

TOSHIBA

Carrier

AIR CONDITIONER (MULTI TYPE)

Installation manual



Indoor Unit

Model name:

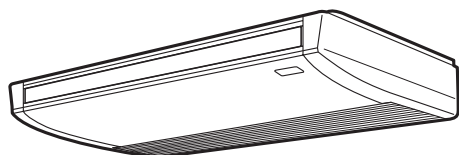
Ceiling type

MMC-AP0181H2UL

MMC-AP0241H2UL

MMC-AP0361H2UL

MMC-AP0421H2UL



Installation manual

1

English

Manuel d'installation

17

Français

Please read this manual thoroughly before installation work and install the products correctly.

- This Manual describes the installation method of the indoor unit.
- For installation of the outdoor unit, refer to the Installation Manual of the outdoor unit.

ADOPTION OF NEW REFRIGERANT









This Air Conditioner uses R410A an environmentally friendly refrigerant.

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1 Accessory Parts

■ Accessory parts

Part name	Q'ty	Shape	Usage
Installation Manual	1	This manual	-
Installation pattern	1	-	Drawing-out port of hanging bolt pipe
Heat insulation pipe	2		For heat insulation of pipe connecting section
Washer	4	3/8" (M10) × Ø1.0" (25 mm)	For holding down unit
Hose band	2		For connecting drain pipe
Drain hose	1		For connecting drain pipe
Bushing Ø2.2" (Ø56)	1		For protection of edge at hole for remote control wires
Bushing Ø1.1" (Ø28)	1		For sealing the back side conduit hole
Heat insulator	1		For heat insulation of drain hose (0.4" - thickness × 7.5" × 7.5" (10 - thickness × 190 × 190 mm))
Heat insulator of top plate	1		For upper pipe hole of indoor unit (0.2" - thickness × 5.1" × 6.3" (6 - thickness × 130 × 160 mm))
Banding band	2		For prevention of open of drain hose heat insulator

2 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 moving 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 appropriately, 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.

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.**
Excessive tightening of the flare nut may cause a crack in the flare nut after a long period, which may result in refrigerant leakage.
- **Wear heavy gloves during the installation work to avoid injury.**

3 Selection of Installation Place

⚠ WARNING

- **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.
- **Install the air conditioner at a height 8' (2.4 m) or more from the floor.**
If you insert your hands or others directly into the unit while the air conditioner operates, it is dangerous because you may contact with revolving fan or active electricity.

⚠ CAUTION

- **Do not install in a location where flammable gas may leaks are possible.**
If the gas leak and accumulate around the unit, it may ignite and cause a fire.

Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.

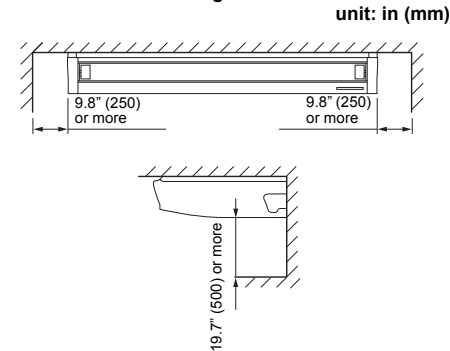
- Place where the unit can be installed horizontally.
- Place where a sufficient servicing space can be ensured for safety maintenance and check.
- Place where drained water will not cause any problem.

Avoid installing in the following places.

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring).
(Should the unit be used in these places, special protective measures are needed.)
- A restaurant kitchen where a lot of oil is used or place near machines in a factory (Oil adhering to the heat exchanger and resin part (turbo fan) in the indoor unit may reduce the performance, generate mist or dew drop, or deform or damage resin parts.)
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighbor house. (Outdoor unit)
- Place where noise of the outdoor unit is easily transmitted.
(When the outdoor unit is installed on the boundary with the neighbor, pay due attention to the level of noise.)
- Place with poor ventilation. (Before air duct work, check whether value of fan speed, static pressure and duct resistance are correct.)
- Do not use the air conditioner for special purposes such as preserving food, precision instruments, or art objects, or where breeding animals or growing plants are kept. (This may degrade the quality of preserved materials.)
- Place where any of high-frequency appliances (including inverter devices, private power generators, medical equipment, and communication equipment) and inverter-type fluorescent light is installed.
(A malfunction of the air conditioner, abnormal control, or problems due to noise to such appliances/equipment may occur.)
- When the wireless remote control is used in a room equipped with an inverter-type fluorescent light or at a place exposed to direct sunlight, signals from the remote control may not be received correctly.
- Place where organic solvent is used.
- Place near a door or window exposed to humid outside air (Dew drop may form.).
- Place where special spray is used frequently.

■ Installation space

Secure the specified space in the figure for installation and servicing.



■ Ceiling height

Set the installable height of the ceiling within 13'1" (4 m), otherwise the air distribution will become poor. If height of ceiling exceeds 11'6" (3.5 m), hot air becomes difficult to reach the floor surface, and then the change of setup of high ceiling is necessary. For the change method of high ceiling, refer to the application control, "Installing indoor unit on high ceiling" in this Manual.

List of installable ceiling height

Setup data		
0000	Standard (Factory default)	11'6" (3.5 m) or less
0001	High ceiling 1	more than 11'6" (3.5 m) up to 13'1" (4.0 m)

According to the conditions of installation, setup time of turning-on of filter sign (notification of filter cleaning) of the remote control can be changed.

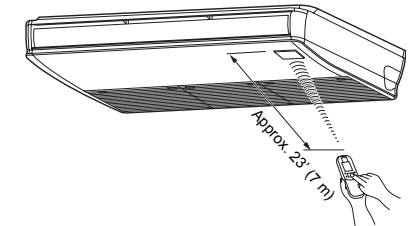
When it is difficult to warm up the room due to installation place or structure of the room, the detection temperature of heating can be raised. For change the setup time, refer to the application control, "Filter sign setting" and "To secure better effect of heating" in this Manual.

■ Wireless remote control

Decide the position which remote control is operated and the installation place. And then refer to the Installation Manual of the wireless remote controller kit sold separately.

(The signal of the wireless type remote control can be received within approx. 23' (7 m). This distance is a criterion and varies a little according to capacity of the battery, etc.)

- To prevent malfunction, select a place where is not affected by a fluorescent lamp or direct sunlight.
- Two or more (up to 6 units) wireless-type indoor units can be set in a room.

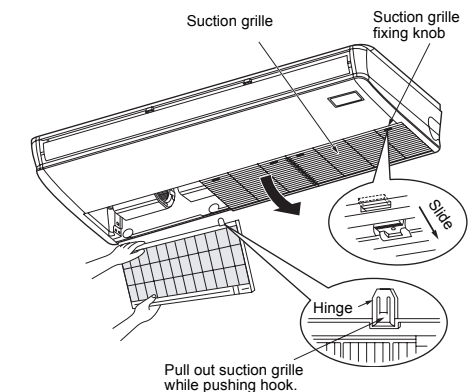


■ Before installation

1 Removal of suction grille

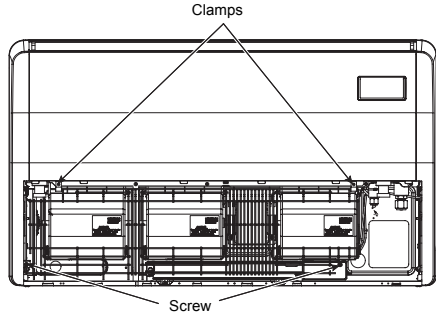
Slide the suction grille fixing knobs (2 positions) toward the arrow direction, and then open the suction grille.

Under the condition of suction grille opened, push the hook section of hinges (2 positions) at the rear side, and then pull out the suction grille.



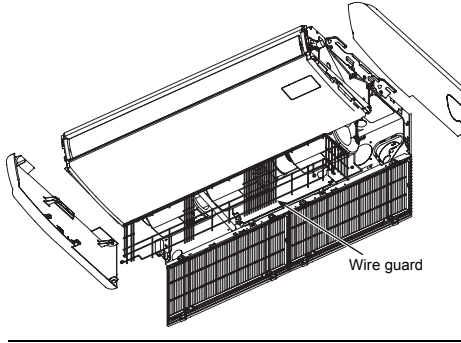
2 Removing wire guard

Remove the screws (2 pcs.) which are fixing the wire guard.
Remove the clamp fixing screws and remove the wire guard.



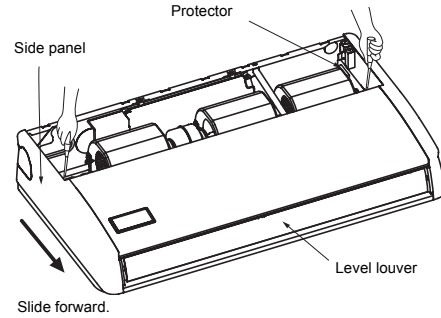
CAUTION

Attach back the wire guard once indoor unit is installed. Remove the 2 screws fixing the wire guard and hung the wire guard with the clamps during a service.



