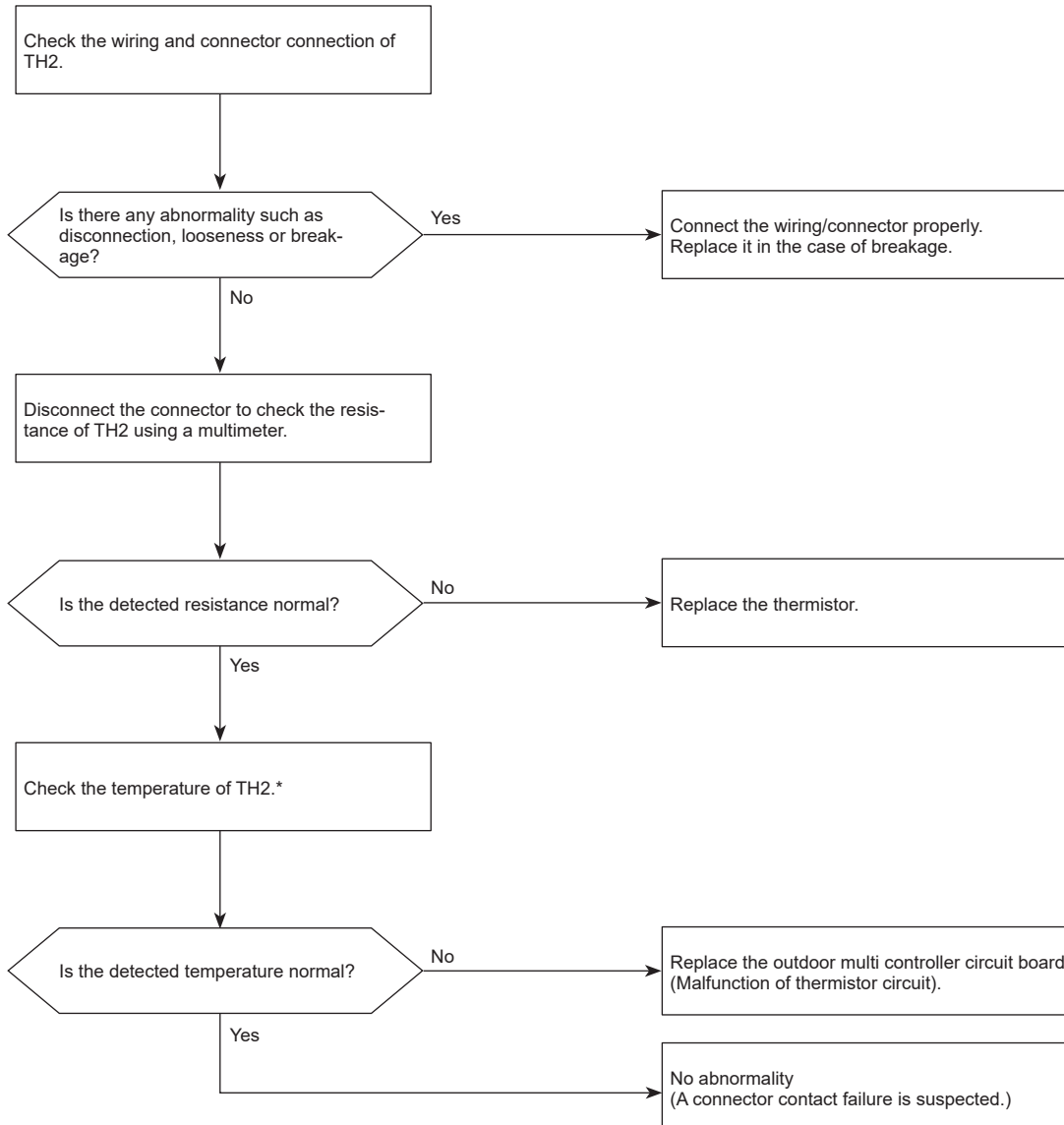
Thermistor <HIC pipe>

Causes and checkpoints

- Disconnection or contact failure of connectors
- Faulty thermistor
- Defective outdoor multi controller circuit board

The black square (■) indicates a switch position.

Diagnosis of failure



* The detected temperature of TH2 can be displayed by an operation of SW4 on the outdoor multi controller circuit board.

SW4 setting		Display on LED1	Unit
ON	■	–99.9–999.9	°C
OFF	□		
	1 2 3 4 5 6 7 8 9 10		

5110 (U4): Heat sink temperature thermistor (TH8) open/short

Abnormal points and detection methods

TH8 (Internal thermistor) is found to be open/short.

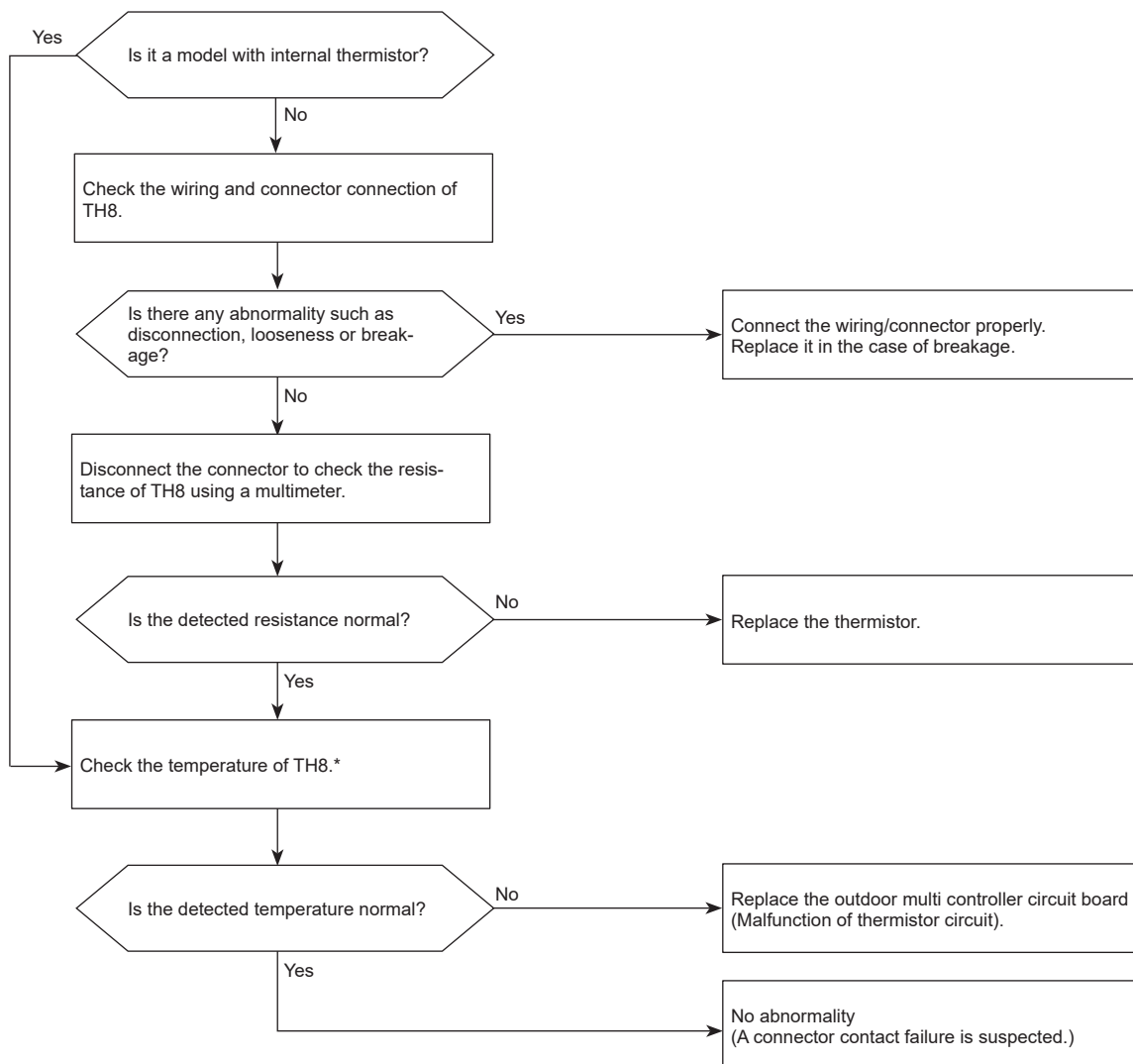
- Open:
–48.4°C or less
- Short:
102.4°C or more
- TH8:
Thermistor <Heat sink>

Causes and checkpoints

- Disconnection or contact failure of connectors
- Faulty thermistor
- Defective outdoor multi controller circuit board

The black square (■) indicates a switch position.

Diagnosis of failure



* The detected temperature of TH8 can be displayed by an operation of SW4 on the outdoor multi controller circuit board.

SW4 setting		Display on LED1	Unit
ON	1 2 3 4 5 6 7 8 9 10	-99.9~999.9	°C
OFF	1 2 3 4 5 6 7 8 9 10		

5201 (F5): High pressure sensor (63HS) trouble

Abnormal points and detection methods

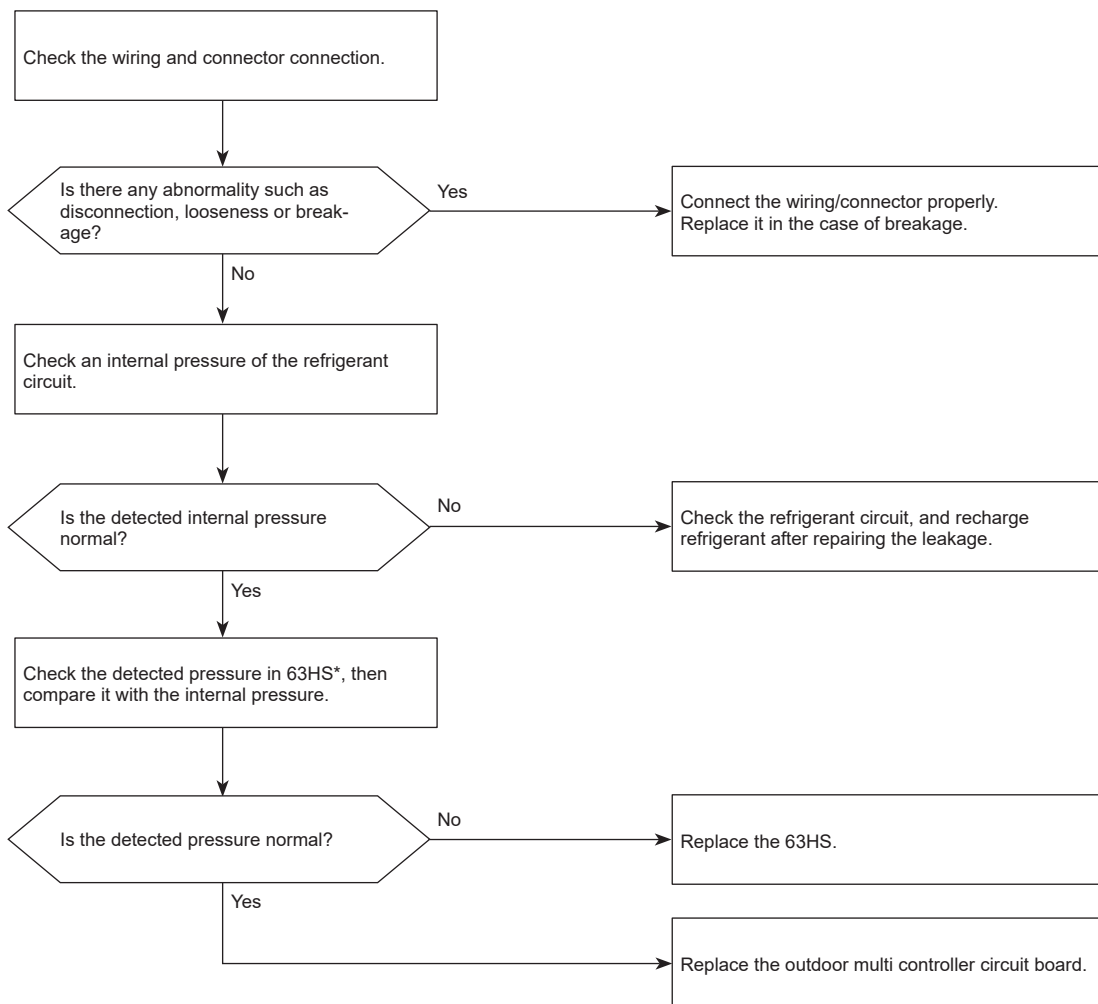
- The detected pressure in the high pressure sensor is 1 kgf/cm² or less during operation, the compressor stops operation and enters into an anti-restart mode for 3 minutes.
- The detected pressure is 1 kgf/cm² or less immediately before restarting, the compressor falls into an abnormal stop with error code 5201.
- For 3 minutes after compressor restarting, during defrosting operation, and for 3 minutes after returning from defrosting operation, above mentioned symptoms are not determined to be abnormal.

Causes and checkpoints

- Defective high pressure sensor
- Decrease of internal pressure caused by gas leakage
- Disconnection or contact failure of connector
- Malfunction of input circuit on outdoor multi controller circuit board

The black square (■) indicates a switch position.

Diagnosis of failure



* For pressure, refer to "How to check the components".

The detected pressure in 63HS can be displayed by an operation of SW4 on the outdoor multi controller circuit board.

SW4 setting		Display on LED1	Unit
ON		-99.9~999.9	kgf/cm ²
OFF			
	1 2 3 4 5 6 7 8 9 10		

5202 (F3): Low pressure sensor (63LS) trouble

Abnormal points and detection methods

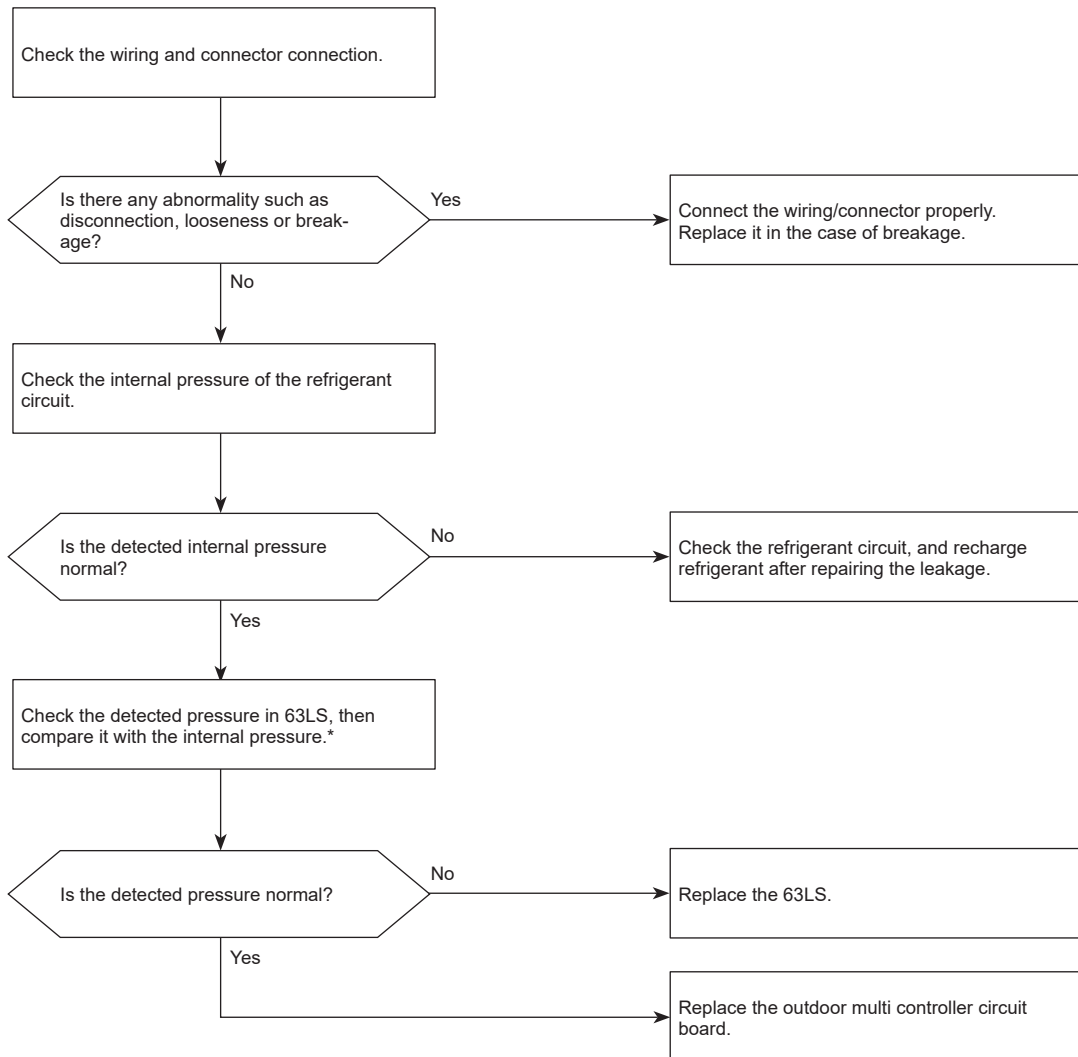
- The detected pressure in the low pressure sensor is -2.3 kgf/cm^2 or less, or 23.1 kgf/cm^2 or more during operation, the compressor stops operation with error code 5202.
- For 3 minutes after compressor restarting, during defrosting operation, and for 3 minutes after returning from defrosting operation, above mentioned symptoms are not determined to be abnormal.

Causes and checkpoints

- Defective low pressure sensor
- Decrease of internal pressure caused by gas leakage
- Disconnection or contact failure of connector
- Malfunction of input circuit on outdoor multi controller circuit board

The black square (■) indicates a switch position.

Diagnosis of failure



* The detected pressure in 63LS can be displayed by an operation of SW4 on the outdoor multi controller circuit board.

SW4 setting		Display on LED1	Unit
ON	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	-99.9~999.9	kgf/cm ²
OFF	■ ■ ■ ■ ■ ■ ■ ■ ■ ■		
	1 2 3 4 5 6 7 8 9 10		

5300 (UH): Current sensor trouble

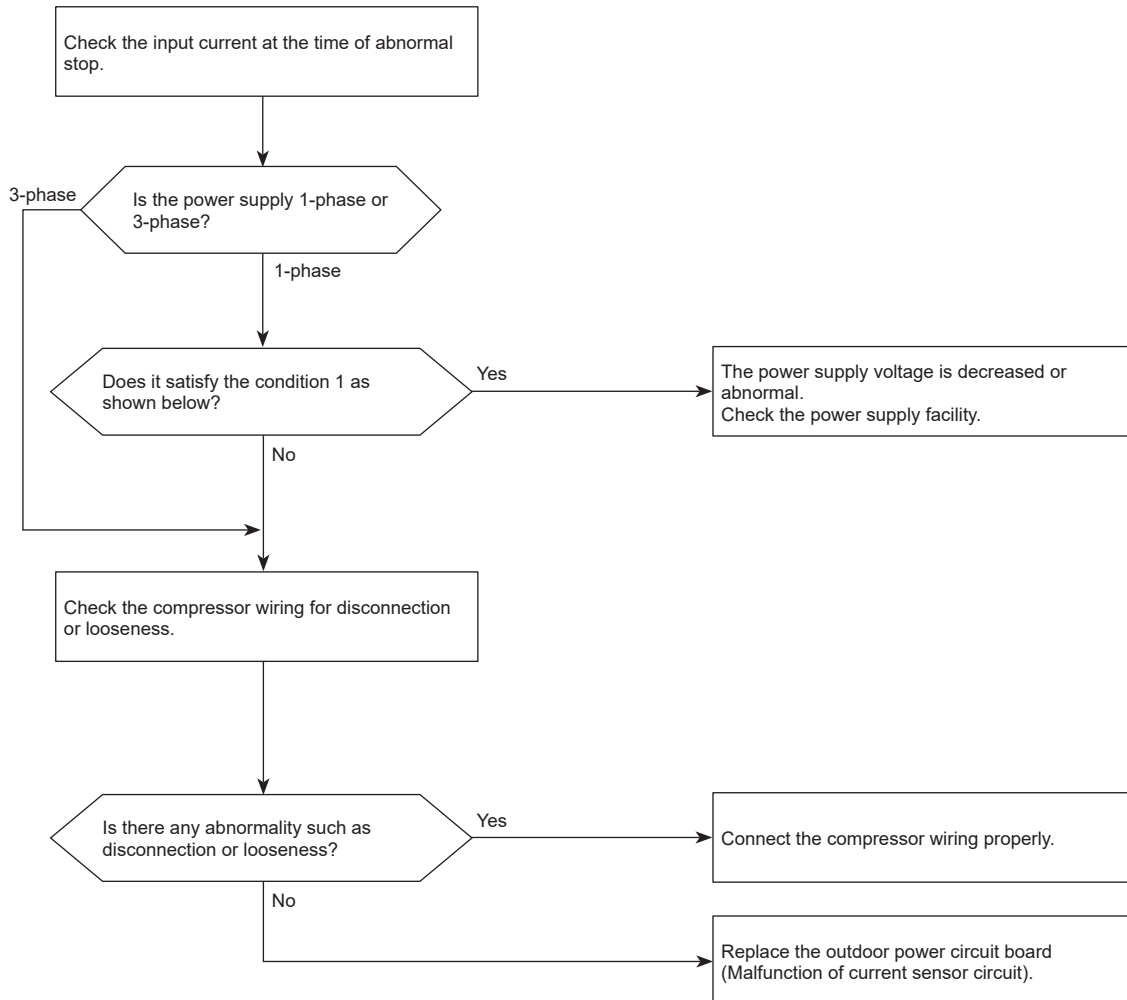
Abnormal points and detection methods

The detected current sensor input value (primary current) during compressor operation is outside the specified range.

Causes and checkpoints

- Decrease/Trouble of power supply voltage
- Disconnection of compressor wiring
- Input sensor trouble on outdoor power circuit board

Diagnosis of failure



Condition 1:

Model	Error detecting condition
1-phase model	34 A or more for 10 consecutive seconds, or 38 A or more

* Applicable only for single phase model

5558 (FH): Refrigerant sensor error

Abnormal points and detection methods

A refrigerant sensor has failed.

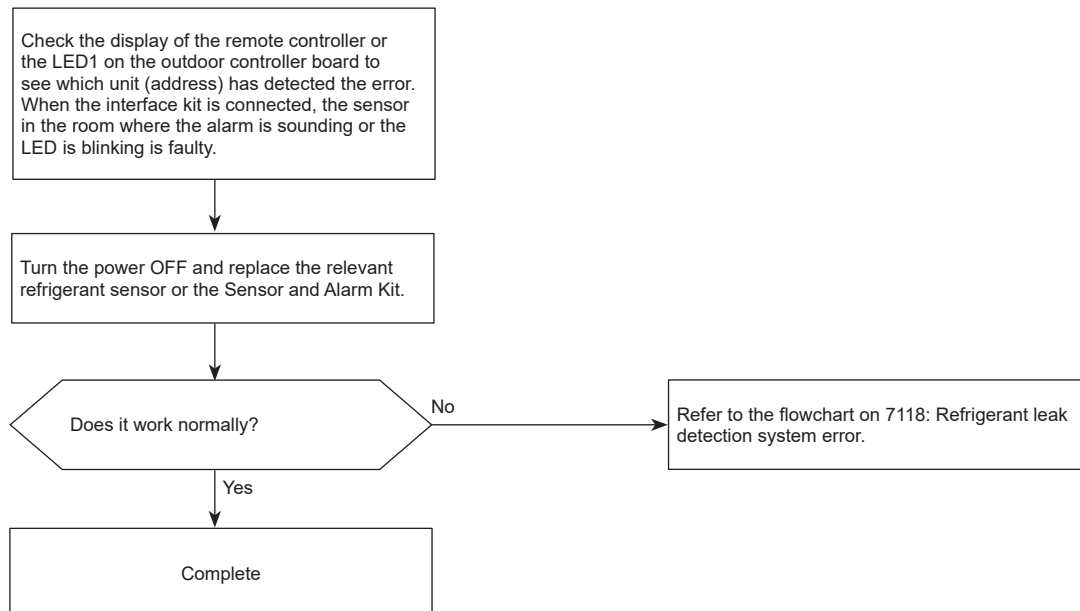
Note:

- When this error occurs in EN378 system (SW5-7 ON), both the controller in the applicable room and the controller in the supervisor room produce an alarm. Also, the system closes the shut-off valve and performs refrigerant recovery.

Causes and checkpoints

- A refrigerant sensor connected to an M-IC has failed.
- A Sensor and Alarm Kit connected to a branch box has failed.

Diagnosis of failure



6600 (A0): Duplex address error

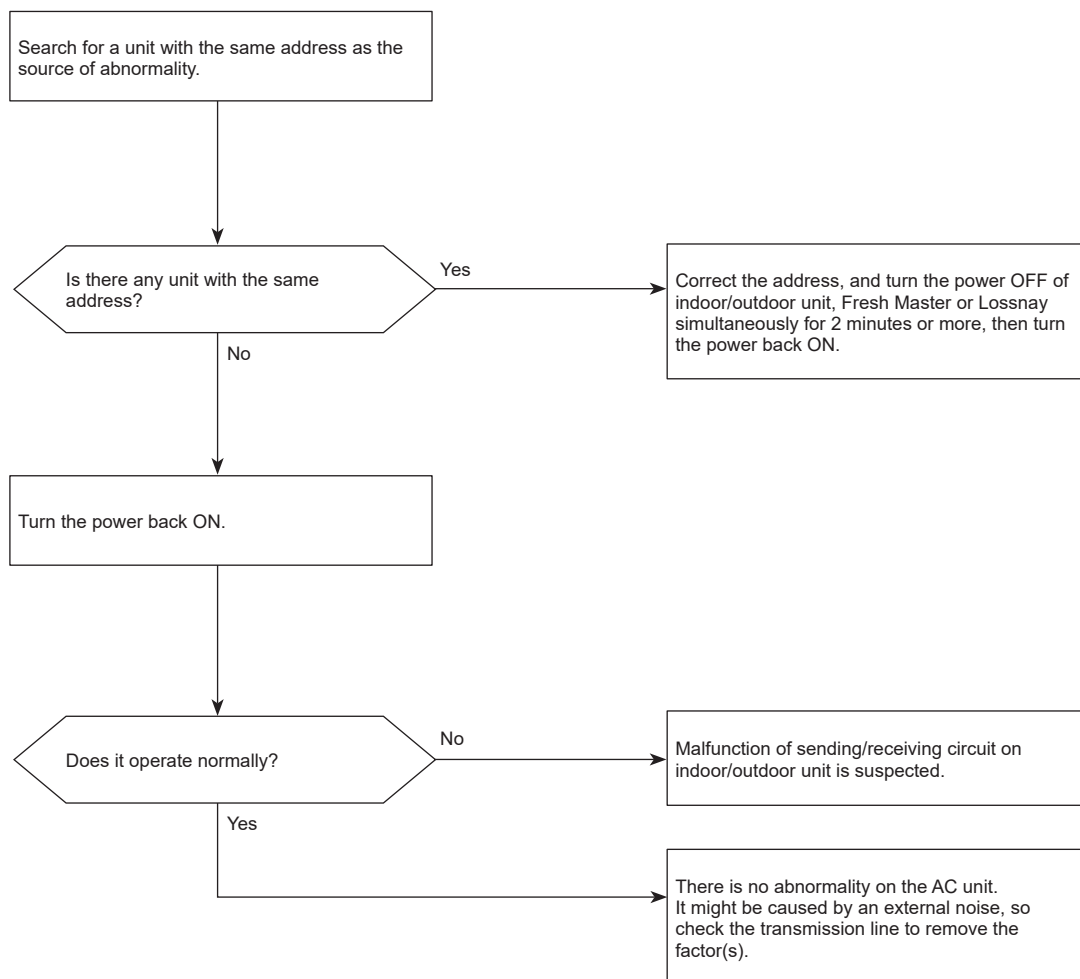
Abnormal points and detection methods

2 or more units with the same address exist.

Causes and checkpoints

- There are 2 units or more with the same address in their controller among outdoor unit, indoor unit, Fresh Master, Lossnay or remote controller.
- Noise interference on indoor/outdoor connectors

Diagnosis of failure



6602 (A2): Transmission processor hardware error

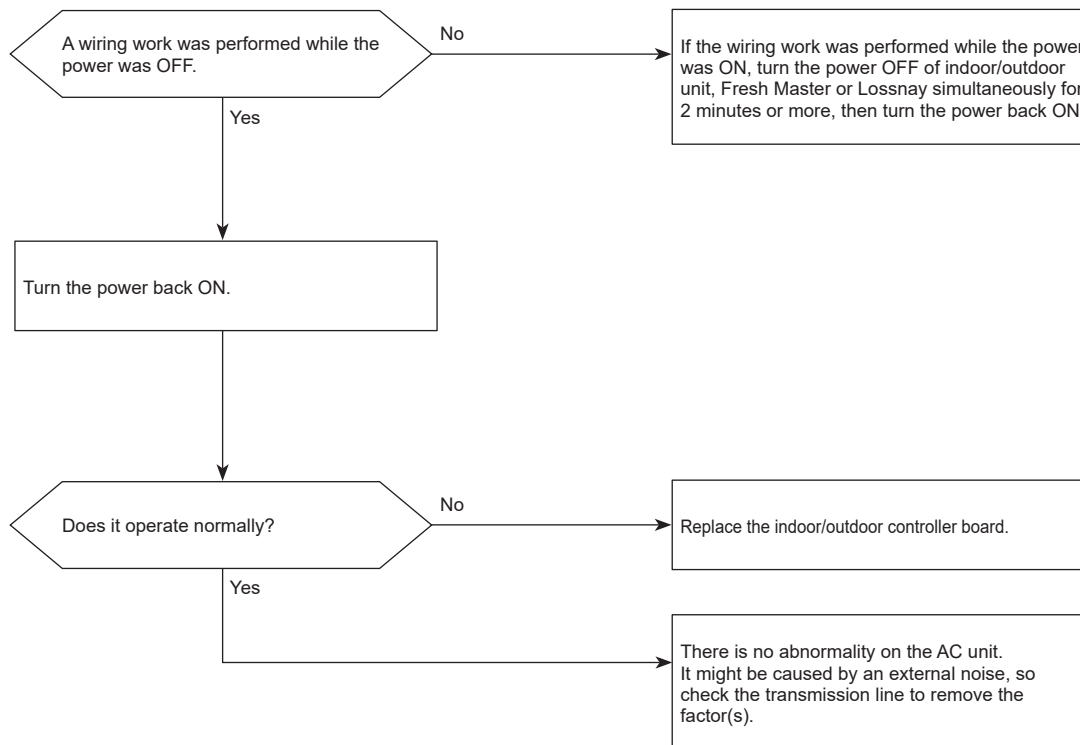
Abnormal points and detection methods

The transmission line shows “1” although the transmission processor transmitted “0”.

Causes and checkpoints

- 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.
- Malfunction of transmitting circuit on transmission processor
- Noise interference on indoor/outdoor connectors

Diagnosis of failure



6603 (A3): Transmission bus BUSY error

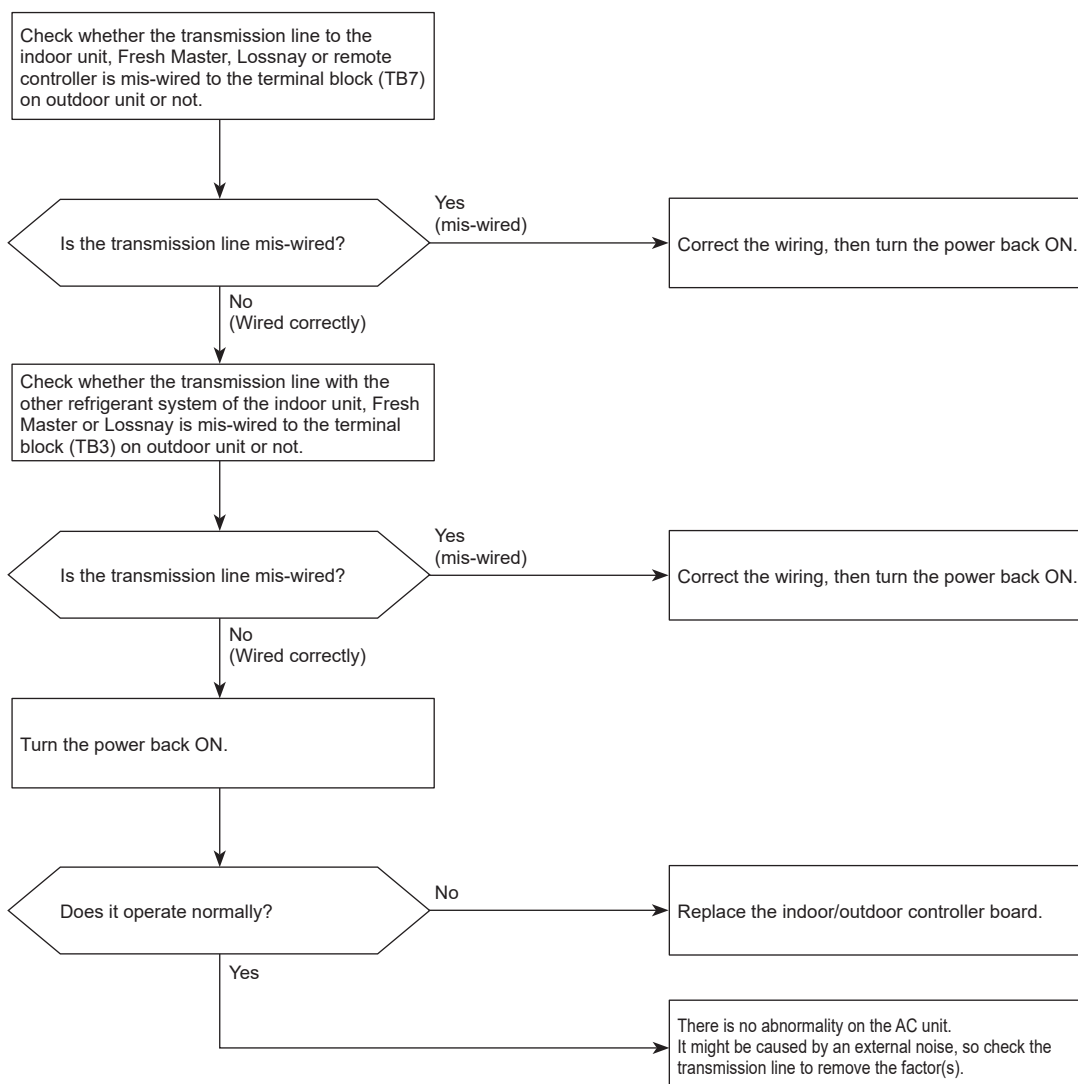
Abnormal points and detection methods

- Transmission fails due to collision and it continues for 8 to 10 minutes.
- Data cannot be output on the transmission line because of noise etc. consecutively for 8 to 10 minutes.

