FILE NO. A10-2210

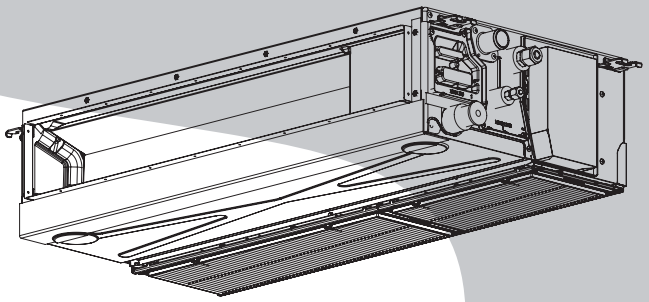
TOSHIBA

SERVICE MANUAL

AIR-CONDITIONER
SPLIT TYPE

INDOOR UNIT <DIGITAL INVERTER>

RAV-HM301SDTY-E
RAV-HM401SDTY-E
RAV-HM561SDTY-E
RAV-HM801SDTY-E
RAV-HM561SDTY-TR
RAV-HM801SDTY-TR



R32

NOTE

A direct current motor is adopted for indoor fan motor in the Compact Slim Duct Type air conditioner. Caused from its characteristics, a current limit works on the direct current motor. When replacing the high-performance filter or when opening the service board, be sure to stop the fan. If an above action is executed during the fan operation, the protective control works to stop the unit operation, and the check code "P12" may be issued. However it is not a trouble. When the desired operation has finished, be sure to reset the system to clear "P12" error code using the leak breaker of the indoor unit. Then push the operation stop button of the remote controller to return to the usual operation.

CONTENTS

Original instruction

Please read carefully through these instructions that contain important information which complies with the “Machinery” Directive (Directive 2006/42/EC), and ensure that you understand them.

Generic Denomination: Air Conditioner

Definition of Qualified Installer or Qualified Service Person

The air conditioner 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 below.

Agent	Qualifications and knowledge which the agent must have
Qualified installer (∗1)	• The qualified installer is a person who installs, maintains, relocates and removes the air conditioners made by Toshiba Carrier Corporation. He or she has been trained to install, maintain, relocate and remove the air conditioners 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 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 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 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 (∗1)	• The qualified service person is a person who installs, repairs, maintains, relocates and removes the air conditioners made by Toshiba Carrier Corporation. He or she has been trained to install, repair, maintain, relocate and remove the air conditioners 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 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 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 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 and from heat 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 and from heat

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]

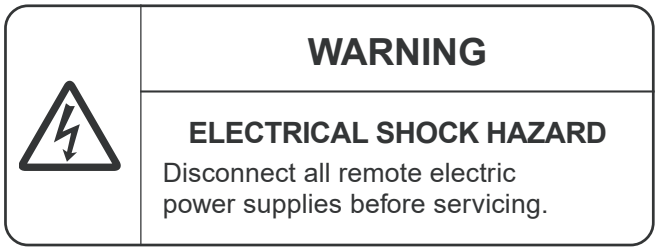
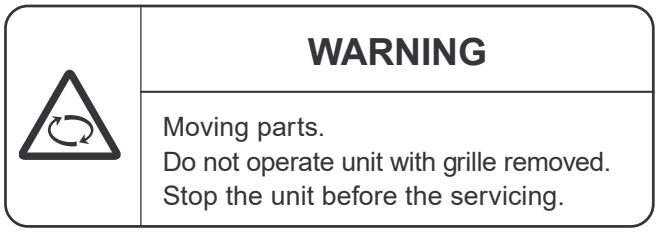
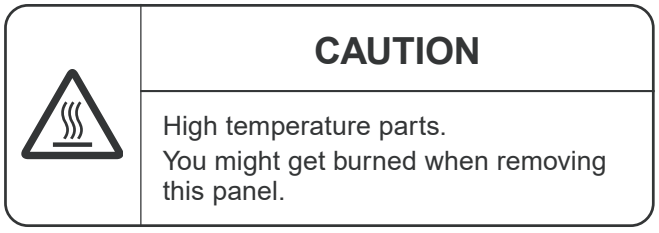
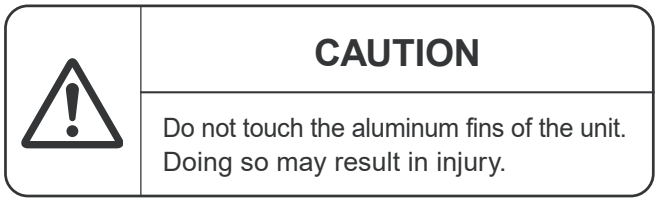
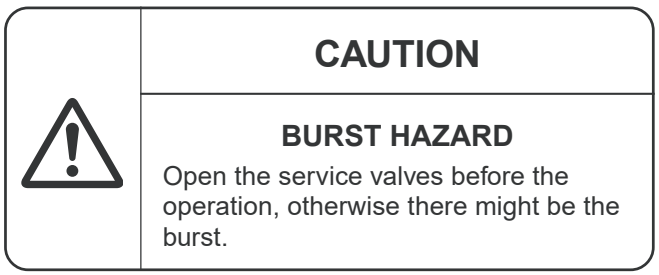
Mark	Explanation
	Indicates prohibited items (Forbidden items to do) The sentences near an illustrated mark describe the concrete prohibited contents.
	Indicates mandatory items (Compulsory items to do) The sentences near an illustrated mark describe the concrete mandatory contents.
	Indicates cautions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

Warning Indications on the Air Conditioner Unit

[Confirmation of warning label on the main unit]

Confirm that labels are indicated on the specified positions

If removing the label during parts replace, stick it as the original.

Warning indication	Description
	**WARNING** ELECTRICAL SHOCK HAZARD Disconnect all remote electric power supplies before servicing.
	**WARNING** Moving parts. Do not operate unit with grille removed. Stop the unit before the servicing.
	**CAUTION** High temperature parts. You might get burned when removing this panel.
	**CAUTION** Do not touch the aluminum fins of the unit. Doing so may result in injury.
	**CAUTION** BURST HAZARD Open the service valves before the operation, otherwise there might be the burst.

Precaution 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 to the OFF position. Otherwise, electric shocks may result.
	Before opening the electrical control box cover of the indoor unit 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 control box cover of the indoor unit or service panel of the outdoor unit and do the work required.
	Before starting to repair the outdoor unit fan or fan guard, be absolutely sure to set the circuit breaker to the OFF position, and place a "Work in progress" sign on the circuit breaker.
	When cleaning the filter or other parts of the indoor unit, set the circuit breaker to OFF without fail, and place a "Work in progress" sign near the circuit breaker before proceeding with the work.
 Electric shock hazard	When checking the electric parts, removing the cover of the electric parts box of Indoor Unit and/or service panel of Outdoor Unit inevitably to determine the failure, use gloves to provide protection for electricians, insulating shoes, clothing to provide protection from electric shock and insulating tools. Be careful not to touch the live part. Electric shock may result. Only "Qualified service person" is allowed to do this work.
	Before operating the air conditioner after having completed the work, check that the electrical parts box cover of the indoor unit 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.
 Execute discharge between terminals.	Even if the circuit breaker has been set to the OFF position before the service panel is removed and the electrical parts are repaired, you will still risk receiving an electric shock. For this reason, short-circuit the high-voltage capacitor terminals to discharge the voltage before proceeding with the repair work. For details on the short-circuiting procedure, refer to the Service Manual. You may receive an electric shock if the voltage stored in the capacitors has not been sufficiently discharged.
 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.
	When checking the electric parts, removing the cover of the electric parts box of Indoor Unit and/or front panel of Outdoor Unit inevitably to determine the failure, put a sign "Do not enter" around the site before the work. Failure to do this may result in third person getting electric shock.
 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 indoor units 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.

⚠ WARNING

 General	Before starting to repair the air conditioner, read carefully through the Service Manual, and repair the air conditioner by following its instructions.
	Only qualified service person (∗1) is allowed to repair the air conditioner. Repair of the air conditioner by unqualified person may give rise to a fire, electric shocks, injury, water leaks and/or other problems.
	Only a qualified installer (∗1) or qualified service person (∗1) is allowed to carry out the electrical work of the air conditioner. 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.

General	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.
	To connect the electrical wires, repair the electrical parts or undertake 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.
	Inside the air conditioner are high-voltage areas and rotating parts. Due to the danger of electric shocks or of your fingers or physical objects becoming trapped in the rotating parts, do not remove the electrical control box cover of the indoor unit or service panel of the outdoor unit. When work involving the removal of these parts is required, contact a qualified installer or a qualified service person.
	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.
	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 electrical control box cover of the indoor unit to undertake work.
	When working at heights, use a ladder which complies with the ISO 14122 standard, and follow the procedure in the ladders instructions. Also wear a helmet for use in industry as protective gear to undertake the work.
	Before 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. While carrying out the work, wear a helmet for protection from falling objects.
	Before opening the suction board cover, set the circuit breaker to the OFF position. Failure to set the circuit breaker to the OFF position may result in injury through contact with the rotation parts. Only a qualified installer (∗1) or qualified service person (∗1) is allowed to remove the suction board cover and do the work required.
	Do not touch the aluminum fin of the unit. You may injure yourself if you do so. If the fin must be touched for some reason, first put on protective gloves and safety work clothing, and then proceed.
	Use forklift to carry in the air conditioner units and use winch or hoist at installation of them.
	When the air conditioner is to be transported, installed, maintained, repaired or removed, wear protective gloves and 'safety' work clothing.
	When transporting the air conditioner, do not take hold of the bands around the packing carton. You may injure yourself if the bands should break.
	When the first filter comes out without connected to the other one, insert it once more to connectthe two filters together and pull out them as connected. Do not insert hands to take out the second filter. You may injure Yourself.
	This air conditioner has passed the pressure test as specified in IEC 60335-2-40 Annex EE.
Check earth wires.	Before troubleshooting or repair work, check the earth wire is connected to the earth terminals of the main unit, 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 ground wires are connected properly.
	Connect earth wire. (Grounding work) Incomplete grounding causes an electric shock. Do not connect ground wires to gas pipes, water pipes, and lightning rods or ground 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 indoor units and the service panel of the outdoor unit removed in order to find out exactly where the trouble lies, place "Keep out" signs around the work site before proceeding. Third-party individuals may enter the work site and receive electric shocks if this warning is not heeded.

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 users' 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 refrigerant used by this air conditioner is the R32.
	Check the used refrigerant name and use tools and materials of the parts which match with it. For the products which use R32 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.
	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.
	For an air conditioner which uses R32, never use other refrigerant than R32. For an air conditioner which uses other refrigerant (R22, etc.), never use R32. If different types of refrigerant are mixed, abnormal high pressure generates in the refrigerating cycle and an injury due to breakage may be caused.
	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 air conditioner 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 air conditioner, 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 R32 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 cocking 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/ Cabling	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's side.
Insulator check	After the work has finished, be sure to use an insulation tester set (500V Megger) to check the resistance is 1MΩ 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.
	If refrigerant gas has leaked during the installation work, ventilate the room immediately. If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
	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 cocking stove though the refrigerant gas itself is innocuous.

 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 cocking stove though the refrigerant gas itself is innocuous. When installing equipment which includes a large amount of charged refrigerant such as a multi air conditioner in a sub-room, it is necessary that the density does not 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 air conditioner 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.
 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 closes 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 suctioned 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 air conditioner. It is dangerous for the air conditioner 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 service panel of the outdoor unit is to be opened in order for the compressor or the area around this part to be repaired immediately after the air conditioner 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 designed to protect electricians.
	When the service panel of the outdoor unit is to be opened in order for the fan motor, reactor, inverter or the areas around these parts to be repaired immediately after the air conditioner 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 fan motor, 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 designed to protect electricians.

 Installation	Only a qualified installer or service person is allowed to do installation work. Inappropriate installation may result in water leakage, electric shock or fire.
	Before starting to install the air conditioner, read carefully through the Installation Manual, and follow its instructions to install the air conditioner.
	If the unit is installed 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 air conditioner when you implement the measures. Accumulation of highly-concentrated refrigerant may cause an oxygen deficiency accident.
	Do not install the air conditioner in a location that may be subject to a risk of expire to a combustible gas. If a combustible gas leaks and becomes concentrated around the unit, a fire may occur.
	Install the indoor unit at least 2.5 m above the floor level since otherwise the users may injure themselves or receive electric shocks if they poke their fingers or other objects into the indoor unit while the air conditioner is running.
	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 agent.
	Do not place any combustion appliance in a place where it is directly exposed to the wind of air conditioner, otherwise it may cause imperfect combustion.
	When mounting the rails, push them until the 3 latches click.
	Insert the filters into the direction which the arrows, carved on the filters, show. (2 filters are identical)

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 air conditioner. It is dangerous for the air conditioner 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.”

Precautions for using R32 refrigerant

The basic installation work procedures are the same as conventional refrigerant (R410A, R22) models.
However, Please read through this manual after understanding the contents below;
These safety cautions describe important matters concerning safety to prevent injury to users or other people and damages to property. Please read through this manual after understanding the contents below (meanings of indications), and be sure to follow the description;

Meanings of symbols displayed on the unit

	**WARNING** (Risk of fire)	This mark is for R32 refrigerant only. Refrigerant type is written on nameplate of outdoor unit. In case that refrigerant type is R32, this unit uses a flammable refrigerant. If refrigerant leaks and comes in contact with fire or heating part, it will create harmful gas and there is risk of fire.
	Read the OWNER’S MANUAL carefully before operation.	
	Service personnel are required to carefully read the OWNER’S MANUAL and INSTALLATION MANUAL before operation.	
	Further information is available in the OWNER’S MANUAL, INSTALLATION MANUAL, and the like.	

Specifications

Model	Sound pressure level (dB(A))		Weight (kg)
	Cooling	Heating	
RAV-HM301SDTY-E	*	*	15
RAV-HM401SDTY-E	*	*	15
RAV-HM561SDTY-E	*	*	19
RAV-HM801SDTY-E	*	*	22
RAV-HM561SDTY-TR	*	*	19
RAV-HM801SDTY-TR	*	*	22

* Under 70 dBA

Refrigerant R32

This air conditioner adopts a new HFC type refrigerant (R32) which does not deplete the ozone layer.

1. Safety Caution Concerned to Refrigerant R32

Be sure that water, dust, the former refrigerant or the former refrigerating oil is not mixed into the refrigerating cycle of the air conditioner with refrigerant R32 during installation work or service work.
If an incorrect work or incorrect service is performed, there is a possibility to cause a serious accident.
Use the tools and materials exclusive to R32 to purpose a safe work.

2. Safety and Cautions on Installation/Service

<Safety items>

When gas concentration and ignition energy are happened at the same time, R32 has a slight possibility of burning. Although it will not ignite under normal work environment conditions, be aware that the flame spreads if ignition should occur.
It is necessary to carry out installation/servicing safely while taking the following precautions into consideration.

1) Never use refrigerant other than specified refrigerant (R32) in an air conditioner which is designed to operate with the specified refrigerant (R32).
   If other refrigerant than R32 is used, it may cause personal injury, etc. by a malfunction, a fire, a rupture.
2) Since R32 is heavier than air, it tends to accumulate on the bottom (near the floor).
   Ventilate properly for the working environment to prevent its combustion.
   Especially in a basement or a closed room where is the high risk of the accumulation, ventilate the room with a local exhaust ventilation.
   If refrigerant leakage is confirmed in the room or the place where the ventilation is insufficient, do not work until the proper ventilation is performed and the work environment is improved.
3) When performing brazing work, be sure to check for leakage refrigerant or residual refrigerant.
   If the leakage refrigerant comes into contact with fire, a poisonous gas may occur or it may cause a fire.
   Keep adequate ventilation during the work.
4) When refrigerant gas leaks during work, execute ventilation. If the leakage refrigerant comes into contact with a fire, a poisonous gas may occur or it may cause a fire.
5) In places where installing / repairing air-conditioning equipment, etc., keep the source of ignition such as gas combustion equipment, petroleum combustion equipment, electric heater etc. away. Do not smoke in the place.
6) When installing or removing an air conditioner, do not mix air in the refrigerant cycle.
   If air or others is mixed with the refrigerant, abnormal high pressure generates in the refrigerating cycle, causing injury due to the breakage.
7) After installation work complete, confirm that refrigerant gas is not leaking on the flare connection part or others. If leaked refrigerant comes to contact with a fire, toxic gas may occur, causing a fire.
8) Perform the installation work and re-installation according to the installation manual.
   Pay attention especially to the area of application. Improper installation may cause refrigeration trouble, water leakage, electric shock, or fire etc.
9) Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician.
   Improper repair may result in water leakage, electric shock and fire, etc.
10) Carry out the airtight test with nitrogen at a specified pressure. Do not use oxygen or acetylene gas absolutely as it may cause an explosion.
11) Always carry a refrigerant leakage detection sensor during the work and work while checking that no refrigerant leaks around working environment.
12) If the leakage refrigerant comes into contact with fire, it may cause a fire.
    Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

<Caution items>

1) The opposite side dimension of the air-conditioner's flared nut using R32 and the shape of the charge port are the same as those of R410A.
2) Be careful not to charge refrigerant by mistake. Should the different type of refrigerant mix in, be sure to recharge the refrigerant
3) Do not mix the other refrigerant or refrigerating oil with the refrigerant.
4) Since the pressure of R32 is 1.6 times higher than that of the former refrigerant (R22), use tools and parts with high pressure resistance specification similar to R410A.
5) In the installation time, use clean pipe materials and work with great attention so that water and others do not mix in because pipes are affected by impurities such as water, oxide film, oil, etc. Use the clean pipes. Be sure to braze while flowing nitrogen gas in the pipe. (Never use gas other than nitrogen gas.)
6) For the earth protection, use a vacuum pump for air purge.
7) R32 refrigerant is Single-component refrigerant that does not change its composition. Although it is possible to charge the refrigerant with either liquid or gas, charge it with liquid.

3. Pipe Materials

For the refrigerant pipes, copper pipe and joints are mainly used.
It is necessary to select the most appropriate pipes to conform to the standard.
Use clean pipes or joints to which little impurities adhere.

1) Copper pipe

<Piping>

The pipe thickness, flare-finishing size, flare nut and others differ according to a refrigerant type.
When using a long copper pipe for R32, it is recommended to select "Copper or copper-base pipe without seam" and one with bonded oil amount 40mg/10m or less.
Also do not use crushed, deformed, discolored (especially inside) pipes.
(Impurities cause clogging of expansion valves and capillary tubes.)

<Flare nut>

Use the flare nuts which are attached to the air conditioner unit.

Be sure to select the pipes with copper thickness in the table below since the pressure of an air conditioner using R32 is higher than that of R22.

Nominal diameter	Outer diameter (mm)	Thickness (mm) R410A or R32
1/2	6.4	0.80
3/8	9.5	0.80
1/2	12.7	0.80
5/8	15.9	1.00

Make sure not to use a thin copper pipe such as 0.7 mm copper thickness in the market.

2) Joint

The flare joint and socket joint are used for joints of the copper pipe.
The joints are rarely used for installation of the air conditioner.
However clear impurities when using them.

4. Tools

○: R410A tools available
△: Partly unavailable, ×: R410A tools unavailable

No.	Installation/service tools		Use	Applicability to R32 air conditioner or not	Applicability to R22 air conditioner or not
	Tools / Equipment	specification			
1	Flare tool	Clutch type	Pipe flaring	○	○
2	Copper pipe gauge for adjusting projection margin	—	Flaring by conventional flare tool	○	—
3	Torque wrench	—	Tightening of flare nut	○	×
4	Gauge manifold	Port size 1/2"-20UNF (5/16" Flare)	Evacuating, refrigerant charge, run check, etc.	○ Note 2	×
5	Charge hose	High-voltage		○	×
6	Vacuum pump	—	Vacuum drying	○ Note 3 1/2"-20UNF(5/16" Flare)	△ Connection diameter 1/4"
7	Vacuum pump adapter	—	Vacuum drying	○ Note 4 1/2"-20UNF(5/16" Flare)	△ Connection diameter 1/4"
8	Electronic balance for refrigerant charging	For 10 kg or 20 kg cylinder	Refrigerant charge	○	○
9	Leakage detector	—	Gas leakage check	○ Note 5	○ Note 5
10	Refrigerant cylinder	—	Refrigerant charge	× Note 6	×
11	Refrigerant recovery cylinder	Exclusive for R32	Refrigerant recovery container	× Note 7	×
12	Refrigerant recovery device	—	Refrigerant recovery device	○ Note 8	△ Connection diameter 1/4"

Note 1 When flaring is carried out for R410A or R32 using the conventional flare tools, adjustment of projection margin is necessary. For this adjustment, a copper pipe gauge, etc. are necessary.

Note 2 When saturation temperature is described, the gauge manifold differs for R410A and R32. If saturation temperature reading is required, special tools exclusive for R32 are required.

Note 3 Since R32 has a slight possibility of burning, be sure to use the tools corresponding to R32.

Note 4 Like R410, a Vacuum pump adapter needs installing to prevent a Vacuum pump oil (mineral oil) from flowing backward into the Charge hose. Mixing of the Vacuum pump oil into R32 refrigerant may cause a trouble such as generation of sludge, clogging of capillary, etc.

Note 5 Be sure to use those tools after confirming they correspond to each refrigerant.

Note 6 For a refrigerant cylinder exclusive for R32, the paint color (or label color) of the cylinder is set to the specified color (light blue) together with the indication of the refrigerant name.

Note 7 Although the container specification is the same as R410A, use a recovering container exclusive for R32 to avoid mixing with other refrigerants.

Note 8 Be careful for miss charging of the refrigerant during work. Miss charging of the refrigerant type may cause not only damage of the equipment but also a fire etc.

General tools

In addition to the above exclusive tools, the following equipment is necessary as the general tools.

1) Pipe cutter
2) Reamer
3) Pipe bender
4) Level vial
5) Screwdriver (+, –)
6) Spanner or Adjustable wrench
7) Hole core drill
8) Tape measure
9) Metal saw

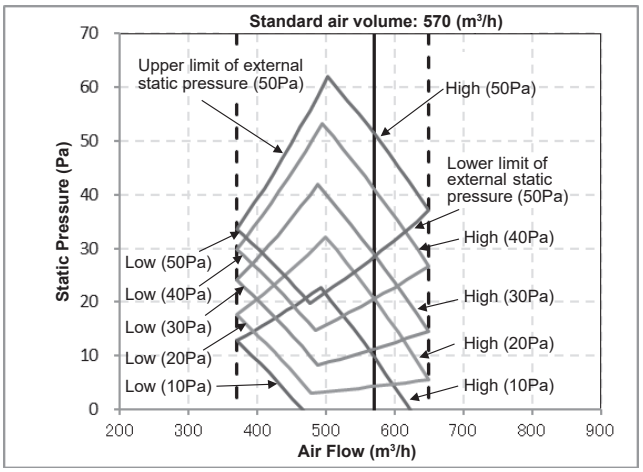
Also prepare the following equipment for other installation method and run check.