3 Removal of side panel

After removing the side panel fixing screws (1 each at right and left), slide the side panel forward and then remove it.



4 Removal of protective vinyl

Peel out the protective vinyl on the level louver.

5 Removal of protector

Remove the protector (1 pcs.) of the fan. (AP024 only)

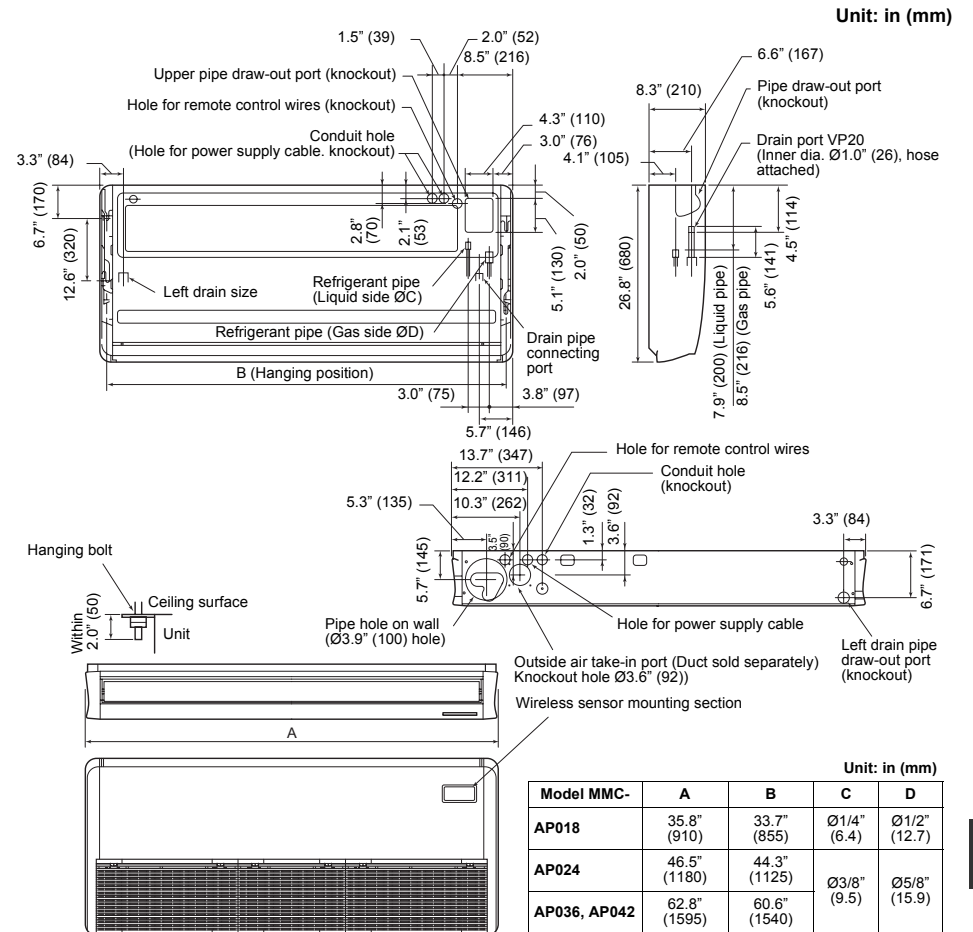
4 Installation

REQUIREMENT

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

- Do not put a heavy article on the indoor unit. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible. If carrying in the indoor unit unpacked by necessity, use buffering cloth or other soft cloth to not damage the unit.
- To move the indoor unit, hold the hooking metals (4 positions) only.
- Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts).
- Carry the package by two or more persons, and do not bundle it with plastic band at positions other than specified.

External view



Ceiling type

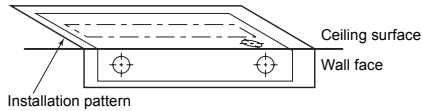
Installation of hanging bolts

- Consider the piping/wiring after the unit is hung to determine the location of the indoor unit installation and orientation.
- The hanging bolt pitches are given in the outline drawing and the attached installation pattern.
- When a ceiling already exists, lay the drain pipe, refrigerant pipe, control wires, and remote control wires to their connection locations before hanging the indoor unit.

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

Hanging bolt	3/8" (M10)	4 pieces
Nut	3/8" (M10)	12 pieces

Using the installation pattern (accessory)



Using the pattern, positioning of the hanging bolt and pipe hole can be performed.

* As an error to some degree may generate on the pattern size due to temperature and humidity, be sure to confirm the size.

Installation of hanging bolt

Use 3/8" (M10) hanging bolts (4 pcs, to be local procure). Matching to the existing structure, set pitch according to size in the unit external view as shown below.

<p>New concrete slab</p> <p>Install the bolts with insert brackets or anchor bolts.</p> <p>(Blade type bracket) (Slide type bracket) (Pipe hanging anchor bolt)</p>
<p>Steel frame structure</p> <p>Use existing angles or install new support angles.</p> <p>Hanging bolt Support angle</p>
<p>Existing concrete slab</p> <p>Use a hole-in anchors, hole-in plugs, or a hole-in bolts.</p>

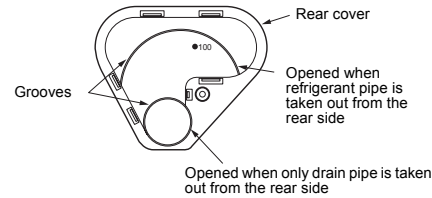
Draw-out direction of pipe/wire

- Decide installation place of the unit and draw-out direction of pipe and wire.

Pipe knockout hole

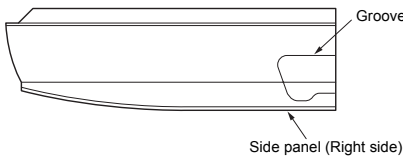
Piping from rear side

- * Cut off the groove section with a plastic cutter, etc.



Piping from right side

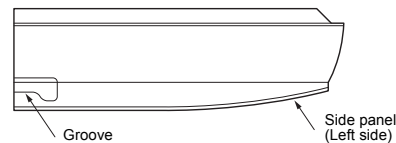
- * Cut off the groove section with a metal saw or plastic cutter, etc.



Piping from left side

Taking pipe from left side is applied only to the drain pipe. The refrigerant pipe cannot be taken out from the left side.

- * Cut off the groove section with a metal saw or plastic cutter, etc.



Piping from upper side

Taking pipe from upper side is applied only to the refrigerant pipe. When taking out the drain pipe from the upper side, use a drain up kit sold separately.

Open the upper pipe draw-out port (Knockout hole) shown in the external view. (Knockout hole of thin plate)
After piping, cut off the attached heat insulator of the top plate to pipe shape, and then seal the knockout hole.

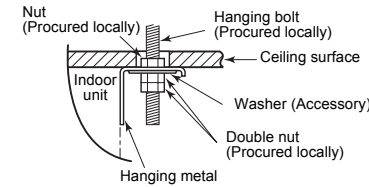
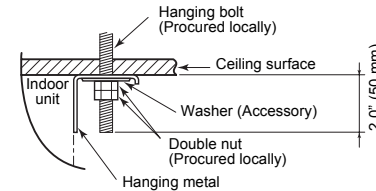
Ceiling type

Installation of indoor unit

Preparation before holding down main unit

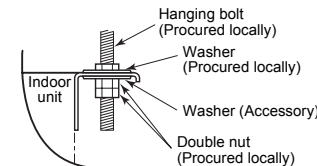
- * Confirm the presence of the ceiling material beforehand because the fixing method of hanging metal when the ceiling material is set differs from that when the ceiling material is not set.

There is ceiling material



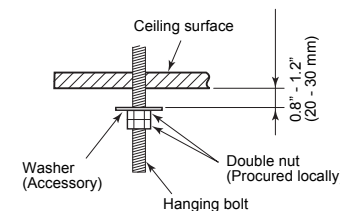
- * Tighten the hanging metal with upper/lower nuts as shown in the figure.

There is no ceiling material

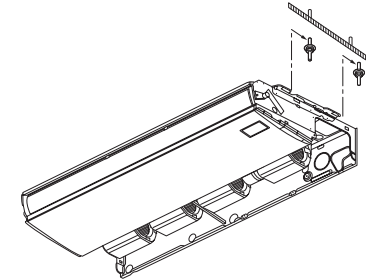


Holding down of main unit

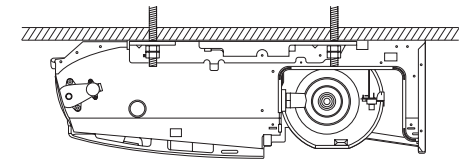
- (1) Attach washer and nuts to the hanging bolt.



- (2) Hang the unit to the hanging bolt as shown the figure below.



- (3) As shown in the figure below, fix the ceiling material securely with the double nuts.



REQUIREMENT

- The ceiling surface may not be horizontal. Be sure to confirm that width and depth directions are level.

