**TOSHIBA**

**Carrier**

**AIR CONDITIONER (MULTI TYPE)**

Installation Manual

Indoor Unit

Model name:

Medium Static Ducted Type

- MMD-AP0074BH2UL
- MMD-AP0094BH2UL
- MMD-AP0124BH2UL
- MMD-AP0154BH2UL
- MMD-AP0184BH2UL
- MMD-AP0214BH2UL
- MMD-AP0244BH2UL
- MMD-AP0304BH2UL
- MMD-AP0364BH2UL
- MMD-AP0424BH2UL
- MMD-AP0484BH2UL
1 Precautions for safety

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location (roofs, elevated structures, etc.). Only trained, qualified installers and service mechanics should install, start-up, and service this equipment. Untrained personnel can perform basic maintenance functions such as cleaning heat exchanger. All other operations should be performed by trained service personnel.

Before working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.

Follow all safety codes. Wear safety glasses and work gloves. Keep quenching cloth and fire extinguisher nearby during brazing. Use care in handling, rigging, and setting bulky equipment.

Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements. Recognize safety information. This is the safety—alert symbol. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words: DANGER, WARNING, and CAUTION. These words are used with the safety—alert symbol.

DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies hazards which could result in personal injury or death. CAUTION is used to identify unsafe practices which may result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

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

WARNING

• 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.

• Connect ground wire. (grounding work) Incomplete grounding may cause an electric shock. Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone wires.

• Turn off all the circuit breaker before attempting any electrical work. Failure to do so may cause electric shock.

• Install the refrigerant pipe securely during the installation work before operating the air conditioner. If the air conditioner is operated with the valve open and without the refrigerant pipe, the compressor sucks air and the refrigeration cycle is overpressurized, which may cause a burst or injury.

• When the air conditioner for the installation into another place, do not enter any gaseous matter other than the specified refrigerant into the refrigeration cycle. If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it resultingly causes pipe burst and injuries on persons.

• Perform installation work properly according to the Installation Manual. Inappropriate installation may result in water leakage, electric shock or fire.

• When the air conditioner is installed 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.

• Install the air conditioner securely in a location where the base can sustain the weight adequately.

• Perform the specified installation work to guard against an earthquake. If the air conditioner is not installed properly, accidents may occur due to the falling unit.

• If refrigerant gas has leaked during the installation work, ventilate the room immediately.

• If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.

• After 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 might generate.

• Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Use an exclusive power supply for the air conditioner at the rated voltage. An insufficient power supply capacity or inappropriate installation may cause fire.

• Use the specified wires for wiring connect the terminals. Securely fix them to prevent external forces applied to the terminals from affecting the terminals.

• Conform to the regulations of the local electric company when wiring the power supply.
• For the refrigerant recovery work (collection of refrigerant from the pipe to the compressor), stop the compressor before disconnecting the refrigerant pipe. If the refrigerant pipe is disconnected while the compressor is working with the valve open, the compressor sucks air and the refrigeration cycle is overpressurized, which may cause a burst or injury.

• Before carrying out the installation, maintenance, repair or removal work, set the circuit breaker to the OFF position. Otherwise, electric shocks may result.

• 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.

• Suction duct length must be longer than 33.5” (850 mm).

• 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.

• The unit can be accessed from the service panel.

• 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.

• 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.

• 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.

**CAUTION**

• 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, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

• 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.

• Tighten the flare nut with a torque wrench in the specified manner.

• Wear heavy gloves during the installation work to avoid injury.

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**Important notices**

The indoor unit of this air-conditioner uses a DC motor. Current limiting is provided to allow the motor current to be regulated due to the characteristics of a DC motor. Additionally, a thermostat protects the unit against an overload condition. Be sure to stop the fan when replacing the air filter or opening the service panel; otherwise, a protection circuit is tripped, causing both the indoor and outdoor units to stop. At this time, the check code “P12” appears, but this is not a malfunction. When maintenance work is completed, reset the power supply and push the ON/OFF button on the remote control to return the air conditioner to normal operation.

**Maximum capacity of the indoor units**

Keep the sum of the capacities of indoor units below 120 % of the total capacity of the outdoor unit.

**NOTE**

If this code comes up after backup setting for outdoor unit failure is performed, perform “no overloading detected” setting.

<“No overloading detected” setting method>

Turn on dip switch 2 of SW 09 interface P.C. board of outdoor header unit. More than 48 indoor units are connected.

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**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>Installation Manual</td>
<td>1</td>
<td>This manual</td>
<td>Hand over to customers</td>
</tr>
<tr>
<td>Heat insulating pipe</td>
<td>2</td>
<td>□</td>
<td>For heat insulation of pipe connecting section</td>
</tr>
<tr>
<td>Washer</td>
<td>8</td>
<td>□</td>
<td>For hanging-up unit (M10 × Ø34)</td>
</tr>
<tr>
<td>Drain socket</td>
<td>1</td>
<td>□</td>
<td>For connect drain pipe</td>
</tr>
<tr>
<td>Banding band</td>
<td>2</td>
<td>□</td>
<td>For fixing of pipe connecting heat insulator</td>
</tr>
<tr>
<td>Screw</td>
<td>8</td>
<td>□</td>
<td>For attaching a fan guard (sold separately) for air intake from underneath</td>
</tr>
</tbody>
</table>
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 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 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 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.

- Locations where 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 control may not be sensed.)

- Locations where organic solvents are being used.

- Locations where liquefied carbonic acid cooling or in chemical plants.

- Locations where special sprays are used frequently.

- Locations where in-house power generators are used.

