TOSHIBA
Leading innovation

AIR CONDITIONER (MULTI TYPE)
Installation Manual

Indoor Unit
Model name:

Slim Duct Type
MMD-AP0074SPH-E
MMD-AP0094SPH-E
MMD-AP0124SPH-E
MMD-AP0154SPH-E
MMD-AP0184SPH-E
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 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 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.</td>
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<td>Qualified service person</td>
<td>• The qualified service person is a person who installs, maintains, relocates and removes 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>
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<td>• 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.</td>
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</tr>
</tbody>
</table>

This Air Conditioner uses R410A, an environmentally friendly refrigerant.
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>
</tr>
</thead>
<tbody>
<tr>
<td>All types of work</td>
<td>Protective gloves</td>
</tr>
<tr>
<td></td>
<td>‘Safety’ working clothing</td>
</tr>
<tr>
<td>Electrical-related work</td>
<td>Gloves to provide protection for electricians and from heat</td>
</tr>
<tr>
<td></td>
<td>Insulating shoes</td>
</tr>
<tr>
<td></td>
<td>Clothing to provide protection from electric shock</td>
</tr>
<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>
</tr>
<tr>
<td>Repair of outdoor unit</td>
<td>Gloves to provide protection for electricians and from heat</td>
</tr>
</tbody>
</table>

Warning indications on the air conditioner unit

<table>
<thead>
<tr>
<th>Warning indication</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WARNING</strong></td>
<td><strong>ELECTRICAL SHOCK HAZARD</strong> Disconnect all remote electric power supplies before servicing.</td>
</tr>
<tr>
<td><strong>WARNING</strong></td>
<td>Moving parts. Do not operate unit with grille removed. Stop the unit before the servicing.</td>
</tr>
<tr>
<td><strong>CAUTION</strong></td>
<td>High temperature parts. You might get burned when removing this panel.</td>
</tr>
<tr>
<td><strong>CAUTION</strong></td>
<td>Do not touch the aluminium fins of the unit. Doing so may result in injury.</td>
</tr>
<tr>
<td><strong>CAUTION</strong></td>
<td><strong>BURST HAZARD</strong> Open the service valves before the operation, otherwise there might be the burst.</td>
</tr>
</tbody>
</table>
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 fin of the unit. You may injure yourself if you do so. If the fin must be touched for some reason, first put on protective gloves and safety work clothing, and then proceed.
- Do not climb onto or place objects on top of the outdoor unit. You may fall or the objects may fall off 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 clearing 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 R410A. In particular, when using in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur 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, 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 combustion 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 forklift 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 shown in the figure.

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.

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 wire that meets the specifications in the Installation Manual and the stipulations in the local regulations and laws. Use of wire which does not meet the specifications may give rise to electric shocks, electrical leakage, smoking and / or a fire.
- Connect earth wire. (Grounding work)
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- 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.
- In the case of appliances which do not require grounding, install a circuit breaker that meets the specifications in the installation manual and the stipulations in the local regulations and laws.
- Install a circuit breaker outdoors.
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- Install a circuit breaker outdoors.
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 refrigeration 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."
3 Selection of Installation Place

Avoid installing in the following places.

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

Avoid installation in the following kinds of locations:

• Saline area (coastal area)

• Locations with acidic or alkaline atmospheres (such as areas with hot springs, factories where chemicals or pharmaceuticals are made and places where the exhaust air from combustion appliances will be sucked into the unit)

Doing so may cause the heat exchanger (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.

• 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.)

• In the case of the wireless type of system, rooms with the inverter type of fluorescent lighting or locations exposed to direct sunlight.

(The signals from the wireless remote controller may not be sensed.)

• Locations where organic solvents are being used.

• 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 under high-humidity atmosphere

In some cases including the rainy season, especially inside of the ceiling may become high-humidity atmosphere (dew-point temperature: 23 °C 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 a place where inside of the ceiling is used for pathway to intake the fresh air

4. Installation to a kitchen

In the above cases, additionally attach the heat insulator to all positions of the air conditioner, which come to contact with the high-humidity atmosphere. In this case, arrange the side plate (Check port) so that it is easily removed.

