TOSHIBA

FILE NO. A10-1812
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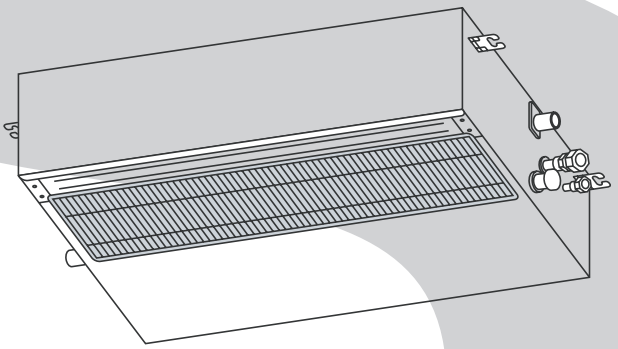
# SERVICE MANUAL

## AIR-CONDITIONER (SPLIT TYPE)

## INDOOR UNIT

### <Slim Duct type>

## RAV-RM301SDT-E (TR)
## RAV-RM401SDT-E (TR)
## RAV-RM561SDT-E (TR)



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## Original instruction

Please read carefully through these instructions that contains 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.
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 | • 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.<br>• 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.<br>• 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.<br>• 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 | • 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.<br>• 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.<br>• 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.<br>• 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<br>'Safety' working clothing |
| Electrical-related work | Gloves to provide protection for electricians Insulating shoes<br>Clothing to provide protection from electric shock |
| Work done at heights<br>(50 cm or more) | Helmets for use in industry |
| Transportation of heavy objects | Shoes with additional protective toecap |
| Repair of outdoor unit | Gloves to provide protection for electricians |

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

### [Explanation of indications]

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

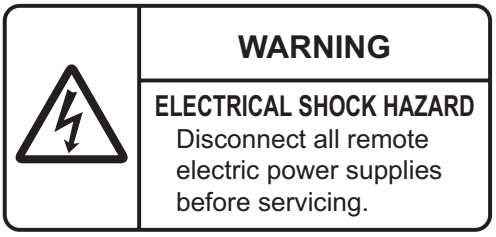
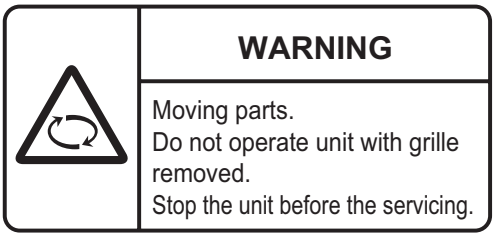
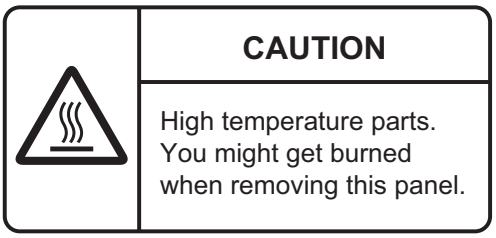
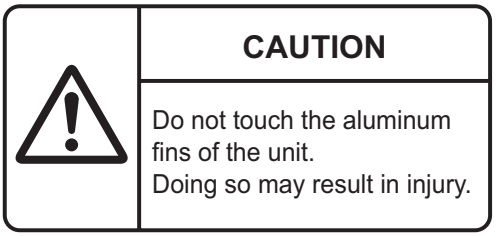
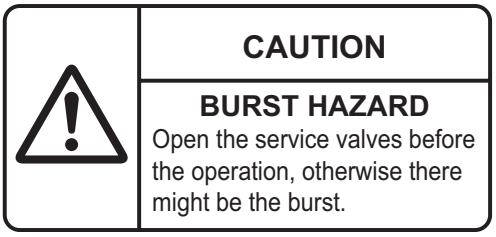
* Property damage: Enlarged damage concerned to property, furniture, and domestic animal / pet

### [Explanation of illustrated marks]

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

## Precaution for Safety

The appliance shall be installed in accordance with national wiring regulations. Capacity shortages of the power circuit or an incomplete installation may cause an electric shock or fire.

## ⚠ DANGER

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|---|---|
|  Check earth wires. | 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 intake grille 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.<br>Only a qualified installer (∗1) or qualified service person (∗1) is allowed to remove the intake grille of the indoor unit or service panel of the outdoor unit and do the work required. |
| | Before opening the electric 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. |
| | 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. |
| | When you have noticed that some kind of trouble (such as when a check code display has appeared, there is a smell of burning, abnormal sounds are heard, the air conditioner fails to cool or heat or water is leaking) has occurred in the air conditioner, do not touch the air conditioner yourself but set the circuit breaker to the OFF position, and contact a qualified service person. Take steps to ensure that the power will not be turned on (by marking "out of service" near the circuit breaker, for instance) until qualified service person arrives. Continuing to use the air conditioner in the trouble status may cause mechanical problems to escalate or result in electric shocks or other failure. |
|  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<br>"Qualified service person" is allowed to do this work. |
|  Prohibition | Do not turn ON the circuit breaker under the condition of removing a cabinet, a panel, etc.<br>Otherwise, it leads to an electric shock with a high voltage, resulting in loss of life. |

(∗1) Refer to the “Definition of Qualified Installer or Qualified Service Person.”

## ⚠ WARNING

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|---|---|
| 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. |
| | Wear protective gloves and safety work clothing during installation, servicing and removal. |
| | Do not use any refrigerant different from the one specified for complement or replacement.<br>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. |
| | When connecting the electrical wires, repairing the electrical parts or undertaking other electrical jobs, wear gloves to provide protection for electricians, insulating shoes and clothing to provide protection from electric shocks. Failure to wear this protective gear may result in electric shocks. |
| | When the air conditioner is to be transported, installed, maintained, repaired or removed, wear protective gloves and safety work clothing. |
| | 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. |
| | 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. |
| | 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. |
| | When working at heights, use a ladder which complies with the ISO 14122 standard, and follow the procedure in the ladder's instructions. Also wear a helmet for use in industry as protective gear to undertake the work. |
| | When working at heights, put a sign in place so that no-one will approach the work location, before proceeding with the work. Parts and other objects may fall from above, possibly injuring a person below. |
| | When executing address setting, test run, or troubleshooting through the checking window on the electric parts box, put on insulated gloves to provide protection from electric shock.<br>Otherwise you may receive an electric shock. |
| | Do not touch the aluminum fin of the outdoor unit. You may injure yourself if you do so.<br>If the fin must be touched for some reason, first put on protective gloves and safety work clothing, and then proceed. |
| | Do not climb onto or place objects on top of the outdoor unit.<br>You may fall or the objects may fall off the outdoor unit and result in injury. |
| | When transporting the air conditioner, wear shoes with additional protective toecaps. |
| | When transporting the air conditioner, do not hold the bands around the packing carton.<br>You may injure yourself if the bands should break. |
| | Be sure that a heavy unit (10 kg or heavier) such as a compressor is carried by four persons. |
| | This air conditioner has passed the pressure test as specified in IEC 60335-2-40 Annex EE. |
| Electric shock hazard | When you access inside of the electric cover to repair electric parts, wait for about five minutes after turning off the breaker. Do not start repairing immediately. Otherwise you may get electric shock by touching terminals of high-voltage capacitors. Natural discharge of the capacitor takes about five minutes. |
| Prohibition | Place a gWork in progress h 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 gDo not enter h around the site before the work. Failure to do this may result in third person getting electric shock. |
| | 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. |

(∗1) Refer to the “Definition of Qualified Installer or Qualified Service Person.”

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|  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.<br>Only qualified service person (∗1) is allowed to do this kind of work. |
|  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 earth wires are connected properly. |
| | Be sure to connect earth wire. (Grounding work) Incomplete grounding causes an electric shock.<br>Do not connect earth wires to gas pipes, water pipes, and lightning rods or earth wires for telephone wires. |
|  Prohibition of modification. | Do not modify the products. Do not also disassemble or modify the parts.<br>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. |
| | Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere due to the refrigerant leak. |
|  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. |
| | Under no circumstances, the power supply wire or the indoor and outdoor connecting wire must not be connected in the middle (Connection using a solder less terminal etc.)<br>Connection trouble in the places where the wire is connected in the middle may give rise to smoking and/or a fire. |
|  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.<br>When repairing the refrigerating cycle, take the following measures.<br>1) Be attentive to fire around the cycle.<br>When using a gas stove, etc., be sure to put out fire before work; otherwise the oil mixed with refrigerant gas may catch fire.<br>2) Do not use a brazing in the closed room.<br>When using it without ventilation, carbon monoxide poisoning may be caused.<br>3) Do not bring inflammables close to the refrigerant cycle, otherwise fire of the brazing may catch the inflammables. |

(∗1) Refer to the “Definition of Qualified Installer or Qualified Service Person.”

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| Refrigerant | This Air Conditioner has adopted a refrigerant HFC R32 or R410A.<br>Be sure to check the refrigerant type for outdoor unit to be combined. In case that refrigerant type is R32, this unit uses a mildly 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. |
| | Check the used refrigerant name and use tools and materials of the parts which match with it.<br>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.<br>Be careful for miss charging since a charging port of R32 is the same diameter as that of R410A. |
| | Do not use any refrigerant different from the one specified for complement or replacement.<br>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. |
| | Be sure to use the refrigerant (R32 or R410A) specified on the combined outdoor unit.<br>If different types of refrigerant are mixed, abnormal high pressure generates in the refrigerating cycle and an injury due to breakage may be caused.<br>If the different type of refrigerants are mixed in, be sure to recharge the refrigerant |
| | When the air conditioner has been installed or relocated, follow the instructions in the Installation Manual and purge the air completely so that no gases other than the refrigerant will be mixed in the refrigerating cycle. Failure to purge the air completely may cause the air conditioner to malfunction. |
| | Do not charge refrigerant additionally.<br>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 other refrigerant 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 the installation work, confirm that refrigerant gas does not leak. If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, it may generate noxious gases, causing a fire. |
| | Never recover the refrigerant into the outdoor unit.<br>When the equipment is moved or repaired, be sure to recover the refrigerant with recovering device.<br>The refrigerant cannot be recovered in the outdoor unit; otherwise a serious accident such as breakage or injury is caused. |
| | When the air conditioner has been installed or relocated, follow the instructions in the Installation Manual and purge the air completely so that no gases other than the refrigerant will be mixed in the refrigerating cycle. Failure to purge the air completely may cause the air conditioner to malfunction. |
| Assembly/ Wiring | After repair work, surely assemble the disassembled parts, and connect and lead the removed wires as before. Perform the work so that the cabinet or panel does not catch the inner wires.<br>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 (500VMΩ) 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.<br>If the refrigerant gas touches to a fire, it may generate noxious gases, causing a fire.<br>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.<br>If the leaked refrigerant gas comes in contact with fire, it may generate noxious gases, causing a fire. |

| | |
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|  Compulsion | When the refrigerant gas leaks, find out the leaked position and repair it surely.<br>If the leaked position cannot be found out and the repair work is interrupted, pump-down and tighten the service valve, otherwise the refrigerant gas may leak into the room.<br>When gas touches to fire such as fan heater, stove or cocking stove, it may generate noxious gases, causing a fire though the refrigerant gas itself is innocuous.<br>When installing equipment which includes a large amount of charged refrigerant in a sub-room, it is necessary that the concentration does not the limit even if the refrigerant leaks.<br>If the refrigerant leaks and exceeds the limit concentration an accident of shortage of oxygen is caused. |
| | Tighten the flare nut with a torque wrench in the specified manner.<br>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.<br>If an incorrect installation is done, a trouble of the refrigerating cycle, water leak, electric shock or fire is caused. |
| | Install the outdoor unit properly in a location that is durable enough to support the weight of the outdoor unit. Insufficient durability may cause the outdoor unit to fall, which may result in injury. |
|  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. |
| | Be sure to fix the screws back which have been removed for installation or other purposes. |
|  Do not operate the unit with the valve closed. | Check the following matters before a test run after repairing piping.<br>• Connect the pipes surely and there is no leak of refrigerant.<br>• The valve is opened.<br>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.<br>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.<br>1) The earth wire is correctly connected.<br>2) The power cord is not caught in the product.<br>3) There is no inclination or unsteadiness and the installation is stable.<br>If check is not executed, a fire, an electric shock or an injury is caused. |
|  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.<br>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.<br>In addition, before proceeding with the repair work, wear the kind of insulated heat-resistant gloves designed to protect electricians. |
|  Cooling | Take care not to get burned by compressor pipes or other parts when checking the cooling cycle while running the unit as they get heated while running. Be sure to put on gloves providing protection for heat. |

(∗1) Refer to the “Definition of Qualified Installer or Qualified Service Person.”

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|---|---|
| Installation | Only a qualified installer (∗1) or qualified service person (∗1) is allowed to install the air conditioner.<br>If the air conditioner is installed by an unqualified individual, a fire, electric shocks, injury, water leakage, noise and/or vibration may result. |
| | Before starting to install the air conditioner, read carefully through the Installation Manual, and follow its instructions to install the air conditioner. |
| | Be sure to use the company-specified products for the separately purchased parts. Use of no specified products may result in fire, electric shock, water leakage or other failure.<br>Have the installation performed by a qualified installer. |
| | Do not supply power from the power terminal block equipped on the outdoor unit to another outdoor unit. Capacity overflow may occur on the terminal block and may result in fire. |
| | Do not install the air conditioner in a location that may be subject to a risk of exposing 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. |
| | When transporting the air conditioner, use a forklift truck and when moving the air conditioner by hand, move the unit with 4 people. |
| | 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. |
| | If you install the unit in a small room, take appropriate measures to prevent the refrigerant from exceeding the limit concentration even if it leaks. Consult the dealer from whom you purchased the air conditioner when you implement the measures. Accumulation of highly concentrated refrigerant may cause an oxygen deficiency accident. |
| | 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. |
| Compulsion | 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 rupture, injury, etc. |
| | When removing the brazing parts of suction and discharge pipe for the compressor, remove them at the place ventilated well after recovering the refrigerant. Improper recovering may cause the spurt of the refrigerant and the refrigeration oil, causing an injury. |
| Prohibition | Do not vent gases to the atmosphere.<br>Venting gases to the atmosphere is prohibited by the law. |

(∗1) Refer to the “Definition of Qualified Installer or Qualified Service Person.”

## ⚠ CAUTION

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|---|---|
| Wearing of gloves | Ensure wearing of gloves when performing any work in order to avoid injury from parts, etc.<br>Failure to wear the proper protective gloves cause an injury due to the parts, etc. |
| Confirm | When performing the brazing work, check whether refrigerant leaks or remains.<br>If the leakage refrigerant gas touches a fire source, it may generate noxious gases, causing a fire. |

### Explanations given to user

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

### Relocation

• Only a qualified installer (*1) or qualified service person (*1) is allowed to relocate the 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 rupture, injury, etc.

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

## Declaration of Conformity

| | |
|---|---|
| Manufacturer: | TOSHIBA CARRIER CORPORATION<br>336 Tadehara, Fuji-shi, Shizuoka-ken 416-8521 JAPAN |
| TCF holder: | TOSHIBA CARRIER EUROPE S.A.S<br>Route de Thil<br>01120 Montluel FRANCE |

Hereby declares that the machinery described below:

| | | |
|---|---|---|
| Generic Denomination: | Air Conditioner | |
| Model / type: | Indoor unit | |
| | <Slim Duct> | |
| | RAV-RM301SDT-E | RAV-RM301SDT-TR |
| | RAV-RM401SDT-E | RAV-RM401SDT-TR |
| | RAV-RM561SDT-E | RAV-RM561SDT-TR |
| Commercial name: | Digital Inverter Series, Super Digital Inverter Series Air Conditioner | |

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

**NOTE**

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

## Specifications

| Model | Sound pressure level (dB(A)) | | Weight (kg) |
|---|---|---|---|
| | Cooling | Heating | |
| RAV-RM301SDT-E | ∗ | ∗ | 22 |
| RAV-RM401SDT-E | ∗ | ∗ | 22 |
| RAV-RM561SDT-E | ∗ | ∗ | 22 |
| RAV-RM301SDT-TR | ∗ | ∗ | 22 |
| RAV-RM401SDT-TR | ∗ | ∗ | 22 |
| RAV-RM561SDT-TR | ∗ | ∗ | 22 |

∗: Under 70 (dB(A))

# About 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 for 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

# About refrigerant R410A

This air conditioner adopts a HFC type refrigerant (R410A) which does not deplete the ozone layer.

## 1. Safety Caution Concerned to R410A Refrigerant

The pressure of R410A is 1.6 times higher than that of the former refrigerant (R22).
Accompanied with change of refrigerant, the refrigerating oil has been also changed.
Therefore, 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 R410A refrigerant 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 R410A to purpose a safe work.

## 2. Cautions on Installation/Service

1) Do not mix the other refrigerant or refrigerating oil.
   For the tools exclusive to R410A, shapes of all the joints including the service port differ from those of the former refrigerant in order to prevent mixture of them.
2) As the use pressure of the R410A refrigerant is high, use material thickness of the pipe and tools which are specified for R410A.
3) 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 scales, oil, etc.
   Use the clean pipes.
   Be sure to brazing with flowing nitrogen gas. (Never use gas other than nitrogen gas.)
4) For the earth protection, use a vacuum pump for air purge.
5) R410A refrigerant is azeotropic mixture type refrigerant.
   Therefore use liquid type to charge the refrigerant. (If using gas for charging, composition of the refrigerant changes and then characteristics of the air conditioner change.)

## 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 material in which impurities adhere inside of pipe or joint to a minimum.

### 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 R410A, 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.

### 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

1. Required Tools for R410A
   Mixing of different types of oil may cause a trouble such as generation of sludge, clogging of capillary, etc. Accordingly, the tools to be used are classified into the following three types.
   1) Tools exclusive for R410A (Those which cannot be used for conventional refrigerant (R22))
   2) Tools exclusive for R410A, but can be also used for conventional refrigerant (R22)
   3) Tools commonly used for R410A and for conventional refrigerant (R22)

   The table below shows the tools exclusive for R410A and their interchangeability.

### Tools exclusive for R410A (The following tools for R410A are required.)

Tools whose specifications are changed for R410A and their interchangeability

| No. | Used tool | Usage | R410A air conditioner installation | | Conventional air conditioner installation |
|---|---|---|---|---|---|
| | | | Existence of new equipment for R410A | Whether conventional equipment can be used | Whether conventional equipment can be used |
| ① | Flare tool | Pipe flaring | Yes | ∗ (Note) | Yes |
| ② | Copper pipe gauge for adjusting projection margin | Flaring by conventional flare tool | Yes | ∗ (Note) | ∗ (Note) |
| ③ | Torque wrench | Tightening of flare nut | Yes | No | No |
| ④ | Gauge manifold | Evacuating, refrigerant charge, run check, etc. | Yes | No | No |
| ⑤ | Charge hose | | | | |
| ⑥ | Vacuum pump adapter | Vacuum evacuating | Yes | No | Yes |
| ⑦ | Electronic balance for refrigerant charging | Refrigerant charge | Yes | Yes | Yes |
| ⑧ | Refrigerant cylinder | Refrigerant charge | Yes | No | No |
| ⑨ | Leakage detector | Gas leakage check | Yes | No | Yes |

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

### General tools (Conventional tools can be used.)

In addition to the above exclusive tools, the following equipment which serve also for R22 are necessary as the general tools.

1) Vacuum pump. Use vacuum pump by attaching vacuum pump adapter.
2) Torque wrench
3) Pipe cutter
4) Reamer
5) Pipe bender
6) Level vial
7) Screwdriver (+, –)
8) Spanner or Adjustable wrench
9) Hole core drill
10) Hexagon wrench (Opposite side 4mm)
11) Tape measure
12) 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. SPECIFICATIONS

## SDI combination (R32)
## <Single type>

| Model name | Indoor Unit | | **RAV-RM** | **561SDT-E** |
|---|---|---|---|---|
| | Outdoor Unit | | **RAV-GP** | **561ATP-E** |
| Cooling capacity (Rated (Min.-Max.)) (*1) | | | kW | 5.0 (1.2 - 5.6) |
| Heating capacity (Rated (Min.-Max.)) (*1) | | | kW | 5.6 (0.9 - 7.0) |
| Power supply | | | | 1phase 50Hz 230V (220V-240V) |
| Electrical charastaristics | Cooling | Running current | A | 7.57 - 6.94 |
| | | Power consumption | kW | 1.56 |
| | | Power factor | % | 93 |
| | | EER | | 3.21 |
| | Heating | Running current | A | 7.81 - 7.15 |
| | | Power consumption | kW | 1.58 |
| | | Power factor | % | 93 |
| | | COP | | 3.54 |
| | Maximum current | | A | 13.1 |
| **Indoor Unit** | | | | |
| Appearance | | | | Zinc hot dipping steel plate |
| Outer dimension | H × W × D | | mm | 210 × 845 × 645 |
| Weight | | | kg | 22 |
| Heat exchanger | | | | Finned tube |
| Fan unit | Fan | | | Centrifugal |
| | Standard air flow ( M / L ) | | $m^3/h$ | 780 (678 / 582) |
| | Motor | | W | 60 |
| | External static pressure (factory default) | | Pa | 29 |
| | External static pressure range | | Pa | 4 - 14 - 29 - 44 |
| Air filter | | | | Standard filter (Long life filter) |
| Drain port (Nominal dia. mm) | | | | VP25 (Polyvinyl chloride tube) |
| Sound pressure level High ( M+ / L+ ) (factory default) | | | dB(A) | 45 (40 / 36) |
| Sound power level High ( M+ / L+ ) (factory default) (2*) | | | dB(A) | 55 (53 / 48) |
| **Outdoor Unit** | | | | |
| Refrigarant ( Type / Charge weight (kg) ) | | | | R32 / 1.35 |
| Outer dimension | H × W × D | | mm | 630 x 799 x 299 |
| Weight | | | kg | 45 |
| Sound puressure level | Cooling/Heating | | dB(A) | 46 / 48 |
| Sound power level | Cooling/Heating | | dB(A) | 63 / 65 |
| Pipe connections | Gas / Liquid | | mm | DIA 12.7 / DIA 6.4 |
| | Min. Length | | m | 3 |
| | Max. Length | | m | 50 |
| | Charge less | | m | 20 |
| | Max. height difference | | m | 30 |
| Operation Range | Cooling | | ˚C | -15 to 52 |
| | Heating | | ˚C | -27 to 15 |

*1 : The cooling capacity, heating capacity and electrical characteristics are measured under the conditions specified by JIS B8615-1 based on the reference piping. The reference piping consists of 5m of main piping and 2.5m of branch piping connected with 0 meter height.

*2 : The sound level are measured in an anechoic chamber in accordance with JIS B 8616. Normally, the values measured in the actual operation environment become larger than the indicated values due to the effects of external sound.

**Notes ;**

Rated conditions Cooling : Indoor air temperature 27°C DB / 19 °C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB / 6 °C WB

## SDI combination (R410A)
## <Single type>

| Model name | Indoor Unit | | | RAV-RM | 401SDT-E | 561SDT-E |
|---|---|---|---|---|---|---|
| | Outdoor Unit | | | RAV-SP | 404ATP-E | 564ATP-E |
| Cooling capacity (Rated (Min.-Max.)) (*1) | | | | kW | 3.6 (1.5 -4.0) | 5.0 (1.2 - 5.6) |
| Heating capacity (Rated (Min.-Max.)) (*1) | | | | kW | 4.0 (1.5 - 5.0) | 5.6 (0.9 -7.4) |
| Power supply | | | | | 1phase 50Hz 230V (220V-240V) | |
| Electrical charastaristics | Cooling | Running current | | A | 5.20 - 4.77 | 7.24 - 6.63 |
| | | Power consumption | | kW | 1.03 | 1.56 |
| | | Power factor | | % | 90 | 98 |
| | | EER | | | 3.50 | 3.21 |
| | Heating | Running current | | A | 4.94 - 4.53 | 6.68 - 6.12 |
| | | Power consumption | | kW | 1.00 | 1.44 |
| | | Power factor | | % | 92 | 98 |
| | | COP | | | 4.00 | 3.89 |
| | Maximum current | | | A | 15.0 | 13.6 |
| **Indoor Unit** | | | | | | |
| Appearance | | | | | Zinc hot dipping steel plate | |
| Outer dimension | H × W × D | | | mm | 210 × 845 × 645 | |
| Weight | | | | kg | 22 | |
| Heat exchanger | | | | | Finned tube | |
| Fan unit | Fan | | | | Centrifugal | |
| | Standard air flow ( M / L ) | | | m³/h | 690 (600 / 522) | 780 (678 / 582) |
| | Motor | | | W | 60 | |
| | External static pressure (factory default) | | | Pa | 30 | 29 |
| | External static pressure range | | | Pa | 5 - 15 - 30 - 45 | 4 - 14 - 29 - 44 |
| Air filter | | | | | Standard filter (Long life filter) | |
| Drain port (Nominal dia. mm) | | | | | VP25 (Polyvinyl chloride tube) | |
| Sound pressure level High ( M+ / L+ ) (factory default) | | | | dB(A) | 39 (36 / 33) | 45 (40 / 36) |
| Sound power level High ( M+ / L+ ) (factory default) (2*) | | | | dB(A) | 52 (48 / 44) | 55 (53 / 48) |
| **Outdoor Unit** | | | | | | |
| Refrigarant ( Type / Charge weight (kg) ) | | | | | R410A / 1.0 | R410A / 1.4 |
| Outer dimension | H × W × D | | | mm | 550 x 780 x 290 | |
| Weight | | | | kg | 40 | 44 |
| Sound puressure level | Cooling/Heating | | | dB(A) | 45 / 47 | 47 / 48 |
| Sound power level | Cooling/Heating | | | dB(A) | 62 / 64 | 63 / 64 |
| Pipe connections | Gas / Liquid | | | mm | DIA 12.7 / DIA 6.4 | |
| | Min. Length | | | m | 5 | |
| | Max. Length | | | m | 30 | |
| | Charge less | | | m | 20 | |
| | Max. height difference | | | m | 30 | |
| Operation Range | Cooling | | | ˚C | -15 to 43 | |
| | Heating | | | ˚C | -15 to 15 | -20 to 15 |

*1 : The cooling capacity, heating capacity and electrical characteristics are measured under the conditions specified by JIS B8615-1 based on the reference piping. The reference piping consists of 5m of main piping and 2.5m of branch piping connected with 0 meter height.

*2 : The sound level are measured in an anechoic chamber in accordance with JIS B 8616. Normally, the values measured in the actual operation environment become larger than the indicated values due to the effects of external sound.

**Notes ;**

Rated conditions Cooling : Indoor air temperature 27°C DB / 19 °C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB / 6 °C WB

## DI combination (R410A)
## <Single type>

| Model name | Indoor Unit | | | RAV-RM | 301SDT-E | 401SDT-E | 561SDT-E |
|---|---|---|---|---|---|---|---|
| | Outdoor Unit | | | RAV-SM | 304ATP-E | 404ATP-E | 564ATP-E |
| Cooling capacity (Rated (Min.-Max.)) (*1) | | | | kW | 2.5 (0.9 - 3.0) | 3.6 (0.9 - 4.0) | 5.0 (1.5 - 5.6) |
| Heating capacity (Rated (Min.-Max.)) (*1) | | | | kW | 3.4 (0.8 - 4.5) | 4.0 (0.8 - 5.0) | 5.3 (1.5 - 6.3) |
| Power supply | | | | | 1phase 50Hz 230V (220V-240V) | | |
| Electrical charastaristics | Cooling | Running current | | A | 2.82 - 2.60 | 4.20 - 4.60 | 8.95 - 8.20 |
| | | Power consumption | | kW | 0.56 | 0.93 | 1.91 |
| | | Power factor | | % | 90 | 92 | 97 |
| | | EER | | | 4.46 | 3.87 | 2.62 |
| | Heating | Running current | | A | 4.20 - 3.85 | 4.35 - 4.75 | 7.03 - 6.44 |
| | | Power consumption | | kW | 0.86 | 0.97 | 1.50 |
| | | Power factor | | % | 93 | 93 | 97 |
| | | COP | | | 3.95 | 4.12 | 3.53 |
| | Maximum current | | | A | 7.85 | 9.15 | 12.9 |
| **Indoor Unit** | | | | | | | |
| Appearance | | | | | Zinc hot dipping steel plate | | |
| Outer dimension | H × W × D | | | mm | 210 × 845 × 645 | | |
| Weight | | | | kg | 22 | | |
| Heat exchanger | | | | | Finned tube | | |
| Fan unit | Fan | | | | Centrifugal | | |
| | Standard air flow ( M / L ) | | | $m^3/h$ | 660 (560 / 480) | 690 (600 / 522) | 780 (678 / 582) |
| | Motor | | | W | 60 | | |
| | External static pressure (factory default) | | | Pa | 30 | 30 | 29 |
| | External static pressure range | | | Pa | 5 - 15 - 30 - 45 | 5 - 15 - 30 - 45 | 4 - 14 - 29 - 44 |
| Air filter | | | | | Standard filter (Long life filter) | | |
| Drain port (Nominal dia. mm) | | | | | VP25 (Polyvinyl chloride tube) | | |
| Sound pressure level High ( M+ / L+ ) (factory default) | | | | dB(A) | 39 (36 / 33) | 39 (36 / 33) | 45 (40 / 36) |
| Sound power level High ( M+ / L+ ) (factory default) (2*) | | | | dB(A) | 51 (48 / 44) | 52 (48 / 44) | 55 (53 / 48) |
| **Outdoor Unit** | | | | | | | |
| Refrigarant ( Type / Charge weight (kg) ) | | | | | R410A / 0.8 | R410A / 1.4 | R410A / 1.1 |
| Outer dimension | H × W × D | | | mm | 550 x 780 x 290 | | |
| Weight | | | | kg | 33 | 39 | 40 |
| Sound puressure level | Cooling/Heating | | | dB(A) | 46 / 47 | 49 / 50 | 46 / 48 |
| Sound power level | Cooling/Heating | | | dB(A) | 61 / 62 | 64 / 65 | 63 / 65 |
| Pipe connections | Gas / Liquid | | | mm | DIA 9.5 / DIA 6.4 | DIA 12.7 / DIA 6.4 | |
| | Min. Length | | | m | 2 | | 5 |
| | Max. Length | | | m | 20 | | 30 |
| | Charge less | | | m | 15 | | 20 |
| | Max. height difference | | | m | 10 | | 30 |
| Operation Range | Cooling | | | ˚C | -15 to 46 | | |
| | Heating | | | ˚C | -15 to 24 | | -15 to 15 |

*1 : The cooling capacity, heating capacity and electrical characteristics are measured under the conditions specified by JIS B8615-1 based on the reference piping. The reference piping consists of 5m of main piping and 2.5m of branch piping connected with 0 meter height.

*2 : The sound level are measured in an anechoic chamber in accordance with JIS B 8616. Normally, the values measured in the actual operation environment become larger than the indicated values due to the effects of external sound.

