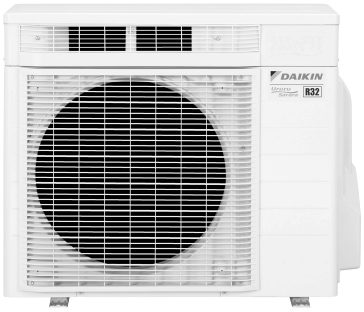
DAIKIN

SiMT041311E

Service Manual

Inverter Pair
Wall Mounted Type FTXZ-N Series



[Applied Models]

- **Inverter Pair : Heat Pump**

Inverter Pair
Wall Mounted Type
FTXZ-N Series

●**Heat Pump**

Indoor Unit

FTXZ25NV1B
FTXZ35NV1B
FTXZ50NV1B

Outdoor Unit

RXZ25NV1B
RXZ35NV1B
RXZ50NV1B

1. Safety Cautions

Be sure to read the following safety cautions before conducting repair work.
After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer.

Caution Items

The caution items are classified into ⚠ **Warning** and ⚠ **Caution**. The ⚠ **Warning** items are especially important since they can lead to death or serious injury if they are not followed closely. The ⚠ **Caution** items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.

Pictograms

△ This symbol indicates the item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.

◯ This symbol indicates the prohibited action.
The prohibited item or action is shown in the illustration or near the symbol.

● This symbol indicates the action that must be taken, or the instruction.
The instruction is shown in the illustration or near the symbol.

1.1 Warnings and Cautions Regarding Safety of Workers

⚠ Warning	
Do not store the equipment in a room with successive fire sources (e.g., naked flame, gas appliance, electric heater).	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for repair. Working on the equipment that is connected to the power supply may cause an electrical shock. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas is discharged during the repair work, do not touch the discharged refrigerant gas. The refrigerant gas may cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, evacuate the refrigerant gas completely at a well-ventilated place first. If there is gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it may cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas may generate toxic gases when it contacts flames.	
Be sure to discharge the capacitor completely before conducting repair work. The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. A charged capacitor may cause an electrical shock.	

Warning	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment may cause an electrical shock or fire.	
Be sure to wear a safety helmet, gloves, and a safety belt when working at a high place (more than 2 m). Insufficient safety measures may cause a fall accident.	
In case of R-32 / R-410A refrigerant models, be sure to use pipes, flare nuts and tools for the exclusive use of the R-32 / R-410A refrigerant. The use of materials for R-22 refrigerant models may cause a serious accident such as a damage of refrigerant cycle as well as an equipment failure.	
Do not mix air or gas other than the specified refrigerant (R-32 / R-410A / R-22) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	

Caution	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands may cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water may cause an electrical shock.	
Be sure to provide the earth / grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and may cause injury.	
Be sure to conduct repair work with appropriate tools. The use of inappropriate tools may cause injury.	
Be sure to check that the refrigerating cycle section has cooled down enough before conducting repair work. Working on the unit when the refrigerating cycle section is hot may cause burns.	

Caution	
Use the welder in a well-ventilated place. Using the welder in an enclosed room may cause oxygen deficiency.	

■ **Checking the area**

Before beginning work, conduct safety checks to minimise the risk of ignition. When repairing the refrigerating system, take the following precautions before work.

■ **Work procedure**

Work shall be conducted under a controlled procedure so as to minimise the risk of working in the presence of R-32 or vapour.

■ **General working 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.
The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable materials.

■ **Checking for presence of refrigerant**

The working area shall be checked with an appropriate refrigerant detector before and during work, to ensure the technician is aware of potentially flammable atmospheres.
Ensure that the leak detection equipment being used is suitable for use with R-32, i.e. non-sparking, adequately sealed or intrinsically safe.

■ **Fire extinguishing equipment**

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be made available at hand. Prepare a dry powder or CO2 fire extinguisher adjacent to the working area.

■ **No ignition sources**

During work on a refrigeration system which involves exposing any piping work that contains or has contained R-32, any sources of ignition shall not be used in a manner that may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept at a safe distance from the site of installation, repairing, or removing space. Before starting work, the area around the equipment shall be examined to make sure that there are no flammable hazard or ignition risks. No Smoking signs shall be displayed.

■ **Ventilated area**

Ensure that the working area is open or that it is adequately ventilated before work.
Adequate ventilation shall be maintained during the entire period of work.
The ventilation should disperse any released refrigerant and preferably discharge it into the external atmosphere.

■ Checking the refrigeration equipment

Where electrical components are to be changed, the new components shall be fit for the purpose and have the correct specifications.
The manufacturer's maintenance and service guidelines shall be followed at all times.
If there are any unclear points, consult the manufacturer's technical department for assistance.
The following checks shall be applied to any installation work involving R-32:

- The amount of charge is in accordance with the size of the room where the refrigerant containing parts are installed;
- The ventilation machinery and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- Marking on the equipment is visible and legible. Markings and signs that are illegible shall be corrected;
- Refrigeration pipes or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, or the refrigerant containing components are constructed of materials which are inherently resistant to corrosion or are suitably protected against corrosion.

■ Checking electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. In case there is any fault that could endanger safety, no electrical supply shall be connected to the circuit until the fault is satisfactorily dealt with.
Initial safety checks shall include:

- that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- that no live electrical components and wiring are exposed while charging, recovering or purging the system;
- that the equipment is earthed at all times.

■ Repairs to sealed components

During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon before the removal of any sealed covers, etc. If it is absolutely necessary to have power supplied to equipment during servicing, continuously operating leak detection shall be installed at the most dangerous point of the system in order to warn of a potentially hazardous situation.
Particular attention shall be paid to the following: ensure that working on electrical components does not alter the casing in such a way that affects the level of protection including damage to cables, excessive number of connections, terminals different from the original specification, damage to seals, incorrect fitting of glands, etc.
Ensure that the equipment is mounted securely.
Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingression of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.
The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated before working on them.

■ Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance load to the circuit without ensuring that this will not exceed the permissible voltage and current for the equipment in use.
Only intrinsically safe components can be worked on in the presence of a flammable atmosphere.
The test apparatus shall be of correct rating.
Replace components only with parts specified by the manufacturer. Using other parts may result in ignition of the refrigerant leaked into the atmosphere.

■ Wiring

Check that wiring is not 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 ageing or continuous vibration from sources such as compressors or fans.

■ **Detecting of R-32**

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

■ **Leak detection methods**

The following leak detection methods can be applied for systems containing R-32.
Electronic leak detectors shall be used to detect R-32, but the sensitivity may not be adequate or may 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 that it is suitable for the refrigerant used. Leak detection equipment shall be set to the percentage of the lower flammability limit (LFL) of the refrigerant and calibrated to fit the refrigerant employed. The appropriate percentage of gas (maximum 25%) shall be confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper piping work.
If a leak is suspected, all naked flames shall be removed or extinguished.
If a refrigerant leakage which requires brazing is found, 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 point of the leakage. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

■ **Removal and evacuation**

When breaking the refrigerant circuit to make repairs or any other purpose, conventional procedures may be used. However, flammability must be taken into consideration. The following procedure shall be adhered to:

- Remove refrigerant;
- Purge the circuit with inert gas;
- Evacuate the inert gas;
- Purge again with inert gas;
- Carry out cutting or brazing of the circuit.

The refrigerant shall be recovered into the correct recovery cylinders. The system shall be cleaned with OFN to render the unit safe. (= Flushing) This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task.
Flushing shall be achieved through breaking the vacuum by filling the system with OFN until the working pressure is achieved, then venting the OFN into the atmosphere, and finally pulling the system down to vacuum again. This process shall be repeated until no refrigerant remains within the system. After the last OFN charge is finished, the system shall be vented down to atmospheric pressure to enable work. This operation is especially important if brazing operations on the piping work are to take place.

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

■ **Charging procedures**

In addition to conventional charging procedures, the following requirements shall be met.
Ensure that the charging equipment to be used is not contaminated by different refrigerants. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.

- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed before charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.

Before recharging, the system shall be tested for leakage with OFN. On completion of charging, the system shall be tested before commissioning. Follow up leakage test shall be carried out before leaving the site.

■ Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details. It is recommended to train technicians so that all of the refrigerant is recovered safely. In case analysis is required before re-using the reclaimed refrigerant, an oil and refrigerant sample shall be taken before proceeding with decommissioning. It is essential that electrical power is available before work.

a) Comprehend the equipment and its operation.
b) Isolate the system electrically.
c) Before starting work, ensure that:
   • mechanical handling equipment is available if required, for handling refrigerant cylinders;
   • protective equipment can be used in compliance with specifications;
   • the recovery process is supervised by a competent person at all times;
   • recovery equipment and cylinders conform to the appropriate standards.
d) Pump down the refrigerant system, if possible.
e) If vacuum can not be ensured, apply a manifold so that refrigerant can be removed from various parts of the system.
f) Make sure that the cylinder is situated on the scale before recovery takes place.
g) Start the refrigerant recovery device and operate it in accordance with the manufacturer's instructions.
h) Do not overfill cylinders. (Do not exceed 80% liquid charge volume).
i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
j) When the cylinders have been filled correctly and the process is completed, make sure that the cylinders and the equipment are removed from site promptly and all valves on the equipment are closed.
k) Recovered refrigerant shall not be charged into another refrigeration system before it has been cleaned and checked.

■ Labelling

Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains R-32.

■ Refrigerant recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended to conduct training so that all refrigerants can be removed safely.
When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are used.
Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used must be designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be equipped with a pressure relief valve and associated shut-off valves in good working order. If possible, empty recovery cylinders shall be cooled in a separate place before recovery is conducted.
The recovery equipment shall be in good working order with instructions concerning the equipment at hand, and shall be suitable for the recovery of R-32. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be equipped with leak-free disconnect couplings and in good condition. Before using the recovery device, check that it has undergone proper maintenance, that it is in satisfactory working order, and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant leakage. Consult manufacturer if in doubt.
The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, with the relevant Waste Transfer Note attached. Do not mix refrigerants in recovery units and especially not in cylinders.
If compressors or compressor oil are to be removed, ensure that the refrigerant melted into the oil has been evacuated to an acceptable level to make certain that R-32 does not remain within the oil. The evacuation process shall be carried out before returning the compressor to the supplier. Only electric heating to the compressor body shall be employed to accelerate this process. Oil drained from the system shall be treated safely.

1.2 Warnings and Cautions Regarding Safety of Users

Warning	
Do not store the equipment in a room with successive fire sources (e.g., naked flame, gas appliance, electric heater).	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools may cause an electrical shock, excessive heat generation or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires may cause an electrical shock, excessive heat generation or fire.	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it may cause an electrical shock, excessive heat generation or fire.	
Be sure to use an exclusive power circuit for the equipment, and follow the local technical standards related to the electrical equipment, the internal wiring regulations, and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work may cause an electrical shock or fire.	
Be sure to use the specified cable for wiring between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections may cause excessive heat generation or fire.	
When wiring between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section may cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable may cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable may damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-32 / R-410A / R-22) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leaking point and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leaking point cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it may generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	

Warning	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment may fall and cause injury.	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet securely. If the plug has dust or loose connection, it may cause an electrical shock or fire.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation may cause the equipment to fall, resulting in injury.	For unitary type only 
Be sure to install the product securely in the installation frame mounted on the window frame. If the unit is not securely mounted, it may fall and cause injury.	For unitary type only 
When replacing the coin battery in the remote controller, be sure to dispose of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	
Do not install the equipment in a place where there is a possibility of combustible gas leaks. If the combustible gas leaks and remains around the unit, it may cause a fire.	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections may cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame may cause the unit to fall, resulting in injury.	

Caution	
Check the earth / grounding, and repair it if the equipment is not properly earthed / grounded. Improper earth / grounding may cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 MΩ or higher. Faulty insulation may cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage may cause the water to enter the room and wet the furniture and floor.	
Do not tilt the unit when removing it. The water inside the unit may spill and wet the furniture and floor.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water may enter the room and wet the furniture and floor.	For unitary type only 

2. Used Icons

The following icons are used to attract the attention of the reader to specific information.

Icon	Type of Information	Description
 Warning	Warning	A **Warning** is used when there is danger of personal injury.
 Caution	Caution	A **Caution** is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
 Note:	Note	A **Note** provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
	Reference	A **Reference** guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

Part 1
List of Functions

1. Functions

Category	Functions	New model (FTXZ-N)	Old model (FTXR-E)	Category	Functions	New model (FTXZ-N)	Old model (FTXR-E)
Basic Function	PAM control	●	●	Health and Cleanliness	Titanium apatite photocatalytic air-purifying filter	—	●
	Swing compressor	●	●				
	Reluctance DC motor	●	●		Photocatalytic air-purifying and deodorising filter	●	—
	Standby electricity saving	●	—				
Operation	URURU HUMIDIFY operation	●	●		Air filter (pre-filter)	●	●
	SARARA DRY operation	●	●		Air supply filter	●	●
	DRY COOLING operation	●	●		MOISTURISING operation	●	●
	Programme dry operation	—	—		FLASH STREAMER AIR PURIFYING operation	●	●
	AUTO operation	●	●				
Comfortable Airflow	Power-airflow flaps	●	●		FRESH AIR SUPPLY VENTILATION operation	●	●
	Wide-angle louvres	●	●				
	Auto-swing (up and down)	●	●		HOME LEAVE VENTILATION operation	—	●
	Auto-swing (right and left)	●	●		MOULD PROOF operation	●	●
					MOULD SHOCK OUT operation	—	●
	3-D airflow	●	●		CLEANING FILTER operation	●	—
	3-area INTELLIGENT EYE operation	●	—		Filter cleaning indicator (remote controller)	—	●
	COMFORT AIRFLOW operation	—	●		Mould proof stick	—	●
	Comfort airflow with INTELLIGENT EYE sensor	●	—		Hydrophilic coated indoor heat exchanger	●	—
	Circulation airflow	●	—		Mould proof indoor heat exchanger	●	—
	COOLING BREEZE operation	—	●		Washable upper grille	—	●
	BREEZE airflow	●	—		Wipe-clean flat panel	●	●
Living Convenience	Auto fan speed	●	●	Comfortable Temperature	Hot-start function	●	●
	Indoor unit quiet operation	●	●		Quick warming function (preheating operation)	—	●
	FAN ONLY operation	●	—				
	Inverter POWERFUL operation	●	●		Automatic defrosting	●	●
	ECONO operation	●	—	Installation and Service	Installation position setting	●	—
	OUTDOOR UNIT QUIET operation	●	—		Multi-split / split type compatible indoor unit	—	—
	AUTO OFF operation	●	—		Either side drain (right or left)	●	●
	INFORMATION display	●	●		Anti-corrosion treatment of outdoor heat exchanger	●	●
	CHILDPROOF LOCK	●	●				
	R/C with back light	●	—		Low temperature cooling operation (–15°C)	—	—
	Remote controller setting memory	●	—		Self-diagnosis display (remote controller)	●	●
	Indoor unit lamp brightness setting	●	●		Home automation correspondence	●	●
	Multi-coloured indicator lamp	—	●				
	Indoor unit **ON/OFF** button	●	●				
	Auto-restart (after power failure)	●	●				
Timer	24-hour ON/OFF TIMER operation	●	●				
	DAILY ON/OFF TIMER operation	●	—				
	WEEKLY TIMER operation	—	—				
	COUNTDOWN OFF TIMER operation	●	●				
	NIGHT SET mode	—	●				
	COMFORT SLEEP TIMER operation	●	●				
	QUICK HEATING TIMER operation	●	—				

Note: ● : Available
— : Not available

Part 2
Specifications

1. Specifications

50 Hz, 220 - 230 - 240 V

Model	Indoor Unit		FTXZ25NV1B		FTXZ35NV1B	
	Outdoor Unit		RXZ25NV1B		RXZ35NV1B	
			Cooling	Heating	Cooling	Heating
Capacity Rated (Min. ~ Max.)		kW	2.5 (0.6 ~ 3.9)	3.6 (0.6 ~ 7.5)	3.5 (0.6 ~ 5.3)	5.0 (0.6 ~ 9.0)
		Btu/h	8,500 (2,000 ~ 13,100)	9,600 (2,000 ~ 25,500)	11,900 (2,000 ~ 18,100)	17,100 (2,000 ~ 30,700)
		kcal/h	2,150 (520 ~ 3,350)	2,150 (520 ~ 6,450)	3,010 (520 ~ 4,560)	2,150 (520 ~ 7,740)
Running Current (Rated)		A	2.0 - 1.9 - 1.9	2.9 - 2.8 - 2.7	3.1 - 2.9 - 2.8	4.6 - 4.4 - 4.3
Power Consumption Rated (Min. ~ Max.)		W	410 (110 ~ 880)	620 (100 ~ 2,010)	660 (110 ~ 1,330)	1,000 (100 ~ 2,530)
Power Factor (Rated)		%	93.2 - 93.8 - 89.9	97.2 - 96.3 - 95.7	96.8 - 99.0 - 98.2	98.8 - 98.8 - 96.9
COP Rated (Min. ~ Max.)		W/W	6.10 (5.45 ~ 4.43)	5.80 (6.00 ~ 3.73)	5.30 (5.45 ~ 3.98)	5.00 (6.00 ~ 3.56)
Piping Connections	Liquid	mm	ϕ 6.4		ϕ 6.4	
	Gas	mm	ϕ 9.5		ϕ 9.5	
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Max. Interunit Piping Length		m	10		10	
Max. Interunit Height Difference		m	8		8	
Chargeless		m	10		10	
Indoor Unit			**FTXZ25NV1B**		**FTXZ35NV1B**	
Front Panel Colour			White		White	
Airflow Rate	H	m³/min (cfm)	10.7 (379)	11.7 (415)	12.1 (428)	13.3 (469)
	M		7.5 (265)	8.6 (303)	8.4 (295)	9.2 (324)
	L		5.3 (188)	6.7 (236)	5.6 (197)	6.9 (245)
	SL		4.0 (141)	4.8 (168)	4.0 (141)	4.8 (168)
Fan	Type		Cross Flow Fan		Cross Flow Fan	
	Motor Output	W	30		30	
	Speed	Steps	5 Steps, Quiet, Auto		5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downwards		Right, Left, Horizontal, Downwards	
Air Filter			Auto cleaning filter		Auto cleaning filter	
Running Current (Rated)		A	0.14 - 0.14 - 0.13	0.14 - 0.14 - 0.13	0.14 - 0.14 - 0.13	0.14 - 0.14 - 0.13
Power Consumption (Rated)		W	30 - 30 - 30	30 - 30 - 30	30 - 30 - 30	30 - 30 - 30
Power Factor (Rated)		%	97.4 - 93.2 - 96.2	97.4 - 93.2 - 96.2	97.4 - 93.2 - 96.2	97.4 - 93.2 - 96.2
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (H × W × D)		mm	295 × 798 × 372		295 × 798 × 372	
Packaged Dimensions (H × W × D)		mm	434 × 865 × 361		434 × 865 × 361	
Weight (Mass)		kg	15		15	
Gross Weight (Gross Mass)		kg	19		19	
Sound Pressure Level	H / M / L / SL	dB(A)	38 / 33 / 26 / 19	39 / 35 / 28 / 19	42 / 35 / 27 / 19	42 / 36 / 29 / 19
Sound Power Level (H)		dB	54	56	57	57
Outdoor Unit			**RXZ25NV1B**		**RXZ35NV1B**	
Casing Colour			Ivory White		Ivory White	
Compressor	Type		Hermetically Sealed Swing Type		Hermetically Sealed Swing Type	
	Model		2YC40DXD		2YC40DXD	
Refrigerant Oil	Type		FW68DA		FW68DA	
	Charge	L	0.405		0.405	
Refrigerant	Type		R-32		R-32	
	Charge	kg	1.34		1.34	
Airflow Rate	H	m³/min (cfm)	31.0 (1,093)	28.3 (999)	34.4 (1,216)	31.5 (1,113)
	L		22.5 (794)	16.2 (571)	22.5 (794)	16.2 (571)
Fan	Type		PZ440		PZ440	
	Motor Output	W	71		71	
Running Current (Rated)		A	1.9 - 1.8 - 1.8	2.8 - 2.7 - 2.6	3.0 - 2.8 - 2.7	4.5 - 4.3 - 4.2
Power Consumption (Rated)		W	380	590	630	970
Power Factor (Rated)		%	90.9 - 91.8 - 88.0	95.8 - 95.0 - 94.6	95.5 - 97.8 - 97.2	98.0 - 98.1 - 96.2
Starting Current		A	2.8		4.4	
Dimensions (H × W × D)		mm	693 × 795 × 300		693 × 795 × 300	
Packaged Dimensions (H × W × D)		mm	735 × 926 × 430		735 × 926 × 430	
Weight (Mass)		kg	50		50	
Gross Weight (Gross Mass)		kg	58		58	
Sound Pressure Level (H)		dB(A)	46	46	48	48
Sound Power Level (H)		dB	59	59	61	61
Drawing No.			3D084168		3D084169	

Notes:

■ The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor ; 27°CDB / 19°CWB Outdoor ; 35°CDB	Indoor ; 20°CDB Outdoor ; 7°CDB / 6°CWB	5 m

■ The maximum allowable refrigerant charge amount is 1.34 kg.

Conversion Formulae
kcal/h = kW × 860 Btu/h = kW × 3412 cfm = m³/min × 35.3

50 Hz, 220 - 230 - 240 V

Model	Indoor Unit		FTXZ50NV1B	
	Outdoor Unit		RXZ50NV1B	
			Cooling	Heating
Capacity Rated (Min. ~ Max.)		kW	5.0 (0.6 ~ 5.8)	6.3 (0.6 ~ 9.4)
		Btu/h	17,100 (2,000 ~ 19,400)	21,500 (2,000 ~ 32,000)
		kcal/h	4,300 (520 ~ 4,990)	5,420 (520 ~ 8,080)
Running Current (Rated)		A	5.1 - 4.9 - 4.6	6.5 - 6.2 - 6.0
Power Consumption Rated (Min. ~ Max.)		W	1,100 (110 ~ 1,600)	1,410 (100 ~ 2,640)
Power Factor (Rated)		%	98.0 - 97.6 - 99.6	98.6 - 98.9 - 97.9
COP Rated (Min. ~ Max.)		W/W	4.55 (5.45 ~ 3.63)	4.47 (6.00 ~ 3.55)
Piping Connections	Liquid	mm	ϕ 6.4	
	Gas	mm	ϕ 9.5	
Heat Insulation			Both Liquid and Gas Pipes	
Max. Interunit Piping Length		m	10	
Max. Interunit Height Difference		m	8	
Chargeless		m	10	
Indoor Unit			**FTXZ50NV1B**	
Front Panel Colour			White	
Airflow Rate	H	m³/min (cfm)	15.0 (545)	14.4 (517)
	M		9.2 (326)	10.7 (378)
	L		6.6 (232)	7.7 (274)
	SL		4.6 (164)	5.9 (210)
Fan	Type		Cross Flow Fan	
	Motor Output	W	30	
	Speed	Steps	5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downwards	
Air Filter			Auto cleaning filter	
Running Current (Rated)		A	0.14 - 0.14 - 0.13	0.14 - 0.14 - 0.13
Power Consumption (Rated)		W	30 - 30 - 30	30 - 30 - 30
Power Factor (Rated)		%	97.4 - 93.2 - 96.2	97.4 - 93.2 - 96.2
Temperature Control			Microcomputer Control	
Dimensions (H × W × D)		mm	295 × 798 × 372	
Packaged Dimensions (H × W × D)		mm	434 × 865 × 361	
Weight (Mass)		kg	15	
Gross Weight (Gross Mass)		kg	19	
Sound Pressure Level	H / M / L / SL	dB(A)	47 / 38 / 30 / 23	44 / 38 / 31 / 24
Sound Power Level (H)		dB	60	59
Outdoor Unit			**RXZ50NV1B**	
Casing Colour			Ivory White	
Compressor	Type		Hermetically Sealed Swing Type	
	Model		2YC40DXD	
Refrigerant Oil	Type		FW68DA	
	Charge	L	0.405	
Refrigerant	Type		R-32	
	Charge	kg	1.34	
Airflow Rate	H	m³/min (cfm)	40.4 (1,427)	33.1 (1,170)
	L		22.5 (764)	16.2 (571)
Fan	Type		PZ440	
	Motor Output	W	71	
Running Current (Rated)		A	5.0 - 4.8 - 4.5	6.4 - 6.1 - 5.9
Power Consumption (Rated)		W	1,070	1,380
Power Factor (Rated)		%	97.3 - 96.9 - 99.1	98.0 - 98.4 - 97.5
Starting Current		A	6.2	
Dimensions (H × W × D)		mm	693 × 795 × 300	
Packaged Dimensions (H × W × D)		mm	735 × 926 × 430	
Weight (Mass)		kg	50	
Gross Weight (Gross Mass)		kg	58	
Sound Pressure Level (H)		dB(A)	49	50
Sound Power Level (H)		dB	63	64
Drawing No.			3D084170	

Notes:

■ The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor ; 27°CDB / 19°CWB Outdoor ; 35°CDB	Indoor ; 20°CDB Outdoor ; 7°CDB / 6°CWB	5 m

■ The maximum allowable refrigerant charge amount is 1.34 kg.

Conversion Formulae
kcal/h = kW × 860 Btu/h = kW × 3412 cfm = m³/min × 35.3

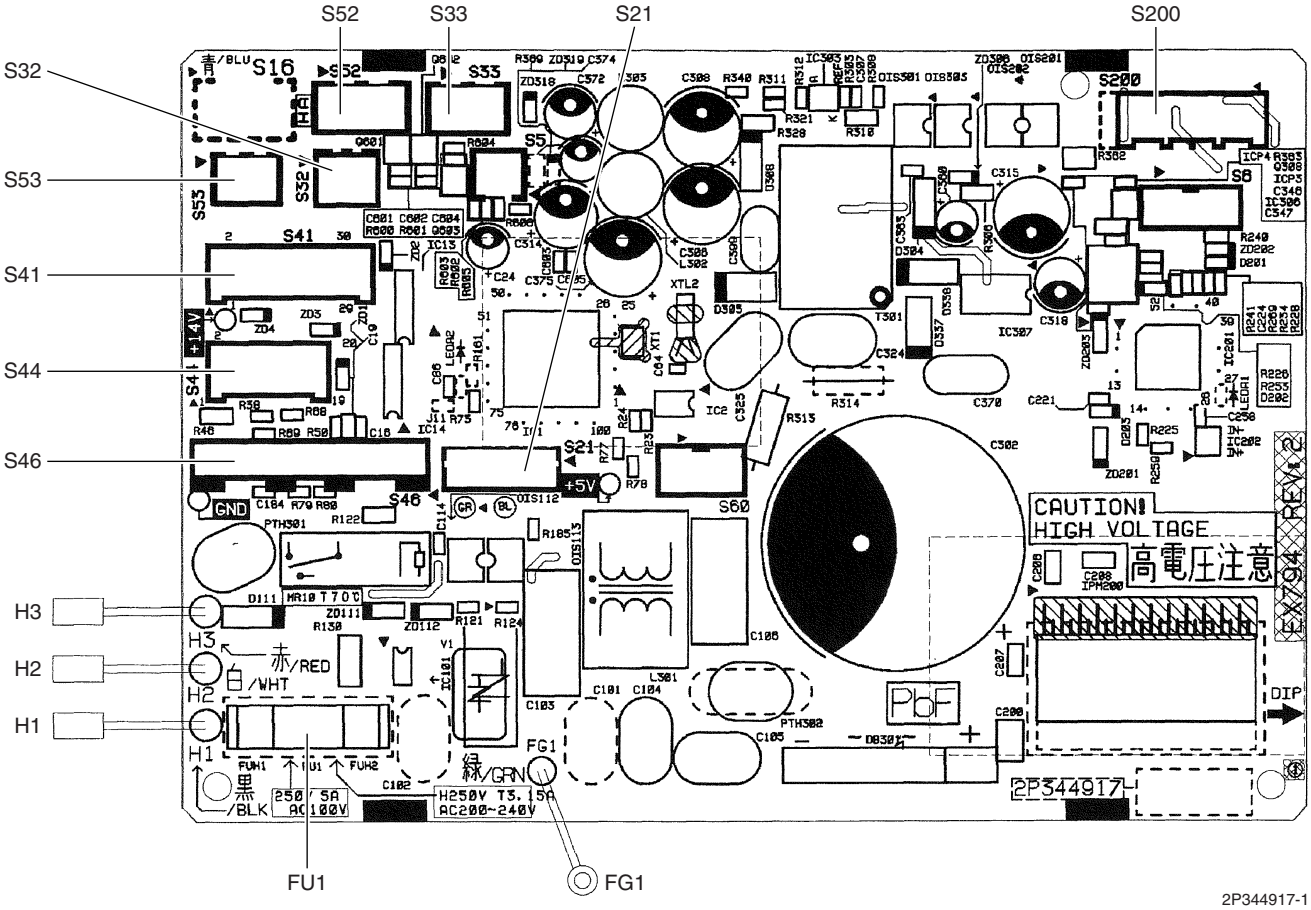
Part 3
Printed Circuit Board Connector Wiring Diagram

1. Indoor Unit

PCB Detail

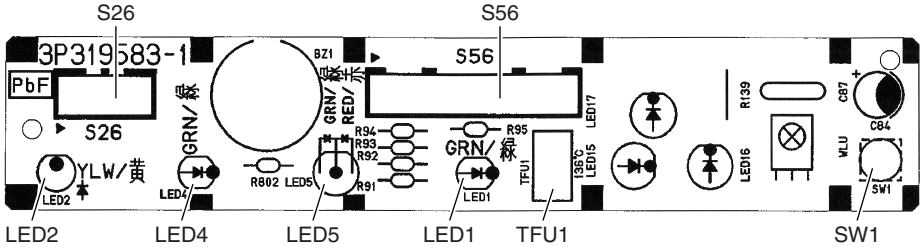
A1P: Control PCB

1)	S21	Connector for centralised control (HA)
2)	S32	Connector for indoor heat exchanger thermistor (R1T)
3)	S33	Connector for humidity sensor PCB (A4P)
4)	S41	Connector for swing motors and humidity sensor PCB (A5P)
5)	S44	Connector for brush motor, filter motors, limit switch for brush
6)	S46	Connector for signal receiver / display PCB (A2P)
7)	S52	Connector for high voltage unit PCB (A3P)
8)	S53	Connector for limit switch for streamer
9)	S200	Connector for fan motor
10)	H1, H2, H3	Connector for terminal board
11)	FG1	Connector for frame ground
12)	FU1 (F1U)	Fuse (3.15 A, 250 V)



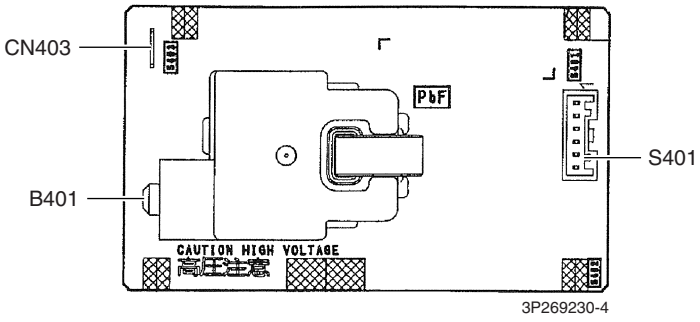
A2P: Signal Receiver / Display PCB

1) S26 Connector for INTELLIGENT EYE sensor PCBs (A6P, A7P)
2) S56 Connector for control PCB (A1P)
3) SW1 (S1W) Forced cooling operation ON/OFF button
4) LED1 (H1P) LED for MOLD PROOF / CLEANING FILTER (green)
5) LED2 (H2P) LED for timer (yellow)
6) LED4 (H4P) LED for operation (green)
7) LED5 (H5P) LED for quick heating timer (red)
8) TFU1 (F1UT) Thermal fuse (136°C)



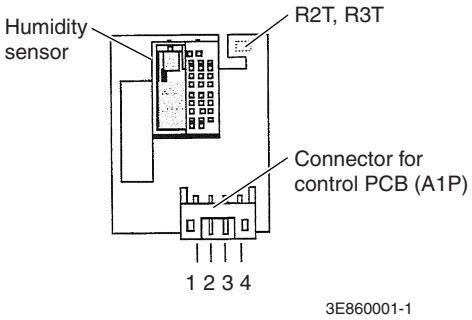
A3P: High Voltage Unit PCB

1) S401 Connector for control PCB (A1P)
2) B401, CN403 Connector for streamer

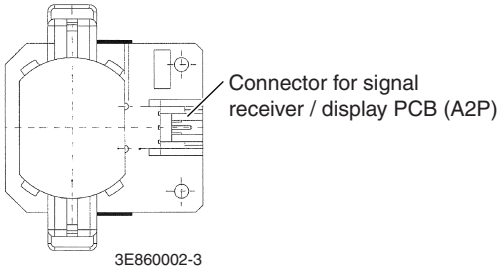


A4P: Humidity Sensor PCB (for room)
A5P: Humidity Sensor PCB (for humidifying)

1) R2T on A4P Room temperature thermistor
2) R3T on A5P Humidifying thermistor



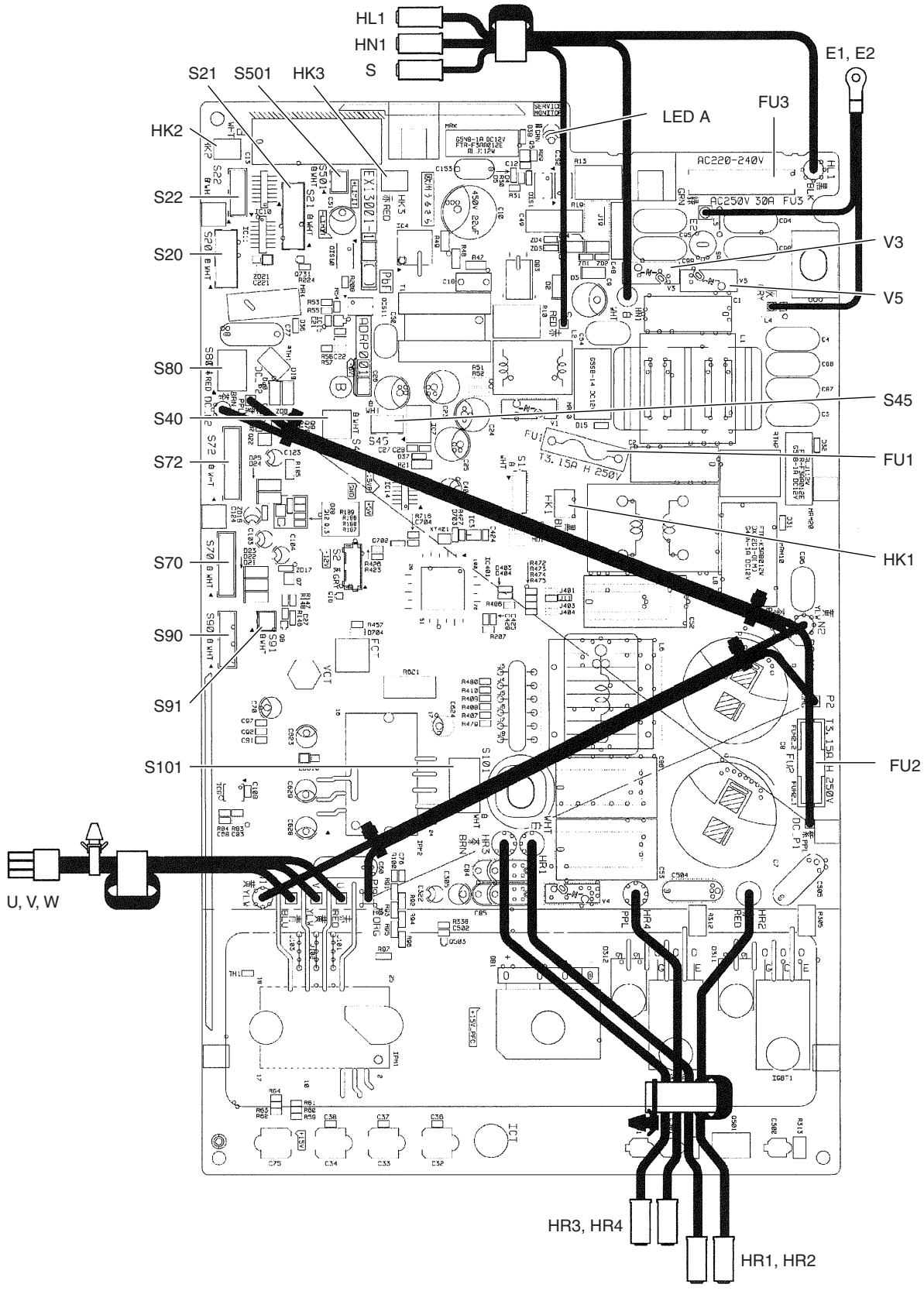
A6P, A7P: INTELLIGENT EYE sensor PCB



2. Outdoor Unit

PCB Detail

1) S20	Connector for electronic expansion valve coil
2) S21	Connector for humidifying rotor motor and humidifying thermistor
3) S22	Connector for damper motor
4) S40	Connector for overload protector
5) S45	Connector for thermal fuse (102°C)
6) S70	Connector for DC fan motor
7) S72	Connector for humidifier fan motor
8) S80	Connector for four way valve coil
9) S90	Connector for thermistors (outdoor temperature, outdoor heat exchanger, discharge pipe)
10) S91	Connector for liquid pipe thermistor
11) S101	Connector for humidifying heater
12) S501	Connector for limit switch
13) HR1, HR2, HR3, HR4	Connector for reactor
14) HK1, HK2, HK3	Connector for hygroscopic fan motor
15) HL1, HN1, S	Connector for terminal board
16) E1, E2	Connector for earth wire
17) U, V, W	Connector for compressor
18) FU1, FU2	Fuse (3.15 A, 250 V)
19) FU3	Fuse (30 A, 250 V)
20) V3, V5	Varistor
21) LED A	LED for service monitor (green)


HL1
HN1
S
E1, E2
S21
S501
HK3
FU3
LED A
HK2
S22
S20
V3
V5
S80
S45
S40
FU1
S72
HK1
S70
S90
S91
S101
FU2
U, V, W
HR3, HR4
HR1, HR2
2P345585-2

Part 4
Function and Control

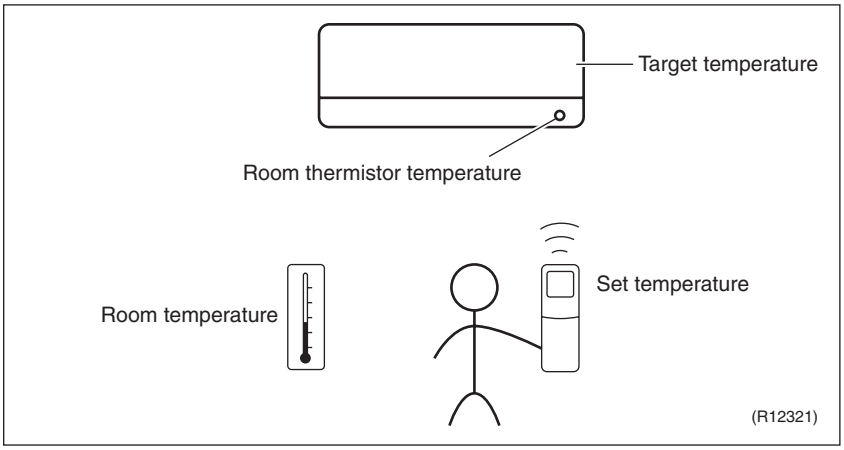
1. Main Functions

1.1 Temperature Control

Definitions of Temperatures

The definitions of temperatures are classified as following.

- Room temperature: temperature of lower part of the room
- Set temperature: temperature set by remote controller
- Room thermistor temperature: temperature detected by room temperature thermistor
- Target temperature: temperature determined by microcomputer



Temperature Control

The temperature of the room is detected by the room temperature thermistor. However, there is a difference between the temperature detected by room temperature thermistor and the temperature of lower part of the room, depending on the type of the indoor unit or installation condition. Practically, the temperature control is done by the target temperature appropriately adjusted for the indoor unit and the temperature detected by room temperature thermistor.

1.2 Frequency Principle

Main Control Parameters

The frequency of the compressor is controlled by the following 2 parameters:

- The load condition of the operating indoor unit
- The difference between the room thermistor temperature and the target temperature

Additional Control Parameters

The target frequency is adapted by additional parameters in the following cases:

- Frequency restrictions
- Initial settings
- Forced cooling operation

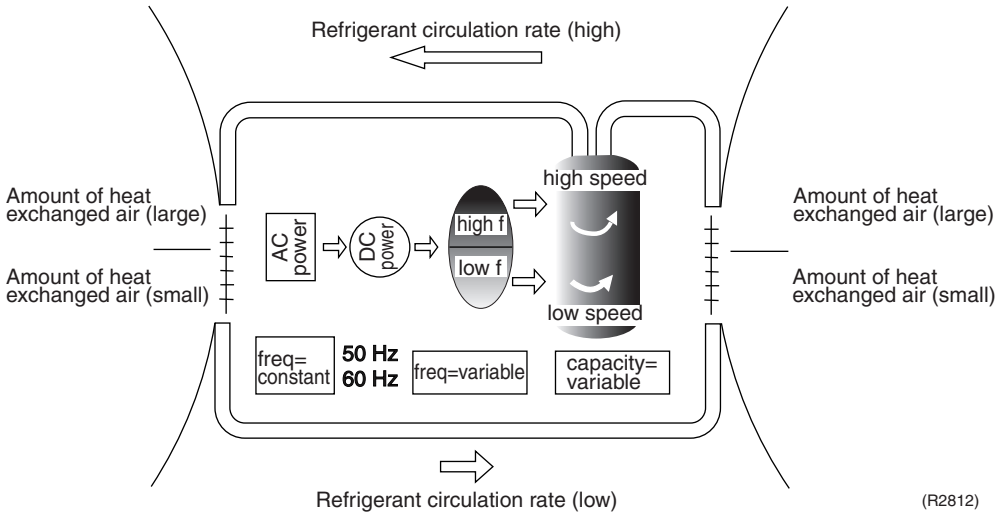
Inverter Principle

To regulate the capacity, a frequency control is needed. The inverter makes it possible to vary the rotation speed of the compressor. The following table explains the conversion principle:

Phase	Description
1	The supplied AC power source is converted into the DC power source for the present.
2	The DC power source is reconverted into the three phase AC power source with variable frequency. ■ When the frequency increases, the rotation speed of the compressor increases resulting in an increase of refrigerant circulation. This leads to a larger amount of heat exchange per unit. ■ When the frequency decreases, the rotation speed of the compressor decreases resulting in a decrease of refrigerant circulation. This leads to a smaller amount of heat exchange per unit.

Drawing of Inverter

The following drawing shows a schematic view of the inverter principle:



Inverter Features

The inverter provides the following features:

- The regulating capacity can be changed according to the changes in the outdoor temperature and cooling / heating load.
- Quick heating and quick cooling
  The rotation speed of the compressor is increased when starting the heating (or cooling). This enables to reach the set temperature quickly.
- Even during extreme cold weather, the high capacity is achieved. It is maintained even when the outdoor temperature is 2°C.
- Comfortable air conditioning
  A fine adjustment is integrated to keep the room temperature constant.
- Energy saving heating and cooling
  Once the set temperature is reached, the energy saving operation enables to maintain the room temperature at low power.

Frequency Limits

The following functions regulate the minimum and maximum frequency:

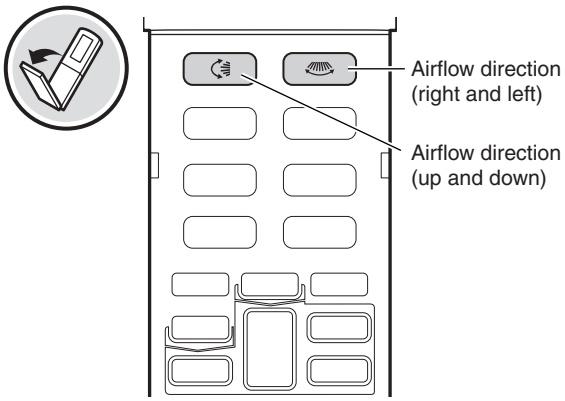
Frequency	Functions
Low	■ Four way valve operation compensation. Refer to page 46.
High	■ Compressor protection function. Refer to page 47. ■ Discharge pipe temperature control. Refer to page 48. ■ Input current control. Refer to page 49. ■ Freeze-up protection control. Refer to page 50. ■ Heating peak-cut control. Refer to page 50. ■ Defrost control. Refer to page 53.

Forced Cooling Operation

Refer to page 192 for details.

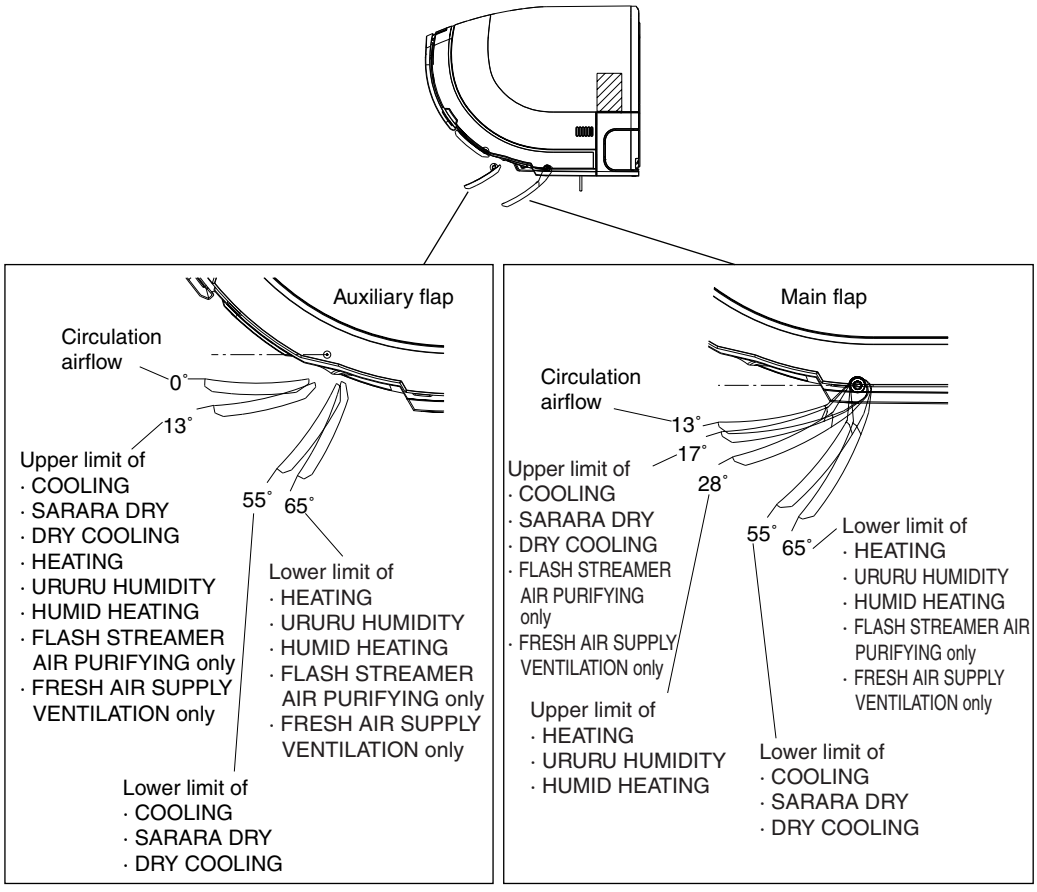
1.3 Airflow Direction Control

Operation



* Refer to the operation manual for details.