- 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.

In some cases including the rainy season, especially inside of the ceiling may become high-humidity atmosphere (dew-point temperature: 73 °F (22.8 °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.

Preparation before installation

Remove a fixing screw for shipping from the cover plate of the filter rack, and block the screw hole with tape.
## Installation space

Reserve sufficient space required for installation or service work.

### Installation space

<table>
<thead>
<tr>
<th>Unit width</th>
<th>Air filter width</th>
<th>Air filter (locally procured)</th>
<th>Electrical control box</th>
<th>Ceiling opening size C</th>
<th>Ceiling opening size</th>
<th>Air intake</th>
<th>Electrical control box</th>
<th>Check port A</th>
<th>Check port B</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.7&quot; (550)</td>
<td>20&quot; (508)</td>
<td>38&quot; (965)</td>
<td>23.8&quot; (605)</td>
<td>23.8&quot; (605)</td>
<td>53.2&quot; (1350)</td>
<td>1.2&quot; (30)</td>
<td>4&quot; (100)</td>
<td>31.5&quot; (800)</td>
<td>31.5&quot; (800)</td>
</tr>
<tr>
<td>39.4&quot; (1000)</td>
<td>38&quot; (965)</td>
<td>52&quot; (1321)</td>
<td>41.3&quot; (1050)</td>
<td>23.8&quot; (605)</td>
<td>60.5&quot; (1530)</td>
<td>2.1&quot; (53)</td>
<td>4&quot; (100)</td>
<td>31.5&quot; (800)</td>
<td>31.5&quot; (800)</td>
</tr>
<tr>
<td>53.2&quot; (1350)</td>
<td>52&quot; (1321)</td>
<td>55.9&quot; (1400)</td>
<td>55.9&quot; (1400)</td>
<td>23.8&quot; (605)</td>
<td>60.5&quot; (1530)</td>
<td>2.1&quot; (53)</td>
<td>4&quot; (100)</td>
<td>31.5&quot; (800)</td>
<td>31.5&quot; (800)</td>
</tr>
</tbody>
</table>

### NOTE

- Set check port A for maintaining the electrical control box, filter, drain pump, drain pipe, and refrigerant pipe.
- Replace the filter through check port A or B. (If you pull out the filter in the opposite direction of the electrical control box, check port B is required.) Reserve space D required for attaching or detaching the filter. Otherwise, the filter cannot be replaced.
- When pulling the refrigerant pipe, drain pipe, etc., avoid the filter port. Otherwise, the filter cannot be replaced.
- The indoor unit is not equipped with an air filter. Procure and install one locally.
- Set a ceiling opening port for maintaining the fan, fan motor, etc. Otherwise, they cannot be maintained.

## Filter cleaning sign term setting

The lighting term setup of the filter sign (Notification of filter cleaning) of the remote control can be changed according to the condition of installation. For setup method, refer to “Filter sign setting” in the Applicable controls of this Manual.

## Arranging the under intake type

For air intake from under air intake, be sure to attach a separately-sold fan guard.

### Model

<table>
<thead>
<tr>
<th>Model</th>
<th>MMO</th>
<th>FAN-GUARD model name</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP007 to AP012</td>
<td>TCB-IG071BUL</td>
<td></td>
</tr>
<tr>
<td>AP015 to AP018</td>
<td>TCB-IG151BUL</td>
<td></td>
</tr>
<tr>
<td>AP021 to AP048</td>
<td>TCB-IG211BUL</td>
<td></td>
</tr>
</tbody>
</table>

### CAUTION

- For air intake from under air intake, be sure to attach a separately-sold fan guard.
- For air intake from under air intake, replace the cover (A) and filter flange as shown below before installing the unit.

1. **<Under air intake>**
   - Attach a separately-sold fan guard. Use the supplied screws.
   - Remove the cover plate A.
   - Fix the cover plate A.
   - Remove the filter flange and then fix it to the bottom surface.
4 Installation

**WARNING**
- Install the air conditioner certainly at a place to sufficiently withstand the weight.
- If the strength is insufficient, the unit may fall down resulting in human injury.
- An incomplete installation can cause accidents by the units falling and dropping.
- Do not install the indoor unit in the way that it takes in the air in the ceiling and provides it into the room. The indoor unit must be installed in the way that it takes in the air from the room and returns it back to the room.

**CAUTION**
- This unit and its ducting (supply and return air) are intended for use in one room only.

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).
- To install vibration isolation material to hanging bolts, confirm that it does not increase the unit vibration.

**External dimensions**

<table>
<thead>
<tr>
<th>Unit: in (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hanging bolt pitch</strong> B</td>
</tr>
<tr>
<td><strong>Hanging bolt pitch</strong> B</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model WR06.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP007, AP009, AP012</td>
<td>21.7” (550)</td>
<td>24.2” (616)</td>
<td>13.9” (351.6)</td>
<td>18.6” (471.6)</td>
<td>3/8” (9.5)</td>
<td>1/4” (6.4)</td>
</tr>
<tr>
<td>AP015, AP018</td>
<td>39.4” (1000)</td>
<td>42” (1066)</td>
<td>31.6” (801.6)</td>
<td>36.5” (921.6)</td>
<td>1/2” (15.9)</td>
<td>1/4” (6.4)</td>
</tr>
<tr>
<td>AP021, AP024, AP030, AP036, AP042, AP048</td>
<td>53.2” (1350)</td>
<td>55.7” (1416)</td>
<td>45.4” (1151.6)</td>
<td>50.1” (1271.6)</td>
<td>5/8” (15.9)</td>
<td>3/8” (9.5)</td>
</tr>
</tbody>
</table>
Installation of the indoor unit

All issues related to locating the unit above the ceiling, hanging the unit from the building structure, routing/suspending the unit wiring and penetrating the ceiling for supply and return air connections to the indoor unit must comply with all applicable codes and regulations.

