TOSHIBA
Leading Innovation

AIR CONDITIONER (MULTI TYPE)
Installation Manual

Indoor Unit
Model name: ________ For commercial use

Concealed Duct Type Fresh Air Intake Unit
MMD-AP0481HFE
MMD-AP0721HFE
MMD-AP0961HFE
Thank you for purchasing this Toshiba air conditioner. Please read carefully through these instructions that contain important information which complies with the 'Machinery' Directive (Directive 2006/42/EC), and ensure that you understand them. After completing the installation work, hand over this Installation Manual as well as the Owner’s Manual attached to the outdoor unit provided with the outdoor unit to the user, and ask the user to keep them in a safe place for future reference.

Generic Denomination: Air Conditioner

Definition of Qualified Installer or Qualified Service Person

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

<table>
<thead>
<tr>
<th>Agent</th>
<th>Qualifications and knowledge which the agent must have</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualified installer</td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
</tbody>
</table>

| 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. |
|                              | • The qualified service person who is allowed to do the electrical work involved in installation, repair, relocation and removal has the qualifications pertaining to this electrical work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to electrical work on the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. |
|                              | • The qualified service person who is allowed to do the refrigerant handling and piping work involved in installation, repair, relocation and removal has the qualifications pertaining to this refrigerant handling and piping work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to refrigerant handling and piping work on the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. |
|                              | • The qualified service person who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. |
Definition of Protective Gear
When the air conditioner is to be transported, installed, maintained, repaired or removed, wear protective gloves and ‘safety’ work clothing.
In addition to such normal protective gear, wear the protective gear described below when undertaking the special work detailed in the table below. Failure to wear the proper protective gear is dangerous because you will be more susceptible to injury, burns, electric shocks and other injuries.

<table>
<thead>
<tr>
<th>Work undertaken</th>
<th>Protective gear worn</th>
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<tbody>
<tr>
<td>All types of work</td>
<td>Protective gloves, ‘Safely’ working clothing</td>
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<tr>
<td>Electrical-related work</td>
<td>Gloves to provide protection for electricians and from heat</td>
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<tr>
<td>Insulating shoes</td>
<td>Clothing to provide protection from electric shock</td>
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<tr>
<td>Work done at heights (50 cm or more)</td>
<td>Helmets for use in industry</td>
</tr>
<tr>
<td>Transportation of heavy objects</td>
<td>Shoes with additional protective toe cap</td>
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<tr>
<td>Repair of outdoor unit</td>
<td>Gloves to provide protection for electricians and from heat</td>
</tr>
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</table>

Warning indications on the air conditioner unit

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

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

**WARNING**

**General**
- Before starting to install the air conditioner, read through the Installation Manual carefully, and follow its instructions to install the air conditioner.
- Only a qualified installer or service person is allowed to do installation work. Inappropriate installation may result in water leakage, electric shock or fire.
- Do not use any refrigerant different from the one specified for complement or replacement. Otherwise, abnormally high pressure may be generated in the refrigeration cycle, which may result in a failure or explosion of the product or an injury to your body.
- 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. 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 carrying out the installation, maintenance, repair or removal work, set the circuit breaker to the OFF position. Otherwise, electric shocks may result.
- Place a “Work in progress” sign near the circuit breaker while the installation, maintenance, repair or removal work is being carried out. There is a danger of electric shocks if the circuit breaker is set to ON by mistake.
- Only a qualified installer(1) or qualified service person(1) is allowed to undertake work at heights using a stand of 50 cm or more or to remove the intake grille of the indoor unit to undertake work.
- Wear protective gloves and safety work clothing during installation, servicing and removal.
- Do not touch the aluminium fins of the unit. You may injure yourself if you do so. If the fins must be touched for some reason, first put on protective gloves and safety work clothing, and then proceed.
- Do not climb onto or place objects on top of the outdoor unit. You may fall or the objects may fall off of the outdoor unit and result in injury.
- When work is performed 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.
- Before cleaning the filter or other parts of the outdoor 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.
- Before working at heights, put a sign in place so that no-one will approach the work location, before proceeding with the work. Parts and other objects may fall from above, possibly injuring a person below. While carrying out the work, wear a helmet for protection from falling objects.
- The refrigerant used by this air conditioner is the R410A.
- The air conditioner must be transported in stable condition. If any part of the product is broken, contact the dealer.
- When the air conditioner must be transported by hand, carry it by two or more people.
- Do not move or repair any unit by yourself. There is high voltage inside the unit. You may get electric shock when removing the cover and main unit.

**Selection of installation location**
- When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occurs in the room does not exceed the critical level.
- Do not install in a location where flammable gas leaks are possible. If the gas leak and accumulate around the unit, it may ignite and cause a fire.
- To transport the air conditioner, wear shoes with additional protective toe caps.
- Do not transport the air conditioner, do not take hold of the bands around the packing carton. You may injure yourself if the bands should break.
- 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.
- Do not place any combustible appliance in a place where it is directly exposed to the wind of air conditioner, otherwise it may cause imperfect combustion.

Installation
- Suction duct length must be longer than 850 mm.
- When the indoor unit is to be suspended, the designated hanging bolts (M10 or W3/8) and nuts (M10 or W3/8) must be used.
- Install the air conditioner securely in a location where the base can sustain the weight adequately. If the strength is not enough, the unit may fall down resulting in injury.
- Follow the instructions in the Installation Manual to install the air conditioner. Failure to follow these instructions may cause the product to fall down or topple over or give rise to noise, vibration, water leakage or other trouble.
- Carry out the specified installation work to guard against the possibility of high winds and earthquake. If the air conditioner is not installed appropriately, a unit may topple over or fall down, causing an accident.
- If refrigerant gas has leaked during the installation work, ventilate the room immediately. If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- Use fork lift to carry in the air conditioner units and use winch or hoist at installation of them.
- Helmet must be worn to protect your head from falling objects. Especially, when you work under an inspection opening, helmet must be worn to protect your head from falling objects from the opening.
- The unit can be accessed from the service panel.

Refrigerant piping
- Install the refrigerant pipe securely during the installation work before operating the air conditioner. If the compressor is operated with the valve open and without refrigerant pipe, the compressor sucks air and the refrigeration cycles is over pressurized, which may cause a injury.
- Tighten the flare nut with a torque wrench in the specified manner. Excessive tighten of the flare nut may cause a crack in the flare nut after a long period, which may result in refrigerant leakage.
- 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, noxious gas may be generated.
- 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.
- Nitrogen gas must be used for the airtight test.
- The charge hose must be connected in such a way that it is not slack.
- Do not connect earth wires to gas pipes, water pipes, and lightning conductor or telephone earth wires.
- 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, noxious gas may be generated.
- 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.
- Nitrogen gas must be used for the airtight test.
- The charge hose must be connected in such a way that it is not slack.