# Specifications for ErP Lot-10

## Slim Duct <Series 1>

### Refrigerant : R32

| No | Outdoor unit type | Connection type | HP | Indoor unit | | Outdoor unit | | Rated Capacity (kW) | | Specifications | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Model name | Qty | Model name | Qty | Cooling | Heating | SEER | Energy Label | Pdesign C | SCOP (average) | Energy Label | Pdesign h (average) |
| 1 | SDI | Single | 2.0 | RAV-RM561SDT-E | 1 | RAV-GP561ATP-E | 1 | 5.0 | 5.6 | 5.77 | A+ | 5.0 | 4.20 | A+ | 3.8 |

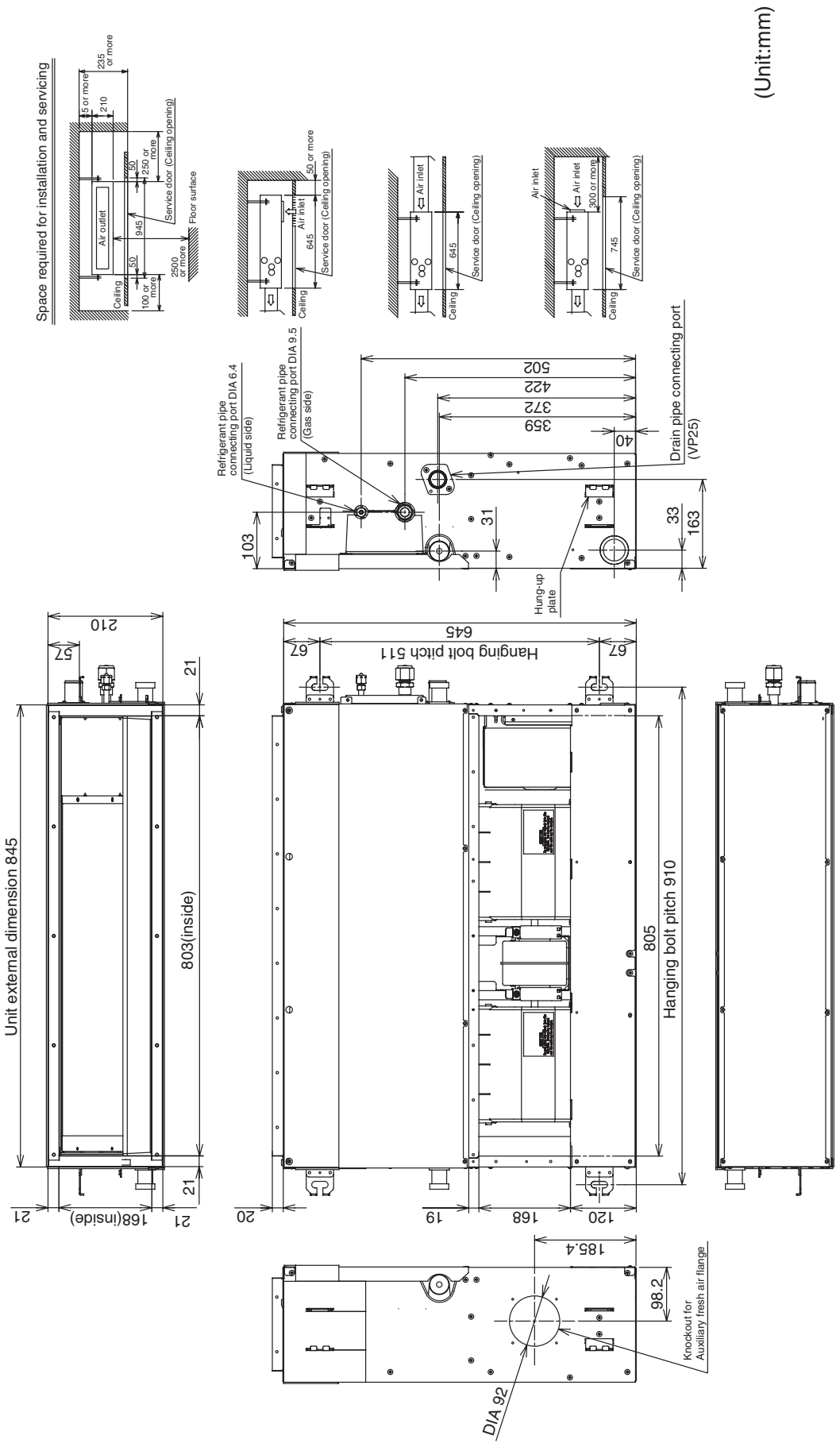
### Refrigerant : R410A

| No | Outdoor unit type | Connection type | HP | Indoor unit | | Outdoor unit | | Rated Capacity (kW) | | Specifications | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Model name | Qty | Model name | Qty | Cooling | Heating | SEER | Energy Label | Pdesign C | SCOP (average) | Energy Label | Pdesign h (average) |
| 1 | DI | Single | 1.0 | RAV-RM301SDT-E | 1 | RAV-SM304ATP-E | 1 | 2.5 | 3.4 | 6.10 | A++ | 2.5 | 4.48 | A+ | 2.9 |
| 2 | DI | Single | 1.5 | RAV-RM401SDT-E | 1 | RAV-SM404ATP-E | 1 | 3.6 | 4.0 | 5.55 | A | 3.6 | 3.88 | A | 3.7 |
| 3 | DI | Single | 2.0 | RAV-RM561SDT-E | 1 | RAV-SM564ATP-E | 1 | 5.0 | 5.3 | 5.06 | B | 5.0 | 4.06 | A+ | 4.4 |
| 4 | SDI | Single | 1.5 | RAV-RM401SDT-E | 1 | RAV-SP404ATP-E | 1 | 3.6 | 4.0 | 5.11 | A | 3.6 | 3.90 | A | 3.8 |
| 5 | SDI | Single | 2.0 | RAV-RM561SDT-E | 1 | RAV-SP564ATP-E | 1 | 5.0 | 5.6 | 5.10 | A | 5.0 | 3.83 | A | 5.4 |

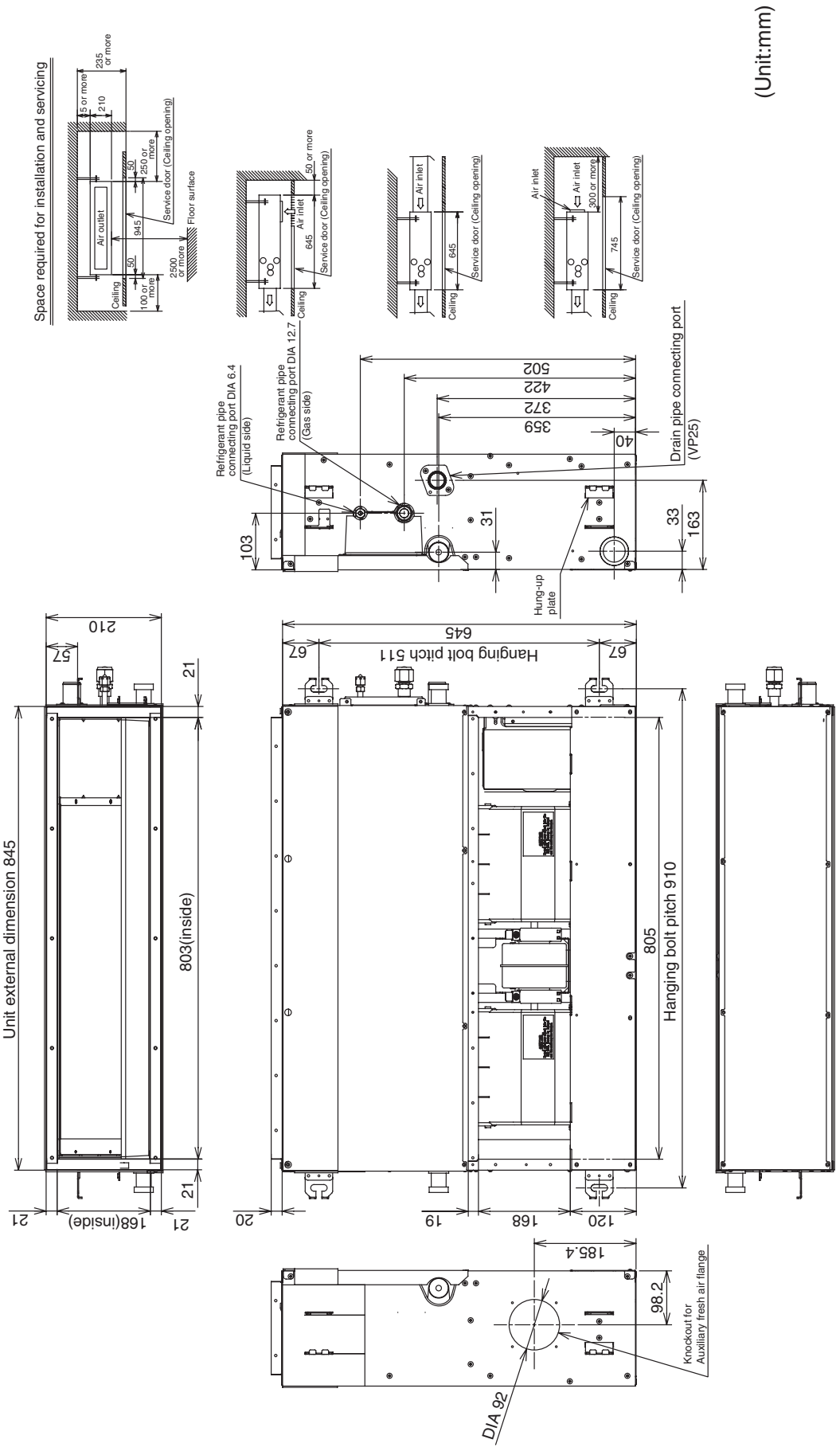
# 2. CONSTRUCTION VIEWS (EXTERNAL VIEWS)

## 2-1. RAV-RM301SDT*

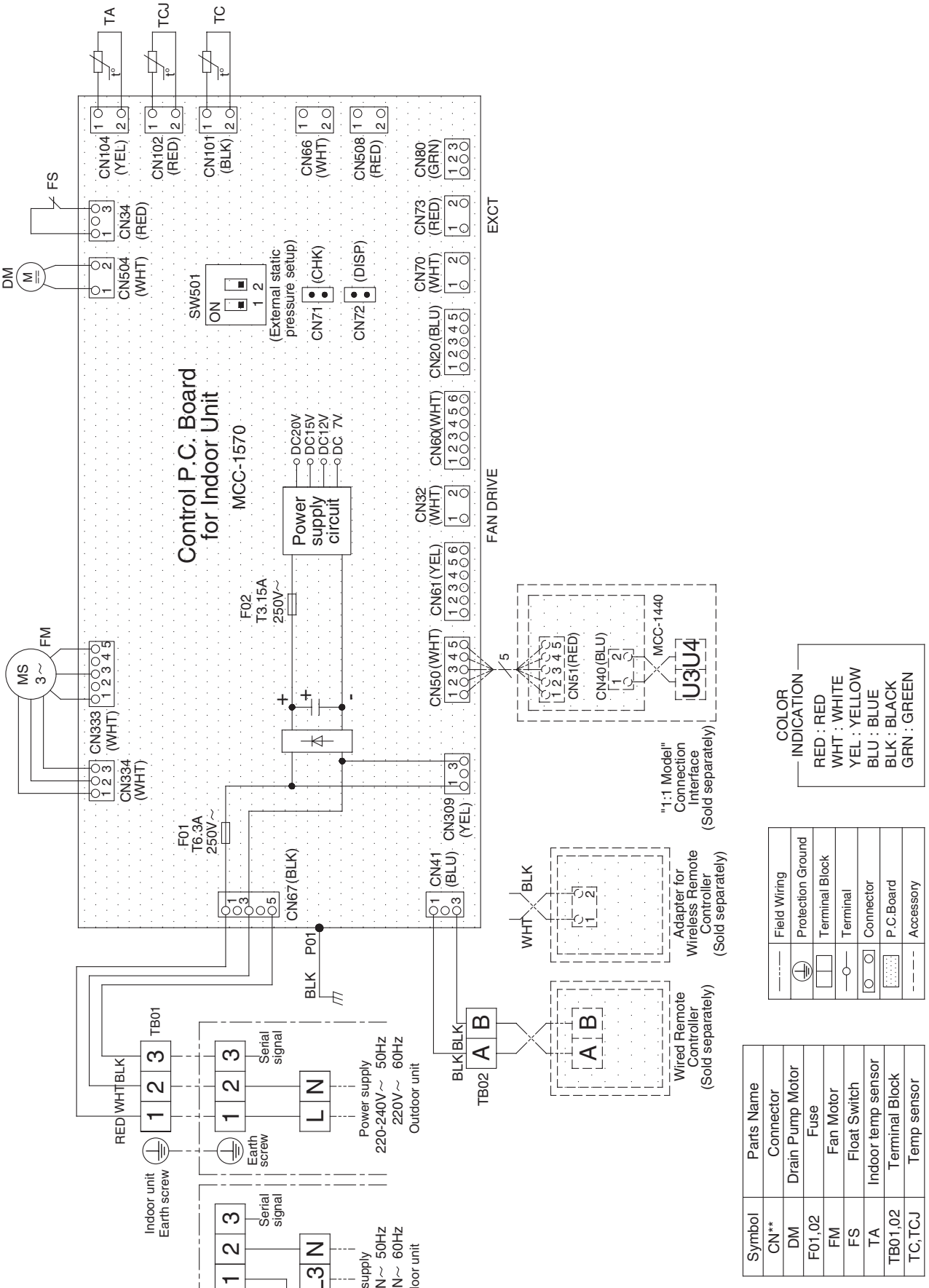
(Unit:mm)



## 2-2. RAV-RM401SDT*, RM561SDT*



# 3. WIRING DIAGRAMS




| Symbol | Parts Name |
|---|---|
| CN** | Connector |
| DM | Drain Pump Motor |
| F01,02 | Fuse |
| FM | Fan Motor |
| FS | Float Switch |
| TA | Indoor temp sensor |
| TB01,02 | Terminal Block |
| TC,TCJ | Temp sensor |

# 4. PARTS RATING

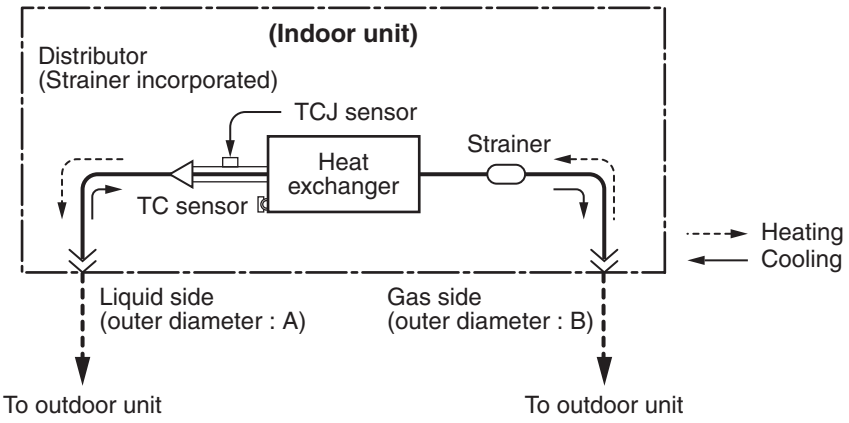
### Indoor unit

| Model RAV- | RM30∗ | RM40∗ | RM56∗ |
|---|---|---|---|
| Fan motor | SWF-280-60-3 | | |
| Float switch | FS-0218-102 | | |
| Drain pump motor | MDP-1401 | | |
| TA sensor | Lead wire length: 328 mm Vinyl tube | | |
| TC sensor | DIA 6 size lead wire length: 1200 mm Vinyl tube (Black) | | |
| TCJ sensor | DIA 6 size lead wire length: 1200 mm Vinyl tube (Red) | | |

# 5. SYSTEMATIC REFRIGERATING CYCLE DIAGRAM

## 5-1. Indoor Unit

**• Single type (Combination of 1 indoor unit and 1 outdoor unit)**

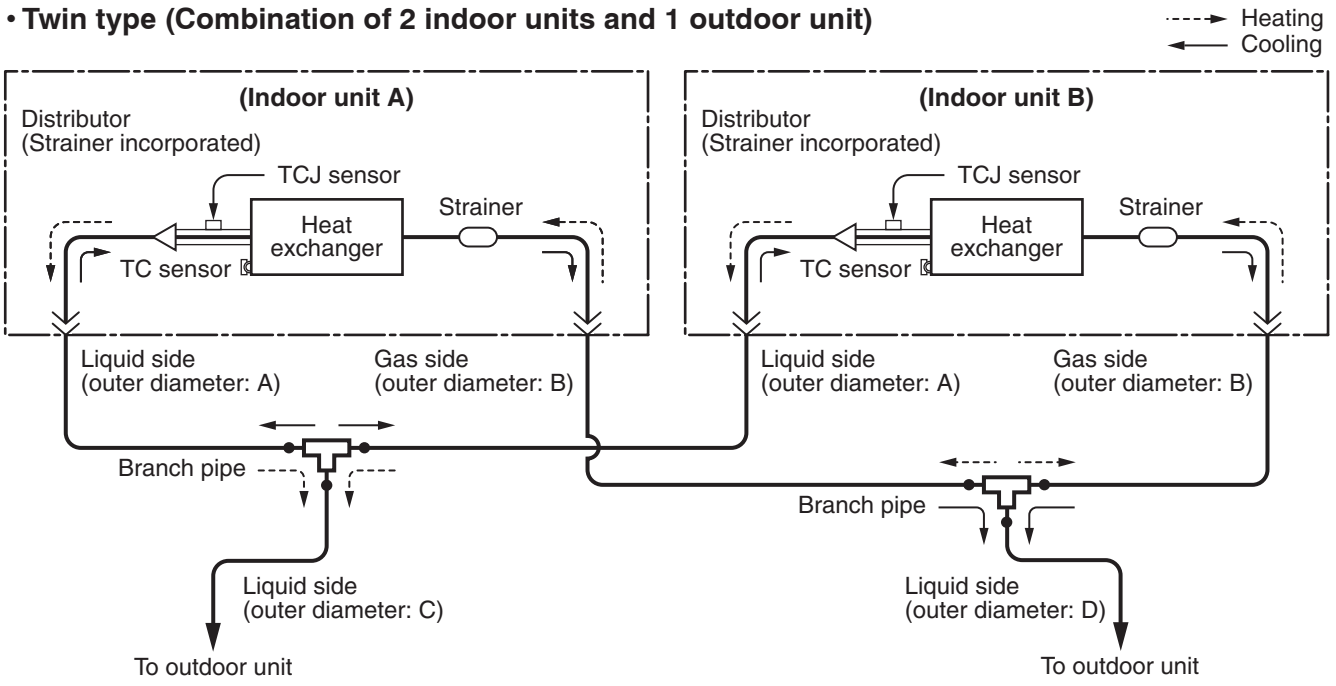



### Dimension table

(Unit: mm)

| Indoor unit | Outer diameter of refrigerant pipe | |
|---|---|---|
| | Liquid side DIA A | Gas side DIA B |
| RM30 type | 6.4 | 9.5 |
| RM40, 56 type | 6.4 | 12.7 |

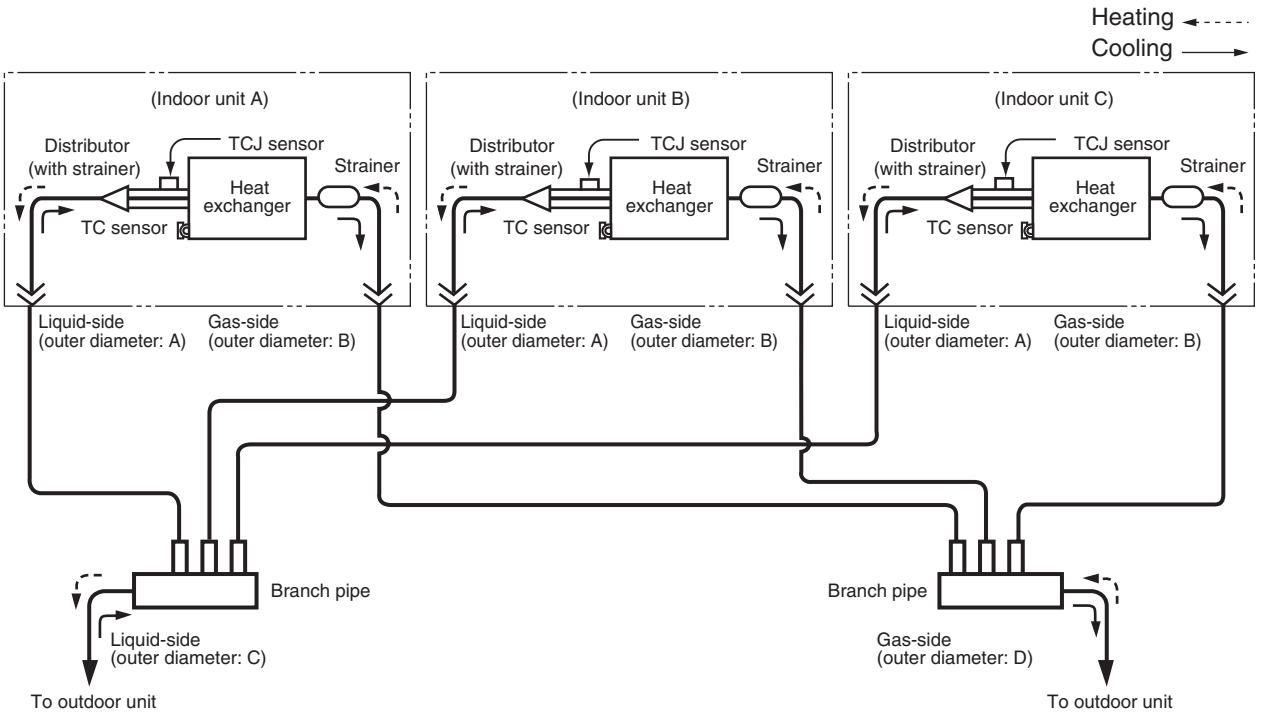
**• Twin type (Combination of 2 indoor units and 1 outdoor unit)**




(Unit: mm)

| Indoor unit | Branch pipe | A | B | C | D |
|---|---|---|---|---|---|
| RM40 × 2 | RBC-TWP30E2 | 6.4 | 12.7 | 9.5 | 15.9 |
| RM56 × 2 | RBC-TWP30E2 | 6.4 | 12.7 | 9.5 | 15.9 |

• **Triple type (3 indoor units and 1 outdoor unit)**

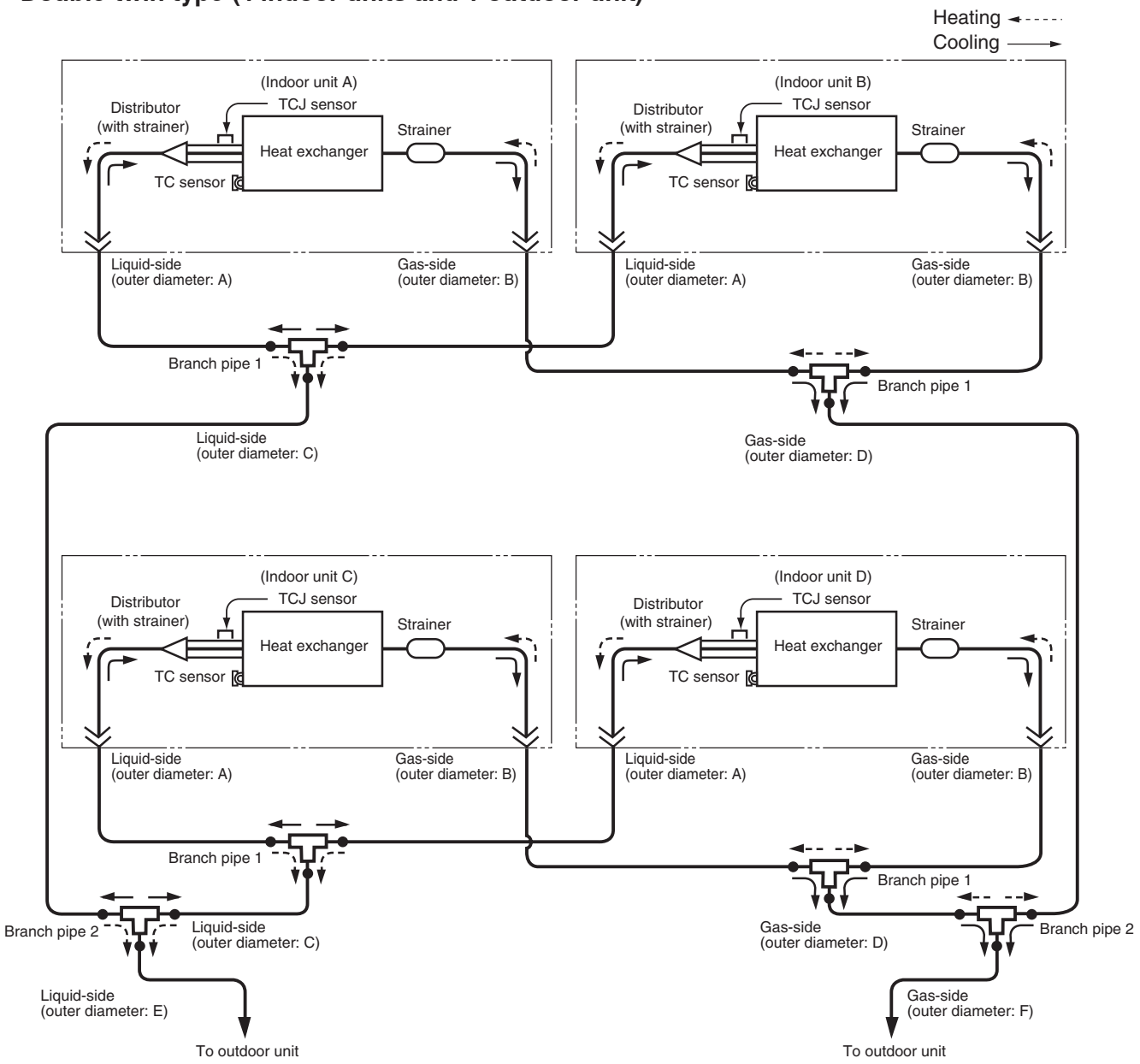



## Dimension table

(Unit: mm)

| Indoor unit | Branch pipe | A | B | C | D |
|---|---|---|---|---|---|
| RM56 × 3 | RBC-TRP100E | 6.4 | 12.7 | 9.5 | 15.9 |

## • Double-twin type (4 indoor units and 1 outdoor unit)




### Dimension table

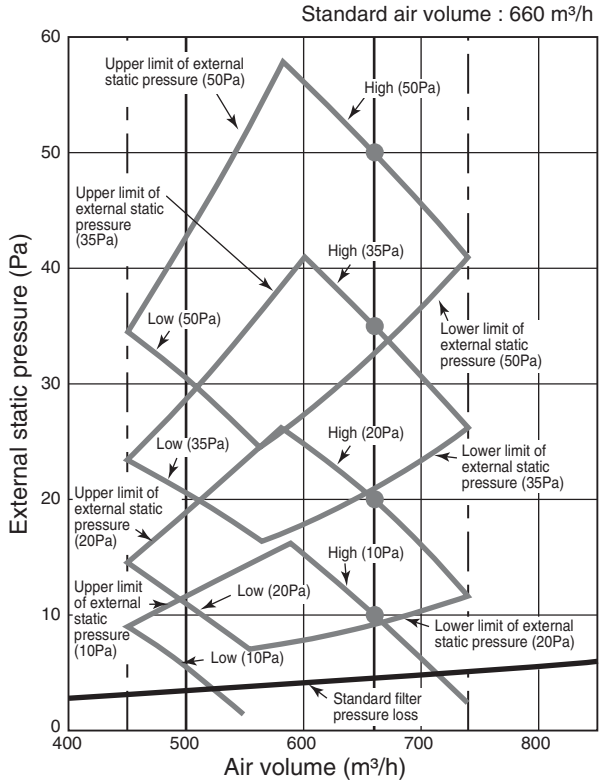
(Unit: mm)

| Indoor unit | Branch pipe 1 | Branch pipe 2 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| RM56 × 4 | RBC-TWP30E2x2 | RBC-TWP101E | 6.4 | 12.7 | 9.5 | 15.9 | 12.7 | 28.6 |

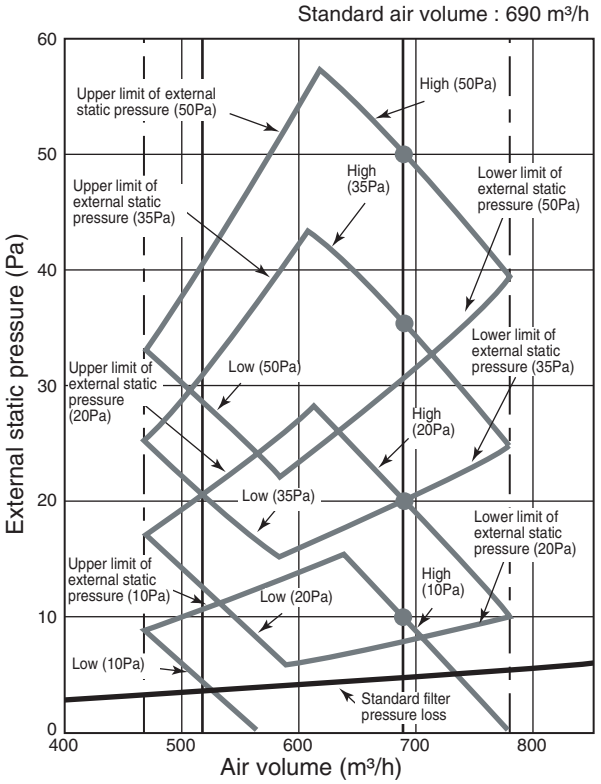
# 6. FAN CHARACTERISTICS

## 6-1. Slim Duct (Filter Attached)

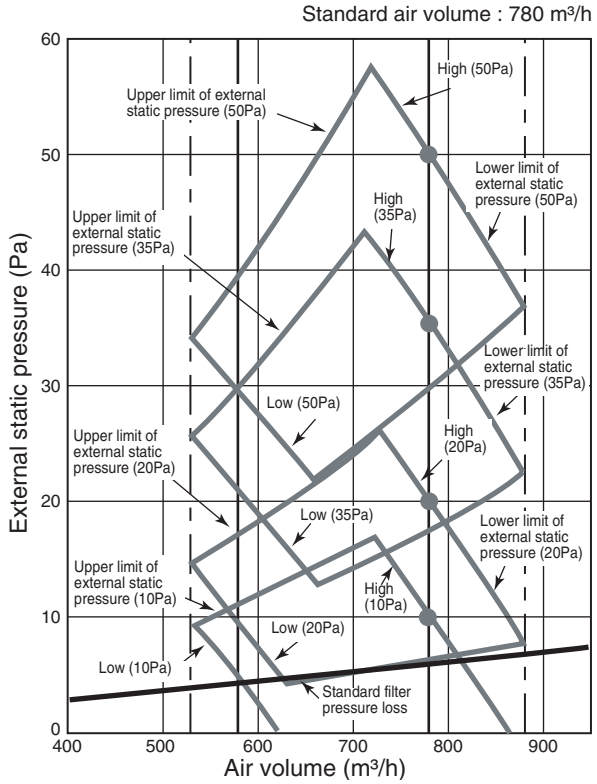
### ◆ RM30 type




### ◆ RM40 type



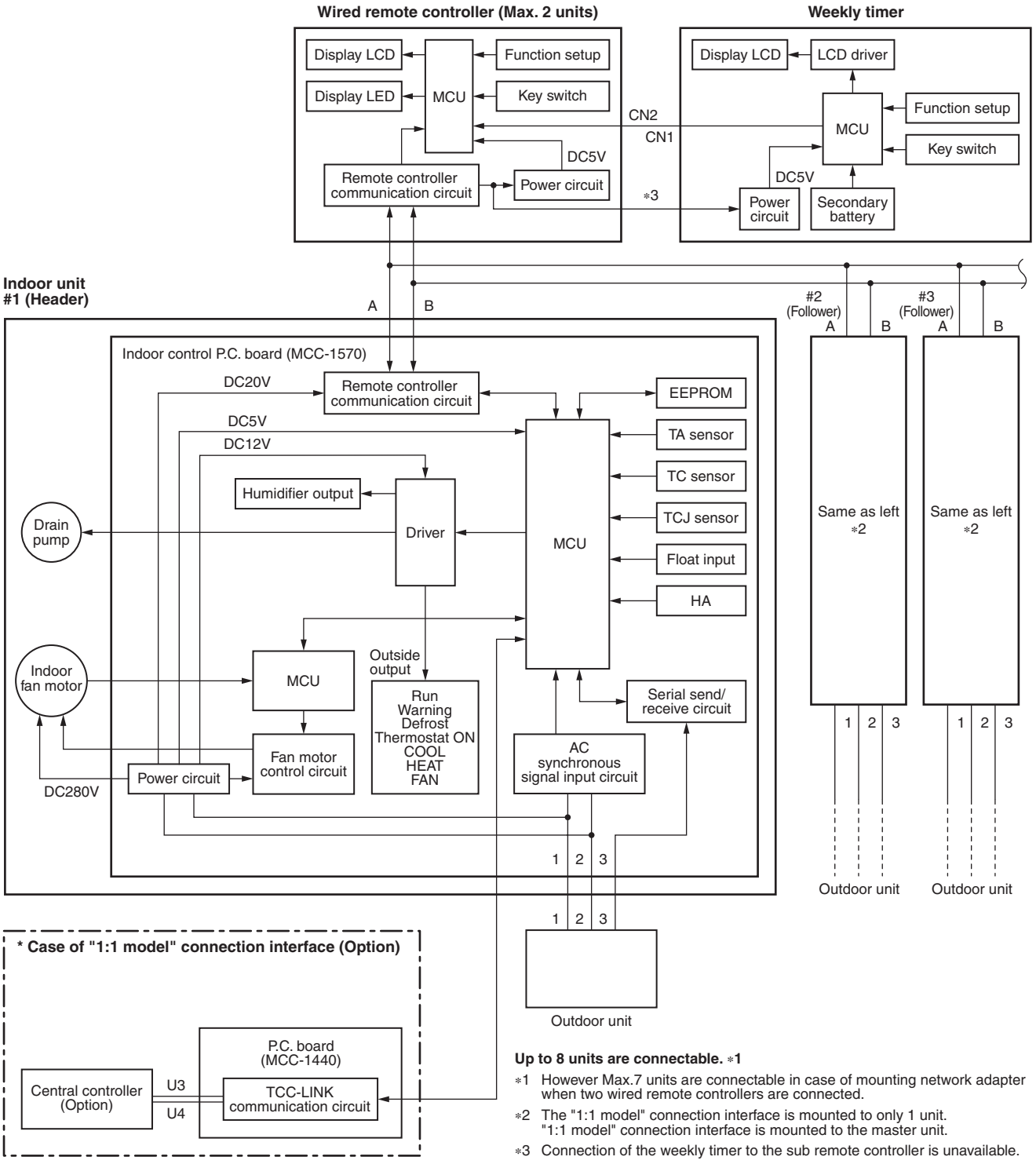

### ◆ RM56 type



# 7. INDOOR CONTROL CIRCUIT

## 7-1. Indoor Controller Block Diagram

### 7-1-1. Connection of Wired (Simple) Remote Controller



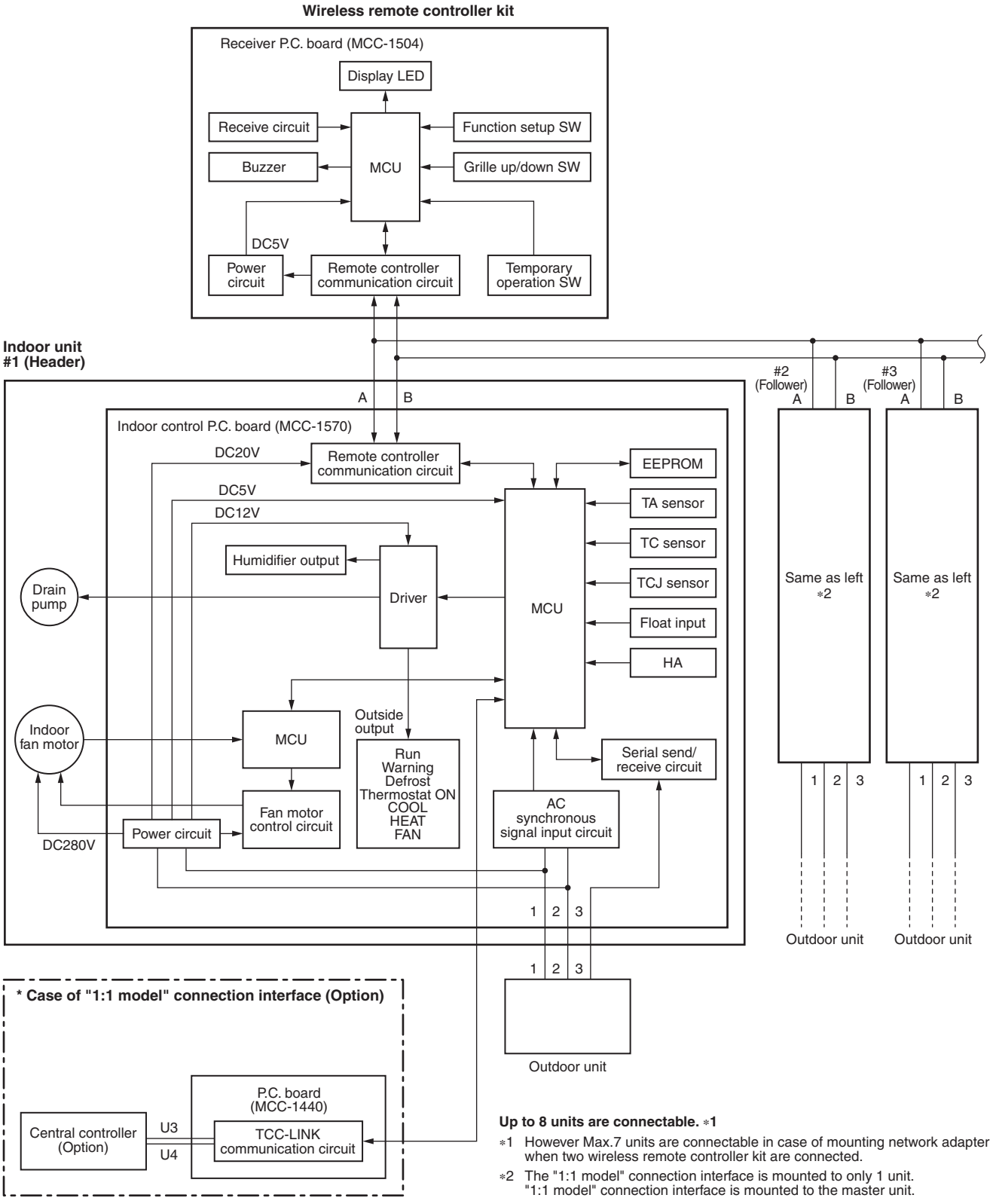

**Up to 8 units are connectable.** *1

*1 However Max.7 units are connectable in case of mounting network adapter when two wired remote controllers are connected.