The indoor unit should be hung above the ceiling utilizing minimum 3/8" x 16 bolts, or threaded rod (4 pieces required) along with 3/8" x 16 nuts, 3/8" flat washers and 3/8" lock washers. All material to be procured locally.

- Check that four sides are horizontal with a level gauge. (Horizontal degree: Within 0.2" (5 mm))

Installation of wired remote control (sold separately)

For installation of the wired remote control refer to the instructions that are supplied with the control. The connection point for the control wiring and the entrance point for the control wiring are clearly marked in the instructions.

The sensor of indoor unit with wireless remote control can receive a signal by distance within approx. 26.2' (8 m). Based upon it, determine a place where the remote control is operated and the installation place.

- Keep 3.3' (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 control can be installed in the same room.

Installation of air filter

The type of air filters required will be specified by applicable codes and requirements for the fan coil installation. The filters for these fan coil units are all 1" thick x 12" high. The lengths vary with the model of fan coil being installed. All the lengths required are specified in the chart below. All filters are to be procured locally.

<table>
<thead>
<tr>
<th>FILTER SPEC: MERV: 7</th>
<th>Unit: in (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter chamber structure and filter size.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MODEL</th>
<th>AP021 to 048</th>
<th>AP015 to 018</th>
<th>AP007 to 012</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>52&quot; (1320)</td>
<td>36.2&quot; (970)</td>
<td>20.9&quot; (520)</td>
</tr>
<tr>
<td>D</td>
<td>12.6&quot; (320)</td>
<td>12.6&quot; (320)</td>
<td>12.6&quot; (320)</td>
</tr>
<tr>
<td>D1</td>
<td>1.1&quot; (28)</td>
<td>1.1&quot; (28)</td>
<td>1.1&quot; (28)</td>
</tr>
<tr>
<td>Filter size (W + W + D) and quantity</td>
<td>12&quot; x 12&quot; x 1&quot;; (2) piece</td>
<td>12&quot; x 12&quot; x 1&quot;; (2) piece</td>
<td>12&quot; x 12&quot; x 1&quot;; (2) piece</td>
</tr>
</tbody>
</table>
Installation of air filter

1. Remove the cover plate (Screw x 3).

2. Pull out the filter rack, and set the air filter (locally procured) in it.

3. Push the filter rack in fully and reattach the cover plate. (Screws x 2)

◆ CAUTION

The cover plate is attached temporarily with the screws indicated by the arrows for protection when shipped. After reattaching it, seal the screw holes with tape instead of using the screws.

All unit models have the FR-1 & FR-2 filter position option available. Both positions use the same filters per model shown in the chart above.
5 Drain piping

\[\text{CAUTION}\]

Condensate drain piping installation and material must comply with applicable codes and regulations for the specific indoor installation.

The condensate drain piping must be insulated to prevent sweating. All material used in the plenum space above the ceiling must comply with applicable codes and regulations. If the condensate drain exits the unit downward (gravity flow) the slope and suspension methods used for the condensate drain piping must comply with applicable codes and regulations.

- The drain pipe must be sloping downward (at an angle of 1/100 or more), and do not run the pipe up and down (arched shape) or allow it to form traps. Doing so may cause abnormal sounds.
- Restrict the length of the traversing drain pipe to 65.6" (20 m) or less. For a long pipe, provide support brackets at intervals of 4'11" to 6'7" (1.5 to 2 m) to prevent flapping.
- Install the collective piping as shown in the following figure.
- Do not provide any air vents. Otherwise, the drain water will spout, causing water to leak.
- Do not allow any force to be applied to the connection area with the drain pipe.

**Connecting drain pipe**

Insert the drain socket into the connector until the socket can go no farther.

**REQUIREMENT**

- Connect the hard vinyl chloride pipes certainly so that water does not leak by using adhesive agent for vinyl chloride.
- 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.

- **Connect the hard vinyl chloride pipes certainly so that water does not leak by using adhesive agent for vinyl chloride.**

- **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.**

**Check the Condensate Drain system**

When all piping and wiring is completed the condensate drain system (including the pump) should be checked for correct operation and leaks. If there are any abnormal sounds, leaks, or if the condensate water does not flow normally, the problem should be diagnosed and corrected before the system is certified for operation.

In the test run, check that water drain is properly performed and water does not leak from the connecting part of the pipes. When doing this, also check that no abnormal sounds are heard from the drain pump motor. Check draining also when installed in heating period.

**When the electrical and wiring work has been completed**

- Pour some water by following the method shown in the following figure. Then, while performing a cooling operation, check that the water drains from the drain pipe connecting port (transparent) and that no water is leaking from the drain pipe.

**When the electrical and wiring work has not been completed**

- Disconnect the float switch connector (3P: Green) from the connector (CN80: Green) on the printed circuit board inside the electrical control box. (Before doing this, the power must be turned off.)
- Connect a 208 / 230 V supply voltage to (L1) and (L2) on the power supply terminal block. (Do not apply a 208 / 230 V voltage to (A), (B) of the terminal block. Otherwise, the printed circuit board may be damaged.)
- Pour the water by following the method shown in the following figure. (Amount of water poured: 0.4 to 0.5 gal (1500 to 2000 cc))
- When the power is turned on, the drain pump automatically starts running. Check whether the water is draining from the drain pipe connecting port, and check that no water is leaking from the drain pipe.

