TOSHIBA

Carrier

AIR CONDITIONER (MULTI TYPE)

Installation manual

Outdoor Unit

Model name:

<Heat Pump Model>

For OUTDOOR USE only

MMY-MAP0724HT9UL
MMY-MAP0964HT9UL
MMY-MAP1144HT9UL
MMY-MAP0724HT6UL
MMY-MAP0964HT6UL
MMY-MAP1144HT6UL
Thank you for purchasing this Toshiba air conditioner. This Installation Manual describes the installation method of the outdoor unit. For installation of indoor units, follow the Installation Manual supplied with the indoor unit. After installation, give this Installation Manual, the Owner’s Manual and the Installation Manual supplied with the indoor unit to the customer and tell the customer to keep them safe.

Indoor units are not wired from outdoor units and require their own power supply. Y-shaped branching joints or a branching header (separately purchased) are required for connecting pipes between indoor and outdoor units. Choose either of them considering the system capacity concerning piping. For installing branching pipes, refer to the installation manual of the Y-shaped branching unit or branching header (separately purchased).

Outdoor connecting branching joints are required for connecting between outdoor units.

Generic Denomination: Air Conditioner

Definition of Qualified Installer or Qualified Service Person
The air conditioner must be installed, maintained, repaired and removed by a certified installer or service person.

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.

ADOPTION OF NEW REFRIGERANT
This Air Conditioner uses R410A an environmentally friendly refrigerant.
## Warning Indications on the Air Conditioner Unit

<table>
<thead>
<tr>
<th>Warning indication</th>
<th>Description</th>
</tr>
</thead>
</table>
| **WARNING**        | **ELECTRICAL SHOCK HAZARD**  
Disconnect all remote electric power supplies before servicing. |
| **CAUTION**        | High temperature parts.  
You might get burned when removing this panel. |

**SERVICE**  
Use only R-410A Refrigerant and POE Compressor Oil. Refer to the literature before installing or servicing this unit.
Precautions for Safety

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

WARNING

General
- Carefully read Owner’s Manual before starting the air conditioner. There are many important things to keep in mind for daily operation.
- Ask for installation to be performed by the dealer or a professional. Only a qualified installer is able to install an air conditioner. If a non-qualified person installs an air conditioner, it may result in problems such as fire, electric shock, injury, water leakage, noise and vibration.
- Do not use any refrigerant different from the one specified for complement or replacement. Otherwise, abnormal 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 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.
- Before carrying out the installation, maintenance, repair or removal work, be sure to set the circuit breakers for both the indoor and outdoor units to the OFF position. Otherwise, electric shock may result.
- Wear protective gloves and safety work clothing during installation, servicing and removal.
- Do not touch the aluminium fin of the outdoor 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 install in a location where flammable gas leaks are possible. If the gas should leak and accumulate around the unit, it may ignite and cause a fire.
- During transporting the air conditioner, wear shoes with protective toe caps, protective gloves, and other protective clothing.
- 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.
- Places where the operation sound of the outdoor unit may cause a disturbance. (Especially at the boundary line with a neighbour, install the air conditioner while considering the noise.)

Installation
- Do not install in a location where flammable gas leaks are possible. If the gas should leak and accumulate around the unit, it may ignite and cause a fire.
- Install the outdoor unit properly in a location that is durable enough to support the weight of the outdoor unit. Insufficient durability may cause the outdoor unit to fall, which may result in injury.
- Install the unit in the prescribed manner for protection against strong wind and earthquake. Incorrect installation may result in the unit falling down, or other accidents.
- Fix the screws back which have been removed for installation or other purposes.
- Ventilate the air if the refrigerant gas leaks during installation. If the leaked refrigerant gas comes into contact with fire, toxic gases may be produced.

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.
- Ventilate the air if the refrigerant gas leaks during installation. If the leaked refrigerant gas comes into contact with fire, toxic gas may be produced.
- 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 refrigeration cycle. Failure to purge the air completely may cause the air conditioner to malfunction.
- Nitrogen gas must be used for the air vent test.

Electrical wiring
- Only a certified installer or qualified service person(*1) is allowed to carry out the electrical work of the air conditioner.
- When connecting the electrical wires, repairing the electrical parts or undertaking 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.
- When executing address setting, test run, or troubleshooting through the checking window on the electric parts box, put on insulated heat-proof gloves, insulated shoes and other clothing to provide protection from electric shock. Otherwise you may receive an electric shock.
- Use wiring that meets the specifications in the Installation Manual, NEC and the local codes.
- Check that the product is properly earthed. (Grounded)
- Do not connect the ground line to a gas pipe, water pipe, lightning conductor, or a telephone earth line.
- After completing the repair or relocation work, check that the ground wires are connected properly.
- Install a circuit breaker that meets the specifications in the installation manual. NEC and local codes.
- Under no circumstances must the power cable be extended. Connection trouble in the places where the cable is extended may give rise to smoking and/or a fire.
- Do not supply power from the power terminal block equipped on the outdoor unit to another outdoor unit. Capacity overflow may occur on the terminal block and may result in fire.
- Each outdoor unit should have its own power supply.

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 when an error display has appeared, there is a smell of burning, abnormal sounds are heard, the air conditioner fails to cool or heat or water is leaking) has occurred in the air conditioner, do not touch the air conditioner yourself but set the circuit breaker to the OFF position, and contact a qualified service person. Take steps to ensure that the power will not be turned on (by marking “out of service” near the circuit breaker, for instance) until qualified service person arrives. Continuing to use the air conditioner in the trouble status may cause mechanical problems to escalate or result in electric shocks or other failure.
- 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.
- 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.
- After the installation work, follow the Owner’s Manual to explain to the customer how to use and maintain the unit.

Relocation
- Only a certified installer(*1) or service person is allowed to relocate the air conditioner.
- When the pump-down work is carried out 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.
- Do not recover the refrigerant into the outdoor unit. Use a refrigerant recovery machine to recover the refrigerant after moving or repairing. It is impossible to recover the refrigerant into the outdoor unit. Refrigerant recovery into the outdoor unit may result in serious accidents such as explosion of the unit, injury or other accidents.

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

New Refrigerant Air Conditioner Installation
• THIS AIR CONDITIONER USES THE ENVIRONMENTARY FRIENDLY 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. As compared 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 changing 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.
• For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter.

2 Accessory Parts

<table>
<thead>
<tr>
<th>Part name</th>
<th>Q'ty</th>
<th>Shape</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner’s Manual</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Installation Manual</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Accessory pipe (for Ø7/8&quot; (22.2 mm))</td>
<td>1</td>
<td>0</td>
<td>Connecting pipe for gas side piping</td>
</tr>
<tr>
<td>Accessory pipe (for Ø1 1/8&quot; (28.6 mm))</td>
<td>0</td>
<td>1</td>
<td>Connecting pipe for gas side piping</td>
</tr>
</tbody>
</table>

3 Installation of R410 Air Conditioner

This air conditioner adopts the HFC refrigerant (R410A) which does not deplete the ozone layer.
• R410A refrigerant is more vulnerable to impurities such as water, oxidizing membranes, or oils because the pressure of R410A refrigerant is higher than that of the former refrigerant by approximately 1.6 times. As well as the adoption of the new refrigerant, the refrigerating oil has also been changed. Therefore, pay attention so that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle of the new refrigerant air conditioner during installation.
• To prevent mixing of refrigerant or refrigerating oil, the size of the charge port of the main unit or connecting section of the installation tool differs to that of an air conditioner for the former refrigerant. Accordingly, exclusive tools are required for the refrigerant (R410A) as shown below.
• For connecting pipes, use new and clean piping materials so that water or dust does not enter.

