TOSHIBA

FILE No. A10-1821

AIR CONDITIONER (MULTI TYPE)

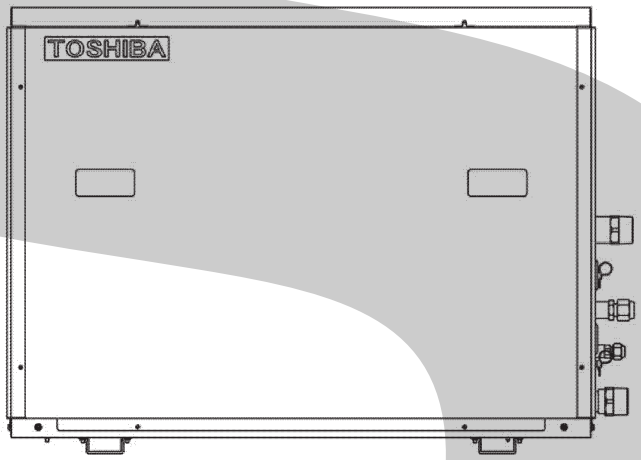
SERVICE MANUAL

Hot Water Module

High temperature type

Model name:

MMW-AP0481CHQ-E
MMW-AP0481CHQ-TR



PRINTED IN JAPAN, Aug., 2018, TOMO

CONTENTS

Please read carefully through these instructions that contain important information, and ensure that you understand them.

Generic Denomination: Hot Water Module

Definition of Qualified Installer or Qualified Service Person

The hot water module must be installed, maintained, repaired and removed by a qualified installer or qualified service person.
When any of these jobs is to be done, ask a qualified installer or qualified service person to do them for you.
A qualified installer or qualified service person is an agent who has the qualifications and knowledge described in the table

Agent	Qualifications and knowledge which the agent must have
Qualified installer	• The qualified installer is a person who installs, maintains, relocates and removes the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation. He or she has been trained to install, maintain, relocate and remove the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such operations by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to these operations. • The qualified installer who is allowed to do the electrical work involved in installation, relocation and removal has the qualifications pertaining to this electrical work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to electrical work on the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified installer who is allowed to do the refrigerant handling and piping work involved in installation, relocation and removal has the qualifications pertaining to this refrigerant handling and piping work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to refrigerant handling and piping work on the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified installer who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.
Qualified service person	• The qualified service person is a person who installs, repairs, maintains, relocates and removes the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation. He or she has been trained to install, repair, maintain, relocate and remove the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such operations by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to these operations. • The qualified service person who is allowed to do the electrical work involved in installation, repair, relocation and removal has the qualifications pertaining to this electrical work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to electrical work on the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified service person who is allowed to do the refrigerant handling and piping work involved in installation, repair, relocation and removal has the qualifications pertaining to this refrigerant handling and piping work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to refrigerant handling and piping work on the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified service person who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.

Definition of Protective Gear

When the air conditioner is to be transported, installed, maintained, repaired or removed, wear protective gloves and 'safety' work clothing.
In addition to such normal protective gear, wear the protective gear described below when undertaking the special work detailed in the table below.
Failure to wear the proper protective gear is dangerous because you will be more susceptible to injury, burns, electric shocks and other injuries.

Work undertaken	Protective gear worn
All types of work	Protective gloves 'Safety' working clothing
Electrical-related work	Gloves to provide protection for electricians Insulating shoes Clothing to provide protection from electric shock
Work done at heights (50 cm or more)	Helmets for use in industry
Transportation of heavy objects	Shoes with additional protective toe cap
Repair of outdoor unit	Gloves to provide protection for electricians

The important contents concerned to the safety are described on the product itself and on this Service Manual.
Please read this Service Manual after understanding the described items thoroughly in the following contents (Indications / Illustrated marks), and keep them.

[Explanation of indications]

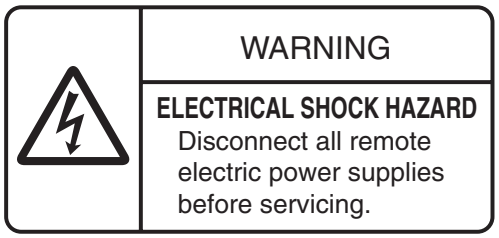
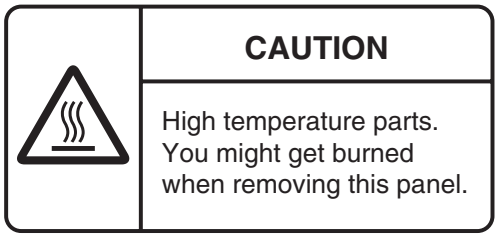
Indication	Explanation
⚠ **DANGER**	Indicates contents assumed that an imminent danger causing a death or serious injury of the repair engineers and the third parties when an incorrect work has been executed.
⚠ **WARNING**	Indicates possibilities assumed that a danger causing a death or serious injury of the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.
⚠ **CAUTION**	Indicates contents assumed that an injury or property damage (*) may be caused on the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.

***** Property damage: Enlarged damage concerned to property, furniture, and domestic animal / pet

[Explanation of illustrated marks]

Mark	Explanation
	Indicates prohibited items (Forbidden items to do) The sentences near an illustrated mark describe the concrete prohibited contents.
	Indicates mandatory items (Compulsory items to do) The sentences near an illustrated mark describe the concrete mandatory contents.
	Indicates cautions (Including danger / warning) The sentences or illustration near or in an illustrated mark describe the concrete cautious contents.

Warning indications on the hot water module

Warning indication	Description
	**WARNING** **ELECTRICAL SHOCK HAZARD** Disconnect all remote electric power supplies before servicing.
	**CAUTION** High temperature parts. You might get burned when removing this panel.

Precautions for Safety

The manufacturer shall not assume any liability for the damage caused by not observing the description of this manual.

⚠ DANGER

 Turn off breaker.	Before carrying out the installation, maintenance, repair or removal work, be sure to set the circuit breaker for both the hot water module, Flow selector unit and outdoor units to the OFF position. Otherwise, electric shocks may result.
	Before opening the electrical parts box cover of the hot water module or service panel of the outdoor unit, set the circuit breaker to the OFF position. Failure to set the circuit breaker to the OFF position may result in electric shocks through contact with the interior parts. Only a qualified installer (*1) or qualified service person (*1) is allowed to remove the electrical parts box cover of the hot water module or service panel of the outdoor unit and do the work required.
	When you have noticed that some kind of trouble (such as when a check display has appeared, there is a smell of burning, abnormal sounds are heard, the hot water module fails to heat or water is leaking) has occurred in the hot water module, do not touch the hot water module yourself but set the circuit breaker to the OFF position, and contact a qualified service person. Take steps to ensure that the power will not be turned on (by marking “out of service” near the circuit breaker, for instance) until qualified service person arrives. Continuing to use the hot water module in the trouble status may cause mechanical problems to escalate or result in electric shocks or other failure.
 Electric shock hazard	When you access inside of the electrical parts box cover to repair electric parts, wait for about five minutes after turning off the breaker. Do not start repairing immediately.Otherwise you may get electric shock by touching terminals of high-voltage capacitors. Natural discharge of the capacitor takes about five minutes.
 Prohibition	Place a “Work in progress” sign near the circuit breaker while the installation, maintenance, repair or removal work is being carried out. There is a danger of electric shocks if the circuit breaker is set to ON by mistake.
	Before operating the hot water module after having completed the work, check that the electrical parts box cover of the hot water module and service panel of the outdoor unit are closed, and set the circuit breaker to the ON position. You may receive an electric shock if the power is turned on without first conducting these checks.
 Stay on protection	If, in the course of carrying out repairs, it becomes absolutely necessary to check out the electrical parts with the electrical parts box cover of one or more of the hot water modules and the service panel of the outdoor unit removed in order to find out exactly where the trouble lies, wear insulated heat-resistant gloves, insulated boots and insulated work overalls, and take care to avoid touching any live parts. You may receive an electric shock if you fail to heed this warning. Only qualified service person (*1) is allowed to do this kind of work.

(*1): Refer to the “Definition of Qualified Installer or Qualified Service Person”

⚠ WARNING

General	Before starting to repair the hot water module, read carefully through the Service Manual, and repair the hot water module by following its instructions.
	Only qualified service person (*1) is allowed to repair the hot water module. Repair of the hot water module by unqualified person may give rise to a fire, electric shocks, injury, water leaks and / or other problems.
	Do not use any refrigerant different from the one specified for complement or replacement. Otherwise, abnormally high pressure may be generated in the refrigeration cycle, which may result in a failure or explosion of the product or an injury to your body.
	Only a qualified installer (*1) or qualified service person (*1) is allowed to carry out the electrical work of the hot water module. Under no circumstances must this work be done by an unqualified individual since failure to carry out the work properly may result in electric shocks and / or electrical leaks.
	When transporting the hot water module, wear shoes with protective toe caps, protective gloves and other protective clothing.
	When the hot water module must be transported by hand, carry it by four or more people.
	When connecting the electrical wires, repairing the electrical parts or undertaking other electrical jobs, wear gloves to provide protection for electricians, insulating shoes and clothing to provide protection from electric shocks. Failure to wear this protective gear may result in electric shocks.
	Appliance shall be installed in accordance with national wiring regulations. Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.
	Electrical wiring work shall be conducted according to law and regulation in the community and installation manual. Failure to do so may result in electrocution or short circuit.
	When working at heights, use a ladder which complies with the ISO 14122 standard, and follow the procedure in the ladder's instructions. Also wear a helmet for use in industry as protective gear to undertake the work.
	Only a qualified installer (*1) or qualified service person (*1) is allowed to undertake work at heights using a stand of 50 cm or more or to remove the front panel of the hot water module to undertake work.
	When working at heights, put a sign in place so that no-one will approach the work location, before proceeding with the work. Parts and other objects may fall from above, possibly injuring a person below.
	Do not touch the plate heat exchanger of the unit. You may injure yourself if you do so. If the plate heat exchanger must be touched for some reason, first put on protective gloves and safety work clothing, and then proceed.
	Do not climb onto or place objects on top of the outdoor unit. You may fall or the objects may fall off of the outdoor unit and result in injury.
	When transporting the hot water module, wear shoes with additional protective toe caps.
	When transporting the hot water module, do not take hold of the bands around the packing carton. You may injure yourself if the bands should break.
	Wear protective gloves and safety work clothing during installation, servicing and removal.
	Be sure that a heavy unit (10 kg or heavier) such as a compressor is carried by two persons.
Check earth wires.	Before troubleshooting or repair work, check the earth wire is connected to the earth terminals of the hot water module, otherwise an electric shock is caused when a leak occurs. If the earth wire is not correctly connected, contact an electric engineer for rework.
	After completing the repair or relocation work, check that the earth wires are connected properly.
	Be sure to connect earth wire. (Grounding work) Incomplete earthing causes an electric shock. Do not connect earth wires to gas pipes, water pipes, and lightning rods or earth wires for telephone wires.
Prohibition of modification.	Do not modify the products. Do not also disassemble or modify the parts. It may cause a fire, electric shock or injury.
Use specified parts.	When any of the electrical parts are to be replaced, ensure that the replacement parts satisfy the specifications given in the Service Manual (or use the parts contained on the parts list in the Service Manual). Use of any parts which do not satisfy the required specifications may give rise to electric shocks, smoking and / or a fire.
Do not bring a child close to the equipment.	If, in the course of carrying out repairs, it becomes absolutely necessary to check out the electrical parts with the electrical parts box cover of one or more of the hot water module and the service panel of the outdoor unit removed in order to find out exactly where the trouble lies, put a sign in place so that no-one will approach the work location before proceeding with the work. Third-party individuals may enter the work site and receive electric shocks if this warning is not heeded.

(*1): Refer to the "Definition of Qualified Installer or Qualified Service Person"

Insulating measures	Connect the cut-off lead wires with crimp contact, etc., put the closed end side upward and then apply a water cut method, otherwise a leak or production of fire is caused at the user's side.
No fire	When performing repairs using a gas burner, replace the refrigerant with nitrogen gas because the oil that coats the pipes may otherwise burn. When repairing the refrigerating cycle, take the following measures. 1) Be attentive to fire around the cycle. When using a gas stove, etc., be sure to put out fire before work; otherwise the oil mixed with refrigerant gas may catch fire. 2) Do not use a welder in the closed room. When using it without ventilation, carbon monoxide poisoning may be caused. 3) Do not bring inflammables close to the refrigerant cycle, otherwise fire of the welder may catch the inflammables.
Refrigerant	The refrigerants used by this hot water module is the R410A and R134a.
	Check the used refrigerant name and use tools and materials of the parts which match with it. For the products which use R410A refrigerant, the refrigerant name is indicated at a position on the outdoor unit where is easy to see. To prevent miss-charging, the route of the service port is changed from one of the former R22.
	For an hot water module which uses R410A and R134a, never use other refrigerant than R410A and R134a. For an hot water module which uses other refrigerant (R22, etc.), never use R410A and R134a. If different types of refrigerant are mixed, abnormal high pressure generates in the refrigerating cycle and an injury due to breakage may be caused.
	When the hot water module has been installed or relocated, follow the instructions in the Installation Manual and purge the air completely so that no gases other than the refrigerant will be mixed in the refrigerating cycle. Failure to purge the air completely may cause the hot water module to malfunction.
	Do not charge refrigerant additionally. If charging refrigerant additionally when refrigerant gas leaks, the refrigerant composition in the refrigerating cycle changes resulted in change of hot water module characteristics or refrigerant over the specified standard amount is charged and an abnormal high pressure is applied to the inside of the refrigerating cycle resulted in cause of breakage or injury. Therefore if the refrigerant gas leaks, recover the refrigerant in the hot water module, execute vacuuming, and then newly recharge the specified amount of liquid refrigerant. In this time, never charge the refrigerant over the specified amount.
	When recharging the refrigerant in the refrigerating cycle, do not mix the refrigerant or air other than R410A and R134a into the specified refrigerant. If air or others is mixed with the refrigerant, abnormal high pressure generates in the refrigerating cycle resulted in cause of injury due to breakage.
	After installation work, check the refrigerant gas does not leak. If the refrigerant gas leaks in the room, poisonous gas generates when gas touches to fire such as fan heater, stove or cooking stove though the refrigerant gas itself is innocuous.
	Never recover the refrigerant into the outdoor unit. When the equipment is moved or repaired, be sure to recover the refrigerant with recovering device. The refrigerant cannot be recovered in the outdoor unit; otherwise a serious accident such as breakage or injury is caused.
Assembly / Wiring	After repair work, surely assemble the disassembled parts, and connect and lead the removed wires as before. Perform the work so that the cabinet or panel does not catch the inner wires. If incorrect assembly or incorrect wire connection was done, a disaster such as a leak or fire is caused at user fs side.
Insulator check	After the work has finished, be sure to use an insulation tester set (500 V Megger) to check the resistance is 1 MΩ or more between the charge section and the non-charge metal section (Earth position). If the resistance value is low, a disaster such as a leak or electric shock is caused at user's side.
Ventilation	When the refrigerant gas leaks during work, execute ventilation. If the refrigerant gas touches to a fire, poisonous gas generates. A case of leakage of the refrigerant and the closed room full with gas is dangerous because a shortage of oxygen occurs. Be sure to execute ventilation.

(*1): Refer to the “Definition of Qualified Installer or Qualified Service Person”

Compulsion	When the refrigerant gas leaks, find up the leaked position and repair it surely. If the leaked position cannot be found up and the repair work is interrupted, pump-down and tighten the service valve, otherwise the refrigerant gas may leak into the room. The poisonous gas generates when gas touches to fire such as fan heater, stove or cooking stove though the refrigerant gas itself is innocuous. When installing equipment which includes a large amount of charged refrigerant such as a multi hot water module in a sub-room, it is necessary that the density does not exceed the limit even if the refrigerant leaks. If the refrigerant leaks and exceeds the limit density, an accident of shortage of oxygen is caused.
	Tighten the flare nut with a torque wrench in the specified manner. Excessive tighten of the flare nut may cause a crack in the flare nut after a long period, which may result in refrigerant leakage.
	Nitrogen gas must be used for the airtight test.
	The charge hose must be connected in such a way that it is not slack.
	For the installation / moving / reinstallation work, follow to the Installation Manual. If an incorrect installation is done, a trouble of the refrigerating cycle, water leak, electric shock or fire is caused.
Check after repair	Once the repair work has been completed, check for refrigerant leaks, and check the insulation resistance and water drainage. Then perform a trial run to check that the hot water module is running properly.
	After repair work has finished, check there is no trouble. If check is not executed, a fire, electric shock or injury may be caused. For a check, turn off the power breaker.
	After repair work (installation of front panel and cabinet) has finished, execute a test run to check there is no generation of smoke or abnormal sound. If check is not executed, a fire or an electric shock is caused. Before test run, install the front panel and cabinet.
	Be sure to fix the screws back which have been removed for installation or other purposes.
Do not operate the unit with the valve closed.	Check the following matters before a test run after repairing piping. • Connect the pipes surely and there is no leak of refrigerant. • The valve is opened. Running the compressor under condition that the valve closed causes an abnormal high pressure resulted in damage of the parts of the compressor and etc. and moreover if there is leak of refrigerant at connecting section of pipes, the air is sucked and causes further abnormal high pressure resulted in burst or injury.
Check after reinstallation	Only a qualified installer (*1) or qualified service person (*1) is allowed to relocate the hot water module. It is dangerous for the hot water module to be relocated by an unqualified individual since a fire, electric shocks, injury, water leakage, noise and / or vibration may result.
	Check the following items after reinstallation. 1) The earth wire is correctly connected. 2) The power cord is not caught in the product. 3) There is no inclination or unsteadiness and the installation is stable. If check is not executed, a fire, an electric shock or an injury is caused.
	When carrying out the pump-down work shut down the compressor before disconnecting the refrigerant pipe. Disconnecting the refrigerant pipe with the service valve left open and the compressor still operating will cause air, etc. to be sucked in, raising the pressure inside the refrigeration cycle to an abnormally high level, and possibly resulting in reputing, injury, etc.
Cooling check	When the front panel of the Hot water module is to be opened in order for the compressor or the area around this part to be repaired immediately after the hot water module has been shut down, set the circuit breaker to the OFF position, and then wait at least 10 minutes before opening the service panel. If you fail to heed this warning, you will run the risk of burning yourself because the compressor pipes and other parts will be very hot to the touch. In addition, before proceeding with the repair work, wear the kind of insulated heat-resistant gloves.
	When the front panel of the Hot water module is to be opened in order for the reactor, inverter or the areas around these parts to be repaired immediately after the hot water module has been shut down, set the circuit breaker to the OFF position, and then wait at least 10 minutes before opening the service panel. If you fail to heed this warning, you will run the risk of burning yourself because the reactor, inverter heat sink and other parts will be very hot to the touch. In addition, before proceeding with the repair work, wear the kind of insulated heat-resistant gloves.

(*1): Refer to the “Definition of Qualified Installer or Qualified Service Person”

Installation	Only a qualified installer (*1) or qualified service person (*1) is allowed to install the hot water module. If the hot water module is installed by an unqualified individual, a fire, electric shocks, injury, water leakage, noise and / or vibration may result.
	Before starting to install the hot water module, read carefully through the Installation Manual, and follow its instructions to install the hot water module.
	Be sure to use the company-specified products for the separately purchased parts. Use of non-specified products may result in fire, electric shock, water leakage or other failure. Have the installation performed by a qualified installer.
	Do not supply power from the power terminal block equipped on the outdoor unit to another outdoor unit. Capacity overflow may occur on the terminal block and may result in fire.
	Do not install the hot water module in a location that may be subject to a risk of exposure to a combustible gas. If a combustible gas leaks and becomes concentrated around the unit, a fire may occur.
	Do not install water pipes in a location that is susceptible to freezing.
	Install a circuit breaker that meets the specifications in the installation manual and the stipulations in the local regulations and laws.
	Install the circuit breaker where it can be easily accessed by the qualified service person (*1).
	If you install the unit in a small room, take appropriate measures to prevent the refrigerant from exceeding the limit concentration even if it leaks. Consult the dealer from whom you purchased the hot water module when you implement the measures. Accumulation of highly concentrated refrigerant may cause an oxygen deficiency accident.
	Use wiring that meets the specifications in the Installation Manual and the stipulations in the local regulations and laws. Use of wiring which does not meet the specifications may give rise to electric shocks, electrical leakage, smoking and / or a fire.

Explanations given to user

If you have discovered that the fan grille is damaged, do not approach the outdoor unit but set the circuit breaker to the OFF position, and contact a qualified service person to have the repairs done.
Do not set the circuit breaker to the ON position until the repairs are completed.

Relocation

- Only a qualified installer (*1) or qualified service person (*1) is allowed to relocate the hot water module. It is dangerous for the hot water module to be relocated by an unqualified individual since a fire, electric shocks, injury, water leakage, noise and / or vibration may result.
- When carrying out the pump-down work, shut down the compressor before disconnecting the refrigerant pipe. Disconnecting the refrigerant pipe with the service valve left open and the compressor still operating will cause air, etc. to be sucked in, raising the pressure inside the refrigeration cycle to an abnormally high level, and possibly resulting in reputing, injury, etc.

(*1): Refer to the “Definition of Qualified Installer or Qualified Service Person”

Specifications

Model	Sound pressure level (dB(A))	Weight (kg) Main unit
	Heating	
MMW-AP0481CHQ-E	*	100
MMW-AP0481CHQ-TR	*	100

* Under 70 dB(A)

Declaration of Incorporation of Partly Completed Machinery

Manufacturer: Toshiba Carrier Corporation
336 Tadehara, Fuji-shi, Shizuoka-ken 416-8521 JAPAN

Representative/ TCF holder: TOSHIBA CARRIER EUROPE S.A.S
Route de Thil
01120 Montluel FRANCE

Hereby declares that the machinery described below:

Generic Denomination: Hot Water Module

Model/type: MMW-AP0481CHQ-E, MMW-AP0481CHQ-TR

Commercial name: Super Heat Recovery Multi System Air Conditioner

Complies with the provisions of the “Machinery” Directive (Directive 2006/42/EC) and the regulations transposing into national law.

NOTE

This declaration becomes invalid if technical or operational modifications are introduced without the manufacturer’s consent.

1. SUMMARIES OF PRODUCT CHARACTERISTICS

CONCEPT

- To design and produce a high temperature hot water module, capable of producing up to 82°C outlet water temperature, whilst maximizing the performance and efficiency of the entire VRF system.
- To be used in both space heating and domestic hot water applications. Typical applications include hotel, office and residential apartment suits.
- To create a single solution for our customers heating and domestic hot water requirements.

Domestic Hot Water Installation Example

Typical Installations examples include –

- Office use, where there is a requirement for DHW, such as small canteen or rest room.
- Apartment block, where there is a requirement for DHW, such as kitchen, shower and bath.
- Hotel use, where there is an auxiliary requirement for DHW, for the purpose of cleaning and sanitary operations.
- Small Businesses, for example coffee shops, hairdressers etc, where there is a requirement for a single heating solution.

Space Heating Installation Example

Typical Installations examples include –

- Office use, where there is a requirement for space heating via fan coils or AHU's
- Apartment, where there is a requirement for space heating via under-floor heating
- Hotel use, where there is an auxiliary requirement for space heating via a combination of fan coils, AHU or under-floor heating circuits.
- Small Businesses, for example coffee shops, hairdressers etc, where there is a requirement for a single heating solution.

Connectable units

VRF products

- The outdoor unit which is connectable to "Hot Water Module" is SHRM-e.
- The system does not work when it connect to the other outdoor units.

2. SPECIFICATIONS

Model				MMW-AP0481CHQ-E
Heating capacity (*1)			(kW)	14.0
Electrical characteristics	Power supply (*2)			1 phase 50Hz 220-240V
	Running current (max)		(A)	17.5
	Power consumption (max)		(kW)	4.15
Appearance				Zinc hot dipping steel plate
Dimension	Unit	Height	(mm)	700
		Width	(mm)	900
		Depth (leg include)	(mm)	320 (400)
	Packed	Height	(mm)	790
		Width	(mm)	1,035
		Depth	(mm)	440
Weight	Unit		(kg)	100
	Packed		(kg)	105
Design Pressure	Refrigerant (R410A) side		(MPa)	3.73
	Refrigerant (R134a) side		(MPa)	4.15
	Water side		(MPa)	1.0
Heat exchanger (Water)				Plate type heat exchanger
Heat exchanger (Cascade)				Plate type heat exchanger
Heat-insulating material				Polyethylene foam + Polyurethane foam
Water flow rate	Standard		(L/min)	40
	Max - Min.		(L/min)	46 - 34
Water pressure loss (at standard water flow rate)			(kPa)	15
Controll method				Wired remote controller (option)
Operation range	Ambient	indoor	(°CDB)	5 - 32
		Allowable dew point	(°CWB)	23 or less
			RH(%)	30 - 85
		Outdoor (at heating) SHRM-e	(°CDB)	-25 - 40 (*3)
			(°CWB)	-25 - 28 (*3)
	Water outlet side		(°C)	50 - 82
Water filter				Strainer with Mesh 30 to 40 (procured locally)
Connecting pipe	Water pipe	Inlet		R1-1/4
		Outlet		R1-1/4
	Refrigerate pipe	Gas pipe	(mm)	Ø15.9 flare connection
		Liquid pipe	(mm)	Ø9.5 flare connection
	Drain nipple		(mm)	ID 15
Sound pressure level *1			(dB(A))	44
Sound power level *1			(dB(A))	60
Installation place				Indoor

*1 Rated conditions : entering condenser water temp. 60°C leaving condenser water temp. 65°C Outdoor air temp. 7°C DB / 6°C WB
The standard piping means that main pipe length is 5m, branching pipe length is 2.5m of branch piping connected with a 0 meter height.

*2 The source voltage must not fluctuate more than ± 0%.

*3 Low ambient heating (-20° or less) for extended periods of time is not allowed.

Model				MMW-AP0481CHQ-TR
Heating capacity (*1)			(kW)	14.0
Electrical characteristics	Power supply (*2)			1 phase 50Hz 220-240V
	Running current (max)		(A)	17.5
	Power consumption (max)		(kW)	4.15
Appearance				Zinc hot dipping steel plate
Dimension	Unit	Height	(mm)	700
		Width	(mm)	900
		Depth (leg include)	(mm)	320 (400)
	Packed	Height	(mm)	790
		Width	(mm)	1,035
		Depth	(mm)	440
Weight	Unit		(kg)	100
	Packed		(kg)	105
Design Pressure	Refrigerant (R410A) side		(MPa)	3.73
	Refrigerant (R134a) side		(MPa)	4.15
	Water side		(MPa)	1.0
Heat exchanger (Water)				Plate type heat exchanger
Heat exchanger (Cascade)				Plate type heat exchanger
Heat-insulating material				Polyethylene foam + Polyurethane foam
Water flow rate	Standard		(L/min)	40
	Max - Min.		(L/min)	46 - 34
Water pressure loss (at standard water flow rate)			(kPa)	15
Controll method				Wired remote controller (option)
Operation range	Ambient	indoor	(°CDB)	5 - 32
		Allowable dew point	(°CWB)	23 or less
			RH(%)	30 - 85
		Outdoor (at heating) SHRM-e	(°CDB)	-25 - 40 (*3)
			(°CWB)	-25 - 28 (*3)
	Water outlet side		(°C)	50 - 82
Water filter				Strainer with Mesh 30 to 40 (procured locally)
Connecting pipe	Water pipe	Inlet		R1-1/4
		Outlet		R1-1/4
	Refrigerate pipe	Gas pipe	(mm)	Ø15.9 flare connection
		Liquid pipe	(mm)	Ø9.5 flare connection
	Drain nipple		(mm)	ID 15
Sound pressure level *1			(dB(A))	44
Sound power level *1			(dB(A))	60
Installation place				Indoor

*1 Rated conditions : entering condenser water temp. 60°C leaving condenser water temp. 65°C Outdoor air temp. 7°CDB / 6°CWB
The standard piping means that main pipe length is 5m, branching pipe length is 2.5m of branch piping connected with a 0 meter height.

*2 The source voltage must not fluctuate more than ± 0%.

*3 Low ambient heating (-20° or less) for extended periods of time is not allowed.

3. WIRING DIAGRAM

Symbol	Parts Name
CM	Compressor
CN**	Connector
D***	Display
FM	Fan motor
FS	Flow switch
F01	Fuse
PD, PS	Pressure sensor
PMV	Pulse motor valve
SW	DIP switch
TA(TWI), TC2(TWO)	Water temp sensor
TCJ, TC1, TD, TE, TS	Temp sensor
TB**	Terminal block
49C	Compressor case thermostat
63H	High-pressure switch

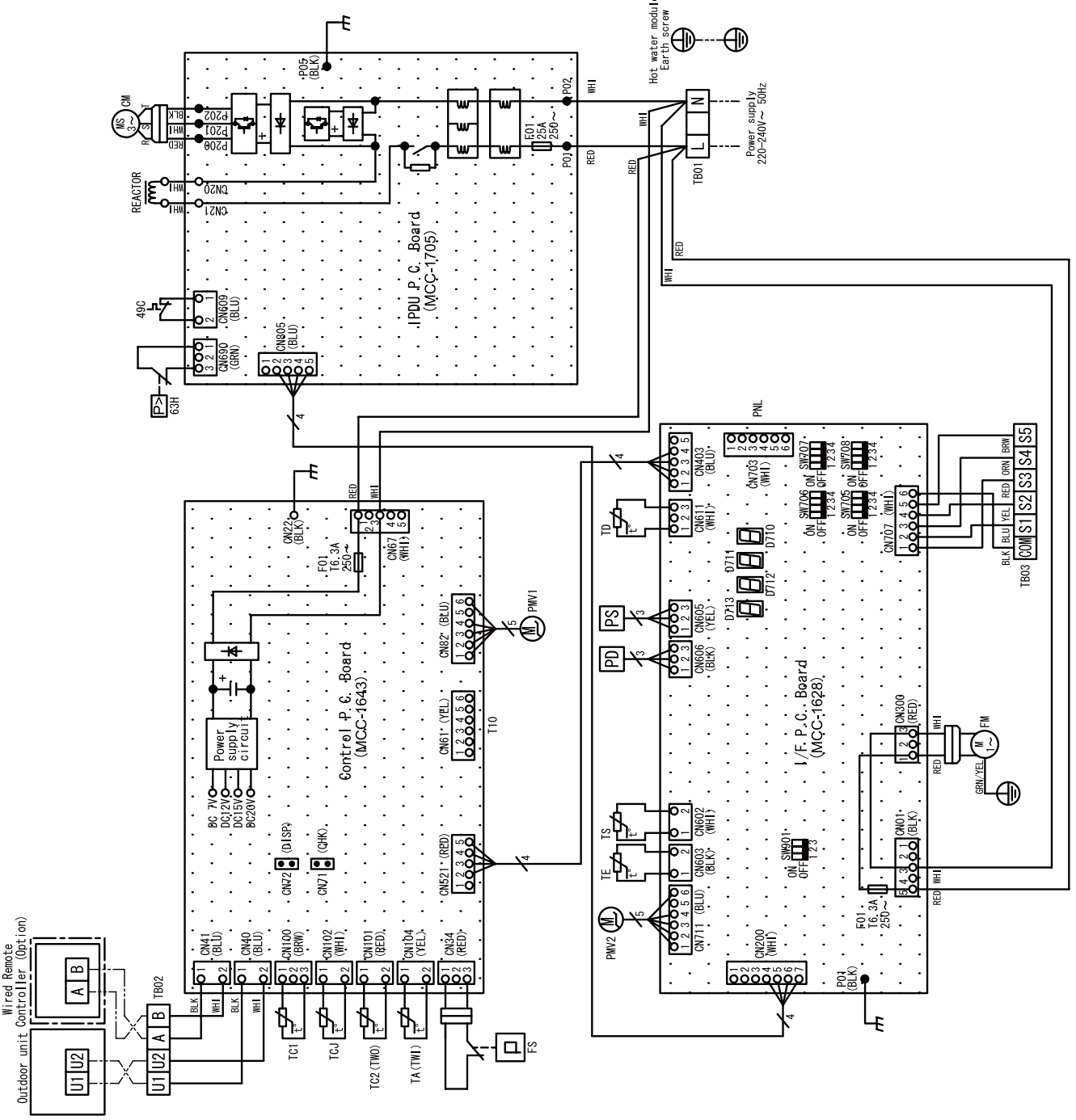
———	Accessory
- - - -	Field wiring
⏚	Protective earth
□	Terminal block
—o—	Terminal
o o	Connector
▭	P.C.Board

COLOR IDENTIFICATION

RED:RED	BLK:BLACK
WHI:WHITE	ORN:ORANGE
YEL:YELLOW	BRW:BROWN
BLU:BLUE	GRN:GREEN

Output signal function

COM:DC12V(COM)
S1:Defrosting output(COM-S1)
S2:Line Heater output(COM-S2)
S3:-
S4:Heating Thermostat ON output(COM-S4)
S5:Pump output(COM-S5)

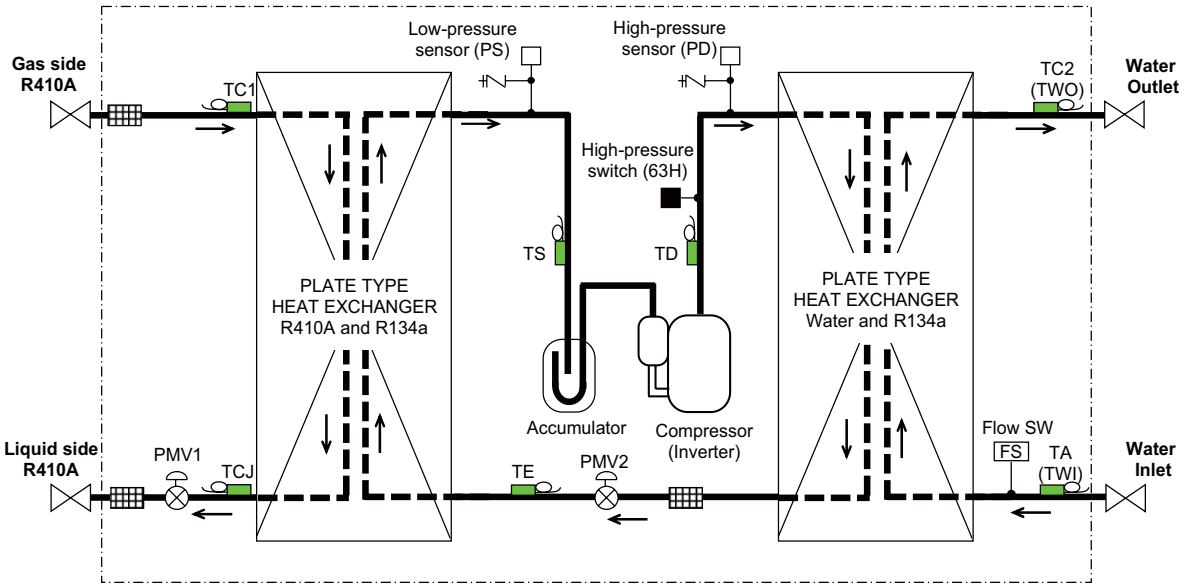


4. PARTS RATING

No.	Name	Model	Specifications	MMW-AP0481CHQ	
				-E	-TR
1	Compressor	DW422A3F-10M	R134a Output: 1.5kW	○	○
2	High pressure SW	ACB-1UB117W	OFF 3.95MPa, ON 3.1MPa	○	○
3	Compressor case thermostat	US-622KXTMQO-SS	OFF 125˚C, ON 90˚C	○	○
4	Pulse motor (PMV1, R410A cycle)	EFM-MD12TF-3	DC12V	○	○
5	Pulse motor (PMV2, R134a cycle)	EFM-MD12TF-4	DC12V	○	○
6	TD sensor	—	Ø6, wire length 1200mm, connector color white	○	○
7	TS sensor	—	Ø6, wire length 1200mm, connector color white	○	○
8	TE sensor	—	Ø6, wire length 1400mm, connector color black	○	○
9	TC1 sensor	—	Ø4, wire length 1400mm, connector color brown	○	○
10	TCJ sensor	—	Ø6, wire length 2000mm, connector color white	○	○
11	TA(TWI) sensor	—	Ø6, wire length 1200mm, connector color yellow	○	○
12	TC2(TWO) sensor	—	Ø6, wire length 1300mm, connector color red	○	○
13	Pressure sensor PD	NSK-BH038F-460	0.5-4.5V / 0-3.92MPa	○	○
14	Pressure sensor PS	NSK-BH038F-460	0.5-4.5V / 0-3.92MPa	○	○
15	Flow switch	VK-320	Set point 15.5 L/min ±10%	○	○
16	Motor-Fan	ASEN10417	AC240V	○	○
17	P.C.Board (IPDU)	MCC-1705	—	○	○
18	P.C.Board (I/F)	MCC-1628	—	○	○
19	P.C.Board (Control)	MCC-1643	—	○	○
20	Reactor	CH-101-Z	10.0mH/25A	○	○

5. REFRIGERANT CYCLE DIAGRAM

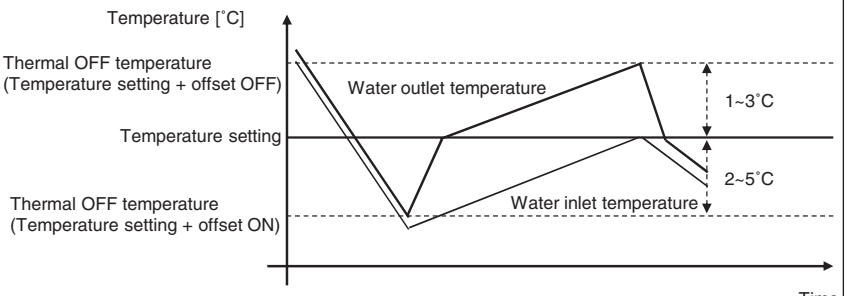
Model: MMW-AP0481CHQ-E (TR)



Symbol		
Check joint	Strainer	Temperature sensor

Functional part name		Functional outline
Pulse Motor Valve	PMV1 (R410A side)	(Connector CN82 (6P) Blue on Control P.C.Board) 1) Controls sub cool in heating operation 2) Recovers refrigerant oil in cooling operation 3) Recovers refrigerant oil in heating operation
	PMV2 (R134a side)	(Connector CN711 (6P) Blue on I/F P.C.Board) 1) Controls super heat in operation
Temperature sensor	TD	(Connector CN611 (3P) White on I/F P.C.Board) 1) Detects discharge gas temperature (R134a side)
	TS	(Connector CN602 (2P) White on I/F P.C.Board) 1) Detects suction gas temperature (R134a side)
	TE	(Connector CN603 (2P) Black on I/F P.C.Board) 1) Detects refrigerant gas temperature (R134a side)
	TC1	(Connector CN100 (3P) Brown on Control P.C.Board) 1) Detects refrigerant gas temperature (R410A side)
	TCJ	(Connector CN102 (2P) White on Control P.C.Board) 1) Detects refrigerant liquid temperature (R410A side)
	TA (TWI)	(Connector CN104 (2P) Yellow on Control P.C.Board) 1) Detects water inlet temperature
	TC2 (TWO)	(Connector CN101 (2P) Red on Control P.C.Board) 1) Detects water outlet temperature
High-pressure sensor	PD	(Connector CN606 (3P) Black on I/F P.C.Board) 1) Detects discharge refrigerant gas pressure
Low-pressure sensor	PS	(Connector CN605 (3P) Yellow on I/F P.C.Board) 1) Detects suction refrigerant gas pressure
High-pressure switch	63H	(Connector CN690 (3P) Green on IPDU P.C.Board) 1) Protects high pressure rise
Flow switch	FS	(Connector CN34 (3P) Red on Control P.C.Board) 1) Detects water flow

6. CONTROL OUTLINE

<table>
<tr><th>No.</th><th>Item</th><th>Specifications</th><th>Remarks</th></tr>
<tr><td>1</td><td>Upon power supply reset</td><td>1. Identification of outdoor unit
When the power supply is reset, the outdoor unit is identified, and control is redirected according to the identification result.
2. If power supply reset is performed in the wake of a trouble, the check code is cleared. If the abnormality persists after the Start / Stop button on the remote controller is pushed to resume operation, the check code is redisplayed on the remote controller.</td><td></td></tr>
<tr><td>2</td><td>Operation selection</td><td>1. The operation mode changes in response to an operation selection command issued via the remote controller.
<table><tr><th>Remote controller command</th><th>Control outline</th></tr><tr><td>STOP</td><td>Hot water module shutdown</td></tr><tr><td>HEAT</td><td>Heating operation</td></tr></table></td><td></td></tr>
<tr><td>3</td><td>Water outlet temperature control</td><td>1. Adjustment range - remote controller temperature setting (˚C)
<table><tr><th></th><th>HEAT</th></tr><tr><td>Wired type</td><td>50~82</td></tr></table></td><td></td></tr>
<tr><td>4</td><td>Water temperature control</td><td>If a hot water outlet temperature (TWO) is lower than thermal ON temperature, a compressor in high temperature HWM starts operation, if TWO is higher than thermal OFF temperature, the compressor stops the operation. However, the compressor continues its operation until minimum operation time passes since the compressor in high temperature HWM started operation.
(5 minutes in outside temperature 0℃, 10 minutes in outside temperature -20℃)
HWM controls a compressor operation frequency of the high temperature HWM so that TWO approaches temperature setting (TWS).
If TWO becomes higher than 92.5℃, the compressor of high temperature HWM may stop the operation even before the minimum operation time passes.
Thermal control image
 

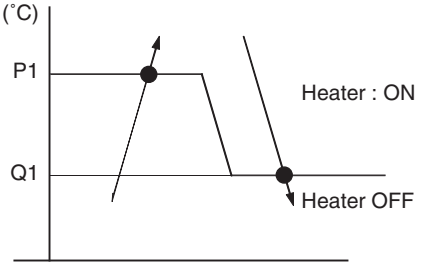
Value of Offset OFF or Offset ON is variable depending on water temperature or compressor frequency of high temperature HWM in thermal off.</td><td>TWO: Water outlet temperature
TWI: Water inlet temperature</td></tr>
<tr><td>5</td><td>Heater control</td><td>1. While the heating themal ON, the heater relay is output by difference between Ts and TWI, and difference between Ts and TWO, Ts and TG.
Start condition: A and B as shown on the right, Table 1 or Table 2
Release condition: A or B as shown on the right, Table 1 or Table 2
 

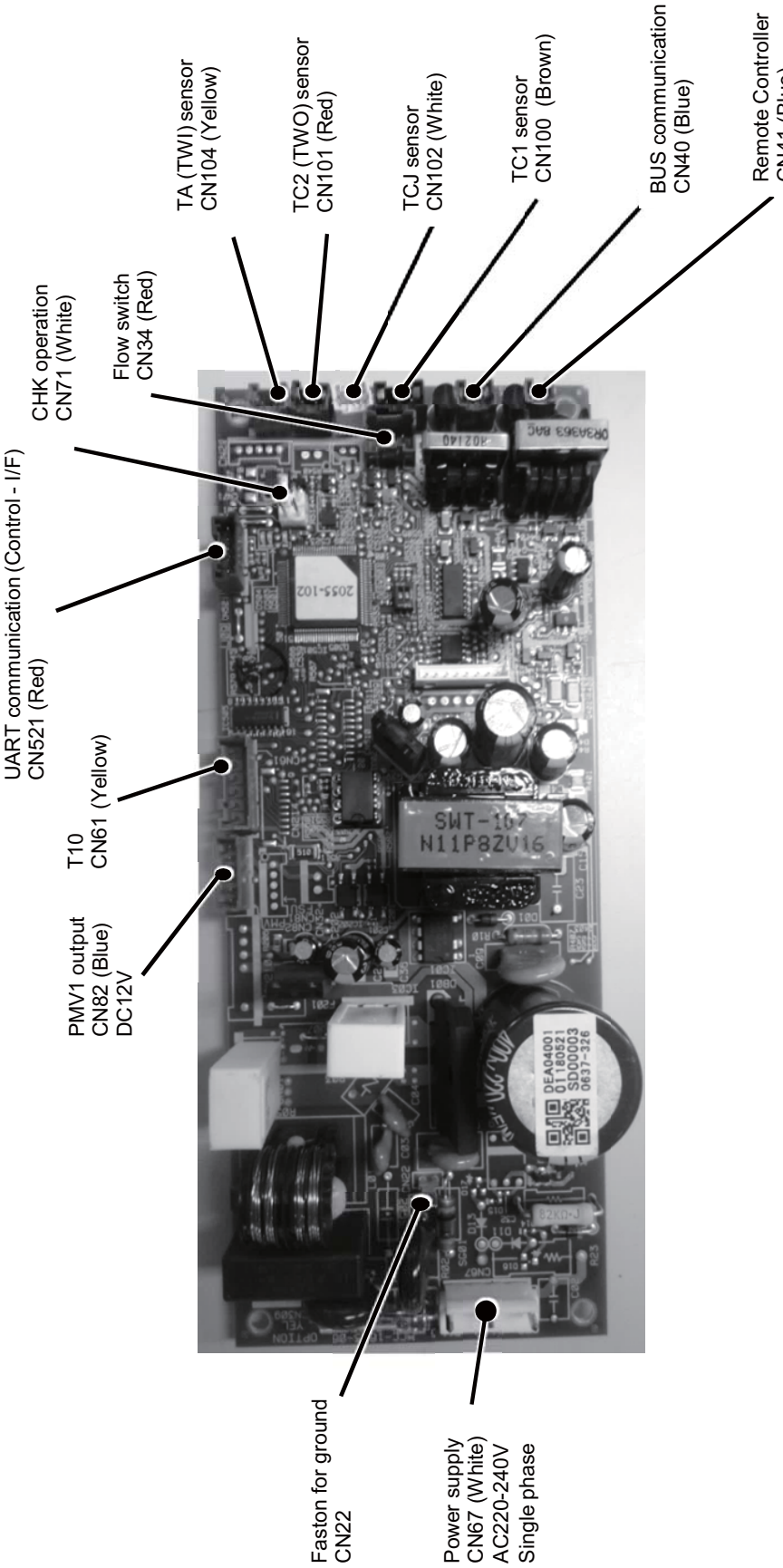
Table 1
<table><tr><th></th><th>Ts – TWI (A)</th><th>Ts – TWO (B)</th></tr><tr><td>P1</td><td>7K</td><td>2K</td></tr><tr><td>Q1</td><td>5K</td><td>0K</td></tr></table>
Table 2
<table><tr><th></th><th>Ts – TWO (A)</th><th>Ts – TG (B)</th></tr><tr><td>P1</td><td>2K</td><td>–11K</td></tr><tr><td>Q1</td><td>0K</td><td>–14K</td></tr></table></td><td>TG: Saturation temperature of discharge pressure
Ts: temperature setting</td></tr>
</table>

No.	Item	Specifications	Remarks
6	Water Heat exchanger frost prevention	As the following description, the pump and the line heater are controlled based on the detected temperature of TC1 sensor, TCJ sensor, TC2 (TWO) sensor, TE sensor, TD sensor and TA (TWI) sensor, regardless of Start/Stop operation. (Even when remote controller is OFF) 1) Pump ON condition (1) TD < 5˚C 30 seconds or more or TE < 5˚C 30 seconds or more (2) TE ≥ 2˚C & TWI or TWO < 6˚C (3) TE > 2˚C & TWI or TWO < 8˚C (1) or (2) or (3) 2) Pump OFF condition (1) TWI or TWO > 9˚C & TE and TD ≥ 12˚C 60 seconds or more (2) After 20 minutes has passed since pump ON 3) Heater ON condition (1) When 65 seconds progressed after the pump was ON, TA (TWI) or TC2 (TWO) decreased below 15˚C 4) Heater OFF condition The state TA (TWI) or TC2 (TWO) ≥ 15˚C continued for 2 minutes or more.	TC1: Gas Temperature TCJ: Liquid Temperature TC2 (TWO): Water outlet Temperature
7	Refrigerant (oil) recovery control	While the outdoor unit is recovering refrigerant (oil), the High temperature HWM perform the following control tasks: [Heating thermostat ON / thermostat OFF unit] 1) Continue operating [Non-operational unit] 1) Open the PMV1(R410A side) to a certain degree. 2) Operate the water pump 3) Engage in recovery control for a specified period of time	• Recovery operation normally takes place roughly every 2 hours.
8	Heating refrigerant (oil) recovery control	While the outdoor unit is recovering heating refrigerant (oil), the indoor units perform the following control tasks: 1) Open the PMV1(R410A side) to a certain degree. 2) Terminate the recovery operation depending on the TC2 (TWO) temperature reading. The timing of termination is determined by each High temperature HWM unit.	• Recovery operation normally takes place roughly every hour.
9	Defrosting control	While the outdoor unit is engaged in defrosting control, the High temperature HWM perform the following control tasks: 1) Stop compressor operation 2) Open the PMV1 to a certain degree. 3) Operate the water pump 4) As defrosting control comes to an end, it gives way to heating refrigerant (oil) recovery control. (For control details, see "8. Heating refrigerant (oil) recovery control" above.)	
10	Short intermittent operation compensation control	1. For 5 to 10 minutes* after startup, the system is forced to continue operating even if it reaches the thermostat OFF region. 2. However, priority is given to cooling/heating selection, operation standby, and protective control, so that there is no overriding of thermostat OFF in these cases.	* Depend on outdoor ambient: TO. TO ≥ 0˚C : 5min TO ≤ -20˚C :10min
11	Operation standby Heating standby	<Operation standby> ..... Displayed on remote controller 1. When any of the check codes listed below is displayed • “P05” - Detection of an open phase in the power supply wiring • “P10” - Detection of indoor flooding in at least one indoor unit with the exception of the hot water module. • “L30” - Detection of an interlock alarm in at least one indoor unit 2. The system is engaged in a heating refrigerant (oil) recovery control. <Heating standby> ..... Displayed on remote controller 1. Normal thermostat OFF • During heating, the indoor unit goes thermostat OFF as the heating temperature setting is reached. 2. Forced thermostat OFF • “HEAT” operation is unavailable because at least one indoor unit is operating in “COOL / DRY” mode .	• “OPERATION STANDBY ⏻” displayed • “HEATING STANDBY ☼” displayed

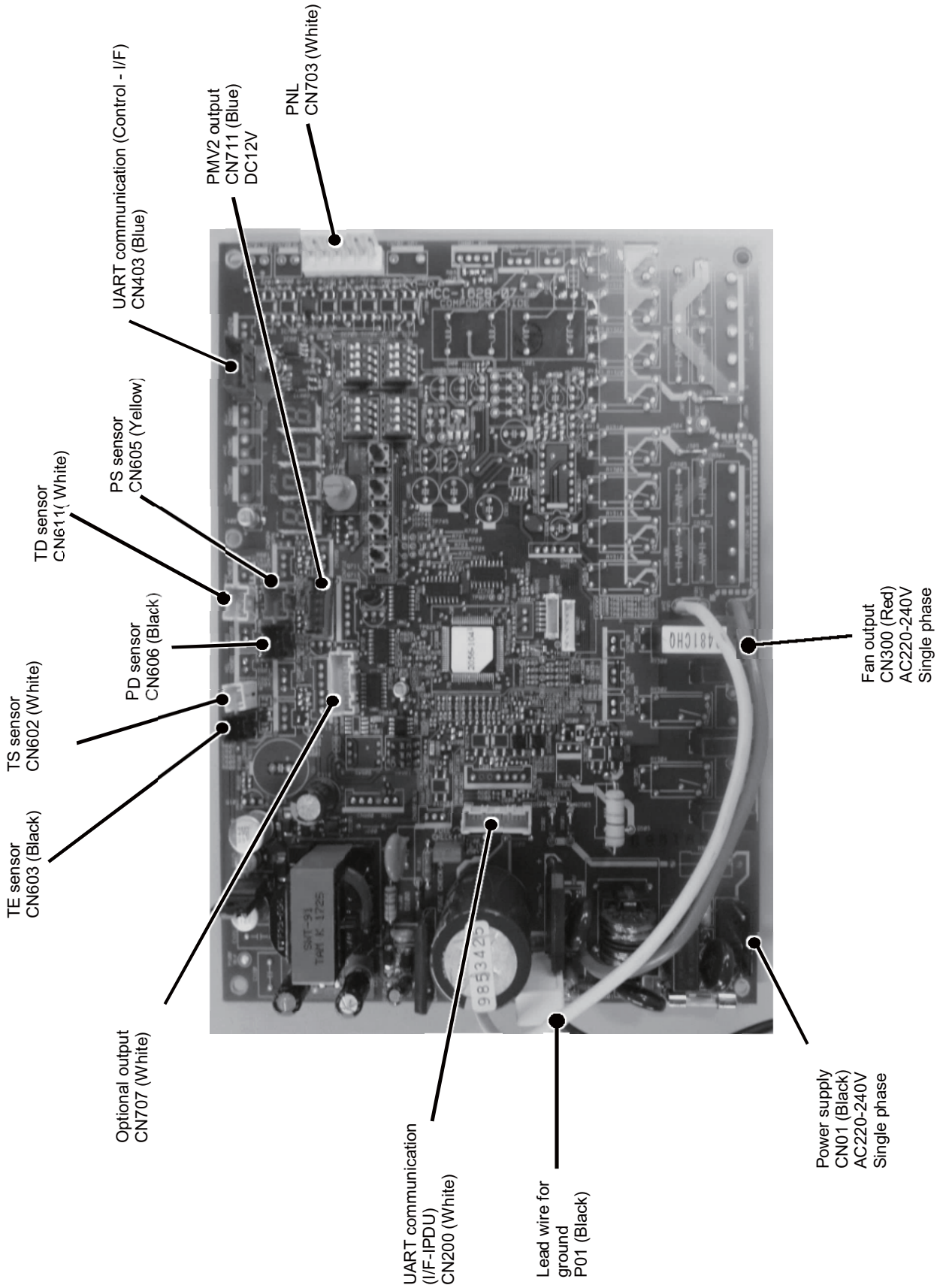
7. APPLIED CONTROL AND FUNCTIONS

7-1. Print circuit board

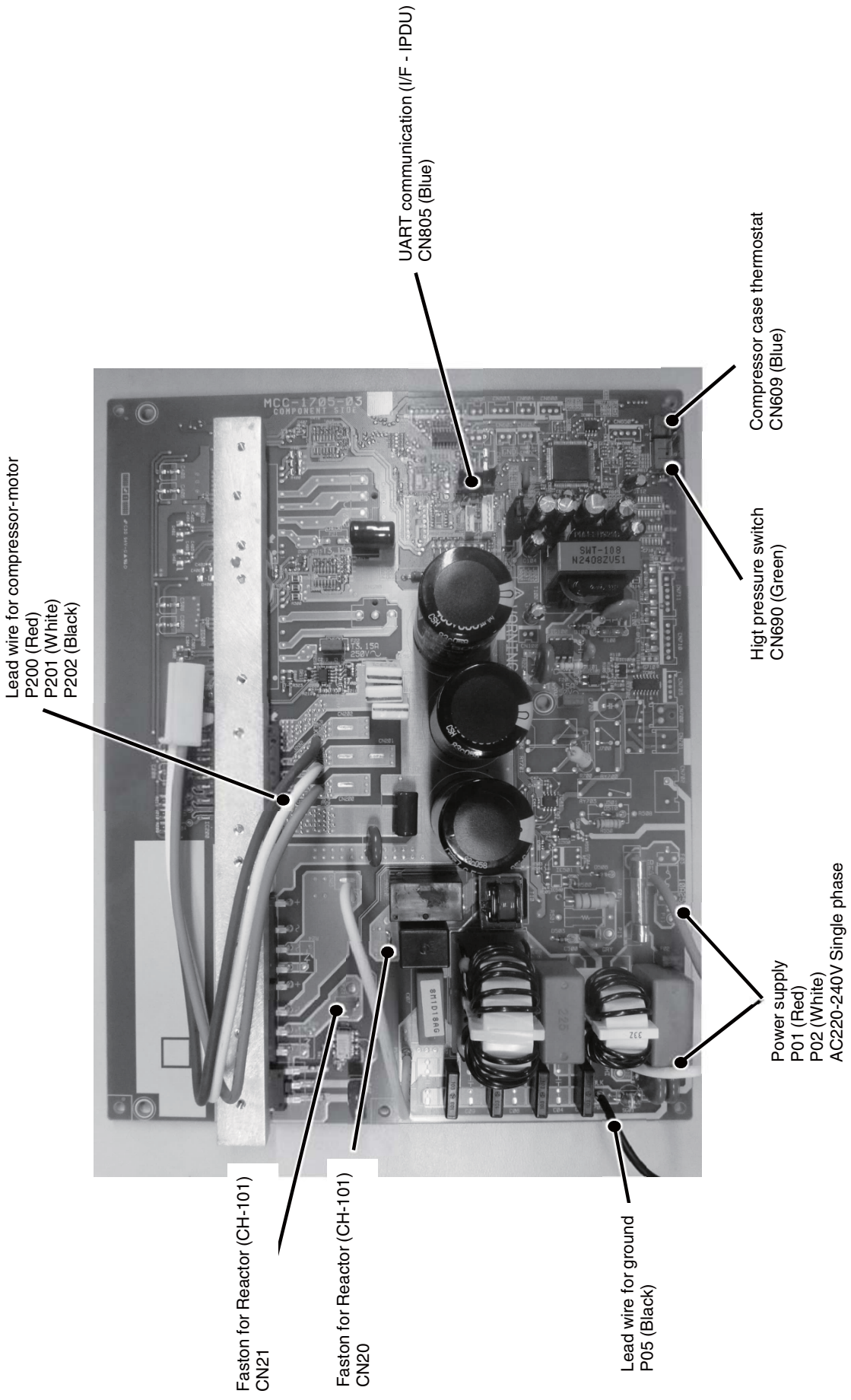
Control print circuit board
MCC-1643



I/F print circuit board
MCC-1628



IPDU print circuit board
MCC-1705



7-2. Optional connector specifications of hot water module P.C. board

Function	Terminal	Pin No.	Specifications	Remarks
HA	MCC-1643 /CN61	1	Start/stop input	Start/stop input for HA (J01:In place/ Removed = Pulse input (factory default) / Step input)
		2	0V (COM)	—
		3	Remote controller disabling input	Enables / disables start / stop control via remote controller
		4	In-operation output	ON during operation (HA answerback signal)
		5	DC12V (COM)	—
		6	Alarm output	ON while alarm ON
CHK Operation check	MCC-1643 /CN71	1	GND	Used for hot water module operation check (prescribed operational status output, such as R410A_PMV (PMV1) ON, to be generated without communication with outdoor unit or remote controller)
		2	Check mode input	
Outside trouble input	MCC-1628 /CN703	1	COM (DC12V)	Generates test code L30 and automatically shuts down air conditioner (only if condition persists for 1 minute)
		2	Outside trouble input	
		3	—	—
		4	—	—
		5	—	—

Function	Terminal	Pin No.	Specifications	Remarks
Option output	TB03	COM	DC12V	—
		S1	Defrosting output	ON while outdoor unit is defrosting
		S2	Heater output	—
		S3	—	—
		S4	Heating thermostat output	ON while heating thermostat ON (compressor ON)
		S5	Pump output	—

7-3. Test operation of hot water module unit

Check function for operation of hot water module (Functions at hot water module side)

This function is provided to check the operation of the hot water module singly without communication with the remote controller or the outdoor unit. This function can be used regardless of operation or stop of the system. However, if using this function for a long time, a trouble of the equipment may be caused. Limit using this function within several minutes.