- **Connect the hard vinyl chloride pipes certainly so that water does not leak by using adhesive agent for vinyl chloride.**

- **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 (condensate pumped up from unit)**

When gravity drainage cannot be provided directly from the indoor unit condensate exit the piping can be arranged for upward condensate discharge. The vertical leg of the drain line must be a maximum of 12" or less from the indoor condensate exit and the total vertical height of the leg must be a maximum of 21" or less before the drain enters a gravity flow line. These dimensions are specified by the indoor unit condensate pump limitations. As specified for the gravity flow installation all materials and suspension methods must comply with applicable codes and regulations.

- **Pour the water by following the method shown in the following figure.** (Amount of water poured: 0.4 to 0.5 gal (1500 to 2000 cc))

- **When the power is turned on, the drain pump automatically starts running. Check whether the water is draining from the drain pipe connecting port, and check that no water is leaking from the drain pipe.**

- **After checking that the water drains and there are no water leaks, turn off the power, connect the float switch connector to its original location (CN80) on the printed circuit board, and return the electrical control box to its original position.**

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**Drain up (condensate pumped up from unit)**

When gravity drainage cannot be provided directly from the indoor unit condensate exit the piping can be arranged for upward condensate discharge. The vertical leg of the drain line must be a maximum of 12" or less from the indoor condensate exit and the total vertical height of the leg must be a maximum of 21" or less before the drain enters a gravity flow line. These dimensions are specified by the indoor unit condensate pump limitations. As specified for the gravity flow installation all materials and suspension methods must comply with applicable codes and regulations.

- **Pour the water by following the method shown in the following figure.** (Amount of water poured: 0.4 to 0.5 gal (1500 to 2000 cc))

- **When the power is turned on, the drain pump automatically starts running. Check whether the water is draining from the drain pipe connecting port, and check that no water is leaking from the drain pipe.**

- **After checking that the water drains and there are no water leaks, turn off the power, connect the float switch connector to its original location (CN80) on the printed circuit board, and return the electrical control box to its original position.**
Condensate drain pipe insulation

The condensate drain system piping must be insulated to prevent sweating after the leak check is performed. All material used in the condensate drain system must comply with applicable codes and regulations covering materials installed in the ceiling plenum area.

To cover the pipe and the indoor unit with a heat insulator, do not make a space between them.

Pipe insulator (locally procured)
Fix the insulator with adhesive tape

1” drain pipe (locally procured)

Refrigerant piping

6 Refrigerant piping

CAUTION
When the refrigerant pipe is long, provide support brackets at intervals of 8’2” to 9’10” (2.5 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

<table>
<thead>
<tr>
<th>Model MMD-</th>
<th>Pipe size</th>
<th>Unit: in (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP007 to AP012</td>
<td>3/8” (9.5)</td>
<td>3/8” (9.5)</td>
</tr>
<tr>
<td>AP015 to AP018</td>
<td>1/2” (12.7)</td>
<td>1/2” (12.7)</td>
</tr>
<tr>
<td>AP021 to AP048</td>
<td>5/8” (15.9)</td>
<td>5/8” (15.9)</td>
</tr>
</tbody>
</table>

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.

- In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.02” (0.5 mm) more than that for R22 to adjust to the specified flare size. The copper pipe gauge is useful for adjusting projection margin size.
- The sealed gas was sealed at the atmospheric pressure so when the flare nut is removed, there will no “whooshing” sound. This is normal and is not indicative of trouble.
- Use two wrenches to connect the indoor unit pipe.

Projection margin in flaring

<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>3/8” (9.5)</td>
<td>0.36” (9.1)</td>
<td>0.36” (9.1)</td>
</tr>
<tr>
<td>1/2” (12.7)</td>
<td>0.52” (13.2)</td>
<td>0.52” (13.2)</td>
</tr>
<tr>
<td>5/8” (15.9)</td>
<td>0.78” (19.7)</td>
<td>0.78” (19.7)</td>
</tr>
</tbody>
</table>

Flaring diameter size

<table>
<thead>
<tr>
<th>Outer dia. of copper pipe</th>
<th>Unit: in (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8” (9.5)</td>
<td>0.52” (13.2)</td>
</tr>
<tr>
<td>1/2” (12.7)</td>
<td>0.65” (16.6)</td>
</tr>
<tr>
<td>5/8” (15.9)</td>
<td>0.78” (19.7)</td>
</tr>
</tbody>
</table>
• Use the tightening torque levels as listed in the following table.

<table>
<thead>
<tr>
<th>Outer dia. of connecting pipe (in (mm))</th>
<th>Tightening torque (ft•lbs (N•m))</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; (6.4)</td>
<td>10 to 13 (14 to 18)</td>
</tr>
<tr>
<td>3/8&quot; (9.5)</td>
<td>24 to 31 (33 to 42)</td>
</tr>
<tr>
<td>1/2&quot; (12.7)</td>
<td>37 to 46 (50 to 62)</td>
</tr>
<tr>
<td>5/8&quot; (15.9)</td>
<td>46 to 57 (63 to 77)</td>
</tr>
</tbody>
</table>

• Tightening torque of flare pipe connections.

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

**CAUTION**

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

**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 248 °F (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).
- Apply heat insulating materials to both the gas side and liquid side as shown:

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

For air tightness testing, 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.

---

**7 Electrical connection**

**WARNING**

1. Use predefined wire and connect them certainly. Keep the connecting terminal free from external force. Improper wire connection or clamping may result in exothermic, fire or malfunction.