Installation of remote control (Sold separately)

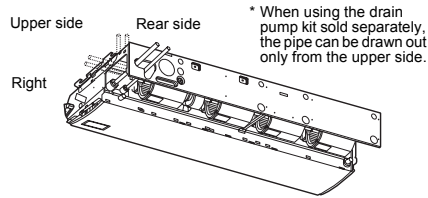
For installation of the wired remote control, follow the Installation Manual attached with the remote control.

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

5 Refrigerant Piping

Refrigerant Piping

- The connecting sections of the refrigerant pipes are provided at the positions in the figure below.



- Use copper pipe with 0.03" (0.8 mm) or more thickness. (In case pipe size is $\varnothing 5/8"$ (15.9 mm), with 0.04" (1.0 mm) or more.)
- Flare nut and flare works are also different from those of the conventional refrigerant. Take out the flare nut attached to the main unit of the air conditioner, and use it.

REQUIREMENT

When the refrigerant pipe is long, provide support brackets at intervals of 8'2" - 9'10" (2.5 - 3 m) to clamp the refrigerant pipe. Otherwise, abnormal sound may be generated.

CAUTION

IMPORTANT 4 POINTS FOR PIPING WORK

- Remove dust and moisture from the inside of the connecting pipes.
- Tight connection (between pipes and unit)
- Evacuate the air in the connecting pipes by using VACUUM PUMP.
- Check the gas leakage. (Connected points)

Pipe size

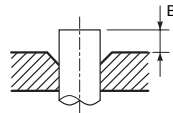
Model name	MMC-	AP018 type	AP024, AP036, AP042 type
Pipe size	Gas side	1/2" (12.7 mm)	5/8" (15.9 mm)
	Liquid side	1/4" (6.4 mm)	3/8" (9.5 mm)

Permissible Piping Length and Height Difference

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

Flaring

- Cut the pipe with a pipe cutter. Remove burrs completely. Remaining burrs may cause gas leakage.
- Insert a flare nut into the pipe, and flare the pipe. As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended. However, the conventional tools can be used by adjusting projection margin of the copper pipe.



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

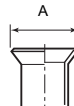
Rigid (Clutch type)

Outer dia. of copper pipe	R410A tool used	Conventional tool used
	R410A	R410A
1/4" (6.4), 3/8" (9.5)	0 - 0.02" (0 - 0.5)	0.04" - 0.06" (1.0 - 1.5)
1/2" (12.7), 5/8" (15.9)		

Flaring dia. meter size: A (Unit: in (mm))

Outer dia. of copper pipe	A ⁺⁰ / _{-0.02 (0.4)}
	R410A
1/4" (6.4)	0.36" (9.1)
3/8" (9.5)	0.52" (13.2)
1/2" (12.7)	0.65" (16.6)
5/8" (15.9)	0.78" (19.7)

- 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.



Tightening connection

CAUTION

- Do not apply excessive torque. Otherwise, the nut may crack depending on the conditions.

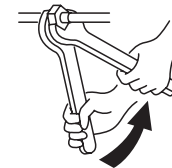
Unit: ft·lbs (N·m)

Outer dia. of copper pipe	Tightening torque
1/4" (6.4 mm)	10 - 13 (14 - 18)
3/8" (9.5 mm)	24 - 31 (33 - 42)
1/2" (12.7 mm)	37 - 46 (50 - 62)
5/8" (15.9 mm)	46 - 57 (63 - 77)

Tightening torque of flare pipe connections

Pressure of R410A is higher than that of R22. (Approx. 1.6 times) Use 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. Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. Then tighten the nut with a spanner and torque wrench as shown in the figure.



Work using double spanner

REQUIREMENT

Tightening with an excessive torque may crack the nut depending on installation conditions. Tighten the nut within the specified tightening torque.

Piping with outdoor unit

- Shape of valve differs according to the outdoor unit. For details of installation, refer to the Installation Manual of the outdoor unit.

Leak check test, evacuation and other procedure

For leak check test, evacuation, addition of refrigerant, and gas leak check, refer to the Installation Manual attached to the outdoor unit.

REQUIREMENT

Do not supply power to the indoor unit until the leak check test and evacuation 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. For details, refer to the Installation Manual attached to the outdoor unit.

Heat insulation process

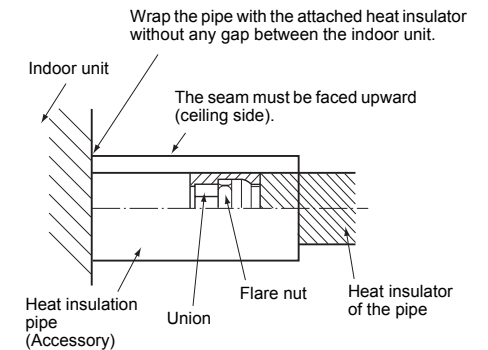
Apply heat insulation for the pipes separately at liquid side and gas side.

For the heat insulation to the pipes at gas side, use the material with heat-resisting temperature 248 °F (120 °C) or higher.

Apply the attached 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 may causes water leak.)
- Wrap heat insulator with its slits facing up (ceiling side).



6 Drain Piping Work

CAUTION

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

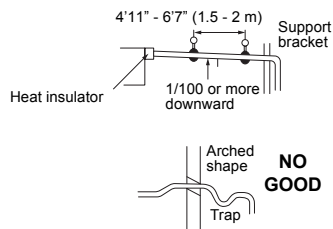
Piping/Heat insulating material

Require the following materials for piping and heat insulating at site.

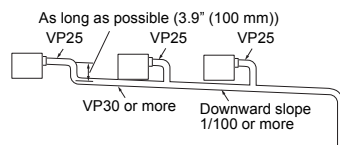
Piping	Hard vinyl chloride pipe VP20 (Outer dia.: $\varnothing 1.0"$ (26 mm))
Heat insulator	Foam polyethylene: Thickness 0.4" (10 mm) or more

REQUIREMENT

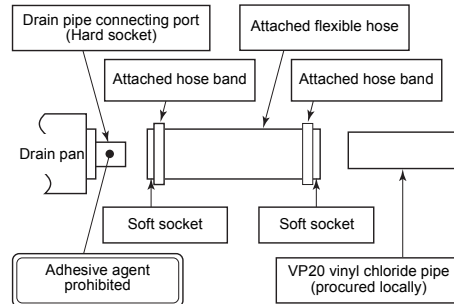
- Perform heat insulation of the drain pipes of the indoor unit.
- Perform heat insulation of the connecting part with the indoor unit. An incomplete heat insulation causes dew drop.
- Set the drain pipe with downward slope (1/100 or more), and do not make swelling or trap on the piping. It may cause an abnormal sound.
- For length of the traversing drain pipe, restrict to 65'7" (20 m) or less. In case of a long pipe, provide support brackets with interval of 4'11" - 6'7" (1.5 - 2 m) in order to prevent waving.



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



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

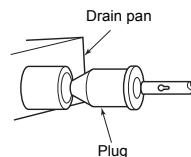


Adhesive inhibited:

Use the attached flexible hose and hose band for connecting the drain hose to the clear drain socket. If applying the adhesive, socket will be damaged and cause water leakage.

Connecting drain pipe

- Connect the hard vinyl chloride pipe (procured locally) to the mounted drain hose which was attached.
- Piping from left side**
 - To take pipe from the left side, exchange the plug from left to right. Push in the plug of which end is not sharp up to the end.



Drain up

When not securing down slope on the drain pipe, use a Drain pump kit sold separately. Also refer to the "Drain pump kit installation manual". The drain pipe can be raised 23.6" (600 mm) from the top face of the main unit.

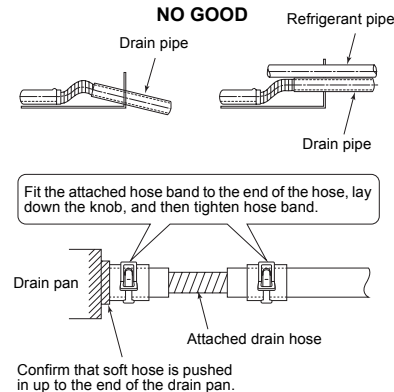
- When using Drain pump kit, both drain pipe and refrigerant pipe can be taken only from upper side.
- VP25 PVC pipe is needed when a drain pump is used.

Connection of drain hose

- Insert the attached drain hose into the drain pipe connecting port on the drain pan up to the end.
- Fit the attached hose band to the end of the pipe connecting port, and then tighten it securely.

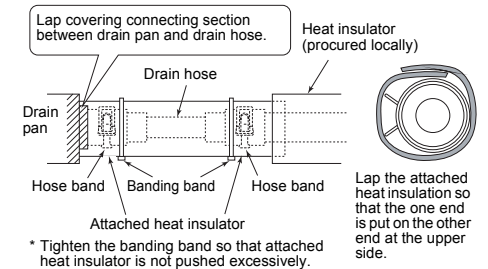
REQUIREMENT

- Fix the drain hose with the attached hose band, and set the tightening position upward.
- As the draining is the natural water draining, arrange the pipe outside of the unit on the down slope.
- If piping is performed as shown in the figure, drain cannot be discharged.



