INSTALLATION INSTRUCTIONS
Air Conditioner

Panasonic®

This air conditioner uses the refrigerant R410A.

Model No.

Indoor Units			
Type	Indoor Unit Type	Nominal Capacity	
		18	24
K2	Wall Mounted	S-18MK2U6	S-24MK2U6

Read through the Installation Instructions before you proceed with the installation.
In particular, you will need to read under the “IMPORTANT!” section at the top of the page.

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IMPORTANT!
Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- This air conditioner shall be installed in accordance with National Wiring Regulations.
- Pay close attention to all warning and caution notices given in this manual.

WARNING This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

CAUTION This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

SPECIAL PRECAUTIONS

WARNING **When Wiring**

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidental injury or death**.
- **Ground the unit** following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause over-heating at connection points and a possible fire hazard.
- To prevent possible hazards from insulation failure, the unit must be grounded.

- This equipment is strongly recommended to be installed with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case of equipment breakdown or insulation breakdown.

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When Installing…

Select an installation location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.

…In a Room

Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

CAUTION Keep the fire alarm and the air outlet at least 5 feet (1.5 m) away from the unit.

…In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

…In an Area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

…In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

When Connecting Refrigerant Tubing

- Pay particular attention to refrigerant leakages.
- Ventilate the room immediately, in the event that is refrigerant gas leaks during the installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of toxic gas.
- Keep all tubing runs as short as possible.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

WARNING

- When performing piping work, do not mix air except for specified refrigerant (R410A) in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigerant cycle.
- If the refrigerant comes in contact with a flame, it produces a toxic gas.
- Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury, etc.

- Do not leak refrigerant while piping work for an installation or re-installation, and while repairing refrigeration parts.
  Handle liquid refrigerant carefully as it may cause frostbite.

When Servicing

- Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit.

WARNING

- This product must not be modified or disassembled under any circumstances. Modified or disassembled unit may cause fire, electric shock or injury.
- Do not clean inside the indoor and outdoor units by users. Engage authorized dealer or specialist for cleaning.
- In case of malfunction of this appliance, do not repair by yourself. Contact to the sales dealer or service dealer for a repair.

CAUTION

- Do not touch the air inlet or the sharp aluminum fins of the outdoor unit. You may get injured.
- Ventilate any enclosed areas when installing or testing the refrigeration system. Leaked refrigerant gas, on contact with fire or heat, can produce dangerously toxic gas.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of toxic gas.

Others

CAUTION

- Do not sit or step on the unit, you may fall down accidentally.
- Do not touch the air inlet or the sharp aluminum fins of the outdoor unit.
  You may get injured.
- Do not stick any object into the FAN CASE.
  You may be injured and the unit may be damaged.

Check of Density 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 density 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 imposed to protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its density should rise excessively. Suffocation from leakage of refrigerant is almost non-existent. With the recent increase in the number of high density 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 to conventional individual air conditioners.

If a single unit of the multi air 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 density does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

ASHRAE and the International Mechanical Code of the ICC as well as CSA provide guidance and define safeguards related to the use of refrigerants, all of which define a Refrigerant Concentration Level (RCL) of 25 pounds (11.3 kg) per 1,000 cubic feet (28.3 m^3) for R410A refrigerant.

For additional guidance and precautions related to refrigerant safety, please refer to the following documents:

International Mechanical Code 2012 (IMC-2012)
(or more recently revised)
ASHRAE 15
ASHRAE 34

CONTENTS

1. GENERAL

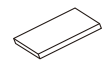
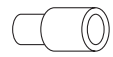
This booklet briefly outlines where and how to install the air conditioning system. Please read over the entire set of instructions for the indoor and outdoor units and make sure all accessory parts listed are with the system before beginning.

1-1. Tools Required for Installation (not supplied)

1. Flathead screwdriver
2. Phillips head screwdriver
3. Knife or wire stripper
4. Tape measure
5. Carpenter's level
6. Sabre saw or keyhole saw
7. Hacksaw
8. Core bits
9. Hammer
10. Drill
11. Tube cutter
12. Tube flaring tool
13. Torque wrench
14. Adjustable wrench
15. Reamer (for deburring)

1-2. Accessories Supplied with Unit

Table 1-1 (Wall Mounted)

Part Name	Figure	Q'ty	Remarks
Tapping screw		8	Truss-head Phillips 5/32" × 13/16" (4 × 20 mm)
Tapping screw		2	Truss-head Phillips 5/32" × 13/32" (4 × 10 mm)
Flare insulation		1	
Drain hose adapter		1	
Operating Instructions		1	
Installation Instructions		1	
Warranty card		1	

1-3.Type of Copper Tube and Insulation Material

If you wish to purchase these materials separately from a local source, you will need:

1. Deoxidized annealed copper tube for refrigerant tubing. Cut each tube to the appropriate lengths +11-13/16" (30 cm) to 15-6/8" (40 cm) to dampen vibration between units.
2. Foamed polyethylene insulation for copper tubes as required to precise length of tubing. Wall thickness of the insulation should be not less than 5/16" (8 mm).
3. Use insulated copper wire for field wiring. Wire size varies with the total length of wiring. See the section "**4. ELECTRICAL WIRING**" for details.

⚠ CAUTION

Check local electrical codes and regulations before obtaining wire. Also, check any specified instructions or limitations.

1-4. Additional Materials Required for Installation

1. Refrigeration (armored) tape
2. Insulated staples or clamps for connecting wire (See your local codes.)
3. Putty
4. Refrigeration tubing lubricant
5. Clamps or saddles to secure refrigerant tubing
6. Scale for weighing

2. SELECTING THE INSTALLATION SITE

2-1. Indoor Unit

AVOID:

- areas where leakage of flammable gas may be expected.
- places where large amounts of oil mist exist.
- direct sunlight.
- locations near heat sources which may affect the performance of the unit.
- locations where external air may enter the room directly. This may cause “condensation” on the air discharge ports, causing them to spray or drip water.
- locations where the remote controller will be splashed with water or affected by dampness or humidity.
- installing the remote controller behind curtains or furniture.
- locations where high-frequency emissions are generated.

DO:

- select an appropriate position from which every corner of the room can be uniformly cooled.
- select a location where the ceiling is strong enough to support the weight of the unit.

WARNING

- select a location which can support a load that is four times the indoor unit weight.
- select a location where tubing and drain pipe have the shortest run to the outdoor unit.
- allow room for operation and maintenance as well as unrestricted air flow around the unit.
- install the unit within the maximum elevation difference above or below the outdoor unit and within a total tubing length (L) from the outdoor unit as detailed in the Installation Instructions packed with the outdoor unit.
- allow room for mounting the remote controller about 3.3 ft. (1 m) off the floor, in an area that is not in direct sunlight or in the flow of cool air from the indoor unit.

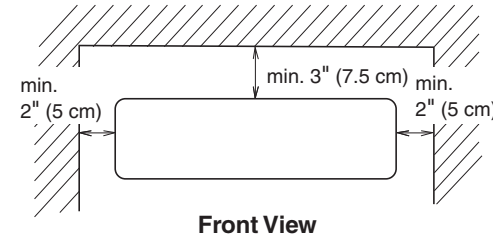
NOTE

Air delivery will be degraded if the distance from the floor to the ceiling is greater than 9.8 ft. (3 m).

Wall Mounted

The air inlet and outlet of the indoor unit must be free of any obstructions to allow air to spread throughout the room.

1. The indoor unit must be within a maintenance soace.



Front View

Fig. 2-1

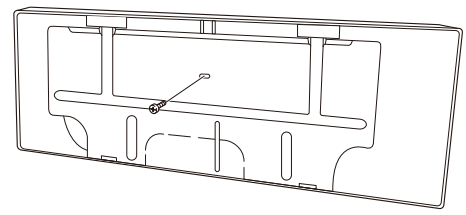
3. HOW TO INSTALL THE INDOOR UNIT

3-1. Remove the Rear Panel from the Unit

(1) Remove and discard the set screw on the rear panel. (Fig. 3-1)

(2) Press the 2 △ marks on the frame cover and disengage the stationary tabs from the frame. (Fig. 3-2)

(3) Remove the rear panel by grasping the sections shown in Fig. 3-3 and pulling it in the direction shown by the arrow.



Set screw only for transportation

Fig. 3-1

NOTE

Tubing can be extended in 6 directions as shown in Fig. 3-5. Select the direction you need providing the shortest run to the outside unit.

- When left tubing is to be done, switch the drain hose and drain cap. (For details, see the section “Switching drain hose and drain cap” on page 12.)

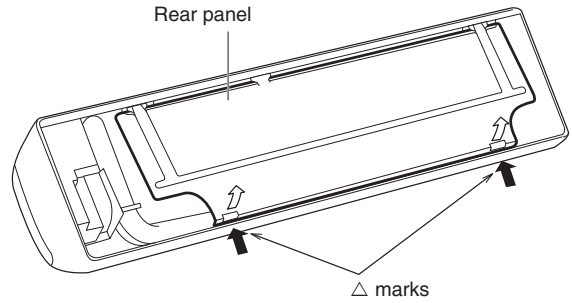


Fig. 3-2

3-2. Make a Hole

(1) Place the rear panel from the indoor unit on the wall at the location selected. Make sure the panel is horizontal, using a carpenter’s level or tape measure to measure down from the ceiling. Wait until after cutting the hole before attaching the rear panel to the wall.

(2) Determine which side of the unit you should make the hole for tubing and wiring. (Fig. 3-6)

NOTE

In the case of left-rear tubing, use the measurement points 158 mm from the marked position on the rear panel for precise placement of the hose outlet. (Fig. 3-6)

(3) Before making the hole, check carefully that no studs or pipes are directly run behind the spot to be cut.

CAUTION **Also avoid areas where electrical wiring or conduits are located.**

The above precautions are also applicable if tubing goes through the wall in any other location.