2. Connect ground wire. (grounding work)

   Incomplete grounding cause an electric shock. Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone wires.

3. Install appliance in accordance with national wiring regulations.

   Capacity shortage of circuit breaker or incomplete installation may cause an electric shock or a fire.

**CAUTION**

- Consult local building codes, NEC (National Electrical Code) or CEC (Canadian Electrical Code) for special requirements.
- If incorrect / incomplete wiring is carried out, it will cause an electrical fire or smoke.
- Install circuit breaker is not tripped by shock waves. If circuit 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 control wires when peeling them.
- Use the power cord and control wire of specified thickness, type, and protective devices required.
- Do not connect 208 / 230 V power to the terminal blocks (U1, U2, A, B etc.) for control wiring. (Otherwise, the system will fail.)
- 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.
- Do not turn on the circuit breaker of the indoor unit until vacuuming of the refrigerant pipes completes.

**REQUIREMENT**

- For power supply wiring, strictly conform to the Local Regulation in each country.
- Run the refrigerant piping line and control wiring line in the same line.

**Power supply wire and control wires specifications**

Power supply wire and control wires are locally procured.

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

**Indoor unit power supply**

For the power supply of the indoor unit, prepare the exclusive power supply separated from that of the outdoor unit.

**Power supply**

<table>
<thead>
<tr>
<th>Power supply</th>
<th>208 / 230-1-60</th>
</tr>
</thead>
</table>

**Control wiring, Central control wiring**

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

**REQUIREMENT**

- For power supply wiring, strictly conform to the Local Regulation in each country.
- Run the refrigerant piping line and control wiring line in the same line.
**Power supply wire**

Recommended wire diameter and wire length for power supply wire.

<table>
<thead>
<tr>
<th>Model</th>
<th>Power Supply Voltage Range (V)</th>
<th>MCA (A)</th>
<th>MOCP (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMD-AP0074BH2UL</td>
<td>208 / 230 V-1-60 Hz</td>
<td>1.0</td>
<td>15</td>
</tr>
<tr>
<td>MMD-AP0094BH2UL</td>
<td></td>
<td>1.0</td>
<td>15</td>
</tr>
<tr>
<td>MMD-AP0124BH2UL</td>
<td></td>
<td>1.2</td>
<td>15</td>
</tr>
<tr>
<td>MMD-AP0154BH2UL</td>
<td></td>
<td>1.2</td>
<td>15</td>
</tr>
<tr>
<td>MMD-AP0214BH2UL</td>
<td></td>
<td>1.8</td>
<td>15</td>
</tr>
<tr>
<td>MMD-AP0244BH2UL</td>
<td></td>
<td>1.8</td>
<td>15</td>
</tr>
<tr>
<td>MMD-AP0304BH2UL</td>
<td></td>
<td>2.3</td>
<td>15</td>
</tr>
<tr>
<td>MMD-AP0364BH2UL</td>
<td></td>
<td>2.8</td>
<td>15</td>
</tr>
<tr>
<td>MMD-AP0424BH2UL</td>
<td></td>
<td>2.8</td>
<td>15</td>
</tr>
<tr>
<td>MMD-AP0484BH2UL</td>
<td></td>
<td>2.8</td>
<td>15</td>
</tr>
</tbody>
</table>

**Control wire**

Control wiring between indoor units, and outdoor unit (2-core shielded wire)

<table>
<thead>
<tr>
<th>Wire size</th>
<th>(Up to 3281'10&quot; (1000 m)) AWG16</th>
<th>(Up to 6561'8&quot; (2000 m)) AWG14</th>
</tr>
</thead>
</table>

**Remote control wiring**

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

**Wiring example**

The remote control wire (Communication line) and AC208 / 230 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**

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

**NOTE**

- Use copper supply wire.
- Use UL wire rated 600 V for the power supply.
- Use UL wire rated 300 V for the remote control wires and control wires.
### 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.
- The low-voltage circuit is provided for the remote control. (Do not connect the high-voltage circuit)
- Remove the cover of the control box by taking off the mounting screws (3 positions).
- Attach the conduit pipe with a lock nut.
- Tighten the screws of the terminal block, and fix the wires with cord clamp attached to the electrical control box. (Do not apply tension to the connecting section of the terminal block.)
- Mount the cover of the electrical control box without pinching wires.

### Power supply wires and ground wire

1. Strip the wire ends.  
   - Power supply wire: 0.4” (10 mm)
   - Ground wire: 0.8” (20 mm)
2. Match the wire colors with the terminal numbers on the indoor unit's and circuit breakers' terminal blocks and firmly screw the wires to the corresponding terminals.
3. Secure the ground wire with the ground screw.
4. Fix the wires with a cord clamp.

**Unit:** in (mm)

**CAUTION**
Firmly tighten the screws of the terminal block.
Keep the wire length as shown in figure below when it is connected to the terminal block.

### Address setup

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

### 8 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 control 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 control operations can be performed. Setup takes up to 10 minutes (usually about 5 minutes).
- When the power is turned on after automatically 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.

**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.

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 control 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.)