• Apply also a sufficient heat insulation to the duct and connecting part of the duct.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Condensation test conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor side:</td>
<td>27 °C dry bulb temperature</td>
</tr>
<tr>
<td>Air volume:</td>
<td>24 °C wet bulb temperature</td>
</tr>
</tbody>
</table>

Installation space (Unit: mm)

Reserve sufficient space required for installation or service work.

<Under air intake>

Air intake

Floor surface

Celing

<table>
<thead>
<tr>
<th>5 or more</th>
<th>50 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 or more</td>
<td>100 or more</td>
</tr>
</tbody>
</table>

<Back air intake>

Air intake

Floor surface

Celing

<table>
<thead>
<tr>
<th>5 or more</th>
<th>50 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 or more</td>
<td>100 or more</td>
</tr>
</tbody>
</table>
### Service space

![Diagram of service space]

- Air outlet
- Ceiling
- Service door (Ceiling opening)

### Arranging the to back air intake type

#### <Back air intake>

![Diagram of back air intake]

- Remove the cover plate and then fix it to the bottom surface.
- Do surely hooking to the main unit.
- Remove the filter from the main unit while pushing down on the tabs.

### Filter cleaning sign term setting

The lighting term setup of the filter sign (Notification of filter cleaning) of the remote controller can be changed according to the condition of installation.

For setup method, refer to “Filter sign setting” in the Applicable controls of this Manual.
4 Installation

**CAUTION**
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 or let a person get on it. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible. If carrying in the indoor unit unpacked by necessity, use buffering cloth or other material to not damage the unit.
- To move the indoor unit, hold the hooking brackets (4 positions) only. Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, resin parts or other parts).
- Hanging bolt pitch of air inlet chamber side is different (centre position), make sure not to make mistake to install the setting direction.
- Carry the package by two or more persons, and do not bundle it with plastic band at positions other than specified.

**External dimensions** (Unit: mm)

![Diagram of external dimensions](image_url)

**Installation of hanging bolt**
- Consider the piping / wiring after the unit is hung to determine the location of the indoor unit installation and orientation.
- After the location of the indoor unit installation has been determined, install hanging bolts.
- For the dimensions of the hanging bolt pitches, refer to the external view.
- When a ceiling already exists, lay the drain pipe, refrigerant pipe, control wires, and remote controller wires to their connection locations before hanging the indoor unit.

Procure hanging bolts washer and nuts for installing the indoor unit (these are not supplied).

<table>
<thead>
<tr>
<th>Hanging bolt</th>
<th>M10 or W3/8</th>
<th>4 pieces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nut</td>
<td>M10 or W3/8</td>
<td>12 pieces</td>
</tr>
</tbody>
</table>

**Installation of hanging bolt**
- Use M10 hanging bolts (4 pcs, to be local procure).
- Matching to the existing structure, set pitch according to size in the unit external view as shown below.

- **New concrete slab**
  - Install the bolts with insert brackets or anchor bolts.
- **Steel flame structure**
  - Use existing angles or install new support angles.
- **Existing concrete slab**
  - Use a hole-in anchors, hole-in plugs, or a hole-in bolts.
Installation of indoor unit

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.

- Attach the nuts and the M10 flat washers to the hanging bolt.
- Put washers at up and down of the hanging bracket of the indoor unit to hang down the indoor unit.
- Check that four sides are horizontal with a level gauge. (Horizontal degree: Within 5 mm)

Wireless remote controller
The sensor of indoor unit with wireless remote controller can receive a signal by distance within approx. 8 m. Based upon it, determine a place where the remote controller is operated and the installation place.

- Operate the remote controller, confirm that the indoor unit receives a signal surely, and then install it.
- Keep 1 m or more from the devices such as television, stereo. (Disturbance of image or noise may generate.)
- To prevent a malfunction, select a place where is not influenced by a fluorescent light or direct sunlight.
- Two or more (Up to 6 units) indoor units with wireless type remote controller can be installed in the same room.