*2 The "1:1 model" connection interface is mounted to only 1 unit. "1:1 model" connection interface is mounted to the master unit.

*3 Connection of the weekly timer to the sub remote controller is unavailable.

## 7-1-2. Connection of Wireless Remote Controller Kit

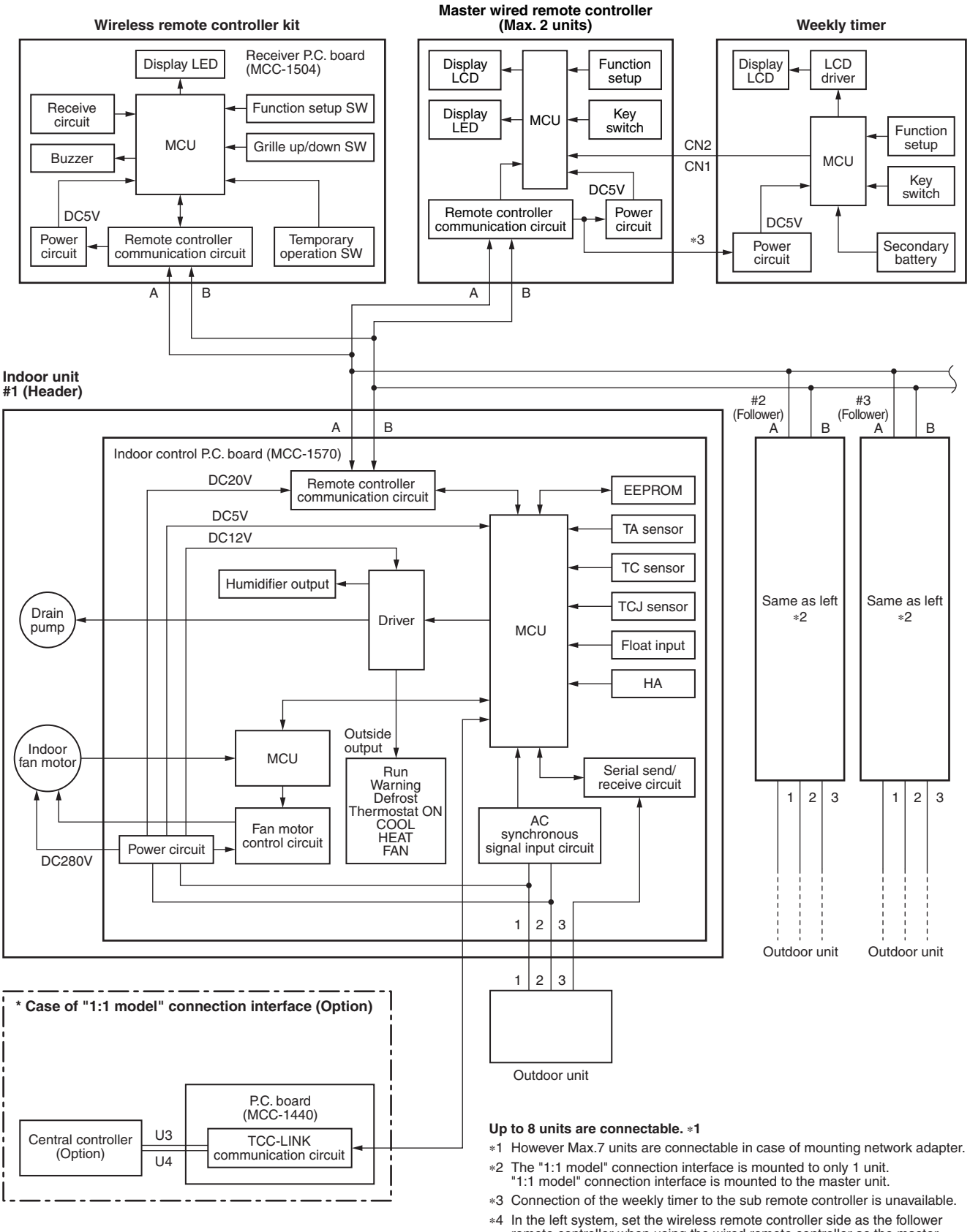



**Up to 8 units are connectable.** ∗1

∗1 However Max.7 units are connectable in case of mounting network adapter when two wireless remote controller kit are connected.

∗2 The "1:1 model" connection interface is mounted to only 1 unit.
"1:1 model" connection interface is mounted to the master unit.

## 7-1-3. Connection of Both Wired (Simple) Remote Controller and Wireless Remote Controller Kit




**Up to 8 units are connectable. *1**

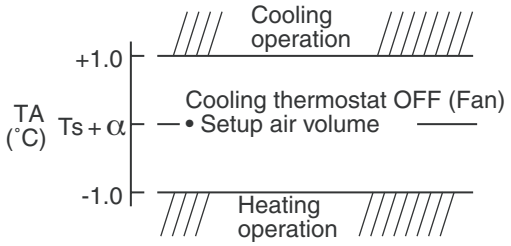
*1 However Max.7 units are connectable in case of mounting network adapter.

*2 The "1:1 model" connection interface is mounted to only 1 unit. "1:1 model" connection interface is mounted to the master unit.

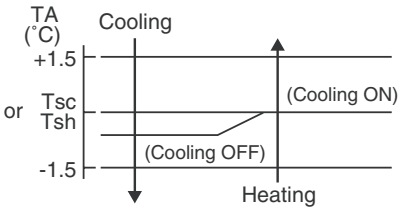
*3 Connection of the weekly timer to the sub remote controller is unavailable.

*4 In the left system, set the wireless remote controller side as the follower remote controller when using the wired remote controller as the master remote controller.

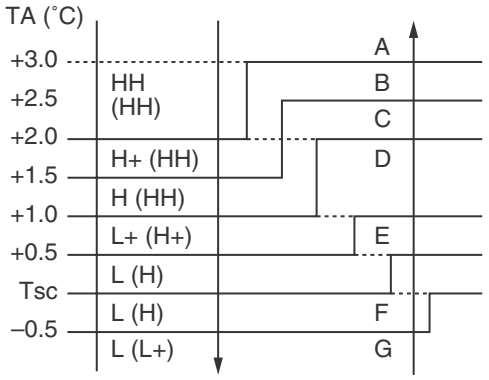
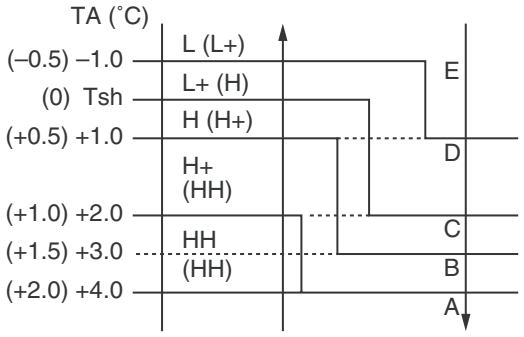
## 7-2. Control Specifications

<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<br>When the power supply is reset, the outdoors are distinguished and the control is selected according to the distinguished result.<br>2) Resetting of indoor fan speed.<br>Based on EEPROM data, select setting of the indoor fan speed.</td><td>Air speed (rpm)/<br>Air direction adjustment</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.<br>• 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 thermostat 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>TO Nothing</td><td>0˚C</td></tr>
<tr><td>TO ≥ 24˚C</td><td>–1˚C</td></tr>
<tr><td>24 > TO ≥ 18˚C</td><td>0˚C</td></tr>
<tr><td>TO < 18˚C</td><td>+1˚C</td></tr>
<tr><td>TO Trouble</td><td>0˚C</td></tr>
</table></td><td>TA: Room temp.<br>Ts: Setup temp.<br>TO: Outside temp.</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 to 29</td><td>18 to 29</td><td>18 to 29</td></tr>
<tr><td>Wireless type</td><td>17 to 30</td><td>17 to 30</td><td>17 to 30</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 Item code 06, the setup temperature in heating operation can be corrected.<br><table><tr><th>Setup 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<br><table><tr><th>Setup 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<br><br>(GA control)</td><td>1) Based on the difference between TA and Ts, the operation frequency is instructed to the outdoor unit.<br>2) Cooling operation<br>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.<br>TA (n) – Ts (n) : Room temp. difference<br>n : Counts of detection<br>TA (n-1) – Ts (n) : Varied room temp. value<br>n – 1 : Counts of detection of 90 seconds before<br>3) Heating operation<br>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.<br>Ts (n) – TA (n) : Room temp. difference<br>n : Counts of detection<br>TA (n) – TA (n – 1) : Varied room temp. value<br>n – 1 : Counts of detection of 1 minute before<br>4) Dry operation<br>The frequency correction control is same as those of the cooling operation.<br>However the maximum frequency is limited to approximately “S6”.<br>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 exceeds against Tsh 10 minutes and after thermostat OFF, heating operation (Thermostat OFF) exchanges to cooling operation. Description in the parentheses shows an example of cooling ON/OFF.<br> 

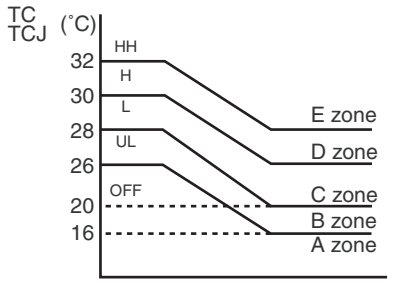
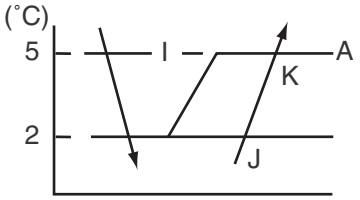
When –1.5 lowers against Tsc 10 minutes and after thermostat OFF, cooling operation (Thermostat OFF) exchanges to heating operation.<br>2) For the automatic capacity control after judgment of cooling/heating, see Item 4.<br>3) For temperature correction of room temp. control in automatic heating, see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

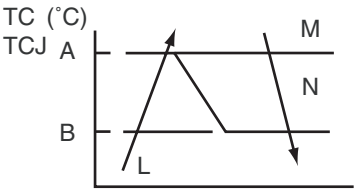
| No. | Item | Outline of specifications | Remarks |
|---|---|---|---|
| 6 | Air speed selection | 1) Operation with (HH), (H+), (H), (L+) (L) or [AUTO] mode is carried out by the command from the remote controller.<br>2) When the air speed mode [AUTO] is selected, the air speed varies by the difference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

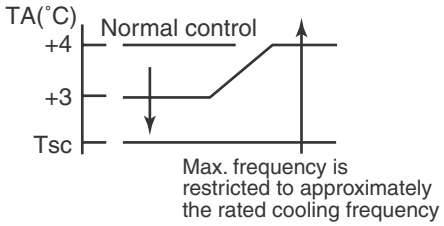
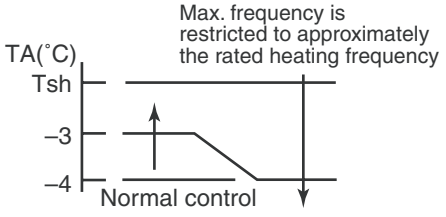
| No. | Item | Outline of specifications | Remarks |
|---|---|---|---|
| 6 | Air speed selection (Continued): | | Selection of External static pressure CODE No. :[5d] or selection of External static pressure on P.C. board SW501 |

| CODE No. [5d] | Standard | | Type 1 | | Type 3 | | Type 6 | |
|---|---|---|---|---|---|---|---|---|
| | 0000 | | 0001 | | 0003 | | 0006 | |
| SW501 (1)/(2) | OFF/OFF | | ON/OFF | | OFF/ON | | OFF/ON | |
| Tap | COOL | HEAT | COOL | HEAT | COOL | HEAT | COOL | HEAT |
| F1 | | | | | | | HH | HH |
| F2 | | | | | HH | HH | H+ | H+ |
| F3 | | | | | | | H | H |
| F4 | | | HH | HH | H+ | H+ | | |
| F5 | | | | | H | H | L+ | L+ |
| F6 | | | | | | | L | L |
| F7 | HH | HH | H+ | H+ | | | | |
| F8 | | | H | H | L+ | L+ | | |
| F9 | H+ | H+ | | | L | L | | |
| FA | H | H | L+ | L+ | | | | |
| FB | L+ | L+ | L | L | | | | |
| FC | L | L | | | | | | |
| FD | 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 (Item 7).

| No. | Item | Outline of specifications | Remarks |
|---|---|---|---|
| 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.<br>However B zone is assumed as C zone for 6 minutes and after when the compressor activated.<br>In defrost operation, the control value of TC is shifted by 6˚C.<br>  | In D and E zones, the priority is given to air volume selection setup of remote controller.<br>In A zone while thermostat is ON, [PRE-HEAT (Heating ready)] is displayed.<br><br>TCJ:<br>Indoor heat exchanger sensor temperature |
| 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.<br>When [J] zone is detected for 6 minutes (Following figure), the commanded frequency is decreased from the real operation frequency.<br>After then the commanded frequency changes every 30 seconds while operation is performed in [J] zone.<br>In [K] zone, time counting is interrupted and the operation is held.<br>When [ I ] zone is detected, the timer is cleared and the operation returns to the normal operation.<br>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.<br>  <br>In heating operation, the freeze-preventive control works if 4-way valve is not changed and the following conditions are satisfied.<br>(However the temperature for J zone dashing control is changed from 2˚C to –5˚C.)<br>**<Conditions>**<br>• When ① or ② is established 5 minutes after activation.<br>① TCn ≤ TC (n – 1) – 5<br>② TCn < TC (n – 1) – 1 and TCn ≤ TA < 5˚C | **TCn:**<br>TC temperature when 5 minutes elapsed after activation<br>**TC (n – 1):**<br>TC temperature at start time |

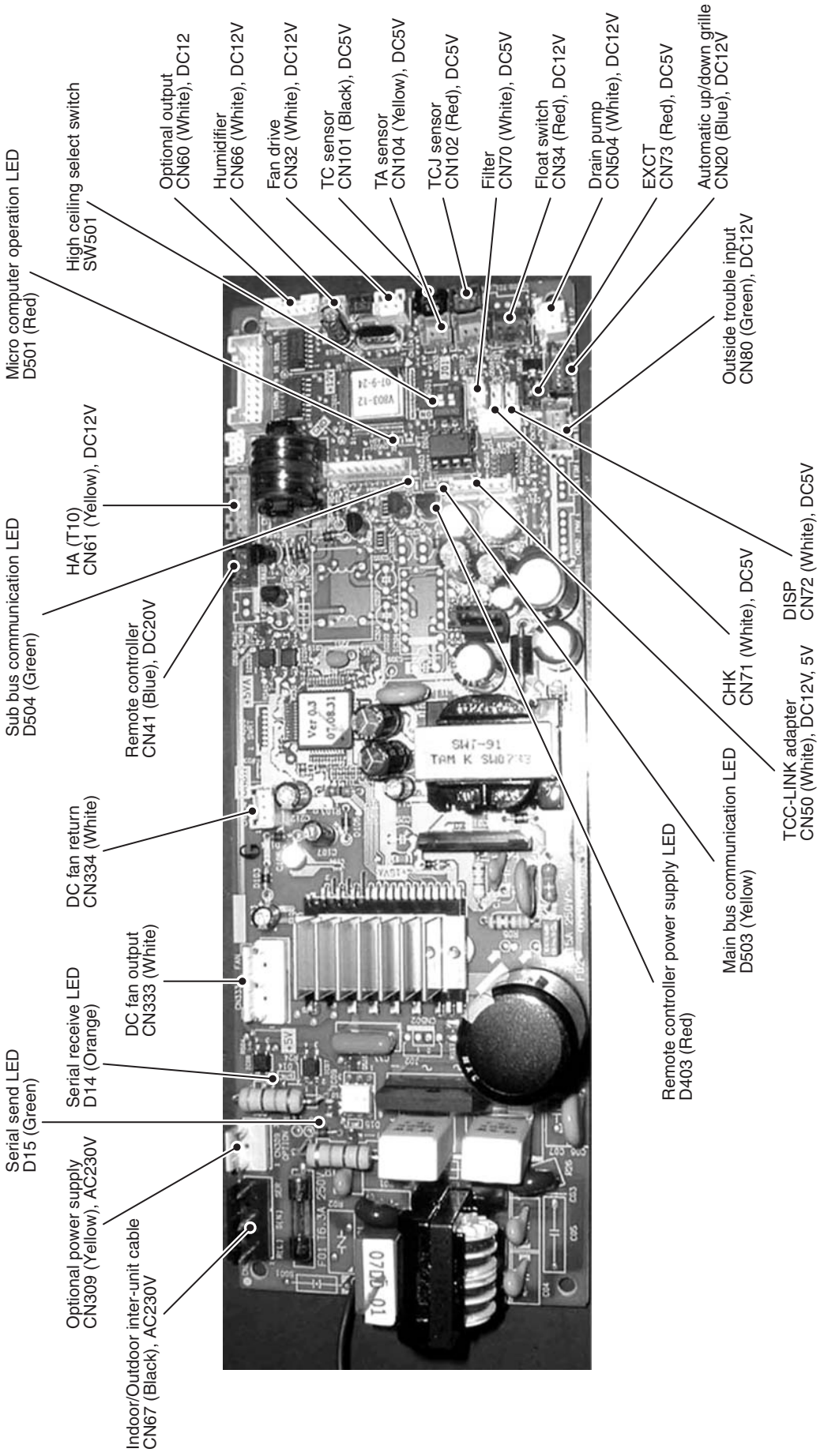
<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>9</td><td>High-temp. release control</td><td>1) The heating operation is performed as follows based on the detected temperature of TC sensor or TCJ sensor.<br>• When [M] zone is detected, the commanded frequency is decreased from the real operation frequency. After then the commanded frequency changes every 30 seconds while operation is performed in [M] zone.<br>• In [N] zone, the commanded frequency is held.<br>• When [L] zone is detected, the commanded frequency is returned to the original value by approx. 6Hz every 60 seconds.<br>Setup at shipment<br><table><tr><td rowspan="2">Refrigerant</td><td colspan="2">Control temp. (˚C)</td></tr><tr><td>A</td><td>B</td></tr><tr><td>R410A</td><td>56 (54)</td><td>52 (52)</td></tr><tr><td>R32</td><td>55 (53)</td><td>51 (51)</td></tr></table>  <br>NOTE:<br>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.<br><br>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.<br>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.<br>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.<br>4) The drain pump doesn't stop immediately to decrease the drain water in the drain pan when the cooling operation (including Dry operation) was stopped and drive the drain pump for five minutes.</td><td>Check code [P10]</td></tr>
<tr><td>11</td><td>Residual 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 | HA control | 1) This control is connected to telecontrol system or remote start/stop I/F, etc, and start/stop are available by HA signal input from the remote position.<br>2) This control outputs start/stop status to HA output terminal.<br>3) I/O specifications conform to JEMA regulations.<br>4) This control outputs [Operation OFF (STOP) signal] to HA output terminal while self-cleaning works. However selection of [Operation ON (Operating) signal] is possible by changing [0000 (At shipment)] of Item code (DN) [CC] to [0001]. In this case, if HA is input during self-clean operation during operation of the air conditioner, the self-clean operation is not performed. (Unit stops.) | In the group operation, use this control by connecting to either header or follower indoor unit. |
| 13 | Frequency fixed operation (Test run) | Refer to "9-1-1. Test Run Setup on Remote Controller" | Command frequency is approximately [S7] |
| 14 | Filter sign display (Except wireless type) | 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.<br>2) When the filter reset signal has been received from the remote controller, time of the calculation timer is cleared.<br>In this case, the measurement time is reset if the specified time has passed, and display on LCD disappears. | [FILTER ▦ ] goes on. |
| 15 | Central control mode selection | 1) Setting at the central controller side enables to select the contents which can be operated on the remote controller at indoor unit side.<br>* In case of the wireless type, the display lamp does not change but the contents are same. If operating an item which is prohibited by the central control mode from the remote controller, it is notified with the receive sound, Pi, Pi, Pi, Pi, Pi (5 times). | |
| 16 | Max. frequency cut control | 1) This control is operated by selecting [AUTO] operation mode.<br>2) COOL operation mode:<br>It is controlled according to the following figure if TO < 28˚C.<br>  <br><br>3) HEAT operation mode:<br>It is controlled according to the following figure if TO > 15˚C.<br>  <br> | |

| No. | Item | Outline of specifications | Remarks |
|---|---|---|---|
| 17 | DC motor | 1) When the fan operation has started, positioning of thestat or and the rotor are performed.<br>(Moves slightly with tap sound)<br>2) The motor operates according to the command from the indoor controller.<br>**Notes)**<br>• 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.<br>• When a fan lock is found, the air conditioner stops, and a trouble is displayed. | Check code [P12] |
| 18 | Power saving | 1) Turn on SAVE button on the remote controller.<br>2) During operation of save operation, SAVE lights on the wired remote controller.<br>3) During power save operation, the current release control is performed with the restriction ratio set in EEPROM on the outdoor unit.<br>4) The restriction ratio can be set by keeping SAVE button pushed for 4 seconds or more on the remote controller.<br>5) When validating the power save operation, the next operation starts with power save operation valid because contents are held even when operation stops, operation mode changes or power supply is reset.<br>6) The restriction ratio can be set by changing the setup data of CODE No. (DN) [C2] in the range of 50 to 100% (every 1%, Setting at shipment: 75%). | Operation and display also are unavailable on the wired remote controller RBC-AMT31E and before.<br>Carry out setting operation during stop of the unit; otherwise the unit stops operation.<br>For the setup operation, refer to "Power saving mode" of Installation Manual. |
| 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).<br>2) This function is valid only for combination with the outdoor units.<br>3) Using the indoor DN code [D1] (1 bit), Valid/Invalid of this function is set up at the customer's side.<br>∗ The setup by DN code is Invalid [0]/Valid [1] and Invalid [0] has been set at the shipment.<br>4) This operation is the heating operation which sets 8˚C as the setup temperature of the target.<br>5) This function starts operation by pushing temperature button (▼) during heating operation; besides by pushing (▲) button for 4 seconds or more after temperature reached the minimum set temperature.<br>6) To stop/release this operation, select and execute one from the following operations.<br>① Push (▲) button: Heating operation (18˚C setting) continues.<br>② Push [START/STOP] button: Air conditioner stops. (Heating 18˚C operation at the next start)<br>③ Push MODE : Other operation mode is selected and the operation continues.<br>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.<br>8) The settings of the air direction and air volume are changeable during this operation.<br>9) The indoor fan stops to protect the compressor for 2 minutes after start of heating operation (Thermostat ON) bythis function. | In a group connection, if there is even one combination with other unit, "This function is not provided." is displayed.<br>The setup temperature jumps from [18] to [8]. |

## 7-3. Indoor Print Circuit Board

**<MCC-1570>**



| Function | Connector No. | Pin No. | Specifications | Remarks |
|---|---|---|---|---|
| Ventilation output | CN32 | 1 | DC12V | Setting at shipment: Interlock of ON by indoor unit operation, with OFF by stop operation<br>∗ The single operation setting by FAN button on the remote controller is performed on the remote controller (DN [31] = 0000 → 0001) |
| | | 2 | Output (Open collector) | |
| 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 |
| Option output | CN60 | 1 | DC12V | |
| | | 2 | Defrost output (Open collector) | ON when outdoor unit is defrosted |
| | | 3 | Thermostat ON output (Open collector) | ON when real thermostat is on. (Compressor ON) |
| | | 4 | Cooling output (Open collector) | ON when operation mode is cooling system (COOL, DRY, Cooling/Heating automatic cooling) |
| | | 5 | Heating output (Open collector) | ON when operation mode is heating system (HEAT, Cooling/Heating automatic heating) |
| | | 6 | Fan output (Open collector) | ON when indoor fan is on. (When air cleaner is used) OFF while clean operation is performed. |
| Outside trouble input | CN80 | 1 | DC12V | Generate the check code “L30” (continuously for 1 minute) and stop the operation forcibly. |
| | | 2 | NC | |
| | | 3 | Outside trouble input | |
| FILTER<br>Option trouble / Humidifier setting (∗) | CN70 | 1 | 0V | Selection of option trouble input (Protective operation display of device attached to outside) or Humidifier setting input (Vaporizing + Drain pump ON)<br>Humidifier is set at shipment from factory.<br>∗ Setting of option trouble input is performed on the remote controller. (DN [2A] = 0002 → 0001) |
| | | 2 | | |
| CHK<br>Operation check | CN71 | 1 | 0V | This check is used to check indoor operation. (Performs operation of indoor fan "H", and Drain pump ON without communication with outdoor and remote controller) |
| | | 2 | | |
| DISP<br>Exhibition mode | CN72 | 1 | 0V | Communication is available by indoor unit and remote controller only. |
| | | 2 | | |
| EXCT<br>Demand | CN73 | 1 | 0V | Indoor unit forced thermostat OFF operation |
| | | 2 | | |

∗ This option is not provided to oversea models.

# 8. TROUBLESHOOTING

## 8-1. Summary of Troubleshooting

### <Wired remote controller type>

### 1. Before troubleshooting

1) Required tools/instruments
   - ⊕ and ⊖ screwdrivers, spanners, Needle-nose 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 the air conditioner being controlled by the 3-minute protective function?
         - Is it in standby status though the room temperature has reached the setup temperature?
         - Is it being operated in timer mode or fan mode?
         - Is the remote controller set in “heating” under the high outside air temperature?
      2. Indoor fan does not operate.
         - Is the air conditioner being controlled by the cool air discharge preventive function in “heating”?
      3. Indoor fan does not operate or fan speed changes.
         - Is the air conditioner being controlled by high-temperature release function in “heating”?
         - Is the remote controller set in “cooling” under the low outside air temperature?
         - Is the air conditioner being operated in defrost operation?
      4. ON/OFF operation cannot be performed from remote controller.
         - Is the air conditioner being operated by the central control system?
         - Is an 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 a test run of the air conditioner being carried out?
   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 troubled position and parts.**

**NOTE :**

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

**<Wireless remote controller type>**

## 1. Before troubleshooting

1) Required tools/instruments
   - ⊕ and ⊖ screwdrivers, spanners, Needle-nose pliers, nippers, etc.
   - Tester, thermometer, pressure gauge, etc.
2) Confirmation points before check
   a) The following operations are normal.
      1. Compressor does not operate.
         - Is the air conditioner being controlled by the 3-minute protective function?
         - Is it in standby status though the room temperature has reached the setup temperature?
         - Is it being operated in timer mode or fan mode?
         - Is the remote controller set in “heating” under the high outside air temperature?
      2. Indoor fan does not operate.
         - Is the air conditioner being controlled by the cool air discharge preventive function in “heating”?
      3. Indoor fan does not operate or fan speed changes.
         - Is the air conditioner being controlled by high-temperature release function in “heating”?
         - Is the remote controller set in “cooling” under the low outside air temperature?
         - Is the air conditioner being operated in defrost operation?
      4. ON/OFF operation cannot be performed from remote controller.
         - Is the air conditioner in forced operation?
         - Is it being operated by the central control system?
         - Is an 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 a test run of the air conditioner being carried out?
   b) Did you return the cabling to the initial positions?
   c) Are connecting cables between indoor unit and receiving unit correct?