Causes and checkpoints

- The transmission processor is unable to transmit due to a short-cycle voltage such as noise is mixed on the transmission line.
- 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.
- 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.

Diagnosis of failure



6606 (A6): Signal communication error with transmission processor

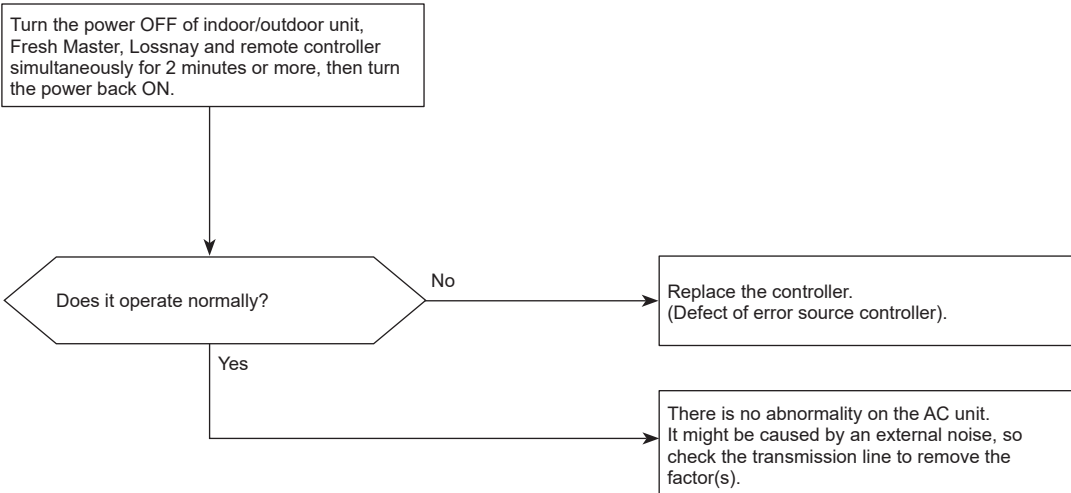
Abnormal points and detection methods

- The data of unit/transmission processor were not normally transmitted.
- The address transmission from the unit processor was not normally transmitted.

Causes and checkpoints

- Accidental disturbance such as noise or lightning surge
- Hardware malfunction of transmission processor

Diagnosis of failure



Abnormal points and detection methods

■ Common to all

An abnormality detected by the sending side controller when receiving no ACK from the receiving side, though signal was once sent. The sending side detects the abnormality when that occurs 6 times in succession at 30 second intervals.

- The previous address unit does not exist since the address switch was changed while power was on.
- Decline of transmission voltage/signal because the transmission line exceeds the following limits.
 - Indoor/outdoor transmission line maximum distance: 200 m
 - For remote controller line: 12 m
- Decline of transmission voltage/signal due to unmatched transmission line types
 - Types for shield line: CVVS, CPEVS, or MVVS
 - Line diameter: 1.25 mm² or more
- Decline of transmission voltage/signal due to excessive number of connected units
- Malfunction due to accidental disturbance such as noise or lightning surge
- Defect of error source controller

■ The address/attribute of the outdoor unit was displayed:

An abnormality detected by the indoor unit if it received no ACK when transmitting signal to the outdoor unit.

- Contact failure of indoor/outdoor unit transmission line.
- Disconnection of transmission connector (CN2M) on indoor unit.
- Malfunction of sending/receiving circuit on indoor/outdoor unit.
- Disconnection of the connectors on the circuit board
- Cut off of power supply for outdoor unit caused by high pressure protection (63H).

■ The address/attribute of the indoor unit was displayed:

An abnormality detected by the remote controller if it received no ACK when transmitting signal to the indoor unit.

- While operating with the indoor units in a different refrigerant system, an abnormality is detected when the indoor unit transmits signal to the remote controller during the other refrigerant-system outdoor unit is turned OFF, or within 2 minutes after it turned back ON.
- Contact failure of indoor unit or remote controller transmission line
- Disconnection of transmission connector (CN2M) on indoor unit
- Malfunction of sending/receiving circuit on indoor unit or remote controller

■ The address/attribute of the remote controller was displayed:

An abnormality detected by the indoor unit if it received no ACK when transmitting signal to the remote controller.

- While operating with the indoor units in a different refrigerant system, an abnormality is detected when the indoor unit transmits signal to the remote controller during the other refrigerant-system outdoor unit is turned OFF, or within 2 minutes after it turned back ON.
- Contact failure of indoor unit or remote controller transmission line
- Disconnection of transmission connector (CN2M) on indoor unit
- Malfunction of sending/receiving circuit on indoor unit or remote controller

■ The address/attribute of Fresh Master was displayed:

An abnormality detected by the indoor unit if it received no ACK when transmitting signal to the Fresh Master.

- While the indoor unit is operating with the remote controller in a different refrigerant system, an abnormality is detected when the indoor unit transmits signal to the remote controller while the outdoor unit in the same refrigerant system as the Fresh Master is turned OFF, or within 2 minutes after it turned back ON.
- Contact failure of indoor unit or Fresh Master transmission line
- Disconnection of transmission connector (CN2M) on indoor unit or Fresh Master
- Malfunction of sending/receiving circuit on indoor unit or Fresh Master

Abnormal points and detection methods

■ The address/attribute of Lossnay was displayed:

An abnormality detected by the indoor unit if it received no ACK when transmitting signal to the Lossnay.

- An abnormality is detected when the indoor unit transmits signal to Lossnay while the Lossnay is turned OFF.
- While the indoor unit is operating with Lossnay in a different refrigerant system, an abnormality is detected when the indoor unit transmits signal to the Lossnay while the outdoor unit in the same refrigerant system as the Lossnay is turned OFF, or within 2 minutes after it turned back ON.
- Contact failure of indoor unit or Lossnay transmission line
- Disconnection of transmission connector (CN2M) on indoor unit
- Malfunction of sending/receiving circuit on indoor unit or Lossnay

■ The displayed address/attribute is not assigned to any controller.

- The previous address unit does not exist since the address switch was changed while power was on.
- The abnormality was detected when the indoor unit sent or received signal because the address of the Fresh Master/Lossnay was changed after a setting for linking the Fresh master/Lossnay was made on the remote controller.

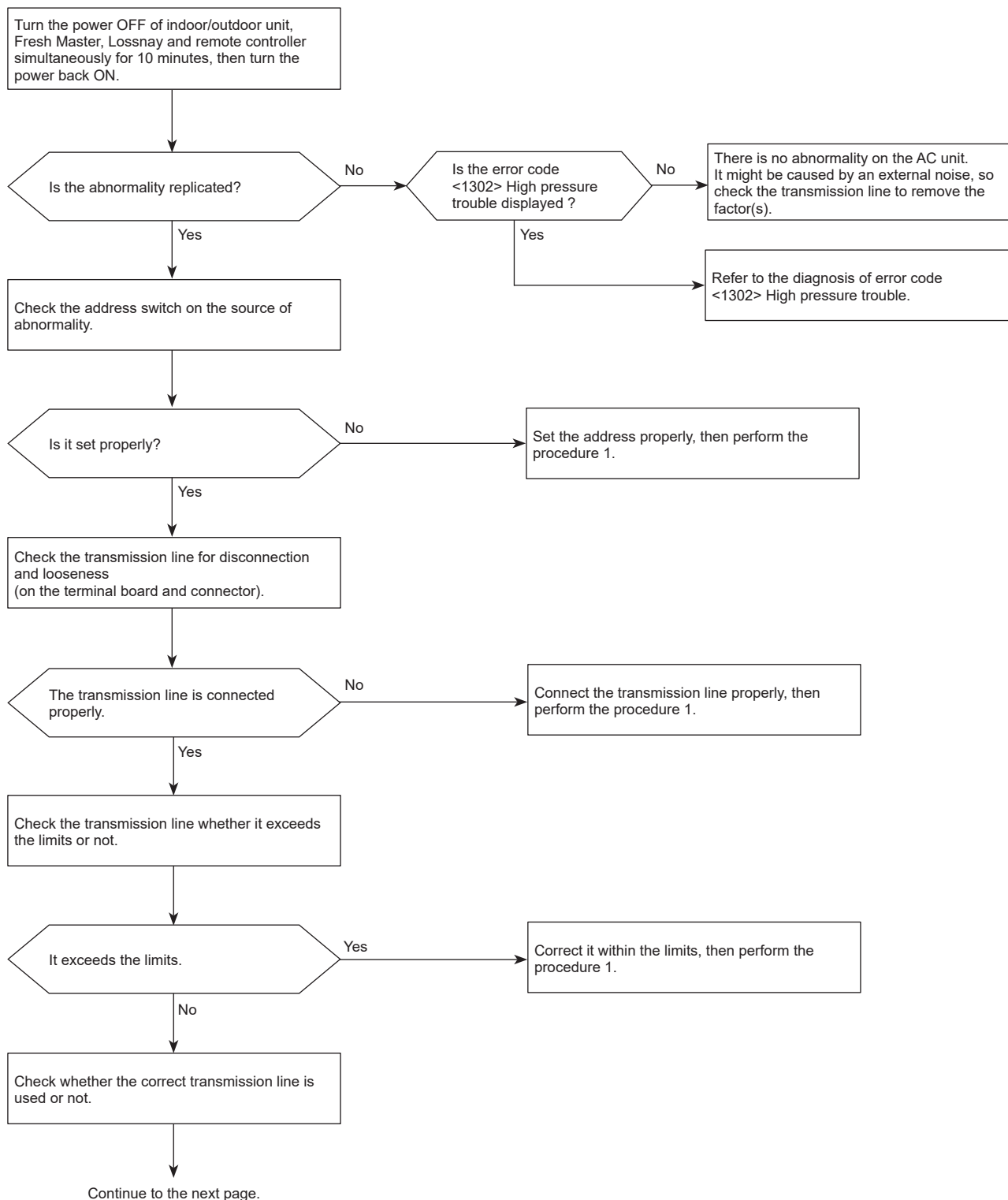
Causes and checkpoints

Diagnosis of failure

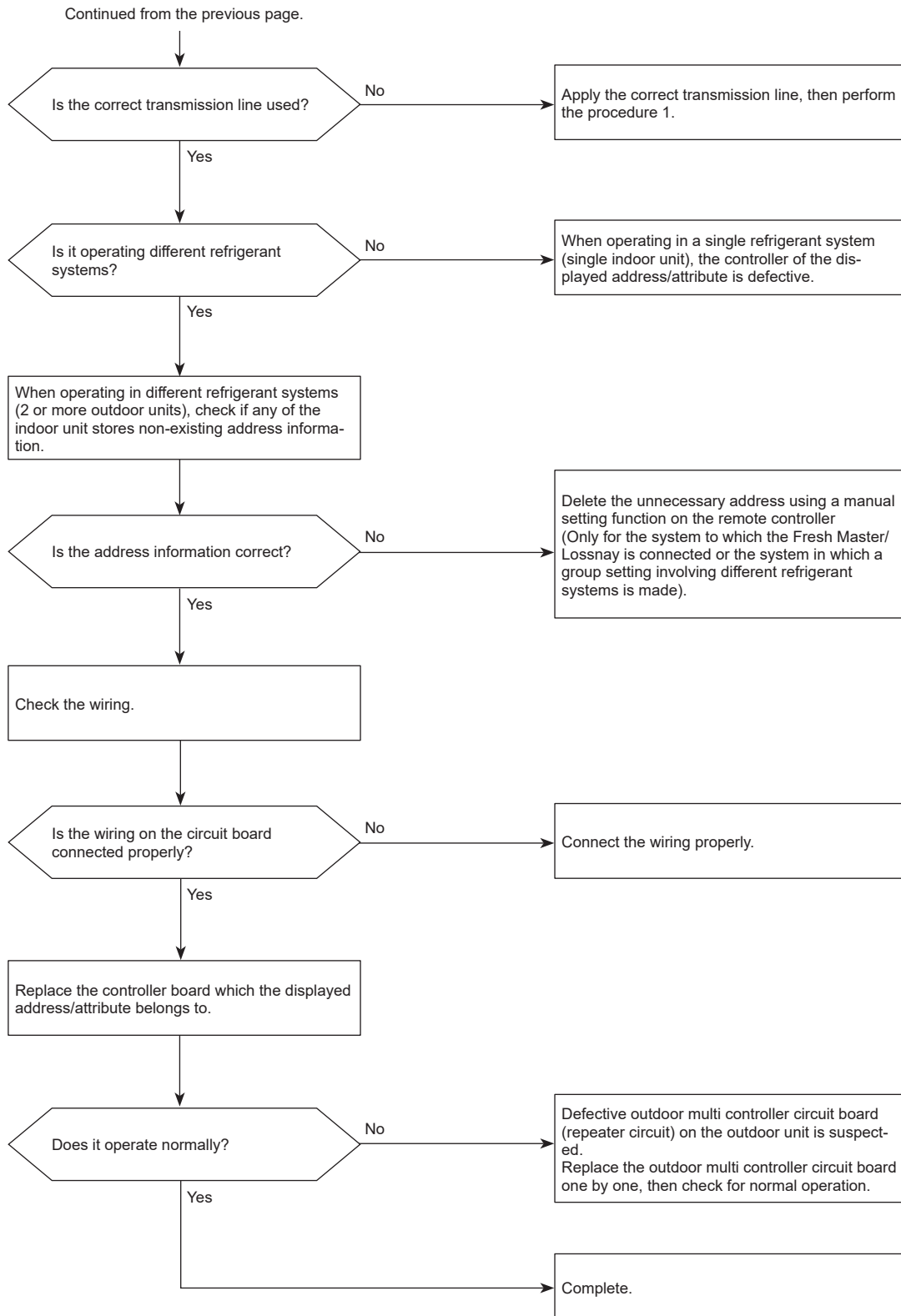
Note:

- When the address of the outdoor unit is displayed as abnormal, the outdoor circuit board may be faulty. If the unit is not restored after conducting the following procedure, check the outdoor circuit board.

Procedure 1:



Diagnosis of failure



6608 (A8): No response frame error

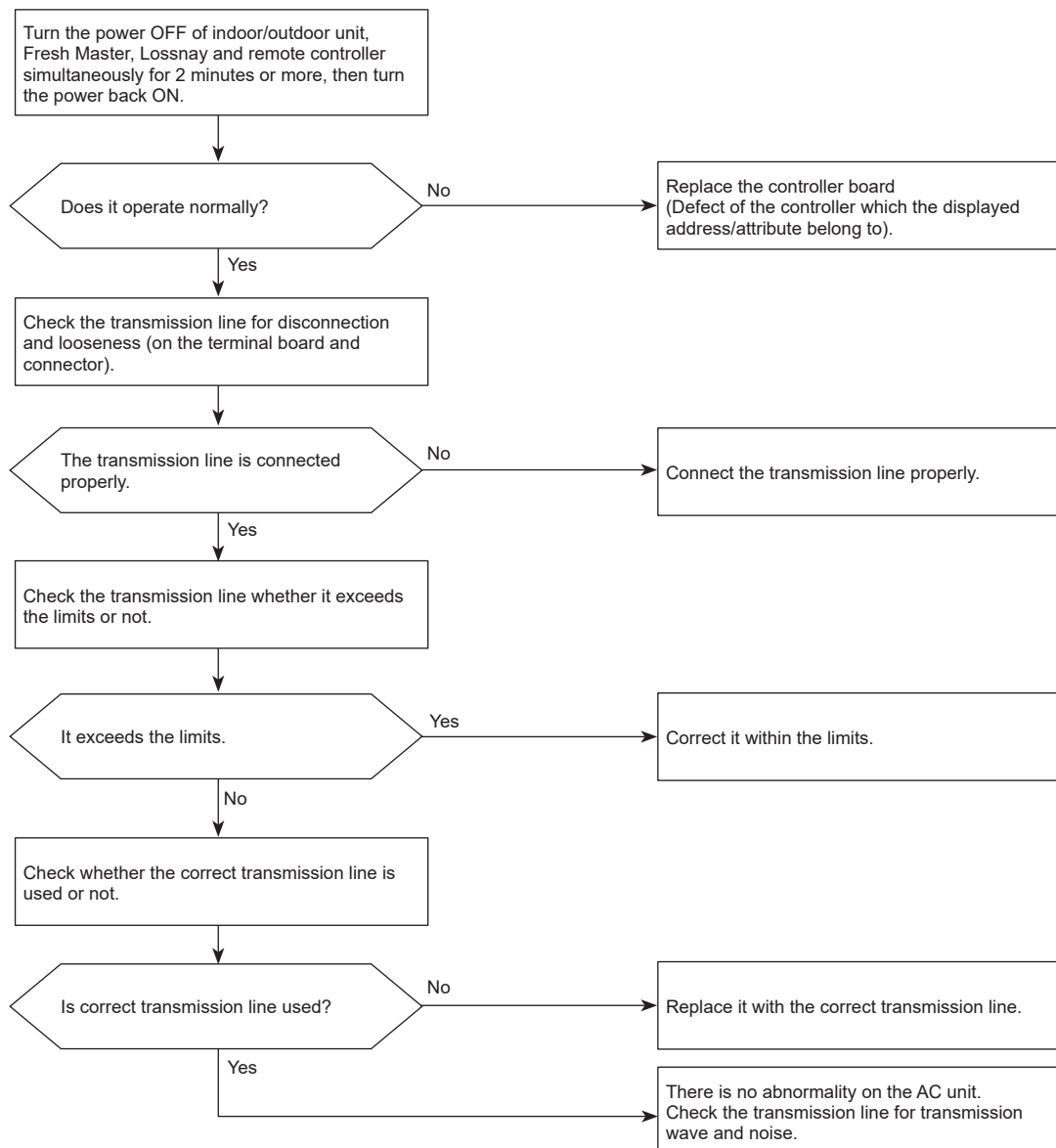
Abnormal points and detection methods

Although the sending side controller received ACK that notifies the reception of signal, no response command is transmitted from the receiving side.
The sending side detects the abnormality when that occurs 6 times in succession at 30 second intervals.

Causes and checkpoints

- Continuous failure of transmission due to noise, etc.
- Decline of transmission voltage/signal because the transmission line exceeds the following limits.
 - Indoor/outdoor transmission line maximum distance: 200 m
 - On remote controller line: 12 m
- Decline of transmission voltage/signal due to unmatched transmission line types
 - Types for shield line: CVVS, CPEVS, or MVVS
 - Line diameter: 1.25 mm² or more
- Accidental malfunction of error source controller

Diagnosis of failure



6815 (FH): Supervisor mode alarm kit communication error, MA supervisor remote controller communication error

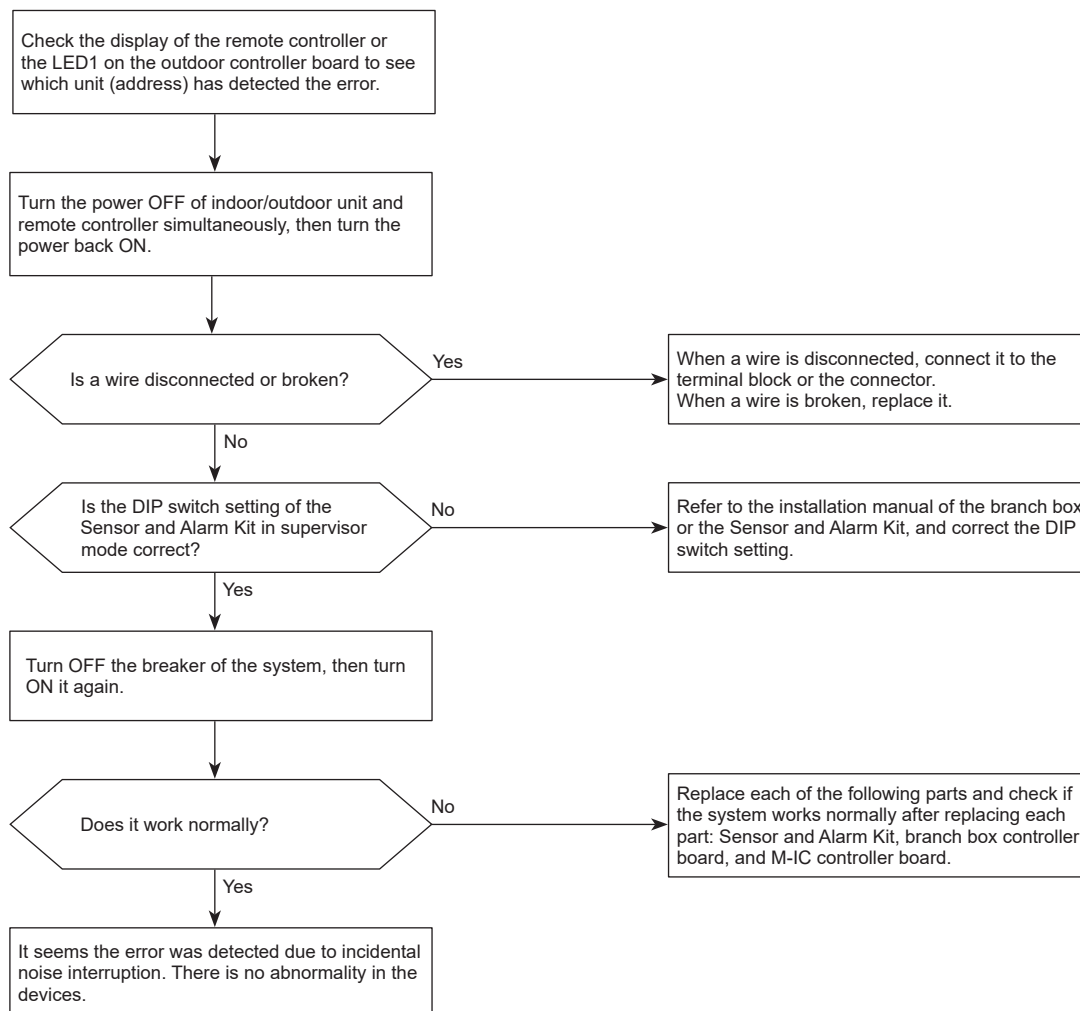
Abnormal points and detection methods

A communication error has occurred with a Sensor and Alarm Kit in supervisor mode or with an MA remote controller in supervisor mode.

Causes and checkpoints

- A wire of the MA remote controller in supervisor mode connected to M-IC is incorrect or broken.
- A wire of a Sensor and Alarm Kit in supervisor mode connected to a branch box is incorrect or broken, or a DIP switch has not been set.

Diagnosis of failure



Abnormal points and detection methods

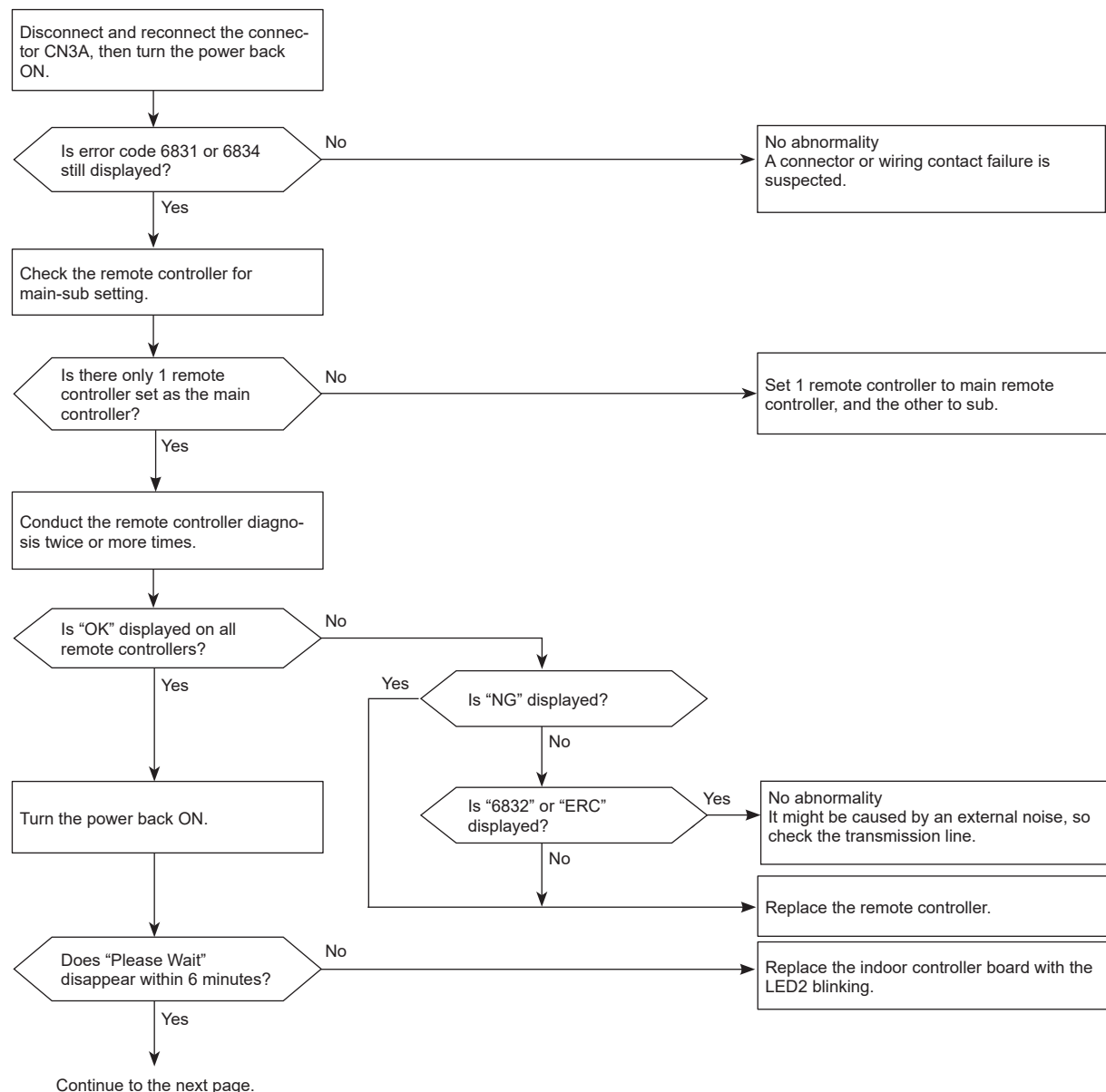
Detected in remote controller or indoor unit:

- The main or sub remote controller cannot receive signal from indoor unit which has the "0" address.
- The sub remote controller cannot receive signal.
- The indoor controller board cannot receive signal from remote controller or another indoor unit.
- The indoor controller board cannot receive signal.

Causes and checkpoints

- Contact failure of remote controller wiring
- 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 installation manual of the indoor unit.)
- Malfunction of the remote controller sending/receiving circuit in the indoor unit with the LED2 blinking.
- Malfunction of the remote controller sending/receiving circuit
- Remote controller transmitting error caused by noise interference

Diagnosis of failure

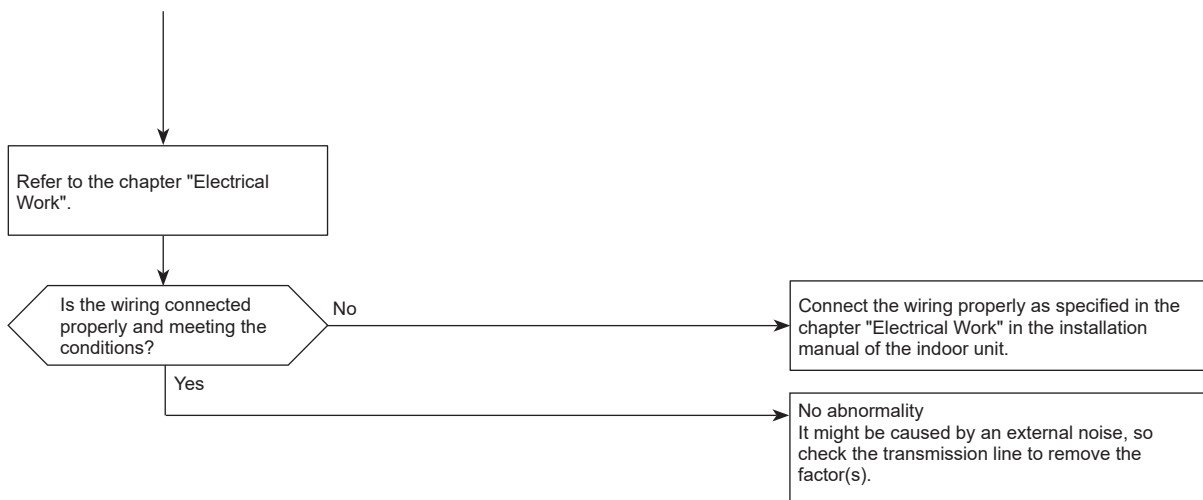


Note:

- It takes 6 seconds at maximum until the result is displayed.

Diagnosis of failure

Continued from the previous page.



6831 (E4): Sensor and Alarm Kit communication error

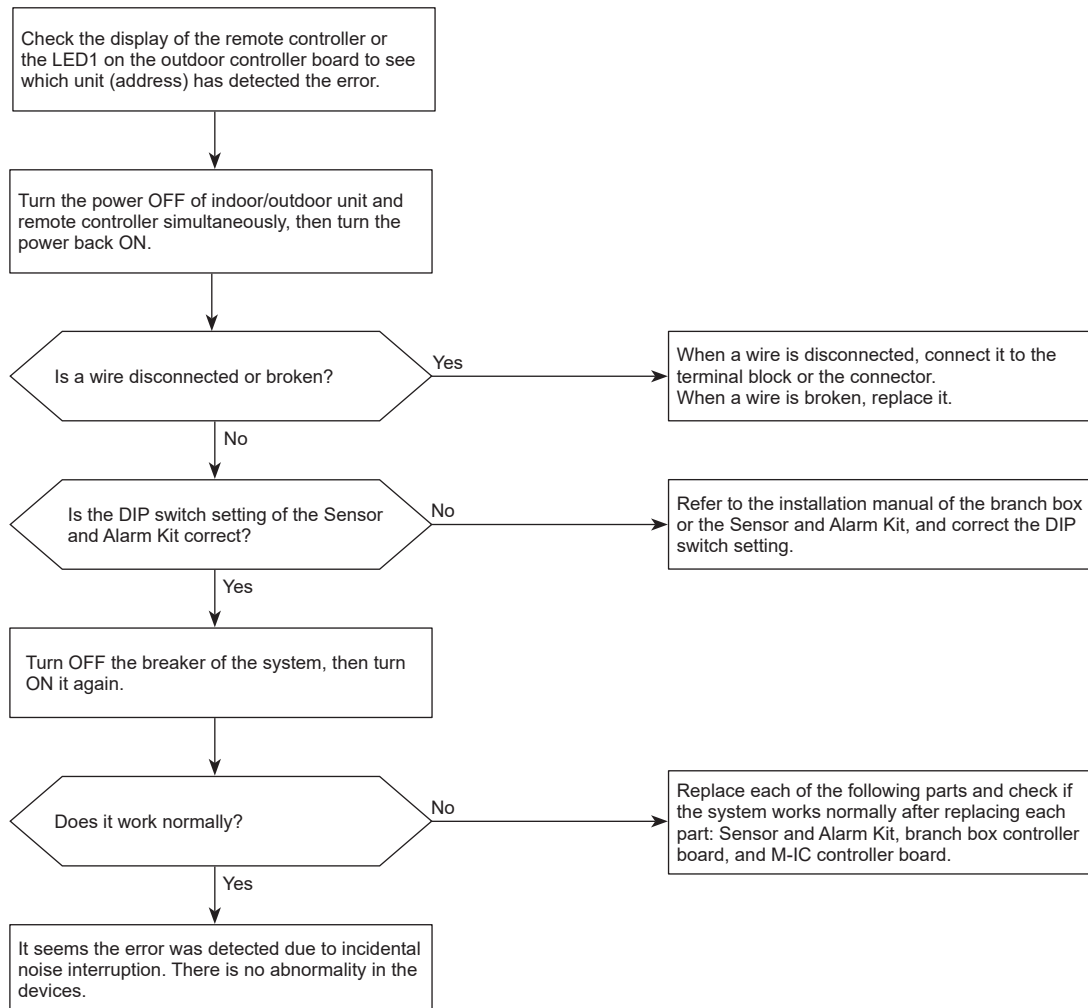
Abnormal points and detection methods

An communication error has occurred with a refrigerant sensor.

Causes and checkpoints

- A wire of a refrigerant sensor connected to an M-IC is incorrect or broken.
- A wire of a Sensor and Alarm Kit connected to a branch box is incorrect or broken, or a DIP switch has not been set.