Installation of remote controller (Sold separately)
For installation of the wired remote controller, follow the Installation Manual attached with the remote controller.

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

5 Drain Piping

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

Piping / Heat insulating material
Require the following materials for piping and heat insulating at site.

- Piping: Hard vinyl chloride pipe VP25 (Outer dia.: Ø32 mm)
- Heat insulator: Foam polyethylene: Thickness 10 mm or more

Flexible hose
Use the attached flexible hose to adjust centre discrepancy of the hard vinyl chloride pipe or to adjust the angle.

- Do not use the flexible hose as stretched, or do not deform it more extent than that in the following figure.
- Fix the soft end of the flexible hose with the attached hose band.
- Use the flexible hose on a horizontal level.

- Set the collective piping as shown in the below figure.

- Do not apply force to the connecting part of the drain pipe.
- The hard vinyl-chloride pipe cannot be directly connected to the drain pipe connecting port of the indoor unit. For connection with the drain pipe connecting port, fix the attached flexible hose with the hose band, otherwise a damage or water leak is caused on the drain pipe connecting port.
Connecting drain pipe

- Connect a hard socket (locally procured) to the hard socket of the attached supplied flexible hose.
- Connect a drain pipe (locally procured) to the connected hard socket.

REQUIREMENT

- Connect hard vinyl chloride pipes securely using an adhesive for vinyl chloride to avoid water leakage.
- It takes some time until the adhesive is dried and hardened. (Refer to the manual of the adhesive. Do not apply stress to the joint with the drain pipe during this period.

Drain up

When a down-gradient cannot be secured for the drainpipe, drain-up piping is possible.
- The height of the drain pipe must be 850 mm or less from the bottom of the ceiling.
- Take the drain pipe out of the drain pipe joint with the indoor unit in 300 mm or less, and bend up the pipe vertically.
- Immediately after the pipe is bent up vertically, lay the pipe making a down-gradient.
- Set downward grading immediately after raising up vertically.

Check the draining

In the test run, check that water drain is properly performed and water does not leak from the connecting part of the pipes.
Check draining also when installed in heating period.
- By using a pitcher or hose, pour water (1500 - 2000 cc) into the discharge port before installation of the ceiling panel.
- Pour water gradually so that water does not spread on the motor of the drain pump.

CAUTION

Pour water gently so that it does not spread around inside the indoor unit, which may cause a malfunction.

Check draining also when installed in heating period.
- After the electric work has finished, pour water during COOL mode operation.
- If the electric work has not yet finished, pull out the float switch connector (CN34: Red) from the electrical control box, and check draining by plugging the single phase 220 - 240 V power to the terminal blocks R (L) and S (N). (If doing so, the drain pump motor operates.
- Test water drain while checking the operation sound of the drain pump motor.

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Pour water gently so that it does not spread around inside the indoor unit, which may cause a malfunction.

Check the draining

In the test run, check that water drain is properly performed and water does not leak from the connecting part of the pipes.
Check draining also when installed in heating period.
- By using a pitcher or hose, pour water (1500 - 2000 cc) into the discharge port before installation of the ceiling panel.
- Pour water gradually so that water does not spread on the motor of the drain pump.

CAUTION

Pour water gently so that it does not spread around inside the indoor unit, which may cause a malfunction.

Check the draining

In the test run, check that water drain is properly performed and water does not leak from the connecting part of the pipes.
Check draining also when installed in heating period.
- By using a pitcher or hose, pour water (1500 - 2000 cc) into the discharge port before installation of the ceiling panel.
- Pour water gradually so that water does not spread on the motor of the drain pump.

CAUTION

Pour water gently so that it does not spread around inside the indoor unit, which may cause a malfunction.
Perform heat insulating

- As shown in the figure, cover the flexible hose and hose band with the attached heat insulator up to the bottom of the indoor unit without gap.
- Cover the drain pipe seamlessly with a heat insulator to be procured locally so that it overlaps with the attached heat insulator of the drain connecting section.

* Direct the slits and seams of the heat insulator upward to avoid water leakage.