[How to operate]

1) Short-circuit CHK pin (CN71 on the hot water module P.C. board).
   The operation mode differs according to the hot water module status in that time.
2) Restricted to the normal time, if short-circuiting DISP pin (CN72 on the hot water module P.C. board) in addition to short-circuit of CHK pin (CN71 on the hot water module P.C. board), the minimum opening degree (30 pls) can be set to the hot water module PMV1 (R410A side) only.
   When open DISP pin, the maximum opening degree (1500 pls) can be obtained again.

[How to clear]

Open CHK pin. While the system is operating, it stops once but automatically returns to operation after several minutes.

	Short-circuit of CHK pin	
	DISP pin open	DISP pin short circuit
Hot water module PMV 1 (*)	Max. opening degree (1500 pls)	Min. opening degree (30 pls)
Communication	All ignored	All ignored
P.C. board LED	Lights	Lights

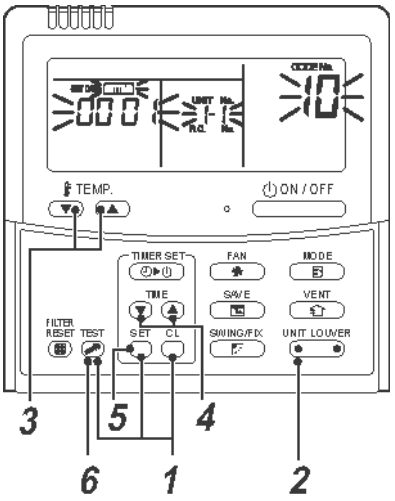
* To exchange the hot water module PMV1 coil, set the hot water module PMV1 to Max. opening degree.

• For the detailed positions of CHK pin (CN71 on hot water module P.C. board), refer to the hot water module P.C. board MCC-1643.

7-4. Method to set hot water module function DN code

(When performing this task, be sure to use a wired remote controller.)

<Procedure> To be performed only when system at rest



1 **Push the TEST + SET + CL buttons simultaneously and hold for at least 4 seconds.**

The unit No. displayed first is the address of the header indoor unit (including Hot Water Module) in group control.

2 **Each time the "Select unit" side of the UNIT LOUVER button is pushed, one of the indoor unit (including Hot Water Module) No. under group control is displayed in turn.**

3 **Use the TEMP. button to select the CODE No. (DN code) of the desired function.**

4 **Use the TIME button to select the desired SET DATA associated with the selected function.**

5 **Push the SET button. (The display changes from flashing to steady.)**

- To change the selected hot water module, go back to step ***2***.
- To change the selected function, go back to step ***3***.

6 **When the SET button is pushed, the system returns to normal off state.**

NOTE: In case of the hot water module, remove the front panel so that P.C. board is visible and then check the D02 LED at the center of P.C. board goes on to judge whether DN is being set or not. The LED goes on while DN code is being set.

Function CODE No. (DN Code) table (includes all functions needed to perform applied control on site)

DN	Item	Description			Factory default
03	Central control address	0001: No.1 unit 0099: Unfixed	to	0064: No.64 unit	0099: Unfixed
04	Specific H-HWM priority	0000: No priority		0001: Priority	0000: No priority
10	Type	0062: High temperature Hot Water Module * refer to Type CODE No. [10]			Depending on model type
11	H-HWM capacity	0000: Unfixed	to	0001 to 0040	According to capacity type
12	Line address	0001: No.1 unit	to	0030: No.30 unit	0099: Unfixed
13	H-HWM address	0001: No.1 unit	to	0064: No.64 unit	0099: Unfixed
14	Group address	0000: Individual 0002: Follower unit of group		0001: Header unit of group	0099: Unfixed
28	Automatic restart of power failure	0000: None		0001: Restart	0000: None
2E	HA terminal (CN61) select	0000: Usual 0002: Fire alarm input		0001: Leaving-ON prevention control	0000: Usual (HA terminal)
60	Timer setting (wired remote controller)	0000: Available (can be performed)		0001: Unavailable (cannot be performed)	0000: Available

Type
DN code "10"

Value	Type	Model
0062*	High temperature Hot Water Module	MMW-AP✻✻✻✻CHQ

* Default value stored in EEPROM mounted on service P.C. board

H-HWM Capacity
DN code "11"

Value	Capacity
0000*	Invalid
0016	048 type

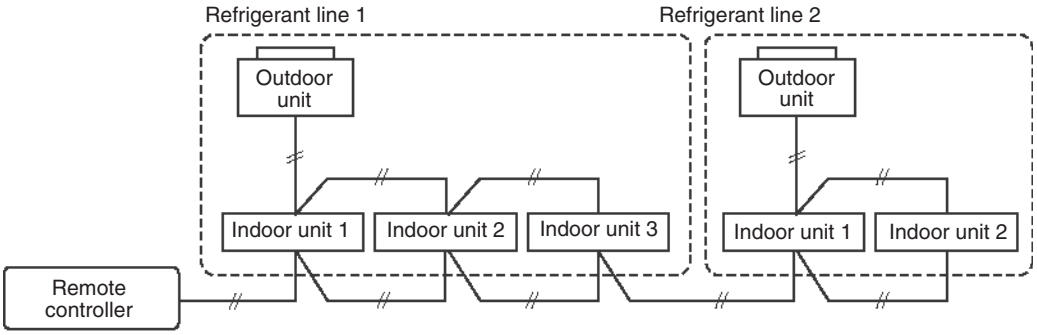
*1 Default value stored in EEPROM mounted on service P.C. board

7-5. Applied control of indoor unit (including Hot Water Module)

Manual address setting using the remote controller

Procedure when setting indoor units' addresses first under the condition that indoor wiring has been completed and outdoor wiring has not been started (manual setting using the remote controller)

▼ Wiring example of 2 refrigerant lines

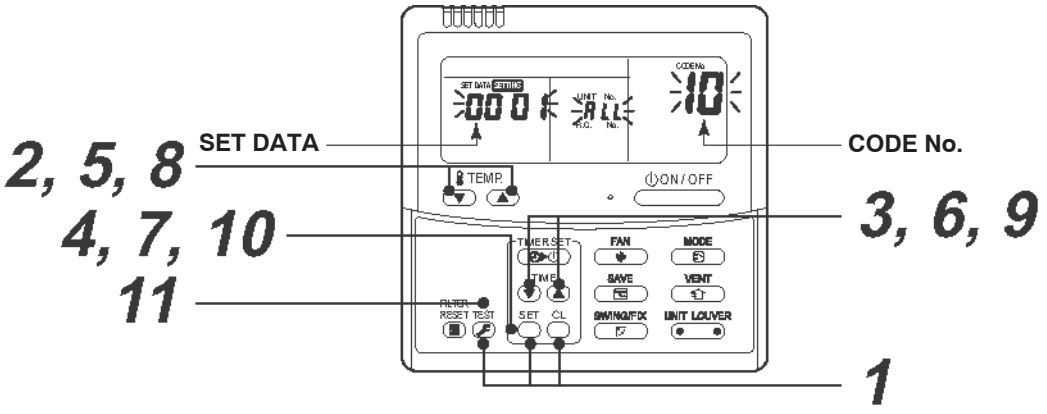


NOTE

- In case of connecting at least one Hot Water Module in the systems, all of FS unit type should be Single port type (long piping model) or Multi port type.
- The group control of more than two refrigerant systems is possible only when all FS units are single port type.
- It is not possible to connect any Hot Water Modules and any indoor units together for a group control.
- It is not possible to connect High temperature type and Mid temperature type together for a group control.

Line (system) address	1	1	1		2	2
Indoor unit address	1	2	3		1	2
Group address	1 Header unit	2 Follower unit	2 Follower unit		2 Follower unit	2 Follower unit

In the example above, disconnect the remote controller connections between the indoor units and connect a wired remote controller to the target unit directly before address setting.



Pair the indoor unit to set and the remote controller one-to-one.

Turn on the power.

1 **Push and hold the SET, CL, and TEST buttons at the same time for more than 4 seconds.**
LCD starts flashing.

<Line (system) address>

2 **Push the TEMP. ▼ / ▲ buttons repeatedly to set the CODE No. to 12.**

3 **Push the TIME ▼ / ▲ buttons repeatedly to set a system address.**
(Match the address with the address on the interface P.C. board of the header outdoor unit in the same refrigerant line.)

4 **Push SET button.**
(It is OK if the display turns on.)

<Indoor unit address>

5 **Push the TEMP. ▼ / ▲ buttons repeatedly to set the CODE No. to 13.**

6 **Push the TIME ▼ / ▲ buttons repeatedly to set an indoor unit address.**

7 **Push the SET button.**
(It is OK if the display turns on.)

<Group address>

8 **Push the TEMP. ▼ / ▲ buttons repeatedly to set the CODE No. to 14.**

9 **Push the TIME ▼ / ▲ buttons repeatedly to set a group address. If the indoor unit is individual, set the address to 0000 ; header unit, 0001 ; follower unit, 0002 .**

10 **Push the SET button.**
(It is OK if the display turns on.)

11 **Push the TEST button.**
The address setting is complete.
(SETTING flashes. You can control the unit after SETTING has disappeared.)

NOTE

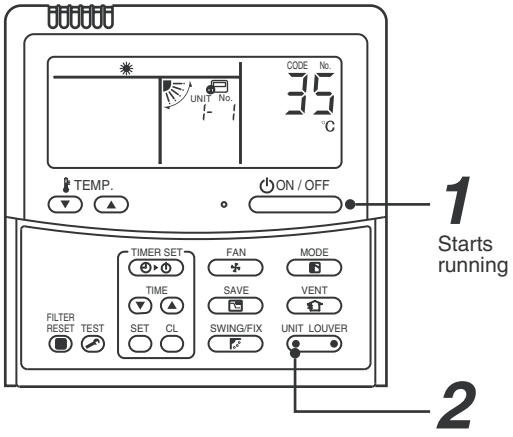
1. **Do not use address numbers 29 or 30 when setting system addresses using the remote controller.**
   These 2 address numbers cannot be used on outdoor units and the CODE No. [E04] (Indoor / outdoor communication trouble) will appear if they are mistakenly used.
2. **If you set addresses to indoor units in 2 or more refrigerate lines manually using the remote controller and will control them centrally, set the header outdoor unit of each line as below.**
   - Set a system address for the header outdoor unit of each line with SW13 and 14 of their interface P.C. boards.
   - Turn off DIP switch 2 of SW30 on the interface P.C. boards of all the header outdoor units connected to the same central control, except the unit that has the lowest address. (For unifying the termination of the wiring for the central control of indoor and outdoor units)
   - Connect the relay connectors between the [U1, U2] and [U3, U4] terminals on the header outdoor unit of each refrigerate line.
   - After finishing all the settings above, set the address of the central control devices. (For the setting of the central control address, refer to the installation manuals of the central control devices.)
3. **In case of the hot water module, remove the front panel so that P.C. board is visible and then check the DO2 LED at the center of P.C. board goes on to judge whether DN is being set or not.**
   The LED goes on while DN code is being set.

Confirming the indoor unit addresses and the position of an indoor unit using the remote controller

◆ Confirming the numbers and positions of indoor units

To see the indoor unit address of an indoor unit which you know the position of

▼ When the unit is individual (the indoor unit is paired with a wired remote controller one-to-one), or it is a group-controlled one.



(Execute it while the units are running.)

1 **Push the ON / OFF button if the units stop.**

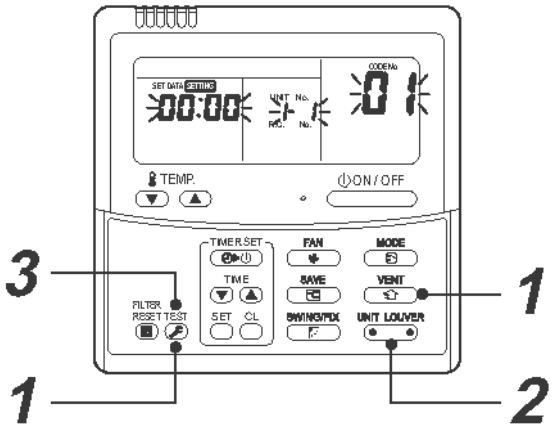
2 **Push the UNIT LOUVER button (left side of the button).**

A unit number 1- 1 is indicated on the LCD (it will disappear after a few seconds). The indicated number shows the system address and indoor unit address of the unit.
When 2 or more indoor units are connected to the remote controller (group-controlled units), a number of other connected units appears each time you push the UNIT LOUVER button (left side of the button).

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

To find an indoor unit's position from its address

▼ When checking unit numbers controlled as a group



(Execute it while the units are stopped.)

The indoor unit numbers in a group are indicated one after another. The fan and louvers of the indicated units are activated.

1 **Push and hold the VENT and TEST buttons at the same time for more than 4 seconds.**

- ALL appears on UNIT No. on the LCD display.
- The fans and louvers of all the indoor units in the group are activated.

2 **Push the UNIT LOUVER button (left side of the button). Each time you push the button, the indoor unit numbers are indicated one after another.**

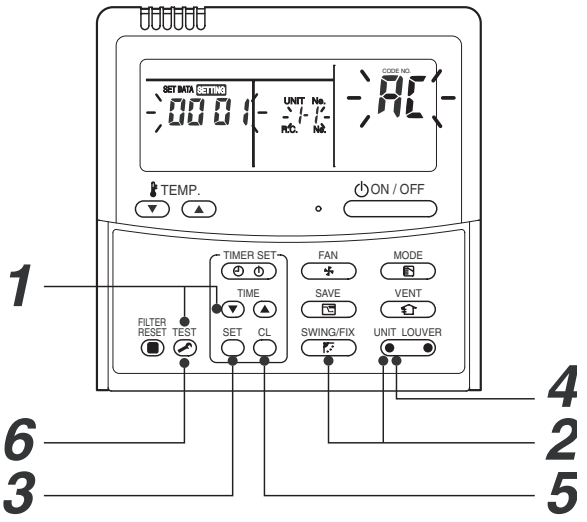
- The first-indicated unit number is the address of the header unit.
- Only the fan and louvers of the indicated indoor unit are activated.

3 **Push the TEST button to finish the procedure.**

All the indoor units in the group stop.

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

▼ To check all the indoor unit addresses using an arbitrary wired remote controller. (When communication wirings of 2 or more refrigerant lines are interconnected for central control)



(Execute it while the units are stopped.)

You can check indoor unit addresses and positions of the indoor units in a single refrigerant line.
When an outdoor unit is selected, the indoor unit numbers of the refrigerant line of the selected unit are indicated one after another and the fan and louvers of the indicated indoor units are activated.

1 **Push and hold the TIME ▼ and TEST buttons at the same time for more than 4 seconds. At first, the line 1 and CODE No. AC (Address Change) are indicated on the LCD display. (Select an outdoor unit.)**

2 **Push the UNIT LOUVER (left side of the button) and SWING/FIX buttons repeatedly to select a system address.**

3 **Push the SET button to confirm the system address selection.**

- The address of an indoor unit connected to the selected refrigerant line is indicated on the LCD display and its fan and louvers are activated.

4 **Push the UNIT LOUVER button (left side of the button). Each time you push the button, the indoor unit numbers of the selected refrigerant line are indicated one after another.**

- Only the fan and louvers of the indicated indoor unit are activated.

◆ To select another system address

5 **Push the CL button to return to step *2*.**

- After returning to step ***2***, select another system address and check the indoor unit addresses of the line.

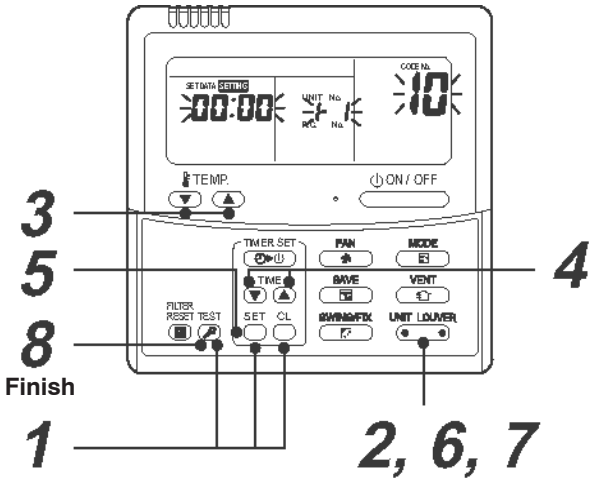
6 **Push the TEST button to finish the procedure.**

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

◆ Changing the indoor unit address using a remote controller

To change an indoor unit address using a wired remote controller.

▼ The method to change the address of an individual indoor unit (the indoor unit is paired with a wired remote controller one-to-one), or an indoor unit in a group. (The method is available when the addresses have already been set automatically.)



(Execute it while the units are stopped.)

1 **Push and hold the SET, CL, and TEST buttons at the same time for more than 4 seconds.**
(If 2 or more indoor units are controlled in a group, the first indicated UNIT No. is that of the head unit.)

2 **Push the UNIT LOUVER button (left side of the button) repeatedly to select an indoor unit number to change if 2 or more units are controlled in a group. (The fan and louvers of the selected indoor unit are activated.)**
(The fan of the selected indoor unit is turned on.)

3 **Push the TEMP. ▼ / ▲ buttons repeatedly to select 13 for CODE No..**

4 **Push the TIME ▼ / ▲ buttons repeatedly to change the value indicated in the SET DATA section to that you want.**

5 **Push the SET button.**

6 **Push the UNIT LOUVER button (left side of the button) repeatedly to select another indoor UNIT No. to change.**
Repeat steps ***4*** to ***6*** to change the indoor unit addresses so as to make each of them unique.

7 **Push the UNIT LOUVER button (left side of the button) to check the changed addresses.**

8 **If the addresses have been changed correctly, push the TEST button to finish the procedure.**

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

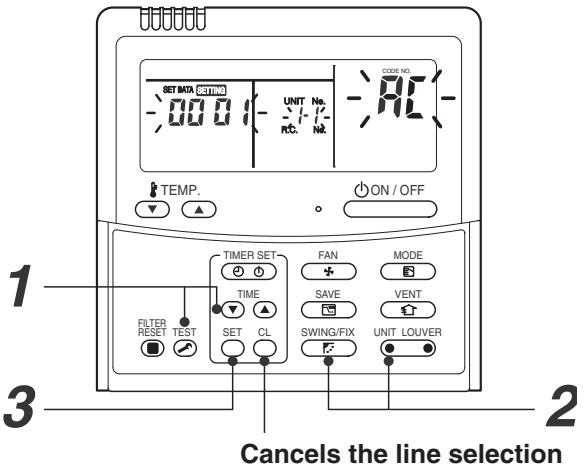
▼ To change all the indoor unit addresses using an arbitrary wired remote controller. (The method is available when the addresses have already been set automatically.)

(When communication wirings of 2 or more refrigerant lines are interconnected for central control)

NOTE

You can change the addresses of indoor units in each refrigerant line using an arbitrary wired remote controller.

* Enter the address check / change mode and change the addresses.



If no number appears on UNIT No., no outdoor unit exists on the line. Push CL button and select another line following step **2**.

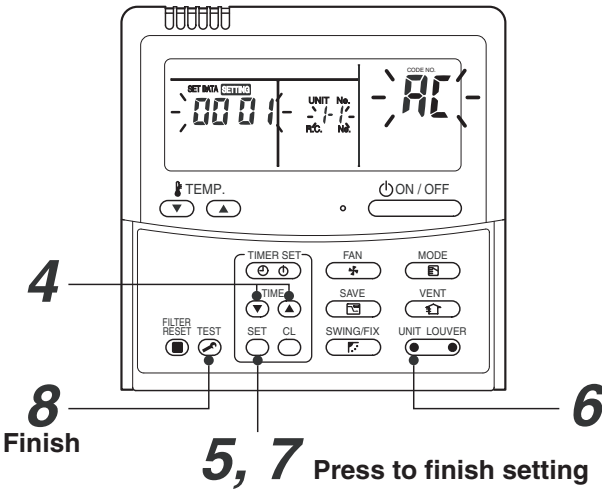
(Execute it while the units are stopped.)

1 Push and hold the TIME ▼ / ▲ buttons at the same time for more than 4 seconds. At first, the line 1 and CODE No. AC (Address Change) are indicated on the LCD display.

2 Push UNIT LOUVER (left side of the button) and SWING/FIX buttons repeatedly to select a system address.

3 Push the SET button.

- The address of one of the indoor units connected to the selected refrigerant line is indicated on the LCD display and the fan and louvers of the unit are activated.
  At first, the current indoor unit address is displayed in SET DATA.
  (No system address is indicated.)



4 **Push the TIME ▼ / ▲ buttons repeatedly to change the value of the indoor unit address in SET DATA.**
Change the value in SET DATA to that of a new address.

5 **Push the SET button to confirm the new address on SET DATA.**

6 **Push the UNIT LOUVER button (left side of the button) repeatedly to select another address to change.**
Each time you push the button, the indoor unit numbers in a refrigerant line are indicated one after another. Only the fan and louvers of the selected indoor unit are activated.
Repeat steps ***4*** to ***6*** to change the indoor unit addresses so as to make each of them unique.

7 **Push the SET button.**
(All the segments on the LCD display light up.)

8 **Push the TEST button to finish the procedure.**

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

◆ Check code clearing function

How to clear the check code using the wired remote controller

▼ Clearing a check code of the outdoor unit
Clear the currently detected outdoor unit for each refrigerant line to which the HWM controlled by the remote controller is connected. (The HWM trouble is not cleared.)
Use the service monitoring function of the remote controller.

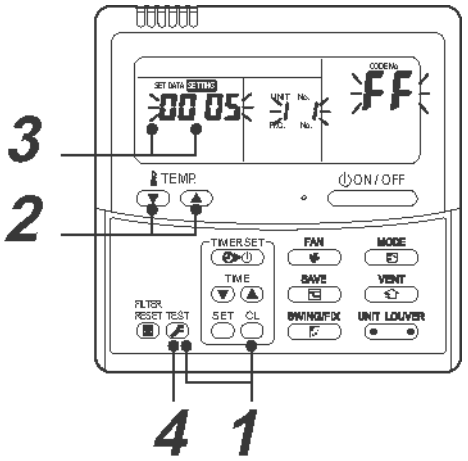
1 **Push and hold the CL and TEST for 4 seconds or longer to enter the service monitoring mode.**

2 **Push the TEMP. button to set CODE No. to " FF ".**

3 **The display in A of the following figure counts down as follows at 5-second intervals:**
" 0005 " → " 0004 " → " 0003 " → " 0002 " → " 0001 " → " 0000 ".

The check code is cleared when " 0000 " appears.
However, the display counts down from " 0005 " again.

4 **Push the TEST to return the display to normal.**

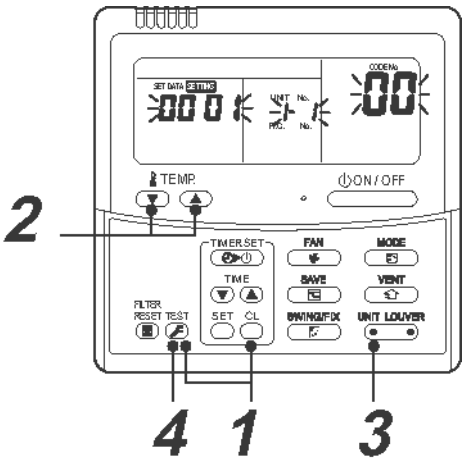


▼ Clearing a check code of the indoor unit
Push the ON / OFF button on the remote controller.
(Only the check code of the indoor unit controlled by the remote controller will be cleared.)

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

◆ Monitoring function of wired remote controller

The following monitoring function is available if the remote controller RBC-AMT32E is used.



▼ Content

Enter the service monitoring mode using the remote controller to check the sensor temperature or operation status of the remote controller, indoor unit, and outdoor unit.

1 **Push and hold the TEST, and CL for 4 seconds or longer to enter the service monitoring mode. The service monitor lights up. The temperature of CODE No. 00 appears at first.**

2 **Push the TEMP. button to change to CODE No. of the item to monitor. Refer to the following table for CODE No.**

3 **Push the UNIT LOUVER button (left side of the button) to change to the item to monitor. Monitor the sensor temperature or operation status of the indoor unit and outdoor unit in the refrigerant line**

4 **Push the TEST to return the display to normal.**

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

◆ Outdoor unit

	CODE No.	Data name	Refrigerant	Display format	Unit	Remote controller display example
Hot Water Module (High temperature type) *1	00	Water inlet temperature (in control)		×1	˚C	[0024]=24˚C
	02	Water inlet temperature (TA (TWI))		×1	˚C	
	03	Heat exchanger temperature (TCJ)	R410A	×1	˚C	
	04	Water outlet temperature (TC2 (TWO))		×1	˚C	
	05	Heat exchanger temperature (TC1)	R410A	×1	˚C	
	08	PMV opening	R410A	×1/10	pls	[0150]=1500pls
	C0	Compressor revolutions	R134a	×10	rps	[0642]=64.2rps
	C1	PMV opening	R134a	×1/10	pls	[0150]=1500pls
	C2	Compressor discharge temperature (TD)	R134a	×1	˚C	[0024]=24˚C
	C3	Plate type heat exchanger temperature (TE)	R134a	×1	˚C	
	C4	Suction temperature (TS)	R134a	×1	˚C	
	C5	High-pressure sensor detection pressure (PD)	R134a	×100	MPa	[0123]=1.23MPa
	C6	Low-pressure sensor detection pressure (PS)	R134a	×100	MPa	
	C7	Compressor IPDU heat sink temperature	R134a	×1	˚C	[0024]=24˚C
	C8	Compressor current	R134a	×10	A	[0135]=13.5A
System data	0A	No. of connected indoor units		×1	unit	[0032]=32 units
	0B	Total horsepower of connected indoor units		×10	HP	[0415]=41.5HP
	0C	No. of connected outdoor units		×1	unit	[0003]=3 units
	0D	Total horsepower of outdoor units		×10	HP	[0420]=42HP
	E0	Refrigerant leakage detection		—	—	[————]=Not valid [0000]=Normal [0001]=Possibility of leakage

	CODE No.			Data name	Display format	Unit	Remote controller display example
	U1	U2	U3				
Outdoor unit individual data 1	10	20	30	High-pressure sensor detection pressure (PD)	×100	MPa	[0123]=1.23MPa
	11	21	31	Low-pressure sensor detection pressure (PS)	×100	MPa	
	12	22	32	Compressor 1 discharge temperature (TD1)	×1	˚C	[0024]=24˚C
	13	23	33	Compressor 2 discharge temperature (TD2)	×1	˚C	
	15	25	35	Outdoor coil temperature (TE1)	×1	˚C	
	16	26	36	Outdoor coil temperature (TE2)	×1	˚C	
	19	29	39	Outside ambient temperature (TO)	×1	˚C	
	1A	2A	3A	Suction temperature (TS1)	×1	˚C	
	1B	2B	3B	Suction temperature (TS2)	×1	˚C	
	1D	2D	3D	Temperature at liquid side (TL1)	×1	˚C	

	CODE No.			Data name	Display format	Unit	Remote controller display example
	U1	U2	U3				
Outdoor unit individual data 2 *3	50	60	70	PMV1 opening	×1	pls	[0500]=500pls
	51	61	71	PMV3 opening	×1	pls	
	52	62	72	PMV4 opening	×1	pls	
	53	63	73	1 fan model : Compressor 1 current (I1) 2 fan model : Compressor 1 and Outdoor fan 1 current (I1)	×10	A	[0135]=13.5A
	54	64	74	1 fan model : Compressor 2 and Outdoor fan 1 current (I2) 2 fan model : Compressor 2 and Outdoor fan 2 current (I2)	×10	A	
	56	66	76	Compressor 1 revolutions	×10	rps	[0642]=64.2rps
	57	67	77	Compressor 2 revolutions	×10	rps	
	59	69	79	Outdoor fan mode	×1	mode	[0058]=58 mode
	5A	6A	7A	Compressor IPDU 1 heat sink temperature	×1	˚C	[0024]=24˚C
	5B	6B	7B	Compressor IPDU 2 heat sink temperature	×1	˚C	
	5D	6D	7D	Outdoor fan IPDU 1 heat sink temperature	×1	˚C	
	5E	6E	7E	Outdoor fan IPDU 2 heat sink temperature	×1	˚C	
	5F	6F	7F	Outdoor unit horsepower	×1	HP	[0016]=16HP

	CODE No.	Data name	Refrigerant	Display format	Unit	Remote controller display example
Outdoor unit individual data 3 *4	90	Heating/cooling recovery controlled		0:Normal 1:Recovery controlled		[0010]=Heating recovery controlled [0001]=Cooling recovery controlled
	91	Pressure release		0:Normal 1:Release controlled		[0010]=Pressure release
	92	Discharge temperature release				[0001]=Discharge temperature release controlled
	93	Follower unit release (U2/U3 outdoor units)				[0100]=U2 outdoor unit release controlled [0010]=U3 outdoor unit release controlled

*1 When the units are connected to a group, data of the header indoor unit only can be displayed.

*2 The first digit of an CODE No. indicates the outdoor unit number.

*3 The upper digit of an CODE No. -4 indicates the outdoor unit number.
1∗, 5∗…U1 outdoor unit (Header unit)
2∗, 6∗…U2 outdoor unit (Follower unit1)
3∗, 7∗...U3 outdoor unit (Follower unit2)

4 Only the CODE No.9 of U1 outdoor unit (Header unit) is displayed.

◆ LED display of circuit board

1.D02 (Red)

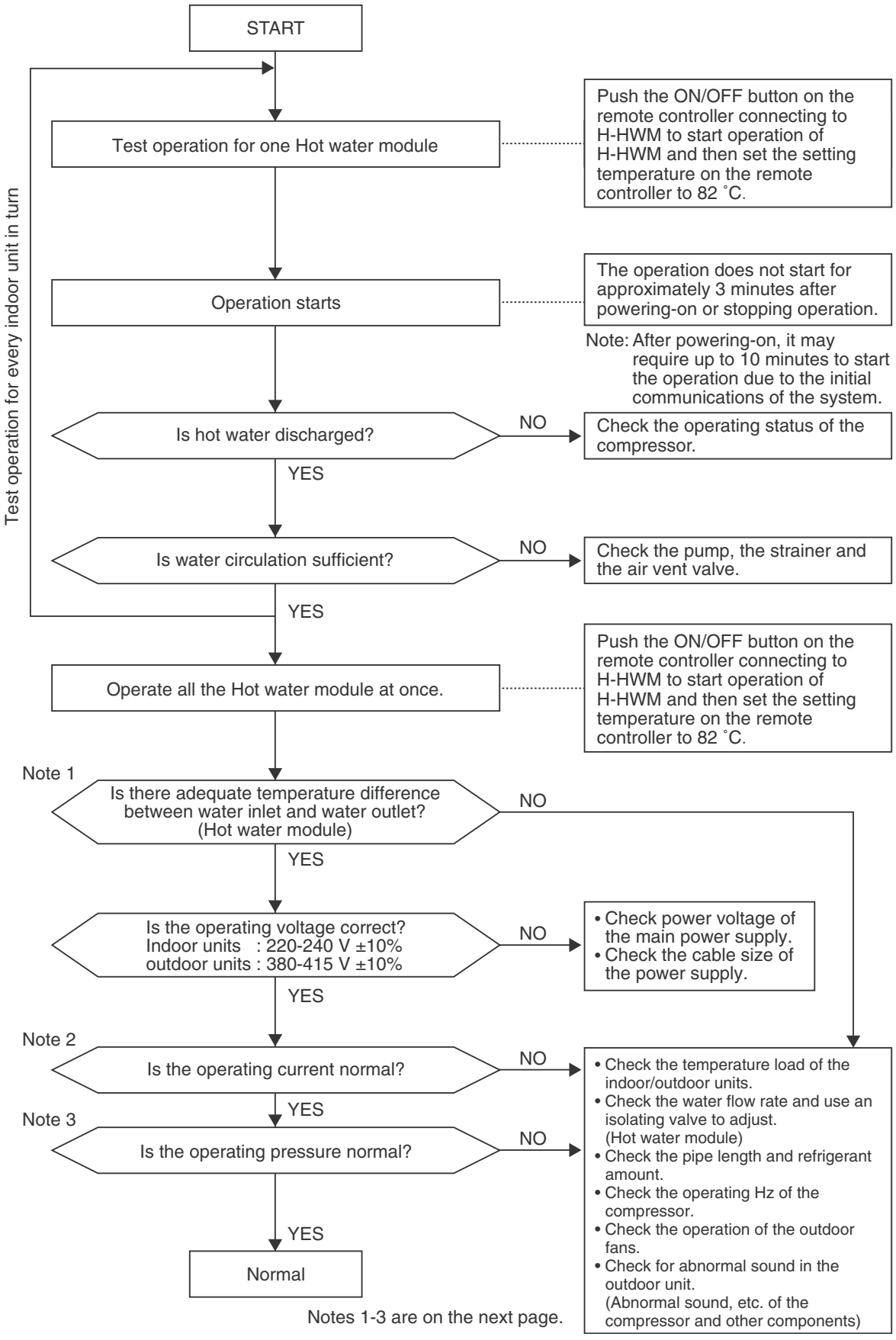
- Lights up when the power is turned on (Microprocessor works)
- Blinks at 1-second intervals (0.5-second): No EEPROM, or writing trouble
- Blinks at 10-second intervals (5-second): No DISP mode
- Blinks at 2-second intervals (1-second): Function change being set (EEPROM)

2.D203 (Red): Remote controller communication

- Lights up for 5 seconds of first half : Group header unit is communicating with the remote controller
- Blinks at 0.2-second intervals (0.1-second) of later half : communication between group indoor header and follower

7-6. Test operation check

Test operation



Notes 1-3 are on the next page.

Note 1: Criteria for the difference between suction and discharge temperatures, between water inlet and water outlet temperature

(1) Heating operation

After operating for a minimum of 30 minutes in “HEAT” mode, if the ΔT water temperature difference between water inlet and water outlet of the hot water module is 3 to 5 degrees, it is normal. (Hot water module)

* If demand from the indoor unit on the outdoor unit is low because the difference between the temperature set by the remote controller and the temperature of the room or the difference between the temperature set by the remote controller and the water inlet temperature is small, then the ΔT temperature difference is small.
* Consider that ΔT temperature difference may diminish in cases of a system in which the connected indoor unit capacity exceeds the outdoor unit capacity, the pipe length is long, or a large difference exists among outdoor units.

Note 2: Criteria for operating power current

The table below shows the maximum current for each outdoor unit. Under standard conditions, operating current is about 80% of the value shown in the table below.

<SHRM-e>

Outdoor unit	MMY-MAP	0806∗	1006∗	1206∗	1406∗	1606∗	1806∗	2006∗
Current value	(A)	21.5	26.1	31.0	35.8	40.6	44.9	49.3

Note 3: Criteria for cycle status

(1) These data are based on operating a 4-way Air Discharge Cassette type air conditioner of 100% connection with standard piping length.

Data may vary depending on temperature conditions, installed pipe length, and room shape combinations, or indoor unit connection capacity.

For pressure criteria in different temperature conditions, refer to (2).

<SHRM-e>

Outdoor unit MMY-MAP	Operating mode	Pressure (MPa)		Pipe surface temperature (°C)					Number of compessor rotations (rps)		Indoor fan	Air temperature condition (°C)	
		PD	PS	Discharge (TD)	Suction (TS)	Indoor heat exchanger (TC)	Outdoor heat exchanger (TE)	Liquid tempreture (TL3)	Compressor 1	Compressor 2		Indoor	outdoor
0806*	Cooling	2.9	0.9	80	16	10	40	30	50	50	High	27/19	35/-
	Heating	2.6	0.7	75	5	35	3	30	50	50	High	20/-	7/6
1006*	Cooling	3.1	0.9	85	16	11	40	30	60	60	High	27/19	35/-
	Heating	2.6	0.7	80	4	35	2	30	65	65	High	20/-	7/6
1206*	Cooling	3.2	0.9	90	16	11	40	30	70	70	High	27/19	35/-
	Heating	2.6	0.7	85	3	35	2	25	75	75	High	20/-	7/6
1406*	Cooling	3.2	0.9	90	16	10	40	35	60	60	High	27/19	35/-
	Heating	2.6	0.7	80	4	35	3	30	65	65	High	20/-	7/6
1606*	Cooling	3.2	0.9	90	16	10	40	35	70	70	High	27/19	35/-
	Heating	2.8	0.7	85	3	30	2	25	70	70	High	20/-	7/6
1806*	Cooling	3.1	0.9	80	15	11	40	35	70	70	High	27/19	35/-
	Heating	2.8	0.7	70	4	30	3	25	75	75	High	20/-	7/6
2006*	Cooling	3.1	0.9	85	15	11	40	35	80	80	High	27/19	35/-
	Heating	2.8	0.6	75	3	30	2	25	85	85	High	20/-	7/6

* This compressor is driven with a 4-pole motor. The value of the compressor number of rotations (rps) measured with a clamp meter at the compressor lead line is two times the rotation count (rps) of the compressor.
* Each compressor may have a different frequency as a measure against resonance.
* The temperature of the indoor heat exchanger (TC) indicates TCJ sensor temperature when cooling, and TC2 sensor temperature when heating, respectively.

(2) Criteria for operating pressure

Operating mode		Cooling	Heating
Indoor temperature (°C)		18~32	15~25
Outdoor temperature (°C)		25~35	5~10
Pressure	High pressure (MPa)	2.0~3.3	2.5~3.3
	Low pressure (MPa)	0.5~0.9	0.5~0.7

* Criteria after 15 minutes or more has passed since operating started

(3) On rotations of outdoor fans

Outdoor fans may rotate slowly to control pressure when cooling with low outer air temperature or heating with excessive load. For control content, also refer to items in Section 6, “Control Outline: Outdoor Unit, Outdoor Fan Control.”

8. TROUBLESHOOTING

8-1. Overview

(1) Before engaging in troubleshooting

(a) Applicable models

Super Heat Recovery Multi (SHRM-e) models.
(Indoor units: MMW-APOOO, Outdoor units: MMY-MAPOOOO*)

(b) Tools and measuring devices required

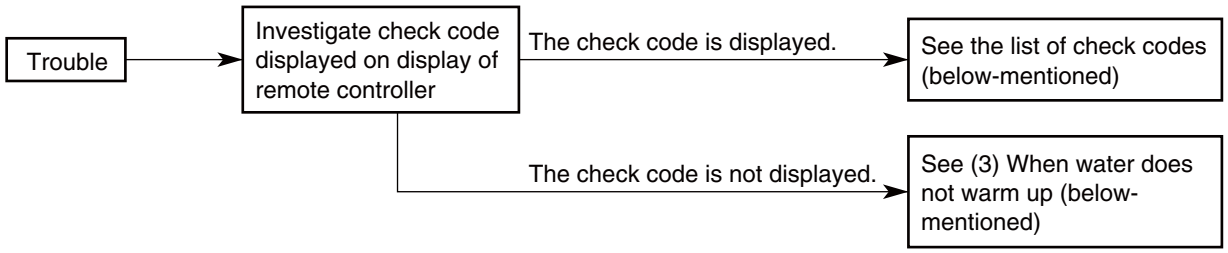
- Screwdrivers (Philips, flat head), spanners, long-nose pliers, nipper, pin to push reset switch, etc.
- Multimeter, thermometer, pressure gauge, etc.

(c) Things to check prior to troubleshooting (behaviors listed below are normal)

NO.	Behavior	Possible cause
1	A compressor would not start	• Could it just be the 3-minute delay period (3 minutes after compressor shutdown)? • Could it just be the hot water module having gone thermostat OFF ? • Could it just be the hot water module put on the timer ? • Could it just be the system going through initial communication ?
2	A pump would not start	• Could it just be out of the water temperature using range ? Hot water module is not possible to operate when water temperatue above 87˚C
3	An outdoor fan would not start or would change speed for no reason	• Could it just be defrosting operation ?
4	A pump would not stop	• Could it just be defrosting or under oil (refrigerant) recovery control ?
5	The air conditioner would not respond to a start / stop command from a remote controller	• Could it just be the hot water module operation under external controller ?
6	The water temperature dose not increase	• Could it just be the water flow rate is out of using range ? Using range of hot water module is rated ±15%

(2) Troubleshooting procedure

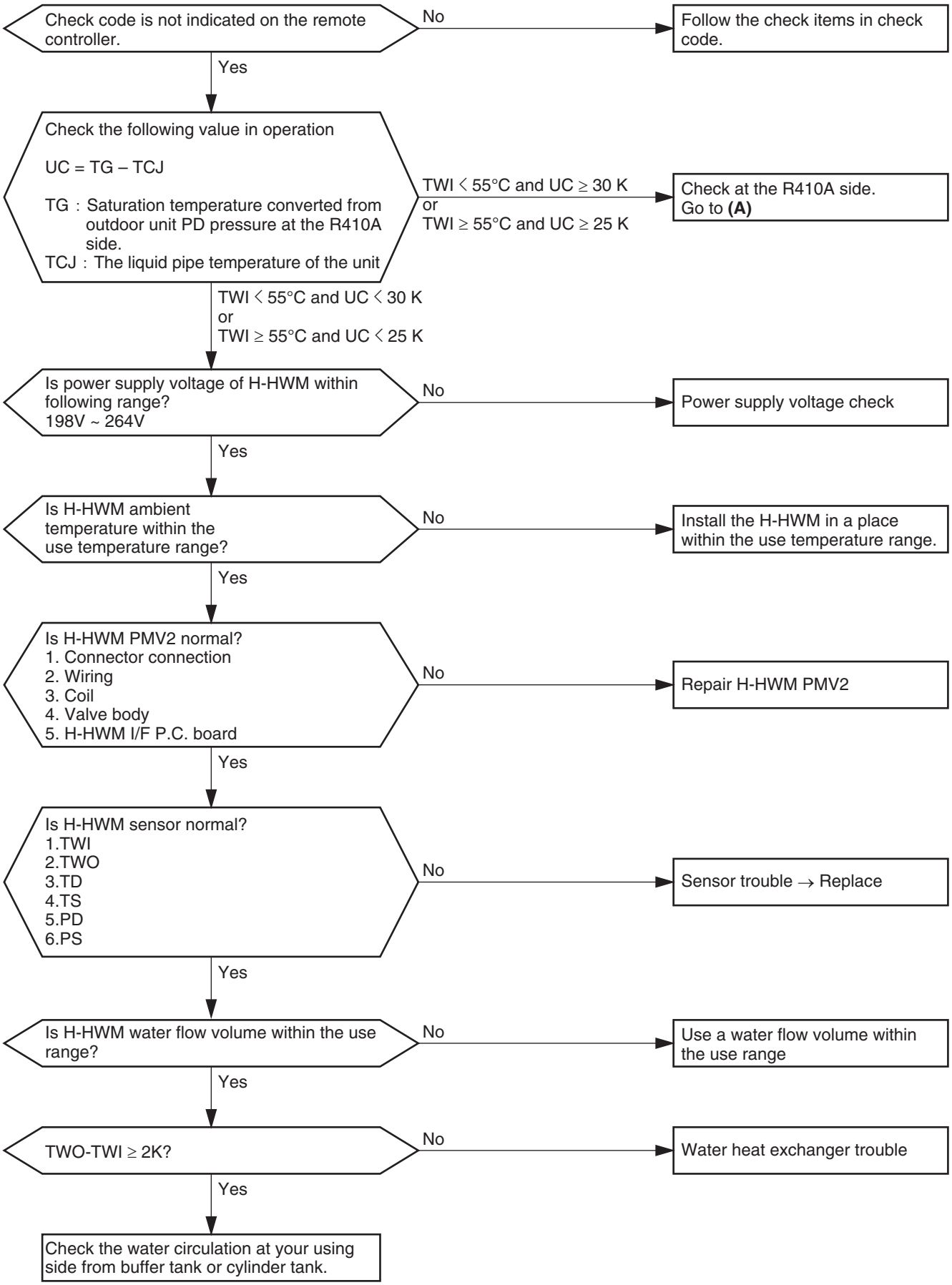
When a trouble occurs, proceed with troubleshooting in accordance with the procedure shown below.



NOTE

Rather than a genuine trouble (see the List of Check Codes below), the problem could have been caused by a microprocessor malfunction attributable to a poor quality of the power source or an external noise. Check for possible noise sources, and shield the remote controller wiring and signal wires as necessary.

(3) When water does not warm up.



(A)

Is outdoor unit ambient temperature within the use temperature range?
-25°CDB ~ 40°CDB
-25°CWB ~ 28°CWB

No → Install the outdoor unit in a place within the use temperature range.

Yes

Is H-HWM TC1 temperature less than room temperature + 5°C?

No → H-HWM cascade heat exchanger trouble

Yes

Is discharge gas pipe temperature of FS unit connected to H-HWM more than room temperature + 5°C?
* Do not touch the discharge gas pipe directly. It's very dangerous since the temperature at the discharge gas pipe rises to approximately 100°C. (see the figure below)

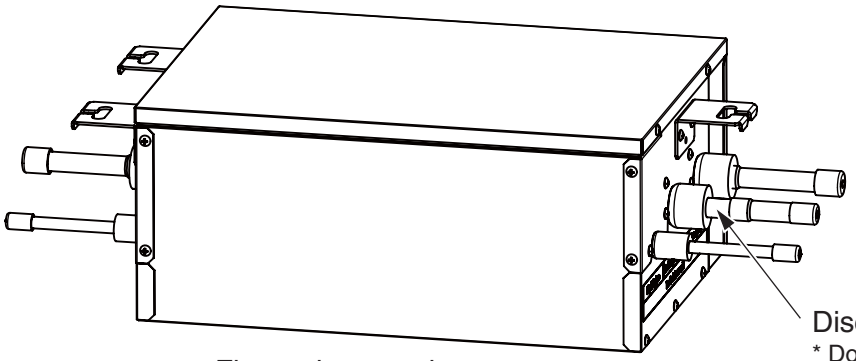
FS unit = Flow selector unit

No → Outdoor unit or connection pipe (between outdoor unit and H-HWM FS unit) trouble

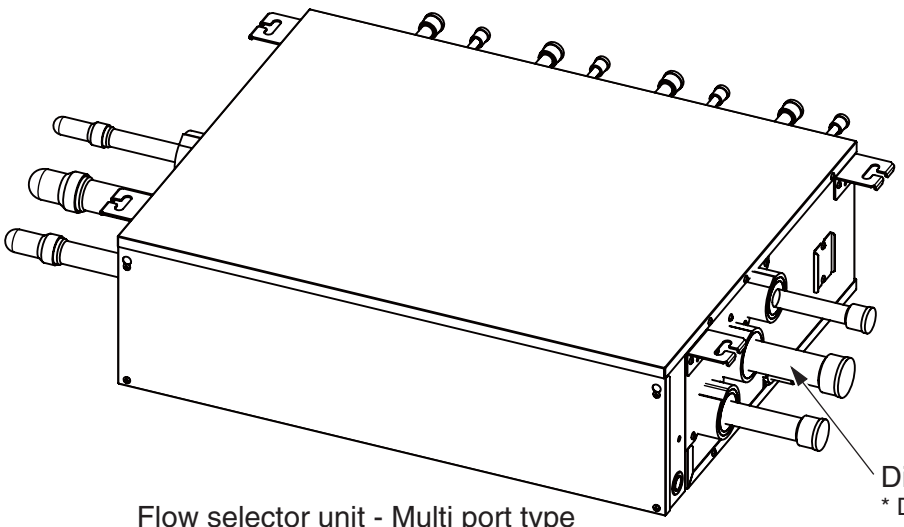
Yes →

Check FS unit.
1.SVD coil and valve body
2.SVS coil and valve body
3.Discharge gas pipe check valve
4.P.C. board
5.Wiring (coil)
6.Wiring (between FS unit and H-HWM)
7.Power supply

Failure → replace



Flow selector unit
(FS unit)



Flow selector unit - Multi port type
(FS unit)

8-2. Troubleshooting method

The remote controllers (main remote controller) and the interface P.C. board of an outdoor unit are provided with an LCD display (remote controller) or a 7-segment display (outdoor interface P.C. board) to display operational status. Using this self-diagnosis feature, the trouble site / trouble part may be identified in the event of a trouble by following the method described below.

The list below summarizes check codes detected by various devices. Analyze the check code according to where it is displayed and work out the nature of the trouble in consultation with the list.

- When investigating a trouble on the basis of a display provided on the indoor remote controller. See the “main remote controller display” section of the list.
- When investigating a trouble on the basis of a display provided on an outdoor unit - See the “Outdoor 7-segment display” section of the list.

List of check codes (indoor unit)

(Trouble detected by indoor unit)

IPDU: Intelligent Power Drive Unit (Inverter P.C. board)
Indoor unit (including Hot Water Module)

Check code			Typical trouble site	Description of trouble
Main remote controller display	Outdoor 7-segment display			
		Sub-code		
A01	A01	Detected indoor nuit No.	Flow switch operation trouble	When water flow rate is reduced.
A02	A02	Detected indoor nuit No.	Water temperature decrease trouble	Water temperature continued the low status regardless of that the water-heater and water pump is operating.
A04	A04	Detected indoor nuit No.	Activation of water heat exchanger frost protection	Frost protection for water heat exchanger is activated
E03	—	—	Indoor-remote controller periodic communication trouble	Communication from remote controller or network adaptor has been lost (so has central control communication).
E04	—	—	Indoor-outdoor periodic communication trouble	Signals are not being received from outdoor unit.
E08	E08	Duplicated indoor address	Duplicated indoor address	Indoor unit detects address identical to its own.
E10	—	—	Indoor inter-MCU communication trouble	MCU communication between main controller and motor microcontroller is trouble.
E18	—	—	Trouble in periodic communication between indoor header and follower unit	Periodic communication between indoor header and follower units cannot be maintained.
F01	—	—	Indoor heat exchanger temperature sensor (TCJ) trouble	Heat exchanger temperature sensor (TCJ) has been open / shortcircuited.
F03	—	—	Indoor heat exchanger temperature sensor (TC1) trouble	Heat exchanger temperature sensor (TC1) has been open / shortcircuited.
F25	—	—	Water inlet temperature sensor (TWI (TA)) trouble	Water inlet temperature sensor (TWI (TA)) has been open / shortcircuited.
F26	—	—	Water outlet temperature sensor (TWO (TC2)) trouble	Water outlet temperature sensor (TWO (TC2)) has been open / shortcircuited.
F29	—	—	P.C. board or other indoor trouble	Indoor EEPROM is abnormal (some other trouble may be detected).
L03	—	—	Duplicated indoor group header unit	There is more than one header unit in group.
L07	—	—	Connection of group control cable to stand-alone indoor unit	There is at least one stand-alone indoor unit to which group control cable is connected.
L08	L08	—	Indoor group address not set	Address setting has not been performed for one or more indoor units (also detected at outdoor unit end).
L09	—	—	Indoor capacity not set	Capacity setting has not been performed for indoor unit.
L20	—	—	Duplicated central control address	There is duplication in central control address setting.
L30	L30	Detected indoor unit No.	Indoor external trouble input (interlock)	Unit shutdown has been caused by external trouble input (CN80).
P31	—	—	Other indoor unit trouble	Follower unit cannot be operated due to header unit alarm (E03 / L03 / L07 / L08).

List of check codes (Hot Water Module)

(Trouble detected by Hot Water Module)

Check code			Typical trouble site	Description of trouble
Main remote controller	Outdoor 7-segment display			
	Check code	Sub-code		
A01	A01	Detected indoor nuit No.	Flow switch operation trouble	When water flow rate is reduced.
A02	A02	Detected indoor unit No.	Water temperature decrease trouble	Water temperature continued the low status regardless of that the water-heater and water pump is operating.
A04	A04	Detected indoor nuit No.	Activation of water heat exchanger frost protection	Frost protection for water heat exchanger is activated.
A05	—	—	Activation of water High-temperature protection	Compressor is in operation, water temperature (TWI or TWO) maintain the state of high.
A06	—	—	Activation of low-pressure protection	Compressor is in operation, Low-pressure PS sensor or High-pressure PD sensor detects lower pressure than the specified value.
A07	—	—	PMV 2 trouble	Compressor is in operation, PMV 2 is in smaller angle than the specified value and the refrigerant superheat of compressor inlet maintain the state of small.
A08	—	—	Reversal of inlet water temperature and outlet water temperature	Compressor is in operation, inlet water temperature (TWI) is higher than outlet water temperature (TWO).
A09	A09	Detected indoor unit No.	Mixed refrigerant	Compressor is in operation, the difference between TU and TE is higher than the specified value.
A10	—	—	TD/TE/TS sensor trouble	Resistance value of sensor is infinite or zero (Open/Short).
A11	—	—	TD/TE/TS sensor connection trouble	The difference between TE and TS is higher than the specified value. The difference between TS and TD is higher than the specified value.
A12	—	—	Pressure sensor trouble (PD, PS)	Output voltage of PD/PS sensor is zero. PD sensor is reverse to PS sensor.
A13	—	—	EEPROM (I/F) trouble	P.C. board (I/F) do not operate normally.
A14	—	—	Heat sink overheat trouble	IGBT built-in temp sensor (TH) is overheated.
A15	—	—	IGBT short-circuit protection trouble	Instant over-current was detected when compressor started operation.
A16	—	—	Current detection circuit system trouble	While inverter compressor stopped, the status that current flowed more than the specified amount was detected.
A17	—	—	Compressor trouble (lock)	Over-current was detected a few seconds after inverter compressor had started.
A18	—	—	Compressor breakdown	Inverter current detection circuit detected over-current and stopped.
A19	—	—	Compressor position detection circuit system trouble	Position detection is not going on normally.
A22	—	—	Compressor case thermostat operation	Compressor case thermostat performed protective operation due to overheating of compressor.
A23	—	—	High-pressure SW system trouble	High-pressure SW operated.
A24	—	—	TH sensor trouble	Resistance value of sensor is infinite or zero (Open/Short).
A25	—	—	Discharge temperature TD trouble	Discharge temperature (TD) is higher than the specified value.
A26	—	—	Gas leak detection (R134a)	Discharge temperature (TD) and refrigerant superheat (SH) are higher than the specified value.
A27	—	—	High-pressure protective operation	PD sensor detect pressure is higher than the specified value.
A28	—	—	H-HWM communication trouble between I/F and IPDU.	Communication interrupted between HHWM P.C. board (I/F) and H-HWM P.C. board (IPDU).