Required Tools and Cautions on handling

Prepare the tools and equipment listed in the following table before starting the installation work.
△: R410A exclusive
○: Generic

<table>
<thead>
<tr>
<th>Tools/equipment</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manifold gauge*</td>
<td>Vacuum/charging refrigerant and operation check</td>
</tr>
<tr>
<td>Charging hose</td>
<td></td>
</tr>
<tr>
<td>Gas leak detector</td>
<td>Gas leak check</td>
</tr>
<tr>
<td>Vacuum pump with backflow prevention function</td>
<td>Vacuum drying</td>
</tr>
<tr>
<td>Flare tool</td>
<td>Flare machining of pipes</td>
</tr>
<tr>
<td>Bender</td>
<td>Bending pipes</td>
</tr>
<tr>
<td>Refrigerant recovery equipment</td>
<td>Refrigerant recovery</td>
</tr>
<tr>
<td>Torque wrench</td>
<td>Tightening flare nuts Ø1/2&quot; (12.7 mm) and Ø5/8&quot; (15.9 mm)</td>
</tr>
<tr>
<td>Pipe cutter</td>
<td>Cutting pipes</td>
</tr>
<tr>
<td>Brazing torch and nitrogen cylinder</td>
<td>Brazing torch</td>
</tr>
<tr>
<td>Refrigerant charging scales</td>
<td>Charging refrigerant</td>
</tr>
<tr>
<td>4 mm hexagon wrench</td>
<td>Opening liquid valve</td>
</tr>
</tbody>
</table>
Selection of Installation Place

Upon customer’s approval, install the air conditioner in a place which satisfies the following conditions:

- Place where it can be installed horizontally.
- Place which can reserve a sufficient service space for safe maintenance or checks.
- Place where there is no problem even if the drained water overflows.

Avoid the following places:

- Salty places (seaside area) or places with much gas sulfide (hot spring area) (If selecting such a place, special maintenance is required.)
- Places where oil (including machine oil), steam, oil smoke or corrosive gas is generated.
- Places where an organic solvent is used.
- Chemical plants with a cooling system using liquid carbon dioxide.
- Places where a device generating high frequency (inverter, non-utility generator, medical apparatus, or communication equipment) is set. (Malfunction or abnormal control of the air conditioner, or interference to devices listed above may occur.)
- Places where discharged air from the outdoor unit blows against the windows of a neighbour’s house.
- Places unable to bear the weight of the unit.
- Places with poor ventilation.

安装空间

留出运行、安装和维护所需的空间。

注意

- 如果室外机上方有障碍物，留出至少7.9”(200mm)的水平空间。
- 如果有墙围绕室外机，确保其高度不超过31.5”（800）。

组合的室外机

<table>
<thead>
<tr>
<th>模型名称</th>
<th>协同室外机</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMY-MAP1724</td>
<td>MMY-MAP0724</td>
</tr>
<tr>
<td>MMY-MAP1984</td>
<td>MMY-MAP0964</td>
</tr>
<tr>
<td>MMY-MAP1144</td>
<td>MMY-MAP1144</td>
</tr>
<tr>
<td>MMY-AP1444</td>
<td>MMY-MAP0724</td>
</tr>
<tr>
<td>MMY-AP1684</td>
<td>MMY-MAP0964</td>
</tr>
<tr>
<td>MMY-AP1924</td>
<td>MMY-MAP0964</td>
</tr>
<tr>
<td>MMY-AP2284</td>
<td>MMY-MAP1144</td>
</tr>
<tr>
<td>MMY-AP2684</td>
<td>MMY-MAP1144</td>
</tr>
</tbody>
</table>
5 Carrying in the Outdoor Unit

**CAUTION**

Handle the outdoor unit carefully, observing the following items.

- To use a forklift or other machinery for loading/unloading in transportation, insert the prongs of the forklift into the rectangular holes for handling as shown below.
- To lift up the unit, insert a rope capable of bearing the weight of the unit into the rectangular holes shown below. (Apply padding in positions where the rope comes in contact with the outdoor unit so that no damage is caused to the outer surface of the outdoor unit.)

There are reinforcing plates on the side surfaces, so the rope cannot be passed through.

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**Weight centre and weight**

Unit: in (mm)

**Weight centre of an outdoor unit**

<table>
<thead>
<tr>
<th>Model type</th>
<th>X (in (mm))</th>
<th>Y (in (mm))</th>
<th>Z (in (mm))</th>
<th>Weight (lb (kg))</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(A)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAP0724HT9UL</td>
<td>19.7&quot; (500)</td>
<td>15.4&quot; (390)</td>
<td>25.4&quot; (645)</td>
<td>546 (247)</td>
</tr>
<tr>
<td>MAP0724HT6UL</td>
<td>21.3&quot; (540)</td>
<td>15.8&quot; (400)</td>
<td>24.4&quot; (620)</td>
<td>621 (281)</td>
</tr>
<tr>
<td><strong>(B)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAP0964HT9UL</td>
<td>23.8&quot; (605)</td>
<td>13.8&quot; (350)</td>
<td>27.6&quot; (700)</td>
<td>742 (336)</td>
</tr>
<tr>
<td>MAP0964HT6UL</td>
<td>25.8&quot; (655)</td>
<td>15.4&quot; (390)</td>
<td>25.6&quot; (650)</td>
<td>817 (370)</td>
</tr>
<tr>
<td>MAP1144HT9UL</td>
<td>23.8&quot; (605)</td>
<td>13.8&quot; (350)</td>
<td>27.6&quot; (700)</td>
<td>742 (336)</td>
</tr>
<tr>
<td>MAP1144HT6UL</td>
<td>25.8&quot; (655)</td>
<td>15.4&quot; (390)</td>
<td>25.6&quot; (650)</td>
<td>817 (370)</td>
</tr>
</tbody>
</table>
6 Installation of the Outdoor Unit

WARNING
Install the outdoor unit securely in a location where the base can sustain the weight adequately. If strength is insufficient, the unit may fall down resulting in human injury.

CAUTION
• Drain water is discharged from the outdoor unit. (Especially while heating) Install the outdoor unit in a place with good drainage.
• For installation, be careful of the strength and level of the foundation so that abnormal sounds (vibration or noise) are not generated.

REQUIREMENT
Installation in a snowfall area
1. Install the outdoor unit on a higher foundation than the snowfall or set up a stand to install the unit so that snowfall will not affect the unit.
   • Set up a stand higher than the snowfall.
   • Apply an angled structure to the stand so that drainage will not be prevented. (Avoid using a stand with a flat surface.)
2. Mount a snowfall-hood onto the air inlet and the air outlet.
   • Leave enough space for the snowfall-hood so that it will not be an obstacle for the air inlet and the air outlet.

1. To install multiple outdoor units, arrange them with 7.9” (recommendation, at least 0.8”) or more spaces in between. Fix each outdoor unit with M12 anchor bolts at 4 positions. 0.8” (20mm) projection is appropriate for an anchor bolt.

- Anchor bolt positions are as shown below:

  ![Anchor bolt positions diagram]

- Model type: A B L
  - MAP0724: 27.6” (700) 39.0” (990) Recommendation 7.9” (200), at least 0.8” (20)
  - MAP0964, MAP1144: 36.2” (920) 47.6” (1210)

2. To draw out the refrigerant pipe from the underside, set the height of the stand to 19.7” (500mm) or more.
3. Do not use 4 stands on the corner to support the outdoor unit.
4. If vibration-proof rubbers (including vibration-proof blocks) are used, fit them under the whole clamping legs.
5. When multiple units are connected header unit must have the largest capacity.
   • Connect the header unit to the main pipe. (Figure 1 and 3)
   • Use a T-shaped branch joint (RBM-BT14UL: separately purchased) to connect the liquid line of each outdoor unit.
   • Connect of the Outdoor unit connection piping kit for the liquid side in the right direction. (As shown in Figure 2, a Outdoor unit connection piping kit cannot be attached so that the refrigerant of the main pipe flows directly into the header unit.)
**Liquid piping**

- **Figure 1**
  - Correct
  
  ![Correct Liquid piping](image)

- **Figure 2**
  - Incorrect
  
  ![Incorrect Liquid piping](image)

**Gas piping**

- **Figure 3**
  - Correct
  
  ![Correct Gas piping](image)

- **Figure 4**
  - Incorrect
  
  ![Incorrect Gas piping](image)

• When a Y-shaped branch unit for the gas side is attached, attach it parallel with the ground (Do not exceed ±15 degrees.). Regarding a T-shape branch joints for the liquid side, there is no restriction for its angle.