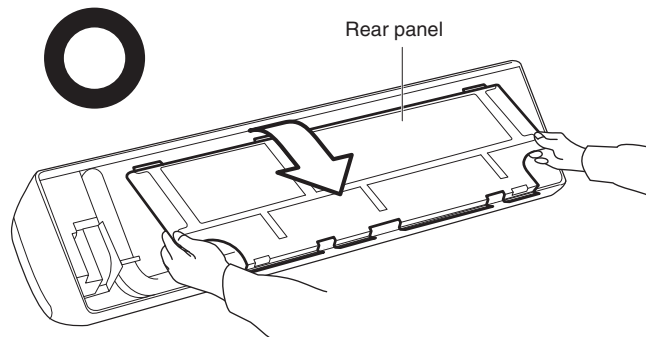
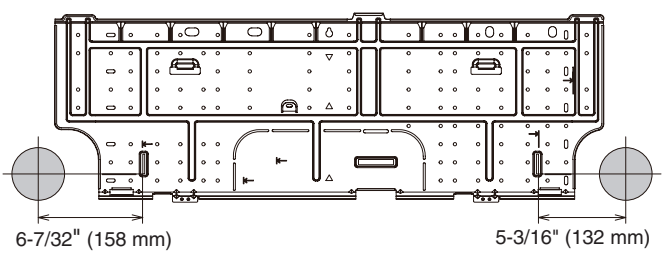


Fig. 3-3



Unit: inch (mm)

Fig. 3-6

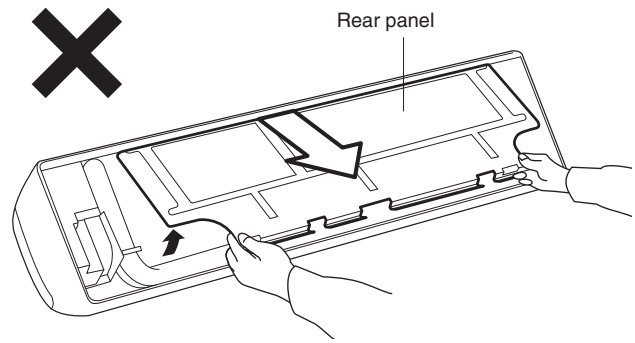


Fig. 3-4

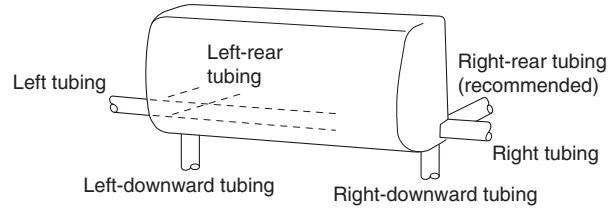


Fig. 3-5

(4) Using a sabre saw, keyhole saw or hole-cutting drill attachment, cut a hole in the wall. See Table 3-1 and Fig. 3-7.

Table 3-1

Hole Dia.
3-5/32" (80 mm)

(5) Measure the thickness of the wall from the inside edge to the outside edge and cut PVC pipe at a slight angle 1/4" (6 mm) shorter than the thickness of the wall. (Fig. 3-8)

(6) Place the plastic cover over the end of the pipe (for indoor side only) and insert the pipe in the wall. (Fig. 3-9)

3-3. Install the Rear Panel on the Wall

Be sure to confirm that the wall is strong enough to suspend the unit.

There are a number of screw holes on the rear panel.

Using the 8 screw holes with ⇦ mark is recommended to attach the rear panel securely to the wall.

NOTE

Be sure to install the unit within the range of the wall.

If Wooden Wall

(1) Attach the rear panel to the wall with the 8 screws provided. (Fig. 3-10)

If you are not able to line up the holes in the rear panel with the beam locations marked on the wall, use rawl plugs or toggle bolts to go through the holes on the panel or drill 3/16" (5 mm) dia. holes in the panel over the stud locations and then mount the rear panel.

(2) Double check with a carpenter's level or tape measure that the panel is level. This is important to install the unit properly. (Fig. 3-11)

(3) Make sure the panel is flush against the wall. Any space between the wall and unit will cause noise and vibration.

NOTE

Hole should be made at a slight downward slant to the outdoor side.

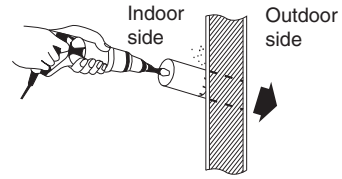


Fig. 3-7

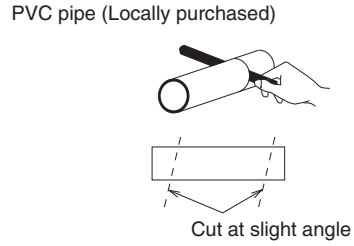


Fig. 3-8

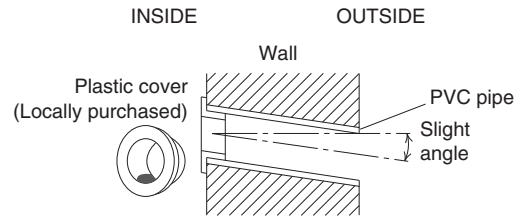


Fig. 3-9

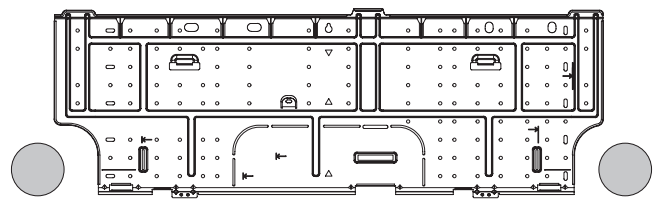


Fig. 3-10

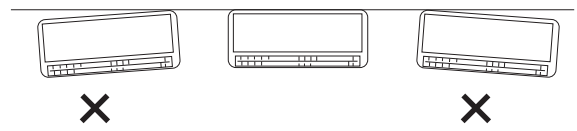


Fig. 3-11

3-4. Removing and Installing the Grille

Basically, these models can be installed and wired without removing the grille. If access to any internal part is needed, follow the steps as given below.

How to remove the grille

(1) Open the front panel until it is nearly horizontal, grasp the sections near the front panel arms on both sides, and then remove the panel by pushing the arms towards the outside while pulling the panel towards you.
If the front panel is difficult to remove, grasp both ends of it and lift it up slightly. Move it to the left and disengage the left arm, then move it to the right and disengage the right arm. (Fig. 3-12)

(2) Lift the anti-mold filter up slightly to disengage it from the protrusions on the unit, and then pull downward to remove the filter from the unit. (Fig. 3-12)

(3) Remove the 3 screws from the front of the unit and remove the screw covers on the bottom surface. Then remove the 2 screws. (Fig. 3-13)

(4) Remove the screw on the right side cover plate and remove the cover. (Fig. 3-13)

(5) Remove the lower flap by disengaging 4 pins of the lower flap in order. (Figs. 3-14 and 3-15)
(The flap is so flexible that it can be easily removed.)

(6) Lift up the grille in the direction shown by the arrow and pull the grille towards you to remove it. (Fig. 3-16)

How to replace the grille

(1) While aligning the top edge of the grille with the frame, move the grille horizontally and insert the top and bottom into the frame.

(2) Press the grille firmly with your hand to ensure no gap exists between the frame and grille.

(3) Tighten the 6 screws. And fix the removed covers in place.

(4) Grasp the sections near the front panel arms on both sides, and hold the front panel so that it is nearly horizontal. Push the arm shafts towards the outside so that they come into contact with the top of the indentations on the right and left sides of the air conditioner. Then push firmly until the arm shafts click into place. (Fig. 3-17)

(5) Remount the lower flap.
(In remounting the flap, it cannot be turned end for end because the right and left pins of the flap differ in form. (Fig. 3-15))

(6) Insert the top of the anti-mold filter, and then secure the bottom of the filter with the protrusions on the unit.

(7) When closing the front panel, push the central part of the front panel first and then press the bottom right and left corners in place until you feel a click. (Fig. 3-18)

NOTE

Check that no gap exists between the frame and the grille.

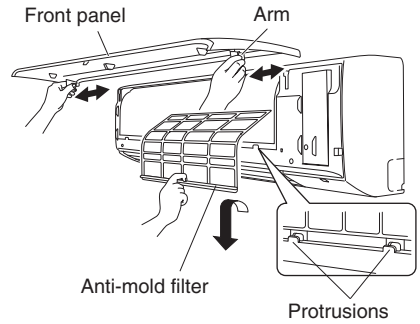


Fig. 3-12

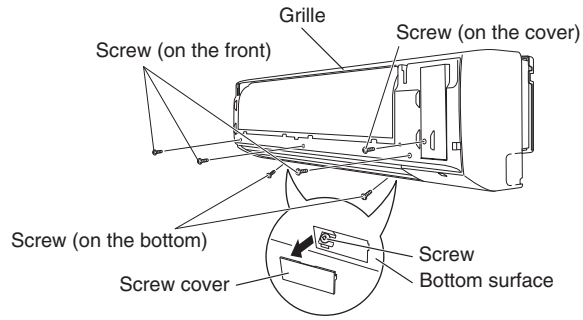


Fig. 3-13

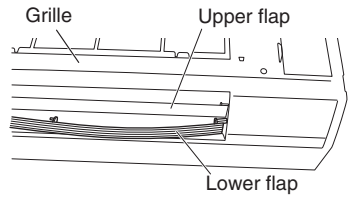


Fig. 3-14

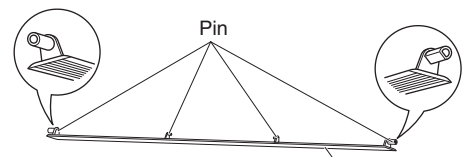


Fig. 3-15

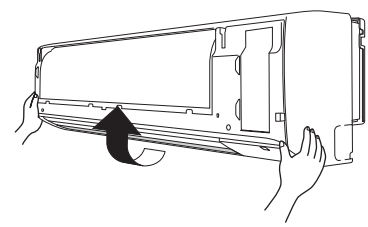


Fig. 3-16

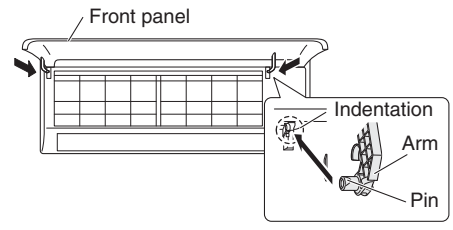


Fig. 3-17

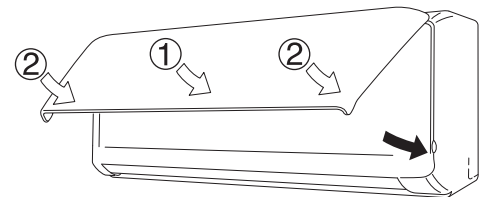


Fig. 3-18

3-5. Shape the Indoor Side Tubing

(1) Arrangement of tubing by direction

a) Right or left tubing

Cut out the corner of the right/left frame with a hacksaw or the like. (Figs. 3-19 and 3-20)

b) Right-rear or left-rear tubing

In this case, the corner of the frame need not be cut.