Diagnosis of failure

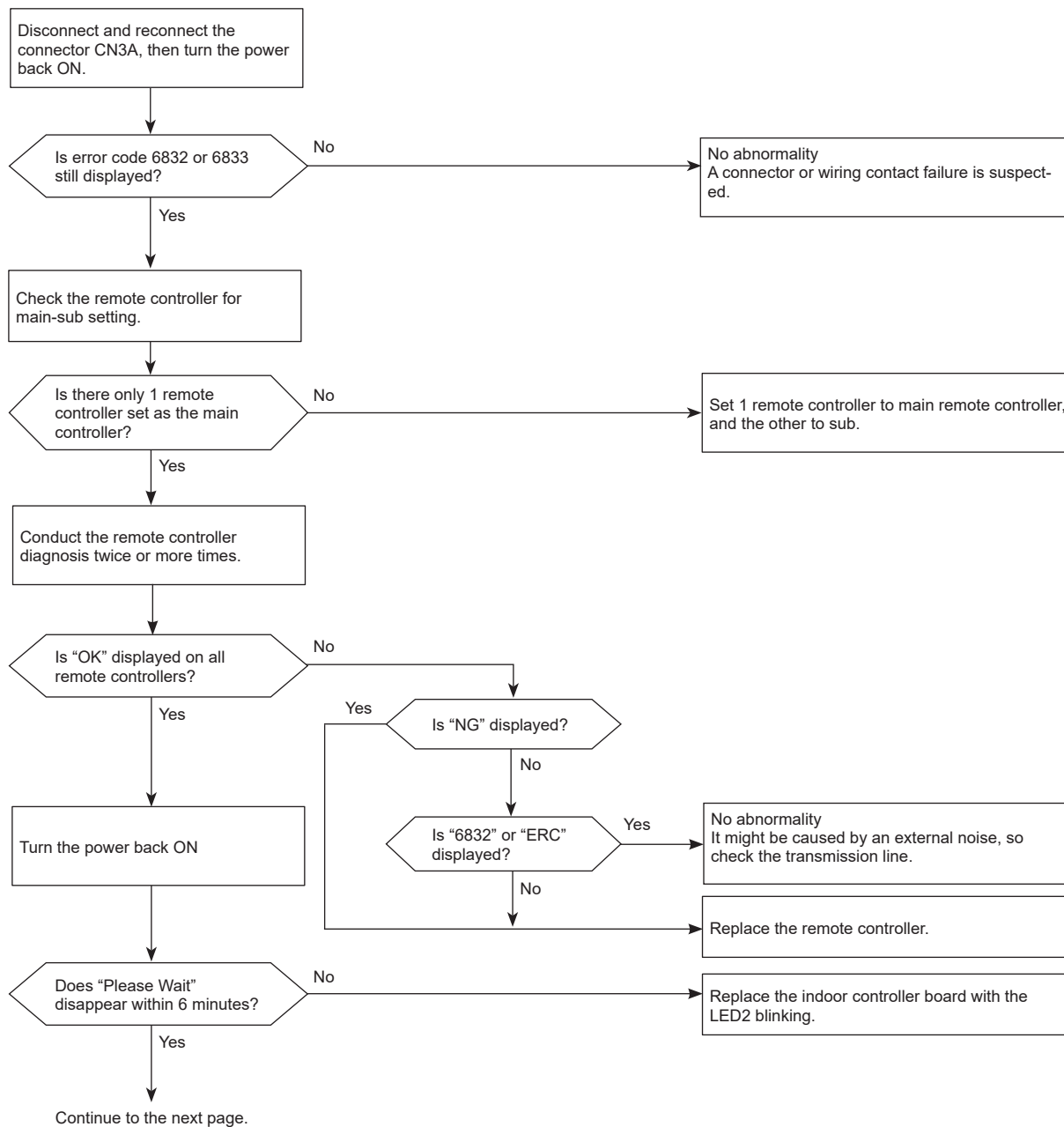


Abnormal points and detection methods

Detected in remote controller or indoor unit.

Causes and checkpoints

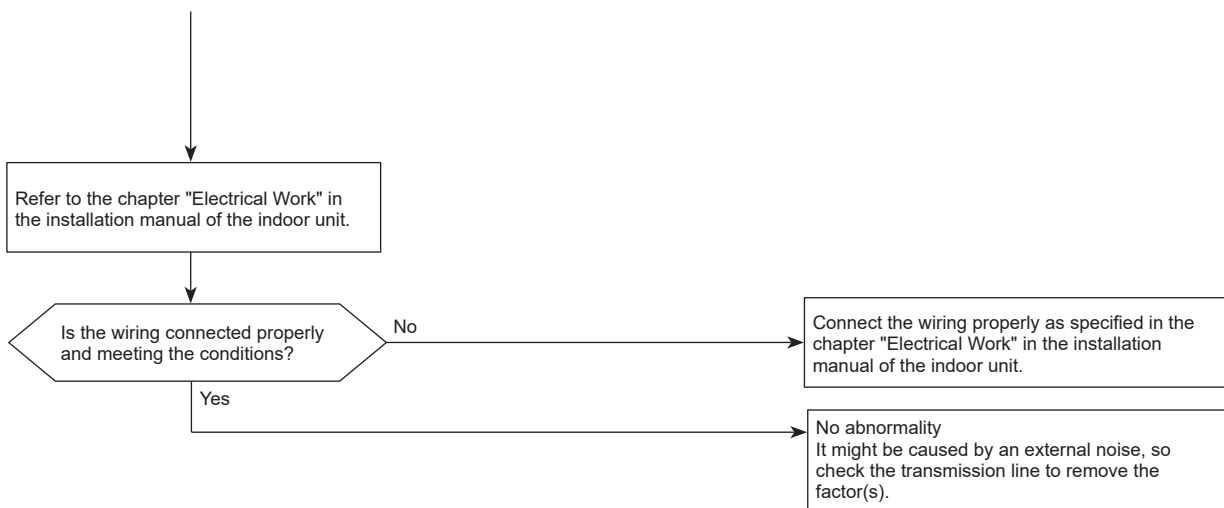
- There are 2 remote controllers set as main.
- Malfunction of remote controller sending/receiving circuit
- Malfunction of sending/receiving circuit on indoor controller board
- Remote controller transmitting error caused by noise interference

Diagnosis of failure**Note:**

- It takes 6 seconds at maximum until the result is displayed.

Diagnosis of failure

Continued from the previous page.



7100 (EF): Total capacity error

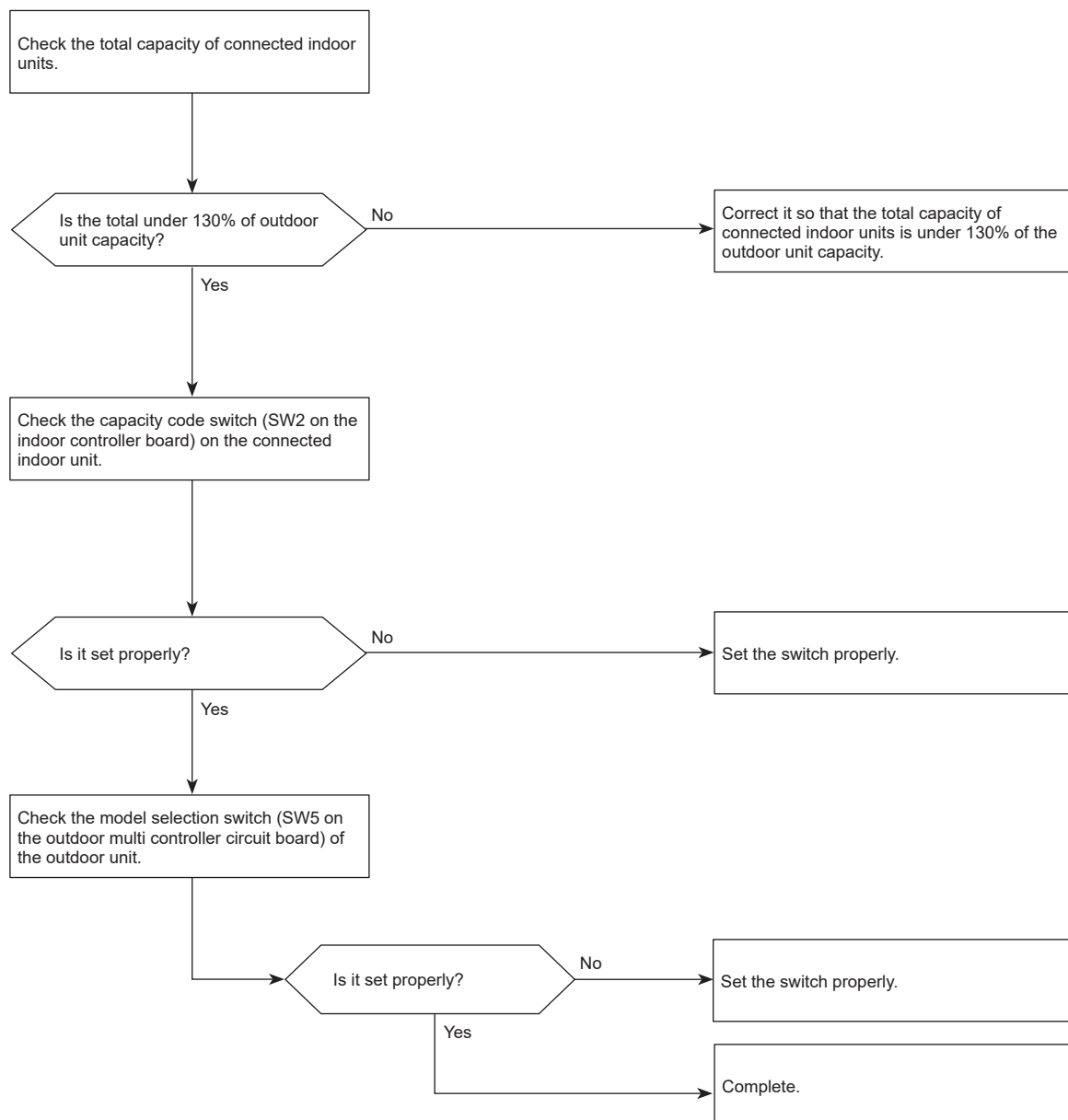
Abnormal points and detection methods

The sum of the model class of the connected indoor units exceeds the specified value (130% of the outdoor unit model class), error code 7100 is displayed.

Causes and checkpoints

- The total of number on connected indoor unit model names exceeds the specified capacity level.
- The setting of the model selection switches of the outdoor unit is registered wrongly.

Diagnosis of failure



7101 (EF): Capacity code error

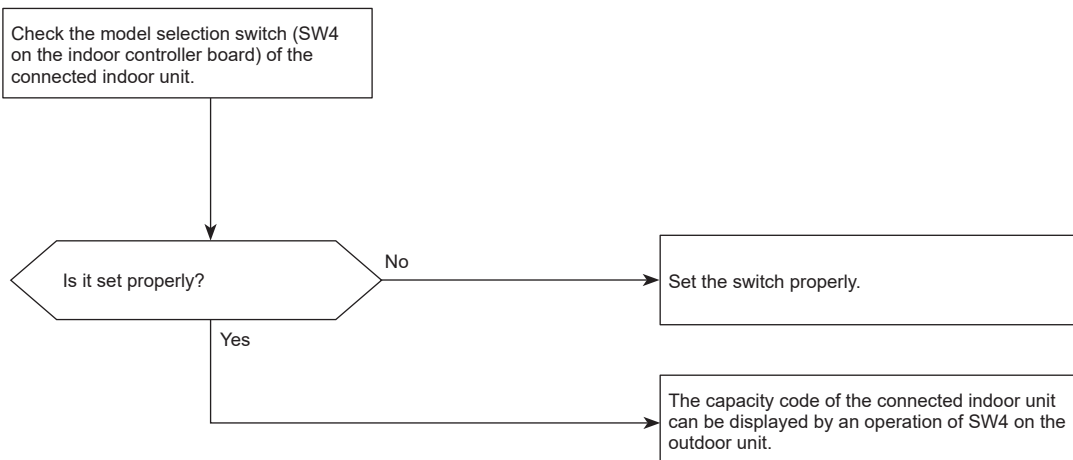
Abnormal points and detection methods

- A connected indoor unit is incompatible, error code 7101 is displayed.

Causes and checkpoints

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

Diagnosis of failure



7102 (EF): Connecting excessive number of units and branch boxes

Abnormal points and detection methods

The number of the connected indoor units exceeds the limit, error code 7102 is displayed.

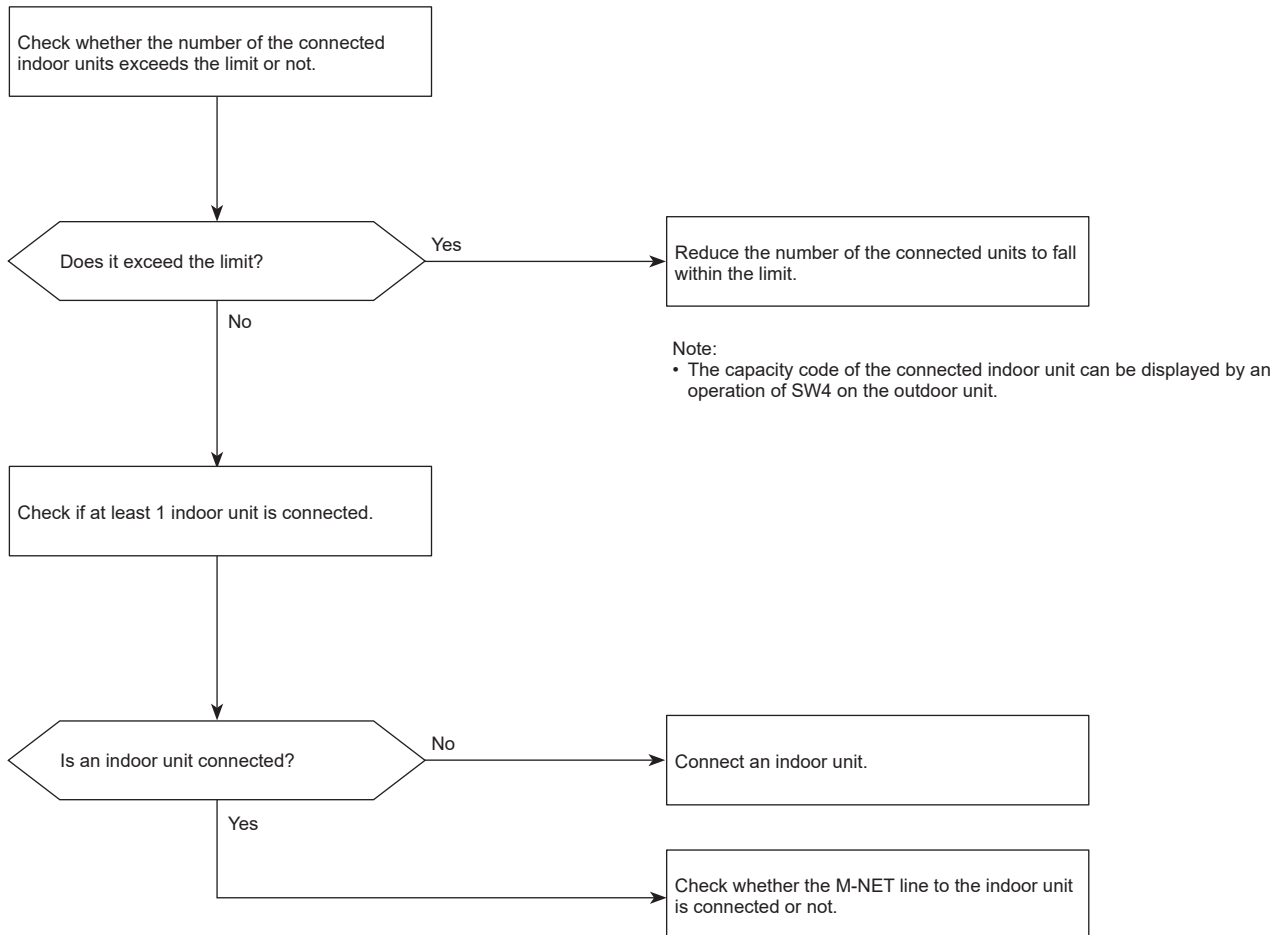
Causes and checkpoints

Connecting more indoor units and branch boxes than the limit.

If connecting status does not comply with the following limit;

- Connectable up to 12 indoor units
- Connect at least 1 indoor unit (Abnormal if connected none).
- Connectable up to 2 branch boxes

Diagnosis of failure



Abnormal points and detection methods

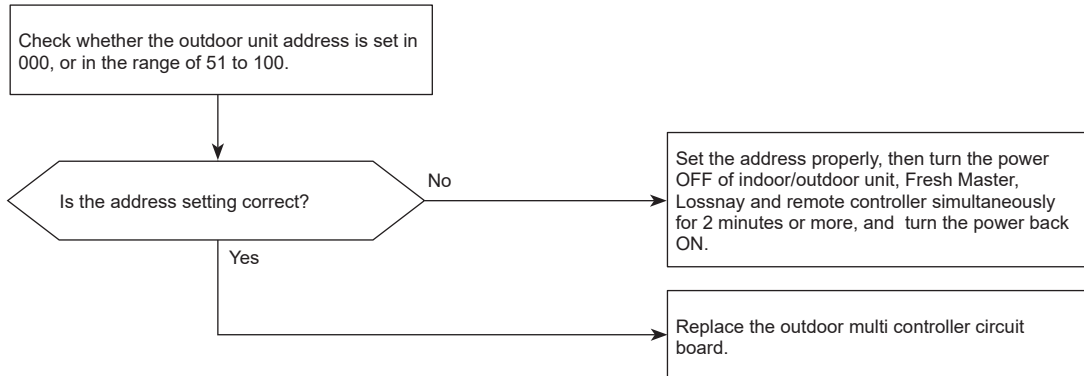
The address setting is wrong.

Causes and checkpoints

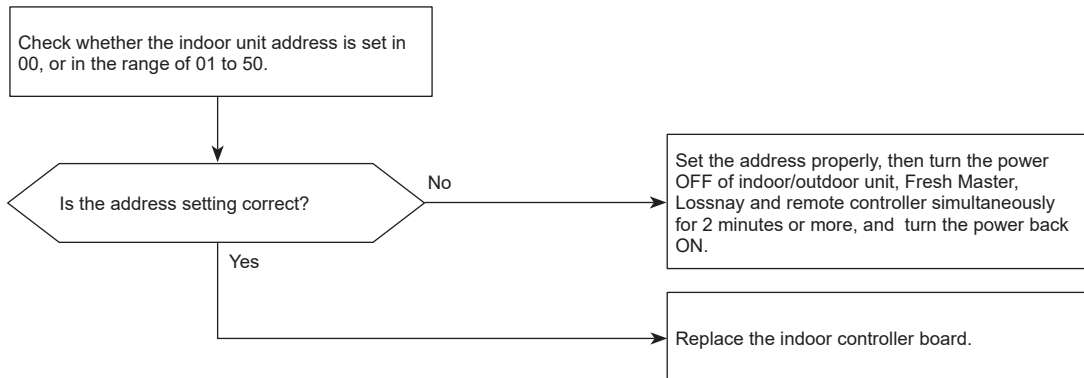
There is a unit without correct address setting in the range specified in the installation manual.

Diagnosis of failure

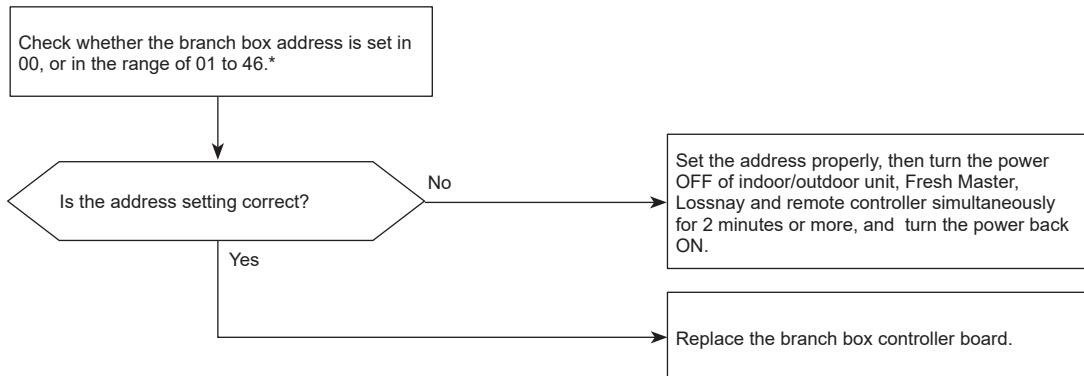
<Outdoor unit>



<Indoor unit>



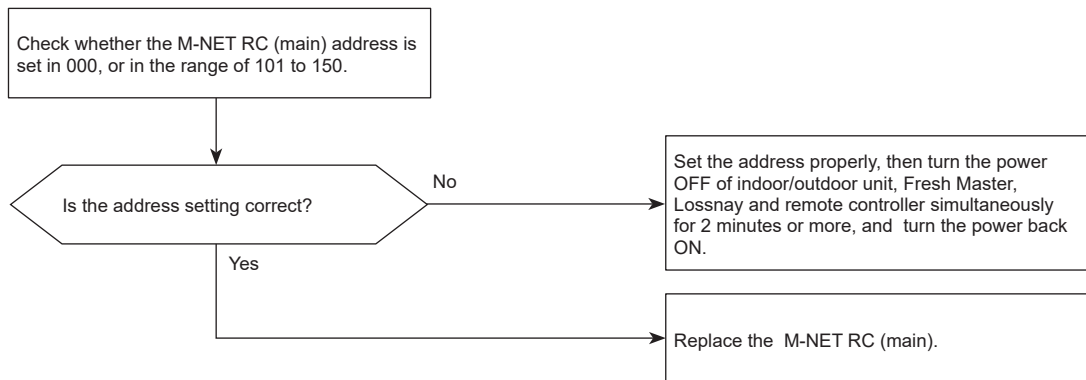
<Branch box>



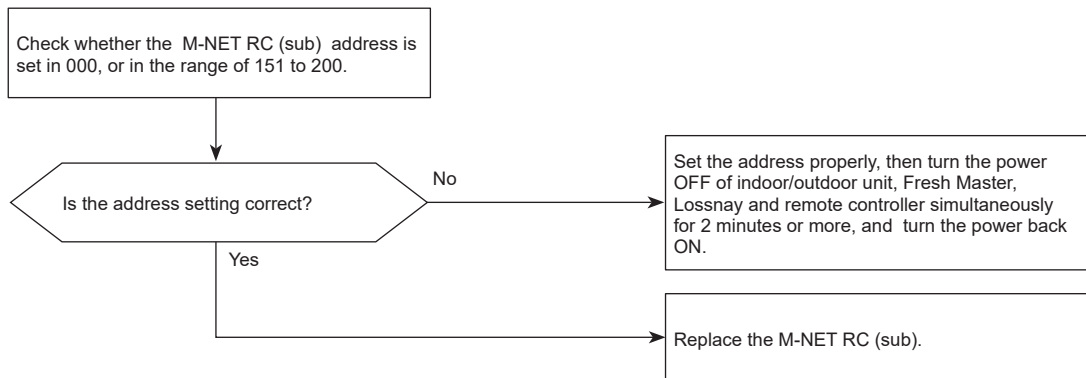
* Branch box port addresses are set sequentially and they must not exceed 50. For example, when 5 indoor units are connected and the branch box address (port A address) is set to 47, it is not allowable because the port E address exceeds 50 (A: 47, B: 48, C: 49, D: 50, E: 51).

Diagnosis of failure

<M-NET RC (main)>



<M-NET RC (sub)>



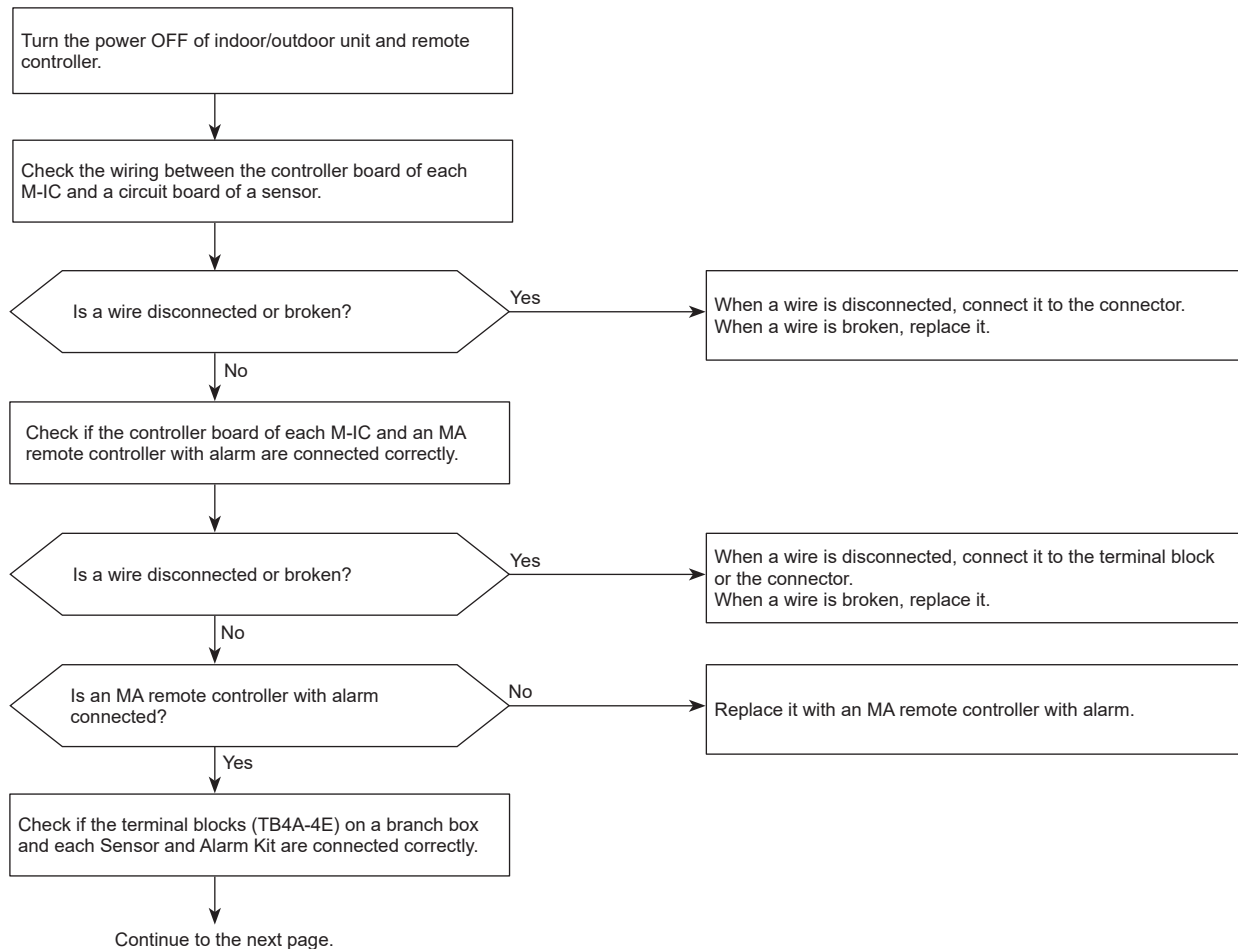
Abnormal points and detection methods

The system construction is not appropriate, so refrigerant leak cannot be detected at start-up. The outdoor unit detects this error.

Causes and checkpoints

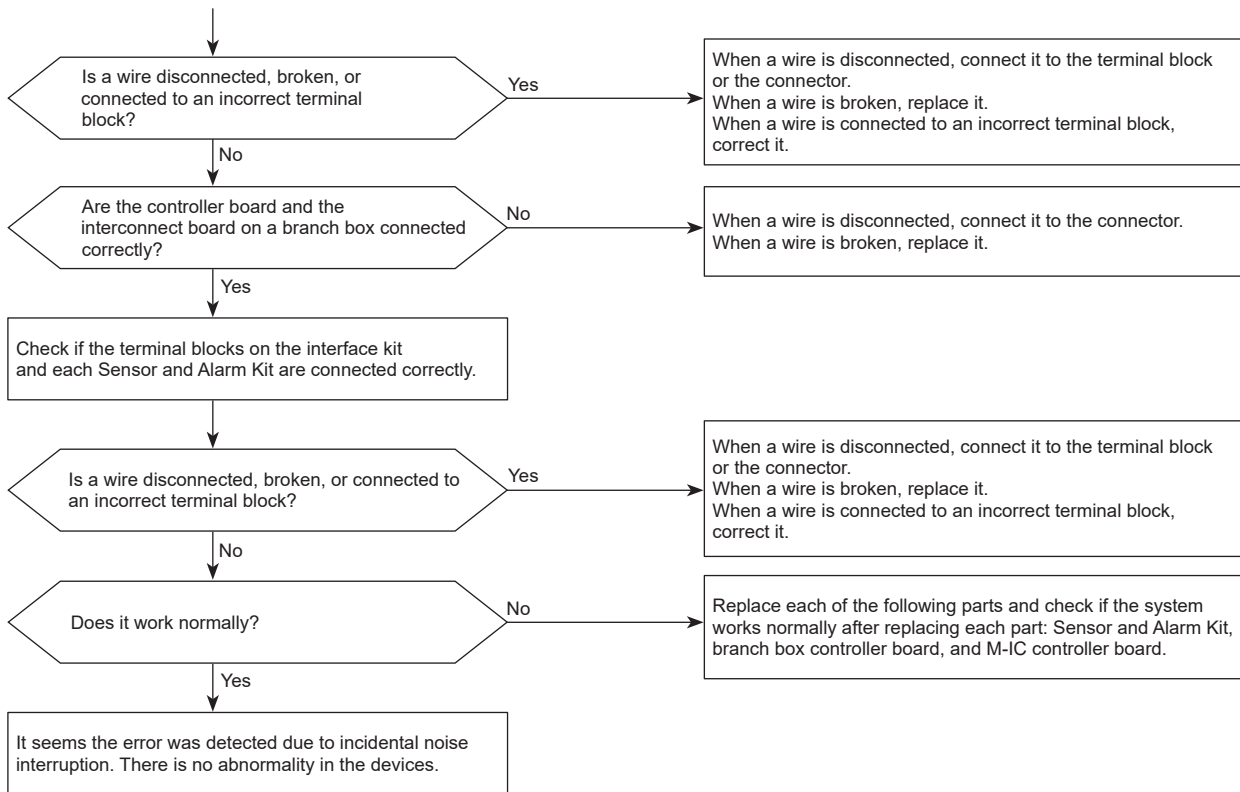
- A refrigerant sensor is not connected to an M-IC or there is an abnormality in the connection.
- An MA remote controller with alarm is not connected to an M-IC or there is an abnormality in the connection.
- Required number of Sensor and Alarm Kits is not connected to the branch box / interface kit or there is an abnormality in the connection.
- The outdoor unit could not receive information of the system construction correctly due to incidental noise interruption to the communication circuit.

Diagnosis of failure



Diagnosis of failure

Continued from the previous page.



7121 (EF): Power supply failure

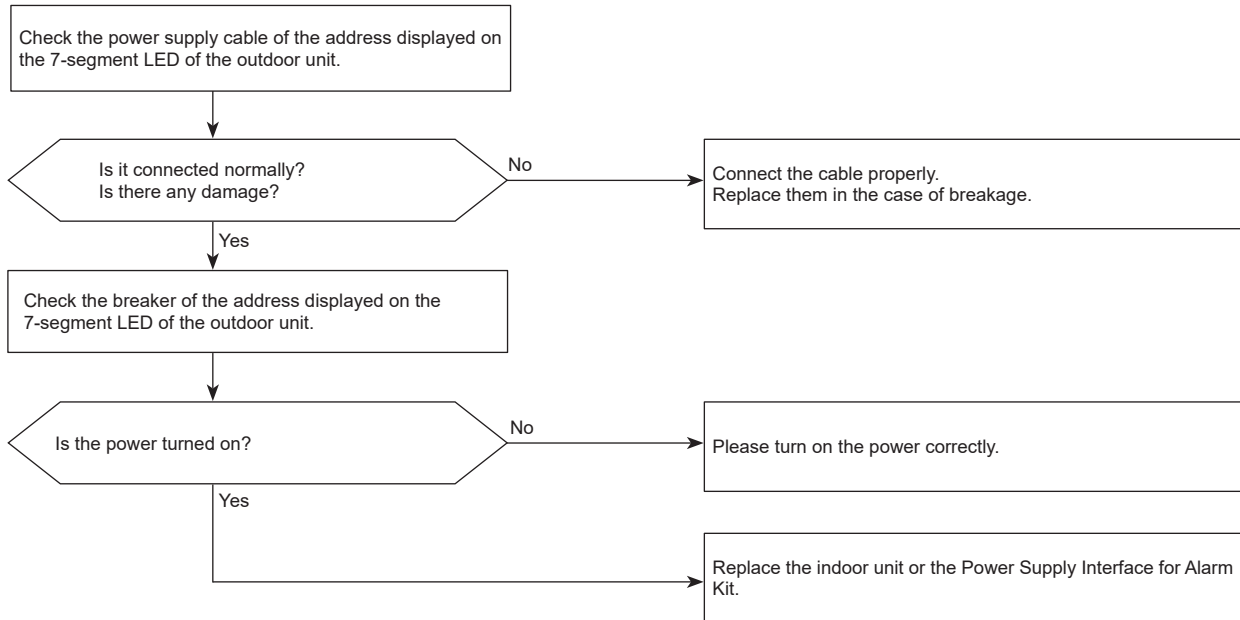
Abnormal points and detection methods

- Occurs when power is not supplied to the indoor unit or the Power Supply Interface for Alarm Kit at the initial startup of the outdoor unit.

Causes and checkpoints

- Power is not supplied to the indoor unit or the Power Supply Interface for Alarm Kit.
- Check whether the indoor unit or the Power Supply Interface for Alarm Kit is properly connected.