## 2. Troubleshooting procedure

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

## 8-2. Troubleshooting

### 8-2-1. Outline of judgment

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

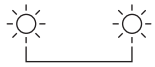
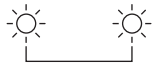
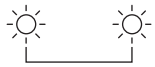
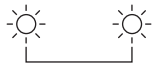
Method to judge the troubled position by flashing indication on the display part of the indoor unit (sensors of the receiving part)

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 ●<br>No indication at all | — | Power supply OFF or miswiring between receiving unit and indoor unit |
| Operation ☼ Timer ● Ready ●<br>Flash | E01 | Receiving trouble } Receiving unit } Miswiring or wire connection trouble between receiving unit and indoor unit |
| | E02 | Sending trouble } Receiving unit } Miswiring or wire connection trouble between receiving unit and indoor unit |
| | E03 | Communication stop } Receiving unit } Miswiring or wire connection trouble between receiving unit and indoor unit |
| | E08 | Duplicated indoor unit No. } Setup trouble |
| | E09 | Duplicated header units of remote controller } Setup trouble |
| | E10 | Communication trouble between indoor MCU |
| | E18 | Wire connection trouble between indoor units, Indoor power OFF (Communication stop between indoor header and follower or between master and sub indoor twin) |
| Operation ● Timer ● Ready ☼<br>Flash | E04 | Miswiring between indoor unit and outdoor unit or connection trouble (Communication stop between indoor and outdoor units) |
| Operation ● Timer ☼ Ready ☼<br>Alternate flash | P10 | Overflow was detected. } Protective device of indoor unit worked. |
| | P12 | Indoor DC fan trouble } Protective device of indoor unit worked. |
| Operation ☼ Timer ● Ready ☼<br>Alternate flash | P03 | Outdoor unit discharge temp. trouble } Protective device of outdoor unit worked. ∗1 |
| | P04 | Outdoor high pressure system trouble } Protective device of outdoor unit worked. ∗1 |
| | P05 | Negative phase detection trouble } Outdoor unit trouble |
| | P07 | Heat sink overheat trouble } Outdoor unit trouble |
| | P15 | Gas leak detection trouble } Outdoor unit trouble |
| | P19 | 4-way valve system trouble (Indoor or outdoor unit judged.) |
| | P20 | Outdoor unit high pressure protection |
| | P22 | Outdoor unit: Outdoor unit trouble } 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 trouble } Protective device of outdoor unit worked. ∗1 |
| | P31 | Stopped because of trouble 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<br>  <br>Alternate flash | F01 | Heat exchanger sensor (TCJ) trouble |
| | F02 | Heat exchanger sensor (TC) trouble |
| | F10 | Room air temperature sensor (TA) trouble<br>} Indoor unit sensor trouble |
| Operation Timer Ready<br>  <br>Alternate flash | F04 | Discharge temp. sensor (TD) trouble |
| | F06 | Temp. sensor (TE) trouble |
| | F07 | Temp. sensor (TL) trouble |
| | F08 | Temp. sensor (TO) trouble |
| | F12 | Temp. sensor (TS) trouble |
| | F13 | Temp. sensor (TH) trouble |
| | F15 | Temp. Sensor miswiring (TE, TS)<br>} Sensor trouble of outdoor unit ∗1 |
| Operation Timer Ready<br>  <br>Simultaneous flash | F29 | Indoor EEPROM trouble |
| Operation Timer Ready<br>  <br>Simultaneous flash | F31 | Outdoor EEPROM trouble |
| Operation Timer Ready<br>  <br>Flash | H01 | Compressor break down |
| | H02 | Compressor lock |
| | H03 | Current detection circuit trouble |
| | H04 | Case thermostat worked.<br>} Outdoor compressor system trouble ∗1 |
| | H06 | Outdoor unit low pressure system trouble |
| Operation Timer Ready<br>  <br>Simultaneous flash | L03 | Duplicated header indoor units |
| | L07 | There is indoor unit of group connection in individual indoor unit.<br>→ AUTO address |
| | L08 | Unsetting of group address |
| | L09 | Missed setting<br>(Unset indoor capacity)<br>* If group construction and address are not normal when power supply turned on, automatically goes to address setup mode. |
| Operation Timer Ready<br>  <br>Simultaneous flash | L10 | Unset model type (Service board) |
| | L20 | Duplicated indoor central addresses |
| | L29 | Outdoor unit and other trouble |
| | L30 | Outside interlock trouble |
| | L31 | Negative phase trouble<br>} Others |

### 8-2-2. Others (Other than Check Code)

| Lamp indication | Check code | Cause of trouble occurrence |
|---|---|---|
| Operation Timer Ready<br>  <br>Simultaneous flash | — | During test run |
| Operation Timer Ready<br>○  <br>Alternate flash | — | Disagreement of cool/heat<br>(Automatic cool/heat setting to automatic cool/heat prohibited model, or setting of heating to cooling-only model) |

## 8-2-3. Check Code List (Indoor)

### (Indoor unit detected)

○ : Go on, ◎ : Flash, ● : Go off ALT (Alternate): Alternate flashing when there are two flashing LED SIM (Simultaneous): Simultaneous flashing when there are two flashing LED

| Check code indication | Lamp indication | | | | Representative trouble position | Explanation of trouble contents | Air conditioner operation | |
|---|---|---|---|---|---|---|---|---|
| TCC-LINK central & Wired remote controller | Block indication | | | | | | Automatic reset | Operation continuation |
| | Operation | Timer | Ready | Flash | | | | |
| E03 | ◎ | ● | ● | | Regular communication trouble between indoor and remote controller | No communication from remote controller and network adapter (Also no communication from central control system) | ✓ | — |
| E04 | ● | ● | ◎ | | Indoor/Outdoor serial trouble | There is trouble on serial communication between indoor and outdoor units | ✓ | — |
| E08 | ◎ | ● | ● | | Duplicated indoor addresses ✧ | Same address as yours was detected. | ✓ | — |
| E10 | ◎ | ● | ● | | Communication trouble between indoor MCU | MCU communication trouble between main motor and micro computer | ✓ | — |
| E18 | ◎ | ● | ● | | Regular communication trouble between indoor header and follower units | Regular communication between indoor header and follower units is impossible, Communication between twin header (master) and follower (sub) units is impossible. | ✓ | — |
| F01 | ◎ | ◎ | ● | ALT | Indoor unit, Heat exchanger (TCJ) trouble | Open/short-circuit was detected on heat exchanger (TCJ). | ✓ | — |
| F02 | ◎ | ◎ | ● | ALT | Indoor unit, Heat exchanger (TC) trouble | Open/short-circuit was detected on heat exchanger (TC). | ✓ | — |
| F10 | ◎ | ◎ | ● | ALT | Indoor unit, Room temp. sensor (TA) trouble | Open/short-circuit was detected on room temp. sensor (TA). | ✓ | — |
| F29 | ◎ | ◎ | ● | SIM | Indoor unit, other indoor P.C. board trouble | EEPROM trouble (Other trouble may be detected. If no trouble, automatic address is repeated. | — | — |
| L03 | ◎ | ● | ◎ | SIM | Duplicated setting of indoor group header unit ✧ | There are multiple header units in a group. | — | — |
| L07 | ◎ | ● | ◎ | SIM | There are group cable in individual indoor unit. ✧ | When even one group connection indoor unit exists in individual indoor unit. | — | — |
| L08 | ◎ | ● | ◎ | SIM | Unset indoor group address ✧ | Indoor group address is unset. | — | — |
| L09 | ◎ | ● | ◎ | SIM | Unset indoor capacity | Capacity of indoor unit is unset. | — | — |
| L20 | ◎ | ○ | ◎ | SIM | Duplicated central control system address | Duplicated setting of central control system address | ✓ | — |
| L30 | ◎ | ○ | ◎ | SIM | Outside trouble input to indoor unit (Interlock) | Abnormal stop by outside trouble (CN80) input | — | — |
| P01 | ● | ◎ | ◎ | ALT | Indoor unit, AC fan trouble | An trouble of indoor AC fan was detected. (Fan motor thermal relay worked.) | — | — |
| P10 | ● | ◎ | ◎ | ALT | Indoor unit, overflow detection | Float switch worked. | — | — |
| P12 | ● | ◎ | ◎ | ALT | Indoor unit, DC fan trouble | Indoor DC fan trouble (Over-current/Lock, etc.) was detected. | — | — |
| P19 | ◎ | ● | ◎ | ALT | 4-way valve system trouble | In heating operation, a trouble was detected by temp. down of indoor heat exchanger sensor. | ✓ | — |
| P31 | ◎ | ● | ◎ | ALT | Other indoor unit trouble | Follower unit in group cannot operate by warning from [E03/L03/L07/L08] of header 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 | Lamp indication | | | | Representative trouble position | Explanation of trouble contents | Air conditioner operation | |
|---|---|---|---|---|---|---|---|---|
| Wired remote controller | Block indication | | | | | | Automatic reset | Operation continuation |
| | Operation | Timer | Ready | Flash | | | | |
| E01 | ◎ | ● | ● | | No master remote controller, Remote controller communication (Receive) trouble | Signal cannot be received from indoor unit. Master remote controller was not set. (including 2 remote controllers) | — | — |
| E02 | ◎ | ● | ● | | Remote controller communication (Send) trouble | 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.) | — | △ |

△ : It is based on a situation.

### (Central control devices detected)

| Check code indication | Lamp indication | | | | Representative trouble position | Explanation of trouble contents | Air conditioner operation | |
|---|---|---|---|---|---|---|---|---|
| TCC-LINK central | Block indication | | | | | | Automatic reset | Operation continuation |
| | Operation | Timer | Ready | Flash | | | | |
| C05 | Is not displayed. (Common use of wired remote controller, etc.) | | | | Central control system communication (send) trouble | Signal sending operation of central control system is impossible. There are multiple same central devices. (AI-NET) | — | — |
| C06 | | | | | Central control system communication (receive) trouble | Signal receiving operation of central control system is impossible. | — | — |
| C12 | — | | | | General-purpose device control interface batched warning | An trouble on device connected to general-purpose device control interface of exclusive to TCC-LINK/AI-NET | — | — |
| P30 | By warning unit (Above-mentioned) | | | | Group follower unit is trouble. | Group follower unit is trouble. (For remote controller, above-mentioned [***] details are displayed with unit No. | — | — |

**NOTE:** Even for the same contents of trouble such as communication trouble, the display of check code may differ according to detection device.
When wired remote controller or central controller detects an trouble, it is not necessarily related to operation of the air conditioner. In this list, the check codes that outdoor unit detects are not described.

## Trouble 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 (including wireless) and communication adapter | Stop (Automatic reset) | Displayed when trouble is detected | 1. Check cables of remote controller and communication adapters.<br>• Remote controller LCD display OFF (Disconnection)<br>• Central remote controller [97] check code |
| E04 | The serial signal is not output from outdoor unit to indoor unit.<br>• Miswiring of inter-unit wire<br>• Serial communication circuit trouble of outdoor P.C. board<br>• Serial communication circuit trouble of indoor P.C. board | Stop (Automatic reset) | Displayed when trouble is detected | 1. Outdoor unit does not completely operate.<br>• Inter-unit wire check, correction of miswiring<br>• Check outdoor P.C. board. Correct wiring of P.C. board.<br>2. When outdoor unit normally operates<br>• Check P.C. board (Indoor receiving / Outdoor sending). |
| E08 | Duplicated indoor unit address | Stop | Displayed when trouble 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).<br>* 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 trouble is detected | 1. Set indoor capacity (DN=11) |
| L30 | Abnormal input of outside interlock | Stop | Displayed when trouble is detected | 1. Check outside devices.<br>2. Check indoor P.C. board. |
| P10 | Float switch operation<br>• Float circuit, Disconnection, Coming-off, Float switch contact trouble | Stop | Displayed when trouble is detected | 1. Trouble of drain pump<br>2. Clogging of drain pump<br>3. Check float switch.<br>4. Check indoor P.C. board. |
| P12 | Indoor DC fan trouble | Stop | Displayed when trouble is detected | 1. Position detection trouble<br>2. Check fan motor (Protective circuit operation).<br>3. Indoor fan locked.<br>4. Check indoor P.C. board. |
| P19 | 4-way valve system trouble<br>• After heating operation has started, indoor heat exchangers temp. is down. | Stop (Automatic reset) | Displayed when trouble is detected | 1. Check 4-way valve.<br>2. Check 2-way valve and check valve.<br>3. Check indoor heat exchanger (TC/TCJ).<br>4. Check indoor P.C. board. |
| P31 | Unit automatically stops while warning is output to other indoor units. | Stop (Follower unit) (Automatic reset) | Displayed when trouble is detected | 1. Judge follower unit while header unit is [E03], [L03], [L07] or [L08].<br>2. Check indoor P.C. board. |
| F01 | Coming-off, disconnection or short-circuit of indoor heat exchanger temp. sensor (TCJ) | Stop (Automatic reset) | Displayed when trouble is detected | 1. Check indoor heat exchanger temp. sensor (TCJ).<br>2. Check indoor P.C. board. |
| F02 | Coming-off, disconnection or short-circuit of indoor heat exchanger temp. sensor (TC) | Stop (Automatic reset) | Displayed when trouble is detected | 1. Check indoor heat exchanger temp. sensor (TC).<br>2. Check indoor P.C. board. |
| F10 | Coming-off, disconnection or short-circuit of indoor room air temp. sensor (TA) | Stop (Automatic reset) | Displayed when trouble is detected | 1. Check indoor room air temp. sensor (TA).<br>2. Check indoor P.C. board. |
| F29 | Indoor EEPROM trouble<br>• EEPROM access trouble | Stop (Automatic reset) | Displayed when trouble is detected | 1. Check indoor EEPROM. (including socket insertion)<br>2. Check indoor P.C. board. |
| E18 | Regular communication trouble between indoor header and follower units andbetween master and sub units | Stop (Automatic reset) | Displayed when trouble is detected | 1. Check remote controller wiring.<br>2. Check indoor power supply wiring.<br>3. Check indoor P.C. board. |

## Trouble mode detected by remote controller or central controller (TCC-LINK)

| 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 header indoor unit<br>• Remote controller wiring is not correct.<br>• Power of indoor unit is not turned on.<br>• Automatic address cannot be completed. | Stop | — | Power supply trouble of remote controller, Indoor EEPROM trouble<br>1. Check remote controller inter-unit wiring.<br>2. Check remote controller.<br>3. Check indoor power wiring.<br>4. Check indoor P.C. board.<br>5. Check indoor EEPROM. (including socket insertion)<br>Automatic address repeating phenomenon generates. |
| E01<br>∗1 | No communication with header indoor unit<br>• Disconnection of inter-unit wire between remote controller and header indoor unit (Detected by remote controller side) | Stop (Automatic reset)<br>∗ If central controller exists, operation continues | Displayed when trouble is detected | Receiving trouble from remote controller<br>1. Check remote controller inter-unit wiring.<br>2. Check remote controller.<br>3. Check indoor power wiring.<br>4. Check indoor P.C. board. |
| E02 | Signal send trouble to indoor unit (Detected by remote controller side) | Stop (Automatic reset)<br>∗ If central controller exists, operation continues | Displayed when trouble is detected | Sending trouble of remote controller<br>1. Check sending circuit inside of remote controller.<br>→ Replace remote controller. |
| E09 | There are multiple master remote controllers. (Detected by remote controller side) | Stop (Follower unit continues operation.) | Displayed when trouble is detected | 1. In 2-remote controllers (including wireless), there are multiple header units.<br>Check that there are 1 master remote controller and other sub remote controllers. |
| L20<br>Central controller L20 | Duplicated indoor central addresses on communication of central control system (Detected by indoor/central controller side) | Stop (Automatic reset) | Displayed when trouble is detected | 1. Check setting of central control system network address. (Network adapter SW01)<br>2. Check network adapter P.C. board. |
| —<br>∗2<br>Central controller (Send)<br>C05<br>(Receive)<br>C06 | Communication circuit trouble of central controller (Detected by central controller side) | Continues (By remote controller) | Displayed when trouble is detected | 1. Check communication wire / miswiring<br>2. Check communication (U3, U4 terminals)<br>3. Check network adapter P.C. board.<br>4. Check central controller (such as central control remote controller, etc.)<br>5. Check terminal resistance. (TCC-LINK) |
| —<br>Central controller P30 | Indoor Gr sub unit trouble (Detected by central controller side) | Continuation/Stop (According to each case) | Displayed when trouble is detected | Check the check code of the corresponding unit from remote controller. |

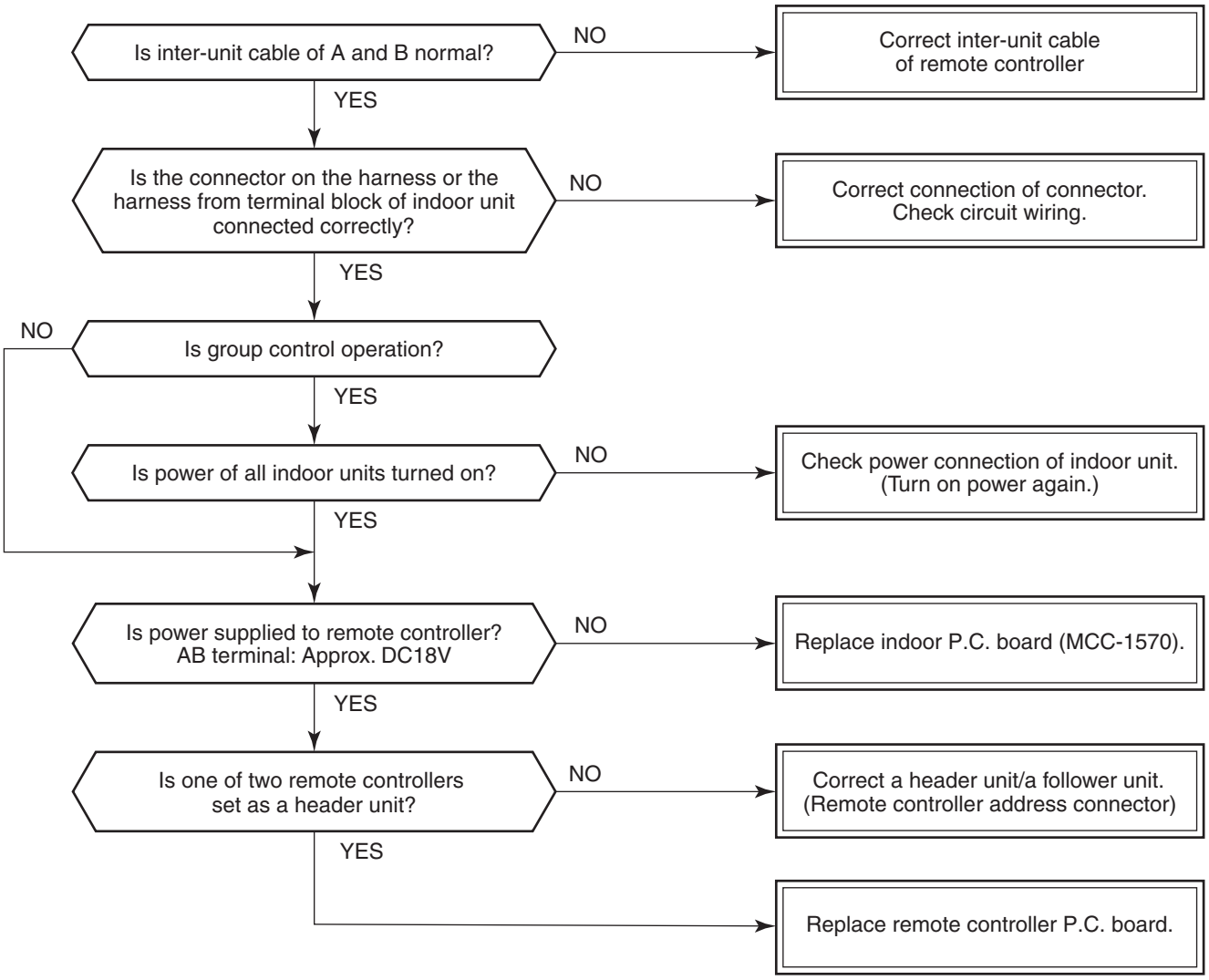
∗1 The check code cannot be displayed by the wired remote controller.
(Usual operation of air conditioner becomes unavailable.)
For the wireless models, a trouble is notified with indication lamp.

∗2 This trouble is related to communication of remote controller (A, B), central system (TCC-LINK U3, U4), and [E01], [E02], [E03], [E09] or [E18] is displayed or no check display on the wired remote controller according to the contents.

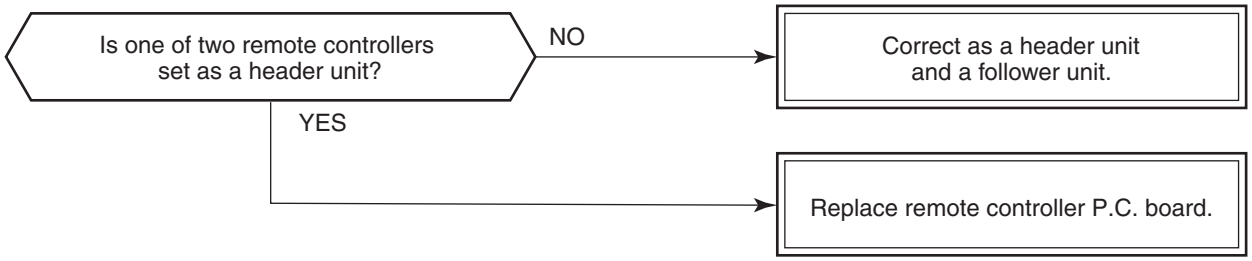
### 8-2-4. Diagnostic Procedure for Each Check Code (Indoor Unit)

**Check code**

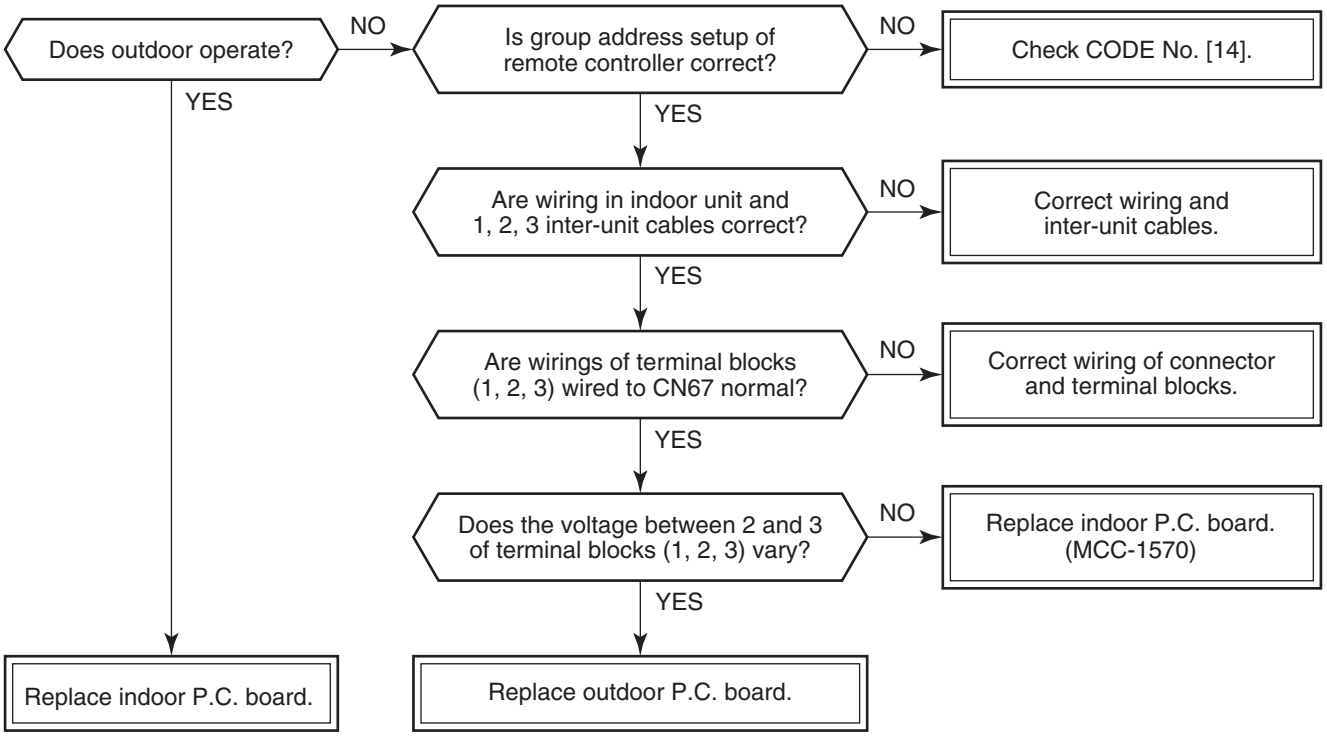
**[E01 trouble]**




**[E09 trouble]**

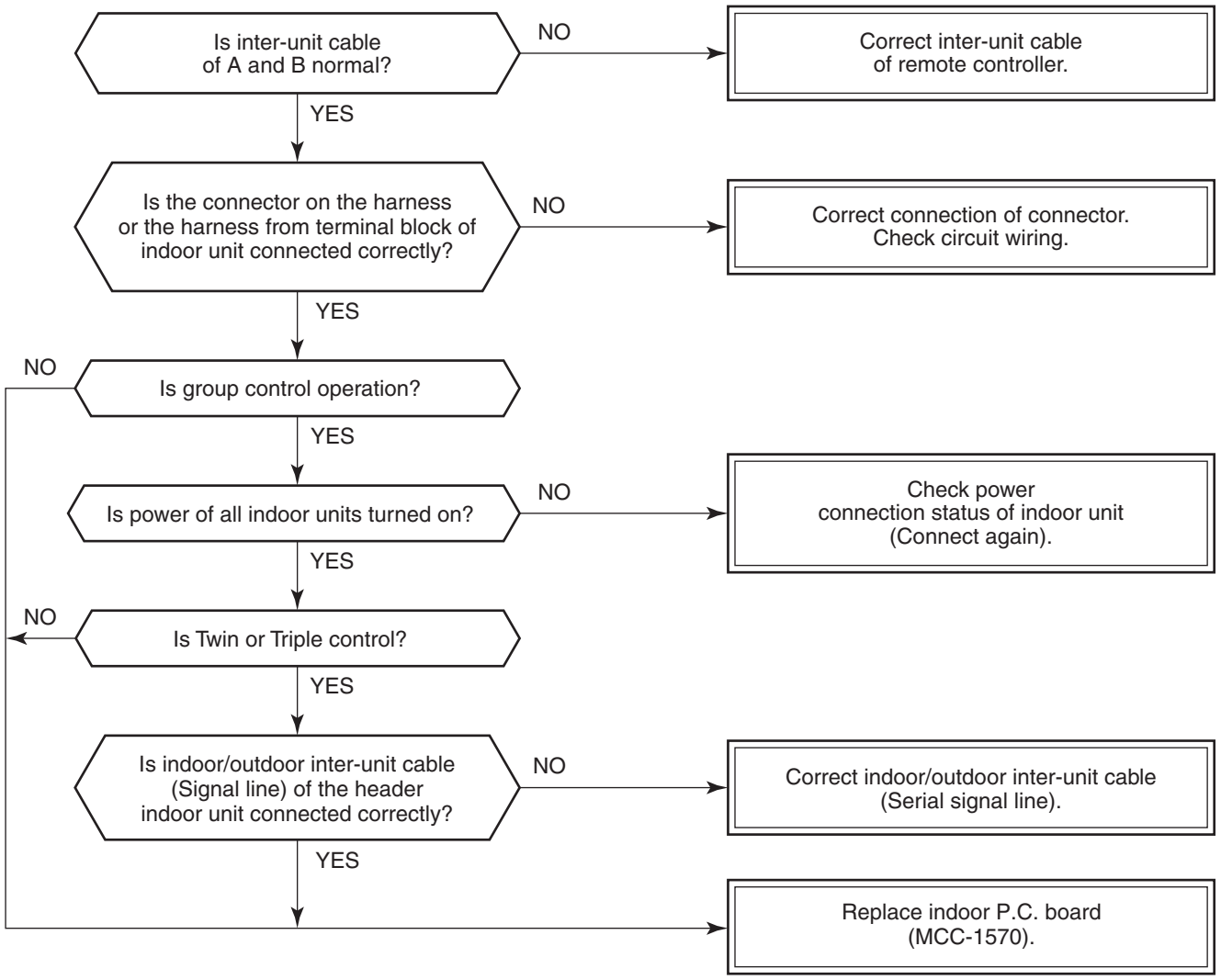


**[E04 trouble]**




As shown in the following figure, carry out measurement within 20 seconds after the power was turned on.

**[E18 trouble]**




**[E08, L03, L07, L08 trouble]**

E08: Duplicated indoor unit No.

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

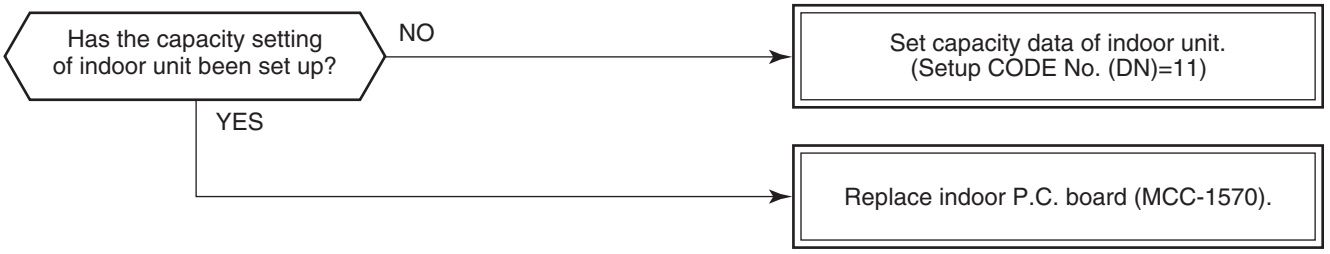
L07: There is 1 or more group address [Individual] in a group control.

L08: The indoor group address is unset. (In case DN code [14] is 0099)

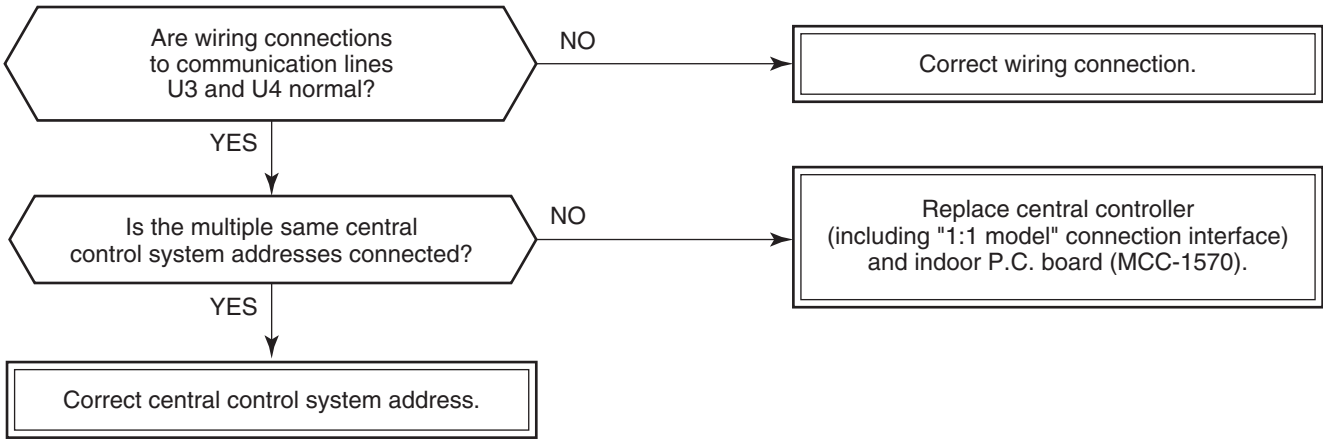
If the above trouble is detected when power supply turned on, the mode enters automatically in the automatic address set mode. (Check code is not output.)