(2) To mount the indoor unit on the rear panel:

Hang the 3 mounting slots of the unit on the upper tabs of the rear panel. (Fig. 3-21)

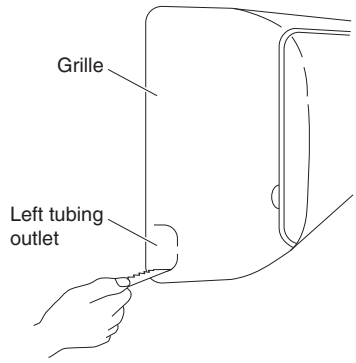


Fig. 3-19

3-6. Wiring Instructions

General precautions on wiring

(1) Before wiring, confirm the rated voltage of the unit as shown on its nameplate, then carry out the wiring closely following the wiring diagram.

(2) Provide a power outlet to be used exclusively for each unit, with a power supply disconnect and circuit breaker for overcurrent protection provided in the exclusive line.

(3) To prevent possible hazards due to insulation failure, the unit must be grounded.

(4) Each wiring connection must be done tightly and in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.

(5) Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.

(6) Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.

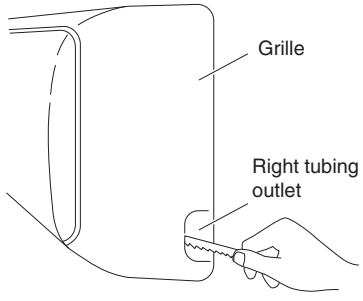


Fig. 3-20

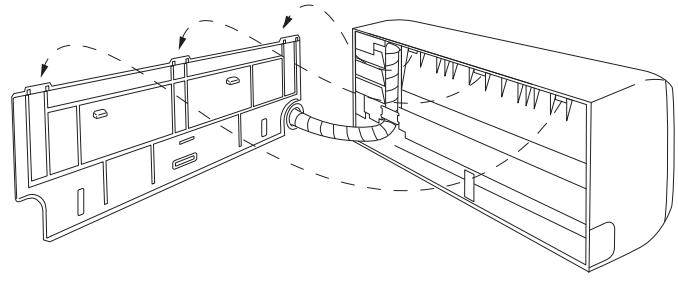


Fig. 3-21

3-7. Mounting

(1) To install the indoor unit, mount the indoor unit onto the 3 tabs on the upper part of the rear plate.

(2) Hold down the air discharge outlet and press the lower part of the indoor unit until it clicks to securely fasten to the 2 tabs on the lower part of the rear plate. (Fig. 3-22)

NOTE

For tubing, choose either the right or left tubing direction and follow the steps below. Also, extend the support on the back of the indoor unit as a stand to make your work easier. (Fig. 3-23)

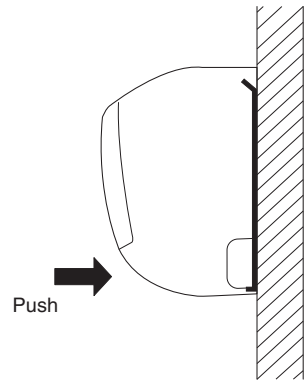


Fig. 3-22

■ Right-side tubing

(1) Shape the refrigerant tubing so that it can easily go into the wall hole. (Fig. 3-24)

(2) Push the wiring, refrigerant tubing, and drain hose through the hole in the wall. Adjust the indoor unit so it is securely seated on the rear panel. (Fig. 3-25)

(3) Carefully bend the tubing (if necessary) to run along the wall in the direction of the outdoor unit and then tape as far as the fittings. The drain hose should come straight down the wall to a point where water runoff won't stain the wall.

(4) Connect the refrigerant tubing to the outdoor unit. (After performing a leak test on the connecting part, insulate it with the tubing insulation. (Fig. 3-26)).

(5) Assemble the refrigerant tubing, drain hose, and conduit (including inter-unit wiring) as shown in Fig. 3-27.

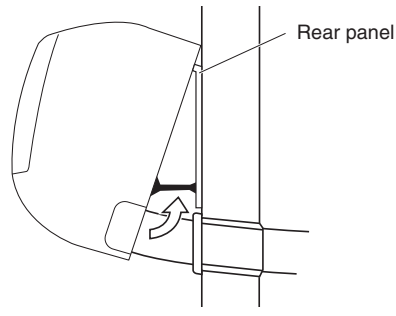


Fig. 3-23

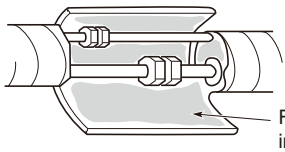


Fig. 3-26

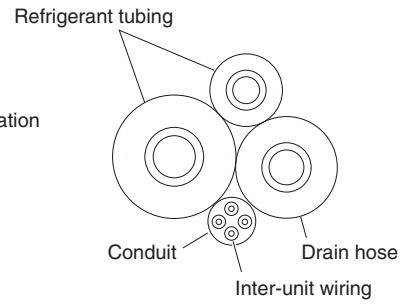


Fig. 3-27

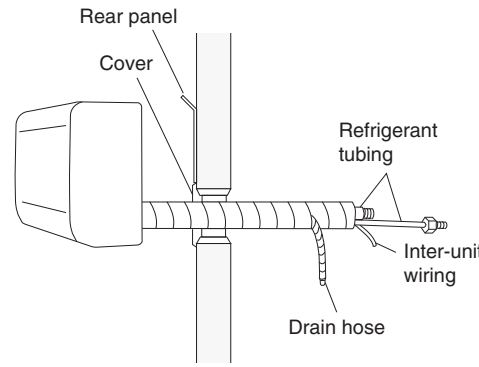


Fig. 3-24

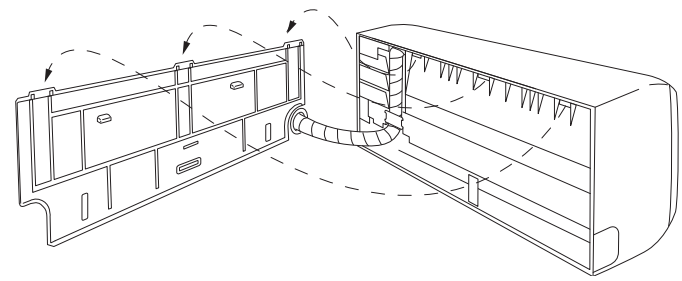


Fig. 3-25

■ Left-side tubing

(1) Lead the tubing and drain hose through the wall, allowing sufficient length for connection. Then bend the tubing using a tube bender to make the attachment. (Fig. 3-28)

(2) Switch the drain hose and drain cap.

Switching drain hose and drain cap

(a) Locate the drain hose and the drain cap. (Fig. 3-29)

(b) Remove the screw fastening the drain hose on the right side, and pull out the drain hose to remove it. (Fig. 3-29)

(c) Apply moderate force to pull off the drain cap on the left side. (If you cannot pull it off by hand, use a long-nose pliers.)

(d) Reattach the drain hose to the left side and the drain cap to the right side. (Fig. 3-30)

Drain hose

Slide the drain hose fully onto the drain pan outlet. (It will be easy to slide when water is added.) Check that the screw holes in the drain bracket and the drain pan outlet are aligned and securely in contact, then fasten them with the screw. (After attaching the drain hose, check that it is attached securely.) (Fig. 3-31)

Drain cap

Use a Phillips head screwdriver to push the drain cap in firmly. (If it is difficult to push in, wet the cap with water first.)

(3) Install the indoor unit on the rear panel.

(4) Connect the tubing and wiring led inside from outdoors.