Diagnosis of failure



7130 (EF): Incompatible unit combination error

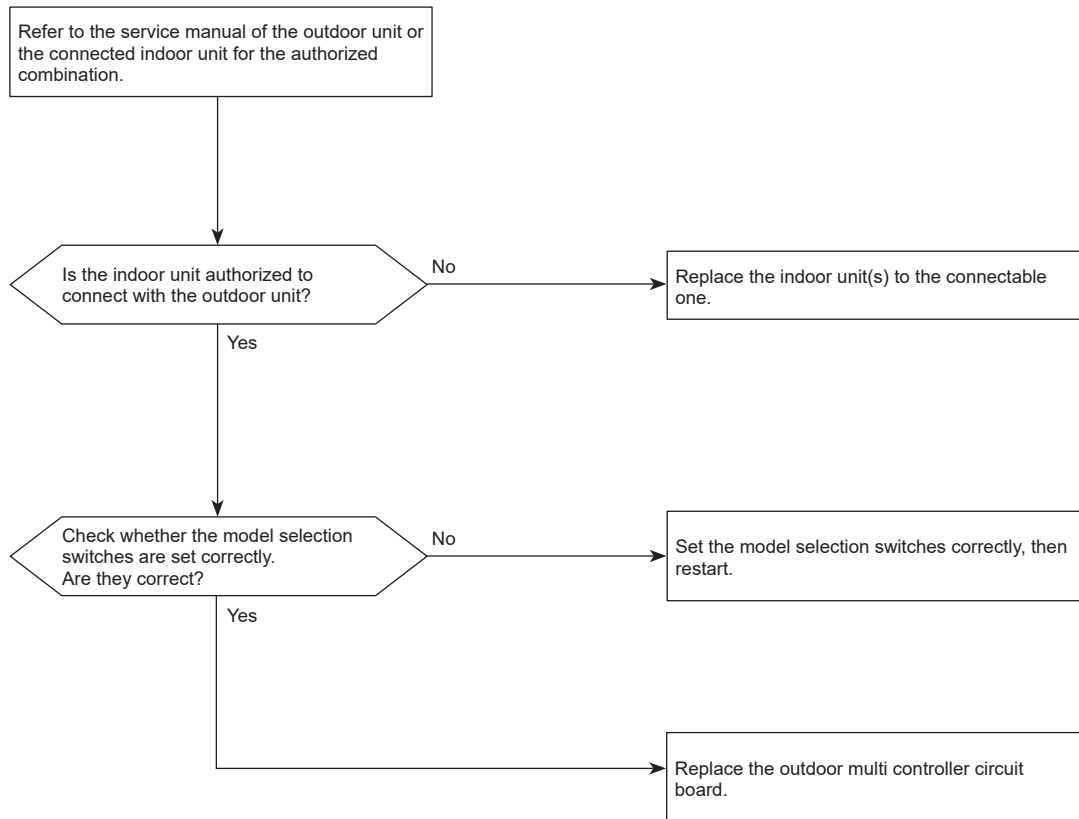
Abnormal points and detection methods

The connected indoor unit is not compatible with the outdoor unit, the outdoor unit detects the error at startup.

Causes and checkpoints

Connecting indoor unit(s) which is not authorized to connect to the outdoor unit.

Diagnosis of failure



8-2. Remote controller diagnosis

Refer to "Remote controller check" in MA remote controller operation manual.

8-3. Remote controller trouble

8-3-1. M-NET remote controller systems

Symptom or inspection code	Cause
Though the content of operation is displayed on the remote controller, some indoor units do not operate.	• The power supply of the indoor unit is not on. • The address of the indoor units in the same group or the remote controller is not set correctly. • The indoor units connected in the other system are not set in the same group by the remote controller. • The fuse on the indoor unit controller board is blown.
Though the indoor unit operates, the display of the remote controller goes out soon.	• The power supply of the indoor unit is not on. • The fuse on the indoor unit controller board is blown.
The display of the remote controller does not come up.	• The power supply of the outdoor unit is not on. • The connector of transmission outdoor power board is not connected. • The number of connected indoor units in the refrigeration system is over the limit or the number of connected remote controller is over the limit. • M-NET remote controller is connected to MA remote controller cable. • The transmission line of the indoor/outdoor unit is shorted or down. • M-NET remote controller cable is shorted or down. • Transmission outdoor power board failure.
"Startup screen" keeps being displayed or it is displayed periodically. (“Startup screen” is usually displayed about 3 minutes after the power supply of the outdoor unit is on.)	• The power supply for the feeding expansion unit for the transmission line is not on. • The address of the outdoor unit remains “00”. • The address of the indoor unit or the remote controller is not set correctly. • MA remote controller is connected to the transmission line of the indoor/outdoor unit.
The remote controller does not operate.	• The transmission line of the indoor/outdoor unit is connected to TB15. • The transmission line of the indoor/outdoor unit is shorted down or badly contacted.
Inspection method and solution	
Check the part where the abnormality occurs. 1. The entire system 2. In the entire refrigerant system 3. In same group only 4. 1 indoor unit only	In the case of the entire system or in the entire refrigerant system • Check the self-diagnosis LED1 of the outdoor unit. • Check the items shown in the left that are related to the outdoor unit. In the case of in the same group only or 1 indoor unit only • Check the items shown in the left that are related to the indoor unit.

8-3-2. For MA remote controller systems

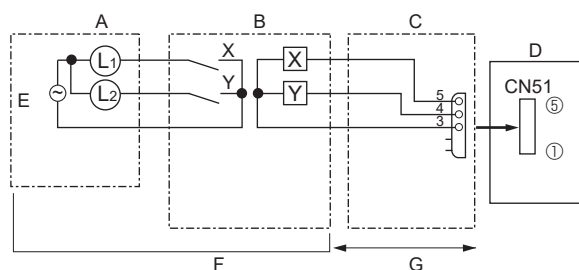
Symptom or inspection code	Cause
Though the content of operation is displayed on the remote controller, some indoor units do not operate.	• The power supply of the indoor unit is not on. • Wiring between indoor units in the same group is not finished. • M-IC and A-IC are connected in the same group. • The fuse on the indoor unit controller board is blown.
Though the indoor unit operates, the display of the remote controller goes out soon.	• The power supply of the indoor unit (Main) is not on. • In the case of connecting the system controller, the setting of the system controller does not correspond to that of MA remote controller. • The fuse on the indoor unit (Main) controller board is blown.
The display of the remote controller does not come up.	The remote controller is not fed until the power supply of both indoor unit and outdoor unit is on and the startup of both units is finished normally. • The power supply of the indoor unit is not on. • The power supply of the outdoor unit is not on. • The number of connected remote controllers is over the limit (Maximum: 2 units) or the number of connected indoor units is over the limit (Maximum: 16 units). • The address of the indoor unit is "00" and the address for the outdoor unit is the one other than "00". • The transmission line of the indoor/outdoor unit is connected to TB15. • MA remote controller is connected to the transmission line of the indoor/outdoor unit. • The remote controller cable is shorted or down. • The power supply cable or the transmission line is shorted or down. • The fuse on the indoor unit controller board is blown.
"Please Wait" keeps being displayed or it is displayed periodically. ("Please Wait" is usually displayed for 3 minutes after the power supply of the outdoor unit is on.)	• The power supply of the outdoor unit is not on. • The power supply of the feeding expansion unit for the transmission line is not on. • The setting of MA remote controller is not main remote controller, but sub-remote controller. • MA remote controller is connected to the transmission line of the indoor/outdoor unit.
The remote controller does not operate.	• The power supply of the indoor unit (Main) is not on. • The transmission line of the indoor/outdoor unit is connected to TB15. • The transmission line of the indoor/outdoor unit is shorted, down or badly contacted. • The fuse on the indoor unit controller board is blown.
Inspection method and solution	
• Check the part where the abnormality occurs. 1. The entire system 2. In the entire refrigerant system 3. In the same group only 4. 1 indoor unit only	In the case of the entire system or in the entire refrigerant system • Check the self-diagnosis LED1 of the outdoor unit. • Check the items shown in the left that are related to the outdoor unit. In the case of in the same group only or 1 indoor unit only • Check the items shown in the left that are related to the indoor unit.

8-4. The following symptoms do not represent product failure

Symptom	Cause
Even the cooling (heating) operation selection button is pressed, the indoor unit cannot be operated. Display: "Cooling (Heating)" blinks	The indoor unit cannot cool (heat) if other indoor units are heating (cooling).
The auto vane runs freely. Display: Normal display	Because of the control operation of auto vane, it may change over to horizontal blow automatically from the downward blow in cooling because the downward blow operation has been continued for 1 hour. At defrosting in heating, hot adjusting and thermostat OFF, it automatically changes over to horizontal blow.
Fan setting changes during heating. Display: Normal display	Ultra-low speed operation is commenced at thermostat OFF. Light air automatically change over to set value by time or piping temperature at thermostat ON.
Fan stops during heating operation. Display: "Heat Defrost" 	The fan stops during defrosting.
Fan does not stop while operation has been stopped. Display: Light is off	Fan runs for 1 minute after stopping to exhaust residual heat (only in heating).
No setting of fan while start SW has been turned on. Display: "Heat Standby" 	Ultra-low speed operation for 5 minutes after SW ON or until piping temperature reaches 35°C. Then low speed operates for 2 minutes and operates at the normal set air volume. (Hot adjust control)
Indoor unit remote controller shows "Please Wait" indicator for about 2 minutes when turning ON power supply. Display: "Please Wait" blinks	The system is in the process of startup. Operate remote controller again after "Please Wait" disappears.
Drain pump does not stop while unit has been stopped. Display: Light is off	After a stop of cooling operation, unit continues to operate drain pump for 3 minutes and then stops.
Drain pump continues to operate while unit has been stopped. Display: —	Unit continues to operate drain pump if drainage is generated, even during a stop.

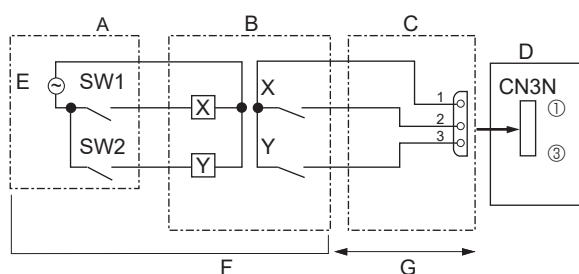
8-5. Outdoor unit input/output connector

■ State (CN51)



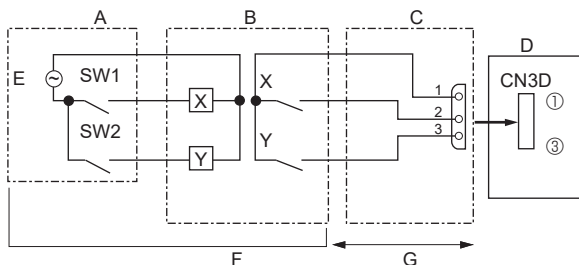
- A: Distant control board
- B: Relay circuit
- C: External output adapter (PAC-SA88HA-E)
- D: Outdoor unit control board
- E: Output power supply
- F: Procure locally
- G: Max. 10m [32 ft]
- L1: Error display output
- L2: Compressor operation output
- X, Y: Relay (coil rating: ≤ 0.9W. DC 12 VDC)

■ Auto changeover (CN3N)



- A: Remote control panel
- B: Relay circuit
- C: External input adapter (PAC-SC36NA-E)
- D: Outdoor unit control board
- E: Relay power supply
- F: Procure locally
- G: Max. 10 m [32 ft]
- SW1: Switch
- SW2: Switch
- X, Y: Relay (contact rating: ≥ 0.1 A. 15 VDC, min. applicable load: ≤ 1 mA)
- SW1-ON: Heating, SW1-OFF: Cooling
- SW2-ON: Validity of SW1, SW2-OFF: Invalidity of SW1

■ Silent Mode/Demand Control (CN3D)



A: Remote control panel

B: Relay circuit

C: External input adapter (PAC-SC36NA-E)

D: Outdoor unit control board

E: Relay power supply

F: Procure locally

G: Max. 10 m [32 ft]

SW1: Switch

SW2: Switch

X, Y: Relay (contact rating: ≥ 0.1 A, 15 VDC, min. applicable load: ≤ 1 mA)

The silent mode and the demand control are selected by the function setting No. 0010.

It is possible to set it to the following power consumption (compared with ratings) by setting SW1, 2.

	Function setting No. 0010	SW1	SW2	Function
Silent mode (Cooling only)	OFF	OFF	OFF	Normal
		ON	OFF	Silent mode
		OFF	ON	Super silent mode 1
		ON	ON	Super silent mode 2
Demand control	ON	OFF	OFF	100% (Normal)
		ON	OFF	75%
		ON	ON	50%
		OFF	ON	0% (Stop)

8-6. How to check the parts

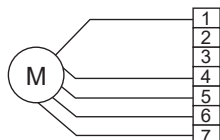
8-6-1. Checkpoints for each part

■ Thermistors

Disconnect the connector then measure the resistance with a multimeter (at the ambient temperature 10 to 30°C).

Thermistors	Normal	Abnormal
TH4 (Compressor)	160 to 410 kΩ	Open or short
TH2 (HIC pipe)		
TH3 (Outdoor liquid pipe)		
TH6 (Suction pipe)		
TH7 (Ambient)		
TH8 (Heat sink)	39 to 105 kΩ	

■ Fan motor (MF1, MF2)



Measure the resistance between the connector pins with a multimeter (at the ambient temperature 20°C).

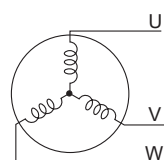
Connector pins	Normal	Abnormal
Red - Blue	1.1 ± 0.05 MΩ	Open or short (Short, for White - Blue)
Brown - Blue	40 ± 4 kΩ	
Orange - Blue	220 ± 22 kΩ	
White - Blue	Open	

■ Solenoid valve coil <4-way valve> (21S4)

Measure the resistance between the terminals with a multimeter (at the ambient temperature 20°C).

Normal	Abnormal
1725 ± 172.5 Ω	Open or short

■ Motor for compressor (MC)



Measure the resistance between the terminals with a multimeter (at the ambient temperature 20°C).

Model	Normal	Abnormal
PUMY-SM•VKM	0.440 ± 0.022 Ω	Open or short
PUMY-SM•YKM	0.880 ± 0.044 Ω	

■ Solenoid valve coil <Bypass valve> (SV1)

Measure the resistance between the terminals with a multimeter (at the ambient temperature 20°C).

Normal	Abnormal
1182.5 ± 83 Ω	Open or short

■ Liquid shut-off valve coil (SV2)

Measure the resistance between the terminals with a multimeter (at the ambient temperature 20°C).

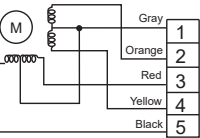
Normal	Abnormal
1182.5 ± 83 Ω	Open or short

■ Gas shut-off valve coil (SV3)

Measure the resistance between the terminals with a multimeter (at the ambient temperature 20°C).

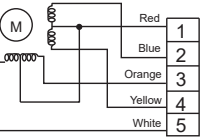
Normal	Abnormal
1182.5 ± 83 Ω	Open or short

■ Linear expansion valve (LEV-A)



Connector pins	Normal	Abnormal
Gray - Black	46 ± 3 Ω	Open or short
Gray - Red		
Gray - Yellow		
Gray - Orange		

■ Linear expansion valve (LEV-B)



Connector pins	Normal	Abnormal
Red - White	46 ± 4 Ω	Open or short
Red - Orange		
Red - Yellow		
Red - Blue		

8-7. How to check the components

8-7-1. Thermistor feature chart

■ Low temperature thermistors

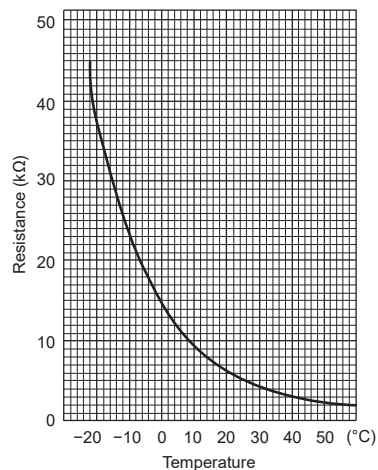
- TH2 (HIC pipe)
- TH3 (Outdoor liquid pipe)
- TH6 (Suction pipe)
- TH7 (Ambient)

Thermistor R0 = 15 kΩ ± 3 %

B constant = 3480 ± 1 %

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

Temperature	Resistance value
0°C	15 kΩ
10°C	9.6 kΩ
20°C	6.3 kΩ
25°C	5.2 kΩ
30°C	4.3 kΩ
40°C	3.0 kΩ



■ Medium temperature thermistor

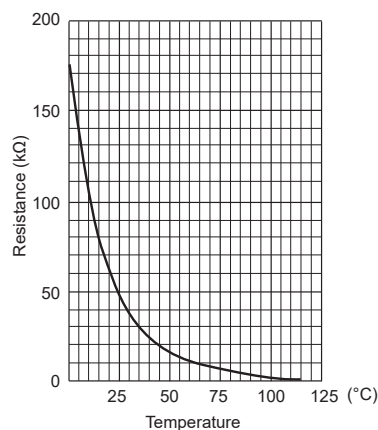
- TH8 (Heat sink)

Thermistor R50 = 17 kΩ ± 2 %

B constant = 4150 ± 3 %

$$R_t = 17 \exp\left\{4150 \left(\frac{1}{273+t} - \frac{1}{323}\right)\right\}$$

Temperature	Resistance value
0°C	180 kΩ
25°C	50 kΩ
50°C	17 kΩ
70°C	8 kΩ
90°C	4 kΩ



■ High temperature thermistor

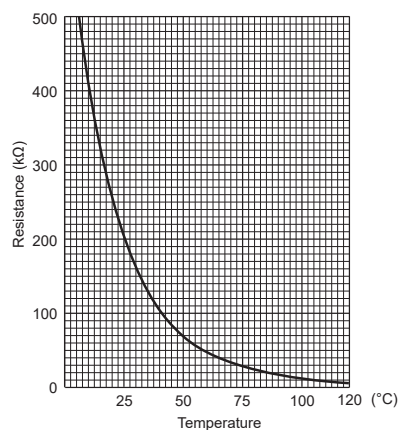
- TH4 (Compressor)

Thermistor R120 = 7.465 kΩ ± 2 %

B constant = 4057 ± 2 %

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

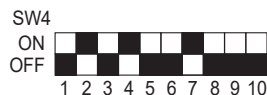
Temperature	Resistance value
20°C	250 kΩ
30°C	160 kΩ
40°C	104 kΩ
50°C	70 kΩ
60°C	48 kΩ
70°C	34 kΩ
80°C	24 kΩ
90°C	17.5 kΩ
100°C	13.0 kΩ
110°C	9.8 kΩ



8-7-2. High pressure sensor

■ The methods of comparing the high pressure sensor measurement and gauge pressure

By configuring the digital display setting switch (SW4) as shown in the figure below, the pressure as measured by the high pressure sensor appears on the LED1 on the control board.



The black square (■) indicates a switch position.

- While the outdoor unit is stopped, compare the gauge pressure and the pressure displayed on the self-diagnosis LED1.
 - When the gauge pressure is between 0 and 0.098 MPaG, internal pressure is caused due to gas leak.
 - When the pressure displayed on the self-diagnosis LED1 is between 0 and 0.098 MPaG, the connector may be faulty or be disconnected. Check the connector and go to the method 4.
 - When the pressure displayed on the self-diagnosis LED1 exceeds 5.0 MPaG, go to the method 3.
 - If other than listed above, compare the pressures while the sensor is running. Go to the method 2.
- Compare the gauge pressure and the pressure displayed on the self-diagnosis LED1 after 15 minutes have passed since the start of operation. (Compare them by MPaG/psig unit.)
 - When the difference between both pressures is within 0.25 MPaG, both the high pressure sensor and the control board are normal.
 - When the difference between both pressures exceeds 0.25 MPaG, the high pressure sensor has a problem. (performance deterioration)
 - When the pressure displayed on the self-diagnosis LED1 does not change, the high pressure sensor has a problem.
- Remove the high pressure sensor from the control board to check the pressure on the self-diagnosis LED1.
 - When the pressure displayed on the self-diagnosis LED1 is between 0 and 0.098 MPaG, the high pressure sensor has a problem.
 - When the pressure displayed on the self-diagnosis LED1 is approximately 5.0 MPaG, the control board has a problem.
- 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 the self-diagnosis LED1.
 - When the pressure displayed on the self-diagnosis LED1 exceeds 5.0 MPaG, the high pressure sensor has a problem.
 - If other than listed above, the control board has a problem.

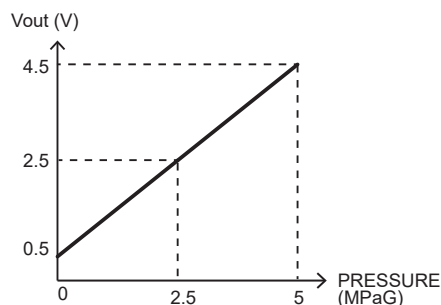
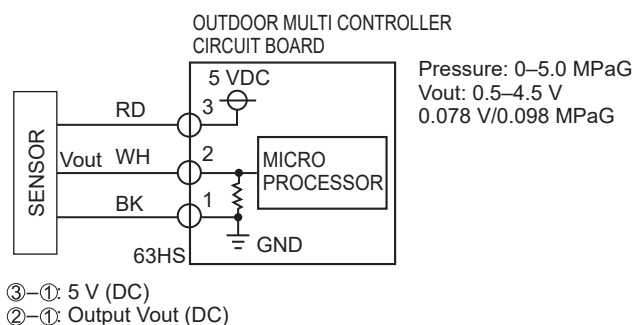
■ High pressure sensor configuration (63HS)

The high pressure sensor consists of the circuit shown in the figure below. If 5 VDC 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 microprocessor. The output voltage is 0.078 V per 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



8-7-3. Low pressure sensor

■ The methods of comparing the low pressure sensor measurement and gauge pressure

By configuring the digital display setting switch (SW4) as shown in the figure below, the pressure as measured by the low pressure sensor appears on the LED1 on the control board.



The black square (■) indicates a switch position.

- While the outdoor unit is stopped, compare the gauge pressure and the pressure displayed on the self-diagnosis LED1.
 - When the gauge pressure is between 0 and 0.098 MPaG, internal pressure is caused due to gas leak.
 - When the pressure displayed on the self-diagnosis LED1 is between 0 and 0.098 MPaG, the connector may be faulty or be disconnected. Check the connector and go to the method 4.
 - When the outdoor temperature is 30°C or less, and the pressure displayed on the self-diagnosis LED1 exceeds 1.7 MPaG, go to the method 3.
 - When the outdoor temperature exceeds 30°C, and the pressure displayed on the self-diagnosis LED1 exceeds 1.7 MPaG, go to the method 5.
 - If other than listed above, compare the pressures while the sensor is running. Go to the method 2.
- Compare the gauge pressure and the pressure displayed on the self-diagnosis LED1 after 15 minutes have passed since the start of operation. (Compare them by MPaG/psig unit.)
 - When the difference between both pressures is within 0.2 MPaG, both the low pressure sensor and the control board are normal.
 - When the difference between both pressures exceeds 0.2 MPaG, the low pressure sensor has a problem. (performance deterioration)
 - When the pressure displayed on the self-diagnosis LED1 does not change, the low pressure sensor has a problem.
- Remove the low pressure sensor from the control board to check the pressure with the self-diagnosis LED1.
 - When the pressure displayed on the self-diagnosis LED1 is between 0 and 0.098 MPaG, the low pressure sensor has a problem.
 - When the pressure displayed on the self-diagnosis LED1 is approximately 1.7 MPaG, the control board has a problem.
- 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.
 - When the pressure displayed on the self-diagnosis LED1 exceeds 1.7 MPaG, the low pressure sensor has a problem.
 - If other than listed above, the control board has a problem.
- 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.
 - When the pressure displayed on the self-diagnosis LED1 exceeds 1.7 MPaG, the control board has a problem.
 - If other than listed above, go to the method 2.

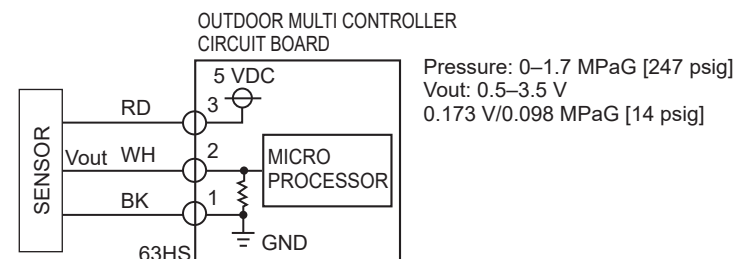
■ Low pressure sensor configuration (63LS)

The low pressure sensor consists of the circuit shown in the figure below. If 5 VDC 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 microprocessor. The output voltage is 0.173 V per 0.098 MPaG.

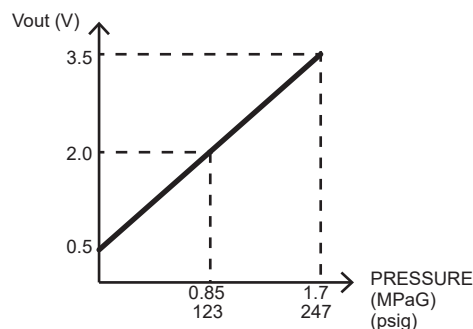
Note:

- 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)

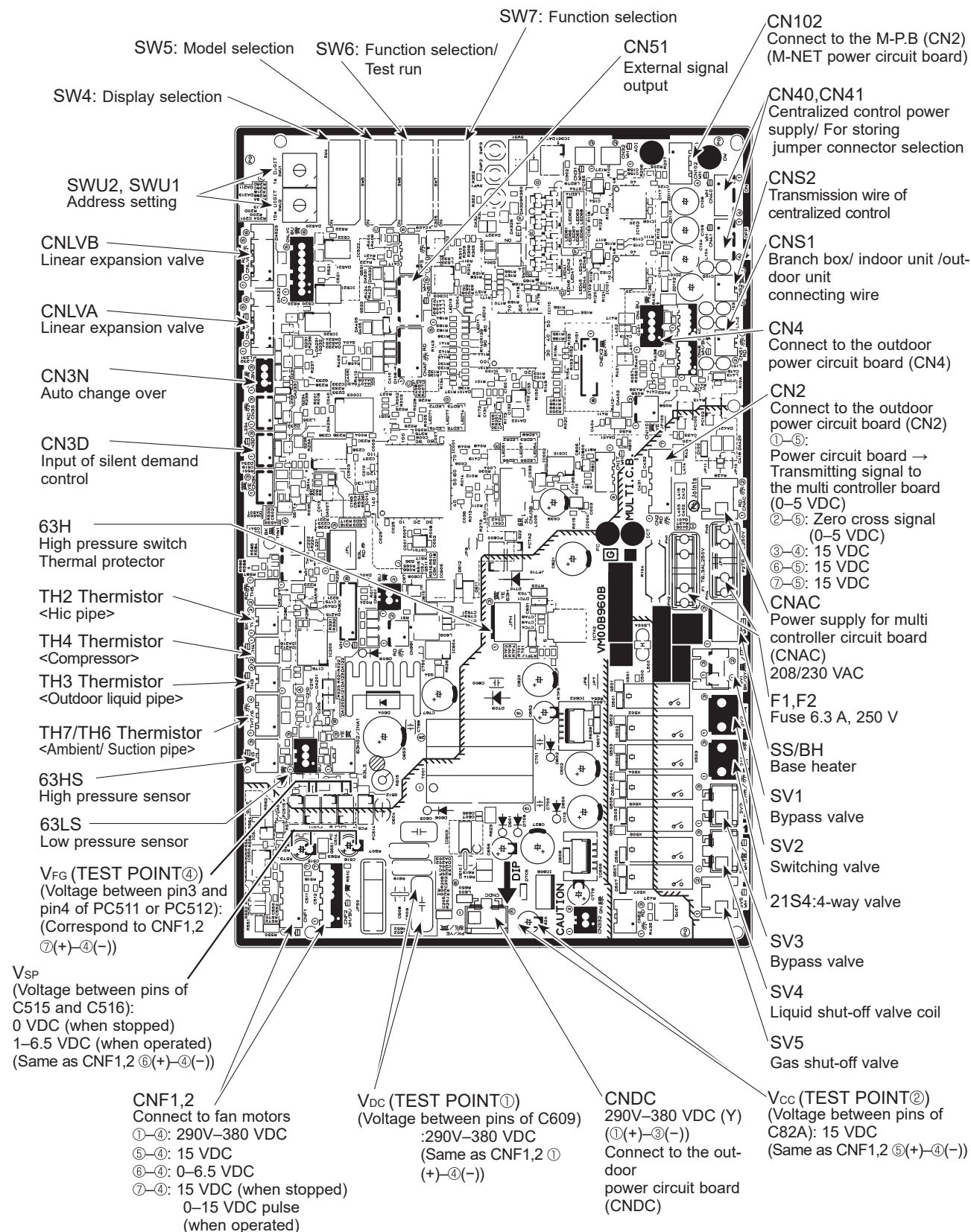


8-8. Test point diagram

■ Outdoor multi controller circuit board

⚠ Caution:

- TEST POINT① is high voltage.



■ Outdoor power circuit board

Brief check of the power module

If they are short-circuited, it means that they are broken.
Measure the resistance in the following points (connectors, etc.).

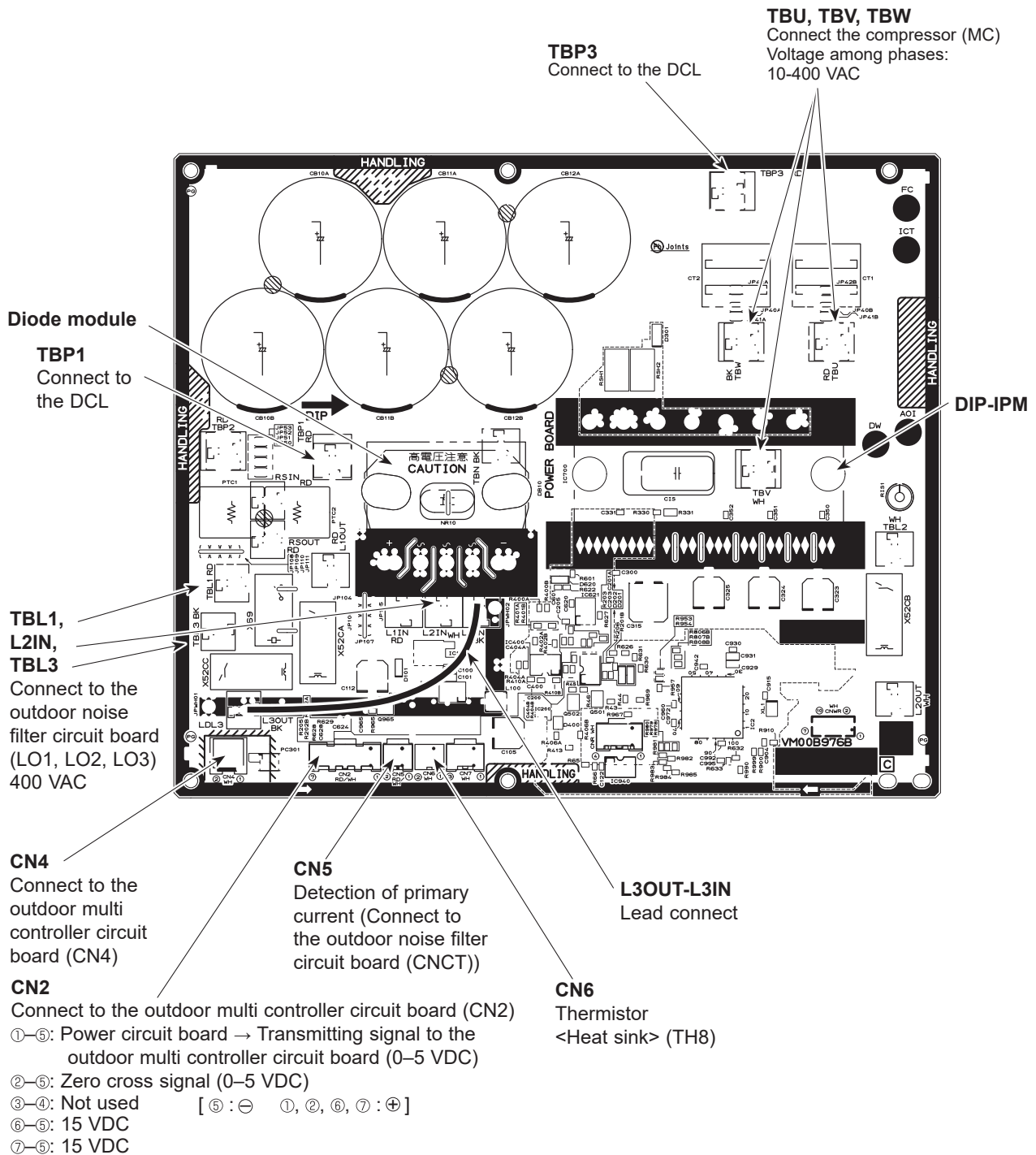
1. Check of the diode module

[L1]–[P1], [L2]–[P1], [L3]–[P1], [L1]–[N1], [L2]–[N1], [L3]–[N1]

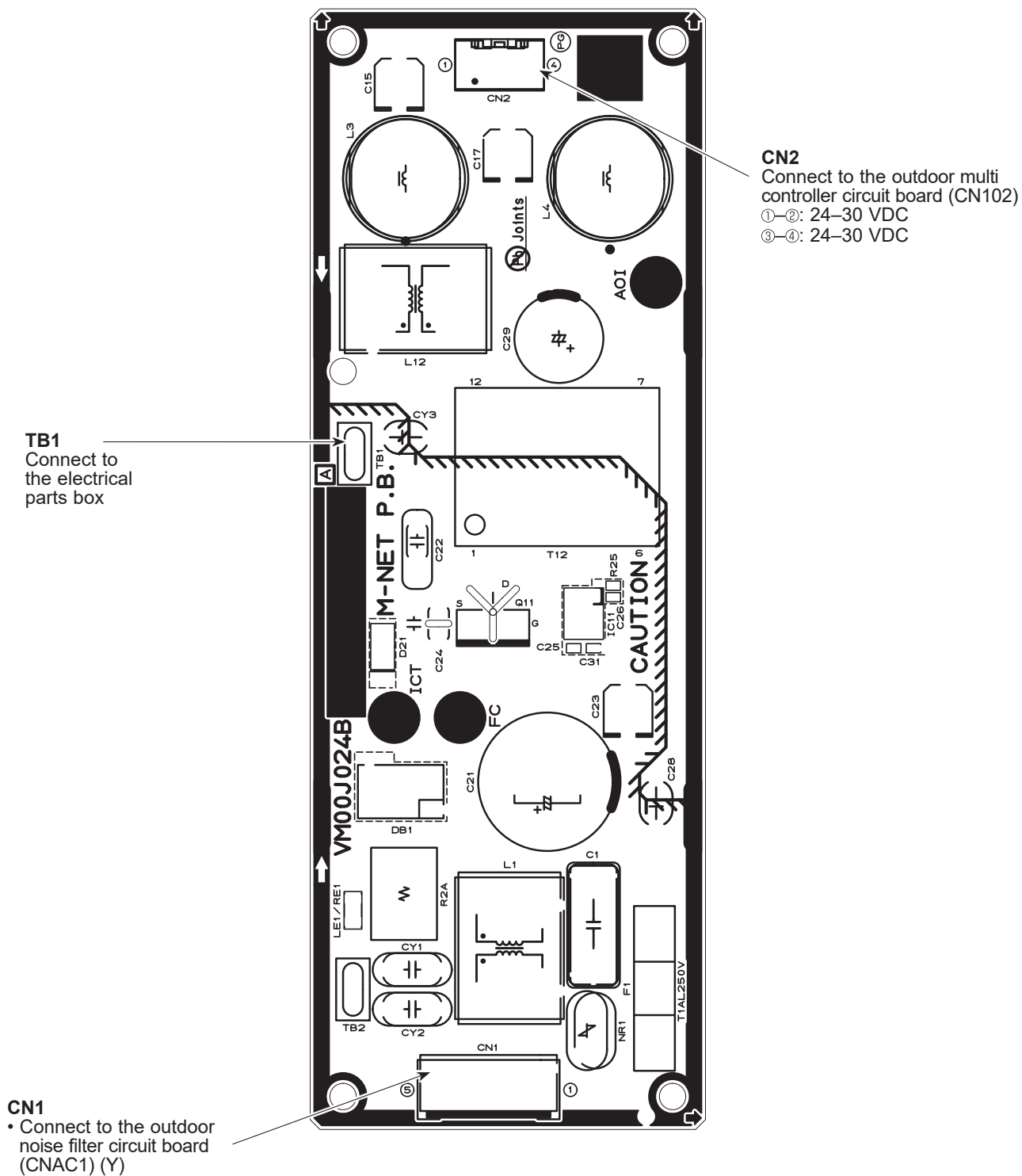
2. Check of DIP-IPM

[P2]–[U], [P2]–[V], [P2]–[W], [N2]–[U], [N2]–[V], [N2]–[W]

Note: The marks [L1], [L2], [L3], [N1], [N2], [P1], [P2], [U], [V], and [W] shown in the diagram are not actually printed on the board.