1) Clamp meter
2) Thermometer
3) Insulation resistance tester (Megger)
4) Electroscope

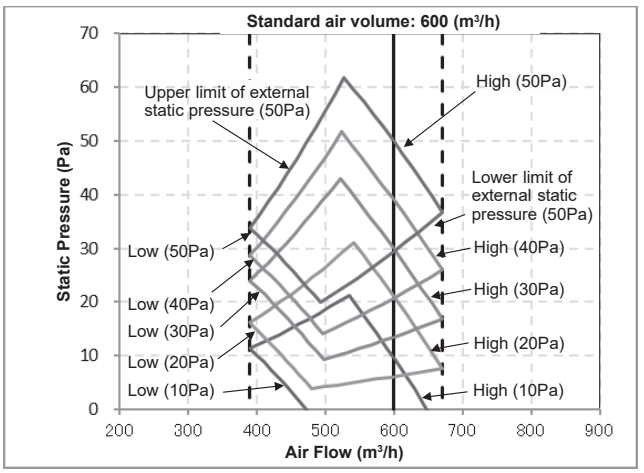
1. AIR DUCTING WORK

1-1. Static Pressure Characteristics

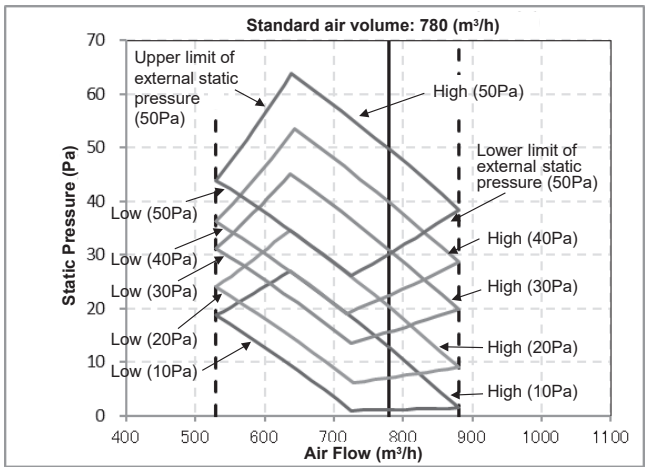
301 type



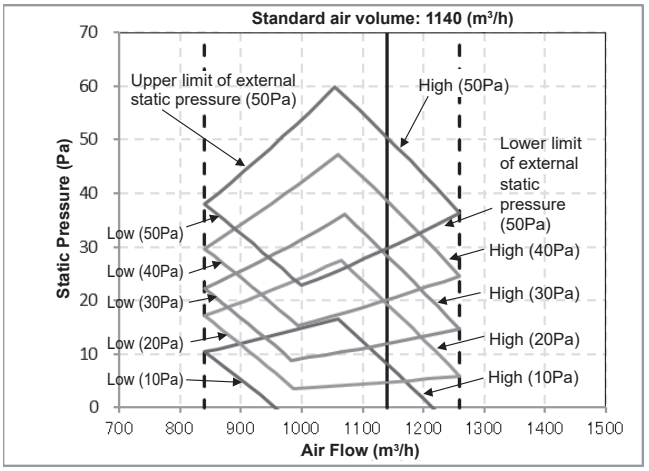
401 type



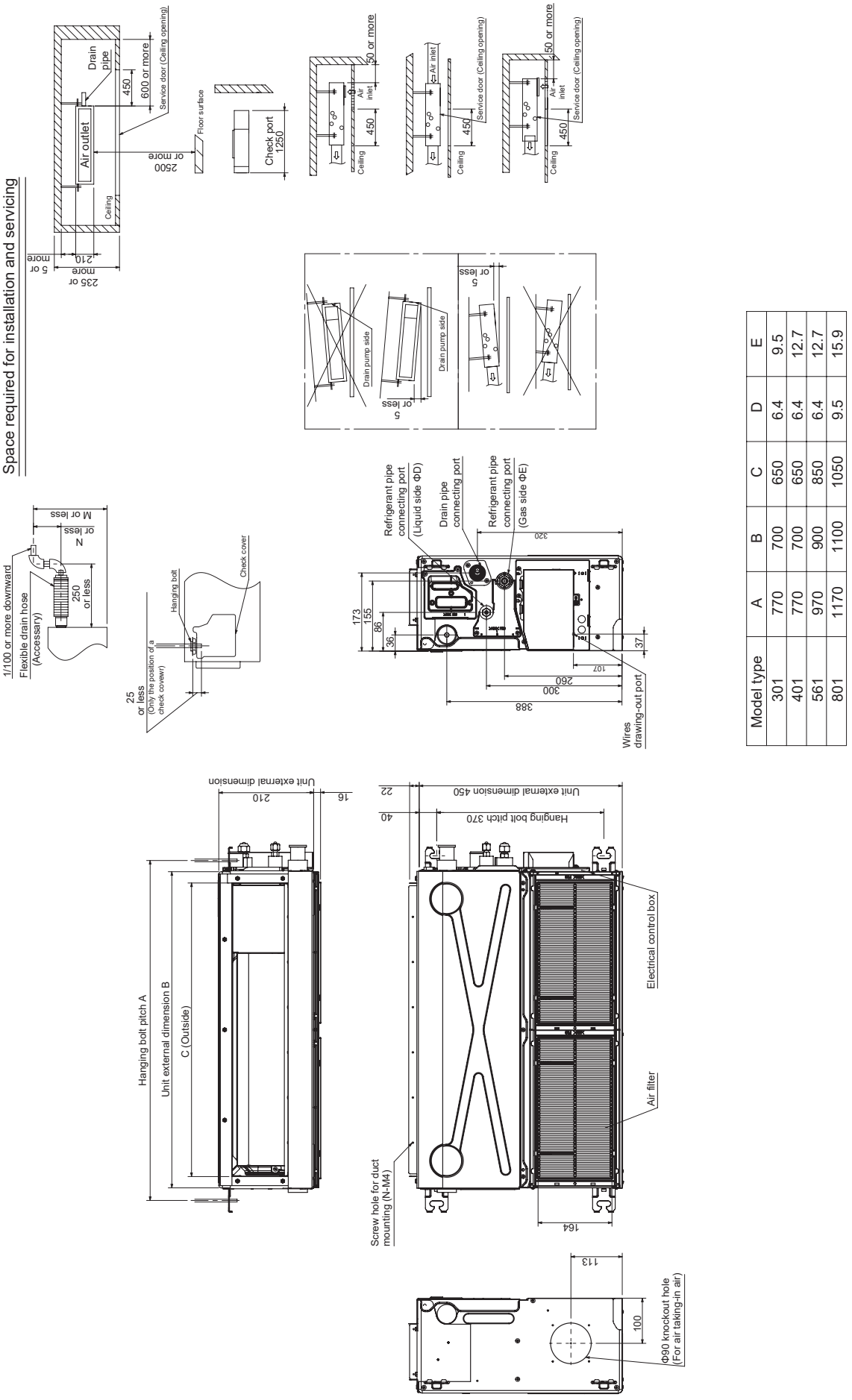
561 type



801 type



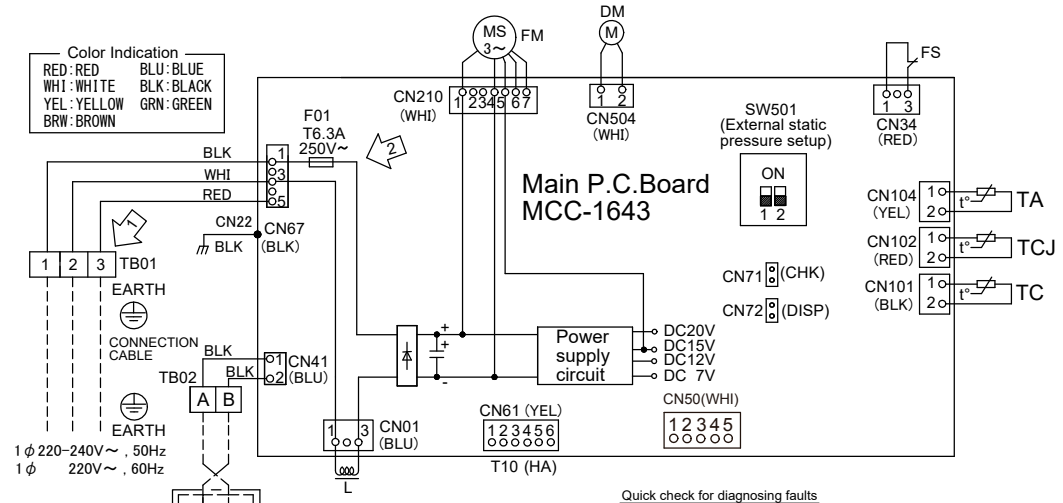
2. CONSTRUCTION VIEWS (EXTERNAL VIEWS)



Model type	A	B	C	D	E
301	770	700	650	6.4	9.5
401	770	700	650	6.4	12.7
561	970	900	850	6.4	12.7
801	1170	1100	1050	9.5	15.9

3. WIRING DIAGRAM

WIRING DIAGRAM



Symbol	Parts name
CN**	Connector
F01	Fuse
FM	Fan Motor
TA	Indoor temp.sensor
TB01,02	Terminal Block
TC,TCJ	Temp.sensor
DM	Drain pump Motor
FS	Float Switch
L	Reactor

1. Broken line indicate the wiring at site. Long dashed short dashed line indicate the accessories.
2. ▯ indicates the terminal block.
—○— indicates the connection terminal.
▭ indicates the connector on the control P.C.board.
3. ⏚ indicates the protection ground.
4. ▭ indicates the control P.C.board.

Quick check for diagnosing faults

Check Items	Diagnosis result
(1) Terminal block	Check for the voltage between ① and ② is 220 to 240VAC. Check for the voltage between ② and ③ is 15 to 60VDC.
(2) Fuse 6.3A	Check Varistor if the fuse is open.

4. SPECIFICATIONS OF ELECTRICAL PARTS

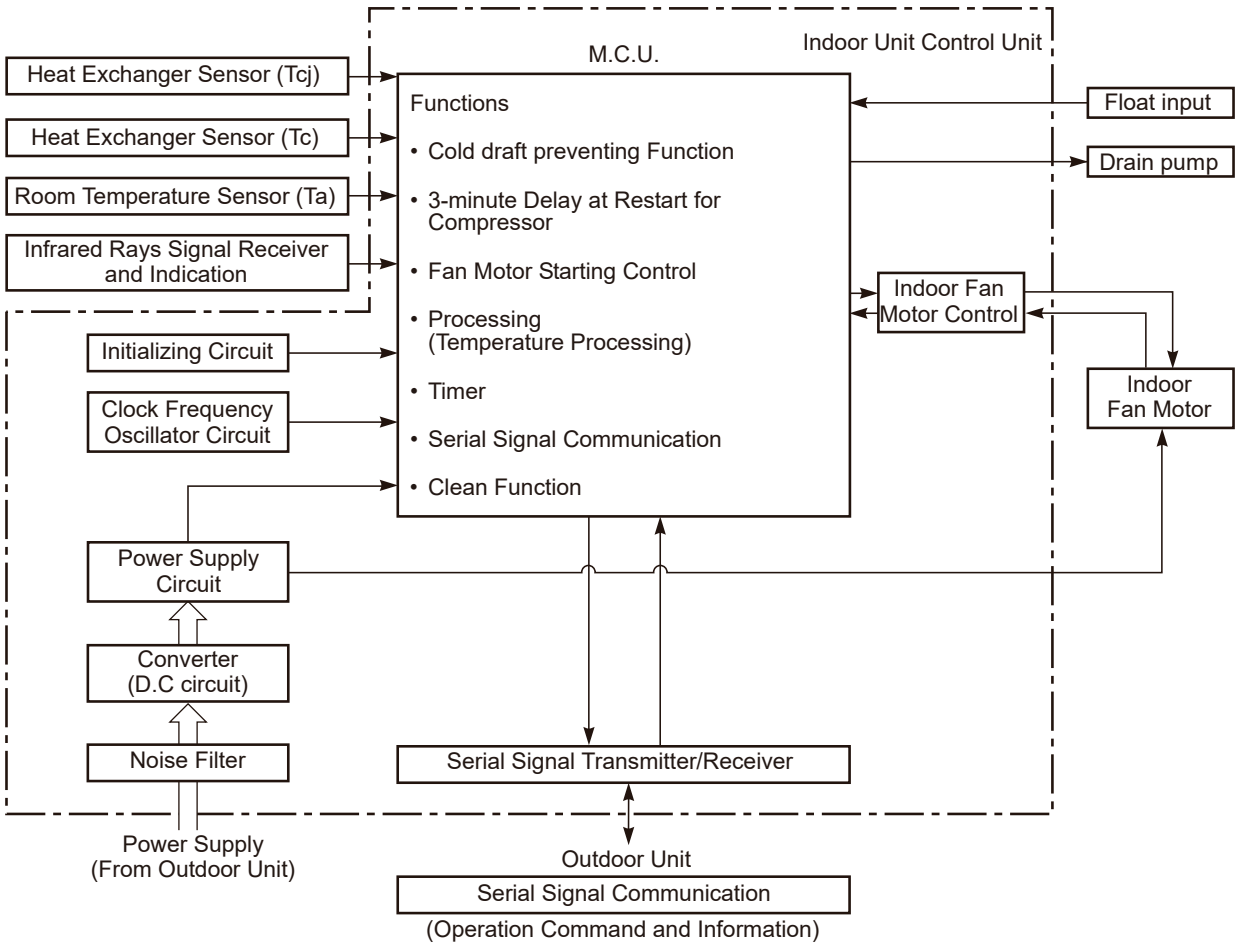
Compact Slim Duct Type

No.	Parts name	Type	Specifications
1	Fan motor	ICF-340WD50-1	Output (Rated) 50W
2	Fan motor	ICF-340WD94-3	Output (Rated) 94W
3	Thermo. Sensor (TA-sensor)	328mm	10kΩ at 25°C
4	Heat exchanger sensor (TCJ-sensor)	Ø6mm, 1000mm	10kΩ at 25°C
5	Heat exchanger sensor (TC-sensor)	Ø6mm, 1000mm	10kΩ at 25°C
6	Float switch	FS-1A-31	
7	Drain pump motor	MDP-1401	
8	Reactor	CH-49-Z-T	

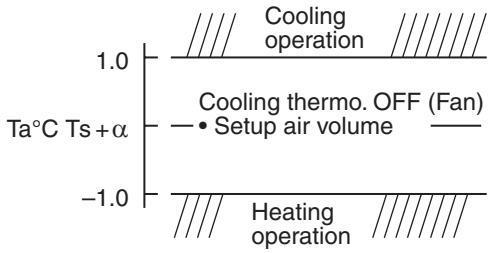
5. CONTROL BLOCK DIAGRAM

5-1. Indoor Controller Block Diagram

5-1-1. In Case of Connection of Wired (Simple) Remote Controller



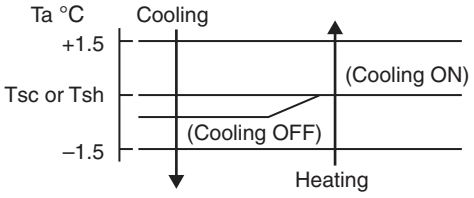
5-2. Control Specifications

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>1</td><td>When power supply is reset</td><td>1) Distinction of outdoor unit
When the power supply is reset, the outdoors are distinguished and the control is selected according to the distinguished result.
2) Setting of indoor fan speed and existence of air direction adjustment
Based on EEPROM data, select setting of the indoor fan speed.</td><td>Fan speed (rpm)</td></tr>
<tr><td>2</td><td>Operation mode selection</td><td>1) Based on the operation mode selecting command from the remote controller, the operation mode is selected.
<table>
<tr><th>Remote controller command</th><th>Control outline</th></tr>
<tr><td>STOP</td><td>Air conditioner stops.</td></tr>
<tr><td>FAN</td><td>Fan operation</td></tr>
<tr><td>COOL</td><td>Cooling operation</td></tr>
<tr><td>DRY</td><td>Dry operation</td></tr>
<tr><td>HEAT</td><td>Heating operation</td></tr>
<tr><td>AUTO</td><td>• COOL/HEAT operation mode is automatically selected by Ta, Ts and To for operation.
• The operation is performed as shown in the following figure according to Ta value at the first time only. (In the range of Ts + α –1 < Ta < Ts + α + 1, Cooling thermo. OFF (Fan)/Setup air volume operation continues.)</td></tr>
</table>


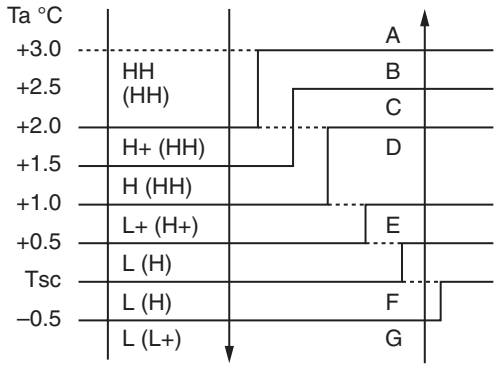
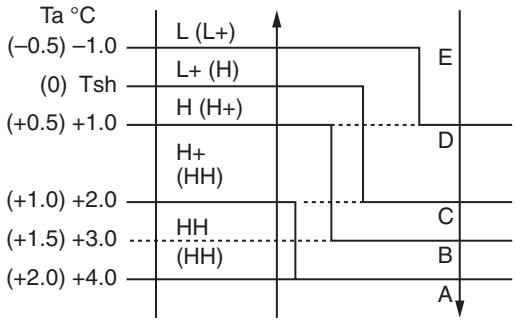
• α is corrected according to the outside temperature.
<table>
<tr><th>Outside temp.</th><th>Correction value (α)</th></tr>
<tr><td>No To</td><td>0K</td></tr>
<tr><td>To ≥ 24°C</td><td>–1K</td></tr>
<tr><td>24°C > To ≥ 18°C</td><td>0K</td></tr>
<tr><td>To < 18°C</td><td>+1K</td></tr>
<tr><td>To error</td><td>0K</td></tr>
</table></td><td>Ta: Room temp.
Ts: Setup temp.
To: Outside temp.

K = deg</td></tr>
<tr><td>3</td><td>Room temp. control</td><td>1) Adjustment range: Remote controller setup temperature (°C)
<table>
<tr><th></th><th>COOL/DRY</th><th>HEAT</th><th>AUTO</th></tr>
<tr><td>Wired type</td><td>18°C to 29°C</td><td>18°C to 29°C</td><td>18°C to 29°C</td></tr>
</table></td><td></td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>3</td><td>Room temp. control (Continued)</td><td>2) Using the CODE No. 06, the setup temperature in heating operation can be corrected.
<table><tr><th>SET DATA</th><th>0</th><th>2</th><th>4</th><th>6</th></tr><tr><td>Setup temp. correction</td><td>+0°C</td><td>+2°C</td><td>+4°C</td><td>+6°C</td></tr></table>Setting at shipment
<table><tr><th>SET DATA</th><td>2</td></tr></table></td><td>Shift of suction temperature in heating operation</td></tr>
<tr><td>4</td><td>Automatic capacity control

(GA control)</td><td>1) Based on the difference between Ta and Ts, the operation frequency is instructed to the outdoor unit.
2) Cooling operation
Every 90 seconds, the room temperature difference between temperature detected by Ta and Ts and the varied room temperature value are calculated to obtain the correction value of the frequency command and then the present frequency command is corrected.
Ta (n) – Ts (n) : Room temp. difference
n : Counts of detection
Ta (n-1) – Ts (n) : Varied room temp. value
n – 1 : Counts of detection of 90 seconds before
3) Heating operation
Every 1 minute (60 sec.), the room temperature difference between temperature detected by Ta and Ts and the varied room temperature value are calculated to obtain the correction value of the frequency command and then the present frequency command is corrected.
Ts (n) – Ta (n) : Room temp. difference
n : Counts of detection
Ta (n) – Ta (n – 1): Varied room temp. value
n – 1 : Counts of detection of 1 minute before
4) Dry operation
The frequency correction control is same as those of the cooling operation.
However the maximum frequency is limited to approximately “S6”.
Note) When LOW is set up, the maximum frequency is limited to approximately “SB”.</td><td></td></tr>
<tr><td>5</td><td>Automatic cooling/heating control</td><td>1) The judgment of selecting COOL/HEAT is carried out as shown below. When +1.5°C exceeds against Tsh 10 minutes and after thermo. OFF, heating operation (Thermo. OFF) exchanges to cooling operation. Description in the parentheses shows an example of cooling ON/OFF.
 

When –1.5°C lowers against Tsc 10 minutes and after thermo. OFF, cooling operation (Thermo. OFF) exchanges to heating operation.
2) For the automatic capacity control after judgment of cooling/heating, see Item 4.
3) For temperature correction of room temp. control in automatic heating, see Item 3.</td><td>Tsc: Setup temp. in cooling operation
Tsh: Setup temp. in heating operation + temp. correction of room temp. control</td></tr>
</table>

No.	Item	Outline of specifications	Remarks
6	Fan speed control	1) Operation with (HH), (H), (L) or [AUTO] mode is carried out by the command from the remote controller. 2) When the fan speed mode [AUTO] is selected, the fan speed varies by the difference between Ta and Ts. **<COOL>**  • Controlling operation in case when thermostat of remote controller works is same as a case when thermostat of the body works. • If the fan speed has been changed once, it is not changed for 3 minutes. However when the air volume is exchanged, the fan speed changes. • When cooling operation has started, select a downward slope for the fan speed, that is, the high position. • If the temperature is just on the difference boundary, the fan speed does not change. • Mode in the parentheses indicates one in automatic cooling operation. **<HEAT>**  Value in the parentheses indicates one when thermostat of the remote controller works. Value without parentheses indicates one when thermostat of the body works. • If the fan speed has been changed once, it is not changed for 1 minute. However when the fan speed exchanged, the fan speed changes. • When heating operation has started, select an upward slope for the fan speed, that is, the high position. • If the temperature is just on the difference boundary, the fan speed does not change. • Mode in the parentheses indicates one in automatic heating operation. • In Tc ≥ 60°C, the fan speed increases by 1 step.	HH > H+ > H > L+ > L > UL Tc: Indoor heat exchanger sensor temperature

No.	Item	Outline of specifications	Remarks
6	Fan speed control (Continued)		

CODE No.	10Pa		20Pa		25Pa		35Pa		50Pa		60Pa		45Pa	
[5d]	0000		0001		0002		0003		0004		0005		0006	
SW501(1)/(2)	OFF/OFF		ON/OFF		-		OFF/ON		-		-		ON/ON	
tap	COOL	HEAT	COOL	HEAT	COOL	HEAT	COOL	HEAT	COOL	HEAT	COOL	HEAT	COOL	HEAT
F1									HH	HH	HH	HH	HH	HH
F2							HH	HH	H+	H+	H+	H+	H+	H+
F3			HH	HH	HH	HH	H+	H+	H	H	H	H	H	H
F4	HH	HH	H+	H+	H+	H+	H	H						
F5									L+	L+	L+	L+	L+	L+
F6	H+	H+					L+	L+						
F7			H	H	H	H								
F8									L	L	L	L	L	L
F9	H	H	L+	L+	L+	L+	L	L						
FA	L+	L+	L	L	L	L								
FB	L	L												
FC														
FD	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL

3) In heating operation, the mode changes to [UL] if thermostat is turned off.

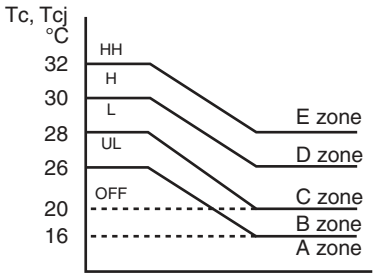
4) If Ta ≥ 25°C when heating operation has started and when defrost operation has been cleared, the air conditioner operates with (H) mode or higher mode for 1 minute after Tc entered in E zone of cool air discharge preventive control (No. 7).

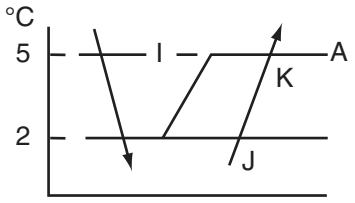
5) Self-clean operation

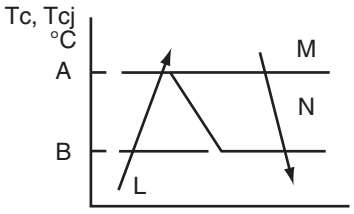
When performing self-clean operation after stopping the cooling operation, the mode becomes 610 rpm.

※ When the factory is shipped, self-clean operation is not set.

[Self-clean ⓐ] is displayed.

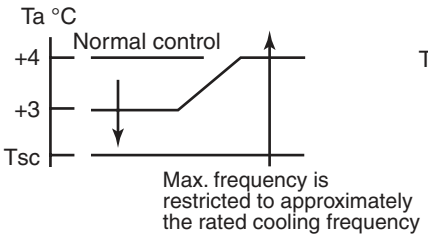
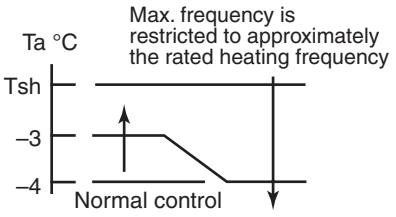
7	Cool air discharge preventive control	1) In heating operation, the indoor fan is controlled based on the detected temperature of Tc sensor or Tcj sensor. As shown below, the upper limit of the revolution frequency is restricted. However B zone is assumed as C zone for 6 minutes and after when the compressor activated. In defrost operation, the control value of Tc is shifted by 6°C. 	In D and E zones, the priority is given to air volume selection setup of remote controller. In A zone while thermo is ON, [PRE-HEAT ⓑ (Heating ready)] is displayed.

No.	Item	Outline of specifications	Remarks
8	Freeze preventive control (Low temperature release)	1) The cooling operation (including Dry operation) is performed as follows based on the detected temperature of Tc sensor or Tcj sensor. When [J] zone is detected for 6 minutes (Following figure), the commanded frequency is decreased from the real operation frequency. After then the commanded frequency changes every 30 seconds while operation is performed in [J] zone. In [K] zone, time counting is interrupted and the operation is held. When [I] zone is detected, the timer is cleared and the operation returns to the normal operation. If the commanded frequency becomes S0 because the operation continues in [J] zone, the return temperature A is raised from 5°C to 12°C until [I] zone is detected and the indoor fan operates with [L] mode.  In heating operation, the freeze-preventive control works if 4-way valve is not exchanged and the following conditions are satisfied. (However the temperature for J zone dashing control is changed from 2°C to –5°C.) **<Conditions>** • When ① or ② is established 5 minutes after activation. ① Tcn ≤ Tc (n – 1) – 5 ② Tcn < Tc (n – 1) – 1 and Tcn ≤ Ta < 5°C	**Tcj:** Indoor heat exchanger sensor temperature **Tcn:** Tc temperature when 5 minutes elapsed after activation **Tc (n – 1):** Tc temperature at start time

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>9</td><td>High-temp. release control</td><td>1) The heating operation is performed as follows based on the detected temperature of Tc sensor or Tcj sensor.
• When [M] zone is detected, the commanded frequency is decreased from the real operation frequency. After then the commanded frequency changes every 30 seconds while operation is performed in [M] zone.
• In [N] zone, the commanded frequency is held.
• When [L] zone is detected, the commanded frequency is returned to the original value by approx. 6Hz every 60 seconds.
Setup at shipment
<table><tr><th colspan="2">Control temp. °C</th></tr><tr><th>A</th><th>B</th></tr><tr><td>56 (54)</td><td>52 (52)</td></tr></table> 
NOTE:
When the operation has started or when Tc or Tcj < 30°C at start of the operation or after operation start, temperature is controlled between values in parentheses of A and B.</td><td>However this control is ignored in case of the follower unit of the twin.

Same status as that when “thermostat-OFF” (status that the air conditioner enters in the room temp. monitor mode when the temperature reached the setup temperature on the remote controller)</td></tr>
<tr><td>10</td><td>Drain pump control</td><td>1) In cooling operation (including Dry operation), the drain pump is usually operated.
2) If the float switch works while drain pump drives, the compressor stops, the drain pump continues the operation, and a check code is output.
3) If the float switch works while drain pump stops, the compressor stops and the drain pump operates. If the float switch keeps operating for approx. 4 minutes, a check code is output.</td><td>Check code [P10]</td></tr>
<tr><td>11</td><td>After-heat elimination</td><td>When heating operation stops, in some cases, the indoor fan operates with (L) for approx. 30 seconds.</td><td></td></tr>
</table>

No.	Item	Outline of specifications	Remarks
12	Frequency fixed operation (Test run)	**<In case of wired remote controller>** 1) When pushing [CHK] button for 4 seconds or more, [TEST] is displayed on the display screen and the mode enters in Test run mode. 2) Push [ON/OFF] button. 3) Using [MODE] button, set the mode to [COOL] or [HEAT]. • Do not use other mode than [COOL]/[HEAT] mode. • During test run operation, the temperature cannot be adjusted. • An error is detected as usual. • A frequency fixed operation is performed. 4) After the test run, push [ON/OFF] button to stop the operation. (Display in the display part is same as the procedure in Item 1.) 5) Push [CHK] button to clear the test run mode. ([TEST] display in the display part disappears and the status returns to the normal stop status.)	Command frequency is approximately [S7]
13	Filter sign display	1) The operation time of the indoor fan is calculated, the filter reset signal is sent to the remote controller when the specified time (2500H) has passed, and it is displayed on LCD. 2) When the filter reset signal has been received from the remote controller, time of the calculation timer is cleared. In this case, the measurement time is reset if the specified time has passed, and display on LCD disappears.	[FILTER ▦] goes on.