Perform heat insulating

- Using the attached drain hose heat insulator, lap the connecting section and the drain hose without clearance, and then tighten with two handing band so that heat insulator does not open.
- Covering the attached drain hose heat insulator, lap the heat insulator (procured locally) to the drain pipe without clearance.



7 Electrical Connection

⚠ WARNING

- 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.
- 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.
- 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 procured locally.
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

Power supply	208/230-1-60
--------------	--------------

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.

Power supply wire

- Recommended wire diameter and wire length for power supply wire.

Power supply wiring	Wire size: 2 × AWG12 Ground 1 × AWG12 or thicker	Up to 164'1" (50m)
---------------------	---	--------------------

Electric characteristics

MCA : Minimum Circuit Amps
MOCP : Maximum Overcurrent Protection (Amps)

Model	Power Supply	Voltage Range (V)		MCA	MOCP
		Min	Max	(A)	(A)
MMC-AP0181H2UL	208/230V-1-60Hz	187	253	0.5	15
MMC-AP0241H2UL				0.7	15
MMC-AP0361H2UL				1.0	15
MMC-AP0421H2UL				1.2	15

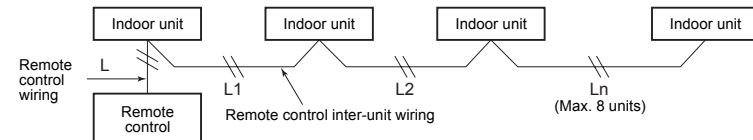
Control wire

Control wiring between indoor units, and outdoor unit (2-core shielded wire)	Wire size	(Up to 3280'10" (1000m)) AWG16 (Up to 6561'8" (2000m)) AWG14
--	-----------	---

Remote control wiring

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

Remote control wiring, remote control inter-unit wiring	Wire size: AWG20	
Total wire length of remote control wiring and remote control inter-unit wiring = L + L1 + L2 + ... Ln	In case of wired type only	Up to 1640'5" (500m)
	In case of wireless type included	Up to 1312'4" (400m)
Total wire length of remote control inter-unit wiring = L1 + L2 + ... Ln	Up to 656'2" (200m)	



NOTE

- Use copper supply wire.
- Use UL wire rated 600V for the power supply.
- Use UL wire rated 300V for the remote control wires and control wires.

⚠ CAUTION

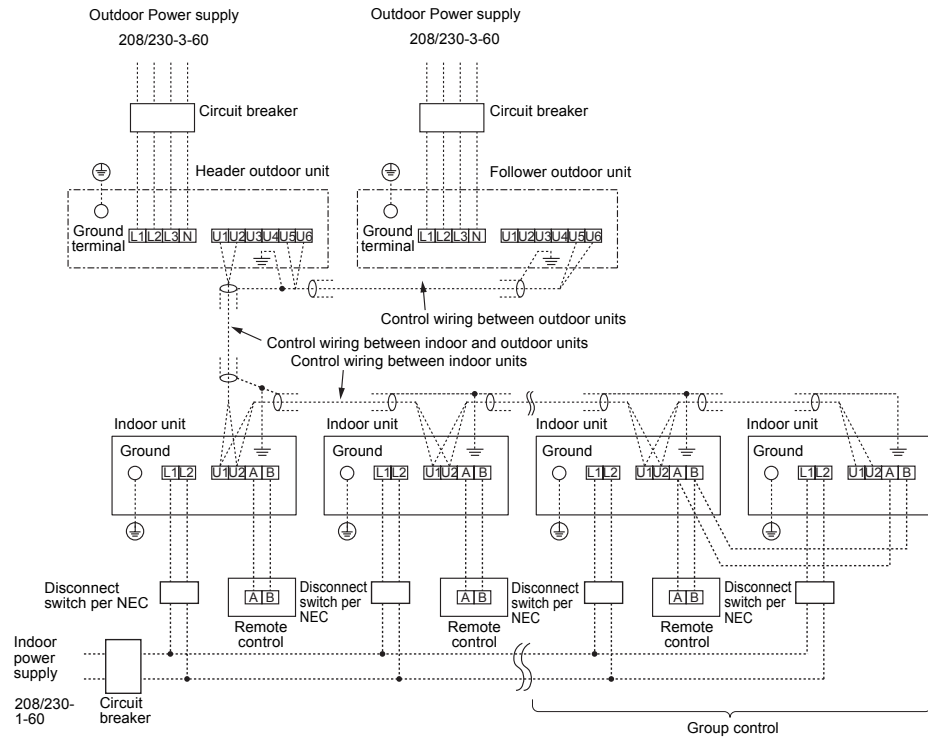
The remote control wire (Communication line) and AC208/230V wires cannot be parallel to contact each other and cannot be stored in the same conduits. If doing so, a trouble may be caused on the control system due to noise or other factor.

■ Wiring between indoor and outdoor units

NOTE

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

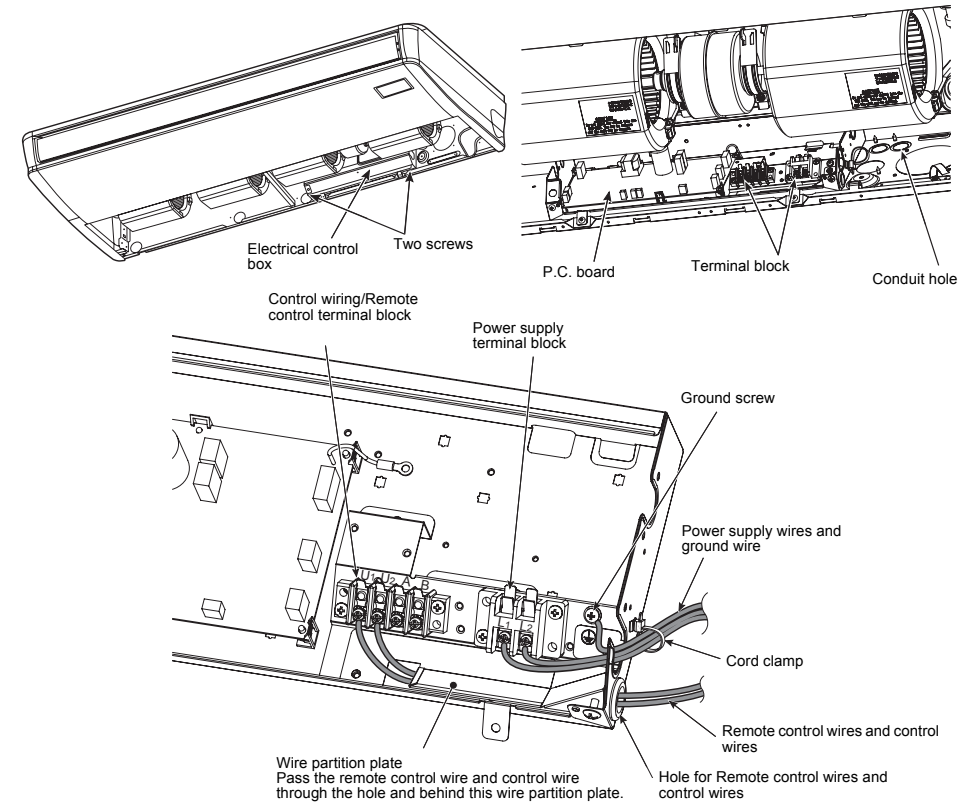
▼ Wiring example



■ Wire connection

REQUIREMENT

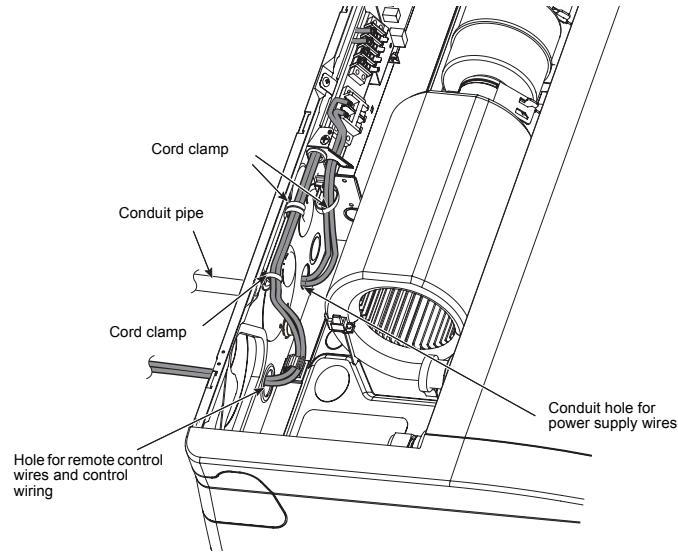
- Connect the wires matching the terminal numbers. Incorrect connection causes a trouble.
- The low-voltage circuit is provided for the control wire and the remote control wire. (Do not connect the high-voltage circuit)
- Loosen the cover mounting screws (2 positions) of the electrical control box, and then remove the cover.
- Attach the conduit pipe to the conduit hole with a lock nut.
- Slit the film of bushing attached to the hole for control wire and remote control wire, and then pass through wires.
- Connect the power supply wires, control wiring and the remote control wire to the terminal block of the electrical control box. Secure the ground wire with the ground screw.
- Tighten screws of the terminal block securely, and fix the wires with code 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 so that it does not pinch the wires.