(Trouble detected by main remote controller) Indoor unit (including Hot Water Module)

Check code			Typical trouble site	Description of trouble
Main remote controller	Outdoor 7-segment display			
		Sub-code		
E01	—	—	No master remote controller, trouble remote controller communication (reception)	Signals cannot be received from indoor unit; master remote controller has not been set (including two remote controller control).
E02	—	—	Troubley remote controller communication (transmission)	Signals cannot be transmitted to indoor unit.
E09	—	—	Duplicated master remote controller	Both remote controllers have been set as master remote controller in two remote controller control (alarm and shutdown for header unit and continued operation for follower unit)

(Trouble detected by central control device)

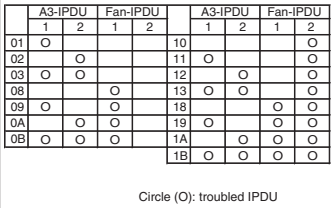
Check code			Typical trouble site	Description of trouble
TCC-LINK central control	Outdoor 7-segment display			
		Sub-code		
C06	—	—	Trouble central control communication (reception)	Central control device is unable to receive signal.
C12	—	—	Lumping alarm for general purpose device control interface	Device connected to general-purpose device control interface for TCC-LINK is trouble.
P30	—	—	Group control follower unit trouble	Group follower unit is trouble (unit No. and above detail [∗∗∗] displayed on main remote controller)

Note: The same trouble, e.g. a communication trouble, may result in the display of different check codes depending on the device that detects it.

List of Check Codes (Outdoor Unit)

(Check code detected by SHRM-e outdoor interface - typical examples)
If “HELLO” is displayed on the oudoor 7-segment for 1 minute or more, turn off the power supply once and then turn on the power supply again after passage of 30 seconds or more.
When the same symptom appears, it is considered there is a possibility of I/F board trouble.

IPDU: Intelligent Power Drive Unit (Inverter P.C. board)
○ : Lighting, ◎ : Flashing, ● : Goes off
ALT.: Flashing is alternately when there are two flashing LED
SIM: Simultaneous flashing when there are two flashing LED

Check code			Display of receiving unit				Typical problem site	Description of check code
Outdoor 7-segment display		TCC-LINK central control or main remote controller display	Indicator light block					
	Sub-code		Operation ⏻	Timer 🕘	Ready ❋	Flash		
E06	Number of indoor units from which signal is received normally	E06	●	●	◎		Signal lack of indoor unit	Indoor unit initially communicating normally fails to return signal (reduction in number of indoor units connected).
E07	–	(E04)	●	●	◎		Indoor-outdoor communication circuit trouble	Signal cannot be transmitted to indoor units (→ indoor units left without communication from outdoor unit).
E08	Duplicated indoor address	(E08)	◎	●	●		Duplicated indoor address	More than one indoor unit are assigned same address (also detected at indoor unit end).
E12	01: Indoor-outdoor communication 02: Outdoor-outdoor communication	E12	◎	●	●		Automatic address starting trouble	• Indoor automatic address setting is started while automatic address setting for equipment in other refrigerant line is in progress. • Outdoor automatic address setting is started while automatic address setting for indoor units is in progress.
E15	–	E15	●	●	◎		Indoor unit not found during automatic address setting	Indoor unit fails to communicate while automatic address setting for indoor units is in progress.
E16	00: Overloading 01: Number of units connected	E16	●	●	◎		Too many indoor units connected/overloading	Combined capacity of indoor units is too large (more than 135% of combined capacity of outdoor units).
E19	00: No header unit 02: Two or more header units	E19	●	●	◎		Trouble in number of outdoor header units	There is no or more than one outdoor header unit in one refrigerant line.
E20	01: Connection of outdoor unit from other refrigerant line 02: Connection of indoor unit from other refrigerant line	E20	●	●	◎		Connection to other refrigerant line found during automatic address setting	Indoor unit from other refrigerant line is detected while indoor automatic address setting is in progress.
E23	–	E23	●	●	◎		Outdoor-outdoor communication transmission trouble	Signal cannot be transmitted to other outdoor units.
E25	–	E25	●	●	◎		Duplicated follower outdoor address	There is duplication in outdoor addresses set manually.
E26	Address of outdoor unit from which signal is not received normally	E26	●	●	◎		Signal lack of outdoor unit	Follower outdoor unit initially communicating normally fails to do so (reduction in number of follower outdoor units connected).
E28	Detected outdoor unit No.	E26	●	●	◎		Outdoor follower unit trouble	Outdoor header unit detects trouble relating to follower outdoor unit (detail displayed on follower outdoor unit).
E31		E31	●	●	◎		IPDU communication trouble Sub MCU communication trouble	There is no communication between IPDUs (P.C. boards) in inverter box.
F04	–	F04	◎	◎	○	ALT	Outdoor discharge temperature sensor (TD1) trouble	Outdoor discharge temperature sensor (TD1) has been open/short-circuited.
F05	–	F05	◎	◎	○	ALT	Outdoor discharge temperature sensor (TD2) trouble	Outdoor discharge temperature sensor (TD2) has been open/short-circuited.
F06	01: TE1 02: TE2	F06	◎	◎	○	ALT	Outdoor heat exchanger liquid side temperature sensor (TE1, TE2) trouble	Outdoor heat exchanger liquid side temperature sensors (TE1, TE2) have been open/short-circuited.
F07	01: TL1 –	F07	◎	◎	○	ALT	Outdoor liquid temperature sensor (TL1) trouble	Outdoor liquid temperature sensor (TL1) has been open/short-circuited.
F08	–	F08	◎	◎	○	ALT	Outdoor outside air temperature sensor (TO) trouble	Outdoor outside air temperature sensor (TO) has been open/short-circuited.

	A3-IPDU		Fan-IPDU			A3-IPDU		Fan-IPDU	
	1	2	1	2		1	2	1	2
01	O				10				O
02		O			11	O			O
03	O	O			12		O		O
08			O		13	O	O		O
09	O		O		18			O	O
0A		O	O		19	O		O	O
0B	O	O	O		1A		O	O	O
					1B	O	O	O	O

Circle (O): troubled IPDU

80 : Communication trouble between MCU and Sub MCU

Check code			Display of receiving unit				Typical problem site	Description of check code
Outdoor 7-segment display		TCC-LINK central control or main remote controller display	Indicator light block					
	Sub-code		Operation	Timer	Ready	Flash		
F12	01: TS1 02: TS2	F12	◎	◎	○	ALT	Outdoor suction temperature sensor (TS1,TS2) trouble	Outdoor suction temperature sensor (TS1,TS2) has been open/short-circuited.
F15	–	F15	◎	◎	○	ALT	Outdoor temperature sensor (TE1,TL1) wiring trouble	Wiring trouble in outdoor temperature sensors (TE1,TL1) has been detected.
F16	–	F16	◎	◎	○	ALT	Outdoor pressure sensor (PD, PS) wiring trouble	Wiring trouble in outdoor pressure sensors (PD, PS) has been detected.
F23	–	F23	◎	◎	○	ALT	Low pressure sensor (PS) trouble	Output voltage of low pressure sensor (PS) is zero.
F24	–	F24	◎	◎	○	ALT	High pressure sensor (PD) trouble	Output voltage of high pressure sensor (PD) is zero or provides abnormal readings when compressors have been turned off.
F31	–	F31	◎	◎	○	SIM	Outdoor EEPROM trouble	Outdoor EEPROM is troubled (alarm and shutdown for header unit and continued operation for follower unit)
H05	–	H05	●	◎	●		Outdoor discharge temperature sensor (TD1) wiring trouble	Wiring/installation trouble or detachment of outdoor discharge temperature sensor (TD1) has been detected.
H06	–	H06	●	◎	●		Activation of low-pressure protection	Low pressure (PS) sensor detects abnormally low operating pressure.
H07	–	H07	●	◎	●		Low oil level protection	Temperature sensor for oil level detection (TK1,TK2,TK4,TK5) detects abnormally low oil level.
H08	01: TK1 sensor trouble 02: TK2 sensor trouble 04: TK4 sensor trouble 05: TK5 sensor trouble	H08	●	◎	●		Trouble in temperature sensor for oil level detection (TK1,TK2,TK4,TK5)	Temperature sensor for oil level detection (TK1,TK2,TK4,TK5) has been open/short-circuited.
H15	–	H15	●	◎	●		Outdoor discharge temperature sensor (TD2) wiring trouble	Wiring/installation trouble or detachment of outdoor discharge temperature sensor (TD2) has been detected.
H16	01: TK1 oil circuit trouble 02: TK2 oil circuit trouble 04: TK4 oil circuit trouble 05: TK5 oil circuit trouble	H16	●	◎	●		Oil level detection circuit trouble	No temperature change is detected by temperature sensor for oil level detection (TK1,TK2,TK4,TK5) despite compressor having been started.
J10	Detected indoor unit No.	J10	●	◎	◎		FS unit overflow trouble	FS unit has been shutdown in one refrigerant line due to detection of overflow
L04	–	L04	◎	○	◎	SIM	Duplicated outdoor refrigerant line address	Identical refrigerant line address has been assigned to outdoor units belonging to different refrigerant piping systems.
L06	Number of priority indoor units (check code L05 or L06 depending on individual unit)	L05	◎	●	◎	SIM	Duplicated priority indoor unit (as displayed on priority indoor unit)	More than one indoor unit have been set up as priority indoor unit.
		L06	◎	●	◎	SIM	Duplicated priority indoor unit (as displayed on indoor unit other than priority indoor unit)	More than one indoor unit have been set up as priority indoor unit.
L08	–	(L08)	◎	●	◎	SIM	Indoor group address not set	Address setting have not been performed for one or more indoor units (also detected at indoor end).
L10	–	L10	◎	○	◎	SIM	Outdoor capacity not set	Outdoor unit capacity has not been set (after P.C. board replacement).
L12	01 : FS unit (s) installation trouble	L12	◎	○	◎		FS unit(s) system trouble	FS unit(s) outside the application setting
L17	–	L17	◎	○	◎	SIM	Outdoor model incompatibility trouble	Old model outdoor unit (prior to 6series) has been connected.
L18	Detected indoor unit No.	L18	◎	○	◎	SIM	Cooling/heating selection unit trouble	Cooling/heating cycle trouble resulting from piping trouble is detected
L23	–	L23	◎	○	◎	SIM	SW setting mistake	Bit 3 and 4 of SW17 are turning on.
L24	01: Duplication of FS units address 02: Indoor units operation mode priority setting	L24	◎	○	◎		FS unit(s) setting trouble	• FS unit(s) detects address identical to its own. • Duplicated priority indoor units operation mode.
L28	–	L28	◎	○	◎	SIM	Too many outdoor units connected	More than three outdoor units have been connected.

<table>
<tr><th colspan="2" rowspan="2">Check code</th><th rowspan="3">TCC-LINK central control or main remote controller display</th><th colspan="4">Display of receiving unit</th><th rowspan="3">Typical problem site</th><th rowspan="3">Description of check code</th></tr>
<tr><th colspan="2">Outdoor 7-segment display</th><th colspan="4">Indicator light block</th></tr>
<tr><th></th><th>Sub-code</th><th>Operation ⏻</th><th>Timer ◴</th><th>Ready ❁</th><th>Flash</th></tr>
<tr><td>L29</td><td><table><tr><th></th><th colspan="2">A3-IPDU</th><th colspan="2">Fan-IPDU</th><th></th><th colspan="2">A3-IPDU</th><th colspan="2">Fan-IPDU</th></tr><tr><th></th><th>1</th><th>2</th><th>1</th><th>2</th><th></th><th>1</th><th>2</th><th>1</th><th>2</th></tr><tr><td>01</td><td>O</td><td></td><td></td><td></td><td>10</td><td></td><td></td><td></td><td>O</td></tr><tr><td>02</td><td></td><td>O</td><td></td><td></td><td>11</td><td>O</td><td></td><td></td><td>O</td></tr><tr><td>03</td><td>O</td><td>O</td><td></td><td></td><td>12</td><td></td><td>O</td><td></td><td>O</td></tr><tr><td>08</td><td></td><td></td><td>O</td><td></td><td>13</td><td>O</td><td>O</td><td></td><td>O</td></tr><tr><td>09</td><td>O</td><td></td><td>O</td><td></td><td>18</td><td></td><td></td><td>O</td><td>O</td></tr><tr><td>0A</td><td></td><td>O</td><td>O</td><td></td><td>19</td><td>O</td><td></td><td>O</td><td>O</td></tr><tr><td>0B</td><td>O</td><td>O</td><td>O</td><td></td><td>1A</td><td></td><td>O</td><td>O</td><td>O</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>1B</td><td>O</td><td>O</td><td>O</td><td>O</td></tr></table>Circle (O): Troubled IPDU</td><td>L29</td><td>◎</td><td>○</td><td>◎</td><td>SIM</td><td>Trouble in number of IPDUs.</td><td>There are insufficient number of IPDUs (P.C. boards) in inverter box</td></tr>
<tr><td>L30</td><td colspan="2">Detected indoor unit No.</td><td>(L30)</td><td>◎</td><td>○</td><td>◎</td><td>SIM</td><td>Indoor external trouble input (interlock)</td><td>Indoor unit has been shut down for external trouble input in one refrigerant line (detected by indoor unit).</td></tr>
<tr><td>P03</td><td colspan="2">–</td><td>P03</td><td>◎</td><td>●</td><td>◎</td><td>ALT</td><td>Outdoor discharge (TD1) temperature trouble</td><td>Outdoor discharge temperature sensor (TD1) has detected abnormally high temperature.</td></tr>
<tr><td rowspan="2">P05</td><td colspan="2">00: Open phase detected</td><td rowspan="2">P05</td><td rowspan="2">◎</td><td rowspan="2">●</td><td rowspan="2">◎</td><td rowspan="2">ALT</td><td>Open phase/power failure</td><td rowspan="2">Open phase is detected when power is turned on. Inverter DC voltage is too high (overvoltage) or too low (undervoltage).</td></tr>
<tr><td>01: Compressor 1
02: Compressor 2</td><td>Inverter DC voltage (Vdc) trouble
MG-CTT trouble</td></tr>
<tr><td>P07</td><td colspan="2">01: Compressor 1
02: Compressor 2</td><td>P07</td><td>◎</td><td>●</td><td>◎</td><td>ALT</td><td>Heat sink overheating trouble</td><td>Temperature sensor built into IPM (TH) detects overheating.</td></tr>
<tr><td>P10</td><td colspan="2">Indoor unit No. detected</td><td>(P10)</td><td>●</td><td>◎</td><td>◎</td><td>ALT</td><td>Indoor unit overflow</td><td>Indoor unit has been shutdown in one refrigerant line due to detection of overflow (detected by indoor unit).</td></tr>
<tr><td>P13</td><td colspan="2">–</td><td>P13</td><td>●</td><td>◎</td><td>◎</td><td>ALT</td><td>Outdoor liquid backflow detection trouble</td><td>State of refrigerant cycle circuit indicates liquid backflow operation.</td></tr>
<tr><td>P15</td><td colspan="2">01: TS condition
02: TD condition</td><td>P15</td><td>◎</td><td>●</td><td>◎</td><td>ALT</td><td>Gas leak detection</td><td>Outdoor suction temperature sensor (TS1) detects sustained and repeated high temperatures that exceed standard value.</td></tr>
<tr><td>P17</td><td colspan="2">–</td><td>P17</td><td>◎</td><td>●</td><td>◎</td><td>ALT</td><td>Outdoor discharge (TD2) temperature trouble</td><td>Outdoor discharge temperature sensor (TD2) detects abnormally high temperature.</td></tr>
<tr><td>P19</td><td colspan="2">Outdoor unit No. detected</td><td>P19</td><td>◎</td><td>●</td><td>◎</td><td>ALT</td><td>4-way valve reversing trouble</td><td>Abnormality in refrigerating cycle is detected during heating operation.</td></tr>
<tr><td>P20</td><td colspan="2">–</td><td>P20</td><td>◎</td><td>●</td><td>◎</td><td>ALT</td><td>Activation of high-pressure protection</td><td>High pressure (PD) sensor detects high pressure that exceeds standard value.</td></tr>
</table>

MG-CTT: Magnet contactor

(Check code detected by IPDU featuring in SHRM-e standard outdoor unit - typical examples)

Check code			Display of receiving unit				Typical problem site	Description of check code
Outdoor 7-segment display		TCC-LINK central control or main remote controller display	Indicator light block					
	Sub-code		Operation ⏻	Timer ◴	Ready ✺	Flash		
F13	01: Compressor 1 02: Compressor 2	F13	◎	◎	○	ALT	Trouble in temperature sensor built into indoor IPM (TH)	Temperature sensor built into indoor IPM (TH) has been open/short-circuited.
H01	01: Compressor 1 02: Compressor 2	H01	●	◎	●		Compressor breakdown	Inverter current (Idc) detection circuit detects overcurrent.
H02	01: Compressor 1 02: Compressor 2	H02	●	◎	●		Compressor trouble (lockup)	Compressor lockup is detected
H03	01: Compressor 1 02: Compressor 2	H03	●	◎	●		Current detection circuit trouble	Abnormal current is detected while inverter compressor is turned off.
P04	01: Compressor 1 02: Compressor 2	P04	◎	●	◎	ALT	Activation of high-pressure SW	High-pressure SW is activated.
P07	01: Compressor 1 02: Compressor 2	P07	◎	●	◎	ALT	Heat sink overheating trouble	Temperature sensor built into IPM (TH) detects overheating or has been short-circuited.
P22	#0: Element short circuit #1: Position detection circuit trouble #3: Motor lock trouble #4: Motor current trouble #C: TH Sensor temperature trouble #D: TH Sensor short circuit/release trouble #E:Vdc voltage trouble ∗ Put in Fan IPDU No. in [#] mark	P22	◎	●	◎	ALT	Outdoor fan IPDU trouble	Outdoor fan IPDU detects trouble.
P26	01: Compressor 1 02: Compressor 2	P26	◎	●	◎	ALT	Activation of IPM short-circuit protection	Short-circuit protection for compressor motor driver circuit components is activated (momentary overcurrent).
P29	01: Compressor 1 02: Compressor 2	P29	◎	●	◎	ALT	Compressor position detection circuit trouble	Compressor motor position detection trouble is detected.

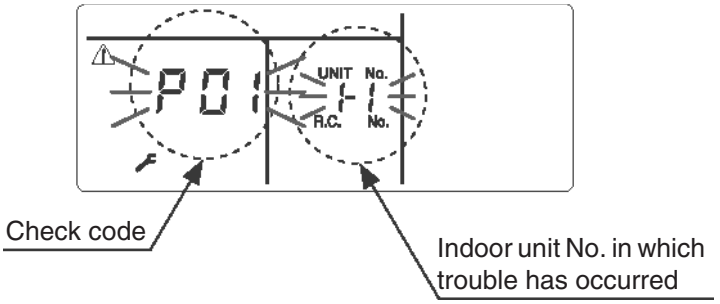
Note: The above check codes are examples only, and different check codes may be displayed depending on the outdoor unit configuration

8-3. Troubleshooting based on information displayed on remote controller

Using main remote controller (RBC-AMT32E)

(1) Checking and testing

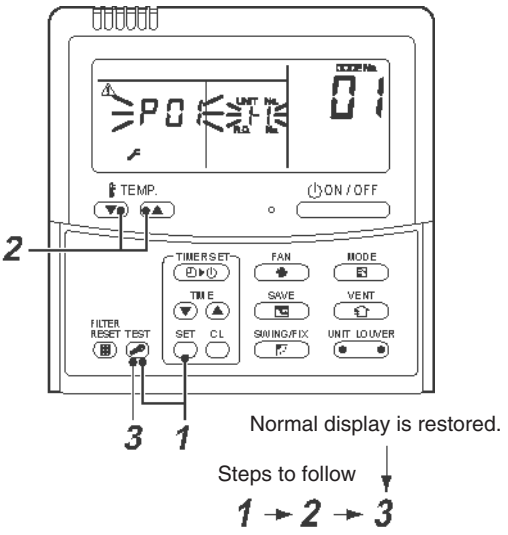
When a trouble occurs to an air conditioner, a check code and indoor unit No. are displayed on the display window of the remote controller. Check codes are only displayed while the air conditioner is in operation.
If the display has already disappeared, access trouble history by following the procedure described below.



(2) Trouble history

The trouble history access procedure is described below (up to four troubles stored in memory).
Trouble history can be accessed regardless of whether the air conditioner is in operation or shut down.

<Procedure> To be performed when system at rest



1 Invoke the SERVICE CHECK mode by pressing the TEST + SET buttons simultaneously and holding for at least 4 seconds.

The letters " SERVICE CHECK" light up, and the check code "01" is displayed, indicating the trouble history. This is accompanied by the indoor unit No. to which the trouble history is related and a check code.

2 To check other trouble history items, press the TEMP. button to select another check code.

Check code "01" (latest) → Check code "04" (oldest)
Note: Trouble history contains four items.

3 When the TEST button is pushed, normal display is restored.

NOTE

Do not push the CL button as it would erase the whole trouble history of the indoor unit.

How to read displayed information

<7-segment display symbols>

0 1 2 3 4 5 6 7 8 9 A b C d E F H J L P

<Corresponding alphanumerical letters>

0 1 2 3 4 5 6 7 8 9 A b C d E F H J L P

8-4. Check Codes Displayed on Remote Controller and SHRM-e Outdoor Unit (7-Segment Display on I/F Board) and Locations to Be Checked

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
A01	A01	Detected indoor unit No.	Indoor unit (M-HWM, H-HWM)	Flow switch operation trouble	All stop	When water flow rate is reduced.	• Check the pump. • Check the strainer. • Check the flow switch. (Type, directtion of attachment and point of contact)
A02	A02	Detected indoor unit No.	Indoor unit (M-HWM, H-HWM)	Water temperature decrease trouble	All stop	Water temperature continued the low status regardless of that the water-heater and water pump is operating.	• Check the water temperature. • Check the heat insulator of water pipes.
A04	A04	Detected indoor unit No.	Indoor unit (M-HWM, H-HWM)	Activation of water heat exchanger frost protection	All stop	Frost protection for water heat exchanger is activated.	• Check the line heater • Check the PMV coil and PMV. • Check the 2-way valve coil and 2-way valve
A05	—	—	Indoor unit (H-HWM)	Activation of water High-temperature protection	Stop of corresponding unit	Compressor is in operation, water temperature (TWI or TWO) maintain the state of high.	• Check the water pump. • Check the water strainer. • Check the flow switch.
A06	—	—	Indoor unit (H-HWM)	Activation of low-pressure protection	Stop of corresponding unit	Compressor is in operation, Low pressure PS sensor or High-pressure PD sensor detects lower pressure than the specified value.	• Check the PMV 2 coil and PMV 2.
A07	—	—	Indoor unit (H-HWM)	PMV2 trouble	Stop of corresponding unit	Compressor is in operation, PMV2 is in smaller angle than the specified value and the refrigerant superheat degree at the compressor inlet maintains a small state.	• Check the PMV2 coil and PMV2. • Check clogging of refrigerant pipe (R410A).
A08	—	—	Indoor unit (H-HWM)	Reversal of inletwater temperature and outlet water temperature	Stop of corresponding unit	Compressor is in operation, inlet water temperature (TWI) is higher than outlet water temperature(TWO).	• Check the inlet water piping and outlet water piping.
A09	A09	Detected indoor unit No.	Indoor unit (H-HWM)	Mixed refrigerant	All stop	Compressor is in operation, the difference between TU (PS saturation temperature conversion value.) and TE is higher than the specified value.	• Check refrigerant quantity (R134a).
A10	—	—	Indoor unit (H-HWM)	TD/TE/TS sensor trouble	Stop of corresponding unit	Resistance value of sensor is infinite or zero (Open/Short circuit).	• Check connection of TD/TE/TS sensor connector. • Check characteristics of TD/TE/TS sensor resistance value. • Check H-HWM P.C. board (I/F) trouble.
A11	—	—	Indoor unit (H-HWM)	TD/TE/TS sensor connection trouble	Stop of corresponding unit	The difference between TE and TS is higher than the specified value. The difference between TS and TD is higher than the specified value.	• Check misconnection of TD/TE/TS sensor connector. • Check connection of TD/TE/TS sensor connector. • Check characteristics of TD/TE/TS sensor resistance value. • Check H-HWM P.C. board (I/F) trouble.
A12	—	—	Indoor unit (H-HWM)	Pressure sensor trouble (PD, PS)	Stop of corresponding unit	Output voltage of PD/PS sensor is zero. PD sensor is reverse to PS sensor.	• Check connection of highpressure (PD) sensor connector. • Check connection of lowpressure (PS) sensor connector. • Check for defect in pressure sensors PD and PS. • Check H-HWM P.C. board (I/F) trouble.
A13	—	—	Indoor unit (H-HWM)	EEPROM (I/F) trouble	Stop of corresponding unit	P.C. board (I/F) do not operate normally.	• Check power voltage. • Check power noise. • Check H-HWM P.C. board (I/F) trouble.

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
A14	—	—	Indoor unit (H-HWM)	Heat sink overheat trouble	Stop of corresponding unit	IGBT built-in temp sensor (TH) is overheated.	• Check power voltage • Check cooling fan trouble. • Check clogging of heat sink cooling duct. • Check H-HWM P.C. board (IPDU) trouble.
A15	—	—	Indoor unit (H-HWM)	IGBT short-circuit protection trouble	Stop of corresponding unit	Instant over-current was detected when compressor started operation.	• Check connection of cabling connector on H-HWM P.C. board (IPDU). • Check compressor trouble and layer short circuit. • Check H-HWM P.C. board (IPDU) trouble.
A16	—	—	Indoor unit (H-HWM)	Current detection circuit system trouble	Stop of corresponding unit	While inverter compressor stopped, the status that current flowed more than the specified amount was detected	• Check H-HWM P.C. board (IPDU) trouble.
A17	—	—	Indoor unit (H-HWM)	Compressor trouble (lock)	Stop of corresponding unit	Over-current was detected a few seconds after inverter compressor had started.	• Check compressor trouble • Check power voltage. (AC220V - 10% to 240V + 10%). • Check cable of compressor system and phase-missing. • Check connector/terminal connection on H-HWM P.C. board (IPDU). • Check H-HWM P.C. board (IPDU) trouble.
A18	—	—	Indoor unit (H-HWM)	Compressor breakdown	Stop of corresponding unit	Inverter current detection circuit detected over-current and stopped.	• Check power voltage (AC220V - 10% to 240V + 10%). • Check compressor trouble. • Check cause of abnormal overload operation. • Check H-HWM P.C. board (IPDU) trouble.
A19	—	—	Indoor unit (H-HWM)	Compressor position detection circuit system trouble	Stop of corresponding unit	Position detection is not going on normally.	• Check connection of cabling connector • Check compressor trouble and layer short circuit. • Check H-HWM P.C. board (IPDU) trouble.
A21	—	—	Indoor unit (H-HWM)	Inverter DC voltage (Vdc) trouble (compressor)	Stop of corresponding unit	Inverter DC voltage is too high (overvoltage) or too low (undervoltage).	• Check H-HWM P.C. board (IPDU) trouble.
A22	—	—	Indoor unit (H-HWM)	Compressor case thermostat operation	Stop of corresponding unit	Compressor case thermostat performed protective operation due to overheating of compressor.	• Check TD sensor trouble • Check clogging of PMV 2. • Check clogging of cascade heat exchanger. • Check H-HWM P.C. board (IPDU) trouble. • Check refrigerant shortage (R134a)
A23	—	—	Indoor unit (H-HWM)	High-pressure SW system trouble	Stop of corresponding unit	High-pressure SW operated.	• Check PD pressure sensor trouble • Check clogging of PMV2. • Check clogging of water heat exchanger. • Check H-HWM P.C. board (IPDU) trouble. • Check refrigerant overcharge (R134a)
A24	—	—	Indoor unit (H-HWM)	TH sensor trouble	Stop of corresponding unit	Resistance value of sensor is infinite or zero (Open/Short circuit).	• Check H-HWM P.C. board (IPDU) trouble.
A25	—	—	Indoor unit (H-HWM)	Discharge temperature TD trouble	Stop of corresponding unit	Discharge temperature (TD) is higher than the specified value.	• Check clogging of PMV2. • Check characteristics of TD sensor resistance value. • Check refrigerant shortage (R134a).
A26	—	—	Indoor unit (H-HWM)	Gas leak detection (R134a)	Stop of corresponding unit	Discharge temperature (TD) and refrigerant superheat (SH) are highger than the specified value.	• Check refrigerant shortage (R134a). • Check clogging of PMV2. • Check characteristics of TD sensor resistance value.

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
A27	—	—	Indoor unit (H-HWM)	High-pressure protective operation	Stop of corresponding unit	PD sensor detect pressuere is higher than the specified value.	• Check PD pressure sensor trouble. • Check clogging of PMV 2. • Check clogging of heat exchangers. • Check H-HWM P.C. board (I/F) trouble. • Check refrigerant overcharge (R134a).
A28	—	—	Indoor unit (H-HWM)	H-HWM communication trouble between I/F and IPDU.	Stop of corresponding unit	Communication interrupted between H-HWM P.C. board (I/F) and H-HWM P.C. board (IPDU).	• Check H-HWM P.C. board (I/F) trouble. • Check H-HWM P.C. board (IPDU) trouble.
E01	—	—	Remote controller	Indoor-remote controller communication trouble (detected at remote controller end)	Stop of corresponding unit	Communication between indoor P.C. board and remote controller is disrupted.	• Check remote controller inter-unit tie cable (A/B). • Check for broken wire or connector bad contact. • Check indoor power supply. • Check for trouble in indoor P.C. board. • Check remote controller address settings (when two remote controllers are in use). • Check remote controller P.C. board.
E02	—	—	Remote controller	Remote controller transmission trouble	Stop of corresponding unit	Signal cannot be transmitted from remote controller to indoor unit.	• Check internal transmission circuit of remote controller. --- Replace remote controller as necessary.
E03	—	—	Indoor unit	Indoor-remote controller communication trouble (detected at indoor end)	Stop of corresponding unit	There is no communication from remote controller	• Check remote controller wiring.
E04	—	—	Indoor unit	Indoor-outdoor communication circuit trouble (detected at indoor end)	Stop of corresponding unit	Indoor unit is not receiving signal from outdoor unit.	• Check order in which power was turned on for indoor and outdoor units. • Check indoor address setting. • Check indoor-outdoor wiring. • Check outdoor terminator resistor setting (SW30, Bit 2).
E06	E06	No. of indoor units from which signal is received normally	I/F	Signal lack of indoor unit	All stop	Indoor unit initially communicating normally fails to return signal for specified length of time.	• Check power supply to indoor unit. (Is power turned on?) • Check connection of indoor-outdoor communication cable. • Check connection of communication connectors on indoor P.C. board. • Check connection of communication connectors on outdoor P.C. board. • Check for trouble in indoor P.C. board. • Check for trouble in outdoor P.C. board (I/F).
—	E07	—	I/F	Indoor-outdoor communication circuit trouble (detected at outdoor end)	All stop	Signal cannot be transmitted from outdoor to indoor units for 30 seconds continuously.	• Check outdoor terminator resistor setting (SW30, Bit 2). • Check connection of indoor-outdoor communication circuit.
E08	E08	Duplicated indoor address	Indoor unit I/F	Duplicated indoor address	All stop	More than one indoor unit are assigned same address.	• Check indoor addresses. • Check for any change made to remote controller connection (group/ individual) since indoor address setting.
E09	—	—	Remote controller	Duplicated master remote controller	Stop of corresponding unit	In two remote controller configuration both controllers are set up as master. (Header indoor unit is shut down with alarm, while follower indoor units continue operating.)	• Check remote controller settings. • Check remote controller P.C. boards.

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
E17	—	—	Indoor unit	Indoor units(s) -FS unit(s) communication trouble	Stop of corresponding unit (s)	There is no communication from FS unit (s)	• Check order in which power was turned on. • Check indoor unit(s)-FS unit (s) cable
E18	—	—	Indoor unit	Trouble in communication between indoor header and follower units	Stop of corresponding unit	Periodic communication between indoor header and follower units cannot be maintained.	• Check remote controller wiring. • Check indoor power supply wiring. • Check P.C. boards of indoor units.
E19	E19	00: No header unit 02: Two or more header units	I/F	Trouble in number of outdoor header units	All stop	• There are more than one outdoor header units in one line. • There is no outdoor header unit in one line.	Outdoor header unit is outdoor unit to which indoor-outdoor wiring (U1,U2) is connected. • Check connection of indoor-outdoor communication line. • Check for trouble in outdoor P.C. board (I/F).
E20	E20	01: Connection of outdoor unit from other line 02: Connection of indoor unit from other line	I/F	Connection to other line found during automatic address setting	All stop	Equipment from other line is found to have been connected when indoor automatic address setting is in progress.	Disconnect inter-line wiring in accordance with automatic address setting method explained in “Address setting” section.
E23	E23	—	I/F	Outdooroutdoor communication transmission trouble	All stop	Signal cannot be transmitted to other outdoor units for at least 30 seconds continuously.	• Check power supply to outdoor units. (Is power turned on?) • Check connection of wiring between outdoor units for bad contact or broken wire. • Check communication connectors on outdoor P.C. boards. • Check for trouble in outdoor P.C. board (I/F). • Check termination resistance setting for communication between outdoor units.
E25	E25	—	I/F	Duplicated follower outdoor address	All stop	There is duplication in outdoor addresses set manually.	**Note:** **Do not set outdoor addresses manually.**
E26	E26	Address of outdoor unit from which signal is not received normally	I/F	Signal lack of outdoor unit	All stop	Outdoor unit initially communicating normally fails to return signal for specified length of time.	• Backup setting is being used for outdoor units. • Check power supply to outdoor unit. (Is power turned on?) • Check connection of wiring between outdoor units for bad contact or broken wire. • Check communication connectors on outdoor P.C. boards. • Check for trouble in outdoor P.C. board (I/F).
E28	E28	Detected outdoor unit No.	I/F	Outdoor follower unit trouble	All stop	Outdoor header unit receives check code from outdoor follower unit.	• Check check code displayed on outdoor follower unit. <Convenient functions> If SW04 is pressed and held for at least 1 second while [E28] is displayed on the 7- segment display of outdoor header unit, the fan of the outdoor unit that has been shut down due to a trouble comes on. If SW04 and SW05 are pressed simultaneously, the fans of normal outdoor units come on. To stop the fan or fans, press SW05 on its own.

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
E31	E31	<table><tr><td></td><td colspan="2">A3-IPDU</td><td colspan="2">Fan-IPDU</td></tr><tr><td></td><td>1</td><td>2</td><td>1</td><td>2</td></tr><tr><td>01</td><td>O</td><td></td><td></td><td></td></tr><tr><td>02</td><td></td><td>O</td><td></td><td></td></tr><tr><td>03</td><td>O</td><td>O</td><td></td><td></td></tr><tr><td>08</td><td></td><td></td><td>O</td><td></td></tr><tr><td>09</td><td>O</td><td></td><td>O</td><td></td></tr><tr><td>0A</td><td></td><td>O</td><td>O</td><td></td></tr><tr><td>0B</td><td>O</td><td>O</td><td>O</td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td>O</td></tr><tr><td>11</td><td>O</td><td></td><td></td><td>O</td></tr><tr><td>12</td><td></td><td>O</td><td></td><td>O</td></tr><tr><td>13</td><td>O</td><td>O</td><td></td><td>O</td></tr><tr><td>18</td><td></td><td></td><td>O</td><td>O</td></tr><tr><td>19</td><td>O</td><td></td><td>O</td><td>O</td></tr><tr><td>1A</td><td></td><td>O</td><td>O</td><td>O</td></tr><tr><td>1B</td><td>O</td><td>O</td><td>O</td><td>O</td></tr></table>Circle (O): troubled IPDU	I/F	IPDU communication trouble	All stop	Communication is disrupted between IPDUs (P.C. boards) in inverter box.	• Check wiring and connectors involved in communication between IPDU-I/F P.C. board for bad contact or broken wire. • Check for trouble in outdoor P.C. board (I/F, A3-IPDU or Fan IPDU). • Check for external noise.
		80		Communication trouble between MCU and Sub MCU	All stop	Communication between MCU and Sub MCU stopped.	• Operation of power supply reset (OFF for 60 seconds or more) • Outdoor I/F PC board trouble check
F01	—	—	Indoor unit	Indoor TCJ sensor trouble	Stop of corresponding unit	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TCJ sensor connector and wiring. • Check resistance characteristics of TCJ sensor. • Check for trouble in indoor P.C. board.
F02	—	—	Indoor unit	Indoor TC2 sensor trouble	Stop of corresponding unit	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TC2 sensor connector and wiring. • Check resistance characteristics of TC2 sensor. • Check for trouble in indoor P.C. board.
F03	—	—	Indoor unit	Indoor TC1 sensor trouble	Stop of corresponding unit	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TC1 sensor connector and wiring. • Check resistance characteristics of TC1 sensor. • Check for trouble in indoor P.C. board.
F04	F04	—	I/F	TD1 sensor trouble	All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TD1 sensor connector. • Check resistance characteristics of TD1 sensor. • Check for trouble in outdoor P.C. board (I/F).
F05	F05	—	I/F	TD2 sensor trouble	All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TD2 sensor connector. • Check resistance characteristics of TD2 sensor. • Check for trouble in outdoor P.C. board (I/F).
F06	F06	01: TE1 sensor trouble 02: TE2 sensor trouble	I/F	TE1/TE2 sensor trouble	All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TE1/TE2 sensor connectors. • Check resistance characteristics of TE1/TE2 sensors. • Check for trouble in outdoor P.C. board (I/F).
F07	F07	01: TL1 sensor trouble	I/F	TL1 sensor trouble	All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TL1 sensor connector. • Check resistance characteristics of TL1 sensor. • Check for trouble in outdoor P.C. board (I/F).
F08	F08	—	I/F	TO sensor trouble	All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TO sensor connector. • Check resistance characteristics of TO sensor. • Check for trouble in outdoor P.C. board (I/F).
F10	—	—	Indoor unit	Indoor TA sensor trouble	Stop of corresponding unit	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TA sensor connector and wiring. • Check resistance characteristics of TA sensor. • Check for trouble in indoor P.C. board.

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
F12	F12	01: TS1 sersor trouble 02: TS2 sersor trouble	I/F	TS1/TS2 sensor trouble	All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TS1/TS2 sensor connector • Check resistance characteristics of TS1/TS2 sensor. • Check for trouble in indoor P.C. board.
F13	F13	01: TS1 sersor trouble 02: TS2 sersor trouble	IPDU	TH sensor trouble	All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Trouble in IPM built-in temperature sensor → Replace A3-IPDU P.C. board.
F15	F15	—	I/F	Outdoor temperature sensor wiring trouble (TE1, TL1)	All stop	During compressor operation in HEAT mode, TL1 continuously provides temperature reading higher than indicated by TL1 by at least specified margin for 3 minutes or more.	• Check installation of TE1 and TL1 sensors. • Check resistance characteristics of TE1 and TL1 sensors. • Check for outdoor P.C. board (I/F) trouble.
F16	F16	—	I/F	Outdoor pressure sensor wiring trouble (PD, PS)	All stop	Readings of high-pressure PD sensor and low-pressure PS sensor are switched. Output voltages of both sensors are zero.	• Check connection of high-pressure PD sensor connector. • Check connection of low-pressure PS sensor connector. • Check for defect in pressure sensors PD and PS. • Check for trouble in outdoor P.C. board (I/F). • Check for deficiency in compressive output of compressor.
F23	F23	—	I/F	PS sensor trouble	All stop	Output voltage of PS sensor is zero.	• Check for connection trouble involving PS sensor and PD sensor connectors. • Check connection of PS sensor connector. • Check for defect in PS sensor. • Check for deficiency in compressive output of compressor. • Check for trouble in 4-way valve. • Check for trouble in outdoor P.C. board (I/F). • Check for trouble in SV4 circuit.
F24	F24	—	I/F	PD sensor trouble	All stop	Output voltage of PD sensor is zero (sensor open-circuited). Pd > 4.15MPa despite compressor having been turned off.	• Check connection of PD sensor connector. • Check for trouble in PD sensor. • Check for trouble in outdoor P.C. board (I/F).
F29	—	—	Indoor unit	Other indoor trouble	Stop of corresponding unit	Indoor P.C. board does not operate normally.	• Check for trouble in indoor P.C. board (trouble EEPROM)
F31	F31	—	I/F	Outdoor EEPROM trouble	All stop *1	Outdoor P.C. board (I/F) does not operate normally.	• Check power supply voltage. • Check power supply noise. • Check for trouble in outdoor P.C. board (I/F).

*1 Total shutdown in case of header unit
Continued operation in case of follower unit

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
H01	H01	01: Compressor 1 side 02: Compressor 2 side	IPDU	Compressor breakdown	All stop	Inverter current detection circuit detects overcurrent and shuts system down.	• Check power supply voltage. (AC380-415V ± 10%). • Check for trouble in compressor. • Check for possible cause of abnormal overloading. • Check for trouble in outdoor P.C. board (A3-IPDU).
H02	H02	01: Compressor 1 side 02: Compressor 2 side	IPDU	Compressor trouble (lockup) MG-CTTtrouble	All stop	Overcurrent is detected several seconds after startup of inverter compressor.	• Check for trouble in compressor. • Check power supply voltage. (AC380-415V ± 10%). • Check compressor system wiring, particularly for open phase. • Check connection of connectors/ terminals on A3-IPDU P.C. board. • Check conductivity of case heater. (Check for refrigerant problem inside compressor.) • Check for trouble in outdoor P.C. board (A3-IPDU). • Check outdoor MG-CTT.
H03	H03	01: Compressor 1 side 02: Compressor 2 side	IPDU	Current detection circuit trouble	All stop	Current flow of at least specified magnitude is detected despite inverter compressor having been shut turned off.	• Check current detection circuit wiring. • Check trouble in outdoor P.C. board (A3-IPDU).
H05	H05	—	I/F	TD1 sensor miswiring (incomplete insertion)	All stop	Discharge temperature of compressor 1 (TD1) does not increase despite compressor being in operation.	• Check installation of TD1 sensor. • Check connection of TD1 sensor connector and wiring. • Check resistance characteristics of TD1 sensor. • Check for trouble in outdoor P.C. board (I/F).
H06	H06	—	I/F	Activation of low-pressure protection	All stop	Low-pressure PS sensor detects operating pressure lower than 0.02MPa.	• Check service valves to confirm full opening (both gas and liquid sides). • Check outdoor PMVs for clogging (PMV1). • Check for trouble in SV2 or SV4 circuits. • Check for trouble in low pressure PS sensor. • Check indoor filter for clogging. • Check valve opening status of indoor PMV. • Check refrigerant piping for clogging. • Check operation of outdoor fan (during heating). • Check for insufficiency in refrigerant quantity.
H07	H07	—	I/F	Low oil level protection	All stop	Operating compressor detects continuous state of low oil level for about 2 hours.	<All outdoor units in corresponding line to be checked> • Check balance pipe service valve to confirm full opening. • Check connection and installation of TK1, TK2, TK4, and TK5 sensors. • Check resistance characteristics of TK1, TK2, TK4, and TK5 sensors. • Check for gas or oil leak in same line. • Check for refrigerant problem inside compressor casing. • Check SV3A, SV3B, SV3C, SV3D valves for trouble. • Check oil return circuit of oil separator for clogging. • Check oil equalizing circuit for clogging.

MG-CTT: Magnet contactor

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
H08	H08	01: TK1 sensor trouble 02: TK2 sensor trouble 04: TK4 sensor trouble 05: TK5 sensor trouble	I/F	Trouble in temperature sensor for oil level detection	All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TK1 sensor connector. • Check resistance characteristics of TK1 sensor. • Check for trouble in outdoor P.C. board (I/F).
					All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TK2 sensor connector. • Check resistance characteristics of TK2 sensor. • Check for trouble in outdoor P.C. board (I/F).
					All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TK4 sensor connector. • Check resistance characteristics of TK4 sensor. • Check for trouble in outdoor P.C. board (I/F).
					All stop	Sensor resistance is infinity or zero (open/ short circuit).	• Check connection of TK5 sensor connector. • Check resistance characteristics of TK5 sensor. • Check for trouble in outdoor P.C. board (I/F).
H15	H15	—	I/F	TD2 sensor miswiring (incomplete insertion)	All stop	Discharge temperature of (TD2) does not increase despite compressor 2 being in operation.	• Check installation of TD2 sensor. • Check connection of TD2 sensor connector and wiring. • Check resistance characteristics of TD2 sensor. • Check for trouble in outdoor P.C. board (I/F).

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
H16	H16	01: TK1 oil circuit trouble 02: TK2 oil circuit trouble 04: TK4 oil circuit trouble 05: TK5 oil circuit trouble	I/F	Oil level detection circuit trouble	All stop	No temperature change is detected by TK1 despite compressor 1 having been started.	• Check for disconnection of TK1 sensor. • Check resistance characteristics of TK1 sensor. • Check for connection trouble involving TK1, TK2, TK4, and TK5 sensors • Check for clogging in oil equalizing circuit capillary and trouble operation in check valve. • Check for refrigerant entrapment inside compressor.
						No temperature change is detected by TK2 despite compressor 2 having been started.	• Check for disconnection of TK2 sensor. • Check resistance characteristics of TK2 sensor. • Check for connection trouble involving TK1, TK2, TK4, and TK5 sensors • Check for clogging in oil equalizing circuit capillary and trouble operation in check valve. • Check for refrigerant entrapment inside compressor.
						No temperature change is detected by TK4 despite compressor having been started.	• Check for disconnection of TK4 sensor. • Check resistance characteristics of TK4 sensor. • Check for connection trouble involving TK1, TK2, TK4, and TK5 sensors • Check for clogging in oil equalizing circuit capillary and trouble operation in check valve. • Check for refrigerant entrapment inside compressor.
						No temperature change is detected by TK5 despite compressor having been started.	• Check for disconnection of TK5 sensor. • Check resistance characteristics of TK5 sensor. • Check for connection trouble involving TK1, TK2, TK4, and TK5 sensors • Check for clogging in oil equalizing circuit capillary and trouble operation in check valve. • Check for refrigerant entrapment inside compressor.
J03	—	—	Indoor unit	Duplication of FS units	Stop of corresponding unit(s)	More than one FS units have been set up in one refrigirant line.	• Check indoor unit (s)-FS unit (s) cable
J10	J10	Detected indoor address	Indoor unit	FS unit overflow trouble	All stop	• Float switch operates • Float switch circuit is open-circuited or disconnected at connector.	• Check float switch connector • Check operation of drain pump. • Check drain pump circuit • Check drain pipe for clogging • Check for trouble indoor PC board.
J11	—	—	Indoor unit	FS unit Temperature sensor(TCS) trouble	Stop of corresponding unit(s)	Sensor resistance is infinity or zero(open/ short circuit)	• Check connection of TCS sensor connector • Check resistance characteristics of TCS sensor. • Check for trouble FS unit PC board.
L02	L02	—	Indoor unit	Outdoor units model disagreement trouble	All stop	In case of different outdoor unit	• Check outdoor unit model.
L03	—	—	Indoor unit	Duplicated indoor header unit	Stop of corresponding unit	There are more than one header units in group.	• Check indoor addresses. • Check for any change made to remote controller connection (group/individual) since indoor address setting.
L04	L04	—	I/F	Duplicated outdoor line address	All stop	There is duplication in line address setting for outdoor units belonging to different refrigerant piping systems.	• Check line addresses.

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
L05	—	—	I/F	Duplicated priority indoor unit (as displayed on priority indoor unit)	All stop	More than one indoor units have been set up as priority indoor unit.	• Check display on priority indoor unit.
L06	L06	No. of priority indoor units	I/F	Duplicated priority indoor unit (as displayed on indoor unit other than priority indoor unit)	All stop	More than one indoor units have been set up as priority indoor unit.	• Check displays on priority indoor unit and outdoor unit.
L07	—	—	Indoor unit	Connection of group control cable to stand alone indoor unit	Stop of corresponding unit	There is at least one stand alone indoor unit to which group control cable is connected.	• Check indoor addresses.
L08	L08	—	Indoor unit	Indoor group / addresses not set	Stop of corresponding unit	Address setting has not been performed for indoor units.	• Check indoor addresses. **Note:** **This code is displayed when power is turned on for the first time after installation.**
L09	—	—	Indoor unit	Indoor capacity not set	Stop of corresponding unit	Capacity setting has not been performed for indoor unit.	Set indoor capacity. (DN = 11)
L10	L10	—	I/F	Outdoor capacity not set	All stop	Jumper wire provided on P.C. board for servicing I/F P.C. board has not been removed as required for given model.	• Check model setting of P.C. board for servicing outdoor I/F P.C. board.
L12	L12	01:FS unit (s) installation trouble	I/F	FS unit (s) outside the application setting	All stop	Set up other than multi port type and single port type (Long piping model) FS unit (s) to 44HP or more system	• Check outdoor unit model name. • Check FS unit model name. • Check restricted installation of FS unit.
L17	L17	—	I/F	Incompatible combination of outdoor units	All stop	Old model outdoor unit (prior to 6 series) has been connected	• Check outdoor unit model.
L18	L18	Detected indoor address	FS unit	Cooling/heating selection unit trouble	Stop of corresponding unit	Cooling/heating cycle trouble resulting from piping trouble is detected	• Check Cooling/Heating FS unit. • Check set Cooling only setting.
L20	—	—	Indoor unit	Duplicated central control address	All stop	There is duplication in central control address setting.	• Check central control addresses.
L24	L24	01:Duplication of FS units address 02:Indoor units operation mode priority setting	I/F	FS unit(s) setting trouble	All stop	• Address setting has not been performed for FS units • Priority setting has not been performed for indoor units	• Check FS units addres. • Check indoor units operation mode priority setting. • Check outdoor unit 7-segment monitor.
L28	L28	—	I/F	Too many outdoor units connected	All stop	There are more than three outdoor units.	• Check No. of outdoor units connected (Only up to 3 units per system allowed). • Check communication lines between outdoor units. • Check for trouble in outdoor P.C. board (I/F).

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
L29	L29	<table><tr><td></td><td colspan="2">A3-IPDU</td><td colspan="2">Fan-IPDU</td></tr><tr><td></td><td>1</td><td>2</td><td>1</td><td>2</td></tr><tr><td>01</td><td>O</td><td></td><td></td><td></td></tr><tr><td>02</td><td></td><td>O</td><td></td><td></td></tr><tr><td>03</td><td>O</td><td>O</td><td></td><td></td></tr><tr><td>08</td><td></td><td></td><td>O</td><td></td></tr><tr><td>09</td><td>O</td><td></td><td>O</td><td></td></tr><tr><td>0A</td><td></td><td>O</td><td>O</td><td></td></tr><tr><td>0B</td><td>O</td><td>O</td><td>O</td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td>O</td></tr><tr><td>11</td><td>O</td><td></td><td></td><td>O</td></tr><tr><td>12</td><td></td><td>O</td><td></td><td>O</td></tr><tr><td>13</td><td>O</td><td>O</td><td></td><td>O</td></tr><tr><td>18</td><td></td><td></td><td>O</td><td>O</td></tr><tr><td>19</td><td>O</td><td></td><td>O</td><td>O</td></tr><tr><td>1A</td><td></td><td>O</td><td>O</td><td>O</td></tr><tr><td>1B</td><td>O</td><td>O</td><td>O</td><td>O</td></tr></table>Circle (O): Troubled IPDU	I/F	Trouble in No. of IPDUs	All stop	Insufficient number of IPDUs are detected when power is turned on.	• Check model setting of P.C. board for servicing outdoor I/F P.C. board. • Check connection of UART communication connector. • Check A3-IPDU, fan IPDU, and I/F P.C. board for trouble.
L30	L30	Detected indoor address	Indoor unit	External interlock of indoor unit	Stop of corresponding unit	• Signal is present at external trouble input terminal (CN80) for 1 minute.	**When external device is connected to CN80 connector:** 1) Check for trouble in external device. 2) Check for trouble in indoor P.C. board. **When external device is not connected to CN80 connector:** 1) Check for trouble in indoor P.C. board.
—	L31	—	I/F	Extended IC trouble	Continued operation	There is part failure in P.C. board (I/F).	• Check outdoor P.C. board (I/F).
P01	—	—	Indoor unit	Indoor fan motor trouble	Stop of corresponding unit		• Check the lock of fan motor (AC fan). • Check wiring.
P03	P03	—	I/F	Discharge temperature TD1 trouble	All stop	Discharge temperature (TD1) exceeds 115°C.	• Check outdoor service valves (gas side, liquid side) to confirm full opening. • Check outdoor PMVs (PMV1,4) for clogging. • Check resistance characteristics of TD1 sensor. • Check for insufficiency in refrigerant quantity. • Check for trouble in 4-way valve. • Check for leakage of SV4 circuit. • Check SV4 circuit (wiring or installation trouble in SV41 or SV42).

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
P04	P04	01: Compressor 1 side 02: Compressor 2 side	IPDU	Activation of high-pressure SW	All stop	High-pressure SW is activated.	• Check connection of high pressure SW connector. • Check for trouble in PD pressure sensor. • Check outdoor service valves (gas side, liquid side) to confirm full opening. • Check for trouble in outdoor fan. • Check for trouble in outdoor fan motor. • Check outdoor PMVs (PMV1, 4) for clogging. • Check indoor/outdoor heat exchangers for clogging. • Check for short-circuiting of outdoor suction/discharge air flows. • Check SV2 circuit for clogging. • Check for trouble in outdoor P.C. board (I/F). • Check for trouble in indoor fan system (possible cause of air flow reduction). • Check opening status of indoor PMV. • Check indoor-outdoor communication line for wiring trouble. • Check for trouble operation of check valve in discharge pipe convergent section. • Check gas balancing SV4 valve circuit. • Check SV5 valve circuit. • Check for refrigerant overcharging.
P05	P05	00:	I/F	Detection of open phase/phase sequence	All stop	• Open phase is detected when power is turned on. • Inverter DC voltage is too high (overvoltage) or too low (undervoltage).	• Check for trouble in outdoor P.C. board (I/F). • Check wiring of outdoor power supply.
		01: Compressor 1 side 02: Compressor 2 side		Inverter DC voltage (Vdc) trouble (compressor) MG-CTT trouble			
P07	P07	01: Compressor 1 side 02: Compressor 2 side	IPDU I/F	Heat sink overheating trouble	All stop	Temperature sensor built into IPM (TH) is overheated.	• Check power supply voltage. • Check outdoor fan system trouble. • Check heat sink cooling duct for clogging. • Check IPM and heat sink for thermal performance for trouble installation. (e.g. mounting screws and thermal conductivity) • Check for trouble in A3-IPDU. (trouble IPM built-in temperature sensor (TH))
P10	P10	Detected indoor address	Indoor unit	Indoor overflow trouble	All stop	• Float switch operates. • Float switch circuit is open-circuited or disconnected at connector.	• Check float switch connector. • Check operation of drain pump. • Check drain pump circuit. • Check drain pipe for clogging. • Check for trouble in indoor P.C. board.
P12	—	—	Indoor unit	Indoor fan motor trouble	Stop of corresponding unit	• Motor speed measurements continuously deviate from target value. • Overcurrent protection is activated.	• Check connection of fan connector and wiring. • Check for trouble in fan motor. • Check for trouble in indoor P.C. board. • Check impact of outside air treatment (OA).