Electrical wiring
- 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.
- To connect the electrical wires, repair the electrical parts or undertake other electrical jobs, wear gloves to provide protection for electricians and from heat, insulating shoes and clothing to provide protection from electric shocks.
- Failure to wear this protective gear may result in electric shocks.
- 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.
- Connect earth wire. (Grounding work)
- Do not connect earth wires to gas pipes, water pipes, and lightning conductor or telephone earth wires.
- After completing the repair or relocation work, check that the earth wires are connected properly.
- 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.
- When installing the circuit breaker outdoors, install one which is designed to be used outdoors.
- Under no circumstances the power wire must not be extended. Connection trouble in the places where the wire is extended may give rise to smoking and / or a fire.
- Electrical wiring work shall be conducted according to law and regulation in the community and installation manual.
- Failure to do so may result in electrocution or short circuit.
Test run
• 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.
• If there is any kind of trouble (such as an error display has appeared, smell of burning, abnormal sounds, 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 trouble.
• After the work has finished, use an insulation tester set (500 V Megger) to check the resistance is 1 MΩ or more between the charge section and the non-charge metal section (Earth section). If the resistance value is low, a disaster such as a leak or electric shock is caused at user’s side.
• Upon completion of the installation work, check for refrigerant leaks and check the insulation resistance and water drainage. Then conduct a test run to check that the air conditioner is operating properly.

Explanations given to user
• Upon completion of the installation work, tell the user where the circuit breaker is located. If the user does not know where the circuit breaker is, he or she will not be able to turn it off in the event that trouble has occurred in the air conditioner.
• If 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(*1) 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 or other gas to be sucked in, raising the pressure inside the refrigeration cycle to an abnormally high level, and possibly resulting in rupture, injury or other trouble.

CAUTION
New Refrigerant Air Conditioner Installation
• THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.
• The characteristics of R410A refrigerant are; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, do not let water, dust, former refrigerant, or refrigerating oil enter the refrigerating cycle during installation work.
• To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are changed from those for the conventional refrigerant.
• Accordingly the exclusive tools are required for the new refrigerant (R410A).
• For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter.

To Disconnect the Appliance from Main Power Supply.
• This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

The installation fuse (all types can be used) must be used for the power supply line of this conditioner.

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

<table>
<thead>
<tr>
<th>Part name</th>
<th>Q'ty</th>
<th>Shape</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner’s Manual</td>
<td>1</td>
<td>—</td>
<td>(Be sure to hand over to customers)</td>
</tr>
<tr>
<td>Installation Manual</td>
<td>1</td>
<td>This manual</td>
<td>(Be sure to hand over to customers)</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>1</td>
<td>—</td>
<td>Installation Manual</td>
</tr>
<tr>
<td>Heat insulator</td>
<td>1</td>
<td>—</td>
<td>For heat insulation of Gas pipe connecting section</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>—</td>
<td>For heat insulation of Liquid pipe connecting section</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>—</td>
<td>For heat insulation of hanging bracket</td>
</tr>
</tbody>
</table>

**NOTE**
The wired remote controller must be connected. Settings cannot be made for systems without remote controls.

3 System control of fresh air intake unit

■ System able to be combined

The fresh air intake unit is connectable to SMMS (Super Modular Multi system). However this is not connectable to SHRM (Super Heat Recovery Multi system).

- Keep the height difference between the fresh air intake units to 0.5 m or less.
  - The fresh air intake unit is usually used together with the indoor units on one line of the multi system. The fresh air intake unit only cannot be connected.
  - The total capacity of the indoor units and the fresh air intake units is restricted to 80 % to 100 % against the capacity of the outdoor units. (This restriction should be strictly kept for correct control of the refrigerant.)
  - Up to two fresh air intake units can be connected on one line of the multi system. The allowable total capacity of the two fresh air intake units shall be 30 % or less against the total capacity of the indoor units (including the fresh air intake units).

Connection which stretches over two floors is unavailable units
4 Selection of installation place

Avoid installing in the following places.

Select a location for the indoor unit where the cool or warm air will circulate evenly.

Avoid installation in the following kinds of locations.
• Locations where inside the ceiling is used as route for fresh air.
• Saline area (coastal area)
• Locations with acidic or alkaline atmospheres (such as areas with hot springs, factories where chemicals or pharmaceuticals are made and places where the exhaust air from combustion appliances will be sucked into the unit).

Doing so may cause the heat exchanger (its aluminum fins and copper pipes) and other parts to become corroded.
• Locations with atmospheres with mist of cutting oil or other types of machine oil.

Doing so may cause the heat exchanger to become corroded, mists caused by the blockage of the heat exchanger to be generated, the plastic parts to be damaged, the heat insulators to peel off, and other such problems to result.
• Places where iron or other metal dust is present. If iron or other metal dust adheres to or collects on the interior of the air conditioner, it may spontaneously combust and start a fire.
• Locations where vapors from food oils are formed (such as kitchens where food oils are used).

Blocked filters may cause the air conditioner’s performance to deteriorate, condensation to form, the plastic parts to be damaged, and other such problems to result.
• Locations near obstructions such as ventilation openings or lighting fixtures where the flow of the blown air will be disrupted (a disruption of the air flow may cause the air conditioner’s performance to deteriorate or the unit to shut down).
• Locations where an in-house power generator is used for the power supply.

The power line frequency and voltage may fluctuate, and the air conditioner may not work properly as a result.
• On truck cranes, ships or other moving conveyances.
• The air conditioner must not be used for special applications (such as for storing food, plants, precision instruments or art works).

The quality of the items stored may be degraded.
• Locations where high frequencies are generated (by inverter equipment, in-house power generators, medical equipment or communication equipment).

(Malfunctioning or control trouble in the air conditioner or noise may adversely affect the equipment’s operation.)
• Locations where there is anything under the unit installed that would be compromised by wetness.

(If the drain has become blocked or when the humidity is over 80 %, condensation from the indoor unit will drip, possibly causing damage to anything underneath.)
• Locations where organic solvents are being used.
• The air conditioner cannot be used for liquefied carbonic acid cooling or in chemical plants.
• Location near doors or windows where the air conditioner may come into contact with high-temperature, high-humidity outdoor air.

(Condensation may occur as a result.)
• Locations where special sprays are used frequently.

— Installation space —

Keep the space necessary for installation and service.

**REQUIREMENT**

1. Before installation of the unit, mount the accessories sold separately (Drain-up kit, etc.) to the unit.

In addition to the air intake panel, set also the check port at the side face.
2. The check port should be 600 × 600 mm.

Unit: mm

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**Installation under atmosphere of the high humidity**

Although it has been confirmed that no trouble occurs on the unit, there is a fear of drip of the water if operation under high humidity condition continues.

In some cases including the rainy season, especially inside of the ceiling may become high-humidity atmosphere (dew-point temperature: 30 °C (humidity: 80 %) or higher).

1. Installation to inside of the ceiling with tiles on the roof.
2. Installation to inside of the ceiling with slated roof.
3. Installation to inside of the ceiling with kitchen.

• In the above cases, additionally attach the heat insulator (Glass wool, etc.) to all positions of the air conditioner, which come to contact with the high-humidity atmosphere.