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

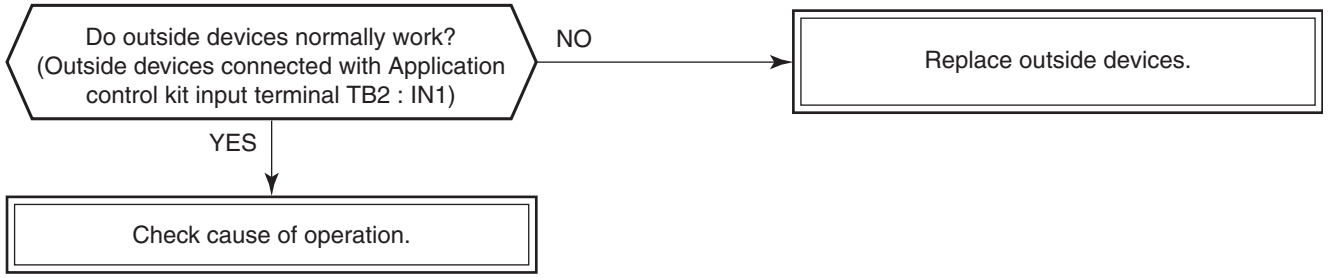
**[L09 trouble]**



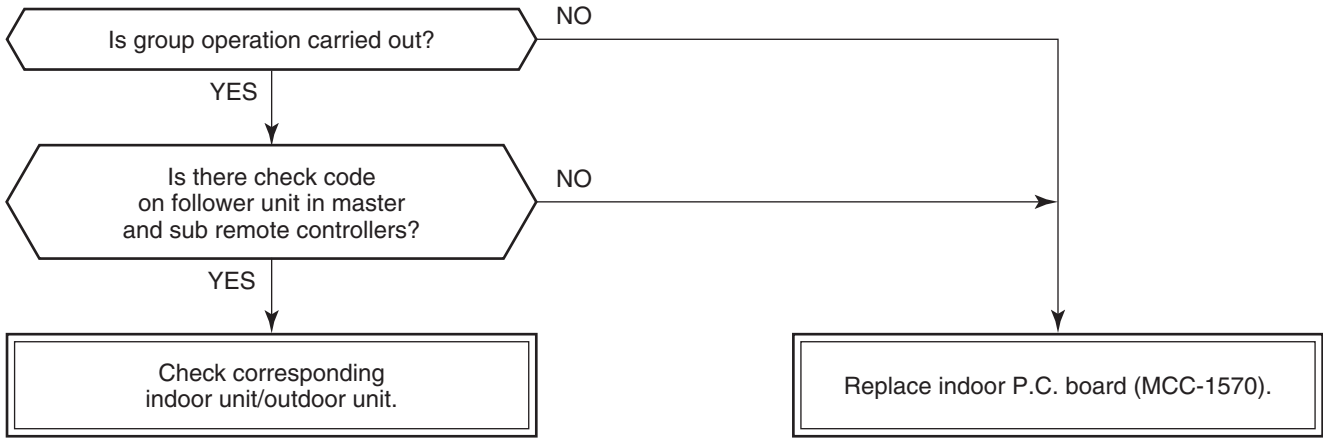
**[L20 trouble]**



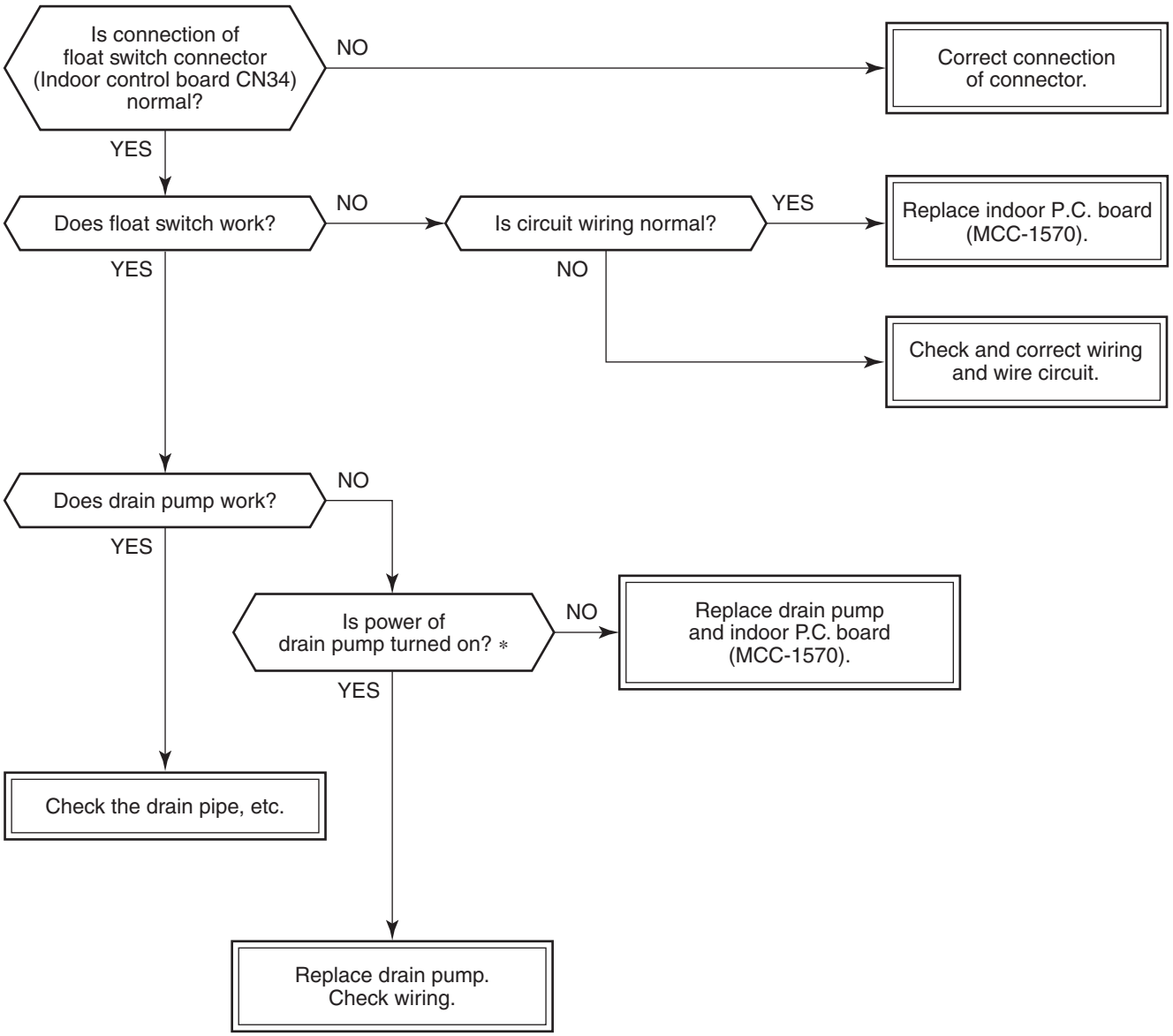

**[L30 trouble]**




**[P30 trouble] (Central controller)**

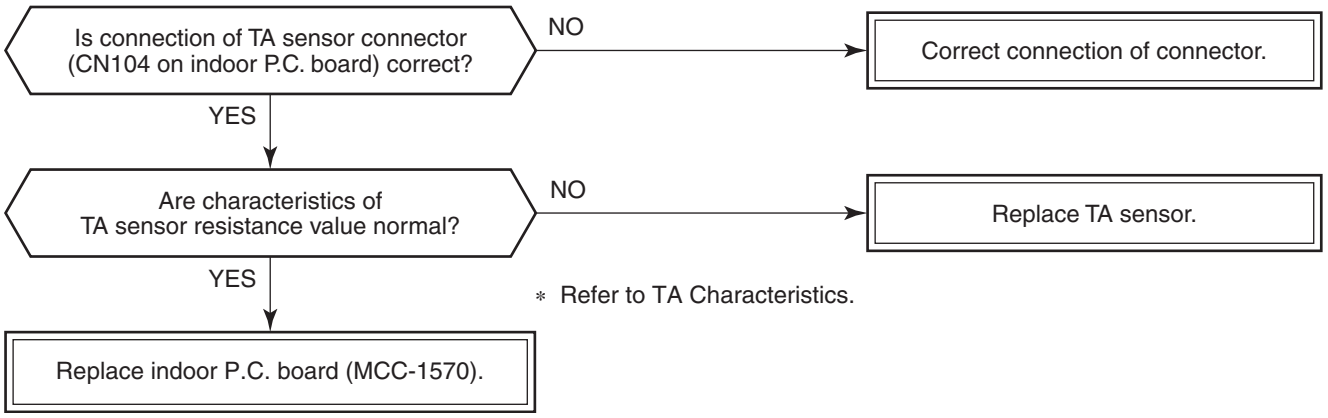


**[P10 trouble]**




* Check that voltage of 1-2 pin of CN504 on the indoor P.C. board is +12V. (1 pin is plus (+).)

**[F10 trouble]**

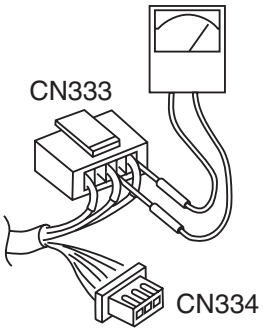


**[P12 trouble]**

Turn off the power.

Are the connectors CN333 and CN334 of indoor unit P.C. board connected correctly (MCC-1570)?

NO → Correct connection of connector.




YES

Remove connectors CN333 and CN334 of indoor unit P.C. board (MCC-1570).

Does the fan rotate without trouble when handling the fan with hands?

NO → Replace indoor fan motor.

YES

Are resistance values between phases at fan motor connector CN333 motor side of indoor P.C. board (MCC-1570) correct? ∗1

Incorrect → Replace indoor fan motor.

Correct

∗1

- Are not coil windings between ① (Red lead) and ③ (White lead), between ③ (White lead) and ⑤ (Black lead), between ⑤ (Black lead) and ① (Red lead) opened or shorted?
  → The resistance should be the resistance value below.
  RM30, RM40, RM56 → Approx. 70 to 100Ω
- Is not grounded between cabinet and ①, ③, ⑤. → It should be 10MΩ or more.

Is resistance value of fan motor connector CN334 motor side of indoor P.C. board (MCC-1570) correct? ∗2

Incorrect → Replace indoor fan motor.

Correct

∗2

Resistance value confirmation of the fan motor position detection circuit

Is not status between ① (Yellow lead) and ② (Pink lead) opened or shorted?

→ The resistance should be approx. 5k to 20kΩ.

Is output of indoor fan motor position detection signal correct? ∗3

NO → Replace indoor fan motor.

YES

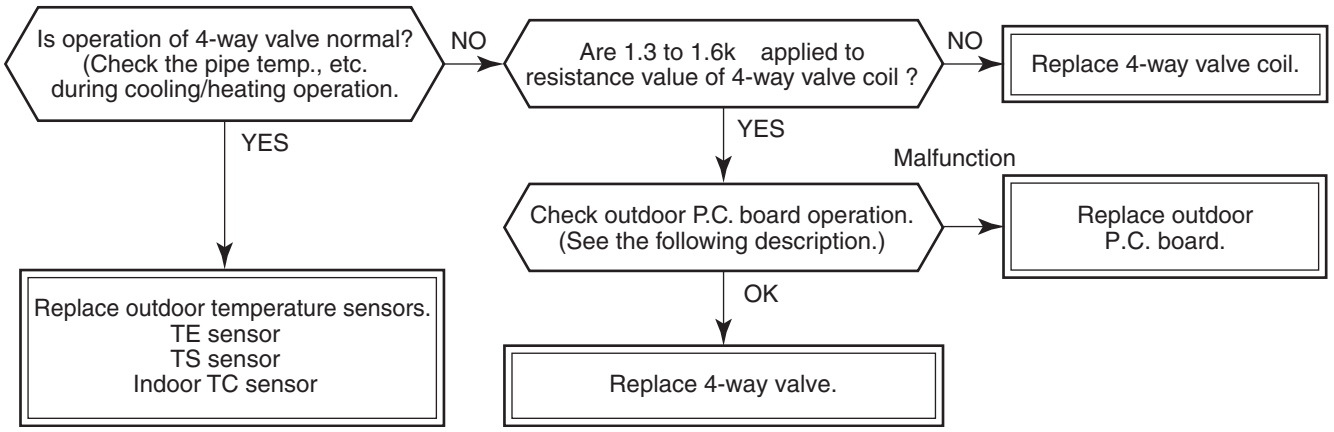
∗3

Confirmation of the fan motor position detection signal

- Using a voltage tester, measure voltage between CN334 ① and ③ on the indoor P.C. board (MCC-1570) under condition that CN333 and CN334 are mounted and the power supply is turned on.
  → When rotating the fan slowly with hands, the pin voltage should shake between 0 and 5V.
- Between ② and ③: 5V

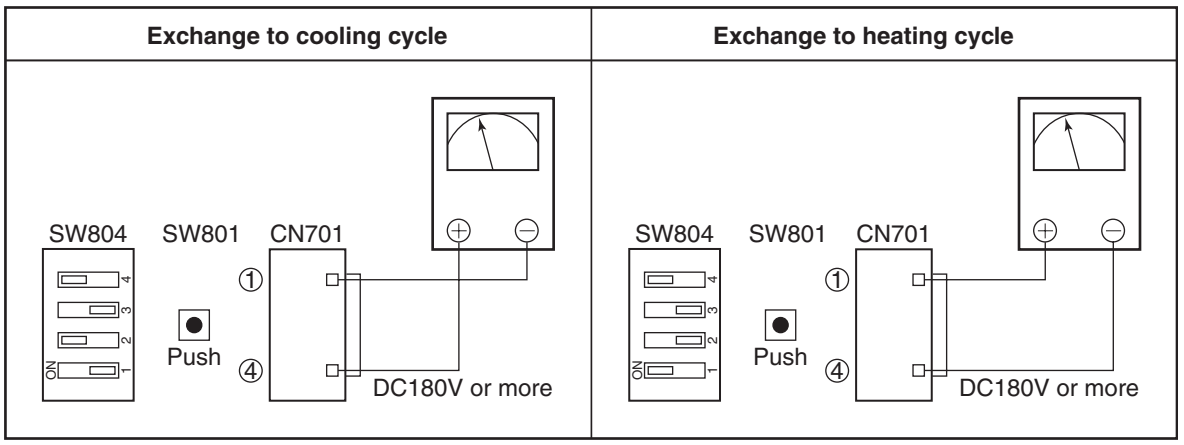
Replace indoor P.C. board (MCC-1570).

**[P19 trouble]**




**Operation check direction of the outdoor P.C. board (In case of 4-way valve with self-prevention function)**

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 amount of heat generation in coil (coil: resistance R700) 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.

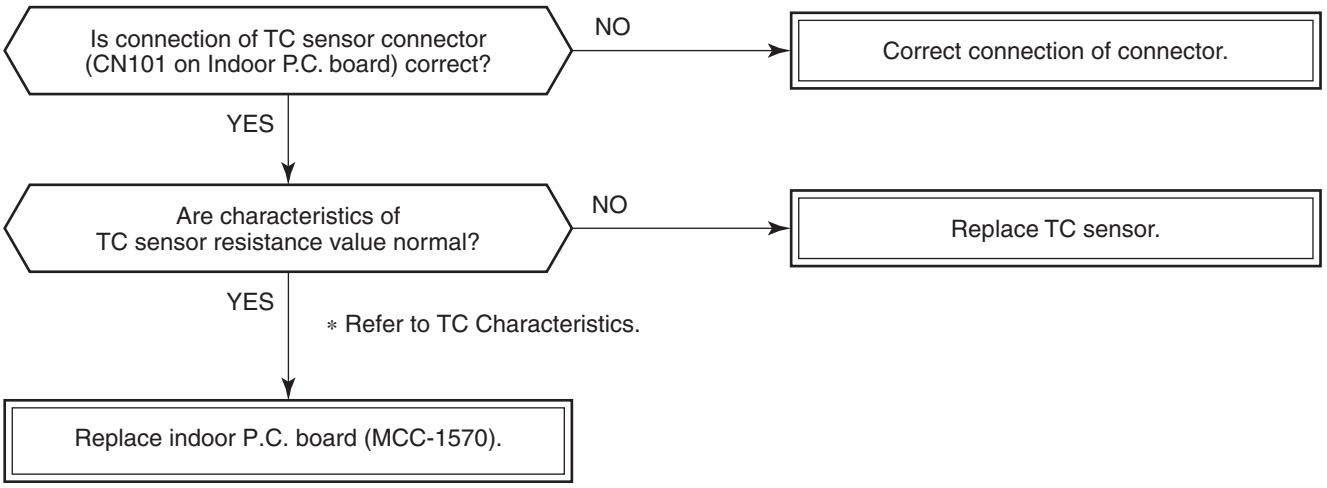



**Check by tester**

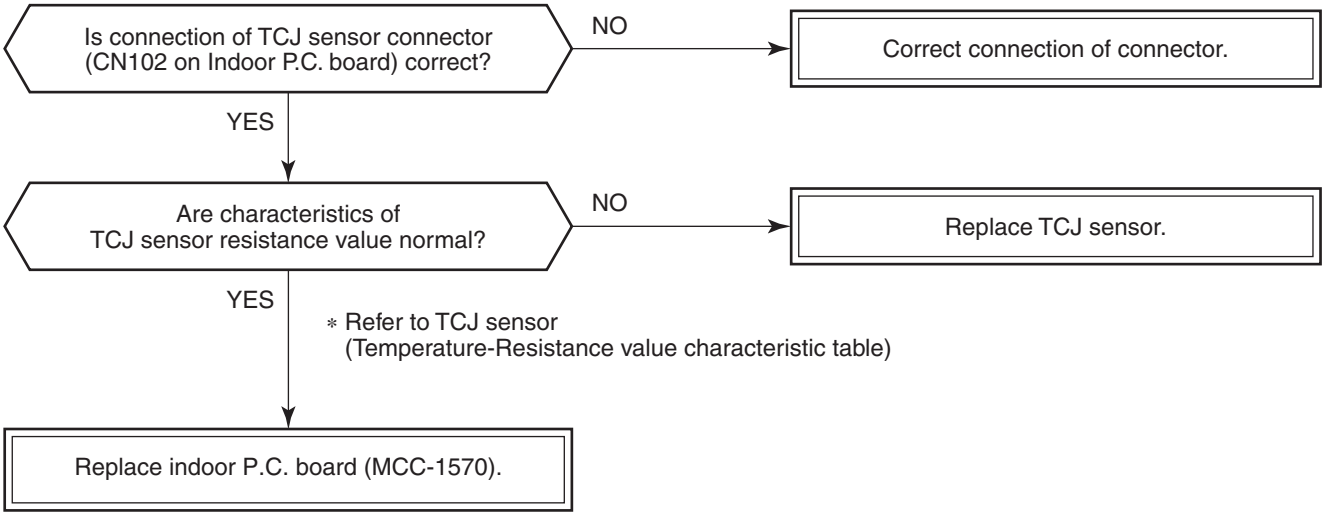
Analog tester: Good article if over DC180V

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

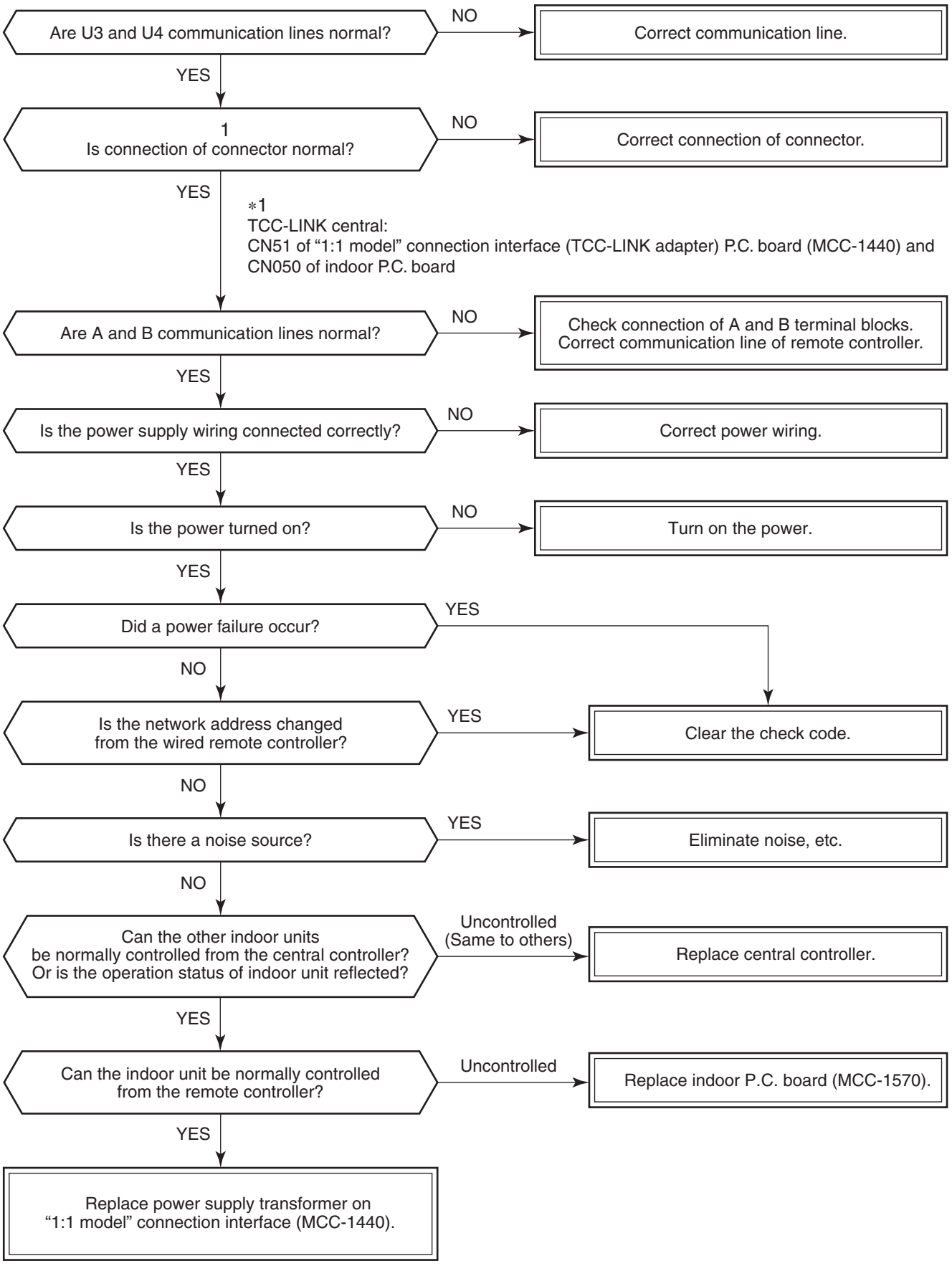
**[F02 trouble]**




**[F01 trouble]**



## [C06 trouble] (“1:1 model” connection interface)



### [E03 trouble] (Header indoor unit)

[E03 trouble] is detected when the indoor unit cannot receive a signal from the remote controller (also central controller).

Check A and B remote controllers and communication lines of the central control system U3 and U4.

As communication is impossible, this check code [E03] is not displayed on the remote controller and the central controller. [E01] is displayed on the remote controller and [C06 trouble] is displayed on the central controller.

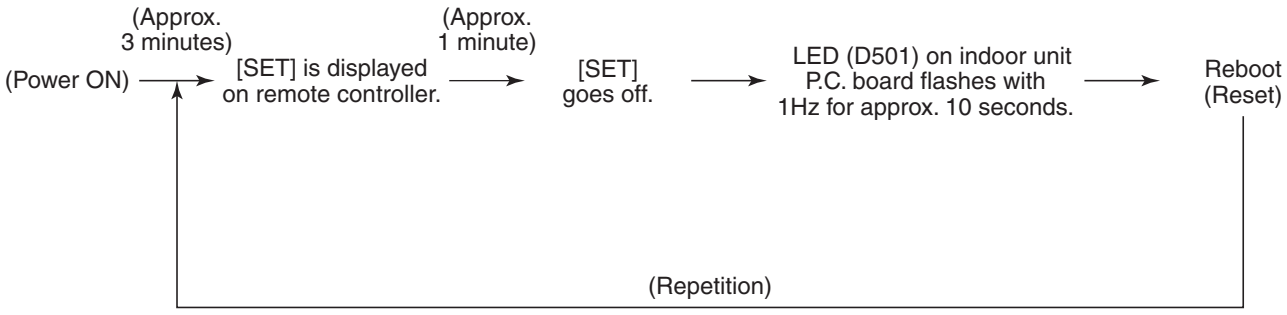
If these check codes generate during operation, the air conditioner stops.

### [F29 trouble]

This check code indicates a detection trouble 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.

* When EEPROM was not inserted when power supply turned on or when the EEPROM data read/write operation is impossible at all, the automatic address mode is repeated. In this time, [C06 trouble] is displayed on the central controller.

### [P31 trouble] (Follower indoor unit)




When the header unit of a group operation detected [E03], [L03], [L07] or [L08] trouble, the follower unit of the group operation detects [P31 trouble] 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] trouble.)

## Temperature sensor  Temperature – Resistance value characteristic table

### TA, TC, TCJ, TE, TS, TO sensors

**Representative value**

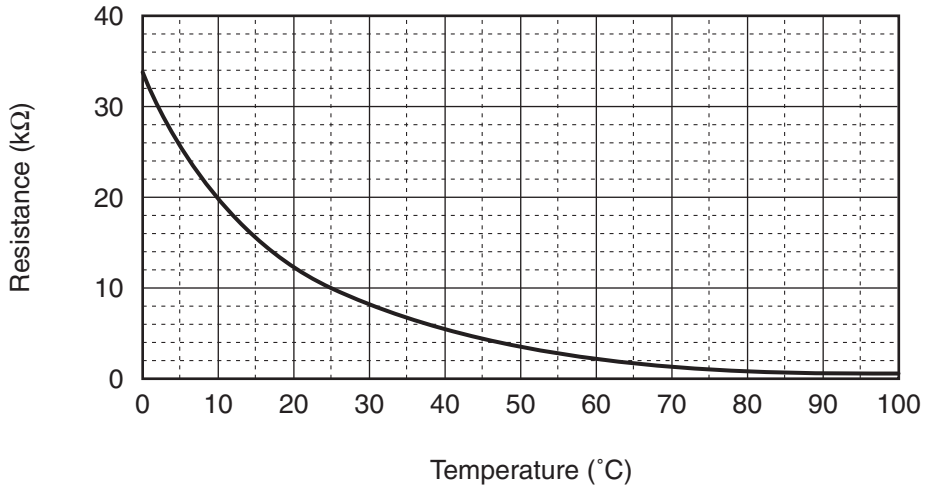
| Temperature (˚C) | Resistance value (kΩ) | | |
|---|---|---|---|
| | (Minimum value) | (Standard value) | (Maximum value) |
| 0 | 32.33 | 33.80 | 35.30 |
| 10 | 19.63 | 20.35 | 21.09 |
| 20 | 12.23 | 12.59 | 12.95 |
| 25 | 9.75 | 10.00 | 10.25 |
| 30 | 7.764 | 7.990 | 8.218 |
| 40 | 5.013 | 5.192 | 5.375 |
| 50 | 3.312 | 3.451 | 3.594 |
| 60 | 2.236 | 2.343 | 2.454 |
| 70 | 1.540 | 1.623 | 1.709 |
| 80 | 1.082 | 1.146 | 1.213 |
| 90 | 0.7740 | 0.8237 | 0.8761 |
| 100 | 0.5634 | 0.6023 | 0.6434 |

### TD, TL sensors

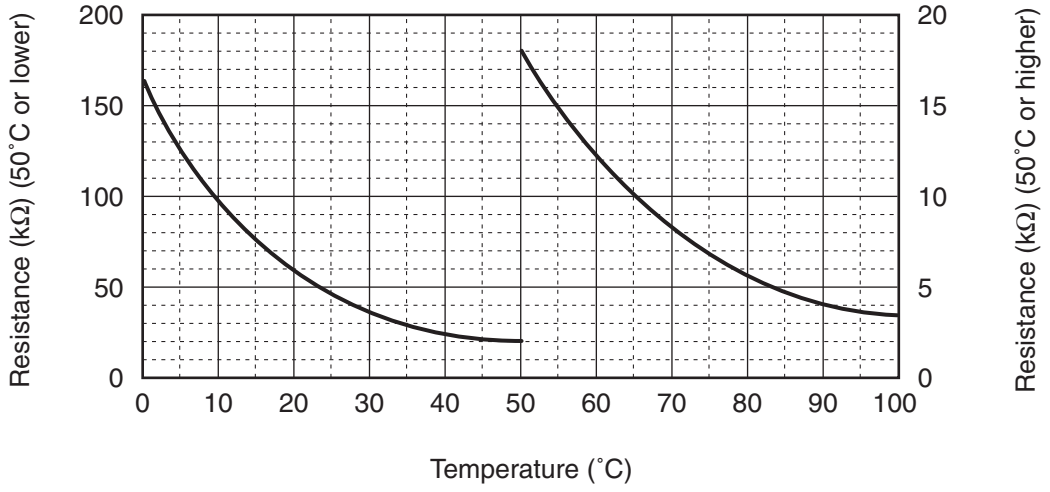
**Representative value**

| Temperature (˚C) | Resistance value (kΩ) | | |
|---|---|---|---|
| | (Minimum value) | (Standard value) | (Maximum value) |
| 0 | 150.5 | 161.3 | 172.7 |
| 10 | 92.76 | 99.05 | 105.6 |
| 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 | 8.269 | 8.668 | 9.074 |
| 80 | 5.925 | 6.195 | 6.470 |
| 90 | 4.321 | 4.507 | 4.696 |
| 100 | 3.205 | 3.336 | 3.468 |

### TA, TC, TCJ, TE, TS, TO sensors




### TD, TL sensors




∗ As TH sensor (Outdoor unit heat sink temp. sensor) is incorporated in the outdoor control P.C. board, the resistance value cannot be measured.

# 9. REPLACEMENT OF SERVICE P.C. BOARD

## 9-1. Indoor Unit

### ⚠ CAUTION

<Model name: RAV-RM∗∗∗SDT∗>
For the above models, set the CODE No. " CE " and the setting data "0000" (initial) to "0001".

**<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, high ceiling 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 trouble 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** Push SET , CL and TEST button on the remote controller simultaneously for more than 4 seconds.

∗ When the group operation control is performed, the unit No. displayed for the first time is the header unit No.
At this time, the CODE No. (DN) shows " 10 ". Also, the fan of the indoor unit selected starts its operation.

**Step 2** Every time when the UNIT LOUVER (left side button) button is pushed, the indoor unit No. under the group control is displayed in order. Specify the indoor unit No. to be replaced.

1. **Change the CODE No. (DN) to 10 → 01 by pushing ▼ / ▲ 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 pushing ▼ / ▲ 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 as shown in the table 1 (example).

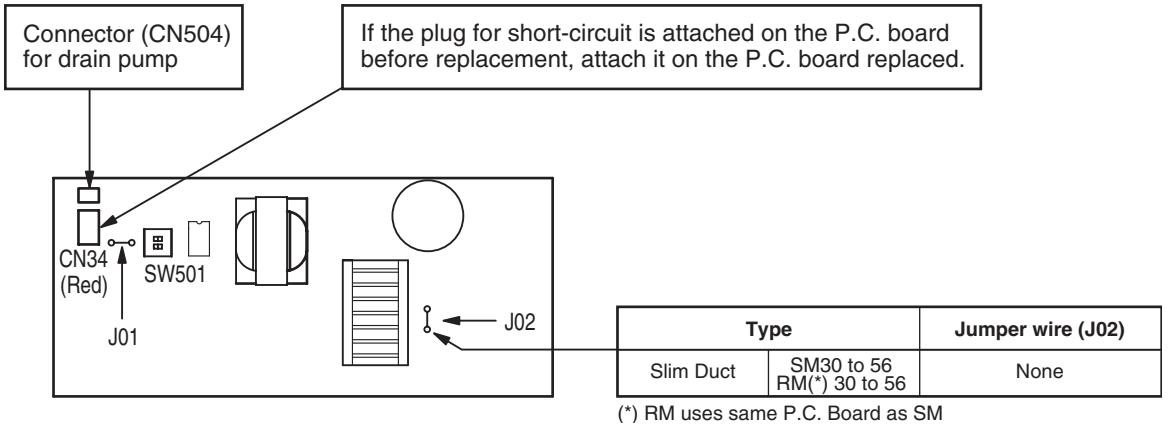
   * The CODE No. (DN) are ranged from " 01 " to " FF ". The CODE No. (DN) may skip.

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

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.
   (when the multiple units group operation including twin system.)

## [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.




| Type | | Jumper wire (J02) |
|---|---|---|
| Slim Duct | SM30 to 56<br>RM(*) 30 to 56 | None |

(*) RM uses same P.C. Board as SM

**Step 2** According to the system configuration, turn on the indoor unit following to the either methods shown below.

a) Single operation (Indoor unit is used as standalone.)
Turn on the indoor unit.

1. After completion of the auto-address setting mode (required time: approx. 5 min.), proceed to [3]. (System address = 1, Indoor unit address = 1, Group address = 0 (standalone) are automatically set.)
2. Push SET , CL and TEST buttons simultaneously for more than 4 seconds to interrupt the auto-address setting mode, and proceed to [3]. (The unit No. " ALL " is displayed.)

b) Group operation (including twin triple and double twin system)
Turn on the indoor unit(s) with its P.C. board replaced to the P.C. board for indoor unit servicing, according to either methods 1 or 2 shown below.

1. Turn on only the indoor unit with its P.C. board replaced. (Be sure to confirm the remote controller is surely connected. If not, the operation [3] cannot be performed.)
   Perform either methods 1 or 2 described in item a) above.
2. Turn on the multiple indoor units including the indoor unit with its P.C. board replaced.
   - Twin or triple or double twin 1 system only
   - All group connections

After completion of the auto-address setting mode (required time: approx. 5 min.), proceed to **[3]**.

* The header unit of the group may be changed by performing the auto-address setting.
  Also, the system address/Indoor unit address of the indoor unit with its P.C. board replaced may be assigned to the addresses (not used) other than those of the indoor units without its P.C. board replaced.
  It is recommended to keep the information in advance, which refrigerant system the indoor unit belongs to or whether the indoor unit works as the header unit or the follower unit in the group control operation.

## [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** Push SET , CL and TEST buttons on the remote controller simultaneously for more than 4 seconds.

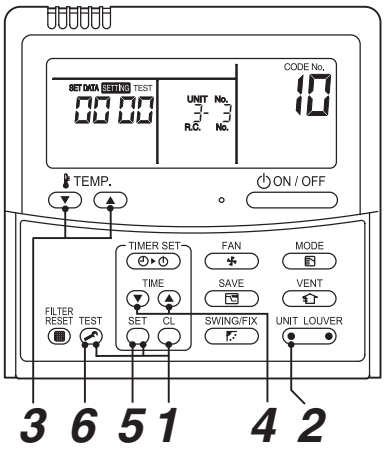
* In the group control operation, the unit No. displayed for the first time is the header unit No..
  At this time, the CODE No. (DN) shows " 10 ". Also, the fan of the indoor unit selected starts its operation.
  (The unit No. " ALL " is displayed if the auto-address setting mode is interrupted in [2] step 2 a))

**Step 2** Every time when UNIT LOUVER (left side button) button is pushed, the indoor unit No. in the group control operation are displayed in order.
(The settings stored in the EEPROM of the P.C. board for indoor unit servicing are the factory-set values.)
Specify the indoor unit No. with its P.C. board replaced to the P.C. board for indoor unit servicing.
(You cannot perform this operation if " ALL " is displayed.)

**Step 3** Select the CODE No. (DN) can be selected by pushing the ▼ / ▲ button for the temperature setting.

- Set the indoor unit type and capacity.
  The factory-set values shall be written to the EEPROM by changing the type and capacity.
  1. Set the CODE No. (DN) to " 10 ". (without change)
  2. Select the type by pushing ▼ / ▲ buttons for the timer setting.
     (For example, 4-way Cassette Type is set to "0001". Refer to table 2)
  3. Push SET button.
     (The operation completes if the setting data is displayed.)
  4. Change the CODE No. (DN) to " 11 " by pushing ▼ / ▲ buttons for the temperature setting.
  5. Select the capacity by pushing ▼ / ▲ buttons for the timer setting.
     (For example, 80 Type is set to " 00 12 ". Refer to table 3)
  6. Push SET button.
     (The setting completes if the setting data are displayed.)

**<Fig. 1 RBC-AMT32E>**



**Step 4** Write the on-site setting data to the EEPROM, such as address setting, etc. Perform the steps 1 and 2 above again.

**Step 5** Change the CODE No. (DN) to "01" by pushing ▼ / ▲ buttons for the temperature setting. (this is the setting for the filter sign lighting time.)

**Step 6** Check the setting data displayed at this time with the setting data put down in [1].

1. If the setting data is different, modify the setting data by pushing ▼ / ▲ buttons for the timer setting to the data put down in [1].
   The operation completes if the setting data is displayed.
2. If the data is the same, proceed to next step.

**Step 7** Change the CODE No. (DN) by pushing ▼ / ▲ buttons for the temperature setting. As described above, check the setting data and modify to the data put down in [1].