Referring to the following dimensions, manufacture duct at the local site.

**Arrangement**

<Under air intake>
Mount an air filter to the air intake side; otherwise decrease of capacity may be caused.

<Under air intake>

Air filter
Main unit

Remove the filter from the main unit while pushing down on the tabs.

<Back air intake>

CAUTION
Take out this cover plate.

Remove the cover plate and then fix it to the bottom surface.

Connecting method of the duct

- Heat insulator with sticking material (100 mm-width locally procured)
- Aluminum tape (locally procured)
- Duct: Insulation material (locally procured)
- Flange
- Connect a duct to the inside of the flange
- Aluminum tape (locally procured)
- Heat insulator with sticking material (100 mm-width locally procured)
- Under surface
- Cover a screw
- Flange (locally procured)

CAUTION
Incomplete heat insulation of the supply air flange and sealing may occur dewing resulted in falling of water drop.
**Fan characteristics**

◆ No filter

AP007
AP009

AP012

AP015
AP018

Filter attached

AP007
AP009

AP012

AP015
AP018

Standard air volume: 540 m³/h

Standard air volume: 600 m³/h

Standard air volume: 780 m³/h
Refrigerant Piping

**CAUTION**
When the refrigerant pipe is long, provide support brackets at intervals of 2.5 m to 3 m to clamp the refrigerant pipe. Otherwise, abnormal sound may be generated. Use the flare nut attached with the indoor unit or R410A flare nut.

### Permissible piping length and height difference
They vary depending on the outdoor unit. For details, refer to the Installation Manual attached to the outdoor unit.

### Pipe size

#### Connecting refrigerant piping

**Flaring**
1. Cut the pipe with a pipe cutter. Remove burrs completely. (Remaining burrs may cause gas leakage.)
2. Insert a flare nut 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>Flaring diameter size: A (Unit: mm)</th>
<th>Pipe size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer dia. of copper pipe</td>
<td>A</td>
</tr>
<tr>
<td>6.4</td>
<td>9.1</td>
</tr>
<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>

#### Projection margin in flaring: B (Unit: mm)

<table>
<thead>
<tr>
<th>Outer dia. of copper pipe</th>
<th>R410A tool used</th>
<th>Conventional tool used</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4</td>
<td>0 to 0.5</td>
<td>1.0 to 1.5</td>
</tr>
<tr>
<td>9.5</td>
<td>3.3 to 4.2</td>
<td>6.3 to 7.7</td>
</tr>
<tr>
<td>12.7</td>
<td>5.0 to 6.2</td>
<td>8.3 to 9.2</td>
</tr>
<tr>
<td>15.9</td>
<td>6.3 to 7.7</td>
<td>9.3 to 10.5</td>
</tr>
</tbody>
</table>

### Pipe size

<table>
<thead>
<tr>
<th>Model MMD-AP to AP012</th>
<th>Gas side</th>
<th>Liquid side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø9.5</td>
<td>Ø6.4</td>
<td></td>
</tr>
<tr>
<td>Ø12.7</td>
<td>Ø6.4</td>
<td></td>
</tr>
</tbody>
</table>

**Connecting refrigerant piping**

- 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>6.4</td>
<td>14 to 18 (1.4 to 1.8 kgf•m)</td>
</tr>
<tr>
<td>9.5</td>
<td>30 to 42 (3.0 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>

**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.

**Airtight test / Air purge, etc.**

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

**Heat insulation process**

- 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.
8 Electrical Connection

**WARNING**
- Use the specified wires for wiring connect the terminals. Securely fix them to prevent external forces applied to the terminals from affecting the terminals.
- Incomplete connection or fixation may cause a fire or other trouble.
- Connect earth wire. (grounding work)
  - Incomplete grounding 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 inter-connecting wires when peeling them.
- Use the power cord and Inter-connecting wire of specified thickness, type, and protective devices required.
- Do not connect 220 V – 240 V power to the terminal blocks ( , , , ) for control wiring. (Otherwise, the system will fail.)
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting wires when peeling them.
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe. The coating may melt resulting in an accident.