No.	Item	Outline of specifications	Remarks
14	Energy-saving control	1) Selecting [AUTO] mode enables an energy-saving to be operated. 2) The setup temperature is shifted (corrected) in the range not to lose the comfort ability according to input values of various sensors. 3) Data (Input value room temp. Ta, Outside temp. To, Air volume, Indoor heat exchanger sensor temp. Tc) for 20 minutes are taken the average to calculate correction value of the setup temperature. 4) The setup temperature is shifted every 20 minutes, and the shifted range is as follows. In cooling time: +1.5 to – 1.0K In heating time: –1.5 to +1.0K.	
15	Max. frequency cut control	1) This control is operated by selecting [AUTO] operation mode. 2) COOL operation mode: It is controlled according to the following figure if To < 28°C.  3) HEAT operation mode: It is controlled according to the following figure if To > 15°C. 	

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>16</td><td>DC motor</td><td>1) When the fan operation has started, positioning of the stator and the rotor are performed.
(Moves slightly with tap sound)
2) The motor operates according to the command from the indoor controller.

Notes)
• When the fan rotates while the air conditioner stops due to entering of outside air, etc, the air conditioner may operate while the fan motor stops.
• When a fan lock is found, the air conditioner stops, and an error is displayed.
• If static pressure of the used duct does not match with the setup value of static pressure, which was decided in the static pressure setting code No. [5D], the air conditioner may stop or an error code may be displayed.</td><td>

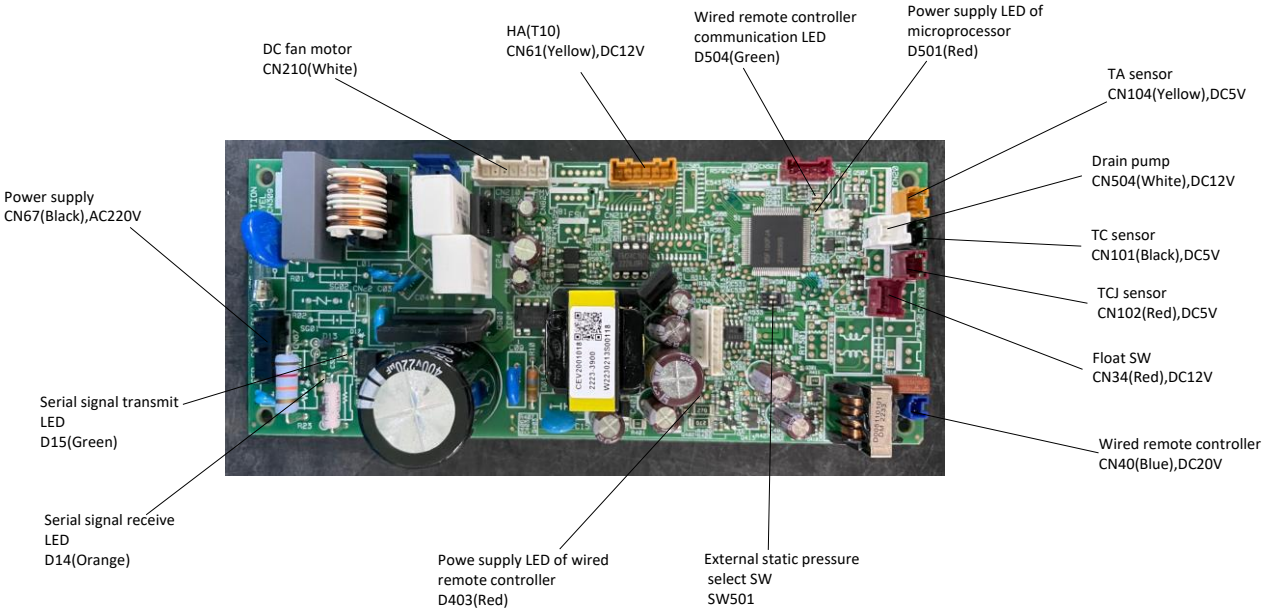
Check code [P12]</td></tr>
<tr><td>17</td><td>Self-clean operation
(Dry operation)

※When the factory is shipped, self-clean operation is not set.</td><td colspan="2">1) When cooling operation mode (AUTO COOL, COOL, DRY) stopped, the following three self-clean operations are performed.
<table>
<tr><th>Compressor ON period</th><th>Self-clean operation period</th><th>FAN</th><th>Drain pump</th></tr>
<tr><td>0 to 10 min.</td><td>None</td><td rowspan="3">Fan (UL)</td><td rowspan="3">STOP</td></tr>
<tr><td>10 to 60 min.</td><td>1 hour</td></tr>
<tr><td>above 60 min.</td><td>2 hours</td></tr>
</table>
<table>
<tr><td>2) During operation of self-clean, lights on the wired remote controller screen. However the operation lamp (Green LED) goes off.
3) To stop the self-clean operation, push twice the [ON/OFF] button on the remote controller continuously. (Stop the operation as compressor ON time in the table above: 10 minutes or below.)
4) When the follower unit executes self-clean operation in the group connection, the segment of is displayed on the wired remote controller screen via master unit.
* If self-clean operation is not used, set invalidity (does not use) of the self-clean operation by changing [0001 (At shipment) of CODE No. (DN) [D3] to [0000].
* To erase the display during operation of self-clean, change CODE No. [D4] from [0000: Display (At shipment)] to [0001: Non-display].</td><td>And it is not also on the wireless remote controller.
It is recognized as [STOP] from the remote monitor side.</td></tr>
</table></td></tr>
</table>

No.	Item	Outline of specifications	Remarks
18	Save operation	1) The current release control is performed with the restriction ratio set in EEPROM on the outdoor unit. 2) Setting method: push and hold [MENU] and [▼] buttons on the remote controller for at least 10 seconds to enter DN setting, adjust CODE No. to [C2] and change the SET DATA. 3) The factory default setting of SET DATA is 75, which is 75% power level. Each time push [▼] or [▲] button, the system will change the power level by 1% within 100% to 50%. 4) Push [ON/OFF] button to complete the setting after pushing [TIME] button to confirm.	This function depends on remote controller
19	8°C heating/Frost protective operation	1) This functional is intended for the cold latitudes and performs objective heating operation (8°C heating operation). 2) This function is valid only for combination with the outdoor units. 3) Using the indoor CODE No. [D1] (1 bit), Valid/Invalid of this function is set up at the customer's side. ∗ The setup by CODE No. is Invalid [0]/Valid [1] and Invalid [0] has been set at the shipment. 4) This operation is the heating operation which sets 8°C as the setup temperature of the target. 5) This function starts operation by pushing button [▼] during heating operation; besides by pushing [▼] button for 4 seconds or more after temperature reached the minimum set temperature. 6) To stop/release this operation, select and execute one from the following operations. Push [▲] button: Heating operation (18°C setting) continues. Push [ON/OFF] button: Air conditioner stops. (Heating 18°C operation at the next start) Push [MENU]: Other operation mode is selected and the operation continues. 7) As the setup temperature is 8°C and the human heating is not targeted, the cold air discharge preventive control (Item 7) is made invalid to suppress the intermittent operation. 8) The settings of the air direction and air volume are changeable during this operation. 9) The indoor fan stops to protect the compressor for 2 minutes after start of heating operation (Thermo-ON) by this function.	In a group connection, if there is even one combination with other unit, "This function is not provided." is displayed. The setup temperature jumps from [18] to [8].

5-3. Indoor Print Circuit Board

<MCC-1643>



Optional Connector Specifications of Indoor P.C. Board (MCC-1643)

Function	Connector No.	Pin No.	Specifications	Remarks
HA	CN61	①	ON/OFF input	HA ON/OFF input (J01: YES/NO=Pulse (At shipment from factory) / Static input selection)
		②	0V	
		③	Remote controller prohibited input	Permission/Prohibition of remote controller operation stop is performed by input.
		④	Operation output (Open collector)	Operation ON (Answer back of HA)
		⑤	DC12V	
		⑥	Warning output (Open collector)	Warning output ON
CHK Operation check	CN71	①	Check mode input	This check is used to check indoor operation. (Performs operation of Drain pump ON without communication with outdoor and remote controller)
		②	0V	
DISP Exhibition mode	CN72	①	Display mode input	Communication is available by indoor unit and remote controller only.
		②	0V	
Option control kit	CN521	①	12V	Connected Application control kit (TCB-PCUC2E)
		②	5V	
		③	Transmission	
		④	Receive	
		⑤	0V	

6. TROUBLESHOOTING

6-1. Summary of Troubleshooting

<Wired remote controller type>

1. Before troubleshooting

1) Required tools/instruments
   - ⊕ and ⊖ screwdrivers, spanners, radio cutting pliers, nippers, push pins for reset switch
   - Tester, thermometer, pressure gauge, etc.
2) Confirmation points before check
   a) The following operations are normal.
      1. Compressor does not operate.
         - Is not 3-minutes delay (3 minutes after compressor OFF)?
         - Is not the outdoor unit in standby status though the remote controller reached the setup temperature?
         - Does not timer operate during fan operation?
         - Is not an overflow error detected on the indoor unit?
         - Is not outside high-temperature operation controlled in heating operation?
      2. Indoor fan does not rotate.
         - Does not cool air discharge preventive control work in heating operation?
      3. Outdoor fan does not rotate or air volume changes.
         - Does not high-temperature release operation control work in heating operation?
         - Does not outside low-temperature operation control work in cooling operation?
         - Is not defrost operation performed?
      4. ON/OFF operation cannot be performed from remote controller.
         - Is not automatic address being set up?
           (When the power is turned on at the first time or when indoor unit address setting is changed, the operation cannot be performed for maximum approx. 5 minutes after power-ON.)
         - Is not being carried out a test run by operation of the outdoor P.C. board?
   b) Did you return the cabling to the initial positions?
   c) Are connecting cables of indoor unit and remote controller correct?

2. Troubleshooting procedure

When a trouble occurred, check the parts along with the following procedure.

Trouble → **Confirmation of check code display** → **Check defective parts.**

NOTE

For cause of a trouble, power conditions or malfunction/erroneous diagnosis of microcomputer due to outer noise is considered except the items to be checked. If there is any noise source, change the cables of the remote controller to shield cables.

Outline of judgment

When one of the following phenomena appears, an error of the power relay (RY01) is considered; therefore replace the P.C. board.

• The operation started from the remote controller.	→	**• The fan stops immediately. • The display on the remote controller disappears.**	→	**After approx. 1minute 30 seconds, "Under setting" is displayed.**	→	**The screen of the remote controller enters in STOP status.**

The primary judgment to check whether a trouble occurred in the indoor unit or outdoor unit is carried out with the following method.

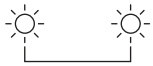
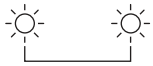
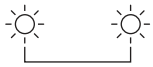
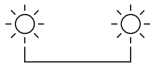
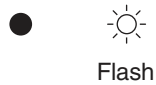
Method to judge the erroneous position by display panel of the indoor unit
(lamp display of the wireless receiving part)

The indoor unit monitors the operating status of the air conditioner, and the blocked contents of self-diagnosis are displayed restricted to the following cases if a protective circuit works.

● : Go off, ○ : Go on, ☼ : Flash (0.5 sec.)

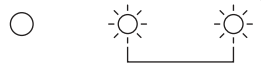
Lamp indication	Check code	Cause of trouble occurrence
Operation ● Timer ● Ready ● No indication at all	—	Power supply OFF or miswiring between lamp indication unit and indoor unit
Operation ☼ Timer ● Ready ● Flash	E01	Receiving error — Miswiring or wire connection error between receiving unit and indoor unit
	E02	Sending error — Miswiring or wire connection error between receiving unit and indoor unit
	E03	Communication stop — Miswiring or wire connection error between receiving unit and indoor unit
	E08	Duplicated indoor unit No. — Setup error
	E09	Duplicated master units of remote controller — Setup error
	E10	Communication error between CPUs on indoor unit P.C. board
	E18	Wire connection error between indoor units, Indoor power OFF (Communication stop between indoor header and follower)
Operation ● Timer ● Ready ☼ Flash	E04	Miswiring between indoor unit and outdoor unit or connection erorr (Communication stop between indoor and outdoor units)
Operation ● Timer ☼ Ready ☼ Alternate flash	P10	Overflow was detected. — Protective device of indoor unit worked.
	P12	Indoor DC fan error — Protective device of indoor unit worked.
Operation ☼ Timer ● Ready ☼ Alternate flash	P03	Outdoor unit discharge temp. error — Protective device of outdoor unit worked. ∗1
	P04	Outdoor high pressure system error — Protective device of outdoor unit worked. ∗1
	P05	Negative phase detection error — Outdoor unit error
	P07	Heat sink overheat error — Outdoor unit error
	P15	Gas leak detection error — Outdoor unit error
	P19	4-way valve system error (Indoor or outdoor unit judged.)
	P20	Outdoor unit high pressure protection
	P22	Outdoor unit: Outdoor unit error — Protective device of outdoor unit worked. ∗1
	P26	Outdoor unit: Inverter Idc operation — Protective device of outdoor unit worked. ∗1
	P29	Outdoor unit: Position detection error — Protective device of outdoor unit worked. ∗1
	P31	Stopped because of error of other indoor unit in a group (Check codes of E03/L03/L07/L08)

∗1: These are representative examples and the check code differs according to the outdoor unit to be combined.

Lamp indication	Check code	Cause of trouble occurrence	
Operation Timer Ready  Alternate flash	F01	Heat exchanger sensor (TCJ) error	Indoor unit sensor error
	F02	Heat exchanger sensor (TC) error	
	F10	Heat exchanger sensor (TA) error	
Operation Timer Ready  Alternate flash	F04	Discharge temp. sensor (TD) error	Sensor error of outdoor unit ∗1
	F06	Temp. sensor (TE) error	
	F07	Temp. sensor (TL) error	
	F08	Temp. sensor (TO) error	
	F12	Temp. sensor (TS) error	
	F13	Temp. sensor (TH) error	
	F15	Temp. Sensor miswiring (TE, TS)	
Operation Timer Ready  Simultaneous flash	F29	Indoor EEPROM error	
Operation Timer Ready  Simultaneous flash	F31	Outdoor EEPROM error	
Operation Timer Ready  Flash	H01	Compressor break down	Outdoor compressor system error ∗1
	H02	Compressor lock	
	H03	Current detection circuit error	
	H04	Case thermostat worked.	
	H06	Outdoor unit low pressure system error	
Operation Timer Ready  Simultaneous flash	L03	Duplicated header indoor units	→ AUTO address ∗ If group construction and address are not normal when power supply turned on, automatically goes to address setup mode.
	L07	There is indoor unit of group connection in individual indoor unit.	
	L08	Unsetting of group address	
	L09	Missed setting (Unset indoor capacity)	
Operation Timer Ready  Simultaneous flash	L10	Unset model type (Service board)	Others
	L20	Duplicated indoor central addresses	
	L29	Outdoor unit and other error	
	L30	Outside interlock error	
	L31	Negative phase error	

∗1: These are representative examples and the check code differs according to the outdoor unit to be combined.

Others (Other than Check Code)

Lamp indication	Check code	Cause of trouble occurrence
Operation Timer Ready  Simultaneous flash	—	During test run
Operation Timer Ready  Alternate flash	—	Disagreement cool/heat (Automatic cool/heat setting to automatic cool/heat prohibited mode)

6-2. Check Code List (Indoor)

(Indoor unit detected)

Check code indication	Representative defective position	Explanation of error contents	Air conditioner operation	
TCC-LINK central & Remote controller			Automatic reset	Operation continuation
E03	Regular communication error between indoor and remote controller	No communication from remote controller and network adapter (Also no communication from central control system)	○	×
E04	Indoor/Outdoor serial error	There is error on serial communication between indoor and outdoor units	○	×
E08	Duplicated indoor addresses ✧	Same address as yours was detected.	○	×
E10	Communication error between indoor MCU	MCU communication error between main motor and micro computer	○	×
E18	Regular communication error between indoor master and follower units	Regular communication between indoor master and follower units is impossible.	○	×
F01	Indoor unit, Heat exchanger (TCJ) error	Open/short was detected on heat exchanger (TCJ).	○	×
F02	Indoor unit, Heat exchanger (TC) error	Open/short was detected on heat exchanger (TC).	○	×
F10	Indoor unit, Room temp. sensor (TA) error	Open/short was detected on room temp. sensor (TA).	○	×
F29	Indoor unit, other indoor P.C. board error	EEPROM error (Other error may be detected. If no error, automatic address is repeated.	×	×
L03	Duplicated setting of indoor group master unit ✧	There are multiple master units in a group.	×	×
L07	There is group cable in individual indoor unit. ✧	When even one group connection indoor unit exists in individual indoor unit.	×	×
L08	Unset indoor group address ✧	Indoor group address is unset.	×	×
L09	Unset indoor capacity	Capacity of indoor unit is unset.	×	×
L20	Duplicated central control system address	Duplicated setting of central control system address	○	×
L30	Outside error input to indoor unit (Interlock)	Abnormal stop by outside error input	×	×
P01	Indoor unit, AC fan error	An error of indoor AC fan was detected. (Fan motor thermal relay worked.)	×	×
P10	Indoor unit, overflow detection	Float switch worked.	×	×
P12	Indoor unit, DC fan error	Indoor DC fan error (Over-current/Lock, etc.) was detected. Static pressure error set	×	×
P19	4-way valve system error	In heating operation, an error was detected by temp. down of indoor heat exchanger sensor.	○	×
P31	Other indoor unit error	Follower unit in group cannot operate by warning from [E03/L03/L07/L08] of master unit.	○	×

✧ When this warning was detected before group construction/address check finish at power supply was turned on, the mode shifts automatically to AUTO address setup mode.

(Remote controller detected)

Check code indication	Representative defective position	Explanation of error contents	Air conditioner operation	
Remote controller			Automatic reset	Operation continuation
E01	No master remote controller, Remote controller communication (Receive) error	Signal cannot be received from indoor unit. Master remote controller was not set. (including 2 remote controllers)	—	—
E02	Remote controller communication (Send) error	Signal cannot be sent to indoor unit.	—	—
E09	Duplicated master remote controller	In 2-remote controller control, both were set as master. (Indoor master unit stops warning and follower unit continues operation.)	×	△

NOTE: Even for the same contents of error such as communication error, the display of check code may differ according to detection device.

Check Code List

Error mode detected by indoor unit

Operation of diagnostic function				Judgment and measures
Check code	Cause of operation	Status of air conditioner	Condition	
E03	No communication from remote controller and communication adapter	Stop (Automatic reset)	Displayed when error is detected	1. Check cables of remote controller and communication adapters. • Remote controller LCD display OFF (Disconnection) • Central remote controller [97] check code
E04	The serial signal is not output from outdoor unit to indoor unit. • Miswiring of inter-unit wire • Defective serial sending circuit on outdoor P.C. board • Defective serial receiving circuit on indoor P.C. board	Stop (Automatic reset)	Displayed when error is detected	1. Outdoor unit does not completely operate. • Inter-unit wire check, correction of miswiring • Check outdoor P.C. board. Correct wiring of P.C. board. 2. When outdoor unit normally operates Check P.C. board (Indoor receiving / Outdoor sending).
E08	Duplicated indoor unit address	Stop	Displayed when error is detected	1. Check whether remote controller connection (Group/Individual) was changed or not after power supply turned on (Finish of group construction/Address check). * If group construction and address are not normal when the power has been turned on, the mode automatically shifts to address setup mode. (Resetting of address)
L03	Duplicated indoor header unit			
L07	There is group wire in individual indoor unit.			
L08	Unset indoor group address			
L09	Unset indoor capacity	Stop	Displayed when error is detected	1. Set indoor capacity (DN=11)
L30	Abnormal input of outside interlock	Stop	Displayed when error is detected	1. Check outside devices. 2. Check indoor P.C. board.
P10	Float switch operation • Float circuit, Disconnection, Coming-off, Float switch contact error	Stop	Displayed when error is detected	1. Trouble of drain pump 2. Clogging of drain pump 3. Check float switch. 4. Check indoor P.C. board.
P12	Indoor DC fan error	Stop	Displayed when error is detected	1. Position detection error 2. Indoor fan driving part over-current protective circuit operation 3. Indoor fan lock 4. Indoor P.C. board check 5. Static pressure error set
P19	4-way valve system error • After heating operation has started, indoor heat exchangers temp. is down.	Stop (Automatic reset)	Displayed when error is detected	1. Check 4-way valve. 2. Check 2-way valve and check valve. 3. Check indoor heat exchanger (TC/TCJ). 4. Check indoor P.C. board.
P31	Own unit stops while warning is output to other indoor units.	Stop (Follower unit) (Automatic reset)	Displayed when error is detected	1. Judge follower unit while master unit is [E03], [L03], [L07] or [L08]. 2. Check indoor P.C. board.
F01	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TCJ)	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor heat exchanger temp. sensor (TCJ). 2. Check indoor P.C. board.
F02	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TC)	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor heat exchanger temp. sensor (TC). 2. Check indoor P.C. board.
F10	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TA)	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor heat exchanger temp. sensor (TA). 2. Check indoor P.C. board.
F29	Indoor EEPROM error • EEPROM access error	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor EEPROM. (including socket insertion) 2. Check indoor P.C. board.
E10	Communication error between indoor MCU • Communication error between fan driving MCU and main MCU	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor P.C. board.
E18	Regular communication error between indoor header and follower units	Stop (Automatic reset)	Displayed when error is detected	1. Check remote controller wiring. 2. Check indoor power supply wiring. 3. Check indoor P.C. board.

Error mode detected by outdoor unit

Operation of diagnostic function				Judgment and measures
Check code / Indoor unit	Cause of operation	Status of air conditioner	Condition	
F04	Disconnection, short of discharge temp. sensor (TD)	Stop	Displayed when error is detected	1. Check discharge temp. sensor (TD). 2. Check outdoor P.C. board.
F06	Disconnection, short of outdoor temp. sensor (TE)	Stop	Displayed when error is detected	1. Check temp. sensor (TE). 2. Check outdoor P.C. board.
F07	Disconnection, short of outdoor temp. sensor (TL)	Stop	Displayed when error is detected	1. Check temp. sensor (TL). 2. Check outdoor P.C. board.
F12	Disconnection, short of suction temp. sensor (TS)	Stop	Displayed when error is detected	1. Check suction temp. sensor (TS). 2. Check outdoor P.C. board.
F15	Miss-mounting of outdoor temp. sensor (TE, TS)	Stop	Displayed when error is detected	1. Check temp. sensor (TE, TS). 2. Check outdoor P.C. board.
F08	Disconnection, short of outside temp. sensor (TO)	Continue	Displayed when error is detected	1. Check outside temp. sensor (TO). 2. Check outdoor P.C. board.
F13	Disconnection, short of heat sink temp. sensor (TH)	Stop	Displayed when error is detected	1. Check outdoor P.C. board. Outdoor IGBT built-in temperature sensor (TH) error
F31	Outdoor P.C. EEPROM error	Stop	Displayed when error is detected	1. Check outdoor P.C. board.
L10	Unset jumper of service P.C. board	Stop	Displayed when error is detected	1. Outdoor service P.C. board Check model type setting jumper wire.
L29	Communication error between outdoor P.C. board MCU	Stop	Displayed when error is detected	1. Check outdoor P.C. board 2. Connection check for each P.C. board.
P07	Heat sink overheat error * Heat sink temp. sensor detected over specified temperature.	Stop	Displayed when error is detected	1. Check screw tightening between PC. Board and heat sink and check radiator grease. 2. Check heat sink blast path.
P15	Detection of gas leak * Discharge temp. sensor (TD), Suction temp. sensor (TS) detected temperature over specified temp.	Stop	Displayed when error is detected	1. Check gas leak, recharge 2. Check full open of service valve. 3. Check PMV (Pulse Motor Valve). 4. Check broken pipe. 5. Check discharge temp. sensor (TD), suction temp. sensor (TS).
P19	4-way valve inverse error * After heating operation has started, indoor heat exchanger temp. lowers under the specified temp. * After heating operation has started, outdoor heat exchanger / suction temp. rises over the specified temp.	Stop	Displayed when error is detected	1. Check operation of 4-way valve. 2. Check outdoor heat exchanger (TE), suction temp. sensor (TS). 3. Check indoor heat exchanger sensor (TC). 4. Check 4-way valve coil. 5. Check PMV (Pulse Motor Valve).
H01	Compressor break down * Although operation has started, operation frequency decreases and operation stops.	Stop	Displayed when error is detected	1. Check power supply voltage. 2. Overload operation of refrigerating cycle
H02	Compressor lock * Over-current detection after compressor start-up	Stop	Displayed when error is detected	1. Trouble of compressor (Lock, etc.): Replace compressor. 2. Wiring error of compressor (Open phase)

Operation of diagnostic function				Judgment and measures
Check code / Indoor unit	Cause of operation	Status of air conditioner	Condition	
H03	Current detection circuit error	Stop	Displayed when error is detected	1. Check outdoor P.C. board. (AC current detection circuit)
P05	Open phase of 3-phase power supply	Stop	Displayed when error is detected	1. Check open phase of 3-phase power supply.
F23	Ps sensor error	Stop	Displayed when error is detected	1. Check connection of Ps sensor connector. 2. Check failure of Ps sensor. 3. Check compressing power error of compressor. 4. Check 4-way valve error. 5. Check outdoor P.C. board error.
H06	Low pressure protective operation	Stop	Displayed when error is detected	1. Check service valves are fully opened. (Gas side, Liquid side) 2. Check clogging of outdoor PMV. (PMV1, 2) 3. Check SV2 circuit. 4. Check Ps sensor error. 5. Check clogging of indoor filter. 6. Check clogging of refrigerant pipe. 7. Check of outdoor fan operation. (In heating mode) 8. Check short of refrigerant.
P03	Discharge temp. error * Discharge temp. (TD) over specified value was detected.(1.6)	Stop	Displayed when error is detected	1. Check refrigerating cycle (Gas leak) 2. Trouble of electronic expansion valve 3. Check discharge temp. sensor (TD).
H04	Case thermostat operation * Abnormal overheat of compressor	Stop	Displayed when error is detected	1. Check case thermostat and connector. 2. Check gas leak, recharge 3. Check full open of service valve. 4. Check PMV (Pulse Motor Valve). 5. Check broken pipe.
P04	High pressure SW system error	Stop	Displayed when error is detected	1. Check service valves are fully opened. (Gas side, Liquid side) 2. Check of outdoor fan operation. 3. Check motor error of outdoor fan. 4. Check clogging of outdoor PMV. (PMV1, 2) 5. Check clogging of heat exchanger in indoor/outdoor units. 6. Short-circuit status of suction/discharge air in outdoor unit. 7. Check outdoor P.C. board error. 8. Check fan system error (Cause of air volume drop) at indoor side. 9. Check PMV opening status in indoor unit.
P05	Power supply voltage error	Stop	Displayed when error is detected	1. Check power supply voltage.
P20	High pressure protective operation • During cooling operation, outdoor temp. sensor (TL) detected temperature over specified temp. • During heating operation, indoor temp. sensor (TC, TCJ) detected temperature over specified temp.	Stop	Displayed when error is detected	1. Check outdoor heat exchanger sensor (TL). 2. Check indoor heat exchanger sensor (TC, TCJ). 3. Check full open of service valve. 4. Check indoor/outdoor fan. 5. Check PMV (Pulse Motor Valve). 6. Check clogging and short circuit of indoor/outdoor heat exchanger. 7. Overcharge of refrigerant. Recharge
P22	Outdoor fan system error	Stop	Displayed when error is detected	1. Check lock of fan motor. 2. Check power supply voltage between L2 and N. 3. Check outdoor P.C. board.
P26	Short-circuit error of compressor driving element	Stop	Displayed when error is detected	1. When performing operation while taking-off compressor wire, P26 error occurs. Check control P.C. board. 2. When performing operation while taking-off compressor wire, an error does not occur. (Compressor rare short)
P29	Position detection circuit error	Stop	Displayed when error is detected	1. Check control P.C. board.