**Step 8** Repeat the steps 6 and 7.

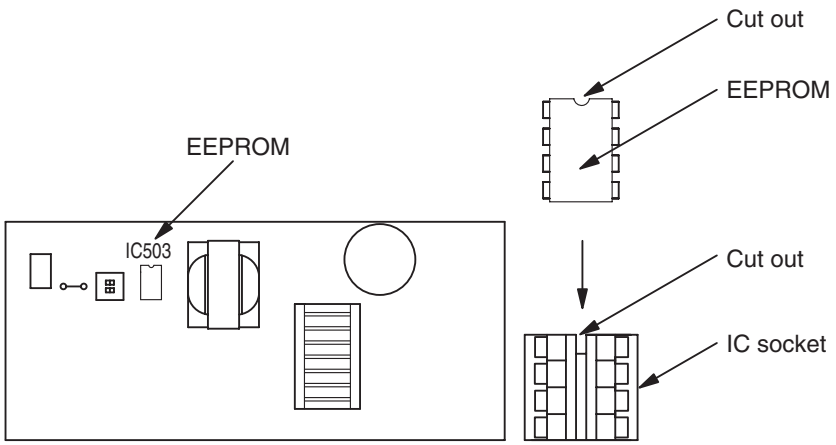
**Step 9** After the setting completes, push TEST button to return to the normal stop status. (It takes approx. 1 min until the remote control operation is available again.)

* The CODE No. (DN) are ranged from "01" to "FF". The CODE No. (DN) is not limited to be serial No.. Even after modifying the data wrongly and pushing SET button, it is possible to return to the data before modification by pushing CL button if the CODE No. (DN) is not changed.

## <Fig. 2 EEPROM layout diagram>

The EEPROM (IC503) is attached to the IC socket. When detaching the EEPROM, use a tweezers, etc. Be sure to attach the EEPROM by fitting its direction as shown in the figure.

* Do not bend the IC lead when replacing.



## Table 1. Setting data (CODE No. table (example))

| CODE No. (DN) | Item | Setting data | Factory-set value |
|---|---|---|---|
| 01 | Filter sign lighting time | | Depending on Type |
| 02 | Filter pollution level | | 0000: standard |
| 03 | Central control address | | 0099: Not determined |
| 06 | Heating suction temperature shift | | Depending on Type |
| 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 ˚C (Ts ±1.5) |
| 28 | Power failure automatic recovery | | 0000: None |
| 2b | Thermostat output SW | | 0000: Thermostat ON |
| 31 | Ventilation fan (standalone) | | 0000: Not available |
| 32 | Sensor SW (Selection of static pressure) | | 0000: Body sensor |
| 5d | External static pressure | | 0000: 10Pa*<br>0001: 20Pa*<br>0003: 30Pa* (Factory default)<br>0006: 50Pa*<br>* Include standard filter pressure loss. |
| 60 | Timer setting (wired remote controller) | | 0000: Available |
| 77 | Dual set point | | 0000: Unavailable |
| 8b | Connection of high heat feeling | | 0000: None |
| C2 | Demand setting (outdoor unit current demand) | | 0075: 75 % |
| d0 | Remote controller operation save function | | 0001: Enable |
| d1 | Frost protection function | | 0000: None |

## Table 2. Type: CODE No. 10

| Setting data | Type | Type name abb. |
|---|---|---|
| 0001∗1 | 4-way Cassette Type | RAV-GM∗∗∗UT∗ |
| 0005∗2 | Slim Duct Type | RAV-RM∗∗∗SDT∗ |

∗1 EEPROM initial value on the P.C. board for indoor unit servicing.

∗2 ⚠ CAUTION
For above models, set the CODE No. to " CE " and the setting data " 0000 " (initial) to " 0001 ".

## Table 3. Indoor unit capacity: CODE No. 11

| Setting data | Type |
|---|---|
| 0000∗ | Disable |
| 0003 | 30 |
| 0006 | 40 |
| 0009 | 56 |

∗ EEPROM initial value on the P.C. board for indoor unit servicing.

## Table 4. External static pressure settings CODE No.5d

Be sure to set up a tap change based upon the resistance (external static pressure) of the duct to be connected.

| Setup data | External static pressure |
|---|---|
| 0000 | 10Pa* |
| 0001 | 20Pa* |
| 0003 | 30Pa* |
| 0006 | 50Pa* |

The list above is when SW501-1 and SW501-2 is OFF.
* Include standard filter pressure loss.

# 10. SETUP AT LOCAL SITE AND OTHERS

## 10-1. Indoor Unit

### 10-1-1. Test Run Setup on Remote Controller

**<Wired remote controller>**

1. When pushing TEST button on the remote controller for 4 seconds or more, “TEST” is displayed on LC display. Then push ON / OFF button.
   - “TEST” is displayed on LC display during operation of Test Run.
   - During Test Run, temperature cannot be adjusted but air volume can be selected.
   - In heating and cooling operation, a command to fix the Test Run frequency is output.
   - Detection of trouble is performed as usual. However, do not use this function except case of Test Run because it applies load on the unit.
2. Use either heating or cooling operation mode for [TEST].
   **NOTE** : The outdoor unit does not operate after power has been turned on or for approx. 3 minutes after operation has stopped.
3. After a Test Run has finished, push TEST button again and check that [TEST] on LC display has gone off. (To prevent a continuous test run operation, 60-minutes timer release function is provided to this remote controller.)

**<Wireless remote controller>**

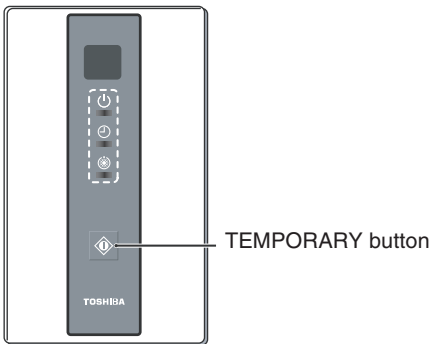
◆ **In case of wireless remote controller**

***1*** **When TEMPORARY button is pushed for 10 seconds or more, “Pi!” sound is heard and the operation changes to a forced cooling operation.**
**After approx. 3 minutes, a cooling operation starts forcedly.**

Check cool air starts blowing. If the operation does not start, check wiring again.

***2*** **To stop a test operation, push TEMPORARY button once again (Approx. 1 second).**

- Check wiring / piping of the indoor and outdoor units in forced cooling operation.



### 10-1-2. Forced Defrost Setup of Remote Controller (For wired remote controller only)

**(Preparation in advance)**

**1** **Push TEST + SET + CL buttons simultaneously for 4 seconds or more on the remote controller. (Push buttons while the air conditioner stops.)**

The first displayed unit No. is the header indoor unit address in the group control.

**2** **Every pushing UNIT LOUVER button (button of the left side), the indoor unit No. in the group control is displayed one after the other.**

Select a header indoor unit (outdoor unit is connected) which is to be defrosted. In this time, fan of the selected indoor unit operate.

**3** **Using the set temperature TEMP. buttons, specify the CODE No. (DN) 8C.**

**4** **Using the timer time TIME buttons, set time to data 0001. (0000 at shipment)**

**5** **Push SET button. (OK if indication lights)**

**6** **Pushing TEST button returns the status to the normal stop status.**

**(Practical operation)**

- Push ON/OFF ON / OFF button.
- 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.

**To execute the defrost operation again, start procedure from above item 1 .**

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

### 10-1-3. 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. D503 (Yellow): Main bus communication**

- It goes on for 5 seconds in the first half of communication with the central controller.

**4. D504 (Green): Sub bus communication**

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

**5. D14 (Orange)**

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

**6. D15 (Green)**

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

### 10-1-4. Function Selection Setup

**<Procedure>** Perform setting while the air conditioner stops.

**1 Push TEST + SET + CL buttons simultaneously for 4 seconds or more.**

The first displayed unit No. is the header indoor unit address in the group control.
In this time, fan of the selected indoor unit operate.

⇩

**2 Every pushing UNIT LOUVER button (button at left side), the indoor unit No. in the group control is displayed one after the other. In this time, fan of the selected indoor unit only operate.**

⇩

**3 Using the set temperature TEMP. buttons, specify the CODE No. (DN).**

⇩

**4 Using the timer time TIME buttons, select the set data.**

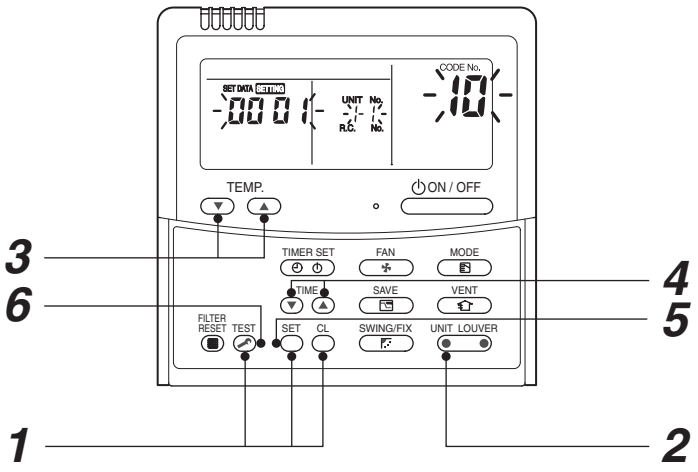
⇩

**5 Push SET button. (OK if indication lights)**

- To change the selected indoor unit, proceed to Procedure **2** .
- To change item to be set up, proceed to Procedure **3** .

⇩

**6 Pushing TEST button returns the status to the normal stop status.**




<Operation procedure>

**1 → 2 → 3 → 4 → 5 → 6** END

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

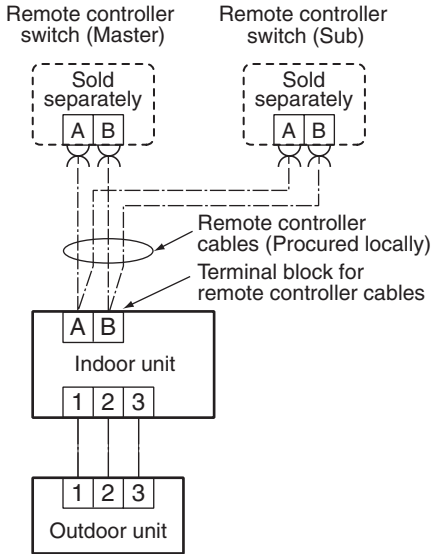
| DN | Item | Description | At shipment |
|---|---|---|---|
| 01 | Filter display delay timer | 0000: None<br>0001: 150H<br>0002: 2500H<br>0003: 5000H<br>0004: 10000H | 0002 : 2500H |
| 02 | Dirty state of filter | 0000: Standard<br>0001: High degree of dirt (Half of standard time) | 0000: Standard |
| 03 | Central control address | 0001: No.1 unit to 0064: No.64 unit<br>0099: Unfixed | 0099: Unfixed |
| 04 | Specific indoor unit priority | 0000: No priority<br>0001: Priority | 0000: No priority |
| 06 | Heating temp shift | 0000: 0 °C<br>0001: +1 °C<br>0002: +2 °C to 0010: +10 °C<br>(Up to +6 recommended) | 0002 : +2°C |
| 0d | Existence of [AUTO] mode | 0000: Provided<br>0001: Not provided (Automatic selection from connected outdoor unit) | 0001: Not provided |
| 0F | Cooling only | 0000: Heat pump<br>0001: Cooling only (No display of [AUTO] [HEAT]) | 0000: Heat pump |
| 10 | Type | 0005 : Slim Duct Type | 0005 : Slim Duct Type |
| 11 | Indoor unit capacity | 0000: Unfixed<br>0001 to 0034 | According to capacity type |
| 12 | Line address | 0001: No.1 unit to 0030: No.30 unit | 0099: Unfixed |
| 13 | Indoor unit address | 0001: No.1 unit to 0064: No.64 unit | 0099: Unfixed |
| 14 | Group address | 0000: Individual<br>0001: Header unit of group<br>0002: Follower unit of group | 0099: Unfixed |
| 1E | Temp difference of [AUTO] mode selection COOL → HEAT, HEAT → COOL | 0000: 0 °C to 0010: 10 °C<br>(For setup temperature, reversal of COOL / HEAT by } (Data value) / 2) | 0003: 3 °C<br>(Ts ±1.5) |
| 28 | Automatic restart of power failure | 0000: None<br>0001: Restart | 0000: None |
| 2A | Selection of option / trouble input (CN70) | 0000: Filter input<br>0001: Alarm input (Air cleaner, etc.)<br>0002: Humidifier input | 0002: Humidifier |
| 2E | HA terminal (CN61) select | 0000: Usual<br>0001: Leaving-ON prevention control<br>0002: Fire alarm input | 0000: Usual<br>(HA terminal) |
| 31 | Ventilating fan control | 0000: Unavailable<br>0001: Available | 0000: Unavailable |
| 32 | TA sensor selection | 0000: Body TA sensor<br>0001: Remote controller sensor | 0000: Body TA sensor |
| 33 | Temperature unit select | 0000: °C (at factory shipment)<br>0001: °F | 0000: °C |
| 5d | External static pressure | 0000: 10Pa*<br>0001: 20Pa*<br>0003: 30Pa* (Factory default)<br>0006: 50Pa*<br>* Include standard filter pressure loss. | 0003: 30Pa |
| 60 | Timer setting (wired remote controller) | 0000: Available (can be performed)<br>0001: Unavailable (cannot be performed) | 0000: Available |
| 77 | Dual set point | 0000: Unavailable<br>0002: Available | 0000: Unavailable |
| d0 | Whether the power saving mode can be set by the remote controller | 0000: Invalid<br>0001: Valid | 0001: Valid |

## 10-1-5. Wiring and Setting of Remote Controller Control

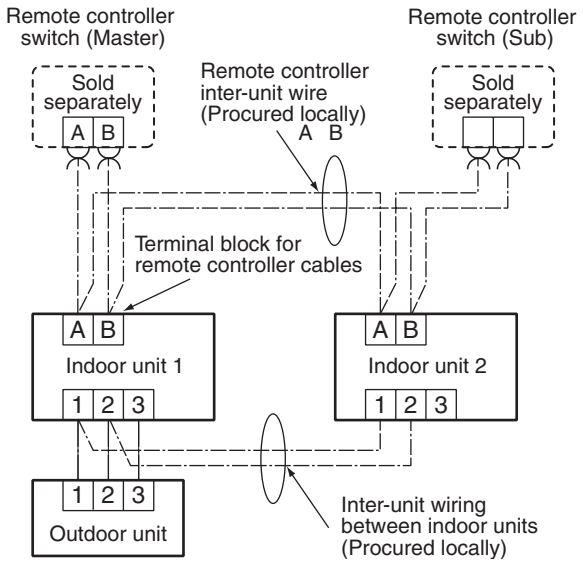
### 2-remote controller control (Controlled by 2 remote controllers)

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**




- **When connected 2 remote controllers operate the twin**



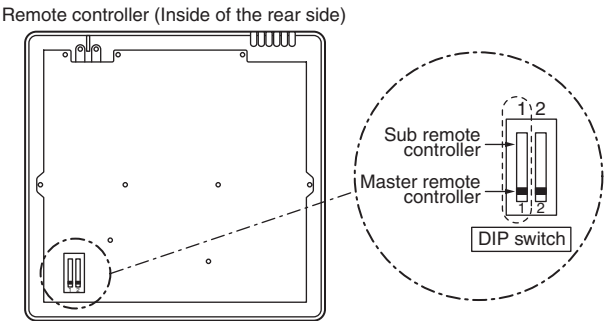

**(Setup method)**

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

**<Wired remote controller>**

**How to set wired remote controller as sub remote controller**

Change DIP switch inside of the rear side of the remote controller switch from remote controller master to sub. (In case of RBC-AMT32E)




**[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.

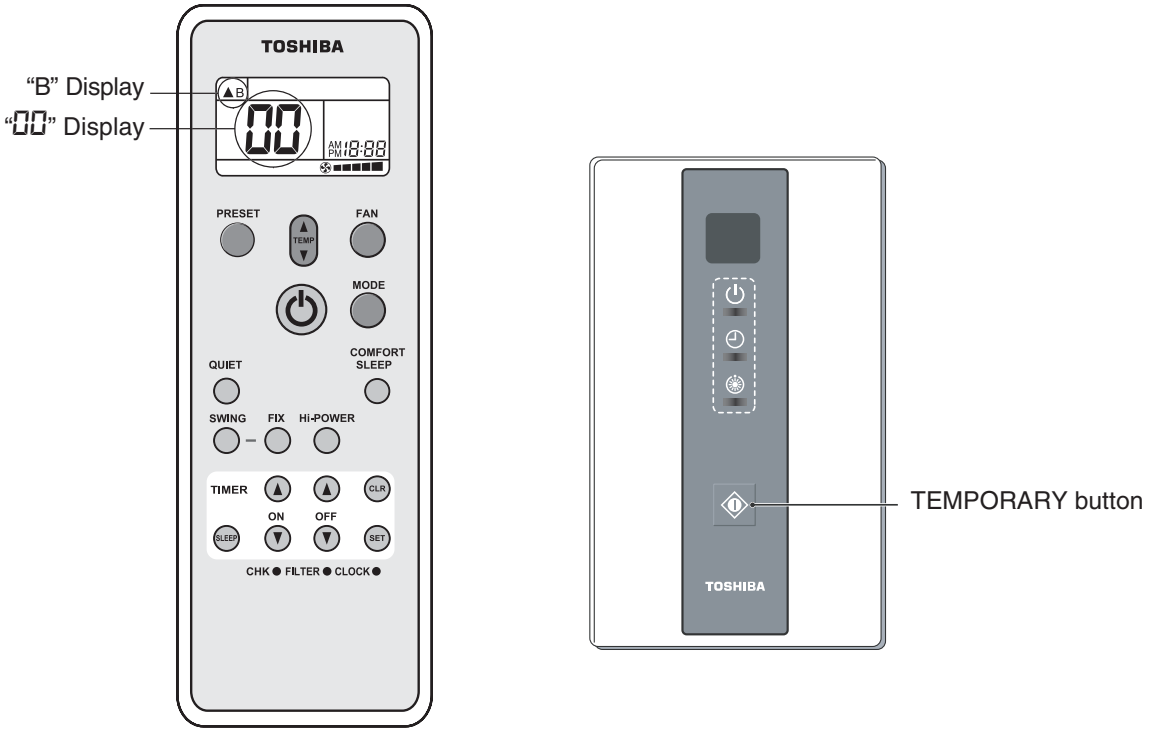
**<Wireless remote controller>**

## Wireless remote controller A-B selection

Using 2 wireless remote controllers for the respective air conditioners, when the 2 air conditioners are closely installed.

## Wireless remote controller B setup

1. Push the START/STOP button to operate the air conditioner. Push it again to stop the air conditioner.
2. Push ◈ [Temporary] button on the signal receiving unit to operate the air conditioner.
3. Point the wireless remote controller at the indoor unit.
4. Push and hold **CHK ●** button on the wireless remote controller by the tip of the pencil. " 00 " will be shown on the display.
5. Push the MODE ● button during pushing **CHK ●**.
   "B" will be shown on the display and " 00 " will be disappear and the air conditioner will turn OFF. The wireless remote controller B is memorized.




**Note:**

- Repeat above step to reset wireless remote controller to be A.
- The wireless remote controllers do not display "A".
- The factory default of the wireless remote controllers is "A".

### 10-1-6. 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.

**<Procedure>**

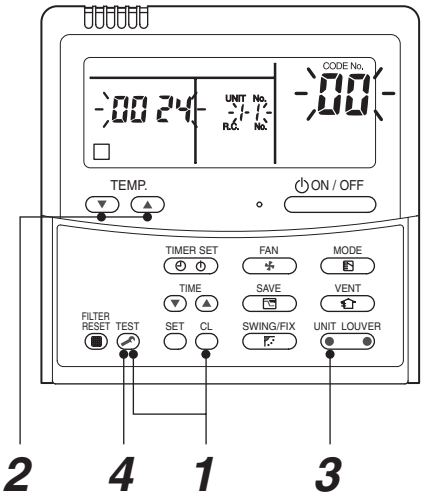
**1 Push TEST + CL buttons simultaneously for 4 seconds to call the service monitor mode.**

The service monitor goes on, the header indoor unit No. is displayed at first and then the temperature of CODE No. 00 is displayed.

⇩

**2 Push temperature set TEMP. buttons and then change the CODE No. of data to be monitored.**

The CODE No. list is shown below.




<Operation procedure>

**1→ 2→ 3→ 4**

Returned to usual display

| | 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 |

| | 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 (TH) | ˚C |
| | 6A | Operation current (× 1/10) | 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 UNIT LOUVER (left side button) button to select the indoor unit to be monitored. Each data of the indoor unit and its outdoor units can be monitored.**

⇩

**4 Pushing TEST button returns the status to the usual display.**

*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 trouble history

**<Contents>**

The trouble contents in the past can be called.

**<Procedure>**

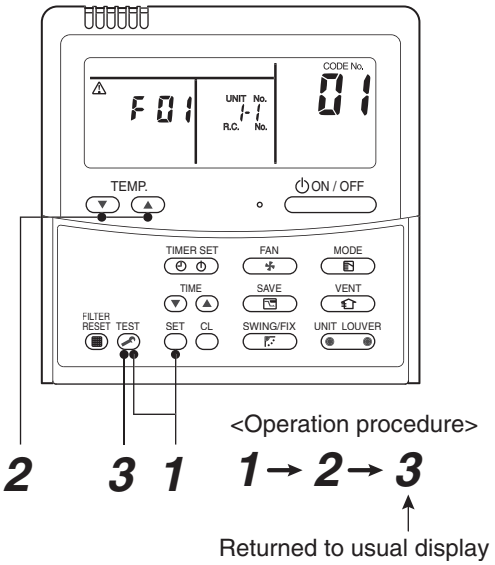
***1*** **Push SET + TEST buttons simultaneously for 4 seconds or more to call the service check mode.**

Service Check goes on, the **CODE No. 01** is displayed, and then the content of the latest alarm is displayed.
The number and trouble contents of the indoor unit in which an trouble occurred are displayed.

***2*** **In order to monitor another trouble history, push the set temperature ▼ / ▲ buttons to change the trouble history No. (CODE No.)**

**CODE No. 01** (Latest) → **CODE No. 04** (Old)
NOTE : 4 trouble histories are stored in memory.

***3*** **Pushing TEST button returns the display to usual display.**



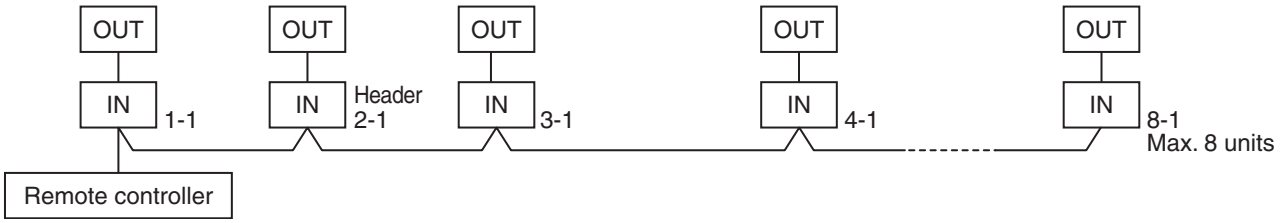

## REQUIREMENT

Do not push CL button, otherwise all the trouble histories of the indoor unit are deleted. If the trouble histories are deleted by pushing CL button, turn off the power supply once and then turn on the power supply again. When the trouble which is same as one occurred at the last before deletion continuously occurs again, it may not be stored in memory.

### (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.

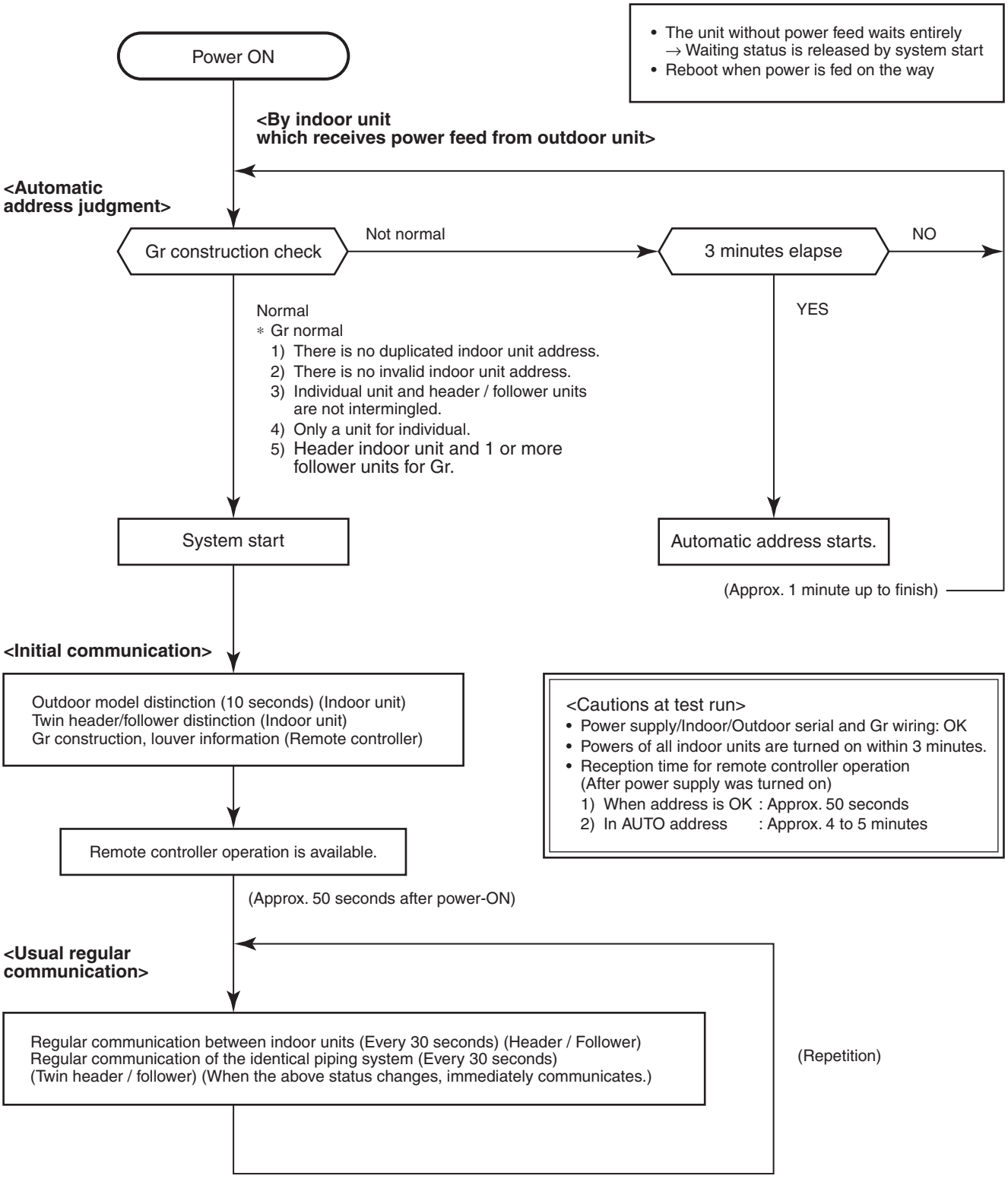
**<System example>**




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 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 nonvolatile 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.
      Especially in case of twin, triple, double twin, check whether they are identical system address or not.
   3) The unit No. (line/indoor gout 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.)

## 10-2. Setup at Local Site / Others

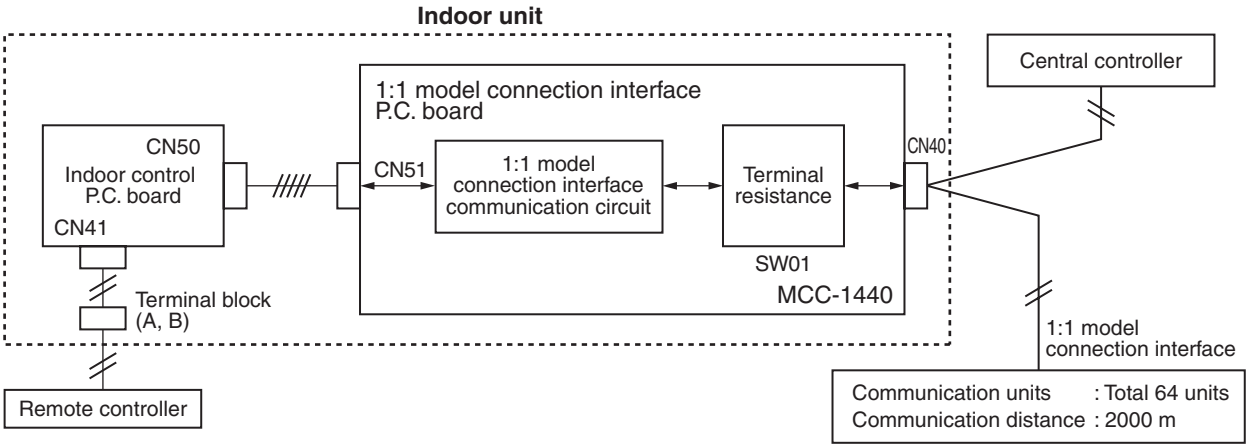
### Model name: TCB-PCNT30TLE2

### 10-2-1. 1:1 Model Connection Interface (TCC-LINK adapter)

#### 1. Function

This model is an optional P.C. board to connect the indoor unit to 1:1 model connection interface.