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

### Power supply wire and communication wires specifications

**Power supply wire and communication wires are processed locally.**
For the power supply specifications, follow to the table below. If capacity is little, it is dangerous because overheat or burnout may be caused.
- **Power supply wire specifications:**
  - Below 50 m: 2.5 mm² (specifications)
  - (Up to 2000 m): 2.0 mm²
- **Control wiring:**
  - Central control line wiring (2-core shield wire)
  - Wire size:
    - (Up to 1000 m): 1.25 mm²
    - (Up to 2000 m): 2.0 mm²

**Remote controller wiring**
- 2-core with non-polarity wire is used for wiring of the remote controller wiring and group remote controllers wiring.
- **Remote controller wiring:**
  - Wire size: 0.5 mm² to 2.0 mm²
  - Total wire length of remote controller wiring and remote controller inter-unit wiring = L + L1 + L2 + ... Ln
  - In case of wired type only:
    - (Up to 500 m)
  - In case of wireless type included:
    - (Up to 400 m)
  - Total wire length of remote controller inter-unit wiring = L1 + L2 + ... Ln
    - (Up to 200 m)

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

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

**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 V - 415 V ~, 50 Hz
  - 380 V ~, 60 Hz

  - Circuit breaker
  - Header outdoor unit
  - Earth terminal

- **Control wiring between outdoor units**

- **Indoor unit**
  - Indoor power supply
  - 220 V - 240 V ~, 50 Hz
  - 220 V ~, 60 Hz

  - Remote controller wire
  - Control wire
  - Electrical control box
  - Earth terminal

### 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)

- Before remove the electrical control box cover, remove the cover plate and air filter.
- Remove the cover of the electrical control box by taking off the mounting screws (2 positions) and pushing the hooking section. (The cover of the electrical control box remains hanged to the hinge.)
- 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 electric parts; otherwise the electrical control box cannot be drawn out in service time.
- Mount the cover of the electrical control box without pinching wires.
Remote controller wiring
Strip off approx. 9 mm the wire to be connected.

Wiring diagram

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

9 Applicable Controls

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 (AMT21E, 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  is pushed, the indoor unit number displayed following “ALL” is the header unit.)

* Display content varies with the indoor unit model.
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 flashes, no operation of the remote controller is accepted.)

---

**External static pressure settings**

Set up a tap change based upon the external static pressure of the duct to be connected.
To set up a tap change, follow to the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6).

- Specify [5d] to the CODE No. in procedure 3.
- For the SET DATA of procedure 4, select a SET DATA of the external static pressure to be set up from the following table.

**<Change on wired remote controller>**

With a remote controller-less system (group control)
Besides the switching method using the wired remote controller as a way to establish the external static pressure switching is also possible by changing over the jumper block settings on the indoor P.C. board as shown in the following table.

- However, once these settings are changed, it is necessary to reset the SET DATA to 0000 that placing the jumper block back to the factory default position and rewriting the SET DATA back to 0000 with wired remote controller (sold separately).
- Change over the jumper blocks on the indoor P.C. board, and select the desired setting.

**Jumper block positions (CN112, CN111 and CN110 from the left)**

---

**SET DATA**

<table>
<thead>
<tr>
<th>SET DATA</th>
<th>External static pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>10 Pa Standard (Factory default)</td>
</tr>
<tr>
<td>0001</td>
<td>20 Pa High static pressure 1</td>
</tr>
<tr>
<td>0003</td>
<td>35 Pa High static pressure 2</td>
</tr>
<tr>
<td>0006</td>
<td>50 Pa High static pressure 3</td>
</tr>
</tbody>
</table>

**External static pressure**

- Standard (Factory default)
- High static Pressure 1
- High static Pressure 2
- High static Pressure 3

---

33-EN
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.

Remote controller sensor
The temperature sensor of the indoor unit senses room temperature usually. Set the remote controller sensor to sense the temperature around the remote controller. Select items following the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6).
- For the CODE No. in Procedure 3, specify [01].
- For 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>

When [ ] flashes, the remote controller sensor is defective.
Select the SET DATA [0000] (not used) or replace the remote controller.