**When drawing pipes downward**

- **Figure 5**
  - Correct
  
  ![Correct Vertical connection](image)

- **Figure 6**
  - Incorrect
  
  ![Incorrect Vertical connection](image)

**Vertical connection of branch units**

- **Figure 7**
  - Correct
  
  ![Correct Vertical connection](image)

- **Figure 8**
  - Incorrect
  
  ![Incorrect Vertical connection](image)
7 Refrigerant Piping

**WARNING**

- If the refrigerant gas leaks during installation, ventilate the room.
- If the leaked refrigerant gas comes into contact with fire, noxious gas may be generated.
- After installation, check that the refrigerant gas does not leak.
- If the refrigerant gas leaks into the room and comes into contact with fire such as a fan heater, stove, or kitchen range, noxious gas may be generated.

**Connection of refrigerant pipe**

- The service valves are inside the outdoor unit. To access them, remove the front panel and the piping/wiring panel. (M5: 9 pcs.)
- As shown in the illustration on the right, the hooks are at the right and left sides of the front panel. Lift up and remove the front panel.
- Pipes can be drawn out forward or downward from the outdoor unit.
- To draw out the pipe forward, draw it out to the outside via the piping/wiring panel, and leave a space of 500mm or more from the main pipe connecting the outdoor unit with the indoor unit, considering service work or other work on the unit. (For replacing the compressor, 19.7" (500mm) or more space is required.)
- To draw out the pipe downward, remove the knockouts on the base plate of the outdoor unit, draw the pipes out of the outdoor unit, and perform piping on the right/left or rear side. Downward length of the balance pipe should be 16.4ft (5m) or less.

**REQUIREMENT**

- For a welding work of the refrigerant pipes, be sure to use nitrogen gas in order to prevent oxidation of the inside of the pipes; otherwise clogging of the refrigerating cycle due to oxidized scale may occur.
- Use clean and new pipes for the refrigerant pipes and perform piping work so that water or dust does not contaminate the refrigerant.
- Use a double spanner to loosen or tighten the flare nut. If a single spanner is used, the required level of tightening cannot be obtained. Tighten the flare nut to the specified torque. (If it is hard to loosen or tighten the flare nut of the balance pipe or packed valve of the liquid side with a double spanner, loosen or tighten the flare nut while holding the valve mounting plate with a spanner.)

<table>
<thead>
<tr>
<th>Outer dia. of copper pipe</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø1/4 (6.4 mm)</td>
<td>10 to 13 (14 to 18)</td>
</tr>
<tr>
<td>Ø3/8 (9.5 mm)</td>
<td>24 to 31 (32 to 42)</td>
</tr>
<tr>
<td>Ø1/2 (12.7 mm)</td>
<td>37 to 46 (50 to 62)</td>
</tr>
<tr>
<td>Ø5/8 (15.9 mm)</td>
<td>50 to 60 (68 to 92)</td>
</tr>
</tbody>
</table>

**Pipe connection method of valve at the gas side (Example)**

**Model** | **Pipe diameter** | **Draw-out forward** | **Draw-out downward** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP072</td>
<td>Ø7/8</td>
<td>Cut the L-shaped pipe at the horizontal straight section, then braze the supplied attachment pipe and the socket and pipe procured locally.</td>
<td>Cut the L-shaped pipe at the vertical straight section, then braze the supplied attachment pipe and the socket and pipe procured locally.</td>
</tr>
<tr>
<td>MAP096</td>
<td>Ø1/2</td>
<td>Cut the L-shaped pipe at the horizontal straight section, then braze the supplied attachment pipe and the socket and pipe procured locally.</td>
<td>Cut the L-shaped pipe at the vertical straight section, then braze the supplied attachment pipe and the socket and pipe procured locally.</td>
</tr>
<tr>
<td>MAP114</td>
<td>Ø1-1/8</td>
<td>Cut the L-shaped pipe at the horizontal straight section, then braze the supplied attachment pipe and the socket and pipe procured locally.</td>
<td>Cut the L-shaped pipe at the vertical straight section, then braze the supplied attachment pipe and the socket and pipe procured locally.</td>
</tr>
</tbody>
</table>
Selection of pipe size

Capacity code of indoor and outdoor units

Selection of pipe material
- For the indoor unit, the capacity code is decided at each capacity type. (Table 1)
- The capacity codes of the outdoor units are decided at each capacity type. The maximum number of connectable indoor units and the total value of capacity codes of the indoor units are also decided. (Table 2)

NOTE
Compared with the capacity code of the outdoor unit, the total value of capacity codes of the connectable indoor units differs based on the height difference between the indoor units.
- When the height difference between the indoor units is 49.2ft (15m) or less
  - If "Medium Static Ducted Type (MMD-AP***BH)" is excluded in the system: Total indoor capacity code is between 80% and 125% of the capacity of the outdoor unit.
  - If "Medium Static Ducted Type (MMD-AP***BH)" is included in the system: Total indoor capacity code is between 80% and 120% of the capacity of the outdoor unit.
- When the height difference between the indoor units is over 49.2ft (15m)
  - Total indoor unit capacity code (Equivalent to Capacity) is between 80% and 105% of the capacity of the outdoor unit.

Table 1

<table>
<thead>
<tr>
<th>Indoor unit capacity type</th>
<th>Indoor capacity code (Equivalent to capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>007 type</td>
<td>7.5</td>
</tr>
<tr>
<td>009 type</td>
<td>9.5</td>
</tr>
<tr>
<td>012 type</td>
<td>12</td>
</tr>
<tr>
<td>015 type</td>
<td>15.4</td>
</tr>
<tr>
<td>018 type</td>
<td>18</td>
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<tr>
<td>021 type</td>
<td>21</td>
</tr>
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<td>024 type</td>
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<td>027 type</td>
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<td>036 type</td>
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<td>042 type</td>
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<td>048 type</td>
<td>48</td>
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<td>054 type</td>
<td>54</td>
</tr>
<tr>
<td>072 type</td>
<td>72</td>
</tr>
<tr>
<td>096 type</td>
<td>96</td>
</tr>
<tr>
<td>114 type</td>
<td>114</td>
</tr>
<tr>
<td>144 type</td>
<td>144</td>
</tr>
<tr>
<td>168 type</td>
<td>168</td>
</tr>
<tr>
<td>192 type</td>
<td>192</td>
</tr>
<tr>
<td>228 type</td>
<td>228</td>
</tr>
</tbody>
</table>

* For combination of the outdoor units, refer to "Combination of outdoor units".