■ M-NET power circuit board



■ Outdoor noise filter circuit board

L11, L12, L13, NI
POWER SUPPLY
L11-L12/L12-L13/L13-L11: 400 VAC input
L11-NI/L12-NI/L13-NI: 230 VAC input
(Connect to the terminal block (TB1))

E1
Connect to the
electrical parts box

CNAC1
230 VAC
(Connect to the
M-NET power
circuit board (CN1))

CNAC2
230 VAC
(Connect to the
outdoor multi
controller
circuit board (CNAC))

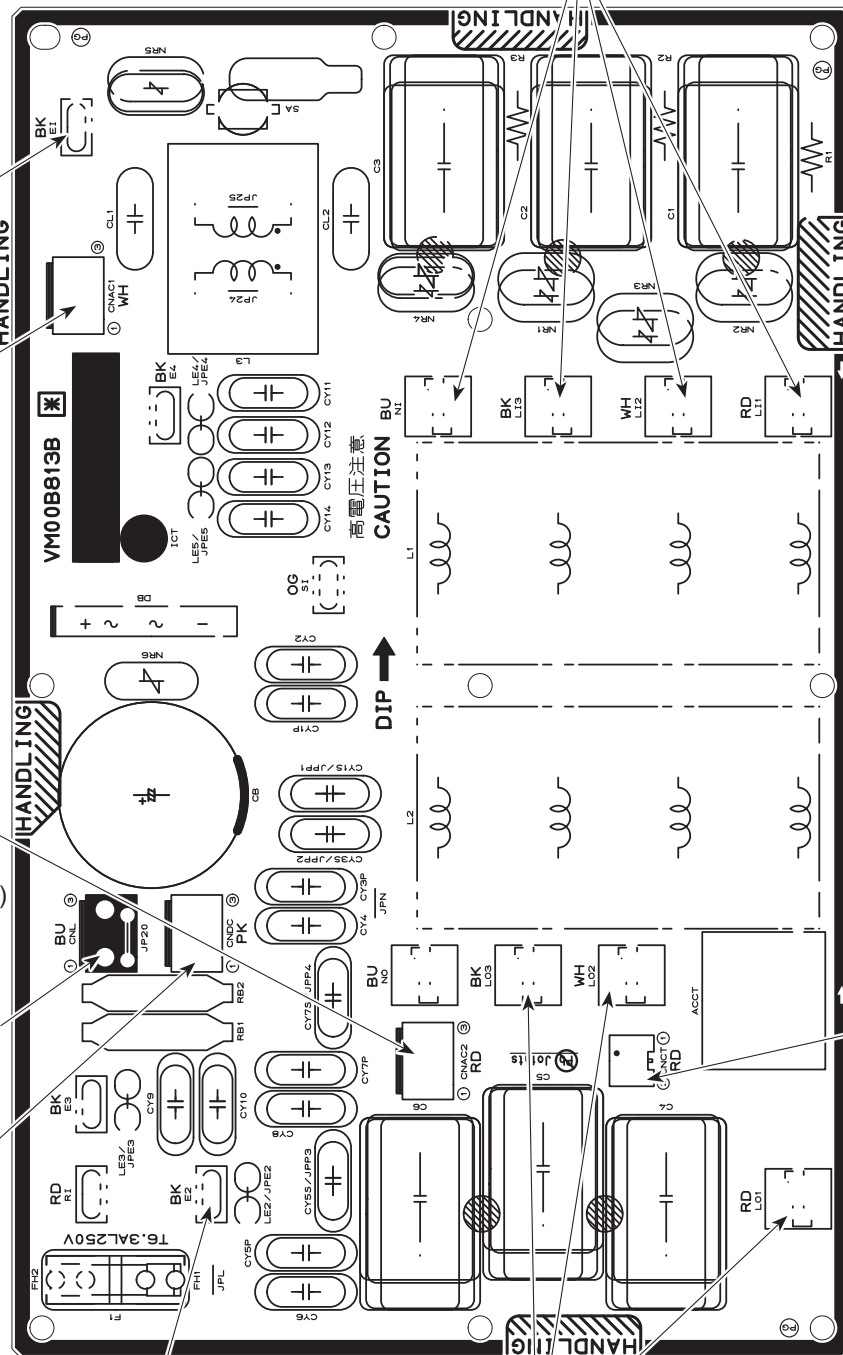
CNL
Connect to the ACL4

CNDC
(Connect to the
outdoor controller
circuit board
(CNDC))

E2
Connect to the
electrical parts box

LO1, LO2, LO3
POWER SUPPLY
LO1-LO2/LO2-LO3/LO3-LO1: 400 VAC OUTPUT
(Connect to the outdoor power circuit board (TBL1, L2IN,
TBL3))

CNCT
Primary current
(Connect to the
outdoor power
circuit board
(CN5))



8-9. Internal switch function table

8-9-1. Function of switches

■ SWU1 and SWU2



SWU2



SWU1

(tens digit) (ones digit)

Bit	When to set
Rotary switch	Before turning the power ON

■ SW4: Digital display switch

Initial setting

ON	☐
OFF	☒
	1 2 3 4 5 6 7 8 9 10

The black square (■) indicates a switch position.

Bit	When to set	Purpose
1-10	Any time	To display outdoor unit's information to the LED on outdoor multi controller circuit board. Refer to "8-10. Outdoor unit information display".

■ SW5: Function switch

Initial setting

ON	☐
OFF	☒
	1 2

* Initial settings for SW5-3, 5-4, 5-5, and 5-6 are depending on the capacity.

The black square (■) indicates a switch position.

Bit	Function	Operation in each switch setting			Purpose	Additional information
		ON	OFF	When to set		
1	Select operating system startup	With centralized controller	Without centralized controller	Before turning the power ON	Turn ON when the centralized controller is connected to the outdoor unit.	- SW5-1 must be turned ON if a centralized controller is connected to the system. An example of this would be a TC-24, EB50A, AG150, AE50 or AE200. If SW5-1 is OFF, while using a centralized controller, in rare circumstances problems may be encountered such as indoor units not responding to group commands. - Group setting of 2 or more A-IC units which are connected to branch box via centralized controller is not allowed.
2	Clear connection information	Activated	Deactivated	Before turning the power ON	To clear connection information.	Clear connection information when relocating units or connecting additional units.
3	Model selection				-	-
4						
5						
6						
7	Switching the interface kit connection	Connection	No connection	Before turning the power ON	Turn ON When the system is configured with an Interface kit connected.	If turn the power on with the setting ON when the interface kit is not connected, an error 7118 will occur.
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-

■ SW6: Function switch

Initial setting

ON	☐
OFF	☒
	1 2 3 4 5 6 7 8 9 10

The black square (■) indicates a switch position.

Bit	Function	Operation in each switch setting			Purpose	Additional information
		ON	OFF	When to set		
1	ON/OFF from outdoor unit	Activated	Deactivated	Anytime after the power is turned ON	-	-
2	Mode setting	Heating	Cooling	Anytime after the power is turned ON	-	-
3	Manual defrost	Activated	Deactivated	While the compressor is running in Heating mode	Turn ON when it is necessary to perform the defrosting operation forcedly. (Effective only at startup, or 10 minutes after the last defrosting operation)	It performs the defrosting operation forcedly. (Heating operation is stopped temporarily.)
4	Ignore current sensor abnormality and rotational frequency abnormality of outdoor fan motor	Activated	Deactivated	Anytime after the power is turned ON	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.	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.

Function Item No.	Switch (SW4) 12345678910	Function	Operation in each switch setting			Purpose	Additional information
			ON	OFF	When to set		
0019	1100100000	Change the indoor unit's LEV opening at startup	Activated	Deactivated	Any time	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.
0021	1010100000	Setting to energize the freeze stat heater (optional part) only during heating	Activated *3	Deactivated *4	Any time	To reduce snow on the base, even it blows inside the unit, by setting the base heater ON while the HEAT operation is stopped	Power consumption raises while the operation is stopped.
0025	1001100000	Change the indoor unit's LEV opening at defrost	Activated	Deactivated	Any time	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 become louder.
0026	0101100000	While the outdoor unit is in HEAT operation, additionally increase by 50 to 70 pulses of the LEV opening on the indoor unit which is in FAN, STOP, COOL or thermo-OFF. *5	Activated	Deactivated	Any time	To additionally increase by 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.
0028	0011100000	While the outdoor unit is in HEAT operation, fully close the LEV on the indoor unit which is in FAN or COOL. *6	Activated	Deactivated	Any time	To reduce the room temperature increase by setting the LEV opening lower for the indoor units in FAN or COOL	The refrigerant is more likely to collect in the indoor units in FAN or COOL, which can cause refrigerant shortage of units, resulting in less capacity and increase in discharge temperature.

*1.

No.0003	OFF	ON
Target Pdm (kgf/cm ²)	29.5	31.5

*2.

No. 0004	OFF	ON	OFF	ON
No. 0005	OFF	OFF	ON	ON
Target ETm (°C)	9	11	6	14

*3. When the ambient temperature is 4°C or below during heating operation, the freeze prevention heater is energized.

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

*5. Function item No.0026 Opens the indoor-linear 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.

*6. Function item No.0028 Countermeasure against room temperature rise for indoor unit in FAN and COOL mode

8-10. Outdoor unit information display

SW: setting
0: OFF
1: ON

No.	SW4 setting	Contents	LED1							
			1	2	3	4	5	6	7	8
0	12345678910 0000000000	Relay output	Compressor operation	52C	21S4	SV1	(SV2)	-	-	Always lighting
		Error code	0000–9999 (Alternating display of addresses and error code)							
			Note: When abnormality occurs, check the display.							
1	1000000000	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
			Note: Light on at time of abnormality							
2	0100000000	Protection input	High pressure abnormality	Superheat due to low discharge temperature abnormality	Compressor shell temperature abnormality	TH4 abnormality	TH3 abnormality	Outdoor fan rotation frequency abnormality	TH7 abnormality	TH8 abnormality
			Note: Display detected microprocessor protection or abnormality							
3	1100000000	Protection input	Heat sink overheating	Compressor overcurrent interception	Voltage abnormality	Insufficient refrigerant amount abnormality	Current sensor/primary current abnormality	63LS abnormality	63HS abnormality	start overcurrent interception abnormality delay
			Note: Display detected microprocessor protection or abnormality							
4	0010000000	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)
			Note: Display detected microprocessor protection or abnormality							
5	1010000000	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
			Note: Display all abnormalities remaining in abnormality delay							
6	0110000000	Abnormality delay display 2	Heat sink overheating delay	Compressor overcurrent interception delay	Voltage abnormality delay	Insufficient refrigerant amount abnormality delay	Current sensor/primary current abnormality delay	63LS abnormality delay	63HS abnormality delay	start overcurrent interception abnormality delay
			Note: Display all abnormalities remaining in abnormality delay							
7	1110000000	Abnormality delay display 3	63LS abnormality delay	TH2 abnormality delay	4-way valve abnormality delay	Delay caused by closed valve in cooling mode	Power module abnormality delay	TH6 abnormality delay	Current sensor open/short delay	—
			Note: Display all abnormalities remaining in abnormality delay							
8	0001000000	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
			Note: Display all abnormalities remaining in abnormality delay							
9	1001000000	Abnormality delay history 2	Heat sink overheating delay	Compressor overcurrent interception delay	Voltage abnormality delay	Insufficient refrigerant amount abnormality delay	Current sensor/primary current abnormality delay	63LS abnormality delay	63HS abnormality delay	start overcurrent interception abnormality delay
			Note: Display all abnormalities remaining in abnormality delay							
10	0101000000	Abnormality delay history 3	63LS abnormality delay	TH2 abnormality delay	4-way valve abnormality delay	Delay caused by closed valve in cooling mode	Power module abnormality delay	TH6 abnormality delay	Current sensor open/short delay	—
			Note: Display all abnormalities remaining in abnormality delay							
11	1101000000	Abnormality code history 1 (the latest)	Alternating display of addresses 0000–9999 and abnormality code (including abnormality delay code)							
			Following is the delay code and the details of the abnormal delay.							
12	0011000000	Abnormality code history 2	1202: Discharge/Comp. temperature, Thermistor <Compressor>(TH4)							
			1205: Thermistor <Outdoor liquid pipe> (TH3)							
13	1011000000	Abnormality code history 3	1211: Thermistor <Suction pipe> (TH6)							
			1214: Thermistor <Heat sink> (TH8)							
14	0111000000	Abnormality code history 4	1221: Thermistor <Ambient> (TH7)							
			1402: High pressure (63H), High pressure sensor (63HS)							
15	1111000000	Abnormality code history 5	1600: Over charge refrigerant							
			1601: Insufficient refrigerant							
16	0000100000	Abnormality code history 6	4165: Power synchronization signal abnormality delay							
			4320: Frequency converter insufficient wiring voltage							
17	1000100000	Abnormality code history 7	4330: Heat sink temperature							
			4350: Power module							
18	0100100000	Abnormality code history 8	Notes:							
			• Display abnormalities up to present (including abnormality terminals)							
19	1100100000	Abnormality code history 9	• History record in 1 is the latest; records become older in sequence; history record in 10 is the oldest.							
20	0010100000	Abnormality code history 10 (the oldest)								
21	1010100000	Cumulative time	0–9999 (unit: 1 hour)							
			Note: Display of cumulative compressor operating time							
22	0110100000	Cumulative time	0–9999 (unit: 10 hours)							
			Note: Display of cumulative compressor operating time							
23	1110100000	Outdoor unit operation display	Excitation Current	Restart after 3 minutes	Compressor operation	Abnormality detection	—	—	—	—

No.	SW4 setting	Contents	LED1							
			1	2	3	4	5	6	7	8
24	0001100000	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
			Cooling: light on, Heating: light blinking, Stop fan: light off							
25	1001100000	Indoor unit operation display	No.1 unit Thermo ON	No.2 unit Thermo ON	No.3 unit Thermo ON	No.4 unit Thermo ON	No.5 unit Thermo ON	No.6 unit Thermo ON	No.7 unit Thermo ON	No.8 unit Thermo ON
26	0101100000	Capacity code (No. 1 indoor unit)	Notes: •Display of indoor unit capacity code •The No. 1 unit will start from the M-NET address with the lowest number							
27	1101100000	Capacity code (No. 2 indoor unit)								
28	0011100000	Capacity code (No. 3 indoor unit)								
29	1011100000	Capacity code (No. 4 indoor unit)								
30	0111100000	Capacity code (No. 5 indoor unit)								
31	1111100000	IC1 operation mode	OFF	Fan	Cooling thermo-ON	Cooling thermo-OFF	Heating thermo-ON	Heating thermo-OFF	—	—
32	0000100000	IC2 operation mode								
33	1000100000	IC3 operation mode								
34	0100100000	IC4 operation mode								
35	1100100000	IC5 operation mode	Note: Display of indoor unit operating mode							
36	0010010000	OC operation mode	Compressor ON/OFF	Heating/ Cooling	Abnormal/ Normal	Defrost/No	Refrigerant pull back/No	Excitation current/No	3-min delay/ No	—
			Note: Light on/light off							
37	1010010000	External connection status	CN3N1-3 input	CN3N1-2 input	CN3S1-2 input	CN3D1-3 input	CN3D1-2 input	—	—	—
			Note: Input: light on, No input: light off							
38	0110010000	Communication demand capacity	0-255 (%)							
			Note: Display of communication demand capacity							
39	1110010000	Number of compressor ON/OFF	0000-9999 (unit: x10)							
			Note: Display a count of compressor operation/stop							
40	0001010000	Compressor operating current	0-999.9 (Arms)							
			Note: Display detected current							
41	1001010000	Input current of outdoor unit	0-999.9 (A)							
			Note: Display detected current							
42	0101010000	Thermo-ON operating time	0000-9999 (unit: x10)							
			Note: Display cumulative time of thermo-ON operation							
43	1101010000	Total capacity of thermo-ON	0-255							
			Note: Display total capacity code of indoor units in thermo-ON							
44	0011010000	Number of indoor units	0-255							
			Note: Display number of connected indoor units							
45	1011010000	DC bus voltage	0-9999 (V)							
			Note: Display bus voltage							
46	0111010000	State of LEV control	Td overheat 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	—
			Note: Display active LEV control							
47	1111010000	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)	—	Freeze prevention control at the beginning of SHd
			Note: Display active compressor frequency control							
48	0000110000	State of compressor frequency control 2	Heat sink overheat 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	—
			Note: Display active compressor frequency control							
49	1000110000	Protection input	63LS abnormality	TH2 abnormality	—	—	4-way valve disconnection abnormality	Frozen protection	TH6 abnormality	Power module abnormality
50	0100110000	The second current value when microprocessor of power board abnormality is detected	0-999.9 (Arms)							
			Note: Display data at time of abnormality							
51	1100110000	Heatsink temperature when microprocessor of power board abnormality is detected	-99.9-999.9 (°C) (Short/Open: -99.9 or 999.9)							
			Note: Display data at time of abnormality							

No.	SW4 setting	Contents	LED1							
			1	2	3	4	5	6	7	8
52	0010110000	Outdoor LEV-A opening pulse	0–2000 (pulse)							
53	1010110000	Outdoor LEV-A opening pulse abnormality delay	Note: Display of opening pulse of outdoor LEV							
54	0110110000	Outdoor LEV-A opening pulse abnormality								
55	1110110000	Outdoor LEV-B opening pulse								
56	0001110000	Outdoor LEV-B opening pulse abnormality delay								
57	1001110000	Outdoor LEV-B opening pulse abnormality								
58	0101110000	63LS (Low pressure)	–99.9–999.9 (kgf/cm ²) (Short/open: –99.9 or 999.9)							
59	1101110000	63LS abnormality delay	Note: Display of data from sensor and thermistor							
60	0011110000	63 LS abnormality								
61	1011110000	TH2 (HIC pipe)								
62	0111110000	TH2 (HIC) abnormality delay	–99.9–999.9 (°C) (Short/open: –99.9 or 999.9)							
63	1111110000	TH2 (HIC) abnormality	Note: Display of data from sensor and thermistor							
64	0000001000	Operational frequency								
65	1000001000	Target frequency	0–255 (Hz)							
66	0100001000	Outdoor fan control step number	0–15							
69	1010001000	IC1 LEV Opening pulse	0–2000 (pulse)							
70	0110001000	IC2 LEV Opening pulse	Note: Display of opening pulse of indoor LEV							
71	1110001000	IC3 LEV Opening pulse								
72	0001001000	IC4 LEV Opening pulse								
73	1001001000	IC5 LEV Opening pulse								
74	0101001000	High pressure sensor (Pd)	–99.9–999.9 (kgf/cm ²) (Short/open: –99.9 or 999.9)							
75	1101001000	TH4(Compressor) (Td) data	–99.9–999.9 (°C) (Short/open: –99.9 or 999.9)							
76	0011001000	TH6(Suction pipe) (ET) data	Note: Display of outdoor subcool (SC) data and detection data from high pressure sensor and each thermistor							
77	1011001000	TH7 (Ambient) data								
78	0111001000	TH3 (Outdoor liquid pipe) data								
80	0000101000	TH8 (Heat sink) data								
81	1000101000	IC1 TH23 (Gas)	–99.9–999.9 (°C)							
82	0100101000	IC2 TH23 (Gas)	(When indoor unit is not connected, it is displayed as 0.)							
83	1100101000	IC3 TH23 (Gas)	Note: Display detected data of indoor unit thermistors							
84	0010101000	IC4 TH23 (Gas)								
85	1010101000	IC5 TH23 (Gas)								
86	0110101000	IC1 TH22 (Liquid)								
87	1110101000	IC2 TH22 (Liquid)								
88	0001101000	IC3 TH22 (Liquid)								
89	1001101000	IC4 TH22 (Liquid)								
90	0101101000	IC5 TH22 (Liquid)								
91	1101101000	IC1 TH21 (Intake)								
92	0011101000	IC2 TH21 (Intake)								
93	1011101000	IC3 TH21 (Intake)								
94	0111101000	IC4 TH21 (Intake)								
95	1111101000	IC5 TH21 (Intake)								
96	0000011000	Outdoor SC (cooling)	–99.9–999.9 (°C) (Short/open: –99.9 or 999.9)							
97	1000011000	Target subcool step	–99.9–999.9 (°C)							
98	0100011000	IC1 SC/SH	–99.9–999.9 (°C) (Short/open: –99.9 or 999.9)							
99	1100011000	IC2 SC/SH	During heating: subcool (SC)							
100	0010011000	IC3 SC/SH	During cooling: superheat (SH) (Fixed to “0” during cooling operation)							
101	1010011000	IC4 SC/SH	Note: Display of indoor SC/SH data							
102	0110011000	IC5 SC/SH								
103	1110011000	Discharge superheat (SHd)	–99.9–999.9 (°C)							
105	1001011000	Target Pd display (heating) kgf/cm ²	Pdm (0.0–30.0) (kgf/cm ²)							
106	0101011000	Target ET display (cooling)	ETm (–2.0–23.0) (°C)							
			Note: Display of all control target data							

No.	SW4 setting	Contents	LED1							
			1	2	3	4	5	6	7	8
107	1101011000	Target outdoor SC (cooling)	SCm (0.0–20.0) (°C) Note: Display of all control target data							
108	0011011000	Target indoor SC/SH (IC1)	SCm/SHm (0.0–20.0) (°C) Note: Display of all control target data							
109	1011011000	Target indoor SC/SH (IC2)								
110	0111011000	Target indoor SC/SH (IC3)								
111	1111011000	Target indoor SC/SH (IC4)								
112	0000111000	Target indoor SC/SH (IC5)								
113	1000111000	Indoor unit check status (IC9-12)	No.9 unit check	No.10 unit check	No.11 unit check	No.12 unit check	—	—	—	—
			Note: Light on at time of abnormality							
114	0100111000	Indoor unit operation mode (IC9-12)	No.9 unit mode	No.10 unit mode	No.11 unit mode	No.12 unit mode	—	—	—	—
			Note: COOL/DRY: light on, HEAT: light blinking, FAN/STOP: light off							
115	1100111000	Indoor unit operation display (IC9-12)	No.9 unit operation	No.10 unit operation	No.11 unit operation	No.12 unit operation	—	—	—	—
			Note: Thermo-ON: light on, Thermo-OFF: light off							
116	0010111000	IC9 operation mode	STOP	Fan	Cooling Thermo-ON	Cooling thermo-OFF	Heating thermo-ON	Heating thermo-OFF	—	—
117	1010111000	IC10 operation mode								
118	0110111000	IC11 operation mode								
119	1110111000	IC12 operation mode	Note: Display of indoor unit operation mode							
120	0001111000	Target indoor SC/SH (IC9)	SCm/SHm (0.0–14.0) (°C) Note: Display of all control target data							
121	1001111000	Target indoor SC/SH (IC10)								
122	0101111000	Target indoor SC/SH (IC11)								
123	1101111000	Target indoor SC/SH (IC12)								
124	0011111000	IC9 LEV opening pulse abnormality delay								
125	1011111000	IC10 LEV opening pulse abnormality delay	0–2000 (pulse) Note: Display of opening pulse of indoor LEV at time of abnormality delay							
126	0111111000	IC11 LEV opening pulse abnormality delay								
127	1111111000	IC12 LEV opening pulse abnormality delay								
128	0000000100	Actual frequency of abnormality delay								
129	1011000100	Fan step number at time of abnormality delay	0–15 Note: Display of fan step number at time of abnormality delay							
130	0100000100	Outdoor LEV-A opening pulse abnormality delay	0–2000 (pulse) Note: Display of opening pulse of outdoor LEV-A at time of abnormality delay							
131	1100000100	IC1 LEV opening pulse abnormality delay	0–2000 (pulse) Note: Delay of opening pulse of indoor LEV at time of abnormality delay							
132	0010000100	IC2 LEV opening pulse abnormality delay								
133	1010000100	IC3 LEV opening pulse abnormality delay								
134	0110000100	IC4 LEV opening pulse abnormality delay								
135	1110000100	IC5 LEV opening pulse abnormality delay								
136	0001000100	High pressure sensor data at time of abnormality delay								
137	1001000100	TH4 (Compressor) sensor data at time of abnormality delay	–99.9–999.9 (kgf/cm ²) (Short/open: –99.9 or 999.9) Note: Display of data from high pressure sensor, all thermistors, and SC/SH at time of abnormality delay							
138	0101000100	TH6 (Suction pipe) sensor data at time of abnormality delay								
139	1101000100	TH3 (Outdoor liquid pipe) sensor data at time of abnormality delay								
140	0011000100	TH8 (Heat sink) sensor data at time of abnormality delay								

No.	SW4 setting	Contents	LED1						
			1	2	3	4	5	6	7
141	1011000100	OC SC (cooling) at time of abnormality delay	-99.9~999.9 (°C) (Short/open: -99.9 or 999.9) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation) Note: Display of data from high pressure sensor, all thermistors, and SC/SH at time of abnormality delay						
142	0111000100	IC1 SC/SH at time of abnormality delay							
143	1111000100	IC2 SC/SH at time of abnormality delay							
144	0000100100	IC3 SC/SH at time of abnormality delay							
145	1000100100	IC4 SC/SH at time of abnormality delay							
146	0100100100	IC5 SC/SH at time of abnormality delay							
147	1100100100	IC9 SC/SH at time of abnormality delay							
148	0010000100	IC10 SC/SH at time of abnormality delay							
149	1010100100	IC11 SC/SH at time of abnormality delay							
150	0110100100	IC12 SC/SH at time of abnormality delay							
151	1110100100	IC9 LEV opening pulse at time of abnormality	0~2000 (pulse) Note: Display of opening pulse of indoor LEV at time of abnormality						
152	0001100100	IC10 LEV opening pulse at time of abnormality							
153	1001100100	IC11 LEV opening pulse at time of abnormality							
154	0101100100	IC12 LEV opening pulse at time of abnormality							
155	1101100100	IC9 SC/SH at time of abnormality	-99.9~999.9 (°C) (Short/open: -99.9 or 999.9) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation) Note: Display of indoor SC/SH data at time of abnormality						
156	0011100100	IC10 SC/SH at time of abnormality							
157	1011100100	IC11 SC/SH at time of abnormality							
158	0111100100	IC12 SC/SH at time of abnormality							
159	1111100100	IC9 Capacity code	0~255 Notes: Display of indoor unit capacity code						
160	0000101000	IC10 Capacity code							
161	1000010100	IC11 Capacity code							
162	0100010100	IC12 Capacity code							
163	1100010100	IC9 SC/SH	-99.9~999.9 (°C) (Short/open: -99.9 or 999.9) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation) Note: Display of indoor SC/SH data						
164	0010010100	IC10 SC/SH							
165	1010010100	IC11 SC/SH							
166	0110010100	IC12 SC/SH							
170	0101010100	ROM version monitor	0.00~99.99 (ver) Note: Display of version data of ROM						
171	1101010100	ROM type	Note: Display of ROM type						
172	0011010100	Check sum mode	0000~FFFF Note: Display of check sum code of ROM						
173	1011010100	IC9 TH23 (Gas)	-99.9~999.9 (°C) Note: Display detected data of indoor unit thermistors						
174	0111010100	IC10 TH23 (Gas)							
175	1111010100	IC11 TH23 (Gas)							
176	0000110100	IC12 TH23 (Gas)							
177	1000110100	IC9 TH22 (Liquid)							
178	0100110100	IC10 TH22 (Liquid)							
179	1100110100	IC11 TH22 (Liquid)							
180	0010110100	IC12 TH22 (Liquid)							
185	1001110100	IC9 TH21 (Intake)							
186	0101110100	IC10 TH21 (Intake)							
187	1101110100	IC11 TH21 (Intake)							
188	0011110100	IC12 TH21 (Intake)							
189	1011110100	4420 Error history	—	—	ACTM error	—	—	Current sensor error	Under voltage error
								Over voltage error	

No.	SW4 setting	Contents	LED1							
			1	2	3	4	5	6	7	8
190	0111110100	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	1111110100	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	—	—	—
192	0000001100	Actual frequency of abnormality	0–255 (Hz) Note: Display of actual frequency at time of abnormality							
193	1000001100	Fan step number at time of abnormality	0–15 Note: Display of fan step number at time of abnormality							
194	0100001100	Outdoor LEV-A opening pulse at time of abnormality	0–2000 (pulse) Note: Display of opening pulse of outdoor LEV-A at time of abnormality							
195	1100001100	IC1 LEV opening pulse at time of abnormality	0–2000 (pulse) Note: Display of opening pulse of indoor LEV at time of abnormality							
196	0010001100	IC2 LEV opening pulse at time of abnormality								
197	1010001100	IC3 LEV opening pulse at time of abnormality								
198	0110001100	IC4 LEV opening pulse at time of abnormality								
199	1110001100	IC5 LEV opening pulse at time of abnormality								
200	0001001100	High pressure sensor data at time of abnormality	–99.9–999.9 (kgf/cm ²) (Short/open: –99.9 or 999.9) Note: Display of data from high pressure sensor, all thermistors, and SC/SH at time of abnormality							
201	0001001100	TH4 (Compressor) sensor data at time of abnormality	–99.9–999.9 (°C) (Short/open: –99.9 or 999.9) Note: Display of data from high pressure sensor, all thermistors, and SC/SH at time of abnormality							
202	0101001100	TH6 (Suction pipe) sensor data at time of abnormality								
203	1101001100	TH3 (Outdoor liquid pipe) sensor data at time of abnormality								
204	0011001100	TH8 (Heat sink) sensor data at time of abnormality								
205	1011001100	OC SC (cooling) at time of abnormality	–99.9–999.9 (°C) (Short/open: –99.9 or 999.9) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation) Note: Display of indoor SC/SH data at time of abnormality							
206	0111001100	IC1 SC/SH at time of abnormality								
207	1111001100	IC2 SC/SH at time of abnormality								
208	0000101100	IC3 SC/SH at time of abnormality								
209	1000101100	IC4 SC/SH at time of abnormality								
210	0100101100	IC5 SC/SH at time of abnormality								
211	1100101100	IC6 Capacity code	0–255 Note: Display of indoor unit capacity code							
212	0010101100	IC7 Capacity code								
213	1010101100	IC8 Capacity code								
214	0110101100	IC6 operation mode	OFF	Fan	Cooling thermo-ON	Cooling thermo-OFF	Heating thermo-ON	Heating thermo-OFF	—	—
215	1110101100	IC7 operation mode								
216	0001101100	IC8 operation mode	Note: Display of indoor unit operation mode							
217	1001101100	IC6 LEV opening pulse	0–2000 (pulse) Note: Display of opening pulse of indoor LEV							
218	0101101100	IC7 LEV opening pulse								
219	1101101100	IC8 LEV opening pulse								

No.	SW4 setting	Contents	LED1							
			1	2	3	4	5	6	7	8
220	0011101100	IC6 TH23 (Gas)	-99.9–999.9 (°C)							
221	1011101100	IC7 TH23 (Gas)	Note: Display detected data of indoor unit thermistor							
222	0111101100	IC8 TH23 (Gas)								
223	1111101100	IC6 TH22 (liquid)								
224	0000011100	IC7 TH22 (liquid)								
225	1000011100	IC8 TH22 (liquid)								
226	0100011100	IC6 TH21 (intake)								
227	1100011100	IC7 TH21 (intake)								
228	0010011100	IC8 TH21 (intake)								
229	1010011100	IC6 SC/SH	-99.9–999.9 (°C) (Short/open: -99.9 or 999.9)							
230	0110011100	IC7 SC/SH	During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation)							
231	1110011100	IC8 SC/SH								
232	0001011100	Target indoor SC/SH (IC6)	SCm/SHm (0.0–20.0) (°C)							
233	1001011100	Target indoor SC/SH (IC7)	Note: Display of all control target data							
234	0101011100	Target indoor SC/SH (IC8)								
235	1101011100	IC6 LEV opening pulse abnormality delay	0–2000 (pulse)							
236	0011011100	IC7 LEV opening pulse abnormality delay	Note: Display of opening pulse of indoor LEV at time of abnormality delay							
237	1011011100	IC8 LEV opening pulse abnormality delay								
238	0111011100	IC6 SC/SH at time of abnormality delay								
239	1111011100	IC7 SC/SH at time of abnormality delay	-99.9–999.9 (°C) (Short/open: -99.9 or 999.9) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation)							
240	0000111100	IC8 SC/SH at time of abnormality delay								
241	1000111100	IC6 LEV opening pulse at time of abnormality	0–2000 (pulse)							
242	0100111100	IC7 LEV opening pulse at time of abnormality	Note: Display of opening pulse of indoor LEV at time of abnormality							
243	1100111100	IC8 LEV opening pulse at time of abnormality								
244	0010111100	IC6 SC/SH at time of abnormality	-99.9–999.9 (°C) (Short/open: -99.9 or 999.9) During heating: subcool (SC) During cooling: superheat (SH) (Fixed to "0" during cooling operation)							
245	1010111100	IC7 SC/SH at time of abnormality	Note: Display of indoor SC/SH data at time of abnormality delay							
246	0110111100	IC8 SC/SH at time of abnormality								
250	0101111100	IC9 LEV opening pulse	0–2000 (pulse)							
251	1101111100	IC10 LEV opening pulse	Note: Display of opening pulse of indoor LEV							
252	0011111100	IC11 LEV opening pulse								
253	1011111100	IC12 LEV opening pulse								

8-11. Operation data collection and storage functions

Operation data of the units collected on the outdoor unit can be recorded in the flash memory of the control board. This data can also be exported to and recorded in a USB memory stick. Refer to "8-11-3. Storing data on a USB memory stick" for information on storing data on a USB memory stick. Refer to "8-11-4. Collecting operation data" for information on the collection of operation data.