In this case, arrange the side plate (Service panel) so that it is easily removed.
• Apply also heat insulating a sufficient thickness 10 mm or more to the duct and connecting part of the duct.
5 Installation

WARNING

Install the air conditioner certainly to sufficiently withstand the weight. If the strength is insufficient, the unit may fall down resulting in human injury. Perform a specified installation work to guard against strong wind or earthquake. An incomplete installation can cause accidents by the units falling and dropping.

REQUIREMENT

Strictly comply with the following rules to prevent damage of the indoor units and human injury.

• Do not put a heavy article on the indoor unit. (Even units are packaged)
• Carry in the indoor unit as it is packaged if possible.
• If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to not damage the unit.
• To move the indoor unit, hold the hooking metals (4 positions) only.
• Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts, etc.).
• Carry the package by two or more persons, and do not bundle it with PP band at positions other than specified.
• Use a forklift to transport materials. Do not drag or push the package because it is made of cardboard.
• If the vibration insulator is applied to the hanging bolt, make sure it does not cause larger vibration in the main unit before using it.

External view

Installing the four 10 mm-diameter hanging bolts

• Space the hanging bolts according to the dimensions shown in the diagrams below.
• Use 10 mm-diameter hanging bolts (Required at the site).

External view

Unit: mm

<table>
<thead>
<tr>
<th>Model MMD-</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
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<tbody>
<tr>
<td>AP048</td>
<td>892</td>
<td>810</td>
<td>Ø9.5 flare</td>
<td>Ø15.9 flare</td>
</tr>
<tr>
<td>AP072-AP096</td>
<td>1392</td>
<td>1260</td>
<td>Ø12.7 flare</td>
<td>Ø22.2 brazing</td>
</tr>
</tbody>
</table>

Considering piping and wire connecting works in the ceiling after hanging down the indoor unit, select an installation place and then determine the drawing-out direction of the pipes.

• If the ceiling has been already set, draw the refrigerant pipe, drain pipe, inter-unit wire between indoor and outdoor units, central control system wire and remote controller cord up to the positions where wires and pipes are connected before hanging down the indoor unit.

External view

Model MMD-

New concrete slab

Steel frame structure

Existing concrete slab

Installation of hanging bolt

Use M10 hanging bolts (4 pcs, locally procured).

Hanging up of unit

• Adjust the nut position (lower side).
• Hang up the main unit by hanging nut of hanging bolt to T groove of hanging bracket of the indoor unit.
• Using the level vial, etc., check that four sides are horizontal. (Horizontal degree: within 5 mm)
• Attach canvas ducts (locally procured) to the air intake and the air discharge so that vibration of the main unit does not travel to the duct or ceiling. Attach also acoustic-absorption material to the inner liner of the duct and the vibration-proof rubber to the hanging bolt.

Installation of ceiling

The ceiling differs according to structure of building. For details, consult your constructor or interior finish contractor.

In the process after the ceiling board has been removed, it is important to reinforce ceiling foundation (frame) and to keep horizontal level of installed ceiling correctly in order to prevent vibration of ceiling board.

Treatment of ceiling

The ceiling differs according to structure of building. For details, consult your constructor or interior finish contractor.

In the process after the ceiling board has been removed, it is important to reinforce ceiling foundation (frame) and to keep horizontal level of installed ceiling correctly in order to prevent vibration of ceiling board.

Hanging up of unit

• Adjust the nut position (lower side).
• Hang up the main unit by hanging nut of hanging bolt to T groove of hanging bracket of the indoor unit.
• Using the level vial, etc., check that four sides are horizontal. (Horizontal degree: within 5 mm)
• Attach canvas ducts (locally procured) to the air intake and the air discharge so that vibration of the main unit does not travel to the duct or ceiling. Attach also acoustic-absorption material to the inner liner of the duct and the vibration-proof rubber to the hanging bolt.

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Installation of indoor unit

1 Install temporarily the indoor unit.
   Attach the hanging bracket to the hanging bolt. Be sure to fix the hanging bracket from both up and down sides of the hanging bracket by using the nuts (M10 locally procured) and the washer.

2 Using nut, adjust height of the main unit.

3 Check the main unit is horizontally installed.
   Attach canvas ducts (locally procured) to the air intake and the air discharge so that vibration of the main unit does not travel to the duct or ceiling. Attach also acoustic-absorption material to the inner liner of the duct and the vibration-proof rubber to the hanging bolt.

REQUIREMENT
Make sure that the unit is hanging level. If it is hung horizontally, the drain pan may overflow. Install the unit within the dimensions indicated below.

6 Duct work

CAUTION
Be sure to apply heat insulation to the duct to prevent dewy condition. If there is an incomplete duct work, the water leakage into the room may happen.

REQUIREMENT
• In order to prevent short circuits, design the duct work so that the intake and discharge openings are not adjacent to each other.
• Install the filter chamber on the intake side of the indoor unit. Attach the long life prefilter and high-efficiency filter to the filter chamber to remove dust. Send fresh air to the air intake of the indoor unit and the area being air conditioned.
• If no air filter is installed, dust will collect in the heat exchanger, which may cause the air conditioner to fail or to leak.
• Be sure to set the duct at air intake side with descending inclination because the suction duct of the this unit is exposed to outdoors and therefore rainwater, leaves and birds are easy to enter in if it is set horizontally. Attaching wire netting and others to end of the suction duct is also recommended.
• Connect the duct so that the air intake sucks fresh air only. Be sure to apply heat insulation for the duct to prevent dewing.
   (Recommended material: Glass wool or foam polyethylene, Thickness: 25 mm)
• When welding the duct at the site, sparks may enter in the air filter or heat insulator. To avoid spread of the fire, cover the duct with iron plate, etc.
• When penetrating metal lath, wire lath or metal plank with the metal duct, isolate the duct from the wall electrically.
• Set the canvas ducts at air intake port and air supply port. It is to avoid conveyance of vibration, abnormal resonance sound and also to make easy the disassembly of the main unit in service time.
• If no air filter is installed, dust will collect in the heat exchanger, which may cause the air conditioner to fail or to leak. Be sure to set the duct at air intake side with descending inclination because the suction duct of the this unit is exposed to outdoors and therefore rainwater, leaves and birds are easy to enter in if it is set horizontally. Attaching wire netting and others to end of the suction duct is also recommended.
• Connect the duct so that the air intake sucks fresh air only. Be sure to apply heat insulation for the duct to prevent dewing.
   (Recommended material: Glass wool or foam polyethylene, Thickness: 25 mm)
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• Set the canvas ducts at air intake port and air supply port. It is to avoid conveyance of vibration, abnormal resonance sound and also to make easy the disassembly of the main unit in service time.
• Connect the ducts so that the ducts do not weight on the main unit.
• Connect the ducts so that the ducts do not weight on the main unit. If connecting the ducts directly to the main unit, the duct vibration abnormal sound from the main unit may happen, and also the filter and service panel cannot be detached.
• Be sure to fix the ducts by using the hanging bolts.

Duct work

After installing the product, perform the duct work according to the working diagram.
Connecting flange

Refer to size in the figure attached to the main unit.