(5) After completing a leak test, bundle the tubing together with armoring tape and store it inside the tubing storage area at the back of the indoor unit and hold it with clamps. (Figs. 3-30 and 3-32)

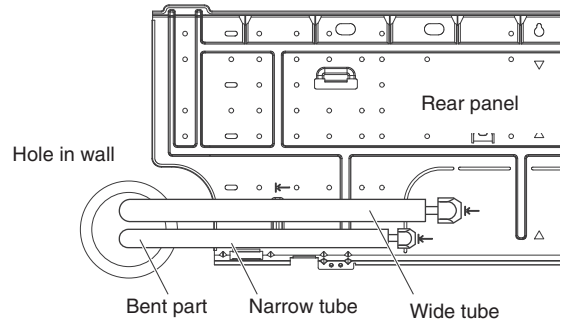


Fig. 3-28

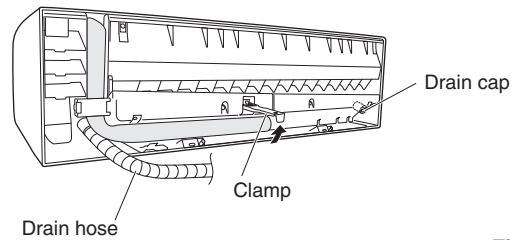


Fig. 3-29

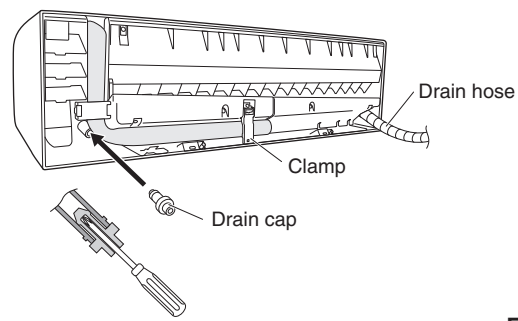


Fig. 3-30

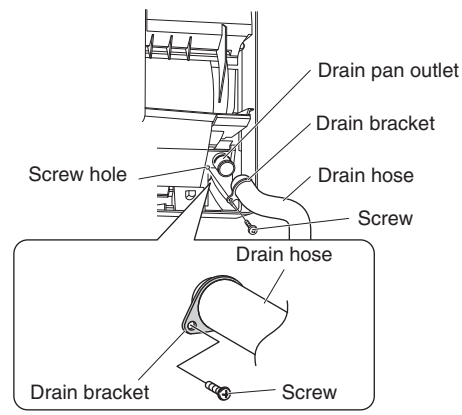


Fig. 3-31

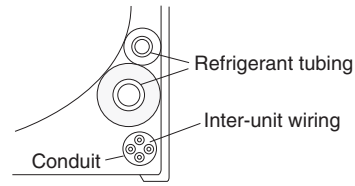


Fig. 3-32

To unmount indoor unit

(1) Remove the screw cover on the bottom surface. (Fig. 3-33)

(2) Fasten the frame to the rear panel using the 2 supplied tapping screws 5/32 × 13/32" (4 × 10 mm). (Fig. 3-33)

(3) Press the 2 △ marks on the lower part of the indoor unit and unlatch the tabs. Then lift the indoor unit and unmount. (Fig. 3-34)

NOTE

Under normal conditions, the installation design calls for a less than 2 mm gap between the air conditioner unit and the wall.
Confirm that the gap is appropriate (less than 5/64" (2 mm)).

3-8. Drain Hose

a) The drain hose should be slanted downward to the outdoors. (Fig. 3-35)

b) Never form a trap in the course of the hose.

c) If the drain hose will run in the room, insulate the hose with insulation* so that chilled condensation will not damage furniture or floors. (Fig. 3-36)

*Foamed polyethylene or its equivalent is recommended.

WARNING **Do not supply power to the unit or operate it until all tubing and wiring to the outside unit are completed.**

Risk of Electric Shock

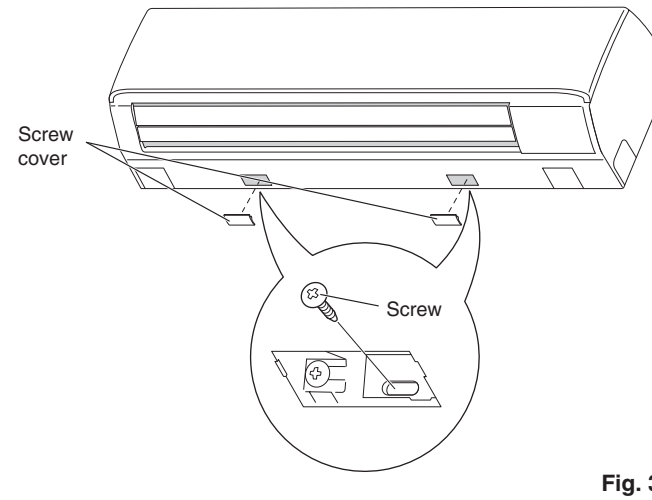


Fig. 3-33

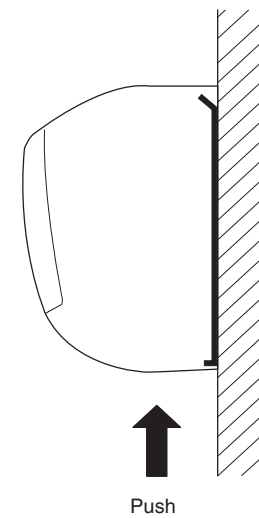


Fig. 3-34

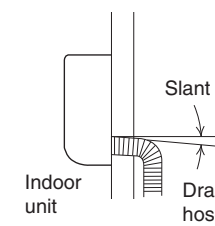


Fig. 3-35

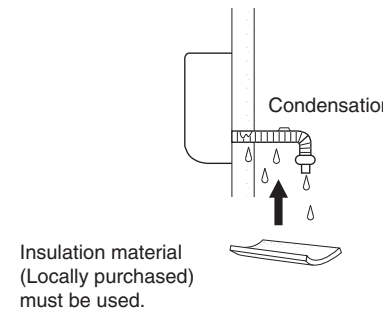


Fig. 3-36

4. ELECTRICAL WIRING

4-1. General Precautions on Wiring

(1) Before wiring, confirm the rated voltage of the unit as shown on its nameplate, then carry out the wiring closely following the wiring diagram.

WARNING

(2) This equipment is strongly recommended to be installed with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case of equipment breakdown or insulation breakdown.
Earth Leakage Circuit Breaker (ELCB) must be incorporated in the fixed wiring in accordance with the wiring regulations. The Earth Leakage Circuit Breaker (ELCB) must be an approved 15 A, having a contact separation in all poles.

(3) To prevent possible hazards from insulation failure, the unit must be grounded.

(4) Each wiring connection must be done in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.

(5) Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.

(6) Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.

(7) Regulations on wire diameters differ from locality to locality. For field wiring rules, please refer to your LOCAL ELECTRICAL CODES before beginning.
You must ensure that installation complies with all relevant rules and regulations.

(8) To prevent malfunction of the air conditioner caused by electrical noise, care must be taken when wiring as follows:

- The remote control wiring and the inter-unit control wiring should be wired apart from the inter-unit power wiring.
- Use shielded wires for inter-unit control wiring between units and ground the shield on single side.

(9) If the power supply cord of this appliance is damaged, it must be replaced by a repair shop designated by the manufacturer, because special-purpose tools are required.

4-2. Recommended Wire Length and Wire Diameter for Power Supply System

Indoor unit

Type	Time delay fuse or circuit capacity
K2	15 A

Control wiring

(A) Inter-unit control wiring (between outdoor and indoor units)	(B) Remote control wiring	(C) Control wiring for group control
AWG #18 ($0.75\ mm^2$) **Use shielded wiring***	AWG #18 ($0.75\ mm^2$) **Use shielded wiring***	AWG #18 ($0.75\ mm^2$) **Use shielded wiring***
Max. 3,280 ft. (Max. 1,000 m)	Max. 1,640 ft. (Max. 500 m)	Max. 650 ft. (Total) (Max. 200 m (Total))

NOTE

* With ring-type wire terminal.

4-3. Wiring System Diagrams

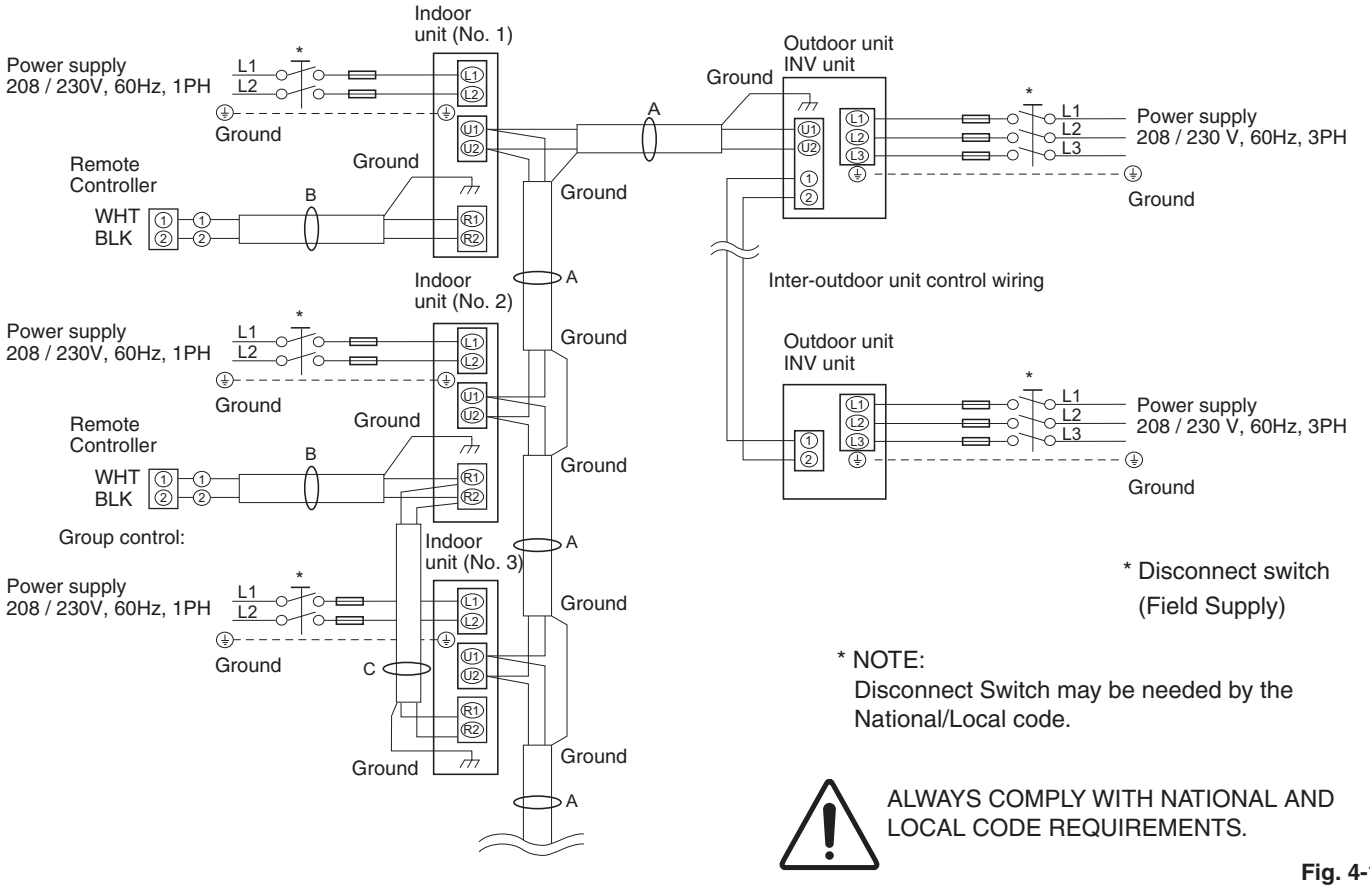


Fig. 4-1

NOTE

(1) See the section “4-2. Recommended Wire Length and Wire Diameter for Power Supply System” for the explanation of “A”, “B” and “C” in the above diagram.