Table 2

<table>
<thead>
<tr>
<th>Outdoor unit capacity type</th>
<th>Outdoor capacity code (Equivalent to capacity)</th>
<th>Maximum number of indoor units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>If &quot;Medium Static Ducted Type (MMD-AP***BH)&quot; is excluded in the system</td>
</tr>
<tr>
<td>Height difference between indoor units</td>
<td>Over 49.2ft (15m) or less</td>
<td>Over 49.2ft (15m)</td>
</tr>
<tr>
<td>072 type</td>
<td>72</td>
<td>12</td>
</tr>
<tr>
<td>096 type</td>
<td>96</td>
<td>16</td>
</tr>
<tr>
<td>114 type</td>
<td>114</td>
<td>19</td>
</tr>
<tr>
<td>144 type</td>
<td>144</td>
<td>24</td>
</tr>
<tr>
<td>168 type</td>
<td>168</td>
<td>28</td>
</tr>
<tr>
<td>192 type</td>
<td>192</td>
<td>32</td>
</tr>
<tr>
<td>228 type</td>
<td>228</td>
<td>38</td>
</tr>
</tbody>
</table>

* For combination of the outdoor units, refer to "Combination of outdoor units".
### Table: Piping parts and Selection of Pipe Size

<table>
<thead>
<tr>
<th>No.</th>
<th>Piping parts</th>
<th>Name</th>
<th>Selection of Pipe Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(144 - 228 type) Outdoor unit connection piping kit</td>
<td>Outdoor unit connecting pipe</td>
<td><strong>Outdoor unit capacity type</strong>&lt;br&gt;072 - 096 type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>096 type</strong>&lt;br&gt;Ø1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>114 type</strong>&lt;br&gt;Ø1-1/8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>144 - 192 type</strong>&lt;br&gt;Ø1-1/8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>228 type</strong>&lt;br&gt;Ø1-3/8</td>
</tr>
<tr>
<td>(2)</td>
<td>Between Outdoor unit connection piping</td>
<td>Balance pipe</td>
<td><strong>Outdoor unit capacity type</strong>&lt;br&gt;072 - 096 type</td>
</tr>
</tbody>
</table>
Allowable length of refrigerant pipes and allowable height difference between units

- **Header unit (A)**
  - Connected to main piping to indoor units.
  - Has the highest capacity code: \( A \geq B \)
  - When connecting gas pipes to outdoor units, use Y-shaped branching joints to keep pipes level.
  - Outdoor unit connection piping kits are used to connect to outdoor units; intersect the pipes to the outdoor unit and those to indoor units at a right angle as shown in Figure 1 on "6. Installation of the Outdoor Unit". Do not connect them as in Figure 2 on "6. Installation of the Outdoor Unit".

- **Cautions for installation**
  - The header unit is connected to main piping to indoor units.
  - To connect gas pipes to outdoor units, use Y-shaped branching joints to keep pipes level.
  - When Outdoor unit connection piping kits is used to pipe to outdoor units, intersect the pipes to the outdoor unit and those to indoor units at a right angle as shown in figure 1 on "6. Installation of the Outdoor Unit". Do not connect them as in figure 2 on "6. Installation of the Outdoor Unit".

### Allowable length and allowable height difference of refrigerant piping

<table>
<thead>
<tr>
<th>Item</th>
<th>Allowable value (ft (m))</th>
<th>Pipes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total extension of pipe (liquid pipe)</td>
<td>Actual length: 985 (300)</td>
<td></td>
</tr>
<tr>
<td>Farthest piping length L (*1)</td>
<td>Equivalent length: 720 (220)</td>
<td></td>
</tr>
<tr>
<td>Main piping length</td>
<td>Actual length: 590 (180)</td>
<td></td>
</tr>
<tr>
<td>Farthest equivalent piping length from the first branch L (*1)</td>
<td>Actual length: 330 (100)</td>
<td></td>
</tr>
<tr>
<td>Maximum equivalent piping length of pipes connected to outdoor units</td>
<td>265 (80) (2)</td>
<td></td>
</tr>
<tr>
<td>Maximum actual length of pipe connected to indoor units</td>
<td>98 (30) a, b, c, d, e, f, g, h, i, j</td>
<td></td>
</tr>
<tr>
<td>Maximum equivalent length between branching sections</td>
<td>165 (50) L2, L3, L4, L5, L6, L7</td>
<td></td>
</tr>
</tbody>
</table>

- **Height difference**
  - Height between outdoor and indoor units H1: 230 ft (70 m) (*3)
  - Height between indoor units H2: 130 ft (40 m)
  - Height between outdoor units H3: 16 ft (5 m)

---

*1: Farthest outdoor unit from the first branch: (B), farthest indoor unit: (j)
*2: Make the difference 215 ft (65 m) or less if the height difference between outdoor and indoor units (H1) is more than 10 ft (3 m).
*3: Make the difference 165 ft (50 m) or less if the height difference between outdoor units (H2) is more than 10 ft (3 m).
*4: Make the difference 98 ft (30 m) or less if the height difference between indoor units (H2) is more than 10 ft (3 m).
Leak check test

After the refrigerant piping has been finished, execute leak check test.
For the leak test follow the steps below:
1. Connect nitrogen bottle to service parts as shown in figure below.
2. Apply nitrogen pressure gradually to a maximum of 540 psi.
3. Any rapid pressure decay will indicate a serious leak. Find and repair the leak and repressurize the system.
4. The system should maintain 540 psi pressure for 24 hour. (Note any large change in ambient temperature will impact the pressure reading)
5. Once the system has maintained per pressure for 24 hours it can be assumed to be leak tight.

WARNING

Never use oxygen, flammable gases, or noxious gases in leak check test.

Vacuum and dehydrate system

After completing the system leak check, follow the steps below to vacuum and dehydrate the system:
1. Disconnect nitrogen bottle and relieve nitrogen gas from the system piping.
2. Reconnect manifold gauge set as shown in figure below including a vacuum pump. Capable of a 85 cfm minimum.
3. Vacuum the system to -14.6 psi minimum. If the system will not reach -14.6 psi, recheck for leaks.
4. When the system reaches -14.6 psi, stop the vacuum pump and check that the system will hold a -14.6 psi vacuum for one hour minimum without decay.
5. When system vacuuming is completed, remove vacuum pump and connect R410A refrigerant bottle in its in place of the vacuum pump.

Adding refrigerant

Calculating additional refrigerant charge to be added
1. The outdoor units are shipped from the factory with a nominal amount of 410A refrigerant in the unit. This amount of refrigerant is not sufficient for any application. For this reason it is required to add additional charge to the system prior to start up.
2. Calculate the additional charge amount using the procedure below.

NOTE

If the additional refrigerant amount indicates minus as the result of calculation, use the air conditioner without additional refrigerant.
**Calculation of additional refrigerant charge amount**

### Table 3

<table>
<thead>
<tr>
<th>Liquid pipe outer dia.</th>
<th>Ø1/4</th>
<th>Ø3/8</th>
<th>Ø1/2</th>
<th>Ø5/8</th>
<th>Ø3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional refrigerant amount/1ft (lb)</td>
<td>0.017</td>
<td>0.037</td>
<td>0.071</td>
<td>0.108</td>
<td>0.168</td>
</tr>
</tbody>
</table>

### Table 4

<table>
<thead>
<tr>
<th>Outdoor unit capacity type</th>
<th>Adjustment amount of refrigerant (lb)</th>
<th>Combined outdoor units</th>
</tr>
</thead>
<tbody>
<tr>
<td>072 type</td>
<td>3.31</td>
<td>072 type –</td>
</tr>
<tr>
<td>096 type</td>
<td>13.23</td>
<td>096 type –</td>
</tr>
<tr>
<td>114 type</td>
<td>15.43</td>
<td>114 type –</td>
</tr>
<tr>
<td>144 type</td>
<td>0.20</td>
<td>072 type – 072 type</td>
</tr>
<tr>
<td>165 type</td>
<td>16.53</td>
<td>096 type – 072 type</td>
</tr>
<tr>
<td>192 type</td>
<td>27.36</td>
<td>096 type – 096 type</td>
</tr>
<tr>
<td>138 type</td>
<td>27.36</td>
<td>114 type – 144 type</td>
</tr>
</tbody>
</table>

Example: (114 type)

\[
\text{Additional charge amount (lb)} = (L_1 \times 0.017\text{lb/ft}) + (L_2 \times 0.037\text{lb/ft}) + (L_3 \times 0.071\text{lb/ft}) + (15.43\text{lb})
\]

1. All service valves on the outdoor units should remain fully closed.
2. R410A refrigerant should be added (in liquid state) at the liquid line service port on the header unit.
3. If the calculated amount of refrigerant can be added to the system, the charging process is finished.
4. If the calculated amount of refrigerant cannot be added to the system, close the valve on the refrigerant bottle, move the charging house from the liquid line service port to the suction line service port.
5. Open the suction and liquid service valves on the header unit and start the system in cooling mode.
6. Slowly open the valve on the refrigerant bottle and carefully release liquid refrigerant into the suction service port.
7. If the total calculated charge amount is added completely to the system, the charging process is finished.