MG-CTT: Magnet contactor

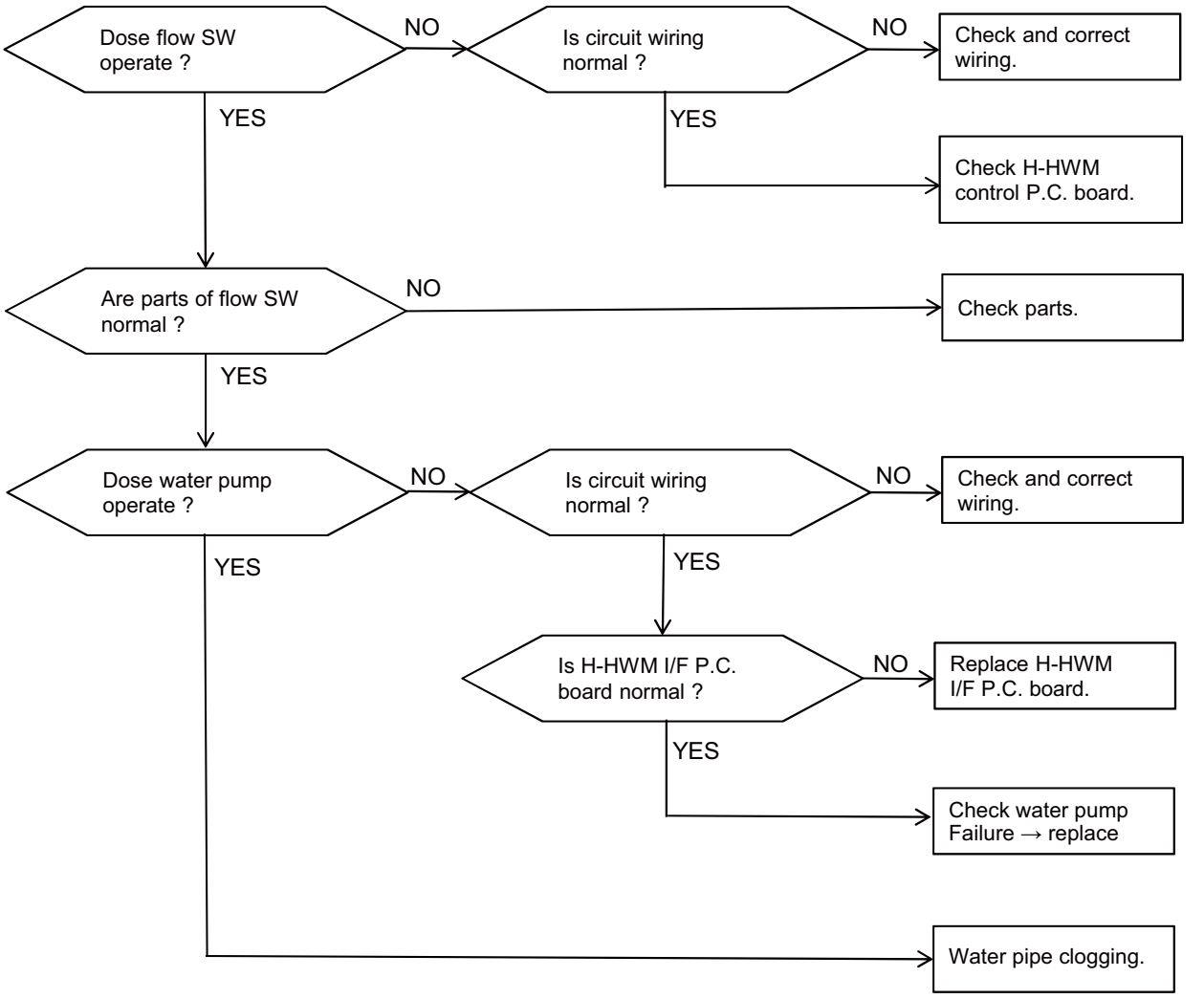
Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
P13	P13	—	I/F	Outdoor liquid backflow detection trouble	All stop	<During cooling operation> When system is in cooling operation, high pressure is detected in follower unit that has been turned off. <During heating operation> When system is in heating operation, outdoor PMV 1 continuously registers opening of 300p or less while under superheat control.	• Check full-close operation of outdoor PMV (1, 4). • Check for trouble in PD or PS sensor. • Check gas balancing circuit (SV2) for clogging. • Check balance pipe. • Check SV3B circuit for clogging. • Check trouble in outdoor P.C. board (I/F). • Check capillary of oil separator oil return circuit for clogging. • Check for leakage of check valve in discharge pipe convergent section.
P15	P15	01: TS condition	I/F	Gas leak detection (TS1 condition)	All stop	Protective shutdown due to sustained suction temperature at or above judgment criterion for at least 10 minutes is repeated four times or more. <TS trouble judgment criterion> In cooling operation: 60°C In heating operation: 40°C	• Check for insufficiency in refrigerant quantity. • Check outdoor service valves (gas side, liquid side) to confirm full opening. • Check PMVs (PMV1, 4) for clogging. • Check resistance characteristics of TS1 sensor. • Check for trouble in 4-way valve. • Check SV4 circuit for leakage
		02: TD condition	I/F	Gas leak detection (TD condition)	All stop	Protective shutdown due to sustained discharge temperature (TD1 or TD2) at or above 108 °C for at least 10 minutes is repeated four times or more.	• Check for insufficiency in refrigerant quantity. • Check PMVs (PMV 1, 4) for clogging. • Check resistance characteristics of TD1 and TD2 sensors. • Check indoor filter for clogging. • Check piping for clogging. • Check SV4 circuit (for leakage or coil installation trouble).
P17	P17	—	I/F	Discharge temperature TD2 trouble	All stop	Discharge temperature (TD2) exceeds 115°C.	• Check outdoor service valves (gas side, liquid side) to confirm full opening. • Check outdoor PMVs (PMV1, 4) for clogging. • Check resistance characteristics of TD2 sensor. • Check for trouble in 4-way valve. • Check SV4 circuit for leakage. • Check SV4 circuit (for wiring or installation trouble involving SV41 and SV42).
P19	P19	Detected outdoor unit No.	I/F	4-way valve reversing trouble	All stop	Abnormal refrigerating cycle data is collected during heating operation.	• Check for trouble in main body of 4-way valve. • Check for coil trouble in 4-way valve and loose connection of its connector. • Check resistance characteristics of TS1 and TE1,TE2 sensors. • Check output voltage characteristics of PD and PS pressure sensors. • Check for wiring trouble involving TE1 and TL1 sensors.

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
P20	P20	—	I/F	Activation of high-pressure protection	All stop	<During cooling operation> PD sensor detects pressure equal to or greater than 3.85 MPa. <During heating operation> PD sensor detects pressure equal to or greater than 3.6MPa.	• Check for trouble in PD pressure sensor. • Check service valves (gas side, liquid side) to confirm full opening. • Check for trouble in outdoor fan. • Check for trouble in outdoor fan motor. • Check outdoor PMV (PMV1, 4) for clogging. • Check indoor/outdoor heat exchangers for clogging. • Check for short-circuiting of outdoor suction/discharge air flows. • Check SV2 circuit for clogging. • Check for trouble in outdoor P.C. board (I/F). • Check for trouble in indoor fan system (possible cause of air flow reduction). • Check opening status of indoor PMV. • Check indoor-outdoor communication line for wiring trouble. • Check for trouble operation of check valve in discharge pipe convergent section. • Check gas balancing SV4 valve circuit. • Check SV5 valve circuit. • Check for refrigerant overcharging.
P22	P22	#0:Element short circuit	IPDU	Outdoor fan IPDU trouble * Put in Fan IPDU No. in [#] mark	All stop	(Sub code: #0) Fan IPDU over current protection circuit Flow of current equal to or greater than the specified value is detected during startup of the fan.	• Check fan motor. • Check for trouble in fan IPDU P.C. board
		#1:Position detection circuit trouble			All stop	(Sub code: #1) Fan IPDU position detection circuit Position detection is not going on normally.	• Check fan motor. • Check connection of fan motor connector. • Check for trouble in fan IPDU P.C. board.
		#3:Motor lock trouble			All stop	(Sub code: #3) Gusty wind, an obstruction, or another external factor Speed estimation is not going on normally.	• Check fan motor. • Check for trouble in fan IPDU P.C. board
		#4:Motor current trouble			All stop	(Sub code: #4) Fan IPDU over current protection circuit Flow of current equal to or greater than the specified value is detected during operation of the fan.	• Check fan motor. • Check connection of fan motor connector. • Check for trouble in fan IPDU P.C. board.
		#C:TH sensor temperature trouble			All stop	(Sub code: #C) Higher temperature than the specified value is detected during operation of the fan.	• Check fan motor. • Check for trouble in fan IPDU P.C. board
		#D:TH sensor short circuit/release trouble			All stop	(Sub code: #D) The resistance value of the sensor is infinite or zero (open or short circuit).	• Check for trouble in fan IPDU P.C. board.
		#E:Vdc voltage trouble			All stop	(Sub code: #E) Fan IPDU DC voltage protection circuit The DC voltage higher or lower than the specified value is detected.	• Check power voltage of the main power supply. • Check for trouble in fan IPDU P.C. board. • Check connection of fan IPDU P.C. board.

Check code			Location of detection	Description	System status	Check code detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
P26	P26	01: Compressor 1 side 02: Compressor 2 side	IPDU	IPM shortcircuit protection trouble	All stop	Overcurrent is momentarily detected during startup of compressor.	• Check connector connection and wiring on A3-IPDU P.C. board. • Check for trouble in compressor (layer shortcircuit). • Check for trouble in outdoor P.C. board (A3-IPDU).
P29	P29	01: Compressor 1 side 02: Compressor 2 side	IPDU	Compressor position detection circuit trouble	All stop	Position detection is not going on normally.	• Check wiring and connector connection. • Check for compressor layer short-circuit. • Check for trouble in A3-IPDU P.C. board.
P31	—	—	Indoor unit	Other indoor trouble (group follower unit trouble)	Stop of corresponding unit	There is trouble in other indoor unit in group, resulting in detection of E07/L07/L03/L08.	• Check indoor P.C. board.

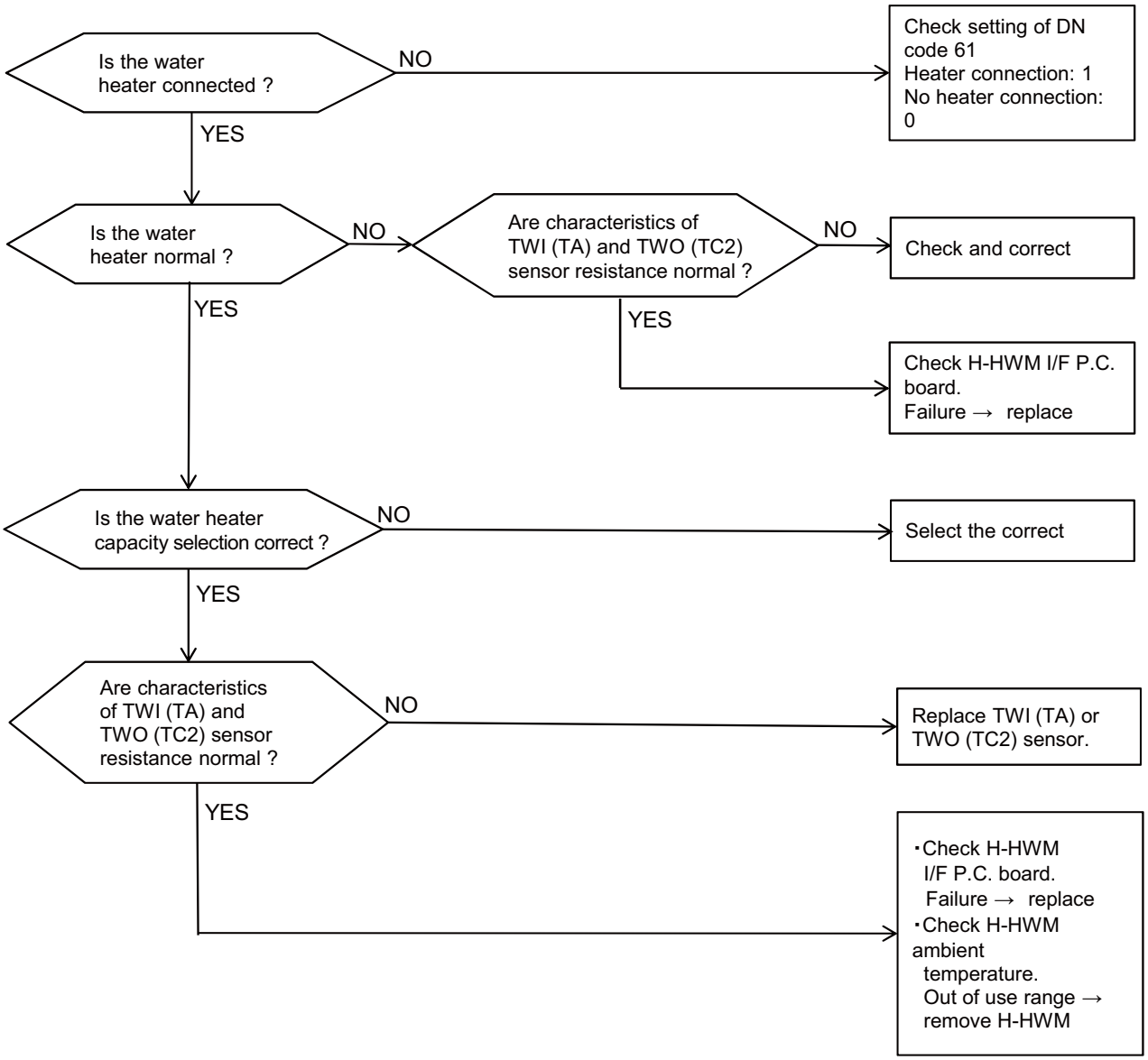
8-5. Diagnostic Procedure for Each Check Code (Hot water module)

Check code	Check code name	Cause
[A01]	Flow switch operation (H-HWM)	①Flow switch trouble ②Water pump trouble ③Clogging of water pipe ④H-HWM control P.C. board trouble ⑤H-HWM I/F P.C. board trouble

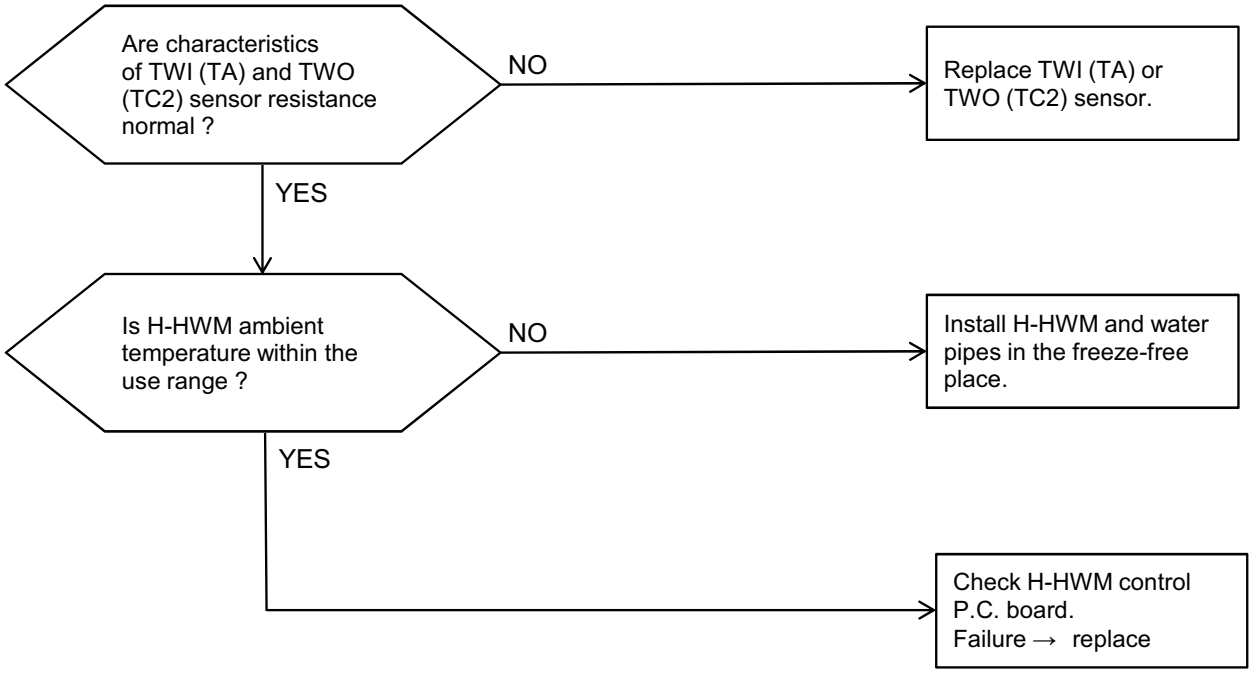


(Check there is no clogging in water pipe.)

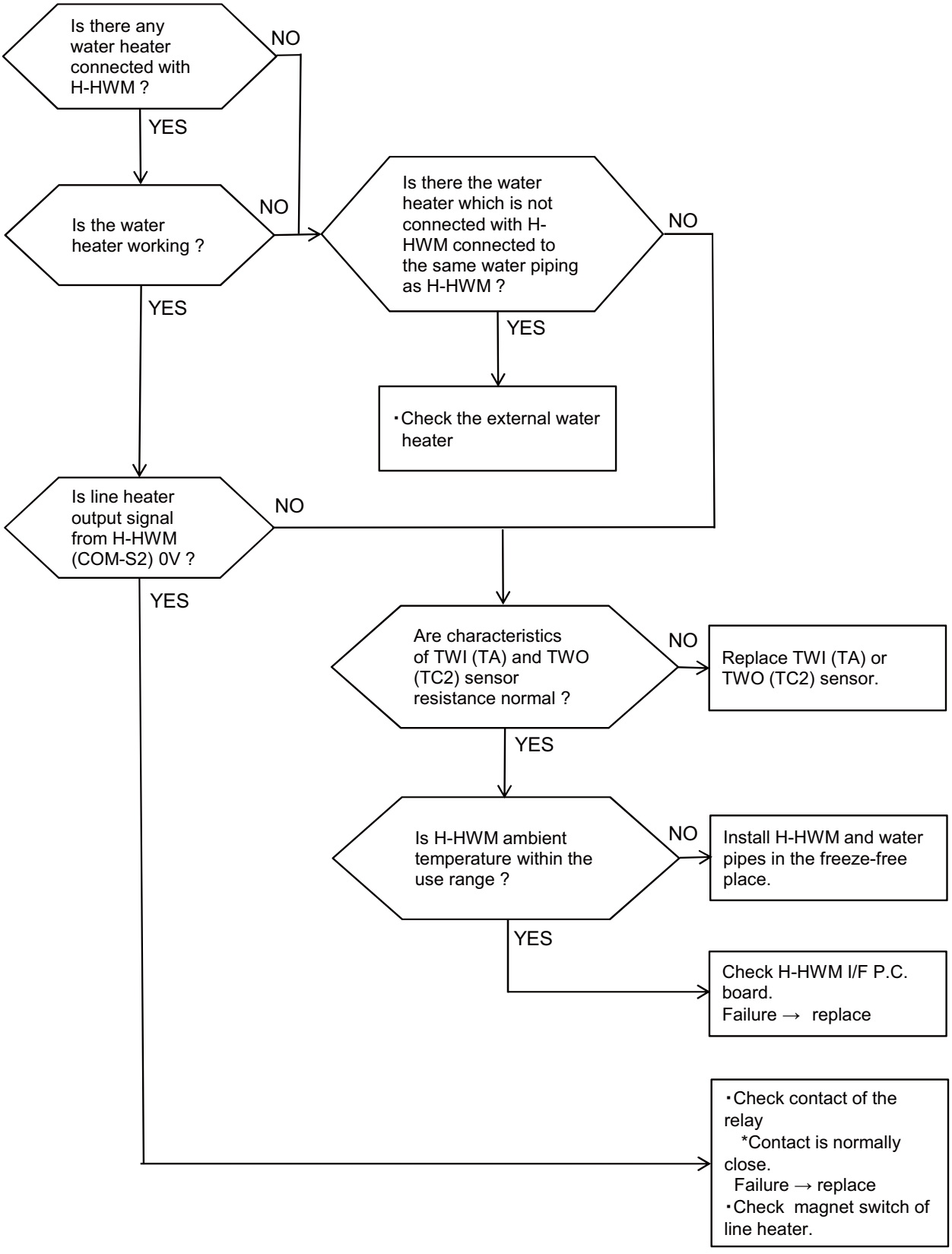
Check code	Check code name	Cause
[A02]	Water temperature decrease trouble (H-HWM)	①Water heater trouble ②H-HWM I/F P.C. board trouble ③TWI (TA) sensor trouble ④TWO (TC2) sensor trouble



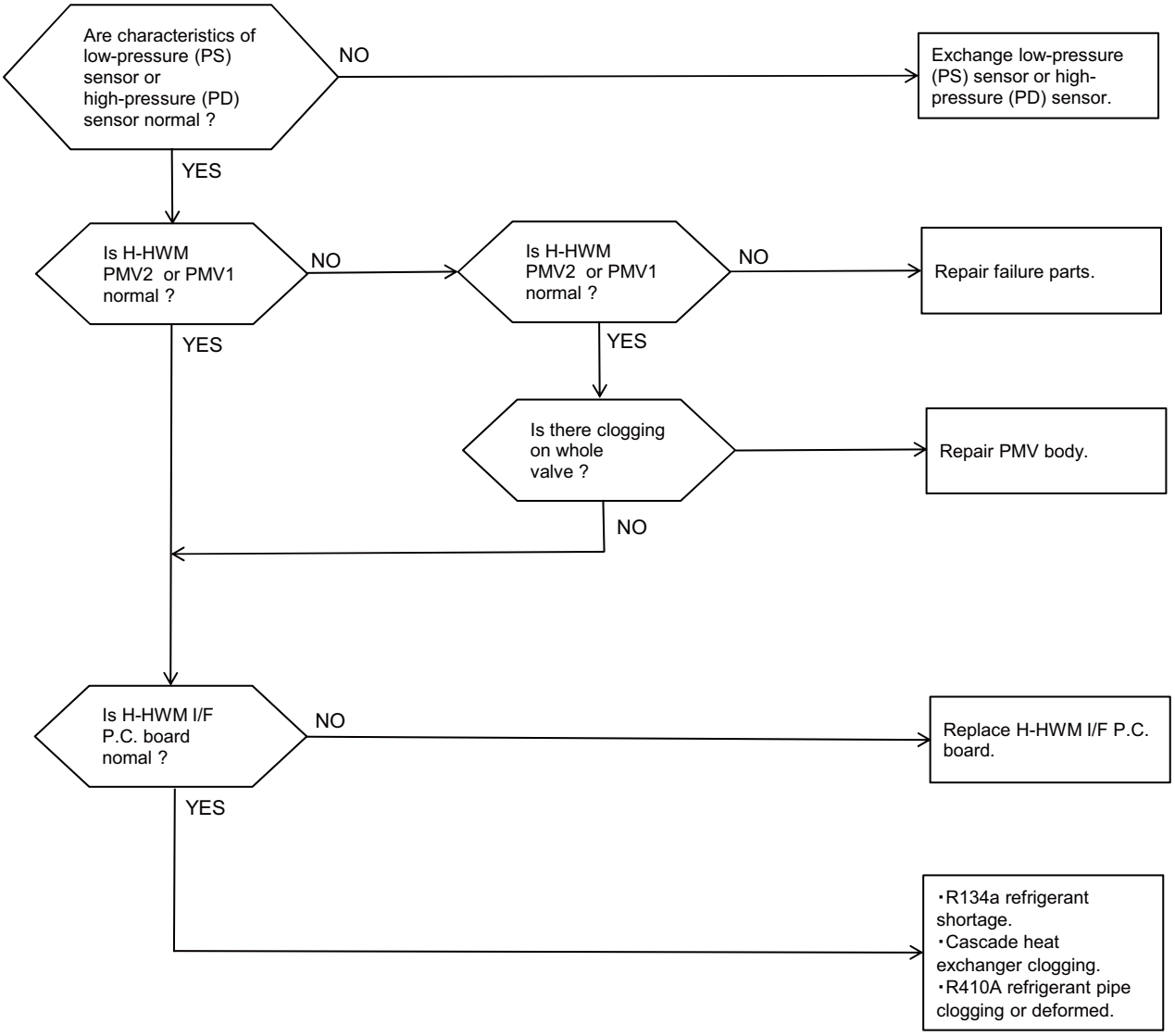
Check code	Check code name	Cause
[A04]	Activation of water heat exchanger frost protection (H-HWM)	①H-HWM ambient temperature decrease ②H-HWM control P.C. board trouble ③TWI (TA) sensor trouble ④TWO (TC2) sensor trouble



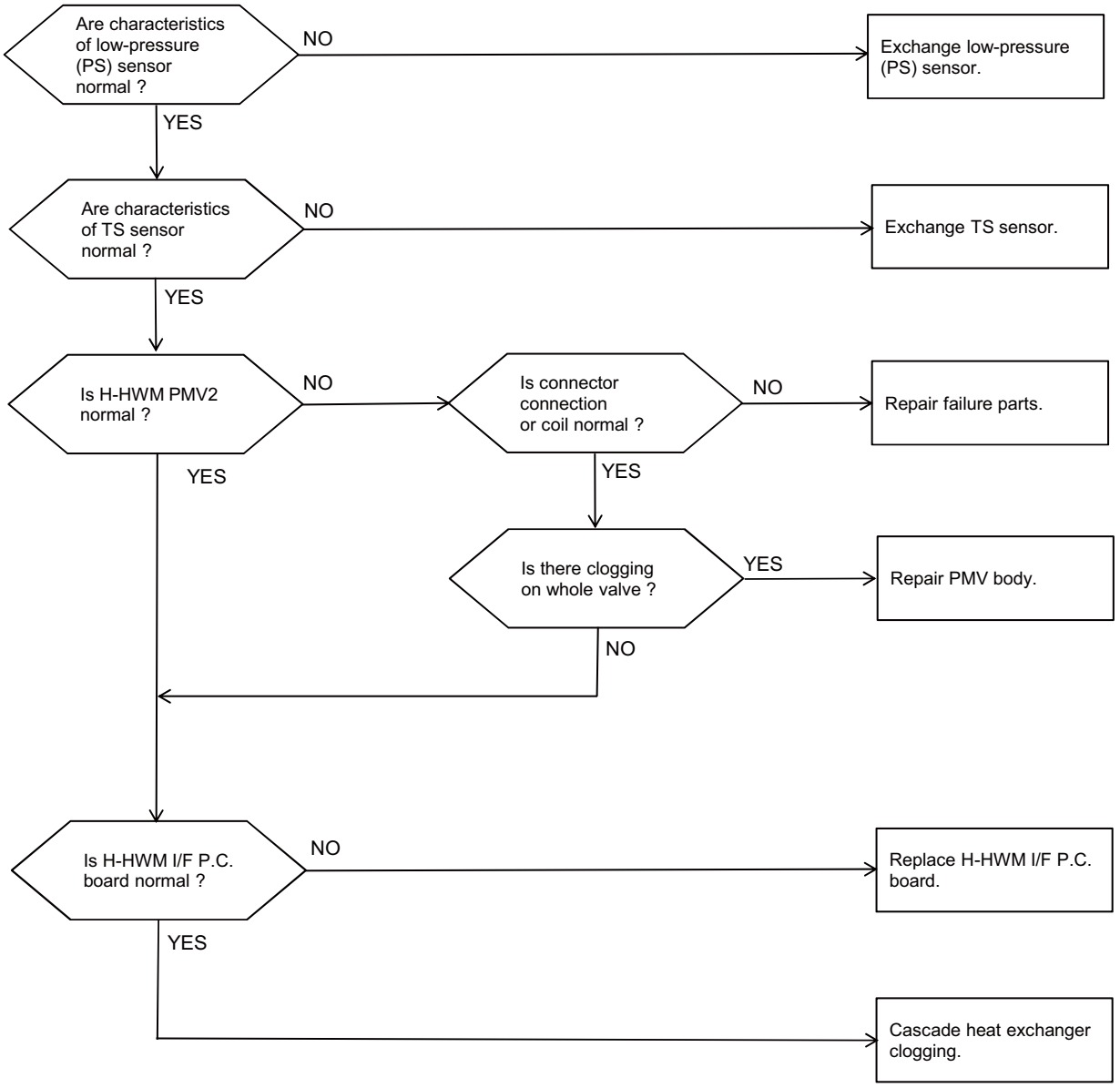
Check code	Check code name	Cause
[A05]	Activation of water High-temperature protection (H-HWM)	①External water heater trouble ②H-HWM control P.C. board trouble ③TWI (TA) sensor trouble ④TWO (TC2) sensor trouble



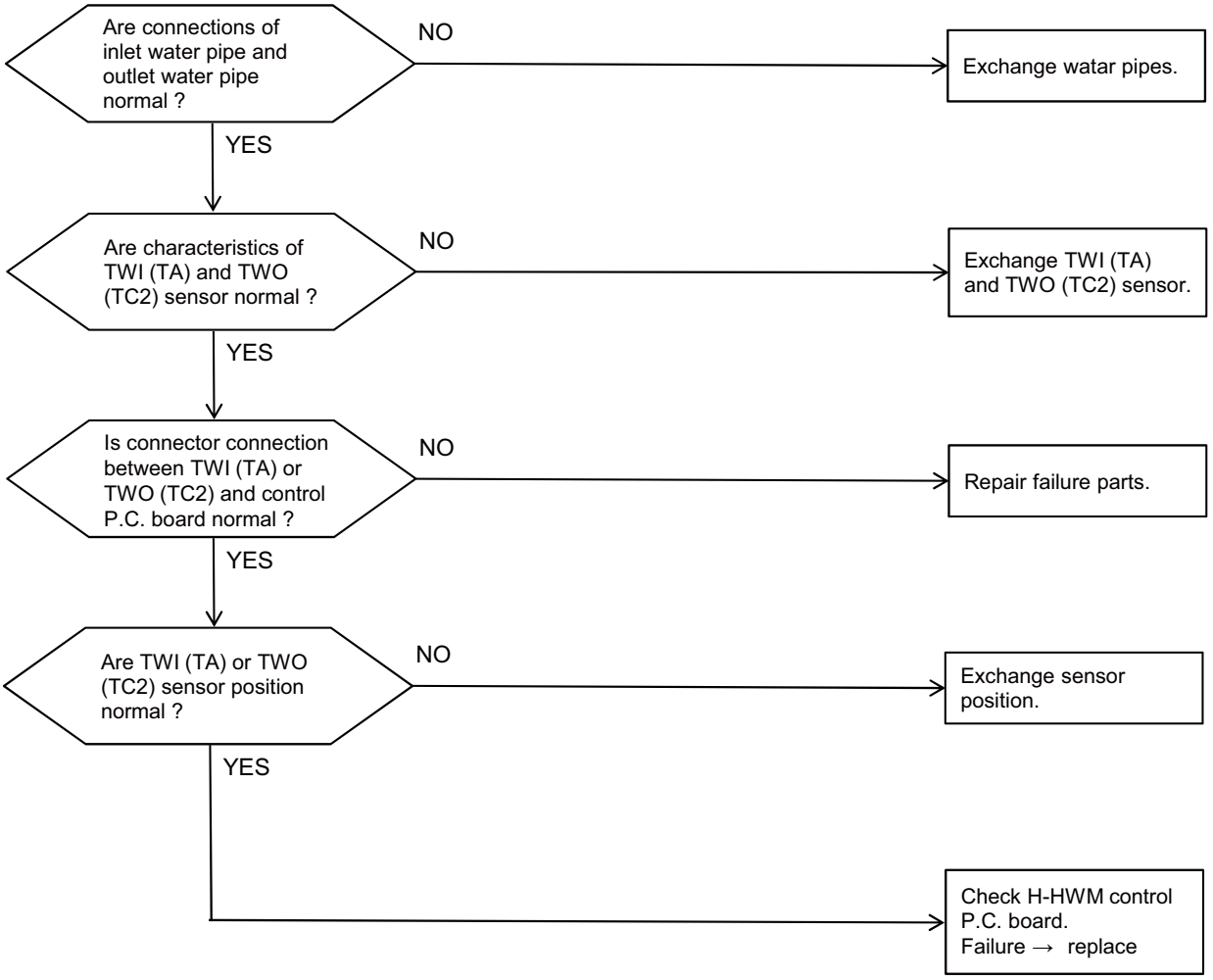
Check code	Check code name	Cause	
[A06]	Activation of low-pressure protection (H-HWM)	①H-HWM I/F P.C. board trouble ②H-HWM high-pressure (PD) sensor trouble ③H-HWM low-pressure (PS) sensor trouble ④R134a refrigerant shortage	⑤H-HWM PMV2 trouble ⑥H-HWM PMV1 trouble ⑦Cascade heat exchanger clogging ⑧R410A refrigerant pipe clogging or deformed



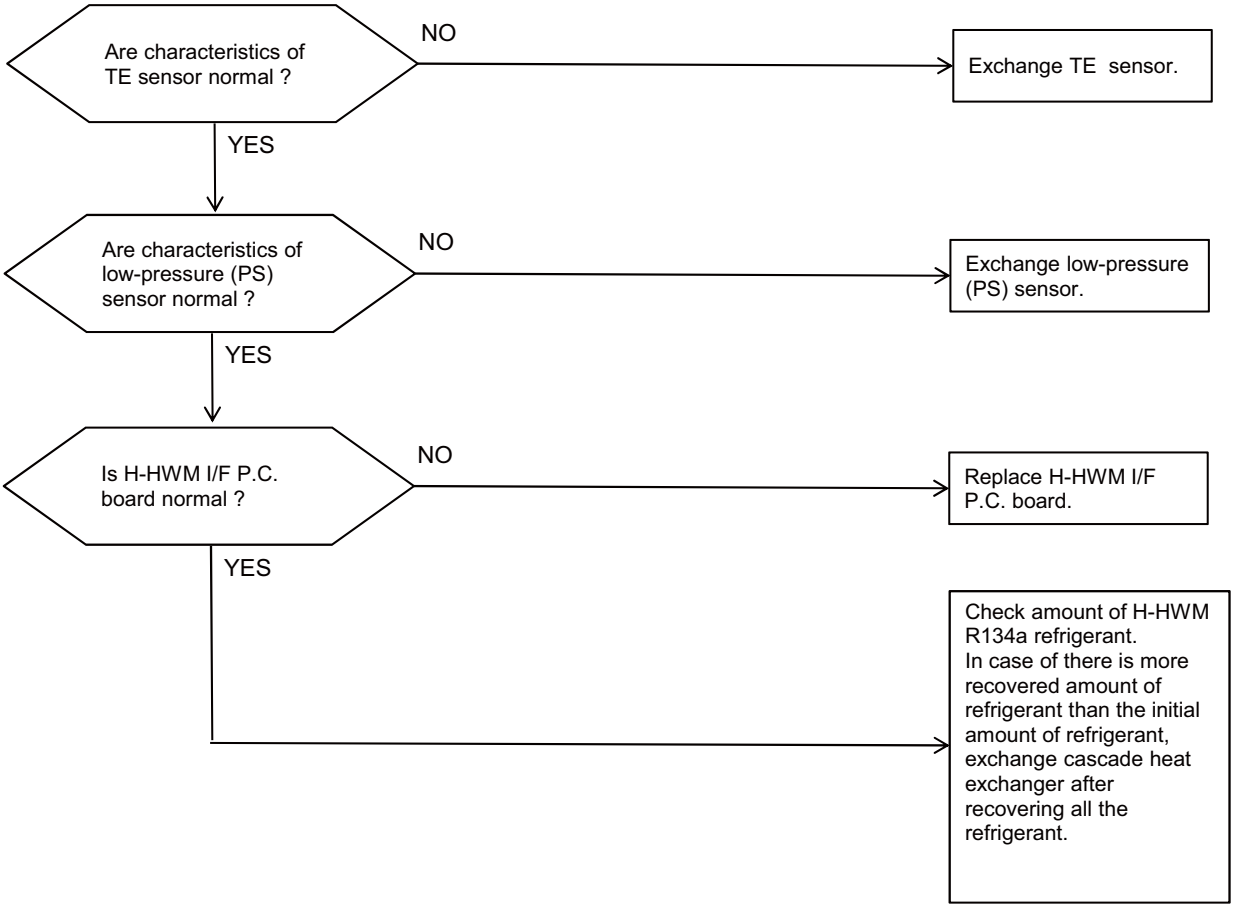
Check code	Check code name	Cause
[A07]	PMV2 trouble (H-HWM)	①H-HWM TS sensor trouble ②H-HWM low-pressure (PS) sensor trouble ③H-HWM PMV2 trouble ④H-HWM I/F P.C. board trouble ⑤Cascade heat exchanger clogging



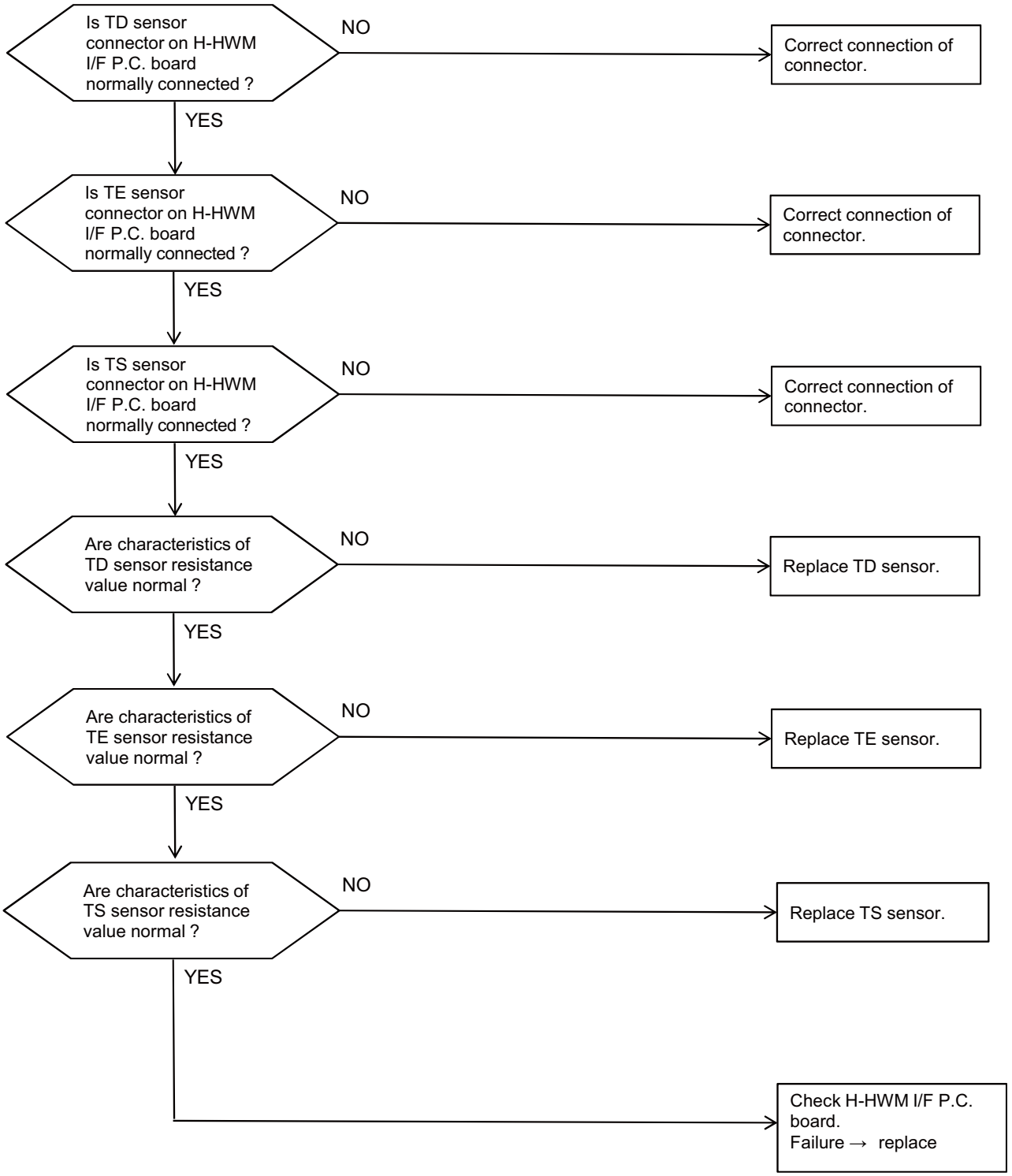
Check code	Check code name	Cause	
[A08]	Reversal of inlet water temperature and outlet water temperature (H-HWM)	①H-HWM TWI (TA) sensor trouble ②H-HWM TWO (TC2) sensor trouble ③H-HWM control P.C. board trouble ④Reversal of inlet water connection and outlet water connection	⑤H-HWM TWI sensor and TWO sensor are exchanged



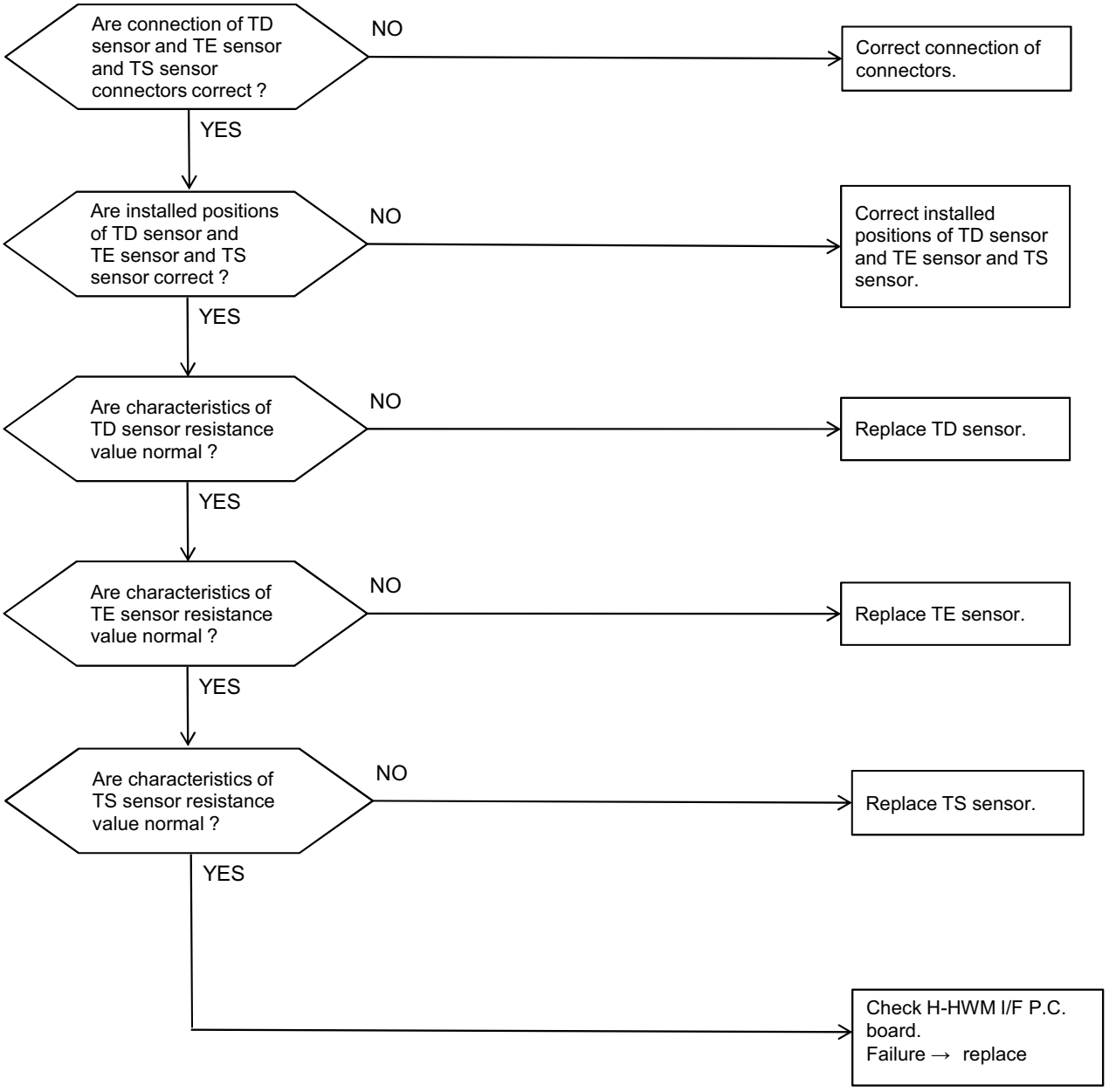
Check code	Check code name	Cause
[A09]	Mixed refrigerant (H-HWM)	①H-HWM TE sensor trouble ②H-HWM low-pressure (PS) sensor trouble ③H-HWM I/F P.C. board trouble ④Mixed refrigerant (R134a, R410A) ⑤H-HWM cascade heat exchanger trouble



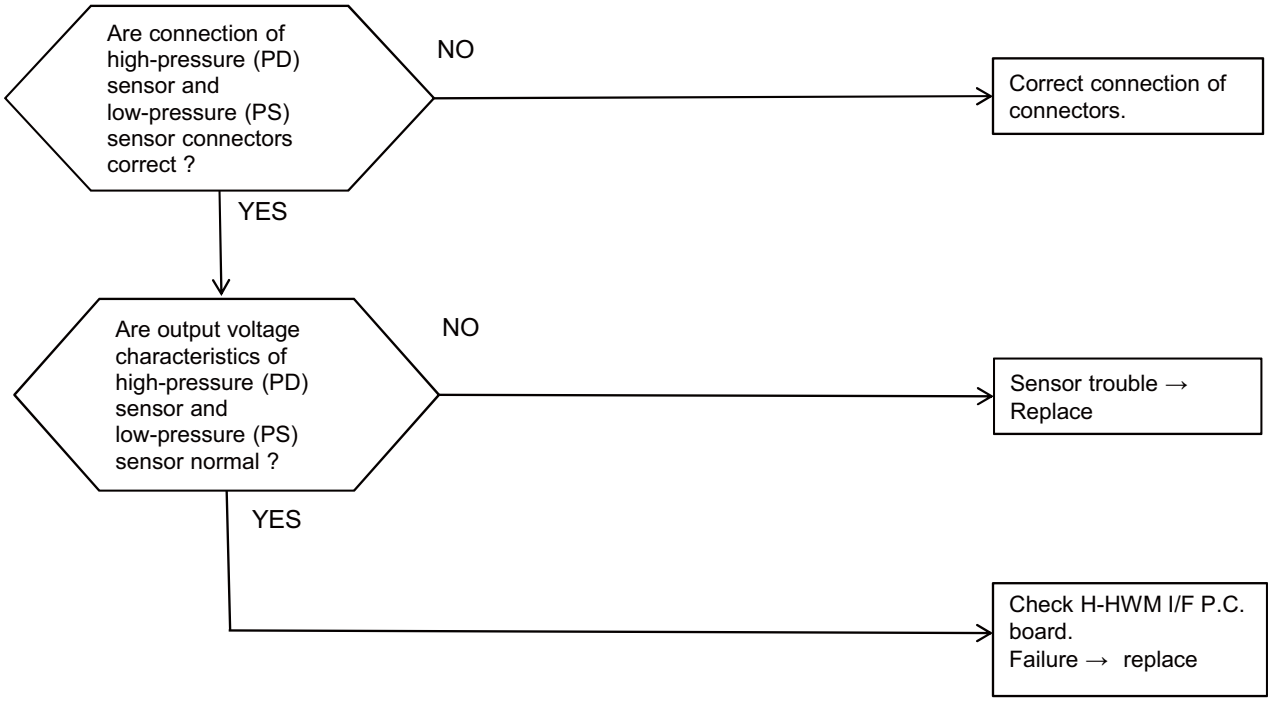
Check code	Check code name	Cause
[A10]	TD/TE/TS sensor trouble (H-HWM)	①H-HWM TD sensor trouble ②H-HWM TE sensor trouble ③H-HWM TS sensor trouble ④H-HWM I/F P.C. board trouble



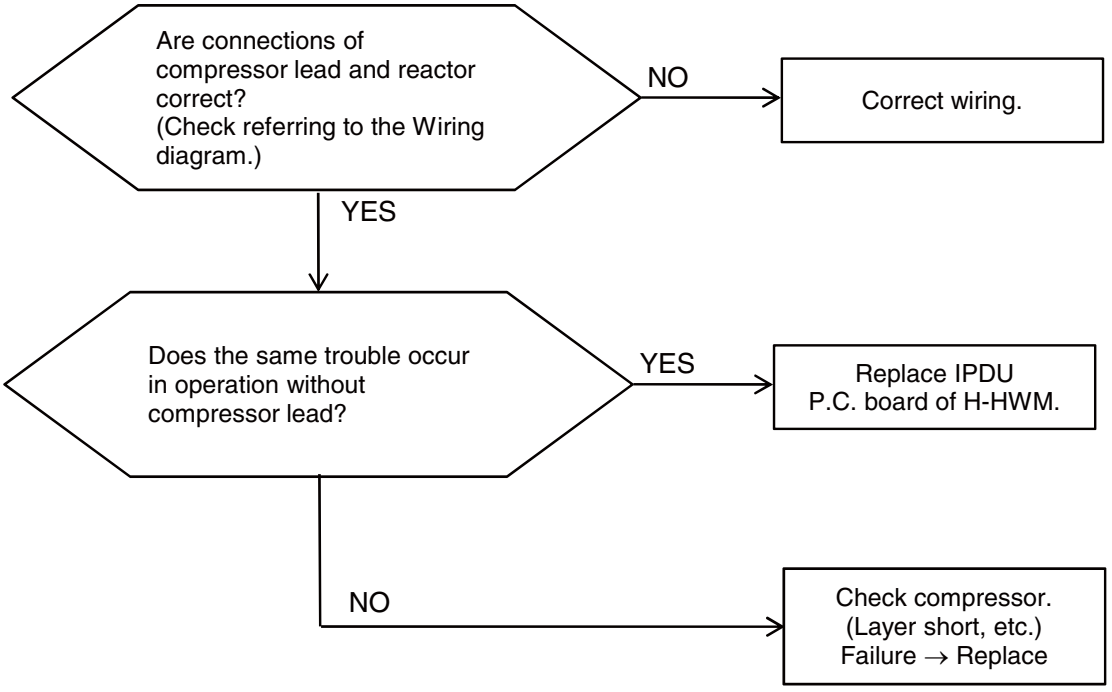
Check code	Check code name	Cause
[A11]	TD/TE/TS sensor miswiring (H-HWM)	①H-HWM I/F P.C. board trouble ②TD/TE/TS sensor miswiring



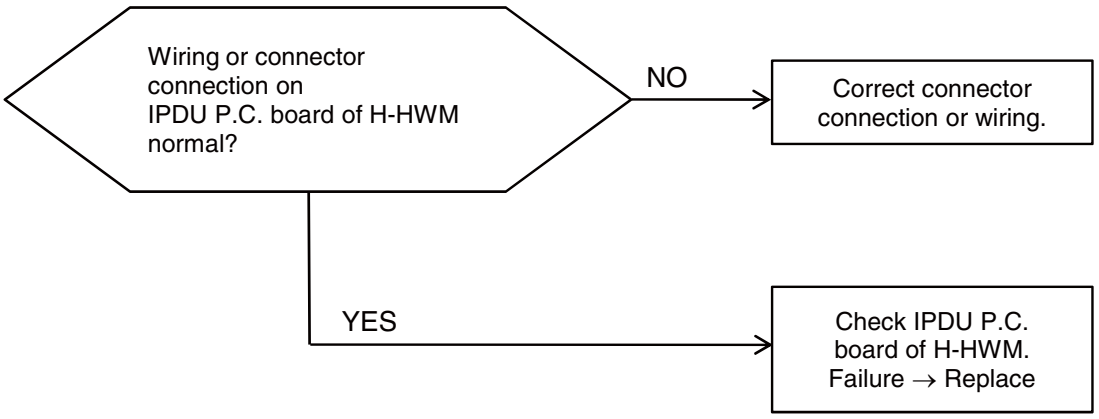
Check code	Check code name	Cause
[A12]	Pressure sensor trouble (PD, PS) (H-HWM)	①H-HWM I/F P.C. board trouble ②H-HWM high-pressure (PD) sensor trouble ③H-HWM low-pressure (PS) sensor trouble



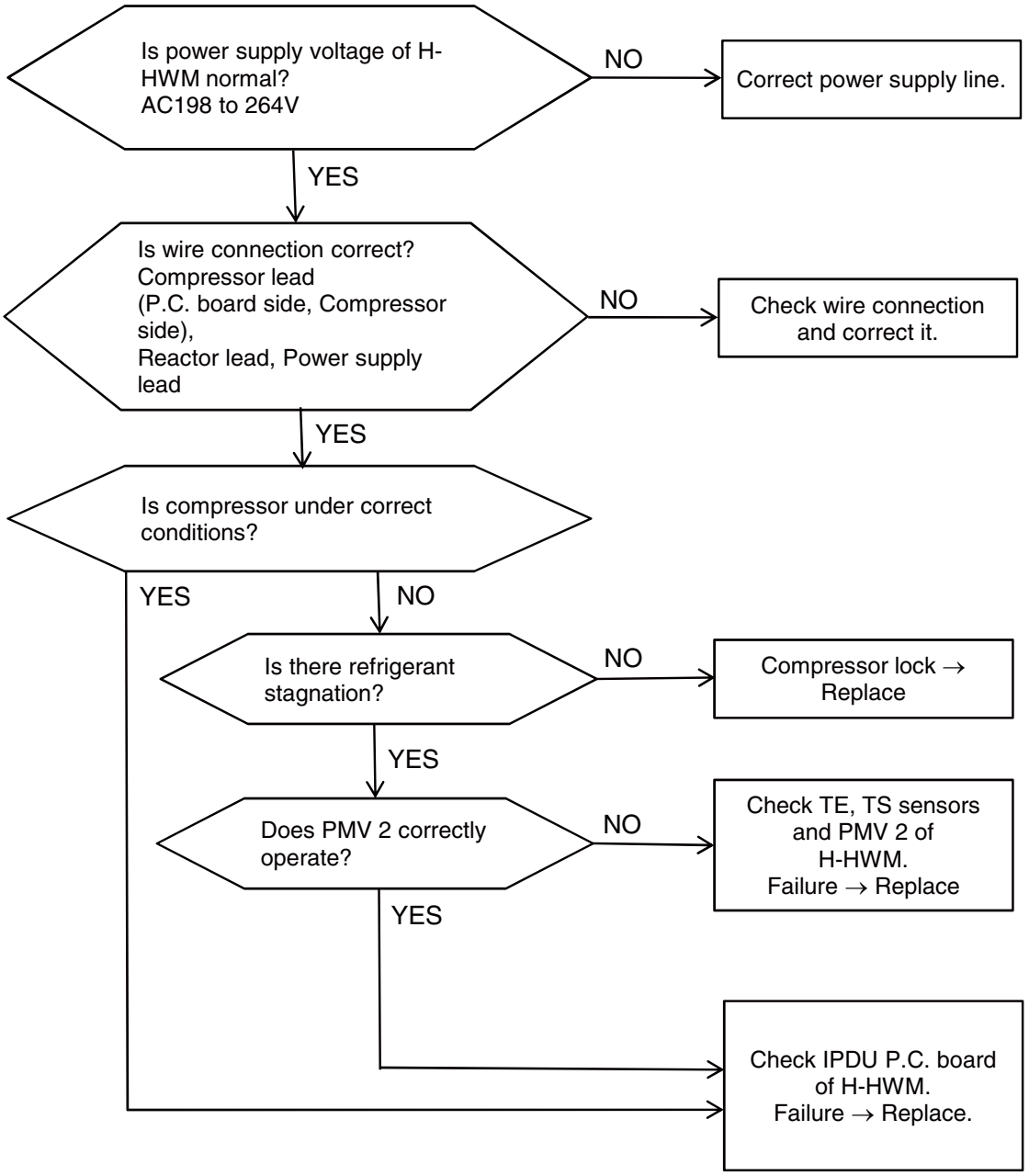
Check code	Check code name	Cause
[A15]	Short circuit protection trouble of compressor drive device (H-HWM)	1. IPDU trouble / Wire connection trouble of H-HWM 2. Compressor trouble 3. IPDU P.C. board trouble of H-HWM