#### 2. Microprocessor block diagram

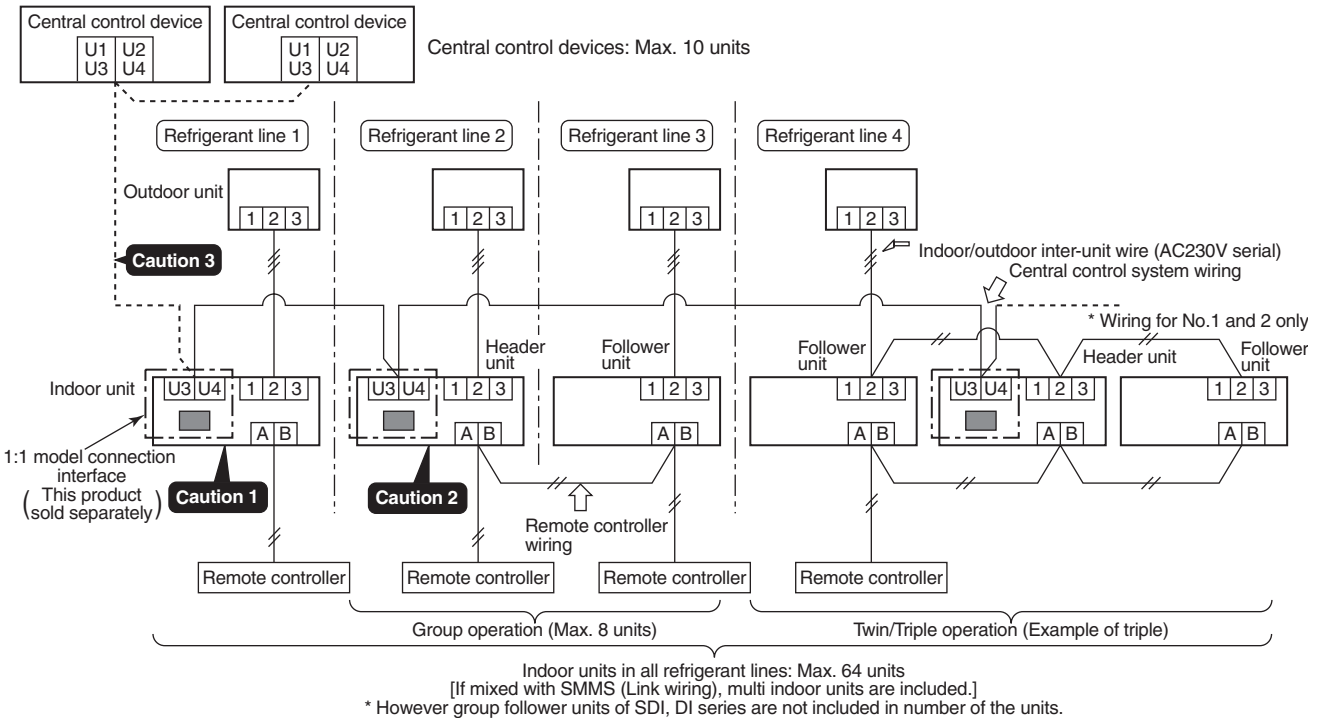



#### 3. 1:1 model connection interface wiring connection

## ⚠ CAUTION

1) When controlling DI, SDI series collectively, 1:1 model connection interface (This option) is required.
2) In case of group operation, twin-triple operation, the 1:1 model connection interface is necessary to be connected to the header unit.
3) Connect the central control devices to the central control system wiring.
4) When controlling DI, SDI series only, turn on only Bit 1 of SW01 of the least line of the system address No. (OFF when shipped from the factory)

*** In case of DI, SDI series, the address is necessary to be set up again from the wired remote controller after automatic addressing.**



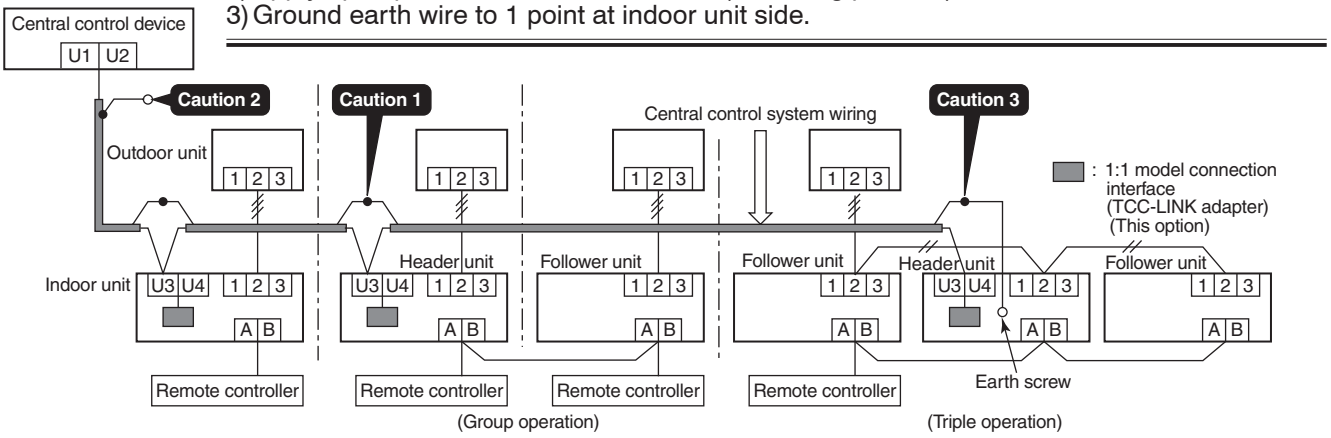
## 4. Wiring Specifications

- Use 2-core with no polar wire.
- Match the length of wire to wire length of the central control system. If mixed in the SMMS system, the wire length is lengthened with all indoor/outdoor inter-unit wire length at side.
- To prevent noise trouble, use 2-core shield wire.
- Connect the shield wire by closed-end connection and apply open process (insulating process) to the last terminal. Ground the earth wire to 1 point at indoor unit side. (In case of central controlling of digital inverter (DI, SDI) unit setup)

| No. of wires | Size |
|---|---|
| 2 | Up to 1000m: twisted wire 1.25mm$^2$<br>Up to 2000m: twisted wire 2.0mm$^2$ |

### ⚠ CAUTION

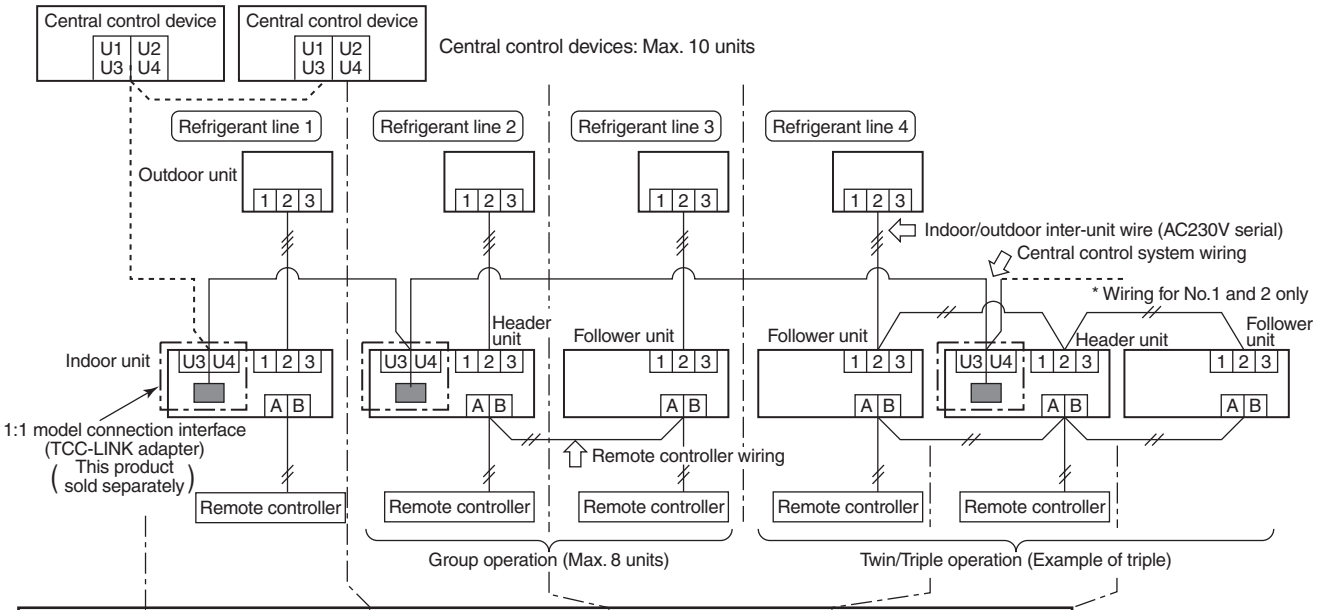
1) Closed-end connection of shield wire (Connect all the connecting parts of each indoor unit)
2) Apply open process to the last terminal (insulating process).
3) Ground earth wire to 1 point at indoor unit side.




## 5. P.C. Board Switch (SW01) Setup

When performing collective control by customized setup only, the setup of terminator is necessary.

- Using SW01, set up the terminator.
- Set up the terminator to only the interface connected to the indoor unit of least line address No.

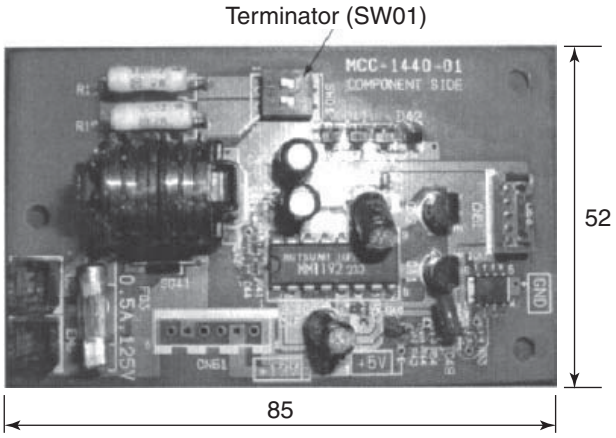



| Line address | 1 | 2 | | 4 | |
|---|---|---|---|---|---|
| SW01 Bit 1 | ON | OFF | | OFF | (OFF at shipment from factory) |
| SW01 Bit 2 | OFF | OFF | | OFF | (OFF at shipment from factory) |
| Remarks | Turn SW01 Bit 1 to ON. | As status shipped from factory | | As status shipped from factory | |

**(Reference)** Setup contents of switch

| SW01 | | Terminator | Remarks |
|---|---|---|---|
| Bit 1 | Bit 1 | | |
| OFF | OFF | None | Mixed with SMMS (Link wiring) at shipment from factory |
| ON | OFF | 100Ω | Central control by digital inverter only |
| OFF | ON | 75Ω | Spare |
| ON | ON | 43Ω | Spare |

## 6. External view of P.C. board assembly




## 7. Address setup

In addition to set up the central control address, it is necessary to change the indoor unit number. (Line/Indoor/Group address). For details, refer to 1:1 model connection interface Installation Manual.

## 10-3. How to Set up Central Control Address Number

When connecting the indoor unit to the central control remote controller using 1:1 model connection interface, it is necessary to set up the central control address number.

- The central control address number is displayed as the line No. of the central control remote controller.

### How to set up from indoor unit side by remote controller

**<Procedure>** Perform setup while the unit stops.

**1 Push TEST + VENT buttons for 4 seconds or more.**

When group control is executed, first the unit No. is displayed and all the indoor units in the group control are selected. In this time, fans of all the selected indoor units are turned on. **(Fig. 1)**
(Keep ALL displayed status without pushing UNIT LOUVER button (button of the left side).)
In case of individual remote controller which is not group-controlled, Line address and Indoor unit address are displayed.

**2 Using temperature setup TEMP. buttons, specify CODE No. 03.**

**3 Using timer time TIME buttons, select the SET DATA.**
**The setup data is shown in the table below (Table 1).**

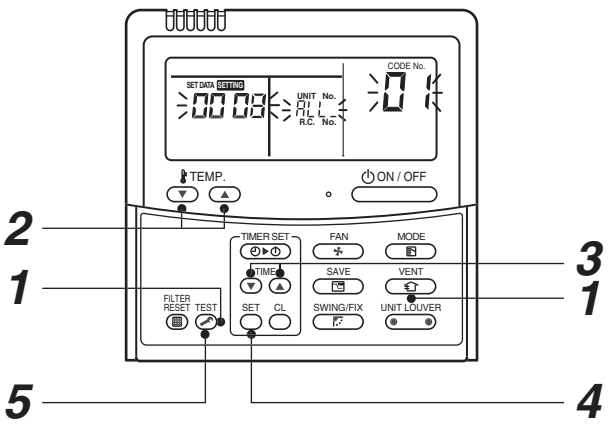
**4 Push SET button. (OK if display goes on.)**

- To change the item to be set up, return to Procedure **2**.

**5 Push TEST button.**

The status returns to usual stop status.

**(Fig.1)**




**(Table 1)**

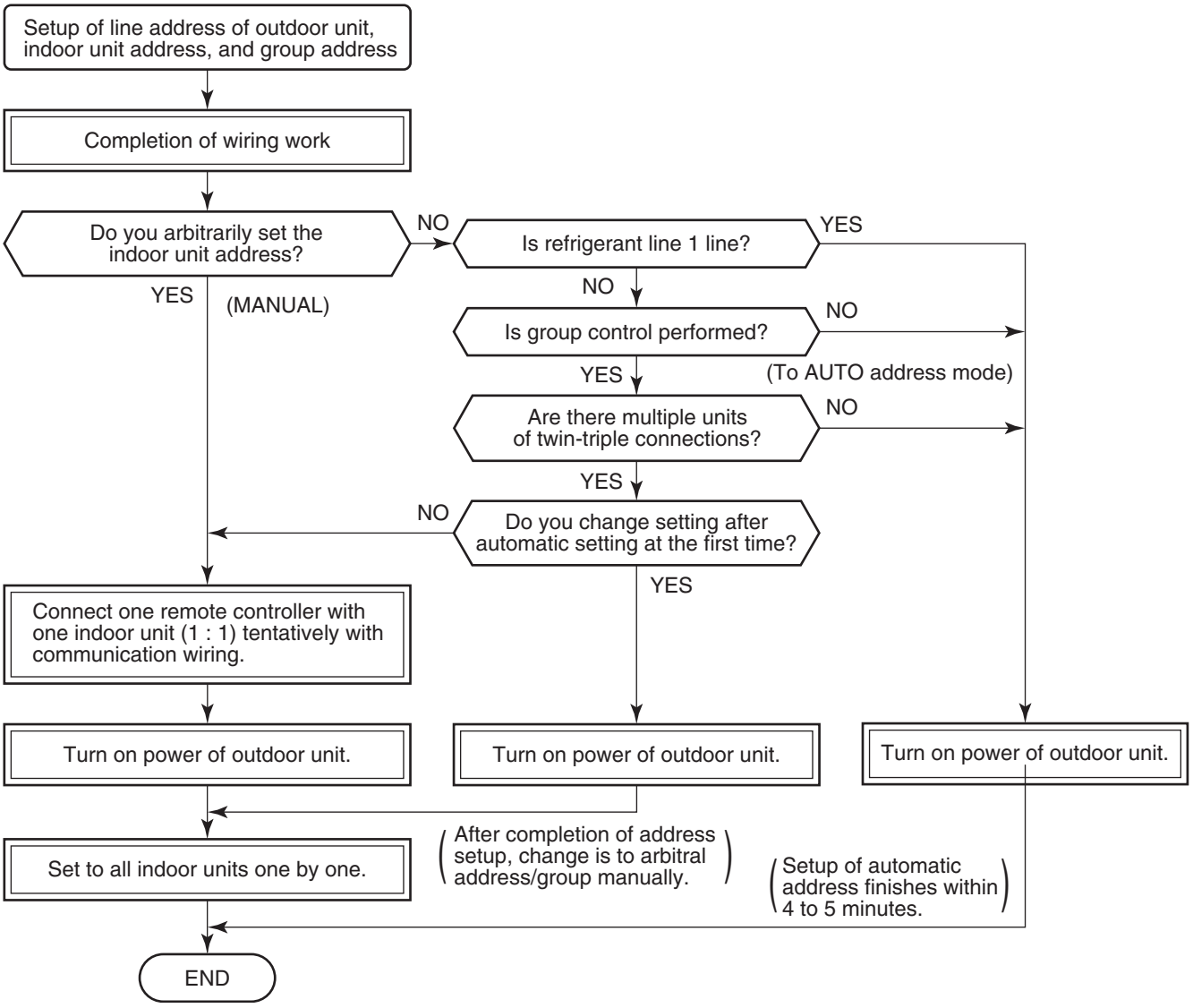
| SET DATA | Central control address No. |
|---|---|
| 0001<br>0002<br>0003<br>:<br>0064 | 1<br>2<br>3<br>:<br>64 |
| 0099 | Unset (Setup at shipment from factory) |

# 11. ADDRESS SETUP

## 11-1. Address Setup

### <Address setup procedure>

When an outdoor unit and an indoor unit are connected and they are twin-triple, or when an outdoor unit is connected to each indoor unit respectively in the group operation even if multiple refrigerant lines are provided, 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 (IC10) 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 0030 (No. 30 unit) |
| Indoor unit address | 13 | 0099 | 0001 (No. 1 unit) to 0064 (No. 64 unit)<br>Max. value of indoor units in the identical refrigerant line (Double twin = 4) |
| Group address | 14 | 0099 | 0000 : Individual (Indoor units which are not controlled in a group)<br>0001 : Header unit (1 indoor unit in group control)<br>0002 : Follower unit (Indoor units other than header unit in group control) |

## 11-2. 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)

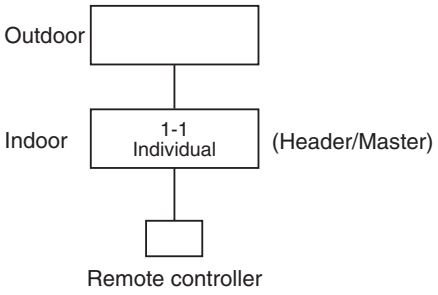
Follower unit (= 2) : Indoor units other than header unit in group operation
Basically, follower units do not send/receive signals to/from the remote controllers.
(Except trouble and response to demand of service data)

Master unit (Representative unit) (Header Twin) : 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 of the identical line address within the minimum unit which configures one of the refrigerating cycles of Twin, Triple, Double twin.

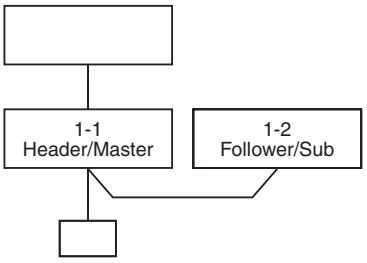
Sub unit (Subordinate unit) (Follower Twin) : Indoor units excluding the header unit in Twin, Triple, Double twin
This unit communicates with (Header) indoor unit in the identical line address and performs control synchronized with (Header) indoor unit.
This unit does not perform the signal send/receive operation with the outdoor units.:
N judgment for serial signal trouble.

### 11-2-1. System configuration

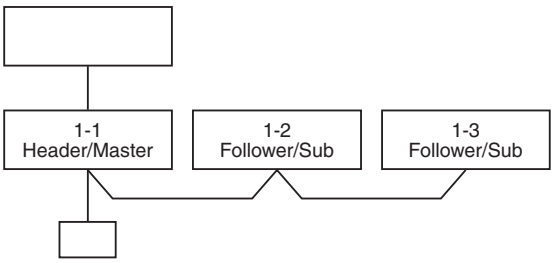
1. Single



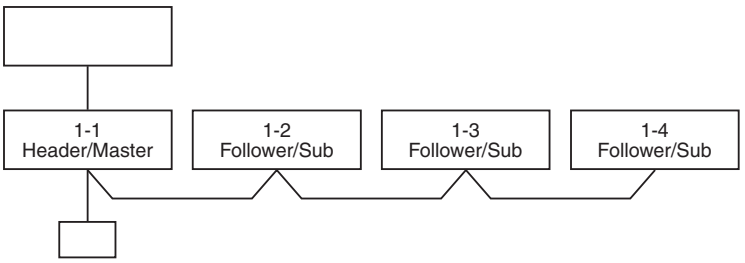

2. Twin



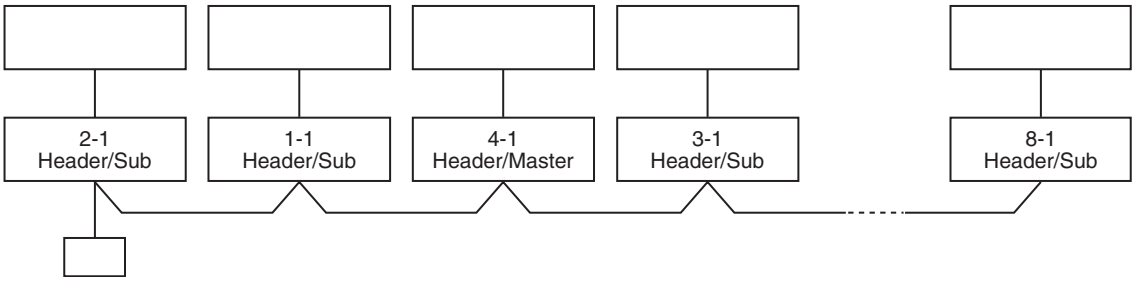

3. Triple



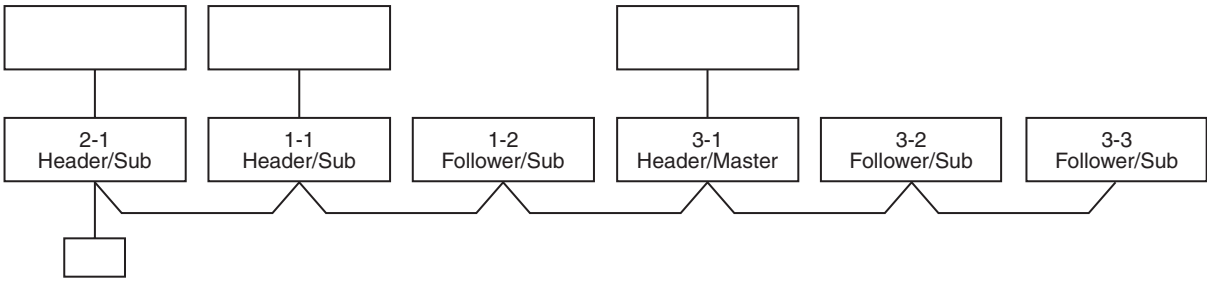

4. Double twin



4. Single group operation
   • Each indoor unit controls the outdoor unit individually.




5. Multiple groups operation (Manual address setting)



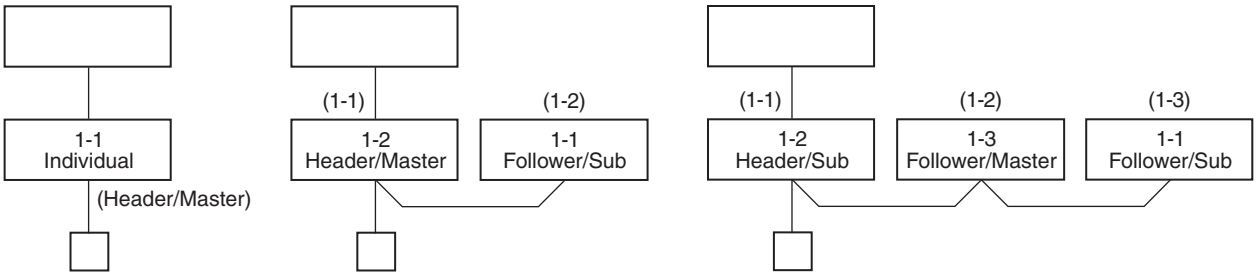

- Master unit: The master unit receives the indoor unit data (Thermostat status) of the sub (Without identical line address & indoor/outdoor serial) and then finally controls the outdoor compressor matching with its own thermostat status.
  The master unit sends this command information to the sub unit.
- Sub unit: The sub unit receives the indoor unit data from the master (With identical line address & indoor/outdoor serial) and then performs the thermostat operation synchronized with the master unit.
  The sub unit sends own thermostat ON/OFF demand to the master unit.

  **(Example)**

  No. 1-1 master unit sends/receives signal to/from No. 1-2 and No. 1-3 sub units.
  (It is not influenced by the line 2 or 3 address indoor unit.)

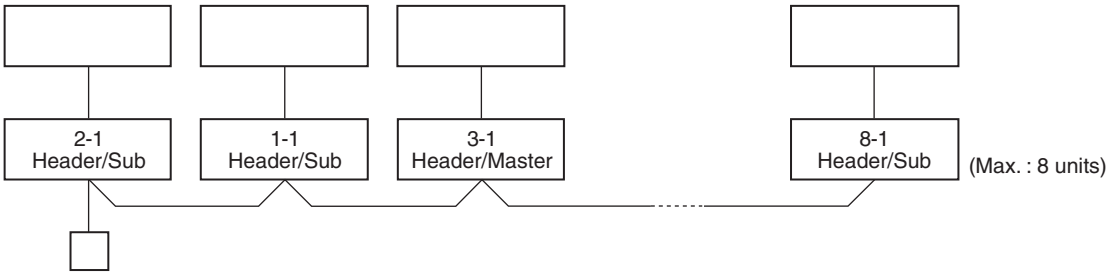
### 11-2-2. Automatic Address Example from Unset Address (No miswiring)

1. Standard (One outdoor unit)



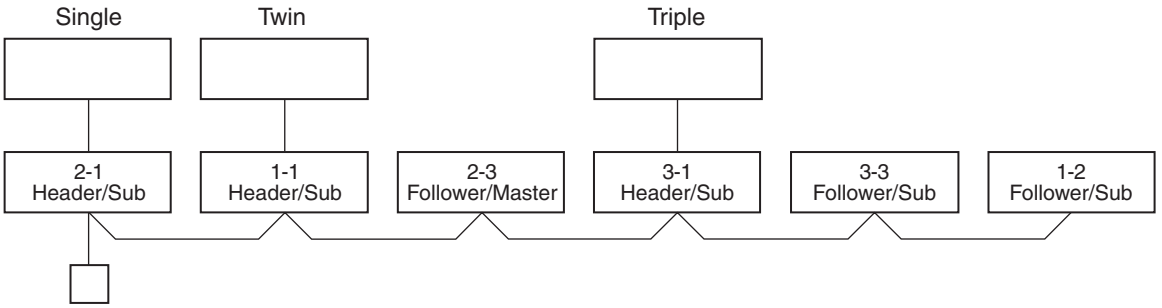

**Only turning on source power supply (Automatic completion)**

2. Group operation
   (Multiple outdoor units = Multiple indoor units with serial communication only, without twin)

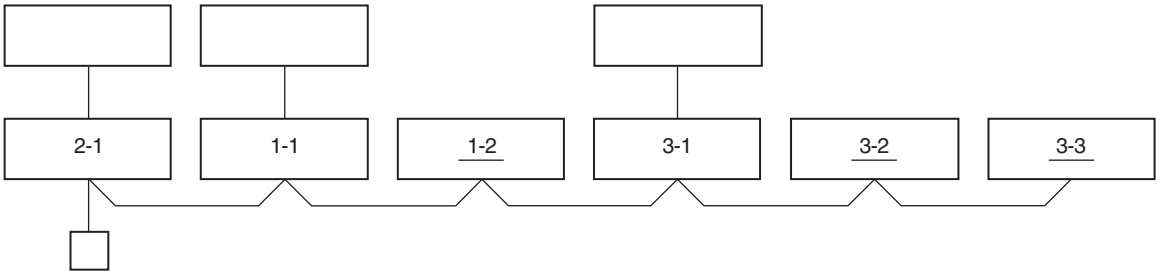



**Only turning on source power supply (Automatic completion)**

3. Multiple groups operation




**Change is necessary**
**Manually change addresses of the multiple sub units simultaneously from the remote controller.**

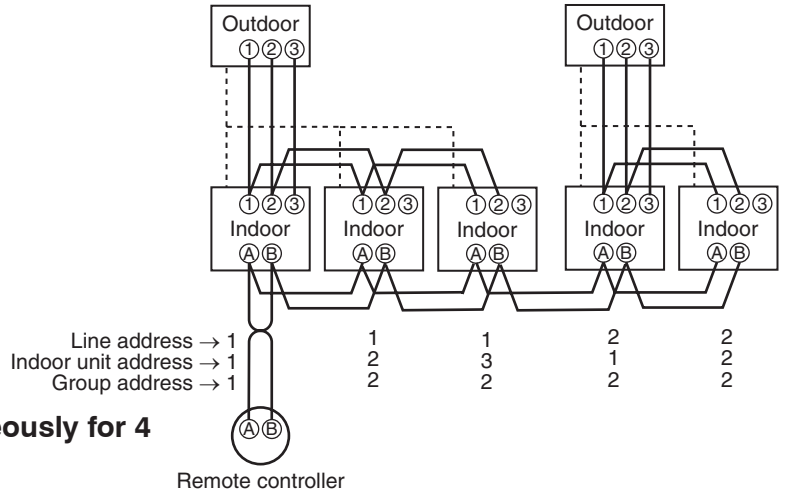


## 11-3. Address Setup (Manual Setting from Remote Controller)

**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 2-lines wiring)
(Solid 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 SET + CL + TEST buttons simultaneously for 4 seconds or more.**

***2*** **(Line address)**
**Using the temperature setup ▼ / ▲ buttons, set *12* to the CODE No.**

***3*** **Using timer time ▼ / ▲ buttons, set the line address.**

***4*** **Push SET button. (OK when display goes on.)**

***5*** **(Indoor unit address)**
**Using the temperature setup ▼ / ▲ buttons, set 13 to the CODE No.**

***6*** **Using timer time ▼ / ▲ buttons, set 1 to the line address.**

***7*** **Push SET button. (OK when display goes on.)**

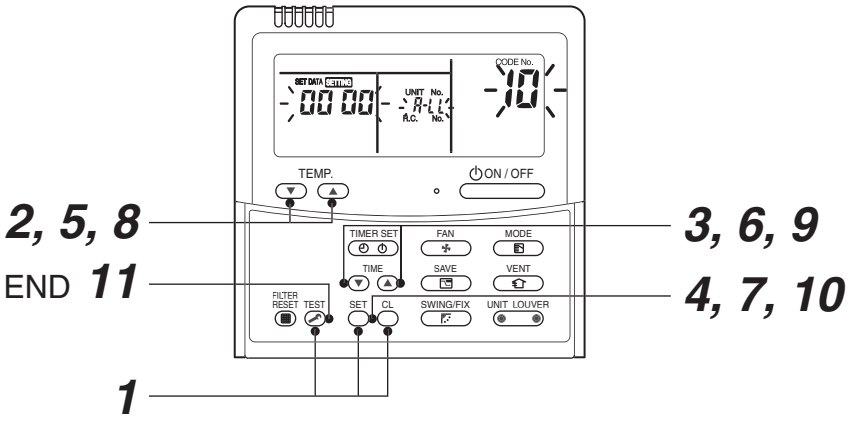
***8*** **(Group address)**
**Using the temperature setup ▼ / ▲ buttons, set 14 to the CODE No.**

***9*** **Using timer time ▼ / ▲ buttons, set 0000 to Individual, 0001 to Header unit, and 0002 to Follower unit.**

***10*** **Push SET button. (OK when display goes on.)**

***11*** **Push TEST button.**

Setup completes. (The status returns to the usual stop status.)




<Operation procedure>

***1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9 → 10 → 11*** END

## 11-4. Confirmation of Indoor Unit No. Position

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

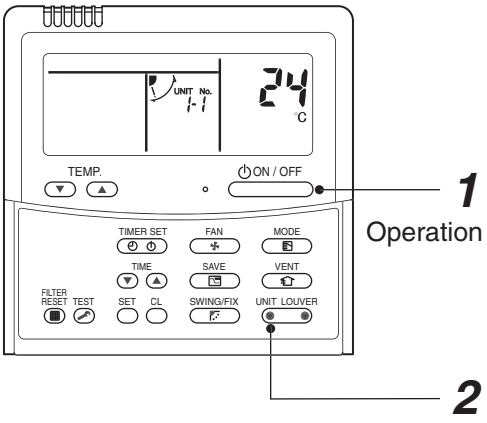
- In case of individual operation (Wired remote controller : indoor unit = 1 : 1)
  (Follow to the procedure during operation)

**<Procedure>**

***1*** **Push ON / OFF button if the unit stops.**

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

Unit No. 1-1 is displayed on LCD.
(It disappears after several seconds.)
The displayed unit No. indicate line address and indoor unit address. (When other indoor units are connected to the identical remote controller (Group control unit), other unit numbers are also displayed every pushing UNIT LOUVER button (button of the left side).




<Operation procedure>

***1*** → ***2*** END

### 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 and drain pump of the corresponding indoor unit are turned on.
(Follow to the procedure during operation)

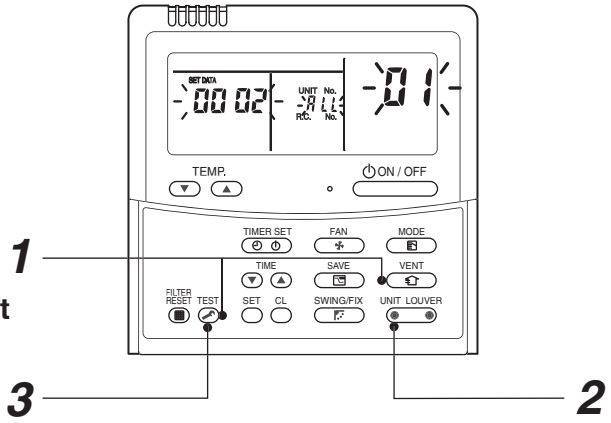
***1*** **Push VENT and TEST buttons simultaneously for 4 seconds or more.**

- Unit No. ALL is displayed.
- Fans of all the indoor units in the group control operate.

***2*** **Every pushing UNIT LOUVER button (button of the left side), the unit numbers in the group control are successively displayed.**

- The unit No. displayed at the first time indicates the header unit address.
- Fan of the selected indoor unit only operate.

***3*** **Push TEST button to finish the procedure. All the indoor units in the group control stop.**




<Operation procedure>

***1*** → ***2*** → ***3*** END

## <Maintenance/Check list>

Aiming in environmental preservation, it is strictly recommended to clean and maintain the indoor/outdoor units of the operating air conditioning system regularly to secure effective operation of the air conditioner.

It is also recommended to maintain the units once a year regularly when operating the air conditioner for a long time.

Check periodically signs of rust or scratches, etc. on coating of the outdoor units.

Repair the trouble position or apply the rust resisting paint if necessary.

If an indoor unit operates for approx. 8 hours or more per day, usually it is necessary to clean the indoor/outdoor units once three months at least.

These cleaning and maintenance should be carried out by a qualified dealer.

Although the customer has to pay the charge for the maintenance, the life of the unit can be prolonged.