1.3.1 Auto-Swing



1.3.2 Room Shape and Installation Position

Airflow direction is properly controlled by setting the room shape and installation position of the indoor unit in the SET UP menu of the remote controller.
The angle of the flap will be set facing higher than the default setting when the room shape is set to horizontal.
Refer to the operation manual for details.

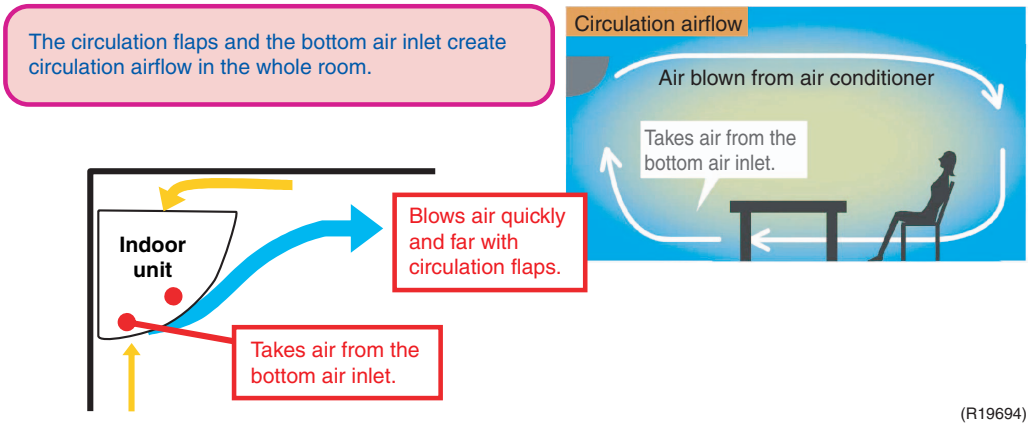
When **Circulate setting** is set to **Low** in the service setting menu of the remote controller, the flap position for oblong room setting is about the same as for horizontal room setting.
Refer to page 194.

1.3.3 Circulation Airflow, BREEZE Airflow, Comfort Airflow

Outline

- As the auxiliary flap turns the airflow toward the ceiling, it sends the air far in cooling operation, or stirs the warm air near the ceiling in heating operation, to resolve the temperature unevenness not only horizontally but also vertically.
- The flaps are set facing higher than the usual position, so as to turn the airflow toward the ceiling.

■ Circulation Airflow



(R19694)

■ BREEZE Airflow

- When the up/down airflow direction is set to **BREEZE**, BREEZE airflow starts generating breeze-like airflow.
- There are several patterns of swinging main flap (lower) and auxiliary flap (upper) with intervals. These patterns appear in random order.
- While according to the set airflow rate, fan speed is slightly changed from the set airflow rate by a random amount in order to simulate natural wind.
- The range of airflow rate fluctuation can be changed as preferred (**Auto, Low**) with the remote controller.

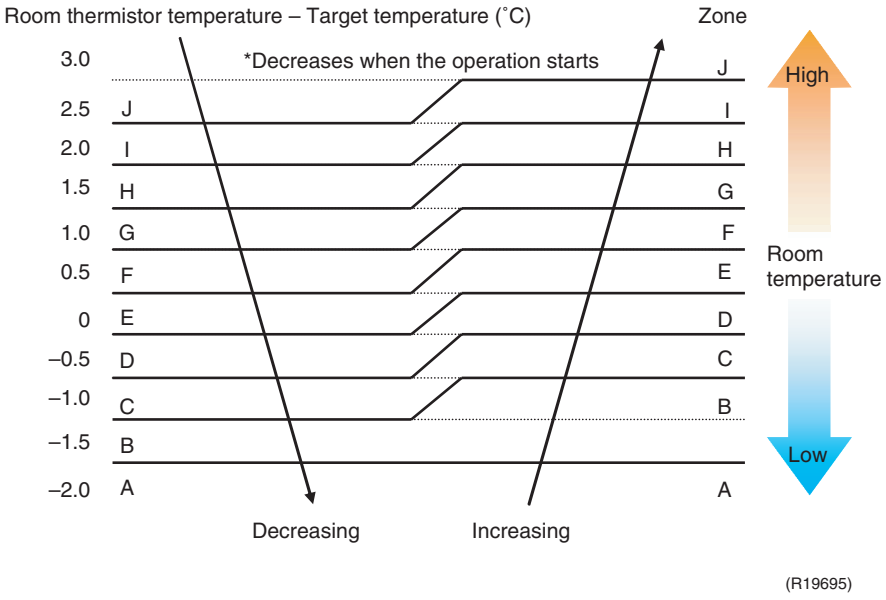
■ Comfort Airflow

- Comfort airflow adjusts the airflow direction to avoid directly blowing at a person.
- Refer to 3-Area INTELLIGENT EYE Operation on page 31 for details.

Detail

■ COOLING, DRY COOLING

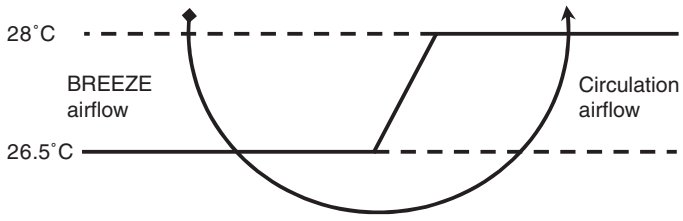
- When the up/down airflow direction is set to **Circulation**, circulation airflow starts.
- When the up/down airflow direction is set to **AUTO**, operation starts in circulation airflow, then switches to BREEZE airflow when the room temperature becomes stable.
- Once it switches to BREEZE airflow, it does not switch back to circulation airflow.
- When you want to switch back to circulation airflow, set the up/down airflow direction to **AUTO** again.
- Circulation airflow switches to BREEZE airflow when the conditions below continue for 10 minutes.
  (1) Thermostat off
  OR
  (2) Temperature difference is in the range of zone E or lower.



(R19695)

■ SARARA DRY

- When the up/down airflow direction is set to **Circulation**, circulation airflow starts.
- When the up/down airflow direction is set to **AUTO**, operation starts in circulation airflow, then switches to BREEZE airflow when the room temperature becomes stable.

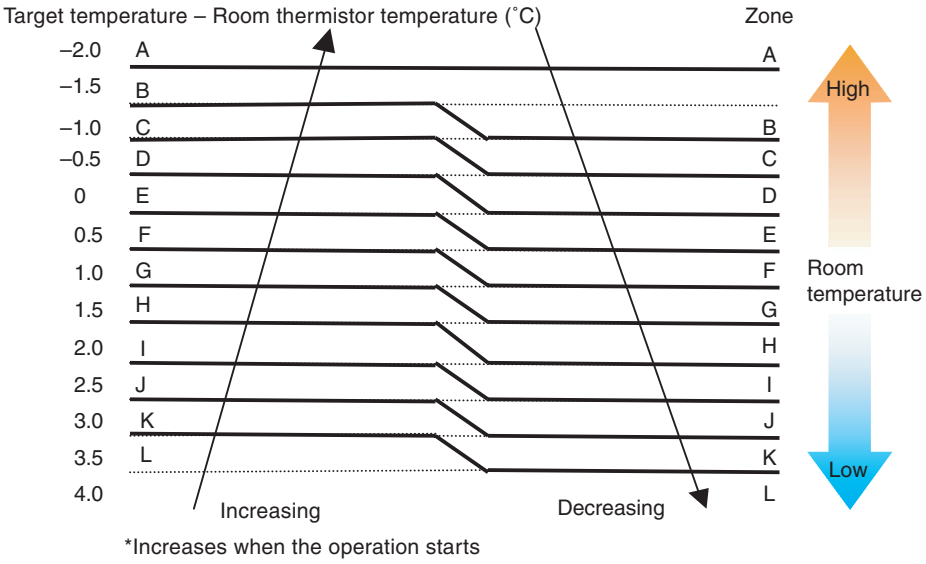


(R20201)

■ HEATING, HUMID HEATING

When the up/down airflow direction is set to **AUTO**, if the room temperature is within the zone A - E, circulation airflow starts. If the room temperature is within the zone F - L, comfort airflow starts.
Comfort airflow starts after operating in circulation airflow for 1 minute.
Operation is shifted from comfort airflow to circulation airflow when the conditions below continue for 5 minutes.

Zone	A ~ E
Compressor frequency	22 Hz or lower



■ URURU HUMIDIFY

When the up/down airflow direction is set to **AUTO**, circulation airflow starts.

1.4 Fan Speed Control for Indoor Unit

Outline

Phase control and fan speed control contains 9 steps: LLL, LL, SL, L, ML, M, MH, H, and HH. The airflow rate can be automatically controlled depending on the difference between the room thermistor temperature and the target temperature.

Automatic Fan Speed Control

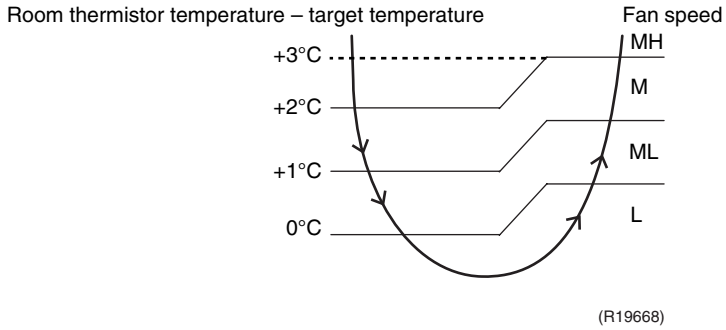
In automatic fan speed operation, the step SL is not available.

Step	Cooling	Heating
LLL		
LL		
L		
ML		
M		
MH		
H		
HH (POWERFUL)	(R11681)	(R6834)

⟺ = The airflow rate is automatically controlled within this range when the **FAN** button is set to automatic.

<Cooling>

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



<Heating>

In heating operation, the fan speed is regulated according to the indoor heat exchanger temperature and the difference between the room thermistor temperature and the target temperature.

Indoor Unit Quiet Operation

Forced dropping of the fan tap decreases the airflow rate and reduces airflow noise. (Noise is reduced by about 3 dB as compared to that in L tap.)

Note

- Airflow rate can not be set.
- Since the performance is lowered as compared to that in normal operation (70% under rated conditions), the room may not be cooled or heated when this operation is used for a long time.
- Indoor unit quiet operation is kept in memory even when the power supply is turned OFF. The indication remains on the display of the wireless remote controller and the indoor unit quiet operation works when the power is turned ON again.

1.5 Thermostat Control

Outline

Thermostat control is based on the difference between the room thermistor temperature and the target temperature.

Detail

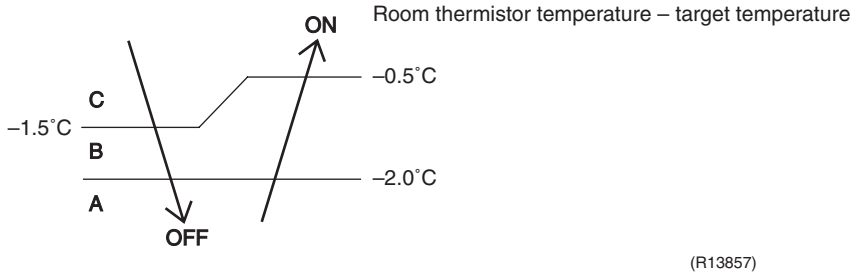
Thermostat OFF Condition

- The temperature difference is in the zone A.

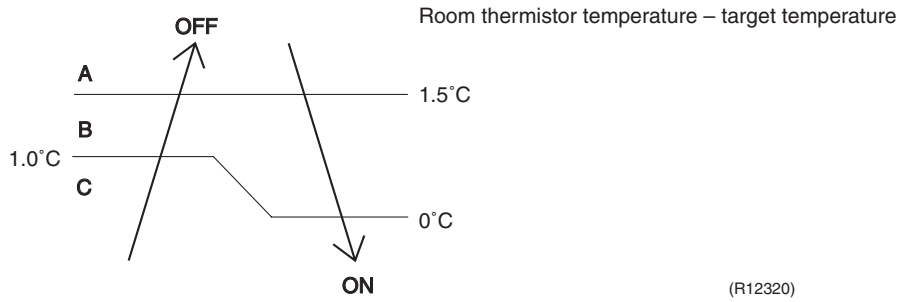
Thermostat ON Conditions

- The temperature difference returns to the zone C after being in the zone A.
- The system resumes from defrost control in any zones except A.
- The operation turns on in any zones except A.
- The monitoring time has passed while the temperature difference is in the zone B. (Cooling : 10 minutes, Heating : 10 seconds)

<Cooling>



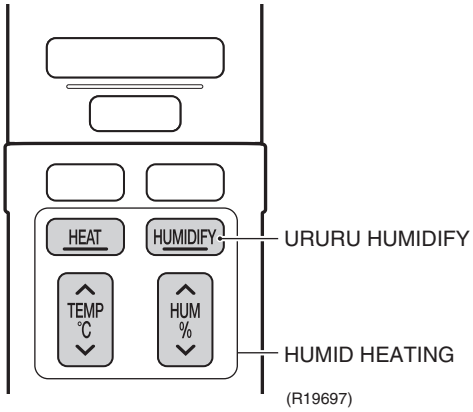
<Heating>



Refer to Temperature Control on page 12 for details.

1.6 URURU HUMIDIFY / HUMID HEATING Operation

Operation



(R19697)

* Refer to the operation manual for details.

Features

■ **Humidifying method**

Moisture is taken from the outdoor air with the hygroscopic element mounted in outdoor unit, and sent to indoor. This has enabled powerful and speedy humidification.

(R13859)

■ **The room is uniformly humidified.**

- Humidifier + heating operation by air conditioner
  Moisture gathers around the ceiling, as it is lighter than the air even if the humidifier is operated. The air on the floor is kept dry.

When using humidifier, moisture gathers around the ceiling.

(R3325)

- URURU HUMIDIFY operation
  This air conditioner enables uniformly humidifying the room by circulating moisture with warm air.

The room is uniformly humidified.

(R3326)

■ **Powerful humidifying ability**

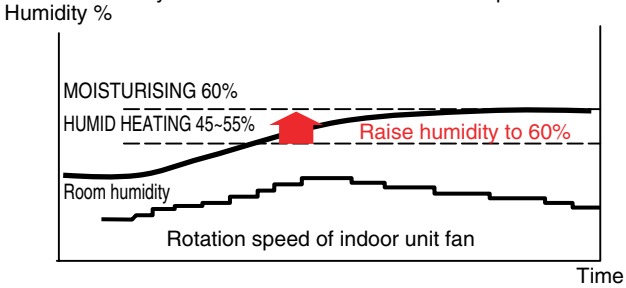
Model	25 class	35 class	50 class
Humidifying capacity	425 ml/h	500 ml/h	600 ml/h

The values above are measured at 7°C DB / 6°C WB of outdoor air and with 4 m of humidifying hose length.

■ **No need for water supply nor cleaning**
Water supply and cleaning are unnecessary as it does not have water tank, unlike humidifiers, and there is no proliferations of bacteria.

■ **Humidity control**
The target of the humidity level is 40 to 50%RH.
You can select from **LOW**, **STD** (standard), **HI** (high), **CONT** (continuous), and **MOISTURISING**. The target humidity cannot be set by %.

<Humidity in HEATING / HUMID HEATING operation>



- MOISTURISING setting keeps the humidity 60%.
- Air is moisturised more than ordinary HUMID HEATING.

(R19670)

Note

■ When the outdoor temperature and humidity are low, the humidifying capacity is decreased. In addition, the moisture in the room may not attain sufficient humidity when the ventilation volume is high, the preset temperature is high, or the preset humidity is high.

■ After the HUMID HEATING operation starts, the relative humidity in the room lowers temporarily. This phenomenon is caused by the increase of the saturation water vapour. Therefore, the humidity raises gradually after the temperature reaches the preset temperature.

■ In the humidifying operation, the operation sound increases by about 2 dB both in the indoor unit and outdoor unit. (When the airflow rate is in L or SL, the operation sound increases by about 3 dB in the indoor unit.)

■ This system does not suppose the storage of musical instruments or the like.

Conditions for Humidifying Operation

While heating mode, humidifying operation can be available when the following conditions 1 ~ 5 are met at the same time.

1. Indoor heat exchanger temperature is 12°C or more.
2. Outdoor temperature is from –10°C to 24°C (meanwhile, in trial operation, up to 34°C is possible). Humidifying operation does not work under –10°C.
3. Approximately 1 minute has already passed after heating operation startup. (See Note.)
4. Heating operation does not work to its full capacity. (Meanwhile, the continuous humidification is selected, humidifying operation has the priority.)
5. Room humidity is under 70%RH.

Note Exclude the case when it is recovered from thermostat-off or when the defrost operation finished.

How to Check the Motion of Humidifying Operation

You can check whether the humidifier unit is in good working order. If you conduct humidifying trial operation, you can check even beyond the range of the normal conditions for humidifying operation.

1. Hygroscopic fan ..... Check if air is exhaled from the front outlet of the humidifier unit.
2. Humidifying fan / heater / damper ..... Check if warm air is blown from the duct of outdoor unit.
3. Humidifying rotor ..... Check if the rotor is rotating with the top panel off.

As for the performance, estimate from psychrometric chart with the measured temperature and humidity of the outdoor air and of the humidified air (in front of the indoor outlet) using thermal hygrometer.

Humidity Fluctuation by Temperature Settings

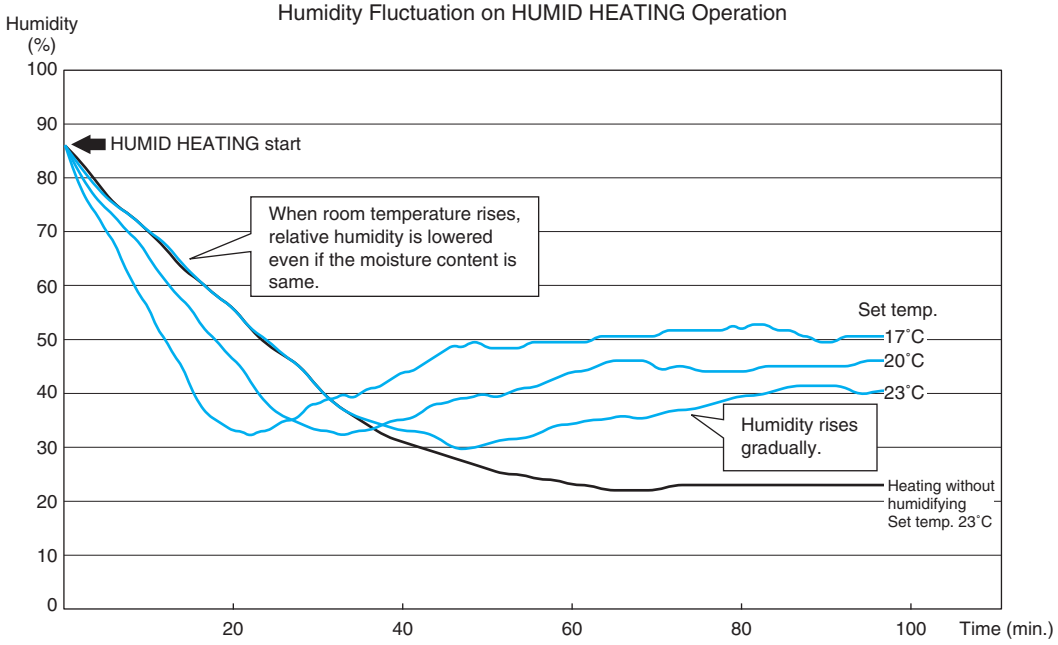
At HUMID HEATING operation, as room temperature rises, relative humidity is temporarily lowered. This is because as room temperature rises, relative humidity is lowered even if the moisture content is the same.

e.g.) The rise in the room temperature from 15°C to 25°C results in the fall in humidity from 40%RH to about 22%RH.

As humidifying operation starts concurrently with heating, humidity rises gradually as shown in the figure below.

Some room conditions (room size, ventilation frequency, number of residents, etc.) and set temperature (higher temperature) may result in unsatisfactory humidity.

Humidity Fluctuation on HUMID HEATING Operation

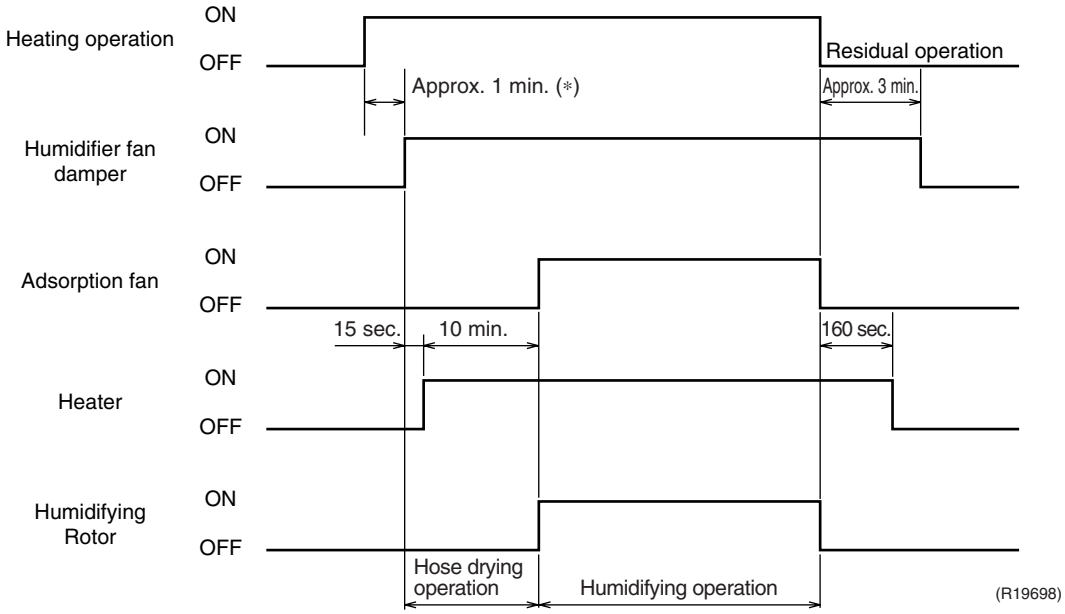


Measurement conditions
- Outdoor temp.: 7˚C
- Humidity setting: CONT (continuous)
- Airflow rate setting: H tap
- Area of the room: 26.4 m²
- Humidifying hose length: 7.5 m
- Ventilation rate: 0.75 times/hour
  - 0.5 times of natural ventilation
  - 0.25 times of humidity absorption by a carpet, a curtain, etc.

(R13861)

Time chart for humidifying operation control

Approximately 1 minute after heating operation starts, hose drying operation starts and blows the warmed air into the room at a strong airflow rate, then humidifying operation starts.



* Humidifying only operation has no 1 minute delay.

Hose drying operation

To prevent dew condensation in the humidifying hose, the hose drying operation may start when the change in the discharge temperature and humidity of the humidified air cannot be detected.
Discharge temperature of the humidified air and the rotation speed of the humidifying rotor are detected every 90 seconds.
The discharge temperature and humidity of the humidified air are recorded if the following conditions are met.

- The discharge temperature of the humidified air is lower than 28°C.

AND

- The rotation speed of the humidifying rotor is higher than the previous record.

The system extracts the highest and the lowest values of the temperature and humidity of the humidified air from the latest record and past 6 data.
When the following conditions are met, the system judges there is no change and starts the hose drying operation.

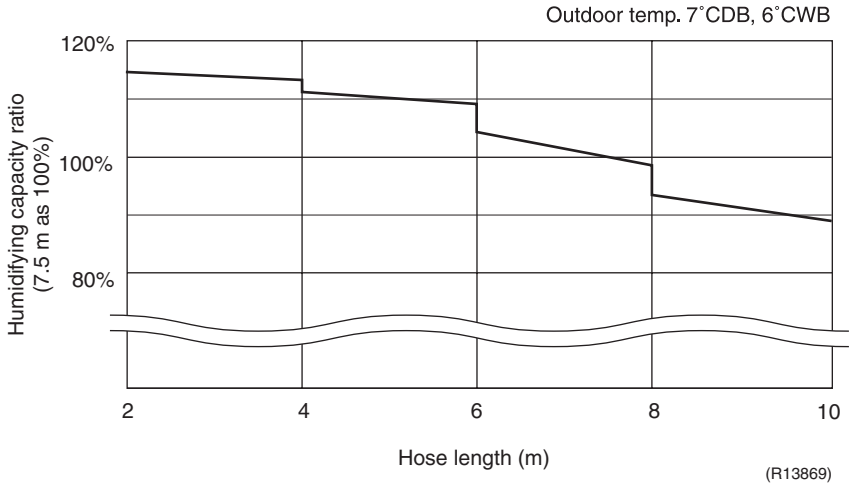
- The difference between the maximum and minimum discharge temperature of the humidified air is less than 2°C.

AND

- The difference between the maximum and minimum humidity of the humidified air is less than 3%.

Performance correction by hose length

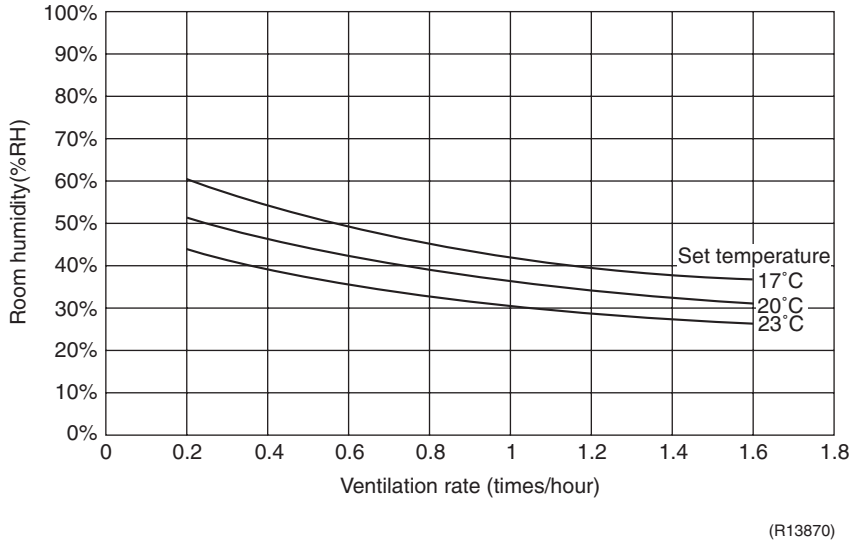
The maximum piping length is set to 10 m, but the humidifying capacity varies with the length of the humidifying hose.
When the hose length increases by 2 m, the humidifying capacity decreases by about 10%.



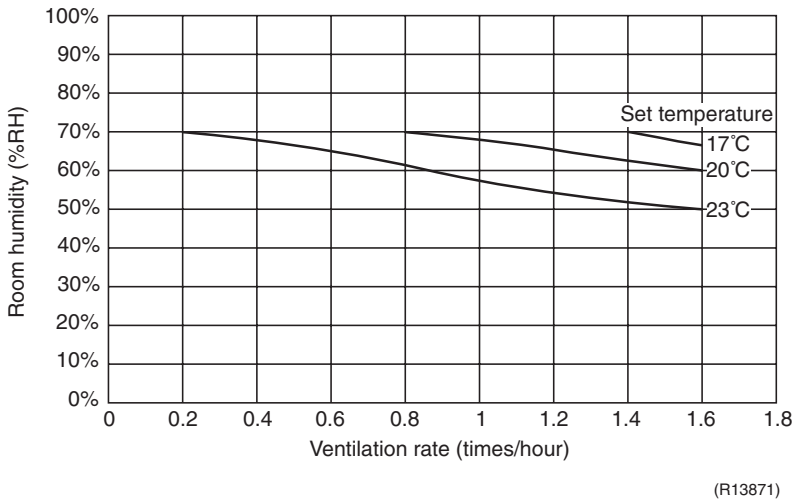
Reference

■ **Room humidity (humidity of the discharged air) by ventilation rate (16 m², hose length: 4 m, 25 class)**

1. Outdoor temp. 0°CDB, 50%RH

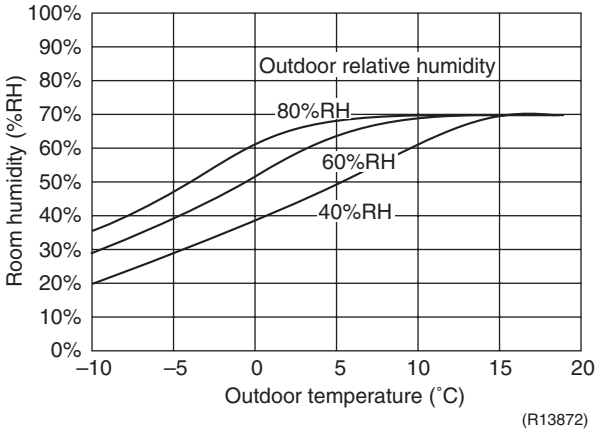


2. Outdoor temp. 7°CDB, 87%RH

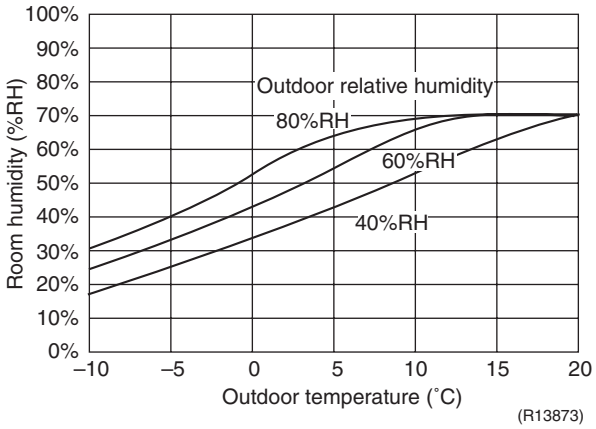


■ **Room humidity (humidity of the discharged air) by outdoor temperature (16 m², hose length: 4 m, ventilation rate: 0.75 times/hour, 25 class)**

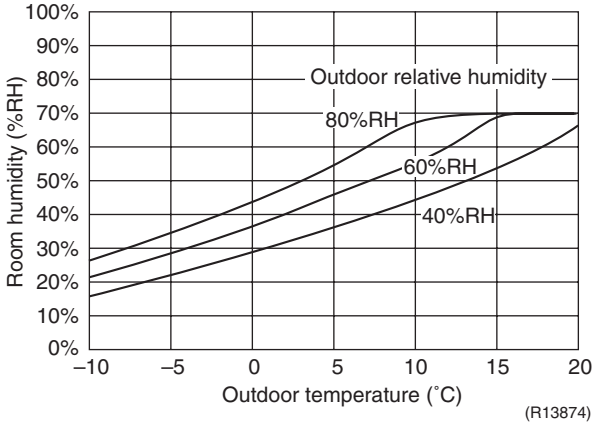
1. Room temp. 17°CDB



2. Room temp. 20°CDB

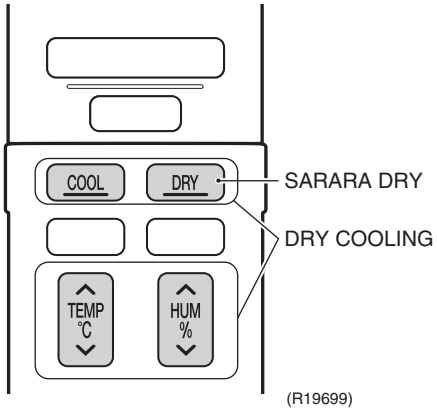


3. Room temp. 23°CDB



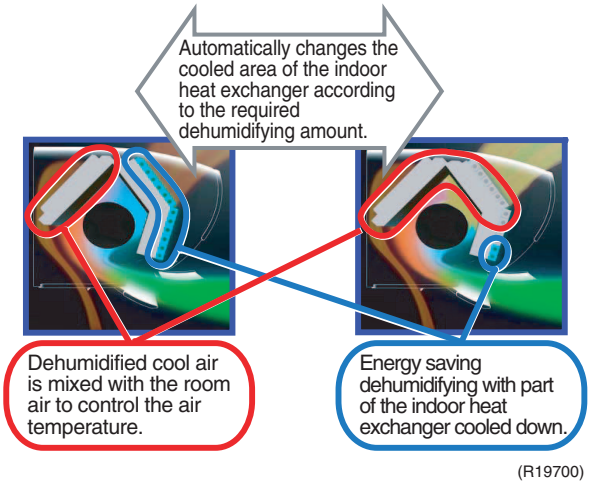
1.7 SARARA DRY / DRY COOLING Operation

Operation



* Refer to the operation manual for details.

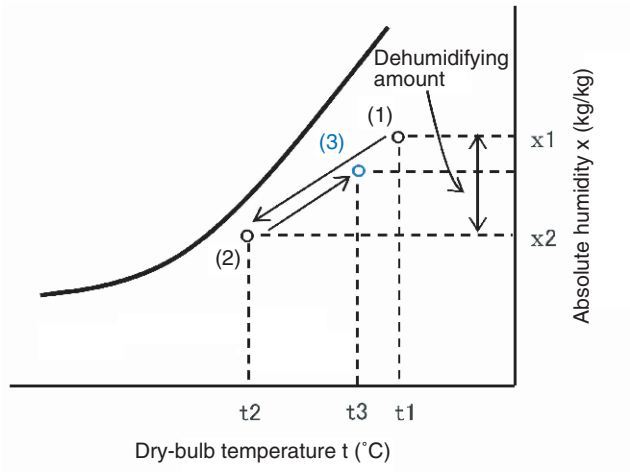
Features of SARARA DRY



Energy saving dehumidifying is realised by cooling down the part of the indoor heat exchanger. Dehumidified cool air is mixed with the room air to be near room temperature and blown into the room. The area of indoor heat exchanger used for dehumidifying is automatically controlled according to the required dehumidifying amount. The larger/smaller the required dehumidifying amount, the larger/smaller the heat exchange area.

Note When the required dehumidifying amount is large, the amount of room air mixed with dehumidified cool air is small. Therefore, the room temperature drops according to the decrease of the discharge air temperature.

Explanation of SARARA DRY Operation with Psychrometric Chart



(R19701)

(1) Suction air
(2) Suction air (the air passing through the cooled part of indoor heat exchanger) is dehumidified.
(3) Dehumidified air is mixed with the room air.

■ Dehumidifying amount

Effective airflow rate changes according to the required dehumidifying amount. The larger the required dehumidifying amount is, the larger the effective airflow rate becomes. Although the difference of absolute humidity is constant, the dehumidifying amount increases.

■ Discharge air temperature

The amount of room air to be mixed with dehumidified air changes according to the required dehumidifying amount. The larger the required dehumidifying amount is, the larger the effective airflow rate for dehumidifying becomes. Consequently, the available volume of room air to be mixed and the discharge air temperature also decrease.

Reference Data for SARARA DRY Operation

Sensible heat	Dehumidifying amount	Discharge air temperature (difference from suction air temperature)
300 W (300 W ~ 1,050 W)	230 cc (230 cc ~ 1,000 cc)	–2°C (–2°C ~ –8°C)

<Condition>
Room temperature: 24°CDB, 60%RH(18.5°CWB)
Outdoor temperature: 24°CDB, 80%RH(21.5°CWB)

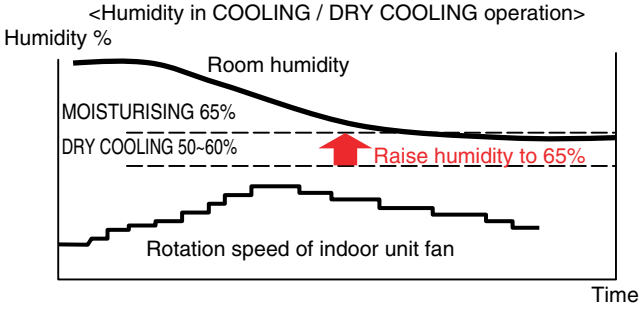
Note

- The larger the required dehumidifying amount is, the more the sensible heat increases, and the discharge air temperature decreases.
- The smaller the air conditioning sensible heat load is, the lower the room temperature drops.
- The drop of room temperature after operation start is within 3 degrees as SARARA DRY operation has a thermostat off point.

MOISTURISING Setting

■ You can select from **HI** (high), **STD** (standard), **LOW**, **CONT** (continuous), and **MOISTURISING**. The target humidity cannot be set by %.

<Humidity in COOLING / DRY COOLING operation>

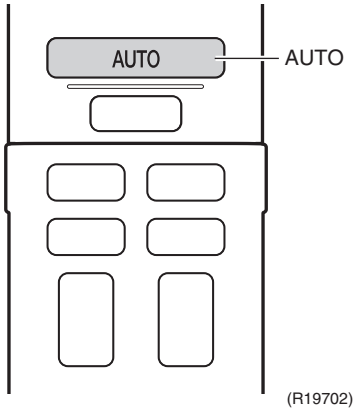


- MOISTURISING setting keeps the humidity 65%.
- Being unlike ordinary DRY COOLING, it prevents the room from drying.

(R19669)

1.8 AUTO Operation

Operation



* Refer to the operation manual for details.

Outline

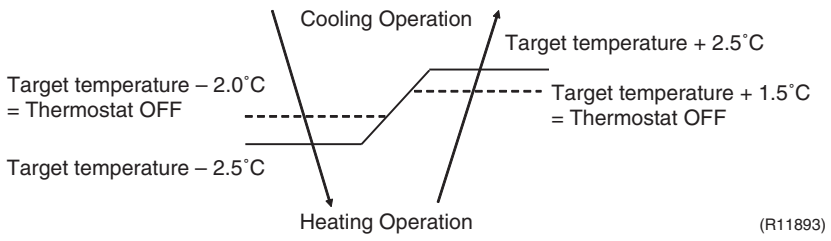
Automatic Cooling / Heating Function

When the AUTO operation is selected with the remote controller, the microcomputer automatically determines the operation mode as cooling or heating according to the room temperature and the set temperature at start-up.
The unit automatically switches the operation mode to maintain the room temperature at the set temperature.

Detail

Ts: set temperature (set by remote controller)
Tt: target temperature (determined by microcomputer)
Tr: room thermistor temperature (detected by room temperature thermistor)
C: correction value

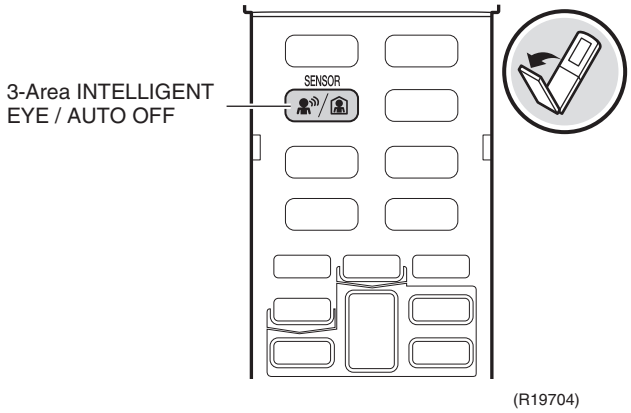
1. The set temperature (Ts) determines the target temperature (Tt).
   (Ts = 18 ~ 30°C).
2. The target temperature (Tt) is calculated as;
   Tt = Ts + C
   where C is the correction value.
   C = 0°C
3. Thermostat ON/OFF point and operation mode switching point are as follows.
   Tr means the room thermistor temperature.
   (1) Heating → Cooling switching point:
   Tr ≥ Tt + 2.5°C
   (2) Cooling → Heating switching point:
   Tr < Tt – 2.5°C
   (3) Thermostat ON/OFF point is the same as the ON/OFF point of cooling or heating operation.
4. During initial operation
   Tr ≥ Ts: Cooling operation
   Tr < Ts: Heating operation



Ex: When the target temperature is 25°C
Cooling → 23.0°C: Thermostat OFF → 22.0°C: Switch to heating
Heating → 26.5°C: Thermostat OFF → 27.5°C: Switch to cooling

1.9 Sensor Operation

Operation

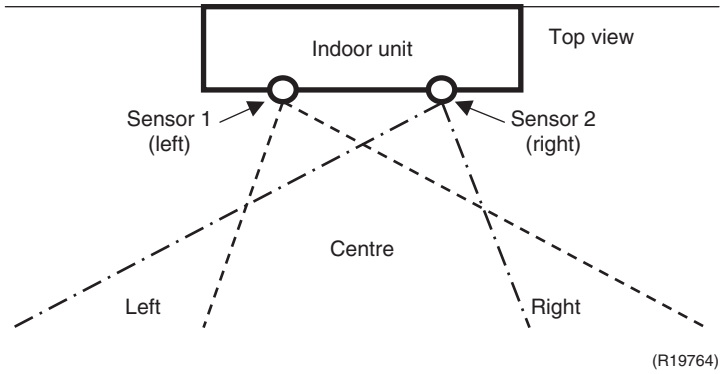


∗ Refer to the operation manual for details.

1.9.1 3-Area INTELLIGENT EYE Operation

Outline

The 2 INTELLIGENT EYE sensors detect the presence of the user by dividing the room (sensor range) into 3 areas, to decide whether to blow air directly at or to avoid a person.
The 2 INTELLIGENT EYE sensors judge whether there is a person according to the signals from the 2 sensors for 3 areas (left, centre, right).



Detail

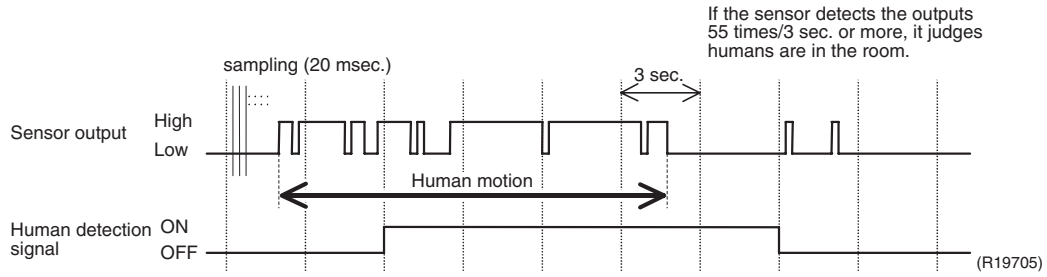
■ **Comfort or Focus**

Comfort or **Focus** can be selected in remote controller.
Comfort: Adjusts the airflow direction to avoid directly blowing at a person.
Focus: Adjusts the airflow direction to directly blow at a person.

Flap movement
(1) When **Comfort** is set and the INTELLIGENT EYE sensor detects a person
- Horizontal flap: It blows air downward in heating operation, upward in cooling operation.
- Vertical flap: It adjusts the airflow to avoid directly blowing at a person.

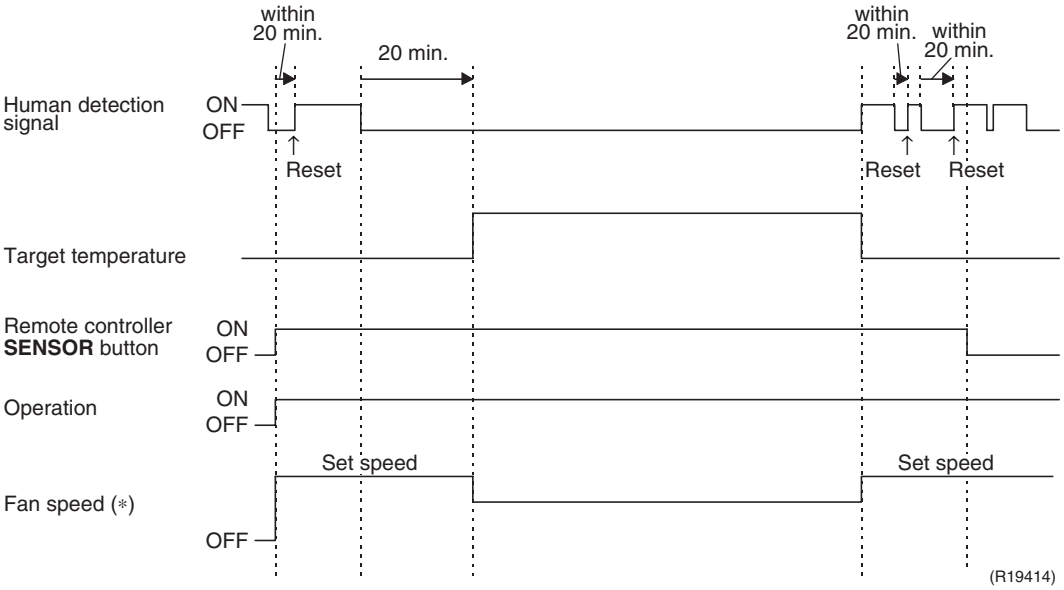
(2) When **Focus** is set and the INTELLIGENT EYE sensor detects a person
- Horizontal flap: It adjusts the airflow direction so that the maximum airflow rate is achieved.
- Vertical flap: It blows air to directly blow at a person.