When it is difficult to obtain satisfactory heating due to installation place of the indoor unit or structure of the room, the detection temperature of heating can be raised. Also use a circulator or other machinery to circulate heat air near the ceiling. Follow to the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6).
- For the CODE No. in Procedure 3, specify [06].
- For the set data in Procedure 4, select the SET DATA of shift value of detection temperature to be set up from the following table.

<table>
<thead>
<tr>
<th>SET DATA</th>
<th>Detection temperature shift value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>No shift</td>
</tr>
<tr>
<td>0001</td>
<td>+1 °C</td>
</tr>
<tr>
<td>0002</td>
<td>+2 °C</td>
</tr>
<tr>
<td>0003</td>
<td>+3 °C</td>
</tr>
<tr>
<td>0004</td>
<td>+4 °C</td>
</tr>
<tr>
<td>0005</td>
<td>+5 °C</td>
</tr>
<tr>
<td>0006</td>
<td>+6 °C</td>
</tr>
</tbody>
</table>

To secure better effect of heating
In a group control, a remote controller can control up to maximum 8 units.
- The wired remote controller only can control a group control. The wireless remote controller is unavailable for this control.
- For wiring procedure and wires of the individual line (identical refrigerant line) system, refer to “Electrical Connection” in this Manual.
- 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.
- If the test run has been performed under the same conditions in the following procedure even if the operation stops by thermostat-OFF. Operate the unit with the wired remote controller as usual.
- 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.

Group control
In a group control, a remote controller can control up to maximum 8 units.
- The wired remote controller only can control a group control. The wireless remote controller is unavailable for this control.
- For wiring procedure and wires of the individual line (identical refrigerant line) system, refer to “Electrical Connection” in this Manual.
- 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.
- When a fan operation is 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.
- 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.

To secure better effect of heating
In a group control, a remote controller can control up to maximum 8 units.
- The wired remote controller only can control a group control. The wireless remote controller is unavailable for this control.
- For wiring procedure and wires of the individual line (identical refrigerant line) system, refer to “Electrical Connection” in this Manual.
- 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.
- From the test run mode, push [TEST] button to stop a test run.
- (Display part is same as procedure 1.)
Wireless remote controller

1. Remove a small screw which fixes the nameplate of the receiver unit. Remove the nameplate of the sensor section by inserting a flat-blade screwdriver into the notch at the bottom of the plate, and set the Dip switch to [TEST RUN ON].

2. Execute a test operation with the ON/OFF button on the wireless remote controller.
   - 1, 2, and 3 LED flash during test operation.
   - Under status of [TEST RUN ON], the temperature adjustment from the wireless remote controller is invalid. Do not use this method in the operation other than test operation because the equipment is damaged.

3. Use either Cool or Heat operation mode for a test operation.
   - The outdoor unit does not operate approx. 3 minutes after power-ON and operation stop.

4. After the test operation finished, stop the air conditioner from the wireless remote controller, and return Dip switch of the receiver section as before.
   (A 60-minutes timer clearing function is attached to the receiver section in order to prevent a continuous test operation.)

11 Maintenance

<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.
   Push the tabs (Forward direction as shown in the figure) of the filter, and then pull out it to take out the air filter.

3. Cleaning with water or vacuum cleaner
   - If dirt is heavy, clean the air filter by tepid water with neutral detergent or water.
   - After cleaning with water, dry the air filter sufficiently in a shade place.
Mount the air filter.
   Attach the filter to the main unit while pushing the tabs

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

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.