**<MMD-AP048 type>**
Air supply port connecting flange

**<MMD-AP072 type, AP096 type>**
Air supply port connecting flange

**<Air intake port connecting flange>**

**<Air intake port connecting flange>**

**REQUIREMENT**

If the air conditioner unit and the canvas joint are connected with the rivets, the fan and the refrigerating cycle cannot be checked.

Be sure to use the flange as shown in the above and tighten it by the bolts.
(Fixing bolts M6 x 12 mm, locally procured)

---

**Example of construction**

1. **Air intake duct**
   - Connect the air intake duct (Locally procured) to the inlet flange.
   - Wrap aluminum tape around connecting part between the air intake port flange and duct, or provide sealer so that air does not leak.
   - For the fresh air intake port, attach a hood so that fresh air is sucked from lower side.
   - And attach wire netting, etc. to the air intake of the hood.
   - Set the air intake duct at descending inclination so that water can be drained even if rainwater enters in.
   - Wrap the outside of the intake duct with heat insulator because it intakes cold air while heating.

2. **Air supply duct**
   - Connect the air supply duct (Locally procured) to the Air supply flange.
   - Wrap aluminum tape around connecting part of the air supply port flange and duct or apply packing so that air does not leak.

---

Wall

*1: Locally procured

Heat insulator *1
Long life prefilter (Sold separately)
High-efficiency filter (Sold separately)

Air supply duct *1
Air supply flange *1
Air intake flange *1
Heat insulator *1
Canvas duct *1
Product main unit
(Sold separately)
Filter chamber
Canvas duct *1
Hood (with wire netting)
Check port (600 × 600)
7 Fan characteristics

Fan characteristics

<MMD-AP048 type>
(Standard air volume: 1080 m³/h, Lower limit air volume: 756 m³/h, Upper limit air volume: 1188 m³/h)

REQUIREMENT
Set a volume damper to the air supply duct, and then adjust the air volume so that it is kept in the range of 70 to 110 % against the standard air volume.

<MMD-AP072 type>
(Standard air volume: 1680 m³/h, Lower limit air volume: 1176 m³/h, Upper limit air volume: 1848 m³/h)

REQUIREMENT
Set a volume damper to the air supply duct, and then adjust the air volume so that it is kept in the range of 70 to 110 % against the standard air volume.
<MMD-AP096 type>
(Standard air volume: 2100 m³/h, Lower limit air volume: 1470 m³/h, Upper limit air volume: 2310 m³/h)

**REQUIREMENT**
Set a volume damper to the air supply duct, and then adjust the air volume so that it is kept in the range of 70 to 110% against the standard air volume.

**Wire connection change of fan motor**

The motor wires for the fan have been connected to at shipment from the factory. Change the wire connection if change of the external static pressure is required due to the duct resistance.

### Table: Terminal block No. & Fan motor wiring

<table>
<thead>
<tr>
<th>Terminal block No.</th>
<th>Fan motor wiring</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1 (Low static pressure tap)</td>
<td>Blue (50 / 60 Hz)</td>
<td>—</td>
</tr>
<tr>
<td>F2 (Middle static pressure tap)</td>
<td>Orange (50 / 60 Hz)</td>
<td>At shipment from factory</td>
</tr>
<tr>
<td>F3 (High static pressure tap)</td>
<td>Black (50 / 60 Hz)</td>
<td>—</td>
</tr>
</tbody>
</table>

**REQUIREMENT**

When the external static pressure was changed, enter the changed static pressure value in the identification plate of the unit.
Drain piping

CAUTION

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

REQUIREMENT

- The drain piping flows the natural drainage. Make sure to set the drain piping from the unit with descending slope of 1/50 to 1/100 and do not make up-down or trap in the midway.
- Set the horizontal pulling of the drain pipe to 20 m or less. When drain piping is too long, attach the support bracket at intervals of 1.5 m to 2 m to avoid the pipe becomes undulant as shown in figure below.

<Example for installation of the main piping (Incl. piping support)>

1.5 to 2 m

Descending slop of 1/50 to 1/100

As long as possible

Descending slop of 1/50 to 1/100

VP-30

Up-down bend

Trap

Be sure to connect the drain pipe to the air conditioner with adhesive to avoid water leakage from the joint portion.
- Condensation may occur on the drain pipes including collective pipes. All drain pipes must be wrapped with heat insulator to prevent dew condensation. Especially a part where drain pipe is connected to the indoor unit must be firmly insulated with the provided heat insulator.

Pipe material, size and insulator

The following materials for piping work and insulating process are locally procured.

<table>
<thead>
<tr>
<th>Pipe material</th>
<th>Hard vinyl chloride pipe socket for VP25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
<td>Foamed polyethylene foam, thickness: 10 mm or more</td>
</tr>
</tbody>
</table>

Connecting drain pipe

REQUIREMENT

- Using adhesive agent for vinyl chloride, connect the hard vinyl chloride pipes certainly so that water does not leak.
- It takes some time to dry and indurate the adhesive agent. (Refer to the manual of adhesive agent.) Do not apply any extra force on the connecting section until the adhesive agent dried.

Drain up

When install the drain up kit of optional accessory, read the Installation Manual supplied to a drain up kit.

Check the draining

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

- Be sure to check draining even if installing the unit in heating season.
- Using a kettle or hose, pour water gradually from the drain pan at the air supply port.
9 Refrigerant piping

---

### CAUTION

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

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

Use general copper pipes with a wall thickness of 0.8 mm for Ø12.7 mm, and with a wall thickness of 1.0 mm for Ø22.2 mm (half hard). Do not use any copper pipes with a wall thickness less than these thicknesses.

### Permissible piping length and height difference

They vary depending on the outdoor unit. For details, refer to the Installation Manual attached to the outdoor unit.

### Pipe size

<table>
<thead>
<tr>
<th>Model</th>
<th>MMD-</th>
<th>AP048</th>
<th>AP072, AP096</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe size (mm)</td>
<td>Gas side</td>
<td>Ø15.9</td>
<td>Ø22.2</td>
</tr>
<tr>
<td></td>
<td>Liquid side</td>
<td>Ø9.5</td>
<td>Ø12.7</td>
</tr>
</tbody>
</table>

- The pipe (Ø22.2 mm) at gas side is connected with brazing.

### Liquid side refrigerant pipe connection

#### Flaring

1. Cut the pipe with a pipe cutter.
   (Remaining burrs may cause gas leakage.)

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

<table>
<thead>
<tr>
<th>Outer dia. of copper pipe</th>
<th>A (Unit: mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5</td>
<td>13.2</td>
</tr>
<tr>
<td>12.7</td>
<td>16.6</td>
</tr>
<tr>
<td>15.9</td>
<td>19.7</td>
</tr>
</tbody>
</table>

- In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that for R22 to adjust to the specified flare size. The copper pipe gauge is useful for adjusting projection margin size.
- The sealed gas was sealed at the atmospheric pressure so when the flare nut is removed, there will be no “whooshing” sound: This is normal and is not indicative of trouble.
- Use two wrenches to connect the indoor unit pipe.