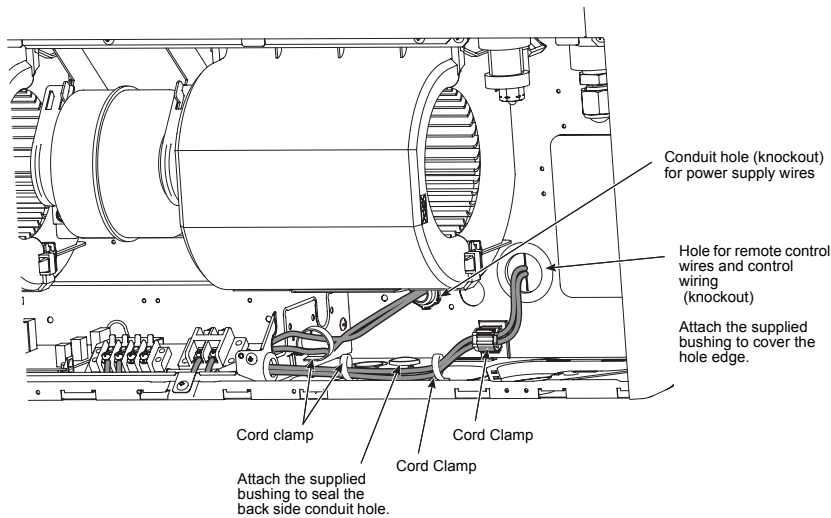
CAUTION

Fix the power supply wires and the control wires/remote control wires separately with the cord clamp as show below.

Connected at backside



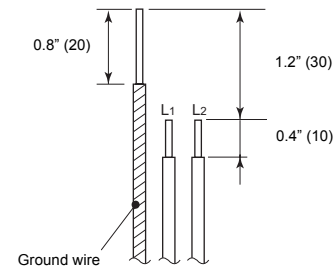
Connected at upside



Power supply wires and ground wire

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

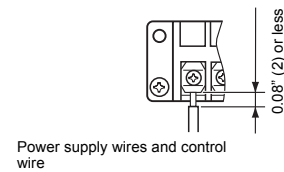
Unit: in (mm)



CAUTION

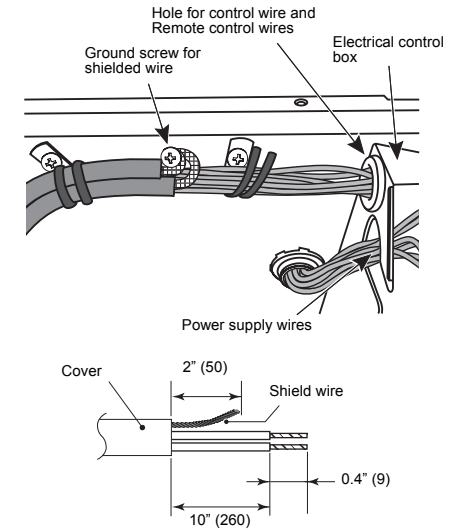
Firmly tighten the screws of the terminal block.

Keep the wire length as shown in figure below when it is connected to the terminal block.



Control wires

Because a "hole for control wires and remote control wires" has little space, a cover of control wires (2-core shielded wire) should be removed up to 10" (260mm).



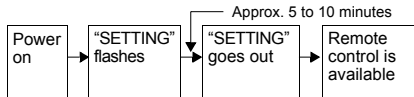
Address setup

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

8 Applicable Controls

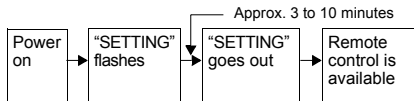
REQUIREMENT

- When this air conditioner is used for the first time, it takes approx. 5 minutes until the remote control becomes available after power-on. This is normal. **<When power is turned on for the first time after installation>** It takes **approx. 5 to 10 minutes** until the remote control becomes available.



<When power is turned on for the second (or later) time>

It takes **approx. 3 to 10 minutes** until the remote control becomes available.



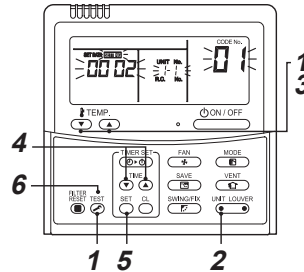
- Normal settings were made as factory default. Change the indoor unit settings as required.
- Use the wired remote control to change the settings.
 - * The settings cannot be changed using the wireless remote control, simple wired remote control, or central control system. Therefore, install the wired remote control to change the settings.

Changing applicable control setting

Basic procedure for changing settings

Change the settings while the air conditioner is not working.

(Stop the air conditioner before making settings.)

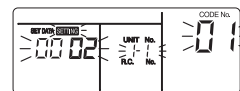


Procedure 1

Push **TEST** button and temp. setup **▼** button simultaneously for 4 seconds or more.

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 **TEST** button to erase the display content, and repeat the procedure from the beginning. (No operation of the remote control is accepted for a while after **TEST** button is pushed.) (While air conditioners are operated under the group control, "ALL" is displayed first. When **UNIT LOUVER** button is pushed, the indoor unit number displayed following "ALL" is header unit.)

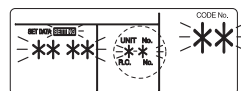


(* Display content varies with the indoor unit model.)

Procedure 2

Each time **UNIT LOUVER** 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 can be confirmed for which to change settings.



Procedure 3

Specify CODE No. [** *] with temp. setup **▼** / **▲** buttons.

Procedure 4

Select SET DATA [****] with timer time **▼** / **▲** buttons.

Procedure 5

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

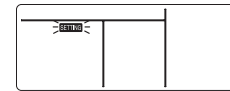
- To change settings of another indoor unit, repeat from Procedure 2.
- To change other settings of the selected indoor unit, repeat from Procedure 3. Use **SET** button to clear the settings. To make settings after **SET** button was pushed, repeat from Procedure 2.

Procedure 6

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

When **TEST** button is pushed, "SETTING" flashes and then the display content disappears and the air conditioner enters the normal stop mode.

(While "SETTING" is flashing, no operation of the remote control is accepted.)



Installing indoor unit on high ceiling

When the height of the ceiling to be installed exceeds 3.5 m (11'6"), adjustment of fan speed is necessary. Set up the high ceiling.

- Set according to the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6).
- CODE No. in Procedure specifies [5d].
- Select [SET DATA] in Procedure from "List of installable ceiling height" in this Manual.
- For the CODE No. in Procedure 3, specify [5d].
- For the SET DATA in Procedure 4, select the setup data of high ceiling to be set up from the table on the below.

(Exchange by wired remote control)

SET DATA		
0000	Standard (Factory default)	11'6" (3.5 m) or less
0001	High ceiling 1	more than 11'6" (3.5 m) up to 13'1" (4.0 m)

Remote control-less setting

To set the unit to high ceiling setting, there is a method that requires the changing of the short plugs on the indoor P.C. board. The details are shown in the below table.

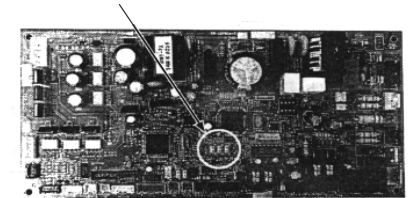
This method is only to be used where a wired remote control (Group control) is not used.

- * However, once the setting is changed, it is necessary to reset the setting back to 0000 that placing the short plugs back to the factory default position and rewriting the setting data back to 0000 with wired remote control.

- Select by exchange of short plugs on indoor P.C. board.

Short plug position	SET DATA	Note
	0000	Standard (Factory default)
	0001	High ceiling 1

- Short plugs position (CN112, CN111, CN110 from the left)



Filter sign setting

According to the installation condition, the lighting time of the filter sign (Notification of filter cleaning) can be changed.

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

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

SET DATA	Filter sign lighting time
0000	None
0001	150 H
0002	2500 H (Factory default)
0003	5000 H
0004	10000 H

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 device to circulate heat air near the ceiling.

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

- For the CODE No. in Procedure 3, specify [06].
- For the set data in Procedure 4, select the SET DATA of shift value of detection temperature to be set up from the table below.

SET DATA	Detection temp shift value
0000	No shift
0001	+1.8 °F (+1 °C)
0002	+3.6 °F (+2 °C) (Factory default)
0003	+5.4 °F (+3 °C)
0004	+7.2 °F (+4 °C)
0005	+9.0 °F (+5 °C)
0006	+10.8 °F (+6 °C)


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.

SET DATA	0000	0001
Remote control sensor	Not used (factory setting)	Used

When  flashes, the remote control sensor is defective.