■ **Detection Method**



- The sensor detects human motion by receiving infrared rays and displays the pulse wave output.
- The microcomputer in the indoor unit carries out a sampling every 20 msec. and if it detects 55 cycles of the wave in 3 seconds in total, it judges humans are in the room as the motion signal is ON.
- The sensor may detect human motion with up to 20 msec latency.

■ **Ex. Cooling**



* In FAN operation, the fan speed is reduced by 100 rpm.
- When the microcomputer does not have a signal from the sensor in 20 minutes, it judges that nobody is in the room and operates the unit at a temperature shifted from the target temperature. (Cooling: 1 ~ 2°C higher, Heating: 2°C lower.)

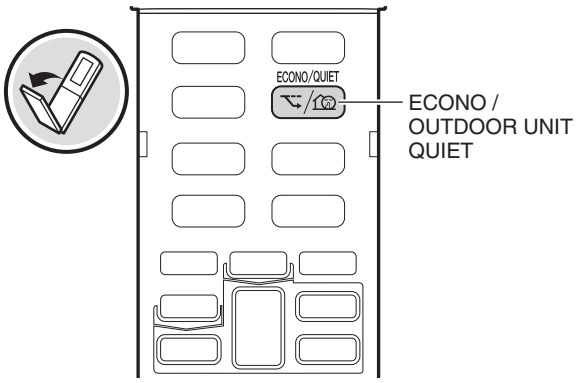
Note For dry operation, you cannot set the temperature with a remote controller, but the target temperature is shifted internally.

1.9.2 AUTO OFF Operation

- When the INTELLIGENT EYE sensor judges that there is no one in the room, the set temperature is shifted by +2°C in COOLING / –2°C in HEATING operation. When the set time elapses with no change in the condition, the air conditioner automatically stops the operation.
- If **INTELLIGENT EYE** is off and **AUTO OFF** is on, the operation stops after the set period of time.

1.10 ECONO / OUTDOOR UNIT QUIET Operation

Operation

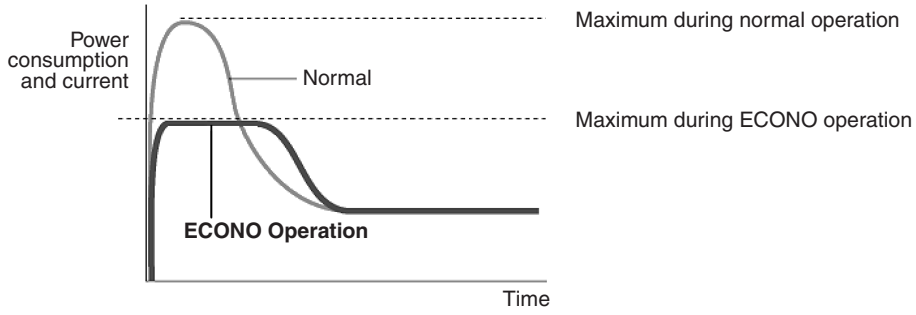


(R19706)

* Refer to the operation manual for details.

1.10.1 ECONO Operation

- ECONO operation reduces the maximum operating current and the power consumption. This operation is particularly convenient for energy-saving-oriented users. It is also a major bonus for those whose breaker capacities do not allow the use of multiple electrical devices and air conditioners.
- When this function is activated, the maximum capacity also decreases.
- ECONO operation can be available when the unit is running.
- ECONO operation and POWERFUL operation cannot be used at the same time. The latest command has the priority.



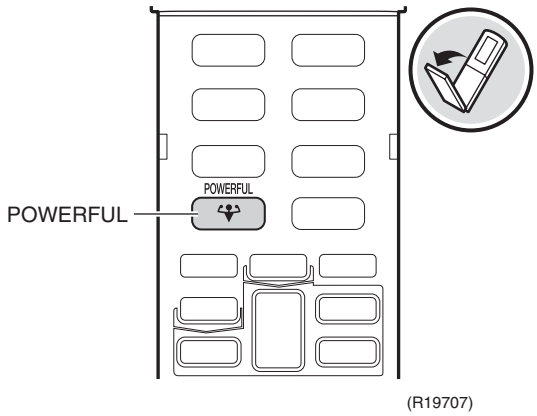
(R9288)

1.10.2 OUTDOOR UNIT QUIET Operation

- OUTDOOR UNIT QUIET operation lowers the noise level of the outdoor unit by changing the frequency and fan speed on the outdoor unit. This function is useful when you need to consider minimising noise in your neighbourhood, such as during the night.
- OUTDOOR UNIT QUIET operation and POWERFUL operation cannot be used at the same time. The latest command has the priority.

1.11 POWERFUL Operation

Operation



(R19707)

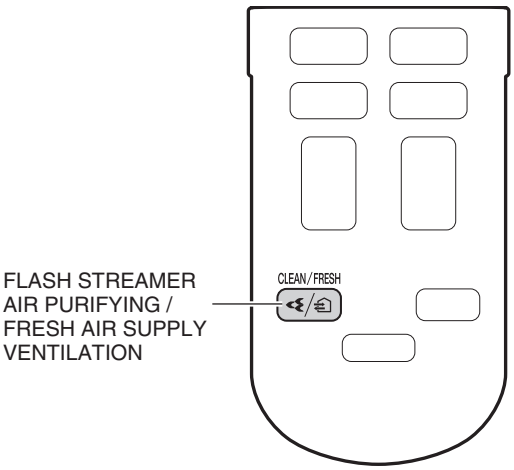
* Refer to the operation manual for details.

Features

- Operating sound becomes slightly loud.
- It is impossible to change the airflow rate, temperature, and humidity.
- The airflow rate and the compressor rotating speed are increased from the normal operation for 20 minutes. Normal operation resumes automatically in 20 minutes.
- During POWERFUL operation, fan rotates at H tap + 80 rpm.

1.12 Air Purifying and Ventilation

Operation



(R19708)

* Refer to the operation manual for details.

1.12.1 FLASH STREAMER AIR PURIFYING Operation

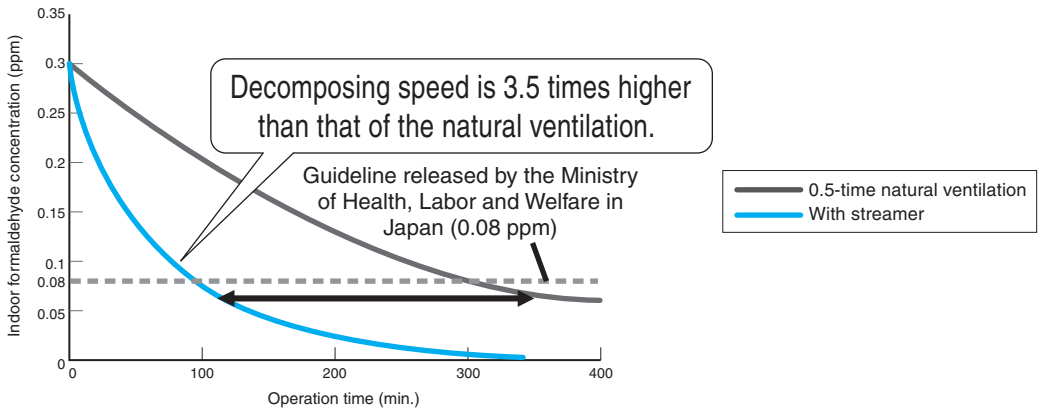
Features

The technology for the real air purifier is adopted for the air conditioner. The original technology FLASH STREAMER system used for Daikin's air purifiers is incorporated.
This technology realizes the air purifying exceeding far from the air purifying performance of the normal air conditioner and powerfully decomposes diesel dust, NOx, mold, virus, etc.

■ **Mechanism of FLASH STREAMER Air-Purifying**

The streamer unit discharges high energy electron and powerfully decomposes odour, bacteria, and hazardous chemical materials at the oxidative distraction speed of 1000 times higher than the general glow discharge.

■ **Removing Formaldehyde**



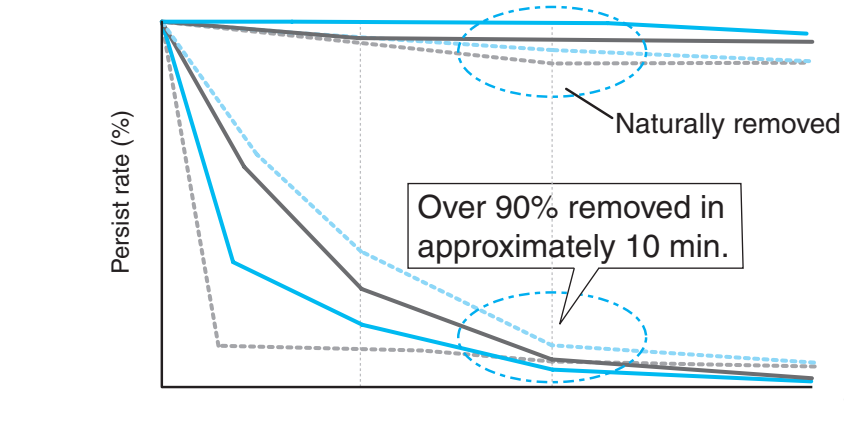
The formaldehyde concentration in the laboratory (10 m^2) at 0.5-time natural ventilation and the initial concentration setting of 0.3 ppm (Daikin result) (Nozaki laboratory, Graduate Course of Health and Society System, Tohoku Bunka Gakuen University)

(R13882)

■ **Deodorising Performance of FLASH STREAMER and Titanium Apatite Photocatalyst**

Unpleasant odour daily generated in the room such as pet odour or garbage odour is powerfully removed. Speedy deodorization: 90% or more odour has been removed in 10 minutes.
Cigarette odour of 80% or more has been removed.

Odour removal performance of FLASH STREAMER



Ammonia : Pet odour, Bathroom odour
Methyl Mercaptane : Garbage odour, Putrid odour
Trimethylamine : Fish odour
Hydrogen Sulfide : Egg odour

Persist rate of odour ingredients in a box of $1m^3$ with 50 class model (Daikin result)

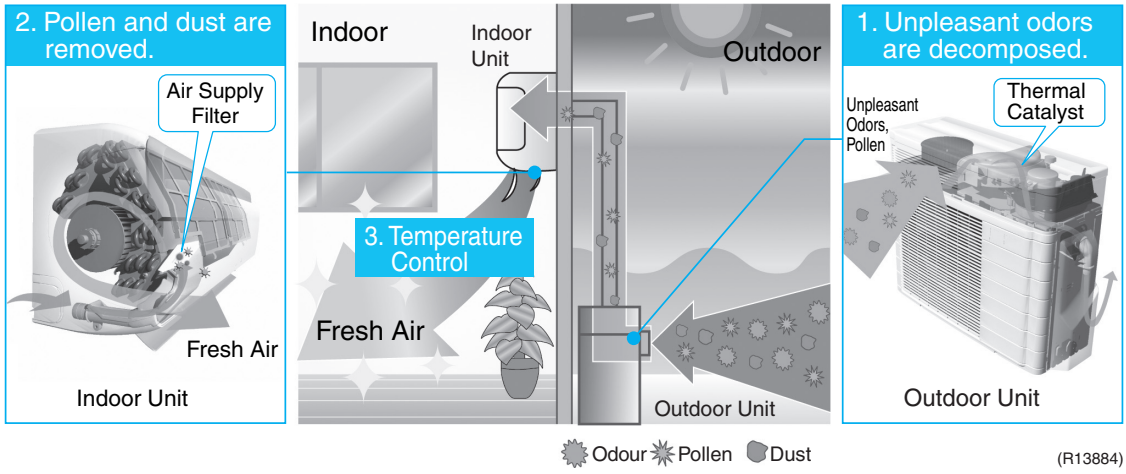
(R13883)

	Ammonia	Acetaldehyde	Acetic Acid	Cigarette Odour
Removal	90.6%	76.5%	87.2%	82.7%

1.12.2 FRESH AIR SUPPLY VENTILATION Operation

Features

The air supply ventilation system using only fresh air.
Any contaminated outdoor air is purified in two stages of indoor unit and outdoor unit. Fresh air from which pollen and dust were removed is supplied into the room.



(R13884)

1. **Purifying air in the outdoor unit**
   Thermal catalyst containing in the humidifying rotor decomposes unpleasant odour and also removes exhaust gases (NOx, SOx).
   Manganese catalyst used to treat the automotive exhaust gas is adopted for the thermal catalyst.

2. **Purifying air in the indoor unit**
   The air supply filter is placed at the humidifying hose outlet of the indoor unit side.
   The air supply filter removes about 97% pollen and dust.

3. Controlling temperature

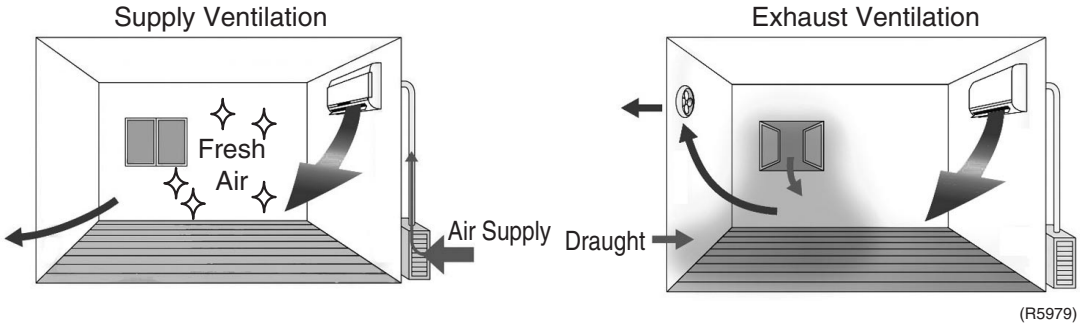
The fresh air passed through the air supply filter is cooled (or heated) in the indoor unit and supplied into the room.

You can keep comfortable temperature and also replace air because the ventilation is performed while temperature is controlled.

Pollen, exhaust gas and odour that could not be removed by the thermal catalyst or the air supply filter are decomposed by FLASH STREAMER and photocatalyst.

■ Ventilation System

The ventilation type is mainly divided into two. The convenient system is supply ventilation.



- Quiet because the ventilation fan is located in the outdoor unit
- Energy saving system due to low heat loss
- The room temperature changes little because no wind enters.

- Operation noise is heard because the ventilation fan is located in the room.
- Electricity charges are high because heat loss is high.
- Draught enters easily to prevent comfortable temperature from being kept.

1.13 MOLD PROOF Operation

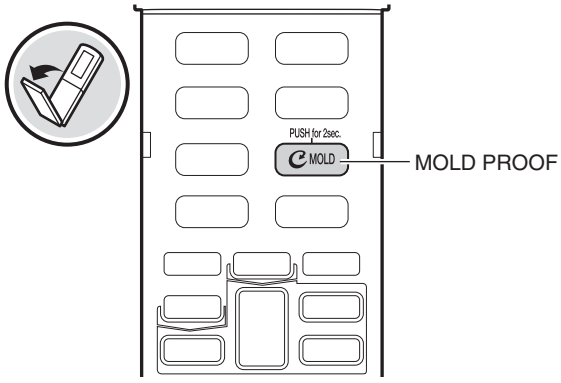
Outline

This is an integrated naming of functions of inside drying and moisture exhaustion. Drying inside the air conditioner prevents mold and odors from growing.

Operation

Automatic or manual operation can be selected.

- Automatic operation
  If MOLD PROOF operation is set ON, the MOLD PROOF operation starts automatically after COOLING, SARARA DRY, or COOLING DRY operation. Operation starts depending on the amount of time the unit has been run. (approximately once every 2 weeks)
- Manual operation



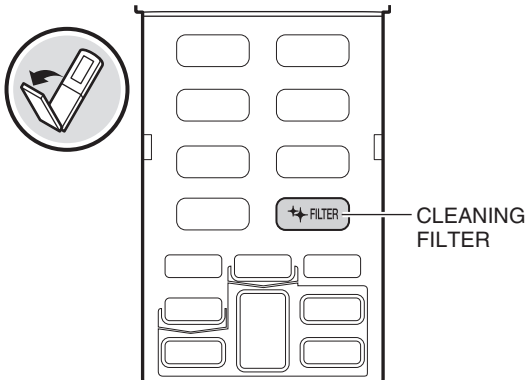
(R19709)

∗ Refer to the operation manual for details.

1.14 CLEANING FILTER Operation

Operation

- Automatic or manual operation can be selected.
- It takes about 11 minutes for cleaning.



(R19710)

∗ Refer to the operation manual for details.

Detail

- CLEANING FILTER operation (manual)

The unit only accepts the CLEANING FILTER operation signal sent from the remote controller while it is not operating.
As the unit is not considered to be operating during MOLD PROOF operation, MOLD PROOF operation is stopped before switching to CLEANING FILTER operation.
When the 24 HOUR FRESH AIR SUPPLY VENTILATION is on, the unit temporarily suspends the ventilation (closes all the panels and flaps, stops the fan, stops the ventilation) and starts the CLEANING FILTER operation. 24 HOUR FRESH AIR SUPPLY VENTILATION will be restarted after the CLEANING FILTER operation is completed.

■ CLEANING FILTER operation (automatic)

CLEANING FILTER operation automatically starts when all the below conditions are met.
When the 24 HOUR FRESH AIR SUPPLY VENTILATION is on, the unit temporarily suspends the ventilation (closes all the panels and flaps, stops the fan, stops the ventilation) and starts the CLEANING FILTER operation. 24 HOUR FRESH AIR SUPPLY VENTILATION will be restarted after the CLEANING FILTER operation is completed.

Condition	Status
CLEANING FILTER operation	ON
Operation	ON → OFF
Accumulated fan rotation time after the last CLEANING FILTER operation (including thermostat off time)	18 hours or more
Room temperature	10°C or more

■ Forced CLEANING FILTER operation

As the unit is required to stop for starting CLEANING FILTER operation, if the unit operates all day and night, the CLEANING FILTER operation may not start.
Therefore, if the indoor fan operates for more than 24 hours, CLEANING FILTER operation starts when all the below conditions are met.
When the 24 HOUR FRESH AIR SUPPLY VENTILATION is on, the unit temporarily suspends the ventilation (closes all the panels and flaps, stops the fan, stops the ventilation) and starts the CLEANING FILTER operation. 24 HOUR FRESH AIR SUPPLY VENTILATION will be restarted after the CLEANING FILTER operation is completed.

Condition	Status
CLEANING FILTER operation (automatic)	ON
Operation	Thermostat off or continuous operation of compressor for more than 30 minutes.
Indoor fan operation time	Continuous operation for more than 24 hours.
Room temperature	10°C or more

* The conditions are set to prevent starting CLEANING FILTER operation if the room temperature has not reached the target temperature.
  (If the compressor operates for more than 30 minutes continuously, it is considered that the room temperature has come closer to the target temperature.)

Note CLEANING FILTER operation (manual, automatic, forced) will not start under the below conditions:

- When a filter malfunction is detected (determined by the signal from the filter position sensor).
- While the MOLD PROOF / CLEANING FILTER lamp (green) is blinking.
- When the room temperature is lower than 10°C

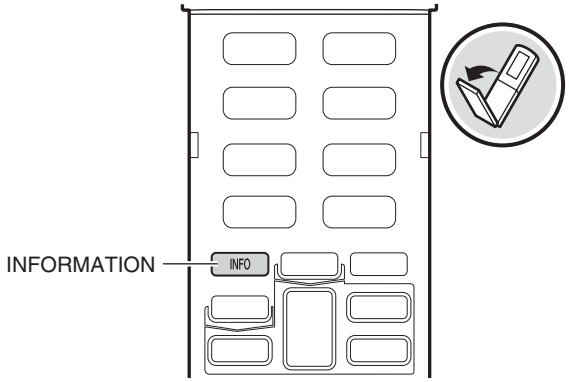
CLEANING FILTER operation starts after the residual operation of the humidifying fan is completed, because dust may be scattered if the CLEANING FILTER operation starts while the humidifying fan is rotating.

■ MOLD PROOF / CLEANING FILTER lamp (green)

MOLD PROOF / CLEANING FILTER lamp blinks after operating for 20000 hours (calculated from accumulated fan operation time) or when a brush malfunction is detected.
Brush malfunction is detected if the limit switch for the brush does not turn on/off while the brush motor is operating. (No sign of malfunction will be indicated.)

1.15 INFORMATION

- Room temperature, indoor humidity, outdoor temperature, and power consumption are displayed.
- Point the remote controller at the indoor unit for 2 seconds.

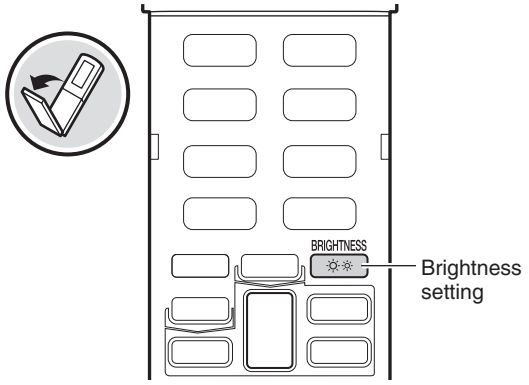


(R19711)

* Refer to the operation manual for details.

1.16 Brightness Setting of Indoor Unit Lamps

The brightness of the indoor unit lamps can be adjusted HIGH, LOW, or OFF.



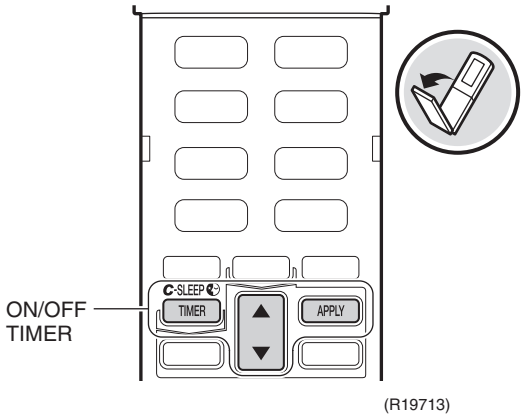
(R19712)

* Refer to the operation manual for details.

1.17 TIMER Operation

1.17.1 ON/OFF TIMER

Operation



∗ Refer to the operation manual for details.

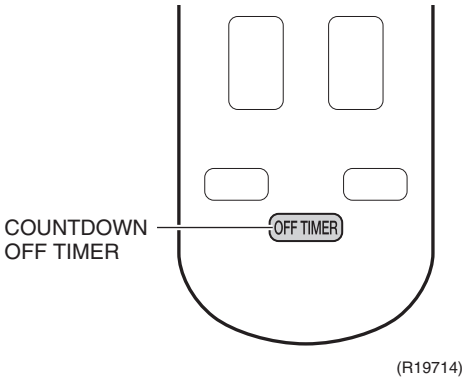
Features

- Time can be set in the unit of 10 minutes.
- When the 24-hour ON/OFF TIMER is set, the indication of present time disappears.
- Time is kept in memory in the next operation unless it is cancelled.
- The clock error is ±30 seconds per month.
- 24-Hour ON/OFF TIMER or DAILY ON/OFF TIMER can be selected.

Note **ON TIMER**
The microcomputer monitors the room temperature and the outdoor temperature before preset time and operation starts automatically about 1 hour before so that the room temperature becomes optimum at the preset time.

1.17.2 COUNTDOWN OFF Timer

Operation



∗ Refer to the operation manual for details.

Features

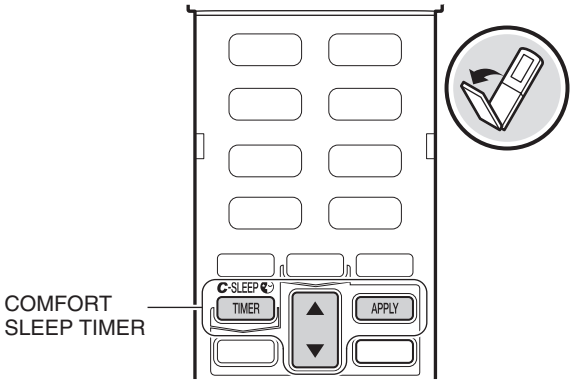
The COUNTDOWN OFF timer can be set by simple button pressing. The operation is stopped when the set time comes. The time can be set in the unit of 0.5 hour for maximum 9.5 hours. It can be used in combination with the ON timer.

1.17.3 Combination of ON Timer and OFF Timer

ON timer and OFF timer, or ON timer and COUNTDOWN OFF timer can be used in combination.
Refer to the operation manual for details.

1.18 COMFORT SLEEP TIMER Operation

COMFORT SLEEP TIMER operation keeps the indoor temperature and humidity at suitable levels for a comfortable sleep and refreshing morning.



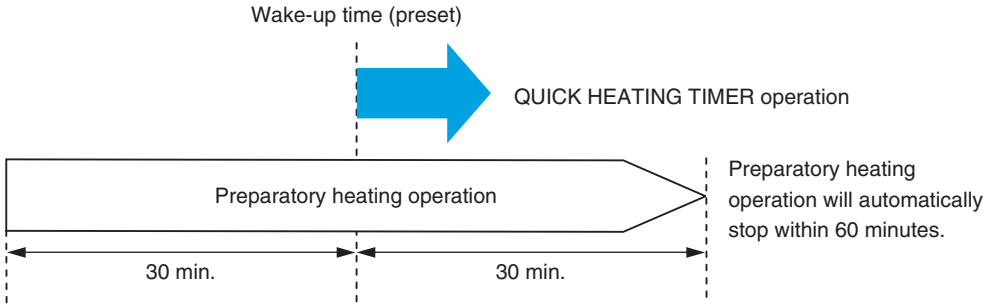
(R19715)

* Refer to the operation manual for details.

1.19 QUICK HEATING TIMER Operation

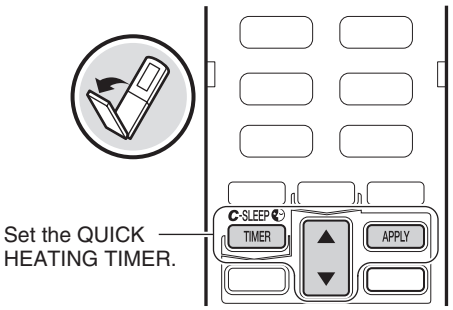
Outline

- QUICK HEATING TIMER operation blows warm air quickly when heating in the morning. It creates a warm zone around the indoor unit, blowing warm air at a weak airflow rate. The warm zone ranges about 1.5 m from the air conditioner.
- Preparatory heating operation preheats 30 minutes before and after the set time for QUICK HEATING TIMER, to be able to start heating operation quickly at any time.



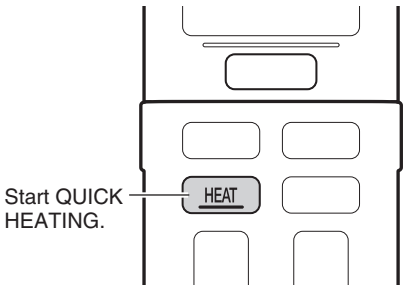
(R19716)

Operation



Previous night

(R19717)



Next morning

(R19718)

* Refer to the operation manual for details.

1.20 Other Functions

1.20.1 Hot-Start Function

In order to prevent the cold air blast that normally occurs when heating operation is started, the temperature of the indoor heat exchanger is detected, and the airflow is either stopped or significantly weakened resulting in comfortable heating.

Note: The cold air blast is prevented using similar control when defrost control starts or when the thermostat is turned ON.

1.20.2 Signal Receiving Sign

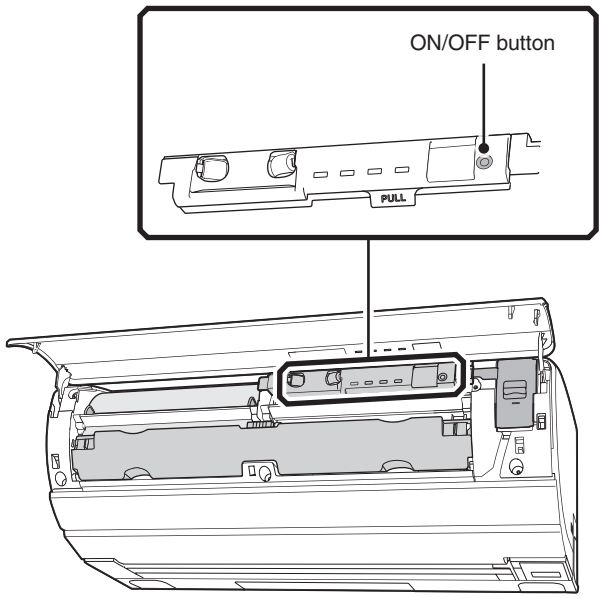
When the indoor unit receives a signal from the remote controller, the unit emits a signal receiving sound.

1.20.3 Indoor Unit ON/OFF Button

An ON/OFF button is provided on the display of the unit.

- Press this button once to start operation. Press once again to stop it.
- This button is useful when the remote controller is missing or the battery has run out.
- The operation mode refers to the following table.

Mode	Temperature setting	Airflow rate
AUTO	25°C	Automatic



(R19719)

<Forced cooling operation>

Forced cooling operation can be started by pressing the ON/OFF button for 5 ~ 9 seconds while the unit is not operating.

Refer to page 192 for detail.

Note: When the ON/OFF button is pressed for 10 seconds or more, the forced cooling operation is stopped.

1.20.4 Auto-restart Function

Even if a power failure (including one for just a moment) occurs during the operation, the operation restarts automatically when the power is restored in the same condition as before the power failure.

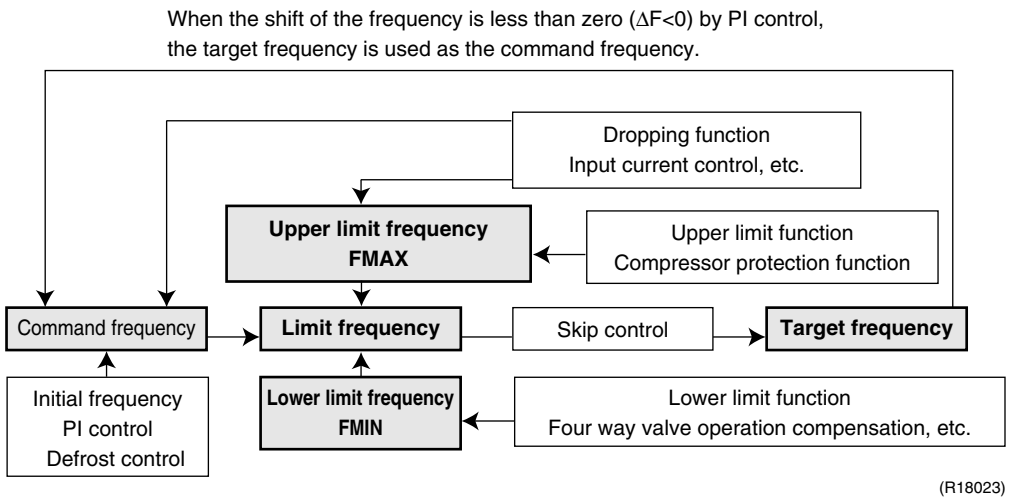
Note: It takes 3 minutes to restart the operation because the 3-minute standby function is activated.

2. Control Specification

2.1 Frequency Control

Outline

The compressor frequency is determined according to the difference between the room thermistor temperature and the target temperature.



Detail

1. Determine command frequency

- Command frequency is determined in the following order of priority.
  1. Limiting defrost control time
  2. Forced cooling
  3. Indoor frequency command

2. Determine upper limit frequency

- The minimum value is set as an upper limit frequency among the frequency upper limits of the following functions:
  Compressor protection, input current, discharge pipe temperature, heating peak-cut, freeze-up protection, defrost control.

3. Determine lower limit frequency

- The maximum value is set as an lower limit frequency among the frequency lower limits of the following functions:
  Four way valve operation compensation, draught prevention, pressure difference upkeep.

4. Determine prohibited frequency

- There is a certain prohibited frequency such as a power supply frequency.

Initial Frequency

When starting the compressor, the frequency is initialised according to the ΔD value of the indoor unit.

<ΔD signal: Indoor Frequency Command>

The difference between the room thermistor temperature and the target temperature is taken as the ΔD signal and is used for frequency command

Temperature difference	ΔD signal	Temperature difference	ΔD signal	Temperature difference	ΔD signal	Temperature difference	ΔD signal
–2.0	∗OFF	0	4	2.0	8	4.0	C
–1.5	1	0.5	5	2.5	9	4.5	D
–1.0	2	1.0	6	3.0	A	5.0	E
–0.5	3	1.5	7	3.5	B	5.5	F

∗OFF = Thermostat OFF

PI Control

1. P control

The ΔD value is calculated in each sampling time (15 ~ 20 seconds), and the frequency is adjusted according to its difference from the frequency previously calculated.

2. I control

If the operating frequency does not change for more than a certain fixed time, the frequency is adjusted according to the ΔD value.
When the ΔD value is low, the frequency is lowered.
When the ΔD value is high, the frequency is increased.

3. Frequency control when other controls are functioning

- When frequency is dropping;
  Frequency control is carried out only when the frequency drops.
- For limiting lower limit;
  Frequency control is carried out only when the frequency rises.

4. Upper and lower limit of frequency by PI control

The frequency upper and lower limits are set according to the command of the indoor unit.
When the indoor or outdoor unit quiet operation command comes from the indoor unit, the upper limit frequency is lowered than the usual setting.

2.2 Controls at Mode Changing / Start-up

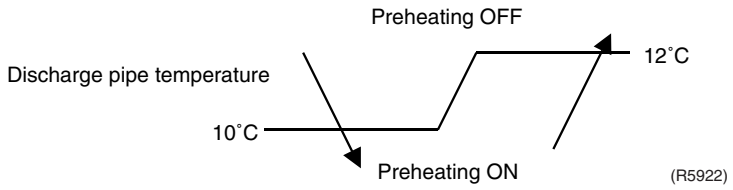
2.2.1 Preheating Control

Outline

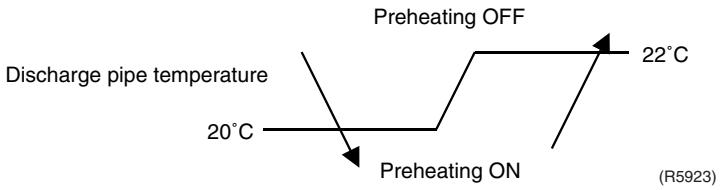
The inverter operation in open phase starts with the conditions of the preheating command from the indoor unit, the outdoor temperature, and the discharge pipe temperature.
Preheating control is set to OFF by default.

Detail

Outdoor temperature ≥ 7°C



Outdoor temperature < 7°C



2.2.2 Four Way Valve Switching

Outline

In heating operation, current is conducted, and in cooling and defrost control, current is not conducted. In order to eliminate the switching sound as the four way valve coil switches from ON to OFF when the heating is stopped, the OFF delay switch of the four way valve is carried out.

Detail

OFF delay switch of four way valve
The four way valve coil is energised for 160 seconds after the operation is stopped.

2.2.3 Four Way Valve Operation Compensation

Outline

At the beginning of the operation as the four way valve is switched, the pressure difference to activate the four way valve is acquired when the output frequency is higher than a certain fixed frequency, for a certain fixed time.

Detail

Starting Conditions

1. When the compressor starts and the four way valve switches from OFF to ON
2. When the four way valve switches from ON to OFF during operation
3. When the compressor starts after resetting
4. When the compressor starts after the fault of four way valve switching

The lower limit of frequency keeps **A** Hz for **B** seconds with any conditions 1 through 4 above.

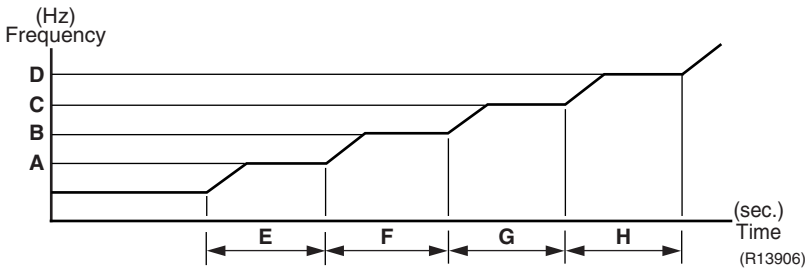
	Cooling	Heating
A (Hz)	46	52
B (seconds)	60	60

2.2.4 3-Minute Standby

Turning on the compressor is prohibited for 3 minutes after turning it off.
(The function is not activated when defrosting.)

2.2.5 Compressor Protection Function

When turning the compressor from OFF to ON, the upper limit of frequency is set as follows.
(The function is not activated when defrosting.)



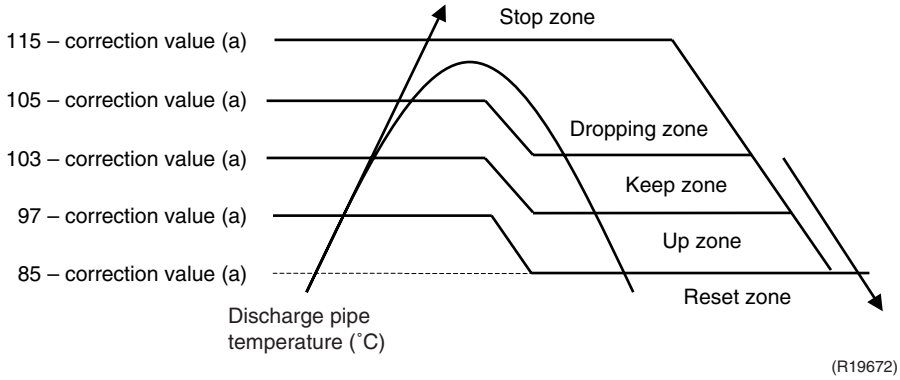
A (Hz)	52
B (Hz)	68
C (Hz)	80
D (Hz)	98
E (seconds)	120
F (seconds)	120
G (seconds)	480
H (seconds)	60

2.3 Discharge Pipe Temperature Control

Outline

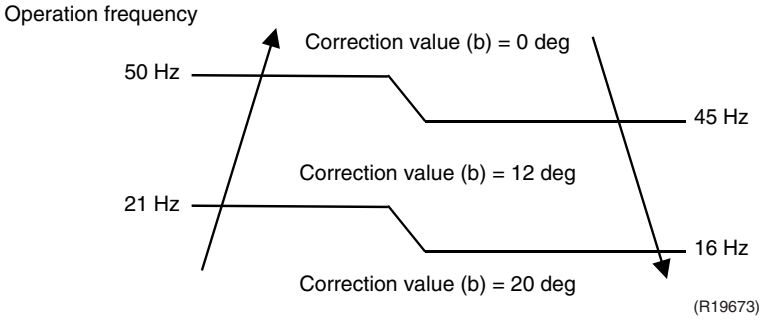
The discharge pipe temperature is used as the internal temperature of the compressor. If the discharge pipe temperature rises above a certain level, the upper limit of frequency is set to keep the discharge pipe temperature from rising further.

Detail

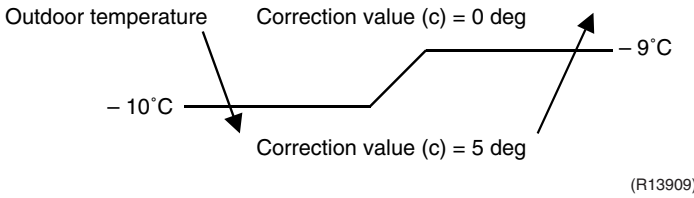


Correction value (a) = correction value by operation frequency (b)
+ correction value by outdoor temperature (c)

Correction value by operation frequency (b)



Correction value by outdoor temperature (c)



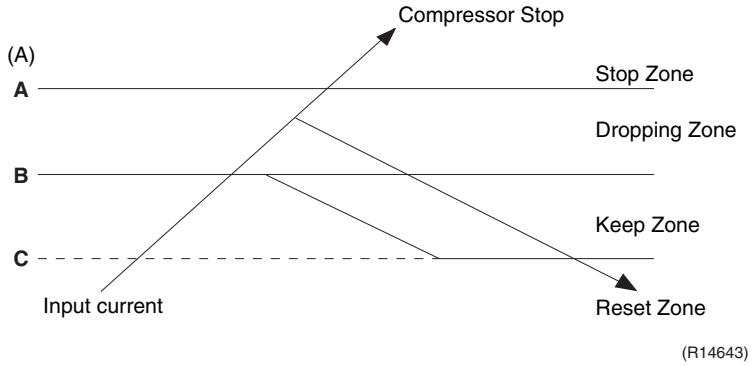
Zone	Control
Stop zone	When the temperature reaches the stop zone, the compressor stops.
Dropping zone	The upper limit of frequency decreases.
Keep zone	The upper limit of frequency is kept.
Up zone	The upper limit of frequency increases.
Reset zone	The upper limit of frequency is cancelled.

2.4 Input Current Control

Outline

The microcomputer calculates the input current while the compressor is running, and sets the frequency upper limit based on the input current.
The input current control is the upper limit control of frequency and takes priority over the lower limit control of four way valve operation compensation.

Detail



Frequency control in each zone

Stop zone

- After 5 seconds in this zone, the compressor is stopped.

Dropping zone

- The upper limit of the compressor frequency is defined as operation frequency – 2 Hz.
- After this, the output frequency is lowered by 2 Hz every second until it reaches the keep zone.

Keep zone

- The present maximum frequency goes on.

Reset zone

- Limit of the frequency is cancelled.

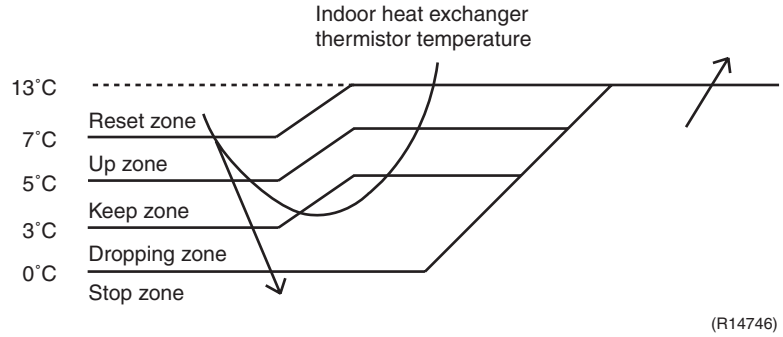
	25 class		35 class		50 class	
	Cooling	Heating	Cooling	Heating	Cooling	Heating
A (A)	21.0		21.0		21.0	
B (A)	10.0	9.75	10.0	12.75	10.0	14.0
C (A)	9.0	8.75	9.0	11.75	9.0	13.0

Limitation of current dropping and stop value according to the outdoor temperature

- The current drops when outdoor temperature becomes higher than a certain level (depending on the model).

2.5 Freeze-up Protection Control

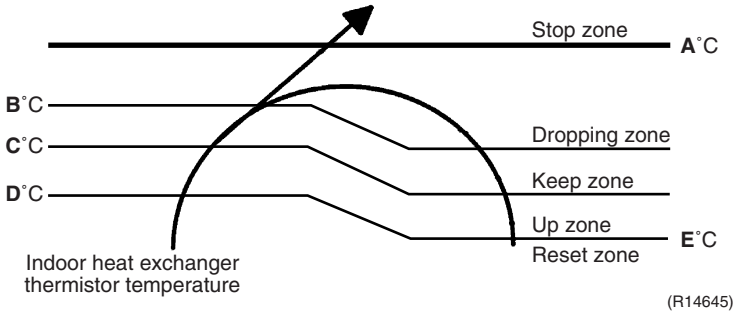
During cooling operation, the signal sent from the indoor unit controls the operating frequency limitation and prevents freezing of the indoor heat exchanger. (The signal from the indoor unit is divided into zones.)



Zone	Control
Stop zone	When the temperature reaches the stop zone, the compressor stops.
Dropping zone	The upper limit of frequency decreases.
Keep zone	The upper limit of frequency is kept.
Up zone	The upper limit of frequency increases.
Reset zone	The upper limit of frequency is cancelled.

2.6 Heating Peak-cut Control

During heating operation, the indoor heat exchanger temperature determines the frequency upper limit to prevent abnormal high pressure.



Zone	Control
Stop zone	When the temperature reaches the stop zone, the compressor stops.
Dropping zone	The upper limit of frequency decreases.
Keep zone	The upper limit of frequency is kept.
Up zone	The upper limit of frequency increases.
Reset zone	The upper limit of frequency is cancelled.

A (°C)	**B** (°C)	**C** (°C)	**D** (°C)	**E** (°C)
54.5	51.5	48.5	46.5	44.0

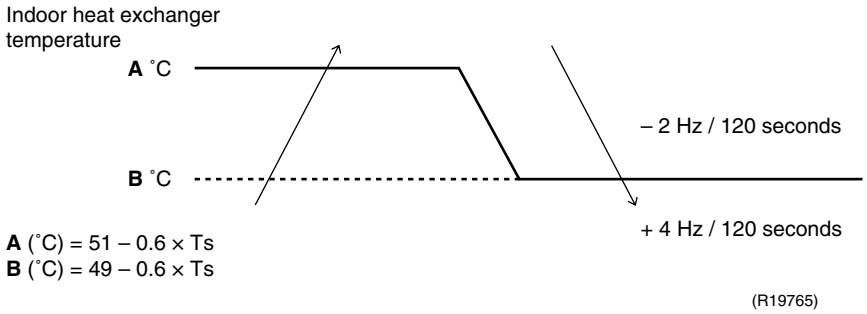
2.7 Draught Prevention Control (Hot-Start Function)

Outline

Draught prevention control prevents cold draught when the unit is started up in heating operation.

Detail

- Draught prevention control is conducted by monitoring the indoor heat exchanger temperature and the set temperature on the remote controller (Ts). When the indoor heat exchanger temperature drops below a certain level or when the Ts exceeds 20°C, the minimum frequency of the compressor increases 4 Hz per 120 seconds.