**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 is flashing, no operation of the remote control 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 control>

<table>
<thead>
<tr>
<th>SET DATA</th>
<th>External static pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>Standard (Factory default)</td>
</tr>
<tr>
<td>0001</td>
<td>High static pressure 1</td>
</tr>
<tr>
<td>0003</td>
<td>High static pressure 2</td>
</tr>
<tr>
<td>0006</td>
<td>Low static pressure</td>
</tr>
</tbody>
</table>

With a remote control-less system (group control)

Besides the switching method using the wired remote control as a way to establish the external static pressure, switching is also possible by changing over the DIP switch settings on the indoor P.C. board as shown in the following table.
- However, once the settings are changed, it is necessary to reset the SET DATA to 0000 that placing the DIP switch back to the factory default position and rewriting the SET DATA back to 0000 with wired remote control (sold separately).
- Change over the DIP switch on the indoor P.C. board, and select the desired setting.

DIP switch positions (SW01, SW02)
Filter sign setting

According to the installation condition, the filter sign term (Notification of filter cleaning) can be changed. Follow 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</td>
</tr>
<tr>
<td>0003</td>
<td>5000 H</td>
</tr>
<tr>
<td>0004</td>
<td>10000 H</td>
</tr>
</tbody>
</table>

Remote control sensor

The temperature sensor of the indoor unit senses room temperature usually. Set the remote control sensor to sense the temperature around the remote control. Select items following the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6).
- Specify [32] for the CODE No. in Procedure 3.
- Select the following data for the SET DATA in Procedure 4.

<table>
<thead>
<tr>
<th>SET DATA</th>
<th>remote control sensor data</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>Not used (Factory default)</td>
</tr>
<tr>
<td>0001</td>
<td>Used</td>
</tr>
</tbody>
</table>

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

Group control

In a group control, a remote control can control up to maximum 8 units.
- The wired remote control only can control a group control. The wireless remote control is unavailable for this control.
- For wiring procedure and wires of the individual line (identical refrigerant line) system, refer to “Electrical connection” in this Manual.
- Wiring between indoor units in a group is performed in the following procedure.
- Connect the indoor units by connecting the remote control wires from the remote control terminal blocks (A, B) of the indoor unit connected with a remote control to the remote control terminal blocks (A, B) of the other indoor unit. (Non-polarity)
- For address setup, refer to the Installation Manual attached to the outdoor unit.

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 L1 to L2 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

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

CAUTION

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

To secure better effect of heating

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 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>1.8 °F (+1 °C)</td>
</tr>
<tr>
<td>0002</td>
<td>3.6 °F (+2 °C)</td>
</tr>
<tr>
<td>0003</td>
<td>5.4 °F (+3 °C)</td>
</tr>
<tr>
<td>0004</td>
<td>7.2 °F (+4 °C)</td>
</tr>
<tr>
<td>0005</td>
<td>9.0 °F (+5 °C)</td>
</tr>
<tr>
<td>0006</td>
<td>10.8 °F (+6 °C)</td>
</tr>
</tbody>
</table>
Wireless remote control

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 ON / OFF button on the wireless remote control.
• ON, , and LED flash during test operation.
• Under status of [TEST RUN ON], the temperature adjustment from the wireless remote control 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 control, 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.)

If a test run cannot be properly performed

If a test run is performed before the outside duct is installed, the protective control works to stop the unit, and the check code "P12" appears. This is not a malfunction. (The current control works and heating protection control due to the characteristics of the DC motor employed as the indoor fan motor of this model.) If performing a test run before installing the outside duct, set the air volume to LOW, or block the air vent.

Troubleshooting

Confirmation and check

When an error occurred in the air conditioner, the check code and the indoor UNIT No. appear on the display part of the remote control. The check 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.

Check code Indoor UNIT No. in which an error occurred

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.)

Procedure 1
Push and buttons simultaneously for 4 seconds or more, the following display appears.
If [Service check] is displayed, the mode enters in the error log mode.
• [01: Order of error log] is displayed in CODE No. window.
• [Check code] is displayed in CHECK window.
• [Indoor unit address in which an error occurred] is displayed in Unit No.

Procedure 2
Push button. 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.

Procedure 3
Push button to return to the usual display after confirmation.

1. Check the errors according to the above procedure.
2. Ask an authorized dealer or qualified service (maintenance) professional to repair or maintain the air conditioner.

Check code Indoor UNIT No. in which an error occurred

Procedure

2

3
## Check codes and parts to be checked

### Check method
On the remote control (Wired remote control, Central control remote control) and the interface P.C. board of the outdoor unit (I/F), a check display LCD (Remote control) or 7-segment display (on the outdoor interface P.C. board) to display the operation is provided. Therefore the operation status can be known. With 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.
- To check from indoor remote control: See “Wired remote control display” in the list.
- To check from outdoor unit: See “Outdoor 7-segment display” in the list.
- To check from indoor unit with a wireless remote control: See “Sensor block display of receiving unit” in the list.