#### Work using double spanner

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

<table>
<thead>
<tr>
<th>Outer dia. of connecting pipe (mm)</th>
<th>Tightening torque (N•m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5</td>
<td>33 to 42 (3.3 to 4.2 kgf•m)</td>
</tr>
<tr>
<td>12.7</td>
<td>50 to 62 (5.0 to 6.2 kgf•m)</td>
</tr>
<tr>
<td>15.9</td>
<td>63 to 77 (6.3 to 7.7 kgf•m)</td>
</tr>
</tbody>
</table>

### Gas side refrigerant pipe connection

- The brazing connections on the gas side are AP072 and AP096 models.
- Turn up the pipe heat insulator to the unit side.
- Wrap the pipe with wet cloth.

#### CAUTION

- Tightly connect the joint part using double spanner (approx. 2.0 to 2.5 N•m = 20 to 25 kgf•mm).
- Do not burn the pipe heat insulator.

---

### Airtight test / air purge, etc.

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

### CAUTION

Do not supply power to the indoor unit until the airtight test and vacuuming are completed. (If the indoor unit is powered on, the pulse motor valve is fully closed, which extends the time for vacuuming.)

### Open the valve fully

Open the valve of the outdoor unit fully.

### Heat insulation process

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

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

#### REQUIREMENT

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

**WARNING**

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

**CAUTION**

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

**REQUIREMENT**

- For power supply wiring, strictly conform to the Local Regulation in each country.
- For wiring of power supply of the outdoor units, follow the Installation Manual of each outdoor unit.
- After connecting wires to the terminal blocks, provide a trap and fix wires with the cord clamp.
- Run the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the indoor unit until vacuuming of the refrigerant pipes completes.

### Power supply wire and communication wires specifications

Power supply wire and communication wires are locally procured.

For the power supply specifications, follow to the table below. If capacity is little, it is dangerous because overheat or burnout may be caused.

For specifications of the power capacity of the outdoor unit and the power supply wires, refer to the Installation Manual attached to the outdoor unit.

#### Indoor unit power supply

- For the power supply of the indoor unit, prepare the exclusive power supply separated from that of the outdoor unit.
- Arrange the power supply, circuit breaker, and main switch of the indoor unit connected to the same outdoor unit so that they are commonly used.
- Power supply wire specification: Cable 3-core 2.5 mm², in conformity with Design 60245 IEC 57.

### Control wiring, Central controller wiring

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

#### Communication line

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

#### CAUTION

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

**CAUTION**

The fresh air intake unit and indoor unit for air conditioning cannot be controlled as a group.

**NOTE**

An outdoor unit connected with control wiring between indoor and outdoor units wire becomes automatically the header unit.

▼ **Wiring example**

- **Outdoor power supply**: 380-415 V~, 50 Hz
- **Indoor unit for air-conditioning**: 220-240 V~, 50 Hz
- **Remote controller wiring**: Strip off approx. 9 mm the wire to be connected.

**Wiring diagram**

- **Terminal block for remote controller wiring**: Terminal block for remote controller wiring of indoor unit (Locally procured)
- **Remote controller unit**: Remote controller unit

**Remote controller wiring**

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

**Address setup**

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

**Wire connection**

**REQUIREMENT**

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

- Remove the cover of the electrical control box by taking off the mounting screws (2 positions).
- Tighten the screws of the terminal block, and fix the wires with cord clamp attached to the electrical control box.
  (Do not apply tension to the connecting section of the terminal block.)
- Set a loop for the connecting wire of the storing part of the indoor unit electrical control; otherwise the electrical control box cannot be drawn out in service time.
- Mount the cover of the electrical control box without pinching wires.

- **Control wiring between outdoor units**: Outdoor unit connected with control wiring between indoor and outdoor units wire becomes automatically the header unit.
- **Control wiring between indoor units**: Indoor unit for air-conditioning.
- **Control wiring between indoor and outdoor units**: Remote controller wiring (A, B terminals)
- **Earth wire**
- **Power supply wire**
11 Applicable controls

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

Concerning the automatic addresses (The automatic addresses are set up by performing operations on the outdoor interface circuit board.) While the automatic addresses are being set up, no remote controller operations can be performed. Setup takes up to 10 minutes (usually about 5 minutes).

When the power is turned on after automatic address setup, it takes up to 10 minutes (usually about 3 minutes) for the outdoor unit to start operating after the power has been turned on. Before the air conditioner was shipped from the factory, all units are set to [STANDARD] (factory default). If necessary, change the indoor unit settings.

The settings are changed by operating the wired remote controller.

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

Basic procedure for changing settings

Change the settings while the air conditioner is not working. (Stop the air conditioner before making settings.)

**CAUTION**

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

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

* The displays appearing during the setting process differ from the ones for previous remote controllers (AMT31E). (There are more CODE No.)

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

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

2. Each time  button is pushed, indoor unit numbers in the control group change cyclically. Select the indoor unit to change settings for.

   The fan of the selected unit runs and the louvers start swinging. The indoor unit for change settings can be confirmed.

3. Specify CODE No. with “TEMP.” / buttons.

4. Select SET DATA with “TIME” / buttons.

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

   - To change settings of another indoor unit, repeat from Procedure 2.

   - To change other settings of the selected indoor unit, repeat from Procedure 3.

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

6. When settings have been completed, push  button to determine the settings.

   - When  button is pushed,  flashes and then the display content disappears and the air conditioner enters the normal stop mode. (While  is flashing, no operation of the remote controller is accepted.)

Filter sign setting

According to the installation condition, the filter sign term (Notification of filter cleaning) can be changed. Follow to the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6).

- For the CODE No. in Procedure 3, specify [01].
- For the [SET DATA] in Procedure 4, select the SET DATA of filter sign term from the following table.

<table>
<thead>
<tr>
<th>SET DATA</th>
<th>Filter sign term</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>None</td>
</tr>
<tr>
<td>0001</td>
<td>150 H</td>
</tr>
<tr>
<td>0002</td>
<td>2500 H (Factory default)</td>
</tr>
<tr>
<td>0003</td>
<td>5000 H</td>
</tr>
<tr>
<td>0004</td>
<td>10000 H</td>
</tr>
</tbody>
</table>

Setting the level of dirtiness for the filter

The time when the filter indicator lights can be changed to half depending on the level of dirtiness.

Follow to the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6). Perform the operation.

- Specify [02] for the CODE No. in Procedure 3.
- The SET DATA in Procedure 4 is [0001].

<table>
<thead>
<tr>
<th>SET DATA</th>
<th>Filter sign term</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>Normal</td>
</tr>
<tr>
<td>0001</td>
<td>Half</td>
</tr>
</tbody>
</table>

Group control

In a group control, a remote controller can control up to maximum 8 units. The fresh air intake unit and indoor unit for air conditioning cannot be controlled as a group.