**Full opening of the valve**

Open the valves of the outdoor unit fully.

**Liquid side**

- **Packed valve**
  - Open the valve stem fully with a 4mm-hexagonal wrench.

**Balance pipe**

- **Balance packed valve**
  - Open the valve rods fully with a 4mm-hexagonal wrench.
  
**Gas side**

- **Ball valve**
  - Turn it counterclockwise by 90° until it hits the stopper with a wrench.
  - (Full open)

---

27-EN

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28-EN
8 Electric Wiring

**WARNING**

The equipment shall be installed in compliance with NEC and local codes.

**CAUTION**

- Do not connect high voltage power wires to the control terminal blocks (U1, U2, U3, U4, U5, U6);
- All field wiring insulation rating must comply with NEC and local codes;
- All wiring must be strained relieved as specified by NEC and local codes;
- Refrigerant piping and control wiring should use the same routing;
- Do not energize the indoor units until leak check and vacuuming are completed.
- For indoor unit power and control wiring see indoor unit installation instructions.

**NOTE**

- Use copper supply wires.
- Use UL wires rated 600V for the system interconnection wires.
- Use UL wires rated 300V for remote control wires.

---

**Pipe insulation**

- Apply pipe insulation separately to liquid, gas, and balance lines.
- All insulation should have a minimum temperature rating of 248°F (120°C).

**Finishing pipe work**

1. After all piping and insulation is complete, fill the remaining gap at the piping panel with silicon sealer.
2. If the piping was routed down or to the side, the remaining gap should be filled with silicon sealer.

**When not using the piping cover**

- Pipe routed to side
- Fill space with silicon sealer
- Pipe routed to front
- Pipe routed down
**Power supply specifications**

Every outdoor unit must have a dedicated power supply.

![Incorrect power supply for outdoor units](image)

---

**Power wiring selection**

**Standard model**

<table>
<thead>
<tr>
<th>Model name</th>
<th>Power Supply</th>
<th>Voltage Range (V)</th>
<th>MCA (A)</th>
<th>MOCP (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>MMY-MAP0724HT9UL</td>
<td>208/230V</td>
<td>187</td>
<td>253</td>
<td>36</td>
</tr>
<tr>
<td>MMY-MAP0964HT9UL</td>
<td>208/230V</td>
<td>187</td>
<td>253</td>
<td>50</td>
</tr>
<tr>
<td>MMY-MAP1144HT9UL</td>
<td>208/230V</td>
<td>187</td>
<td>253</td>
<td>52</td>
</tr>
<tr>
<td>MMY-AP1444HT9UL</td>
<td>208/230V</td>
<td>187</td>
<td>253</td>
<td>30+36</td>
</tr>
<tr>
<td>MMY-AP1684HT9UL</td>
<td>208/230V</td>
<td>187</td>
<td>253</td>
<td>50+36</td>
</tr>
<tr>
<td>MMY-AP1924HT9UL</td>
<td>208/230V</td>
<td>187</td>
<td>253</td>
<td>50+50</td>
</tr>
<tr>
<td>MMY-AP2284HT9UL</td>
<td>208/230V</td>
<td>187</td>
<td>253</td>
<td>52+52</td>
</tr>
</tbody>
</table>

**600 V Model**

<table>
<thead>
<tr>
<th>Model name</th>
<th>Power Supply</th>
<th>Voltage Range (V)</th>
<th>MCA (A)</th>
<th>MOCP (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>MMY-MAP0724HT6UL</td>
<td>460V</td>
<td>187</td>
<td>253</td>
<td>18</td>
</tr>
<tr>
<td>MMY-MAP0964HT6UL</td>
<td>460V</td>
<td>187</td>
<td>253</td>
<td>23</td>
</tr>
<tr>
<td>MMY-MAP1144HT6UL</td>
<td>460V</td>
<td>187</td>
<td>253</td>
<td>24</td>
</tr>
<tr>
<td>MMY-AP1444HT6UL</td>
<td>460V</td>
<td>187</td>
<td>253</td>
<td>18+18</td>
</tr>
<tr>
<td>MMY-AP1684HT6UL</td>
<td>460V</td>
<td>187</td>
<td>253</td>
<td>23+18</td>
</tr>
<tr>
<td>MMY-AP1924HT6UL</td>
<td>460V</td>
<td>187</td>
<td>253</td>
<td>23+23</td>
</tr>
<tr>
<td>MMY-AP2284HT6UL</td>
<td>460V</td>
<td>187</td>
<td>253</td>
<td>24+24</td>
</tr>
</tbody>
</table>

**NOTE**

Be sure to follow the above specifications when plugging in.

---

**Specifications for control wiring**

1. All system interconnecting and control central control wiring should be 2 conductor shielded cable.
2. On the header unit the control wire shield and the central control wire shield should both be connected to the same ground screw in the header unit.
3. The remote control wiring can be 2 conductor un-shielded cable.
4. All system interconnecting and control wiring should be sized per table 5, 6 and 7.
## Connection of power supply wires and control wires

1. Connect the power supply conduit to the field wiring panel.
2. Route the power supply wiring through the raceway and connect to the power supply terminal block and ground screw.
3. Use ring terminals on field power wires if required by NEC and local codes.

### Power supply wire connection

- **NOTE**
  - Bundle the control wires in the cutout so that they do not get caught in the electrical control box cover.

### Table 5: Control wiring between indoor and outdoor units (L1, L2, L3), Central control wiring (L4)

<table>
<thead>
<tr>
<th>Wiring</th>
<th>Type</th>
<th>Size/Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-core</td>
<td>Shielded cable</td>
<td>AWG16: Up to 3280 ft (1000 m)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AWG14: Up to 6560 ft (2000 m)</td>
</tr>
</tbody>
</table>

### Table 6: Control wiring between outdoor units (L5)

<table>
<thead>
<tr>
<th>Wiring</th>
<th>Type</th>
<th>Size/Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-core</td>
<td>Shielded wire</td>
<td>AWG16 to AWG14 / Up to 330 ft (100 m)</td>
</tr>
</tbody>
</table>

### Table 7: Remote control wiring (L6, L7)

<table>
<thead>
<tr>
<th>Wire</th>
<th>Type</th>
<th>Size/Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-core</td>
<td>AWG20 to AWG14</td>
<td>Up to 1640 ft (500 m) (L6 + L7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to 1310 ft (400 m) in case of wireless remote control in group control.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to 660 ft (200 m) total length of control wiring between indoor units (L6)</td>
</tr>
</tbody>
</table>

### Connection of power supply wires and control wires

- **NOTE**
  - Separate power supply wires and control wires.
9 Address Setting

\section*{CAUTION}

\begin{itemize}
\item Complete all electric wiring before setting the addresses.
\item To set the addresses correctly, the indoor units must be energized before the outdoor units are energized. Failure to follow this procedure will result in an "E19" error code being displayed on the outdoor unit control board.
\item It normally takes 5 minutes to automatically address one refrigerant line, however this process could take as long as 10 minutes.
\item Simply energizing the system components does not initiate the address process.
\item It is not required to run the unit during the address process.
\item The address process can be done automatically or manually.
\end{itemize}

\begin{itemize}
\item Electrical shock hazard - the electrical control box contains high voltage parts. All adjustments for address setting should be made through the access cover. Do not remove the electrical control box cover.
\item After completing the address setting the access cover should be closed and secured using the screw provided.
\end{itemize}

\section*{Automatic address setting}

\begin{itemize}
\item Without central control or with central control of 1 refrigerant lines (Example 1) : use Address setting procedure 1
\item With central control of 2 refrigerant lines (Example 2) : use Address setting procedure 2
\end{itemize}

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|}
\hline
\textbf{Example 1} & \textbf{Example 2} \\
\hline
\textbf{Address setting procedure} & \textbf{When a single refrigerant line is centrally controlled} & \textbf{When 2 or more refrigerant lines are centrally controlled} \\
\textbf{Control wiring diagram} & [Diagram] & [Diagram] \\
\hline
\end{tabular}
\end{table}
◆ Address setting procedure 1

1. Energize indoor units first, and then energize outdoor units.
2. About one minute after energizing the outdoor units, confirm that the 7-segment display on the interface P.C. board of the header outdoor unit indicates U.1. 08 . The U.1. will B6 flashing.
3. Press SW 15 to start the automatic address setting.
   It normally takes 5 minutes, but may takes as long as 10 minutes to complete the auto address setting for 1 refrigerant line.
4. The 7 segment display will indicate Auto 1 → Auto 2 → Auto 3.
   When the address sequence has covered all the fan coils for a refrigerant line auto - the 7 segment display will indicate U.1. flashing.
   When the flashing stops and the display indicates U.1. without flashing, the address setting is complete.