Error mode detected by remote controller

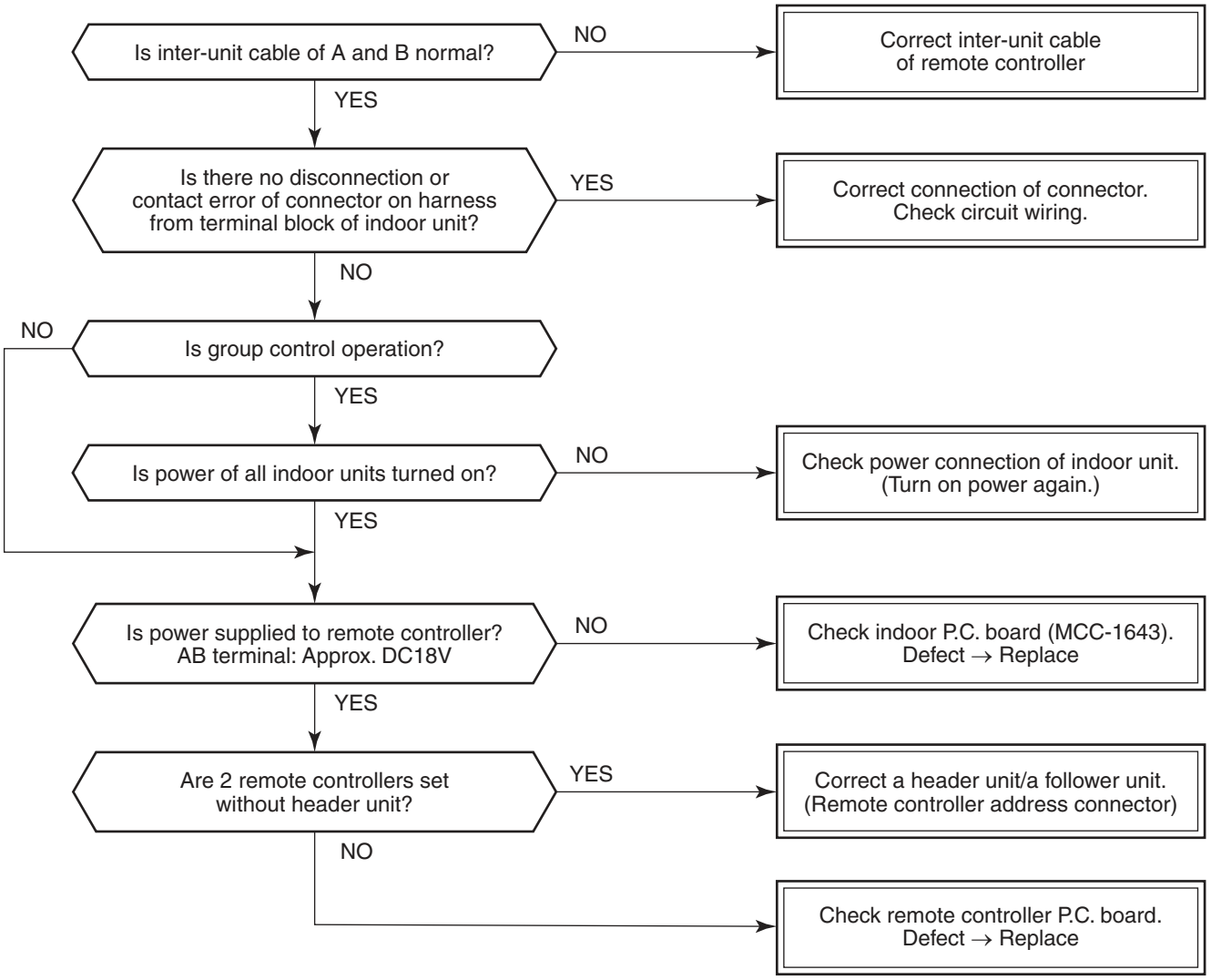
Operation of diagnostic function				Judgment and measures
Check code	**Cause of operation**	**Status of air conditioner**	**Condition**	
Not displayed at all (Operation on remote controller is impossible.)	No communication with master indoor unit • Remote controller wiring is not correct. • Power of indoor unit is not turned on. • Automatic address cannot be completed.	Stop	—	Power supply error of remote controller, Indoor EEPROM error 1. Check remote controller inter-unit wiring. 2. Check remote controller. 3. Check indoor power wiring. 4. Check indoor P.C. board. 5. Check indoor EEPROM. (including socket insertion) → Automatic address repeating phenomenon generates.
E01 ∗2	No communication with master indoor unit • Disconnection of inter-unit wire between remote controller and master indoor unit (Detected by remote controller side)	Stop (Automatic reset) ∗ If center exists, operation continues.	Displayed when error is detected	Receiving error from remote controller 1. Check remote controller inter-unit wiring. 2. Check remote controller. 3. Check indoor power wiring. 4. Check indoor P.C. board.
E02	Signal send error to indoor unit (Detected by remote controller side)	Stop (Automatic reset) ∗ If center exists, operation continues.	Displayed when error is detected	Sending error of remote controller 1. Check sending circuit inside of remote controller. → Replace remote controller.
E09	There are multiple main remote controllers. (Detected by remote controller side)	Stop (Sub unit continues operation.)	Displayed when error is detected	1. In 2-remote controllers, there are multiple main units. Check that there are 1 main remote controller and other sub remote controllers.

∗2 The check code cannot be displayed by the wired remote controller.
(Usual operation of air conditioner becomes unavailable.)

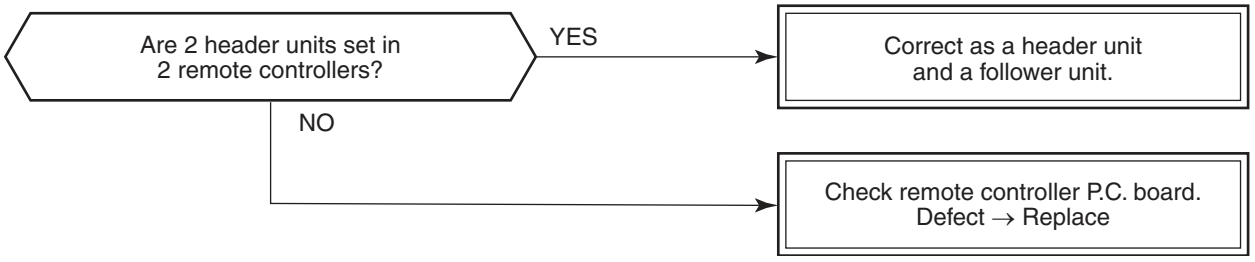
6-3. Diagnostic Procedure for Each Check Code (Indoor Unit)

Check code

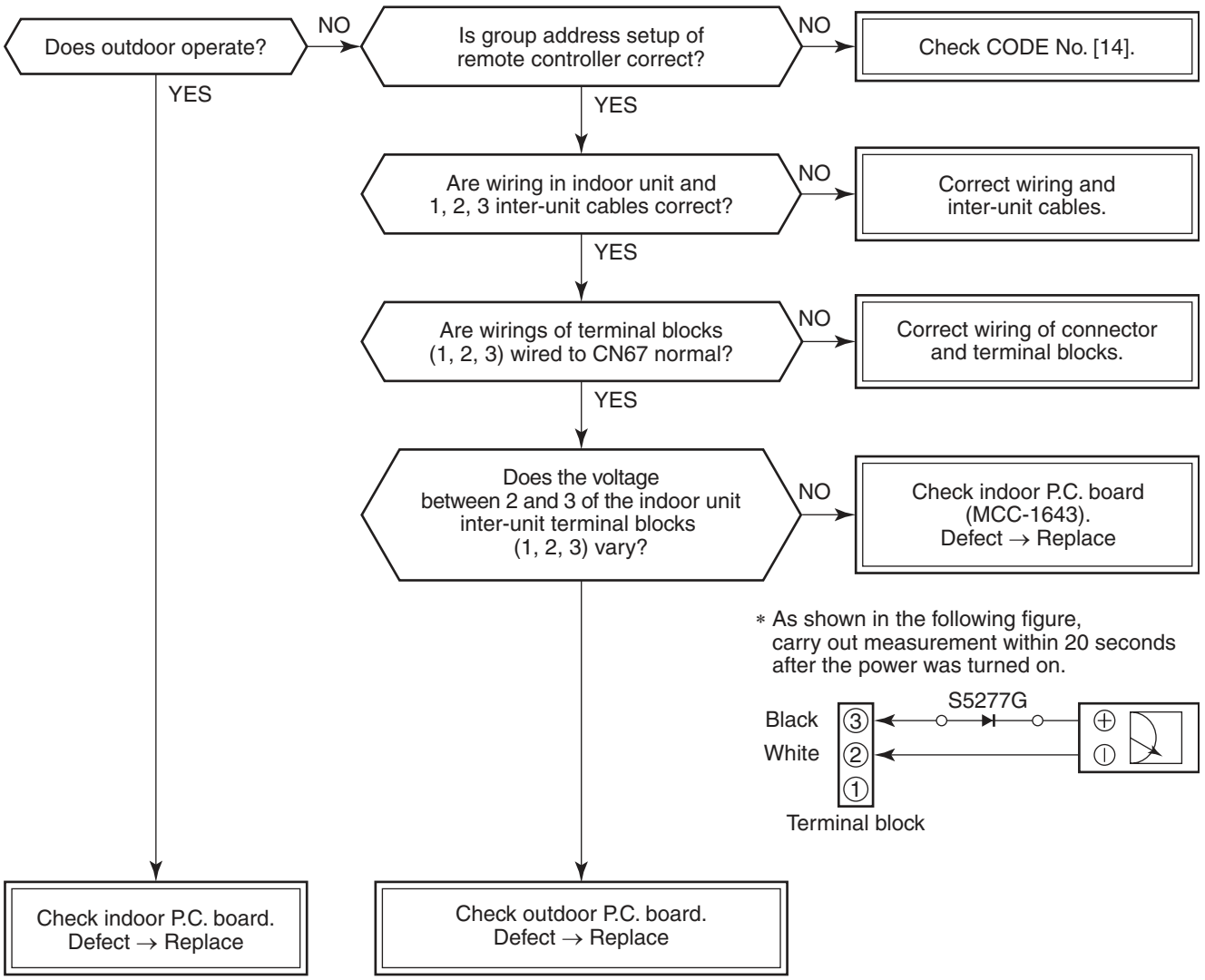
[E01 error]



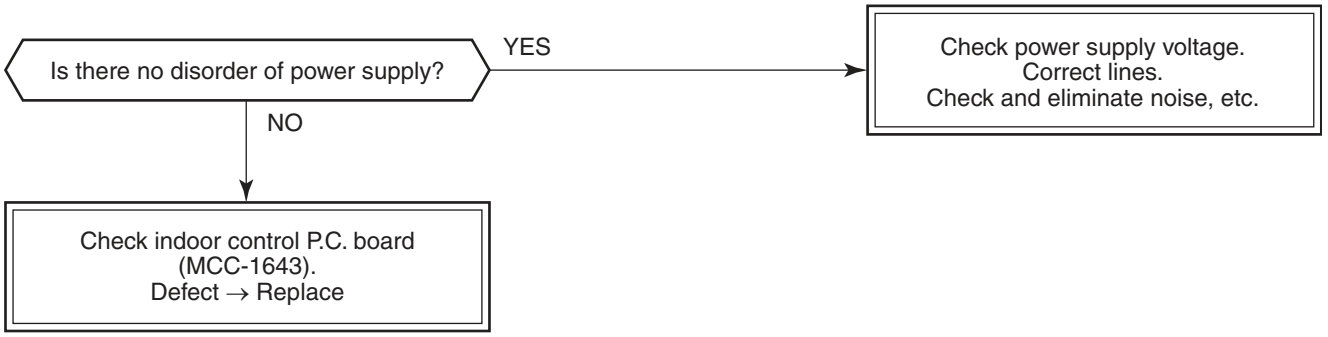
[E09 error]



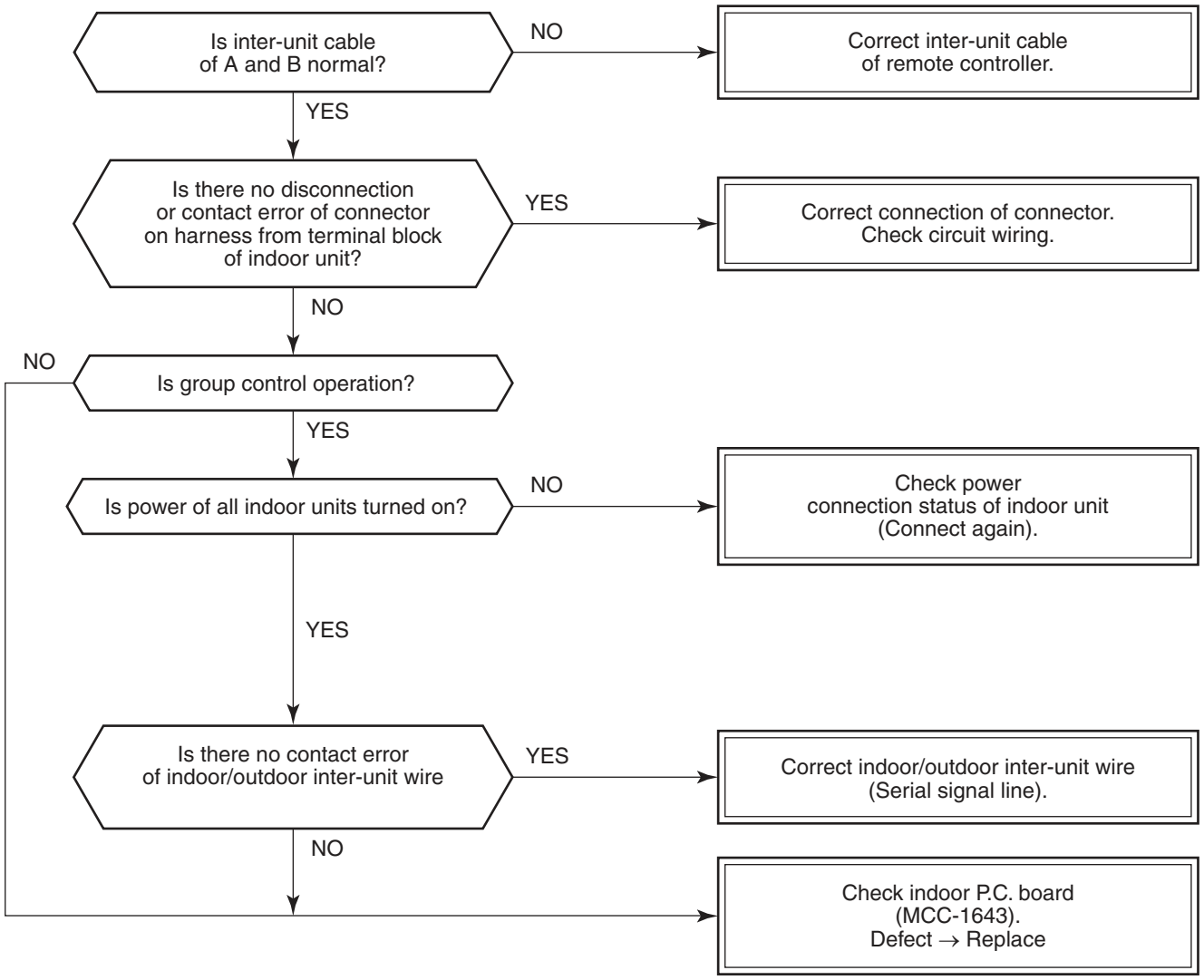
[E04 error]



[E10 error]



[E18 error]



[E08, L03, L07, L08 error]

E08: Duplicated indoor unit No.

L03: There are 2 or more header units in a group control.

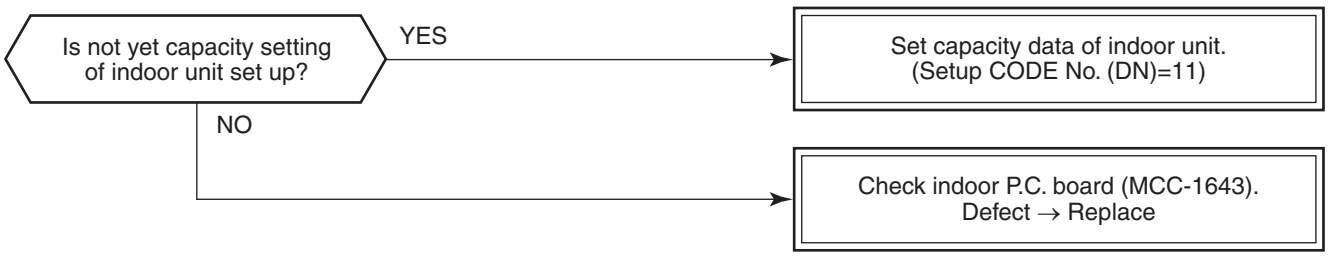
L07: There is 1 or more group address [Individual] in a group control.

L08: The indoor group address is unset. (99)

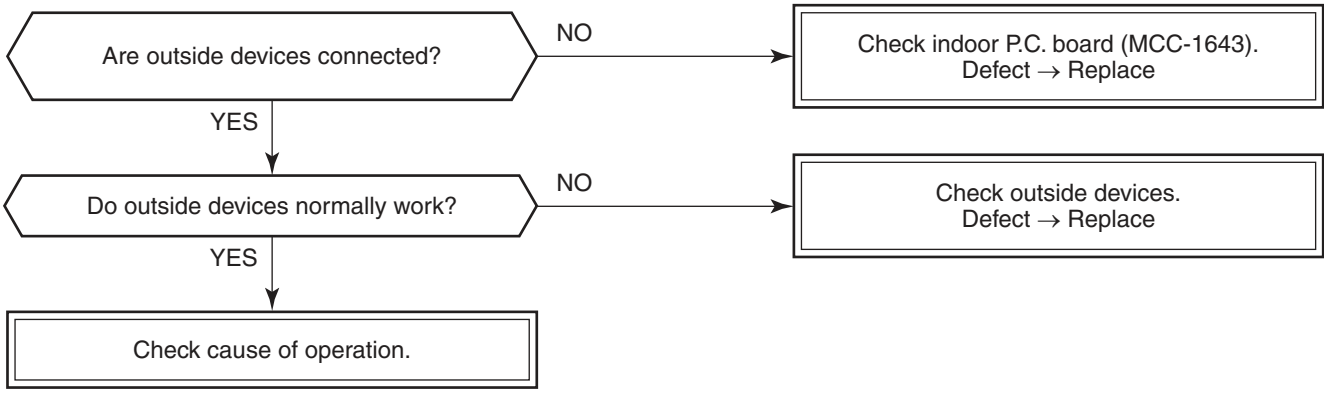
If the above error is detected when power supply turned on, the mode enters automatically in the automatic address set mode. (Check code is not output.)

However, if the above error is detected during the automatic address set mode, a check code may be output.

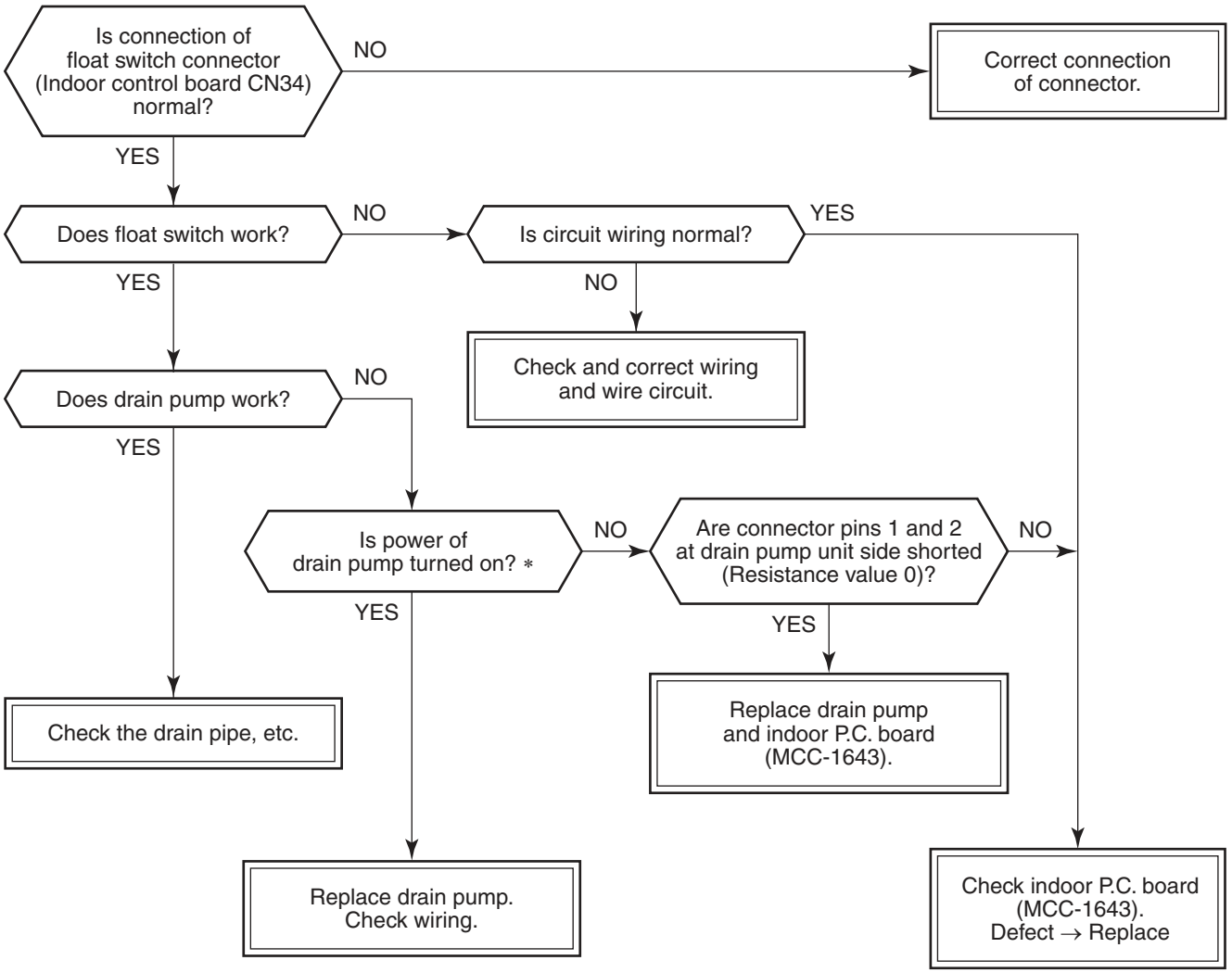
[L09 error]



[L30 error]

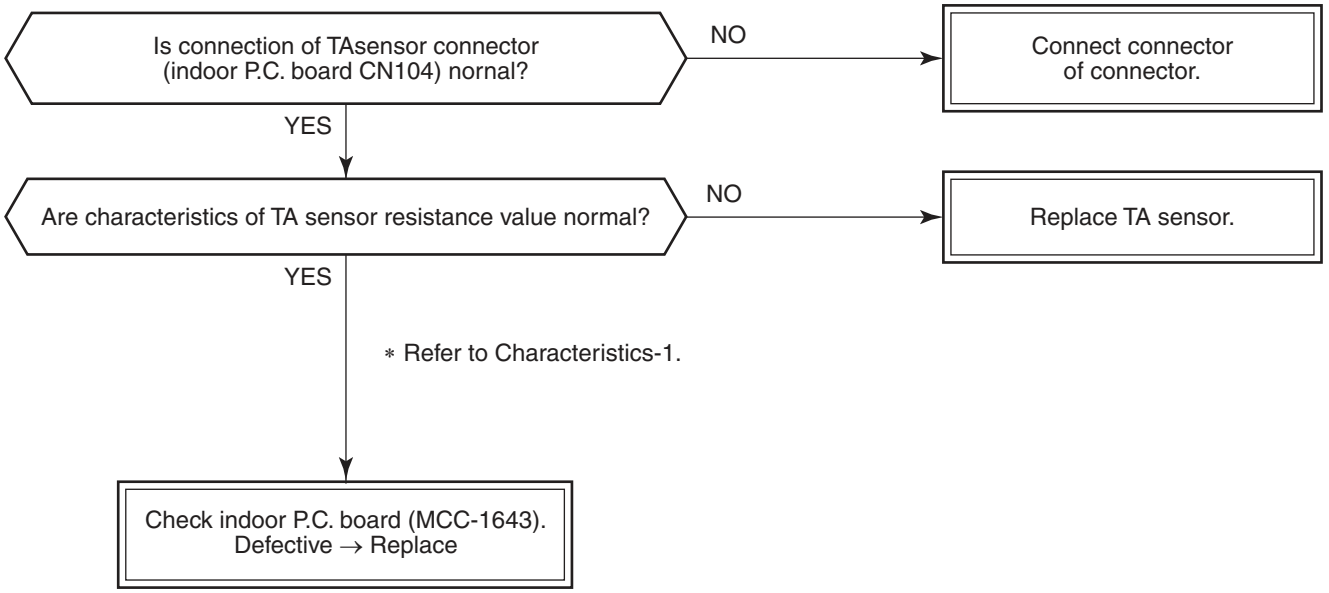

Are outside devices connected?
NO
Check indoor P.C. board (MCC-1643).
Defect → Replace
YES
Do outside devices normally work?
NO
Check outside devices.
Defect → Replace
YES
Check cause of operation.