(2) The basic connection diagram of the indoor unit shows the terminal board, so the terminal boards in your equipment may differ from the diagram.

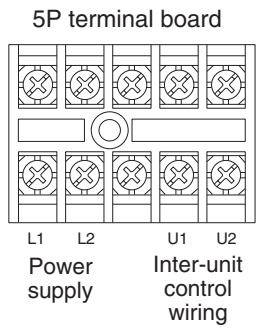
(3) Refrigerant Circuit (R.C.) address should be set before turning the power on.

(4) Regarding R.C. address setting, refer to the installation instructions supplied with the remote controller (optional). Auto address setting can be executed by remote controller automatically. Refer to the installation instructions supplied with the remote controller (optional).

(5) Ensure that the ground shield cable for inter-unit control wiring between outdoor and indoor units should be connected to the outdoor unit.

(6) For the inter-unit control wiring between the indoor units, be sure to connect between the shield.
Then connect it to the shield of inter-unit control wiring between outdoor and indoor units.

(7) Ensure that the ground shield cable for a remote controller should be connected only to the indoor unit.



Type K2

Fig. 4-2

CAUTION

(1) When linking outdoor units in a network, disconnect the terminal extended from the short plug (on the outdoor main control PCB) from all outdoor units except any one of the outdoor units.
(When shipping: In shorted condition.)
For a system without link (no connection wiring between outdoor units), do not remove the short plug.

(2) Do not install the inter-unit control wiring in a way that forms a loop. (Fig. 4-3)

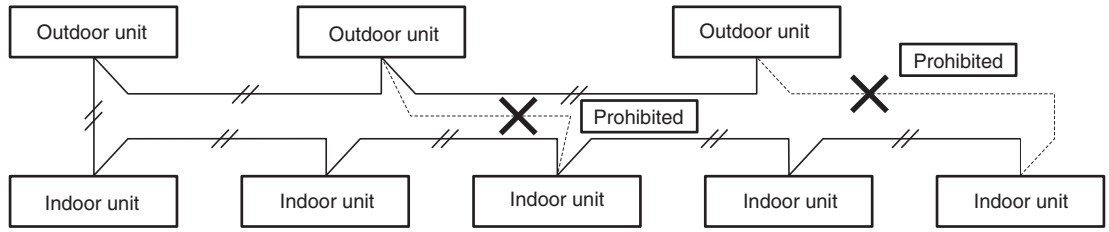


Fig. 4-3

(3) Do not install the inter-unit control wiring such as star branch wiring. Star branch wiring causes misaddress setting. (Fig. 4-4)

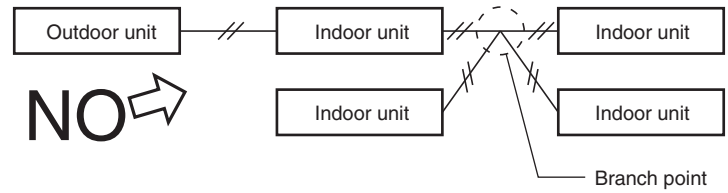


Fig. 4-4

(4) If branching the inter-unit control wiring, the number of branch points should be 16 or fewer.

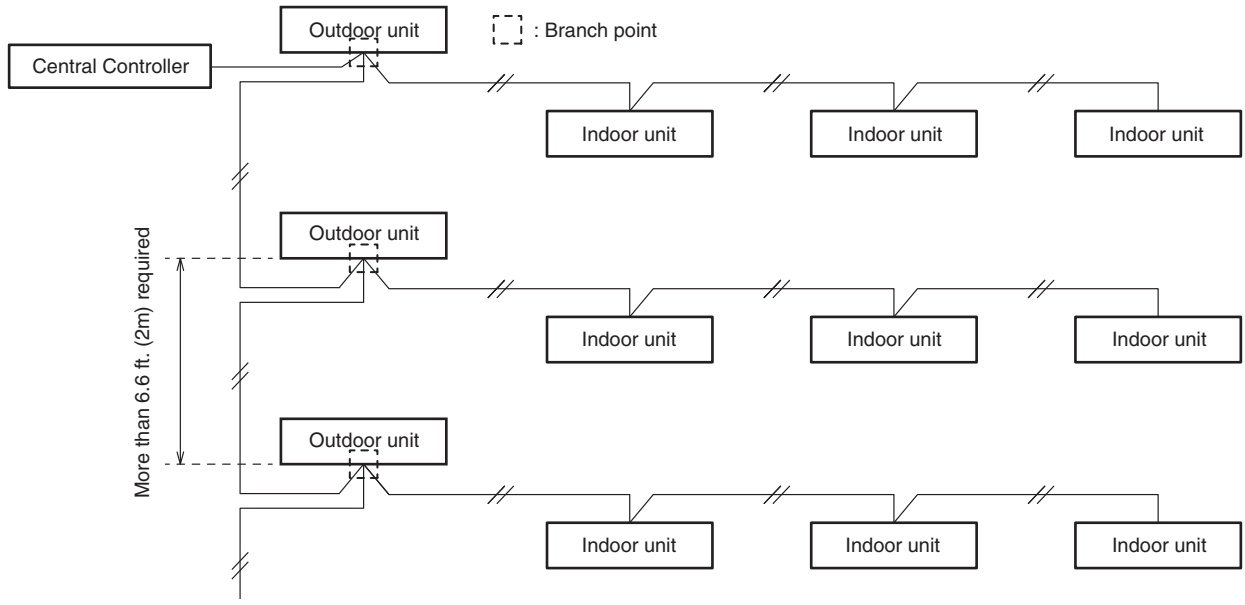


Fig. 4-5

CAUTION

Loose wiring may cause the terminal to overheat or result in unit malfunction.
A fire hazard may also occur.
Therefore, ensure that all wiring is tightly connected.

When connecting each power wire to the terminal, follow the instructions on “How to connect wiring to the terminal” and fasten the wire securely with the fixing screw of the terminal board.

How to connect wiring to the terminal

■ For stranded wiring

(1) Cut the wire end with cutting pliers, then strip the insulation to expose the stranded wiring approx. 3/8” (10 mm) and tightly twist the wire ends. (Fig. 4-6)
(2) Using a Phillips head screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using a ring connector fastener or pliers, securely clamp each stripped wire end with a ring pressure terminal.
(4) Place the ring pressure terminal, and replace and tighten the removed terminal screw using a screwdriver. (Fig. 4-7)
(5) Confirm the “Checkpoint” under the section “7.PRECAUTIONS ON TEST RUN” after installation of indoor and outdoor units, panels and electrical wiring.