Interface P.C. board on the header outdoor unit

- SW04 SW05 SW15
- D000 D001 D002 D003 D004
- SW01 SW02 SW03

REQUIREMENT

- When 2 or more refrigerant lines are controlled as a group (using 1 remote control), be sure to turn on all the indoor units for the group before setting the addresses.
- If the unit address of each refrigerant line is set separately, then the header unit for each line will be set separately. In this case the remote control will display CODE No. “L03” indicating “indoor header unit overlap” when the system starts running. When this happens the group address must be changed to make only one unit the header unit. This operation is done using the wired remote control.

(Example) Controlling 2 or more refrigerant lines as a group

System wiring diagram

Remote controller

◆ Address setting procedure 2

1. Set a system address for each system using SW 13 and 14 on the interface P.C. board for the header outdoor unit of each system.
   (Factory default: Address 1)

NOTE

Set a unique address for each system. Do not reuse any address from another system (refrigerant line).

Interface P.C. board on the header outdoor unit

<table>
<thead>
<tr>
<th>SW06</th>
<th>SW07</th>
<th>SW09</th>
<th>SW10</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
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<tr>
<td>ON</td>
<td>ON</td>
<td>ON</td>
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<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>

Switch settings for a line (system) address on the interface P.C. board for the outdoor unit

<table>
<thead>
<tr>
<th>Line (system) address</th>
<th>SW13</th>
<th>SW14</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>2</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>3</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>4</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>5</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>6</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>7</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>8</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>9</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>10</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>11</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>12</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>13</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>14</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>15</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>16</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>17</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>18</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>19</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>20</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>21</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>22</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>23</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>24</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>25</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>26</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>27</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>28</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>
2 The connectors between the [U1U2] and [U3U4] terminals on all the header outdoor units (that will be connected to the central control) should be open as shown.

3 Energize indoor units first, and then energize outdoor units.

4 About 1 minute after turning energizing the outdoor units, confirm that the 7-segment display on the interface P.C. board of the header outdoor unit indicates . The U.1. will be flashing.

5 Press SW15 to start the automatic address setting.
   It normally takes 5 minutes, but may take as long as 10 minutes to complete the auto address setting for 1 refrigerant line.

6 The 7 segment display will indicate .
   When the address sequence has covered all the fan coils for a refrigerant line auto - the 7 segment display will indicate flashing.
   When the flashing stops and the display indicates without flashing, the address setting is complete.

7 Repeat steps 4 to 6 for every refrigerant line in the system.

8 After completing address setting of all systems, turn off dip switch 2 of SW30 on the interface P.C. boards of all the header outdoor units connected to the same central control, except the unit that has the lowest address.

9 Close the connectors between the [U1, U2] and [U3, U4] terminals on all the header outdoor units (As shown).

10 Set the central control address.
   (For setting the central control address, refer to the installation manuals for the central control devices.)
   Header unit interface P.C. board
**Switch setting (setting example when controlling 2 or more refrigerant lines centrally)**

*Outdoor units (setting manually)*

*The items in bold font must be set manually.*

<table>
<thead>
<tr>
<th>Outdoor unit's interface</th>
<th>P.C. board</th>
<th>Header unit</th>
<th>Follower unit</th>
<th>Header unit</th>
<th>Follower unit</th>
<th>Header unit</th>
<th>Factory default</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW13, 14 (See chart on page 19)</td>
<td>Line (system) address</td>
<td>1</td>
<td>(No setting required)</td>
<td>2</td>
<td>(No setting required)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Dip switch 2 of SW30 (See figure on page 20)</td>
<td>(Terminator of indoor/outdoor system interconnecting line and central control line)</td>
<td>ON</td>
<td>(No setting required)</td>
<td>Set to OFF after setting addresses.</td>
<td>(No setting required)</td>
<td>Set to OFF after setting addresses.</td>
<td>1</td>
</tr>
</tbody>
</table>

**Connector**

Connect after setting addresses.

Open

Connect after setting addresses.

Open

Connect after setting addresses.

Open

---

**Manual address setting using a remote control**

This procedure should be used if the indoor unit wiring is completed and the outdoor unit wiring has not been started.

For this procedure the group remote control should not be connected. One individual remote control should be used to set the address on each individual indoor unit (one unit at a time), by wiring the remote control directly to the indoor unit that is to be addressed.

When the address setting procedure is completed for the individual indoor units the group remote control should be connected as shown.

---

**CAUTION**

Do not close the connectors between the (U1, U2) and (U3, U4) terminals before completing all refrigerant line address setting. If a connector is closed the address cannot be set correctly.

---

**Wiring example for 2 refrigerant lines**

```
Line (system) address 1 1 1 2 2
Indoor unit address 1 2 3 1 2
Group address 0 0 1 2 0
```
How to determine an indoor unit address if the unit position is known.

This instruction works for indoor units that have individual, or group control. This must be done while the units are not operating.

To set-line (system) address
1. Turn on the power.
2. Push the TEMP. \(\text{\textcircled{C}}\)/ \(\text{\textcircled{F}}\) buttons repeatedly to set the CODE No. to \(\text{\textcircled{C}}\).
3. Push the TIME \(\text{\textcircled{C}}\)/ \(\text{\textcircled{F}}\) buttons repeatedly to set a system address.

To set-indoor unit address
4. Push \(\text{\textcircled{C}}\) button.
5. Push the TEMP. \(\text{\textcircled{C}}\)/ \(\text{\textcircled{F}}\) buttons repeatedly to set an indoor unit address.
6. Push the \(\text{\textcircled{C}}\) button.

To set-group address
7. Push the \(\text{\textcircled{C}}\) button.
8. Push the TEMP. \(\text{\textcircled{C}}\)/ \(\text{\textcircled{F}}\) buttons repeatedly to set the CODE No. to \(\text{\textcircled{C}}\).
9. Push the TIME \(\text{\textcircled{C}}\)/ \(\text{\textcircled{F}}\) buttons repeatedly to set a group address. If the indoor unit is individual, set the address to \(\text{\textcircled{C}}\); header unit, \(\text{\textcircled{C}}\); follower unit, \(\text{\textcircled{C}}\).
10. Push the \(\text{\textcircled{C}}\) button.

NOTE
1. Do not use address numbers 29 or 30 when setting system addresses using the remote controller. Those 2 address numbers cannot be used on outdoor units and the CODE No. \(\text{\textcircled{C}}\) (Indoor outdoor communication error) will appear if they are mistakenly used.

2. If addresses to indoor units are set in 2 or more refrigerate lines manually by using the remote control and will control them centrally, set the header outdoor unit of each line as below:
   - Set a system address for the header outdoor unit of each line with SW13 and 14 of their interface P.C. boards.
   - Turn off dip switch 2 of SW30 on the interface P.C. boards of all the header outdoor units connected to the same central control, except the unit that has the lowest address. (This saves the setting.)
   - Connect the relay connectors between the \(\text{U1, U2}\) and \(\text{U3, U4}\) terminals on the header outdoor unit of each refrigerator line.
   - After finishing all the settings above, set the address of the central control devices. (For the setting of the central control address, refer to the installation manuals of the central control devices.)