**Maintenance List**

<table>
<thead>
<tr>
<th>Part</th>
<th>Unit</th>
<th>Check (visual / auditory)</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat exchanger</td>
<td>Indoor / outdoor</td>
<td>Dust / dirt clogging, scratches</td>
<td>Wash the heat exchanger when it is clogged.</td>
</tr>
<tr>
<td>Fan motor</td>
<td>Indoor / outdoor</td>
<td>Sound</td>
<td>Take appropriate measures when abnormal sound is generated.</td>
</tr>
<tr>
<td>Filter</td>
<td>Indoor</td>
<td>Dust / dirt, breakage</td>
<td>Wash the filter with water when it is contaminated. Replace it when it is damaged.</td>
</tr>
<tr>
<td>Fan</td>
<td>Indoor</td>
<td>• Vibration, balance • Dust / dirt, appearance</td>
<td>Replace the fan when vibration or balance is terrible. Brush or wash the fan when it is contaminated.</td>
</tr>
<tr>
<td>Air inlet / outlet grilles</td>
<td>Indoor / outdoor</td>
<td>Dust / dirt, scratches</td>
<td>Fix or replace them when they are deformed or damaged.</td>
</tr>
<tr>
<td>Drain pan</td>
<td>Indoor</td>
<td>Dust / dirt clogging, drain contamination</td>
<td>Clean the drain pan and check the downward slope for smooth drainage.</td>
</tr>
<tr>
<td>Ornamental panel, louvres</td>
<td>Indoor</td>
<td>Dust / dirt, scratches</td>
<td>Wash them when they are contaminated or apply repair coating.</td>
</tr>
<tr>
<td>Exterior</td>
<td>Outdoor</td>
<td>• Rust, peeling of Insulator • Peeling / lift of coil</td>
<td>Apply repair coating.</td>
</tr>
</tbody>
</table>
12 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.
If  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), a check display LCD (Remote controller) 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.
- In case of check from AI-NET central control remote controller: See “AI-NET central control display” in the list.
- In case of check from indoor unit with a wireless remote controller: See “Sensor block display of receiving unit” in the list.

### Check code Wireless remote controller

<table>
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<th>Judging device</th>
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<td>03 — 97 Communication error between indoor unit and remote controller (Detected at indoor unit side)</td>
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<tr>
<td>99 — 01 One of the units connected is abnormal</td>
<td>Indoor unit</td>
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</tbody>
</table>

**Terms and Abbreviations**

- Lighting, Flashing: : Goes off
- AI-NET: Artificial Intelligence
- IPDU: Intelligent Power Drive Unit
- ALT: Flashing is alternately when there are two flashing LED.
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<th>Check code name</th>
<th>Judging device</th>
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</thead>
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<td>At-NET central control display</td>
<td>Sensor block display of receiving unit</td>
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<td>0F</td>
<td>ALT</td>
</tr>
<tr>
<td>F02</td>
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<td>06</td>
<td>ALT</td>
</tr>
<tr>
<td>F03</td>
<td>—</td>
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<td>ALT</td>
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<td>19</td>
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<td>F05</td>
<td>F05</td>
<td>18</td>
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<td>F06</td>
<td>F06</td>
<td>01:TE1 sensor 02:TE2 sensor</td>
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<td>F07</td>
<td>F07</td>
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<td>F08</td>
<td>1b</td>
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<td>02:TE1 sensor 03:TE2 sensor</td>
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<td>F12</td>
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<td>F15</td>
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<td>Detected outdoor unit number</td>
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Error detected by TCC-LINK central control device

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<th>Al-NET central control display</th>
<th>Sensor block display of receiving unit</th>
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<td>(L20 is displayed.)</td>
<td>Decrease of No. of indoor units</td>
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</table>

TCC-LINK: TOSHIBA Carrier Communication Link.
13 Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Sound power level (dBA)</th>
<th>Weight (kg) Main unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMD-AP0074SPH-E</td>
<td>*</td>
<td>22</td>
</tr>
<tr>
<td>MMD-AP0094SPH-E</td>
<td>*</td>
<td>22</td>
</tr>
<tr>
<td>MMD-AP0124SPH-E</td>
<td>*</td>
<td>22</td>
</tr>
<tr>
<td>MMD-AP0154SPH-E</td>
<td>*</td>
<td>23</td>
</tr>
<tr>
<td>MMD-AP0184SPH-E</td>
<td>*</td>
<td>23</td>
</tr>
</tbody>
</table>