Failure to clean the indoor/outdoor units regularly will cause shortage of capacity, freezing, water leakage or trouble on the compressor.

| Part name | Object | | Contents of check | Contents of maintenance |
|---|---|---|---|---|
| | Indoor | Outdoor | | |
| Heat exchanger | ✓ | ✓ | • Blocking with dust, damage check | • Clean it when blocking is found. |
| Fan motor | ✓ | ✓ | • Audibility for sound | • When abnormal sound is heard |
| Filter | ✓ | — | • Visual check for dirt and breakage | • Clean with water if dirty<br>• Replace if any breakage |
| Fan | ✓ | ✓ | • Visual check for swing and balance<br>• Check adhesion of dust and external appearance. | • Replace fan when swinging or balance is remarkably poor.<br>• If a large dust adheres, clean it with brush or water. |
| Suction/ Discharge grille | ✓ | — | • Visual check for dirt and scratch | • Repair or replace it if deformation or damage is found. |
| Drain pan | ✓ | — | • Check blocking by dust and dirt of drain water. | • Clean drain pan, Inclination check |
| Face panel, Louver | ✓ | — | • Check dirt and scratch. | • Cleaning/Coating with repair painting |
| External appearance | — | ✓ | • Check rust and pealing of insulator<br>• Check pealing and floating of coating film | • Coating with repair painting |

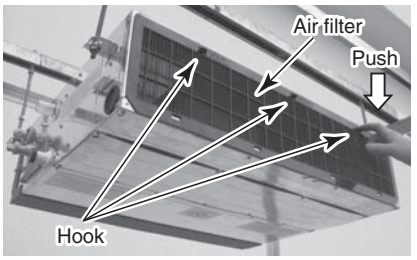
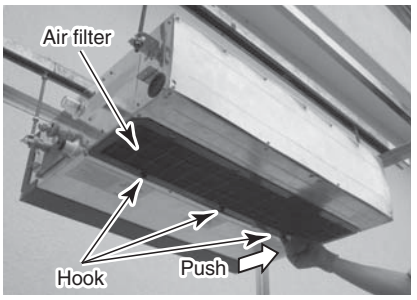
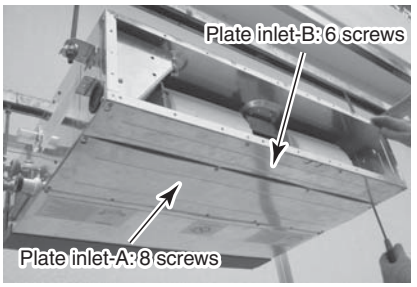
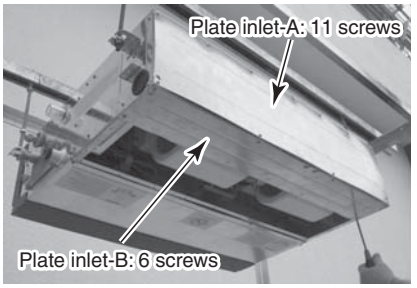
# 12. DETACHMENTS

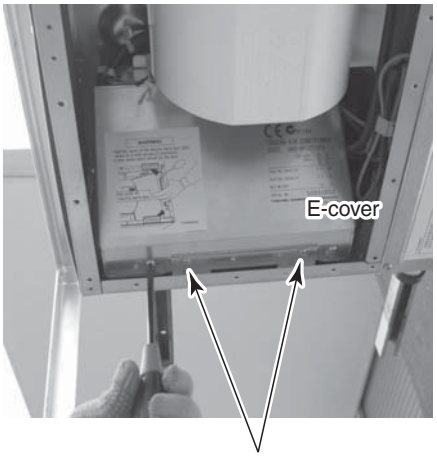
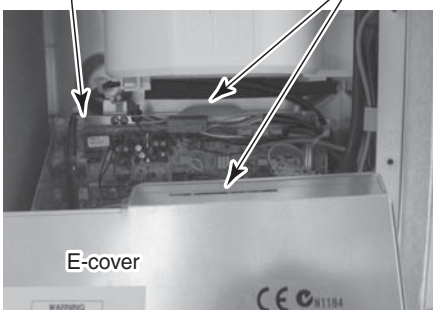
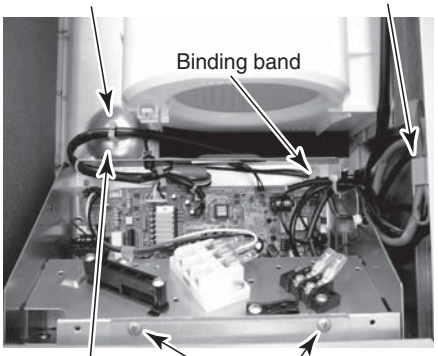
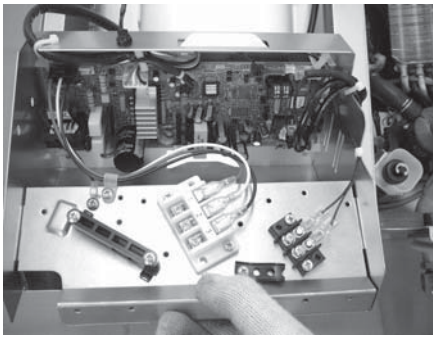
## ⚠ WARNING

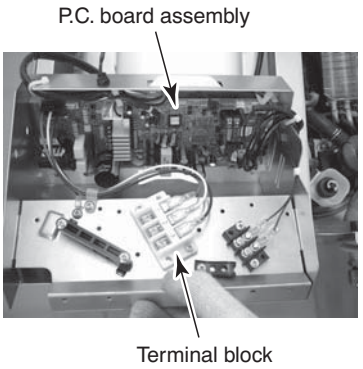
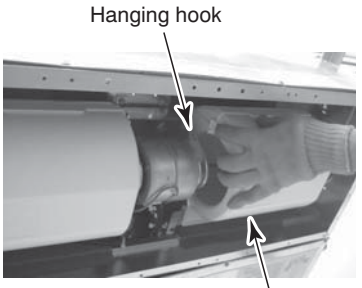
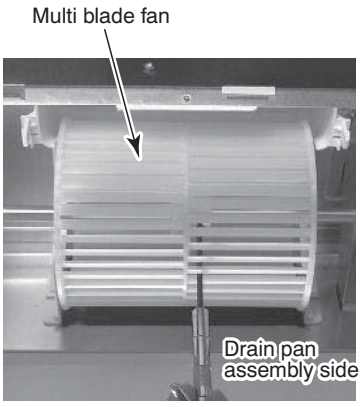
Be sure to stop operation of the air conditioner before work and then turn off switch of the breaker.

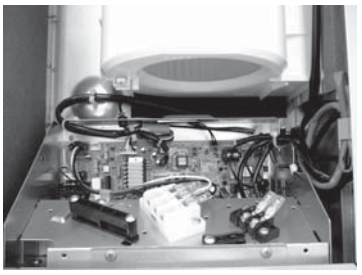
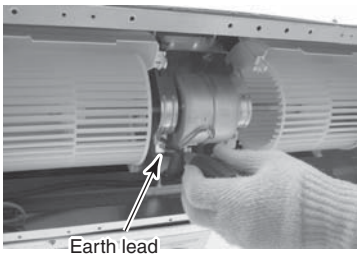
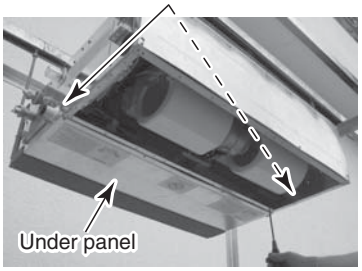
## ⚠ CAUTION

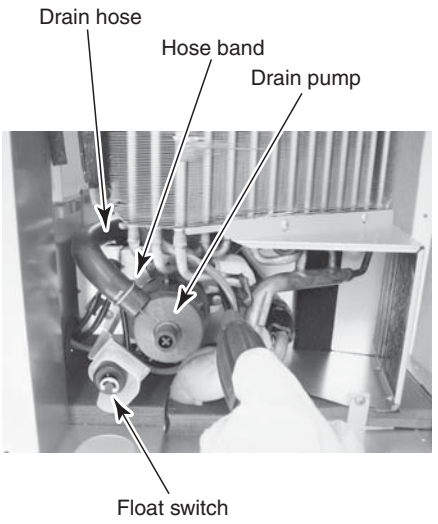
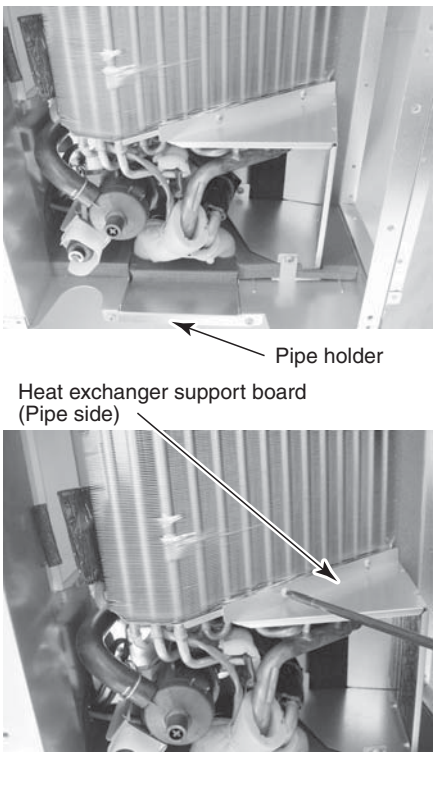
Be sure to put on gloves during working time; otherwise an injury will be caused by a part etc.

| No. | Part name | Procedure | Remarks |
|---|---|---|---|
| ① | Air Filter | **1. Detachment**<br>1) Push knobs (3 positions) of the air filter hooks toward the arrow direction to remove the air filter.<br>**2. Attachment**<br>1) Insert the air filter surely into the hooking grooves (4 positions) at the opposite side of the hooks, and then fix it to the original position.<br>**NOTE)**<br>In case of sucking system from bottom side, installation direction is determined. Install the air filter so that hooks are aligned at discharge side. | **[In case of sucking system from rear side]**<br>  <br><br>**[In case of sucking system from bottom side]**<br>  <br> |
| ② | Plate inlet-A<br>Plate inlet-B | **1. Detachment**<br>1) Take off fixing screws while holding the plate inlet-A with hands to remove it.<br>(Sucking system from rear side: DIA 4 × 10, 8 pcs)<br>(Sucking system from bottom side:<br>DIA 4 × 10, 11 pcs)<br>2) Take off fixing screws while holding the plate inlet-B with hands to remove it.<br>(DIA 4 × 10, 6 pcs)<br>**NOTE)**<br>Be careful that sheeting metal does not fall when removing the plate inlet.<br>**2. Attachment**<br>1) Using the screws taken off in procedure 1. 2) of ② , attach the plate inlets in order of B<br>→ A while holding them not to fall down. | **[In case of sucking system from rear side]**<br>  <br><br>**[In case of sucking system from bottom side]**<br>  <br> |

| No. | Part name | Procedure | Remarks |
|---|---|---|---|
| ③ | E-cover | **1. Detachment**<br>1) Perform work 1. of ② .<br>2) Take off screws fixing E-cover, and then remove hooks of the hooking part by lifting up. (DIA 4 × 10, 2 pcs)<br>**2. Attachment**<br>1) Hang on E-cover to hooks of the hooking part so that it does not fall down.<br>**NOTE)**<br>Be sure not to catch TA sensor in the E-cover; otherwise the equipment cannot operate correctly.<br>2) Using the screws taken off in procedure 1. 2) of ③ , attach E-cover while holding it with hands without clearance.<br>**NOTE)**<br>If there is clearance, dust may enter in the electric parts box. |  <br>2 screws<br>TA sensor Hooking part<br>  |
| ④ | E-box | **1. Detachment**<br>1) Perform works 1. of ② and 1. of ③ .<br>2) Remove clamps and binding band at upper part of the photo. (Drain pump incorporated model: 3 positions)<br>(Natural drain model: 2 positions)<br>3) Take off screws fixing E-box. (DIA 4 × 10, 2 pcs)<br>E-box does not fall down under condition that screws are taken off.<br>4) Remove the E-box over sheeting metal which was fixed with screws.<br>**2. Attachment**<br>1) Insert hooks of E-box into the hooking part of the main body.<br>2) Store E-box as before, and then attach it by using screws taken off in procedure 1. 3) of ④.<br>**NOTE)**<br>Be sure to fix surely as before the lead wires of which clamps and binding band were taken off.<br>**NOTE)**<br>Check that lead wires of the drain pump do not reach the fan so that they are not caught in the fan, and then fix them.<br>(In case of drain pump incorporated model) | Clamp Clamp<br>  <br>Drain pump 2 screws<br>Lead wire:<br>For only drain pump incorporated model<br>  |

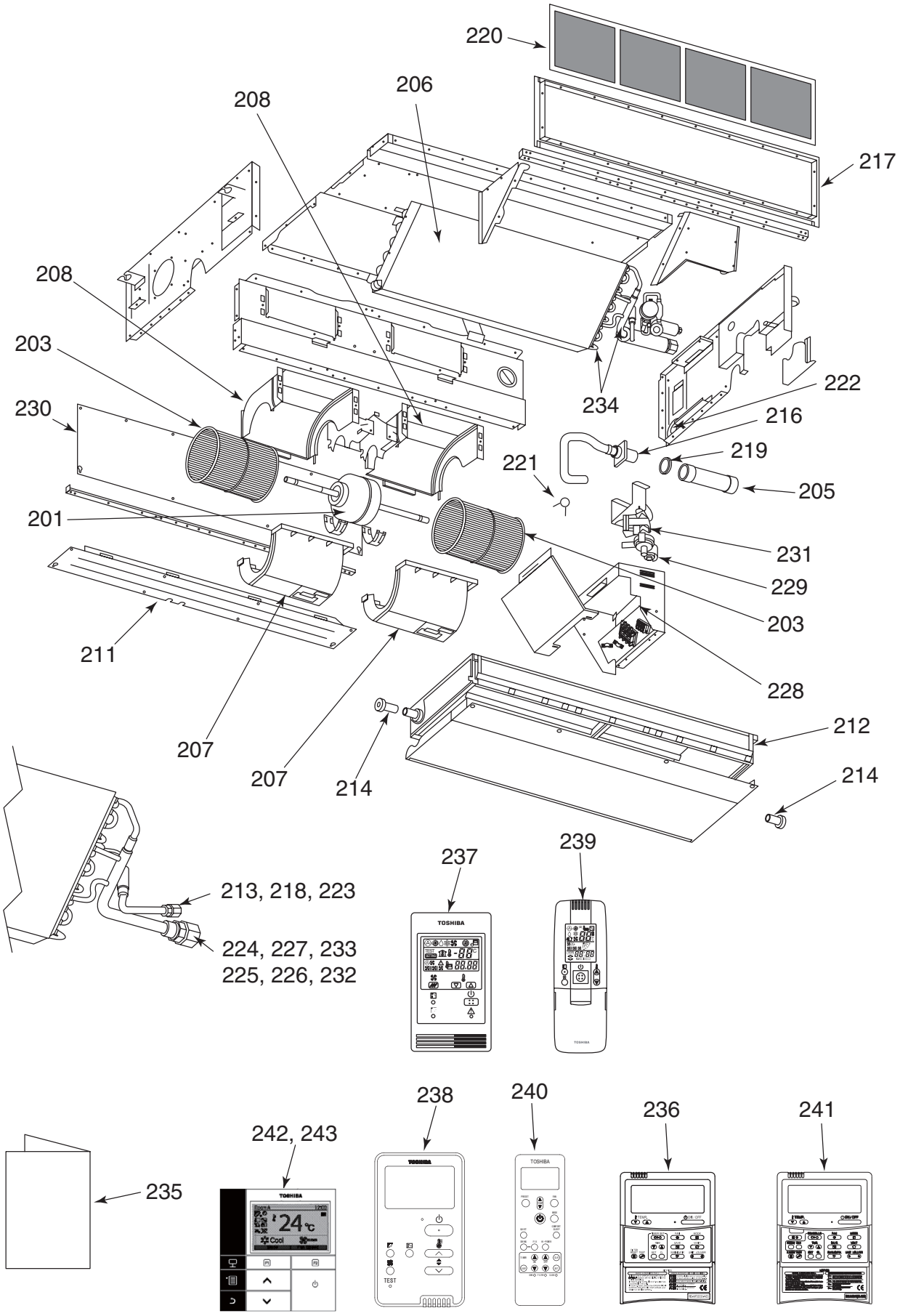
| No. | Part name | Procedure | Remarks |
|---|---|---|---|
| ⑤ | P.C. board assembly | **1. Detachment**<br>1) Perform works 1. of ②, 1. of ③, and 1. of ④.<br>2) Disconnect connectors which are connected from P.C. board assembly to other parts.<br>**NOTE)**<br>Unlock the lock of the housing to disconnect the connectors.<br>CN41 : Remote controller terminal (2P: Blue)<br>Remote controller terminal block: 2P<br>CN67 : Power supply terminal (3P: Black)<br>CN101 : TC sensor (2P: Black)<br>CN102 : TCJ sensor (2P: Red)<br>CN333 : Fan motor power supply (5P: White)<br>CN334 : Detection of fan motor position (3P: White)<br>**(In case of drain pump incorporated model)**<br>CN34 : Float SW (3P: Red)<br>CN504 : Drain pump lead (2P: White)<br>3) Unlock the lock of the card edge spacer, and then remove P.C. board assembly.<br>**2. Attachment**<br>1) Attach P.C. board assembly to the card edge spacer.<br>2) Using wires connect connectors as before, which were disconnected in procedure 1. 2) of ⑤ .<br>**NOTE)**<br>Check there is no missing or poor contact of the connectors. |  |
| ⑥ | Multi blade fan case, fan lower case,<br>fan upper case | **1. Detachment**<br>1) Perform work 1. of ② .<br>2) Take off hanging hooks at both sides of the lower fan case to remove fan lower case.<br>3) Remove the upper fan case while taking off hooks of fan upper case which are hooked to the partition board.<br>4) Loosen hexagonal hole screw of the multi blade fan to remove multi blade fan from the shaft. If necessary, remove multi blade fan and then remove fan upper case.<br>**2. Attachment**<br>1) Determine the position so that multi blade fan positions at the center of the fan upper case, and then fix it with hexagonal hole screw.<br>**NOTE)**<br>Arrange the multi blade fan so that screws position at the right side against the drain pan assembly.<br>**NOTE)**<br>Fix multi blade fan with torque wrench 4.9 N•m or more.<br>2) Hook the lower fan case as before and attach it with hooks.<br>**NOTE)**<br>Finally check whether the multi blade fan turns surely and smoothly or not. |  <br>  <br>Arrange the multi blade fan so that screws position at the right side against the drain pan assembly. |

| No. | Part name | Procedure | Remarks |
|---|---|---|---|
| ⑦ | Fan motor | **1. Detachment**<br>1) Perform works 1. of ②, 1. of ③, and 1. of ⑥.<br>2) Remove lead wires which are connected to the following connectors of P.C. board assembly.<br>**NOTE)**<br>Unlock locks of the housing, and then remove the connectors.<br>CN333 : Fan motor power supply (5P: White)<br>CN334 : Detection of fan motor (3P: White)<br>Remove binding band which fixes lead wires.<br>3) Remove the noise filter from lead wire to detect fan motor position.<br>4) Take off screws of fan motor fixing bracket. Earth wires of the motor are tightened together. (DIA 5 × 10, 2 pcs) Remove binding band which fixes the lead wires.<br>5) Remove fixing bracket of the fan motor by holding it with hands so that the fan motor does not fall down. |  <br>  |
| | | **2. Attachment**<br>1) Mount the fan motor as before in order, Fan motor → Fixing bracket of fan motor → Noise filter → Lead wire process → E-cover.<br>**NOTE)**<br>Check there is no missing or poor contact of the connectors. Check also that the multi blade fan turns surely and smoothly, and check together-tightening of motor earth. | |
| ⑧ | Under panel Drain pan assembly | **1. Detachment**<br>1) Take off the drain cap and drain the drain water accumulated in the drain pan assembly. In case of natural drain model, drain the drain water by taking off hose band and drain hose.<br>**NOTE)**<br>When taking off drain cap and drain hose, be sure receive drain water in a bucket, etc.<br>2) Take off screws fixing the under panel while holding it to remove. (DIA 4 × 10, 8 pcs)<br>**NOTE)**<br>Be careful that sheeting metal does not fall when removing the under panel.<br>3) Pull out the drain pan assy. by holding handle at lower part.<br>**NOTE)**<br>When pulling out the drain pan assy, never pull out the drain socket by drawing it with hands. If doing so, water leak may be caused.<br>4) Pull out it to some extent, lay hand on the bump at suction side, and then remove the drain pan assembly.<br>**2. Attachment**<br>1) Hook and attach the drain pan assy. to the flange at discharge side, and then push in.<br>2) Using screws taken off in procedure 1. 2) of ⑧ , attach under panel by holding with hands.<br>3) Attach drain cap, hose band, and drain hose as before, which were taken off in procedure 1. 1) of ⑧.<br>**NOTE)**<br>Finally, be sure to check there is no water leakage from each attached part. | Drain cap or drain hose<br>  <br>  <br>  <br>Never hold and pull the drain socket.<br>  |

| No. | Part name | Procedure | Remarks |
|---|---|---|---|
| ⑨ | Drain pump, Float switch, Drain hose | **1. Detachment**<br>1) Perform works in procedures 1. of ②, 1. of ③, 1. of ⑧ .<br>2) Disconnect lead wires which are connected to the following connectors of P.C. board assembly.<br>**NOTE)**<br>Unlock locks of the housing to remove the connectors.<br>CN34 : float SW (3P: Red)<br>CN504 : Drain pump lead (2P: White)<br>3) Loosen hose band, remove cap of the drain hose, and take off screws while holding drain pump. Remove them with care that pipes are not damaged. (DIA 4 × 10, 3 pcs)<br>4) Take off screws while holding metal on float switch.<br>Remove them with care so that pipes are not damaged. (DIA 4 × 10, 1 pc)<br>**NOTE)**<br>If the pipes are damaged, refrigerant leak may be caused. Take out them with great care.<br>**2. Attachment**<br>1) Attach ASSY sheeting metal which was removed in procedure 1. 3) of ⑨ with care that pipes are not damaged, and then fix it with screws.<br>2) Insert the drain hose into the inlet of drain pump, and then fix it with hose band. Arrange handle of the hose band at contrary side of heat exchanger side and at direction remote from drain pan assembly.<br>3) Carry out wiring as before, and then perform work of procedure 2. of ⑧ .<br>**NOTE)**<br>Finally check whether they correctly operate or not. |  |
| ⑩ | Evaporator assembly | **1. Detachment**<br>1) Recover refrigerant, and then remove refrigerant pipes at indoor unit side.<br>2) Perform works of procedures 1. of ② , 1. of ③ , 1. of ⑧ .<br>Remove sensors.<br>3) Take off screws of the pipe holder, and remove the pipe holder. (DIA 4 × 10, 2 pcs)<br>4) Take off screws of the heat exchanger support board (Pipe side), and remove the heat exchanger support board (Pipe side). (DIA 4 × 10, 4 pcs)<br>5) Take off screws of the heat exchanger support board (Opposite side) which fixes terminal block of the evaporator assembly. (DIA 4 × 10, 2 pcs)<br>6) Remove the evaporator assembly.<br>**2. Attachment**<br>1) Fasten the parts as before in order, Evaporator assembly → Pipe holder → Set sensors → Drain pan assembly → Under panel.<br>2) Connect the refrigerant pipe as before, and then perform vacuuming. |  |

# 13. EXPLODED VIEWS AND PARTS LIST

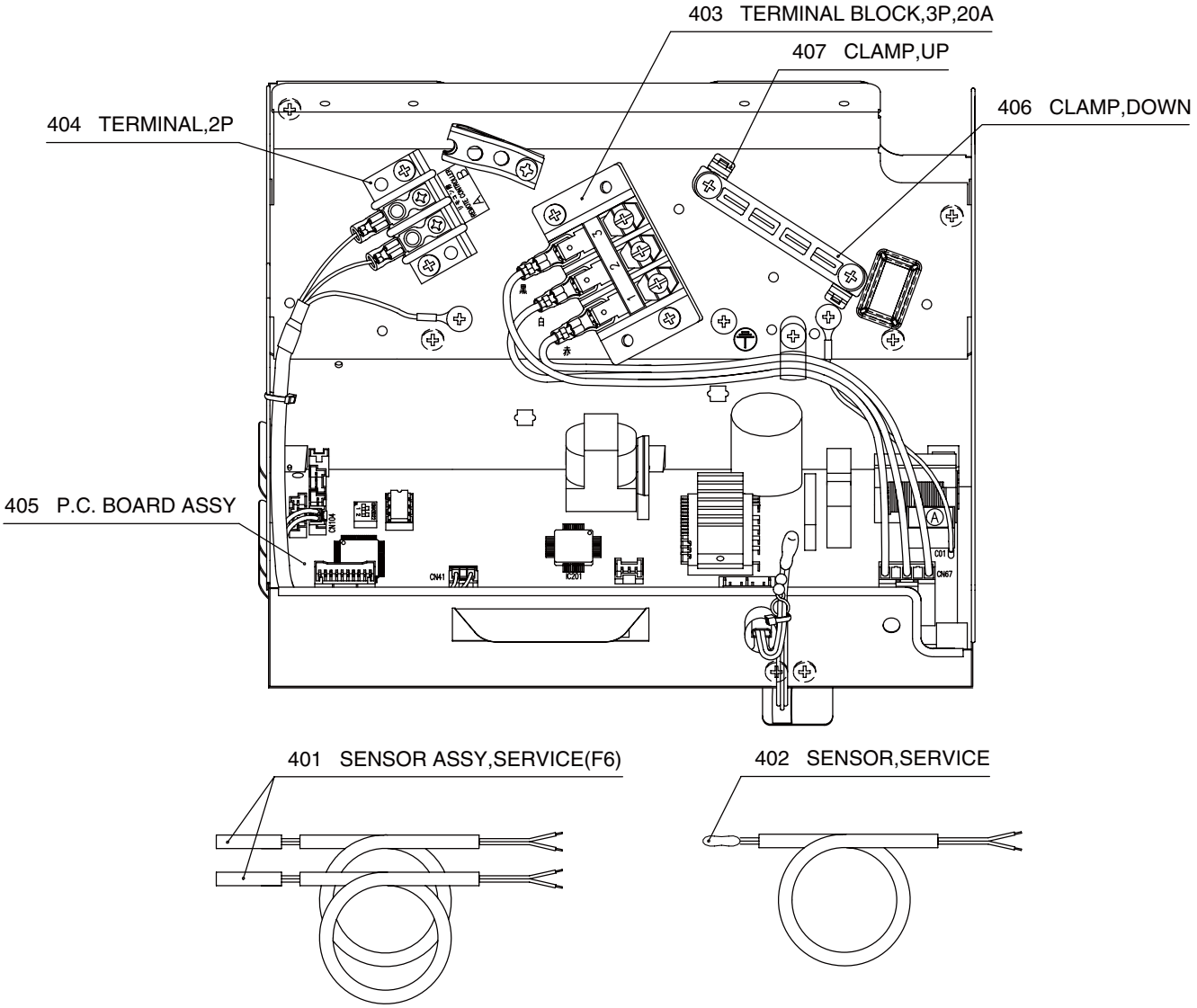
**RAV-RM301SDT-E (TR), RM401SDT-E (TR), RM561SDT-E( TR)**



| Location No. | Part No. | Description | Q'ty/Set RAV-RM | | |
|---|---|---|---|---|---|
| | | | 301SDT-E | 401SDT-E | 561SDT-E |
| 201 | 4312C040 | MOTOR, FAN | 1 | 1 | 1 |
| 203 | 43120257 | FAN, MULTI BLADE | 2 | 2 | 2 |
| 205 | 43170244 | HOSE, DRAIN | 1 | 1 | 1 |
| 206 | 4314J575 | REFRIGERATION CYCLE ASSY | 1 | | |
| 206 | 4314J576 | REFRIGERATION CYCLE ASSY | | 1 | 1 |
| 207 | 43122175 | CASE,FAN,LOWER | 2 | 2 | 2 |
| 208 | 43122176 | CASE,FAN,UPPER | 2 | 2 | 2 |
| 211 | 43100319 | PLATE, INLET-B | 1 | 1 | 1 |
| 212 | 43172183 | PAN ASSY, DRAIN | 1 | 1 | 1 |
| 213 | 43149497 | SOCKET,1/4,IN | 1 | 1 | 1 |
| 214 | 43179129 | CAP DRAIN | 2 | 2 | 2 |
| 216 | 43170240 | HOSE, DRAIN | 1 | 1 | 1 |
| 217 | 43100321 | FLANGE | 1 | 1 | 1 |
| 218 | 43F49697 | BONNET,1/4,IN | 1 | 1 | 1 |
| 219 | 43179149 | BAND, HOSE | 1 | 1 | 1 |
| 220 | 43180327 | AIR FILTER | 1 | 1 | 1 |
| 221 | 43079249 | BAND, HOSE | 1 | 1 | 1 |
| 222 | 43196109 | BUSHING | 2 | 2 | 2 |
| 223 | 43149499 | NUT,FLARE,1/4,IN | 1 | | |
| 224 | 43149500 | NUT,FLARE,3/8,IN | 1 | | |
| 225 | 43149501 | NUT,FLARE,1/2,IN | | 1 | 1 |
| 226 | 43149494 | SOCKET,1/2,IN | | 1 | 1 |
| 227 | 43149498 | SOCKET,3/8,IN | 1 | | |
| 228 | 43F60029 | FILTER,NOISE | 1 | 1 | 1 |
| 229 | 43151302 | SWITCH, FLOAT, FS-0218-102 | 1 | 1 | 1 |
| 230 | 43100320 | PLATE, INLET-A | 1 | 1 | 1 |
| 231 | 43177012 | PUMP, DRAIN, MDP-1401 | 1 | 1 | 1 |
| 232 | 43047692 | BONNET,1/2,IN | | 1 | 1 |
| 233 | 43F47609 | BONNET,3/8,IN | 1 | | |
| 234 | 43F19904 | HOLDER, SENSOR (TS) | 2 | 2 | 2 |
| 235 | 431S8342 | OWNERS MANUAL | 1 | 1 | 1 |
| 236 | 43166011 | REMOTE CONTROLLER, SX-A4EE | 1 | 1 | 1 |
| 237 | 43166004 | REMOTE CONTROLLER, SX-A11JE2 | 1 | 1 | 1 |
| 238 | 43166022 | REMOTE CONTROLLER, SX-U01EE | | 1 | 1 |
| 239 | 43166006 | REMOTE CONTROLLER, WH-H1JE2 | 1 | 1 | 1 |
| 240 | 43166018 | REMOTE CONTROLLER, WIRELESS, WH-L11SE | 1 | | |
| 241 | 43166012 | REMOTE CONTROLLER, SX-A5EE | 1 | 1 | 1 |
| 242 | 43166036 | REMOTE CONTROLLER, RBC-AMS55E-EN | 1 | 1 | 1 |
| 243 | 43166037 | REMOTE CONTROLLER, RBC-AMS55E-ES | 1 | 1 | 1 |

| Location No. | Part No. | Description | Q'ty/Set RAV-RM | | |
|---|---|---|---|---|---|
| | | | 301SDT-TR | 401SDT-TR | 561SDT-TR |
| 201 | 4312C040 | MOTOR, FAN | 1 | 1 | 1 |
| 203 | 43120257 | FAN, MULTI BLADE | 2 | 2 | 2 |
| 205 | 43170244 | HOSE, DRAIN | 1 | 1 | 1 |
| 206 | 4314J575 | REFRIGERATION CYCLE ASSY | 1 | | |
| 206 | 4314J576 | REFRIGERATION CYCLE ASSY | | 1 | 1 |
| 207 | 43122175 | CASE,FAN,LOWER | 2 | 2 | 2 |
| 208 | 43122176 | CASE,FAN,UPPER | 2 | 2 | 2 |
| 211 | 43100319 | PLATE, INLET-B | 1 | 1 | 1 |
| 212 | 43172183 | PAN ASSY, DRAIN | 1 | 1 | 1 |
| 213 | 43149497 | SOCKET,1/4,IN | 1 | 1 | 1 |
| 214 | 43179129 | CAP DRAIN | 2 | 2 | 2 |
| 216 | 43170240 | HOSE, DRAIN | 1 | 1 | 1 |
| 217 | 43100321 | FLANGE | 1 | 1 | 1 |
| 218 | 43F49697 | BONNET,1/4,IN | 1 | 1 | 1 |
| 219 | 43179149 | BAND, HOSE | 1 | 1 | 1 |
| 220 | 43180327 | AIR FILTER | 1 | 1 | 1 |
| 221 | 43079249 | BAND, HOSE | 1 | 1 | 1 |
| 222 | 43196109 | BUSHING | 2 | 2 | 2 |
| 223 | 43149499 | NUT,FLARE,1/4,IN | 1 | | |
| 224 | 43149500 | NUT,FLARE,3/8,IN | 1 | | |
| 225 | 43149501 | NUT,FLARE,1/2,IN | | 1 | 1 |
| 226 | 43149494 | SOCKET,1/2,IN | | 1 | 1 |
| 227 | 43149498 | SOCKET,3/8,IN | 1 | | |
| 228 | 43F60029 | FILTER,NOISE | 1 | 1 | 1 |
| 229 | 43151302 | SWITCH, FLOAT, FS-0218-102 | 1 | 1 | 1 |
| 230 | 43100320 | PLATE, INLET-A | 1 | 1 | 1 |
| 231 | 43177012 | PUMP, DRAIN, MDP-1401 | 1 | 1 | 1 |
| 232 | 43047692 | BONNET,1/2,IN | | 1 | 1 |
| 233 | 43F47609 | BONNET,3/8,IN | 1 | | |
| 234 | 43F19904 | HOLDER, SENSOR (TS) | 2 | 2 | 2 |
| 235 | 431S8345 | OWNERS MANUAL | 1 | 1 | 1 |
| 236 | 43166011 | REMOTE CONTROLLER, SX-A4EE | 1 | 1 | 1 |
| 237 | 43166004 | REMOTE CONTROLLER, SX-A11JE2 | 1 | 1 | 1 |
| 238 | 43166022 | REMOTE CONTROLLER, SX-U01EE | | 1 | 1 |
| 239 | 43166006 | REMOTE CONTROLLER, WH-H1JE2 | 1 | 1 | 1 |
| 240 | 43166018 | REMOTE CONTROLLER, WIRELESS, WH-L11SE | 1 | | |
| 241 | 43166012 | REMOTE CONTROLLER, SX-A5EE | 1 | 1 | 1 |
| 242 | 43166036 | REMOTE CONTROLLER, RBC-AMS55E-EN | 1 | 1 | 1 |
| 243 | 43166037 | REMOTE CONTROLLER, RBC-AMS55E-ES | 1 | 1 | 1 |

**<E-parts assembly>**




| Location No. | Part No. | Description | Q'ty/Set RAV-RM | | |
|---|---|---|---|---|---|
| | | | 301SDT-E 301SDT-TR | 401SDT-E 401SDT-TR | 561SDT-E 561SDT-TR |
| 401 | 43050425 | SENSOR ASSY, SERVICE, TC (F6) | 2 | 2 | 2 |
| 402 | 43F50426 | SENSOR, SERVICE, TA | 1 | 1 | 1 |
| 403 | 43160565 | TERMINAL BLOCK, 3P, 20A | 1 | 1 | 1 |
| 404 | 43160568 | TERMINAL, 2P | 1 | 1 | 1 |
| 405 | 4316V657 | PC BOARD ASSY, MCC-1570 | 1 | 1 | 1 |
| 406 | 43163057 | CLAMP, DOWN | 1 | 1 | 1 |
| 407 | 43163058 | CLAMP, UP | 1 | 1 | 1 |

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| | | | |
|---|---|---|---|
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| Revision 2 | Description of parts list was changed. | Page 93, 94 | Apr., 2021 |