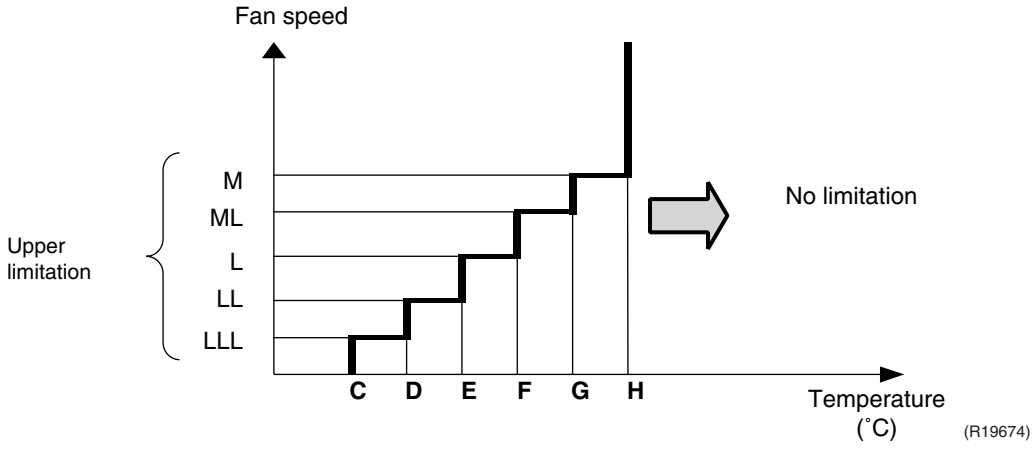


Also, the followings are controlled in order to improve energy efficiency, considering room thermistor temperature, set temperature, and airflow rate.

After starting heating operation, the unit controls the indoor heat exchanger temperatures **A** and **B** as follows, if the condition ΔD ≤ 4 continues for 60 minutes
∗ Refer to page 45 as for ΔD.

Condition		**A** (°C)	**B** (°C)
27°C ≤ Room thermistor temperature		Ts + 2°C	Ts
20°C ≤ Room thermistor temperature < 27°C	Indoor fan speed > M tap	Ts + 10°C	Ts + 8°C
	M tap ≥ Indoor fan speed > L tap	Ts + 9°C	Ts + 7°C
	L tap ≥ Indoor fan speed	Ts + 7°C	Ts + 5°C
Room thermistor temperature < 20°C		Ts + 2°C	Ts

- When the indoor heat exchanger is not hot enough, the indoor fan does not start at the set speed. The fan speed increases step by step. The limitation of the fan speed is lifted when the indoor heat exchanger temperature rises above **H**°C.



C (°C)	**D** (°C)	**E** (°C)	**F** (°C)	**G** (°C)	**H** (°C)
10	25	35	37	38	39

2.8 Dew Prevention Control

Outline

Cooling the air around us means that the air is dehumidified (condensation of water on the indoor heat exchanger). But because the air is cooled down, less moisture can present in the air and as a consequence the relative humidity of the air rises. When the relative humidity of the outlet air nears 100%, water may be blown out. To prevent this from happening, the unit changes, its target evaporating temperature and the frequency of the compressor under certain circumstances. Normally speaking, even under these conditions (dew prevention safety active), the room should still be cooled down, only slower. Of course, if the capacity of the indoor unit is small in comparison to the heat load, this is not the case and capacity shortage complaints may follow.

Detail

- When the indoor heat exchanger temperature is lower than the target temperature of the indoor heat exchanger, the compressor frequency decreases by 2 Hz in every minute.
- The target temperature of the indoor heat exchanger is calculated with the room temperature and the indoor humidity.

2.9 Outdoor Fan Control

1. Fan OFF delay when stopped

The outdoor fan is turned OFF 70 seconds after the compressor stops.

2. Fan ON control to cool down the electrical box

The outdoor fan is turned ON when the electrical box temperature is high while the compressor is OFF.

3. Fan OFF control during defrosting

The outdoor fan is turned OFF during defrosting.

4. Fan ON/OFF control when operation starts / stops

The outdoor fan is turned ON when the operation starts. The outdoor fan is turned OFF when the operation stops.

5. Fan speed control during cooling operation

The rotation speed of the outdoor fan is fixed. However, when the outdoor temperature is low, the unit may lower the fan rotation frequency to set a pressure difference. Also, when the outdoor temperature is high, the unit may raise the fan rotation frequency to cool the electrical box.

Class	Cooling
25 class	710 rpm
35 class	780 rpm
50 class	860 rpm

6. Fan speed control during heating operation

The rotation speed of the outdoor fan is fixed. However, when the outdoor temperature is high, the unit may lower the fan rotation frequency to set a pressure difference.

Class	Heating
25 class	700 rpm
35 class	780 rpm
50 class	820 rpm

2.10 Defrost Control

Outline

Defrosting is carried out by the cooling cycle (reverse cycle). The defrosting time or outdoor heat exchanger temperature must be more than a certain value to finish defrosting.

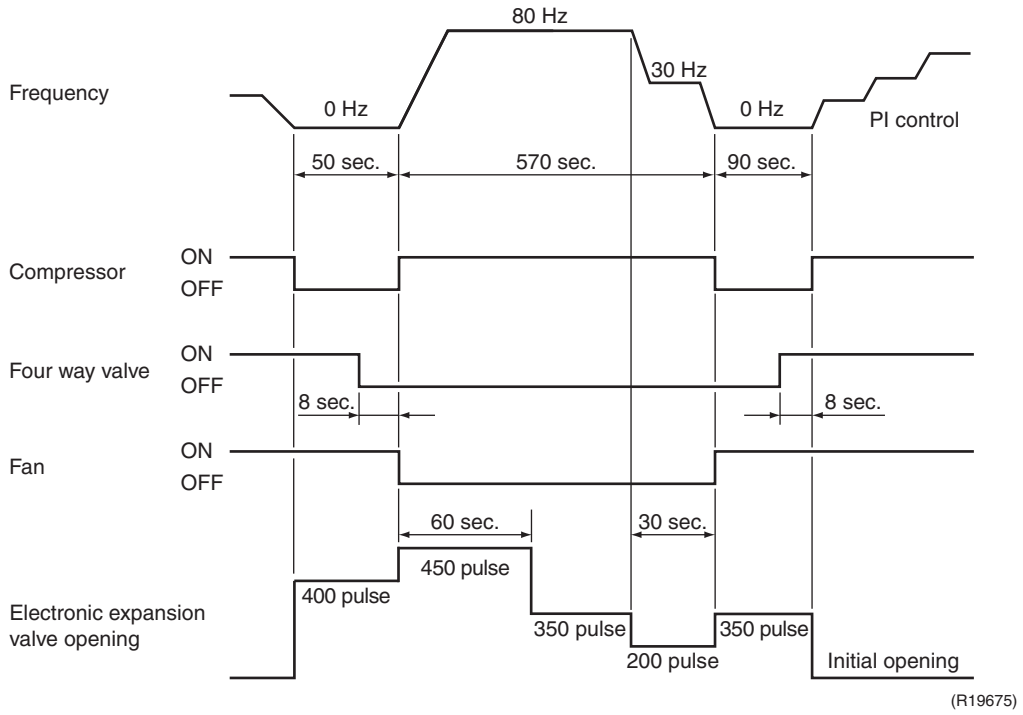
Detail

Conditions for Starting Defrost

- The starting conditions are determined with the outdoor temperature and the outdoor heat exchanger temperature.
- The system is in heating operation.
- The compressor operates for 6 minutes.
- More than 25 minutes of accumulated time have passed since the start of the operation, or ending the previous defrosting.

Conditions for Cancelling Defrost

The judgement is made with the outdoor heat exchanger temperature. (6 ~ 30°C)



2.11 Electronic Expansion Valve Control

Outline

The following items are included in the electronic expansion valve control.

Electronic expansion valve is fully closed

1. Electronic expansion valve is fully closed when turning on the power.
2. Pressure equalising control

Open Control

1. Electronic expansion valve control when starting operation
2. Electronic expansion valve control when the frequency changes
3. Electronic expansion valve control for defrosting
4. Electronic expansion valve control when the discharge pipe temperature is abnormally high
5. Electronic expansion valve control when the discharge pipe thermistor is disconnected

Feedback Control

Target discharge pipe temperature control

Detail

The followings are the examples of electronic expansion valve control which function in each operation mode.

Operation mode	Main control	Secondary control	
		Control when the frequency changes	High discharge pipe temperature control
Power ON	Power initialising control	–	–
Cooling operation	Starting control	–	●
	Target discharge pipe temperature control	●	●
Stop	Pressure equalising control	–	–
Heating operation	Starting control	–	●
	Target discharge pipe temperature control	●	●
Stop	Pressure equalising control	–	–
Operation with discharge pipe thermistor disconnected	Starting control	–	●
	Target discharge pipe temperature control	–	–
Stop	Pressure equalising control	–	–

● : Available
– : Not available

2.11.1 Fully Closing with Power ON

The electronic expansion valve is initialised when turning on the power. The opening position is set and the pressure is equalised.

2.11.2 Pressure Equalising Control

When the compressor is stopped, the pressure equalising control is activated. The electronic expansion valve opens, and develops the pressure equalisation.

2.11.3 Opening Limit Control

The maximum and minimum opening of the electronic expansion valve are limited.

Maximum opening (pulse)	470
Minimum opening (pulse)	10

The electronic expansion valve is fully closed when cooling operation stops, and is opened at a fixed degree during defrosting.

2.11.4 Starting Operation Control

The electronic expansion valve opening is controlled when the operation starts, and preventing superheating or liquid compression.

2.11.5 Control when the Frequency Changes

When the target discharge pipe temperature control is active, if the target frequency changes to a specified value in a certain time period, the target discharge pipe temperature control is cancelled and the target opening of the electronic expansion valve is changed according to the frequency shift.

2.11.6 High Discharge Pipe Temperature Control

When the compressor is operating, if the discharge pipe temperature exceeds a certain value, the electronic expansion valve opens and the refrigerant runs to the low pressure side. This procedure lowers the discharge pipe temperature.

2.11.7 Discharge Pipe Thermistor Disconnection Control

Outline

The disconnection of the discharge pipe thermistor is detected by comparing the discharge pipe temperature with the condensation temperature. If the discharge pipe thermistor is disconnected, the electronic expansion valve opens according to the outdoor temperature and the operation frequency, operates for a specified time, and then stops.
After 3 minutes, the operation restarts and checks if the discharge pipe thermistor is disconnected. If the discharge pipe thermistor is disconnected, the system stops after operating for a specified time.
If the disconnection is detected repeatedly, the system is shut down. When the compressor runs for 60 minutes without any error, the error counter is reset.

Detail

When the starting control (360 seconds) finishes, the detection timer for disconnection of the discharge pipe thermistor (720 seconds) starts. When the timer is over, the following adjustment is made.

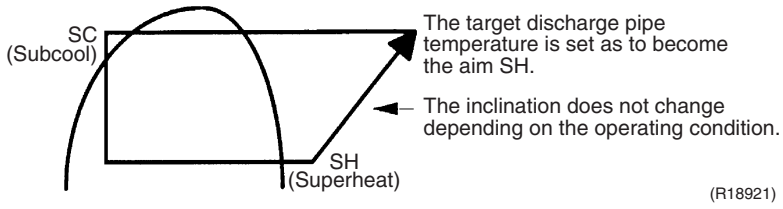
1. When the operation mode is cooling
   When the following condition is fulfilled, the discharge pipe thermistor disconnection is ascertained.
   Discharge pipe temperature + 6°C < outdoor heat exchanger temperature
2. When the operation mode is heating
   When the following condition is fulfilled, the discharge pipe thermistor disconnection is ascertained.
   Discharge pipe temperature + 6°C < indoor heat exchanger temperature

When the thermistor is disconnected

When the disconnection is ascertained, the compressor continues operation for 9 minutes and then stops.
When the compressor stops repeatedly, the system is shut down.

2.11.8 Target Discharge Pipe Temperature Control

The target discharge pipe temperature is obtained from the indoor and outdoor heat exchanger temperature, and the electronic expansion valve opening is adjusted so that the actual discharge pipe temperature becomes close to the target discharge pipe temperature. (Indirect SH (superheating) control using the discharge pipe temperature)



The electronic expansion valve opening and the target discharge pipe temperature are checked every 20 seconds. The opening degree of the electronic expansion valve is adjusted by the followings.

- Target discharge pipe temperature
- Actual discharge pipe temperature
- Previous discharge pipe temperature

Part 6
Service Diagnosis

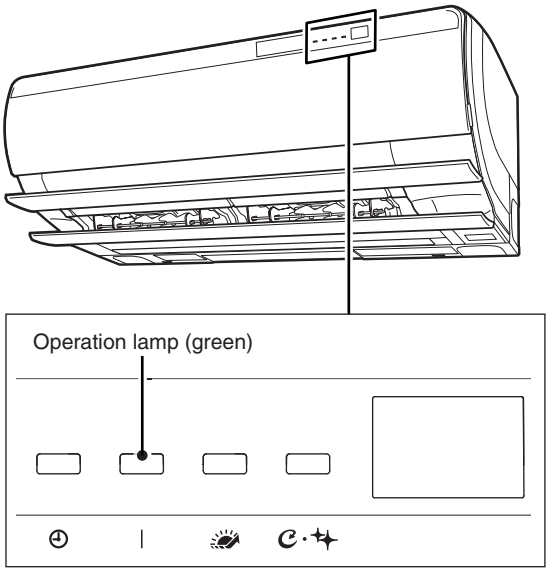
1. Service Diagnosis

1.1 Indoor Unit

The operation lamp blinks when any of the following errors is detected.

1. When a protection device of the indoor or outdoor unit is activated, or when the thermistor malfunctions.
2. When a signal transmission error occurs between the indoor and outdoor units.

In either case, conduct the diagnostic procedure described in the following pages.



(R19676)

1.2 Outdoor Unit

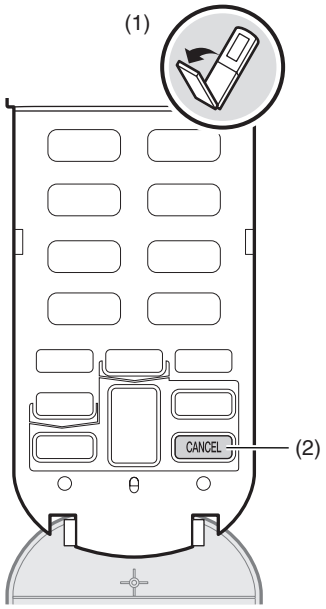
The outdoor unit has one green LED (LED A) on the PCB. When the microcomputer works in order, the LED A blinks.

1.3 Remote Controller

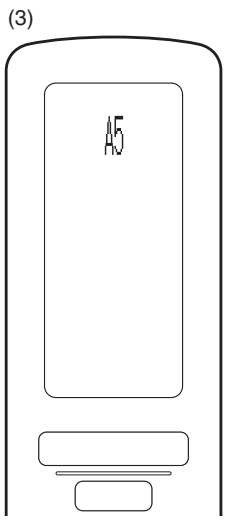
Confirm the error code with the remote controller.

Method 1

(1) Open the cover of the remote controller.
(2) Press the **CANCEL** button for 5 seconds pointing the remote controller at the indoor unit.
(3) The display on the remote controller shows an error code with a beep.



(R19721)

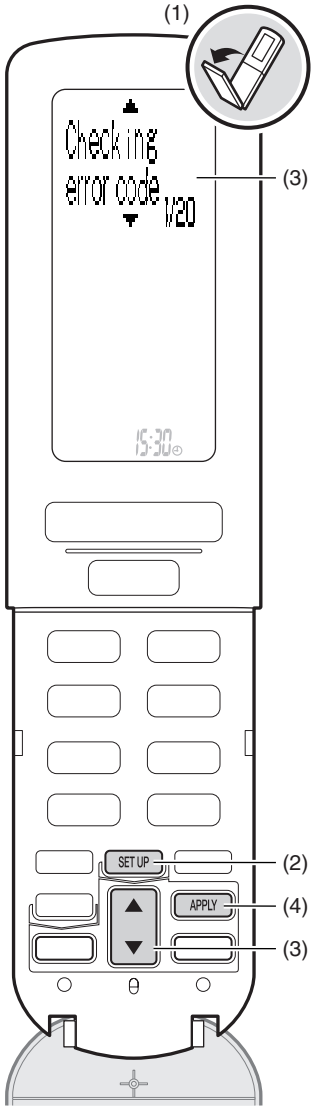


(R19722)

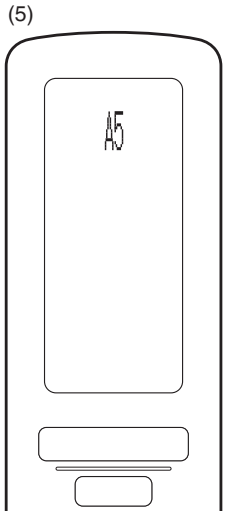
Method 2

(1) Open the cover of the remote controller.
(2) Press the **SET UP** button for 5 seconds.
(3) Press the ▲ or ▼ button and select **Checking error code**.
(4) Press the **APPLY** button pointing the remote controller at the indoor unit.
(5) The display on the remote controller shows an error code with a long beep.

Note: To return to the normal mode, press the **SET UP** button for 5 seconds again or leave the remote controller untouched for 60 seconds.



(R19723)



(R19722)

2. Troubleshooting

2.1 Error Codes and Description

Error Code	Unit	Description	Reference page
Basic Failure Diagnosis		Air conditioner does not run.	126
		Air conditioner runs but does not cool (heat) the room.	128
		When operation starts, safety breaker works.	129
		Air conditioner makes big noise and vibration.	130
		Air is not humidified enough.	131
		FLASH STREAMER AIR PURIFYING operation does not run.	132
		INTELLIGENT EYE operation does not run.	133
A1	Indoor	Indoor unit PCB abnormality	134
A5		Freeze-up protection control / heating peak-cut control	135
A6		Fan motor (DC motor) or related abnormality	137
C4		Indoor heat exchanger thermistor or related abnormality	139
C9		Room temperature thermistor or related abnormality	139
CA		Humidity sensor (for humidifying) / humidifying thermistor abnormality	140
CC		Humidity sensor (for room) abnormality	141
E1	Outdoor	Outdoor unit PCB abnormality	142
E5		OL activation (compressor overload)	143
E6		Compressor lock	145
E7		DC fan lock	146
E8		Input overcurrent detection	147
EA		Four way valve abnormality	148
F3		Discharge pipe temperature control	150
F6		High pressure control in cooling	151
H0		Compressor system sensor abnormality	152
		Power factor correction circuit abnormality	153
H6		Position sensor abnormality	154
H9		Outdoor temperature thermistor or related abnormality	156
J3		Discharge pipe thermistor or related abnormality	156
J6		Outdoor heat exchanger thermistor or related abnormality	156
J8		Liquid pipe thermistor or related abnormality	156
L3		Electrical box temperature rise	158
L4		Radiation fin temperature rise	159
L5		Output overcurrent detection	161
P4		Radiation fin thermistor or related abnormality	156
P9	Humidifying unit	Humidifier fan motor system abnormality / fan lock	163
PA		Heater wire abnormality	164
PH		Humidifying thermistor abnormality / humidifying heater temperature abnormality	165
U0	System	Refrigerant shortage	167
U2		Low-voltage detection or over-voltage detection	169
U4		Signal transmission error (between indoor unit and outdoor unit)	171
	Outdoor	Outdoor unit PCB abnormality or communication circuit abnormality	173
U7	Humidifying unit	Signal transmission error on microcomputer for humidifying	176
UA	System	Unspecified voltage (between indoor unit and outdoor unit)	177
		Improper power supply wiring	178
	Indoor	Incomplete setting for hose length	179
No display	System	Lights-out of microcomputer status lamp	180

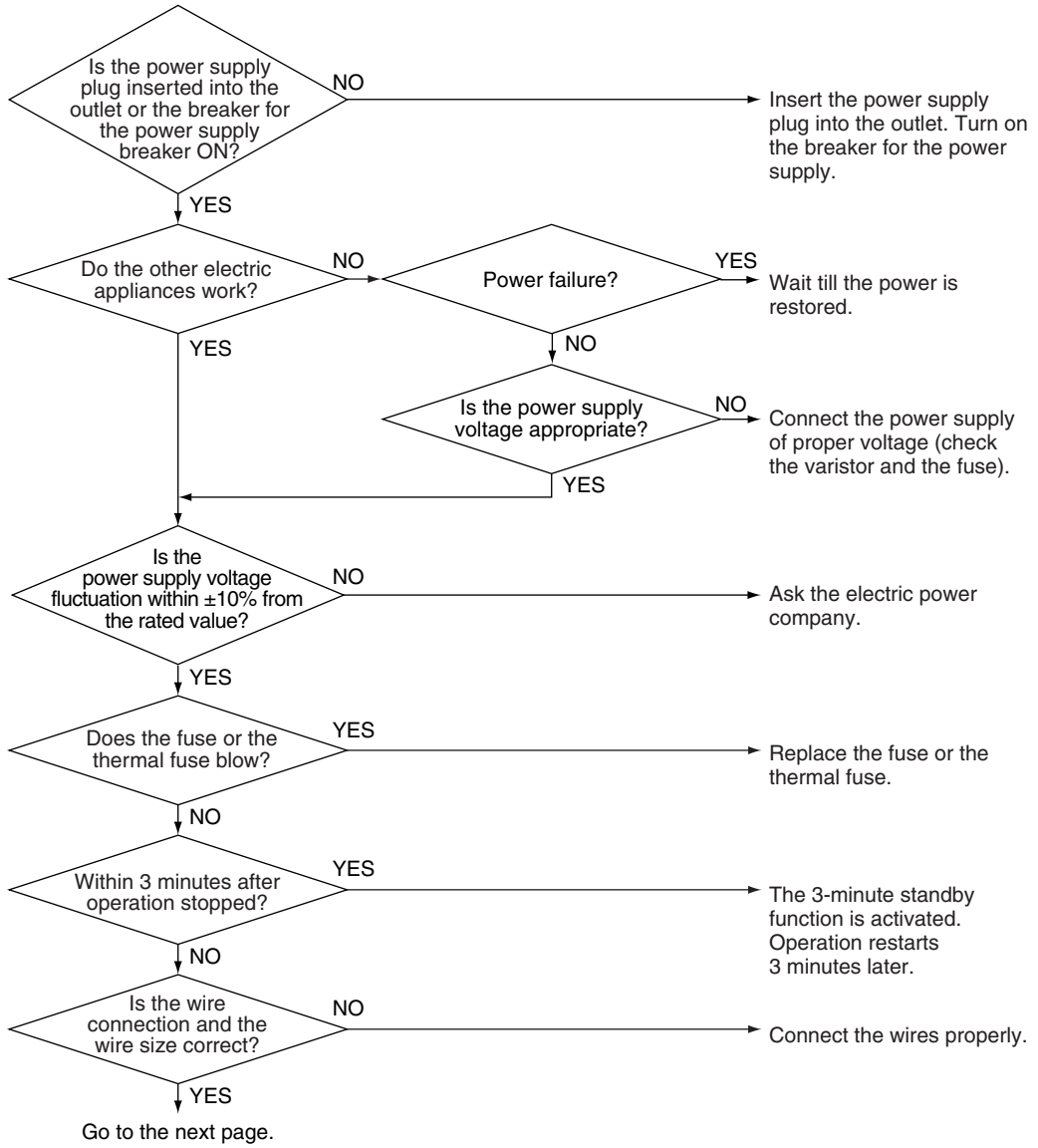
2.2 Air conditioner does not run.

Supposed Causes

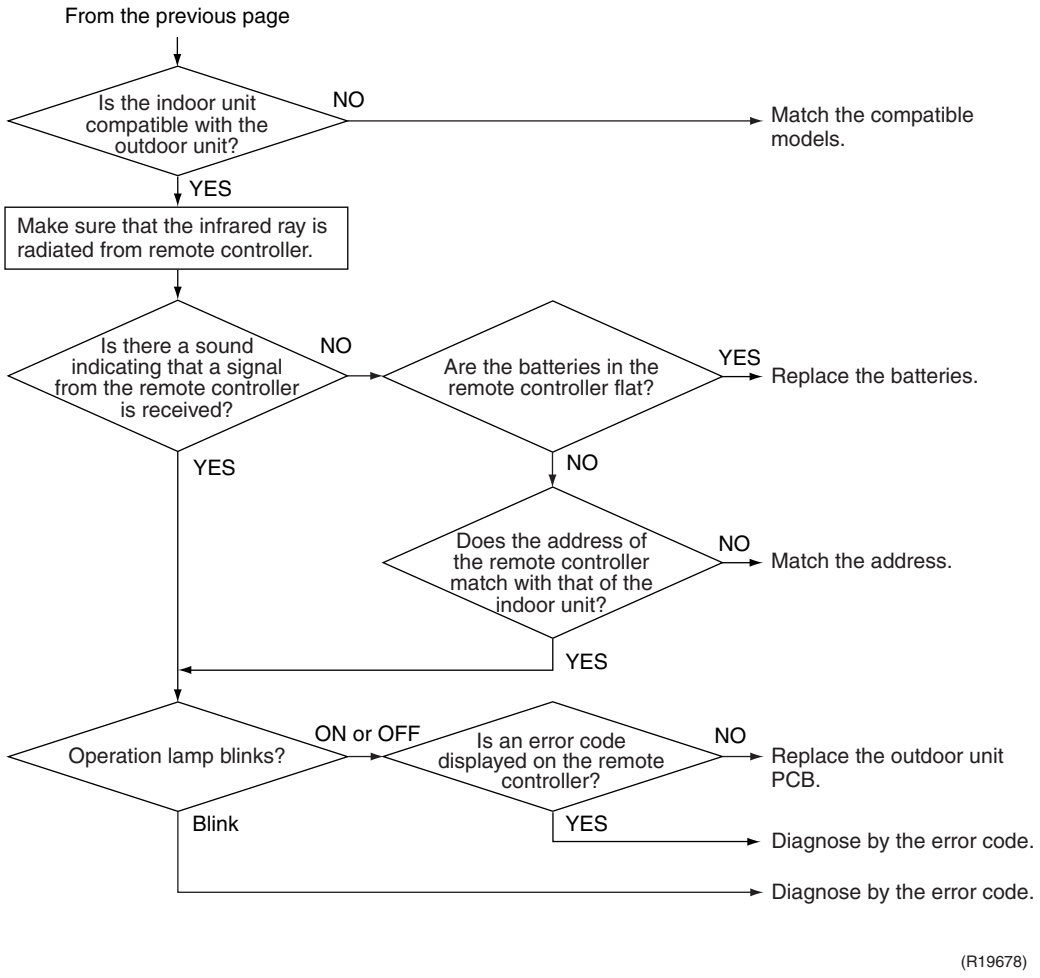
- Power supply is OFF.
- Improper power supply voltage
- Improper connection of wire
- Incorrect combination of indoor unit and outdoor unit
- Battery shortage of remote controller
- Invalid address setting
- Protection device works
  (dirty air filter, refrigerant shortage, overfilling, mixed air, etc.)
- Transmission error between indoor unit and outdoor unit
  (Defective outdoor unit PCB)

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19677)


From the previous page
Is the indoor unit compatible with the outdoor unit?
NO
Match the compatible models.
YES
Make sure that the infrared ray is radiated from remote controller.
Is there a sound indicating that a signal from the remote controller is received?
NO
Are the batteries in the remote controller flat?
YES
Replace the batteries.
YES
NO
Does the address of the remote controller match with that of the indoor unit?
NO
Match the address.
YES
Operation lamp blinks?
ON or OFF
Is an error code displayed on the remote controller?
NO
Replace the outdoor unit PCB.
Blink
YES
Diagnose by the error code.
Diagnose by the error code.

(R19678)

2.3 Air conditioner runs but does not cool (heat) the room.

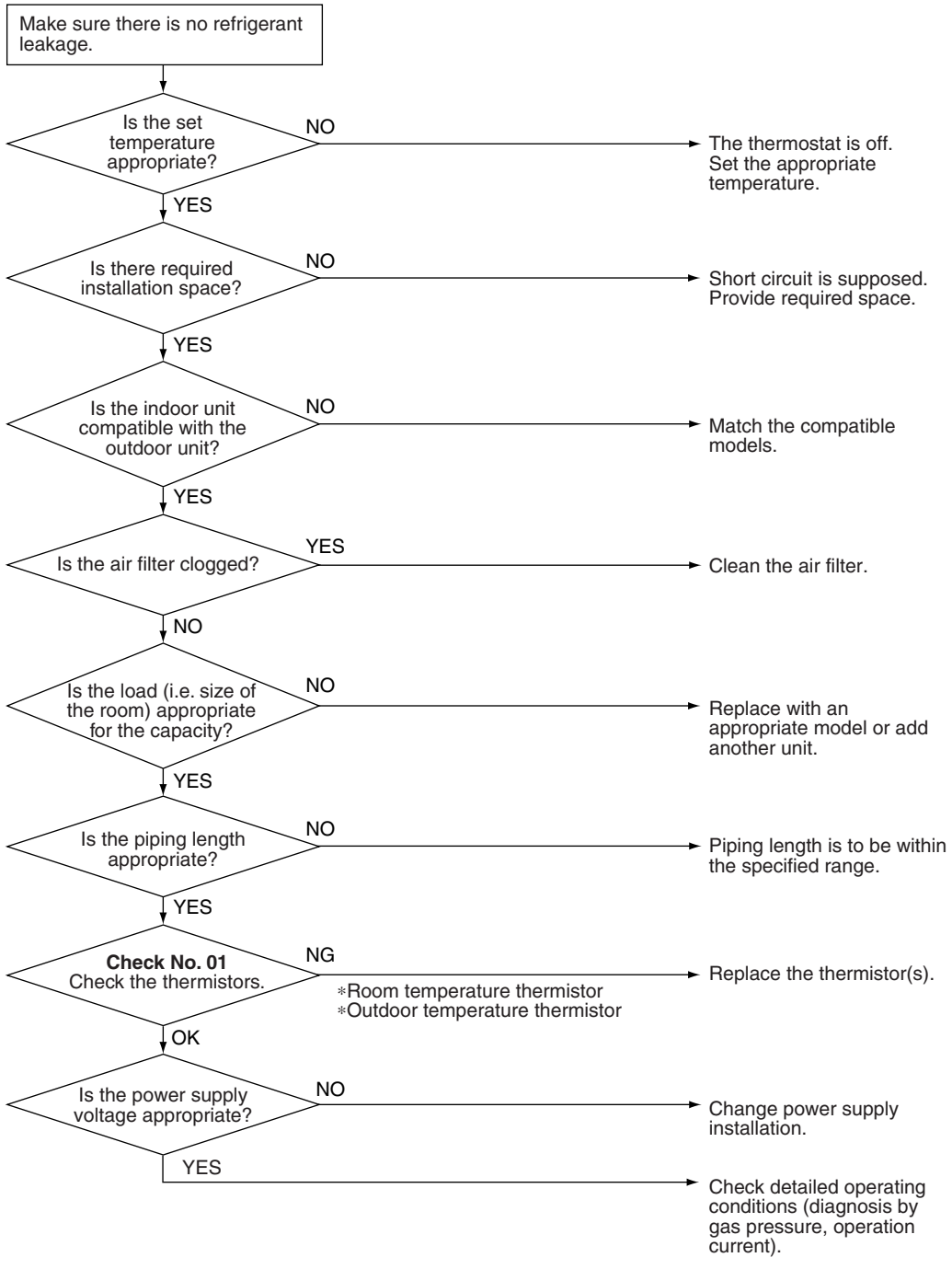
Supposed Causes

- Refrigerant leakage
  (Make sure that there is no refrigerant leakage or breaks due to over-tightened flare part.)
- Improper setting for temperature
- Incorrect combination of indoor unit and outdoor unit
- Clogged air filter
- Insufficient power
- Refrigerant piping is too long
- Defective field piping (squeezed, etc.)

Troubleshooting

Check No.01
Refer to P.181

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19679)

2.4 When operation starts, safety breaker works.

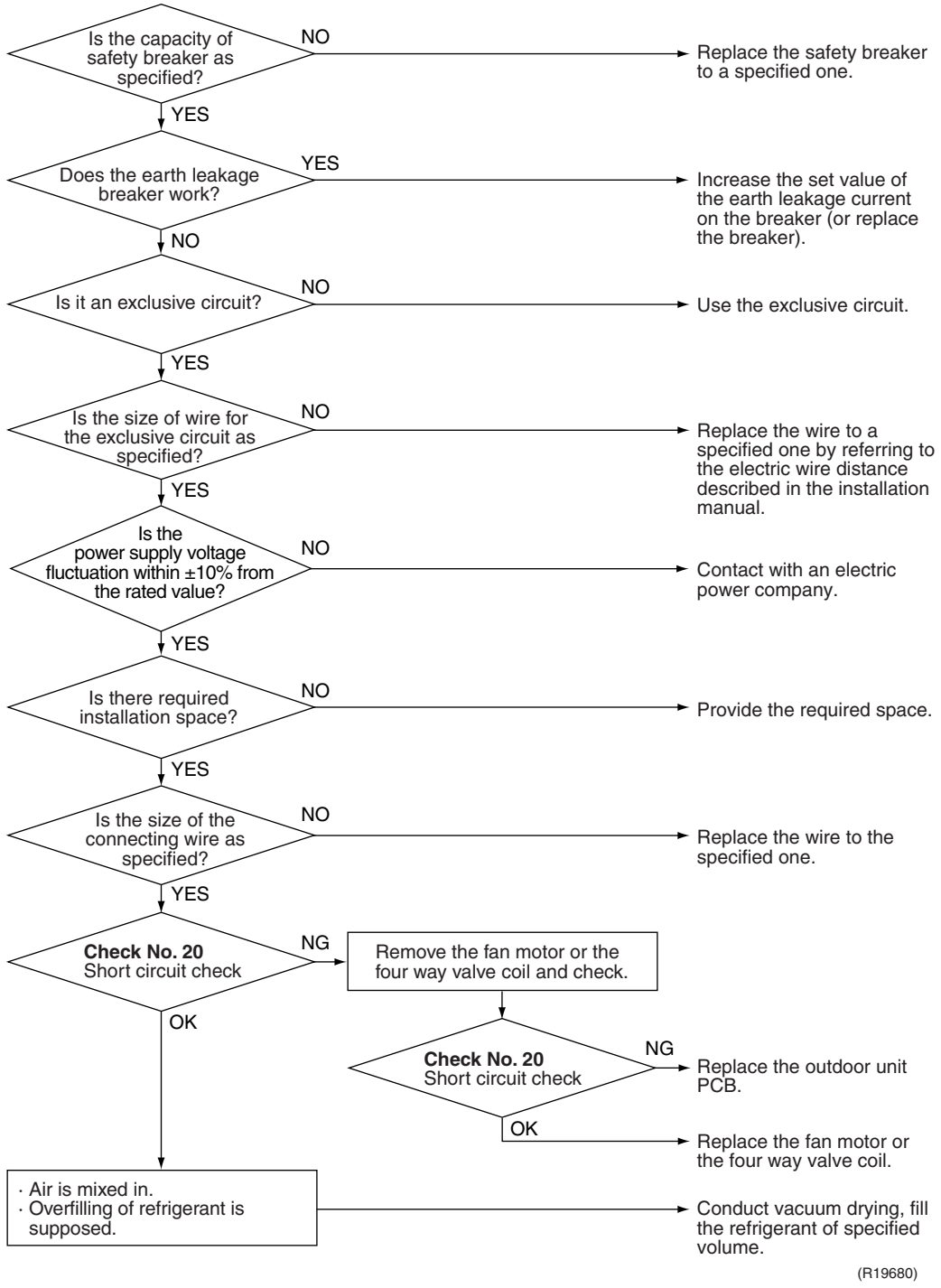
Supposed Causes

- Insufficient capacity of safety breaker
- Earth leakage breaker is too sensitive.
- Not exclusive circuit
- The power supply voltage fluctuation is not within ±10% from the rated value.
- The size of connecting wire is thin.
- Air is mixed.
- Overfilling of refrigerant
- Defective outdoor unit PCB (short circuit)

Troubleshooting

Check No.20
Refer to P.189

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19680)

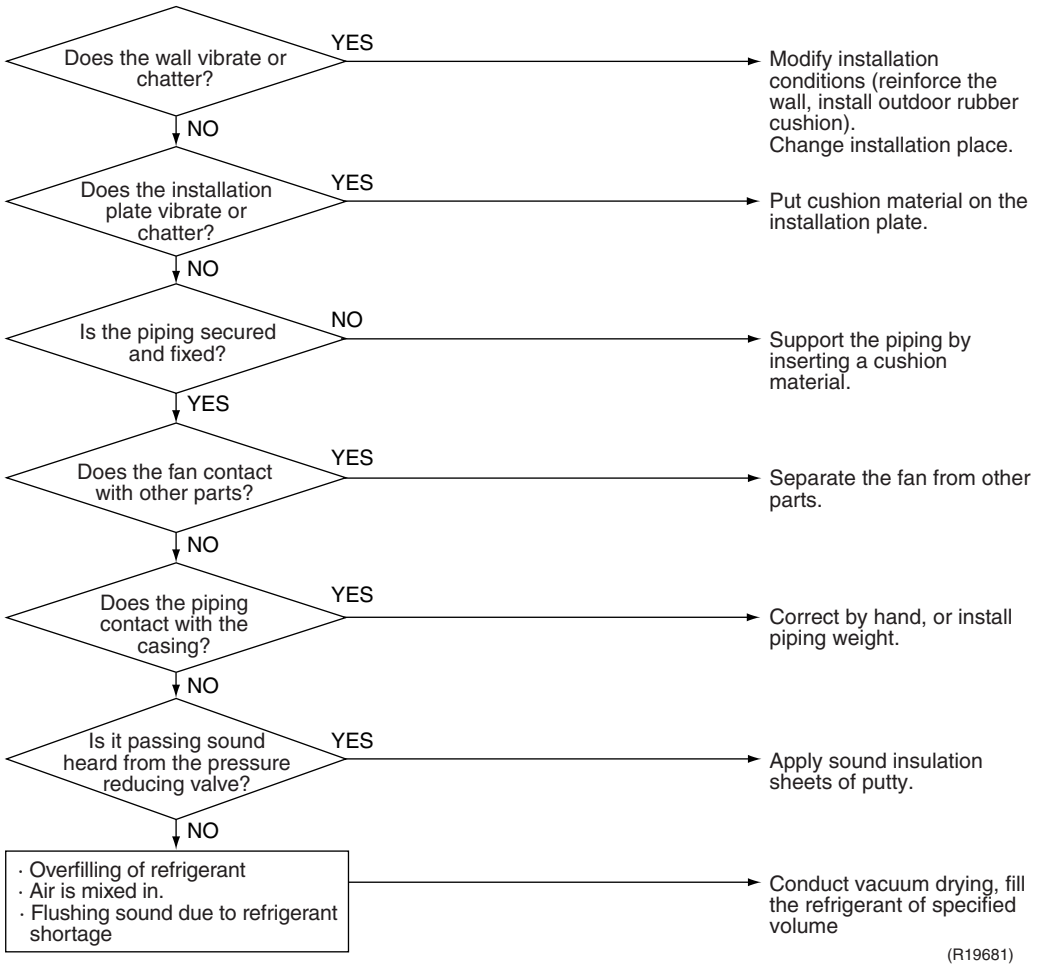
2.5 Air conditioner makes big noise and vibration.

Supposed Causes

- Refrigerant piping is too short.
- Mounting wall is too thin.
- Insufficient vibration prevention measures
- Deformation of the unit
- Improper quantity of refrigerant

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



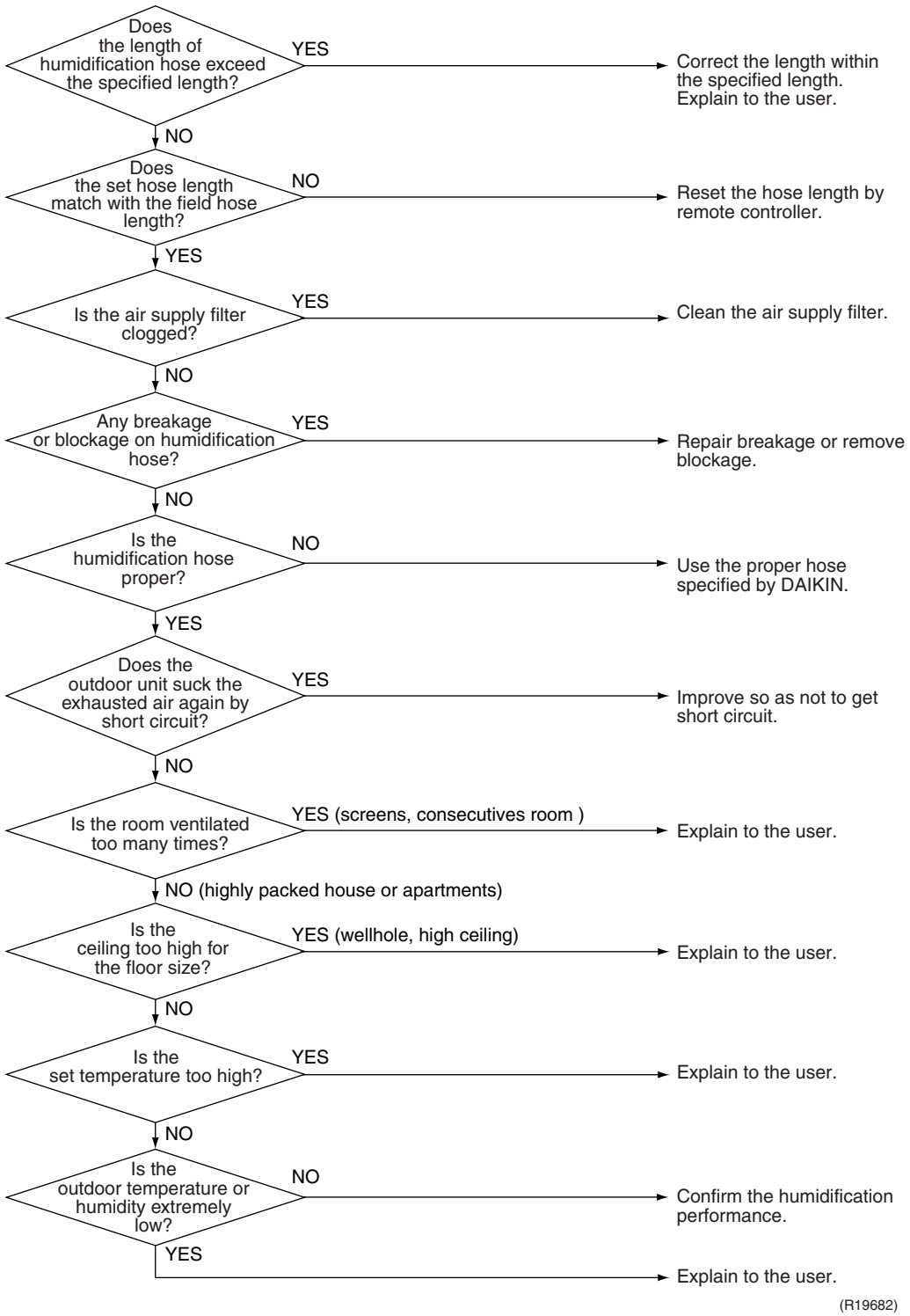
2.6 Air is not humidified enough.

Supposed Causes

- Hose length is not set.
- Improper setting for hose length
- Air is short-circuited at outdoor unit.
- Clogged air supply filter
- Insufficient heat insulation of duct
- Indoor ventilation is made too often.
- Ceiling is very high.

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19682)

2.7 FLASH STREAMER AIR PURIFYING operation does not run.

Supposed Causes

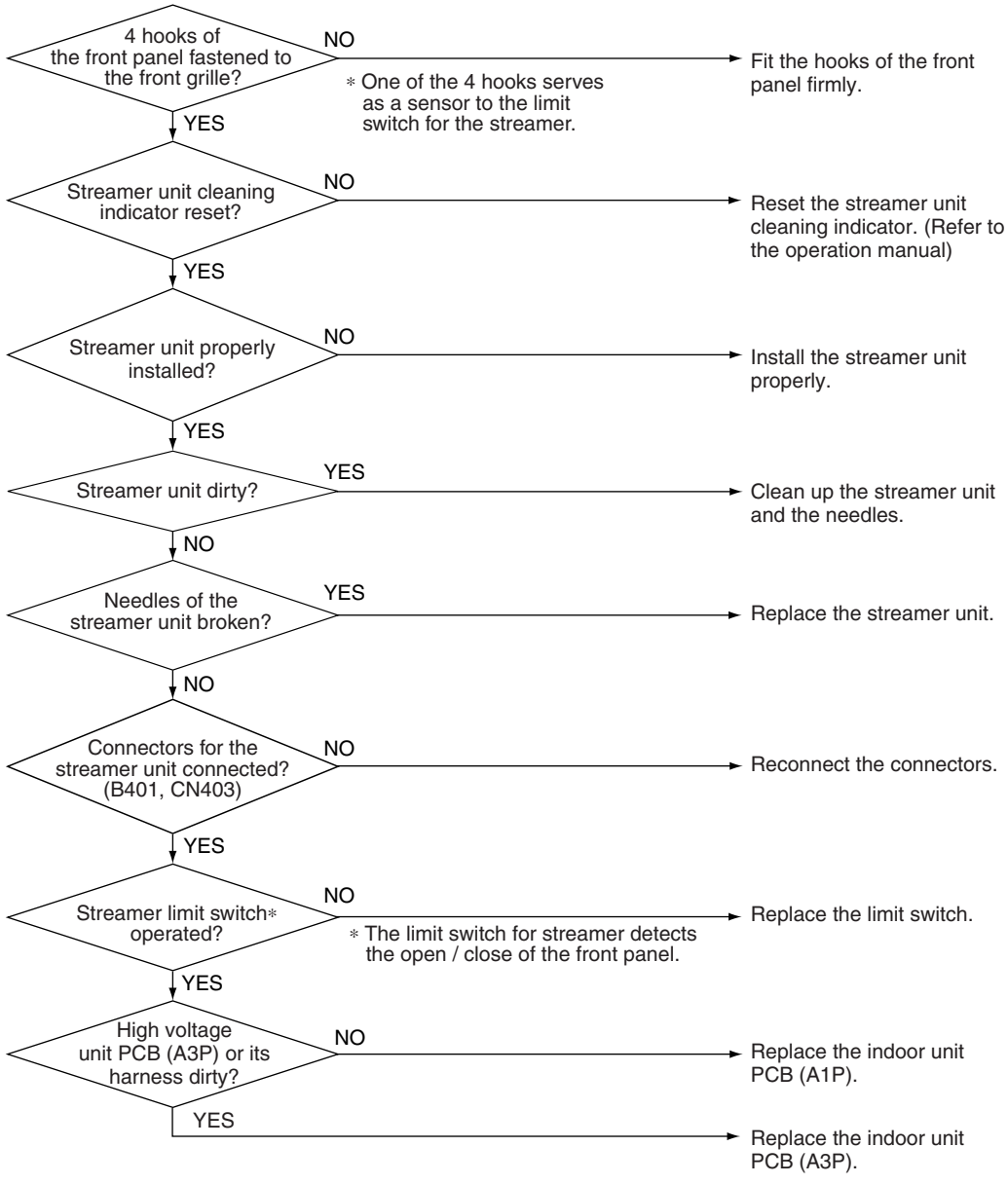
- Front panel is open.
- Streamer unit cleaning indicator is not reset.
- Streamer unit is not installed.
- Dirty streamer unit
- Dust adheres to the needles of the streamer unit.
- Broken needles of streamer unit
- Disconnection of the connector
- Defective limit switch of the streamer unit

Troubleshooting

Check No.01
Refer to P.181

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

∗ Streamer unit starts electric discharge 90 ~ 180 seconds after air purifying operation.