8-11-1. Preparation

A USB memory stick and a portable battery charger are required to store data on a USB memory stick (not supplied). Prepare a USB memory stick and a portable battery charger as described in "8-11-2. Necessary materials".

8-11-2. Necessary materials

The use of the USB function requires a USB memory stick and a portable battery charger. See below for the types of USB memory stick and portable charger that can be used.

■ USB memory stick

Use a USB memory stick that meets the following specifications.

- USB 2.0 compatible
- Formatted in FAT 32
- Without a security function

■ Portable battery charger

Use a portable battery charger that meets the following specifications for rewriting the software.

- USB 2.0 compatible
- Voltage and amperage rating of 5 V and 2.1 A (Max.)

A LEAD WIRE ASSY USB is required to connect the control board and the portable charger. Use a cable that meets the following specifications.

- [Type A male] - [Male XA connector for the PCB] USB cable

For details of "LEAD WIRE ASSY USB", please contact the sales office. The connector on the control board side is a female XA connector for the PCB.

8-11-3. Storing data on a USB memory stick

Store operation data recorded in the flash memory on the control board in a USB memory stick. The content of the stored file can be confirmed using the maintenance tool. Operation data should be stored in a dedicated mode (Store Mode). The procedure for making the operation data settings is shown below.

1. Preparation of a USB memory stick

Since the size of the saved file containing operation data is 50 MB, prepare a USB memory stick with 50 MB or more available memory. A USB memory stick which has other data in it may also be used. However, it is recommended to clear the remaining data in advance to prevent any malfunctions. The saved file is named "MNTXXX.MT." XXX represents a serial number from 000 to 100. Since files named "MNT101.MT" or more cannot be created, unnecessary folders and files should be deleted.

2. Storing on a USB memory stick

Data can be stored to a USB memory stick either with the main power to the outdoor unit turned ON (Method 2) or OFF (Method1). For safety reasons, it is recommended to store the data on a USB memory stick with the main power to the outdoor unit turned OFF (Method 1). If turning off the power is not feasible, take appropriate measures to ensure safety.

■ Method 1: Storing data on a USB memory stick with the main power to the outdoor unit turned OFF (Recommended)

Starting up the unit in the data storage mode

- Turn off the main power to the outdoor unit.
- Connect a USB memory stick to the USB port (CNUSB) on the control board.
- With SWP3 (ENTER) being held down, connect the portable battery charger to the XA connector (CN601) for the PCB, and supply power to the control board. Wait for five seconds until the USB memory stick is recognized.
- [Usb] will appear on the LED1. (See the figure below.) If [Usb] does not appear, please check if system was started in Storage Mode or USB memory stick is not connected or switch SWP3 may not be pressed deeply enough.
- When [Usb] has appeared on the LED1, lift the finger off SWP3 (ENTER). The unit is now in the data storage mode.

Storing data

- Press SWP3 (ENTER). If the data storage process has properly started, the progress (0-99) will be shown on the LED1.
- [End] on the LED1 indicates successful completion of the data storage process. It takes approximately five minutes for the data storage process to be completed.

Ending the data storage mode

- When done storing data, disconnect the USB memory stick from the control board.
- Press and hold SWP3 (ENTER) for approximately 10 seconds until [End] disappears from the LED1.
- Restart the indoor and outdoor units that were stopped to perform data storage.
- If the data collection process needs to be started, check the operation data collection status by following the procedures explained in "8-11-4. Collecting operation data" and making the necessary settings.

■ Method 2: Storing data on a USB memory stick with the main power to the outdoor unit turned ON

Starting up the unit in the data storage mode

- Stop the operation of all indoor units. Although operation data can be collected without stopping all indoor units, doing so may be detected as a communication error.
- Connect a USB memory stick to the USB port (CNUSB) on the control board. Wait for five seconds until the USB memory stick is recognized.
- Press and hold SWP3 (ENTER) for approximately 10 seconds until [Usb] appears on the LED1.
- When [Usb] has appeared on the LED, lift the finger off SWP3 (ENTER). The unit is now in the data storage mode.

Storing data

- Press SWP3 (ENTER). If the data storage process has properly started, the progress (0-99) will be shown on the LED1.
- [End] on the LED indicates successful completion of the data storage process. It takes approximately five minutes for the data storage process to be completed.

Ending the data storage mode

- When done storing data, disconnect the USB memory stick from the control board.
- Press and hold SWP3 (ENTER) for approximately 10 seconds until [End] disappears from the LED1.
- Restart the indoor and outdoor units that were stopped to perform data storage.
- If the data collection process needs to be started, check the operation data collection status by following the procedures explained in "8-11-4. Collecting operation data" and making the necessary settings.

Note:

- Display of [Usb] and [End]

■ Confirmation of stored file

Confirm that the operation data is stored in the USB memory stick. Insert the USB memory stick into a computer, and check the contents in the memory stick. Check that there is a file named "MNTXXX.MT" in the memory stick. "XXX" represents serial numbers from "000" to "100."

8-11-4. Collecting operation data

This function is used to collect the operation data of the outdoor and indoor units via M-NET, and record the data in the flash memory on the control board. When the memory is full, it is overwritten from the first segment. The settings for checking the status of operation data collection, for starting/ending data collection, and for continuing/stopping error-data collection are made, using the switches on the control board. The items to be set are shown in the table below. The data collection setting is enabled by default, and the setting for error data collection during an error is disabled by default.

Switch setting			Function	Operation set by the switch (LED1 indication)			Unit for setting
SW6-10 SW4							
	No.	12345678910		ON	OFF	When to set	
OFF	277	1010100010	Data being collected	-	-	Anytime after the power is turned ON.	OC setting is necessary.
ON	34	0100010000	Data collection enabled	Enabled	Disabled	Anytime after the power is turned ON.	OC setting is necessary.
ON	35	1100010000	Data collection during an error	Enabled	Disabled	While the compressor is running in Heating mode	OC setting is necessary.

Note:

- When setting SW4 on the control board, make sure the outdoor unit is energized. Also refer to "8-5. Internal switch function table" as a reference.

The procedure for making the operation data settings is shown below.

1. Status confirmation

Confirm the current status of operation data collection by setting the switches on the control board following the table shown above.

Switch setting: SW6-10: OFF

SW4: 277

Check the status on the maintenance LED display (LED1).

- When [ON] or [OFF] is displayed, go to step 2 and the later steps.
- When [Err] is displayed, go to step 3 and the later steps.
- When [F-Er] is displayed, it indicates an error in the flash memory on the control board.

2. Setting Start and End of data collection

1. Set the switches on the control board by following the table shown above.
Switch setting: SW6-10: ON
SW4: 34
2. Press SWP3 (ENTER). With each switch operation, the setting can be alternately switched ON and OFF.
3. After conducting the step 1, check that the operating condition is stable.
Data collection start: OFF (Enabled)
Data collection end: ON (Disabled)
Setting procedure is now completed.

3. Settings for error-data collection during an error

Stops or continues error-data collection when an error occurs.

1. Referring to the table above, set the control switches.
Switch setting: SW6-10: ON
SW4: 35
Stop collecting error-data when an error occurs: OFF
Continue collecting error-data when an error occurs: ON
2. To set the switches, press SWP3 (ENTER). Pressing SWP3 (ENTER) toggles between ON and OFF. Error data in the 6000's and the 7000's will be collected, regardless of the SW4 (35) settings.

4. Restarting data collection

If "Err" is shown, it indicates that data collection is being suspended for some reason, even though data collection is enabled. To restart, it is necessary to set the switches on the control board. Referring to 2-1 and 2-2, set the switches on the control board from OFF (original setting) to ON, and then to OFF again, and make sure the switches settings are indicated as being ON, following the instructions in 1.

9

DISASSEMBLY PROCEDURE

—>: Indicates the visible parts in the photos/figures.
 - - ->: Indicates the invisible parts in the photos/figures.

Note:

- Turn OFF the power supply before disassembly.
- When you remove bands before disassembly, be sure to fix them without looseness when assembling.

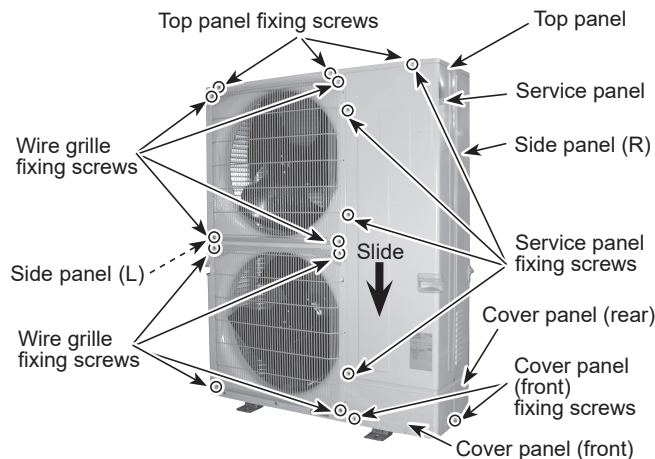
1. Removing the service panel and top panel

1. Remove 4 service panel fixing screws (5 × 12) and slide the hook on the right downward to remove the service panel.
2. Remove screws (5 × 12: 3 for front, 3 for rear) of the top panel and remove it.

Note:

- When removing service panel and top panel at the same time, count one less screw since they share a screw.

Photo 1



2. Removing the fan motor (MF1, MF2)

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Remove the cover panel (front) fixing screws (1 for front/ 5 x 12 and 1 for right side/ 5 x 12), then slide the cover panel (front) upward to remove it. (See Photo 1) The cover panel (front) is fixed to the cover panel (rear) with hooks on the right side.
4. Remove the front panel fixing screws (2 for front/ 4 x 10 and 5 for front/ 5 x 12), then slide the front panel upward to remove it. (See Photo 2) The front panel is fixed to the side panel (L) with hooks on the left side.
5. Remove a nut (for right handed screw of M6) to detach the propeller. (For each fan motor on top and under)
6. Disconnect the connectors CNF1 and CNF2 on outdoor multi controller circuit board in the electrical parts box.
7. Loosen the clamps on the side of the motor support and the separator. (See Figure 1 and 2)
8. Release the lead wire from the hole on separator.
9. Remove the fan motor fixing screws (4 for front/ 5 x 20) to detach the fan motor. (For each fan motor on top and under)

Note:

- Tighten the propeller fan with a torque of $5.7 \pm 0.3 \text{ N}\cdot\text{m}$ [$4.2 \pm 0.2 \text{ lbf}\cdot\text{ft}$].
- When installing the fan motor, make sure to hook the lead wire to the hook under the fan motor, then fasten it with a clamp. When fastening the clamp, make sure to route the lead wire as shown in the figures below.

Photo 2

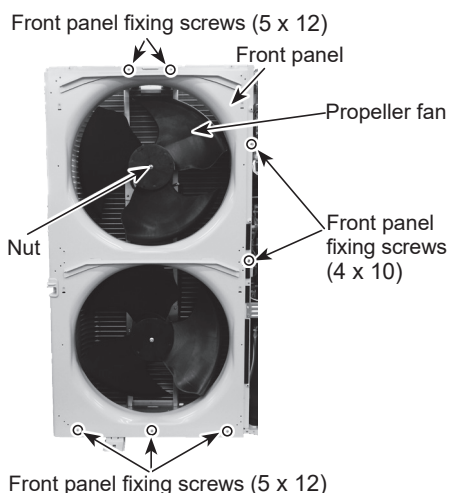


Photo 3

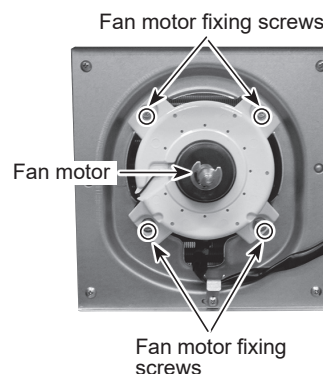


Figure 1

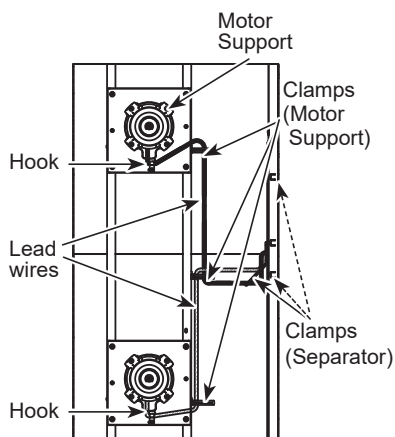
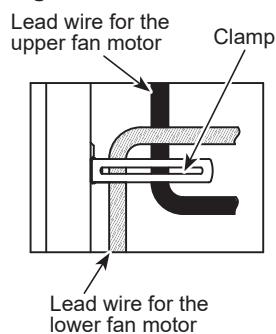


Figure 2



3. Removing the electrical parts box

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Disconnect the connecting wire from the terminal block. (See Photo 4)
4. Remove the side panel (R) by removing the following screws:
 - Electrical parts box fixing screws (4 × 10): 2 pieces
 - Valve bed fixing screws (5 × 12): 2 pieces
 - Side panel fixing screw on the right side of the panel (5 × 12): 1 piece
 - Side panel fixing screws in the rear of the panel (5 × 12): 4 pieces
 (The side panel is fixed to the cover panel (Rear) with 2 screws. Remove the hook of the electrical parts box.)
5. Remove all the following connectors from the outdoor 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> (TH6/7)
- High pressure switch (63H)
- High pressure sensor (63HS)
- Low pressure sensor (63LS)
- 4-way valve (21S4)
- Bypass valve (SV1, SV3)
- Linear expansion valves (CNLVA, CNLVB)
- Liquid shut-off valve (SV4)
- Gas shut-off valve (SV5)

Pull out the disconnected wires from the electrical parts box.

6. Remove the comp felt (top).
7. Remove the terminal cover and disconnect the compressor lead wire. (See Photo 6)
8. Detach the electrical parts box by pulling it upward. The electrical parts box is fixed with 2 hooks on the left. (See Photo 5)

Photo 4

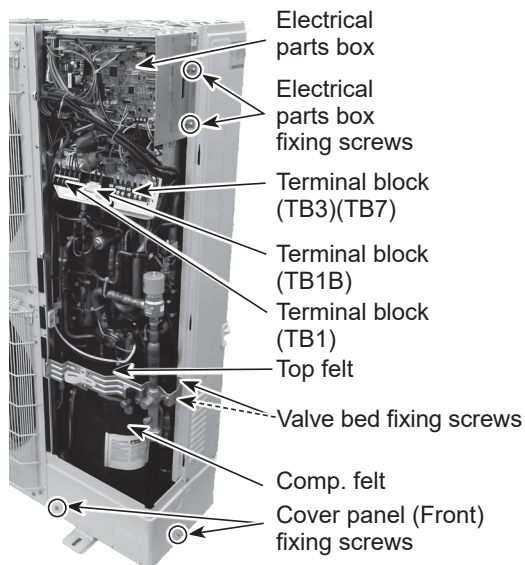


Photo 5

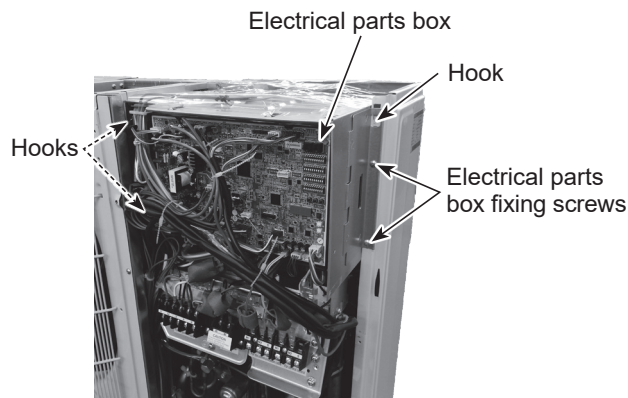
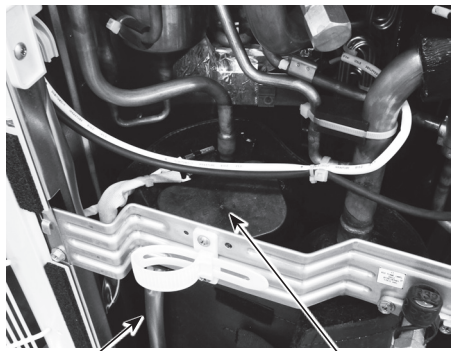


Photo 6



Compressor lead wire

Terminal cover

4. Disassembling the electrical parts box

1. Disconnect all the connectors on the multi controller circuit board.
2. Remove 2 screws (A) which fix the plate holding the multi controller circuit board and the electrical parts box.
3. Remove the multi controller circuit board. (See Photo 7)
4. Disconnect the M-NET power board connector on the back plate of the multi controller circuit board.
5. Disconnect all the connectors on the noise filter circuit board. (See Photo 8)
6. Remove 9 supports on the noise filter circuit board. (See Photo 8)
7. Remove the noise filter circuit board. (See Photo 8)
8. Remove the noise filter plate fixing screws. (See Photo 8)
9. Remove 5 supports on the power circuit board. (See Photo 9)
10. Remove 4 power circuit board fixing screws. (See Photo 9)
11. Remove the power circuit board. (See Photo 9)
12. Disconnect the connectors of reactor on the bottom plate of the electrical parts box. (See Photo 10)
13. Remove 4 screws (B) on the bottom plate of the electrical parts box. (See Photo 10)
14. Remove the reactor. (See Photo 10)

Note:

- When reassembling the electrical parts box, make sure that the wirings are correct.

Photo 7

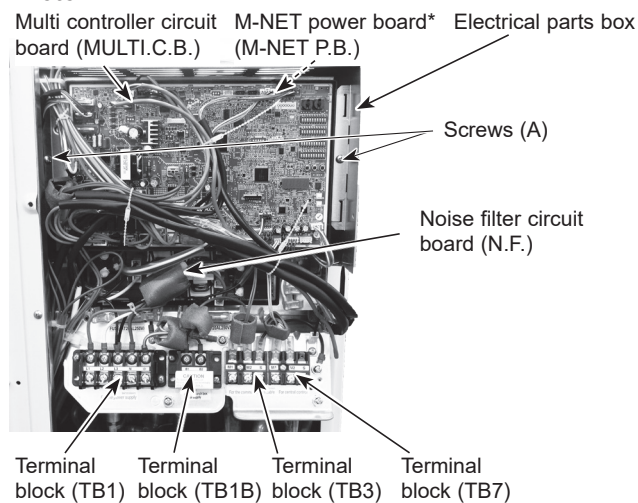


Photo 8

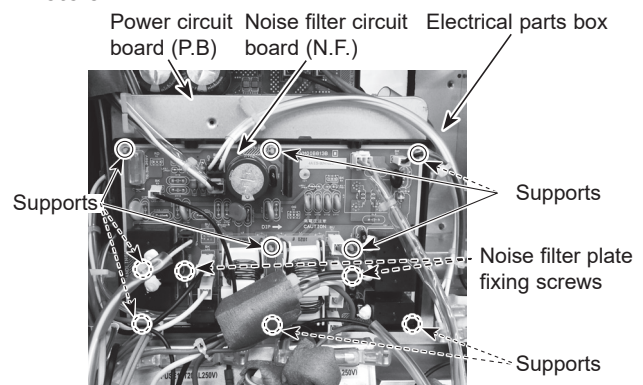


Photo 9

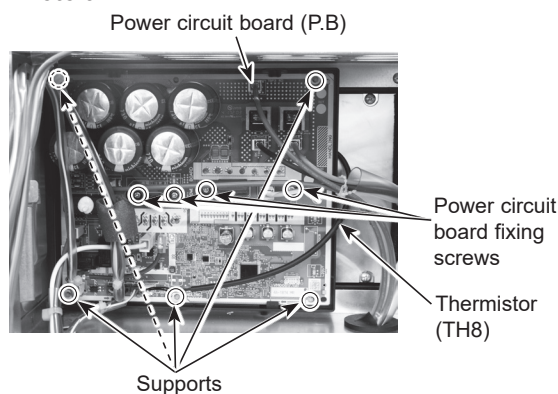
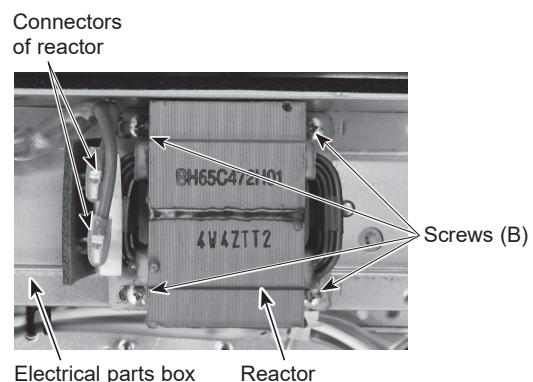


Photo 10



* The M-NET power board is installed behind the multi controller circuit board.

5. Removing thermistors

■ Removing the thermistors <Compressor> (TH4) / <HIC pipe> (TH2) and the thermal protector (TRS)

1. Remove the service panel. (Refer to procedure 1)
2. Disconnect the connectors TH4 and TH2 on the multi controller board in the electrical parts box.
3. Loosen the fastener fixing the connectors to the electrical parts box. (See Photo 11)
4. Pull out the thermistor <HIC pipe> (TH2) from the sensor holder. (See Photo 14)
5. Remove the comp felt (top).
6. Pull out the thermistor <Compressor> (TH4) and the thermal protector (TRS) from the sensor holder. (See Photo 12)

Note:

- When replacing the thermal protector (TRS), replace it together with the connector of the high pressure switch (63H) since they are combined together.

Photo 11

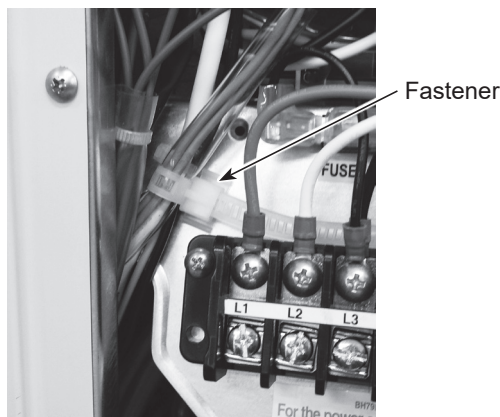
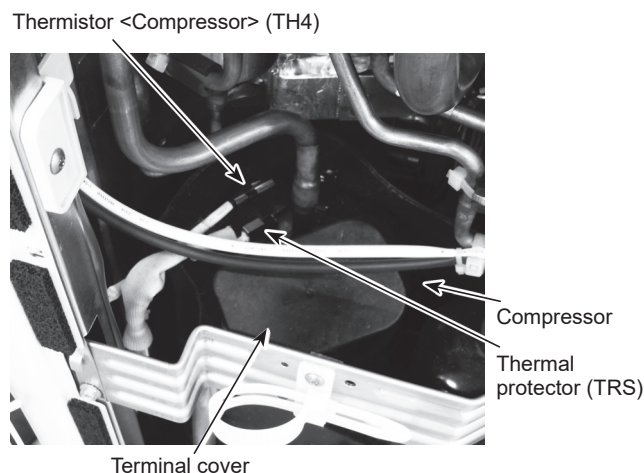


Photo 12



■ Removing the thermistors <Outdoor liquid pipe> (TH3) / <Suction pipe> (TH6) / <Ambient> (TH7)

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Remove the side panel (R) by removing the following screws:
 - Electrical parts box fixing screws (4 × 10): 2 pieces
 - Valve bed fixing screws (5 × 12): 2 pieces
 - Side panel fixing screw on the right side of the panel (5 × 12): 1 piece
 - Side panel fixing screw in the rear of the panel (5 × 12): 4 pieces
4. Disconnect the following connectors on the multi controller circuit board in the electrical parts box.
 - TH3: White
 - TH7/6: Red
5. Loosen the fastener fixing the connector to the electrical parts box. (See Photo 11)
6. Pull out each thermistor from the sensor holder. (See Photo 13, 14, 15)

Note:

- When replacing the thermistor <Ambient> (TH7), replace it together with the thermistor <Suction pipe> (TH6) since they are combined together.

Photo 13

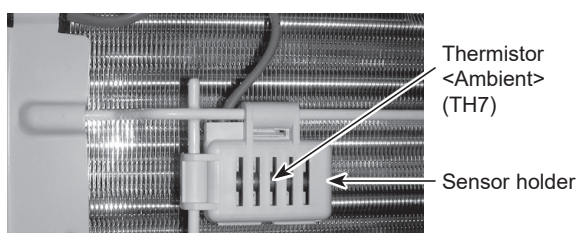
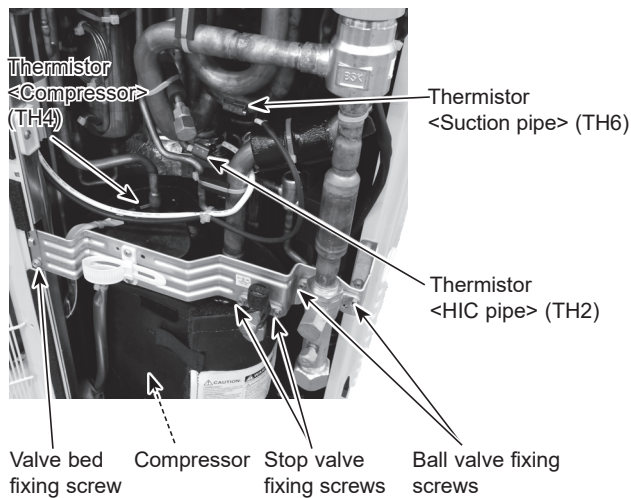
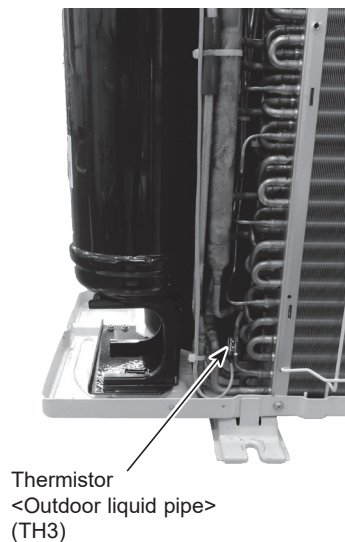
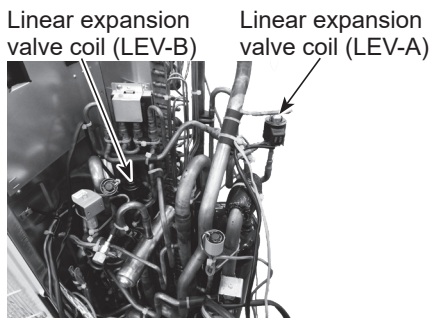


Photo 14**Photo 15**

6. Removing LEV coils

1. Remove the service panel. (Refer to procedure 1)
2. Disconnect the connector CNLVA for LEV-A and CNLVB for LEV-B on the multi controller circuit board in the electrical parts box.
3. Remove each LEV coil by sliding the coil upward. (See Photo 16)

Photo 16

7. Removing linear expansion valve (LEV-A, LEV-B)

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Remove the side panel (R) and the electrical parts box. (Refer to procedure 3)
4. Remove the linear expansion valve coil. (Refer to procedure 6)
5. Recover refrigerant.
6. Remove the welded part of linear expansion valve.

⚠ Caution:

- Recover refrigerant with the stop valve and the ball valve opened through both the check valves and the service ports.

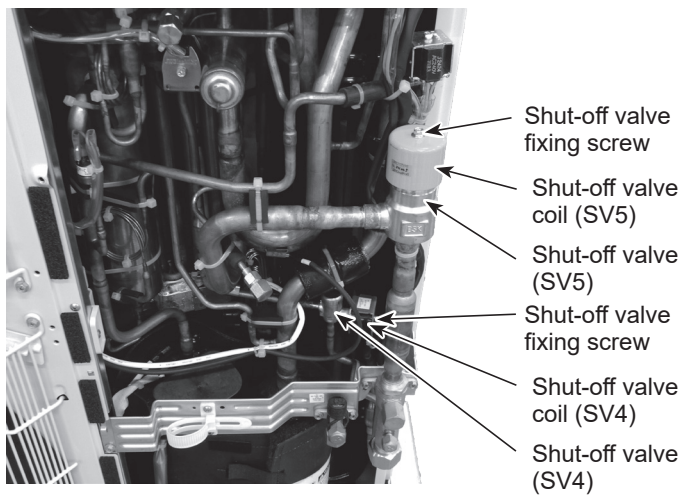
Notes:

- Recover refrigerant without spreading it in the air.
- When installing the linear expansion 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.

8. Removing shut-off valve coils (for liquid shut-off valve and gas shut-off valve)

1. Remove the service panel. (Refer to procedure 1)
2. Disconnect the connector SV4 and the connector SV5 on the multi controller circuit board in the electrical parts box.
3. Remove shut-off valve coil fixing screws (SV4: M4 x 6, SV5: M5 x 8).
4. Slide the shut-off valve coils to remove. (See Photo 17)

Photo 17



9. Removing shut-off valve

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Remove the side panel (R) and the electrical parts box. (Refer to procedure 3)
4. Remove the shut-off valve coil. (Refer to procedure 8)
5. Recover refrigerant.
6. Remove the welded part of the shut-off valve. (See Photo 17)

⚠Caution:

- Recover refrigerant with the stop valve and the ball valve opened through both the check valves and the service ports.

Notes:

- Recover refrigerant without spreading it in the air.
- When installing the shut-off 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.

10. Removing the 4-way valve coil (21S4)

1. Remove the service panel. (Refer to procedure 1)
2. Remove 4-way valve coil fixing screws (M5 × 7).
3. Remove the 4-way valve coil by sliding the coil toward you.
4. Disconnect the connector 21S4 on the outdoor multi controller circuit board in the electrical parts box.

11. Removing the 4-way valve

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Remove the side panel (R) and the electrical parts box. (Refer to procedure 3)
4. Remove 1 valve bed fixing screw (5 × 12) and 4 ball valve and stop valve fixing screws (5 × 16), then remove the valve bed. (See Photo 14)
5. Remove the 4-way valve coil. (Refer to procedure 10)
6. Recover refrigerant.
7. Remove the 2 rubber mounts on the bypass pipes. (See Photo 19)
8. Remove the 5 welded points on the pipe (C-R) assy.
9. Remove the welded point on the pipe (R-B) assy.
10. Remove the welded part of 4-way valve.

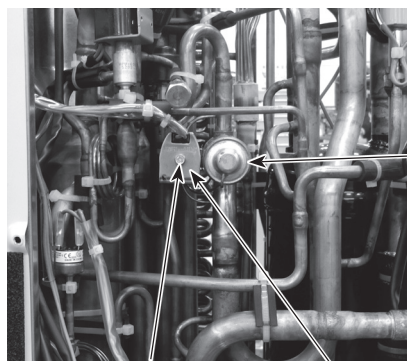
⚠Caution:

- Recover refrigerant with the stop valve and the ball valve opened through both the check valves and the service ports.

Notes:

- Recover refrigerant without spreading it in the air.
- When installing the 4-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.