[P10 error]



* Check that voltage of 1 – 2 pin of CN504 on the indoor P.C. board is Approx., 12V.

[F10 error]



[P12 error]

Power off.

Is not connection error or disconnection on the connector CN210 of indoor unit P.C. board?

YES → Repair the connector connection.

NO

Disconnect the connector CN210 to the indoor P.C. board

Does the fan turn smoothly when turned by hand?

NO → Replace the indoor fan motor.

YES

Is each resistance value on the motor side of the fan motor connector CN210 of the indoor P.C. board correct?

NO → Replace the indoor fan motor.

YES

<Checking procedure>
Measure the resistance of the following terminals with the tester.
Internal motor circuit is damaged if the measured value is out of the range in below table.

Pin No.	⑦	⑥	⑤	④	③	②	①
Color	Blue	Yellow	White	Black	-	-	Red

※ Measure by connecting the com side to ④ (Black) while measuring.
The measurement may vary.

	Measurement place	Resistance value
		a, b, c
I.	Between ④ (Black) - ① (Red)	∞ (MΩ)
II.	Between ④ (Black) - ⑤ (White)	35k – 65kΩ
III.	Between ④ (Black) - ⑥ (Yellow)	130k – 170kΩ
IV.	Between ④ (Black) - ⑦ (Blue)	∞ (MΩ)

[Action if the measurement is out of the range]
If any measurement in the above table is between 0 to several 100 Ω, replace the indoor P.C. board together with the motor since the indoor P.C. board is damaged.

Is F01 of the indoor P.C. board open?

YES → Replace the indoor P.C. board (MCC-1643).

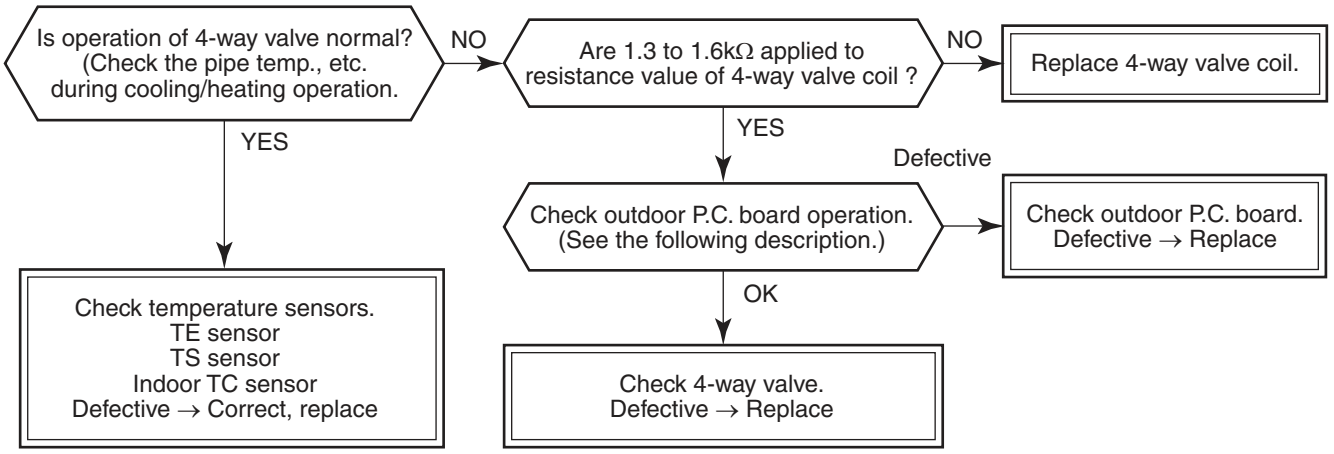
NO

Is R04 or R05 of the indoor P.C. board open?

YES → Replace the indoor P.C. board (MCC-1643).

NO → Check the indoor P.C. board (MCC-1643). If faulty→Replace

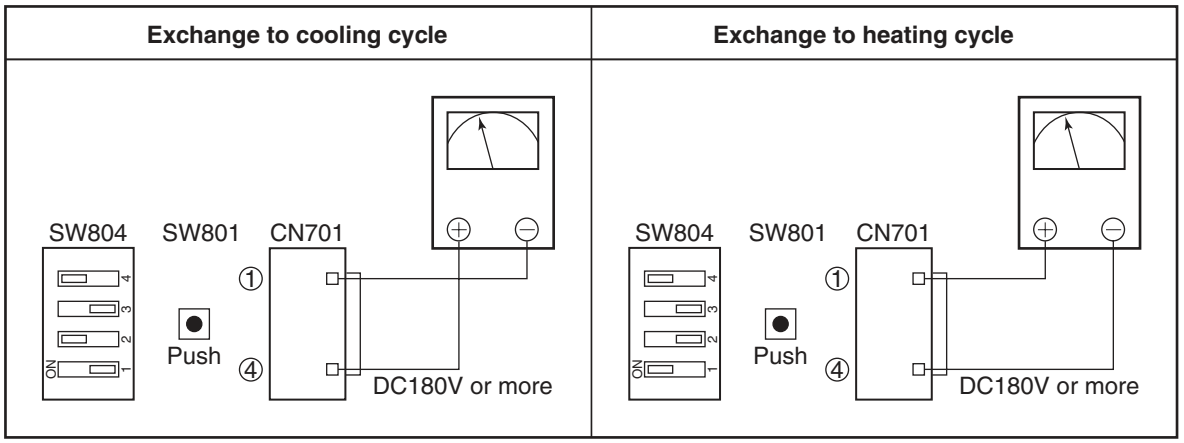
[P19 error]



Operation check direction of the outdoor P.C. board (In case of self-preservation valve)

1) Set the Dip switch SW804 as same as the following table and push SW801 for approx. 1 second. It enables you to check the exchange operation to cooling cycle or heating cycle.
   - Only for approx. 10 seconds, the power is turned on.
   - As the heat value of part (coil: resistance R701) is large, when checking the operation continuously, wait 1 minute or more until the next check. (There is no problem if a coil is not connected.)

2) After check, turn off all the Dip switches SW804.

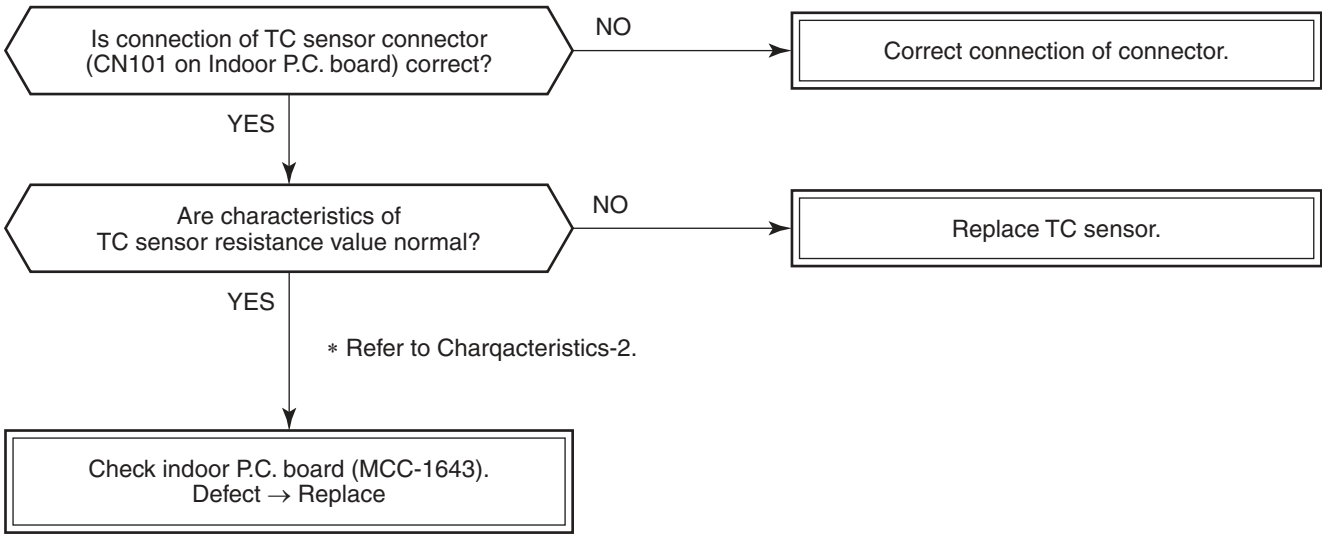


Check by tester

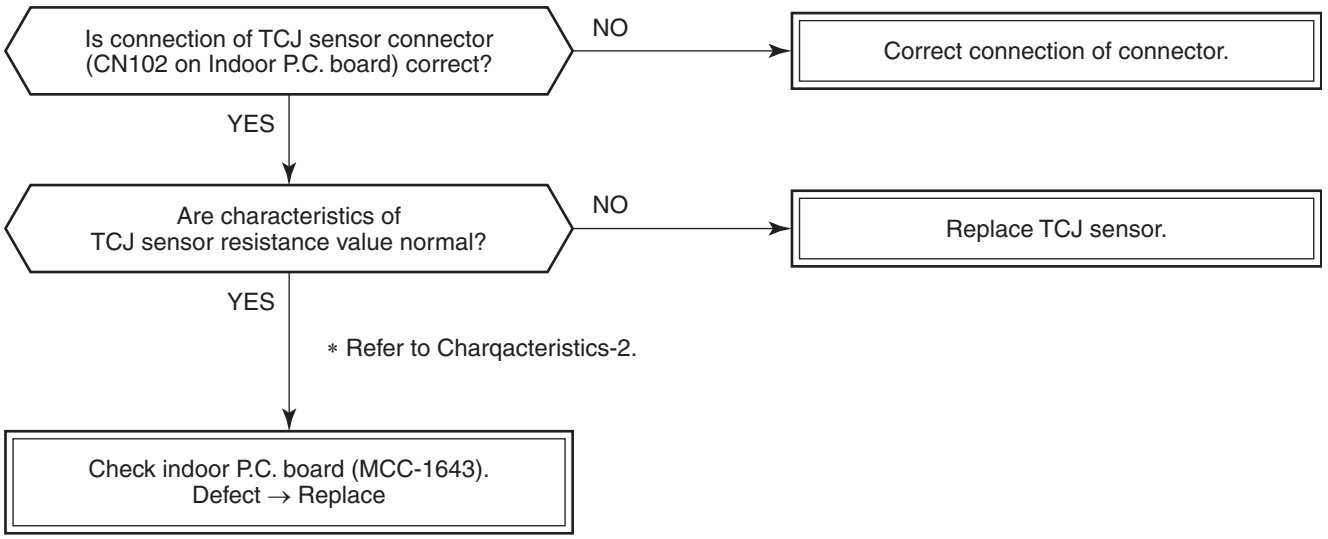
Analog tester: Good article if over DC180V

Digital tester: Although in some cases, the value varied and indicated. If the maximum value is DC180V or more, it is good article.

[F02 error]



[F01 error]

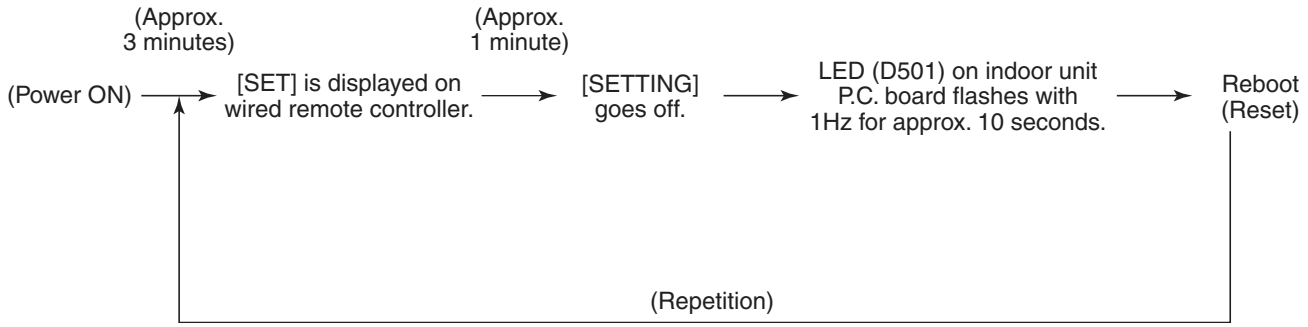


[E03 error] (Master indoor unit)

[E03 error] is detected when the indoor unit cannot receive a signal from the wired remote controller.

[F29 error]

This check code indicates a detection error of IC503 non-volatile memory (EEPROM) on the indoor unit P.C. board, which generated during operation of the air conditioner. Replace the service P.C. board.



[P31 error] (Follower indoor unit)

When the master unit of a group operation detected [E03], [L03], [L07] or [L08] error, the follower unit of the group operation detects [P31 error] and then the unit stops.

There is no display of the check code or alarm history of the wired remote controller. (In this model, the mode enters in automatic address set mode when the header unit detected [L03], [L07] or [L08] error.)

Temperature – Resistance value characteristic table

TA, TC, TCJ, TE, TS, TO sensor

Representative value

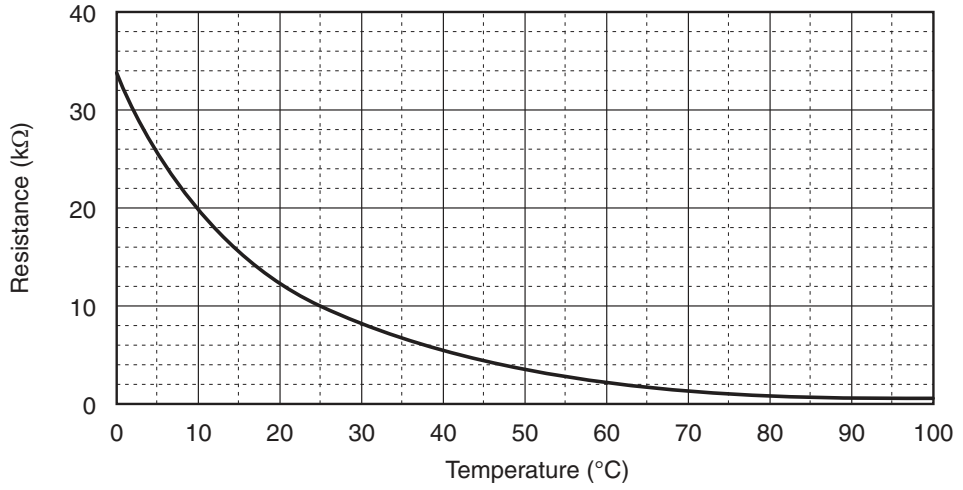
Temperature (°C)	Resistance value (kΩ)		
	(Minimum value)	(Standard value)	(Maximum value)
0	32.33	33.80	35.30
10	19.63	20.35	21.09
20	12.23	12.59	12.95
25	9.75	10.00	10.25
30	7.76	7.99	8.22
40	5.01	5.19	5.37
50	3.31	3.45	3.59
60	2.24	2.34	2.45
70	1.54	1.62	1.71
80	1.08	1.15	1.21
90	0.77	0.82	0.88
100	0.56	0.60	0.64

TD, TL sensor

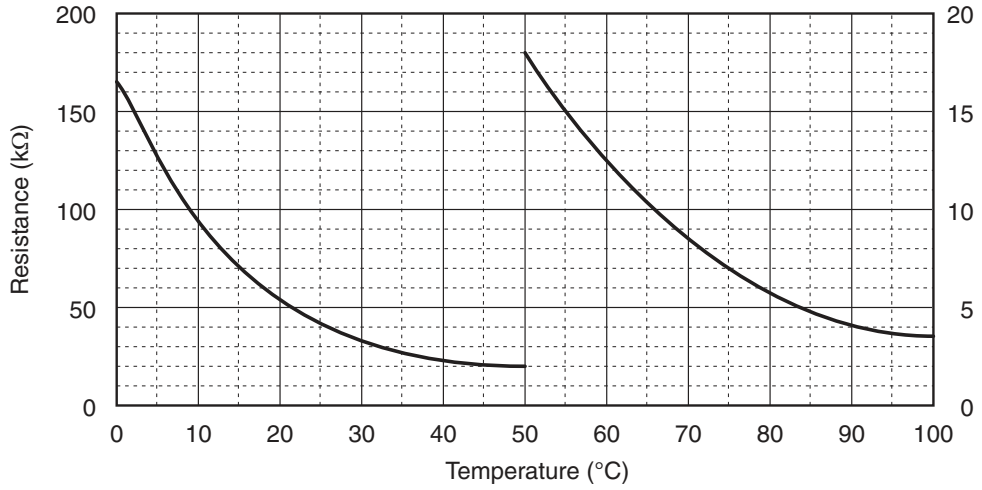
Representative value

Temperature (°C)	Resistance value (kΩ)		
	(Minimum value)	(Standard value)	(Maximum value)
0	150.50	161.30	172.70
10	92.76	99.05	105.60
20	58.61	62.36	66.26
25	47.01	49.93	52.97
30	37.93	40.22	42.59
40	25.12	26.55	28.03
50	17.00	17.92	18.86
60	11.74	12.34	12.95
70	8.27	8.67	9.07
80	5.92	6.19	6.47
90	4.32	4.51	4.70
100	3.20	3.34	3.47

TA, TC, TCJ, TE, TS, TO sensor

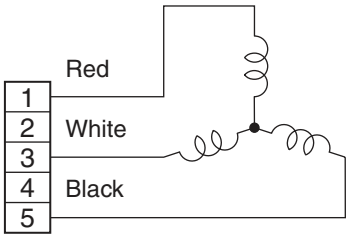


TD, TL sensor



Winding Resistance of Fan Motor

<table>
<tr><th>Part name</th><th>Checking procedure</th></tr>
<tr><td>Compact Slim Duct Type
Fan motor</td><td>Measure the resistance value of each winding by using the tester.

Fan motor inside wiring diagram
 

<table>
<tr><th>Position</th><th>Resistance value</th></tr>
<tr><td>Black – Red</td><td>37.7 ± 3.8</td></tr>
<tr><td>Black – White</td><td>37.7 ± 3.8</td></tr>
<tr><td>Red – White</td><td>37.7 ± 3.8</td></tr>
</table>
Under 20°C</td></tr>
</table>

7. REPLACEMENT OF SERVICE P.C. BOARD

7-1. Indoort Unit

⚠CAUTION

<Model : RAV-HM*SDTY-E(TR)>**

For the above models, set the CODE No. to "EO" and the setting data to "0004".

<Note: when replacing the P.C. board for indoor unit servicing>

The nonvolatile memory (hereafter called EEPROM, IC503) on the indoor unit P.C. board before replacement includes the model specific type information and capacity codes as the factory-set value and the important setting data which have been automatically or manually set when the indoor unit is installed, such as system/ indoor/group addresses, external static pressure select setting, etc.

When replacing the P.C. board for indoor unit servicing, follow the procedures below.

After replacement completes, confirm whether the settings are correct by checking the indoor unit No., Group header unit/follower unit settings and perform the cooling cycle confirmation through the trial operation.

<Replacement procedures>

CASE 1

Before replacement, the indoor unit can be turned on and the setting data can be read out by wired remote control operation.

EEPROM data read out **[1]**

⇩

Replacement of P.C. board for Indoor unit servicing and power on **[2]**

⇩

Writing the read out EEPROM data **[3]**

⇩

Power reset

(for all indoor units connected to the remote control when the group operation control is performed.)

CASE 2

The EEPROM before replacement is defective and the setting data cannot be read out.

EEPROM data read out **[2]**

⇩

Writing the setting data to EEPROM, such as high ceiling installation setting and optional connection setting, etc., based on the customer information. **[3]**

⇩

Power reset

(for all indoor units connected to the remote control when the group operation control is performed.)

[1] Setting data read out from EEPROM

The setting data modified on the site, other than factory-set value, stored in the EEPROM shall be read out.

Step 1 Press ■ and ▼ button on the remote control simultaneously for more than 10 seconds.

* In the air-conditioning group control mode, SETTING and the indoor unit No.1-N are displayed first. 1 is the piping system address (the value of the refrigerant piping system is the same as the number of outdoor units, and one outdoor unit is displayed as 1).The indoor unit address represented by N is the main indoor unit address.
* In the non-group control mode (only one indoor unit), only 1-1 is displayed on the left.

Step 2 Push ▼ or ▲ button to adjust the indoor unit number. The indoor unit number in the group control will be changed cyclically. Select an indoor unit to change the settings and push ⏲ button to confirm.

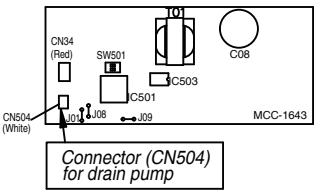
1. Change the CODE No. (DN) to 10 - 01 by pressing ▼ / ▲ buttons for the temperature setting. (this is the setting for the filter sign lighting time.) At this time, be sure to write down the setting data displayed.
2. Change the CODE No. (DN) by pressing ▼ / ▲ buttons for the temperature setting. Similarly, be sure to write down the setting data displayed.
3. Repeat the step 2-2 to set the other settings in the same way and write down the setting data in as shown the table 1 (example) on page 4. The CODE No. (DN) are ranged from "01" to "272". The CODE No. (DN) may skip.

Step 3 After writing down all setting data, press ⏻ button to return to the normal stop status. (It takes approx. 1 min until the remote control operation is available again.)

CODE No.required at least

DN	Contents
10	*Type*
11	*Indoor unit capacity*
12	*System address*
13	*Indoor unit address*
14	*Group address*
5d	*High ceiling SW*
E0	*The country designed for*

1. The CODE No. for the Indoor unit type and Indoor unit capacity are required to set the rotation number setting of the fan.
2. If the system/indoor/group addresses are different from those before replacement, the auto-address setting mode starts and the manual resetting may be required again.

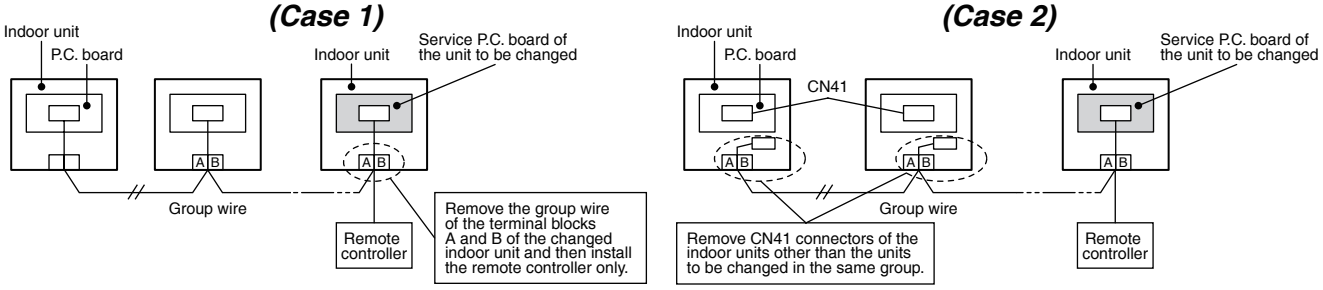


[2] P.C. Board for indoor unit servicing replacement procedures

Step 1 *Replace the P.C. board to the P.C. board for indoor unit servicing.*
At this time, perform the same setting of the jumper wire (J01,J08,J09) setting (cut), switch SW501 (short-circuit), connector CN34 as the setting of the P.C. board before replacement.

Step 2 It is necessary to set Indoor unit to be exchanged: Remote controller = 1:1
Based upon the system configuration, turn on power of the indoor unit with one of the following items.

1) Single (Individual) operation
   Turn on power of the indoor units and proceed to [3].
2) Group operation
   A) In case that power of the exchanged indoor unit only can be turned on.
      Turn on power of the exchanged indoor unit only and proceed to [3].
   B) In case that power of the indoor units cannot be turned on individually. (Case 1)
      a) Remove temporarily the group wire connected to the terminal blocks A and B of the exchanged indoor unit.
      b) After connecting the remote controller wire only to the removed terminal block, turn on power of the indoor units and proceed to [3].
   *When the above methods cannot be used, follow to the (case 2) below.
   C) In case that power of the indoor units cannot be turned in individually. (Case 2)
      a) Remove all CN41 connectors of the indoor units in the same group except those of the exchanged indoor unit.
      b) Turn on power of the indoor units and proceed to [3].



**After [3]. operation has finished, be sure to return the temporarily removed group wire or CN41 connector to the original connection.*

[3] Writing the setting data to EEPROM

The settings stored in the EEPROM of the P.C. board for indoor unit servicing are the factory-set values.

Step 1 In STOP status, push [MENU] and [▼] buttons simultaneously for at least 10 seconds.

- In the air-conditioning group control mode, SETTING and the indoor unit No.1-N are displayed. 1 is the piping system address (the value of the refrigerant piping system is the same as the number of outdoor units, and one outdoor unit is displayed as 1). The indoor unit address is represented by N. The indoor unit number displayed first is the main indoor unit number.
- In the non-group control mode (only one indoor unit), only 1-1 is displayed on the left. (If the auto-address setting mode is interrupted in [2] step 2a, the unit No. [all] is displayed)

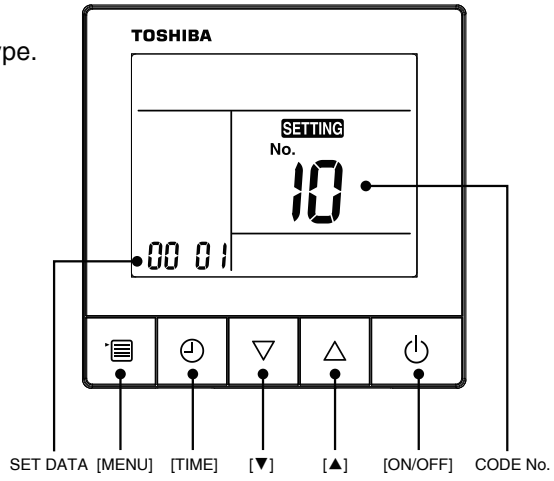
Step 2 Push [▼] or [▲] button to adjust the indoor unit number. The indoor unit number in the group control will be changed cyclically. Select an indoor unit to change the settings and push [TIME] button to confirm.