- For wiring procedure and wires of the individual line (identical refrigerant line) system, refer to “Electrical connection” in this Manual.
- Wiring between indoor units in a group is performed in the following procedure.
- Connect the indoor units by connecting the remote controller wires from the remote controller terminal blocks (A, B) of the indoor unit connected with a remote controller to the remote controller terminal blocks (A, B) of the other indoor unit. (Non-polarity)
- For address setup, refer to the Installation Manual attached to the outdoor unit.
12 Test run

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

Execute a test run
- When a fan operation is to be performed for an individual indoor unit, turn off the power, short CN72 on the circuit board, and then turn the power back on. (First set the operating mode to "fan," and then operate.) When the test run has been performed using this method, do NOT forget to release the shorting of CN72 after the test run is completed.
- Operate the unit with the wired remote controller as usual.

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

1 Push \[\text{ON-OFF}\] button for 4 seconds or more. [TEST] is displayed on the display part and the selection of mode in the test mode is permitted.
2 Push \[\text{ON-OFF}\] button.

3 Select the operation mode with \[\text{COOL}\] button, [\text{Cool}] or [\text{Heat}].
   - Do not run the air conditioner in a mode other than [\text{Cool}] or [\text{Heat}].
   - The temperature controlling function does not work during test run.
   - The detection of error is performed as usual.

4 After the test run, push \[\text{ON-OFF}\] button to stop a test run.
   (Display part is same as procedure 1.)
5 Push \[\text{ON-OFF}\] button to cancel (release from) the test run mode.
   ([TEST] disappears on the display and the status returns to a normal.)

Requirements for turning thermostat OFF

Cooling operation
- When the outside air temperature is lower than or equal to 19 °C.
- When the outside air temperature is lower than or equal to 3 °C above the set temperature.

Heating operation
- When the outside air temperature is lower than or equal to -5 °C.
- When the outside air temperature is higher than or equal to 15 °C.
- When the outside air temperature is higher than or equal to 3 °C above the set temperature.
<Daily maintenance>

Cleaning of air filter
If □ is displayed on the remote controller, maintain the air filter.

1) Push the button to stop the operation, then turn off the circuit breaker.

2) Take out the air filter.

3) Long life prefilter
   Remove dust with a vacuum cleaner or rinse it off with water.
   • If excessively dirty, it can be cleaned effectively by washing it with a soft brush and neutral detergent.
   • After washing with water, drain off the water and dry it in the shade.

High-efficiency filter
Replace it when it is time for replacement.
• When cleaning the long life prefilter, check the dust collecting status and the reduction in air volume for the high-efficiency filter, then replace the prefilter when it is time for replacement (approximately 2500 hours of operation is recommended).
Note that the high-efficiency filter cannot be washed with water and reused.
However, the lifetime of the high-efficiency filter may be shortened depending on the intake air condition.

NOTE
• Do not wash with water that is over 50 °C. This may cause discoloration or deformation.
• Do not expose to fire. Doing so could cause a fire.
• The factory default of the filter indicator is [2500H]. If the filter becomes excessively dirty, change the setting time. Ask your dealer to describe how to change the setting time.

3) Mount the air filter.

2) Turn on the circuit breaker, then push the button on the remote controller to start the operation.

3) After cleaning, push .
   display disappears.

CAUTION
• Do not start the air conditioner while leaving air filter removed.
• Push the filter reset button. ( indication will be turn off.)

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

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

<table>
<thead>
<tr>
<th>Parts</th>
<th>Inspection method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat exchanger Indoor / outdoor</td>
<td>Dust / dirt clogging, scratches Wash the heat exchanger when it is clogged.</td>
</tr>
<tr>
<td>Fan motor    Indoor / outdoor</td>
<td>Sound Take appropriate measures when abnormal sound is generated.</td>
</tr>
<tr>
<td>Filter       Indoor</td>
<td>Dust / dirt, breakage • Wash the filter with water when it is contaminated.</td>
</tr>
<tr>
<td>Fan          Indoor</td>
<td>• Replace it when it is damaged.</td>
</tr>
<tr>
<td>Air intake / discharge grilles Indoor / outdoor</td>
<td>Dust / dirt, scratches Fix or replace them when they are deformed or damaged.</td>
</tr>
<tr>
<td>Drain pan    Indoor</td>
<td>Dust / dirt clogging, drain contamination Clean the drain pan and check the downward slope for smooth drainage.</td>
</tr>
<tr>
<td>Ornamental panel, louvres Indoor</td>
<td>Dust / dirt, scratches Wash them when they are contaminated or apply repair coating.</td>
</tr>
<tr>
<td>Exterior     Outdoor</td>
<td>• Rust, peeling of insulator • Peeling / lift of coat Apply repair coating.</td>
</tr>
</tbody>
</table>
14 Troubleshooting

**Confirmation and check**
When an error occurred in the air conditioner, an error code and indoor UNIT No. appear on the display part of the remote controller. The error code is only displayed during the operation. If the display disappears, operate the air conditioner according to the following “Confirmation of error log” for confirmation.

**Confirmation of error log**
When an error occurred on the air conditioner, the error log can be confirmed with the following procedure. (The error log is stored in memory up to 4 errors.) The log can be confirmed from both operating status and stop status.

1. When and buttons are pushed simultaneously for 4 seconds or more, the following display appears.
   - [ ] is displayed, the mode enters in the error log mode.
   - [01: Order of error log] is displayed in CODE No.
   - [Error code] is displayed in CHECK.
   - [Indoor unit address in which an error occurred] is displayed in Unit No.

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

**REQUIREMENT**
Do not push button because all the error log of the indoor unit will be deleted.

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

---

**Check method**
On the wired remote controller, central control remote controller and the interface P.C. board of the outdoor unit (I/F), or 7-segment display (on the outdoor interface P.C. board) to display the operation is provided. Therefore the operation status can be known. Using this self-diagnosis function, a trouble or position with error of the air conditioner can be found as shown in the table below.

**Check code list**
The following list shows each check code. Find the check contents from the list according to part to be checked.
- In case of check from indoor remote controller: See “Wired remote controller display” in the list.
- In case of check from outdoor unit: See “Outdoor unit 7-segment display” in the list.