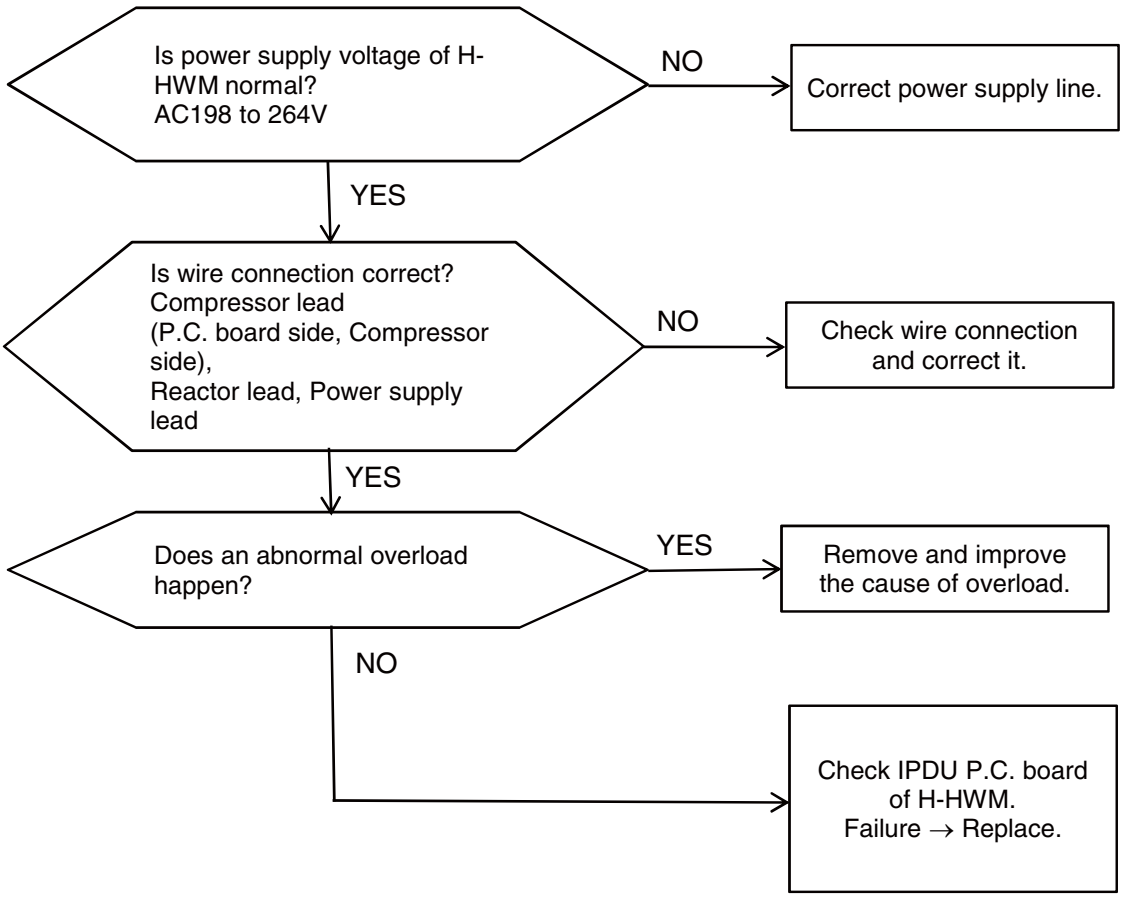
Check code	Check code name	Cause
[A16]	Current detective circuit system trouble (H-HWM)	1. Wiring or connector connection trouble on IPDU P.C. board of H-HWM 2. IPDU P.C. board trouble of H-HWM



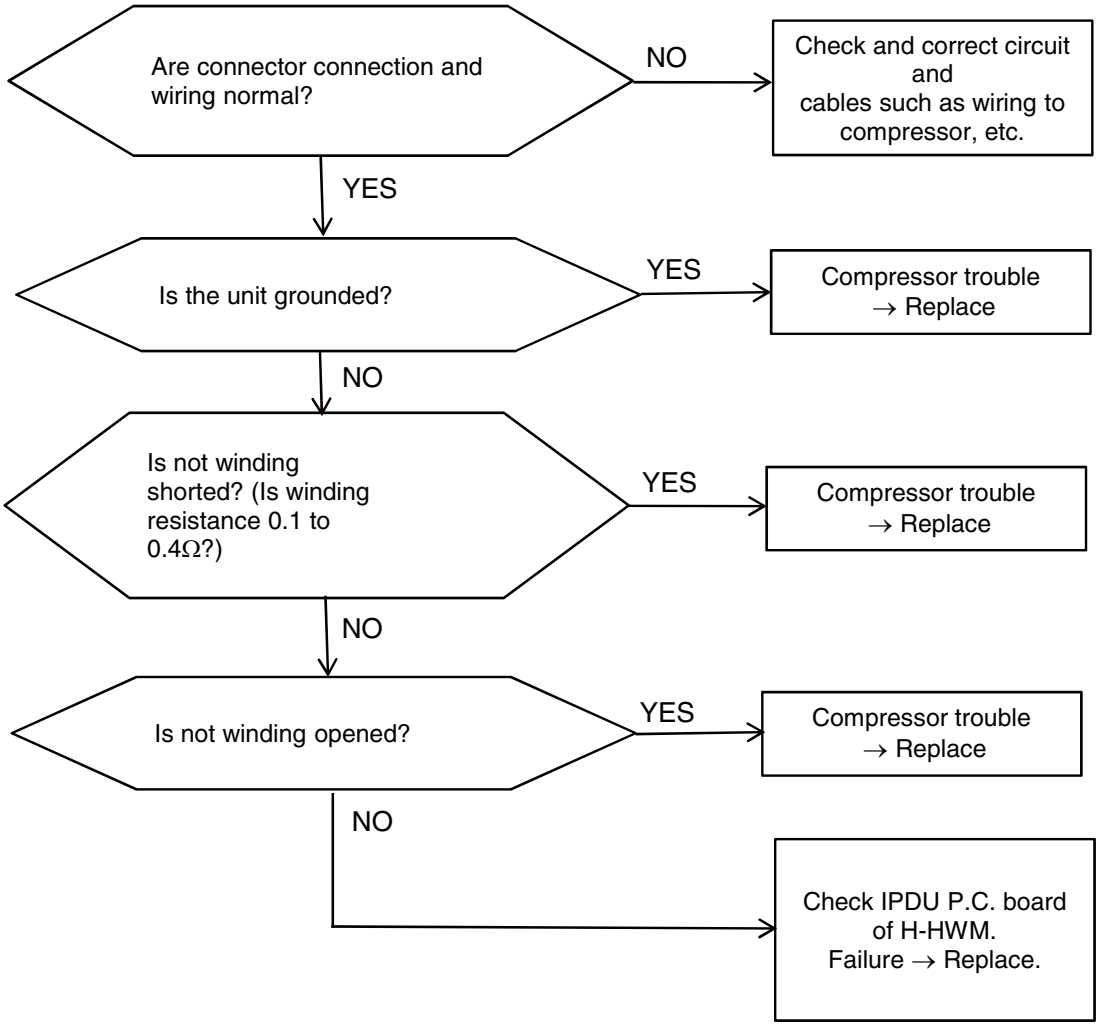
Check code	Check code name	Cause
[A17]	Compressor trouble (Lock) (H-HWM)	1. H-HWM power line trouble 2. Compressor circuit system trouble 3. Compressor trouble 4. Refrigerant stagnation in compressor shell 5. IPDU P.C. board trouble 6. TE, TS, PMV 2 trouble



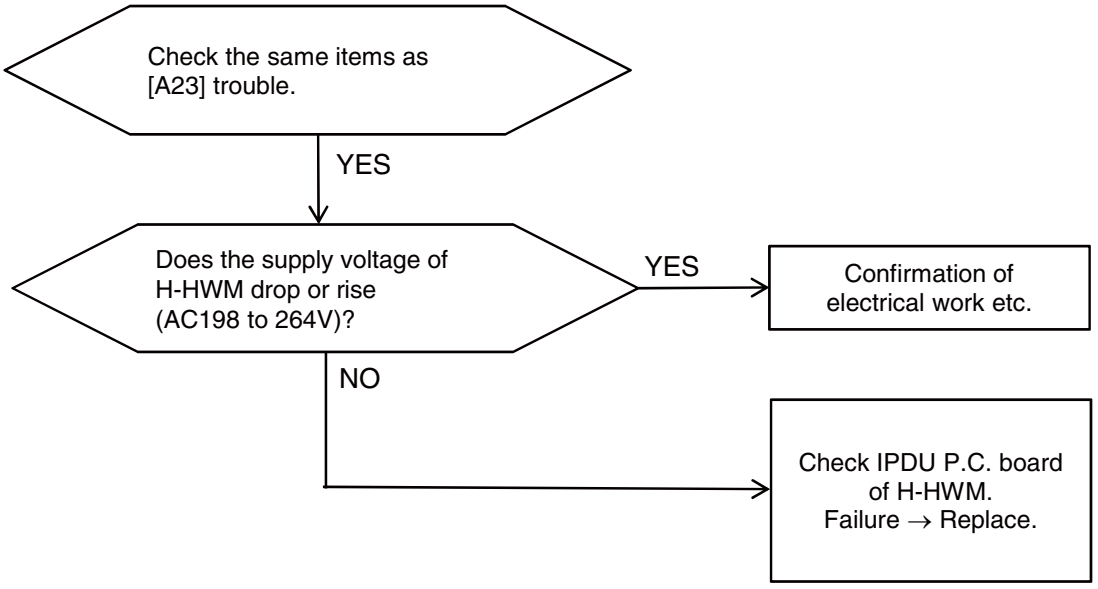
Check code	Check code name	Cause
[A18]	Compressor breakdown Conduction in rotor-stop has occurred (H-HWM)	1. H-HWM power line trouble 2. Compressor circuit system trouble 3. Compressor trouble 4. Abnormal overload in operation 5. IPDU P.C. board of H-HWM trouble



Check code	Check code name	Cause
[A19]	Compressor position detective circuit trouble (H-HWM)	1. Wire/connector connection trouble 2. Compressor trouble 3. IPDU P.C. board of H-HWM trouble

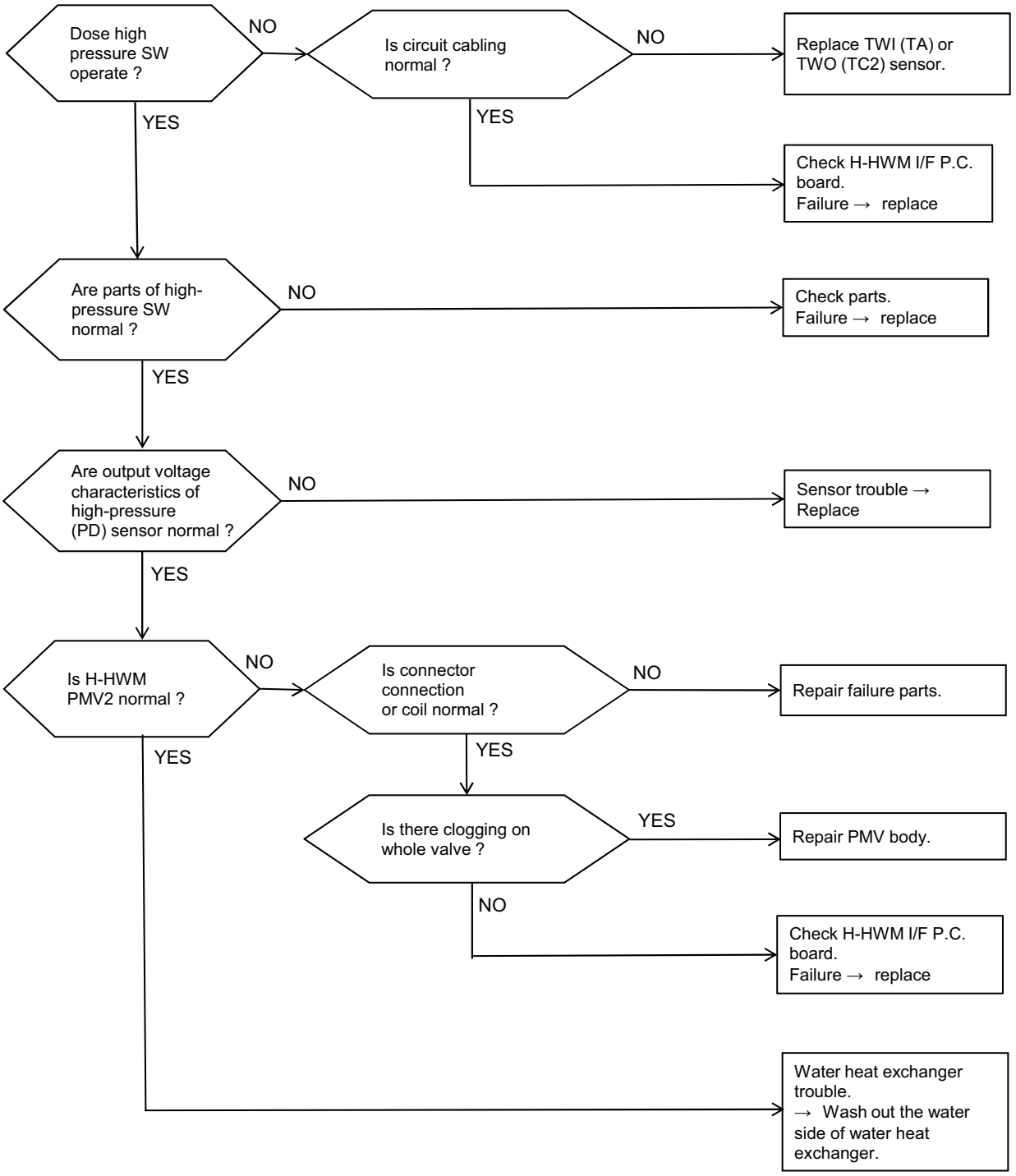


Check code	Check code name	Cause
[A21]	Power failure detected, abnormal inverter DC voltage (on compressor) (H-HWM)	Power failure of the power supply to H-HWM



Check code	Check code name	Cause
[A23]	High-pressure SW system trouble (H-HWM)	①PMV2 trouble ②H-HWM I/F P.C. board trouble ③H-HWM high-pressure (PD) sensor trouble ④Water heat exchanger trouble ⑤Water heat exchanger trouble

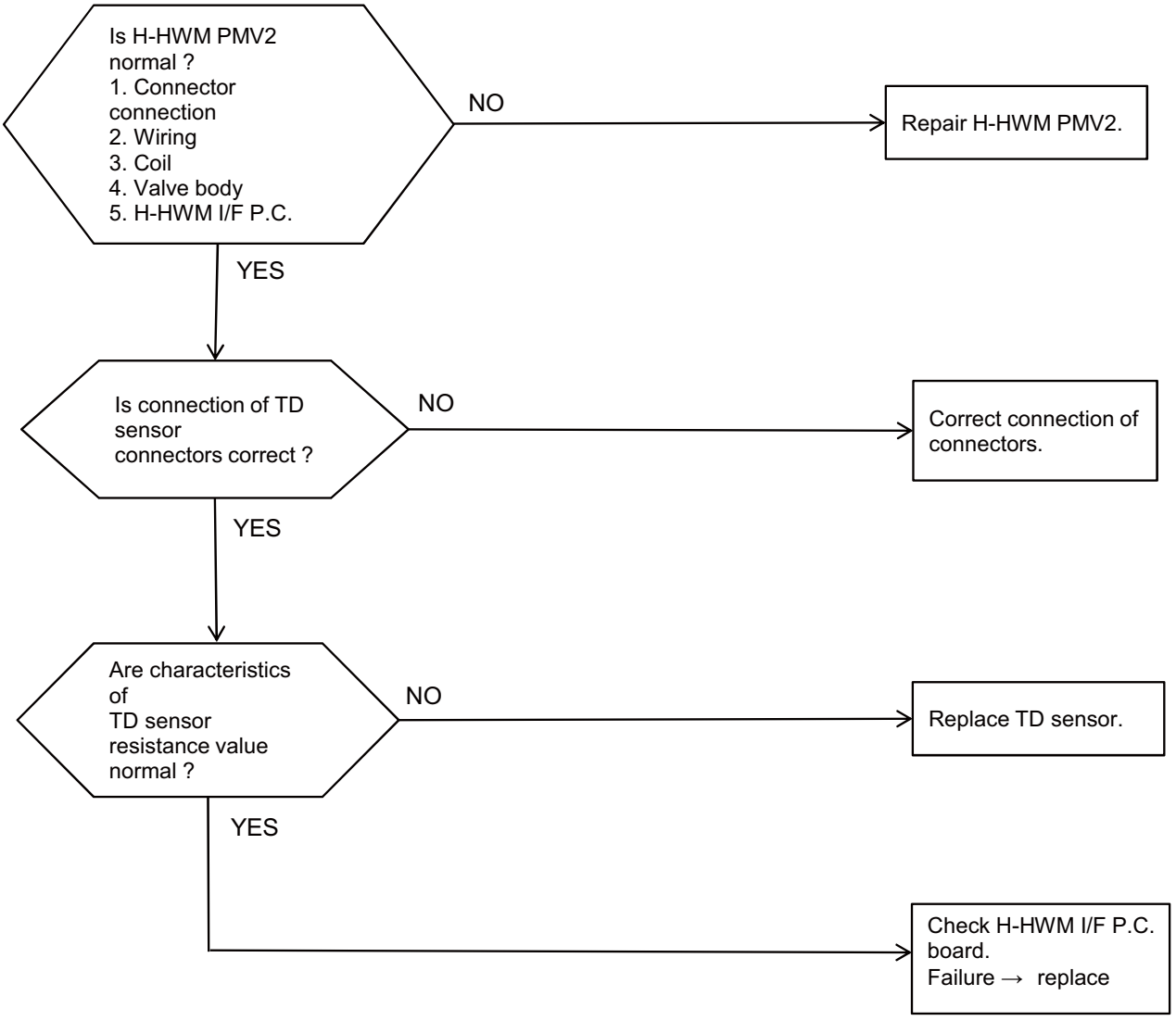
Note) High-pressure SW is normally closed.(B contact)



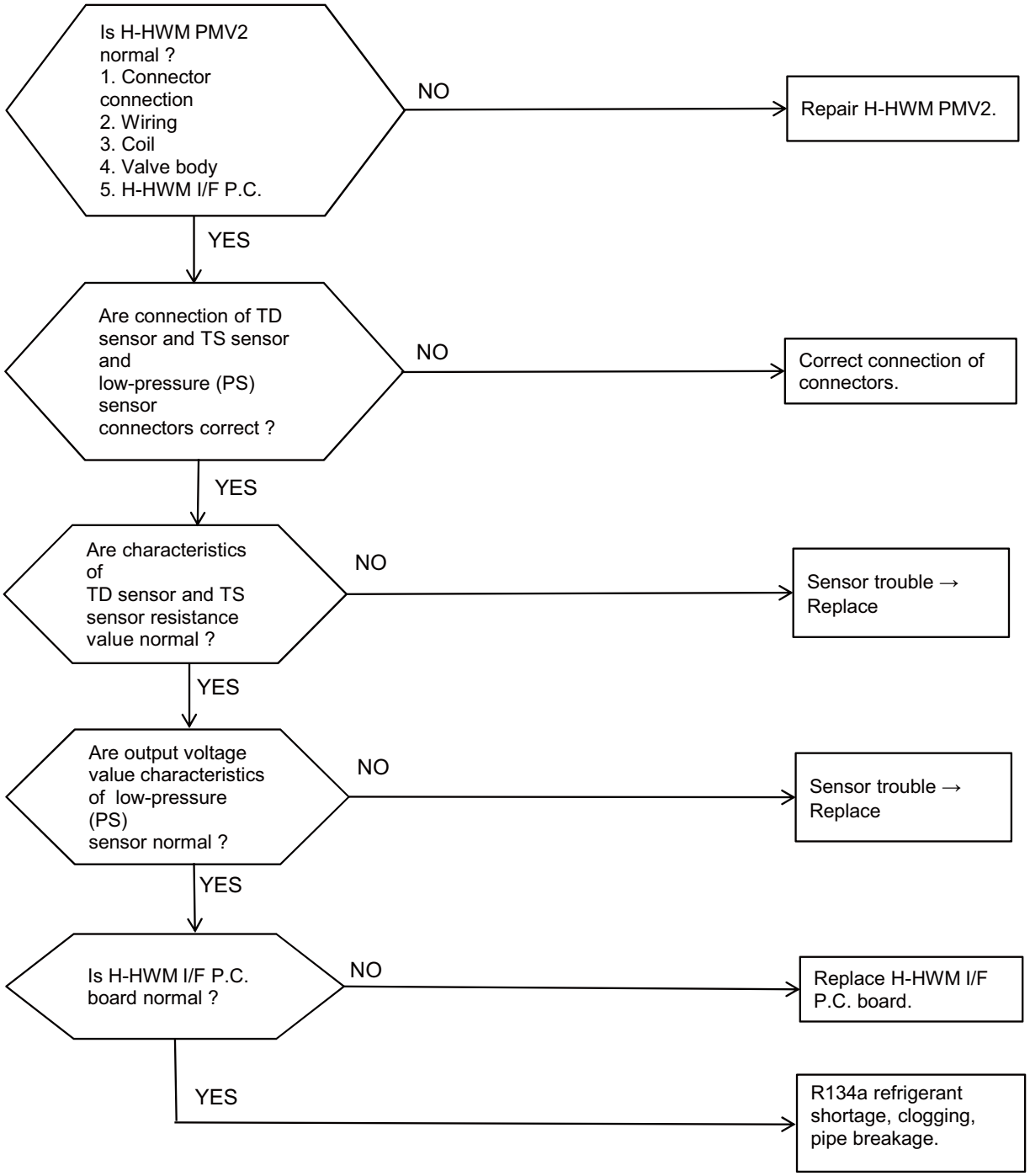
Check code	Check code name	Cause
[A24]	TH sensor trouble (H-HWM)	Compressor drive device built-in sensor trouble in IPDU P.C. board of H-HWM

This trouble code means compressor drive device built-in temperature sensor trouble.
Check IPDU P.C. board of H-HWM
Failure → Replace

Check code	Check code name	Cause
[A25]	Discharge temperature TD trouble (H-HWM)	①PMV2 trouble ②H-HWM I/F P.C. board trouble ③H-HWM TD sensor trouble

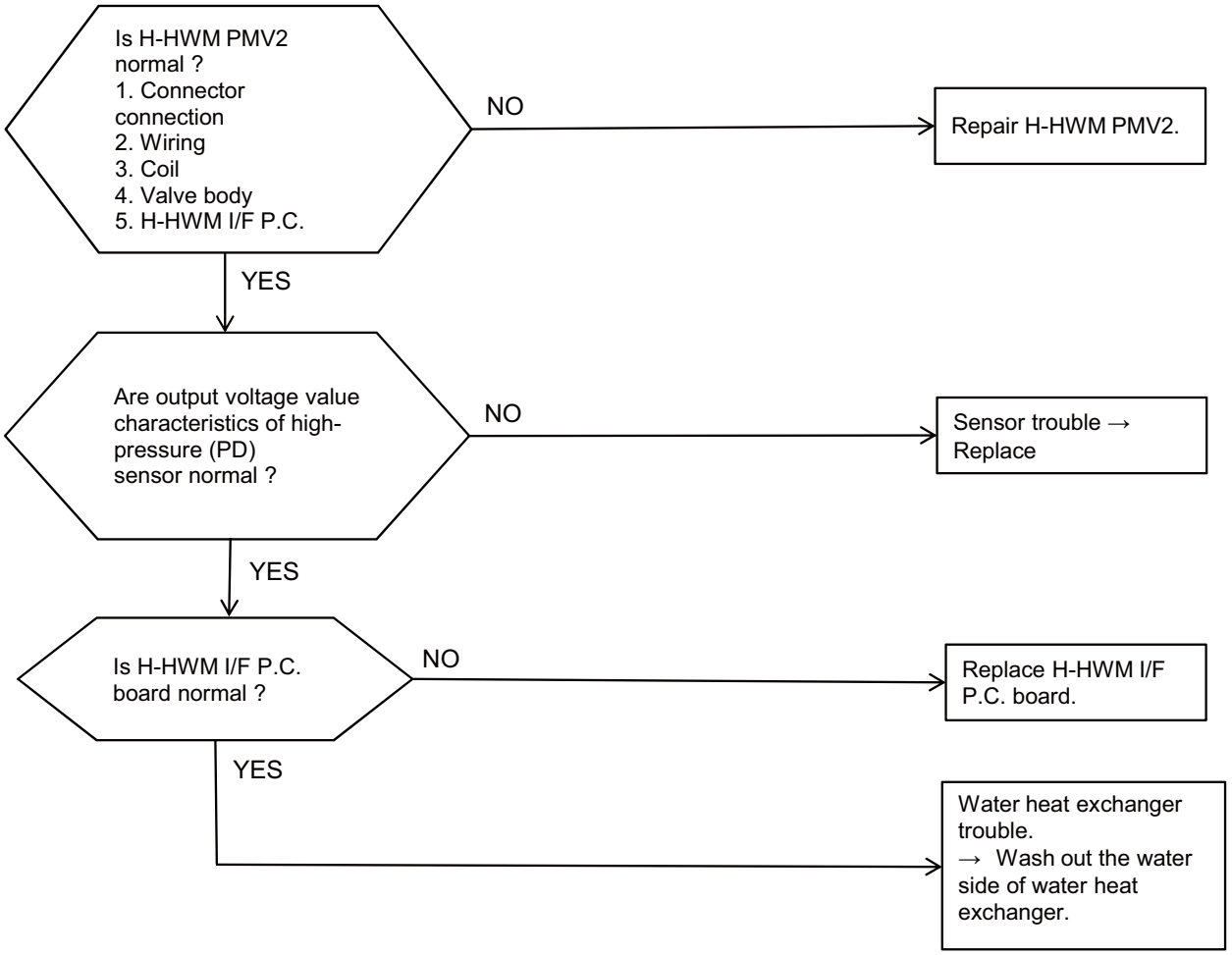


Check code	Check code name	Cause
[A26]	Gas leak detection (R134a) (H-HWM)	①PMV2 trouble ②H-HWM I/F P.C. board trouble ③H-HWM TD sensor trouble ④H-HWM low-pressure (PS) sensor trouble ⑤H-HWM TS sensor trouble ⑥R134a gas leak trouble

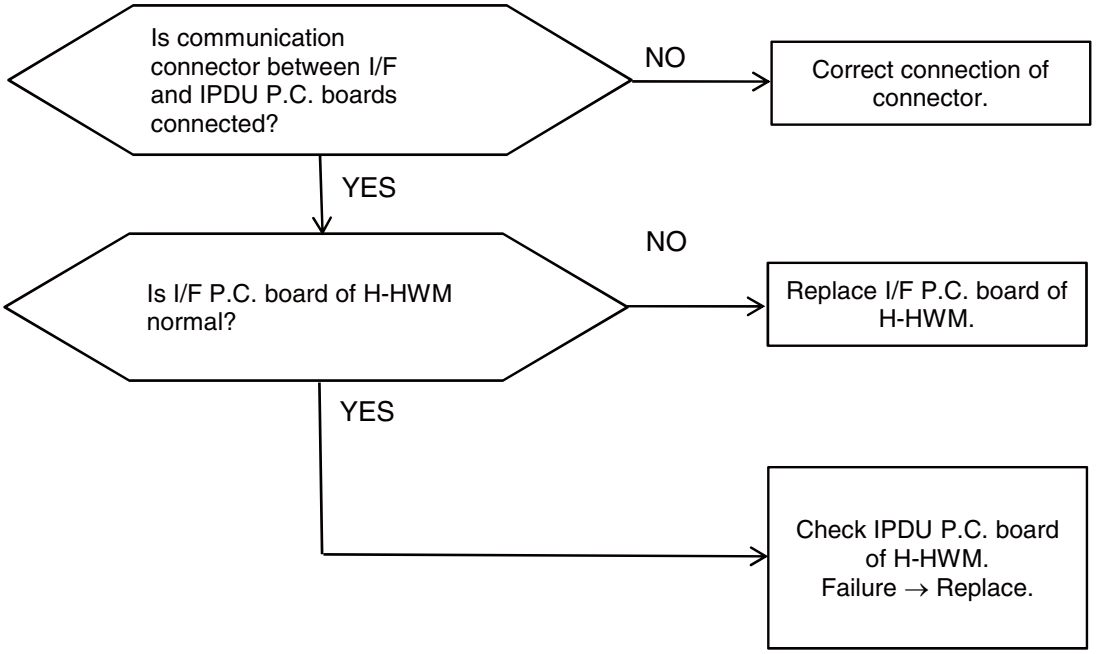


(Check there is no clogging and pipe breakage and then recharge refrigerant.)

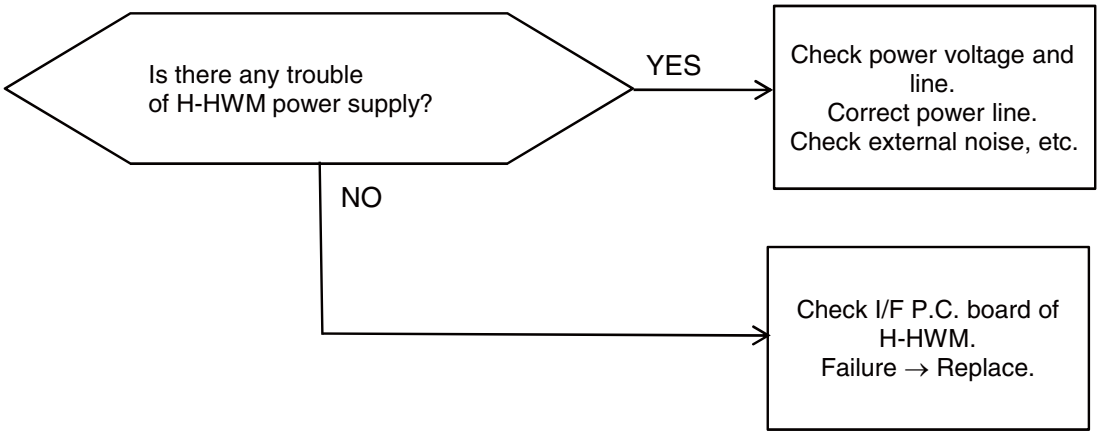
Check code	Check code name	Cause
[A27]	High-pressure protective operation (H-HWM)	①PMV2 trouble ②H-HWM I/F P.C. board trouble ③H-HWM high-pressure (PD) sensor trouble ④Water heat exchanger trouble



Check code	Check code name	Cause
[A28]	Communication trouble between I/F and IPDU P.C. boards (H-HWM)	1. Communication trouble between I/F and IPDU P.C. boards of H-HWM 2. I/F, IPDU P.C. boards of H-HWM trouble



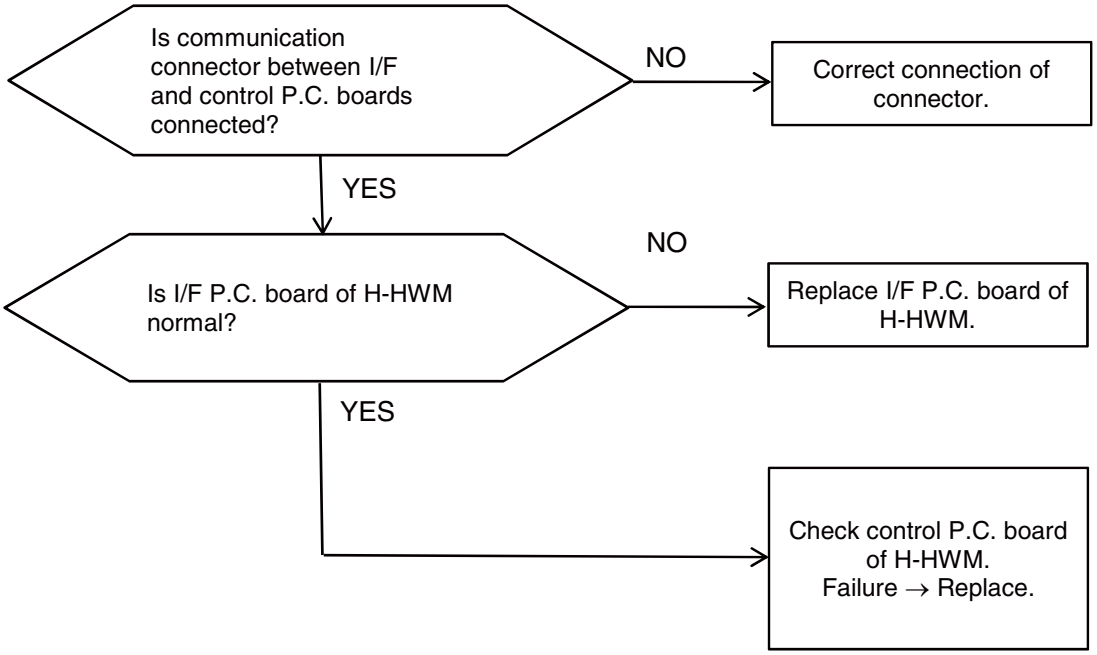
Check code	Check code name	Cause
[A31]	I/F P.C. board trouble (H-HWM)	1. H-HWM power trouble (Voltage, noise, etc.) 2. I/F P.C. board of H-HWM trouble



Check code	Check code name	Cause
[F29]	Indoor other trouble (H-HWM)	Indoor P.C. board trouble

Check the defect in I/F P.C. board of H-HWM. (Failure EEPROM)
Failure → Replace

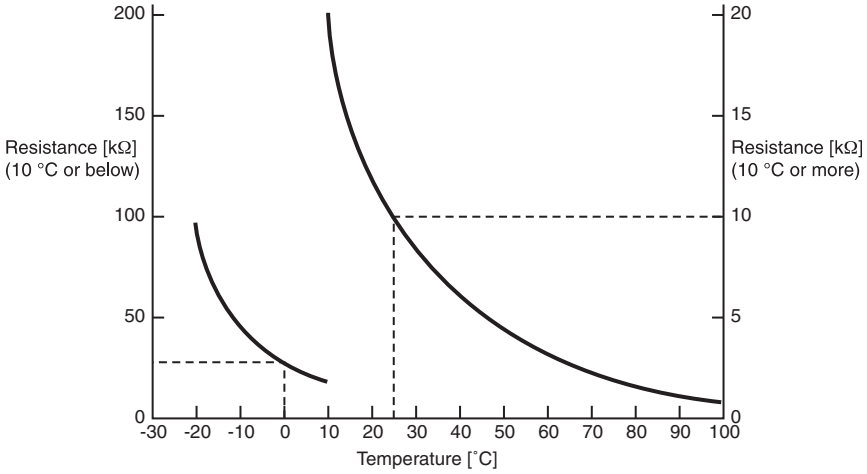
Check code	Check code name	Cause
[L29]	Communication trouble between I/F and control P.C. boards (H-HWM)	1. Communication trouble between I/F and control P.C. boards of H-HWM 2. I/F, control P.C. boards of H-HWM trouble



8-6. Sensor characteristics

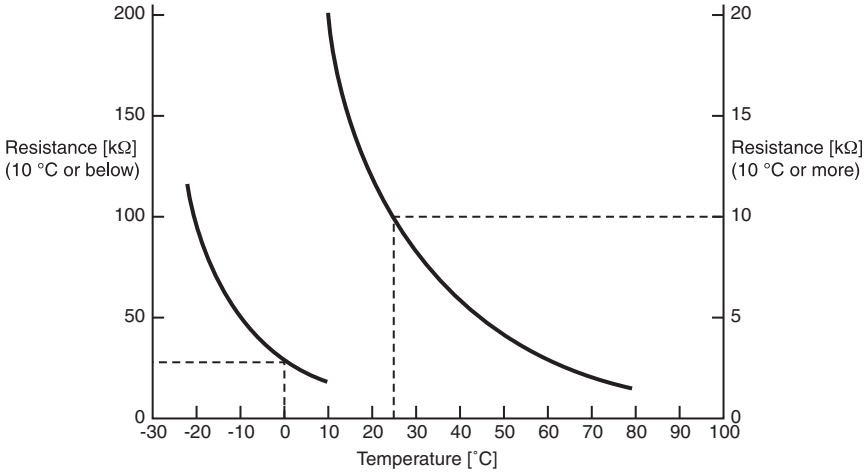
▼Temperature sensor characteristics

TC1 sensor



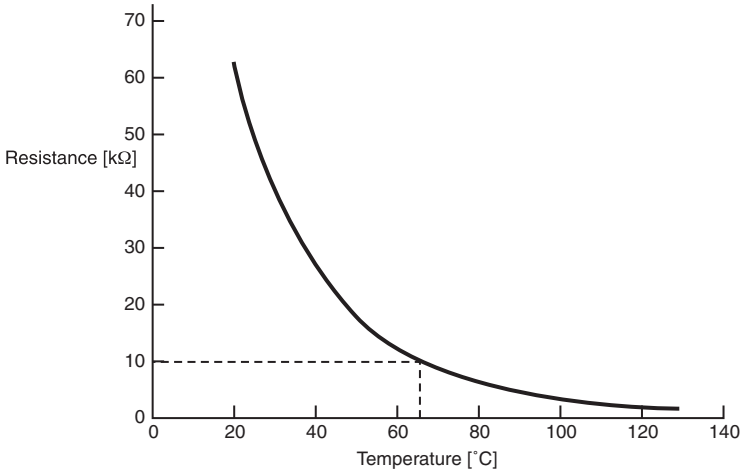
Temperature [˚C]	Resistance [kΩ]
-20	98.3
-15	73.7
-10	55.8
-5	42.6
0	32.8
5	25.5
10	20.0
15	15.7
20	12.5
25	10.0
30	8.1
35	6.5
40	5.3
45	4.4
50	3.6
55	3.0
60	2.5
65	2.1
70	1.7
75	1.5
80	1.2
85	1.1
90	0.9
95	0.8
100	0.7

TA (TWI), TC2 (TWO) and TD sensor



Temperature [˚C]	Resistance [kΩ]
-20	102.9
-15	76.6
-10	57.7
-5	44.0
0	38.8
5	26.1
10	20.4
15	16.0
20	12.6
25	10.0
30	8.0
35	6.4
40	5.2
45	4.2
50	3.5
55	2.8
60	2.3
65	1.9
70	1.6
75	1.4
80	1.2

TCJ and TS sensor



Temperature [˚C]	Resistance [kΩ]
20	62.3
25	49.9
30	40.1
35	32.5
40	26.5
45	21.7
50	17.9
55	14.8
60	12.4
65	10.3
70	8.7
75	7.3
80	6.2
85	5.3
90	4.5
95	3.9
100	3.4
105	2.9
110	2.5
115	2.2
120	1.9
125	1.7
130	1.5

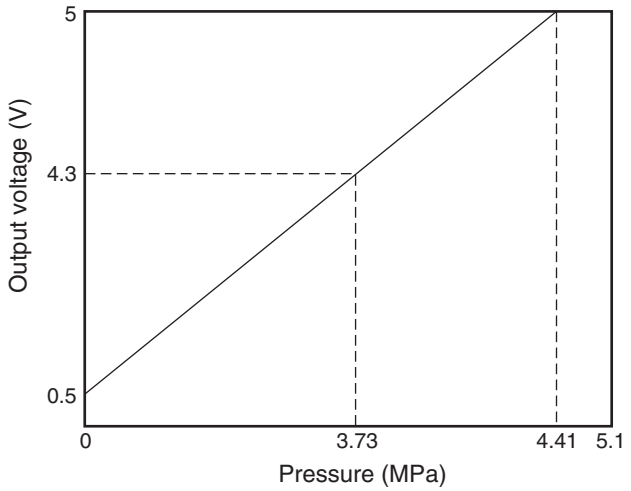
▼ Pressure sensor characteristics

• Input/output wiring summary

Pin No.	High pressure side (PD) / Low pressure side (PS)	
	Input/output name	Lead wire color
1	OUTPUT	White
2	—	—
3	GND	Black
4	+5V	Red

• Output voltage vs. pressure

High pressure side (PD) / Low pressure side (PS)
0.5~4.3V 0~3.73MPa



Pressure Sensor Output Check

▼ PD/PS sensor characteristics

0 to 4.41 MPa (0.5 to 5V output for 0 to 4.41 MPa)
Voltage readings across pins 1 and 3 of CN606 (PD: Black) / CN605 (PS: Yellow) on H-HWM Control P.C. board (MCC-1643) (with negative-side probe of multimeter placed on pin 3)

VOLT	PD (MPa)	PD (kg/cm²)	VOLT	PD (MPa)	PD (kg/cm²)	VOLT	PD (MPa)	PD (kg/cm²)	VOLT	PD (MPa)	PD (kg/cm²)	VOLT	PD (MPa)	PD (kg/cm²)
0.00	0.00	0.0	1.00	0.49	5.0	1.99	1.46	14.9	2.99	2.44	24.9	3.98	3.42	34.8
0.02	0.00	0.0	1.02	0.51	5.2	2.01	1.48	15.1	3.01	2.46	25.1	4.00	3.44	35.0
0.04	0.00	0.0	1.04	0.53	5.4	2.03	1.50	15.3	3.03	2.48	25.3	4.02	3.45	35.2
0.06	0.00	0.0	1.06	0.54	5.5	2.05	1.52	15.5	3.05	2.50	25.5	4.04	3.48	35.4
0.08	0.00	0.0	1.07	0.56	5.7	2.07	1.54	15.7	3.07	2.52	25.7	4.06	3.49	35.6
0.10	0.00	0.0	1.09	0.58	5.9	2.09	1.56	15.9	3.09	2.54	25.9	4.08	3.51	35.8
0.12	0.00	0.0	1.11	0.60	6.1	2.11	1.58	16.1	3.11	2.56	26.1	4.10	3.53	36.0
0.14	0.00	0.0	1.13	0.62	6.3	2.13	1.60	16.3	3.13	2.57	26.3	4.12	3.55	36.2
0.16	0.00	0.0	1.15	0.64	6.5	2.15	1.62	16.5	3.15	2.59	26.4	4.14	3.57	36.4
0.18	0.00	0.0	1.17	0.66	6.7	2.17	1.64	16.7	3.16	2.61	26.6	4.16	3.59	36.6
0.20	0.00	0.0	1.19	0.68	6.9	2.19	1.66	16.9	3.18	2.63	26.8	4.18	3.61	36.8
0.22	0.00	0.0	1.21	0.70	7.1	2.21	1.67	17.1	3.20	2.65	27.0	4.20	3.63	37.0
0.23	0.00	0.0	1.23	0.72	7.3	2.23	1.69	17.3	3.22	2.67	27.2	4.22	3.65	37.2
0.25	0.00	0.0	1.25	0.74	7.5	2.25	1.71	17.5	3.24	2.69	27.4	4.24	3.67	37.4
0.27	0.00	0.0	1.27	0.76	7.7	2.27	1.73	17.7	3.26	2.71	27.6	4.26	3.69	37.6
0.29	0.00	0.0	1.29	0.77	7.9	2.29	1.75	17.9	3.28	2.73	27.8	4.28	3.70	37.8
0.31	0.00	0.0	1.31	0.79	8.1	2.31	1.77	18.0	3.30	2.75	28.0	4.30	3.72	38.0
0.33	0.00	0.0	1.33	0.81	8.3	2.32	1.79	18.2	3.32	2.77	28.2	4.32	3.74	38.2
0.35	0.00	0.0	1.35	0.83	8.5	2.34	1.81	18.4	3.34	2.79	28.4	4.34	3.76	38.4
0.37	0.00	0.0	1.37	0.85	8.7	2.36	1.83	18.6	3.36	2.80	28.6	4.36	3.78	38.6
0.39	0.00	0.0	1.39	0.87	8.9	2.38	1.85	18.8	3.38	2.82	28.8	4.38	3.80	38.8
0.41	0.00	0.0	1.41	0.89	9.1	2.40	1.87	19.0	3.40	2.84	29.0	4.40	3.82	38.9
0.43	0.00	0.0	1.43	0.91	9.3	2.42	1.89	19.2	3.42	2.86	29.2	4.41	3.84	39.1
0.45	0.00	0.0	1.45	0.93	9.5	2.44	1.90	19.4	3.44	2.88	29.4	4.43	3.86	39.3
0.47	0.00	0.0	1.47	0.95	9.6	2.46	1.92	19.6	3.46	2.90	29.6	4.45	3.88	39.5
0.49	0.00	0.0	1.48	0.97	9.8	2.48	1.94	19.8	3.48	2.92	29.8	4.47	3.90	39.7
0.51	0.01	0.1	1.50	0.99	10.0	2.50	1.96	20.0	3.50	2.94	30.0	4.49	3.92	39.9
0.53	0.03	0.3	1.52	1.00	10.2	2.52	1.98	20.2	3.52	2.96	30.2	4.51	3.93	40.1
0.55	0.05	0.5	1.54	1.02	10.4	2.54	2.00	20.4	3.54	2.98	3.04	4.53	3.95	40.3
0.57	0.07	0.7	1.56	1.04	10.6	2.56	2.02	20.6	3.56	3.00	30.5	4.55	3.97	40.5
0.59	0.08	0.9	1.58	1.06	10.8	2.58	2.04	20.8	3.57	3.02	30.7	4.57	3.99	40.7
0.61	0.10	1.1	1.60	1.08	11.0	2.60	2.06	21.0	3.59	3.03	30.9	4.59	4.01	40.9
0.63	0.12	1.3	1.62	1.10	11.2	2.62	2.08	21.2	3.61	3.05	31.1	4.61	4.03	41.1
0.65	0.14	1.4	1.64	1.12	11.4	2.64	2.10	21.4	3.63	3.07	31.3	4.63	4.05	41.3
0.66	0.16	1.6	1.66	1.14	11.6	2.66	2.12	21.6	3.65	3.09	31.5	4.65	4.07	41.5
0.68	0.18	1.8	1.68	1.16	11.8	2.68	2.13	21.8	3.67	3.11	31.7	4.67	4.09	41.7
0.70	0.20	2.0	1.70	1.18	12.0	2.70	2.15	22.0	3.69	3.13	31.9	4.69	4.11	41.9
0.72	0.22	2.2	1.72	1.20	12.2	2.72	2.17	22.2	3.71	3.15	32.1	4.71	4.13	42.1
0.74	0.24	2.4	1.74	1.21	12.4	2.73	2.19	22.3	3.73	3.17	32.3	4.73	4.15	42.3
0.76	0.26	2.6	1.76	1.23	12.6	2.75	2.21	22.5	3.75	3.19	32.5	4.75	4.16	42.5
0.78	0.28	2.8	1.78	1.25	12.8	2.77	2.23	22.7	3.77	3.21	32.7	4.77	4.18	42.7
0.80	0.30	3.0	1.80	1.27	13.0	2.79	2.25	22.9	3.79	3.23	32.9	4.79	4.20	42.9
0.82	0.31	3.2	1.82	1.29	13.2	2.81	2.27	23.1	3.81	3.25	33.1	4.81	4.22	43.0
0.84	0.33	3.4	1.84	1.31	13.4	2.83	2.29	23.3	3.83	3.26	33.3	4.82	4.24	43.2
0.86	0.35	3.6	1.86	1.33	13.6	2.85	2.31	23.5	3.85	3.28	33.5	4.84	4.26	43.4
0.88	0.37	3.8	1.88	1.35	13.8	2.87	2.33	23.7	3.89	3.30	33.7	4.86	4.28	43.6
0.90	0.39	4.0	1.90	1.37	13.9	2.89	2.35	23.9	3.89	3.32	33.9	4.88	4.30	43.8
0.92	0.41	4.2	1.91	1.39	14.1	2.91	2.36	24.1	3.91	3.34	34.1	4.90	4.32	44.0
0.94	0.43	4.4	1.93	1.41	14.3	2.93	2.38	24.3	3.93	3.36	34.3	4.92	4.34	44.2
0.96	0.45	4.6	1.95	1.43	14.5	2.95	2.40	24.5	3.95	3.38	34.5	4.94	4.36	44.4
0.98	0.47	4.8	1.97	1.44	14.7	2.97	2.42	24.7	3.97	3.40	34.7	4.96	4.38	44.6
												4.98	4.39	44.8

9. P.C. BOARD EXCHANGE PROCEDURES

Replacement of control P.C. boards

Part code	Model type	P.C. board type
431-6V-673	MMW-AP0481CHQ series	MCC-1643

Points to note when replacing control P.C. board assembly

The electrically erasable programmable read-only memory (hereinafter EEPROM, IC503) mounted on a P.C. board holds important setting data, including the type and capacity codes intrinsic to the model (set at the factory), as well as the line / indoor (including hot water module) / group addresses, and the like (during installation, either automatically or manually). Proceed with the replacement of a P.C. board assembly in accordance with the procedure described below.
After completion of the work, check the settings again, including the hot water module No. and group header / follower designation, and confirm the integrity of the refrigerating cycle by conducting a test operation, etc.

<Replacement procedure>

Method 1

If it is possible to turn on the hot water module and read the setting data from the P.C. board to be replaced via a wired remote controller -

Reading EEPROM data: **Procedure 1**

Replacing P.C. board and turning on power: **Procedure 2**

Writing EEPROM data in new EEPROM: **Procedure 3**

Resetting power supply (applicable to all hot water module units connected to remote controller in case of group operation)

Method 2

If it is not possible to read the setting data due to the failure of the EEPROM itself -
Replacing P.C. board and turning on power: **Procedure 2**

Writing EEPROM data on basis of information supplied by customer: **Procedure 3**

Resetting power supply (applicable to all hot water module units connected to remote controller in case of group operation)

Procedure 1: reading setting data from EEPROM

(Read the setting data from EEPROM, including both the factory settings and any modifications made to them on site.)

1 Push the TEST + SET + CL buttons simultaneously and hold for at least 4 seconds.

* In the case of group control, the unit No. displayed first is the indoor unit (including Hot Water Module) No. of the header unit.
At the same time, the CODE No. (DN code) 10 is displayed.

2 Each time the UNIT LOUVER button (left side of the button) is pushed, one of the Hot Water Module No. under group control is displayed in turn.

3 The TEMP. button allows you to move the CODE No. (DN code) up / down by one place.

4 First, change the CODE No. (DN code) from 10 to 03. (To set central control address)

Jot down the setting data displayed.

5 Change the CODE No. (DN code) using the TEMP. button.

Again, jot down the setting data displayed.

6 Repeat step 5 until all the setting data has been jotted down. (See the CODE No. list.)

* CODE No. (DN code) go from 01 to FF with a few gaps along the way.

7 When finished, push the TEST button to bring the system back to normal off state.

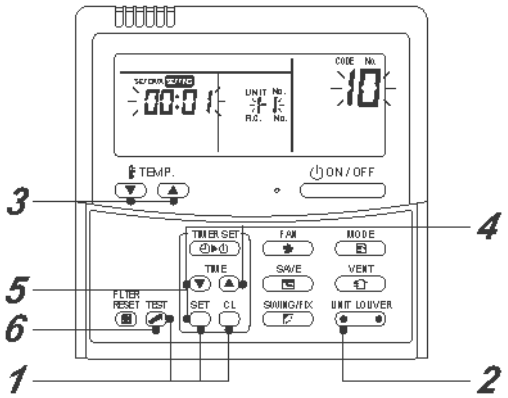
(It takes the system about 1 minute to become responsive to remote controller operation.)

CODE No. (DN code) necessary at minimum

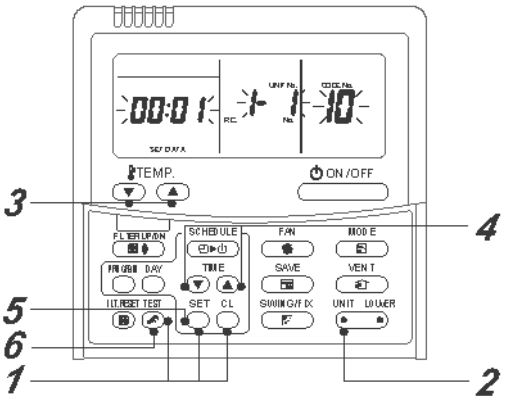
DN	Contents
10	Type
11	Indoor unit capacity
12	Line address
13	Indoor address
14	Group address

Remote controller operation diagram

<Fig. 1 RBC-AMT32E>



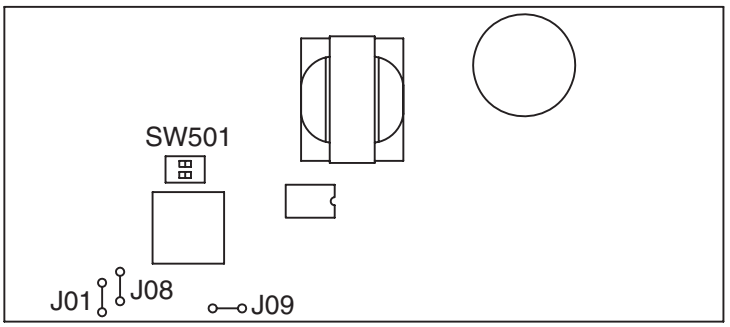
<Fig. 2 RBC-AMS41E>



Procedure 2: replacing P.C. board

1 Replace the trouble P.C. board with a service P.C. board.

Be sure to replicate the old jumper setting (removal) on the service P.C. board. (See the diagram at below.)



2 It is necessary to establish a one-to-one correspondence between the hot water module being serviced and the remote controller.

Turn on the hot water module using one of the methods described below according to the system configuration.

(1) Single (stand-alone) operation
Turn on the hot water module and proceed to **Procedure 3**.

(2) Group operation

A) If it is possible to selectively turn on the hot water module being serviced
Turn on the hot water module being serviced and proceed to **Procedure 3**.

B) If it is not possible to selectively turn on the hot water module being serviced (**Case 1**)

a) Temporarily disconnect the group control wiring from terminals A and B of the hot water module being serviced.

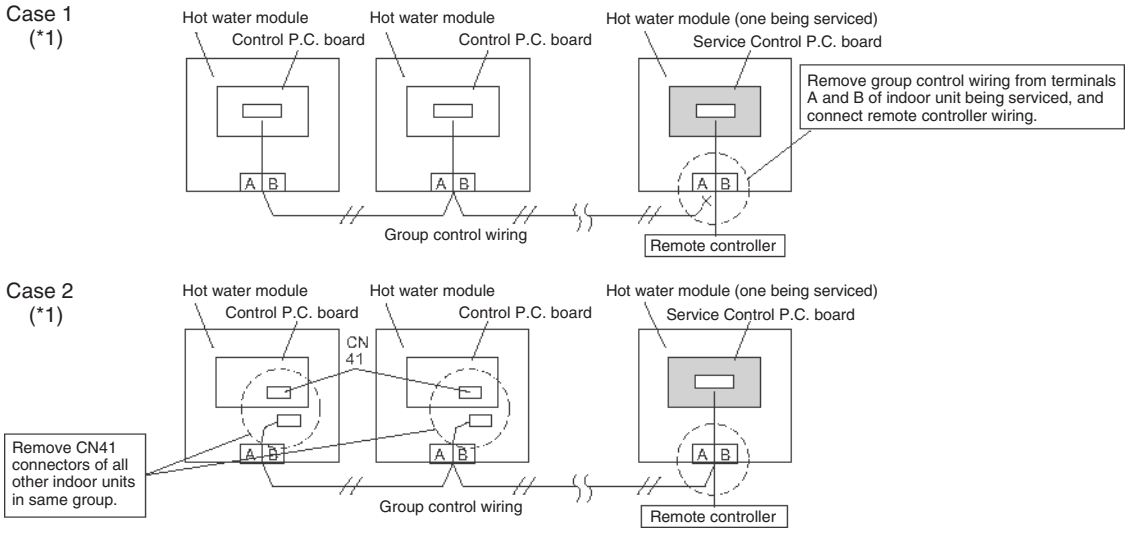
b) Connect the remote controller wiring to the terminals, turn on the hot water module, and proceed to **Procedure 3**.

***** If this method cannot be used, proceed to the alternative method described below (**Case 2**).

C) If it is not possible to selectively turn on the hot water module being serviced (**Case 2**)

a) Remove the CN41 connectors of all other hot water modules in the same group.

b) Turn on the hot water module and proceed to **Procedure 3**.



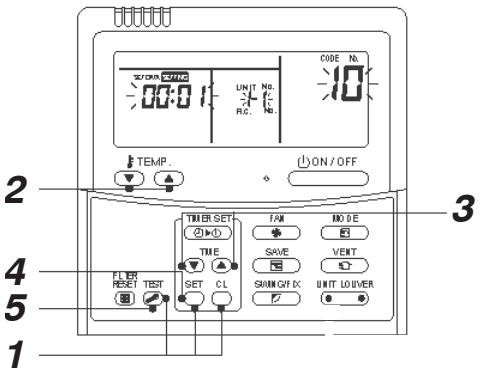
***** Be sure to restore the temporarily removed group control wiring and CN41 connectors to their initial states after Procedure 3 has been completed.