Select the SET DATA [0000] (not used) or replace the remote control.

Group control

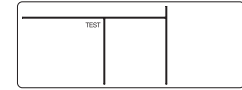
In a group control, a remote control can control up to maximum 8 units.

- 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 "Electric work" 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.


9 Test Run

Before test run


- Before turning on the circuit breaker, carry out the following procedure.
 - By using 500V-megger, check that resistance of 1MΩ or more exists between the terminal block L1 to L2 and the ground (grounding). If resistance of less than 1MΩ is detected, do not run the unit.
 - 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.
- Before starting a test run, be sure to set addresses following the Installation Manual supplied with the outdoor unit.



Procedure 2

Push  button.

Procedure 3

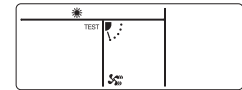
Select the operation mode with  button, [COOL] or [HEAT].

- Do not run the air conditioner in a mode other than [COOL] or [HEAT].
- The temperature controlling function does not work during test run.
- The detection of error is performed as usual.


Execute a test run

Operate the unit with the remote control as usual. For the procedure of the operation, refer to the attached Owner's Manual.

A forced test run can be executed in the following procedure even if the operation stops by thermo.-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.




Procedure 4

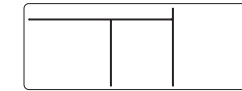
After the test run, push  button to stop a test run.

(Display part is same as procedure 1.)

Procedure 5

Push  check button to cancel (release from) the test run mode.

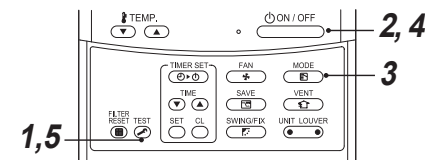
([TEST] disappears on the display and the status returns to a normal.)




CAUTION

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

Wired remote control



Procedure 1

Push  button for 4 seconds or more. [TEST] is displayed on the display part and the selection of mode in the test mode is permitted.

Wireless remote control**Procedure 1**

Turn on the power of the air conditioner.

When power is turned on for the first time after installation, it takes approx. 5 minutes until the remote control becomes available. In the case of subsequent power-on, it takes approx. 1 minute until the remote control becomes available. Execute a test run after the predetermined time has passed.

Procedure 2

Push "ON/OFF" button on the remote control, select [COOL] or [HEAT] with "MODE" button, and then select [HIGH] with "FAN" button.

Procedure 3

Cooling test run	Heating test run
Set the temperature to 64 °F (18 °C) with the temp. setup buttons.	Set the temperature to 86 °F (30 °C) with the temp. setup buttons.

Procedure 4

Cooling test run	Heating test run
After confirming a signal receiving sound "beep" immediately set the temperature to 66 °F (19 °C) with the temp. setup buttons.	After confirming a signal receiving sound "beep" immediately set the temperature to 84 °F (29 °C) with the temp. setup buttons.

Procedure 5

Cooling test run	Heating test run
After confirming a signal receiving sound "beep" immediately set the temperature to 64 °F (18 °C) with the temp. setup buttons.	After confirming a signal receiving sound "beep" immediately set the temperature to 86 °F (30 °C) with the temp. setup buttons.

Procedure 6

Repeat procedures **4** → **5** → **4** → **5**.

Indicators "Operation" (green), "Timer" (green), and "Ready" (orange) in the wireless receiver section flash in approx. 10 seconds, and the air conditioner starts operation. If any of these indicators does not flash, repeat procedures **2** to **5**.

Procedure 7

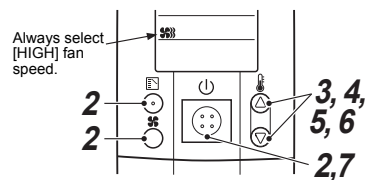
Upon completion of the test run, push "ON/OFF" button to stop operation.

<Overview of test run operations using the wireless remote control>**▼ Cooling test run:**

ON/OFF → 64 °F (18 °C) → 66 °F (19 °C) → 64 °F (18 °C) → 66 °F (19 °C) → 64 °F (18 °C) → 66 °F (19 °C) → 64 °F (18 °C) → (test run) → ON/OFF

▼ Heating test run:

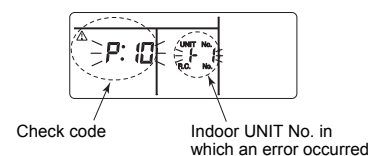
ON/OFF → 86 °F (30 °C) → 84 °F (29 °C) → 86 °F (30 °C) → 84 °F (29 °C) → 86 °F (30 °C) → 84 °F (29 °C) → 86 °F (30 °C) → (test run) → ON/OFF



10 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.



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.

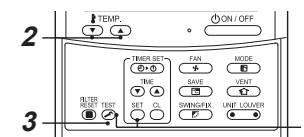
Procedure 3

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.

Confirmation of error log

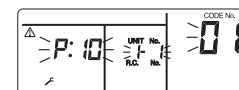
When an error occurred on the air conditioner, the error log can be confirmed with the following procedure. (The error log is stored in memory up to 4 errors.) The log can be confirmed from both operating status and stop status.

**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.

■ 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.

IPDU : Intelligent Power Drive Unit
 ○ : Lighting, □ : Flashing, ● : Goes off
 ALT. : Flashing is alternately when there are two flashing LED.
 SIM : Simultaneous flashing when there are two flashing LED.

Check code		Wireless remote control				Check code name	Judging device
Wired remote control display	Outdoor 7-segment display	Sensor block display of receiving unit					
	Auxiliary code	Operation	Timer	Ready	Flash		
E01	—	—	□	●	●	Communication error between indoor and remote control (Detected at remote control side)	Remote control
E02	—	—	□	●	●	Remote control transmission error	Remote control
E03	—	—	□	●	●	Communication error between indoor and remote control (Detected at indoor side)	Indoor
E04	—	—	●	●	□	Communication circuit error between indoor/outdoor (Detected at indoor side)	Indoor
E06	E06	No. of indoor units in which sensor has been normally received	●	●	□	Decrease of No. of indoor units	I/F
—	E07	—	●	●	□	Communication circuit error between indoor/outdoor (Detected at outdoor side)	I/F
E08	E08	Duplicated indoor addresses	□	●	●	Duplicated indoor addresses	Indoor / I/F
E09	—	—	□	●	●	Duplicated header remote controls	Remote control
E10	—	—	□	●	●	Communication error between indoor MCU	Indoor
E12	E12	01: Indoor/Outdoor communication 02: Communication between outdoor units	□	●	●	Automatic address start error	I/F
E15	E15	—	●	●	□	Indoor is nothing during automatic addressing	I/F
E16	E16	00: Capacity over 01 ~No. of connected units	●	●	□	Capacity over / No. of connected indoor units	I/F
E18	—	—	□	●	●	Communication error between indoor units	Indoor
E19	E19	00: Header is nothing 02: Two or more header units	●	●	□	Outdoor header units quantity error	I/F
E20	E20	01: Outdoor of other line connected 02: Indoor of other line connected	●	●	□	Other line connected during automatic address	I/F
E23	E23	—	●	●	□	Sending error in communication between outdoor units	I/F
E25	E25	—	●	●	□	Duplicated follower outdoor addresses	I/F
E26	E26	No. of outdoor units which received signal normally	●	●	□	Decrease of No. of connected outdoor units	I/F
E28	E28	Detected outdoor unit number	●	●	□	Follower outdoor unit error	I/F