<table>
<thead>
<tr>
<th>Check code</th>
<th>Check code name</th>
<th>Judging device</th>
</tr>
</thead>
<tbody>
<tr>
<td>E01 — — —</td>
<td>Communication error between indoor unit and remote controller (Detected at remote controller side)</td>
<td>Remote controller</td>
</tr>
<tr>
<td>E02 — — —</td>
<td>Remote controller transmission error</td>
<td>Remote controller</td>
</tr>
<tr>
<td>E03 — — —</td>
<td>Communication error between indoor unit and remote controller (Detected at indoor unit side)</td>
<td>Indoor unit</td>
</tr>
<tr>
<td>E04 — — —</td>
<td>Communication circuit error between indoor / outdoor unit (Detected at indoor unit side)</td>
<td>Indoor unit</td>
</tr>
<tr>
<td>E06 E06</td>
<td>No. of indoor units in which sensor has been normally received</td>
<td>Decrease of No. of indoor units</td>
</tr>
<tr>
<td>E07 — —</td>
<td>Communication circuit error between indoor / outdoor unit (Detected at outdoor unit side)</td>
<td>I/F</td>
</tr>
<tr>
<td>E08 E08</td>
<td>Duplicated indoor unit addresses</td>
<td>Duplicated indoor unit addresses</td>
</tr>
<tr>
<td>E09 — —</td>
<td>Duplicated master remote controllers</td>
<td>Remote controller</td>
</tr>
<tr>
<td>E10 — —</td>
<td>Communication error between indoor unit MC</td>
<td>Indoor unit</td>
</tr>
<tr>
<td>E12 E12</td>
<td>01: Indoor / Outdoor units communication 02: Outdoor / Outdoor units communication</td>
<td>Automatic address start error</td>
</tr>
<tr>
<td>E15 E15</td>
<td>No indoor unit during automatic addressing</td>
<td>I/F</td>
</tr>
<tr>
<td>E16 E16</td>
<td>Capacity over / No. of connected indoor units</td>
<td>I/F</td>
</tr>
<tr>
<td>E18 — —</td>
<td>Communication error between header and follower units Indoor unit</td>
<td>Indoor unit</td>
</tr>
<tr>
<td>E19 E19</td>
<td>00: No header 02: Two or more header units</td>
<td>Outdoor header units quantity error</td>
</tr>
<tr>
<td>E20 E20</td>
<td>01: Outdoor unit of other line connected 02: Indoor unit of other line connected</td>
<td>Other line connected during automatic address</td>
</tr>
</tbody>
</table>

*: Lighting, : Flashing, : Goes off
IPDU: Intelligent Power Drive Unit
ALT: Flashing is alternately when there are two flashing LED.
SIM: Simultaneous flashing when there are two flashing LED.
<table>
<thead>
<tr>
<th>Wired remote controller display</th>
<th>Outdoor unit 7-segment display</th>
<th>Check code name</th>
<th>Judging device</th>
</tr>
</thead>
<tbody>
<tr>
<td>E21 E21 02:No header unit 00:Multiple number of header units</td>
<td>Outdoor unit CA1 sensor error</td>
<td>Error in number of heat storage master units</td>
<td>I/F</td>
</tr>
<tr>
<td>E22 E22 02:No header unit 00:Multiple number of header units</td>
<td>—</td>
<td>Reduction in number of heat storage units</td>
<td>I/F</td>
</tr>
<tr>
<td>E23 E23 02:No header unit 00:Multiple number of header units</td>
<td>—</td>
<td>Sending error in communication between outdoor units</td>
<td>I/F</td>
</tr>
<tr>
<td>E25 E25 02:No header unit 00:Multiple number of header units</td>
<td>—</td>
<td>Duplicated follower outdoor addresses</td>
<td>I/F</td>
</tr>
<tr>
<td>E26 E26 02:No header unit 00:Multiple number of header units</td>
<td>—</td>
<td>No. of outdoor units which received signal normally</td>
<td>I/F</td>
</tr>
<tr>
<td>E28 E28 Detected outdoor unit number</td>
<td>—</td>
<td>Decrease of No. of connected outdoor units</td>
<td>I/F</td>
</tr>
<tr>
<td>E31 E31 Number of IPDU (*1)</td>
<td>—</td>
<td>IPDU communication error</td>
<td>I/F</td>
</tr>
<tr>
<td>F01 — — —</td>
<td>Indoor unit TC1 sensor error</td>
<td>Indoor unit</td>
<td></td>
</tr>
<tr>
<td>F02 — — —</td>
<td>Indoor unit TC2 sensor error</td>
<td>Indoor unit</td>
<td></td>
</tr>
<tr>
<td>F03 — — —</td>
<td>Indoor unit TC1 sensor error</td>
<td>Indoor unit</td>
<td></td>
</tr>
<tr>
<td>F04 F04 — —</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>F05 F05 — —</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>F06 F06 01:TE1 sensor 02:TE2 sensor</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>F07 F07 — —</td>
<td>—</td>
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</tr>
<tr>
<td>F08 F08 — —</td>
<td>—</td>
<td>—</td>
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</tr>
<tr>
<td>F10 — — —</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>F12 F12 — —</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>F13 F13 01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>F15 F15 — —</td>
<td>—</td>
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<tr>
<td>F16 F16 — —</td>
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<tr>
<td>F22 F22 — —</td>
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<tr>
<td>F23 F23 — —</td>
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<tr>
<td>F24 F24 — —</td>
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<tr>
<td>F29 — — —</td>
<td>—</td>
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<td></td>
</tr>
<tr>
<td>F31 F31 — —</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>H01 H01 01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>H02 H02 01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>H03 H03 01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>H04 H04 — —</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>H05 H05 — —</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Check code</th>
<th>Wired remote controller display</th>
<th>Outdoor unit 7-segment display</th>
<th>Check code name</th>
<th>Judging device</th>
</tr>
</thead>
<tbody>
<tr>
<td>E21 E21 02:No header unit 00:Multiple number of header units</td>
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<td>I/F</td>
<td></td>
</tr>
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<td>E22 E22 02:No header unit 00:Multiple number of header units</td>
<td>—</td>
<td>Reduction in number of heat storage units</td>
<td>I/F</td>
<td></td>
</tr>
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<td>E23 E23 02:No header unit 00:Multiple number of header units</td>
<td>—</td>
<td>Sending error in communication between outdoor units</td>
<td>I/F</td>
<td></td>
</tr>
<tr>
<td>E25 E25 02:No header unit 00:Multiple number of header units</td>
<td>—</td>
<td>Duplicated follower outdoor addresses</td>
<td>I/F</td>
<td></td>
</tr>
<tr>
<td>E26 E26 02:No header unit 00:Multiple number of header units</td>
<td>—</td>
<td>No. of outdoor units which received signal normally</td>
<td>I/F</td>
<td></td>
</tr>
<tr>
<td>E28 E28 Detected outdoor unit number</td>
<td>—</td>
<td>Decrease of No. of connected outdoor units</td>
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<td></td>
</tr>
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<td>E31 E31 Number of IPDU (*1)</td>
<td>—</td>
<td>IPDU communication error</td>
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<td></td>
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<td></td>
<td></td>
</tr>
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<td>F03 — — —</td>
<td>Indoor unit TC1 sensor error</td>
<td>Indoor unit</td>
<td></td>
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<tr>
<td>F04 F04 — —</td>
<td>—</td>
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<tr>
<td>F05 F05 — —</td>
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<tr>
<td>F06 F06 01:TE1 sensor 02:TE2 sensor</td>
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<tr>
<td>F07 F07 — —</td>
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<td>F08 F08 — —</td>
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<tr>
<td>F12 F12 — —</td>
<td>—</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>F13 F13 01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side</td>
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<tr>
<td>F16 F16 — —</td>
<td>—</td>
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</tr>
<tr>
<td>F22 F22 — —</td>
<td>—</td>
<td>—</td>
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<tr>
<td>F23 F23 — —</td>
<td>—</td>
<td>—</td>
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</tr>
<tr>
<td>F24 F24 — —</td>
<td>—</td>
<td>—</td>
<td></td>
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</tr>
<tr>
<td>F29 — — —</td>
<td>—</td>
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<tr>
<td>F31 F31 — —</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H01 H01 01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H02 H02 01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H03 H03 01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H04 H04 — —</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H05 H05 — —</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Error detected by TCC-LINK central control device

<table>
<thead>
<tr>
<th>Check code</th>
<th>Check code name</th>
<th>Judging device</th>
</tr>
</thead>
<tbody>
<tr>
<td>C05</td>
<td>—</td>
<td>Sending error in TCC-LINK central control device</td>
</tr>
<tr>
<td>C06</td>
<td>—</td>
<td>Receiving error in TCC-LINK central control device</td>
</tr>
<tr>
<td>C12</td>
<td>—</td>
<td>Batch alarm of general-purpose equipment control interface</td>
</tr>
<tr>
<td>P30</td>
<td>—</td>
<td>Decrease of No. of indoor units</td>
</tr>
</tbody>
</table>

Different according to error contents of unit with occurrence of alarm

General-purpose equipment, I/F

Outdoor unit 7-segment display

TCC-LINK: TOSHIBA Carrier Communication Link.