The fan of the selected indoor unit starts its operation and the swing operation of the louvers starts after confirmation.
(If [all] is displayed, directly push [TIME] button to enter the DN setting mode.)
CODE No. is displayed as [10] for the first time.

Step 3 Set the indoor unit type and capacity

(This data has been written to EEPROM at the factory by changing the type and capacity code.)

1. CODE No. is displayed as [10] for the first time.
2. Use [MENU] button to adjust the flash from CODE No. to SET DATA on the left. Push [▼] or [▲] button to select the type. (For example, 4way Air Cassette type is set to [0001]. Refer to table 2)
3. Push [MENU] button to adjust the flash to CODE No. on the right after pushing [TIME] button to confirm. (If the setting data is displayed, the operation is completed.)
4. Press [▼] or [▲] button to set the CODE No. to [11].
5. Use [MENU] button to adjust the flash from CODE No. to SET DATA on the left. Push [▼] or [▲] button to select the capacity. (For example, 80 Type is set to [0012]. Refer to table 3)
6. Push [MENU] button to adjust the flash to CODE No. on the right after pushing [TIME] button to confirm. (If the setting data is displayed, the operation is completed.)
7. Push [ON/OFF] button to complete the setting when the setting is completed. When [ON/OFF] button is pushed, SETTING flashes, then the display disappears and the air conditioner enters the normal stop mode. (When SETTING flashes, it cannot receive operation instructions from the remote controller.)



Step 4 Write the setting data on the site (such as address setting, etc.) into the EEPROM, and then turn off the remote controller after confirming.

Step 5 Repeat steps 1, 2 and push [▼] or [▲] button to adjust the CODE No. to check the setting data (SET DATA) and compare it with the data recorded in [1].

If the result is different, change the setting data of the corresponding CODE No. to the data recorded in [1] according to step **3**.
If the result is same, proceed to the next step.

Step 6 Push [ON/OFF] button to complete the setting when the setting is completed.

When [ON/OFF] button is pushed, SETTING flashes, then the display disappears and the air conditioner enters the normal stop mode.
(When SETTING flashes, it cannot receive operation instructions from the remote controller.)

Table 1

DN	Item	Setting data	Factory-set value
01	Filter sign lighting time		Depending on Type
02	Filter pollution level		0000: standard
06	Heating suction temperature shift		0002: +2°C
0F	Cooling only		0000: Heat pump
10	Type		Depending on model type
11	Indoor unit capacity		Depending on capacity type
12	System address		0099: Not determined
13	Indoor unit address		0099: Not determined
14	Group address		0099: Not determined
1E	Temperature range of cooling/heating automatic SW control point		0003: 3 deg (Ts ± 1.5)
28	Auto restart after power failure		0000: None
2b	Thermo output SW (T10 ③)		0000: Thermo ON
31	Ventilation fan (standalone)		0000: Not available
32	Sensor select (Selection of static pressure)		0000: Body sensor
5d	High ceiling SW (External static pressure selection)		Depending on capacity type
60	Timer setting (wired remote controller)		0000: Available
8b	Correction of high heat feeling		0000: None
C2	Power saving		0075: 75%
d0	Remote controller save function		0001: Valid
d1	Frost protection function		0000: Not available
d3	Revolution count of self clean		0000: Not available
E0	The country designed for		0004: Global

Table 2. Type: CODE No. 10

Setting data	Type	Type name abb.
0015	Compact Slim Duct Type	RAV-HM***SDTY-E(TR)

⚠CAUTION

< Model Name : RAV-HM*SDTY-E(TR)>**

For the above models, set the CODE No. to "E0" and the setting data to "0004".

8. SETUP AT LOCAL SITE AND OTHERS

8-1. Indoor Unit

8-1-1. Test Run Setup on Remote Controller

<Wired remote controller>

1. Push [TIME] and [▲] buttons and hold for more than 10 seconds. [TEST] is displayed on the display screen, and mode selection in Test mode is allowed.
2. Push [ON/OFF] button to start the air conditioner.
3. Using [MENU] button to change the cooling or heating mode
   - Do not use [MENU] button to change modes other than cooling and heating modes.
   - Under heating and cooling operations, a command for fixing test running frequency will be output.
   - The temperature cannot be adjusted during the test run, but the air volume can be selected.
   - Fault detection is operating normally, but do not use this function in "test run" as this will cause load on the equipment.
4. Push [ON/OFF] button to stop the operation after the test run.
5. Push [TIME] button to clear the TEST mode, [TEST] display in the display part disappears and the status returns to the normal stop status.
   (To prevent a continuous test run operation, it will be automatically shut down after 60 minutes by the remote controller.)

8-1-2. Forced Defrost Setup of Remote Controller (For wired remote controller only)

(Prepare in advance)

1 **Push [MENU] and [▼] buttons simultaneously for at least 10 seconds.**

- In the air-conditioning group control mode, SETTING and the indoor unit No. are displayed. The indoor unit number displayed first is the main indoor unit number.
- In the non-group control mode (only one indoor unit), only 1-1 is displayed on the left.

2 **Push [▼] or [▲] button to adjust the indoor unit number. The indoor unit number in the group control will be changed cyclically. Select an indoor unit to change the settings and push [TIME] button to confirm.**

The fan of the selected indoor unit starts its operation and the swing operation starts after confirmation if it has the louvers.

3 **Using [▼] or [▲] button, set the CODE No. to [8C].**

4 **Use [MENU] button to adjust the flash from CODE No. to SET DATA on the left. Push [▼] or [▲] button to set SET DATA to [0001].**

5 **Push [MENU] button to adjust the flash to CODE No. on the right after pushing [TIME] button to confirm.**

6 **Push [ON/OFF] button to complete the setting when the setting is completed.**

- To change the settings of another indoor unit, repeat from step ***1***.

(Practical operation)

7 **Push [ON/OFF] button to start the air conditioner**

8 **Select the HEAT mode**

- After a while, the forced defrost signal is sent to the outdoor unit and then the outdoor unit starts defrost operation.
  (The forced defrost operation is performed for Max. 12 minutes)
- After defrost operation finished, the operation returns to the heating operation.

Note: to execute the defrost operation again, start procedure from step *1*.

(If the forced defrost operation was executed once, setting of the above forced defrost operation is cleared.)

8-1-3. LED Display on P.C. Board

1. D501 (Red)

- It goes on (Goes on by operation of the main microcomputer) at the same time when the power supply is turned on.
- It flashes with 1-second interval (every 0.5 second): When there is no EEPROM or writing-in operation fails.
- It flashes with 10-seconds interval (every 5 second): During DISP mode
- It flashes with 2-seconds interval (every 1 second): While setting of function select (EEPROM)

2. D403 (Red)

- It goes on when power supply of the remote controller is turned on. (Lights on hardware)

3. D504 (Green): Sub bus communication

- It flashes for 5 seconds in the first half of communication with the remote controller. (Group master unit)
- It flashes with 0.2-second interval (for 0.1 second) for 5 second in the latter half of communication between master and follower in the Gr indoor unit.

4. D14 (Orange)

- It flashes while receiving the serial signal from the outdoor unit. (Hardware)

5. D15 (Green)

- It flashes while sending the serial signal to the outdoor unit. (Hardware)

8-1-4. Function Selection Setup

<Procedure> Perform setting while the air conditioner stops.

1 **In STOP status push [MENU] and [▼] buttons simultaneously for at least 10 seconds.**

- In the air-conditioning group control mode, SETTING and the indoor unit No.1-N are displayed first. 1 is the piping system address (the value of the refrigerant piping system is the same as the number of outdoor units, and one outdoor unit is displayed as 1). The indoor unit address represented by N is the main indoor unit address.
- In the non-group control mode (only one indoor unit), only 1-1 is displayed on the left.

⇩

2 **Push [▼] or [▲] button to adjust the indoor unit number. The indoor unit number in the group control will be changed cyclically. Select an indoor unit to change the settings and push [TIME] button to confirm.**

The fan of the selected indoor unit starts its operation and the swing operation of the louvers starts after confirmation.

⇩

3 **Using [▼] or [▲] button, select the CODE No. [**] to be set.**

⇩

4 **Use [MENU] button to adjust the flash from CODE No. to SET DATA on the left. Select the specified SET DATA [****] as required.**

(Set the SET DATA of CODE No. [33] from [0000] to [0001], and change the unit of the temperature on the remote controller from "°C" to "°F".)

⇩

5 **Push [MENU] button to adjust the flash to CODE No. on the right after pushing [TIME] button to confirm.**

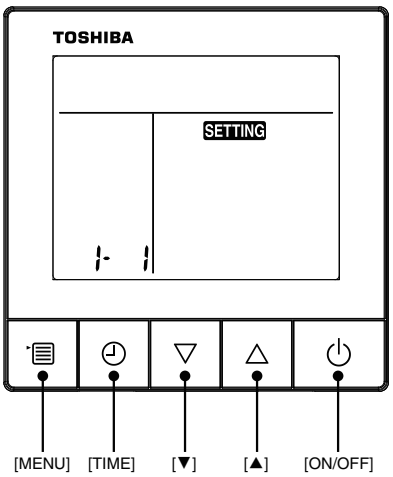
- To change the settings of another indoor unit, push [ON/OFF] button to close the current setting, and repeat from step ***1***.
- To change other settings of the indoor unit, repeat from step ***3***.

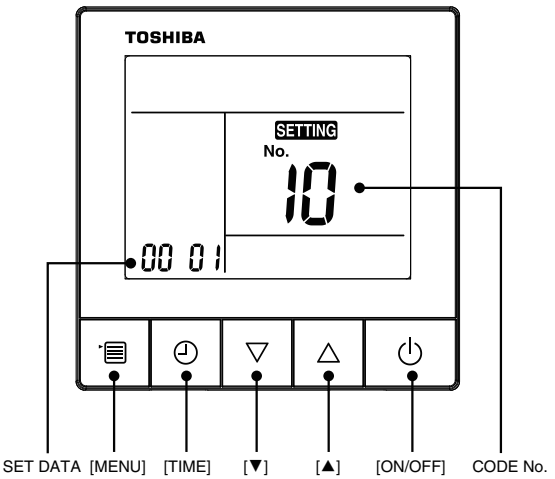
⇩

6 **Push [ON/OFF] button to complete the setting when the setting is completed.**

When [ON/OFF] button is pushed, SETTING flashes, then the display disappears and the air conditioner enters the normal stop mode.

(When SETTING flashes, it cannot receive operation instructions from the remote controller.)





Item No. (DN) table (Selection of function)

<table>
<tr><th>DN</th><th>Item</th><th>Description</th><th>At shipment</th></tr>
<tr><td>01</td><td>Filter sign lighting time}</td><td>0000 : None
0002 : 2500H (4-Way/Duct/Ceiling Type)</td><td>0002 : 2500H</td></tr>
<tr><td>02</td><td>Dirty state of filter</td><td>0000 : Standard
0001 : High degree of dirt
(Half of standard time)</td><td>0000 : Standard</td></tr>
<tr><td>06</td><td>Heating suction temp shift</td><td>0000 : No shift
0001 : +1°C
0002 : +2°C to 0010 : –10°C
(Up to recommendation + 6)</td><td>0002 : +2°C</td></tr>
<tr><td>0F</td><td>Cooling only</td><td>0000 : Heat pump
0001 : Cooling only
(No display of [AUTO] [HEAT])</td><td>0000 : Heat pump</td></tr>
<tr><td>10</td><td>Type</td><td>0004 : Concealed duct type
0007 : Ceiling type
0014 : Compact 4-way cassette type</td><td>According to model type</td></tr>
<tr><td>11</td><td>Indoor unit capacity</td><td>0000 : Unfixed
0012 : 80 type
0017 : 140 type
0015 : 110 type</td><td>According to capacity type</td></tr>
<tr><td>12</td><td>Line address</td><td>0001 : No.1 unit to 0008 : No.8 unit</td><td>0099 : Unfixed</td></tr>
<tr><td>13</td><td>Indoor unit address</td><td>0001 : No.1 unit to 0008 : No.8 unit</td><td>0099 : Unfixed</td></tr>
<tr><td>14</td><td>Group address</td><td>0000 : Individual
0001 : Master of group
0002 : Follower of group</td><td>0099 : Unfixed</td></tr>
<tr><td>19</td><td>Louver type
(Air direction adjustment)
* None for concealed duct</td><td>0000 : No louver
0001 : Swing only
0002 : 1-way
0003 : 2-way
0004 : 4-way</td><td>According to model type</td></tr>
<tr><td>1E</td><td>Temp difference of automatic cooling/heating mode selection COOL → HEAT, HEAT →COOL</td><td>0000 : 0 deg to 0010 : 10 deg
(For setup temperature, reversal of COOL/HEAT by ± (Data value)/2)</td><td>0003 : 3 deg (Ts±1.5)</td></tr>
<tr><td>28</td><td>Auto restart after power failure</td><td>0000 : None
0001 : Auto restart</td><td>0000 : None</td></tr>
<tr><td>2A</td><td>Option</td><td></td><td>0002 : Default</td></tr>
<tr><td>2b</td><td>Thermo output selection (T10 ③)</td><td>0000 : Indoor thermo ON
0001 : Output of outdoor comp-ON receiving</td><td>0000: Thermo. ON</td></tr>
<tr><td>2E</td><td>Option</td><td></td><td>0000 : Default</td></tr>
<tr><td>30</td><td>Option</td><td></td><td>0000 : Default</td></tr>
<tr><td>31</td><td>Option</td><td></td><td>0000 : Default</td></tr>
<tr><td>32</td><td>Sensor selection</td><td>0000 : Body TA sensor0001 : Remote controller sensor</td><td>0000 : Body sensor</td></tr>
<tr><td>33</td><td>Temperature indication</td><td>0000 : °C (celsius)
0001 : °F (Fahrenheit)</td><td>0000 : °C</td></tr>
<tr><td>40</td><td>Option</td><td></td><td>0003 : Default</td></tr>
<tr><td>5d</td><td>High ceiling selection
(External static pressure selection)</td><td><Slim Duct Compact Type>
<table><tr><th>Set data</th><th>0000</th><th>0001</th><th>0002</th><th>0003</th><th>0004</th><th>0005</th><th>0006</th></tr><tr><td rowspan="2">External static pressure</td><td>10Pa</td><td>20Pa</td><td>25Pa</td><td>35Pa</td><td>50Pa</td><td>60Pa</td><td>45Pa</td></tr><tr><td>Factory default</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>The list above is when SW501-1 and SW501-2 is OFF.</td><td>According to capacity type</td></tr>
</table>

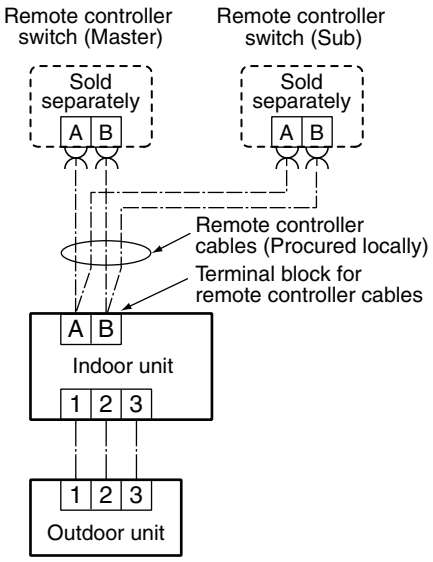
DN	Item	Description	At shipment
60	Timer set (Wired remote controller)	0000 : Available (Operable) 0001 : Unavailable (Operation prohibited)	0000 : Available
8b	Correction of high heat feeling	0000 : None 0001 : Correction	0000 : None
42	Self clean time	0000: None 0001: 0.5h to 0.012: 6.0h The case that compressor-ON time is 10 to 60 minutes is set up. When ON time is over 60 minutes, the operating time becomes two times of it.	0000: None
C2	Power saving (Current demand × % to outdoor unit)	0050: 50% to 0100: 100%	0075: 75%
CC	Forced stop setting for self clean	0000: None 0001: Set	0000: None
CD	Self clean stop function when [START/ STOP] operation was prohibited	When stopping the air conditioner (including “Fire alarm” of the control system, etc.) while [START/STOP] operation is prohibited (Central 1, 2) from the central controller side, 0000: Valid (No self cleaning) 0001: Invalid (Self cleaning)	0000: Valid
D0	Existence of Power save operation	0000: Invalid (Unavailable) 0001: Valid (Available)	0001: Valid (Available)
D1	Existence of 8°C heating operation function	0000: Invalid (Unavailable)} 0001: Valid (Available)	0000: Invalid (Unavailable)
D3	Revolution count of self clean	0000: Invalid (Self cleaning is not performed.) 0041: Valid (Self cleaning is performed at 610 rpm.)	0000: Invalid
D4	Display/ No display of [SELF CLEANING] during self clean operation	0000: Displayed, 0001: Not displayed	0000: Displayed

8-1-5. Wiring and Setting of Remote Controller Control

2-remote controller control
(Controlled by 2 remote controllers)

This control is to operate 1 or multiple indoor units are operated by 2 remote controllers.
(Max. 2 remote controllers are connectable.)

- **When connected 2 remote controllers operate an indoor unit**



(Setup method)

One or multiple indoor units are controlled by 2 remote controllers.
(Max. 2 remote controllers are connectable.)

[Operation]

1. The operation contents can be changed by Last-push-priority.
2. Use a timer on either Master remote controller or Sub remote controller.

8-1-6. Monitor Function of Remote Controller Switch

■ Calling of sensor temperature display

<Contents>

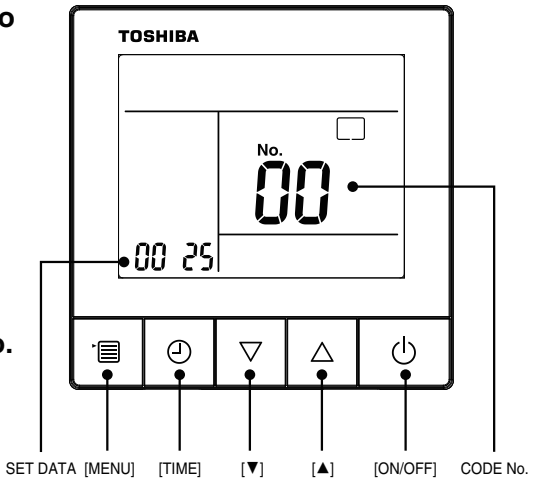
Each data of the remote controller, indoor unit and outdoor unit can be understood by calling the service monitor mode from the remote controller.

1 **Push and hold [MENU] button for at least 10 seconds to call the service monitor mode. (It is possible to enable the switch monitor mode during the normal operation or shutting down)**

The service monitor indicator lights up and displays the main indoor unit number first.

⇩

2 **Push [▼] or [▲] button, select the indoor unit number to be monitored, and push [TIME] button to enter the sensor monitor interface. The temperature of CODE No. [00] is displayed first. The number on the left represents the current temperature.**



	CODE No.	Data name	Unit
Indoor unit data	01	Room temperature (Remote controller)	°C
	02	Indoor suction temperature (TA)	°C
	03	Indoor heat exchanger (Coil) temperature (TCJ)	°C
	04	Indoor heat exchanger (Coil) temperature (TC)	°C
	07	Indoor fan revolution frequency	rpm
	F2	Indoor fan calculated operation time	×100h
	F3	Filter sign time	×1h
	F8	Indoor discharge temperature*1	°C

	CODE No.	Data name	Unit
Outdoor unit data	60	Outdoor heat exchanger (Coil) temperature (TE)	°C
	61	Outside temperature (TO)	°C
	62	Compressor discharge temperature (TD)	°C
	63	Compressor suction temperature (TS)	°C
	65	Heat sink temperature (THS)	°C
	6A	SM80,110,140: Operation current (×1/10) SM160: Operation current (×1/10×2)	A
	6D	Outdoor heat exchanger (Coil) temperature (TL)	°C
	70	Compressor operation frequency	rps
	72	Outdoor fan revolution frequency (Lower)	rpm
	73	Outdoor fan revolution frequency (Upper)	rpm
	F1	Compressor calculated operation time	×100h

⇩

3 **Push [▼] or [▲] button to select the sensor number (CODE No.) to monitor. (See table below)**

- The SET DATA at the left side shows the corresponding sensor temperature.
- The data value of each item is not the real time, but value delayed by a few seconds.

⇩

4 **Push [ON/OFF] button to return to the normal display.**

If it is required to call other indoor unit temperature to display, please repeat from step ***1***.

∗1 The indoor discharge temperature of CODE No. [F8] is the estimated value from TC or TCJ sensor.
Use this value to check discharge temperature at test run.
(A discharge temperature sensor is not provided to this model.)

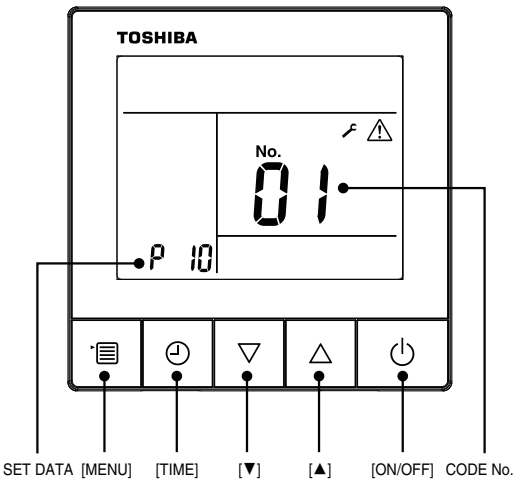
- The data value of each item is not the real time, but value delayed by a few seconds to ten-odd seconds.
- If the combined outdoor unit is one before 2 or 3 series, the outdoor unit data [6D], [70], [72] and [73] are not displayed.

■ Calling of error history

<Contents>

The error contents in the past can be called.

<Procedure>



1 **Push and hold [TIME] button for more than 10 seconds, and an indicator icon appears, indicating it is in the troubleshooting history mode.**

- [01] (01-04: Error record sequence) is displayed at CODE No.
- The SET DATA alternately displays the check code and the error indoor unit number.

2 **Each time push [▼] or [▲] button, the number (CODE No.) of error history record will be displayed in order. The error history record is displayed in the order from [01] (latest) to [04] (oldest).**

- Up to 4 error history records can be stored.

Warning:

In the error history mode, do not push and hold [MENU] button for more than 10 seconds, otherwise, all error history records of the indoor unit will be deleted. If push [MENU] button to delete the error history, turn off the power, and then turn it on again.

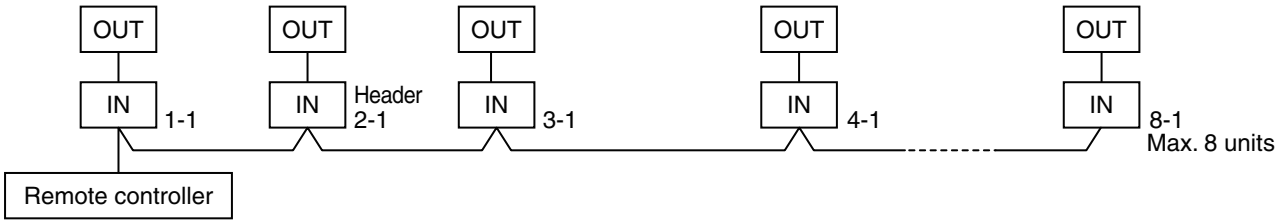
When the last error that occurred before deletion occurs again in succession, it may not be saved in the memory.

3 **Push [ON/OFF] button to return to the normal mode after completing the check.**

(Group control operation)

In a group control, operation of maximum 8 indoor units can be controlled by a remote controller.
Twin, triple or double twin of an outdoor unit is one of the group controls.
The indoor unit connected with outdoor unit (Individual/Header of twin) controls room temperature according to setting on the remote controller.