Photo 18



4-way valve coil fixing screw 4-way valve coil (21S4)

Photo 19

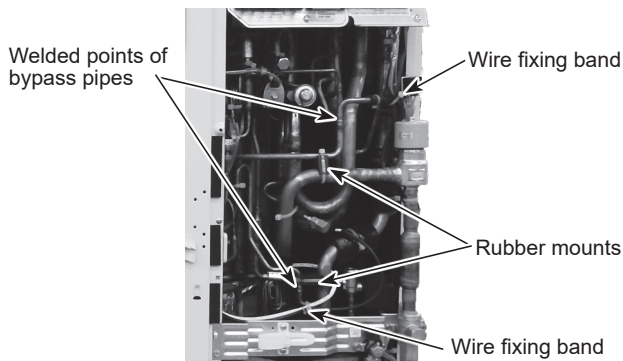


Figure 3

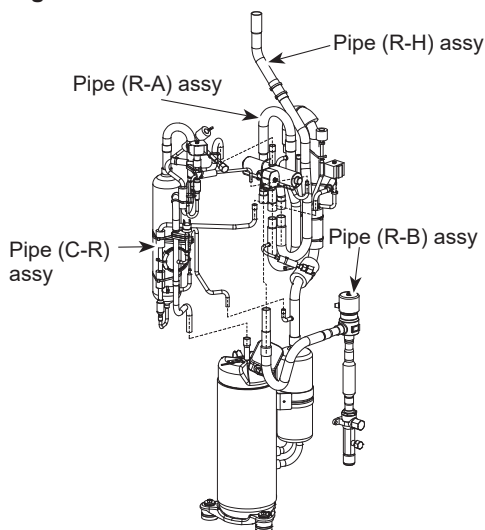
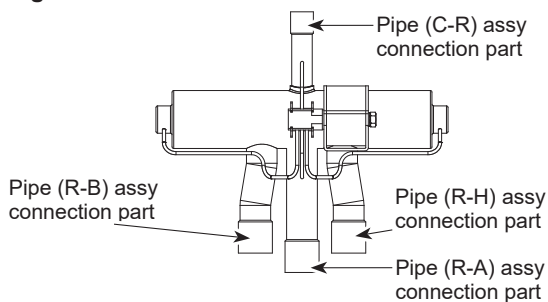


Figure 4



12. Removing bypass valve coil (SV1, SV3) and bypass valve

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Disconnect the connector SV1 and SV3 on the multi controller circuit board in the electrical parts box.
4. Remove the side panel (R) and the electrical parts box. (Refer to procedure 3)
5. Remove the bypass valve coil fixing screw (M4 × 6).
6. Remove the bypass valve coil by sliding the coil upward. (See Photo 20)
7. Recover refrigerant.
8. Remove the welded part of bypass valve.

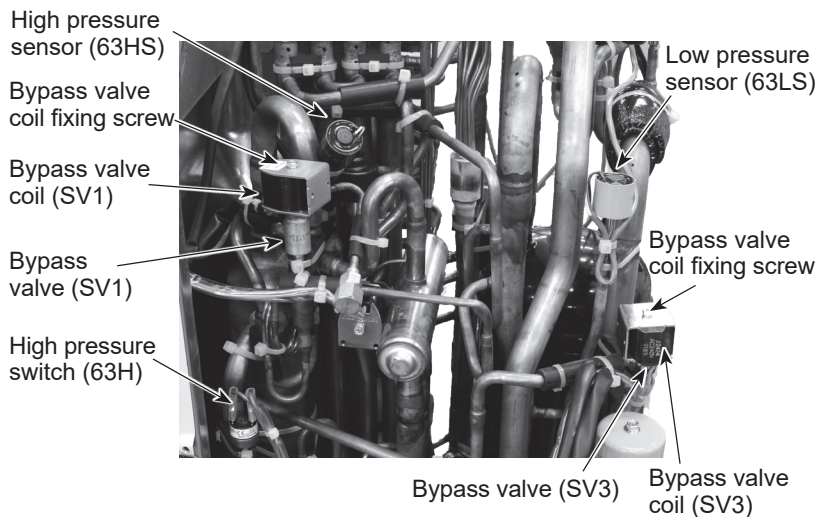
⚠ Caution:

- Recover refrigerant with the stop valve and the ball valve opened through both the check valves and the service ports.

Notes:

- Recover refrigerant without spreading it in the air.
- When installing the bypass 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.

Photo 20



13. Removing the high pressure switch (63H)

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Remove the side panel (R) and the electrical parts box. (Refer to procedure 3)
4. Pull out the lead wire of high pressure switch.
5. Recover refrigerant.
6. Remove the welded part of high pressure switch.

⚠ Caution:

- Recover refrigerant with the stop valve and the ball valve opened through both the check valves and the service ports.

Notes:

- Recover refrigerant without spreading it in the air.
- When installing the high pressure switch, cover it with a wet cloth to prevent it from heating (100°C or more), then braze the pipes so that the inside of pipes are not oxidized.

14. Removing the low pressure sensor (63LS) and the high pressure sensor (63HS)

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Disconnect the connectors 63LS and 63HS on the multi controller circuit board in the electrical parts box.
4. Remove the side panel (R) and the electrical parts box. (Refer to procedure 3)
5. Recover refrigerant.
6. Remove the welded part of low pressure sensor and high pressure sensor.

⚠ Caution:

- Recover refrigerant with the stop valve and the ball valve opened through both the check valves and the service ports.

Notes:

- Recover refrigerant without spreading it in the air.
- When installing the low pressure sensor and high pressure sensor, cover them with a wet cloth to prevent them from heating (100°C or more), then braze the pipes so that the inside of pipes are not oxidized.

15. Removing the compressor (MC)

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Remove the side panel (R) and the electrical parts box. (Refer to procedure 3)
4. Remove the valve bed. (Refer to procedure 11-4)
5. Remove the cover panel (front). (Refer to procedure 2-3)
6. Remove 2 cover panel (rear) fixing screws (5 × 12) and remove the cover panel (rear).
7. Remove 3 separator fixing screws (4 × 10). (See Figure 5)
8. Remove the front panel. (Refer to procedure 2-4)
9. Recover refrigerant.
10. Remove the top felt and the comp. felt, and then remove the thermistor <Compressor> (TH4) and the lead wires for compressor. Remove the thermal protector (TRS) as well.
11. Remove the 2 rubber mounts on the bypass pipes of the compressor inlet and outlet and the 2 wire fixing bands.
Then, separate the bypass pipes at the welded points (2 points). (See Photo 19)
12. Remove the welded pipe of compressor inlet and outlet and then remove the compressor.
13. Remove the 3 compressor fixing nuts and washers for motor using spanner or adjustable wrench.

⚠ Caution:

- Recover refrigerant with the stop valve and the ball valve opened through both the check valves and the service ports.

Notes:

- Recover refrigerant without spreading it in the air.
- See Figure 7 for the cut-off points on the compressor inlet and outlet pipes.
- Use an appropriate tool for hexagon nuts of 10 mm width across flats to remove and attach compressor fixing nuts.
A tool with the length of 140 mm is recommended as your work space is narrow.
- Compressor fixing screws are non-magnetic.
- Work in a pair when removing a welded part.

Photo 21

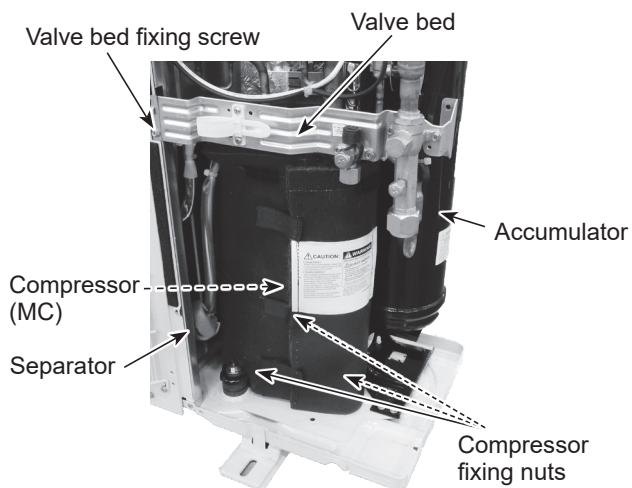


Figure 5

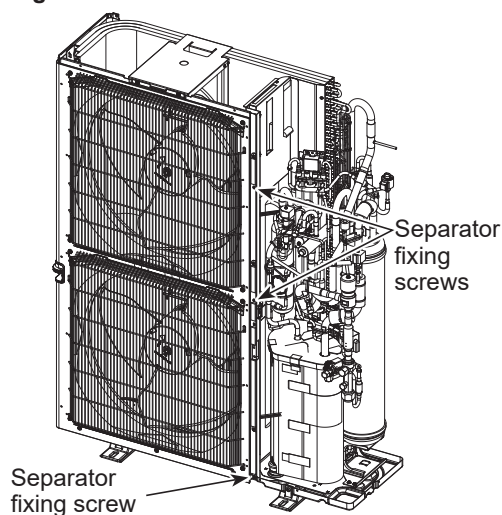


Figure 6

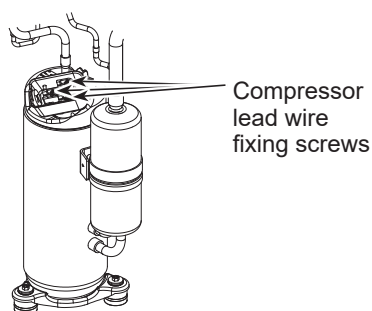
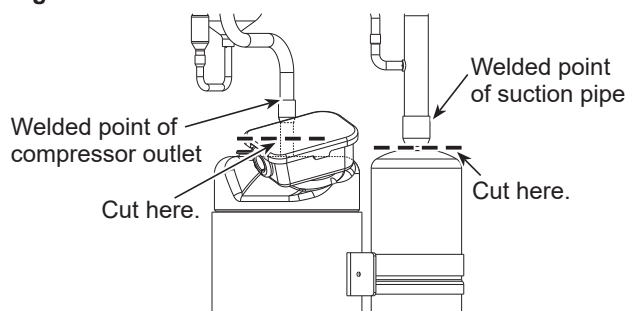


Figure 7



16. Removing the accumulator

1. Remove the service panel. (Refer to procedure 1)
2. Remove the top panel. (Refer to procedure 1)
3. Remove the side panel (R) and the electrical parts box. (Refer to procedure 3)
4. Remove the valve bed. (Refer to the procedure 11-4)
5. Remove the cover panel (front). (Refer to the procedure 2-3)
6. Remove the cover panel (rear). (Refer to the procedure 15-6)
7. Recover refrigerant.
8. Remove welded pipe of accumulator inlet and outlet. (See Photo 22)
9. Remove 2 accumulator leg fixing screws (5 × 12). (See Photo 23)

⚠ Caution:

- Recover refrigerant with the stop valve and the ball valve opened through both the check valves and the service ports.

Note:

- Recover refrigerant without spreading it in the air.

Photo 22

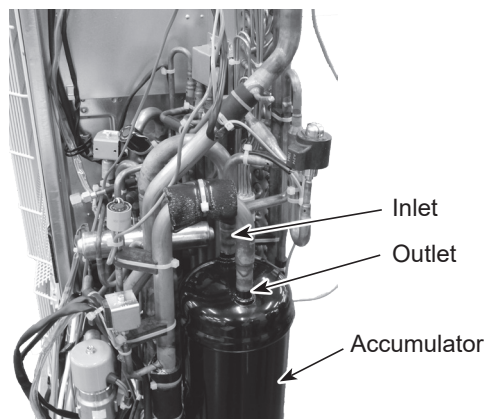
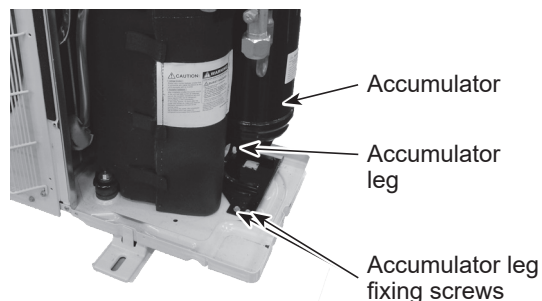
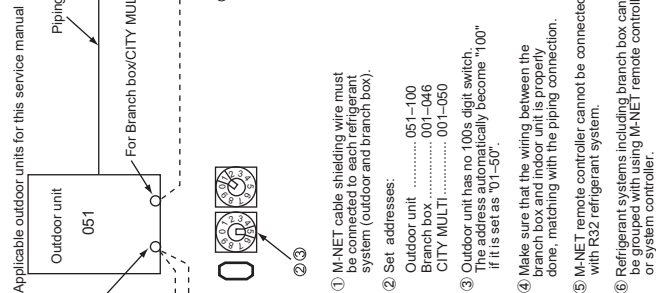


Photo 23



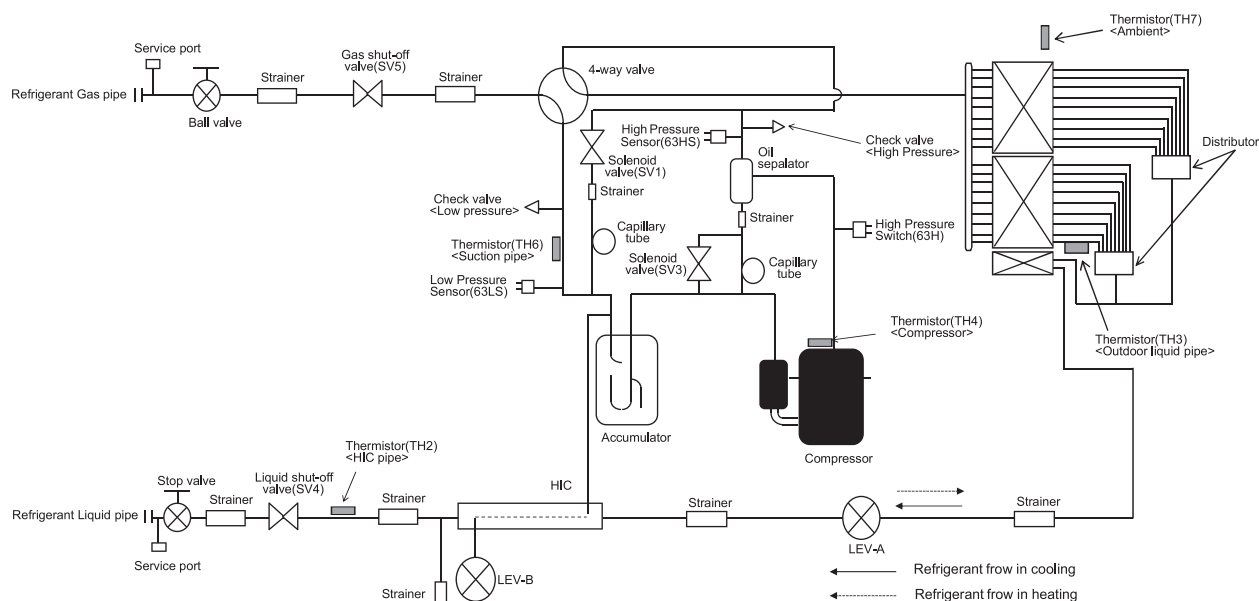
10-1. Example of refrigerant piping and transmission cable wiring



10-2. Special function operation and settings for M-NET remote controller

Refer to “Special function operation and settings” for setting details.

10-3. Refrigerant system diagram

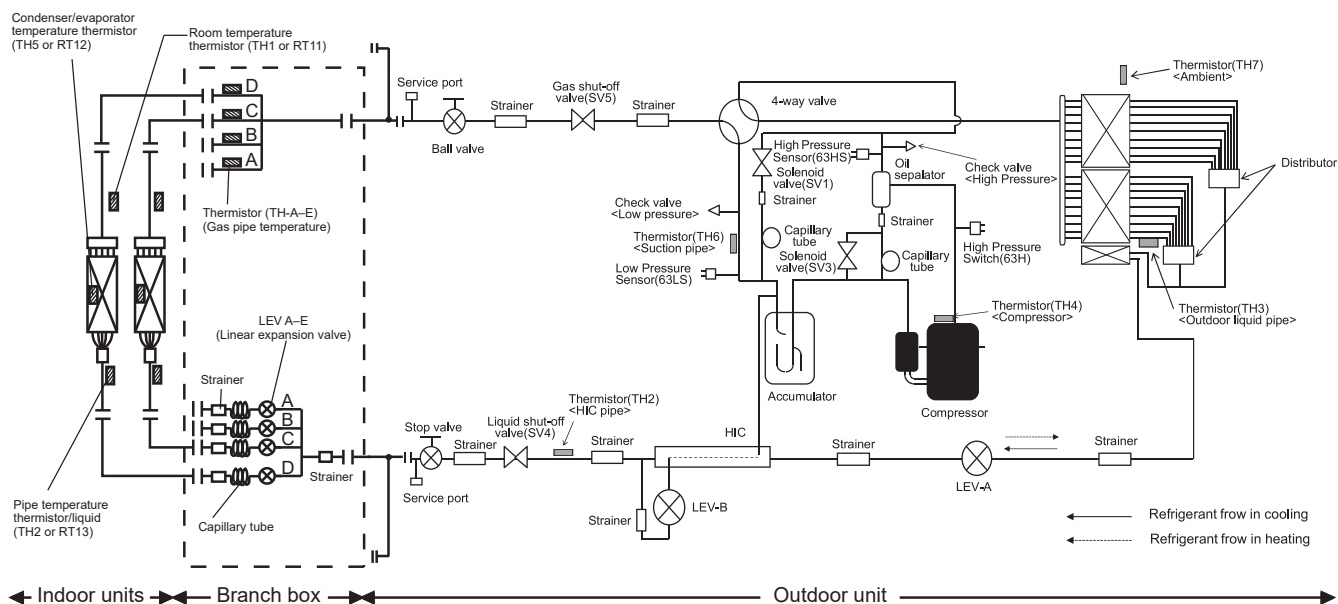


Refrigerant piping specifications <dimensions of flared connector>

Unit: mm <in.>

Capacity		Item	Liquid piping		Gas piping
Indoor unit	M(S)10/15/20/25/32/40/50		The farthest piping length from the first joint ≤ 30 m	ø6.35 <1/4>	ø12.7 <1/2>
			The farthest piping length from the first joint > 30 m	ø9.52 <3/8>	
	M(S)63/80/100/125/140		ø9.52 <3/8>		ø15.88 <5/8>
Outdoor unit	M200		ø9.52 <3/8>		ø19.05 <3/4>

10-4. Refrigerant system diagram (when using branch box)



Note:

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

10-5. Selecting pipe size

Refer to installation manual “Selecting pipe size” for piping connection.

10-6. System control

Refer to installation manual “Wiring transmission cables” for system control.

11 ELECTRICAL WIRING

Refer to the installation manual "Electrical work" for details.

12 REFRIGERANT PIPING TASKS

12-1. Refrigerant piping system

Refer to the installation manual "Pipe length and height difference" for the refrigerant piping system.

12-2. Precautions against refrigerant leakage

12-2-1. Introduction

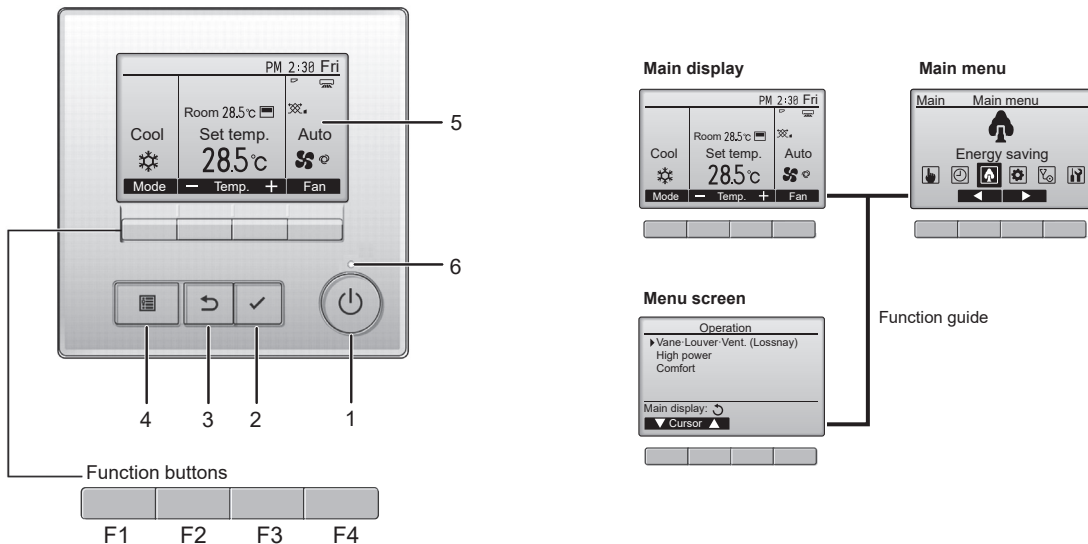
If a large amount of R32 refrigerant leaks in a room, suffocation or fire may result. Satisfy the installation area specified in the installation manual to meet safety standards.

13 REMOTE CONTROLLER

13-1. Remote controller functions

13-1-1. PAR-41MAA

Controller interface



Note:

- The functions of the function buttons change depending on the screen. Refer to the button function guide that appears at the bottom of the LCD for the functions they serve on a given screen. When the system is centrally controlled, the button function guide that corresponds to the locked button will not appear.

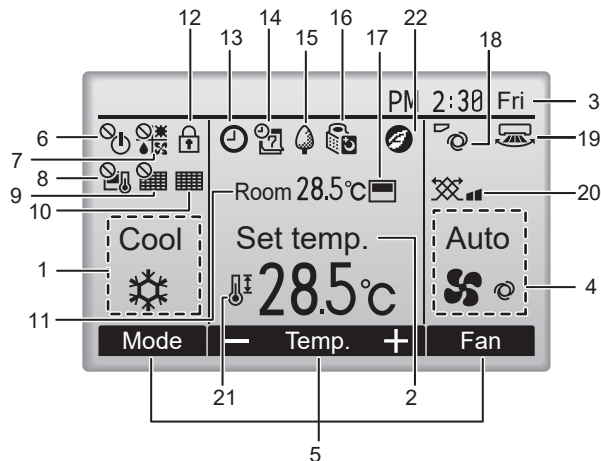
- ON/OFF button**
Press to turn ON/OFF the indoor unit.
 - Select button**
Press to save the setting.
 - Return button**
Press to return to the previous screen.
 - Menu button**
Press to open the main menu.
 - Backlit LCD**
Operation settings will appear.
When the backlight is off, pressing any button, except for the ON/OFF button, turns the backlight on, and it will stay lit for a certain period of time depending on the screen.
 - ON/OFF lamp**
This lamp lights up in green while the unit is in operation. It blinks while the remote controller is starting up or when there is an error.
- F1: Function button 1**
Main display: Press to change the operation mode.
Menu screen: The button function varies depending on the screen.
- F2: Function button 2**
Main display: Press to decrease temperature.
Main menu: Press to move the cursor left.
Menu screen: The button function varies depending on the screen.
- F3: Function button 3**
Main display: Press to increase temperature.
Main menu: Press to move the cursor right.
Menu screen: The button function varies depending on the screen.
- F4: Function button 4**
Main display: Press to change the fan speed.
Menu screen: The button function varies depending on the screen.

Display

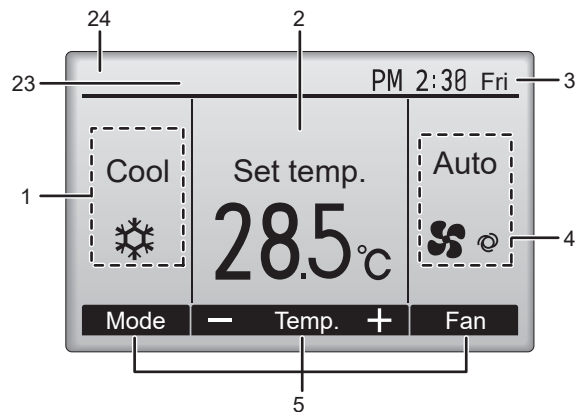
The main display can be displayed in 2 different modes: [Full] and [Basic]. The initial setting is [Full]. To switch to [Basic] mode, change the setting on the [Main display] setting. (Refer to operation manual included with remote controller.)

■ [Full] mode

All icons are displayed for explanation.



■ [Basic] mode



Note:

- Most settings (except ON/OFF, mode, fan speed, temperature) can be made from the main menu.

1. Operation mode
2. Preset temperature
3. Clock
4. Fan speed
5. Button function guide: Functions of the corresponding buttons appear here.
6. Appears when the ON/OFF operation is centrally controlled.
7. Appears when the operation mode is centrally controlled.
8. Appears when the preset temperature is centrally controlled.
9. Appears when the filter reset function is centrally controlled.
10. Appears when filter needs maintenance.
11. Room temperature
12. Appears when the buttons are locked.
13. Appears when [On/Off timer], [Night setback], or [Auto-off] function is enabled.
 Appears when the timer is disabled by the centralized control system.
14. Appears when [Weekly timer] is enabled.
15. Appears while the units are operated in the energy saving mode.
(Will not appear on some models of indoor units)
16. Appears while the outdoor units are operated in the silent mode.
17. Appears when the built-in thermistor on the remote controller is activated to monitor the room temperature (11).
 Appears when the thermistor on the indoor unit is activated to monitor the room temperature.
18. Indicates the vane setting.
19. Indicates the louver setting.*1
20. Indicates the ventilation setting.
21. Appears when the preset temperature range is restricted.
22. Appears when an energy saving operation is performed using [3D i-See sensor] function.*1
23. Centrally controlled: Appears for a certain period of time when a centrally-controlled item is operated.
24. Preliminary error display: A error code appears during the preliminary error.

*1. These functions are not applied to the floor standing models.

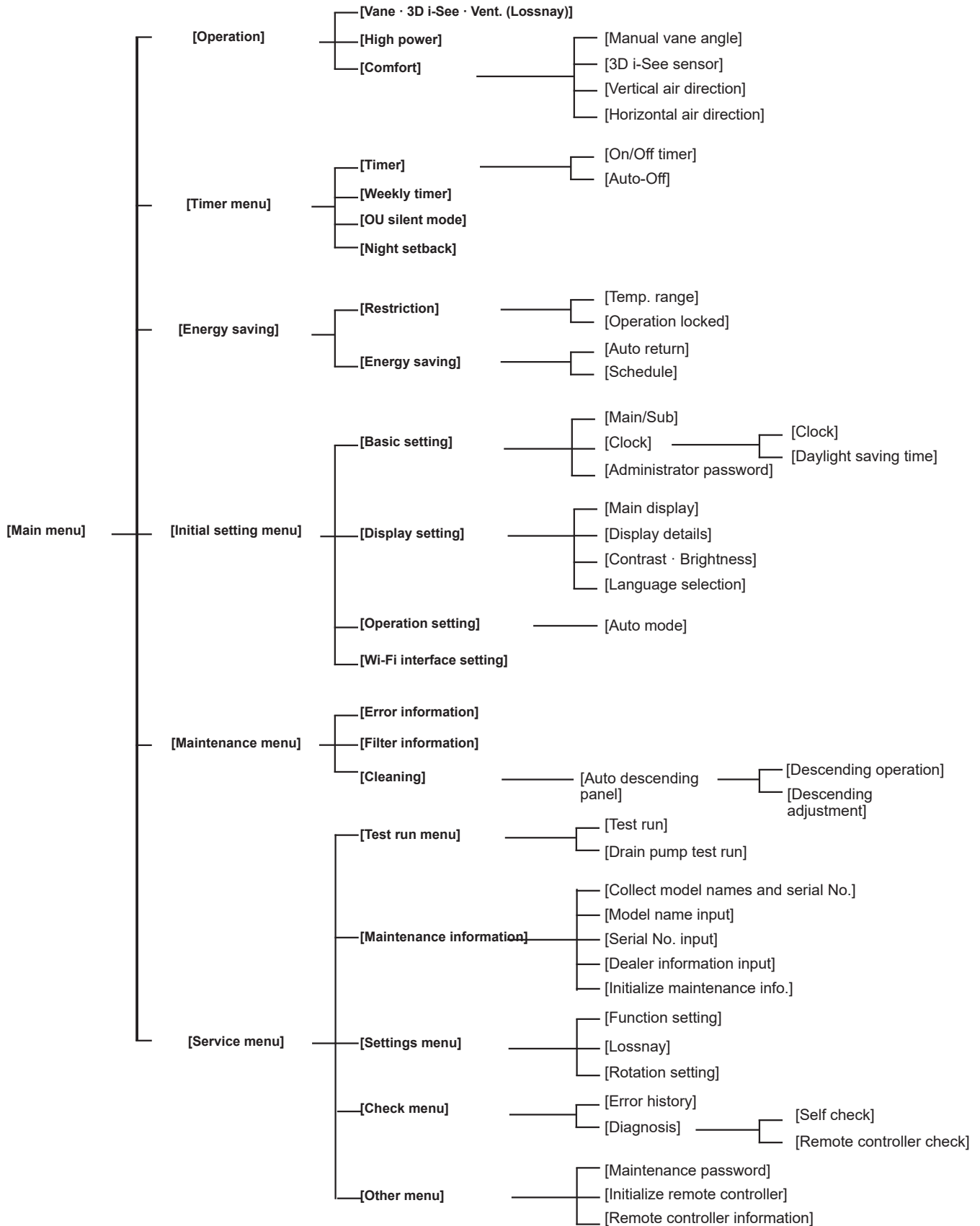
Menu structure

Press [] button.

Move the cursor to the desired item with F1 and F2 buttons, and press [] button

Note:

- Not all functions are available on all models of indoor units.



Main menu list

Main menu	Setting and display items		Setting details
Operation	Vane · 3D i-See · Vent. (Vane.Vent. (Lossnay))		Vane: Use to set the vertical air direction. Louver: Use to set the horizontal air direction. 3D i-See sensor: This setting is available only for the air conditioners that support easy setting function of motion sensing air direction. Vent: Use to set the amount of ventilation.
	High power ^{*3}		Use to reach the comfortable room temperature quickly. • Units can be operated in the High-power mode for up to 30 minutes.
	Comfort	Manual vane angle	Vertical air direction • Sets the vertical airflow direction (vane) of each unit. Horizontal air direction • Sets the horizontal airflow direction (vane) of each unit.
		3D i-See sensor	Use to set the following functions for 3D i-See sensor. • Air distribution • Energy saving option • Seasonal airflow
Timer	Timer	ON/OFF timer ^{*1}	Use to set the operation ON/OFF time. • Time can be set in 5-minute increments.
		Auto-OFF timer	Use to set the Auto-OFF time. • Time can be set to a value from 30 to 240 in 10-minute increments.
	Weekly timer ^{*1,*2}		Use to set the weekly operation ON/OFF time. • Up to 8 operation patterns can be set for each day. (Not valid when the ON/OFF timer is enabled.)
	OU silent mode ^{*1,*3}		Use to set the time periods in which priority is given to quiet operation of outdoor units over temperature control. Set the start/stop time for each day of the week. • Select the desired silent level from "Normal," "Middle," and "Quiet."
	Night setback ^{*1}		Use to make Night setback settings. • Select "Yes" to enable the setting, and "No" to disable the setting. The temperature range and the start/stop times can be set.
Energy saving	Restriction	Temp. range ^{*2}	Use to restrict the preset temperature range. • Different temperature ranges can be set for different operation modes.
		Operation lock	Use to lock selected functions. • The locked functions cannot be operated.
	Energy saving	Auto return ^{*2}	Use to get the units to operate at the preset temperature after performing energy saving operation for a specified time period. • Time can be set to a value from 30 and 120 in 10-minute increments. (This function will not be valid when the preset temperature ranges are restricted.)
		Schedule ^{*1,*3}	Set the start/stop time to operate the units in the energy saving mode for each day of the week, and set the energy saving rate. • Up to 4 energy saving operation patterns can be set for each day. • Time can be set in 5-minute increments. • Energy saving rate can be set to a value from 0% or 50 to 90% in 10% increments.
	Energy data (for unit time, month, and day)		Displays the amount of power consumption during operation. • Unit time data: Data for the last one-month period can be displayed in 30-minute units. • Monthly/daily data: Data for the last 14-month period are displayed in day-and month-units. * Data can be deleted. * Data are obtained based on the power consumption estimated from the operating state.
Initial setting	Basic setting	Main/Sub	When connecting 2 remote controllers, one of them needs to be designated as a sub controller.
		Clock	Use to set the current time.
		Daylight saving time	Set the daylight saving time.
		Administrator password	The administrator password is required to make the settings for the following items. • Timer setting • Energy saving setting • Weekly timer setting • Restriction setting • Outdoor unit silent mode setting • Night set back
	Display setting	Main display	Use to switch between "Full" and "Basic" modes for the Main display, and use to change the background colors of the display to black.
		Display details	Make the settings for the remote controller related items as necessary. Clock: The initial settings are "Yes" and "24h" format. Temperature: Set either Celsius (°C) or Fahrenheit (°F). Room temp.: Set Show or Hide. Auto mode: Set Auto mode display or Only Auto display.
		Contrast · Brightness	Use to adjust screen contrast and brightness.
		Language selection	Use to select the desired language.
	Operation setting	Auto mode	Whether or not to use Auto mode can be selected by using the button. This setting is valid only when indoor units with Auto mode function are connected.
Maintenance	Error information		Use to check error information when an error occurs. • Error code, error source, refrigerant address, model name, manufacturing number, contact information (dealer's phone number) can be displayed. (The model name, manufacturing number, and contact information need to be registered in advance to be displayed.)
	Filter information		Use to check the filter status. • The filter sign can be reset.
	Cleaning	Auto descending panel	Use to lift and lower the auto descending panel (Optional parts).

Main menu	Setting and display items		Setting details
Service	Test run		Select "Test run" from the Service menu to bring up the Test run menu. • Test run • Drain pump test run
	Input maintenance info.		Select "Input maintenance Info." from the Service menu to bring up the Maintenance information screen. The following settings can be made from the Maintenance Information screen. • Model name input • Serial No. input • Dealer information input • Initialize maintenance info.
	Settings	Function setting	Make the settings for the indoor unit functions via the remote controller as necessary.
		LOSSNAY setting	This setting is required only when the operation of CITY MULTI units is interlocked with LOSSNAY units.
	Check	Error history	Display the error history and execute "delete error history".
		Diagnosis	Self check: Error history of each unit can be checked via the remote controller. Remote controller check: When the remote controller does not work properly, use the remote controller checking function to troubleshoot the problem.
	Others	Maintenance password	Use to change the maintenance password.
		Initialize remote controller	Use to initialize the remote controller to the factory shipment status.
		Remote controller information	Use to display the remote controller model name, software version, and serial number.

*1. Clock setting is required.