Check code		Wireless remote control				Check code name	Judging device																																																																																											
Wired remote control display	Outdoor 7-segment display	Sensor block display of receiving unit																																																																																																
	Auxiliary code	Operation	Timer	Ready	Flash																																																																																													
E31	E31	<table border="1"> <tr> <td></td> <td colspan="3">A3-IPDU</td> <td rowspan="2">Fan IPDU</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>01</td> <td>○</td> <td></td> <td></td> <td></td> </tr> <tr> <td>02</td> <td></td> <td>○</td> <td></td> <td></td> </tr> <tr> <td>03</td> <td>○</td> <td>○</td> <td></td> <td></td> </tr> <tr> <td>04</td> <td></td> <td></td> <td>○</td> <td></td> </tr> <tr> <td>05</td> <td>○</td> <td></td> <td>○</td> <td></td> </tr> <tr> <td>06</td> <td></td> <td>○</td> <td>○</td> <td></td> </tr> <tr> <td>07</td> <td>○</td> <td>○</td> <td>○</td> <td></td> </tr> <tr> <td>08</td> <td></td> <td></td> <td></td> <td>○</td> </tr> <tr> <td>09</td> <td>○</td> <td></td> <td></td> <td>○</td> </tr> <tr> <td>0A</td> <td></td> <td>○</td> <td></td> <td>○</td> </tr> <tr> <td>0B</td> <td>○</td> <td>○</td> <td></td> <td>○</td> </tr> <tr> <td>0C</td> <td></td> <td></td> <td>○</td> <td>○</td> </tr> <tr> <td>0D</td> <td>○</td> <td></td> <td>○</td> <td>○</td> </tr> <tr> <td>0E</td> <td></td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>0F</td> <td>○</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td colspan="5">○ : IPDU error</td> </tr> </table>					A3-IPDU			Fan IPDU	1	2	3	01	○				02		○			03	○	○			04			○		05	○		○		06		○	○		07	○	○	○		08				○	09	○			○	0A		○		○	0B	○	○		○	0C			○	○	0D	○		○	○	0E		○	○	○	0F	○	○	○	○	○ : IPDU error					●	●	□	IPDU communication error	I/F
			A3-IPDU			Fan IPDU																																																																																												
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F01	—	—	□	□	●	ALT	Indoor TCJ sensor error	Indoor																																																																																										
F02	—	—	□	□	●	ALT	Indoor TC2 sensor error	Indoor																																																																																										
F03	—	—	□	□	●	ALT	Indoor TC1 sensor error	Indoor																																																																																										
F04	F04	—	□	□	○	ALT	TD1 sensor error	I/F																																																																																										
F05	F05	—	□	□	○	ALT	TD2 sensor error	I/F																																																																																										
F06	F06	TE1 sensor TE2 sensor	□	□	○	ALT	TE1 sensor error TE2 sensor error	I/F																																																																																										
F07	F07	—	□	□	○	ALT	TL sensor error	I/F																																																																																										
F08	F08	—	□	□	○	ALT	TO sensor error	I/F																																																																																										
F10	—	—	□	□	●	ALT	Indoor TA sensor error	Indoor																																																																																										
F12	F12	—	□	□	○	ALT	TS1 sensor error	I/F																																																																																										
F13	F13	01: Comp. 1 side 02: Comp. 2 side 03: Comp. 3 side	□	□	○	ALT	TH sensor error	IPDU																																																																																										
F15	F15	—	□	□	○	ALT	Outdoor temp. sensor miswiring (TE1, TL)	I/F																																																																																										
F16	F16	—	□	□	○	ALT	Outdoor pressure sensor miswiring (Pd, Ps)	I/F																																																																																										
F22	F22	—	□	□	○	ALT	TD3 error	I/F																																																																																										
F23	F23	—	□	□	○	ALT	Ps sensor error	I/F																																																																																										
F24	F24	—	□	□	○	ALT	Pd sensor error	I/F																																																																																										
F29	—	—	□	□	●	SIM	Indoor other error	Indoor																																																																																										
F31	F31	—	□	□	○	SIM	Indoor EEPROM error	I/F																																																																																										
H01	H01	01: Comp. 1 side 02: Comp. 2 side 03: Comp. 3 side	●	□	●		Compressor break down	IPDU																																																																																										
H02	H02	01: Comp. 1 side 02: Comp. 2 side 03: Comp. 3 side	●	□	●		Compressor trouble (lock)	IPDU																																																																																										
H03	H03	01: Comp. 1 side 02: Comp. 2 side 03: Comp. 3 side	●	□	●		Current detect circuit system error	IPDU																																																																																										
H05	H05	—	●	□	●		TD1 miswiring	I/F																																																																																										
H06	H06	—	●	□	●		Low pressure protective operation	I/F																																																																																										
H07	H07	—	●	□	●		Oil level down detective protection	I/F																																																																																										
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	●	□	●		Oil level detective temp sensor error	I/F																																																																																										
H15	H15	—	●	□	●		TD2 miswiring	I/F																																																																																										

Ceiling type

Wired remote control display	Check code			Wireless remote control				Check code name	Judging device																																																																																							
	Outdoor 7-segment display	Sensor block display of receiving unit			Flash																																																																																											
		Auxiliary code	Operation	Timer						Ready																																																																																						
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	●	○	●			Oil level detective circuit error	I/F																																																																																							
H25	H25	—	●	○	●			TD3 miswiring	I/F																																																																																							
L03	—	—	○	●	○	SIM		Indoor center unit duplicated	Indoor																																																																																							
L04	L04	—	○	○	○	SIM		Outdoor line address duplicated	I/F																																																																																							
L05	—	—	○	●	○	SIM		Duplicated indoor units with priority (Displayed in indoor unit with priority)	I/F																																																																																							
L06	L06	No. of indoor units with priority	○	●	○	SIM		Duplicated indoor units with priority (Displayed in unit other than indoor unit with priority)	I/F																																																																																							
L07	—	—	○	●	○	SIM		Group line in individual indoor unit	Indoor																																																																																							
L08	L08	—	○	●	○	SIM		Indoor group/Address unset	Indoor, I/F																																																																																							
L09	—	—	○	●	○	SIM		Indoor capacity unset	Indoor																																																																																							
L10	L10	—	○	○	○	SIM		Outdoor capacity unset	I/F																																																																																							
L17	L17	—	○	○	○	SIM		Outdoor unit model unmatched error	I/F																																																																																							
L20	—	—	○	○	○	SIM		Duplicated central control addresses	Indoor																																																																																							
L28	L28	—	○	○	○	SIM		Over No. of connected outdoor units	I/F																																																																																							
L29	L29	<table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="3">A3-IPDU</th> <th rowspan="2">Fan IPDU</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr><td>01</td><td>○</td><td></td><td></td><td></td></tr> <tr><td>02</td><td></td><td>○</td><td></td><td></td></tr> <tr><td>03</td><td>○</td><td>○</td><td></td><td></td></tr> <tr><td>04</td><td></td><td></td><td>○</td><td></td></tr> <tr><td>05</td><td>○</td><td></td><td>○</td><td></td></tr> <tr><td>06</td><td></td><td>○</td><td>○</td><td></td></tr> <tr><td>07</td><td>○</td><td>○</td><td>○</td><td></td></tr> <tr><td>08</td><td></td><td></td><td></td><td>○</td></tr> <tr><td>09</td><td>○</td><td></td><td></td><td>○</td></tr> <tr><td>0A</td><td></td><td>○</td><td></td><td>○</td></tr> <tr><td>0B</td><td>○</td><td>○</td><td></td><td>○</td></tr> <tr><td>0C</td><td></td><td></td><td>○</td><td>○</td></tr> <tr><td>0D</td><td>○</td><td></td><td>○</td><td>○</td></tr> <tr><td>0E</td><td></td><td>○</td><td>○</td><td>○</td></tr> <tr><td>0F</td><td>○</td><td>○</td><td>○</td><td>○</td></tr> <tr><td colspan="5">○ : IPDU error</td></tr> </tbody> </table>		A3-IPDU			Fan IPDU	1	2	3	01	○				02		○			03	○	○			04			○		05	○		○		06		○	○		07	○	○	○		08				○	09	○			○	0A		○		○	0B	○	○		○	0C			○	○	0D	○		○	○	0E		○	○	○	0F	○	○	○	○	○ : IPDU error					○	●	○	SIM	No. of IPDU error	I/F
	A3-IPDU			Fan IPDU																																																																																												
	1	2	3																																																																																													
01	○																																																																																															
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0F	○	○	○	○																																																																																												
○ : IPDU error																																																																																																
L30	L30	Detected indoor address	○	○	○	SIM		Indoor outside interlock	Indoor																																																																																							
—	L31	—	—	—	—			Extended I/C error	I/F																																																																																							
P01	—	—	●	○	○	ALT		Indoor fan motor error	Indoor																																																																																							
P03	P03	—	○	●	○	ALT		Discharge temp. TD1 error	I/F																																																																																							
P04	P04	01: Comp. 1 side 02: Comp. 2 side 03: Comp. 3 side	○	●	○	ALT		High-pressure SW system operation	IPDU																																																																																							
P05	P05	00: Detected phase loss 01: Comp. 1 side 02: Comp. 2 side 03: Comp. 3 side	○	●	○	ALT		Phase loss error/interruption of power supply Inverter DC voltage (Vdc) error	I/F																																																																																							
P07	P07	01: Comp. 1 side 02: Comp. 2 side 03: Comp. 3 side	○	●	○	ALT		Heat sink overheat error	IPDU, I/F																																																																																							
P10	P10	Detected indoor address	●	○	○	ALT		Indoor overflow error	Indoor																																																																																							
P12	—	—	●	○	○	ALT		Indoor fan motor error	Indoor																																																																																							
P13	P13	—	●	○	○	ALT		Outdoor liquid back detection error	I/F																																																																																							
P15	P15	01: TS condition 02: TD condition	○	●	○	ALT		Gas leak detection	I/F																																																																																							
P17	P17	—	○	●	○	ALT		Discharge temp. TD2 error	I/F																																																																																							