(R20442)

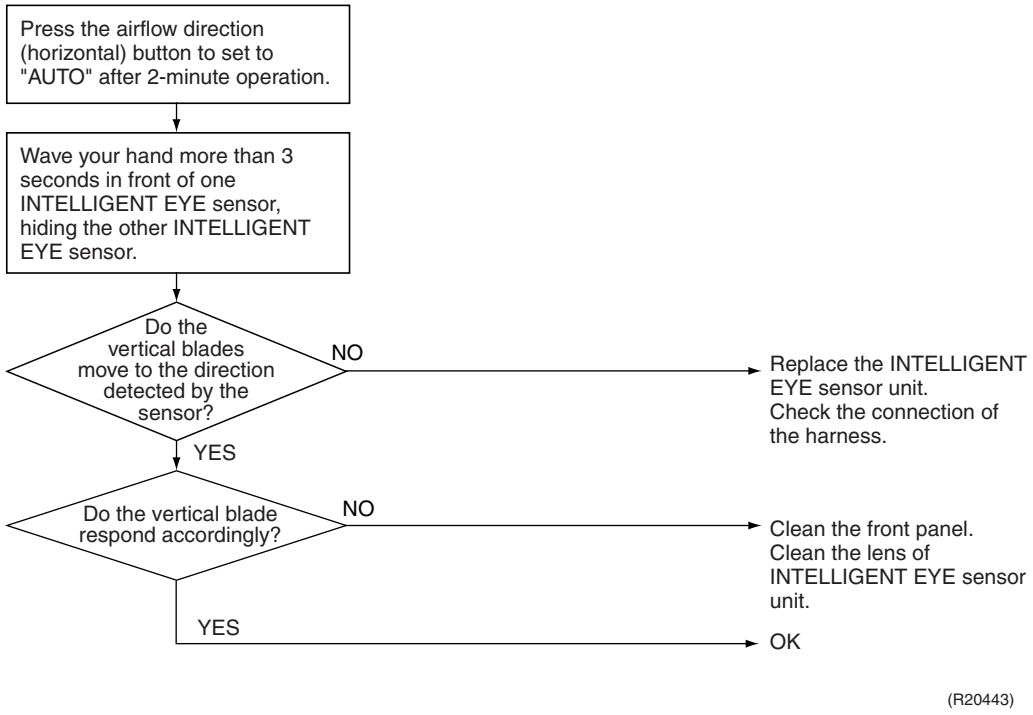
2.8 INTELLIGENT EYE operation does not run.

Supposed Causes

- Defective INTELLIGENT EYE sensor unit
- Disconnection of the harness
- Dirt on the front panel
- Dirt on the lens of the INTELLIGENT EYE sensor unit

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R20443)

- Check the other sensor in the same way.

Note: The INTELLIGENT EYE sensors recognize where human motion occurs.

- The sensors work within 9 m distance in front of the indoor unit.
- The sensors do not work directly below or directly beside the indoor unit.
- The sensors might misdetect other heaters, or home electric appliances, the motion of small animals like dogs and cats as a human motion.
  The sensors might also detect a place of sunlight wrongly.
- In case the sensors detect several people in a room, the airflow is directed to the last detected person.

2.9 Indoor Unit PCB Abnormality

Error Code **A1**

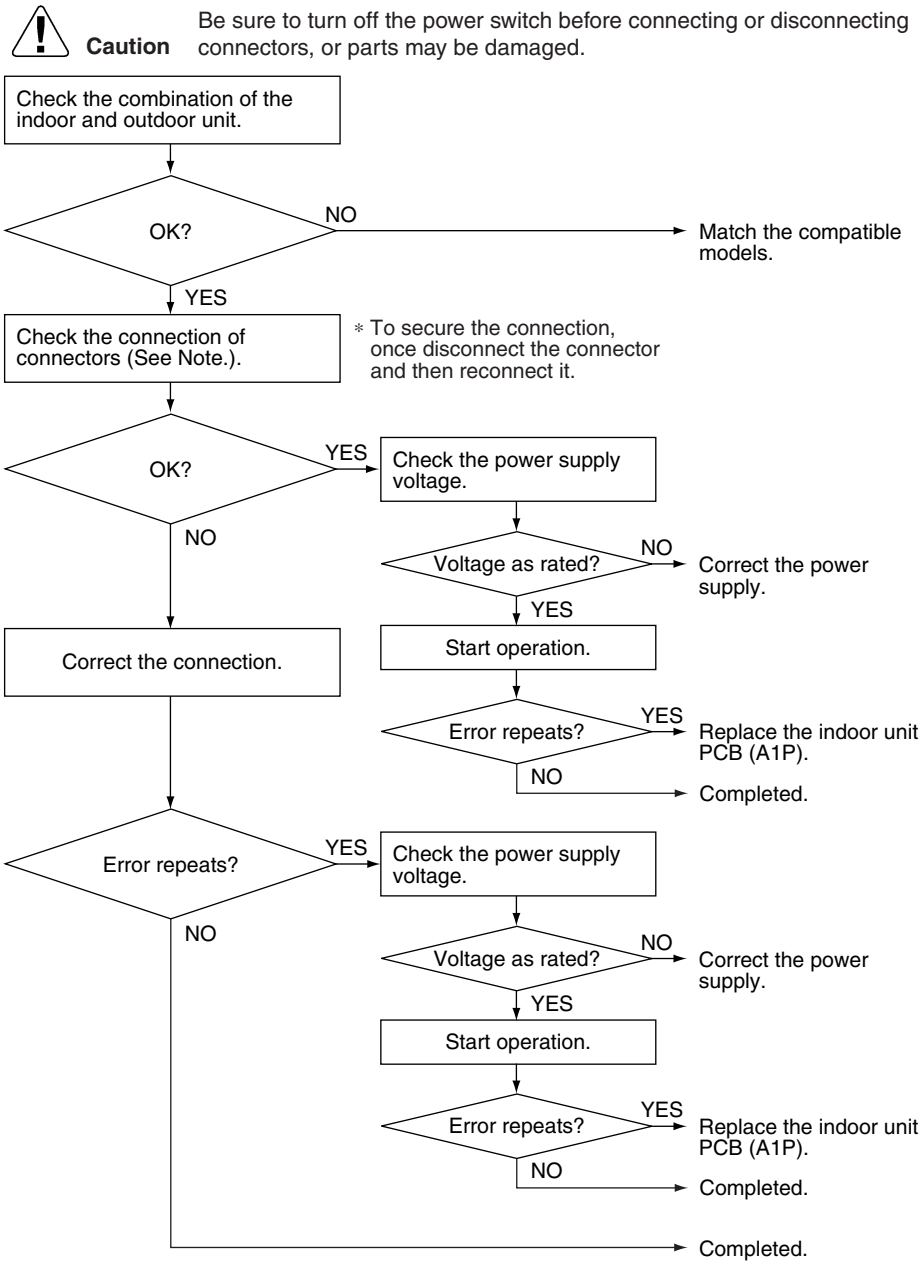
Method of Error Detection The system checks if the circuit works properly within the microcomputer of the indoor unit.

Error Decision Conditions The system cannot set the internal settings.

Supposed Causes

- Wrong models interconnected
- Defective indoor unit PCB (A1P)
- Disconnection of connector
- Reduction of power supply voltage

Troubleshooting



(R19513)

Note: Check the following connector.

Model Type	Connector
Wall mounted type	Terminal board ~ Control PCB (H1, H2, H3)

2.10 Freeze-up Protection Control / Heating Peak-cut Control

Error Code

A5

Method of Error Detection

- Freeze-up protection control
  During cooling operation, the freeze-up protection control (operation halt) is activated according to the temperature detected by the indoor heat exchanger thermistor.
- Heating peak-cut control
  During heating operation, the temperature detected by the indoor heat exchanger thermistor is used for the heating peak-cut control (operation halt, outdoor fan stop, etc.)

Error Decision Conditions

- Freeze-up protection control
  During cooling operation, the indoor heat exchanger temperature is below 0°C.
- Heating peak-cut control
  During heating operation, the indoor heat exchanger temperature is above 54.5°C

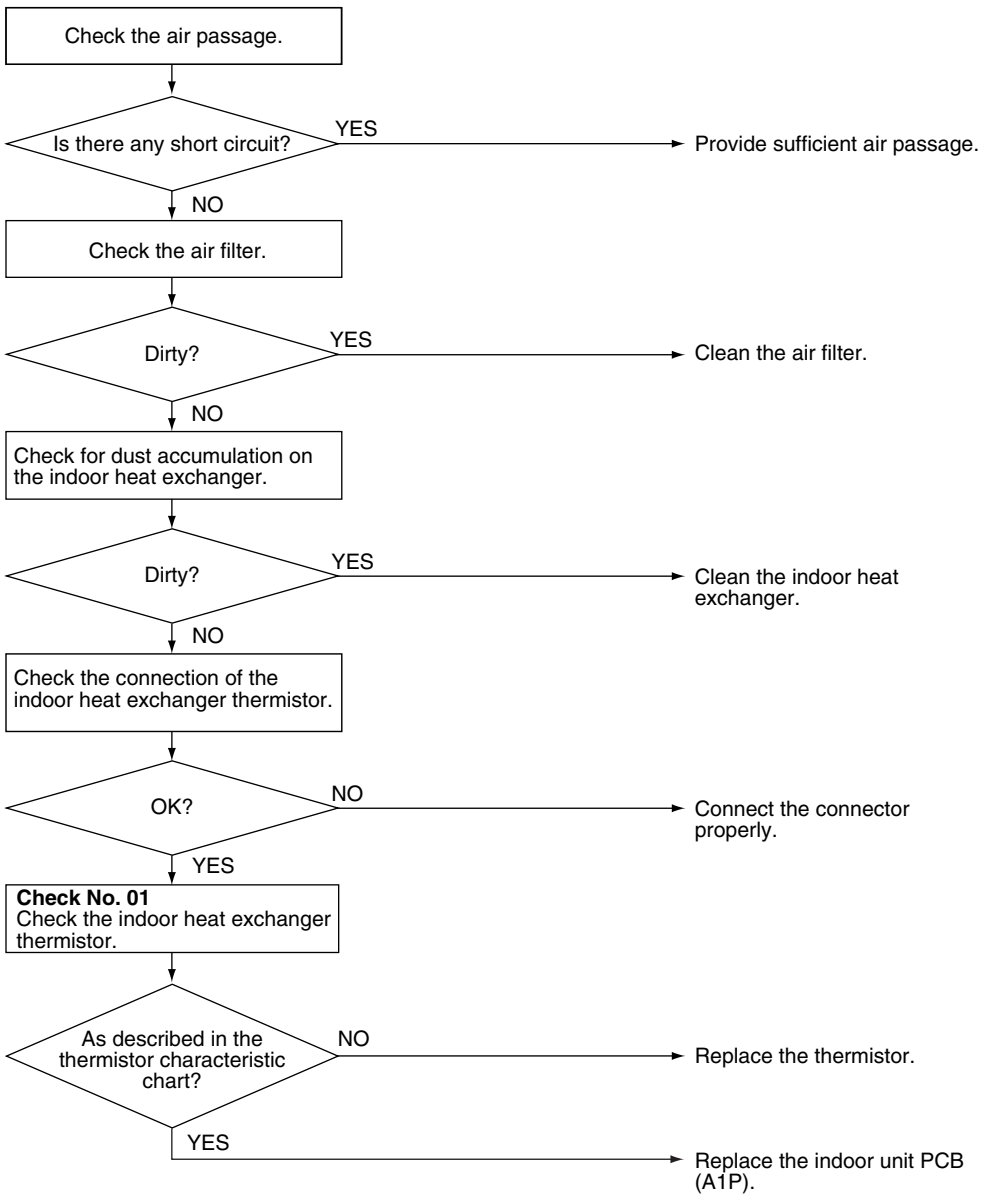
Supposed Causes

- Short-circuited air
- Clogged air filter of the indoor unit
- Dust accumulation on the indoor heat exchanger
- Defective indoor heat exchanger thermistor
- Defective indoor unit PCB (A1P)

Troubleshooting

Check No.01
Refer to P.181

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19514)

2.11 Fan Motor (DC Motor) or Related Abnormality

Error Code

A6

Method of Error Detection

The rotation speed detected by the microcomputer during fan motor operation is used to determine abnormal fan motor operation.

Error Decision Conditions

- The detected rotation speed is less than 50% of HH tap when the maximum fan motor rotation speed is commanded.
- The fan does not rotate for more than 5 seconds after operation starts.

Supposed Causes

- Remarkable decrease in power supply voltage
- Layer short inside the fan motor winding
- Breaking of wire inside the fan motor
- Breaking of the fan motor lead wires
- Defective indoor unit PCB (A1P)

Troubleshooting

Check No.02
Refer to P.182

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

Check the power supply voltage.

Is the power supply voltage fluctuation within ±10% from the rated value?
- NO → Correct the power supply.
- YES

Turn off the power. (Unplug the power cable or turn the breaker off.)

Note: The motor may break when the motor connector is disconnected while the power is turned on. (Be sure to turn off the power before reconnecting the connector.)

Check the connector for connection.

∗ To secure the connection, once disconnect the connector and then reconnect it.

OK?
- NO → Correct the connection.
- YES

Foreign matters in or around the fan?
- YES → Remove the foreign matters.
- NO

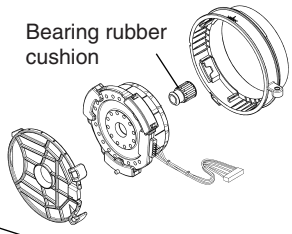
Rotate the fan by hand.

Fan rotates smoothly?
- NO

Abnormal sound occurs?
- NO
- YES

YES

Check No. 02
Check the fan motor for breakdown or short circuit.



Is the bearing rubber cushion properly fitted?
- NO → Correct the position of bearing rubber cushion or replace the bearing rubber cushion.
- YES → Replace the bearing rubber cushion.

Resistance OK?
- NO → Replace the indoor fan motor.
- YES → Replace the indoor unit PCB (A1P).

(R19724)

2.12 Thermistor or Related Abnormality (Indoor Unit)

Error Code

C4, C9

Method of Error Detection

The temperatures detected by the thermistors determine thermistor errors.

Error Decision Conditions

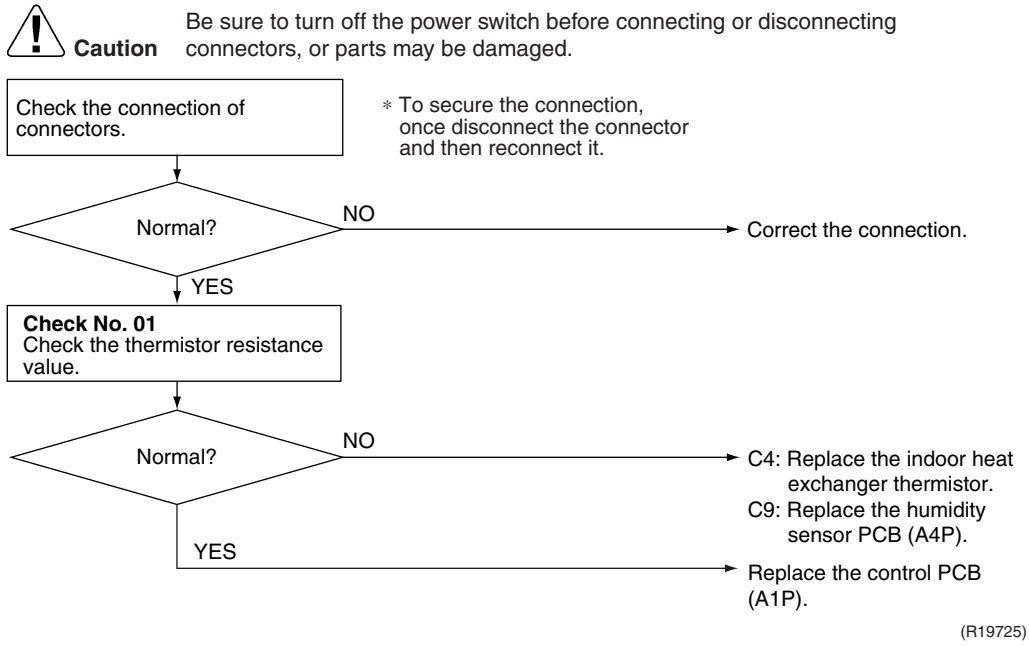
The thermistor input is 4.96 V and more or 0.04 V and less during compressor operation.

Supposed Causes

- Disconnection of connector
- Thermistor corresponding to the error code is defective.
- Defective indoor unit PCB (A1P, A4P)

Troubleshooting

Check No.01
Refer to P.181



C4 : Indoor heat exchanger thermistor
C9 : Room temperature thermistor

2.13 Humidity Sensor (for Humidifying) / Humidifying Thermistor Abnormality

Error Code

CA

Method of Error Detection

The humidity detected by the humidity sensor determine humidity sensor errors.

Error Decision Conditions

The input from the humidity sensor is 4.96 V and more or 0.04 V and less during compressor operation.

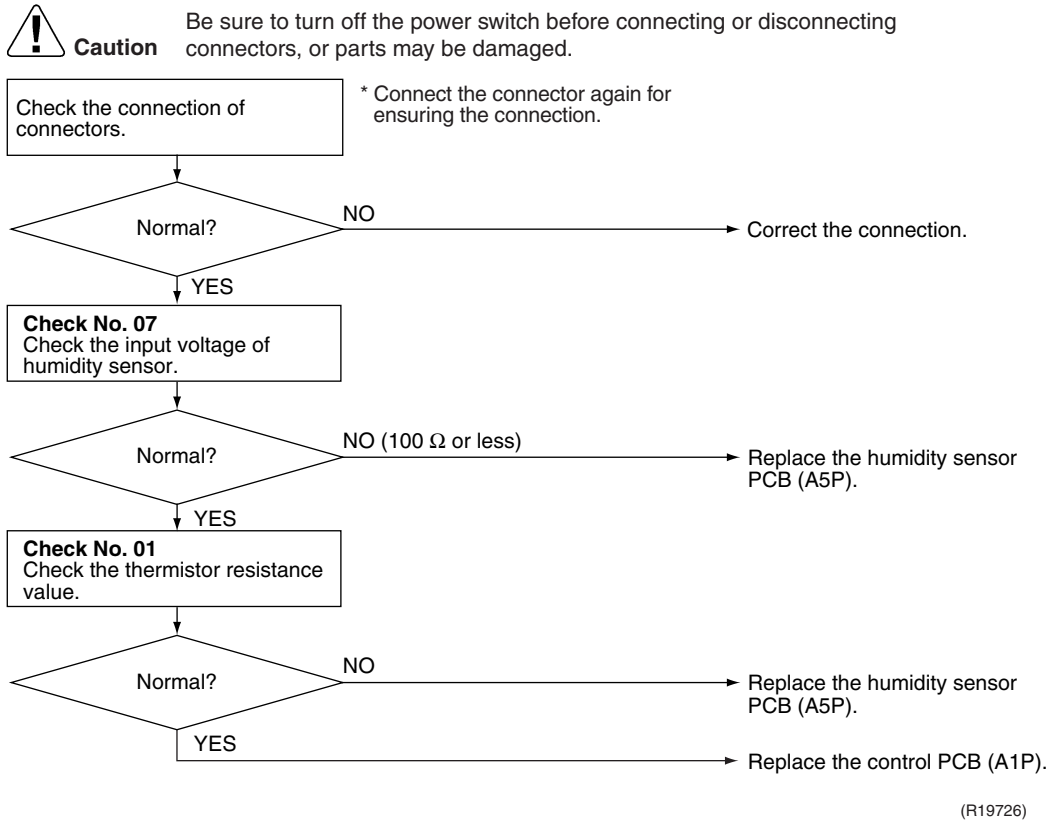
Supposed Causes

- Disconnection of connector
- Defective humidity sensor
- Defective indoor unit PCB (A1P, A5P)

Troubleshooting

Check No.01
Refer to P.181

Check No.07
Refer to P.182



2.14 Humidity Sensor (for Room) Abnormality

Error Code

CC

Method of Error Detection

Sensor abnormality is detected by input value.

Error Decision Conditions

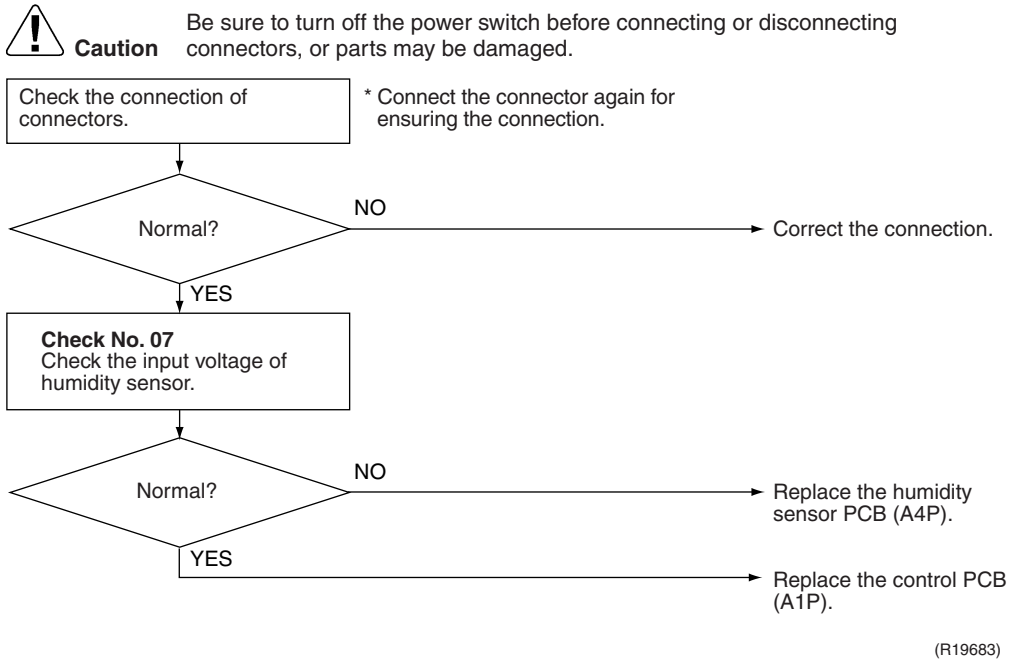
The input from the humidity sensor is 4.96 V and more or 0.04 V and less.

Supposed Causes

- Disconnection of connector
- Defective humidity sensor
- Defective indoor unit PCB (A1P, A4P)

Troubleshooting

Check No.07
Refer to P.182



2.15 Outdoor Unit PCB Abnormality

Error Code

E1

Method of Error Detection

Detect within the programme of the microcomputer.

Error Decision Conditions

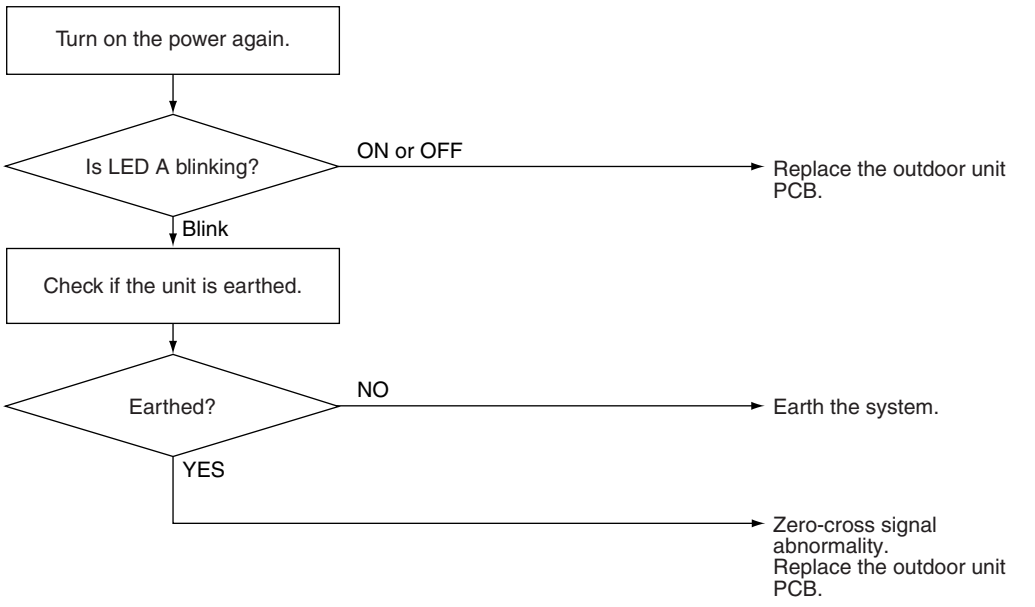
The programme of the microcomputer is in abnormal running order.

Supposed Causes

- Defective outdoor unit PCB
- Noise
- Momentary drop of voltage
- Momentary power failure

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19727)

2.16 OL Activation (Compressor Overload)

Error Code

E5

Method of Error Detection

A compressor overload is detected through compressor OL.

Error Decision Conditions

- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed Causes

- Disconnection of discharge pipe thermistor
- Defective discharge pipe thermistor
- Disconnection of connector S40 or relay connector for OL (Q1M)
- Disconnection of 2 terminals of OL (Q1M)
- Defective OL (Q1M)
- Broken OL harness
- Defective electronic expansion valve or coil
- Defective four way valve or coil
- Defective outdoor unit PCB
- Refrigerant shortage
- Water mixed in refrigerant
- Defective stop valve

Troubleshooting

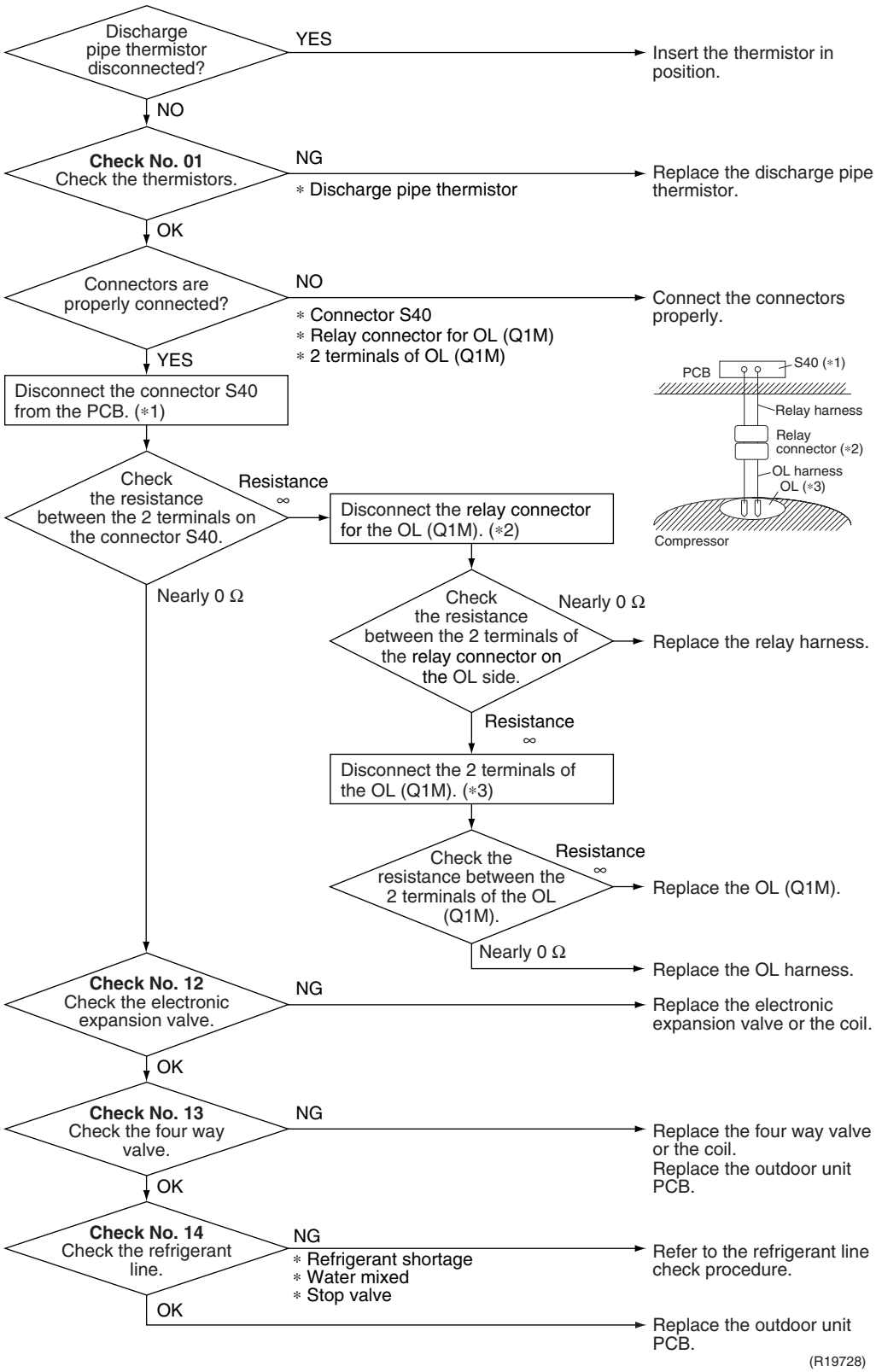
Check No.01
Refer to P.181

Check No.12
Refer to P.183

Check No.13
Refer to P.184

Check No.14
Refer to P.184

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



Note: OL (Q1M) activating temperature: 120°C
OL (Q1M) recovery temperature: 95°C

2.17 Compressor Lock

Error Code

E6

Method of Error Detection

A compressor lock is detected by checking the compressor running condition through the position detection circuit.

Error Decision Conditions

- Operation stops due to overcurrent.
- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 11 minutes without any other error

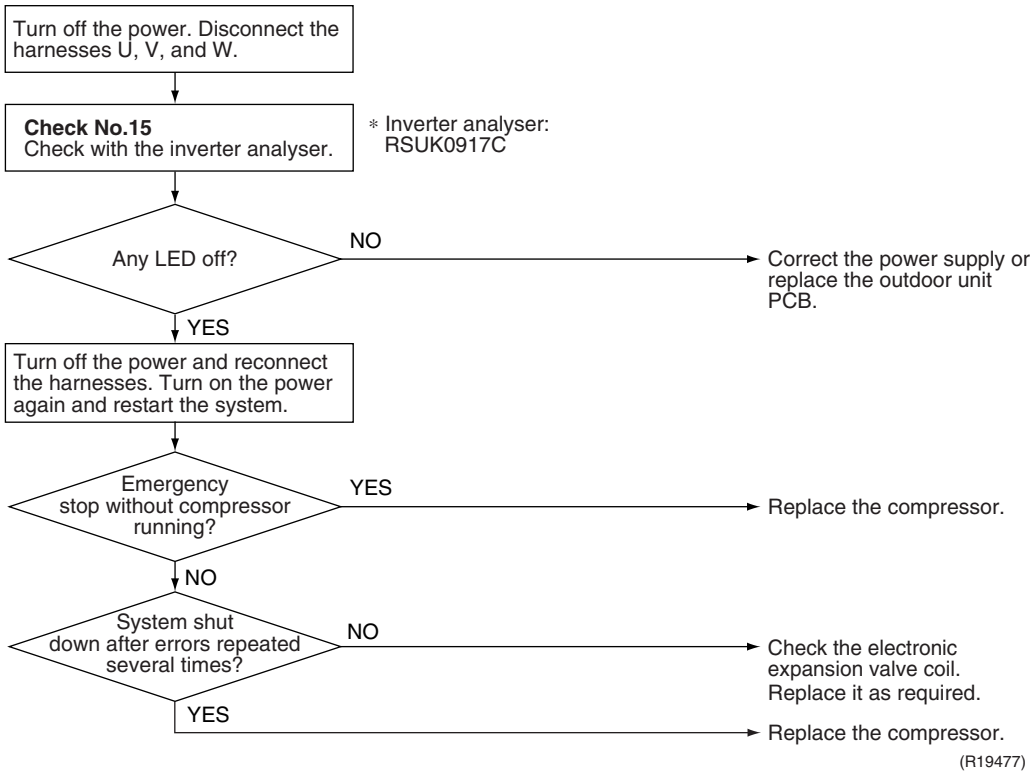
Supposed Causes

- Compressor locked
- Compressor harness disconnected

Troubleshooting

Check No.15
Refer to P.185

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



2.18 DC Fan Lock

Error Code

E7

Method of Error Detection

An error is determined with the high-voltage fan motor rotation speed detected by the Hall IC.

Error Decision Conditions

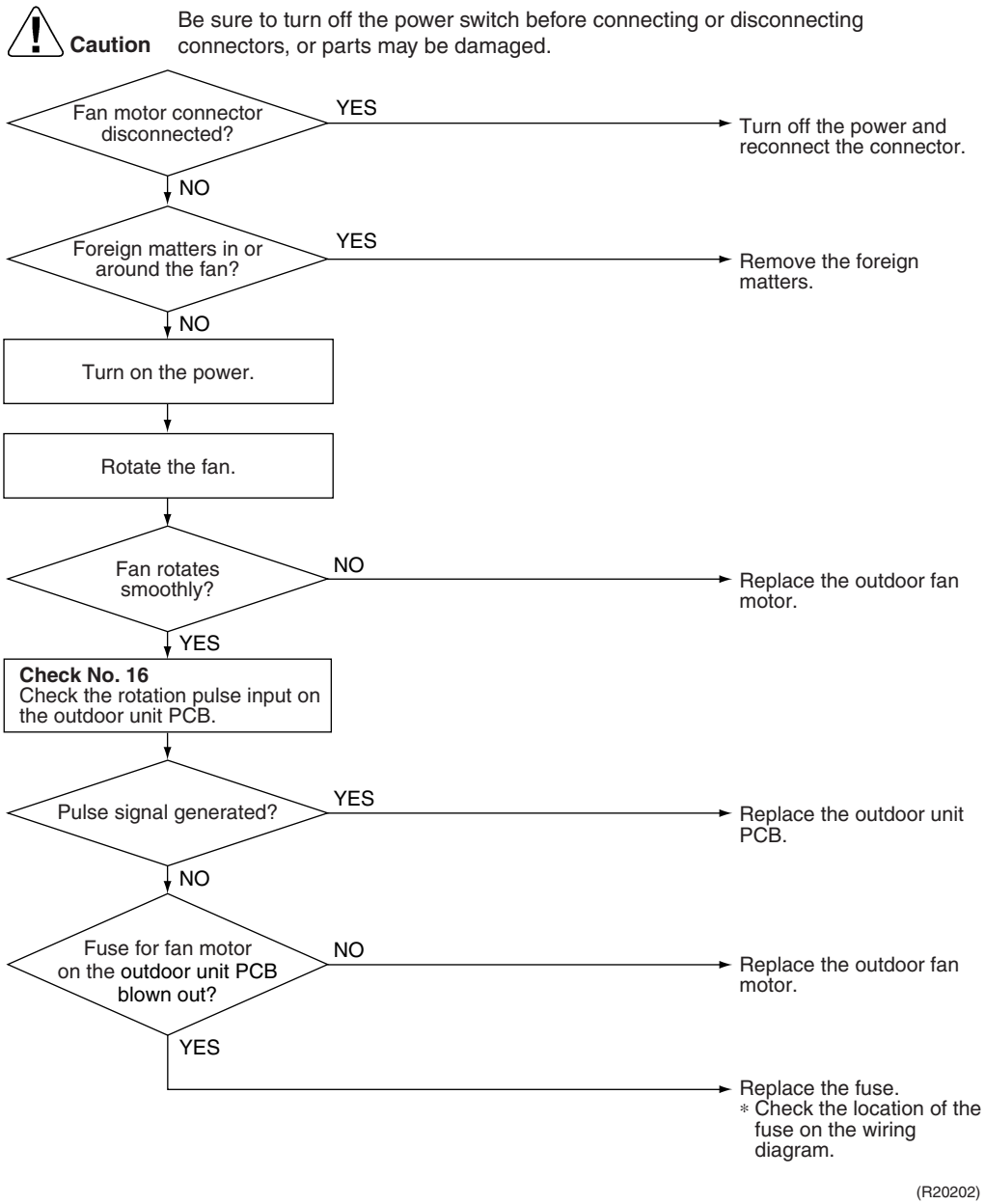
- The fan does not start in 60 seconds even when the fan motor is running.
- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 11 minutes without any other error

Supposed Causes

- Disconnection of the fan motor
- Foreign matters stuck in the fan
- Defective fan motor
- Fuse for fan motor on the outdoor unit PCB is blown out.
- Defective outdoor unit PCB

Troubleshooting

Check No.16
Refer to P.187



(R20202)

2.19 Input Overcurrent Detection

Error Code

E8

Method of Error Detection

An input overcurrent is detected by checking the input current value with the compressor running.

Error Decision Conditions

The current exceeds 21 A for 2.5 seconds with the compressor running.
(The upper limit of the current decreases when the outdoor temperature exceeds a certain level.)

Supposed Causes

- Outdoor temperature is out of operation range.
- Defective compressor
- Defective power module
- Defective outdoor unit PCB
- Short circuit

Troubleshooting

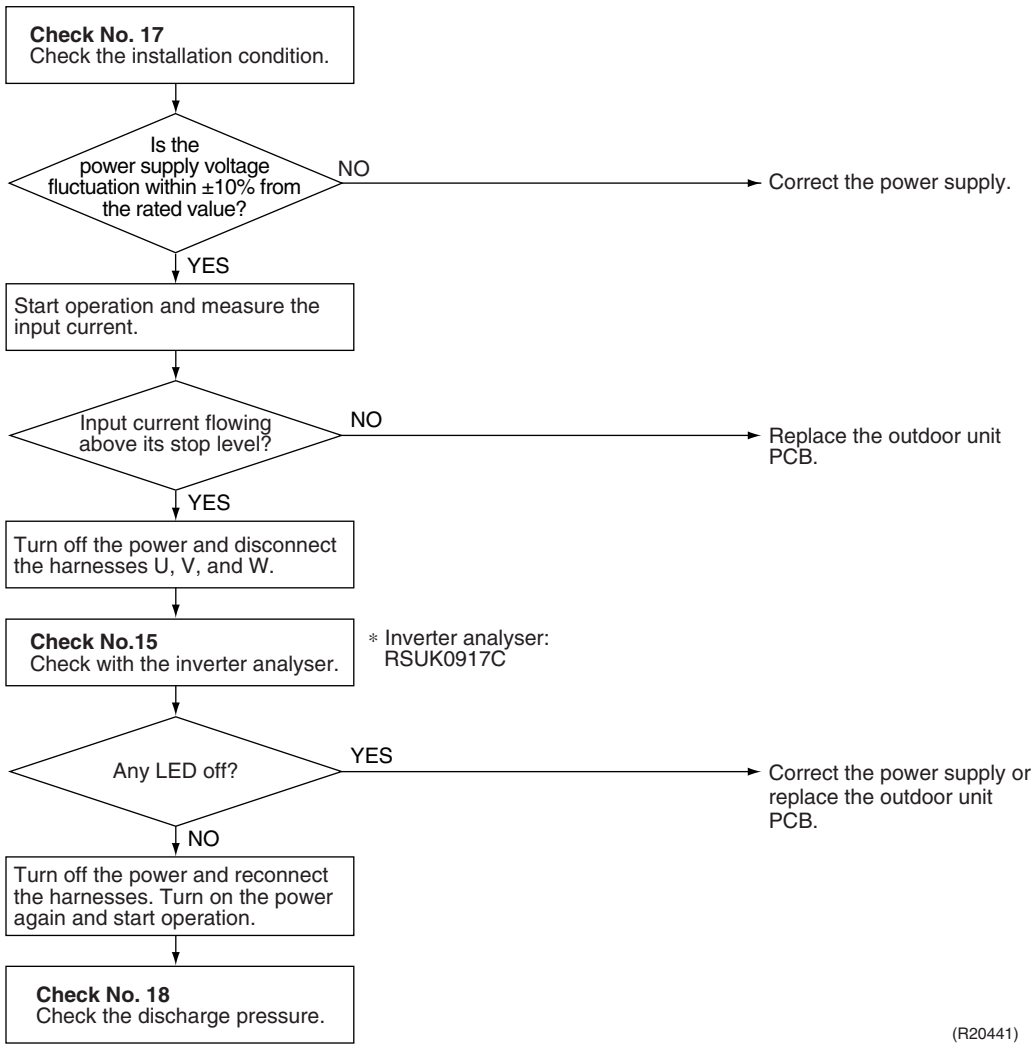
Check No.15
Refer to P.185

Check No.17
Refer to P.188

Check No.18
Refer to P.188

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

∗ An input overcurrent may result from wrong internal wiring. If the system is interrupted by an input overcurrent after the wires have been disconnected and reconnected for part replacement, check the wiring again.



2.20 Four Way Valve Abnormality

Error Code

EA

Method of Error Detection

The room temperature thermistor and the indoor heat exchanger thermistor are checked if they function within their normal ranges in each operation mode.

Error Decision Conditions

A following condition continues over 10 minutes after operating for 5 minutes.

<Cooling / Dry>

A – B < –5°C

<Heating>

B – A < –5°C

A: Room thermistor temperature
B: Indoor heat exchanger temperature

- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed Causes

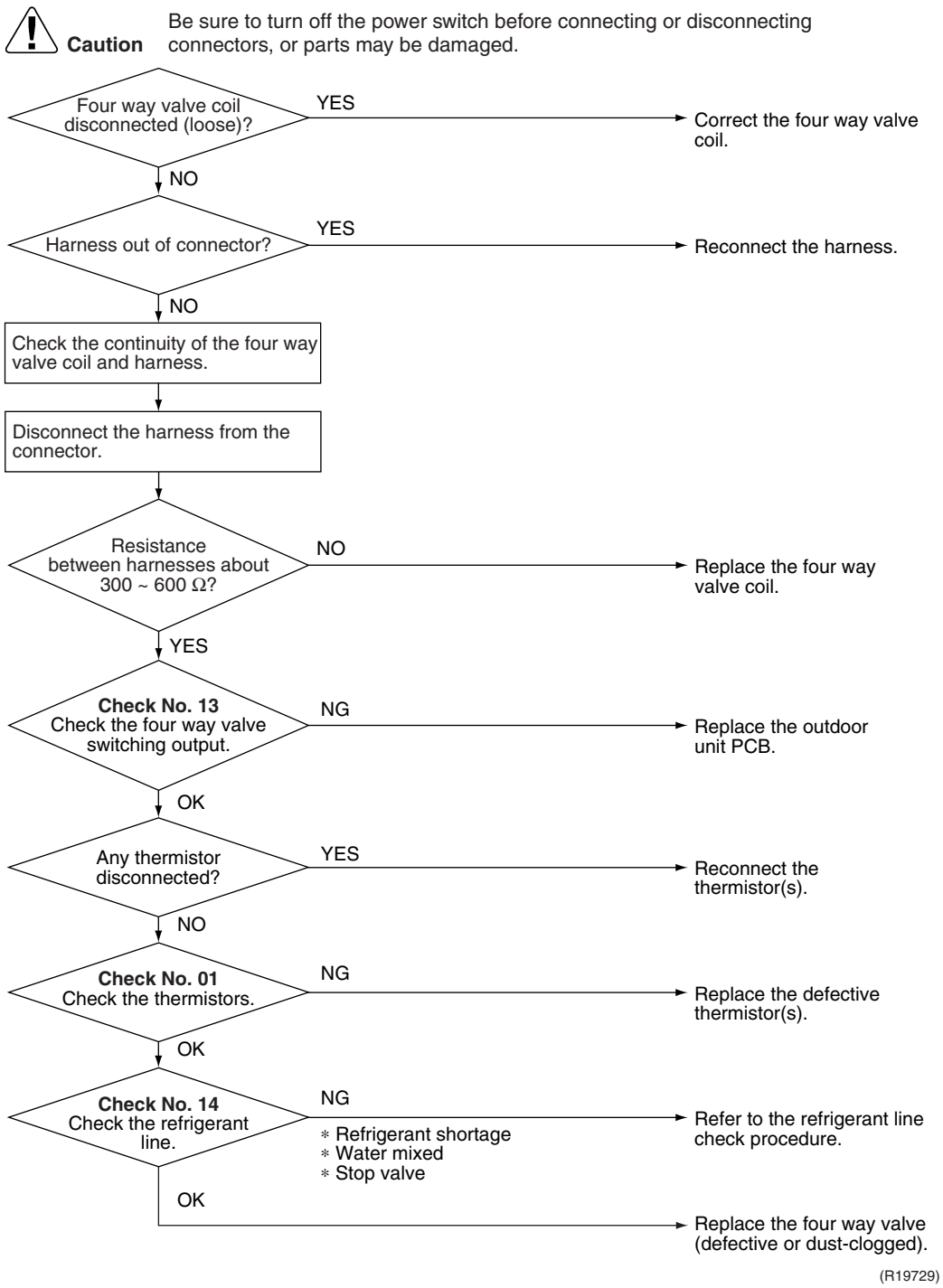
- Disconnection of four way valve coil
- Defective four way valve, coil, or harness
- Defective outdoor unit PCB
- Defective thermistor
- Refrigerant shortage
- Water mixed in refrigerant
- Defective stop valve

Troubleshooting

Check No.01
Refer to P.181

Check No.13
Refer to P.184

Check No.14
Refer to P.184



(R19729)

2.21 Discharge Pipe Temperature Control

Error Code

F3

Method of Error Detection

An error is determined with the temperature detected by the discharge pipe thermistor.