### Check code

<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 and remote control (Detected at remote control side)</td>
<td>Remote control</td>
</tr>
<tr>
<td>E02</td>
<td>Communication error between indoor and remote control (Detected at indoor side)</td>
<td>Indoor</td>
</tr>
<tr>
<td>E04</td>
<td>Communication error between indoor / outdoor (Detected at outdoor side)</td>
<td>Outdoor</td>
</tr>
<tr>
<td>E06</td>
<td>Decrease of No. of indoor units</td>
<td></td>
</tr>
<tr>
<td>E08</td>
<td>Equivalent indoor addresses</td>
<td>Indoor / I/F</td>
</tr>
<tr>
<td>E10</td>
<td>Communication error between indoor / outdoor (Detected at outdoor side)</td>
<td>Outdoor</td>
</tr>
<tr>
<td>E12</td>
<td>Automatic address start error</td>
<td>I/F</td>
</tr>
<tr>
<td>E14</td>
<td>Error in re-numbering</td>
<td></td>
</tr>
<tr>
<td>E16</td>
<td>Capacity error</td>
<td></td>
</tr>
<tr>
<td>E18</td>
<td>Combination error between indoor units</td>
<td></td>
</tr>
<tr>
<td>E19</td>
<td>Outdoor header units error</td>
<td></td>
</tr>
<tr>
<td>E20</td>
<td>Other line connected</td>
<td></td>
</tr>
<tr>
<td>E22</td>
<td>Address error in communication between indoor units</td>
<td></td>
</tr>
<tr>
<td>E24</td>
<td>Equivalent outdoor addresses</td>
<td></td>
</tr>
<tr>
<td>E26</td>
<td>Decrease of No. of connected outdoor units</td>
<td></td>
</tr>
<tr>
<td>E28</td>
<td>Outdoor unit error</td>
<td></td>
</tr>
<tr>
<td>E30</td>
<td>Other line error</td>
<td></td>
</tr>
<tr>
<td>E32</td>
<td>Address error</td>
<td></td>
</tr>
<tr>
<td>E34</td>
<td>Communication error between indoor / outdoor</td>
<td></td>
</tr>
<tr>
<td>E32</td>
<td>Communication error between indoor / outdoor</td>
<td></td>
</tr>
<tr>
<td>E36</td>
<td>Other line error</td>
<td></td>
</tr>
<tr>
<td>E38</td>
<td>Address error</td>
<td></td>
</tr>
</tbody>
</table>

### Check code table

<table>
<thead>
<tr>
<th>Check code</th>
<th>Wireless remote control display</th>
<th>Sensor block display of receiving unit</th>
<th>Check code name</th>
<th>Judging device</th>
</tr>
</thead>
<tbody>
<tr>
<td>E01</td>
<td>Indoor / Outdoor communication error</td>
<td></td>
<td>Communication error between indoor and outdoor units</td>
<td></td>
</tr>
<tr>
<td>E02</td>
<td>Remote control transmission error</td>
<td></td>
<td>Remote control transmission error</td>
<td></td>
</tr>
<tr>
<td>E04</td>
<td>Communication error between indoor / outdoor (Detected at outdoor side)</td>
<td></td>
<td>Communication error between indoor / outdoor (Detected at outdoor side)</td>
<td></td>
</tr>
<tr>
<td>E06</td>
<td>Decrease of No. of indoor units</td>
<td></td>
<td>Decrease of No. of indoor units</td>
<td></td>
</tr>
<tr>
<td>E08</td>
<td>Equivalent indoor addresses</td>
<td></td>
<td>Equivalent indoor addresses</td>
<td>Indoor / I/F</td>
</tr>
<tr>
<td>E10</td>
<td>Communication error between indoor / outdoor (Detected at outdoor side)</td>
<td></td>
<td>Communication error between indoor / outdoor (Detected at outdoor side)</td>
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</tr>
<tr>
<td>E12</td>
<td>Automatic address start error</td>
<td></td>
<td>Automatic address start error</td>
<td>I/F</td>
</tr>
<tr>
<td>E14</td>
<td>Error in re-numbering</td>
<td></td>
<td>Error in re-numbering</td>
<td></td>
</tr>
<tr>
<td>E16</td>
<td>Capacity error</td>
<td></td>
<td>Capacity error</td>
<td></td>
</tr>
<tr>
<td>E18</td>
<td>Combination error between indoor units</td>
<td></td>
<td>Combination error between indoor units</td>
<td></td>
</tr>
<tr>
<td>E19</td>
<td>Outdoor header units error</td>
<td></td>
<td>Outdoor header units error</td>
<td></td>
</tr>
<tr>
<td>E20</td>
<td>Other line connected</td>
<td></td>
<td>Other line connected</td>
<td></td>
</tr>
<tr>
<td>E22</td>
<td>Address error in communication between indoor units</td>
<td></td>
<td>Address error in communication between indoor units</td>
<td></td>
</tr>
<tr>
<td>E24</td>
<td>Equivalent outdoor addresses</td>
<td></td>
<td>Equivalent outdoor addresses</td>
<td></td>
</tr>
<tr>
<td>E26</td>
<td>Decrease of No. of connected outdoor units</td>
<td></td>
<td>Decrease of No. of connected outdoor units</td>
<td></td>
</tr>
<tr>
<td>E28</td>
<td>Outdoor unit error</td>
<td></td>
<td>Outdoor unit error</td>
<td></td>
</tr>
<tr>
<td>E30</td>
<td>Other line error</td>
<td></td>
<td>Other line error</td>
<td></td>
</tr>
<tr>
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<td>Address error</td>
<td></td>
<td>Address error</td>
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</tr>
<tr>
<td>E34</td>
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<td>Communication error between indoor / outdoor</td>
<td></td>
</tr>
<tr>
<td>E36</td>
<td>Other line error</td>
<td></td>
<td>Other line error</td>
<td></td>
</tr>
<tr>
<td>E38</td>
<td>Address error</td>
<td></td>
<td>Address error</td>
<td></td>
</tr>
</tbody>
</table>
### Error detected by TCC-LINK central control device