Ceiling type

Wired remote control display	Check code			Wireless remote control				Check code name	Judging device
	Outdoor 7-segment display	Sensor block display of receiving unit			Flash				
		Auxiliary code	Operation	Timer					
P18	P18	—	○	●	○	ALT		Discharge temp. TD3 error	I/F
P19	P19	Detected outdoor unit number	○	●	○	ALT		4-way valve inverse error	I/F
P20	P20	—	○	●	○	ALT		High-pressure protective operation	I/F
P22	P22	0*: IGBT circuit 1*: Location detection circuit error 3*: Motor lock-up error 4*: Motor current was detected. C*: Abnormal temperature was detected by the TH sensor. D*: TH sensor error E*: Inverter DC voltage error (outdoor unit fan) Caution) Although letters 0 to F appear at locations indicated by "*", please ignore them.	○	●	○	ALT		Outdoor fan IPDU error	IPDU
P26	P26	01: Comp. 1 side 02: Comp. 2 side 03: Comp. 3 side	○	●	○	ALT		G-TR short protection error	IPDU
P29	P29	01: Comp. 1 side 02: Comp. 2 side 03: Comp. 3 side	○	●	○	ALT		Comp position detective circuit system error	IPDU
P31	P31	—	○	●	○	ALT		Other indoor unit error (Group follower unit error)	Indoor

Error detected by TCC-LINK central control device

Wired remote control display	Check code			Wireless remote control				Check code name	Judging device	
	Outdoor 7-segment display	Sensor block display of receiving unit			Flash					
		Auxiliary code	Operation	Timer						Ready
C05	—	—	—	—	—	—		Sending error in TCC-LINK central control device	TCC-LINK	
C06	—	—	—	—	—	—		Receiving error in TCC-LINK central control device	TCC-LINK	
C12	—	—	—	—	—	—		Batch alarm of general-purpose equipment control interface	General-purpose equipment I/F	
P30	—	—	—	—	—	—		Differs according to error contents of unit with occurrence of alarm (L20 is displayed)	Group control branching unit error Duplicated central control addresses	TCC-LINK

TCC-LINK : TOSHIBA Carrier Communication Link.

WARNINGS ON REFRIGERANT LEAKAGE

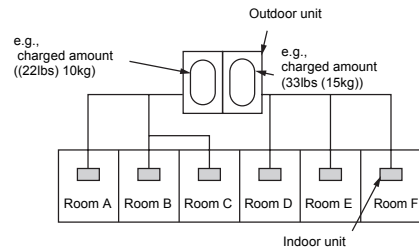
Check of Concentration Limit

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.

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

The concentration limit of R410A which is used in multi air conditioners is 0.019lbs/ft³ (0.3kg/m³).

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

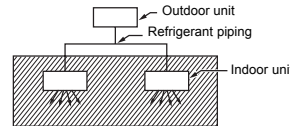
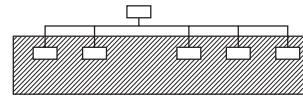


For the amount of charge in this example:
The possible amount of leaked refrigerant gas in rooms A, B and C is 22lbs (10kg).
The possible amount of leaked refrigerant gas in rooms D, E and F is 33lbs (15kg).

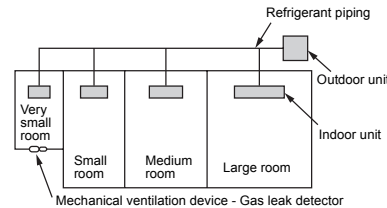
Important

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

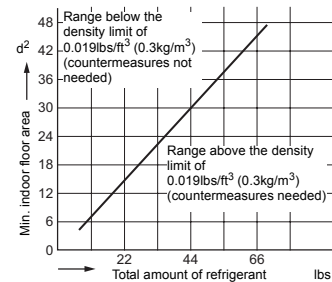
- (1) No partition (shaded portion)
- (2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).



- (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 3 :
The minimum indoor floor area compared with the amount of refrigerant is roughly as follows:
(When the ceiling is 8.9ft (2.7m) high)



Confirmation of Indoor Unit Setup

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

REQUIREMENT

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

Indoor unit setup check sheet

Indoor unit			Indoor unit			Indoor unit			Indoor unit		
Room name			Room name			Room name			Room name		
Model			Model			Model			Model		
Check indoor unit address. (For check method, refer to Applicable controls in this manual.) * In case of a single system, it is unnecessary to enter the indoor address. (CODE No.: Line [12], Indoor [13], Group [14], Central control [03])											
Line	Indoor	Group	Line	Indoor	Group	Line	Indoor	Group	Line	Indoor	Group
Central control address			Central control address			Central control address			Central control address		
Various setup			Various setup			Various setup			Various setup		
Have you changed high ceiling setup? If not, fill check mark [x] in [NO CHANGE], and fill check mark [x] in [ITEM] if changed, respectively. (For check method, refer to Applicable controls in this manual.) * In case of replacement of short plugs on indoor microcomputer P.C. board, setup is automatically changed.											
High ceiling setup (CODE No. [5d]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> STANDARD [0000] <input type="checkbox"/> HIGH CEILING 1 [0001]			High ceiling setup (CODE No. [5d]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> STANDARD [0000] <input type="checkbox"/> HIGH CEILING 1 [0001]			High ceiling setup (CODE No. [5d]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> STANDARD [0000] <input type="checkbox"/> HIGH CEILING 1 [0001]			High ceiling setup (CODE No. [5d]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> STANDARD [0000] <input type="checkbox"/> HIGH CEILING 1 [0001]		
Have you changed lighting time of filter sign? If not, fill check mark [x] in [NO CHANGE], and fill check mark [x] in [ITEM] if changed, respectively. (For check method, refer to Applicable controls in this manual.)											
Filter sign lighting time (CODE No. [01]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> NONE [0000] <input type="checkbox"/> 150H [0001] <input type="checkbox"/> 2500H [0002] <input type="checkbox"/> 5000H [0003] <input type="checkbox"/> 10000H [0004]			Filter sign lighting time (CODE No. [01]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> NONE [0000] <input type="checkbox"/> 150H [0001] <input type="checkbox"/> 2500H [0002] <input type="checkbox"/> 5000H [0003] <input type="checkbox"/> 10000H [0004]			Filter sign lighting time (CODE No. [01]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> NONE [0000] <input type="checkbox"/> 150H [0001] <input type="checkbox"/> 2500H [0002] <input type="checkbox"/> 5000H [0003] <input type="checkbox"/> 10000H [0004]			Filter sign lighting time (CODE No. [01]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> NONE [0000] <input type="checkbox"/> 150H [0001] <input type="checkbox"/> 2500H [0002] <input type="checkbox"/> 5000H [0003] <input type="checkbox"/> 10000H [0004]		
Have you changed detected temp. shift value? If not, fill check mark [x] in [NO CHANGE], and fill check mark [x] in [ITEM] if changed, respectively. (For check method, refer to Applicable controls in this manual.)											
Detected temp. shift value setup (CODE No. [06]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> NO SHIFT [0000] <input type="checkbox"/> +1°C 1.8°F [0001] <input type="checkbox"/> +2°C 3.6°F [0002] <input type="checkbox"/> +3°C 5.4°F [0003] <input type="checkbox"/> +4°C 7.2°F [0004] <input type="checkbox"/> +5°C 9.0°F [0005] <input type="checkbox"/> +6°C 10.8°F [0006]			Detected temp. shift value setup (CODE No. [06]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> NO SHIFT [0000] <input type="checkbox"/> +1°C 1.8°F [0001] <input type="checkbox"/> +2°C 3.6°F [0002] <input type="checkbox"/> +3°C 5.4°F [0003] <input type="checkbox"/> +4°C 7.2°F [0004] <input type="checkbox"/> +5°C 9.0°F [0005] <input type="checkbox"/> +6°C 10.8°F [0006]			Detected temp. shift value setup (CODE No. [06]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> NO SHIFT [0000] <input type="checkbox"/> +1°C 1.8°F [0001] <input type="checkbox"/> +2°C 3.6°F [0002] <input type="checkbox"/> +3°C 5.4°F [0003] <input type="checkbox"/> +4°C 7.2°F [0004] <input type="checkbox"/> +5°C 9.0°F [0005] <input type="checkbox"/> +6°C 10.8°F [0006]			Detected temp. shift value setup (CODE No. [06]) <input type="checkbox"/> NO CHANGE <input type="checkbox"/> NO SHIFT [0000] <input type="checkbox"/> +1°C 1.8°F [0001] <input type="checkbox"/> +2°C 3.6°F [0002] <input type="checkbox"/> +3°C 5.4°F [0003] <input type="checkbox"/> +4°C 7.2°F [0004] <input type="checkbox"/> +5°C 9.0°F [0005] <input type="checkbox"/> +6°C 10.8°F [0006]		
Incorporation of parts sold separately			Incorporation of parts sold separately			Incorporation of parts sold separately			Incorporation of parts sold separately		
Have you incorporated the following parts sold separately? If incorporated, fill check mark [x] in each [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.)											
<input type="checkbox"/> Others () <input type="checkbox"/> Others ()			<input type="checkbox"/> Others () <input type="checkbox"/> Others ()			<input type="checkbox"/> Others () <input type="checkbox"/> Others ()			<input type="checkbox"/> Others () <input type="checkbox"/> Others ()		