Error Decision Conditions

- If the temperature detected by the discharge pipe thermistor rises above 115°C, the compressor stops.
- The error is cleared when the discharge pipe temperature has dropped below 85°C.
- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed Causes

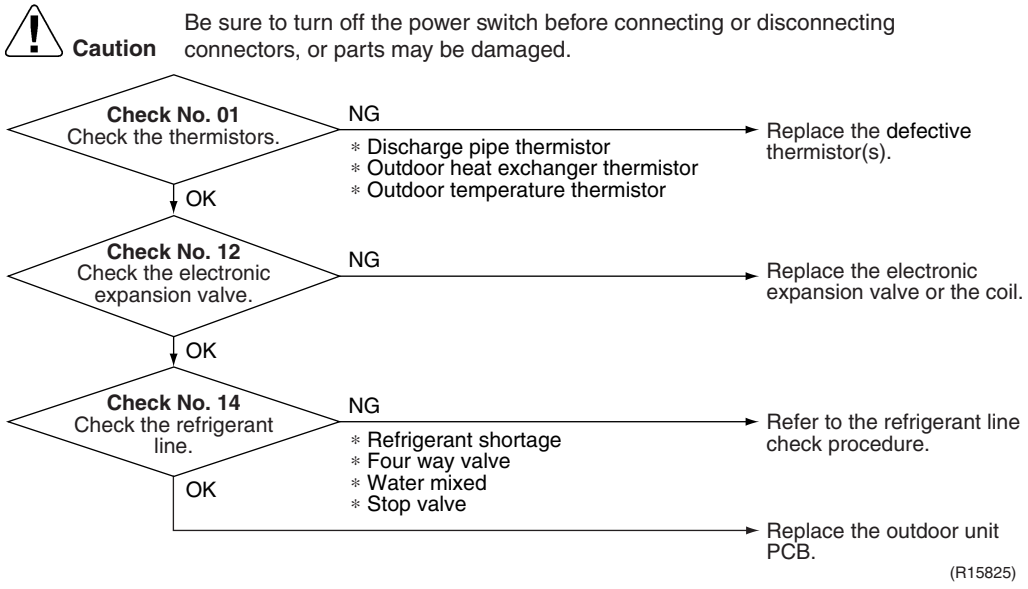
- Defective discharge pipe thermistor
  (Defective outdoor heat exchanger thermistor or outdoor temperature thermistor)
- Defective electronic expansion valve or coil
- Refrigerant shortage
- Defective four way valve
- Water mixed in refrigerant
- Defective stop valve
- Defective outdoor unit PCB

Troubleshooting

Check No.01
Refer to P.181

Check No.12
Refer to P.183

Check No.14
Refer to P.184



2.22 High Pressure Control in Cooling

Error Code

F6

Method of Error Detection

High-pressure control (operation halt, frequency drop, etc.) is activated in cooling operation if the temperature sensed by the outdoor heat exchanger thermistor exceeds the limit.

Error Decision Conditions

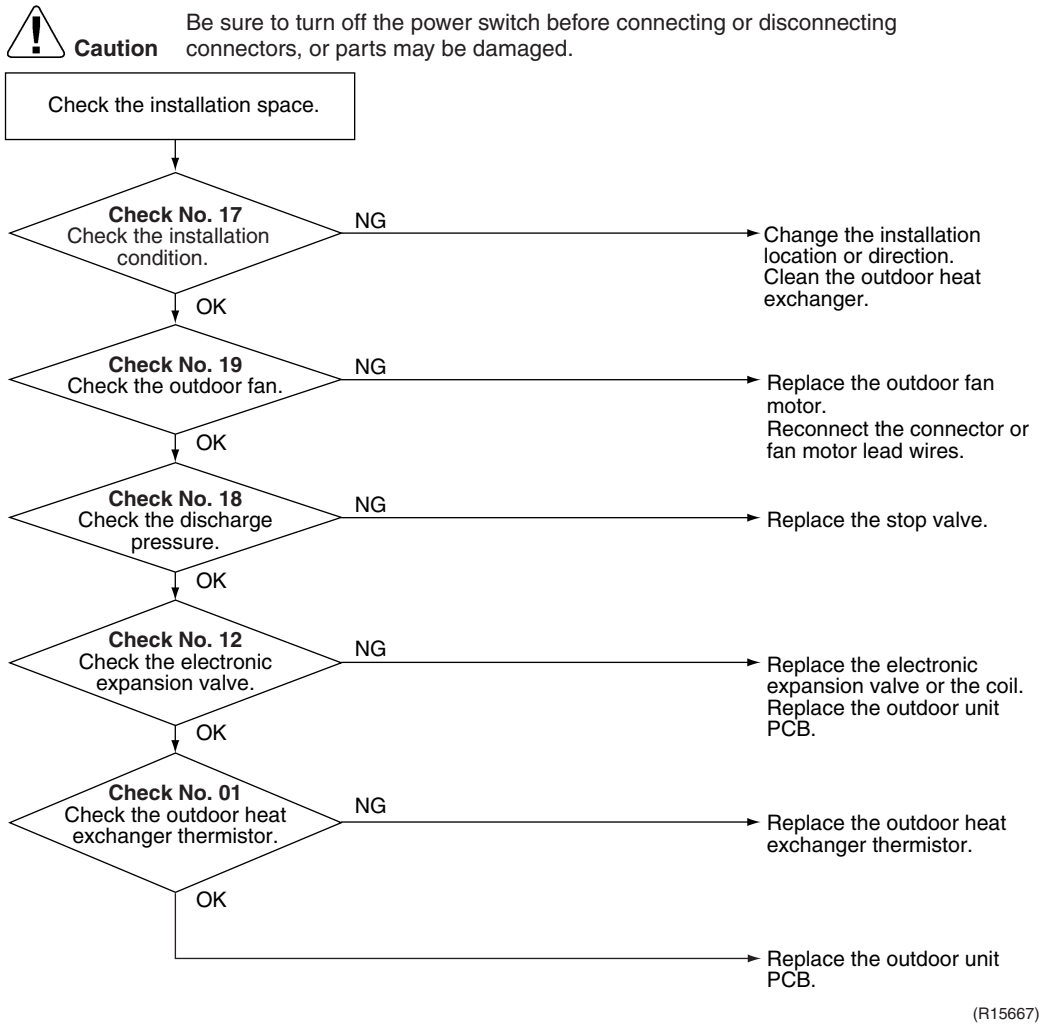
- The temperature sensed by the outdoor heat exchanger thermistor rises above about 54.5°C.
- The error is cleared when the temperature drops below about 47.5°C.

Supposed Causes

- The installation space is not large enough.
- Dirty outdoor heat exchanger
- Defective outdoor fan motor
- Defective stop valve
- Defective electronic expansion valve or coil
- Defective outdoor heat exchanger thermistor
- Defective outdoor unit PCB

Troubleshooting

Check No.01 Refer to P.181
Check No.12 Refer to P.183
Check No.17 Refer to P.188
Check No.18 Refer to P.188
Check No.19 Refer to P.189



(R15667)

2.23 Compressor System Sensor Abnormality

Error Code

H0

Method of Error Detection

The system checks the DC voltage before the compressor starts.

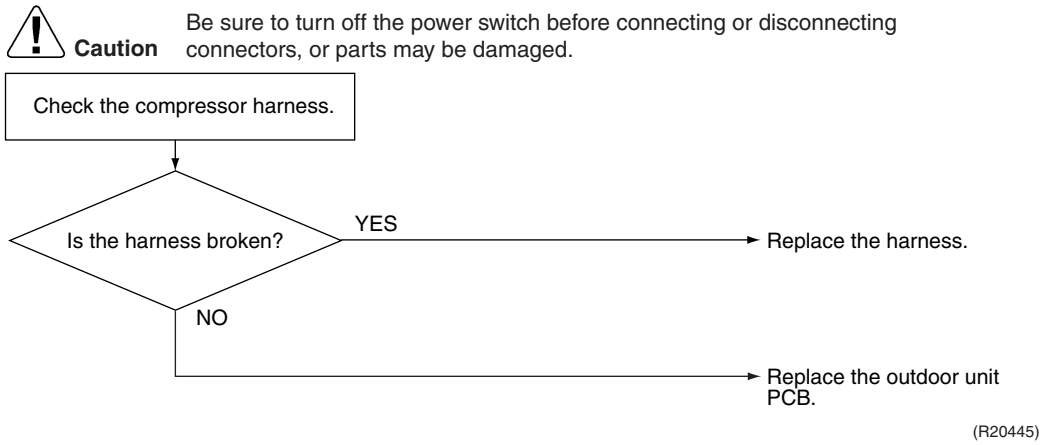
Error Decision Conditions

- The voltage converted from the DC current before compressor start-up is out of the range 0.5 ~ 4.5 V.
- The DC voltage before compressor start-up is below 50 V.

Supposed Causes

- Broken or disconnected harness
- Defective outdoor unit PCB

Troubleshooting



2.24 Power Factor Correction Circuit Abnormality

Error Code

H0

Method of Error Detection

Overcurrent or overvoltage is detected on power factor correction circuit.

Error Decision Conditions

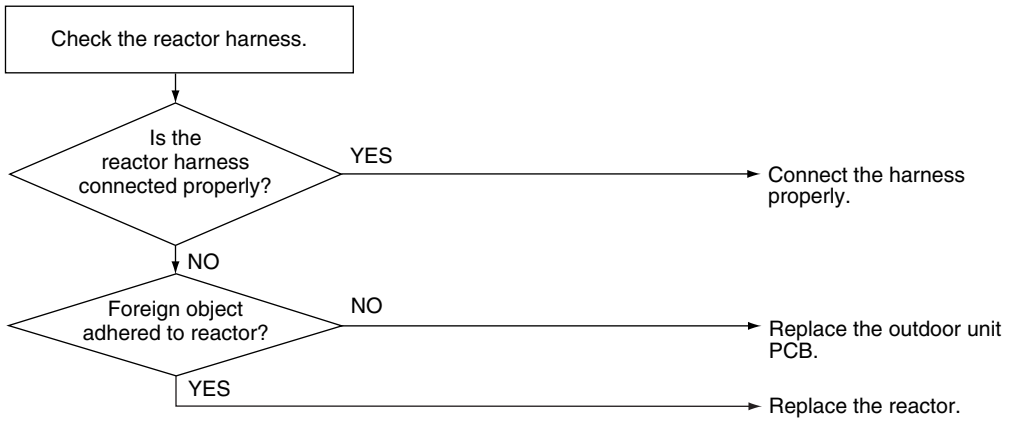
When the abnormal signal is detected from the power factor correction circuit.

Supposed Causes

- Defective reactor
- Reactor harness disconnection or wire breakage
- Defective outdoor unit PCB

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R20211)

2.25 Position Sensor Abnormality

Error Code

H6

Method of Error Detection

A compressor start-up failure is detected by checking the compressor running condition through the position detection circuit.

Error Decision Conditions

- When the compressor does not run for 15 seconds after receiving operation start command.
- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 11 minutes without any other error

Supposed Causes

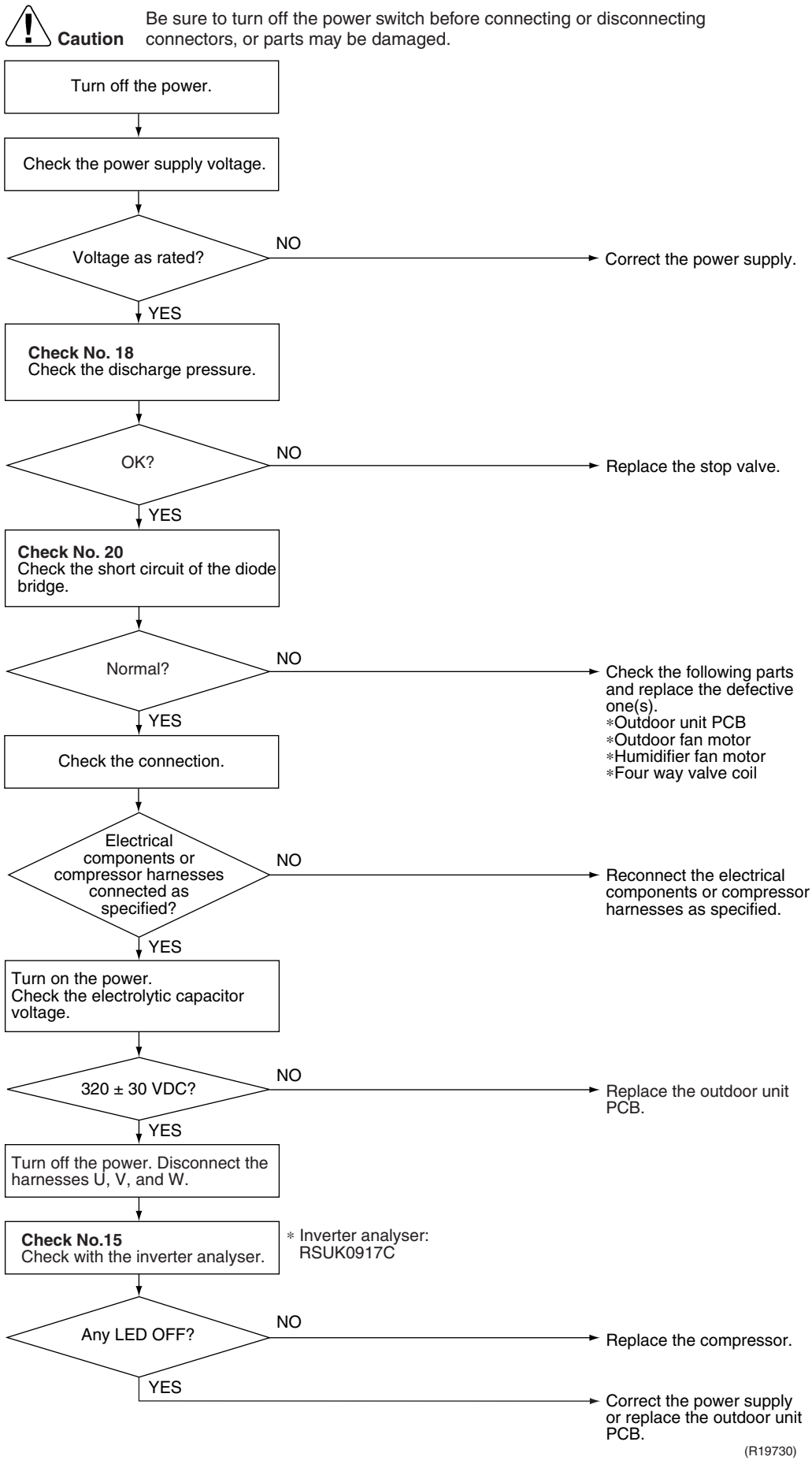
- Disconnection of the compressor relay cable
- Defective compressor
- Defective outdoor unit PCB
- Start-up failure caused by the closed stop valve
- Input voltage is outside the specified range.

Troubleshooting

Check No.15
Refer to P.185

Check No.18
Refer to P.188

Check No.20
Refer to P.189



2.26 Thermistor or Related Abnormality (Outdoor Unit)

Error Code

H9, J3, J6, J8, P4

Method of Error Detection

This fault is identified based on the thermistor input voltage to the microcomputer.
A thermistor fault is identified based on the temperature sensed by each thermistor.

Error Decision Conditions

- The thermistor input voltage is 4.98 V and more or 0.02 V and less for 5 seconds with the power on.
- **J3** error is judged if the discharge pipe temperature is lower than the heat exchanger temperature.

Supposed Causes

- Disconnection of the connector for the thermistor
- Thermistor corresponding to the error code is defective.
- Defective heat exchanger thermistor in the case of **J3** error (outdoor heat exchanger thermistor in cooling operation, or indoor heat exchanger thermistor in heating operation)
- Defective outdoor unit PCB

Troubleshooting

In case of P4 (Radiation fin thermistor)

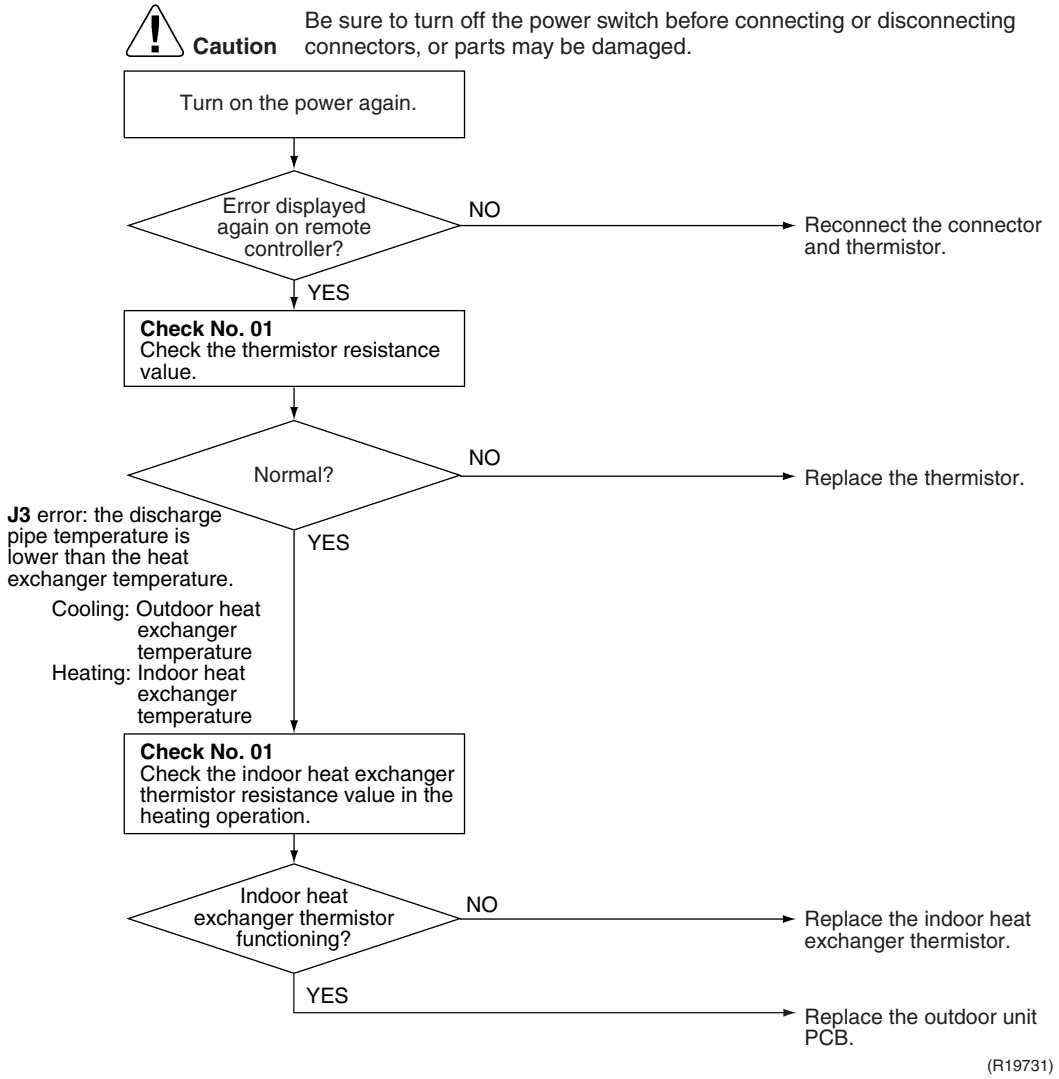
Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

Replace the outdoor unit PCB.

Troubleshooting

Check No.01
Refer to P.181

■ In case of H9, J3, J6, J8



H9: Outdoor temperature thermistor
J3: Discharge pipe thermistor
J6: Outdoor heat exchanger thermistor
J8: Liquid pipe thermistor

2.27 Electrical Box Temperature Rise

Error Code

L3

Method of Error Detection

An electrical box temperature rise is detected by checking the radiation fin thermistor with the compressor off.

Error Decision Conditions

- With the compressor off, the radiation fin temperature is above **A**°C.
- The error is cleared when the radiation fin temperature drops below **B**°C.
- To cool the electrical components, the outdoor fan starts when the radiation fin temperature rises above **C**°C and stops when it drops below **B**°C.

A (°C)	**B** (°C)	**C** (°C)
122	64	113

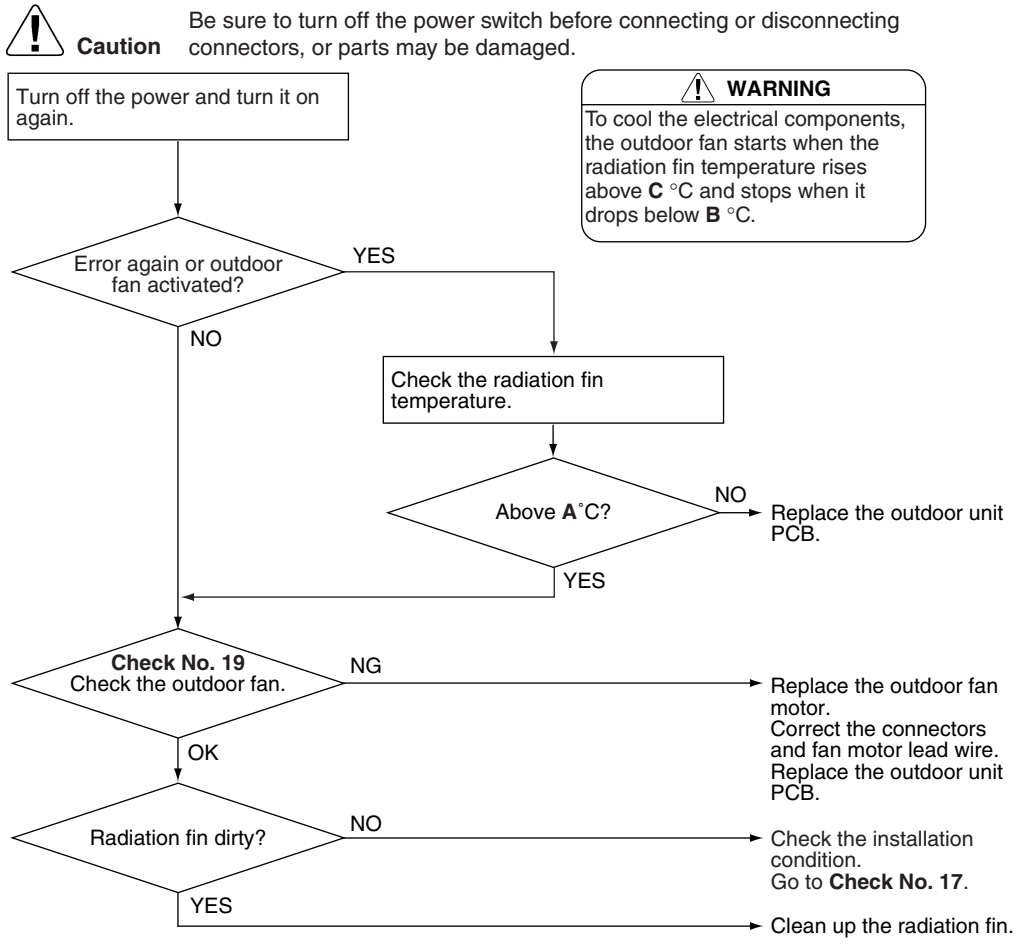
Supposed Causes

- Defective outdoor fan motor
- Short circuit
- Defective radiation fin thermistor
- Disconnection of connector
- Defective outdoor unit PCB

Troubleshooting

Check No.17
Refer to P.188

Check No.19
Refer to P.189



(R19556)

2.28 Radiation Fin Temperature Rise

Error Code

L4

Method of Error Detection

A radiation fin temperature rise is detected by checking the radiation fin thermistor with the compressor on.

Error Decision Conditions

- The radiation fin temperature with the compressor on is above **A**°C.
- The error is cleared when the radiation fin temperature drops below **B**°C.
- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

A (°C)	**B** (°C)
86	57

Supposed Causes

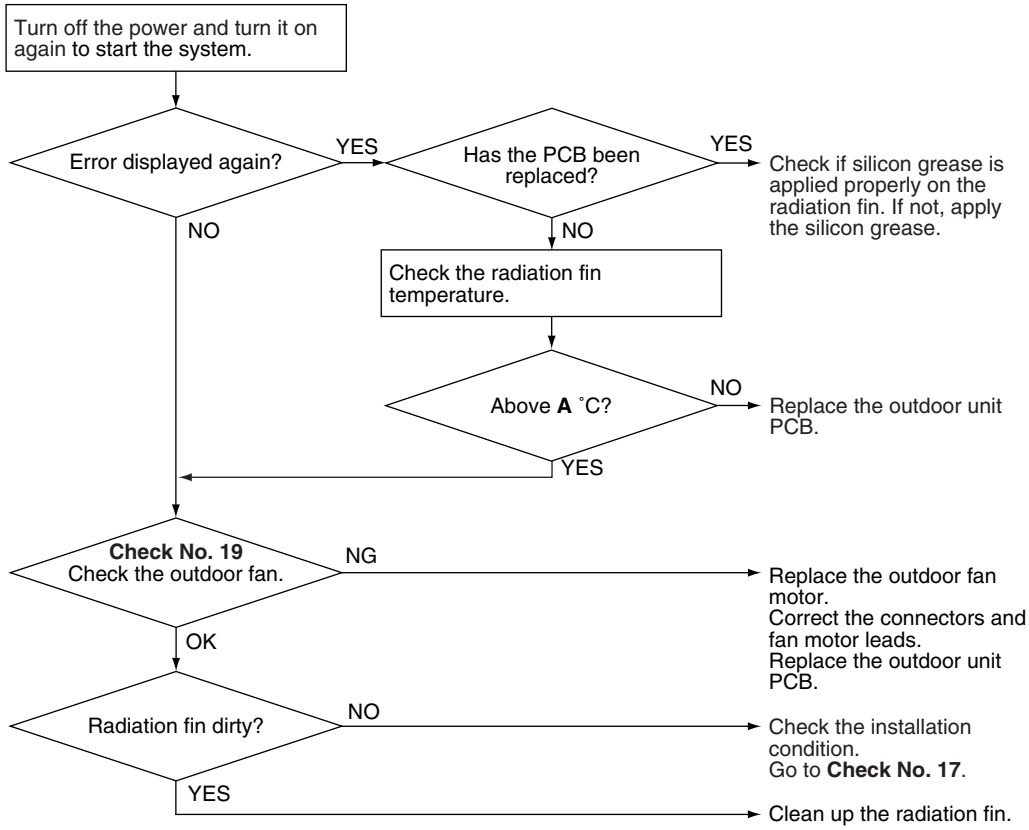
- Defective outdoor fan motor
- Short circuit
- Defective radiation fin thermistor
- Disconnection of connector
- Defective outdoor unit PCB
- Silicon grease is not applied properly on the radiation fin after replacing the outdoor unit PCB.

Troubleshooting

Check No.17
Refer to P.188

Check No.19
Refer to P.189

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19529)

A (°C)
86

Note: Refer to Silicon Grease on Power Transistor / Diode Bridge on page 198 for detail.

2.29 Output Overcurrent Detection

Error Code

L5

Method of Error Detection

An output overcurrent is detected by checking the current that flows in the inverter DC section.

Error Decision Conditions

- A position signal error occurs while the compressor is running.
- A rotation speed error occurs while the compressor is running.
- An output overcurrent signal is fed from the output overcurrent detection circuit to the microcomputer.
- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 11 minutes without any other error

Supposed Causes

- Poor installation condition
- Closed stop valve
- Defective power module
- Wrong internal wiring
- Abnormal power supply voltage
- Defective outdoor unit PCB
- Defective compressor

Troubleshooting

Check No.15
Refer to P.185

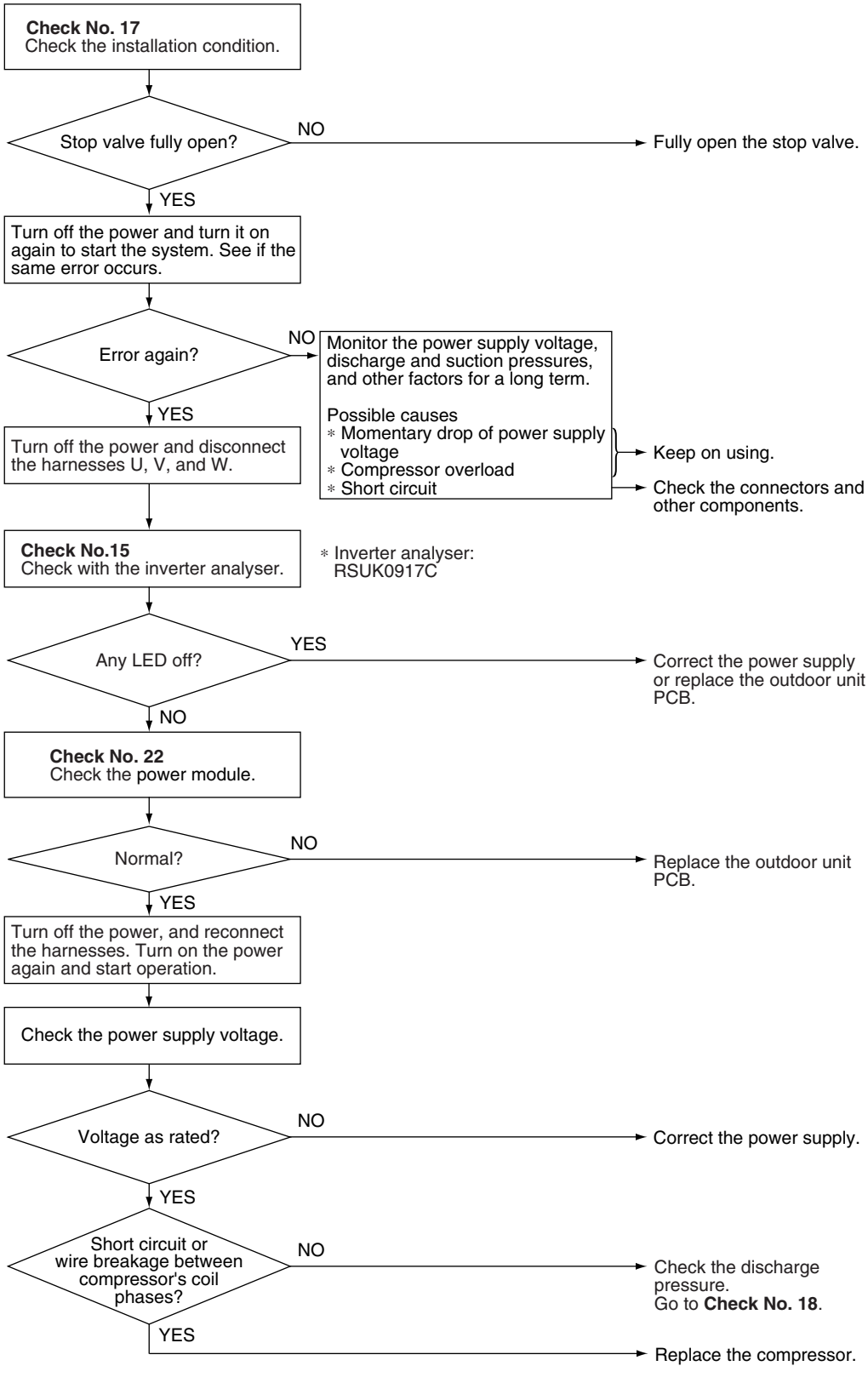
Check No.17
Refer to P.188

Check No.18
Refer to P.188

Check No.22
Refer to P.190

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

* An output overcurrent may result from wrong internal wiring. If the system is interrupted by an output overcurrent after the wires have been disconnected and reconnected for part replacement, check the wiring again.



(R19545)

2.30 Humidifier Fan Motor System Abnormality / Fan Lock

Error Code

P9

Method of Error Detection

During humidifier fan motor running, fan motor system abnormality is identified based on the fan motor rotation speed detected by the Hall IC.

Error Decision Conditions

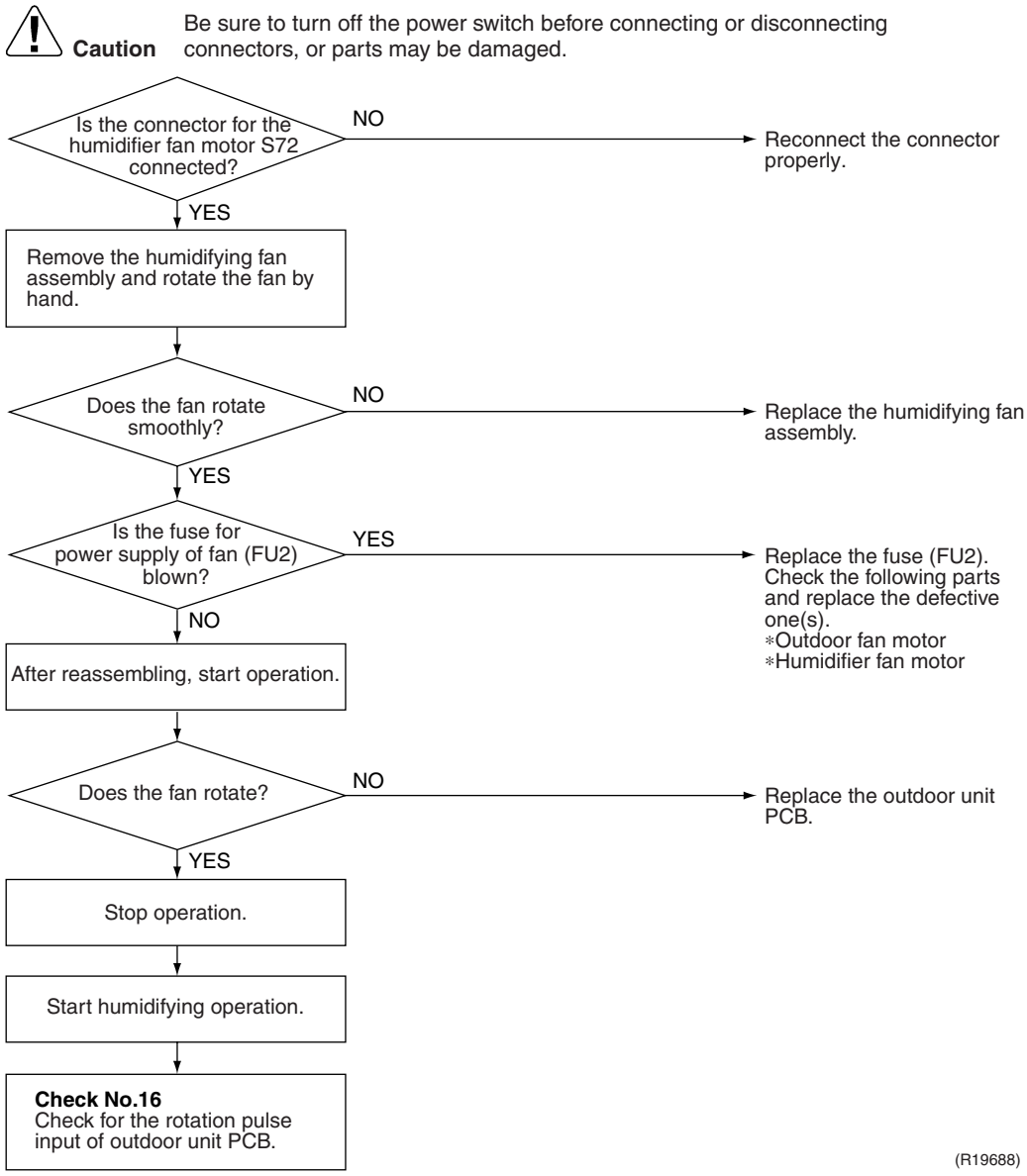
The fan motor rotation speed does not reach 100 rpm within 12 seconds after starting.

Supposed Causes

- Defective humidifier fan motor
- Breakage of relay harness or loose connector
- Detection fault of fan motor rotation speed due to defective outdoor unit PCB

Troubleshooting

Check No.16
Refer to P.187



Note: FU2 is commonly used for the outdoor fan motor, humidifier fan motor, and the four way valve coil.

2.31 Heater Wire Abnormality

Error Code

PA

Method of Error Detection

An error is identified when the outlet temperature of humidifying fan does not reach a certain temperature within a given time after the heater is turned on.

Error Decision Conditions

The temperature detected by the humidifying thermistor is lower than the outdoor temperature (with the heater turned off) + 6°C, and this condition continues for 30 minutes.

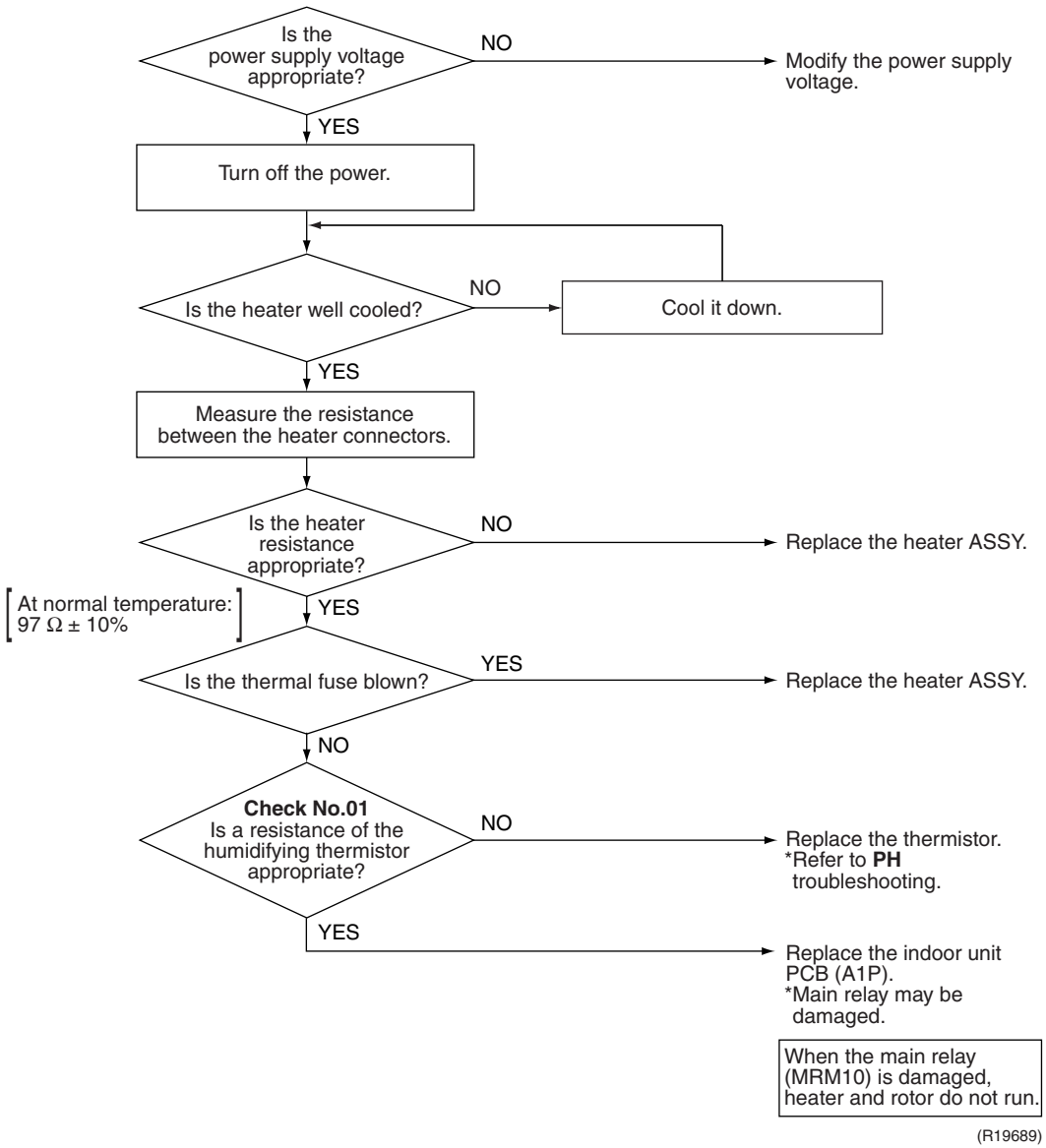
Supposed Causes

- Power supply voltage is extremely low.
- Breakage of heater filament
- Breakage of heater harness
- Abnormal temperature detected by outdoor temperature thermistor
- Abnormal temperature detected by humidifying thermistor
- Defective main relay
- Blown thermal fuse
- Defective heater control part

Troubleshooting

Check No.01
Refer to P.181

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19689)

2.32 Humidifying Thermistor Abnormality / Humidifying Heater Temperature Abnormality

Error Code

PH

Method of Error Detection

An error is identified when the temperature detected by the humidifying thermistor is abnormal.

Error Decision Conditions

- When the power is supplied and the thermistor input is 4.90 V and more or 0.06 V and less.
- The outlet temperature of humidifying fan is more than 90°C.

Supposed Causes

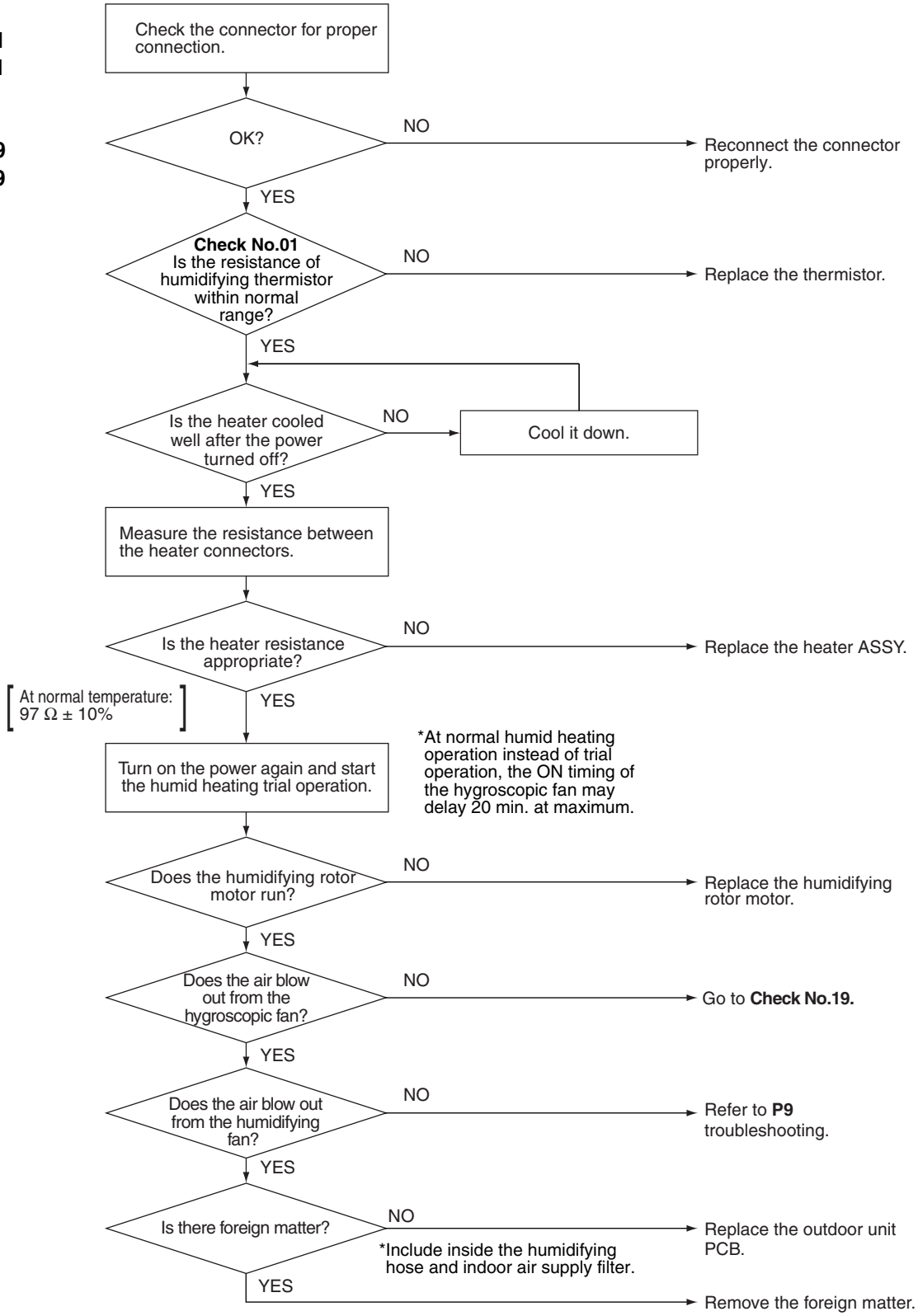
- Short circuit and wire breakage of humidifying thermistor
- Disconnection of connector
- Heater has a high power.
- Thermistor temperature detection error
- Defective rotor motor
- Defective hygroscopic fan motor
- Defective heater control part
- Defective humidifying fan

Troubleshooting

Check No.01
Refer to P.181

Check No.19
Refer to P.189

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19690)

2.33 Refrigerant Shortage

Error Code

U0

Method of Error Detection

Refrigerant shortage detection I:
Refrigerant shortage is detected by checking the input current value and the compressor running frequency. If the refrigerant is short, the input current is lower than the normal value.

Refrigerant shortage detection II:
Refrigerant shortage is detected by checking the discharge pipe temperature and the opening of the electronic expansion valve. If the refrigerant is short, the discharge pipe temperature tends to rise.

Refrigerant shortage detection III:
Refrigerant shortage is detected by checking the difference between suction and discharge temperature.

Error Decision Conditions

Refrigerant shortage detection I:
The following conditions continue for 7 minutes.

- Input current × input voltage ≤ **A** × output frequency + **B**
- Output frequency > **C**

A (–)	**B** (W)	**C** (Hz)
2800/256	–350	55

Refrigerant shortage detection II:
The following conditions continue for 80 seconds.

- Opening of the electronic expansion valve ≥ **D**
- Discharge pipe temperature > **E** × target discharge pipe temperature + **F**

D (pulse)	**E** (–)	**F** (°C)
470	128/128	20

Refrigerant shortage detection III:
When the difference of the temperature is smaller than **G**°C, it is regarded as refrigerant shortage.