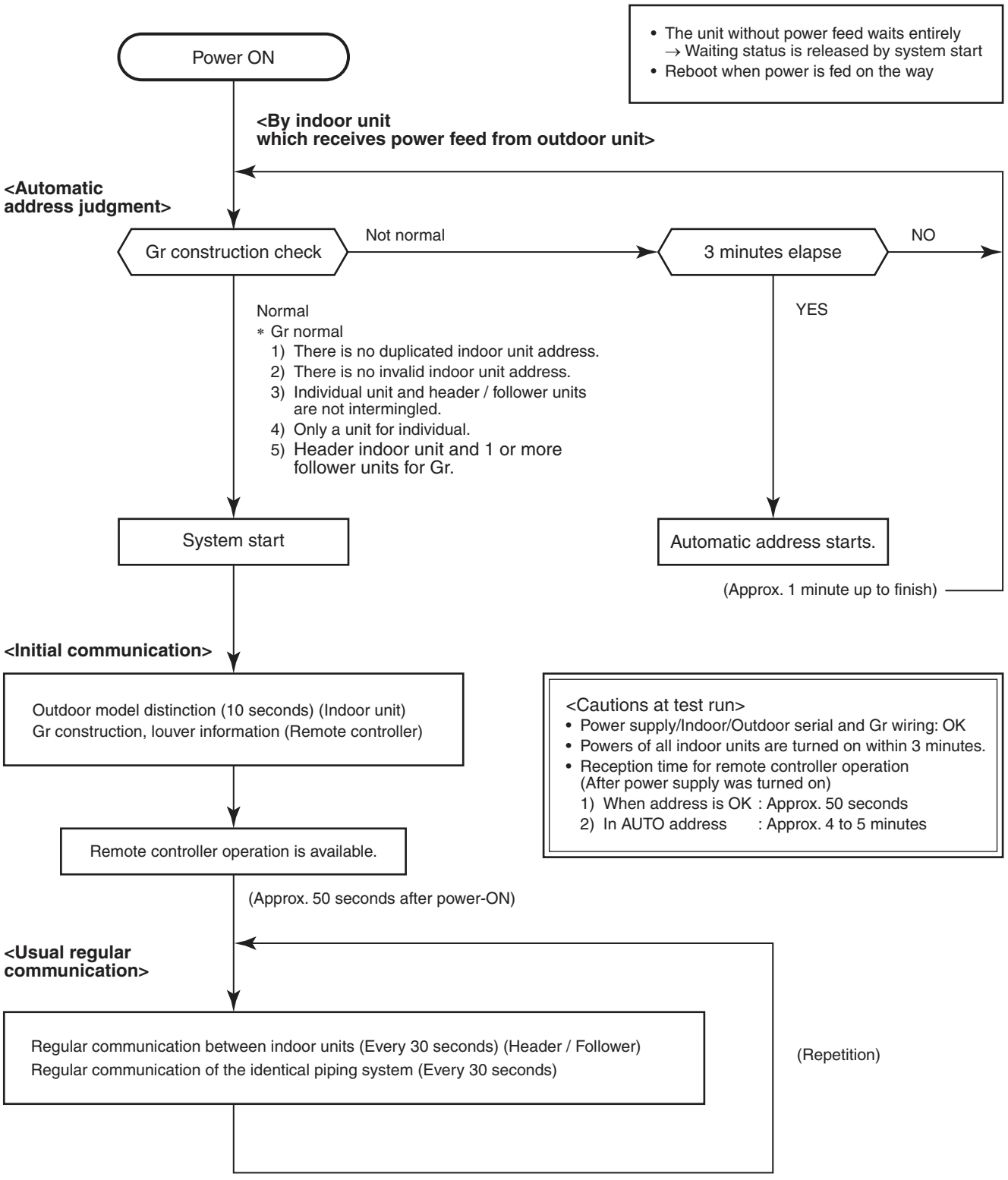
<System example>



1. Display range on remote controller
   The setup range (Operation mode/Air volume select/Setup temp) of the indoor unit which was set to the header unit is reflected on the remote controller.
   1) Concealed duct high static pressure type (RAV-SMXXX) is not set up on the header unit.
      - If the Concealed duct high static pressure type is the header unit:
        Operation mode: [Cooling/Heating AUTO] [HEAT] [COOL] [FAN] and no [DRY]
        Air volume select: [HIGH]
      - When the operation mode is [DRY], [FAN] stops in concealed duct high static pressure models.
2. Address setup
   If there is no serial communication between indoor and outdoor when the power is turned on, it is judged as follower unit of the twin. (Every time when the power is turned on)
   - The judgment of header (wired) / follower (simple) of twin is carried out every time. It is not stored in non-volatile memory.

   Turn on power of the indoor unit to be controlled in a group within 3 minutes after setting of automatic address.
   If power of the indoor unit is not turned on within 3 minutes (completion of automatic address setting), the system is rebooted and the automatic address setting will be judged again.
   1) Connect indoor/outdoor connecting wire surely.
   2) Check line address/indoor address/group address of the unit one by one.
   3) The unit No. (line/indoor group address) which have been set once keep the present status as a rule if the unit No. is not duplicated with one of another unit.

■ Indoor unit power-ON sequence



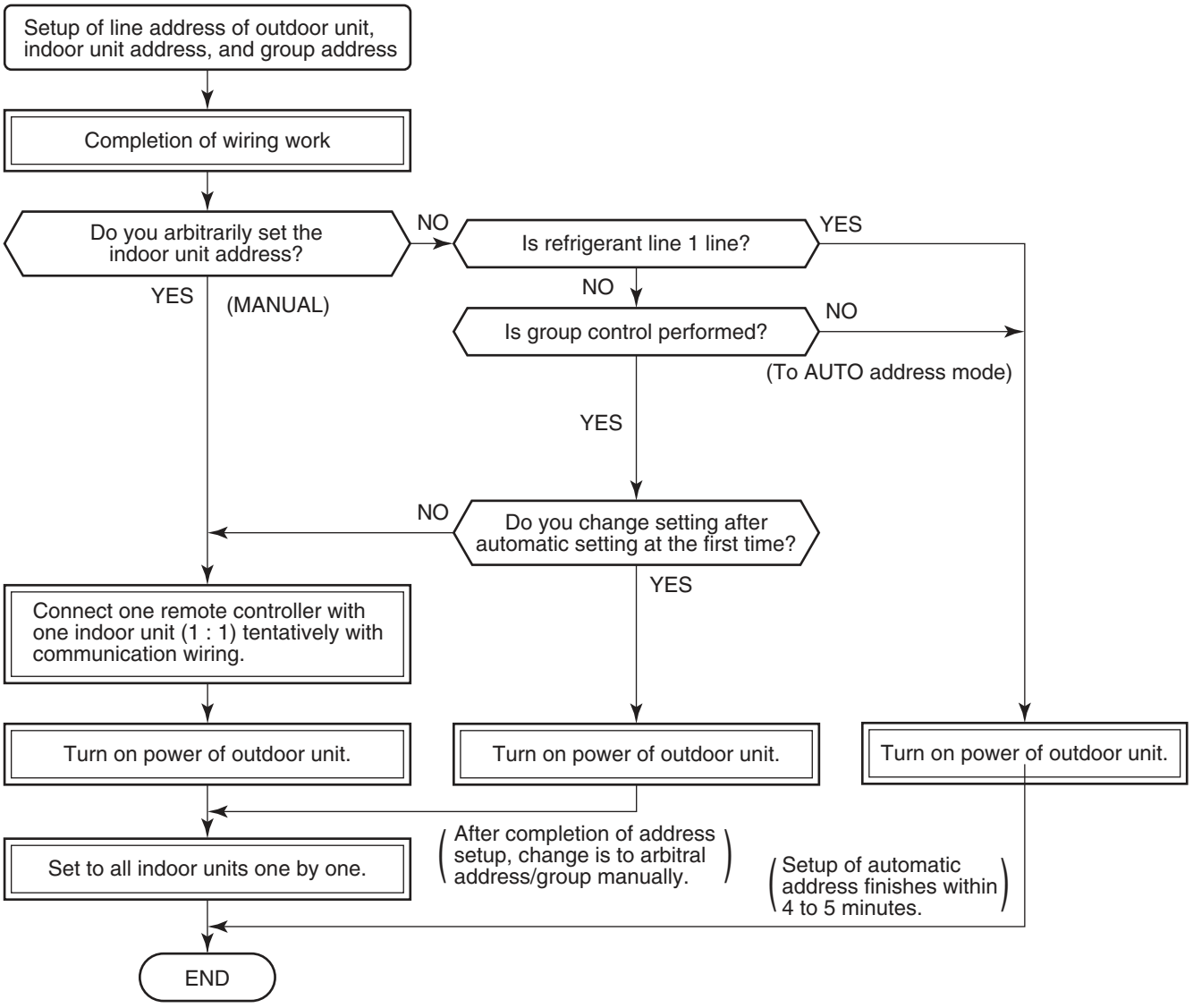
- In a group operation, if the indoor unit which was fed power after judgment of automatic address cannot receive regular communication from the header unit and regular communication on identical pipe within 120 seconds after power was turned on, it reboots (system reset).
  → The operation starts from judgment of automatic address (Gr construction check) again.
  (If the address of the header unit was determined in the previous time, the power fed to the header unit and reboot works, the header unit may change though the indoor unit line address is not changed.)

9. ADDRESS SETUP

9-1. Address Setup

<Address setup procedure>

When an outdoor unit and an indoor unit are connected or when an outdoor unit is connected to each indoor unit respectively in the group operation, the automatic address setup completes with power-ON of the outdoor unit. The operation of the remote controller is not accepted while automatic address works. (Approx. 4 to 5 minutes)



- When the following addresses are not stored in the neutral memory on the indoor P.C. board, a test run operation cannot be performed. (Unfixed data at shipment from factory)

	CODE No.	Data at shipment	SET DATA range
Line address	12	0099	0001 (No. 1 unit) to 0008 (No. 8 unit)
Indoor unit address	13	0099	0001 (No. 1 unit) to 0008 (No. 8 unit)
Group address	14	0099	0000 : Individual (Indoor units which are not controlled in a group) 0001 : Header unit (1 indoor unit in group control) 0002 : Follower unit (Indoor units other than header unit in group control)

9-2. Address Setup & Group Control

<Terminology>

Indoor unit No. : N – n = Outdoor unit line address N (Max. 30) – Indoor unit address n (Max. 64)

Group address : 0 = Single (Not group control)
1 = Header unit in group control
2 = Follower unit in group control

Header unit (= 1) : The representative of multiple indoor units in group operation sends/receives signals to/from the remote controllers and follower indoor units.
(*It has no relation with an indoor unit which communicates serially with the outdoor units.)
The operation mode and setup temperature range are displayed on the remote controller LCD. (Except air direction adjustment of louver)

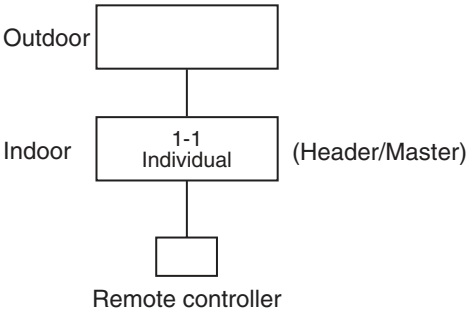
Follower unit (= 2) : Indoor units other than header unit in group operation
Basically, follower units do not send/receive signals to/from the remote controllers. (Except errors and response to demand of service data)

Master unit (Representative unit) : This unit communicates with the indoor unit (sub) which serial-communicates with the outdoor units and sends/receives signal (Command from compressor) to/from the outdoor units as the representative of the cycle control in the indoor units.

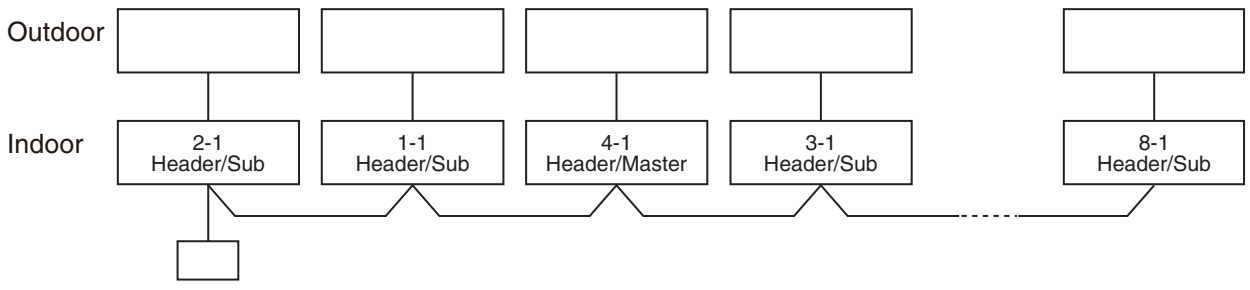
Sub unit (Subordinate unit) : This unit communicates with (Master) indoor unit in the identical line address and performs control synchronized with (Master) indoor unit.
This unit does not perform the signal send/receive operation with the outdoor units.: N judgment for serial signal error.

9-2-1. System configuration

1. Single

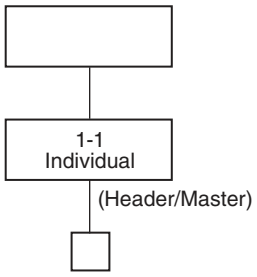


2. Single group operation
   - Each indoor unit controls the outdoor unit individually.



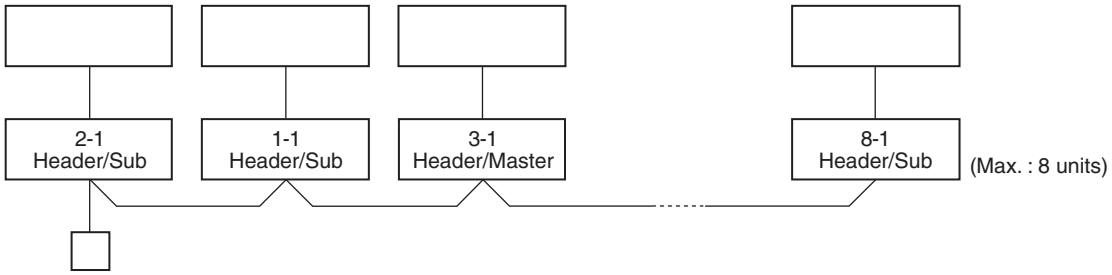
9-2-2. Automatic Address Example from Unset Address (No miswiring)

1. Standard (One outdoor unit)



Only turning on source power supply (Automatic completion)

2. Group operation
   (Multiple outdoor units = Multiple indoor units with serial communication only)

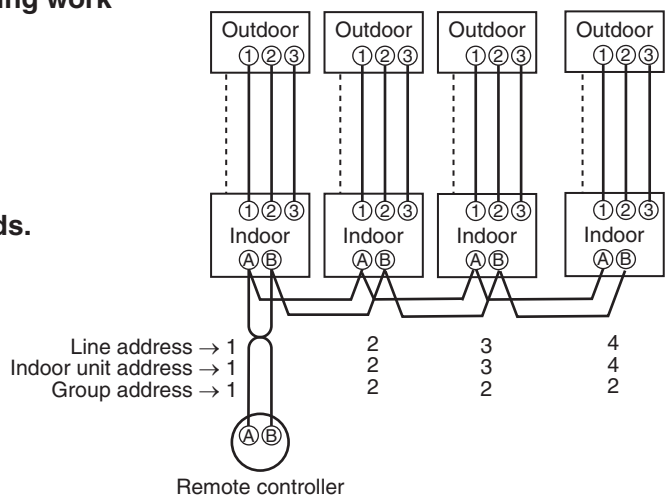


9-3. Address Setup (Manual Setting from Remote Controller)

In case that addresses of the indoor units will be determined prior to piping work after wiring work

- Set an indoor unit per a remote controller.
- Turn on power supply.

(Example of 4-lines wiring)
(Real line: Wiring, Broken line: Refrigerant pipe)



For the above example, perform setting by connecting singly the wired remote controller without remote controller inter-unit wire.

Group address
Individual : 0000
Header unit : 0001
Follower unit : 0002
} In case of group control

1 **Push [MENU] and [▼] buttons simultaneously for at least 10 seconds.**

2 **Push [▼] or [▲] button to adjust the indoor unit number, and push [TIME] button to confirm.**

Line address settings:

3 **Using [▼] or [▲] button, set the CODE No. to [12].**

4 **Use [MENU] button to adjust the flash from CODE No. to SET DATA on the left. Use [▼] or [▲] button to set the line address.**

5 **Push [MENU] button to adjust the flash to CODE No. on the right after pushing [TIME] button to confirm.**

Setting of indoor unit address:

6 **Using [▼] or [▲] button, set the CODE No. to [13].**

7 **Use [MENU] button to adjust the flash from CODE No. to SET DATA on the left. Use [▼] or [▲] button to set the address of the indoor unit.**

8 **Push [MENU] button to adjust the flash to CODE No. on the right after pushing [TIME] button to confirm.**

Setting of group address:

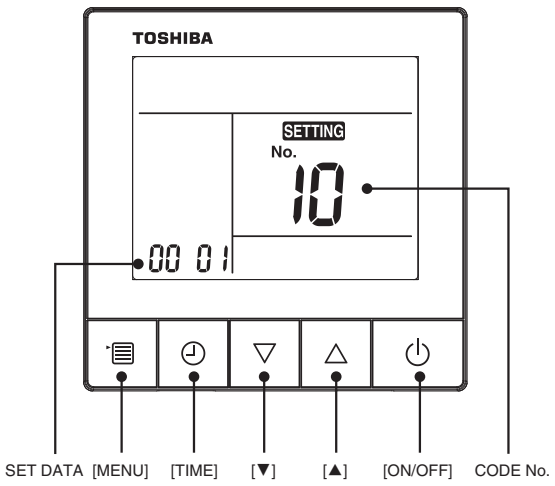
9 **Using [▼] or [▲] button, set the CODE No. to [14].**

10 **Use [MENU] button to adjust the flash from CODE No. to SET DATA on the left. Set 0000 as a standalone unit, set 0001 as a main unit, set 0002 as a sub unit.**

11 **Push [MENU] button to adjust the flash to CODE No. on the right after pushing [TIME] button to confirm.**

12 **Push [ON/OFF] button to complete the setting when the setting is completed.**

- To change the settings of another indoor unit, repeat from step ***1***.
- Repeat steps ***1*** to ***9*** until all indoor unit addresses are set and with no duplication.

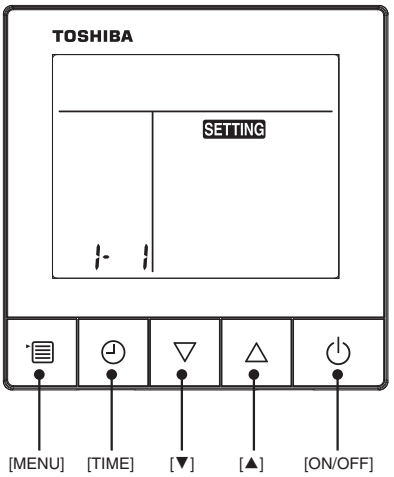


9-4. Confirmation of Indoor Unit No. Position

1. To know the indoor unit addresses though position of the indoor unit body is recognized

- In case of individual operation (Wired remote controller : indoor unit = 1 : 1)
  (Follow to the procedure during operation)

<Procedure>



1 **When the indoor unit is stopped, push [MENU] and [▼] buttons simultaneously for at least 10 seconds.**

- After entering, the screen displays SETTING and the indoor unit number. The indoor unit number displayed first is the main indoor unit number.
- In the non-group control mode (only one indoor unit), only 1-1 is displayed on the left.
  The displayed 1-1 indicates the address of the piping system and the address of the indoor unit.
- If other indoor units are connected to the same remote controller (group control), when [▼] or [▲] button is pushed, the addresses of other indoor units will be displayed in order.

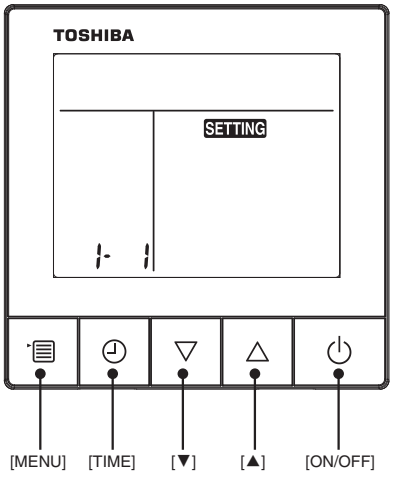
2 **Push [ON/OFF] button to exit after checking.**

2. To know the position of indoor unit body by address

- To confirm the unit No. in the group control
  (Follow to the procedure during operation) (in this procedure, the indoor units in group control stop.)

<Procedure>

The indoor unit numbers in the group control are successively displayed, and fan, louver, and drain pump of the corresponding indoor unit are turned on.
(Follow to the procedure during operation)



1 **Push [MENU] and [▼] buttons simultaneously for at least 10 seconds.**

- In the air-conditioning group control mode, SETTING and the indoor unit No. are displayed. The indoor unit number displayed first is the main indoor unit number.
- In the non-group control mode (only one indoor unit), only 1-1 is displayed on the left.
  The displayed 1-1 indicates the address of the piping system and the address of the indoor unit.

2 **Push [▼] or [▲] button to adjust the indoor unit address. The indoor unit number in the group control will be changed cyclically. Select the indoor unit number to be identified, and push [TIME] button to confirm. The fan of the selected indoor unit starts its operation and the swing operation of the louvers starts after confirmation to determine the position of the indoor unit.**

3 **Push [ON/OFF] button to return to the normal mode after confirmation.**

When [ON/OFF] button is pushed, SETTING flashes, then the display disappears and the air conditioner enters the normal stop mode.
(When SETTING flashes, it cannot receive operation instructions from the remote controller.)

10. DETACHMENTS

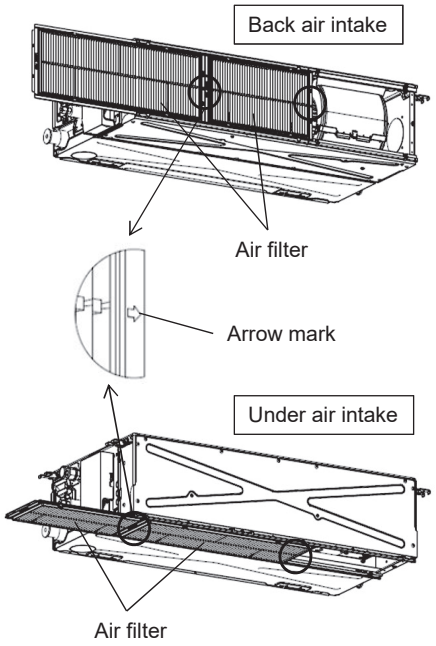
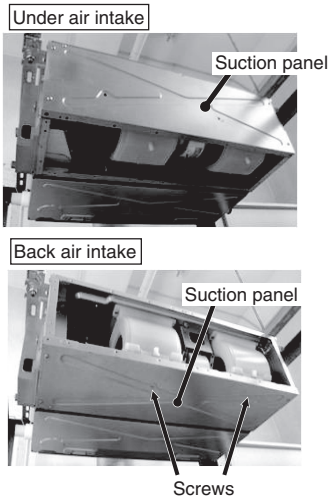
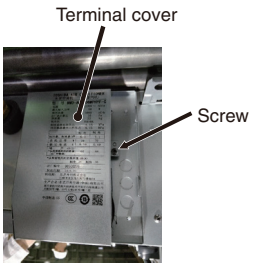
⚠ WARNING

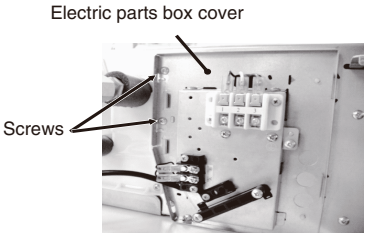
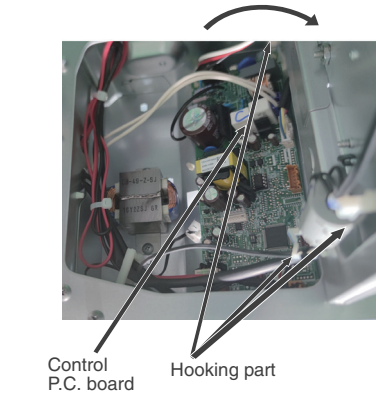
Be sure to stop operation of the air conditioner before work and then turn off switch of the breaker.

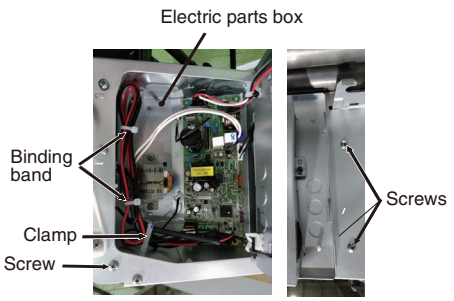
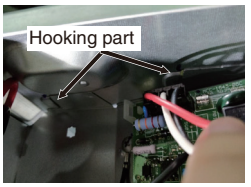
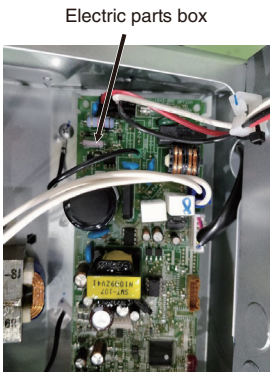
⚠CAUTION

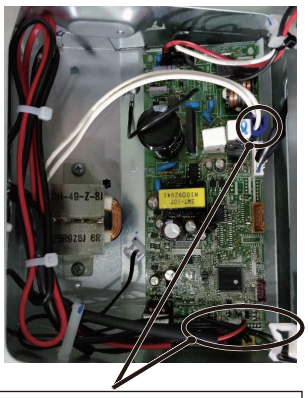
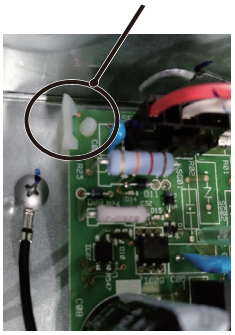
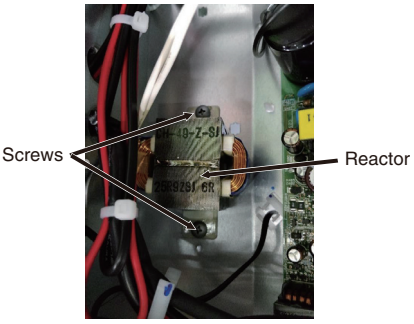
Be sure to put on gloves during working time; otherwise an injury will be caused by a part, etc.

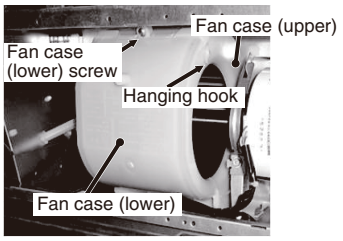
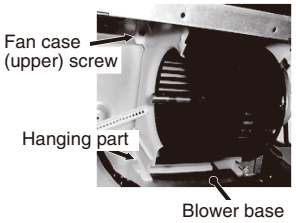
10-1. Indoor Unit

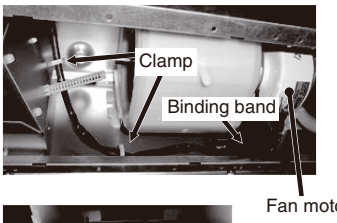
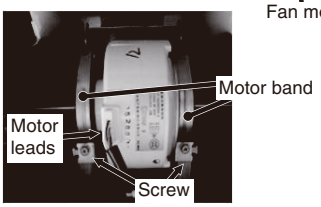
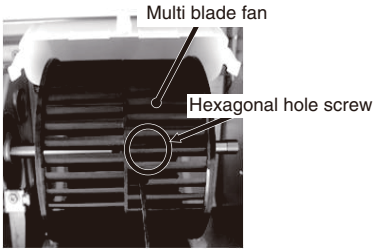
No.	Part name	Procedure	Remarks
①	Air filter	**1. Detachment** 1) Slide the filter toward the opposite side of the arrow mark and then pull out the filter. (Pull out the first filter, then the second filter will be pulled out connected with the first filter.) **2. Attachment** 1) Insert the filter in the filter rail toward the arrow mark, slide it until the filter stops and then fix it. (Insert the second filter in the same direction after inserting the first filter.)	
②	Suction panel	**1. Detachment** 1) Holding the suction panel with your hand, remove the screws fixing the panel in place. (HM301 401: M4×10 7 pcs) (HM561 801: M4×10 9 pcs) **NOTE)** • Be careful that the suction panel doesn't fall while at work. • For the back air intake, remove the screws (2 locations) used to fix the fan case (lower) in place as well. **2. Attachment** 1) While holding the suction panel with your hand so that the panel does not fall off, tighten the screws that you removed in step 1-1) of "②Suction panel."	
③	Terminal cover	**1. Detachment** 1) Slightly loosen the screw holding the terminal cover in place. (Ø4×10 1 pcs) 2) Lifting the terminal cover upward, pull the right side of the cover toward you and then disengage the claws on the left side of the cover from their slits to detach the terminal cover.	