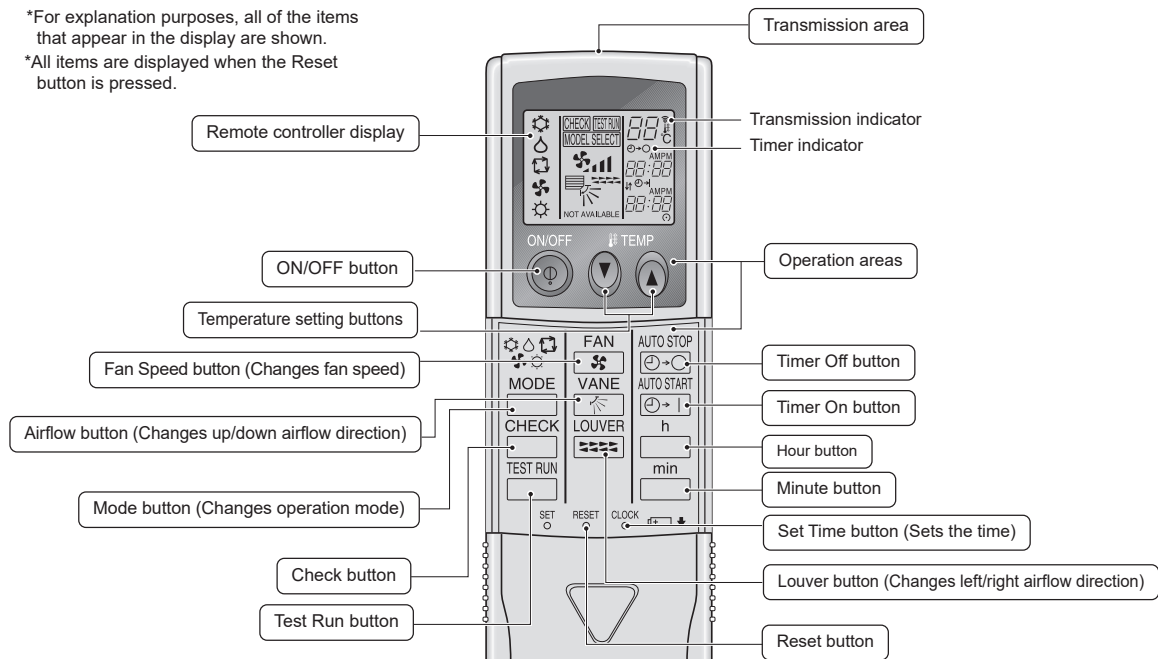
*2. 1°C (2°F) increments.

*3. This function is available only when certain outdoor units are connected.

13-1-2. PAR-SL97A-E

Controller interface

*For explanation purposes, all of the items that appear in the display are shown.
*All items are displayed when the Reset button is pressed.

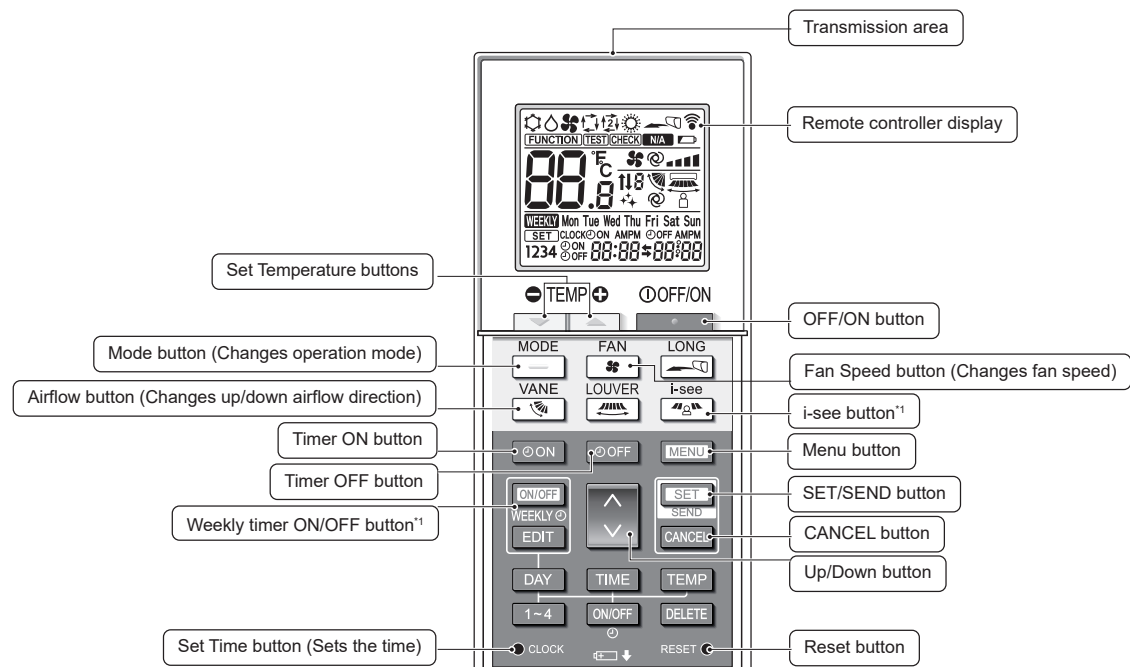


Instructions for use

- When using the wireless remote controller, point it towards the receiver on the indoor unit.
- If the remote controller is operated within approximately three minutes after power is supplied to the indoor unit, the indoor unit may beep three times as the unit is performing the initial automatic check.
- The indoor unit beeps to confirm that the signal transmitted from the remote controller has been received. Signals can be received up to approximately 7 meters in a direct line from the indoor unit in an area 45° to the left and right of the unit. However, illumination such as fluorescent lights and strong light can affect the ability of the indoor unit to receive signals.
- If the operation lamp near the receiver on the indoor unit is blinking, the unit needs to be inspected. Consult your dealer for service.
- Handle the remote controller carefully. Do not drop the remote controller or subject it to strong shocks. In addition, do not get the remote controller wet or leave it in a location with high humidity.
- To avoid misplacing the remote controller, install the holder included with the remote controller on a wall and be sure to always place the remote controller in the holder after use.

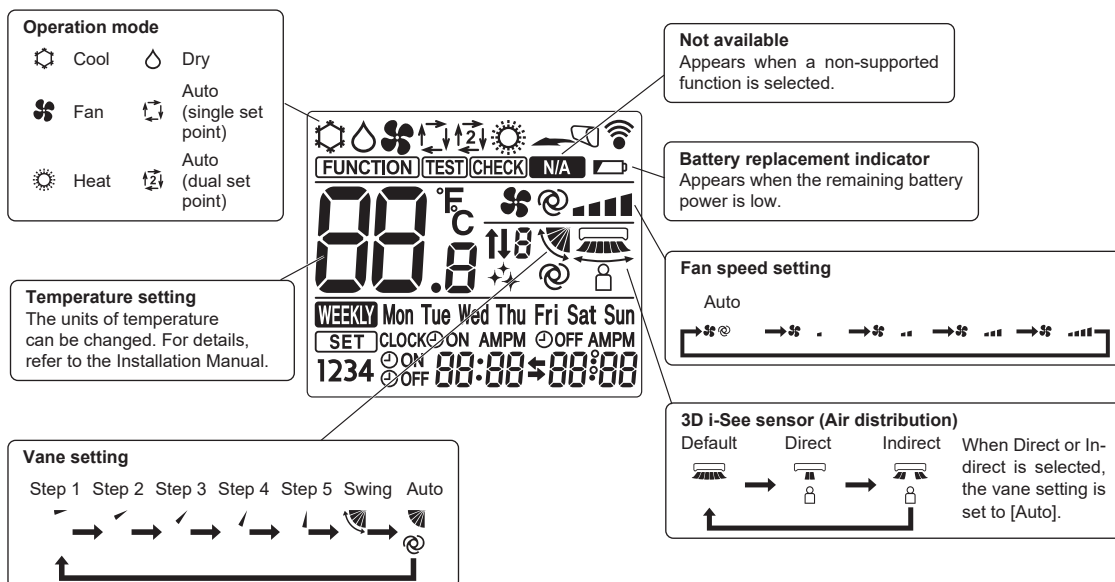
13-1-3. PAR-SL101A-E

Controller interface



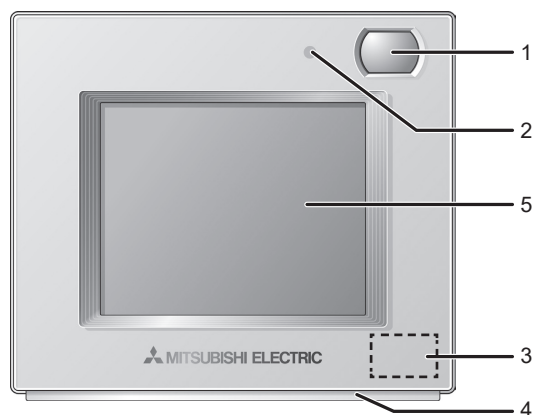
*1. This button is enabled or disabled depending on the model of the indoor unit.

Display



13-1-4. PAR-U02MEDA

Controller interface



- Occupancy Sensor**
The occupancy sensor detects vacancy for energy saving control.
- Brightness Sensor**
The brightness sensor detects the brightness of the room for energy saving control.
- Temperature & Humidity Sensor**
The sensor detects the room temperature and the relative humidity.
- LED Indicator**
The LED indicator indicates the operation status in different colors.
The LED indicator lights up during normal operation, lights off when units are stopped, and blinks when an error occurs.
- Touch panel & Backlit LCD**
The touch panel shows the operation settings screen.
When the backlight is off, touching the panel turns the backlight on, and it will stay lit for a predetermined period of time.

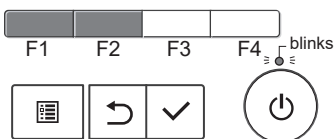
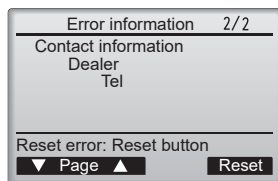
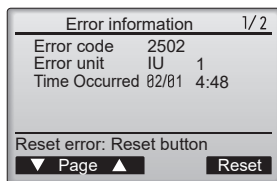
13-2. [Error information]

Operating instructions

■ How to check the error information when an error occurs

When an error occurs, the following screen will appear. Check the error status, stop the operation, and consult your dealer.

- Check the error information**
Error code, error unit, refrigerant address, date and time of occurrence, model name, and serial number will appear. The model name and serial number will appear only if the information has been registered.
 - Press F1 or F2 button to go to the next screen.
 - Contact information (dealer's phone number) will appear if the information has been registered.

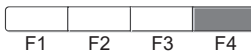
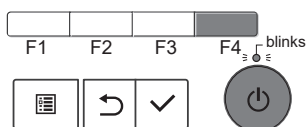
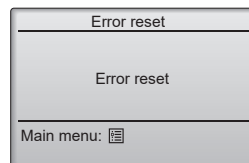
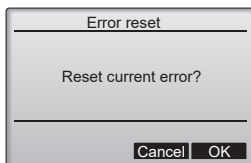
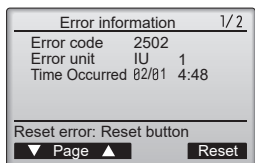


2. Reset the error

- Press F4 button or [] button to reset the error that is occurring.
- Select [OK] with F4 button.

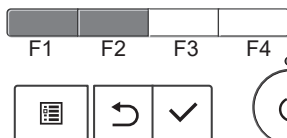
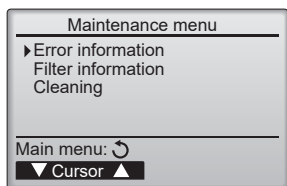
Note:

- Errors cannot be reset while the ON/OFF operation is prohibited.
- To go back to [Service menu], press [] button.



■ How to check the error information later

While no errors are occurring, page 2/2 of the error information can be viewed by selecting [Error information] from [Maintenance menu]. Errors cannot be reset on this screen.



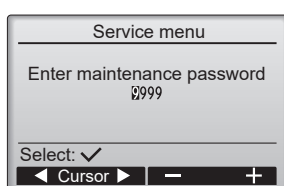
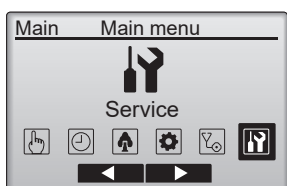
13-3. [Service menu]

Note:

- Maintenance password is required to set each item in the service menu.

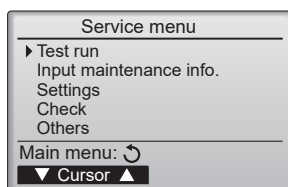
Operating instructions

1. Press [] button to open the main menu.
2. Select [Service] from [Main menu], and press [] button.
A window asking for the password will appear when [Service menu] is selected.



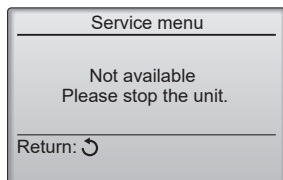
3. Enter the current maintenance password (4 numerical digits).
Move the cursor to the digit you want to change with F1 or F2 button and set each number (0 through 9) with F3 or F4 button.
4. Press [] button.

[Service menu] will appear if the password matches.



Notes:

- The initial maintenance password is "9999". Change the default password as necessary to prevent unauthorized access. Have the password available for those who need it.
- If you forget your maintenance password, you can initialize the password to the default password "9999" by pressing and holding F1 button for 10 seconds on the maintenance password setting screen.
- Air conditioning units need to be stopped depending on the item you want to set. Remote controller might not be used when the system is centrally controlled. The following screen will appear in this case.



Notes:

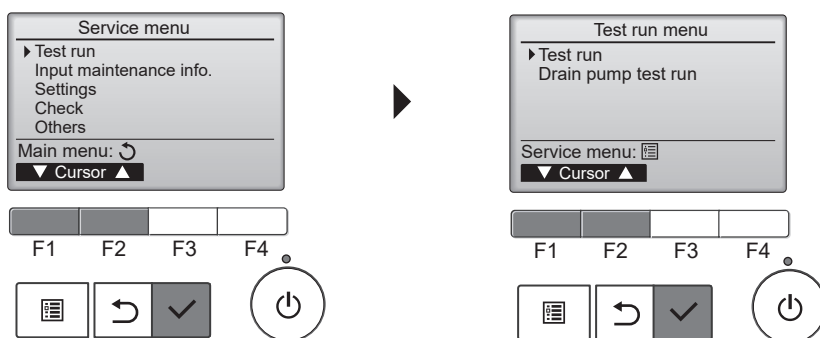
- To go back to [Service menu], press [Menu] button.
- To return to the previous screen, press [Return] button.

13-4. [Test run]

13-4-1. PAR-41MAA

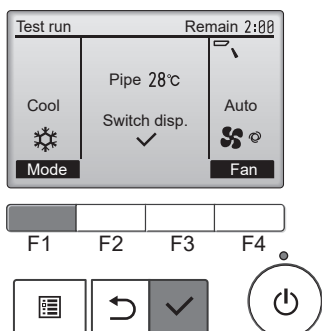
Operating instructions

1. Select [Service] from [Main menu], and press [✓] button.
2. Select [Test run] with F1 or F2 button, and press [✓] button.



■ Test run operation

1. Press F1 button to go through the operation modes in the order of [Cool] and [Heat].
Cooling mode: Check if the cold air blows out.
Heating mode: Check if the heat blows out.
2. Check the operation of the outdoor unit's fan.
3. Press [✓] button and open the vane setting screen.

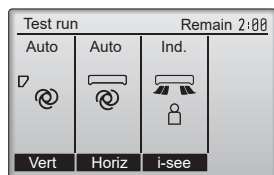


■ Auto vane check

1. Check the auto vane with F1, F2 and F3 buttons.
2. Press [Return] button to return to test run operation.
3. Press [Power] button.

Notes:

- When the test run is completed, [Test run menu] screen will appear.
- The test run will automatically stop after 2 hours.
- The function is available only for the model with vanes.



13-4-2. PAR-SL97A-E

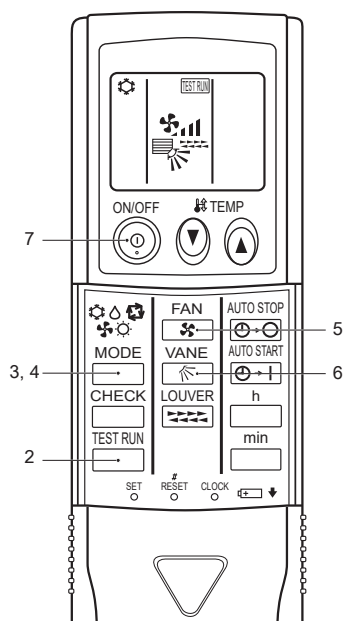
Measure an impedance between the power supply terminal block on the outdoor unit and ground with a 500 V Megger and check that it is equal to or greater than 1.0 MΩ.

Operating instructions

1. Turn on the main power to the unit.
2. Press button twice continuously.
(Start this operation from the status of remote controller display turned off.)
The symbol of and current operation mode are displayed.
3. Press button to activate the cool mode , then check whether cool air blows out from the unit.
4. Press button to activate the heat mode , then check whether warm air blows out from the unit.
5. Press button and check whether strong air blows out from the unit.
6. Press button and check whether the auto vane operates properly.
7. Press button to stop the test run.

Notes:

- Point the remote controller towards the indoor unit receiver to perform steps 2 to 7.
- It is not possible to run in the fan, the dry or the auto mode.



13-4-3. PAR-SL101A-E

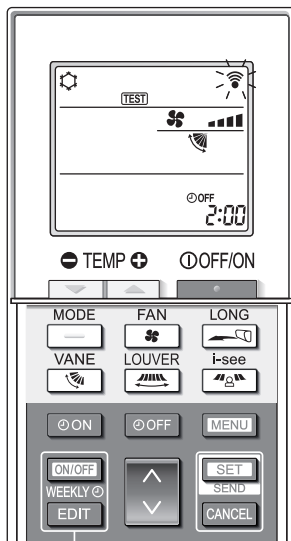
Operating instructions

1. Stop the air conditioner
 - Press button to stop the air conditioner.
 - If the weekly timer is enabled (is shown on the display), press button to disable it (is off).
2. Start the test run
 - Press button for 5 seconds.
 appears on the display and the unit starts the service mode.
 - Press button.
 appears on the display and the unit starts the test run mode.
 - Press the following buttons to start the test run.
 - : Switch the operation mode between cooling and heating and start the test run.
 - : Switch the fan speed and start the test run.

-  : Switch the airflow direction and start the test run.
-  : Switch the louver and start the test run.
-  : Start the test run.

3. Stop the test run.

- Press  button to stop the test run.
- After 2 hours, the stop signal is transmitted.



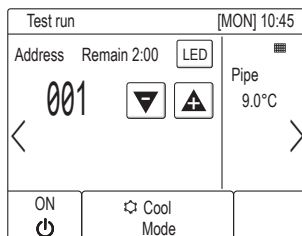
13-4-4. PAR-U02MEDA

Operating instructions

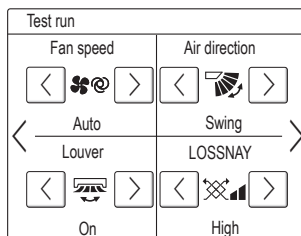
- Read the section about Test run in the indoor unit Installation Manual before performing a test run.
- During the test run, indoor units will be forced to operate in the Thermo-ON status. Except the set temperature, normal operation functions are accessible during test run.
- By selecting the address of another indoor unit, the liquid pipe temperature of the selected unit can be monitored.
- The test run will automatically end in 2 hours.

Notes:

- When AHC is controlled from the controller
To monitor the operating status of AHC, touch the [<] button on the [Test run] screen and access the [General equipment] screen.
- To set the humidity setting for the humidifier (when one is connected to the AHC), touch the [>] button on the [Indoor unit setting] screen.



[Test run screen]



[Indoor unit setting screen]

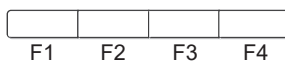
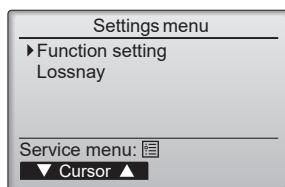
13-5. [Function setting]

13-5-1. PAR-41MAA

Operating instructions

1. Open the [Function setting] screen.
 - Select [Service] from [Main menu], and press [✓] button.
 - Select [Setting] from [Service menu], and press [✓] button.
 - Select [Function setting] and press [✓] button.

[Function setting] screen will appear.



2. Set the function.

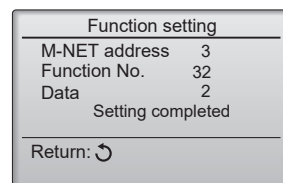
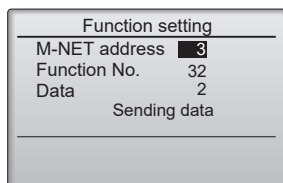
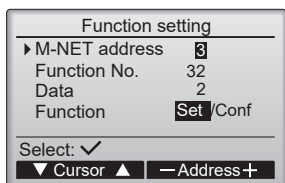
- Press F1 or F2 button to move the cursor to one of the following: M-NET address, function setting number, or setting value.
- Press F3 or F4 button to change the settings to the desired settings.
- Once the settings have been completed, press [✓] button.
- A screen will appear indicating that the settings information is being sent.
- To check the current settings of a given unit, enter the setting for its M-NET address and function setting number, select Conf for the Function, and press [✓] button.
- A screen will appear indicating that the settings are being searched for.
- When the search is done, the current settings will appear.

When the settings information has been sent, a screen will appear indicating its completion.

- To make additional settings, press [↺] button to return to the screen shown in the above step. Set the function numbers for other indoor units by following the same steps.

Notes:

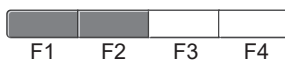
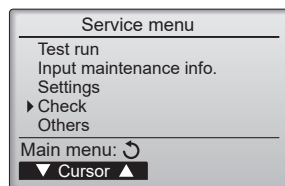
- Refer to the installation manual of the indoor unit for the information about initial settings, function setting numbers, and setting values of indoor units.
- Be sure to write down the settings for all functions if any of the initial settings has been changed after the completion of installation work.



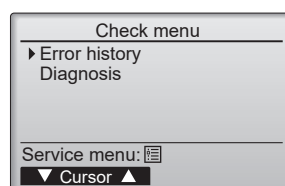
13-6. [Error history]

Operating instructions

1. Open [Service menu] and select [Check].
 - Select [Service] from [Main menu], and press [✓] button.
 - Select [Check] with F1 or F2 button, and press [✓] button.



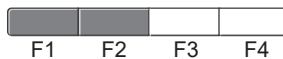
2. Select [Error history] with F1 or F2 button, and press [✓] button.



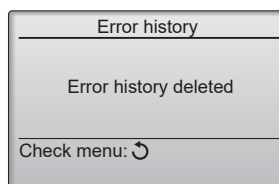
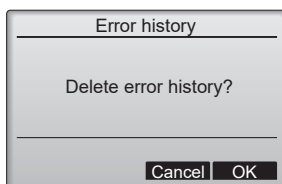
3. 16 error history records will appear.
4 records are shown per page, and the top record on the first page indicates the latest error record.

Error history 1/4				
Error	Unt#	dd/mm/yy		
2502	1	12/04/20	12:34	
2502	1	12/04/20	12:34	
2502	1	12/04/20	12:34	
2502	1	12/04/20	12:34	

Check menu: ↺
▼ Page ▲ Delete



4. Delete the error history.
 - Press F4 button [Delete].
A confirmation screen will appear asking if you want to delete the error history.
 - Press F4 button [OK] to delete the history.
[Error history deleted] will appear on the screen.
 - Press [↺] button to go back to [Check menu] screen.

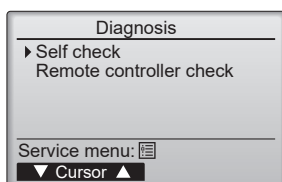


13-7. Self-diagnosis

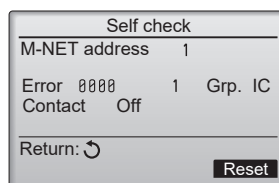
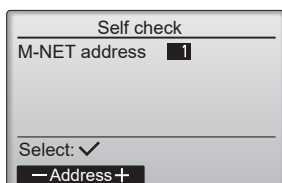
13-7-1. PAR-41MAA

Operating instructions

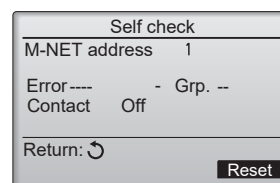
1. Open [Self check] screen
 - Select [Service] from [Main menu], and press [✓] button.
 - Select [Check] from [Service menu], and press [✓] button.
 - Select [Diagnosis] from [Check menu], and press [✓] button.
 - Select [Self check] with F1 or F2 button, and press [✓] button.
[Self check] screen will appear.



2. Enter the M-NET address with F1 or F2 button, and press [✓] button.
 - Error code, unit number, attribute, and indoor unit demand signal ON/OFF status at the contact will appear.
[-] will appear when there is no error history.

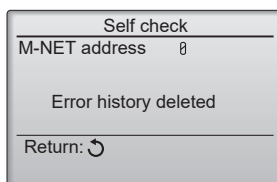
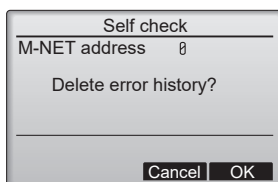


<Error history is shown.>



<Error history is not shown.>

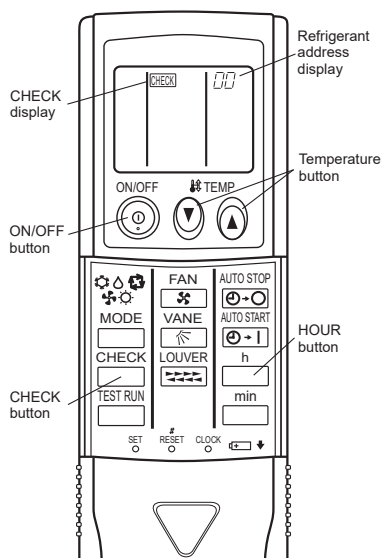
3. Reset the error history.
 - Press F4 button [Reset].
A confirmation screen will appear to ask you if you want to delete the error history.
 - Press F4 button [OK] to delete the error history.
[Request rejected] will appear if deletion fails.
[Unit not exist] will appear if no indoor unit is assigned to the entered address.



13-7-2. PAR-SL97A-E

Operating instructions

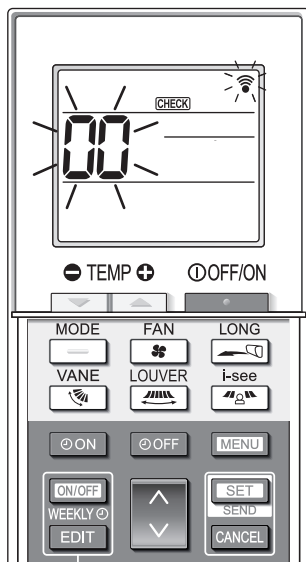
1. Press button twice.
 appears, and the refrigerant address "00" blinks.
Make sure that the remote controller's display has stopped before continuing.
2. Press buttons to select the refrigerant address of the indoor unit for self-diagnosis.
Set the address of the indoor unit that is to be self-diagnosed.
3. Point the remote controller at the sensor of the indoor unit and press button.
If an air conditioner error occurs, the indoor unit's sensor emits an intermittent buzzer sound, the operation light blinks, and the error code is output.
4. Point the remote controller at the sensor of the indoor unit and press button.
The check mode is cancelled.



13-7-3. PAR-SL101A-E

Operating instructions

1. Press button to stop the air conditioner.
If the weekly timer is enabled (is shown on the display), press button to disable it (is off).
2. Press button for 5 seconds. appears and the unit starts the self-check mode.
3. Press button to select the refrigerant address (M-NET address) of the indoor unit for which you want to perform the self-check.
4. Press button.
If an error is detected, the error code is indicated by the number of beeps from the indoor unit and the number of blinks of the operation indicator lamp.
5. Press button.
 and the refrigerant address (M-NET address) go off and the self-check is completed.

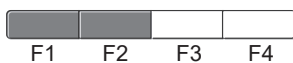
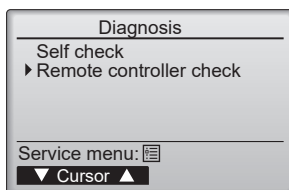


13-8. [Remote controller check]

Operating instructions

If operations cannot be completed with the remote controller, diagnose the remote controller with this function.

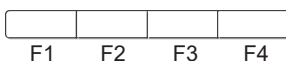
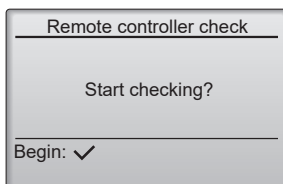
1. Go to [Remote controller check] screen.
 - Select [Service] from [Main menu], and press [✓] button.
 - Select [Check] from [Service menu], and press [✓] button.
 - Select [Diagnosis] from [Check menu], and press [✓] button.
 - Select [Remote controller check] with F1 or F2 button, and press [✓] button.



2. Start the remote controller check.
 - Select [Remote controller check] from [Diagnosis], and press [✓] button to start the remote controller check and see the check results.

Notes:

- To cancel the remote controller check and exit [Remote controller check] menu screen, press [𐄂] or [↺] button.
- The remote controller will not reboot itself.



3. Check the result of the remote controller check.
See the following descriptions for each result:

[OK]:

- The remote controller has no problem. Check other parts to find problems.

[E3], [6832]:

- There is noise on the transmission line, or the indoor unit or another remote controller is faulty. Check the transmission line and the other remote controllers.

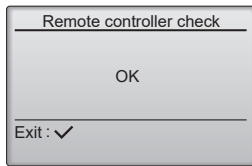
[NG] (ALL0, ALL1):

- Send-receive circuit fault. The remote controller needs to be replaced.

[ERC]:

- The number of data errors is the discrepancy between the number of bits in the data transmitted from the remote controller and that of the data that was actually transmitted over the transmission line. If data errors are found, check the transmission line for external noise interference.

If [✓] button is pressed after the remote controller check results are displayed, remote controller check will end, and the remote controller will automatically reboot itself.



Remote controller check results screen

Note:

- Check the remote controller display and see if anything is displayed (including lines). Nothing will appear on the remote controller display if the correct voltage (8.5 – 12 VDC) is not supplied to the remote controller. If this is the case, check the remote controller wiring and indoor units.

13-9. Special function operation setting

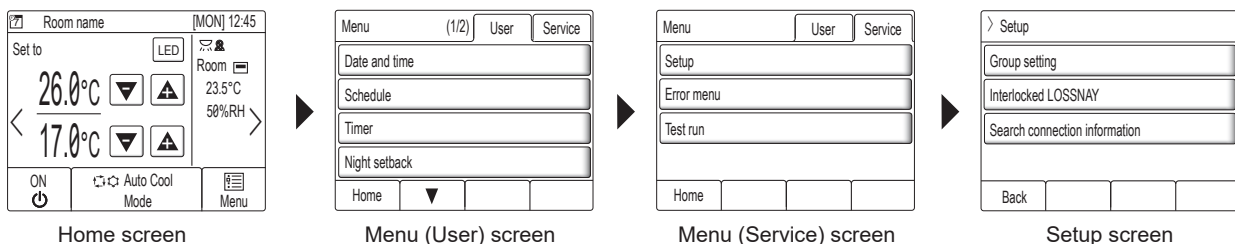
13-9-1. PAR-U02MEDA

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

It is necessary to perform "group settings" and "Interlocked LOSSNAY" at making group settings of different refrigerant systems (multiple outdoor unit).

Operating instructions

1. Touch the "Menu" on the home screen.
2. Touch the "Service" on the menu (user) screen.
3. Touch the "Setup" on the menu (service) screen.
4. Setup screen will appear.



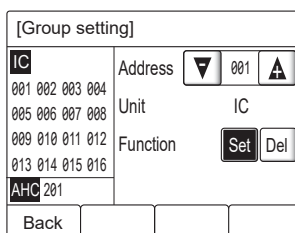
■ Group settings

Enter the indoor unit controlled by the remote controller, check the content of entries, and clear entries, etc. Use the following screen to register the indoor units and the AHC to be controlled from the controller.

1. Select an indoor unit or an AHC address in the [Address] field.
The number of units that can be registered.
Indoor unit: 16 units maximum
AHC: 1 unit maximum

Note:

- AHC cannot be controlled from the controller unless indoor units are registered with the system.
2. Touch the [Set] button to register the address, and touch the [Del] to delete the address.
Successful address registration/deletion: The registered address(es) will appear on the left side of the screen.
Deleted address will not appear on the screen.
Error: "Request denied." or "Is not to be connected" will appear.



■ Interlocked LOSSNAY:

Use this function to interlock the operation of indoor units and LOSSNAY units.

1. To register LOSSNAY units
 - Select the indoor unit address in the Add. 1 section.
 - Select the interlocked LOSSNAY address in the Add. 2 section.
 Touch the [Set] button to save the setting.

2. To search for an interlocked setting
 - Touch the [Conf] button to display in the left column the addresses of the units that are interlocked with the unit whose address was set in the Add. 1 section.
3. To delete the interlock settings
 - After taking Step 2 above, select the address to be deleted in the Add. 2 section, and then touch the [Del] button.

Note:

- When the setting or deletion is successfully completed, "Completed" will appear below [Function] field on the screen. If setting or deletion fails, "Request denied" will appear below [Function] field on the screen.

[Interlocked LOSSNAY]			
001 IC 007 IC	Add. 1	▼	001 ▲
002 IC 008 IC	Add. 2	▼	013 ▲
003 IC 009 IC	Function	Set	Conf
004 IC 010 IC			Del
005 IC 011 IC			
006 IC 012 IC			
Back			

■ Search connection information

Use this screen to specify a unit and search for the controllers that are connected to the unit.

1. Select an address in the [Address] field.
2. Touch the [Conf] button to search for the interlocked units.
The results will appear in the left column. (When multiple units are found, the addresses that do not fit on the first page will appear on the successive pages.)
Search error: "Request denied." will appear.

[Search connection information]	
001 IC	Address ▼ 051 ▲
002 IC	
003 IC	
004 IC	Function Conf
005 IC	
006 IC	
Back	

After completing the settings, touch the [Back] button on the setup screen. The message "Collecting the information from the air conditioner." will appear, and then the screen will jump to the home screen. This signals the completion of the setup process. Access the Service Menu from the home screen to make the settings for other items as necessary.

CITY MULTI

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