(*****1) Hot water module can connect up to 12 units in one refrigerative system.

Procedure 3: writing setting data in EEPROM

(The EEPROM of the service control P.C. board has been set to the factory trouble values.)

<Fig. 1 RBC-AMT32E>



1 Push the TEST + SET + CL buttons simultaneously and hold for at least 4 seconds.

(Under UNIT No., ALL is displayed.)
At the same time, the CODE No. (DN code) 10 is displayed.

2 The TEMP. button allows you to moved the CODE No. (DN code) up / down by one place.

3 First, set the type and capacity codes of the hot water module.

(Changing the type and capacity codes in EEPROM overwrites the factory default settings.)

(1) Set the CODE No. (DN code) to 10 (no change)
(2) Use the TIME button to select the type.
(0062 is for the hot water module type.) - See the CODE No. list.
(3) Push the SET button. (The display should change from flashing to steady.)
(4) Use the TEMP. button to set the CODE No. (DN code) to 11.
(5) Use the TIME button to set the capacity code.
(For example, 0016 is for the 048 type.) - See the CODE No. list.
(6) Push the SET button. (The display should change from flashing to steady.)
(7) Push the TEST button to bring the system back to normal off state.

4 Next, write any setting changes made on-site after installation, such as address settings, in the EEPROM. Perform the tasks specified in step 1 again.

5 Use the TEMP. button to set the CODE No. (DN code) to 03 (To set central control address)

6 Check the value displayed with the value jotted down in Procedure 1 or information supplied by the customer.

(1) If there is a discrepancy, change the setting in accordance with the value jotted down or information supplied by the customer, and push the SET button.
(The display should change from flashing to steady.)
(2) If there is no discrepancy, do nothing.

7 Use the TEMP. button to change the CODE No. (DN code).

Again, check the value, and change the setting if necessary.

8 Repeat steps 6 and 7 until all the settings are checked.

9 When finished, push the TEST button to bring the system back to normal off state.

In the case of group operation, turn the unit off, reconnect the group control wiring from terminal A and B of Hot Water Module and CN41 connectors, and turn on all the Hot Water Module.
(It takes the system about 1 minute to become responsive to remote controller operation.)

* CODE No. (DN code) go from 01 to FF with a few gaps along the way.
If you realize you have wrongly corrected a certain setting after pushing the SET button, you can recover the initial value by pushing the CL button, provided that the CODE No. (DN code) is yet to be changed.

CODE No. list (Example)

CODE No. (DN)	Item	Setting data	Factory-set value
03	Central control address		0099: Unfixed
10	Type		Depending on model type
11	H-HWM capacity		Depending on capacity type
12	System address		0099: Unfixed
13	H-HWM address		0099: Unfixed
14	Group address		0099: Unfixed
28	Power failure automatic recovery		0000: None
60	Timer setting (wired remote controller)		0000: Standard
61	Line heater inter lock		0001: Available (can be performed)

Type
Code No. [10]

Setup data	Type	Model abb. name
0062	High temperature hot water module	MMW-AP0481CHQ✻

H-HWM capacity
CODE No. [11]

Setup data	model
0000*	Invalid
0016	048 type

* The initial setup value of EEPROM installed on the service control P.C. board

10. DETACHMENTS

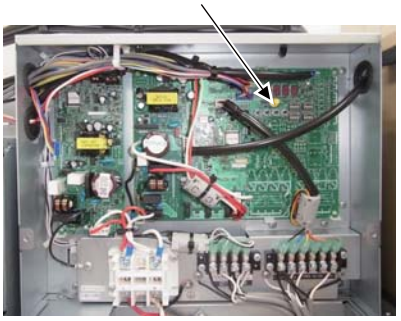
⚠ WARNING

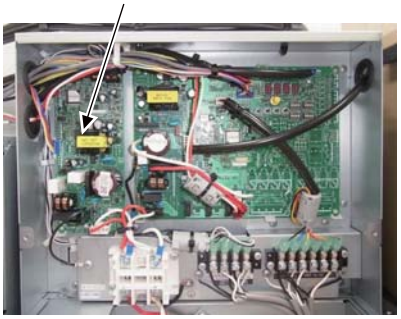
Stop the air conditioner(including HWM) operation, and turn off the circuit breaker.

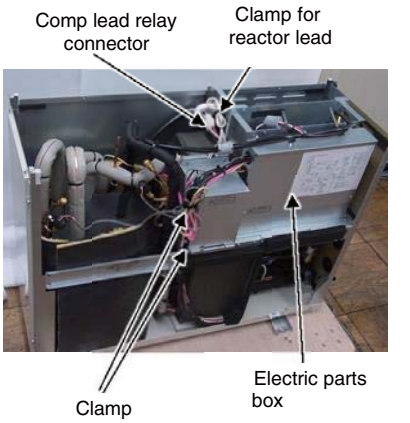
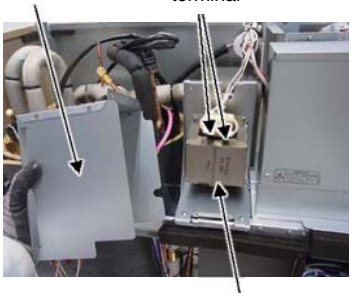
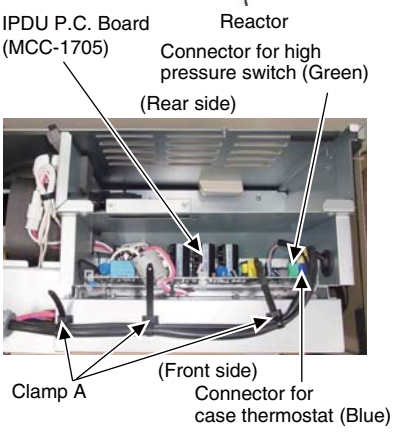
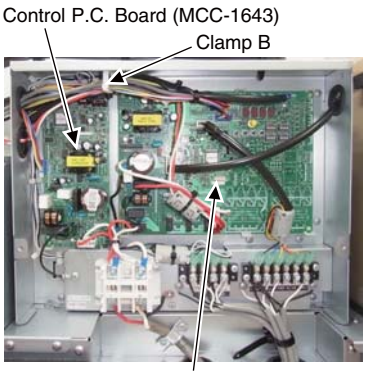
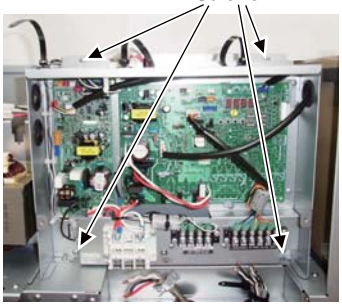
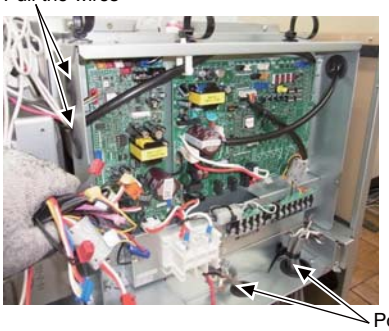
⚠ CAUTION

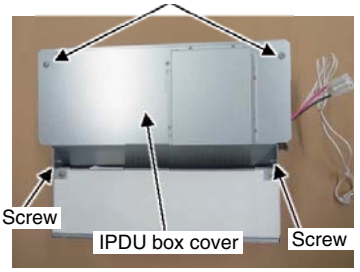
Wear a pair of gloves. Otherwise, you will risk an injury.

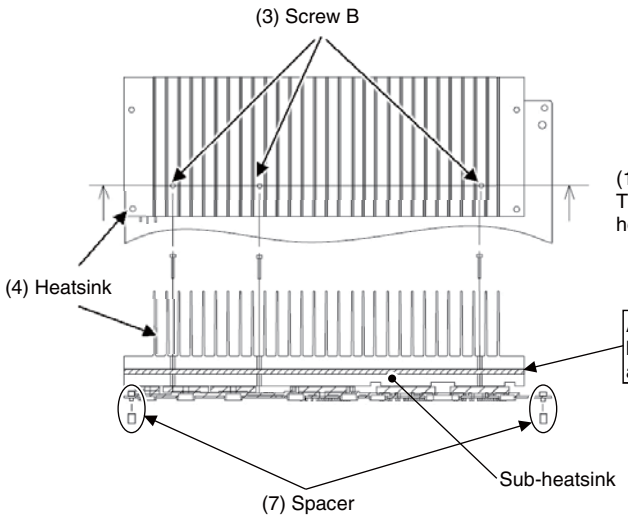
No.	Part to be replaced	Work procedure	Remarks
①	Part to be replaced • Top plate • Front panel	**1. Detachment** 1) Remove the hexagon screws for the top plate and remove the top plate. (M4 × 10, 8 pcs.) 2) Remove the hexagon screws for the front panel and remove the front panel. (M4 × 10, 6 pcs.) **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	Top plate  Front panel 
②	Rear cabinet	**1. Detachment** 1) Carry out the detachment of item ①. 2) Remove the hexagon screws for the rear cabinet and remove the rear cabinet . (M4 x 10, 6 pcs.) **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	 Rear cabinet

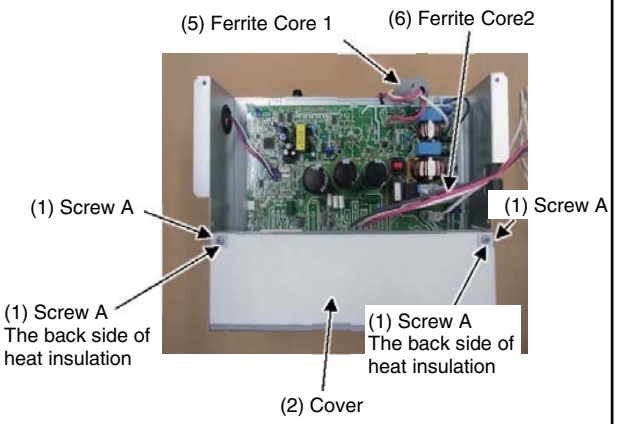
No.	Part to be replaced	Work procedure	Remarks
③	Electric parts box cover	**1. Detachment** 1) Carry out the detachment of item ①. 2) Remove the screws at the lower side of the electric parts box cover. (M4 × 8, 2 pcs) 3) Remove the screws at the upper side of the electric parts box cover. (M4×8, 2 pcs) **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	Electric parts box cover upper side  Electric parts box cover lower side 
④	I/F P.C. Board (MCC-1628)	**1. Detachment** 1) Carry out the detachment of item ①. 2) Carry out the detachment of item ③. 3) Remove the connectors connected from I/F P.C. Board (MCC-1628) to the other parts. CN01 .... Power input (5P : Black) CN200 .... IPDU P.C. Board (7P : White) CN300 .... Fan motor (2P : Red) CN403 .... Control P.C. Board (5P : Blue) CN602 .... TS sensor (2P : White) CN603 .... TE sensor (2P : Black) CN605 .... PS sensor (3P : Yellow) CN606 .... PD sensor (3P : Black) CN611.... TD sensor (3P : White) CN703 .... Outside trouble input (6P : White) CN707 .... Optional output (6P : White) CN711 .... PMV2 (6P : Blue) ∗ Unlock the lock on the housing part and remove the connector. 4) Remove the screw for Ground wire (Black wire). 5) Unlock the locks of the card edge spacer (6 positions) and then remove the I/F P.C. board. **2. Attachment** ∗ When installing a new circuit board, be sure to perform the DIP switch setting and confirm that it is properly set. 1) Carry out installation by following the detachment procedure in reverse.	I/F P.C. Board (MCC-1628)   Ground wire (Black wire)

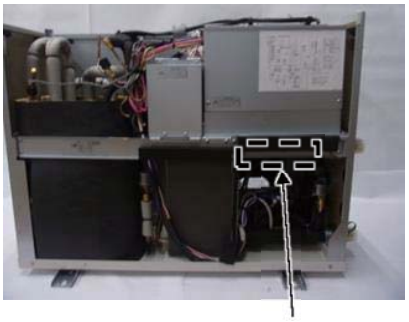
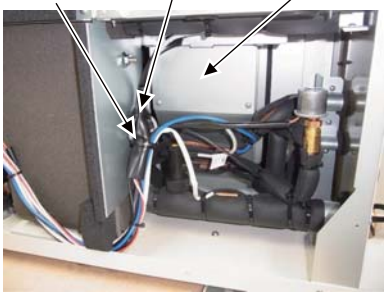
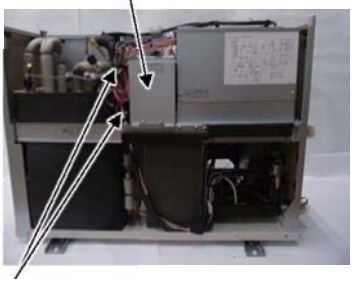
No.	Part to be replaced	Work procedure	Remarks
⑤	Control P.C. Board (MCC-1643)	**1. Detachment** 1) Carry out the detachment of item ①. 2) Carry out the detachment of item ③. 3) Remove the connectors connected from Control P.C. Board (MCC-1643) to the other parts. CN34 .... FS (Flow switch) (3P : Red) CN40 .... Outdoor unit (2P : Blue) CN41 .... Remote controller (2P : Blue) CN61 .... External input/output (HA) (6P : Yellow) CN67 .... Power input (5P : White) CN82 .... PMV1 (6P : Blue) CN100.... TC1sensor (3P : Brown) CN101 .... TC2 (TWO) (2P : Red) CN102 .... TCJ sensor (2P : White) CN104 .... TA (TWI) sensor (2P : Yellow) CN521 .... I/F P.C. Board (5P : Red) ∗ Unlock the lock on the housing part and remove the connector. 4) Remove the Ground wire (Black wire) from the quick connect terminal on the P.C .board.(CN22) 5) Unlock the locks of the card edge spacer (4 positions) and then remove the control P.C. board. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	Control P.C. Board (MCC-1643)   Quick connect terminal

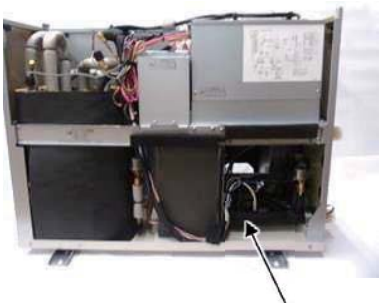
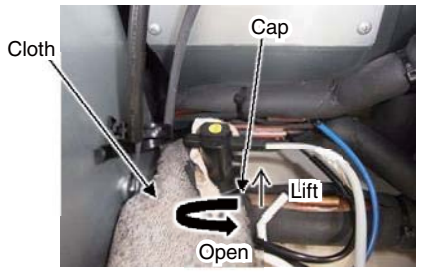
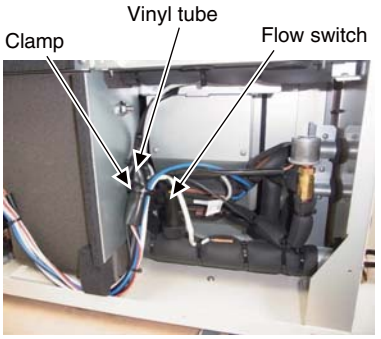
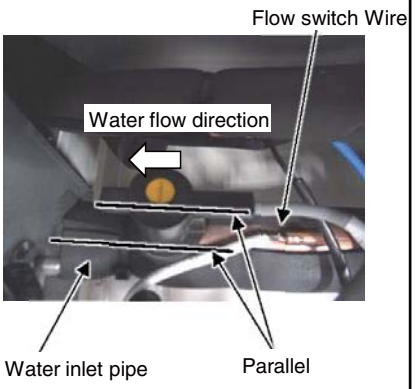
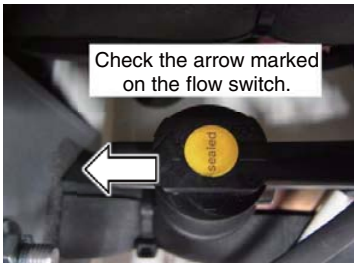
No.	Part to be replaced	Work procedure	Remarks
⑥	Electric parts box	**1. Detachment** 1) Carry out the detachment of item ①. 2) Carry out the detachment of item ③. 3) Remove the bundled lead wires from clamps (two places). 4) Remove the screws for the reactor cover. (M4 × 8, 4 pcs) 5) Remove the quick connect terminal for reactor lead from the reactor (Two places). 6) Remove the reactor lead from the clamp. 7) Remove the relay connector for compressor lead. 8) Remove the connector for Compressor thermostat from IPDU P.C. Board (MCC-1705). (CN609.... Blue 2P) 9) Remove the connector for the high pressure switch from the IPDU P.C. Board (MCC-1705). (CN690 .... Green3P) 10) Remove the wires for the Compressor thermostat and the high pressure switch from clamp A (Three places) 11) Remove the connector connected from I/F P.C. Board (MCC-1628) to the other parts. CN300 .... Fan motor (2P : Red) CN602 .... TS sensor (2P : White) CN603 .... TE sensor (2P : Black) CN605 .... PS sensor (3P : Yellow) CN606 .... PD sensor (3P : Black) CN611 .... TD sensor (3P : White) CN711 .... PMV2 (6P : Blue) ∗ Unlock the lock on the housing part and remove the connector. 12) Remove the lead wire removed by the work of 11) from a clamp B. 13) Remove the connector connected from Control P.C. Board (MCC-1643) to the other parts. CN34 .... Flow switch (3P : Red) CN82 .... PMV1 (6P : Blue) CN100 .... TC1 sensor (3P : Brown) CN101 .... TC2 (TWO) sensor (2P : Red) CN102 .... TCJ sensor (2P : White) CN104 .... TA (TWI) sensor (2P : Yellow) ∗ Unlock the lock on the housing part and remove the connector. 14) Pull out the lead wires removed at 11) and 12) from the electric parts box. 15) Remove a power supply wire, communication wire, a remote controller wire, and external output wires. 16) Remove the screws for the electric parts box. (M4 × 8, 4 pcs.) **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	   
			 

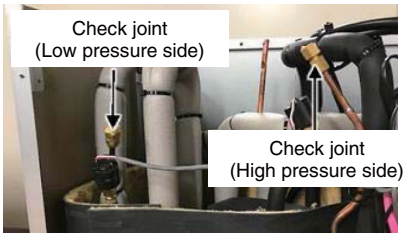
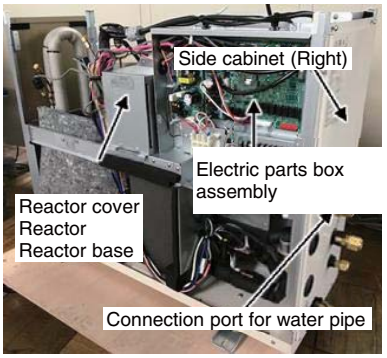
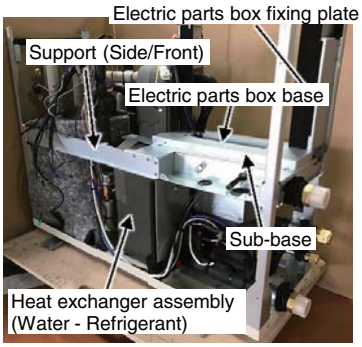
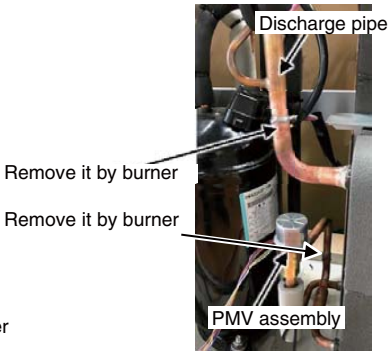
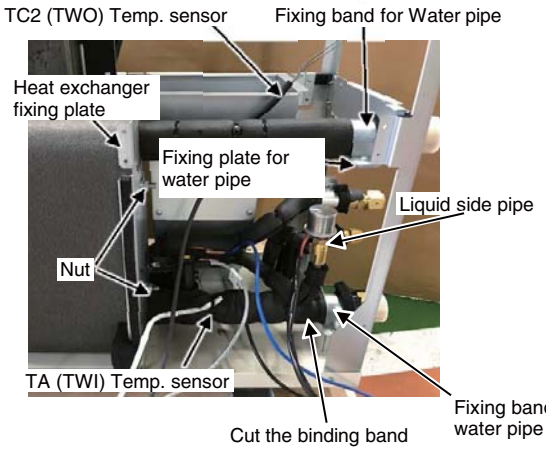
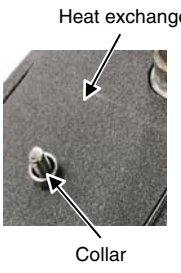
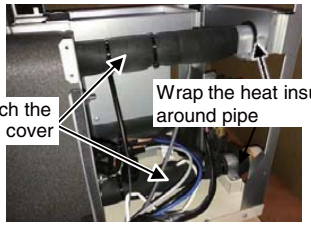
No.	Part to be replaced	Work procedure	Remarks
⑦	IPDU P.C. Board (MCC-1705)	**1. Detachment** 1) Carry out the detachment of item ①. 2) Carry out the detachment of item ③. 3) Carry out the detachment of item ⑥. 4) Remove the screws for the IPDU box cover. (M4 × 8, 4 pcs.) 5) Remove the lead wires connected to the IPDU P.C. Board. Power supply terminal (2P : Red and White) CN805 .... I/F P.C. Board (5P : Blue) CH20 .... Reactor (1P : White) CH21 .... Reactor (1P : White) Ground wire (Black wire) 6) Remove below parts in the following order. (1) Screw A (4 pcs.) → (2) Cover → (3) Screw B (3 pcs.) → (4) Heatsink 7) Remove the following parts from the IPDU P.C. Board, and attach them to a Service P.C. Board. (5) Ferrite core 1 (1 pcs.), (6) Ferrite core 2 (1 pcs.), (7) Spacer (2 pcs.) **2. Attachment** 1) Apply thermal grease to sub-Heat sink of Service P.C. board. 2) Attach Service P.C. board and Heat sink. 3) Carry out installation by following the detachment procedure in reverse. Silicone Thermal Grease use one of the following • Momentive Performance Materiais "TIG1000" • Dow Cornig Toray "SC102" • Mizutani Electric Ind "HSC1000" • Shin-Etsu Chemical "G-746" or "G-747"	IPDU P.C. Board (MCC-1705)  Screw  Viewing from the rear side

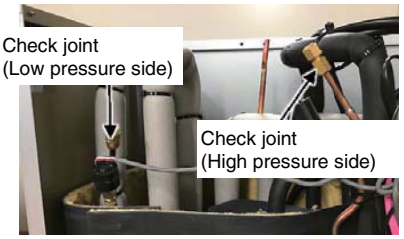
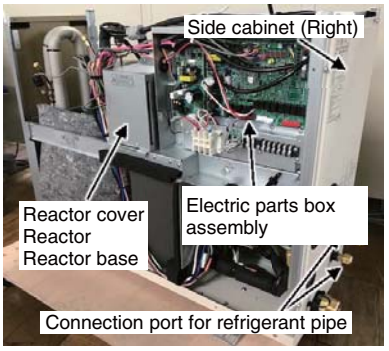
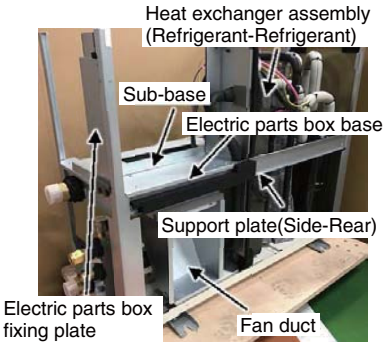
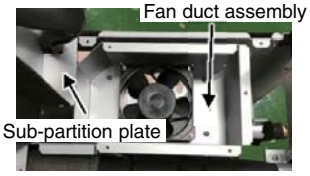
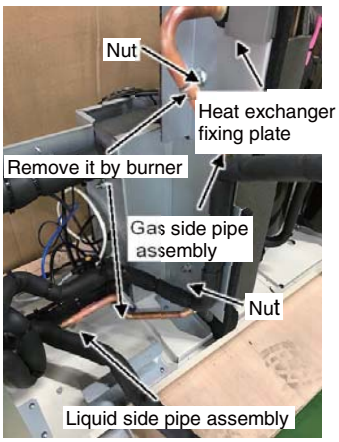
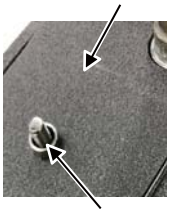


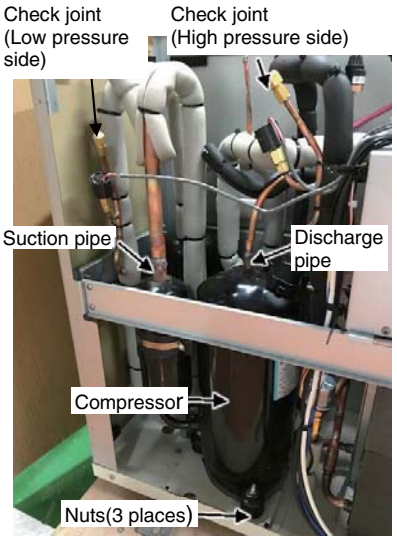
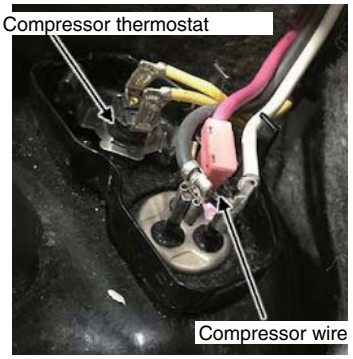


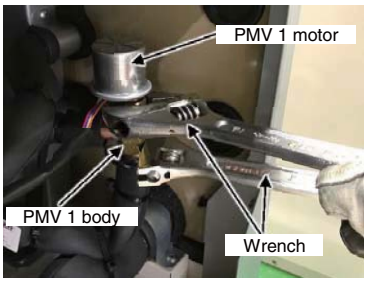
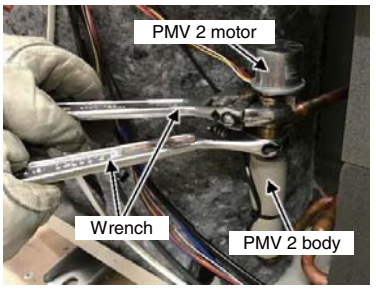
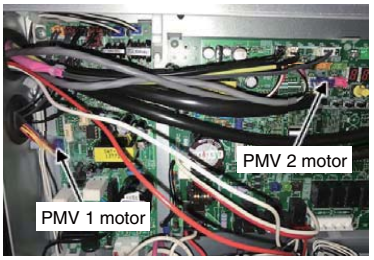
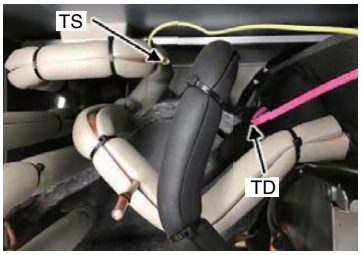
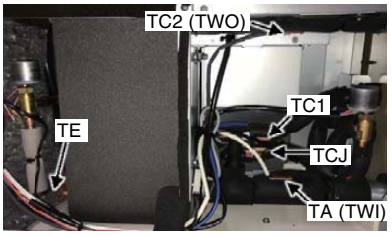
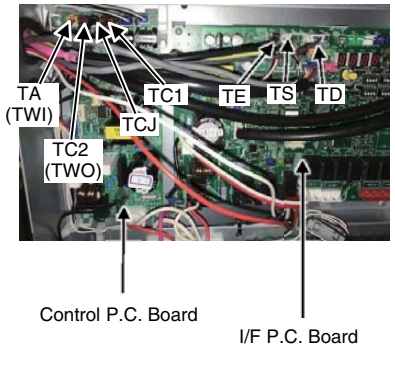
No.	Part to be replaced	Work procedure	Remarks
⑧	Cooling fan assembly	**1. Detachment** 1) Carry out the detachment of item ① and ②. 2) Remove a vinyl tube from a clamp. 3) Remove the relay connector (3P:Red) for fan motor. 4) Remove the screws for duct cover. (M4 × 8, 2 pcs.) 5) Remove the hexagon screws for the cooling fan assembly. (M4 × 10, 4pcs.) **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse. Cooling fan assembly 	 Cooling fan assembly Clamp Vinyl tube Duct cover 
⑨	Reactor	* Since a reactor becomes high temperature, don't touch a reactor immediately after operation. **1. Detachment** 1) Carry out the detachment of item ①. 2) Remove the lead wires bundled from the clamps (Two places). 3) Remove the screws for the reactor cover. (M4 × 8, 4pcs) 4) Remove the quick connect terminal for reactor lead from the reactors (two places). 5) Remove the screws for the reactors. (M4 × 8, 4pcs) **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	Reactor cover  Clamp Quick connect terminal  Reactor

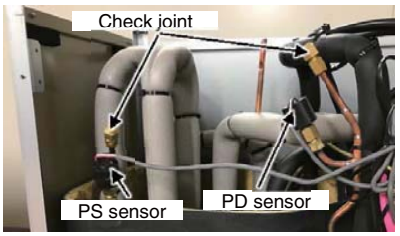
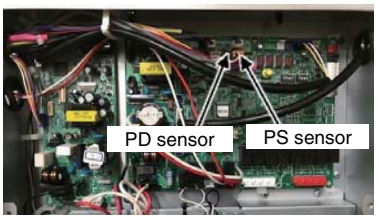
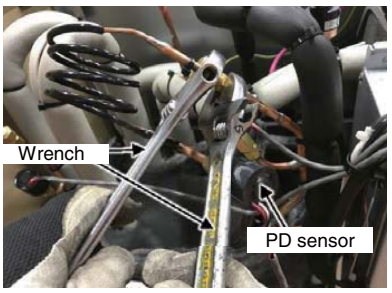
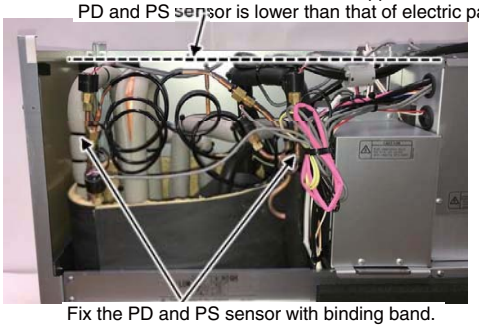
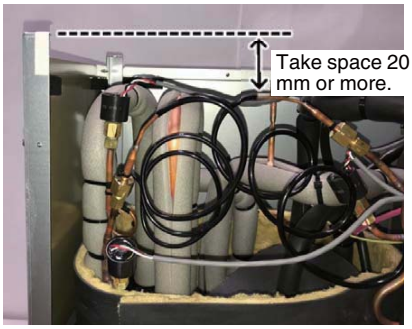
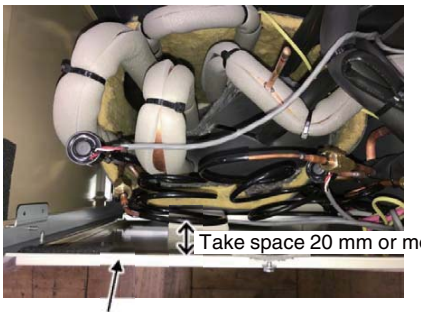
No.	Part to be replaced	Work procedure	Remarks
⑩	Flow switch	**1. Detachment** 1) Close the water supply source valve. 2) Carry out the detachment of item ①. 3) Remove a vinyl tube from a clamp. 4) Remove the relay connector (2P:White) for flow switch. 5) Slowly, turn the cap of flow switch completely and then lift the flow switch upward.	  
		2. Attachment 1) Carry out installation by following the detachment procedure in reverse. **NOTE:** • The flow switch connection uses a O-ring for water seal. Be careful not to scratch the O-ring. Otherwise, water leakage may occur. • Place the flow switch parallel to the water outlet pipe. • The flow switch wire is placed on the right side. • After the flow switch replacement repair, open the water supply source valve and water piping valve to pass water through the unit, and check that the flow switch connection has no water leakage. • Carry out the work of air ventilation in water circuit.	  

No.	Part to be replaced	Work procedure	Remarks
⑪	Heat exchanger assembly (Water - Refrigerant)	**1. Detachment** 1) Carry out the detachment of item ① and ②. 2) Recover R134a gas from check joint. 3) Remove the pipe connected to connection port for refrigerant pipe. 4) Remove the parts (following parts) around the heat exchanger assembly (water - refrigerant). • Side cabinet (Right) • Electric parts box assembly • Reactor cover • Reactor • Reactor base • Sub-base • Electric parts box base • Electric parts box fixing plate • Support plate (Side-Front) • Fixing plate for water pipe • Fixing band for water pipe 5) Remove the PMV assembly connected to the heat exchanger assembly (water - refrigerant) by the burner. (It works, while cooling down a PMV body.) 6) Remove the discharge pipe connected to the heat exchanger assembly (water - refrigerant) by burner. 7) Remove the TA (TWI) or TC2 (TWO) temperature sensors. 8) Cut the binding band fixing the liquid side pipe. 9) Remove the nuts and remove the heat exchanger assembly (water - refrigerant) from heat exchange plate and replace it. **NOTE:** • Protect the peripheral parts so that flame won't touch them directly. • Be sure to remove collar from the removed heat exchanger and attach to a new heat exchanger. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse. 2) Attach the pipe cover removed and the heat insulation.	      

No.	Part to be replaced	Work procedure	Remarks
⑫	Heat exchanger assembly (Refrigerant-Refrigerant)	**1. Detachment** 1) Carry out the detachment of item ① and ②. 2) Recover R134a refrigerant from check joint. 3) Remove the pipe connected to the connection port for the refrigerant. 4) Remove the parts(following parts) around the heat exchanger assembly (Refrigerant-Refrigerant). • Side cabinet (Right) • Electric parts box assembly • Reactor cover • Reactor • Reactor base • Sub-base • Electric parts box base • Electric parts box fixing plate • Fan duct assembly • Fan duct • Support plate (Side-Rear) 5) Remove the PMV assembly connected to the heat exchanger assembly (refrigerant - refrigerant) by the burner. (It works, while cooling down a PMV body.) 6) Remove the accumulator inlet pipe connected to the heat exchanger assembly (refrigerant - refrigerant) using burner. 7) Remove each assembly at the liquid or gas side being connected to the heat exchanger assembly (refrigerant - refrigerant). 8) Remove the nut to remove the heat exchanger (refrigerant - refrigerant) and replace it. **NOTE:** • Protect the peripheral parts so that flame won't touch them directly. • Be sure to remove collar from the removed heat exchanger and attach to a new heat exchanger. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	       

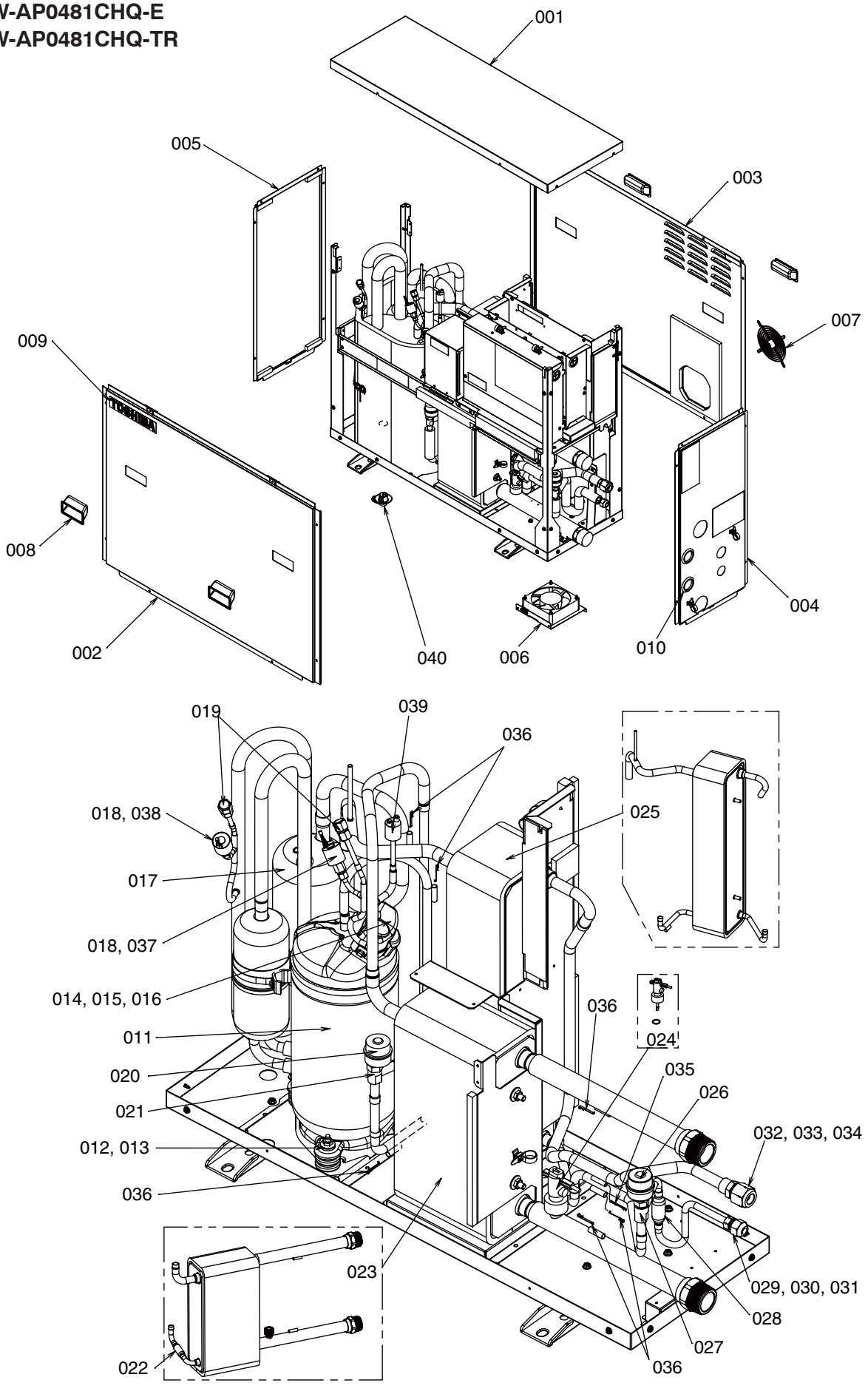
No.	Part to be replaced	Work procedure	Remarks
⑬	Compressor	**1. Detachment** 1) Carry out the detachment of item ①. 2) Recover R134a refrigerant from check joint. 3) Remove the parts around compressor. 4) Remove the terminal cover for compressor and remove the compressor lead wire and Compressor thermostat. 5) Remove the suction pipe and discharge pipe being connected to the compressor by the burner. **NOTE:** • Protect the peripheral parts so that flame of burner won't touch them directly. 6) Remove the nuts fixing the compressor. (Nuts three places) 7) Lift the compressor up and replace it pulling straight up. **NOTE:** • After replacing the compressor, when reconnecting wires for compressor terminal part, connect them so that quick connect terminal does not loosen. • Be careful when brazing pipes by burner to remove them because the pipes become high temperature. Oil remaining in the pipes may generate fire. • The compressor weighs over 20 kg. Two persons should work together. If there is no oil in the compressor, it weighs 22 kg. **2. Attachment** 1) Carry out installation of replaced compressor by following the detachment procedure in reverse. 2) Braze the suction pipe and discharge pipe to be connecting to the compressor by the burner. 3) Carry out leak test whether there are no gas leaks from their pipes. 4) Vacuum the refrigerant pipe and charge R134a refrigerant. (Refrigerant amount : 2.1 kg)	 

No.	Part to be replaced	Work procedure	Remarks
⑭	PMV motor 1) PMV 1 motor	**1. Detachment** 1) Carry out the detachment of item ①. 2) Remove the connector from Control P.C. Board. CN82 ... PMV motor (6P : Blue) 3) Loosen the nut fixing PMV motor by the two wrenches and remove the PMV motor. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse. **NOTE:** • Control the tightening torque for PMV motor from 14 to 16 N•m.	
	2) PMV 2 motor	**1. Detachment** 1) Carry out the detachment of item ①. 2) Remove the connectors from I/F PC board. CN711 PMV motor (6P : Blue) 3) Loosen the nut fixing PMV motor by two wrenches and remove the PMV motor. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse. **NOTE:** • Control the tightening torque for PMV motor from 14 to 16 N•m.	 
⑮	Sensor TD sensor TS sensor TE sensor TC1 sensor TCJ sensor TA (TWI) sensor TC2 (TWO) sensor	**1. Detachment** 1) Carry out the detachment of item ①. 2) Remove the connectors from I/F P.C. Board CN611 ... TD (2P : Red) CN602 ... TS (2P : Yellow) CN603 ... TE (2P : Black) Remove the connectors from Control P.C. Board CN100 ... TC1 (2P : Blue) CN102 ... TCJ (2P : Black) CN104 ... TA (TWI) (2P : White) CN101 ... TC2 (TWO) (2P : Black) 3) Replace each sensor. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	  

No.	Part to be replaced	Work procedure	Remarks
⑯	Pressure sensor (PD, PS)	**1. Detachment** 1) Carry out the detachment of item ①. 2) Remove the connectors from I/F P.C. board. CN606 ...PD (3 P : Black) CN605 ...PS (3 P : Yellow) 3) Remove the cap for check joint and attach the pressure sensor by two wrenches with the tightening torque of 12+2 N・m. 4) Fix the PD and PS sensor with the binding band as shown in figure. **NOTE:** • Attach the capillary tubes for PD or PS sensor so that they do not touch the ceiling board or front panel. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	   Fix the PD and PS sensor so that upper surface of the PD and PS sensor is lower than that of electric parts box.  Fix the PD and PS sensor with binding band. (Two places)   Front panel

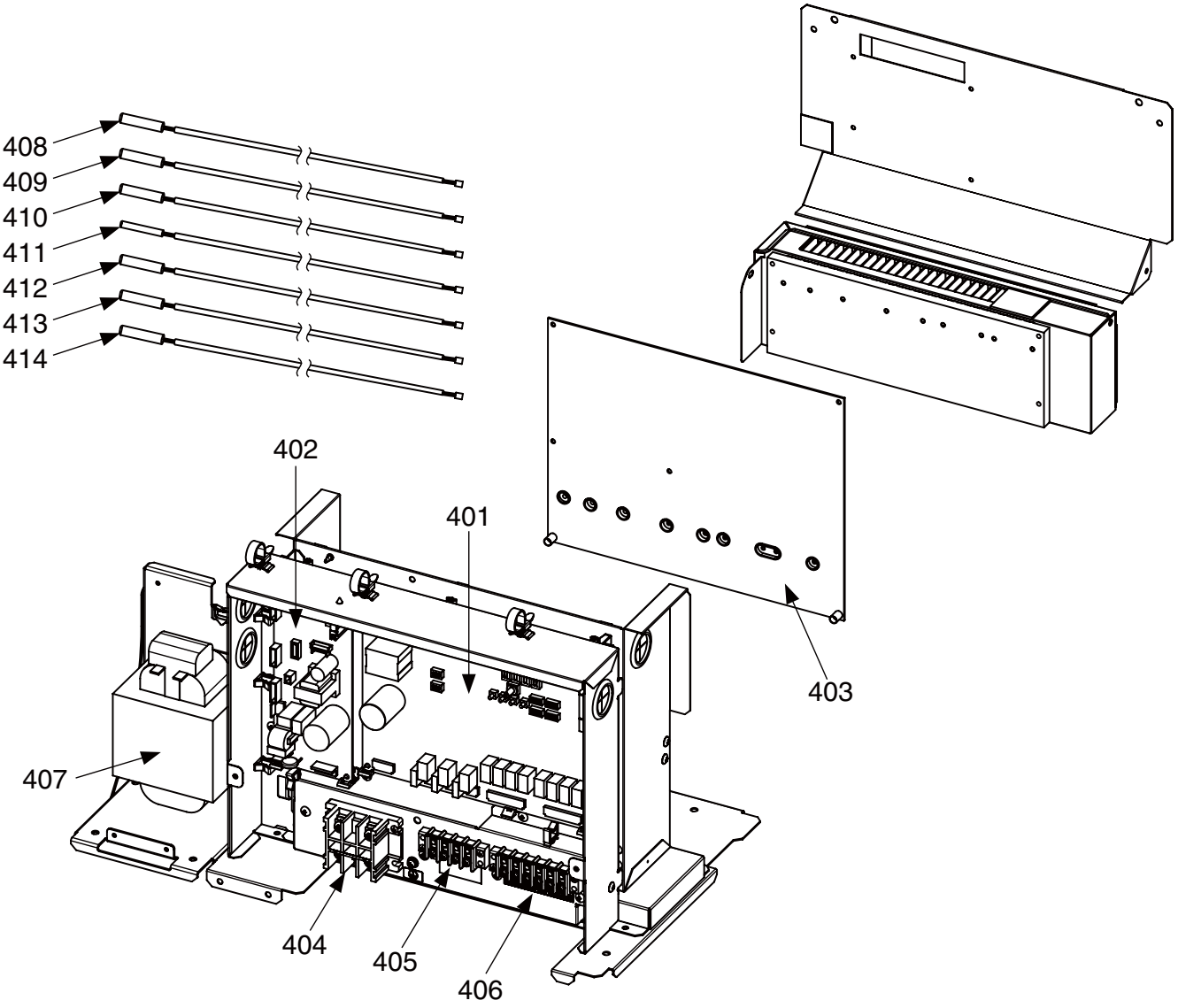
11. EXPLODED DIAGRAM / SERVICE PARTS LIST

MMW-AP0481CHQ-E
MMW-AP0481CHQ-TR



Location No.	Part No.	Description	Q'ty/Set	MMW-AP0481CHQ
			-E	-TR
001	4310A166	CABINET ASSY, UP	1	1
002	4310A167	CABINET ASSY, FRONT	1	1
003	43103150	CABINET ASSY, BACK	1	1
004	43102662	CABINET ASSY, RIGHT	1	1
005	43102663	CABINET ASSY, LEFT	1	1
006	4312C170	FAN, ASSY	1	1
007	4312C171	GUARD, FAN	1	1
008	43119390	HANGER	4	4
009	4311L666	MARK,TOSHIBA	1	1
010	43096201	BUSHING	2	2
011	375J1701	COMPRESSOR DW422A3F-10M (R134a)	1	1
012	43049739	CUSHION, RUBBER	3	3
013	43F97212	NUT	7	7
014	43F50407	THERMOSTAT, BIMETAL	1	1
015	43F63317	THERMOSTAT, HOLDER	1	1
016	43160683	LEAD COMPRESSOR	1	1
017	43148170	ACCUMULATOR, 2.5L	1	1
018	43149351	SOCKET, 6.35	2	2
019	37547765	JOINT, CHECK	2	2
020	4314N175	COIL, PMV, EFM-MD12TF-4 (PMV2)	1	1
021	43146729	VALVE, PMV, EDM-BA0YGTF-1 (PMV2)	1	1
022	4314Q051	STRAINER, 12.7	1	1
023	4314J581	HEAT EXCHANGER, (W-REF)	1	1
024	37551735	SWITCH, FLOW	1	1
025	4314J582	HEAT EXCHANGER, (REF)	1	1
026	4314N098	COIL-PMV, EFM-MD12TF-3 (PMV1)	1	1
027	43146723	VALVE, PMV, EDM-B60YGTF-1 (PMV1)	1	1
028	43147664	STRAINER, 9.52	1	1
029	43049776	SOCKET, 9.52	1	1
030	43149355	NUT,FLARE, 9.52	1	1
031	43F47609	BONNET, 9.52	1	1
032	43149354	SOCKET, 15.88	1	1
033	43149352	NUT,FLARE, 15.88	1	1
034	43194029	BONNET, 15.88	1	1
035	43107215	HOLDER, SENSOR	1	1
036	43F19904	HOLDER, SENSOR (TS)	6	6
037	37550757	SENSOR ASSY, HP, NSK-BH038F460	1	1
038	43150405	SENSOR ASSY, LP, NSK-BH038F460	1	1
039	37551739	SWITCH, PRESSURE, ACB-1UB117W	1	1
040	43F32441	NIPPLE, DRAIN	1	1
041	431S8358	OWNER'S MANUAL	1	
042	431S8359	OWNER'S MANUAL		1

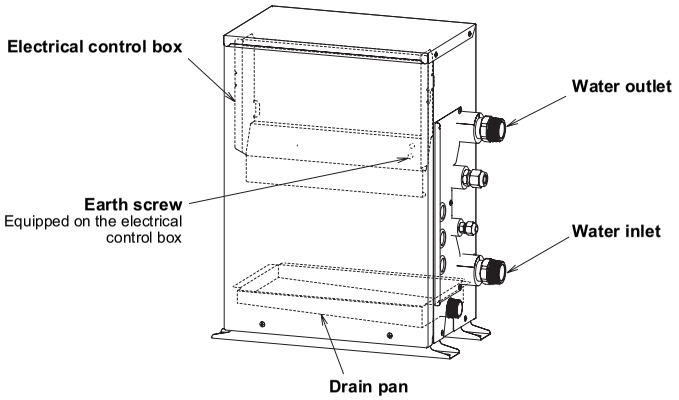
E-Parts



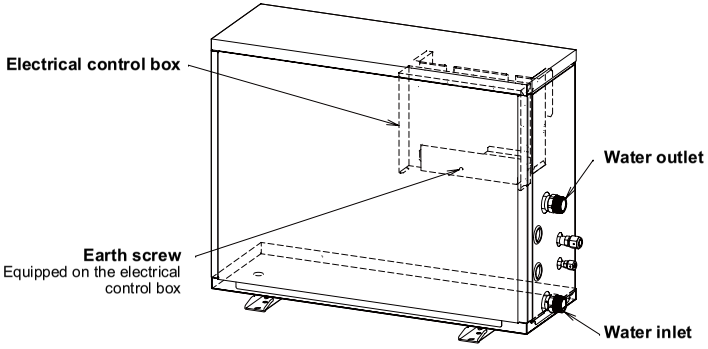
Location No.	Part No.	Description	Q'ty/Set	MMW-AP0481CHQ
			-E	-TR
401	4316V672	P.C.BOARD ASSY, MCC-1628 (I/F)	1	1
402	4316V673	P.C.BOARD ASSY, MCC-1643 (CONTROL)	1	1
403	4316V674	P.C.BOARD ASSY, MCC-1705 (IPDU)	1	1
404	43160567	TERMINAL BLOCK, 3P, 30A	1	1
405	43160561	TERMINAL, 4P	1	1
406	43160548	TERMINAL, 6P	1	1
407	43158243	REACTOR, CH-101	1	1
408	37550761	SENSOR ASSY, TD (F6)	1	1
409	43150404	SENSOR ASSY, TS (F6)	1	1
410	43050425	SENSOR ASSY, TE (F6)	1	1
411	43150320	SENSOR ASSY, TC1 (F4)	1	1
412	43150376	SENSOR ASSY, TCJ (F6)	1	1
413	43150403	SENSOR ASSY, TA (TWI) (F6)	1	1
414	43150402	SENSOR ASSY, TC2 (TWO) (F6)	1	1
415	43163059	SPACER(BUSH)	1	1
416	43163066	SPACER(COLLAR)	1	1
417	43F63248	SUPPORTER, ASSY	1	1

2 Part names

■ Mid temperature Hot Water Module



■ High temperature Hot Water Module



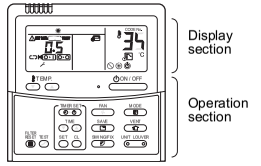
3 Part names and functions of the remote controller

3-1. Standard remote controller (RBC-AMT32E)

■ Display section

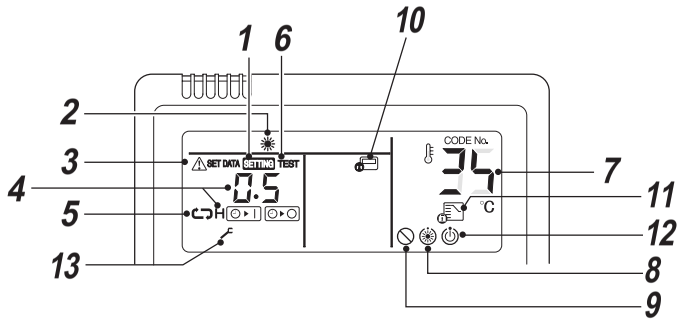
All indicators are displayed in the display example below.
Actually, only the selected options will be displayed.

- SETTING blinks on the display of the remote controller the first time the power switch is turned on.
- The initial settings progress while SETTING is blinking. Start to use the remote controller after SETTING has disappeared.



NOTE

The LCD may temporarily be blurred due to static electricity.



1 **SETTING indicator**
Displayed when setting the timer or other functions.

2 **Operation mode indicator**
Indicates the operation mode selected.

3 **Check code indicator**
Displayed when the protective device activates or a trouble occurs.

4 **Time display**
Indicates time concerning the timer.
(Indicates a check code when a trouble occurs)

5 **Timer mode indicator**
Displays the timer mode.

6 **TEST run indicator**
Displayed during test run.

7 **Set temperature display**
The selected set temperature is displayed.

8 **Pre-heat indicator**
Displayed when defrost cycle is initiated.

9 **No function indicator**
Displayed when the function requested is not available on that model.

10 **Central control indicator**
Displayed when the air conditioner is controlled centrally and used with central control devices such as the central remote controller.
If the use of the remote controller is prohibited by the central control, blinks when the ON/OFF, MODE, or TEMP. button on the remote controller is pushed, and the buttons do not function.
(Settings that can be configured on the remote controller differ depending on the mode of the central control. For details, read the Owner's Manual of the central remote controller.)

11 **Operation mode controlled indicator**
Displayed when the operation mode is restricted.

12 **Operation ready display**
This display appears on some models.

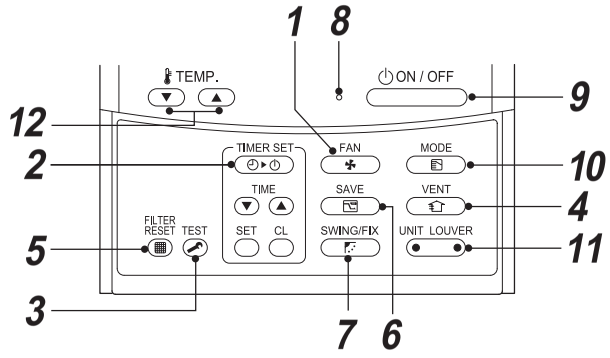
13 **Service display**
Displayed while the protective device works or a trouble occurs.

⚠ CAUTION

Remote controller sensor cannot be used for the hot water module. Remote controller sensor has no function when remote controller is connected to the hot water module.

■ Operation section

Once the settings have been configured, all you need to do is push the ON / OFF button from then on.



1 **FAN button (Fan speed select button)**
No function.

2 **TIMER SET button (Timer set button)**
Use to setup the timer.

3 **TEST button (TEST button)**
Use only for service.
(During normal operation, do not use this button.)

4 **VENT button**
No function.

5 **FILTER RESET button (Filter reset button)**
No function.

6 **SAVE button (Power save operation)**
No function.

7 **SWING/FIX button**
No function.

8 **Operation lamp**
Lights up during running.
Blinks when a trouble occurs or the protective device activates.

9 **ON / OFF button**
Turns on the unit when pushed, and turns off when pushed again.

10 **MODE button (Operation mode select button)**
Heating mode is only available. Only heating symbol is displayed.

11 **UNIT LOUVER button (Unit / Louver select button)**
UNIT button:
No function.
LOUVER button:
No function.

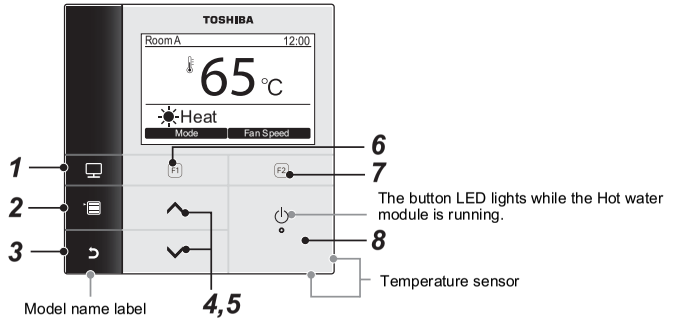
12 **TEMP. button**
Adjusts the set temperature.
Select the desired set point by pushing TEMP. ▼ or TEMP. ▲

3-2. Wired remote controller (RBC-AMS55E-ES/EN)

<Only for High temperature Hot Water Module>

Refer to Owner's Manual of RBC-AMS55E-ES/EN for the detailed operation method.