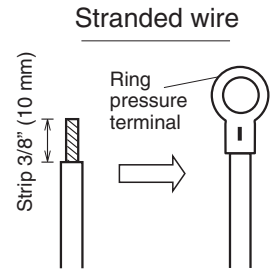


Fig. 4-6

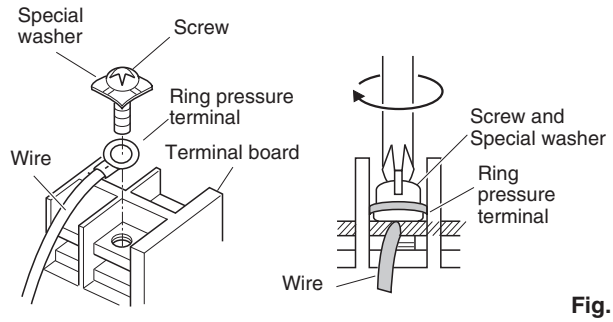
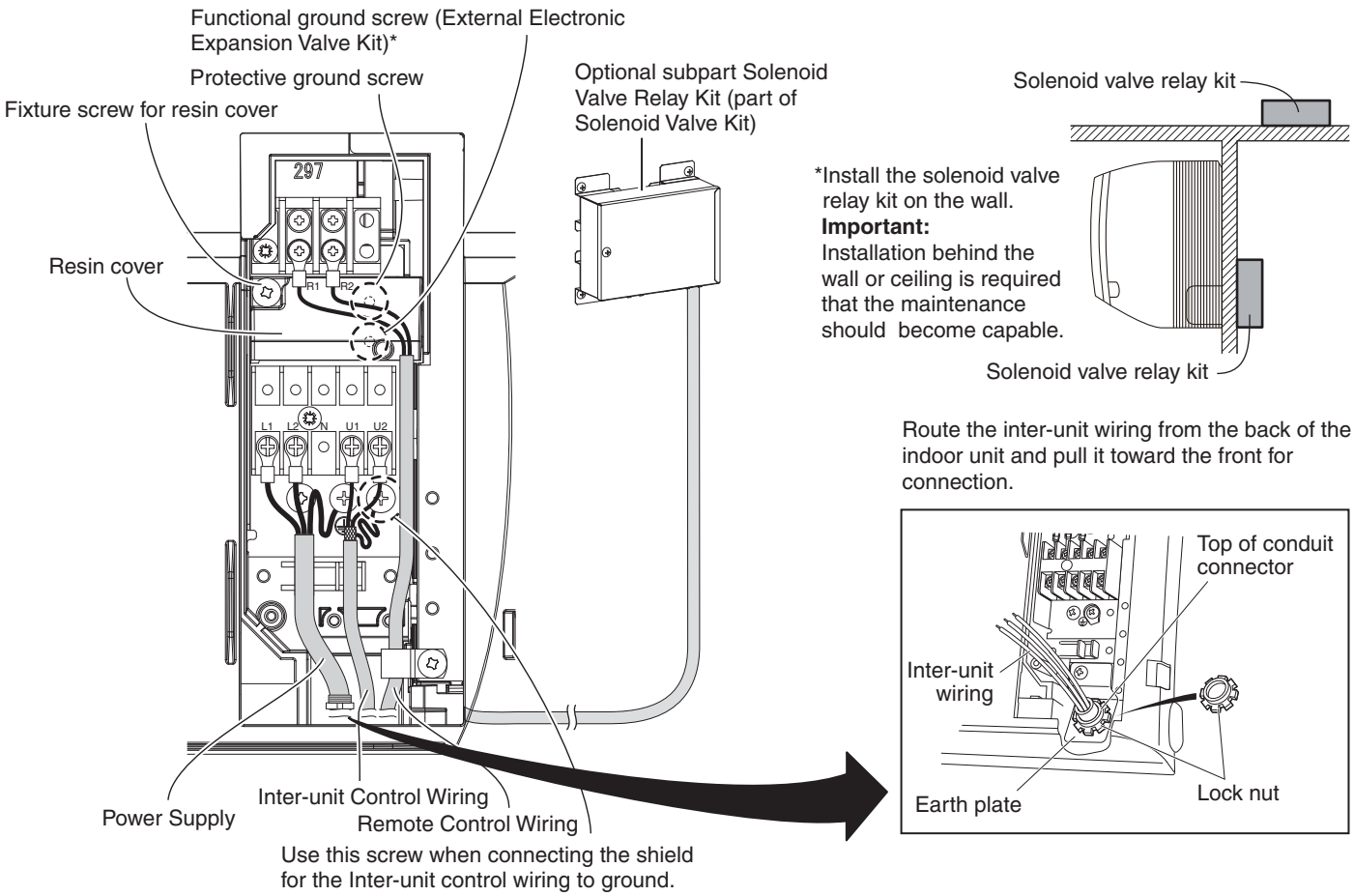


Fig. 4-7

■ Wiring sample

Type K2



* As to functional ground screw and protective ground screw, remove the fixture screw and resin cover. Then, carry out earth ground work.

5. HOW TO PROCESS TUBING

The liquid tubing side is connected by a flare nut, and the gas tubing side is connected by brazing.

5-1. Connecting the Refrigerant Tubing

Use of the Flaring Method

Many of conventional split system air conditioners employ the flaring method to connect refrigerant tubes which run between indoor and outdoor units. In this method, the copper tubes are flared at each end and connected with flare nuts.

Flaring Procedure with a Flare Tool

(1) Cut the copper tube to the required length with a tube cutter. It is recommended to cut approx. 1 – 2 ft. (30 - 50 cm) longer than the tubing length you estimate.
(2) Remove burrs at the end of the copper tube with a tube reamer or a similar tool. This process is important and should be done carefully to make a good flare. (Fig. 5-1)

NOTE

When reaming, hold the tube end downward and be sure that no copper scraps fall into the tube. (Fig. 5-2)

(3) Remove the flare nut from the unit and be sure to mount it on the copper tube.
(4) Make a flare at the end of the copper tube with a flare tool. (Fig. 5-3)

NOTE

A good flare should have the following characteristics:

- inside surface is glossy and smooth
- edge is smooth
- tapered sides are of uniform length

Caution Before Connecting Tubes Tightly

(1) Apply a sealing cap or water-proof tape to prevent dust or water from entering the tubes before they are used.
(2) Be sure to apply refrigerant lubricant to the matching surfaces of the flare and union before connecting them together. This is effective for reducing gas leaks. (Fig. 5-4)
(3) For proper connection, align the union tube and flare tube straight with each other, then screw in the flare nut lightly at first to obtain a smooth match. (Fig. 5-5)

- Adjust the shape of the liquid tube using a tube bender at the installation site and connect it to the liquid tubing side valve using a flare.

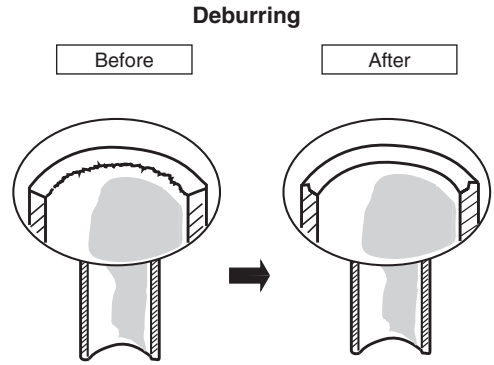


Fig. 5-1

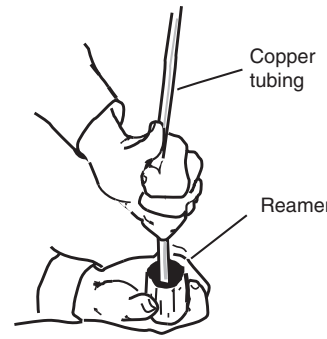


Fig. 5-2

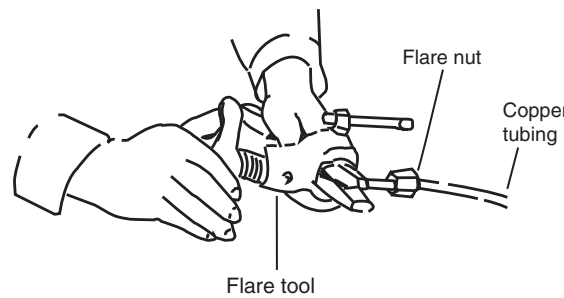


Fig. 5-3

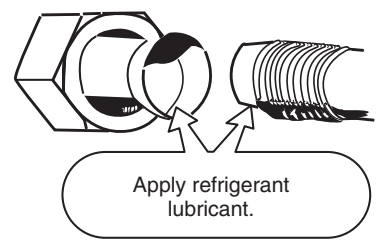


Fig. 5-4

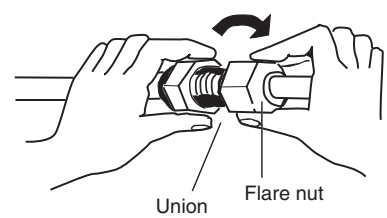


Fig. 5-5

Cautions During Brazing

- **Replace air inside the tube with nitrogen gas to prevent copper oxide film from forming during the brazing process. (Oxygen, carbon dioxide and Freon are not acceptable.)**
- **Do not allow the tubing to get too hot during brazing. The nitrogen gas inside the tubing may overheat, causing refrigerant system valves to become damaged. Therefore allow the tubing to cool when brazing.**
- **Use a reducing valve for the nitrogen cylinder.**
- **Do not use agents intended to prevent the formation of oxide film. These agents adversely affect the refrigerant and refrigerant oil, and may cause damage or malfunctions.**

5-2. Connecting Tubing Between Indoor and Outdoor Units

(1) Tightly connect the indoor-side refrigerant tubing extended from the wall with the outdoor-side tubing.

Indoor Unit Tubing Connection (ℓ_1, ℓ_2...ℓ_{n-1})

Indoor unit type		18	24
Gas tubing	inch	ø1/2	ø5/8
	mm	ø12.7	ø15.88
Liquid tubing	inch	ø1/4	ø3/8
	mm	ø6.35	ø9.52

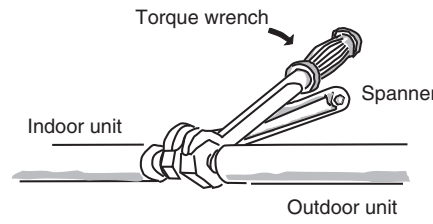


Fig. 5-6

(2) To fasten the flare nuts, apply specified torque as at right:

- When removing the flare nuts from the tubing connections, or when tightening them after connecting the tubing, be sure to use a torque wrench and a spanner. (Fig. 5-6)
  If the flare nuts are over-tightened, the flare may be damaged, which could result in refrigerant leakage and cause injury or asphyxiation to room occupants.

- For the flare nuts at tubing connections, be sure to use the flare nuts that were supplied with the unit, or else flare nuts for R410A (type 2). The refrigerant tubing that is used must be of the correct wall thickness as shown in the table at right.

  Because the pressure is approximately 1.6 times higher than conventional refrigerant pressure, the use of ordinary flare nuts (type 1) or thin-walled tubes may result in tube rupture, injury, or asphyxiation caused by refrigerant leakage.