Operation mode	Description	**G** (°C)
Cooling	room thermistor temperature – indoor heat exchanger temperature	4.0
	outdoor heat exchanger temperature – outdoor temperature	4.0
Heating	indoor heat exchanger temperature – room thermistor temperature	4.0
	outdoor temperature – outdoor heat exchanger temperature	4.0

- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed Causes

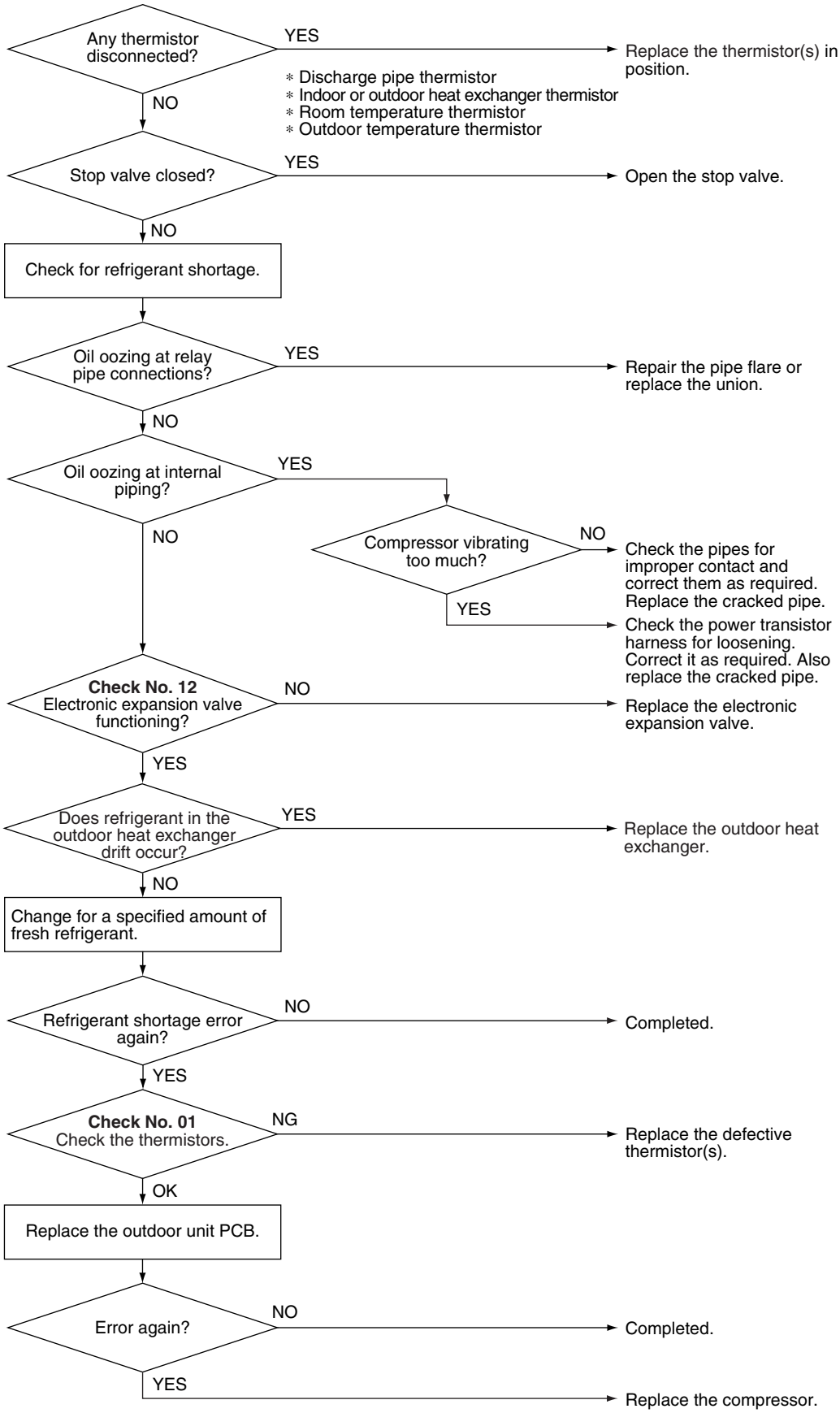
- Disconnection of the discharge pipe thermistor, indoor or outdoor heat exchanger thermistor, room or outdoor temperature thermistor
- Closed stop valve
- Refrigerant shortage (refrigerant leakage)
- Defective electronic expansion valve
- Refrigerant drift in the outdoor heat exchanger
- Poor compression performance of compressor

Troubleshooting

Check No.01
Refer to P.181

Check No.12
Refer to P.183

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19373)

2.34 Low-voltage Detection or Over-voltage Detection

Error Code

U2

Method of Error Detection

★ Indoor Unit

The zero-cross detection of the power supply is evaluated by the indoor unit PCB.

★ Outdoor Unit

Low-voltage detection:
An abnormal voltage drop is detected by the DC voltage detection circuit.

Over-voltage detection:
An abnormal voltage rise is detected by the over-voltage detection circuit.

Error Decision Conditions

★ Indoor Unit

There is no zero-cross detection in approximately 10 seconds.

★ Outdoor Unit

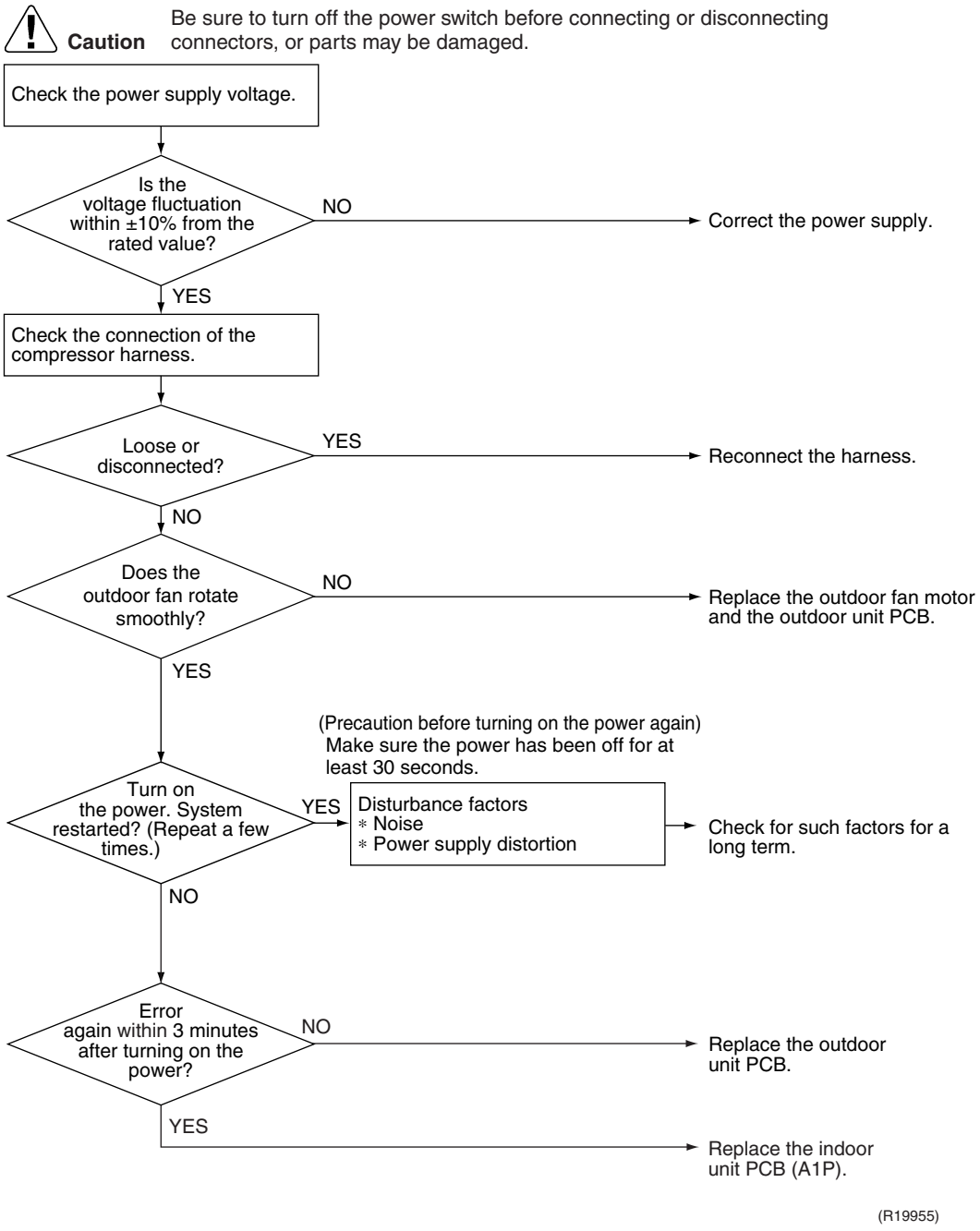
Low-voltage detection:
- The voltage detected by the DC voltage detection circuit is below 150 ~ 180 V (depending on the model).
- The compressor stops if the error occurs, and restarts automatically after 3-minute standby.

Over-voltage detection:
- An over-voltage signal is fed from the over-voltage detection circuit to the microcomputer.
- The compressor stops if the error occurs, and restarts automatically after 3-minute standby.

Supposed Causes

- Power supply voltage is not as specified.
- Defective DC voltage detection circuit
- Defective over-voltage detection circuit
- Defective PAM control part
- Disconnection of compressor harness
- Short circuit inside the fan motor winding
- Noise
- Momentary drop of voltage
- Momentary power failure
- Defective outdoor unit PCB
- Defective indoor unit PCB

Troubleshooting



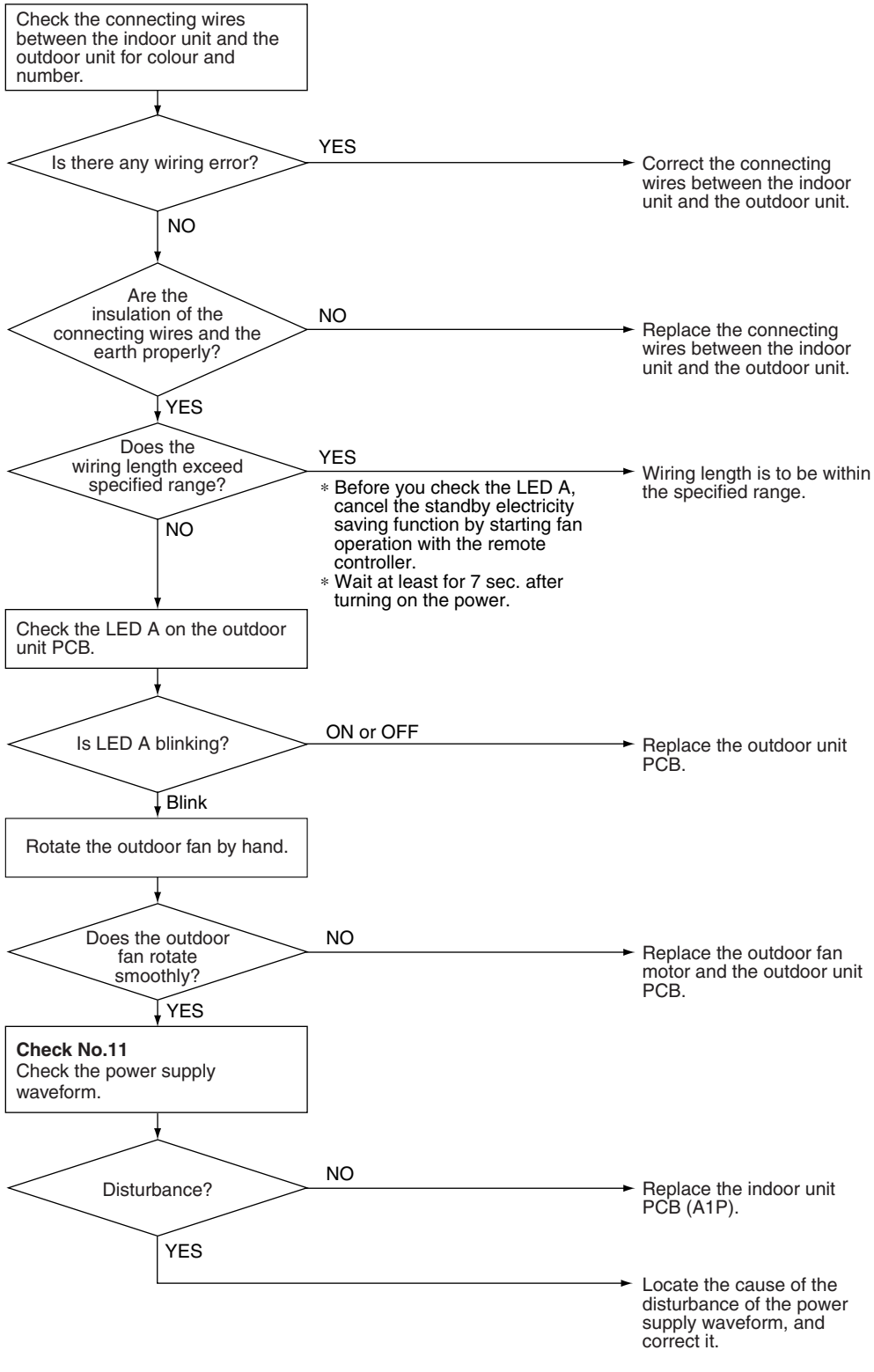
2.35 Signal Transmission Error (Between Indoor Unit and Outdoor Unit)

Error Code	**U4**
Method of Error Detection	The data sent from the outdoor unit is checked for problem.
Error Decision Conditions	The data sent from the outdoor unit cannot be received without error, or the disable status of signal transmission continues for 15 seconds.
Supposed Causes	■ Wiring error ■ Breaking of the connecting wires between the indoor unit and the outdoor unit ■ Improper insulation of the connecting wires and earth ■ Wiring length exceeds the specified range ■ Defective outdoor unit PCB ■ Defective indoor unit PCB ■ Layer short inside the fan motor winding

Troubleshooting

Check No.11
Refer to P.183

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19684)

2.36 Outdoor Unit PCB Abnormality or Communication Circuit Abnormality

Error Code

U4

Method of Error Detection

Detection within the programme of the microcomputer

Error Decision Conditions

- The programme of the microcomputer does not work in order.
- Indoor-outdoor unit signal transmission cannot be performed for more than 15 seconds.

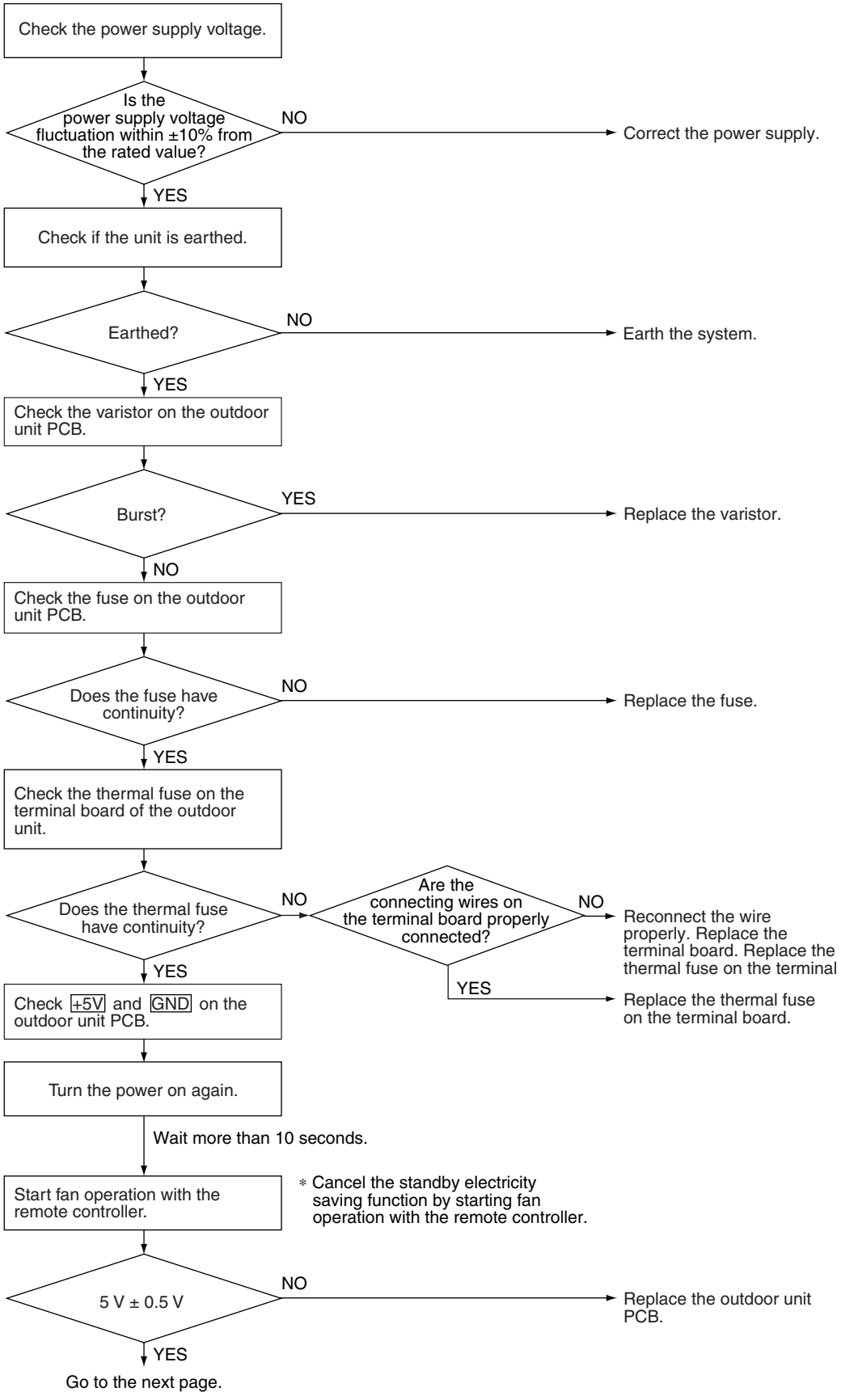
Supposed Causes

- Power supply voltage is not as specified.
- Improper earth work
- Defective varistor or fuse on the outdoor unit PCB
- Defective thermal fuse on the terminal board of the outdoor unit
- Disconnection of connecting wires
- Defective outdoor unit PCB
- Noise
- Disturbed power supply waveform
- Wrong wiring
- Improper insulation of the connecting wires and earth
- Defective indoor unit PCB

Troubleshooting

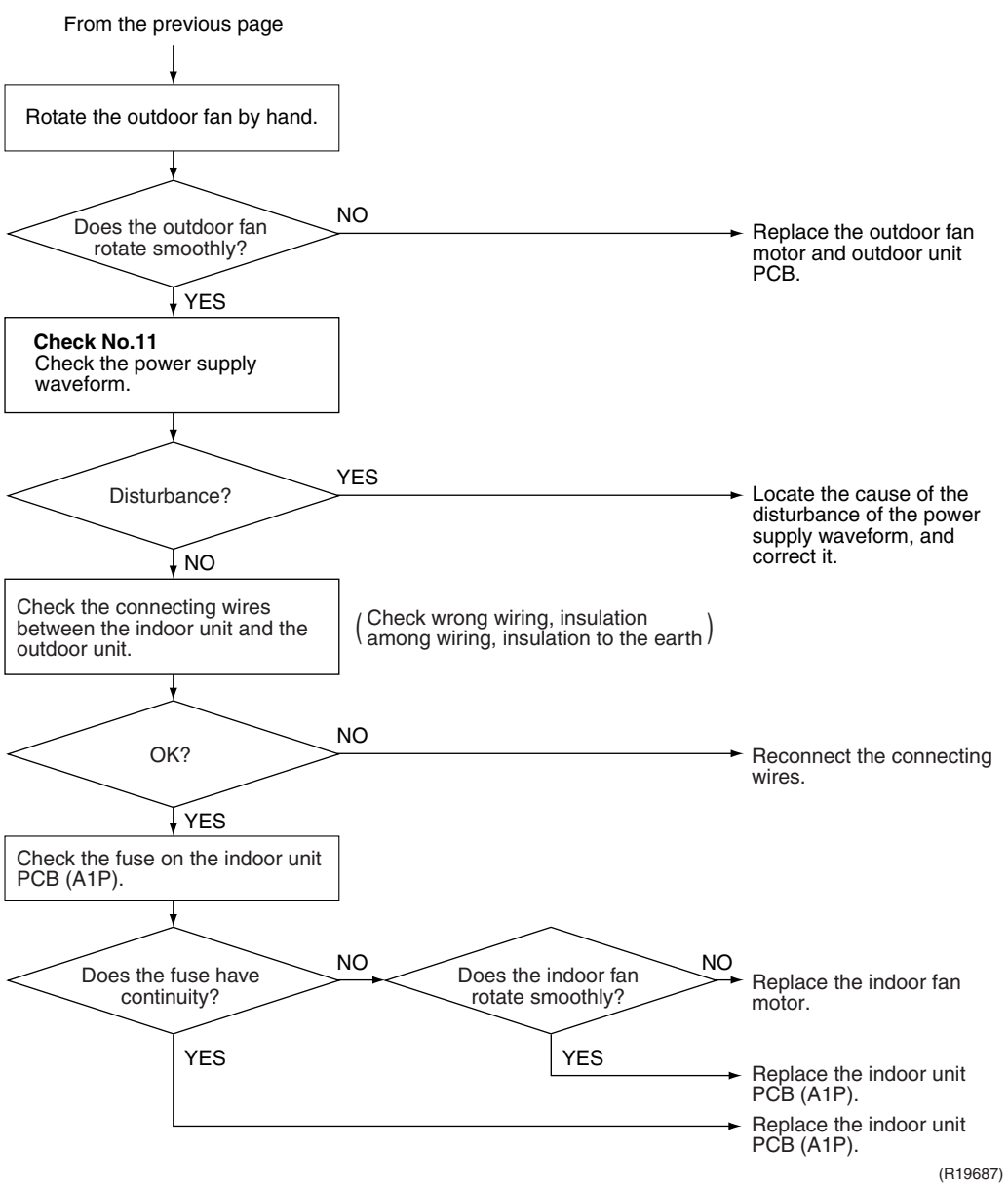
Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

Check indoor unit also, because a communication circuit fault may be caused by the problem related to the indoor unit.



(R19686)

Check No.11
Refer to P.183



2.37 Signal Transmission Error on Microcomputer for Humidifying

Error Code

U7

Method of Error Detection

Communication error between microcomputers mounted on the outdoor unit PCB.

Error Decision Conditions

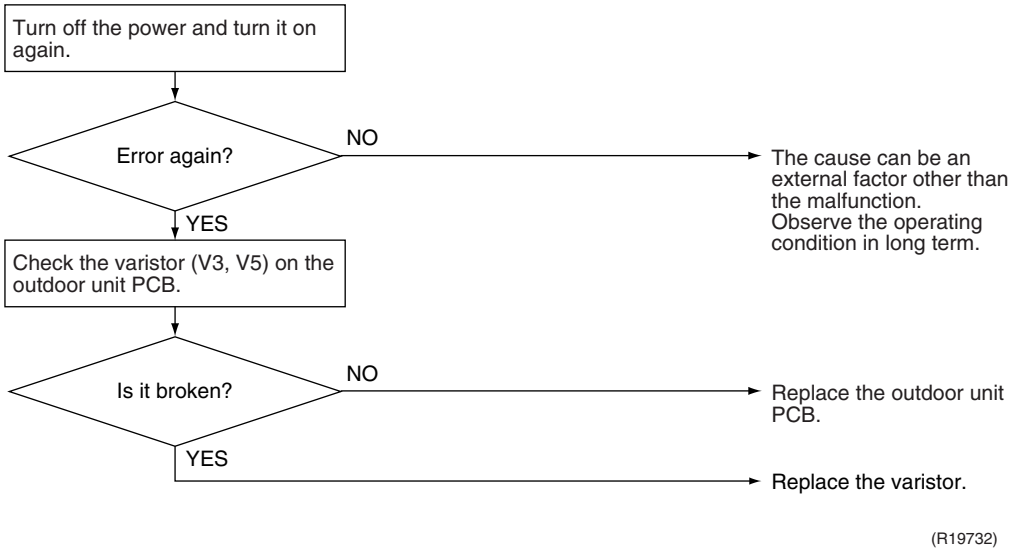
- The data sent from the microcomputer for humidifying can not be received for 10 seconds.
- Zero-cross signal on the microcomputer for humidifying cannot be detected.
- Error counter is reset when the data from the microcomputer for humidifying can be successfully received.

Supposed Causes

- Defective outdoor unit PCB
- Noise

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19732)

2.38 Unspecified Voltage (Between Indoor Unit and Outdoor Unit)

Error Code

UA

Method of Error Detection

Check the incompatible power supply between indoor unit and outdoor unit by using signal transmission.

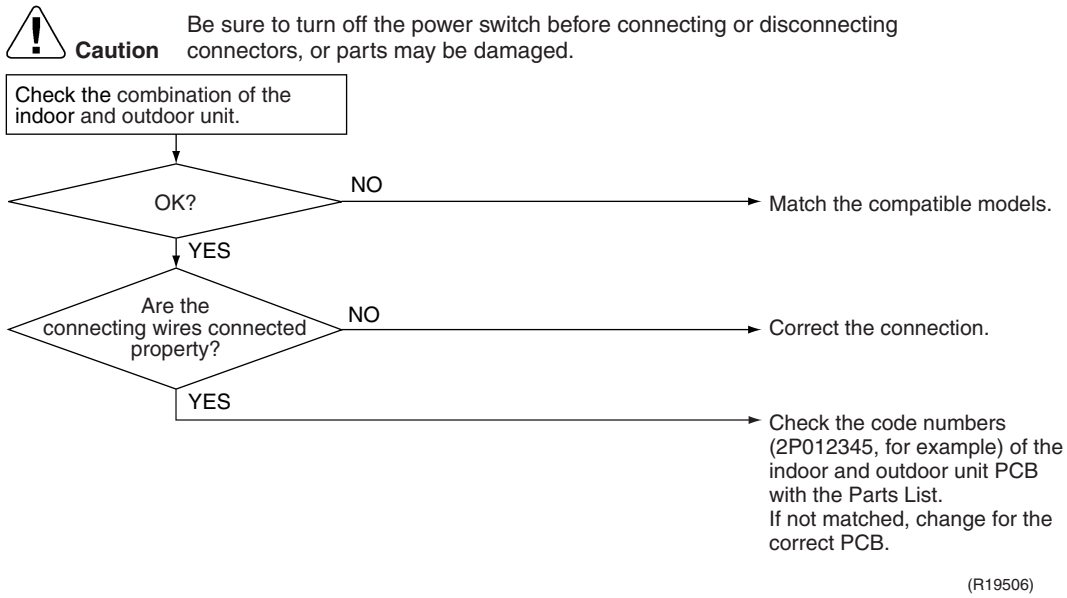
Error Decision Condition

In case that the indoor unit model is not compatible with outdoor unit model.

Supposed Causes

- Wrong models interconnected
- Wrong wiring of connecting wires
- Wrong indoor unit PCB or outdoor unit PCB mounted
- Defective indoor unit PCB
- Defective outdoor unit PCB

Troubleshooting



2.39 Improper Power Supply Wiring

Error Code

UA

Method of Error Detection

Check for the incompatible power supply of DC part by using the DC voltage detection circuit.

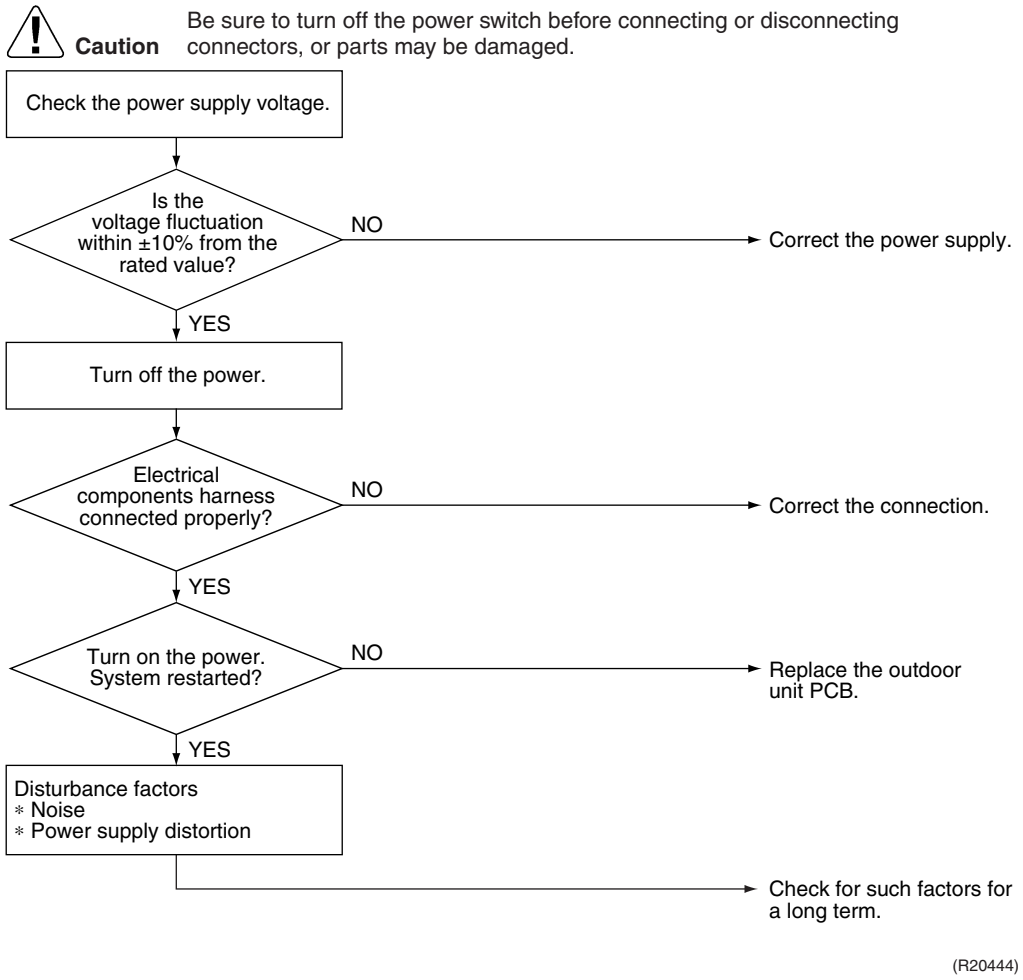
Error Decision Condition

- The voltage detected by the DC voltage detection circuit is 350 V and more or 180 V and less for more than 1 second.
- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 20 minutes without any other error

Supposed Causes

- Power supply voltage is not as specified.
- Malfunction of DC voltage detection circuit

Troubleshooting



2.40 Incomplete Setting for Hose Length

Error Code

UA

Method of Error Detection

This fault occurs when the humidification hose length is not stored in the EEPROMs of the indoor unit and the outdoor unit.
(Hose length is not stored at initial power on.)

Error Decision Conditions

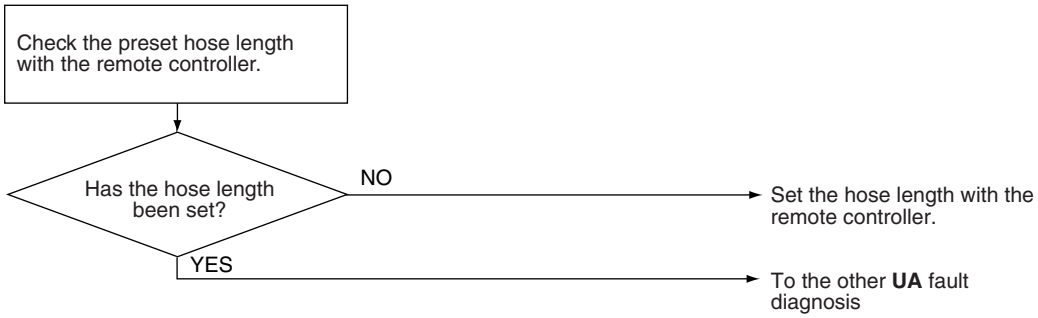
When the humidification hose length is not stored in EEPROMs of the indoor unit and the outdoor unit.

Supposed Causes

- Hose length is not set.
- Hose length is erased by replacement of the indoor unit PCB and the outdoor unit PCB. (When both the indoor unit PCB and the outdoor unit PCB are replaced simultaneously, the set value is erased.)

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



How to check the preset hose length

(1) Open the cover of the remote controller.
(2) Press the **SET UP** button for 5 seconds.
(3) Press the ▲ or ▼ button and select **Hose length**.
(4) Press the **APPLY** button pointing the transmitter of the remote controller at the indoor unit.
(5) The display shows the preset hose length.

Note:

- When the hose length is not set, **Hose Unset** is displayed.
  Referring to Humidifying Hose Length Setting on Part 7, set the hose length.
- To return to the normal mode,
  - ∗ press the **SET UP** button for 5 seconds.
  - ∗ close the cover of the remote controller.
  - ∗ leave the remote controller for 60 seconds.

2.41 Lights-out of Microcomputer Status Lamp

Error Code

No display

Method of Error Detection

When a microcomputer fault is detected, LED A turns off.

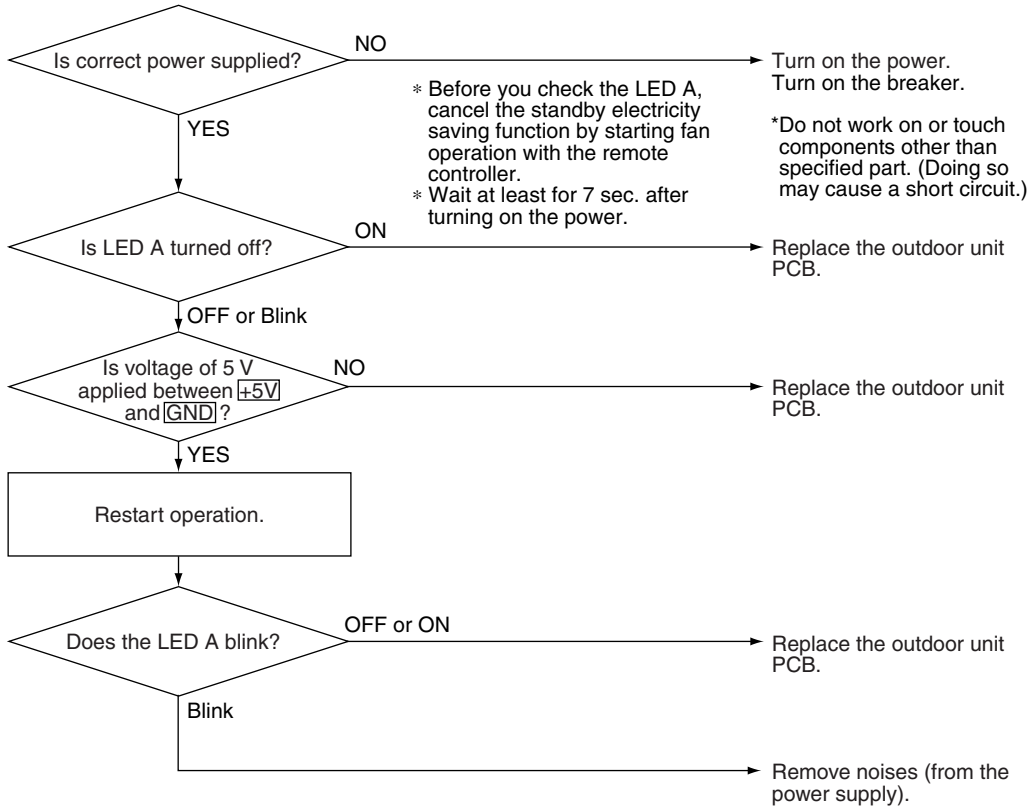
Error Decision Conditions

Supposed Causes

- Outdoor unit PCB is not power supplied.
- Power supply failure due to noise

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R19691)

3. Check

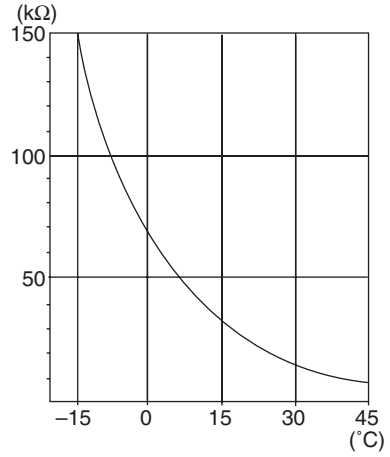
3.1 Thermistor Resistance Check

Check No.01 Disconnect the connectors of the thermistors from the PCB, and measure the resistance of each thermistor using a multimeter.

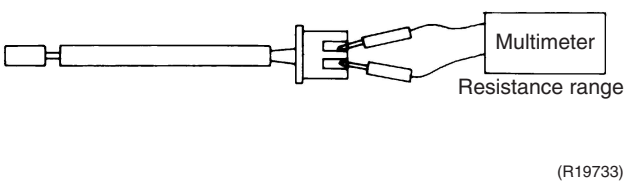
The data is for reference purpose only.

Thermistor temperature (°C)	Resistance (kΩ)
–20	197.8
–15	148.2
–10	112.1
–5	85.60
0	65.93
5	51.14
10	39.99
15	31.52
20	25.02
25	20.00
30	16.10
35	13.04
40	10.62
45	8.707
50	7.176

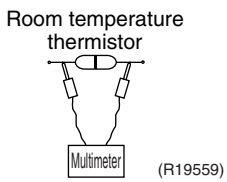
(R25°C = 20 kΩ, B = 3950 K)



(R11905)



(R19733)



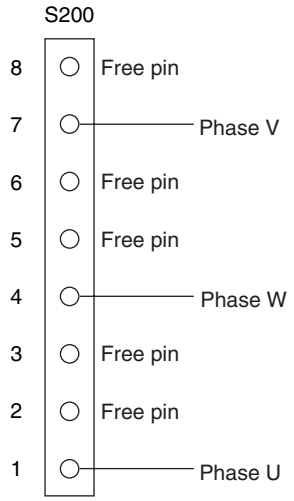
(R19559)

- When the room temperature thermistor is soldered on a PCB, remove the PCB from the control PCB to measure the resistance.
- When the connector of indoor heat exchanger thermistor is soldered on a PCB, remove the thermistor and measure the resistance.

3.2 Fan Motor Connector Output Check

Check No.02

1. Check the connection of connector.
2. Turn off the power.
3. Check if the resistances between the phases U - V (pins 1 - 7) and between the phases V - W (pins 7 - 4) are 45 ~ 65 Ω respectively.

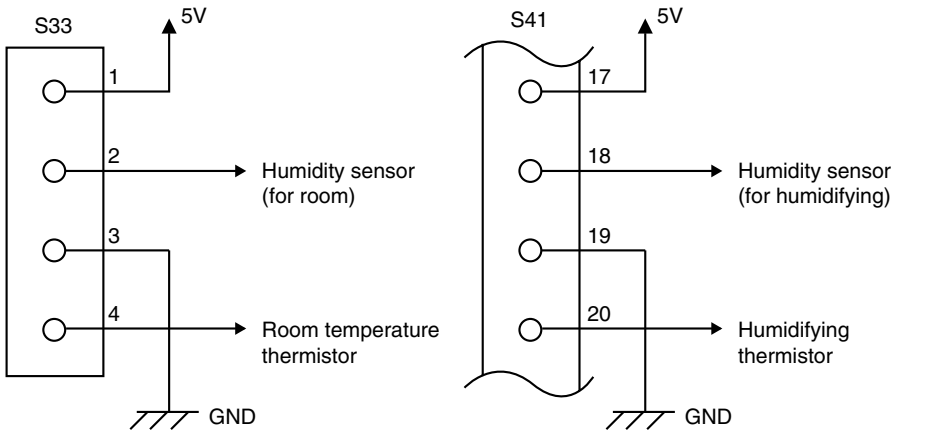


(R19733)

3.3 Humidity Sensor Check

Check No.07

1. Check the connection of connector.
2. Check the input from the humidity sensor (*1).
3. Change the ambient conditions (*2) and check that the input level changes accordingly.
   *1 The voltage value may differ depending on the sensors.
   *2 Change the humidity, temperature, airflow rate. To do this, merely breathe upon.



(R19734)

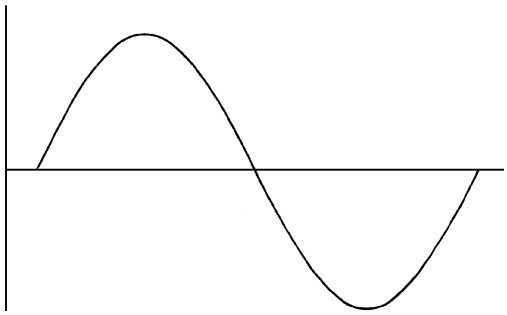
3.4 Power Supply Waveforms Check

Check No.11

Measure the power supply waveform between No. 1 and No. 2 on the terminal board, and check the waveform disturbance.

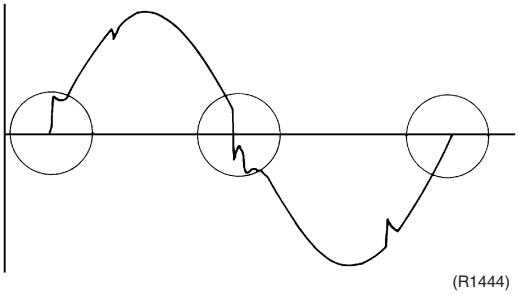
- Check if the power supply waveform is a sine wave. (Fig.1)
- Check if there is waveform disturbance near the zero cross. (sections circled in Fig.2)

Fig.1



(R1736)

Fig.2



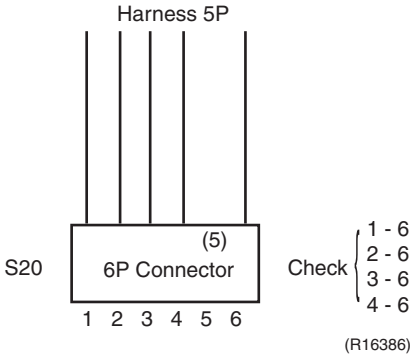
(R1444)

3.5 Electronic Expansion Valve Check

Check No.12

Conduct the followings to check the electronic expansion valve (EV).

1. Check if the EV connector is correctly connected to the PCB.
2. Turn the power off and on again, and check if the EV generates a latching sound.
3. If the EV does not generate a latching sound in the above step 2, disconnect the connector and check the continuity using a multimeter.
4. Check the continuity between the pins 1 - 6, 2 - 6, 3 - 6, 4 - 6. If there is no continuity between the pins, the EV coil is faulty.
5. If the continuity is confirmed in step 3, the outdoor unit PCB is faulty.

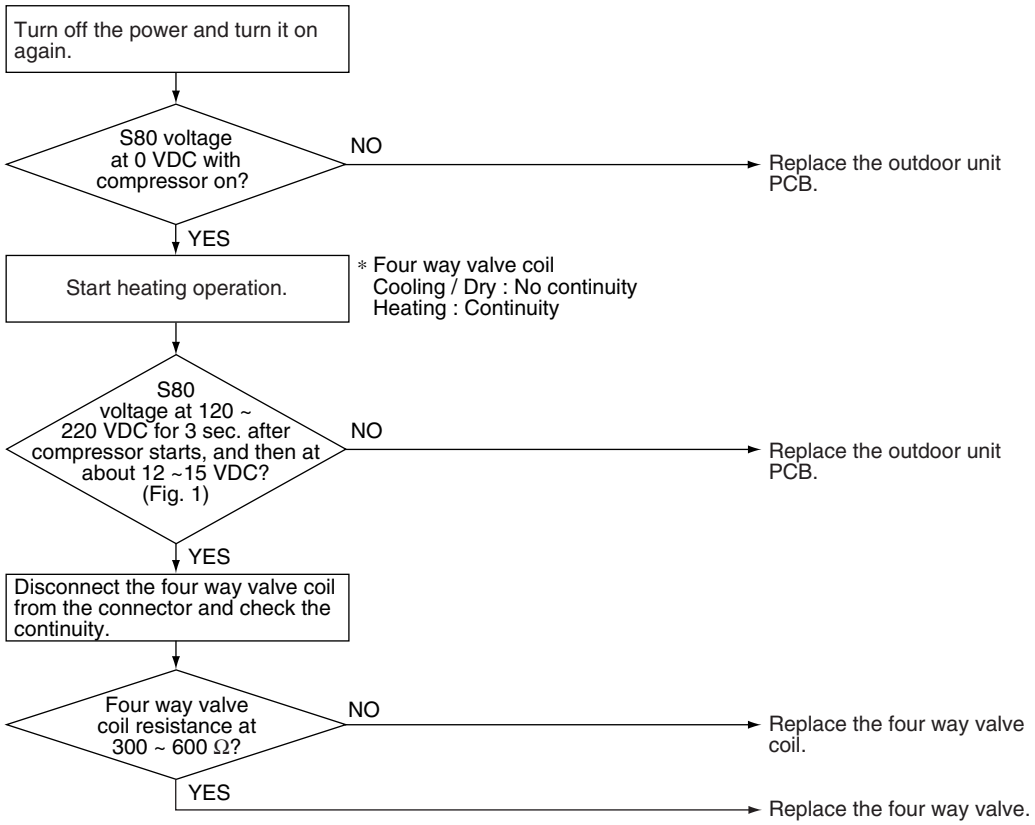


(R16386)

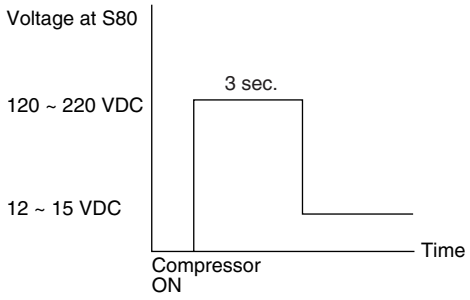
3.6 Four Way Valve Performance Check

Check No.13

< Caution on resetting the power supply >
* Be sure to wait for 30 sec. or more after turning off the power.