- **Only High temperature Hot Water Module can operate with the RBC-AMS55E-ES/EN remote controller.**



1 **[MONITOR] button**
Displays the monitoring screen.

2 **[MENU] button**
Displays the menu screen.
For menu items, refer to following table.

3 **[CANCEL] button**
Functions as indicated on the screen, such as returning to the previous menu screen.

4 **[∧] button**
During normal operation: adjusts the temperature.
On the menu screen: selects a menu item.

5 **[∨] button**
During normal operation: adjusts the temperature.
On the menu screen: selects a menu item.

6 **[F1] button**
Varies its function according to the setting screen.

7 **[F2] button**
Varies its function according to the setting screen.

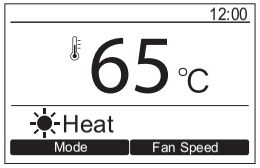
8 **[ON/OFF] button**

Menu items		High temperature Hot Water Module	
		Available function	No function
1	Wind Direction		✓
2	Individual louver		✓
3	Louver setting		✓
4	Off reminder timer	✓	
5	Schedule timer	✓	
6	Night operation	✓	
7	Filter sign		✓
8	Auto grille		✓
9	Energy saving		✓
10	Initial setting		✓
11	Ventilation		✓
12	Soft cooling setting		✓
13	Occupancy sensor		✓
14	Power consumption		✓
15	Information	✓	

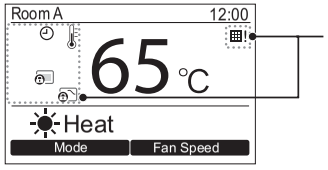
Switching between the normal display and detailed display

Push and hold the [CANCEL] button and [MONITOR] button at the same time for more than 4 seconds to switch the display mode.
The normal display mode is selected as a factory default setting.

Normal display mode (factory default)



Detailed display mode



Icons appear on the screen when the detailed display mode is selected.

▼Icon list

	Shows the central control device prohibits the use of the remote controller		Shows a timer function is activated.
	Shows operation switching control is in progress.		

4 Basic operation

When you use the hot water module for the first time or change the settings, follow the procedures below.
From next time, pushing the ON / OFF button starts running of the hot water module with the chosen settings.

■ Preparation

Turn on the power switch

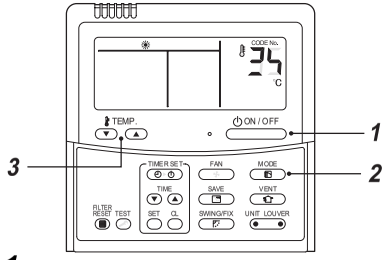
- When turned on, the separation line appears and SETTING blinks on the remote controller display.

* **The remote controller will not work for about 1 minute after turning on the power. This is not a malfunction.**

REQUIREMENT

- Keep the power switch turned on during use.
- When you resume using the hot water module after a long period of disuse, turn on the power switch at least 12 hours before starting running.

■ Operations



1 Push the ON / OFF button.
The operation lamp lights up.

2 Push the "MODE (MODE) " button to select a operation mode.
Only heating symbol is displayed. Heating mode is only available.

☀ Heating

3 Push the "TEMP. (▼) (▲) " buttons.
Push (▲) to increase the temperature, and (▼) to decrease the temperature.

	Operation mode	Setting range	Factory default
Mid temperature Hot Water Module	HEAT	25 to 50 °C	35 °C
High temperature Hot Water Module	HEAT	50 to 82 °C	65 °C

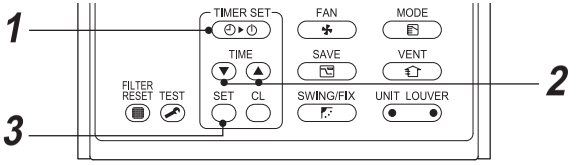
4 Push the ON / OFF button to stop running.
The operation lamp turns off.

5 Timer operation

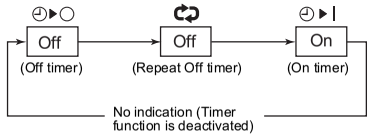
Select a timer type from the following three: (Max. 168 hours)

OFF timer	: Stops running after the specified period.
Repeat-OFF timer	: Stops running after the specified period every time you use the hot water module.
On timer	: Starts running after the specified period.

■ Setting the timer



1 Push the TIMER SET button.
Each time you push the button, the timer mode and indication change in the following order:



- SETTING and the time indicator blink.

2 Push the TIME (▼) (▲) buttons to set the period of time until the timer actions.

- The time setting increases in 0.5-hour (30-minute) increments each time you push (▲). The setting increases in 1-hour increments if it is over 1d (24 hours). The maximum is 7d (168 hours).
  On the remote controller, settings between 0.5h and 23.5h (*1) are displayed as is.
  If it is over 24 hours (*2), the days and hours appear.
- The time setting decreases in 0.5-hour (30-minute) decrements (0.5 hours to 23.5 hours) or 1-hour decrements (24 hours to 168 hours) each time you push (▼).

Example of remote controller display

- **23.5 hours (*1)**

- **34 hours (*2)**

1d indicates 1 day (24 hours).
10h indicates 10 hours. (Total: 34 hours)

3 Push the SET button.
SETTING disappears, the time indication is displayed, and (▶|) or (○▶○) display flashes.
(When using the ON timer, all indications other than the time and (▶|) turn off.)

■ Cancelling the timer

1 Push the button.
The timer indicator disappears.

NOTE

When using Repeat OFF timer, pushing the ON / OFF button after stopping by the timer starts running again and the timer will stop the running again after the specified period.

6 Installation

■Location

- Install a hot water module indoor.
- Avoid installing near machines emitting high frequency waves.
- Not suitable for chemical plants such as liquefied carbon dioxide refrigerant plants.
- Do not install the hot water module in locations where iron or other metal dust is present. If iron or other metal dust adheres to or collects on the interior of the hot water module, it may spontaneously combust and start a fire.
- A failure may occur in certain locations such as the following:
  - Areas with large amount of oil droplets (including machine oil) or vapors
  - Salty areas near oceans, etc.
  - Hot springs emitting sulfidizing gas, etc.
  - Heavily acidic or alkaline places.

  Special maintenance or parts are required for use in the above places. For details, contact the dealer where you purchased the product.
- Leave an enough space around the air intake and discharge of the outdoor unit so that the ventilation is not restricted.
- Avoid places where strong wind may blow against the air intake and discharge of the outdoor unit.
- Attach a snow stand, snow hood, etc. to the outdoor unit for use in snowfall areas. For details, contact the dealer where you purchased the product.
- Make sure drain water from the outdoor unit and the hot water module are emitted into places with good drainage.
- Keep a distance of at least 1 m between the hot water module / remote controller and a TV or radio. Failure to observe this precaution may cause visual disturbance or noise.
- Leave a distance of at least 1.5 m between the hot water module and a fire alarm. If this precaution is not observed, the alarm may not work properly or detect fire in case of fire.

■Be careful of operation sounds

- Locate the unit in a place secure enough so that the sounds and vibrations do not increase.
- If something is placed near the air discharge of the outdoor unit, noise may increase.
- Be careful not to disturb your neighbors with cool / heat air or noise coming from the air discharge of the outdoor unit.
- Do not install the Hot water module in locations where the operation sound may cause a disturbance. (Especially at the boundary line with a neighbor, do not install the Hot water module in locations where considering the noise.)
- Location such as living rooms and bed rooms where you can easily be bothered by noise. Noise may become a problem.

7 Notes on operations and performance

■Check before operation

- Turn on the power switch at least 12 hours before starting operation.
- Make sure the earth wire is securely connected.

■Defrosting during heating

- If frost falls on the outdoor unit during heating, defrosting is automatically performed (for approximately 2 - 10 minutes) to increase the heating effect.
- The Hot water module keeps operating the pump during defrosting.
- The hot water module stops the compressor operation during defrosting.
  (For High temperature Hot water module type.)

■3-minute protection

The outdoor unit will not operate for approximately 3 minutes after the air conditioner (including hot water module) has been immediately restarted after stopping, or the power switch has been turned on. This is to protect the system.

■Power failure

- In the case of a power failure, all operations stop.
- To resume operations, push the ON/OFF button.

■Protective device (High pressure switch)

The high pressure switch stops the air conditioner (including hot water module) automatically when excessive load is applied to the air conditioner system. If the protective device activates, the unit's running stops and the operation lamp blinks.
When the protective device activates, the 🔧 indicator and the check code are displayed on the remote controller.

The protective device may activate in the following cases:

During cooling
- When the air intake or air discharge of the outdoor unit is blocked.
- When strong wind blows continuously against the air discharge of the outdoor unit.

During heating
- When dust or dirt is excessively adhered to the strainer (locally procured) of water pipe.
- When the water flow rate is lower.

NOTE

When the protective device activates, turn off the power switch, remove the cause, and then restart running.

■Protective operations (For High temperature Hot Water Module)

When the water temperature is low, the hot water module stops.

■Cooling / Heating operations

<Connecting to SMMS-e>

Each unit can be controlled individually. However, indoor units connected to the same outdoor unit cannot perform cooling and heating simultaneously.
When you attempt simultaneous operation, hot water module performing heating are stopped, and the running preparation indicator ⏻ is displayed on the remote controller.
An indoor unit performing cooling continues running.
When you attempt an operation without the configured settings, the running preparation indicator ⏻ is displayed on the remote controller and operation stops.
If operation is fixed to cooling or heating by the air conditioner administrator, only the configured settings apply to the operation.

<Connecting to SHRM-e>

- If the Standard indoor unit is used at outside temperature out of the operating conditions, safety protection may operate, which may cause cooling or heating not to operate.
  At that time, "❁" Pre-heat indicator lights on the operation section.

■ Characteristics of heating

- When the outside temperature increases, the outdoor unit may stop.
- When the outside temperature increases, the hot water module can operate while other indoor units may not operate heating but can operate cooling. (For High temperature Hot Water Module type.)
- When indoor unit and Hot water module are simultaneously operated under the low outside temperature, operation start of the indoor unit may be delayed.

■ Characteristics of simultaneously heating or cooling (SHRM-e)

- When the outside temperature lower during operation, the outdoor fan may stop.

8 Maintenance

⚠WARNING

For daily maintenance, make sure to ask the qualified service person particularly following models as the maintenance requires high-place work;

■ Cleaning the hot water module and remote controller

- Ask qualified service person to clean the hot water module for the models listed in the warning on the top of this chapter.
- Wipe with a dry, soft cloth.
- Do not use benzine, thinner, scouring powder, chemical cloth, etc. as those may cause deformation or breakage.

■ If unused for over a month

- Before a long period of none use, purge the water out of the pipes and thoroughly let them dry. (The water in piping freezes in winter.)
- Turn off the main power switch.

■ Periodic inspection

- After being used for a long period of time, the parts may deteriorate or malfunction, or the drainage may worsen, due to heat, moisture, dust, or general usage.
- In addition to the maintenance, it is recommended that you have a inspection (charges apply) performed by the dealer where you purchased the unit, etc.

■ Before the operating season

Ask a qualified service person to clean the drain pan.

⚠CAUTION

Clean the drain pan

Without cleaning, the drain pan may be filled with waste, and water may overflow onto the floor.

9 Troubleshooting

When the following symptoms are found, check the points described below before asking repair servicing.

	Symptom		Cause
It is not a failure.	Outdoor unit	• White misty cold air or water is out.	• Fan of the outdoor unit stops automatically and performs defrost operation.
		• Sometimes, noise of air leak is heard.	• Solenoid valve works when defrost operation starts or finishes.
	Hot water module	• "Swish" sound is heard sometimes.	• When the operation has started, during the operation, or immediately after the operation has stopped, a sound such as water flows may be heard, and the operation sound may become larger for 2 or 3 minutes immediately after the operation has started. They are flowing sound of refrigerant or draining sound of dehumidifier.
		• "⏻" indication is lit.	• When heating operation cannot be performed because another indoor unit performs cooling operation. (SMMS-e only) • Is outside temperature out of operation temperature range?
		• "" indication is lit.	• When the manager of the air conditioner or the hot water module has fixed the operation to COOL or HEAT, and an operation contrary to the setup operation is performed.
		• Sound is output from the stand by hot water module.	• Since refrigerant is flowed temporarily to prevent stay of oil or refrigerant, sound of flowing refrigerant may be heard when hot water module operates in HEAT mode.
	Pump, Line heater	• The pump and line heater operates automatically during hot water module is stand by.	• The pump and line heater operates for frost protection of water heat exchanger, when water temperature decreases or outdoor unit start operation or refrigerant (oil) recovery control.
		• When power of the hot water module is turned on, "Ticktock" sound is heard.	• Sound is generated when the expansion valve operates when power has been turned on.
		• LCD blurs when it is touched.	• LCD may temporarily blur by static electricity.
Check again.	Operates or stops automatically.		• Is the timer "ON" or "OFF"?
	Does not operate.		• Is it a power failure? • Is the power switch turned off? • Is the power fuse or breaker blown? • Has the protective device operated? (The operation lamp goes on.) • Is the timer "ON"? (The operation lamp goes on.) • Are COOL and HEAT selected simultaneously? "⏻" indication is lit on the display of the remote controller. (SMMS-e only) • Is outside temperature out of operation temperature range? • Is water temperature becoming low at the inlet side of Hot water module? If water temperature at the inlet for Hot water module is low, the Hot water module may sometimes stop to prevent it from freezing.
	Water is not warmed sufficiently?		• Is the water supply or water discharge in water piping obstructed? • Is appropriate temperature on remote controller set? • Is outside temperature out of operation temperature range? • Are indoor unit and Hot water module simultaneously operated in heating? If total operation capacity is large, water may be difficult to be warmed sufficiently.

For proper performance, operate the Hot water module under the following temperature conditions:

Heating operation	Outdoor temperature	: -25* to 28°C (Wet-bulb temperature)
	Room temperature	: 5 to 32°C (Dry-bulb temperature)

* Low ambient heating (-20°C or less) for extended periods of time is not allowed.

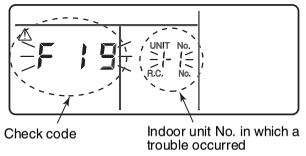
⚠CAUTION

If any of the following conditions occur, turn off the main power supply switch and immediately contact the dealer:

- Switch operation does not work properly.
- The main power fuse often blows out, or the circuit breaker is often activated.
- A foreign matter or water fall inside the hot water module.
- When the hot water module does not operate even after the cause of the protective device activation has been removed.
  (The operation lamp and on the remote controller are flashing. When and a combination of A, E, F, H, L, or P and a number are displayed on the remote controller, also inform a qualified service person of the display content.)
- Any other unusual conditions are observed.

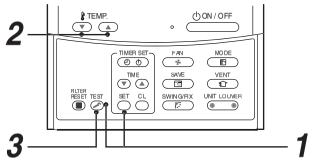
Confirmation and check

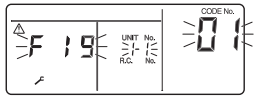
When a trouble occurred in the air conditioner or the hot water module, the check code and the indoor unit No. appear on the display part of the remote controller.
The check code is only displayed during the operation.
If the display disappears, operate the air conditioner or hot water module according to the following “Confirmation of trouble log” for confirmation.



Confirmation of trouble log

When a trouble occurred on the air conditioner or the hot water module, the trouble log can be confirmed with the following procedure. (The trouble log is stored in memory up to 4 troubles.)
The log can be confirmed from both operating status and stop status.



Procedure	Description
1	When pushing SET and TEST buttons at the same time for 4 seconds or more, the following display appears. If [Service check] is displayed, the mode enters in the trouble log mode. • [01: Order of trouble log] is displayed in CODE No. window. • [Check code] is displayed. • [Indoor unit address in which a trouble occurred] is displayed in UNIT No. 
2	Every pushing of [▼ / ▲] button used to set temperature, the trouble log stored in memory is displayed in order. The numbers in CODE No. indicate CODE No. [01] (latest) to [04] (oldest). **⚠CAUTION** Do not push button because all the trouble log of the indoor unit will be deleted.
3	After confirmation, push TEST button to return to the usual display.

1. Check the troubles according to the above procedure.
2. Ask an authorized dealer or qualified service (maintenance) professional to repair or maintain the air conditioner or the hot water module.
3. More details of the check code are explained in Service Manual.

10 Specifications

Model	Sound pressure level (dB(A))	Weight (kg) Main unit
	Heating	
MMW-AP0271LQ-E	*	17.8
MMW-AP0561LQ-E	*	20.3
MMW-AP0481CHQ-E	*	100.0

* Under 70 dB(A)

Hot water module operating conditions

For proper performance, operate the hot water module under the following temperature conditions:

Mid temperature Hot Water Module

Heating operation	Outside temperature (Heat pump)	: -20°C to 19°C (Wet bulb temp.)
	Outside temperature (Heat recovery)	: -25°C to 28°C (Wet bulb temp.)
	Water inlet temperature	: 15°C to below 50°C
Indoor atmosphere	Indoor temperature	: 5°C to 32°C (Dry bulb temp.) : 24 or less (Wet bulb temp.)
	Indoor Relative humidity	: 30% to 85%
	Allowable dew point	: 23 or less (Wet bulb temp.)
⚠CAUTION	Be careful of installation atmosphere. It becomes a cause of failure of a product by dewing or freezing.	

If hot water module is used outside of the above conditions, safety protection may operate.

High temperature Hot Water Module

Heating operation	Outside temperature (Heat recovery)	: -25°C to 28°C (Wet bulb temp.)
	Water inlet temperature	: 15°C to below 80°C
Indoor atmosphere	Indoor temperature	: 5°C to 32°C (Dry bulb temp.) : 24 or less (Wet bulb temp.)
	Indoor Relative humidity	: 30% to 85%
	Allowable dew point	: 23 or less (Wet bulb temp.)
⚠CAUTION	Be careful of installation atmosphere. It becomes a cause of failure of a product by dewing or freezing.	

If hot water module is used outside of the above conditions, safety protection may operate.

13. INSTALLATION MANUAL (EXCERPT)

2 Accessory parts

Part name	Qty	Shape	Usage
Installation Manual	1	This manual	(Hand over to customers) (For other languages that do not appear in this Installation Manual, please refer to the enclosed CD-R.)
Owner's Manual	1	—	(Hand over to customers) (For other languages that do not appear in the Owner's Manual, please refer to the enclosed CD-R.)
CD-ROM	1	—	Installation Manual, Owner's Manual
Heat insulator	1		For heat insulation of Gas pipe connecting section
	1		For heat insulation of Liquid pipe connecting section
Drain nipple	1		
Connector with wire	1		For external connecting to CN703 (I/F P.C. Board)
Clamp filter (large)	1		For external connecting to CN703 (I/F P.C. Board) or CN61 (Control P.C. Board)
Clamp filter (small)	2		
Binding band	3		For fixing clamp filter

3 System control of Hot Water Module

■System able to be combined

The High temperature Hot water module (H-HWM) is connectable to SHRM-e.
In case of connecting at least one Hot water module in SHRM-e system, all of Flow Selector unit type should be Single port type Flow Selector unit (long piping model) or Multi port type Flow Selector unit.
Model name of usable Flow Selector unit: RBM-Y1124FE, RBM-Y1804FE, RBM-Y2804FE, RBM-Y1801F6PE, RBM-Y1801F4PE
The Fresh Air intake type and Air to Air Heat Exchanger with DX Coil cannot be connected with the same refrigerant system.

M-HWM: Mid temperature Hot water module
H-HWM: High temperature Hot water module
HWM: Mid temperature Hot water module and High temperature Hot water module

No.	Item					SHRM-e
1	Indoor connection capacity(*1)	Total	Standard indoor unit + M-HWM + H-HWM			90 - 200% (*2) (*3)
			Standard indoor unit + M-HWM			90 - 135% (*2) (*3)
		Allowed capacity	Standard indoor unit			50 - 120% (*2)
			M-HWM			0 - 67.5% (*2) (*3)
			H-HWM			0 - 100% (*2) (*3)
			M-HWM + H-HWM			0 - 100% (*2) (*3)
2	Maximum indoor unit quantity	Total	Standard indoor unit + M-HWM + H-HWM			32
			Standard indoor unit + M-HWM			32
		Allowed number	Standard indoor unit			2 - 32
			M-HWM			0 - 14
			H-HWM			0 - 12
			M-HWM + H-HWM			0 - 14
3	Height difference	Height difference between outdoor and indoor units **H1** (*4) (Including HWM)		H2 > 3 m	Upper outdoor units	50 m
					Lower outdoor units	30 m
				H2 ≤ 3 m	Upper outdoor units	70 m
					Lower outdoor units	30 m
		Height difference between indoor units (Including HWM) **H2, H4, H5** (*4)		Indoor - Indoor H2	Upper outdoor units	40 m
					Lower outdoor units	15 m (*6)
				HWM - HWM H4	Upper outdoor units	40 m
					Lower outdoor units	15 m (*6)
				Indoor - HWM H5	Upper outdoor units	40 m
					Lower outdoor units	15 m (*6)
		Height between outdoor units **H3**				5 m
		Height difference between indoor units in group control by one Flow Selector unit **H6**				0.5 m

(*1): Ratio of connected total indoor unit capability to outdoor unit capability
(*2): Maximum indoor connection capacity is varied depending on the height difference between indoor unit H2, H4, H5.

Combination of indoor units		SHRM-e
Standard indoor unit + M-HWM + H-HWM	H2, H4, H5 ≤ 15 m	Max. 200% (Standard indoor unit < 120%)
	15 m < H2, H4, H5	Max. 125% (Standard indoor unit < 100%)
Standard indoor unit + M-HWM	H2, H4, H5 ≤ 15 m	Max. 135% (Standard indoor unit < 120%)
	15 m < H2, H4, H5	Max. 125% (Standard indoor unit < 100%)

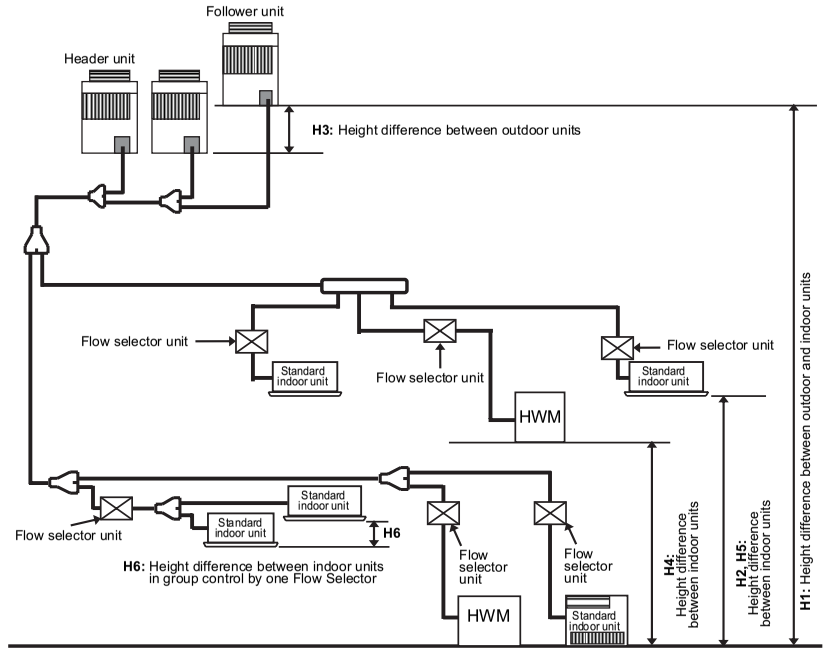
(*3): HWM connecting capacity should be smaller than standard indoor unit.
(*4): As for 44HP to 54HP of SHRM-e, contact our agent.
(*5): When M-HWM and standard indoor units are not operated simultaneously, it is possible up to 40 m.
(*6): When system capacity is greater than 28HP, height difference between indoor units is limited to 3 m.
If the height difference between indoor units exceeds 3 m with a capacity greater than 28HP there may be a case of capacity shortage in cooling.

NOTE

Design the system that total capacity of simultaneous heating operation is 100% or less. If total capacity of simultaneous heating is over 100%, then each indoor units or HWM performance is descended.

▼ Figure 1

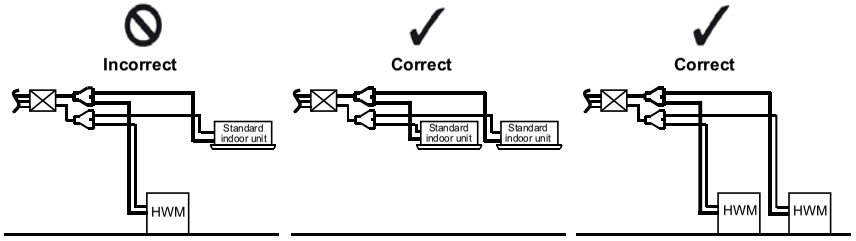
HWM: Mid temperature Hot water module and High temperature Hot water module



H1: Height difference between outdoor units and indoor units (Including HWM)
H2: Height difference between standard indoor units
H3: Height difference between outdoor units
H4: Height difference between HWMs
H5: Height difference between standard indoor units and HWMs

NOTE

It is prohibited to connect the standard indoor unit and the HWM to the same Flow Selector unit in SHRM-e system.



In the case of SHRM-e system including the Hot water module

M-HWM: Mid temperature Hot water module
H-HWM: High temperature Hot water module

SHRM-e	Capacity code of outdoor unit (HP)	Maximum indoor unit quantity	Total capacity code of indoor units (HP) Standard indoor unit + M-HWM + H-HWM		Total capacity code of indoor units (HP) Standard indoor unit + M-HWM	
			H2, H4, H5 ≤ 15m	15m < H2, H4, H5	H2, H4, H5 ≤ 15m	15m < H2, H4, H5
			Total capacity 90 - 200% (Standard indoor unit < 120%)	Total capacity 90 - 125% (Standard indoor unit < 100%)	Total capacity 90 - 135% (Standard indoor unit < 120%)	Total capacity 90 - 125% (Standard indoor unit < 100%)
MMY-MAP0806FT8P	8	18	7.2 to 16.0	7.2 to 10.0	7.2 to 10.8	7.2 to 10.0
MMY-MAP1006FT8P	10	22	9.0 to 20.0	9.0 to 12.5	9.0 to 13.5	9.0 to 12.5
MMY-MAP1206FT8P	12	27	10.8 to 24.0	10.8 to 15.0	10.8 to 16.2	10.8 to 15.0
MMY-MAP1406FT8P	14	31	12.6 to 28.0	12.6 to 17.5	12.6 to 18.9	12.6 to 17.5
MMY-MAP1606FT8P	16	32	14.4 to 32.0	14.4 to 20.0	14.4 to 21.6	14.4 to 20.0
MMY-MAP1806FT8P	18	32	16.2 to 36.0	16.2 to 22.5	16.2 to 24.3	16.2 to 22.5
MMY-MAP2006FT8P	20	32	18.0 to 37.0 (*1)	18.0 to 25.0	18.0 to 25.0 (*2)	18.0 to 25.0
MMY-MAP2206FT8P	22	32	19.8 to 44.0	19.8 to 27.5	19.8 to 29.7	19.8 to 27.5
MMY-MAP2416FT8P	24	32	21.6 to 48.0	21.6 to 30.0	21.6 to 32.4	21.6 to 30.0
MMY-MAP2616FT8P	26	32	23.4 to 52.0	23.4 to 32.5	23.4 to 35.1	23.4 to 32.5
MMY-MAP2816FT8P	28	32	25.2 to 56.0	25.2 to 35.0	25.2 to 37.8	25.2 to 35.0
MMY-MAP3016FT8P	30	32	27.0 to 60.0	27.0 to 37.5	27.0 to 40.5	27.0 to 37.5
MMY-MAP3216FT8P	32	32	28.8 to 64.0	28.8 to 40.0	28.8 to 43.2	28.8 to 40.0
MMY-MAP3416FT8P	34	32	30.6 to 68.0	30.6 to 42.5	30.6 to 45.9	30.6 to 42.5
MMY-MAP3616FT8P	36	32	32.4 to 72.0	32.4 to 45.0	32.4 to 48.6	32.4 to 45.0
MMY-MAP3816FT8P	38	32	34.2 to 72.2 (*1)	34.2 to 47.5	34.2 to 49.4 (*2)	34.2 to 47.5
MMY-MAP4016FT8P	40	32	36.0 to 74.0 (*1)	36.0 to 50.0	36.0 to 50.0 (*2)	36.0 to 50.0
MMY-MAP4216FT8P	42	32	37.8 to 84.0	37.8 to 52.5	37.8 to 56.7	37.8 to 52.5
MMY-MAP4416FT8P	44	32	39.6 to 88.0	39.6 to 55.0	39.6 to 59.4	39.6 to 55.0
MMY-MAP4616FT8P	46	32	41.4 to 92.0	41.4 to 57.5	41.4 to 62.1	41.4 to 57.5
MMY-MAP4816FT8P	48	32	43.2 to 96.0	43.2 to 60.0	43.2 to 64.8	43.2 to 60.0
MMY-MAP5016FT8P	50	32	45.0 to 100	45.0 to 62.5	45.0 to 67.5	45.0 to 62.5
MMY-MAP5216FT8P	52	32	46.8 to 104	46.8 to 65.0	46.8 to 70.2	46.8 to 65.0
MMY-MAP5416FT8P	54	32	48.6 to 108	48.6 to 67.5	48.6 to 72.9	48.6 to 67.5

H2, H4, H5: Height difference between indoor unit (Including HWM)
(*1) 20HP and 40HP: 90-185%, 38HP: 90-190%
(*2) 20HP and 40HP: 90-125%, 38HP: 90-130%

▼ Capacity code of Hot water module

The capacity code of the Hot water module is different from the capacity code of the standard indoor unit.

Hot water module			Mid temperature		High temperature
			MMW-AP0271LQ-E	MMW-AP0561LQ-E	MMW-AP0481CHQ-E
Capacity rank type			027	056	048
Capacity code	Equivalent to HP	(HP)	2.5	5	4.5
Equivalent to capacity		(kW)	7.1	14.0	12.5

▼ Capacity code of standard indoor unit

Capacity rank type			005	007	009	012	015	018	024	027	030	036	048	056	072	096
Capacity code	Equivalent to HP	(HP)	0.6	0.8	1	1.25	1.7	2	2.5	3	3.2	4	5	6	8	10
Equivalent to capacity		(kW)	1.7	2.2	2.8	3.6	4.5	5.6	7.1	8.0	9.0	11.2	14.0	16.0	22.4	28.0

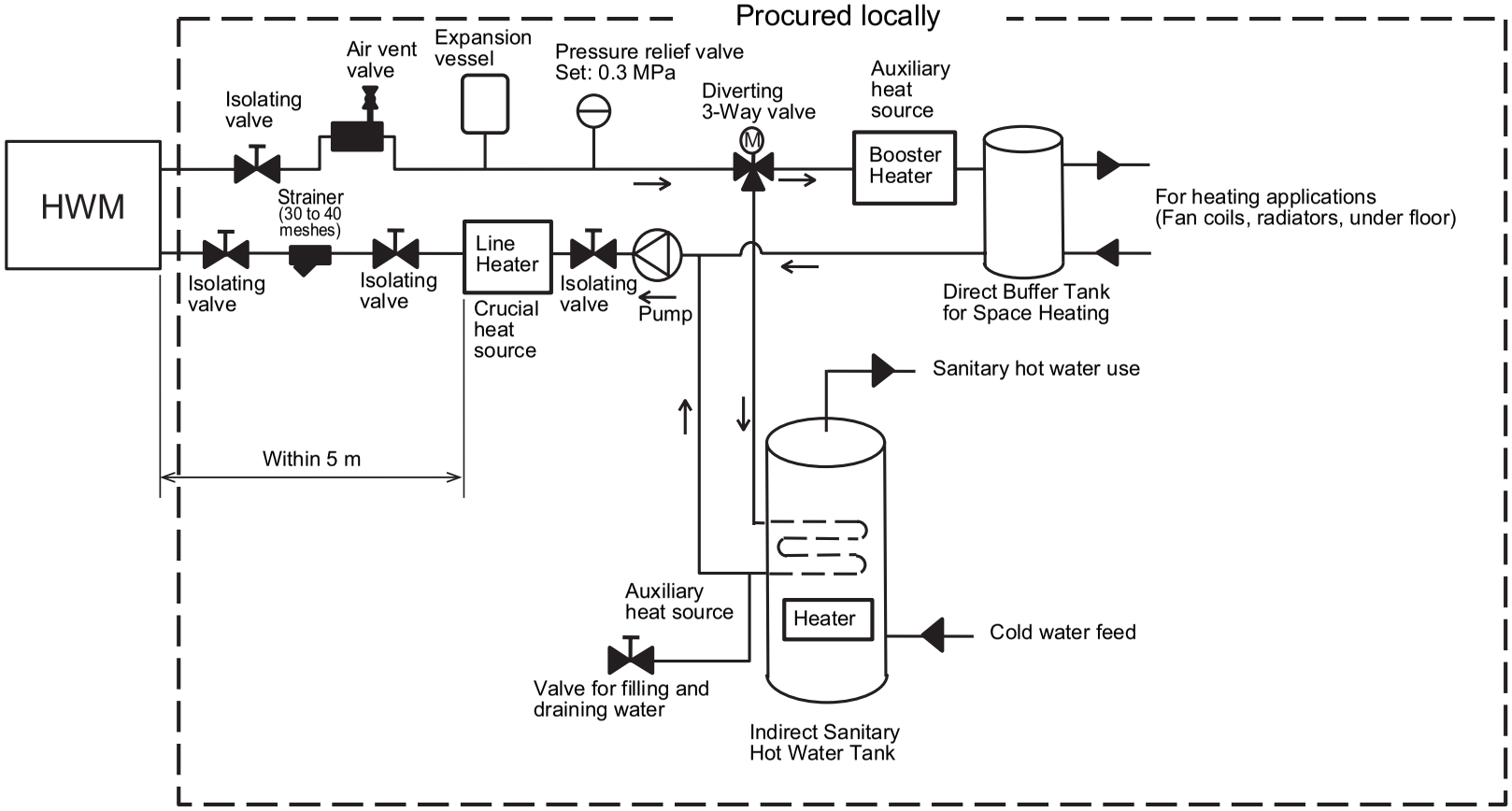
■ Example of Installation for Hot Water Module water piping

GENERAL NOTE

- To install the hot water module, connect the pump (procured locally).
- Do not connect more than one hot water module to one pump.
- Be sure to install one pump to one hot water module as shown in the following examples.
- Be sure to attach the air vent valve (procured locally) vertically at the highest possible place where air tends to rise.

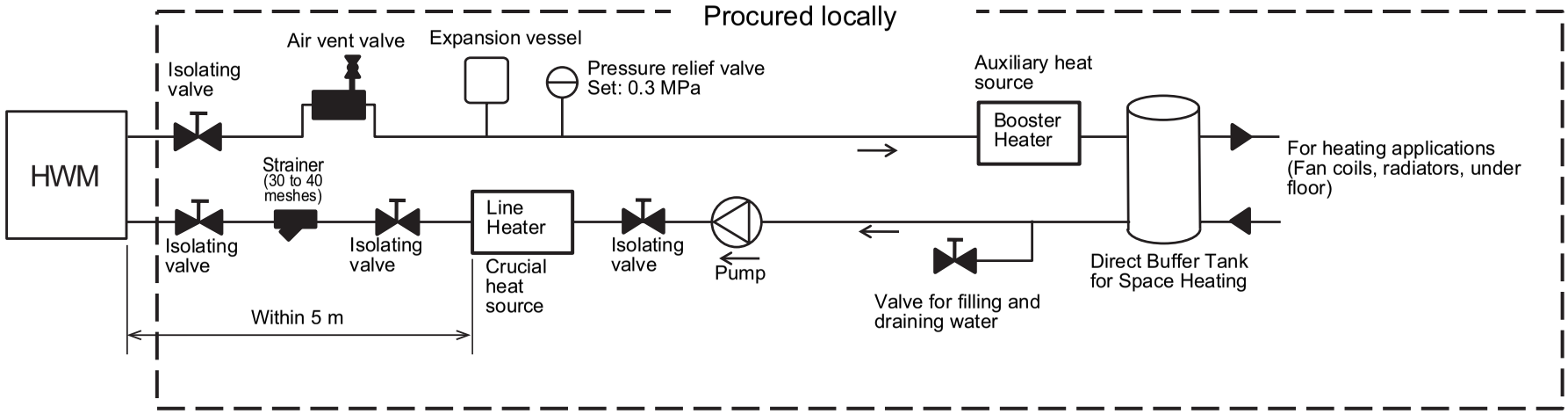
HWM: Hot Water Module

Sample 1.



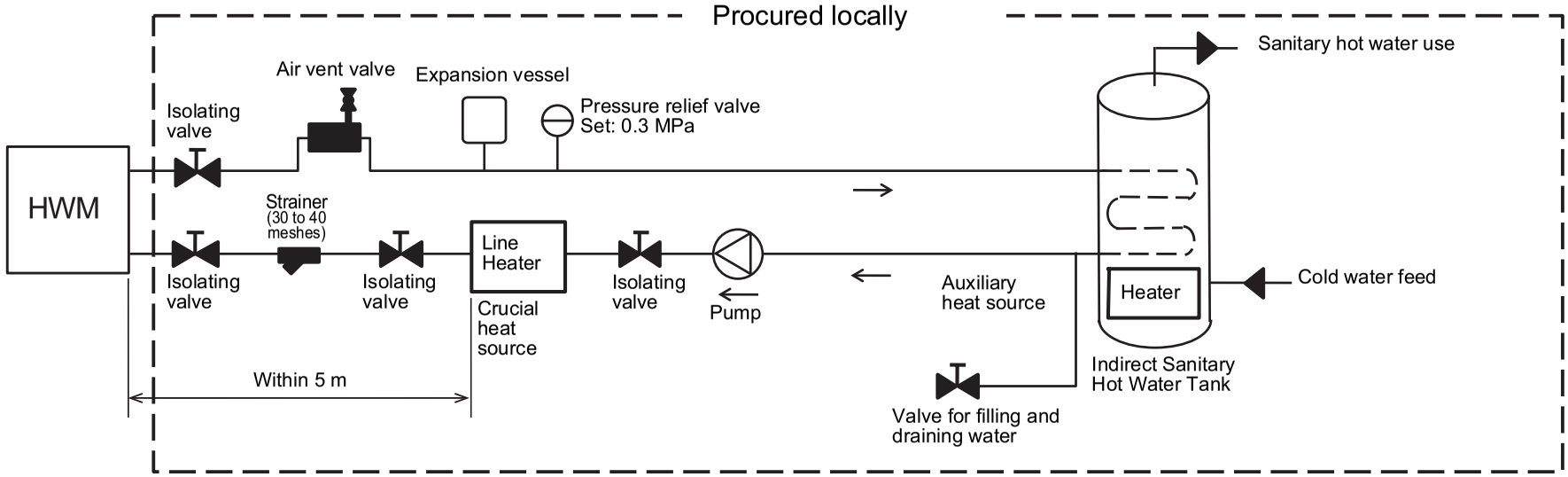
HWM: Hot Water Module

Sample 2.



HWM: Hot Water Module

Sample 3.



4 Selection of installation place

Avoid installing in the following places

Select a location for the indoor unit where the cool or warm air will circulate evenly.
Avoid installation in the following kinds of locations.

- Saline area (coastal area)
- Locations with acidic or alkaline atmospheres (such as areas with hot springs, factories where chemicals or pharmaceuticals are made and places where the exhaust air from combustion appliances will be sucked into the unit).
  Doing so may cause the heat exchanger and other parts to become corroded.
- Locations with atmospheres with mist of cutting oil or other types of machine oil.
  Doing so may cause the heat exchanger to become corroded, mists caused by the blockage of the heat exchanger to be generated, the plastic parts to be damaged, the heat insulators to peel off, and other such problems to result.
- Locations where vapors from food oils are formed (such as kitchens where food oils are used).
  The plastic parts to be damaged, and other such problems to result.
- Locations where an in-house power generator is used for the power supply.
  The power line frequency and voltage may fluctuate, and the hot water module may not work properly as a result.
- On truck cranes, ships or other moving conveyances.
- The hot water module must not be used for special applications (such as for storing food, plants, precision instruments or art works).
  (The quality of the items stored may be degraded.)
- Locations where high frequencies are generated (by inverter equipment, in-house power generators, medical equipment or communication equipment).
  (Malfunctioning or control trouble in the hot water module or noise may adversely affect the equipment's operation.)
- Locations where there is anything under the unit installed that would be compromised by wetness.
  (If the drain has become blocked or when the humidity is over 85%, condensation from the hot water module will drip, possibly causing damage to anything underneath.)
- In the case of the wireless type of system, rooms with the inverter type of fluorescent lighting or locations exposed to direct sunlight.
  (The signals from the wireless remote controller may not be sensed.)
- Locations where organic solvents are being used.
- The hot water module cannot be used for liquefied carbonic acid cooling or in chemical plants.
- Location near doors or windows where the hot water module may come into contact with high-temperature, high-humidity outdoor air.
  (Condensation may occur as a result.)
- Locations where special sprays are used frequently.
- Places where iron or other metal dust is present. If iron or other metal dust adheres to or collects on the interior of the hot water module, it may spontaneously combust and start a fire.
- Locations such as living rooms and bedrooms where you can easily be bothered by noise. Noise may become a problem.

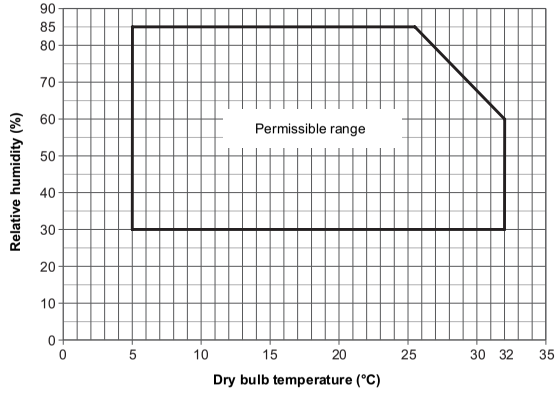
⚠ CAUTION

- Do not install hot water module in a place where water freezes.
- Do not install the hot water module in a place where combustible gas may leak.
- Do not install the hot water module in a place exposed to rain or water.
- Do not install the hot water module near equipment which generates heat.
- Do not install the hot water module to a movable object.
- Do not install the hot water module in a place exposed to vibration.
- The hot water module must be installed in accordance with national wiring regulation.
- The hot water module must not be installed in a high humidity condition area.
- The hot water module must not be installed in a high dusty area.

■ Installation atmosphere

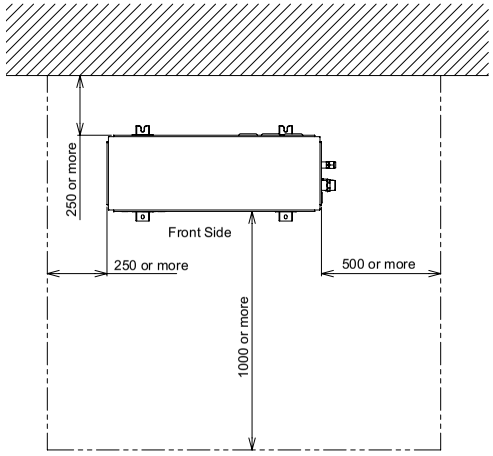
Installation atmosphere of the unit is as follows. Be careful of installation atmosphere.
It becomes a cause of failure of a product by dewing or freezing.

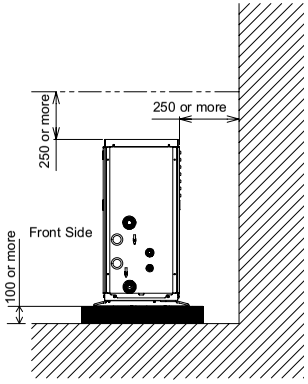
Installation atmosphere	Dry-bulb temp. (°C)	5 to 32
	Wet-bulb temp. (°C)	24 (Max.)
	RH (%)	30 to 85
	Allowable dew point (°C Wet-bulb temp)	23 or less



■ Installation space (Unit: mm)

Reserve sufficient space required for installation or service work.





5 Installation

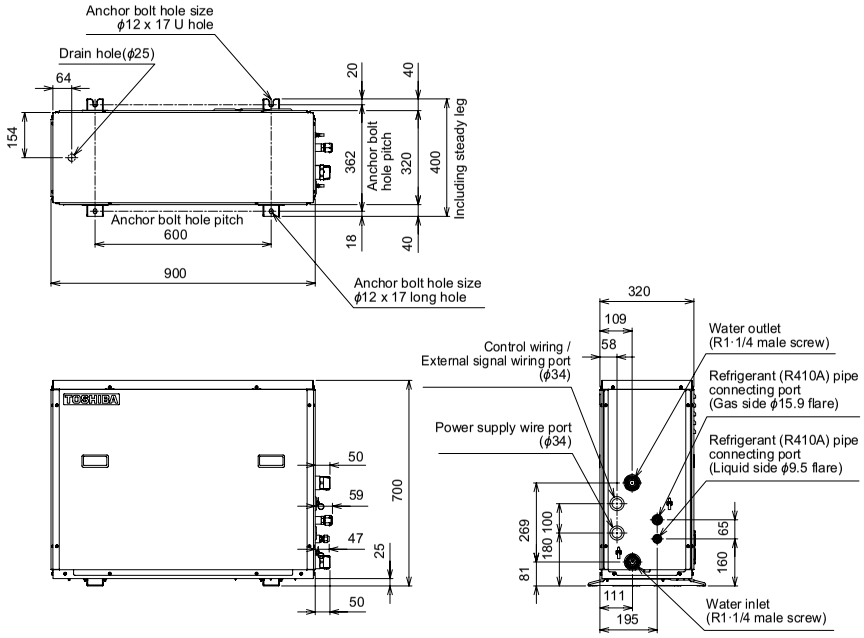
⚠ CAUTION

Strictly comply with the following rules to prevent damage of the hot water modules and human injury.

- Do not put a heavy article on the hot water module or let a person get on it. (Even units are packaged)
- Carry in the hot water module as it is packaged if possible. If carrying in the hot water module unpacked by necessity, use buffering cloth or other material not to damage the unit.
- To move the hot water module, hold the bottom face of the unit only. Do not apply force to the other parts (refrigerant pipe, drain pan, water pipe, foamed parts, resin parts or other parts).
- Carry the package by two or more persons, and do not bundle it with plastic band at positions other than specified.
- To protect yourself from injury, always use PPE (Personal Protective Equipment), that is, wear gloves.
- Install the Hot water module in a place strong enough to withstand the following weights:
  Hot water module weight with no water 100 kg
  Hot water module weight with full water 102 kg

■ External dimensions

(Unit: mm)



■ Fixing the hot water module to floor

⚠ WARNING

- **Be sure to install the hot water module in a place able to bear its weight.**
  If strength is insufficient, the unit may fall down resulting in human injury.
- **Perform specified installation work to protect earthquakes.**
  If the hot water module is imperfectly installed, an accident by falling or dropping may be caused.

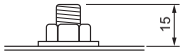
⚠ CAUTION

- Drain water is discharged from the hot water module. (Especially while operating) Install the hot water module in a place with good drainage.
- For installation, be careful of the strength and level of the foundation so that abnormal sounds (vibration or noise) are not generated.

- Be sure to install the hot water module in a place strong enough to withstand its weight. If the base is unstable, reinforce with a concrete base.
- The hot water module must be anchored on a level surface. Use a level to check after installation.
- If the hot water module is installed near a room where noise is a problem, using an anti-vibration stand on the base of the unit is recommended.

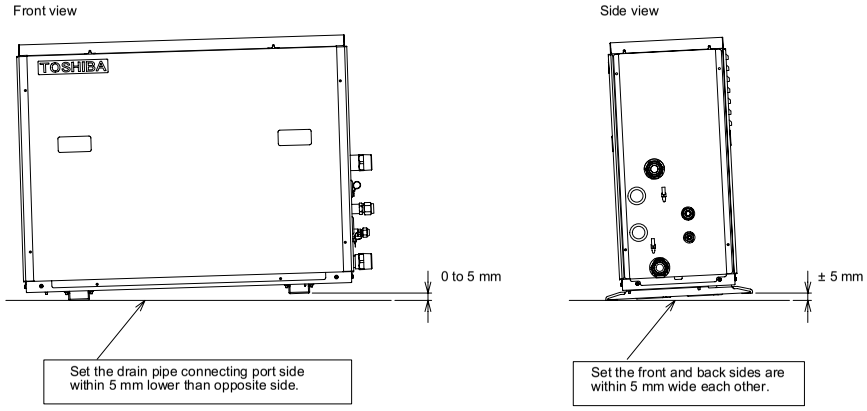
1. Fix the hot water module with M10 anchor bolts at 4 positions. 15 mm projection is appropriate for an anchor bolt.

(Unit: mm)



REQUIREMENT

- Fix the unit in a horizontal position.
  When unit is fixed to slant, it may cause overflow of drainage.
- Install the unit within the dimension according to the figure below.
- Use level gauge or vinyl hose to confirm whether the unit is fix horizontally.



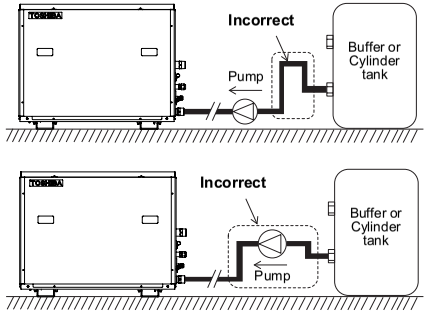
6 Water piping

⚠ WARNING

- Install water pipes according to the regulations of respective countries.
- Install water pipes in the freeze-free place.
- Make sure that water pipes have sufficient pressure resistance. The design pressure is 1.0 MPa.

⚠ CAUTION

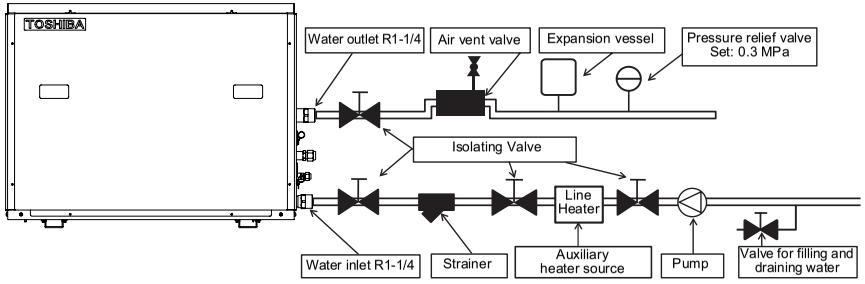
- Do not use zinc plated water pipes. When steel pipes are used, insulate both ends of the pipes.
- Copper pipes are recommended.
- The water to be used must meet the water quality standard specified in EN directive 98/83 EC.
- **After the vacuuming is completed, carry out the following procedure before adding refrigerant.**
  Plate heat exchanger may explode because the water in the plate heat exchanger frozen.
  To avoid this phenomenon, ensure that the VRF system is fully commissioned, including the control system, before filling the water circuit.
- The hot water module and the buffer/cylinder tank must be installed on the same floor height.
- The water piping on the inlet side of the hot water module must not be connected with right-angled loop piping (refer to the figure below).
- When flow switch detects a decrease in the water flow rate, the outdoor unit stops.



■Water piping and line heater installation

- Install a suitably sized expansion vessel, 3 bar (0.3 MPa) pressure relief valve, water drain, and fill valve (procured locally).
  Follow all local regulations for the installation of closed circuit heating systems.
- Make the piping route a closed circuit. (An open water circuit may cause a failure.)
- Before a long period of none use, purge the water out of the pipes and thoroughly let them dry.
  Do not add brine to the circulating water.
- Do not use the water used for the unit for drinking or food manufacturing.
- To insure easy maintenance, inspection, and replacement of the unit, use a proper joint, valve, etc (procured locally) on the water inlet and outlet port.
- Be sure to install a strainer with 30 to 40 meshes (procured locally) on the water inlet pipe. If a strainer is not installed, this may cause impaired performance, or damage to the plate heat exchanger from freezing.
- Install a suitable air vent (procured locally) on the water pipe. After sending water through the pipe, be sure to vent the excess air.
- Be sure to attach the air vent valve vertically at the highest possible place where air tends to rise.
- To avoid water leak, wrap some sealing tape around the screw part.
- Water pipes can get very hot, depending on the preset temperature. Wrap the water pipes with heat insulation (procured locally) to prevent burns.
- In case of installing the line heater (procured locally) on the water inlet side. In addition, position it within 5 m of the water inlet pipe of the hot water module.
- Follow the table below to select a line heater (procured locally) within the range of 40 to 50 % of the hot water module's rated capacity.

Hot water module model name	Capacity of line heater (kW)
MMW-AP0481CHQ-E	5.8 ~ 7.2



■Pipe size, material and insulator

The following specifications for piping work and insulating proess are procured locally.

Model		MMW-	AP048
Connecting pipe (unit side)	Water pipe	Inlet	R 1-1/4
		Outlet	R 1-1/4
Connecting pipes material			Copper pipes are recommended
Insulator			Formed polyethylene foam, thickness: 10 mm or more

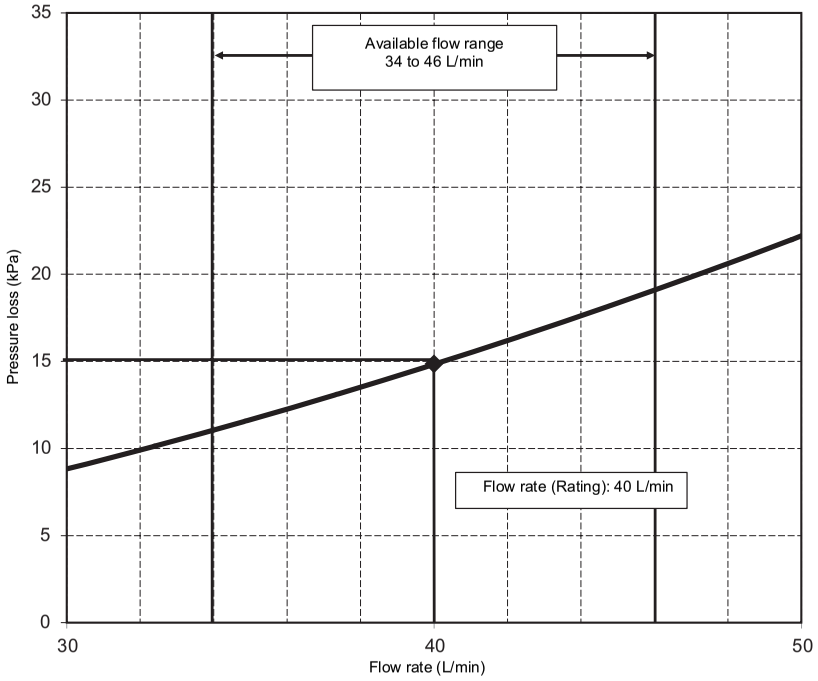
⚠CAUTION

Since the water pipe becomes high temperature (about 90°C), wrap around the pipe with heat insulation (procured locally).

■ Characteristics of hot water module flow rate and pressure loss

The following graph shows the range of flow rates used for the hot water module, and the characteristic pressure losses. Use this as an aid in the local pump procurement process.

048type	Min.	Rated	Max.
Water flow rate (L/min)	34	40	46
Pressure loss (kPa)	12	15	18.5

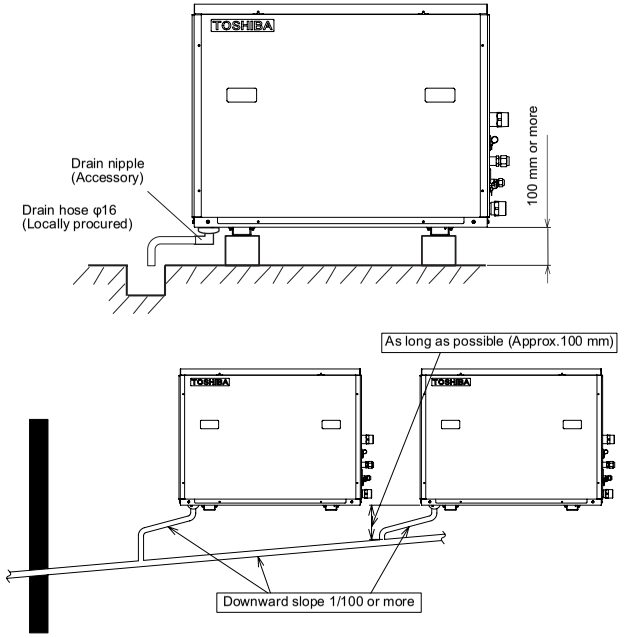


7 Drain piping

⚠CAUTION

• Following the Installation Manual, perform the drain piping work so that water is properly drained. Apply a heat insulation so as not to cause a dew condensation.
Inappropriate piping work may result in water leakage in the room and wet furniture.