Tube diameter		Tightening torque approximate	Tube thickness
ø1/4" (ø6.35 mm)	lbf·inch	120 – 160 lbf·inch	1/32”
	N·m	14 – 18 N·m	0.8 mm
	{kgf·cm}	{140 – 180 kgf·cm}	
ø3/8” (ø9.52 mm)	lbf·inch	300 – 360 lbf·inch	1/32”
	N·m	34 – 42 N·m	0.8 mm
	{kgf·cm}	{340 – 420 kgf·cm}	
ø1/2” (ø12.7 mm)	lbf·inch	430 – 540 lbf·inch	1/32”
	N·m	49 – 61 N·m	0.8 mm
	{kgf·cm}	{490 – 610 kgf·cm}	
ø5/8” (ø15.88 mm)	lbf·inch	590 – 710 lbf·inch	5/128”
	N·m	68 – 82 N·m	1.0 mm
	{kgf·cm}	{680 – 820 kgf·cm}	

- In order to prevent damage to the flare caused by over-tightening of the flare nuts, use the table above as a guide when tightening.
- When tightening the flare nut on the liquid tube, use an adjustable wrench with a nominal handle length of 7-7/8 in. (200 mm).

5-3. Insulating the Refrigerant Tubing

Tubing Insulation

- Thermal insulation must be applied to all units tubing, including distribution joint (field supply).
  * For gas tubing, the insulation material must be heat resistant to 248°F (120°C) or above. For other tubing, it must be heat resistant to 176°F (80°C) or above.

  Insulation material thickness must be 13/32” (10 mm) or greater.
  If the conditions inside the ceiling exceed DB 86°F (30°C) and RH 70%, increase the thickness of the gas tubing insulation material with one grade higher.

Two tubes arranged together

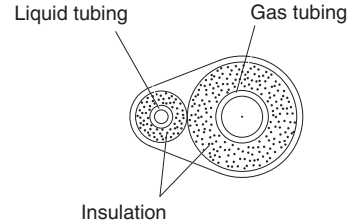


Fig. 5-7

WARNING **If the exterior of the outdoor unit valves has been finished with a square duct covering, make sure you allow sufficient space to access the valves and to allow the panels to be attached and removed.**

Taping the flare nuts

Wind the white insulation tape around the flare nuts at the gas tube connections. Then cover up the tubing connections with the flare insulator, and fill the gap at the union with the supplied black insulation tape. Finally, fasten the insulator at both ends with the supplied vinyl clamps. (Fig. 5-8)

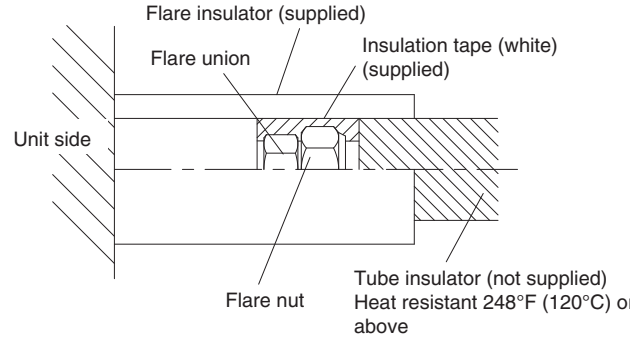


Fig. 5-8

Insulation material

The material used for insulation must have good insulation characteristics, be easy to use, be age resistant, and must not easily absorb moisture.

WARNING **After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.**
Never grasp the drain or refrigerant connecting outlets when moving the unit.

5-4. Taping the Tubes

(1) At this time, the refrigerant tubes (and electrical wiring if local codes permit) should be taped together with armoring tape in 1 bundle. To prevent condensation from overflowing the drain pan, keep the drain hose separate from the refrigerant tubing.
(2) Wrap the armoring tape from the bottom of the outdoor unit to the top of the tubing where it enters the wall. As you wrap the tubing, overlap half of each previous tape turn.
(3) Clamp the tubing bundle to the wall, using 1 clamp approx. each meter. (Fig. 5-9)

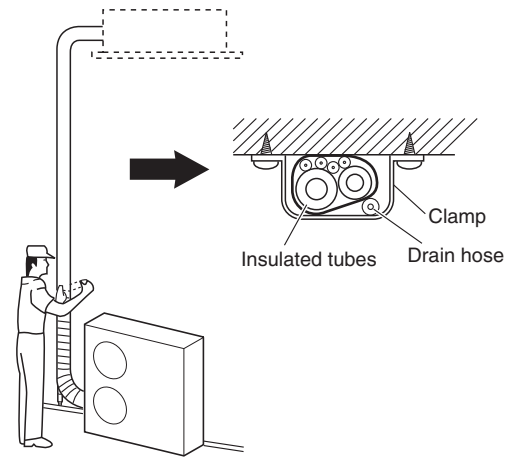


Fig. 5-9

NOTE

Do not wind the armoring tape too tightly since this will decrease the heat insulation effect. Also ensure that the condensation drain hose splits away from the bundle and drips clear of the unit and the tubing.

5-5. Finishing the Installation

After finishing insulating and taping over the tubing, use sealing putty to seal off the hole in the wall to prevent rain and draft from entering. (Fig. 5-10)

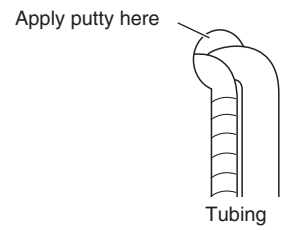


Fig. 5-10

Confirm the “Checkpoint” under the section “8. PRECAUTIONS ON TEST RUN” after installation of indoor and outdoor units, panels and electrical wiring.

6. HOW TO INSTALL TIMER REMOTE CONTROLLER OR HIGH-SPEC WIRED REMOTE CONTROLLER (OPTIONAL PART)

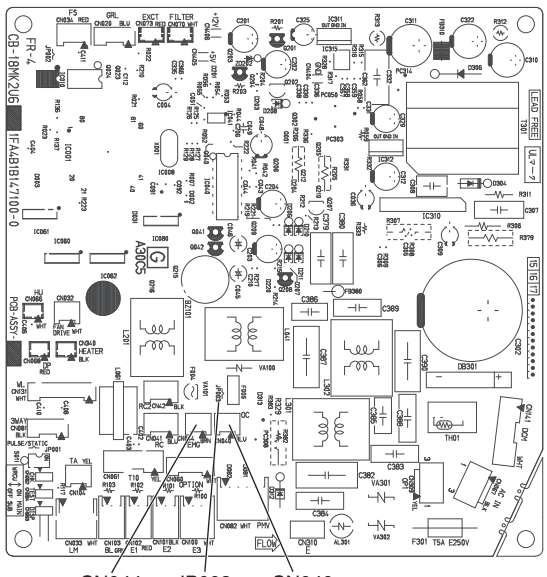
NOTE

Refer to the Operating Instructions attached to the optional

Timer Remote Controller or optional High-spec Wired Remote Controller.

7. PRECAUTIONS ON TEST RUN

- Request that the customer be present at the time the test run is performed. Explain the Operating Instructions to the customer and then have the customer actually operate the system.
- Be sure to pass the manual and warranty certificate to the customer.
- Verify that the AC 208 / 230 V wiring is not connected to the terminal plate which is used to connect the inter-unit control wiring.
  * If AC 208 / 230 V is accidentally applied to this terminal plate, the fuse (0.4A for both indoor and outdoor units) on the inter-unit control PCB will be tripped in order to protect the PCB. Correct the wiring connections, then disconnect the 2P connectors (blue, OC, CN040) which are connected to the PCB and connect the other 2P connectors (brown, EMG, CN044). (See the figure below.)
  If operation is still not possible with the brown connectors connected, cut the JP003.
  (Be sure to turn OFF the power before performing this work.)



■ Checkpoint

Checkpoint		Symptom	Check	Remark
1	Make sure whether indoor and outdoor units are correctly installed.	Fall, vibration, noise		
2	Make sure whether gas leakage is tested.	No cooling, no heating		
3	Make sure whether insulation is completed. (Refrigerant piping and drain piping)	Water leakage		
4	Make sure whether drain water is running smoothly.	Water leakage		
5	Make sure whether the power voltage matches the nameplate.	Inoperative, burnout		
6	Make sure whether there is miswiring or incorrect connection.	Inoperative, burnout		
7	Make sure whether the ground construction is completed.	Ground leakage		
8	Make sure whether the wire gauge is followed by the recommended specifications.	Inoperative, burnout		
9	Make sure whether the air intake and air outlet of the indoor and outdoor units are sealed by obstacles.	No cooling, no heating		

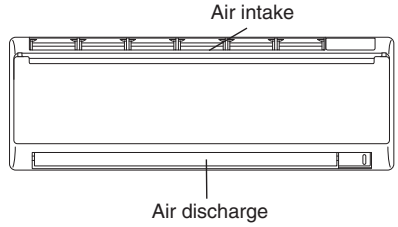
8. HOW TO INSTALL WIRELESS REMOTE CONTROLLER RECEIVER

NOTE

Refer to the Operating Instructions attached to the optional Wireless Remote Controller Receiver.

9. APPENDIX

■ Name of Parts



■ Care and Cleaning

⚠ WARNING

- **For safety, be sure to turn the air conditioner off and also to disconnect the power before cleaning.**
- **Do not pour water on the indoor unit to clean it. This will damage the internal components and cause an electric shock hazard.**

Air intake and discharge side (Indoor unit)

Clean the air intake and discharge side of the indoor unit with a vacuum cleaner brush, or wipe them with a clean, soft cloth.

If these parts are stained, use a clean cloth moistened with water. When cleaning the air discharge side, be careful not to force the vanes out of place.

⚠ CAUTION

- **Never use solvents or harsh chemicals when cleaning the indoor unit.**
  Do not wipe plastic parts using very hot water.
- **Some metal edges and the fins are sharp and may cause injury if handled improperly; be especially careful when you clean these parts.**
- **The internal coil and other components of outdoor unit must be cleaned regularly.**
  Consult your dealer or service center.

Air filter

The air filter collects dust and other particles from the air and should be cleaned at regular intervals as indicated in the table below or when the filter indication (▦) on the display of the remote controller (wired type) shows that the filter needs cleaning. If the filter gets blocked, the efficiency of the air conditioner drops greatly.

Type	K2
Period	2 weeks

NOTE

The frequency with which the filter should be cleaned depends on the environment in which the unit is used.