* Under 70 dBA

Declaration of Conformity

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

Authorized Representative / TCF holder:
Nick Ball
Toshiba EMEA Engineering Director
Toshiba Carrier UK Ltd.
Porsham Close, Bellerive Industrial Estate,
PLYMOUTH, Devon, PL6 7DB.
United Kingdom

Hereby declares that the machinery described below:

Generic Denomination: Air Conditioner
Model / type: MMD-AP0074SPH-E, MMD-AP0094SPH-E, MMD-AP0124SPH-E, MMD-AP0154SPH-E, MMD-AP0184SPH-E
Commercial name: Super Modular Multi System Air Conditioner
Super Heat Recovery Multi System Air Conditioner
Mini-Super Modular Multi System Air Conditioner (MINI-SMMS series)

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

“Declaration of incorporation of partly completed machinery”
Must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of this Directive, where appropriate.

Complies with the provisions of the following harmonized standard:

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

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

The concentration limit of R410A which is used in multi air conditioners is 0.3 kg/m\(^3\).

**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.

```
Outdoor unit

Room A
Room B
Room C
Room D
Room E
Room F

Indoor unit
```

e.g., charged amount (10 kg)

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)

```
Outdoor unit

Refrigerant piping

Indoor unit
```

2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15 % or larger than the respective floor spaces at the top or bottom of the door).

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 interconnected 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)

```
Min. indoor floor area (m\(^2\))

Total amount of refrigerant (kg)

50
40
30
20
10
0

kg

Range below the density limit of 0.3 kg/m\(^3\)

(Countermeasures not needed)

Range above the density limit of 0.3 kg/m\(^3\)

(Countermeasures needed)
```

(When the ceiling is 2.7 m high)
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).

The 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, [For check method, refer to APPLICABLE CONTROLS in this manual.]

### Confirmation of Indoor Unit Setup

<table>
<thead>
<tr>
<th>Indoor Unit Address</th>
<th>Room Name</th>
<th>Model</th>
<th>Filter Sign Lighting Time</th>
<th>Various Setup</th>
<th>External Static Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line 1</td>
<td>Indoor 1</td>
<td>Group 1</td>
<td>HIGH STATIC 1</td>
<td>STANDARD</td>
<td>150H</td>
</tr>
<tr>
<td>Line 2</td>
<td>Indoor 2</td>
<td>Group 2</td>
<td>HIGH STATIC 2</td>
<td>STANDARD</td>
<td>2500H</td>
</tr>
<tr>
<td>Line 3</td>
<td>Indoor 3</td>
<td>Group 3</td>
<td>HIGH STATIC 3</td>
<td>STANDARD</td>
<td>5000H</td>
</tr>
<tr>
<td>Line 4</td>
<td>Indoor 4</td>
<td>Group 4</td>
<td>STANDARD</td>
<td>STANDARD</td>
<td>10000H</td>
</tr>
</tbody>
</table>

Detected temp. shift value setup

**NO CHANGE**

<table>
<thead>
<tr>
<th>(CODE NO. [0000])</th>
<th>(CODE NO. [0001])</th>
<th>(CODE NO. [0002])</th>
<th>(CODE NO. [0003])</th>
<th>(CODE NO. [0004])</th>
<th>(CODE NO. [0005])</th>
<th>(CODE NO. [0006])</th>
</tr>
</thead>
<tbody>
<tr>
<td>+6°C</td>
<td>+5°C</td>
<td>+4°C</td>
<td>+3°C</td>
<td>+2°C</td>
<td>+1°C</td>
<td>NO SHIFT</td>
</tr>
</tbody>
</table>

Have you changed detected temp. shift value? If not, fill check mark [×] in [NO CHANGE], and fill check mark [×] in [ITEM] if changed, respectively.

- **Confirmation of Indoor Unit Setup**
  - [Check indoor unit address. (For check method, refer to APPLICABLE CONTROLS in this manual.)]
  - [Detected temp. shift value setup]
  - [Incorporation of parts sold]
  - [Central control address]
  - [Filter sign lighting time]
  - [External static pressure]
  - [Various setup]

*Requirement*

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