How to determine an indoor unit position if the unit position is known.

This instruction works for group controlled units only. This instruction must be done while the units are not operating.

To review the address and position of an indoor unit
1. Turn on the power.
2. Push the  button.
3. Push the left end of the “UNIT LOUVER ON/OFF” button.
4. Push the TIME / buttons repeatedly to set an indoor unit address.
5. Unit number will be indicated on the control LCD as shown above. The numbers will disappear after a few seconds. The numbers indicate the system address and the unit address for the indoor unit in question.

1. If the unit is “OFF” turn it “ON”.
2. Push the TEMP. / buttons repeatedly to set the CODE No. to .
3. Unit number will be indicated on the control LCD as shown above. The numbers will disappear after a few seconds. The numbers indicate the system address and the unit address for the indoor unit in question.
4. Each time the left of the button is pushed the next consecutive indoor unit address (in the group) will be displayed. While the address is displayed the fan and louvers for that indoor unit will operate. For all other units in the group the fan and louvers will stop.
5. Push the “TEST ” button to finish the procedure. All the indoor units in the control group will stop.
How to change an indoor unit address by using a wired remote control

Use this method to change the address of indoor units (one to one or group control) that have had the original address set automatically.

This procedure must be done while the units are not operating.

1. Simultaneously push and hold the "TIME" and "TEST" buttons for more than 4 seconds.
2. The LCD will display "LINE CODE" and "CODE No.
3. Push the left end of the "UNIT LOUVER SWING/FIX" button and the "SWING/FIX" button repeatedly to select a system address.
4. Push the "SET" button to confirm the address selection.
5. The address of an indoor unit that is connected to the selected refrigerant line will be displayed on the LCD. The fan and louvers for that unit will be energized.
6. Push the "CL" button to return to step 3 and select another refrigerant line and follow steps 3 to 5 to check indoor unit addresses for that line.

Finish

How to use a single remote control to check all the indoor unit addresses when 2 or more refrigerant lines are connected to a central control

This must be done while the units are not operating. Use this method to check the indoor unit address and position for each indoor unit on a single refrigerant line.

1. Simultaneously push and hold the "TIME" and "TEST" buttons for more than 4 seconds.
2. The LCD will display "LINE CODE" and "CODE No.
3. Push the left end of the "UNIT LOUVER SWING/FIX" button and the "SWING/FIX" button repeatedly to select a system address.
4. Push the "SET" button to confirm the "TIME" and "TEST" buttons for more than 4 seconds. If there are 2 or more units in a group, the first "UNIT No." indicated is the header unit.
5. Push the left end of the "UNIT LOUVER SWING/FIX" button repeatedly to select an indoor unit address to change. If 2 or more units are controlled in a group the fan and louvers of the selected unit will be energized.
6. Push the TEMP. / buttons repeatedly to select a CODE No.
7. Push the TIME / buttons repeatedly to change the value indicated in the SET DATA section.
8. Push the "SET" button to save address.

If the addresses have been changed correctly, push the "TEST" button to finish the procedure.

Press to finish setting.
### Resetting to factory default address

**Method 1**  
Follow steps 1 through 11 by using a direct wired remote control (page 22) to reset line (system) address, indoor unit addresses and group addresses to '0099'.

**Method 2**  
Clearing all the indoor unit addresses on a single refrigerant line and reset all addresses to the factory default settings follow the steps below:

1. To turn off the refrigerant line and reset all address to the factory default settings follow the steps below:
   A. On the header outdoor unit, open the connector between (U1, U2) and (U3, U4) terminals.
   B. On the header outdoor, interface PC board, SW30 dip switch 2, set to ON.

2. Turn on the indoor and outdoor units of the refrigerant line for which initialize the addresses to be initialized. About one minute after turning on the power, confirm that the 7-segment display on the header outdoor unit indicates "U.1. - - -" and operate the interface P.C. board on the header outdoor unit of the refrigerant line as follows:

   - SW01, SW02, SW03, SW04 Clearable addresses
   - SW01: 2
   - SW02: 1
   - SW03: 2
   - SW04: 2

   Confirm that the 7-segment display indicates "A.d. c.L." and set SW01, SW02 and SW03 to 1, 1, 1 respectively.

3. After a time "U.1.08" appears on the 7-segment display if the address clearing has been completed successfully.

4. Set the addresses again after finishing the clearance.

---

### Test Run

**CAUTION**
- Turn on the power and turn on the case heater of the compressor.
- To save the compressor when it is activated, leave the power on for more than 12 hours.

**Methods of test run**

**A test run is executed by using a remote controller**

Operate the system normally to check the running condition using the wired remote controller. Follow the instructions in the supplied owner’s manual when operating the unit.

If a wireless remote controller is used for operations, follow the instructions in the installation manual supplied with the indoor unit.

To execute a test run forcibly under the condition that the thermostat automatically turns the unit off due to the indoor temperature, follow the procedure below. The forcible test run will automatically stop after 60 minutes to prevent continuous forcible running and return to normal running.

**CAUTION**
- Do not use forcible running except for a test run as it overloads the unit.

1. Push and hold the **ON / OFF** button for more than 4 seconds. TEST appears on the LCD and the unit enters the TEST mode.

2. Push the **MODE** button.

3. Push the **TEST** button to switch the running mode to COOL or HEAT.

**NOTE**
- Do not run the unit in any mode other than COOL or HEAT.
- The temperature setting cannot be changed during the test run.
- Errors are detected as usual.

4. Push the **ON / OFF** button to stop running after finishing the test run.

5. Push the **MODE** button to exit the test mode. (TEST disappears on the LCD display and the status changes to normal stopped mode.)
When a test run is executed by using the interface P.C. board on the outdoor unit

A test run can be executed by operating switches on the interface P.C. board of the header outdoor unit. "Individual test", which tests each indoor unit separately, and "collective test", which tests all the indoor units connected, are available.

**<Individual test operation>**

- **Starting operation**
  1. Set the running mode to "COOL" or "HEAT" on the remote controller of the indoor unit to be tested. (The unit will run in the current mode unless the mode is set otherwise.)

<table>
<thead>
<tr>
<th>7-segment display</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[A] [01]</td>
<td>[R]</td>
</tr>
</tbody>
</table>

2. Set the rotary switches on the interface P.C. board of the header outdoor unit: SW01 to [16], SW02 and SW03 to the address of the indoor unit to be tested.

<table>
<thead>
<tr>
<th>SW02</th>
<th>SW03</th>
<th>Indoor unit address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 16</td>
<td>1</td>
<td>1 to 16</td>
</tr>
<tr>
<td>1 to 16</td>
<td>2</td>
<td>17 to 32</td>
</tr>
<tr>
<td>1 to 16</td>
<td>3</td>
<td>33 to 48</td>
</tr>
<tr>
<td>1 to 16</td>
<td>4</td>
<td>49 to 64</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7-segment display</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[A] [01]</td>
<td>[R]</td>
</tr>
</tbody>
</table>

3. Push and hold SW04 for more than 10 seconds.

<table>
<thead>
<tr>
<th>7-segment display</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[A] [01]</td>
<td>[R]</td>
</tr>
</tbody>
</table>

**Collective test operation**

- **Starting operation**
  1. Set the rotary switches on the interface P.C. board of the header outdoor unit as below. When in "COOL" mode: SW01=[2], SW02=[5], SW03=[1]. When in "HEAT" mode: SW01=[2], SW02=[6], SW03=[1].

<table>
<thead>
<tr>
<th>7-segment display</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[A] [01]</td>
<td>[R]</td>
</tr>
</tbody>
</table>

- **Finishing operation**
  1. Set the rotary switches on the interface P.C. board of the header unit back: SW01 to [1], SW02 to [1] and SW03 to [1].