Drain piping

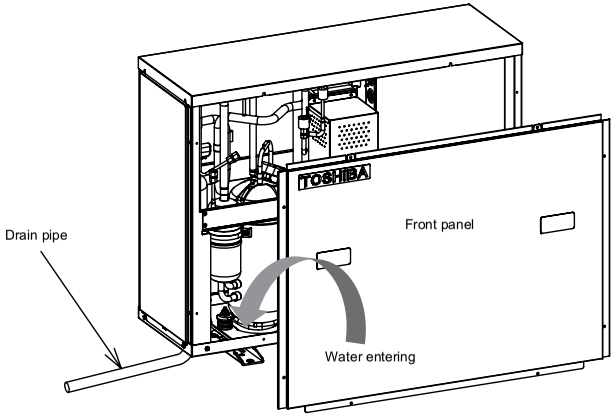


- Connect the drain hose (locally procured) size inner diameter φ16 to the drain nipple (accessory).
- Provide the indoor drain piping with proper heat insulation.
- Provide the area where the pipe connects to the indoor unit with proper heat insulation. Improper heat insulation will cause condensation to form.
- The drain pipe must be sloping downward (at an angle of 1/100 or more), and do not run the pipe up and down (arched shape) or allow it to form traps. Doing so may cause abnormal sounds.
- Install the collective piping as shown in the following figure.
- Do not provide any air vents. Otherwise, the drain water will spout, causing water to leak.
- Do not allow any force to be applied to the connection area with the drain pipe.

■Check the draining

In the test run, check that water drain is properly performed and water does not leak from the connecting part of the pipes. Check draining also when installed in heating period.

Check the water drainage is surely performed at the trial operation.
Check also no water leakage is found at the pipe connecting part.



REQUIREMENT

Enter water gradually using a kettle or a hose from drain pan of the discharge port.

⚠CAUTION

Pour water slowly.
If it is poured urgently, water is spread inside of the indoor unit resulted in a trouble.

8 Refrigerant piping

⚠CAUTION

When the refrigerant pipe is long, provide support brackets at intervals of 2.5 m to 3 m to clamp the refrigerant pipe. Otherwise, abnormal sound may be generated.

Use the flare nut attached with the indoor unit or R410A flare nut.

■Permissible piping length and height difference

They vary depending on the outdoor unit. For details, refer to the Installation Manual attached to the outdoor unit, and this manual (Refer to "3. System control of Hot Water Module").

■Pipe size

Model MMW-	Pipe size (mm)	
	Gas side	Liquid side
AP048	Ø15.9	Ø9.5

■Connecting refrigerant piping

Flaring

1 Cut the pipe with a pipe cutter.

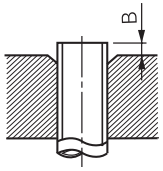
Remove burrs completely. (Remaining burrs may cause gas leakage.)

2 Insert a flare nut around the pipe, and flare the pipe.

Use the flare nut provided with the unit or the one used for the R410A refrigerant. The flaring dimensions for R410A are different from the ones used for the conventional R22 refrigerant. A new flare tool manufactured for use with the R410A refrigerant is recommended, but the conventional tool can still be used if the projection margin of the copper pipe is adjusted to be as shown in the following table.

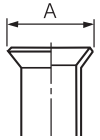
Projection margin in flaring: B (Unit: mm)

Outer dia. of copper pipe	R410A tool used	Conventional tool used
6.4, 9.5	0 to 0.5	1.0 to 1.5
12.7, 15.9		



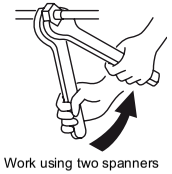
Flaring diameter size: A (Unit: mm)

Outer dia. of copper pipe	A $^{+0}_{-0.4}$
6.4	9.1
9.5	13.2
12.7	16.6
15.9	19.7



* In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that for R22 to adjust to the specified flare size. The copper pipe gauge is useful for adjusting projection margin size.

- The sealed gas was sealed at the atmospheric pressure so when the flare nut is removed, there will no “whooshing” sound: This is normal and is not indicative of trouble.
- Use two wrenches to connect the indoor unit pipe.



Work using two spanners

- Use the tightening torque levels as listed in the table below.

Outer dia. of connecting pipe (mm)	Tightening torque (N•m)
6.4	14 to 18 (1.4 to 1.8 kgf•m)
9.5	33 to 42 (3.3 to 4.2 kgf•m)
12.7	50 to 62 (5.0 to 6.2 kgf•m)
15.9	63 to 77 (6.3 to 7.7 kgf•m)

- Tightening torque of flare pipe connections. Pressure of R410A is higher than that of R22. (Approx. 1.6 times) Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor and outdoor units of the specified tightening torque. Incorrect connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.

⚠CAUTION

Tightening with an excessive torque may crack the nut depending on installation conditions.

■Airtight test / air purge, etc.

For air tightness test, adding refrigerant, refer to the Installation Manual attached to the outdoor unit.

⚠CAUTION

- Do not supply power to the indoor unit and the hot water module until the airtight test and vacuuming are completed. (If the indoor unit or the hot water module is powered on, the pulse motor valve is fully closed, which extends the time for vacuuming.)
- **After the vacuuming is completed, carry out the following procedure before adding refrigerant.**
  Plate heat exchanger may explode because the water in the plate heat exchanger frozen.
  To avoid this phenomenon, add refrigerant before carrying out a water supply to the water pipe system of the Hot Water Module.

■Open the valve fully

Open the valve of the outdoor unit fully.

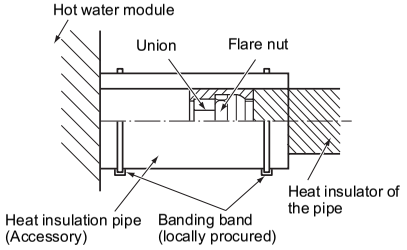
■Heat insulation process

Apply heat insulation for the pipes separately at liquid side and gas side.

- For the heat insulation to the pipes at gas side, use the material with heat-resisting temperature 120 °C or higher.
- To use the attached heat insulation pipe, apply the heat insulation to the pipe connecting section of the hot water module securely without gap.

REQUIREMENT

- Apply the heat insulation to the pipe connecting section of the hot water module securely up to the root without exposure of the pipe. (The pipe exposed to the outside causes water leak.)
- Wrap heat insulator with its slits facing up (ceiling side).



■Installation of remote controller (Sold separately)

For installation of the wired remote controller, follow the Installation Manual attached with the remote controller.

- Pull out the remote controller cord together with the refrigerant pipe or drain pipe.
  Pass the remote controller cord through upper side of the refrigerant pipe and drain pipe.
- Do not leave the remote controller at a place exposed to the direct sunlight and near a stove.

9 Electrical connection

⚠WARNING

- **Use the specified wires for wiring connect the terminals. Securely fix them to prevent external forces applied to the terminals from affecting the terminals.**
  Incomplete connection or fixation may cause a fire or other trouble.
- **Connect earth wire. (grounding work)**
  Incomplete grounding causes an electric shock.
  Do not connect earth wires to gas pipes, water pipes, lightning conductor or telephone earth wires.
- **Appliance shall be installed in accordance with national wiring regulations.**
  Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

⚠CAUTION

- If incorrect / incomplete wiring is carried out, it will cause an electrical fire or smoke.
- Install an earth leakage breaker that is not tripped by harmonics correspondence.
  If an earth leakage breaker is not installed, an electric shock may be caused.
- Use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting wires when peeling them.
- Use the power cord and Inter-connecting wire of specified thickness, type, and protective devices required.
- Do not connect 220 V – 240 V power to the terminal blocks (Ⓤ₁, Ⓤ₂, Ⓐ, Ⓑ) for control wiring and the terminal blocks (COM, S1, S2, S3, S4, S5) for output function. (Otherwise, the system will fail.)
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting wires when peeling them.
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe.
  The coating may melt resulting in an accident.

REQUIREMENT

- For power supply wiring, strictly conform to the Local Regulation in each country.
- For wiring of power supply of the outdoor units, follow the Installation Manual of each outdoor unit.
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe. The coating may melt resulting in an accident.
- After connecting wires to the terminal blocks, provide a trap and fix wires with the cord clamp.
- Run the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the hot water module until vacuuming of the refrigerant pipes completes.

■Power supply wire and communication wires specifications

Power supply wire and communication wires are procured locally.
For the power supply specifications, follow to the table below. If capacity is little, it is dangerous because overheat or burnout may be caused.
For specifications of the power capacity of the outdoor unit and the power supply wires, refer to the Installation Manual attached to the outdoor unit.

Hot water module power supply

- For the power supply of the hot water module, prepare the exclusive power supply separated from that of the outdoor unit and other indoor units.
- Power supply wire specifications: Cable 3-core, **in conformity with 60245 IEC 57.**

▼Power supply

Power supply	220 V – 240 V ~, 50 Hz
Maximum running current	17.5 A
Recommended field fuse	25 A

Control wiring, Centr al controller wiring

- 2-core with non-polarity wires are used for the Control wiring between indoor unit (including hot water module) and outdoor unit and Central controller wiring.
- To prevent noise trouble, use 2-core shield wire.
- The length of the communication line means the total length of the inter-unit wire length between indoor (including hot water module) and outdoor units added with the central control system wire length.

▼Communication line

Control wiring between indoor units (including hot water module), and outdoor unit (2-core shield wire)	Wire size	(Up to 1000 m) 1.25 mm² (Up to 2000 m) 2.0 mm²
Central control line wiring (2-core shield wire)		

Remote controller wiring

- 2-core with non-polarity wire is used for wiring of the remote controller wiring and group remote controllers wiring.

Remote controller wiring, remote controller inter-unit wiring	Wire size: 0.5 mm² to 2.0 mm²

Connecting to SHRM-e	
Total wire length between indoor unit and Flow selector unit (L2+L3)	Up to 200 m
Total wire length between remote controller and Flow selector unit (L1+L2+L3)	Up to 300 m
Maximum wire length of remote controller (L1)	Up to 300 m

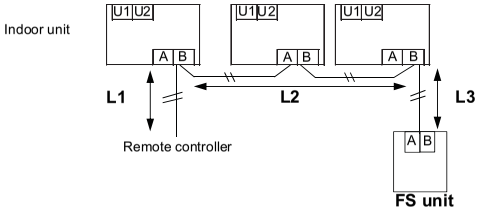
Output signal function wiring

- To prevent noise trouble, use 2-core shield wire.

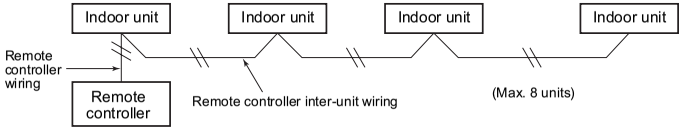
Output function wiring (2-core shield wire)	Wire size	(up to 2 m) 0.5 mm²

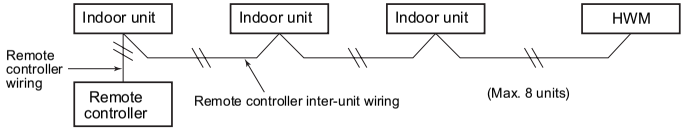
⚠CAUTION

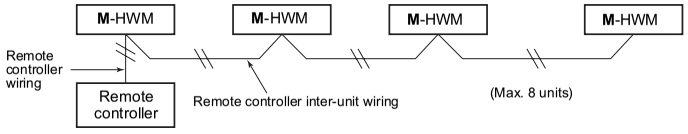
The remote controller wire (Communication line) and AC 220 – 240 V wires cannot be parallel to contact each other and cannot be stored in the same conduits. If doing so, a trouble may be caused on the control system due to noise or other factor.

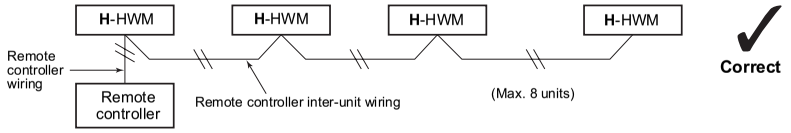


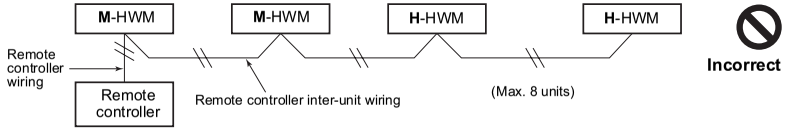
M-HWM: Mid temperature Hot Water Module
H-HWM: High temperature Hot Water Module











(*): In the case of multiple refrigerant systems

NOTE

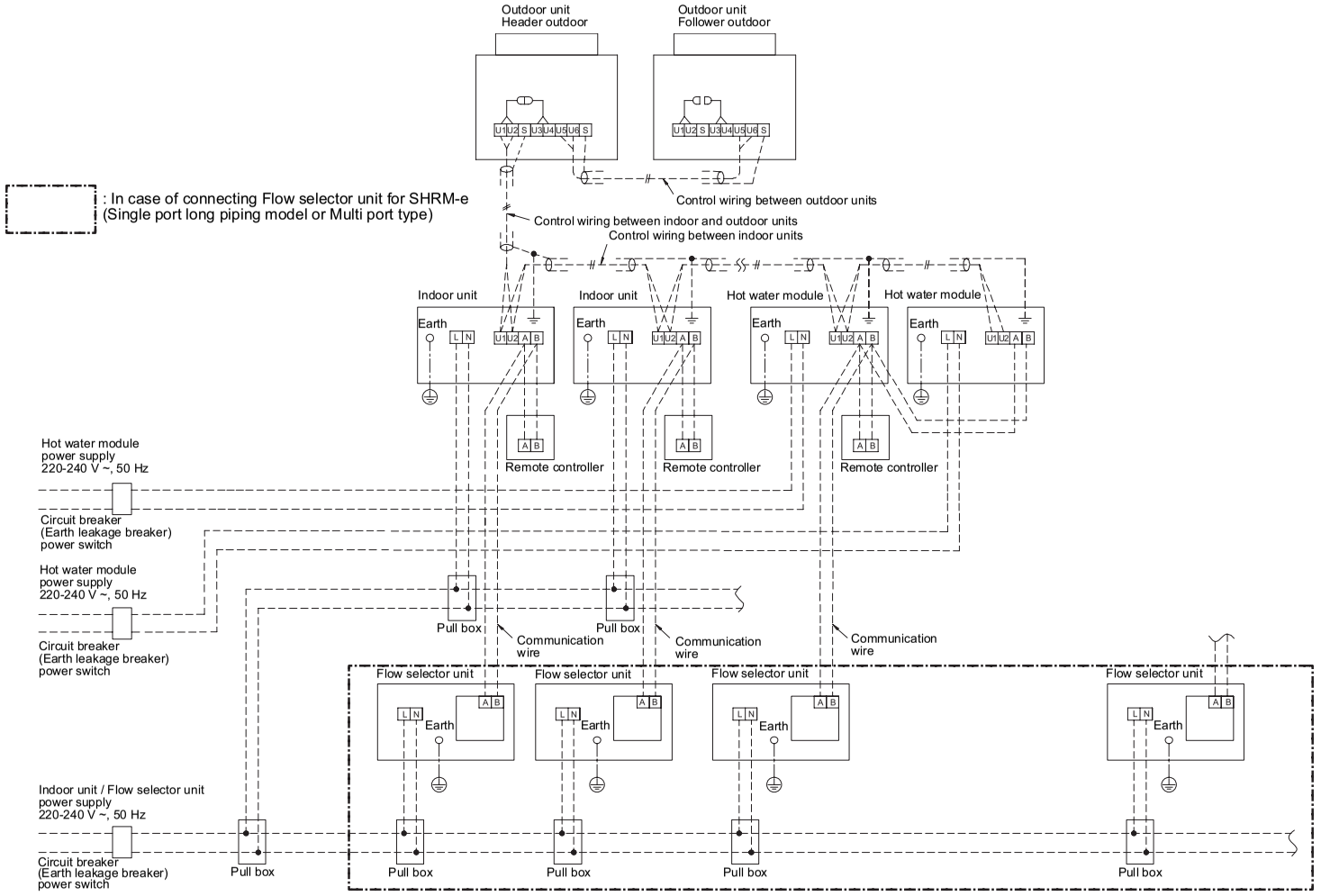
It is not possible to connect any Hot Water Modules and any indoor units together for group control.
It is not possible to connect M-HWM and H-HWM together for group control.

■Wiring between indoor (including hot water module) and outdoor units

NOTE

- An outdoor unit connected with control wiring between indoor (including hot water module) and outdoor units wire becomes automatically the header unit.
- Do not turn off the circuit breaker of the hot water module when the circuit breaker of the system (outdoor unit) is set to the ON position.
- It becomes a cause of a trouble.

▼Wiring example

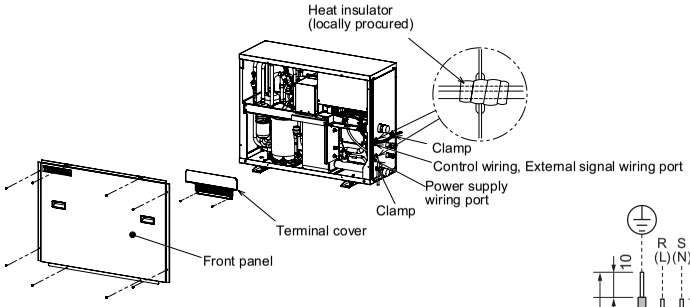


■Wire connection

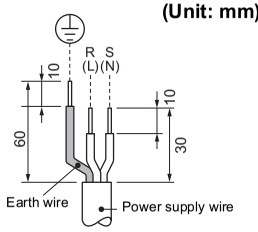
REQUIREMENT

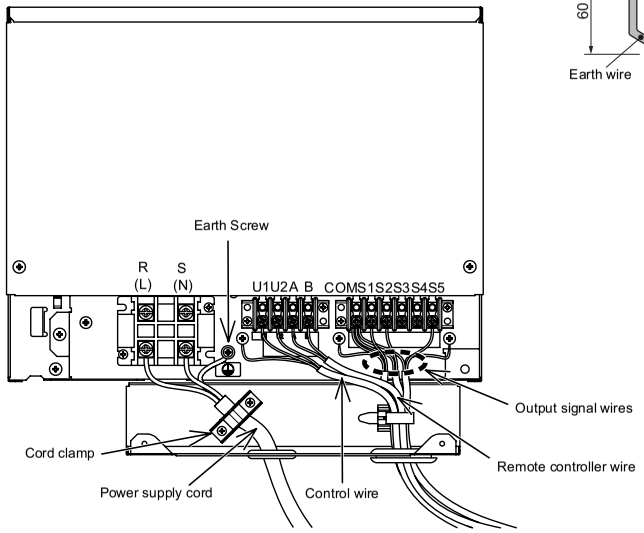
- Connect the wires matching the terminal numbers. Incorrect connection causes a trouble.
- Pass the wires through the bushing of wire connection holes of the hot water module.
- Keep a margin (Approx. 100 mm) on a wire to hang down the electrical control box at servicing or other purpose.
- The low-voltage circuit is provided for the remote controller. (Do not connect the high-voltage circuit)

- Remove the front panel of the hot water module by taking off the mounting screws (8 positions).
- Wrap a heat insulation (locally procured) around the power supply to fill the gap between cord and port cap.
- Wrap a heat insulation (locally procured) around the control wires and external signal wires to fill the gap between cord and port cap.
- Tighten the screws of the terminal block, and fix the wires with cord clamp attached to the electrical control box. (Do not apply tension to the connecting section of the terminal block.)
- Mount the front panel of the hot water module without pinching wires.



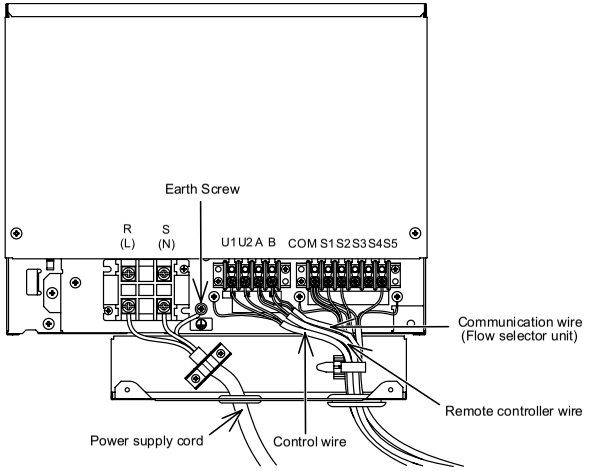
(Unit: mm)





■Wiring for Flow selector unit (FS unit) for SHRM-e

Connect communication wire of FS unit to terminal A, B (no polarity) of Hot Water Module, when the Hot Water Module connects to SHRM-e system.



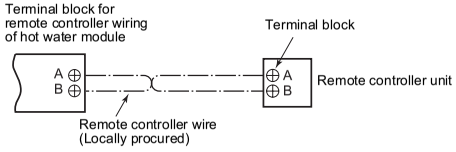
NOTE

- In case of connecting at least one Hot Water Module in SHRM-e system, all of FS units in the system should be Single port type FS unit (long piping model) or Multiport type FS unit.

■Remote controller wiring

- Strip off approx. 9 mm the wire to be connected.

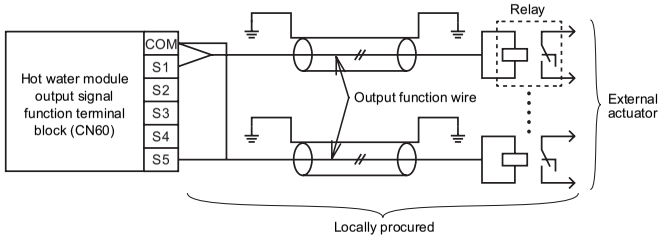
▼Wiring diagram



■ Output signal function wiring

Connect the following output signals from the hot water module.

Terminal block No.	Function	Comments
COM	DC12V (COM)	Common for connector S2 ~ S5
S1	Defrosting output (COM-S1)	DC12V Relay coil is less than 16mA.
S2	Line heater output (COM-S2)	DC12V Relay coil is less than 16mA.
S3	-	-
S4	Heating thermostat ON output (COM-S4)	DC12V Relay coil is less than 16mA.
S5	Pump output (COM-S5)	DC12V Relay coil is less than 16mA.



NOTE

Auxiliary relays (locally procured) must be connected to output signal function wirings to allow connection to the hot water module output signal functions. The maximum current output signal, from each of the output signal function wirings, is 16 mA. Please ensure the rated current of the relay coil is less than 16 mA to avoid damage to the hot water module P.C. board.

▼ Output function wire

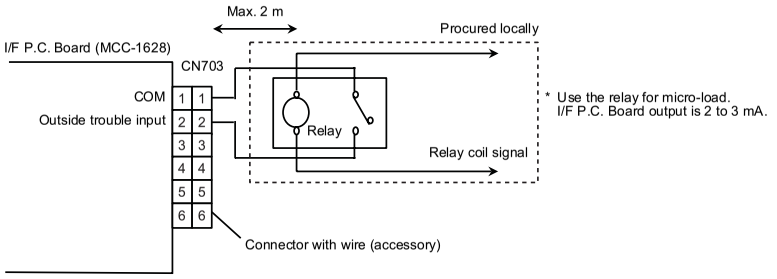
⚠CAUTION

Output signal functions are separated from primary basic insulation.

- To prevent noise trouble, use 2-core shield wire.
- Determine the wire length between the hot water module output signal function terminal block and the relay up to 2 m.
- Locally procure and install protective devices such as the heater and pump.

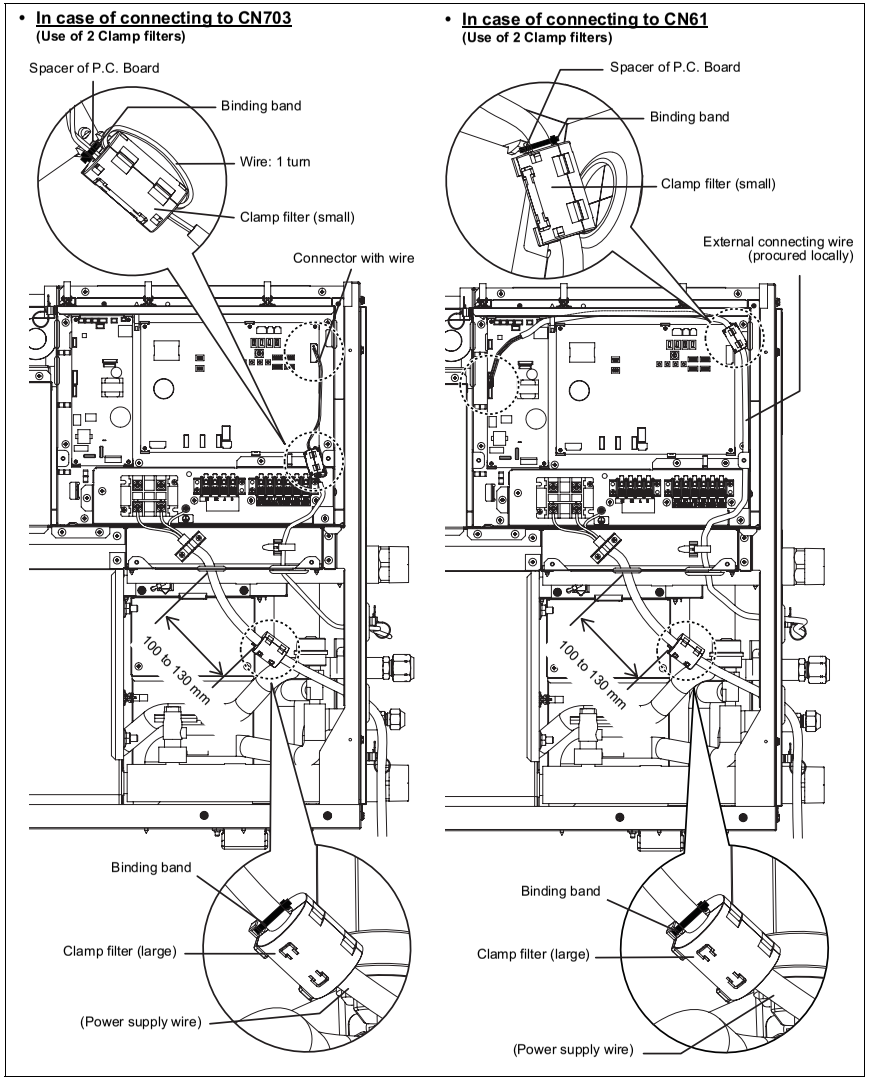
■ Outside trouble input wiring

- In case of connecting the Relay (procured locally) for outside trouble input, connect a connector with wire (accessory) to CN703 on I/F P.C. Board (MCC-1628).
- After signal is input, 3 sec. later : Forced thermostat - OFF
  1 min. later : Check code “L30” (Hot water module is locked)
  (Interlock from outside)



▼ Clamp filter (accessory)

- In case of using external connecting to CN703 on I/F P.C. Board (MCC-1628) or CN61 on Control P.C. Board (MCC-1643), attach the clamp filters (accessory) as following.
- Fix a clamp filter to a spacer of P.C. Board or Power supply wire with a binding band.



■ Address setup

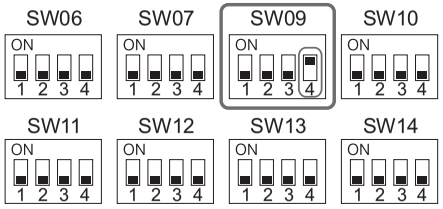
Set up the addresses as per the Installation Manual supplied with the outdoor unit.

⚠ CAUTION

Set the DIP switch 4 of SW09 on the P.C. board of the header outdoor unit "ON". (Factory default is "OFF")

VRF system will be stopped to avoid water freezing when the power supply is disconnected.

Interface P.C. board on the header outdoor unit



10 Applicable controls

REQUIREMENT

When the hot water module is used for the first time, it will take some moments after the power has been turned on before the remote controller becomes available for operations: This is normal and is not indicative of trouble.

- Concerning the automatic addresses (The automatic addresses are set up by performing operations on the outdoor interface circuit board.)
  While the automatic addresses are being set up, no remote controller operations can be performed.
  Setup takes up to 10 minutes (usually about 5 minutes).
- When the power is turned on after automatic address setup
  It takes up to 10 minutes (usually about 3 minutes) for the outdoor unit to start operating after the power has been turned on.

Before the hot water module was shipped from the factory, all units are set to [STANDARD] (factory default). If necessary, change the indoor unit (including hot water module) settings. The settings are changed by operating the wired remote controller.

* The settings cannot be changed using only a wireless remote controller, simple remote controller or group control remote controller by itself so install a wired remote controller separately as well.

■ Group control

In a group control, a remote controller can control up to maximum 8 units.

- The wired remote controller only can control a group control. The wireless remote controller is unavailable for this control.
- For wiring procedure and wires of the individual line (Identical refrigerant line) system, refer to “Electrical Connection” in this Manual.
- Wiring between indoor units in a group is performed in the following procedure.
- Connect the hot water modules by connecting the remote controller wires from the remote controller terminal blocks (A, B) of the hot water module connected with a remote controller to the remote controller terminal blocks (A, B) of the other hot water modules. (Non-polarity)
- For address setup, refer to the Installation Manual attached to the outdoor unit.

■ Remote controller sensor

⚠ CAUTION

Remote controller sensor cannot be used for the hot water module. Remote controller sensor has no function when remote controller is connected to the hot water module.

■ Basic procedure for changing settings

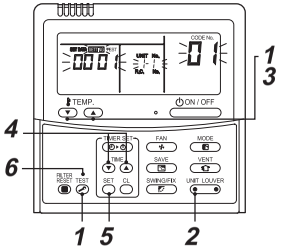
Change the settings while the hot water module is not working. (**Stop the hot water module before making settings.**)

⚠ CAUTION

Set only the CODE No. shown in the following table: Do NOT set any other CODE No.

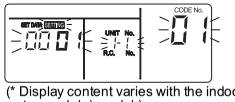
If a CODE No. not listed is set, it may not be possible to operate the hot water module or other trouble with the product may result.

<RBC-AMT32E>



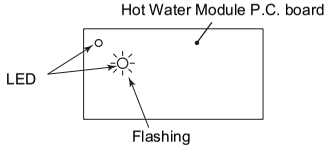
1 **Push and hold TEST button and “TEMP.” ▼ button simultaneously for at least 4 seconds. After a while, the display flashes as shown in the figure. Confirm that the CODE No. is [01].**

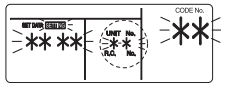
- If the CODE No. is not [01], push TEST button to clear the display content, and repeat the procedure from the beginning. (No operation of the remote controller is accepted for a while after TEST button is pushed.)
  (While hot water modules are operated under the group control, “ALL” is displayed first. When UNIT. LOUVER is pushed, the indoor unit number displayed following “ALL” is the header unit.)



(* Display content varies with the indoor unit (including hot water module) model.)

2 **Each time UNIT. LOUVER button is pushed, hot water module numbers in the control group change cyclically. Select the hot water module to change settings for.**
The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.





3 **Specify CODE No. [✱✱] with “TEMP.” ▼ / ▲ buttons.**

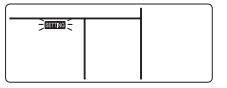
4 **Select SET DATA [✱✱✱✱] with “TIME” ▼ / ▲ buttons.**

5 **Push SET button. When the display changes from flashing to lit, the setup is completed.**

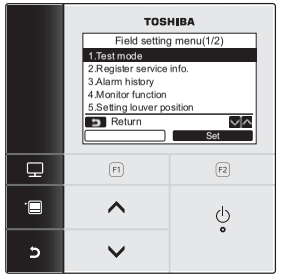
- To change settings of another hot water module, repeat from Procedure **2**.
- To change other settings of the selected hot water module, repeat from Procedure **3**.

Use SET button to clear the settings. To make settings after SET button was pushed, repeat from Procedure **2**.

6 **When settings have been completed, push TEST button to determine the settings.**
When TEST button is pushed, SETTING flashes and then the display content disappears and the hot water module enters the normal stop mode.
(While SETTING is flashing, no operation of the remote controller is accepted.)



<RBC-AMS55E-ES/EN>



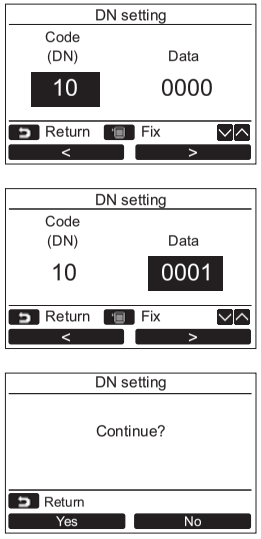
1 **Push the [MENU] button to display the menu screen.**

2 **Push and hold the [MENU] button and the [∨] button at the same time to display the "Field setting menu".**
→Push and hold the buttons for more than 4 seconds.

3 **Push the [CANCEL] button to return.**

Item	Function
1. Test mode	Settings for when performing the test operation after installation
2. Register service info	Registration of information about the contact number for service, model name and serial number of the indoor unit and outdoor unit
3. Alarm history	List of latest 10 alarm data: information of check code, date, time, and unit
4. Monitor function	Monitoring data of sensor temperature, rotating speed of the compressor or other factor.
5. Setting louver position	Change the louver indication setting to match the indoor unit type.
6. Setting timer operation mode	Set whether or not the operation mode can be selected when setting the schedule timer.
7. DN setting	Advanced settings using DN code
8. Reset power consumption data	Resetting the power consumption data saved in the remote controller.

Perform the advanced settings for the air conditioner.
Carry out the setting operation while the indoor unit is stopped. (Turn off the air conditioning unit before starting the setting operation.)



1 **Push the [∧] / [∨] button to select "7. DN setting" on the "Field setting menu" screen, then push the "Set" [F2] F2 button.**
→The fan and louver of the indoor unit operate. When the group control is used, the fan and louver of the selected indoor unit operate.
→Move the cursor to select "Code(DN)" with the "<" [F1] F1 button, then set "Code(DN)" with the [∧] / [∨] button.
→Move the cursor to select "Data" with the ">" [F2] F2 button, then set "Data" with the [∧] / [∨] button.

2 **Refer to the Installation Manual supplied with the indoor unit or service manual for details about the Code(DN) and Data.**

3 **Push the [MENU] button to set the other Code(DN) and Data. After "Continue?" is displayed on the screen, push the "Yes" [F1] F1 button.**

4 **Push the "No" [F2] F2 button to finish the setting operation. "⧖ Setting" appears on the screen for a while, then the screen returns to the "Field setting menu" screen.**
→Pushing the "No" [F2] F2 button displays the unit selection screen when the group control is used. Push the [CANCEL] button on the unit selection screen to finish the setting operation. "⧖ Setting" appears on the screen for a while, then the screen returns to the "Field setting menu" screen.

11 Test run

■ Before test run

- Before turning on the power supply, carry out the following procedure.
  1) By using 500 V-megger, check that resistance of 1 MΩ or more exists between the terminal block L to N and the earth (grounding).
     If resistance of less than 1 MΩ is detected, do not run the unit.
  2) Check the valve of the outdoor unit being opened fully.
- To protect the compressor at activation time, leave power-ON for 12 hours or more before operating.
- Do not press the electromagnetic contactor to forcibly perform a test run. (This is very dangerous because the protective device does not work.)
- Before starting a test run, set addresses by following the Installation Manual supplied with the outdoor unit.
- Before carrying out a test run, complete the water supply (10 °C or more) to the water pipe system and the wiring for the pump.
  The entire system stops by detecting a check code (check code: A01) when the water is not supplied to the Hot Water Module and when the water does not circulate.

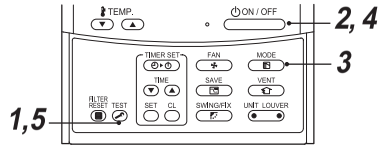
■ Execute a test run

Operate the unit with the wired remote controller as usual.
For the procedure of the operation, refer to the attached Owner's Manual to the outdoor unit.
A forced test run can be executed in the following procedure even if the operation stops by thermostat-OFF.
In order to prevent a serial operation, the forced test run is released after 60 minutes have passed and returns to the usual operation.

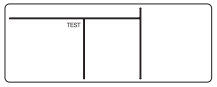
⚠CAUTION

Do not use the forced test run for cases other than the test run because it applies an excessive load to the devices.

<RBC-AMT32E>

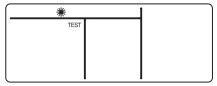


1 **Push [TEST] button for 4 seconds or more. [TEST] is displayed on the display part and the selection of mode in the test mode is permitted.**



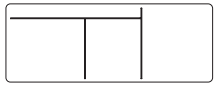
2 **Push [ON / OFF] button.**

3 **Select the operation mode with [MODE] button, [☀Heat].**
- Cannot select the hot water module in a mode other than [☀Heat].
- The temperature controlling function does not work during test run.
- The detection of trouble is performed as usual.

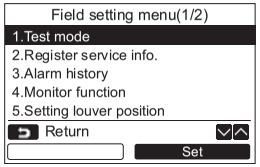


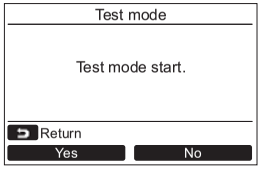
4 **After the test run, push [ON / OFF] button to stop a test run.**
(Display part is same as procedure **1**.)

5 **Push [TEST] check button to cancel (release from) the test run mode.**
([TEST] disappears on the display and the status returns to a normal.)

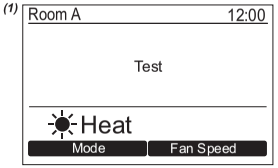


<RBC-AMS55E-ES/EN>

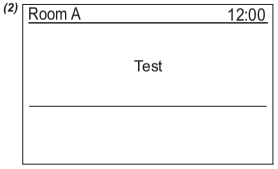




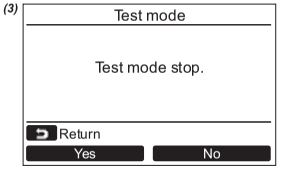
(1)



(2)



(3)



1 **Push the [∧] / [∨] button to select "1. Test mode" on the "Field setting menu" screen, then push the "Set" [F2] button.**
→Pushing the "Yes" [F1] button sets the test mode and the screen returns to the "Field setting menu" screen.
Push [CANCEL] twice, the screen (2) appears.

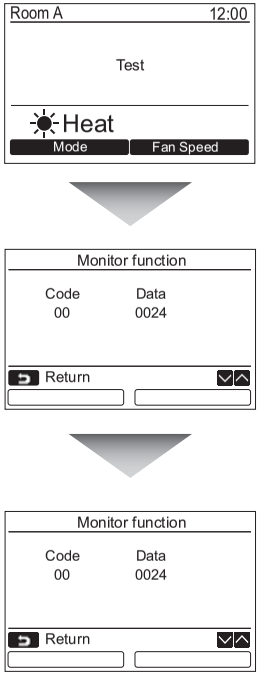
2 **Push the [ON / OFF] button to start the test mode. The screen *(1)* shown in the left appears. (The screen *(2)* appears when the operation is stopped.)**
→Perform the test mode in the "Cool" or "Heat" mode.
→Temperature setting cannot be adjusted during the test mode.
→Check codes are displayed as usual.

3 **When the test mode is finished, push the [∧] / [∨] button to select "1. Test mode" on the "Field setting menu" screen, then push the "Set" [F2] button.**
The screen *(3)* appears.
→Pushing the "Yes" [F1] button stops the test mode screen and continues the normal operation.

NOTE

The test mode stops after 60 minutes and the screen returns to the normal / detailed display.

Using the Service monitor with the [MONITOR] button during the test mode



Push the [MONITOR] button

1 **Push the [∧] / [∨] button to select “4. Monitor function” on the “Field setting menu” screen, then push the “Set” [F2] button.**
→Push the [∧] / [∨] button to select the code to check data.

2 **Refer to the Installation Manual supplied with the indoor unit or outdoor unit or service manual for details about the check code and data.**

3 **Push the [CANCEL] button to return to the “Field setting menu” screen.**

■ Items to check before conducting a trial operation

Check the following items before the trial operation. The numbers in (parentheses) are the chapter numbers in the table of contents of the installation manual.

		Check
Installation work	Is the equipment attached to the legs with bolts? (See chapter 5.)	
	Is there sufficient open space around the equipment for servicing? (See chapter 5.)	
	Have the criteria for selecting a location to install the equipment been met? (See chapter 4.)	
Piping work	Are all of the pipes connected correctly? (See chapter 5.)	
	Are there no water leaks?	
	Is the flow rate suitable? (See chapter 6.)	
	Is the strainer in a suitable location? (See chapters 3 and 6.)	
	Is the line heater in a suitable location and is the flow rate suitable? (See chapters 3 and 6.)	
	Have suitable safety devices for pressure relief and expansion tanks been installed? (See chapters 3 and 6.)	
	Is the shut-off valve in a suitable location? (See chapters 3 and 6.)	
	Is the air vent valve in a suitable location? (See chapters 3 and 6.)	
	Is the piping material suitably heat resistant and corrosion resistant? (See chapters 6 to 8.)	
	Can water discharge through the drain? (See chapter 7.)	
	Was the heat insulation process done suitably? (See chapters 6 to 8.)	
Electric wiring work	Is the electric wiring connected correctly? (See chapter 9.)	
	Is the electric wiring thick enough? (See chapter 9.)	
	Is the power fed from a dedicated ground fault circuit breaker?	
	Is the output terminal wired? (See chapter 9.)	
	Is the addressed fixed? (*1)	
Outdoor unit board settings	Has DIP switch 4 of SW09 on the interface board of the header outdoor unit been set to "ON" (factory default is "OFF")? (See chapter 9.) (*2)	

*1 Do not operate the air conditioner (run the compressor) before the address to the hot water module is fixed. Doing so will cause the heat exchanger in the hot water module to freeze, rupture, and leak water.
*2 Set DIP switch 4 of SW09 on the P.C. board of the header outdoor unit to "ON" (factory default is "OFF"). The VRF system will be stopped to avoid water freezing when the power supply is disconnected.

NOTE

Before you run the compressor, always confirm that the hot water module is operable (power on, address fixed, communication wiring complete).
Failure to do this will cause the heat exchanger in the hot water module to freeze, rupture, and leak water.

12 Maintenance

▼ Periodic Maintenance

- For environmental conservation, it is strongly recommended that the indoor and outdoor units of the air conditioner (including hot water module) in use be cleaned and maintained regularly to ensure efficient operation of the air conditioner.
  When the air conditioner (including hot water module) is operated for a long time, periodic maintenance (once a year) is recommended.
  Furthermore, regularly check the outdoor unit for rust and scratches, and remove them or apply rustproof treatment, if necessary.
  As a general rule, when an indoor unit is operated for 8 hours or more daily, clean the indoor unit and outdoor unit at least once every 3 months. Ask a professional for this cleaning / maintenance work.
  Such maintenance can extend the life of the product though it involves the owner's expense.
  Failure to clean the indoor and outdoor units regularly will result in poor performance, freezing, water leakage, and even compressor failure.

Inspection before maintenance

Following inspection must be carried out by a qualified installer or qualified service person.

Parts	Inspection method
Drain pan	Access from inspection opening and remove the front panel. Check if there is any clogging or drain water is polluted.

▼ Maintenance List

Part	Unit	Check (visual / auditory)	Maintenance
Heat exchanger	Outdoor	Dust / dirt clogging, scratches	Wash the heat exchanger when it is clogged.
Fan motor	Outdoor	Sound	Take appropriate measures when abnormal sound is generated.
Air inlet / outlet grilles	Outdoor	Dust / dirt, scratches	Fix or replace them when they are deformed or damaged.
Drain pan	Hot water module	Dust / dirt clogging, drain contamination	Clean the drain pan and check the downward slope for smooth drainage.
Exterior	Hot water module / Outdoor	• Rust, peeling of insulator • Peeling / lift of coat	Apply repair coating.
Water pipes	Hot water module	Rust, leakage Evidence of leakage	Checking
Strainer	Hot water module	Dust / dirt clogging	Checking
Air vent valve	Hot water module	Air entrainment	Checking an air vent valve

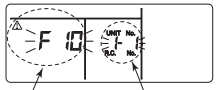
It recommends that a pump and a strainer are maintained periodically.

13 Troubleshooting

<RBC-AMT32E>

■ Confirmation and check

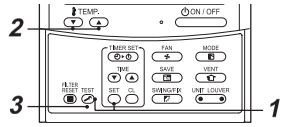
When a trouble occurred in the hot water module, a check code and indoor UNIT No. (including hot water module) appear on the display part of the remote controller.
The check code is only displayed during the operation. If the display disappears, operate the hot water module according to the following "Confirmation of trouble log" for confirmation.



Check code — Indoor UNIT No. (including hot water module) in which a trouble occurred

■ Confirmation of trouble log

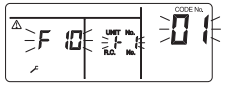
When a trouble occurred on the hot water module, the trouble log can be confirmed with the following procedure. (The trouble log is stored in memory up to 4 troubles.)
The log can be confirmed from both operating status and stop status.



1

When SET and TEST buttons are pushed simultaneously for 4 seconds or more, the following display appears. If 🔧 is displayed, the mode enters in the trouble log mode.

- [**01**: Order of trouble log] is displayed in CODE No..
- [Check code] is displayed in CHECK.
- [Indoor unit address in which a trouble occurred] is displayed in Unit No..



2

Every pushing of TEMP. button used to set temperature, the trouble log stored in memory is displayed in order.
The numbers in CODE No. indicate CODE No. [**01**] (latest) → [**04**] (oldest).

REQUIREMENT

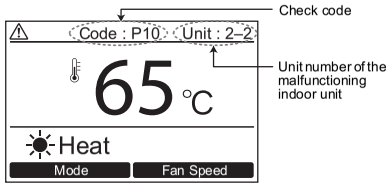
Do not push ON/OFF button because all the trouble log of the indoor unit (including hot water module) will be deleted.

3

After confirmation, push TEST button to return to the usual display.

<RBC-AMS55E-ES/EN>

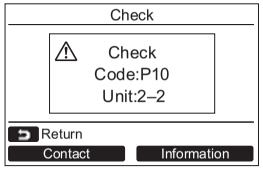
■ Confirmation and check



When a trouble has occurred in the air conditioner, the check code and the unit number of the indoor unit appear on the display of the remote controller.

* The check code appears only while the unit is running.

Push the [MONITOR] button or [CANCEL] button to display the check information screen.



While the check information screen appears:
Push the "Contact Contact" [F1] button to display the contact number for service.
Push the "Information Information" [F2] button to display the model name and serial number of the unit.

in addition to the CODE No. on the remote controller of an indoor unit, you can diagnose failure type of an outdoor unit by checking the 7-segment display on the interface P.C. board.
Use the function for various checks.
Set every DIP switch to OFF after checking.

7-Segment display and check code

Rotary switch setting value			Indication	LED	D600 D601 D602 D603 D604 (A / B)
SW01	SW02	SW03			
1	1	1	Outdoor unit check code	A	Outdoor unit number (U_1 to U_3)
				B	Check code display*

* If a check code has an auxiliary code, the display indicates the check code for three seconds and the auxiliary code for one second alternately.

Check code (indicated on the 7-segment display on the outdoor unit)
Indicated when SW01 = [1], SW02 = [1], and SW03 = [1].

Check code		Check code name
Indication on 7-segment display on the outdoor unit		
	Auxiliary code	
A01	Detected Hot water module address	Flow switch operation trouble
A02	Detected Hot water module address	Water temperature decrease trouble
A04	Detected Hot water module address	Activation of water heat exchanger frost protection
A05	Detected High-temperature Hot water module address	Activation of water High-temperature protection
A06	Detected High-temperature Hot water module address	Activation of low-pressure protection
A07	Detected High-temperature Hot water module address	PMV2 trouble
A08	Detected High-temperature Hot water module address	Reversal of inlet water temperature and outlet water temperature
A09	Detected High-temperature Hot water module address	Mixed refrigerant (R410A with R134a)
A10	Detected High-temperature Hot water module address	TD/TE/TS sensor trouble
A11	Detected High-temperature Hot water module address	TD/TE/TS sensor connection trouble
A12	Detected High-temperature Hot water module address	Pressure sensor trouble (PD, PS)
A13	Detected High-temperature Hot water module address	EEPROM (I/F) trouble
A14	Detected High-temperature Hot water module address	Heat sink overheat trouble
A15	Detected High-temperature Hot water module address	IGBT short-circuit protection trouble
A16	Detected High-temperature Hot water module address	Current detection circuit system trouble
A17	Detected High-temperature Hot water module address	Compressor trouble (lock)
A18	Detected High-temperature Hot water module address	Compressor breakdown
A19	Detected High-temperature Hot water module address	Compressor position detection circuit system trouble
A20	Detected High-temperature Hot water module address	---
A21	Detected High-temperature Hot water module address	Inverter DC voltage (Vdc) trouble (compressor).
A22	Detected High-temperature Hot water module address	Compressor case thermostat operation
A23	Detected High-temperature Hot water module address	High-pressure SW system trouble
A24	Detected High-temperature Hot water module address	TH sensor trouble
A25	Detected High-temperature Hot water module address	Discharge temperature TD trouble

Check code		Check code name
Indication on 7-segment display on the outdoor unit		
	Auxiliary code	
A26	Detected High-temperature Hot water module address	Gas leak detection
A27	Detected High-temperature Hot water module address	High-pressure protective operation
A28	Detected High-temperature Hot water module address	P.C. board communication trouble between I/F and IPDU.
E06	Number of indoor units which received normally	Decrease of number of indoor units
E07	—	Indoor / outdoor communication circuit trouble
E08	Duplicated indoor addresses	Duplication of indoor addresses.
E11	Detected High-temperature Hot water module address	P.C. board communication trouble between I / F and Main.
E12	01: Communication between indoor and outdoor units 02: Communication between outdoor units	Automatic addressing start trouble
E15	—	No indoor unit during automatic addressing
E16	00: Over capacity 01~: Number of connected units	Over capacity / number of connected indoor units
E19	00: Header is nothing 02: 2 or more header units	Number of header outdoor unit trouble
E20	01: Other line outdoor connected 02: Other line indoor connected	Other lines connected during automatic addressing
E23	—	Communication transmission trouble between outdoor units
E25	—	Duplicated follower outdoor address set up
E26	Number of outdoor units which received normally	Decrease of connected outdoor units
E28	Detected outdoor unit No.	Follower outdoor unit trouble
E31	IPDU quantity information(*1)	IPDU communication trouble
E31	80	Communication trouble between MCU and sub MCU
F04	—	TD1 sensor trouble
F05	—	TD2 sensor trouble
F06	01: TE1 sensor 02: TE2 sensor	TE1 sensor trouble TE2 sensor trouble
F07	01: TL1 sensor	TL1 sensor trouble
F08	—	TO sensor trouble
F12	01: TS1 sensor 02: TS2 sensor	TS1 or TS2 sensor trouble
F13	01: Compressor 1 02: Compressor 2	TH (Heat sink) sensor trouble
F15	—	Outdoor temp. sensor miswiring (TE1, TL1)
F16	—	Outdoor pressure sensor miswiring (Pd, Ps)
F23	—	PS sensor trouble
F24	—	PD sensor trouble
F31	—	Outdoor EEPROM trouble
H01	01: Compressor 1 02: Compressor 2	Compressor breaking down
H02	01: Compressor 1 02: Compressor 2	Compressor trouble (Locked)
H03	01: Compressor 1 02: Compressor 2	Current detection circuit trouble
H05	—	TD1 sensor miswiring
H06	—	Low pressure protective operation

Check code		Check code name
Indication on 7-segment display on the outdoor unit		
	Auxiliary code	
H07	Detected outdoor unit No.	Oil level down detection (Indicated only on the header outdoor unit)
H08	01: TK1 sensor trouble 02: TK2 sensor trouble 04: TK4 sensor trouble 05: TK5 sensor trouble	Temperature sensor trouble for oil level
H15	—	TD2 sensor miswiring
H16	01: TK1 oil circuit trouble 02: TK2 oil circuit trouble 04: TK4 oil circuit trouble 05: TK5 oil circuit trouble	Oil level detector circuit trouble
J10	Detected indoor unit address	Flow selector units overflow trouble
L02	Model mismatch of indoor and outdoor unit	System shutdown trouble from indoor unit
L04	—	Outdoor system address duplication
L06	Number of prior indoor units	Duplication of indoor units with priority
L08	—	Indoor unit group / address unset
L10	—	Outdoor unit capacity unset.
L12	01: Flow selector unit(s) installation trouble	Flow selector unit(s) system trouble
L17	—	Inconsistent models of outdoor units
L18	Detected indoor unit address	Flow selector unit trouble
L24	01: Duplication of flow selector unit address 02: Indoor unit(s) operation mode priority setting	Flow selector unit(s) setting trouble
L28	—	Outdoor connected quantity over
L29	IPDU number information(*1)	IPDU quantity trouble
L30	Detected indoor unit address	External interlock of indoor unit
L31	—	Compressor IPDU trouble
P03	—	Discharge temperature TD1 trouble
P04	01: Compressor 1 02: Compressor 2	High-pressure SW relations operation
P05	01: Compressor 1 02: Compressor 2	Compressor Vdc trouble AC detection circuit trouble
P07	01: Compressor 1 02: Compressor 2	Heat sink overheat trouble
P10	Detected indoor unit address	Indoor overflow trouble
P13	—	Outdoor unit flow back trouble detected
P15	01: TS condition 02: TD condition	Gas leak detection
P17	—	Discharge temperature TD2 trouble
P19	Detected outdoor unit number	4-way valve inverse trouble
P20	—	High-pressure protective operation

Check code		Check code name
Indication on 7-segment display on the outdoor unit		
	Auxiliary code	
P22	#0: Element short circuit #E: Vdc voltage trouble #1: Position detection circuit trouble #2: Input current sensor trouble #3: Motor lock trouble #C: Sensor temperature trouble (No TH sensor) #4: Motor current trouble #D: Sensor short circuit/release trouble (No TH sensor) #5: Synchronization/step-out trouble *Put in Fan IPDU No. in [#] mark.	Outdoor fan IPDU trouble
P26	01: Compressor 1 02: Compressor 2	IPM short protection trouble
P29	01: Compressor 1 02: Compressor 2	Compressor position detecting circuit trouble

*1 IPDU number information
01: Compressor 1 trouble
02: Compressor 2 trouble
03: Compressor 1 and 2 trouble
08: Fan 1 trouble
09: Compressor 1, Fan 1 trouble
0A: Compressor 2, Fan 1 trouble
0B: Compressor 1 and 2, Fan 1 trouble

14 Specifications

Model	Sound pressure level (dB(A))	Weight (kg) Main unit
	Heating	
MMW-AP0481CHQ-E	*	100

* Under 70 dB(A)

Contains fluorinated greenhouse gases	
Chemical Name of Gas	R134a
Global Warming Potential (GWP) of Gas	1430

⚠ CAUTION

(1) Stick the enclosed refrigerant label adjacent to the service ports for charging or recovering location and where possible adjacent to existing nameplates or product information label.
(2) Prevent emission of the contained fluorinated greenhouse gas. Ensure that the fluorinated greenhouse gas is never vented to the atmosphere during installation, service or disposal. When any leakage of the contained fluorinated greenhouse gas is detected, the leak shall be stopped and repaired as soon as possible.
(3) Only qualified service personnel are allowed to access and service this product.
(4) Any handling of the fluorinated greenhouse gas in this product, such as when moving the product or recharging the gas, shall comply under (EU) Regulation No.517/2014 on certain fluorinated greenhouse gases and any relevant local legislation.
(5) Periodical inspections for refrigerant leaks may be required depending on European or local legislation.
(6) Contact dealers, installers, etc., for any questions.

TOSHIBA CARRIER CORPORATION
72-34 Horikawa-cho, Saiwai-ku, Kawasaki-shi, Kanagawa 212-8585, JAPAN