<table>
<thead>
<tr>
<th>Check code</th>
<th>Wire remote control display</th>
<th>Wireless remote control</th>
<th>Check code name</th>
<th>Judge device</th>
</tr>
</thead>
<tbody>
<tr>
<td>P18</td>
<td>—</td>
<td>ALT</td>
<td>Ducted outdoor unit number</td>
<td>Indoor</td>
</tr>
<tr>
<td>P19</td>
<td>—</td>
<td>ALT</td>
<td>Motor valve reverse error</td>
<td>IPDU</td>
</tr>
<tr>
<td>P20</td>
<td>—</td>
<td>ALT</td>
<td>High pressure protective operation</td>
<td>Indoor</td>
</tr>
<tr>
<td>P22</td>
<td>—</td>
<td>ALT</td>
<td>Outdoor fan IPDU error</td>
<td>IPDU</td>
</tr>
<tr>
<td>P26</td>
<td>—</td>
<td>ALT</td>
<td>G-TR short protection error</td>
<td>IPDU</td>
</tr>
<tr>
<td>P29</td>
<td>—</td>
<td>ALT</td>
<td>Comp position detect circuit system error</td>
<td>Indoor</td>
</tr>
<tr>
<td>P31</td>
<td>—</td>
<td>ALT</td>
<td>Outdoor fan unit error (group follower unit error)</td>
<td>Indoor</td>
</tr>
</tbody>
</table>

**Check code name**: Outdoor 7-segment display, Sensor block display of monitoring unit, Check code name, Judge device.

**Judge device**: Indoor, IPDU, ALT.

---

### Error detected by TCC-LINK central control device

<table>
<thead>
<tr>
<th>Check code</th>
<th>Wire remote control display</th>
<th>Wireless remote control</th>
<th>Check code name</th>
<th>Judge device</th>
</tr>
</thead>
<tbody>
<tr>
<td>G05</td>
<td>—</td>
<td>—</td>
<td>Sending error of TCC-LINK central control device</td>
<td>TCC-LINK</td>
</tr>
<tr>
<td>G06</td>
<td>—</td>
<td>—</td>
<td>Receiving error of TCC-LINK central control device</td>
<td>TCC-LINK</td>
</tr>
<tr>
<td>C13</td>
<td>—</td>
<td>—</td>
<td>Group temperature of general-purpose equipment control</td>
<td>TCC-LINK</td>
</tr>
<tr>
<td>P30</td>
<td>—</td>
<td>—</td>
<td>Duplicated central control address</td>
<td>TCC-LINK</td>
</tr>
</tbody>
</table>

**Check code name**: Outdoor 7-segment display, Sensor block display of monitoring unit, Check code name, Judge device.

**Judge device**: Indoor, IPDU, ALT.

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**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.

Total amount of refrigerant (lbs (kg))

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

The concentration limit of R410A which is used in multi air conditioners is 0.019 lbs/ft\(^3\) (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 charged in each independent device.

For the amount of charge in this example:
- The possible amount of leaked refrigerant gas in rooms A, B and C is 22 lbs (10 kg).
- The possible amount of leaked refrigerant gas in rooms D, E and F is 33 lbs (15 kg).

**Important**

**NOTE 2 :**
The standards for minimum room volume are as follows.

1. No partition (shaded portion)
   ![Diagram](image1)

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).
   ![Diagram](image2)

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.
   ![Diagram](image3)

**NOTE 3 :**
The minimum indoor floor area compared with the amount of refrigerant is roughly as follows:

<table>
<thead>
<tr>
<th>Total amount of refrigerant (lbs (kg))</th>
<th>Min. indoor floor area (ft(^2) (m(^2)))</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ Concentration limit (lbs/ft(^3) (kg/m(^3)))</td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Room name</th>
<th>Indoor unit</th>
<th>Indoor unit</th>
<th>Indoor unit</th>
<th>Indoor unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check indoor unit address. (For check method, refer to Applicable controls in this manual.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Central control address</th>
<th>Central control address</th>
<th>Central control address</th>
<th>Central control address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you changed high ceiling setup? 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.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>External static pressure</th>
<th>External static pressure</th>
<th>External static pressure</th>
<th>External static pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>(CODE No. [5d])</td>
<td>(CODE No. [5d])</td>
<td>(CODE No. [5d])</td>
<td>(CODE No. [5d])</td>
</tr>
<tr>
<td>Have you changed lighting time of filter sign 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.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Filter sign lighting time</th>
<th>Filter sign lighting time</th>
<th>Filter sign lighting time</th>
<th>Filter sign lighting time</th>
</tr>
</thead>
<tbody>
<tr>
<td>(CODE No. [07])</td>
<td>(CODE No. [07])</td>
<td>(CODE No. [07])</td>
<td>(CODE No. [07])</td>
</tr>
<tr>
<td>Have you changed 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 control in this manual.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Detected temp. shift value setup</th>
<th>Detected temp. shift value setup</th>
<th>Detected temp. shift value setup</th>
<th>Detected temp. shift value setup</th>
</tr>
</thead>
<tbody>
<tr>
<td>(CODE No. [08])</td>
<td>(CODE No. [08])</td>
<td>(CODE No. [08])</td>
<td>(CODE No. [08])</td>
</tr>
<tr>
<td>Have you incorporated the following parts sold separately? If incorporated, fill check mark [×] in [ITEM]. (When incorporating, the setup change is necessary in some cases. For setup change method, refer to Installation Manual attached to each part sold separately.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incorporation of parts sold separately</th>
<th>Incorporation of parts sold separately</th>
<th>Incorporation of parts sold separately</th>
<th>Incorporation of parts sold separately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard panel</td>
<td>Panel</td>
<td>Standard panel</td>
<td>Panel</td>
</tr>
<tr>
<td>Standard panel</td>
<td>Panel</td>
<td>Standard panel</td>
<td>Panel</td>
</tr>
</tbody>
</table>

TOSHIBA CARRIER CORPORATION