<table>
<thead>
<tr>
<th>7-segment display</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[A] [01]</td>
<td>[R]</td>
</tr>
</tbody>
</table>

- **Stop operation**
  1. Set the rotary switches on the interface P.C. board of the header unit back: SW01 to [1], SW02 to [1] and SW03 to [1].

<table>
<thead>
<tr>
<th>7-segment display</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[A] [01]</td>
<td>[R]</td>
</tr>
</tbody>
</table>

**NOTE**

- The running mode follows the mode setting on the remote controller of the target indoor unit.
- The temperature setting cannot be changed during the test run.
- Errors are detected as usual.
- The unit does not perform test run for 3 minutes after energized or terminating the operation.

**NOTE**

- The temperature setting cannot be changed during the test run.
- Errors are detected as usual.
- The unit does not perform test run for 3 minutes after turning the power on or stopping running.
### Troubleshooting

In addition to the CODE No. on the remote control of an indoor unit, the failure type of an outdoor unit can be diagnosed by checking the 7-segment display on the interface P.C. board.

Use the function for various checks. Set every dip switch to OFF after checking.

#### 7-Segment display and check code

<table>
<thead>
<tr>
<th>Rotary switch setting value</th>
<th>Indication</th>
<th>LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW01 SW02 SW03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1 1</td>
<td>Outdoor unit check code A: Outdoor unit number (U1 to U4) B: Check code display*</td>
<td></td>
</tr>
</tbody>
</table>

If a check code has an auxiliary code, the display indicates the check code for three seconds and the auxiliary code for one second alternately.

#### Check code (indicated on the 7-segment display on the outdoor unit)

Indicated when SW01 = [1], SW02 = [1], and SW03 = [1].

<table>
<thead>
<tr>
<th>Check code</th>
<th>Indication on 7-segment display on the outdoor unit</th>
<th>Check code name</th>
</tr>
</thead>
<tbody>
<tr>
<td>E06</td>
<td>Number of indoor units which received normally</td>
<td>Decrease of number of indoor units</td>
</tr>
<tr>
<td>E07</td>
<td>-</td>
<td>Indoor/outdoor communication circuit error</td>
</tr>
<tr>
<td>E08</td>
<td>Duplicated indoor addresses</td>
<td>Duplicated of indoor addresses</td>
</tr>
<tr>
<td>E12</td>
<td>(01): Communication between indoor and outdoor units (02): Communication between outdoor units</td>
<td>Automatic addressing start error</td>
</tr>
<tr>
<td>E15</td>
<td>-</td>
<td>No indoor unit during automatic addressing</td>
</tr>
<tr>
<td>E16</td>
<td>00: Capacity over 01:– Number of connected units 02:– Number of connected indoor units</td>
<td>Capacity over / number of connected indoor units</td>
</tr>
<tr>
<td>E19</td>
<td>00: Header is nothing 01: 2 or more header units 02: 2 or more header units</td>
<td>Number of header outdoor unit error</td>
</tr>
<tr>
<td>E20</td>
<td>(01): Other line indoor connected 02: Other line indoor connected</td>
<td>Other lines connected during automatic addressing</td>
</tr>
<tr>
<td>E23</td>
<td>-</td>
<td>Sending error between outdoor units communication</td>
</tr>
<tr>
<td>E25</td>
<td>00: Duplicated follower outdoor address set up 01: Duplicated follower outdoor address set up</td>
<td>Duplicated follower outdoor address set up</td>
</tr>
<tr>
<td>E26</td>
<td>00: Number of outdoor units which received normally 01: Number of outdoor units which received normally</td>
<td>Decrease of connected outdoor units</td>
</tr>
<tr>
<td>E28</td>
<td>Detected outdoor</td>
<td>Follower outdoor unit error</td>
</tr>
<tr>
<td>E31</td>
<td>IPDU number information 1 / IPDU number information 2</td>
<td>IPDU communication error</td>
</tr>
<tr>
<td>F04</td>
<td>-</td>
<td>TD1 sensor error</td>
</tr>
<tr>
<td>F05</td>
<td>-</td>
<td>TD2 sensor error</td>
</tr>
<tr>
<td>F06</td>
<td>01: TE1 sensor 02: TE2 sensor</td>
<td>TE1 sensor error</td>
</tr>
<tr>
<td>F07</td>
<td>-</td>
<td>TE2 sensor error</td>
</tr>
<tr>
<td>F08</td>
<td>-</td>
<td>TL sensor error</td>
</tr>
<tr>
<td>F12</td>
<td>-</td>
<td>TO sensor error</td>
</tr>
<tr>
<td>F13</td>
<td>01: Compressor 1 02: Compressor 2 03: Compressor 3</td>
<td>TH (Heat sink) / sensor error</td>
</tr>
</tbody>
</table>

#### Check code name

- **Auxiliary code**
  - F15: Outdoor temp. sensor miswiring
  - F16: Outdoor pressure sensor miswiring (TE1, TL)
  - F22: Outdoor pressure sensor miswiring (Pd, Ps)
  - F23: Ps sensor error
  - F24: Pd sensor error
  - F31: Outdoor EEPROM error
  - H01: Compressor 1
  - H02: Compressor 2
  - H03: Compressor 3
  - H05: TD1 sensor miswiring
  - H06: TD2 sensor miswiring
  - H08: Temperature sensor error for oil level
  - H15: TD1 sensor miswiring
  - H16: TD2 sensor miswiring
  - H17: Oil level detector circuit error
  - H25: TD3 sensor miswiring
  - L04: Outdoor system address duplication
  - L06: Number of prior indoor units
  - L08: Duplication of indoor units with priority
  - L10: Outdoor unit capacity unset.
  - L17: Mismatch of the outdoor unit model
  - L28: Outdoor connected quantity over
  - L29: IPDU number information
  - L30: Detected indoor unit address
  - L31: Other compressor errors
  - P03: Discharge temperature TD1 error
  - P04: High-pressure SW system operation
  - P05: Phase missing/power failure detection

---

1. IPDU number information
2. IPDU quantity error
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:

<table>
<thead>
<tr>
<th>Min. volume of the indoor unit installed room (ft³ (m³))</th>
<th>Concentration limit (lbs/ft³ (kg/m³))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room A (Small room)</td>
<td>22 lbs (10 kg)</td>
</tr>
<tr>
<td>Room B (Small room)</td>
<td>33 lbs (15 kg)</td>
</tr>
<tr>
<td>Room C (Small room)</td>
<td>44 lbs (20 kg)</td>
</tr>
<tr>
<td>Room D (Medium room)</td>
<td>55 lbs (25 kg)</td>
</tr>
<tr>
<td>Room E (Large room)</td>
<td>66 lbs (30 kg)</td>
</tr>
<tr>
<td>Room F (Very small room)</td>
<td>77 lbs (35 kg)</td>
</tr>
</tbody>
</table>

For the amount of charged 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).

1. The standards for minimum room volume are as follows:
   (1) No partition (shaded portion)
   (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 interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.

NOTE 2:

- IGBT circuit
- Position detection circuit error
- Motor lock error
- Motor current detected
- TH sensor error
- TH sensor error
- Inverter DC voltage error

NOTE 3:

- Ignoring 0-F appearing in the position of "*".

*IPDU number information
- 01: Compressor 1
- 02: Compressor 2
- 03: Compressor 3
- 04: Compressor 1 and 2
- 05: Compressors 1 and 3
- 06: Compressors 2 and 3
- 07: Compressors 1, 2 and 3
- 08: Fan
- 09: Compressor 1 and fan
- 0A: Compressor 2 and fan
- 0B: Compressors 1, 2 and fan
- 0C: Compressor 3 and fan
- 0D: Compressors 1, 3 and fan
- 0E: Compressors 2, 3 and fan
- 0F: Compressors 1, 2, 3, and fan