No.	Part name	Procedure	Remarks
③	Terminal cover	**2. Attachment** 1) Insert the claws on the left side of the terminal cover into their slits. 2) Moving the terminal cover downward, insert the cover in the gap between the terminal box and screw that you loosened in step 1-1) of "③Terminal cover" and tighten the screw to fix the cover in place.	
④	Electric parts box cover	**1. Detachment** 1) Perform step 1 of "③Terminal cover" as required. (You may be able to perform this procedure without removing the electric parts box cover.) 2) Slightly loosen the screw holding the electric parts box cover in place. (Ø4×10 2 pcs) 3) Lifting the electric parts box cover upward, pull the left side of the cover toward you to open it. **NOTE)** If it is difficult to open the electric parts box cover because of the power supply and communication cables connected to the cover, disconnect these cables and perform the procedure. 4) Disconnect the following connectors from the control P.C. board. **NOTE)** Unlock the lock of the housing to disconnect the connectors. CN41 … Remote control connector (2P: Blue) CN67 … Power supply connector (5P: Black) 5) Lift the electric parts box cover upward and pull the cover to the left toward you to detach it from the claws on the right side. **2. Attachment** 1) Insert the hooking plates of the main body into the hook holes on the right side of the electric parts box cover. 2) Reconnect the cables that you disconnected in step 1-4) of "④Electric parts box cover." 3) Moving the electric parts box cover downward, close the electric parts box cover. Insert the cover in the gap between the box and screws that you loosened in step 1-2) of "④Electric parts box cover" and use the screws to fix the cover into place.	 

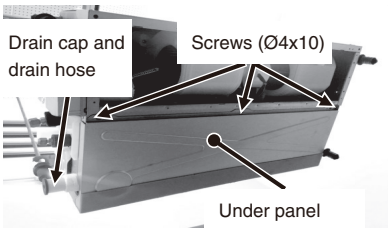
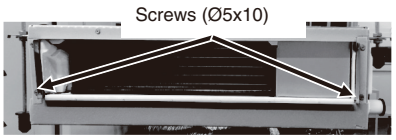
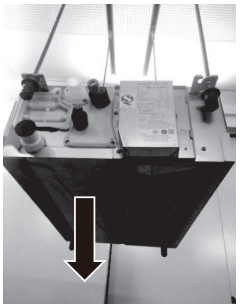
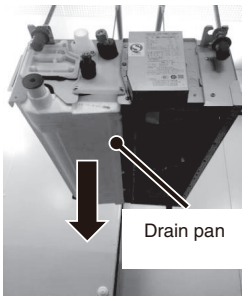
No.	Part name	Procedure	Remarks
⑤	Electric parts box	**1. Detachment** 1) For the back air intake, perform the procedure in 1 of "②Suction panel." 2) Perform the procedure in 1 of "④Electric parts box cover." 3) Remove the binding bands and clamps inside the electric parts box. 4) Remove the screws that fix the electric parts box into place. (Ø4×10 3 pcs) The electric parts box will not fall off even when the screws are removed. 5) Move the electric parts box in the direction opposite to the air blow-off port side to disengage the hooking plates and then remove the electric parts box from the under air intake side. **2. Attachment** 1) Insert the hooking plates of the electric parts box into the hooking parts of the main body. 2) Carefully restore the electric parts box to its original state without getting the cables caught by the box. Fix the box using the screws that you removed in step 1-4) of "⑤Electric parts box." **NOTE)** Make sure that the hooking plates are securely inserted into the hooking parts of the electric parts box. (Hooking plates: 2 locations) **NOTE)** Make sure to securely fix the clamps and binding bands of the cables that you disconnected.	  

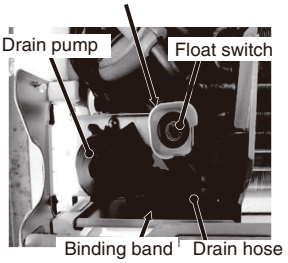
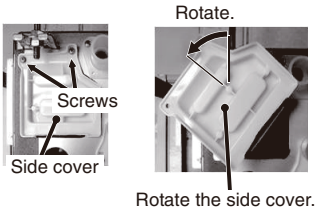
No.	Part name	Procedure	Remarks
⑥	Control P.C. board	**1. Detachment** 1) Perform the procedure in 1 of "④Electric parts box cover." 2) Disconnect the connectors from other components from the control P.C. board. **NOTE)** Unlock the lock of the housing to disconnect the connectors. CN41 … Remote control connector (2P: Blue) CN67 … Power supply connector (5P: Black) CN101 … TC sensor (2P: Black) CN102 … TCJ sensor (2P: Red) CN104 … TA sensor (2P: Yellow) CN210 … Fan motor power supply (7P: White) CN34 … Float switch (3P: Red) Only model with drain pump **NOTE)** The following connector are connected only to the control P.C. board of a model equipped with a drain pump. CN504 … Drain pump lead (2P: White) CN01 … Reactor (2P: Blue) 3) Unlock the card edge spacers (4 locations) to remove the control P.C. board. **2. Attachment** 1) Attach the control P.C. board to the clamps. 2) Reconnect the cables that you disconnected in step 1-2) of "⑥Control P.C. board." **NOTE)** Check there is no missing or contact failure on the connectors.	 If it is difficult to disconnect the bottom connector, first remove the card edge spacers (2 locations at bottom), and then proceed. Card edge spacer 
⑦	Reactor	**1. Detachment** 1) Perform the procedure in 1 of "④Electric parts box cover." 2) The connector of reactor (CN01) is removed from control P.C. board. 3) Remove the screws that fix the reactor. (Ø4×10 2 pcs) **2. Attachment** 1) Attach the reactor to the control P.C. board. 2) Reconnect the detached connector. **NOTE)** Check there is no missing or contact failure on the connectors.	 Screws Reactor

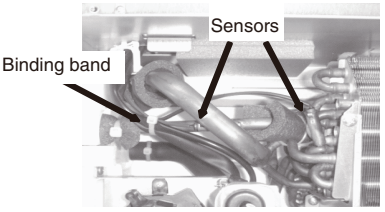
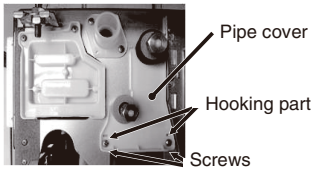
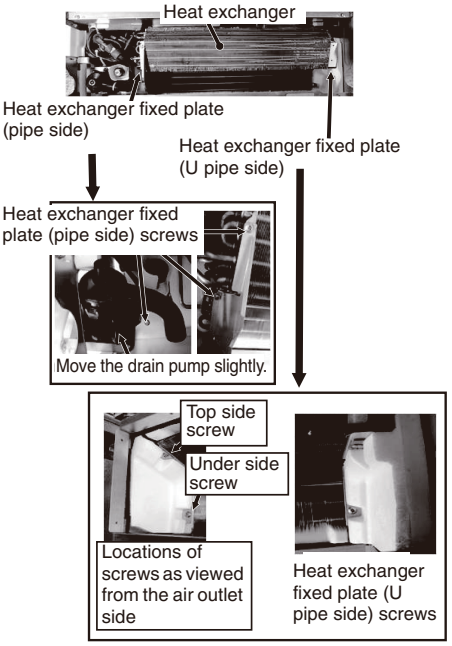
No.	Part name	Procedure	Remarks
⑧	Fan case (lower), Fan case (upper)	**1. Detachment** 1) For the back air intake, perform the procedure in 1 of "②Suction panel." 2) Remove the screw on the rear of the fan case (lower). (One Ø4×10 screw for each fan case) 3) Disengage the hanging hooks on both sides of the fan case (lower) to remove the fan case (lower). 4) Remove the screws used to attach the fan case (upper). (Two Ø4×10 left and right screws for each fan case) 5) Move the hooking plate of the fan case (upper), which is hooked to the blower base, downward to remove the fan case (upper). **2. Attachment** 1) Use the hooking plate to hook the fan case (upper) to the blower base to attach the fan case (upper). **NOTE)** Make sure the fan case (upper) does not move even if you pull on it. 2) Use the screws that you removed in step 1-4) of "⑧Fan case (lower/upper)" to attach the fan case (upper). 3) Insert the tip of the fan case (lower) into the blower base and use the hooking plate to attach the fan case. 4) Use the screws that you removed in step 1-2) of "⑧Fan case (lower/upper)" to attach the fan case (upper).	 

No.	Part name	Procedure	Remarks
⑨	Fan motor, Multi blade fan	**1. Detachment** 1) For the back air intake, perform the procedure in 1 of "②Suction panel." 2) Perform the procedure in steps 1-1), 1-2), 1-3) of "④Electric parts box cover." 3) Disconnect the following connector of the control P.C. board. **NOTE)** Unlock the lock of the housing to disconnect the connectors. CN210 … Fan motor power supply (5P: White) 4) Detach the clamps and binding bands of the cable. 5) Perform the procedure in steps 1-2), 1-3) of "⑧Fan case (lower/upper)." 6) Remove the screws of the motor bands. (Ø5×10 2 pcs) The motor band will not fall off even when the screws are removed. 7) Hold the motor bands with your hand so that they do not fall off, and remove the bands. 8) Loosen the hexagonal hole screw of the multi blade fan and remove the fan from the shaft. **2. Attachment** 1) Insert the fan motor shaft into the multi blade fan, and secure it loosely. With the shaft still loosely secured, assemble the fan motor, and secure it using the motor band. **NOTE)** When assembling the fan motor, ensure that the motors leads are positioned on the left side facing the drain pan, and assemble the motor so that the motor leads are pointing straight down. 2) Align the position of the multi blade fan so that it is positioned at the center of the fan case (upper) and fix the fan using the hexagonal hole screw.	    (Drain pan side)

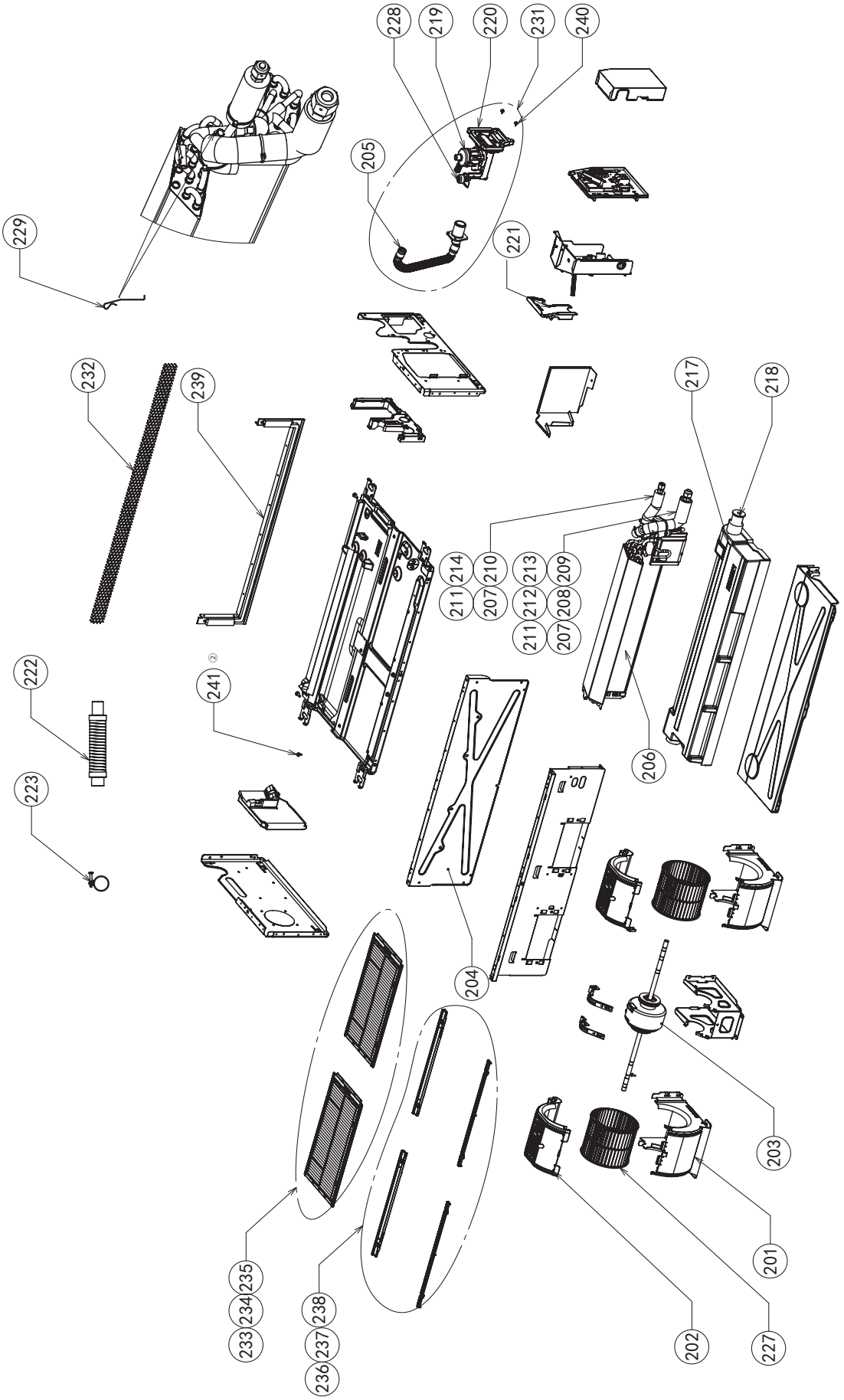
No.	Part name	Procedure	Remarks
⑨	Fan motor, Multi blade fan	**NOTE)** Arrange the multi blade fan so that screws position at the right side against the drain pan. **NOTE)** Fix multi blade fan with torque wrench 4.9 N•m or more. 3) Perform the procedure in steps 2-3) and 2-4) of "⑧Fan case (lower/upper)" to attach the fan case (lower). 4) Reconnect the cables that you disconnected in steps 1-3) and 1-4) of "⑨Fan motor, Multi blade fan". **NOTE)** Check there is no missing or poor contact of the connectors. Finally check whether the multi blade fan turns surely and smoothly or not.	

No.	Part name	Procedure	Remarks
⑩	Under panel, Drain pan	**1. Detachment** 1) Tack off the drain cap and drain the drain water accumulated in the drain pan. In case off natural drain model,drain the drain water by taking off hose band and drain hose. **NOTE)** When taking off drain cap and drain hose,be sure receive drian water in a bucket,ect. 2) Slightly loosen the screw holding the under panel in place and on both sides of outlet. (Ø4x10 3pcs; Ø5x10 2pcs) 3) Slowly remove the under panel 4) Pull out the drain pan **NOTE)** • When pulling out the drain pan.never pull out the drain socket by drawing it with hands.If doing so,water leak may be caused. • When pulling out the drain pan, some drain water may still be left in the pan so be absolutely sure to discard this water 5) After pulling out the drain pan slightly,to detach the pan. **2. Attachment** 1) Align the drain panplate to the base of the drainage socket and push it into it. 2) Hook the under panel on the screws that you untightened in step 1-2)of "⑩Under panel,Drian pan"and tighten these screws. 3) Attach the drain cap and darin hose that you removed in step1-1)of"⑩Under panel ,Drain pan."When you attach the drain cap and drain hose,be sure to insert them firmly into the base of the drain socket of the drain pan. **NOTE)** Finally, be sure to check there is no water leakage from leakage from each attached part.	   

No.	Part name	Procedure	Remarks
⑪	Drain pump, Float switch, Drain hose * For only drain pump incorporated model	**1. Detachment** 1) Perform the procedure in steps 1-1), 1-2), 1-3) of "④Electric parts box cover" and 1 of "⑩Under panel, Drain pan." 2) Disconnect the following connectors and connected cables from the control P.C. board. **NOTE)** Unlock the lock of the housing to disconnect the connectors. CN34 … Float switch (3P: Red) CN504 … Drain pump lead (2P: White) 3) Detach the binding bands to disconnect the drain hose. 4) Detach the binding bands that bundle the drain pump and float switch cables and pull in the cables from the control P.C. board. 5) Remove the screws that fix the side cover. (Ø4×10 2 pcs) 6) Detach the side cover from the side plate and then rotate the cover. Next, pull out the drain pump and other drain pump kit components from the side. (The drain pump and other drain pump kit components are fixed to the side cover.) **NOTE)** • If the pipes are damaged, refrigerant leak may be caused. Take out them with great care. • One of two methods can be used: Either pull out the drain pump from the side or remove the screws (3 locations) used to fix the drain pump in place from the bottom side, and take out the drain pump from the bottom side. **2. Attachment** 1) Carefully insert the side cover (which fixes the drain pump and other drain pump kit components removed in step 1-5) of "⑪Drain pump, Float switch, Drain hose") from the side, so that you do not damage the pipes. Then fix the side cover using the screws. 2) Insert the drain hose into the port of the drain pump and fix the hose using the binding bands. 3) Reconnect the cables and then perform the procedure in 2 of "⑩Under panel, Drain pan." **NOTE)** Finally check whether they correctly operate or not.	*Some models have no float switch cover here.  

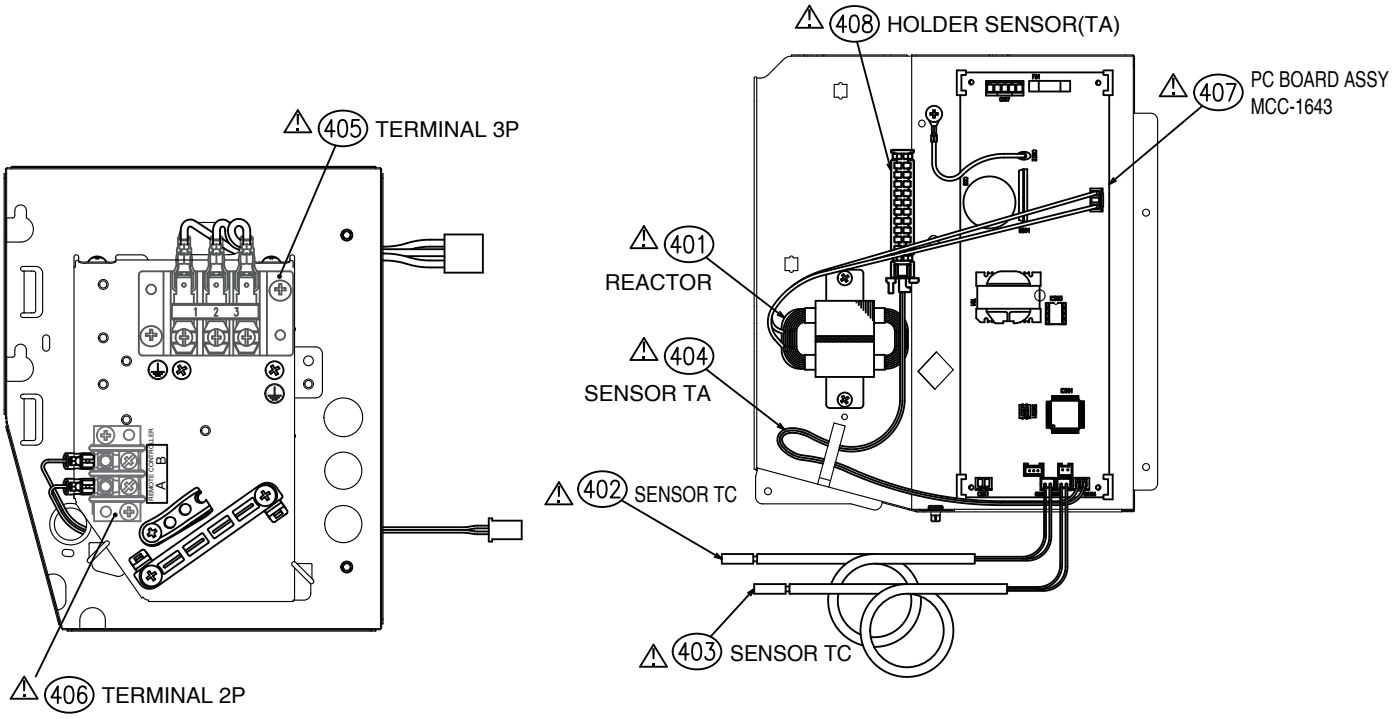
No.	Part name	Procedure	Remarks
⑫	Heat exchanger	**1. Detachment** 1) Recover refrigerant, and then remove refrigerant pipes at indoor unit side. 2) Perform the procedure in steps 1-1), 1-2), 1-3) of "④Electric parts box cover" and 1 of "⑩Under panel, Drain pan." 3) Disconnect the following connector of the control P.C. board. **NOTE)** Unlock the lock of the housing to disconnect the connectors. 4) Remove the TC and TCJ sensors from the heat exchanger, and then detach the binding bands used for fixing cables, such as the sensor cables, and drain pump cable. 5) Remove the screws of the pipe cover. Next lift up the pipe cover and disengage the cover from the hooking parts to remove it. (Ø4×10 2 pcs) 6) Remove the screws of the side cover to which the drain pump is attached, and slightly pull out the side cover. (Ø4×10 2 pcs) 7) Remove the screws of the heat exchanger fixed plate (U pipe side), which are used for fixing the end plate of heat exchanger. (Ø4×10 2 pcs) 8) Remove the screws of the heat exchanger fixed plate (pipe side) and detach the plate (pipe side). (Ø4×10 3 pcs) **NOTE)** • One screw (1 location) is concealed by the drain pump. Shift the drain pump slightly in order to remove the screw. • If it is difficult to remove the screws on the U pipe side, remove the under panel. • When removing the top side screw on the U pipe side, use a longish screwdriver as necessary. Also, when removing the upper side screw, use a shortish screwdriver. 9) Detach the heat exchanger. **2. Attachment** 1) Restore the components and cables to their original conditions and fix them in the following order: Sensors → Heat exchanger → Heat exchanger fixed plate (pipe side) → Heat exchanger fixed plate (Use the screws to fix the plate to the U pipe side.) → Pipe cover → Side cover → Drain pump → Under panel. 2) Connect the refrigerant pipe as before, and then perform vacuuming.	  

11. EXPLODED VIEWS AND PARTS LIST



Location No.	Parts No.	Description	RAV-HM***SDTY-E/TR			
			301	401	561	801
201	43H22003	CASE,FAN,UPPER	2	2		
	43H22004	CASE,FAN,UPPER			2	
	43H22005	CASE,FAN,UPPER				2
202	43H22006	CASE,FAN,LOWER	2	2		
	43H22007	CASE,FAN,LOWER			2	
	43H22008	CASE,FAN,LOWER				2
203	43H21004	MOTOR,FAN			1	1
	43H21011	MOTOR,FAN	1	1		
204	43H00021	PLATE,INLET	1	1		
	43H00022	PLATE,INLET			1	
	43H00023	PLATE,INLET				1
205	43H70001	HOSE,DRAIN	1	1	1	1
206	43H44056	REFRIGERATION CYCLE ASSY	1			
	43H44057	REFRIGERATION CYCLE ASSY		1		
	43H44058	REFRIGERATION CYCLE ASSY			1	
	43H44059	REFRIGERATION CYCLE ASSY				1
207	43H49027	SOCKET	1			1
208	43H49028	SOCKET		1	1	
209	43H49035	SOCKET				1
210	43H49029	SOCKET	1	1	1	
211	43H49030	NUT,FLARE	1			1
212	43H49031	NUT,FLARE		1	1	
213	43H49033	NUT,FLARE				1
214	43H49032	NUT,FLARE	1	1	1	
217	43H72001	PAN ASSY,DRAIN	1	1		
	43H72002	PAN ASSY,DRAIN			1	
	43H72003	PAN ASSY,DRAIN				1
218	43H79001	CAP,DRAIN	1	1	1	1
219	43H77001	PUMP,DRAIN	1	1	1	1
220	43H19006	COVER ASSY,SIDE	1	1	1	1
221	43H19007	COVER,PIPE	1	1	1	1
222	43H70002	HOSE,DRAIN	1	1	1	1
223	43H79002	BAND,HOSE	1	1	1	1
227	43H20006	FAN,MULTI BLADE	2	2		
	43H20007	FAN,MULTI BLADE			2	
	43H20008	FAN,MULTI BLADE				2
228	43H51002	SWITCH,FLOAT	1	1	1	1
229	43H47008	HOLDER,SENSOR(TC)	2	2	2	2
231	43H77002	PUMP,DRAIN ASSY	1	1	1	1
232	43H39005	EVAPORATOR, WIND				1
233	43H80030	AIR FILTER	1	1		
234	43H80036	AIR FILTER			1	
235	43H80037	AIR FILTER				1
236	43H80038	RAIL,FILTER	1	1		
237	43H80039	RAIL,FILTER			1	
238	43H80040	RAIL,FILTER				1
239	43H00024	FLANGE,OUTLET	1	1		
	43H00025	FLANGE,OUTLET			1	
	43H00026	FLANGE,OUTLET				1
240	43H97007	SCREW	1	1	1	1
241	43H97008	SCREW	1	1	1	1

Electric parts



Location No.	Parts No.	Description	RAV-HM***SDTY-E(TR)
401	43H58010	REACTOR	1
402	43H50010	SENSOR,TC	1
403	43H50011	SENSOR,TC	1
404	43H50012	SENSOR,TA	1
405	43H60013	TERMINAL,3P	1
406	43H60014	TERMINAL,2P	1
407	43H69102	PC BOARD ASSY, MCC-1643	1
408	43H63001	HOLDER,SENSOR(TA)	1

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