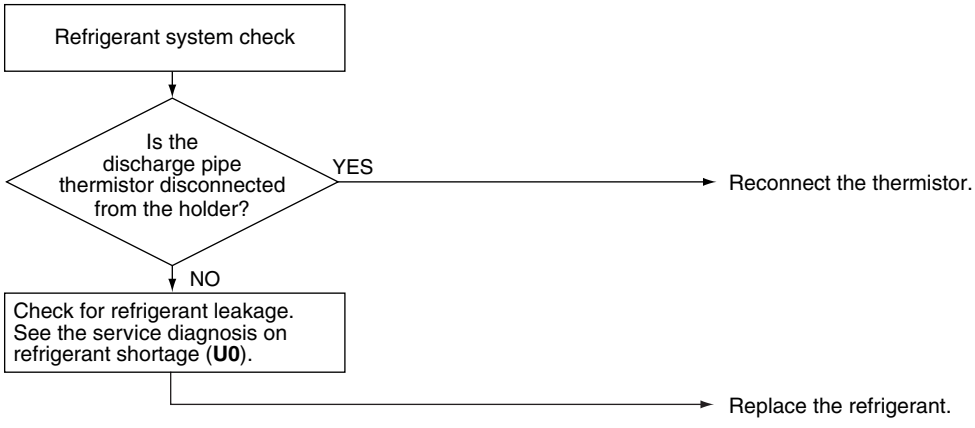
(Fig. 1)



(R13938)

3.7 Inverter Unit Refrigerant System Check

Check No.14



(R15833)

3.8 Inverter Analyser Check

Check No.15

■ **Characteristics**

Inverter analyser: RSUK0917C

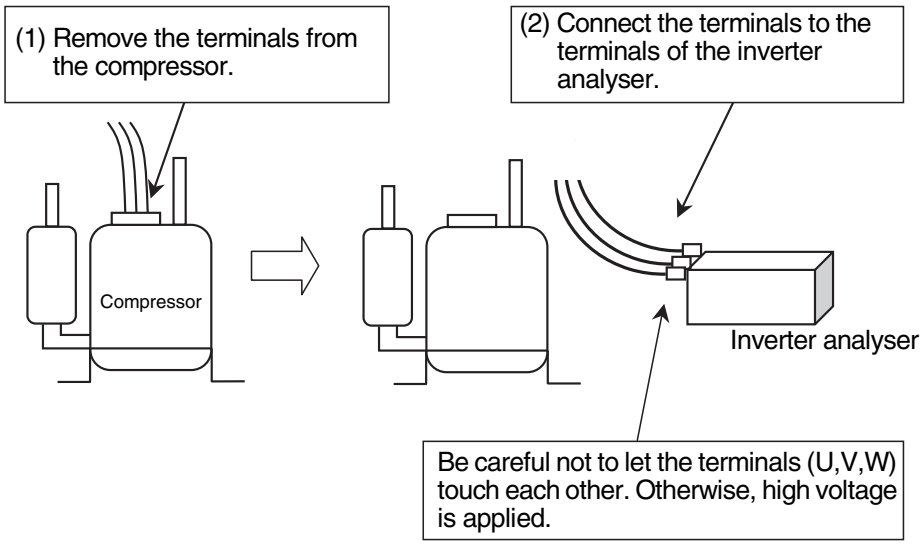
If an abnormal stop occurs due to compressor startup failure or overcurrent output when using an inverter unit, it is difficult to judge whether the stop is caused by the compressor failure or some other failure (main PCB, power module, etc.). The inverter analyser makes it possible to judge the cause of trouble easily and securely. (Connect an inverter analyser as a quasi-compressor instead of compressor and check the output of the inverter)

■ **Operation Method**

Step 1
Be sure to turn the power off.

Step 2
Install an inverter analyser instead of a compressor.

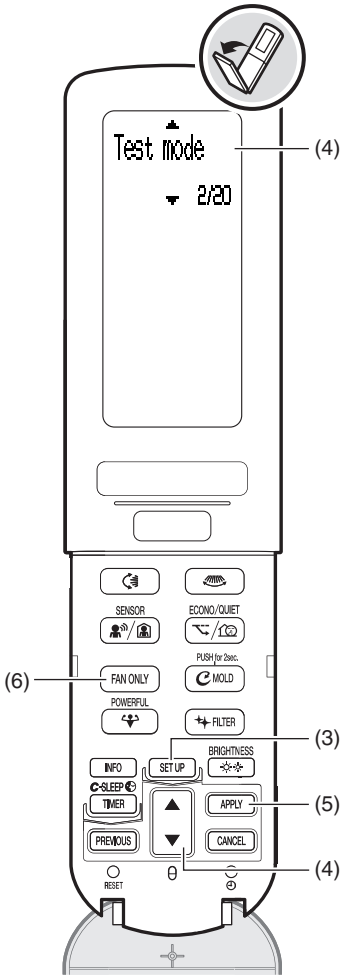
Note:
Make sure the charged voltage of the built-in smoothing electrolytic capacitor drops to 10 VDC or below before carrying out the service work.



Reference:
If the terminals of the compressor are not FASTON terminals (difficult to remove the wire on the terminals), it is possible to connect wires available on site to the outdoor unit from output side of PCB. (Do not connect them to the compressor at the same time, otherwise it may result in incorrect detection.)

Step 3
Activate power transistor test operation from indoor unit.
(1) Turn the power on.
(2) Open the cover of the remote controller.
(3) Press the **SET UP** button for 5 seconds.
(4) Press the ▼ or ▲ button and select **Test mode**.
(5) Press the **APPLY** button.
→ 7" 0 is displayed.
(6) Press the **FAN ONLY** button.
→ Power transistor test operation starts.

(2) Open the cover.



(R20203)

■ **Diagnose method (Diagnose according to 6 LEDs lighting status.)**

(1) If all the LEDs are lit uniformly, the compressor is defective.
→ Replace the compressor.

(2) If the LEDs are not lit uniformly, check the power module.
→ Refer to **Check No.22**.

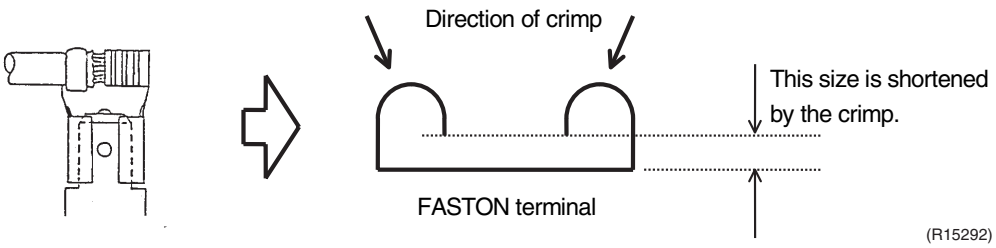
(3) If NG in **Check No.22**, replace the power module.
(Replace the PCB. The power module is united with the PCB.)
If OK in **Check No.22**, check if there is any solder cracking on the PCB.

(4) If any solder cracking is found, replace the PCB or repair the soldered section.
If there is no solder cracking, replace the PCB.

Caution

(1) When the output frequency is low, the LEDs blink slowly. As the output frequency increases, the LEDs blink quicker. (The LEDs look like they are lit.)

(2) On completion of the inverter analyser diagnosis, be sure to re-crimp the FASTON terminals. Otherwise, the terminals may be burned due to loosening.



(R15292)

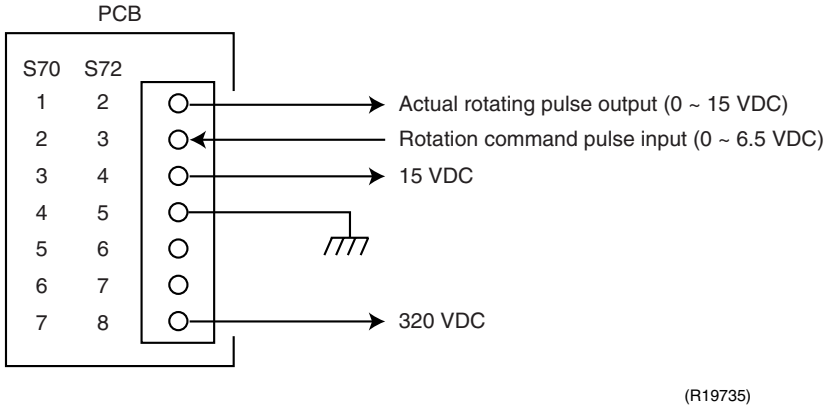
3.9 Rotating Pulse Check on Outdoor Unit PCB

Check No.16

Outdoor fan motor: S70
Humidifier fan motor: S72

Make sure that the voltage of 320 ± 30 V is applied.

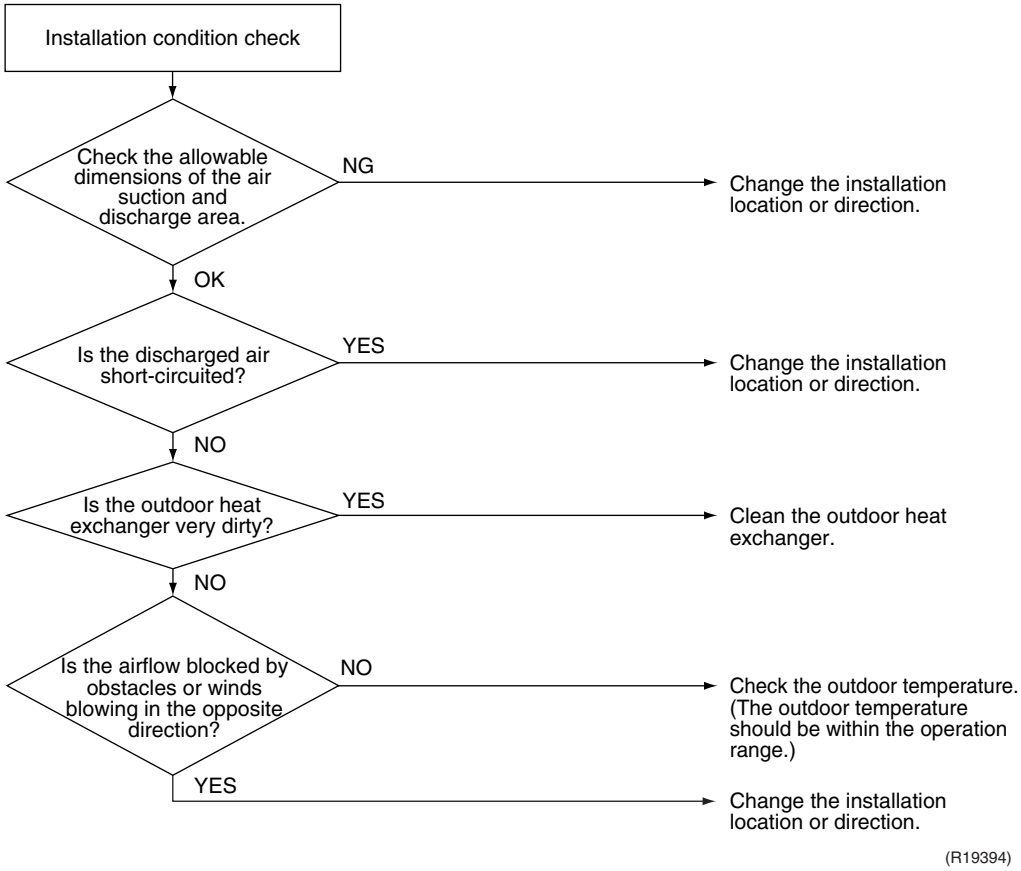
1. Set operation off and power off. Disconnect the connector S70 or S72.
2. Check that the voltage between the pins 4 - 7 (S70) or the pins 5 - 8 (S72) is 320 VDC.
3. Check that the control voltage between the pins 3 - 4 (S70) or the pins 4 - 5 (S72) is 15 VDC.
4. Check that the rotation command voltage between the pins 2 - 4 (S70) or the pins 3 - 5 (S72) is 0 ~ 6.5 VDC.
5. Keep operation off and power off. Connect the connector S70 or S72.
6. Check whether 4 pulses (0 ~ 15 V) are output at the pins 1 - 4 (S70) or the pins 2 - 5 (S72) when the fan motor is rotated 1 turn by hand.



If NG in step 2 → Defective PCB → Replace the outdoor unit PCB.
If NG in step 4 → Defective Hall IC → Replace the corresponding fan motor.
If OK in both steps 2 and 4 → Replace the outdoor unit PCB.

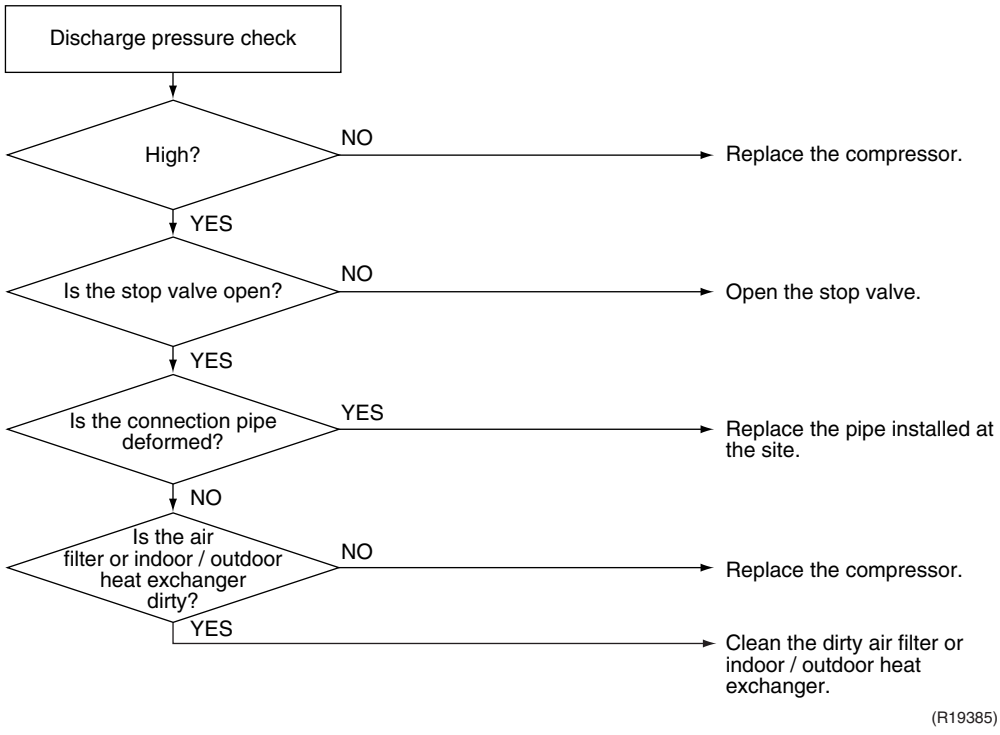
3.10 Installation Condition Check

Check No.17



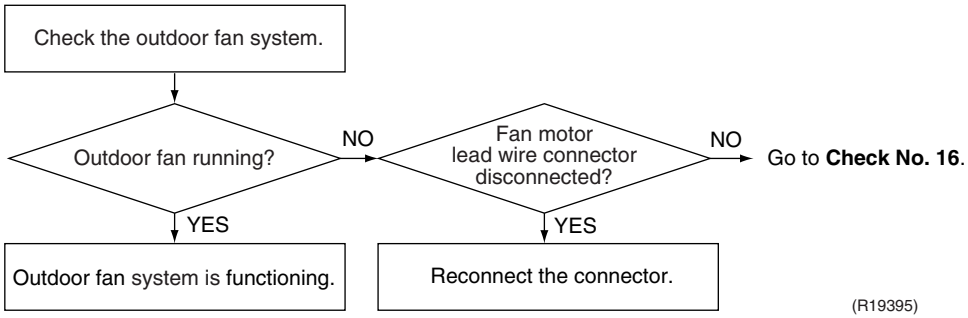
3.11 Discharge Pressure Check

Check No.18



3.12 Outdoor Fan System Check

Check No.19 **DC motor**



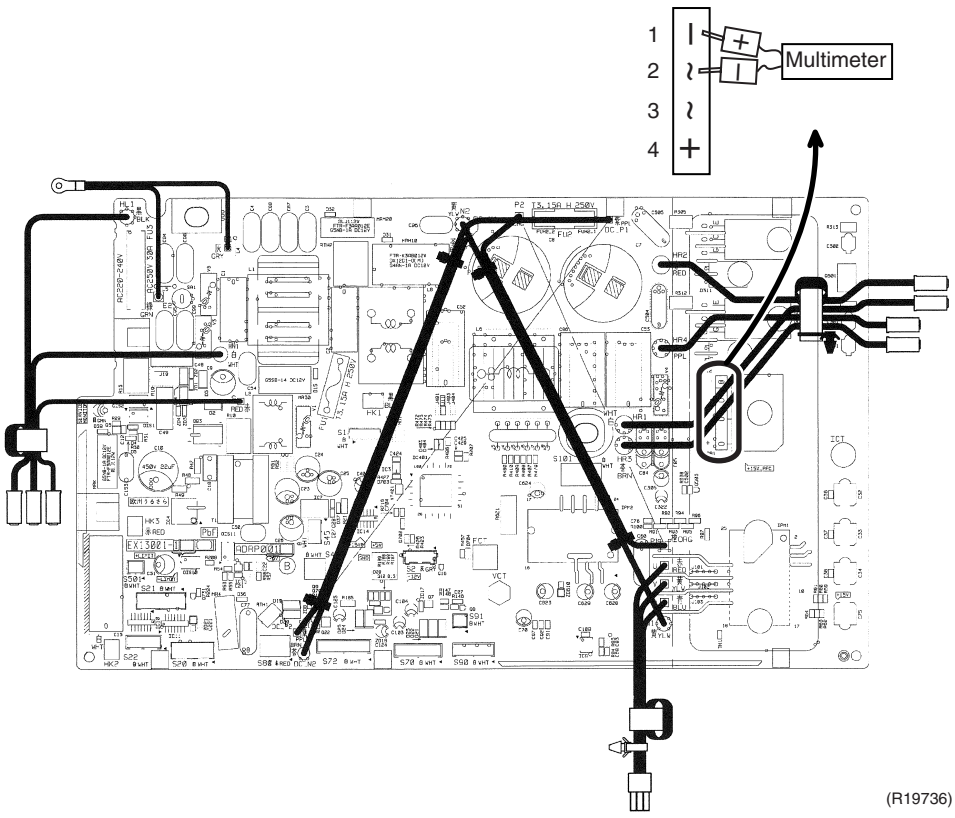
3.13 Main Circuit Short Check

Check No.20

Note: Check to make sure that the voltage between (+) and (–) of the diode bridge (DB1) is approximately 0 V before checking.

- Measure the resistance between the pins of the DB1 referring to the table below.
- If the resistance is ∞ or less than 1 kW, short circuit occurs on the main circuit.

Negative (–) terminal of multimeter (positive terminal (+) for digital multimeter)	~ (2, 3)	+ (4)	~ (2, 3)	− (1)
Positive (+) terminal of multimeter (negative terminal (–) for digital multimeter)	+ (4)	~ (2, 3)	− (1)	~ (2, 3)
Resistance is OK.	several kΩ ~ several MΩ	∞	∞	several kΩ ~ several MΩ
Resistance is NG.	0 Ω or ∞	0	0	0 Ω or ∞



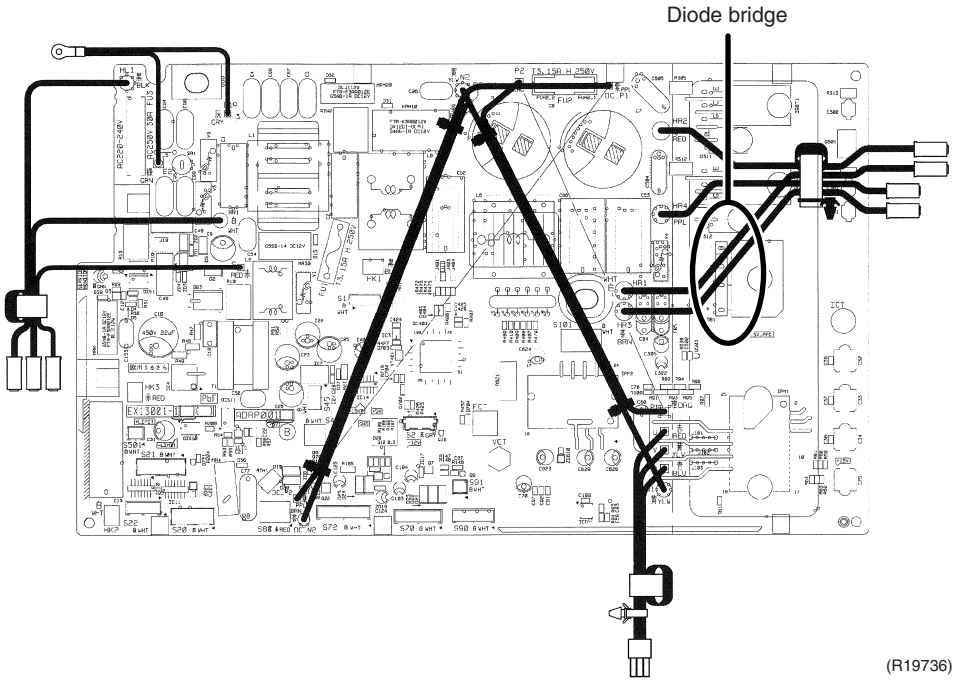
3.14 Power Module Check

Check No.22

Note: Check to make sure that the voltage between (+) and (–) of the diode bridge (DB1) is approximately 0 V before checking.

- Disconnect the compressor harness connector from the outdoor unit PCB. To disengage the connector, press the protrusion on the connector.
- Follow the procedure below to measure resistance between the (+) or (–) terminal of the diode bridge, and the U, V, or W terminal of the compressor with a multimeter. Evaluate the measurement results referring to the following table.

Negative (–) terminal of multimeter (positive terminal (+) for digital multimeter)	Diode bridge (+)	UVW	Diode bridge (–)	UVW
Positive (+) terminal of multimeter (negative terminal (–) for digital multimeter)	UVW	Diode bridge (+)	UVW	Diode bridge (–)
Resistance is OK.	several kΩ ~ several MΩ			
Resistance is NG.	0 Ω or ∞			



Part 7
Tips for Servicing

1. Tips for Servicing

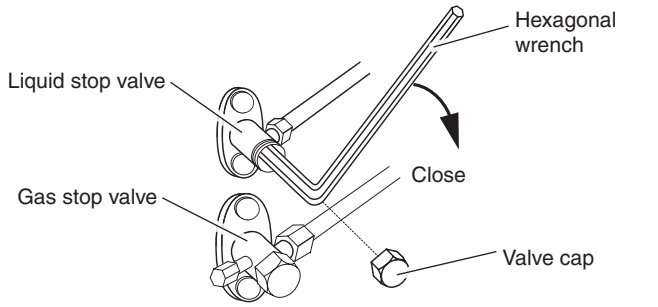
1.1 Pump Down Operation

Outline

In order to protect the environment, be sure to conduct pump down operation when relocating or disposing the unit.

Detail

1) Remove the valve caps from the liquid stop valve and the gas stop valve.
2) Carry out forced cooling operation.
3) After 5 to 10 minutes, close the liquid stop valve with a hexagonal wrench.
4) After 2 to 3 minutes, close the gas stop valve and stop the forced cooling operation.
5) After the operation, reattach the valve caps.



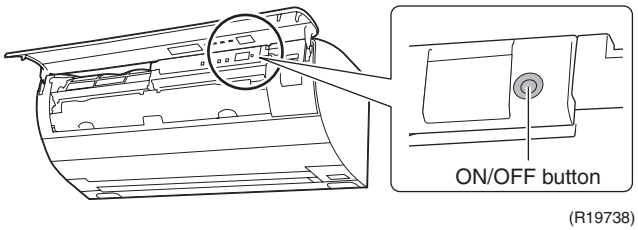
(R19737)

Refer to forced cooling operation below.

1.2 Forced Cooling Operation

Item	Forced Cooling
Conditions	The forced cooling operation is allowed when both the following conditions are met. 1) The outdoor unit is not abnormal and not in the 3-minute standby mode. 2) The outdoor unit is not operating.
Start	Press the forced cooling operation ON/OFF button (SW1) on the indoor unit for 5 seconds.
Command frequency	30 Hz
End	The forced cooling operation ends when any of the following conditions is fulfilled. 1) The operation ends automatically after 15 minutes. 2) Press the forced cooling operation ON/OFF button (SW1) on the indoor unit again. 3) Press the ON/OFF button on the remote controller.
Others	The protection functions are prior to all others in the forced cooling operation.

Indoor Unit



(R19738)

2. Trial Operation

Outline

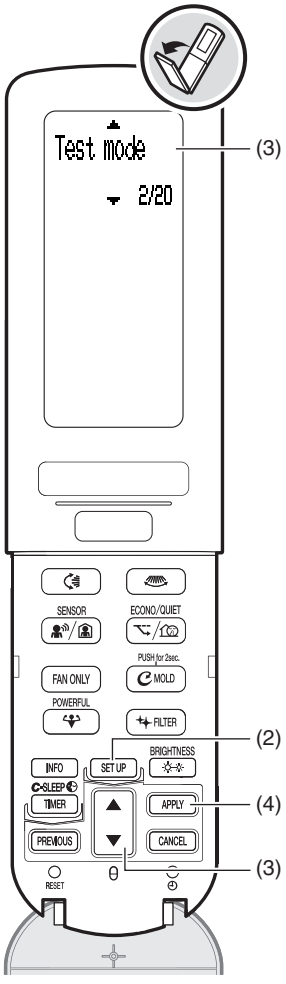
Carry out the trial operation in accordance with the operation manual to ensure that all functions and parts, such as flap movement, are working properly.
Trial operation should be carried out in either cooling or heating operation.

Detail

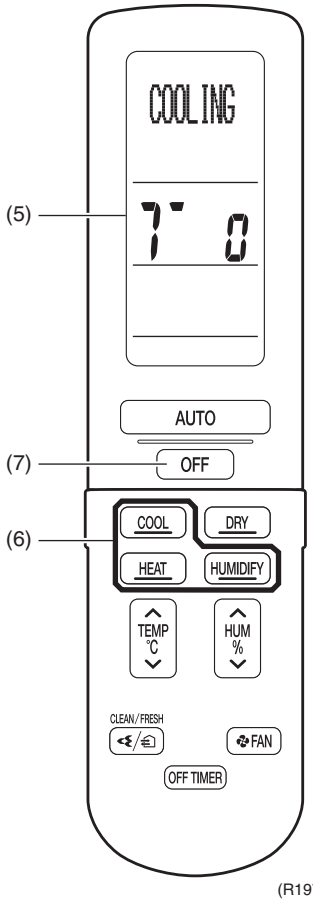
1. Measure the power supply voltage and make sure that it falls within the specified range.
2. In cooling operation, select the lowest programmable temperature (18°C); in heating operation, select the highest programmable temperature (30°C).
   - Trial operation may be disabled in either operation mode depending on the room temperature.
   - After trial operation is complete, set the temperature to a normal level (26°C ~ 28°C in cooling, 20°C ~ 24°C in heating operation).
   - For protection, the system does not start for 3 minutes after it is turned off.

(1) Open the cover of the remote controller.
(2) Press the **SET UP** button for 5 seconds.
(3) Press the ▼ or ▲ button and select **Test mode**.
(4) Press the **APPLY** button.
(5) 7° 0 is displayed.
(6) Close the cover of the remote controller and press the **COOL**, **HEAT** or **HUMIDIFY** button to start trial operation.
(7) Trial operation terminates in approximately 30 minutes and switches into normal mode. To quit trial operation, press the **OFF** button.

(1) Open the cover.



(R19739)



(R19740)

3. Field Settings

3.1 SET UP Menu

You can change the default settings according to your room's environment.

No.	Menu items
1	INTELLIG.EYE AIRFLOW
2	AUTO OFF time
3	BREEZE AIRFLOW
4	HUMIDIFY AIRFLOW
5	CONTINUE DRY
6	INSTALLED POSITION
7	RESET USED POWER
8	SOUND VOLUME
9	CONTRAST
10	24 HOUR FRESH AIR
11	RC ADDRESS
12	CHILD LOCK

∗ Refer to the operation manual for details.

3.2 Service Setting Menu

Press the **SET UP** button for 5 seconds to enter the field setting menu.

Page	Menu	Item				
1	Checking error code	-	-	-	-	-
2	Test mode	-	-	-	-	-
3	Hose length	~ 3M	3.1M ~ 4M	4.1M ~ 6M	6.1M ~ 8M	8.1M ~ 10M
4	Hose drying	-	-	-	-	-
5	RC demo	-	-	-	-	-
6	AC demo	-	-	-	-	-
7	Defrost QUICK HEAT	On	Off	-	-	-
8	Circulate setting	Std	Low	Off	-	-
9	Shutter setting	On	Off	-	-	-
10	MOLD PROOF STREAMER	On	Off	-	-	-
11	Adjust cool Temp.	Std	+1	+2	–1	–2
12	Adjust heat Temp.	Std	+1	+2	–1	–2
13	Humidify unit	On	Off	-	-	-
14	Thermo off setting	Low	Keep	-	-	-
15	Control priority	Wireless	Wired	-	-	-
16	Standby saving	On	Off	-	-	-
17	Preheating	On	Off	-	-	-
18	Auto restart	On	Off	-	-	-
19	Auto clean speed	Std	Fast	-	-	-
20	RESET setting	-	-	-	-	-

1. Checking error code
   It displays the error code. An unconfirmed error code can also be displayed, unlike long pressing the **CANCEL** button.

2. Test mode
   It forces to turn on the thermostat and conducts test operation according to the remote controller setting except for temperature and humidity.
   Test operation will finish automatically in about 30 minutes.

3. Hose length
   It sets the length of the humidifying hose.
   The longer the length setting is, the higher the humidifying fan rotation frequency becomes.

4. Hose drying
   It forces to turn on the humidifying fan and dries the inside of the humidifying hose.
   Forced hose drying operation lasts about 30 minutes.

5. RC demo
   It shows a sample of the remote controller display. (Ex. information by pressing **INFO** button)

6. AC demo
   It starts demonstrational operation of the air conditioner.

7. Defrost QUICK HEAT
   It sets defrost operation on/off while the QUICK HEATING TIMER is set. When it is set to **OFF**, the unit does not carry out defrost operation.

8. Circulate setting
   When **INSTALLED POSITION** is set to oblong, if the **Circulate setting** is set to **Low**, the angle of horizontal flaps in circulation airflow becomes same as in case of **INSTALLED POSITION** is set to horizontal. (The horizontal flaps are set facing a little higher.)
   If **Circulate setting** is set to **OFF**, the angle of horizontal flaps in circulation airflow becomes same as in case of comfort airflow in cooling operation.

9. Shutter setting
   It sets the air inlet shutter for on/off. If it is set to off, there will be no bottom air intake.

10. MOLD PROOF STREAMER
    It sets the streamer on/off during MOLD PROOF operation. If it is set to off, the streamer will not be used.

11. Adjust cool Temp.
    It sets the amount of room temperature adjustment in cooling operation.

12. Adjust heat Temp.
    It sets the amount of room temperature adjustment in heating operation.

13. Humidify unit
    It turns on/off humidifying operation.

14. Thermo off setting
    It sets the airflow rate when the thermostat is off in cooling operation.
    If it is set to **Keep**, the fan keeps rotating at the set airflow rate.

15. Control priority
    Do not change the default setting **(Wireless)**.

16. Standby saving
    It turns on/off the standby electricity saving function.

17. Preheating
    It turns on/off the preheating control.

18. Auto restart
    It turns on/off the auto-restart function.

19. Auto clean speed
    It sets the operation time for cleaning filter.
    If it is set to **Fast**, the cleaning time is about 7 minutes.

20. RESET setting
    It resets the SET UP menu and service setting menu to factory setting.

Note Note for replacing the indoor unit PCB
When the indoor unit PCB is replaced, all the settings are reset and have to be set on the remote controller again because the remote controller does not resend the recorded settings to the indoor unit.
However when only the remote controller is replaced, you do not have to redo each setting because the indoor unit maintains the settings.

3.3 Humidifying Hose Length Setting

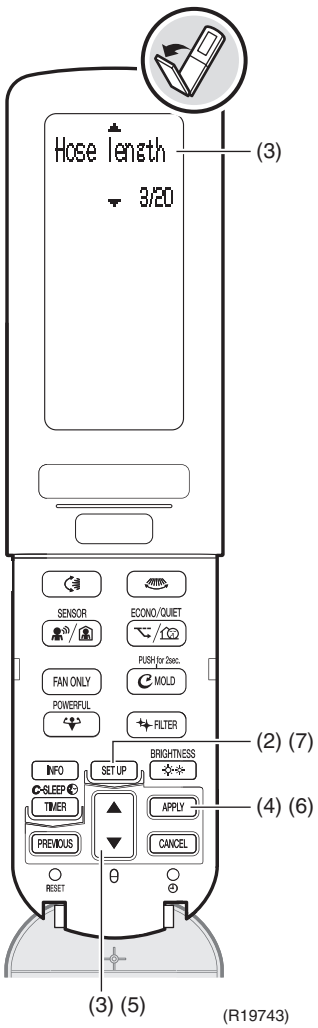
Outline

Set the humidifying hose length with the remote controller to ensure humidifying capacity.
Power on the indoor unit to establish the communication between the indoor unit and the remote controller.
(The humidifying hose length includes the rear part of the indoor unit.)

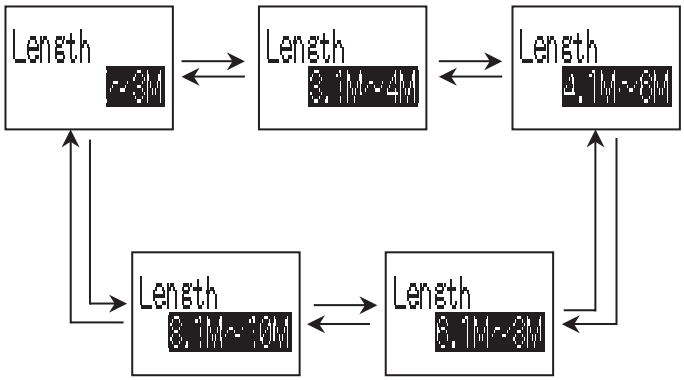
Detail

(1) Open the cover of the remote controller.
(2) Press the **SET UP** button for 5 seconds.
(3) Press the ▲ or ▼ button and select **Hose length**.
(4) Press the **APPLY** button.
(5) Press the ▲ or ▼ button and select hose length from **~3M, 3.1M~4M, 4.1M~6M, 6.1M~8M, 8.1M~10M**.
(6) Press the **APPLY** button pointing the transmitter of the remote controller at the indoor unit to set the hose length.
(7) To return to the normal mode,
* press the **SET UP** button for 5 seconds.
* close the cover of the remote controller.
* leave the remote controller for 60 seconds.

(1) Open the cover.



(R19743)



(R19742)

4. Silicon Grease on Power Transistor / Diode Bridge

Outline

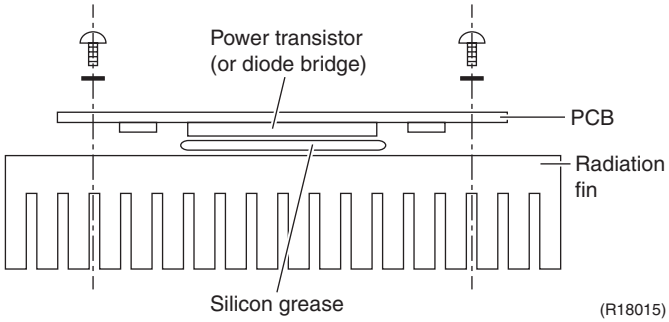
Apply the specified silicon grease to the heat radiation part of a power transistor / diode bridge when you replace an outdoor unit PCB. The silicon grease encourages the heat radiation of a power transistor / diode bridge.

Detail

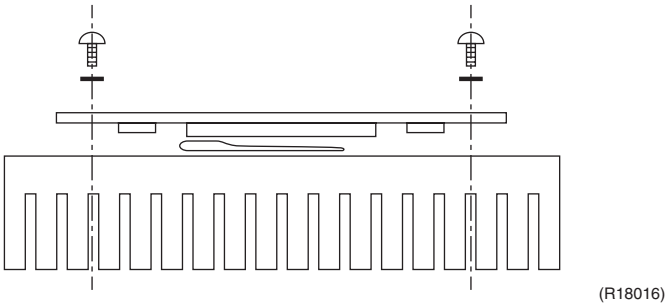
1. Wipe off the old silicon grease completely.
2. Apply the silicon grease evenly. See the illustrations below for examples of application.
3. Tighten the screws of the power transistor / diode bridge.
4. Make sure that the heat radiation parts are firmly contacted to the radiation fin.

Note: Smoke emission may be caused by bad heat radiation when the silicon grease is not appropriately applied.

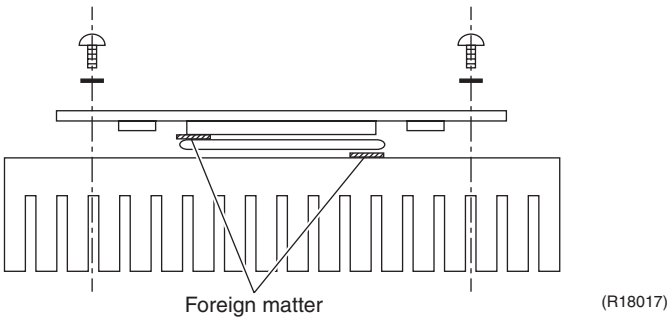
■ OK: Evenly applied



■ NG: Not evenly applied



■ NG: Foreign matter is stuck.

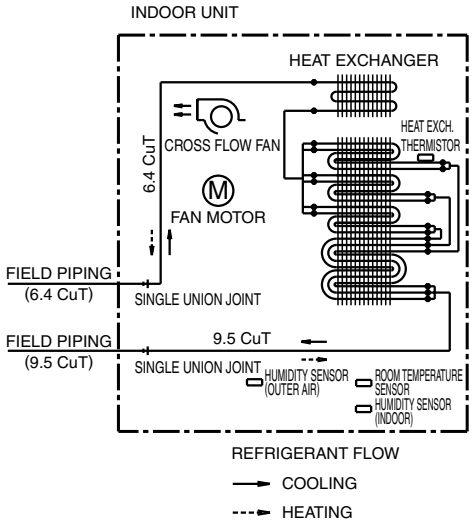


Part 8
Appendix

1. Piping Diagrams

1.1 Indoor Unit

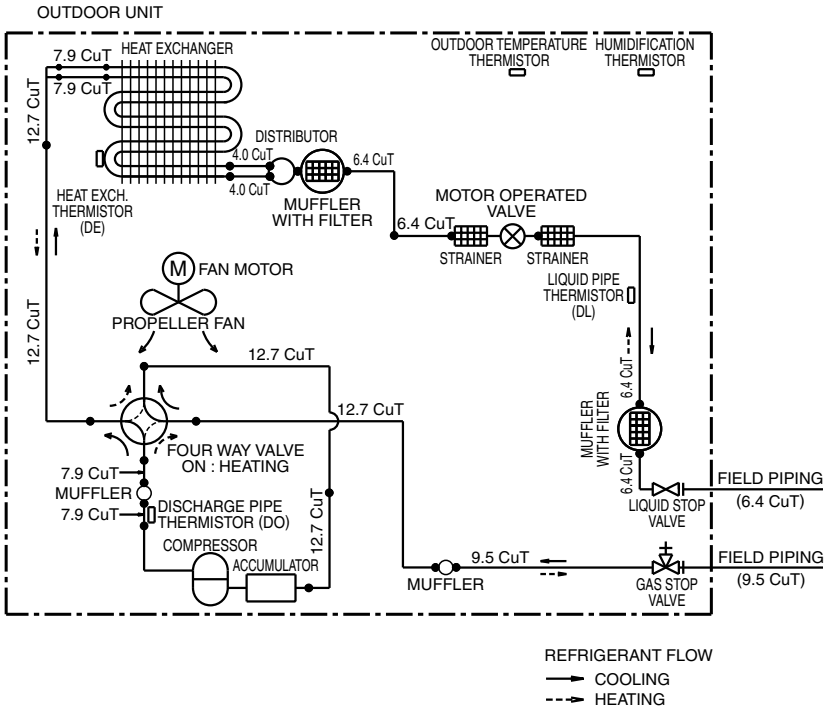
FTXZ25/35/50NV1B



4D084172

1.2 Outdoor Unit

RXZ25/35/50NV1B

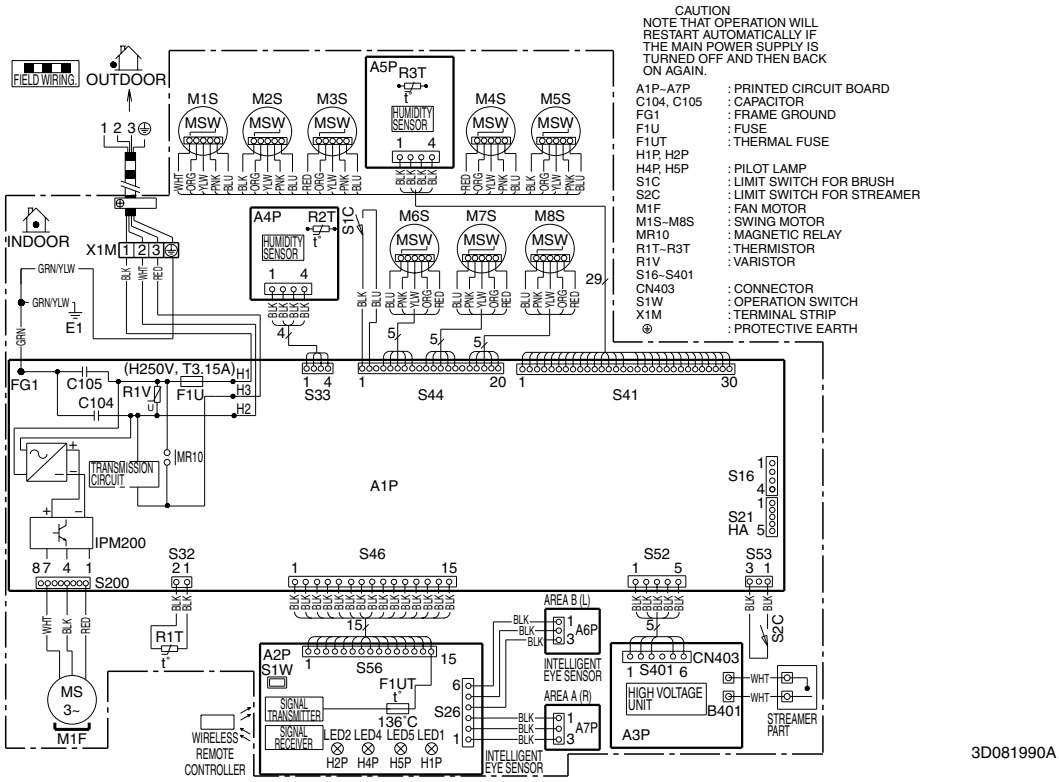


3D084174

2. Wiring Diagrams

2.1 Indoor Unit

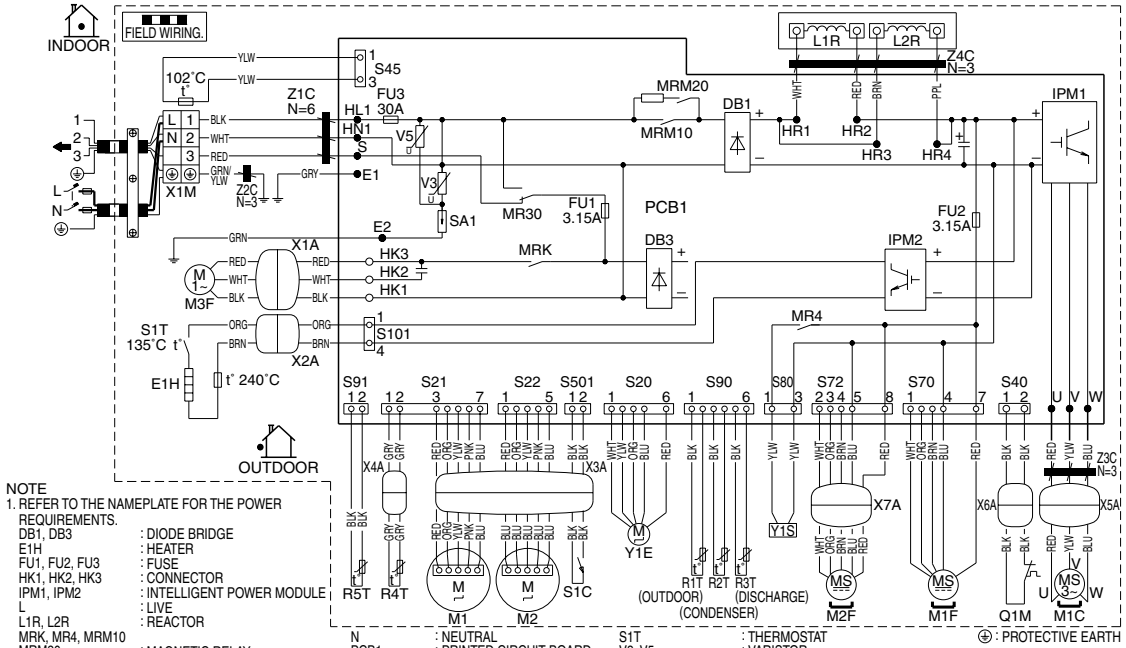
FTXZ25/35/50NV1B



3D081990A

2.2 Outdoor Unit

RXZ25/35/50NV1B



3D082027A

Revision History

Month / Year	Version	Revised contents
03 / 2014	SiMT041311E	First edition

Warning

- Daikin products are manufactured for export to numerous countries throughout the world. Prior to purchase, please confirm with your local authorised importer, distributor and/or retailer whether this product conforms to the applicable standards, and is suitable for use, in the region where the product will be used. This statement does not purport to exclude, restrict or modify the application of any local legislation.
- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorised parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Read the User's Manual carefully before using this product. The User's Manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

If you have any enquiries, please contact your local importer, distributor and/or retailer.

Cautions on product corrosion

1. Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the outdoor unit close to the sea shore, contact your local distributor.

Dealer

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