---

<table>
<thead>
<tr>
<th>Check code</th>
<th>Check code name</th>
<th>Judging device</th>
</tr>
</thead>
<tbody>
<tr>
<td>C05</td>
<td>—</td>
<td>Sending error in TCC-LINK central control device</td>
</tr>
<tr>
<td>C06</td>
<td>—</td>
<td>Receiving error in TCC-LINK central control device</td>
</tr>
<tr>
<td>C12</td>
<td>—</td>
<td>Batch alarm of general-purpose equipment control interface</td>
</tr>
<tr>
<td>P30</td>
<td>—</td>
<td>Decrease of No. of indoor units</td>
</tr>
</tbody>
</table>

Different according to error contents of unit with occurrence of alarm

General-purpose equipment, I/F

Outdoor unit 7-segment display

TCC-LINK: TOSHIBA Carrier Communication Link.

---

<table>
<thead>
<tr>
<th>Check code</th>
<th>Check code name</th>
<th>Judging device</th>
</tr>
</thead>
<tbody>
<tr>
<td>C05</td>
<td>—</td>
<td>Sending error in TCC-LINK central control device</td>
</tr>
<tr>
<td>C06</td>
<td>—</td>
<td>Receiving error in TCC-LINK central control device</td>
</tr>
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<td>C12</td>
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<td>Batch alarm of general-purpose equipment control interface</td>
</tr>
<tr>
<td>P30</td>
<td>—</td>
<td>Decrease of No. of indoor units</td>
</tr>
</tbody>
</table>

Different according to error contents of unit with occurrence of alarm

General-purpose equipment, I/F

Outdoor unit 7-segment display

TCC-LINK: TOSHIBA Carrier Communication Link.
Warnings on Refrigerant Leakage

Check of Concentration Limit
The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its concentration will not exceed a set limit.

The refrigerant R410A which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise excessively. Suffocation from leakage of R410A is almost non-existent. With the recent increase in the number of high concentration buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power etc.

Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared with conventional individual air conditioners. If a single unit of the multi conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its concentration does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device. The concentration is as given below.

\[
\text{Total amount of refrigerant (kg)} \leq \frac{\text{Min. volume of the indoor unit installed room (m}^3\text{)}}{\text{Concentration limit (kg/m}^3\text{)}}
\]

The concentration limit of R410A which is used in multi air conditioners is 0.3 kg/m³.

▼ NOTE 1
If there are 2 or more refrigerating systems in a single refrigerating device, the amounts of refrigerant should be as charged in each independent device.

<table>
<thead>
<tr>
<th>Room A</th>
<th>Room B</th>
<th>Room C</th>
<th>Room D</th>
<th>Room E</th>
<th>Room F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.g., charged amount (10 kg)</td>
<td>Outdoor unit</td>
<td>e.g., charged amount (15 kg)</td>
<td>Indoor unit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the amount of charge in this example:
- The possible amount of leaked refrigerant gas in rooms A, B and C is 10 kg.
- The possible amount of leaked refrigerant gas in rooms D, E and F is 15 kg.

▼ NOTE 2
The standards for minimum room volume are as follows.
1) No partition (shaded portion)

\[
\text{Total amount of refrigerant kg} \leq \frac{\text{Min. indoor floor area (m}^2\text{)}}{\text{Range above the density limit of 0.3 kg/m}^3\text{ needed}}
\]

3) If an indoor unit is installed in each partitioned room and the refrigerant piping is interconnected, the smallest room of course becomes the object. But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.

▼ NOTE 3
The minimum indoor floor area compared with the amount of refrigerant is roughly as follows:
(When the ceiling is 2.7 m high)
**Confirmation of indoor unit setup**

Prior to delivery to the customer, check the address and setup of the indoor unit, which has been installed in this time and fill the check sheet (Table below). Data of four units can be entered in this check sheet. Copy this sheet according to the No. of the indoor units. If the installed system is a group control system, use this sheet by entering each line system into each installation manual attached to the other indoor units.

**REQUIREMENT**

This check sheet is required for maintenance after installation. Fill this sheet and then pass this Installation Manual to the customers.

### Indoor unit setup check sheet

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Room name</td>
<td>Room name</td>
<td>Room name</td>
<td>Room name</td>
</tr>
<tr>
<td>Model</td>
<td>Model</td>
<td>Model</td>
<td>Model</td>
</tr>
</tbody>
</table>

Check indoor unit address. *(For check method, refer to APPLICABLE CONTROLS in this manual.)*

- *In case of a single system, it is unnecessary to enter the indoor address. (CODE NO.: Line [12], Indoor [13], Group [14], Central control [03])*

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Central control address</td>
<td>Central control address</td>
<td>Central control address</td>
<td>Central control address</td>
</tr>
<tr>
<td>Setting the level of dirtiness for the filter <em>(CODE NO. [02])</em></td>
<td>Setting the level of dirtiness for the filter <em>(CODE NO. [02])</em></td>
<td>Setting the level of dirtiness for the filter <em>(CODE NO. [02])</em></td>
<td>Setting the level of dirtiness for the filter <em>(CODE NO. [02])</em></td>
</tr>
<tr>
<td>Normal [0000]</td>
<td>Normal [0000]</td>
<td>Normal [0000]</td>
<td>Normal [0000]</td>
</tr>
</tbody>
</table>

Have you changed the detected temp. shift value? If not, fill check mark [×] in [NO CHANGE], and fill check mark [×] in [ITEM] if changed, respectively. *(For check method, refer to APPLICABLE CONTROLS in this manual.)*

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Others (              )</td>
<td>Others (              )</td>
<td>Others (              )</td>
<td>Others (              )</td>
</tr>
</tbody>
</table>

Incorporation of parts sold separately

Have you incorporated the following parts sold separately? If incorporated, fill check mark [×] in each [ITEM]. *(When incorporating, the setup change is necessary in some cases. For setup change method, refer to APPLICABLE CONTROLS in this manual.)*

<p>| | | | |</p>
<table>
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<td>F 150H [0001]</td>
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