<How to clean the filter>

1. Remove the air filter from the air intake grille.
2. Use a vacuum cleaner to remove light dust. If there is sticky dust on the filter, wash the filter in lukewarm, soapy water, rinse it in clean water, and dry it.

<How to remove the filter>

Casing and Grille (Indoor Unit)

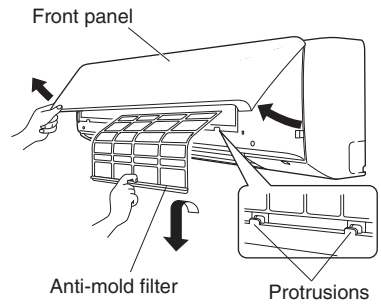
Clean the casing and grille of the indoor unit with a vacuum cleaner brush, or wipe them with a clean, soft cloth.
If these parts are stained, use a clean cloth moistened with a mild liquid detergent. When cleaning the grille, be careful not to force the vanes out of place.

Anti-Mold Filter

The anti-mold filter behind the front panel should be checked and cleaned at least once every two weeks.

How to remove the anti-mold filter

1. Grasp both ends of the front panel and pull forward and up to open the front panel.



2. Lift the anti-mold filter up slightly to disengage it from the protrusions on the unit.

3. Pull downward to remove the filter from the unit.

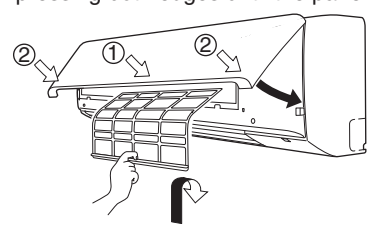
Cleaning

Use a vacuum cleaner to remove light dust. If there is sticky dust on the filter, wash the filter in lukewarm, soapy water, rinse it in clean water, and dry it.

How to replace the anti-mold filter

1. Insert the top of the anti-mold filter, and then secure the bottom of the filter with the protrusions on the unit.

2. Close the front panel by pushing the center of the front panel and then pressing both edges until the panel clicks into place.



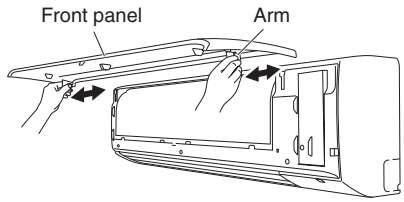
Cleaning the main unit and remote controller

- Wipe clean using a soft, dry cloth.
- To remove stubborn dirt, moisten a cloth in warm water no hotter than 104 °F (40 °C), wring thoroughly, and then wipe.
- The front panel can be removed in order to wash it with water.

Removing and remounting the front panel

Removing

Open the front panel until it is nearly horizontal, grasp the sections near the front panel arms on both sides, and then remove the panel by pushing the arms towards the outside while pulling the panel towards you.
If the front panel is difficult to remove, grasp both ends of it and lift it up slightly.
Move it to the left and disengage the left arm, then move it to the right and disengage the right arm.



⚠ CAUTION

- **Certain metal edges and the condenser fins are sharp and may cause injury if handled improperly; special care should be taken when you clean these parts.**
- **The internal coil and other components must also be cleaned periodically.**
  Consult your dealer or service center.

Care: After a prolonged idle period

Check the indoor and outdoor unit air intakes and outlets for blockage; if there is a blockage, remove it.

Care: Before a prolonged idle period

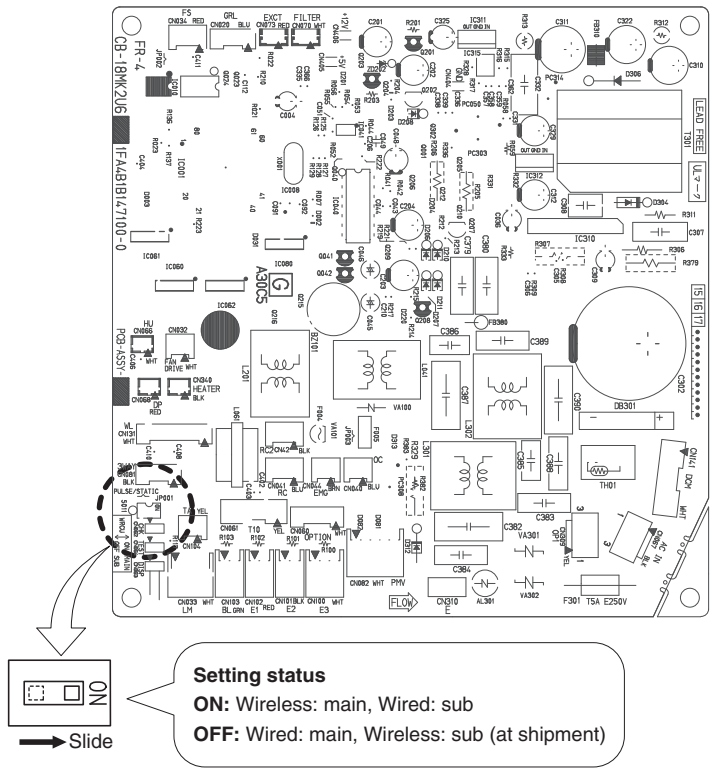
- Operate the fan for half a day to dry out the inside.
- Disconnect the power supply and also turn off the circuit breaker.
- Clean the air filter and replace it in its original position.
- Outdoor unit internal components must be checked and cleaned periodically.
  Contact your local dealer for this service.

■ When Using Wireless Remote Controller Instead of Wired Remote Controller

Wall Mounted (Type K2)

When the wireless remote controller is to be used, slide the switch (S011) on the indoor unit control PCB to the ON position.

- If this setting is not made, an alarm will occur.
  (The operation lamp on the display blinks.)



■ Troubleshooting

If your air conditioner does not work properly, first check the following points before requesting service. If it still does not work properly, contact your dealer or a service center.

● Indoor unit

Symptom		Cause
Noise	Sound like streaming water during operation or after operation.	● Sound of refrigerant liquid flowing inside unit ● Sound of drainage water through drain pipe
	Cracking noise during operation or when operation stops.	Cracking sound due to temperature changes of parts
Odor	Discharged air is smelled during operation.	Indoor odor components, cigarette odor and cosmetic odor accumurated in the air conditioner and its air is discharged. Unit inside is dusty. Consult your dealer.
Dewdrop	Dewdrop gets accumurated near air discharge during operation.	Indoor moisture is cooled by cool wind and accumulated by dewdrop.
Fog	Fog occurs during operation in cooling mode. (Places where large amounts of oil mist exist at restaurants.)	● Cleaning is necessary because unit inside (heat exchanger) is dirty. Consult your dealer as technical engineering is required. ● During defrost operation
Fan is rotating for a while even though operation stops.		● Fan rotating makes operation smoothly. ● Fan may sometimes rotates because of drying heat exchanger due to settings.
Wind-direction changes while operating. Wind-direction setting cannot be made. Wind-direction cannot be changed.		● When air discharge temperature is low or during defrost operation, horizontal wind flow is made automatically. ● Flap position is occasionally set up individually.
When wind-direction is changed, flap operates several times and stops at designated position.		When wind-direction is changed, flap operates after searching for standard position.
Dust		Dust accumulation inside indoor unit is discharged.
Poor cooling or heating performance		The indoor unit is initially designed to control the indoor temperature delected by the bulit-in room sensor inside the indoor unit. Due to indoor unit installation position, however, the bulit-in sensor may occasionally sense temperature improperly; for example, temperature difference between the ceiling and floor, lighting apparatus, electric fan, windows or waist-high partition walls, etc. In this case, the unit does not operate properly at the desired temperature. You may change the use of the temperature sensor inside the indoor unit to that of the remote controller. Then the desired room temperature can be controlled properly. For details, consult your dealer.

● Check Before Requiring Services

Symptom	Cause	Remedy
Air conditioner does not run at all although power is turned on.	Power failure or after power failure	Press ON/OFF operation button on remote controller again.
	Operation button is turned off.	● Switch on power if breaker is turned off. ● If breaker has been tripped, consult your dealer without turning it on.
	Fuse blow out.	If blown out, consult your dealer.
Poor cooling or heating performance.	Air intake or air discharge port of indoor and outdoor units is clogged with dust or obstacles.	Remove dust or obstruction.
	Wind speed switch is set to “Low”.	Change to “High” or “Strong”.
	Improper temperature settings	See the section “■ Tips for Energy Saving”.
	Room is exposed to direct sunlight in cooling mode.	
	Doors and /or windows are open.	
	Air filter is clogged.	See the section “■ Care and Cleaning”.
	Too much heat sources in room in cooling mode	Use minimum heat sources and in a short time.
	Too many people in room in cooling mode	Reduce temperature settings or change to “High” or “Strong”.

If your air conditioner still does not work properly although you checked the points as described above, first stop the operation and turn off the power switch. Then contact your dealer and report the serial number and symptom. Never repair your air conditioner by yourself since it is very dangerous for you to do so. You also report if the inspection mark ⚠ and the letters E, F, H, L, P in combination with the numbers appear on the LCD of the remote controller.

■ Tips for Energy Saving

Avoid

- **Do not block the air intake and outlet of the unit. If either is obstructed, the unit will not work well, and may be damaged.**
- Do not let direct sunlight into the room. Use sunshades, blinds or curtains.
  If the walls and ceiling of the room are warmed by the sun, it will take longer to cool the room.

Do

- Always try to keep the air filter clean. (See the section “■ Care and Cleaning”.) A clogged filter will impair the performance of the unit.
- To prevent conditioned air from escaping, keep windows, doors and any other openings closed.

NOTE

Should the power fail while the unit is running

If the power supply for this unit is temporarily cut off, the unit will automatically resume operation once power is restored using the same settings before the power was interrupted.

– NOTE –

– NOTE –

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