

INSTALLATION INSTRUCTIONS

INSTRUCTIONS D'INSTALLATION

EINBAUANLEITUNG

ISTRUZIONI DI INSTALLAZIONE

INSTRUÇÕES DE INSTALAÇÃO

ΟΔΗΓΙΕΣ ΕΓΚΑΤΑΣΤΑΣΗΣ

INSTRUCCIONES DE INSTALACIÓN

PETUNJUK PEMASANGAN

– **VRF System Air Conditioner** –
for Refrigerant R410A

– **Climatiseur VRF System** –
pour réfrigérant R410A

– **VRF System-Klimaanlage** –
für Kühlmittel R410A

– **Condizionatore d'aria con sistema VRF** –
per refrigerante R410A

– **Sistema de Ar Condicionado VRF** –
para Refrigerante R410A

– **Κλιματιστικό Σύστημα VRF** –
για το Ψυκτικό μέσο R410A

– **Acondicionador de aire con sistema VRF** –
para refrigerante R410A

– **Penyejuk Udara Sistem VRF** –
Untuk Refrigeran R410A

Model No.

Indoor Units / Unités intérieures / Inneneinheiten / Unità interne / Unidades interiores / Εσωτερικές Μονάδες / Unidades interiores / Unit Dalam Ruang							
	22	28	36	45	56	73	106
D1		S-28MD1E5 (CZ-KPD2)**	S-36MD1E5 (CZ-KPD2)**	S-45MD1E5 (CZ-KPD2)**	S-56MD1E5 (CZ-KPD2)**	S-73MD1E5 (CZ-KPD2)**	
L1	S-22ML1E5 (CZ02KPL2)**	S-28ML1E5 (CZ02KPL2)**	S-36ML1E5 (CZ02KPL2)**	S-45ML1E5 (CZ02KPL2)**	S-56ML1E5 (CZ02KPL2)**	S-73ML1E5 (CZ03KPL2)**	
K1	S-22MK1E5	S-28MK1E5	S-36MK1E5	S-45MK1E5	S-56MK1E5	S-73MK1E5	S-106MK1E5
P1	S-22MP1E5	S-28MP1E5	S-36MP1E5	S-45MP1E5	S-56MP1E5	S-71MP1E5	
R1	S-22MR1E5	S-28MR1E5	S-36MR1E5	S-45MR1E5	S-56MR1E5	S-71MR1E5	

** Panel (optional parts)

D1 : 1-Way Cassette / Cassette 1 voies / Einweg-Kassette / A cassetta a 1 via / Cassete de 1 via / Κασέτα 1 οδού / Cassette de 1 vía / Kaset 1-Arah

L1 : 2-Way Cassette / Cassette 2 voies / Zweiweg-Kassette / A cassetta a 2 vie / Cassete de 2 vias / Κασέτα 2 οδών / Cassette de 2 vías / Kaset 2-Arah

K1 : Wall Mounted / Montage mural / Wandmontage / Da muro / De parede / Επιτοίχια μονάδα / Montaje en pared / Dipasang di Dinding

P1 : Floor Standing / Debout / Bodenstehend / Da pavimento, tipo diritto / Em pé no pavimento / Όρθιο δαπέδου / De pie / Berdiri di Lantai

R1 : Concealed Floor Standing / Caché, debout / Verdeckt, bodenstehend / Da pavimento nascosto, tipo diritto / Em pé no pavimento e oculta /
Εντοιχισμένο όρθιο δαπέδου / De pie oculto / Berdiri di Lantai Tersembunyi

Outdoor Units / Unités extérieures / Außeneinheiten / Unità esterne / Unidades exteriores / Εξωτερικές Μονάδες / Unidades exteriores / Unit Luar Ruang		
MF1	3WAY	U-8MF1E8, U-10MF1E8, U-12MF1E8, U-14MF1E8, U-16MF1E8
ME1	2WAY	U-8ME1E8(E), U-10ME1E8(E), U-12ME1E8(E), U-14ME1E8(E), U-16ME1E8(E), U-18ME1E8(E), U-20ME1E8(E)

* Refrigerant R410A is used in the outdoor units.

* Le réfrigérant R410A est utilisé dans les unités extérieures.

* In den Außeneinheiten wird das Kühlmittel R410A verwendet.

* Le unità esterne usano come refrigerante l'R410A.

* O refrigerante R410A é utilizado nas unidades exteriores.

* Το ψυκτικό μέσο R410A χρησιμοποιείται στις εξωτερικές μονάδες.

* En las unidades exteriores se emplea el refrigerante R410A.

* Refrigeran R410A digunakan di unit luar ruang.

INSTALLATION INSTRUCTIONS

– VRF System Air Conditioner – for Refrigerant R410A

For Indoor Units D1, L1, K1, P1, R1 Types

■ R410A Models

Model No.

Indoor Units		22	28	36	45	56	73	106
D1	1-Way Cassette		S-28MD1E5 (CZ-KPD2)**	S-36MD1E5 (CZ-KPD2)**	S-45MD1E5 (CZ-KPD2)**	S-56MD1E5 (CZ-KPD2)**	S-73MD1E5 (CZ-KPD2)**	
L1	2-Way Cassette	S-22ML1E5 (CZ-02KPL2)**	S-28ML1E5 (CZ-02KPL2)**	S-36ML1E5 (CZ-02KPL2)**	S-45ML1E5 (CZ-02KPL2)**	S-56ML1E5 (CZ-02KPL2)**	S-73ML1E5 (CZ-03KPL2)**	
K1	Wall Mounted	S-22MK1E5	S-28MK1E5	S-36MK1E5	S-45MK1E5	S-56MK1E5	S-73MK1E5	S-106MK1E5
P1	Floor Standing	S-22MP1E5	S-28MP1E5	S-36MP1E5	S-45MP1E5	S-56MP1E5	S-71MP1E5	
R1	Concealed Floor Standing	S-22MR1E5	S-28MR1E5	S-36MR1E5	S-45MR1E5	S-56MR1E5	S-71MR1E5	

** Panel (optional parts)

Outdoor Units		
MF1	3WAY	U-8MF1E8, U-10MF1E8, U-12MF1E8, U-14MF1E8, U-16MF1E8
ME1	2WAY	U-8ME1E8(E), U-10ME1E8(E), U-12ME1E8(E), U-14ME1E8(E), U-16ME1E8(E), U-18ME1E8(E), U-20ME1E8(E)

* Refrigerant R410A is used in the outdoor units.

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.
- Observe all local, state, and national electrical codes.
- 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 overheating at connection points and a possible fire hazard.
- Provide a power outlet to be used exclusively for each unit, and a power supply disconnect, circuit breaker and earth leakage breaker for overcurrent protection should be provided in the exclusive line.
- Provide a power outlet exclusively for each unit, and full disconnection means having a contact separation in all poles must be incorporated in the fixed wiring in accordance with the wiring rules.

- To prevent possible hazards from insulation failure, the unit must be grounded. 

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...

...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 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



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.
- Refrigerant gas leakage may cause fire.
- Ventilate the room well, 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 poisonous gas.
- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- 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.
- 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 being serviced.







- 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 the sales dealer or service dealer for repair.



- 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. Escaped 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 poisonous gas.

Others



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


NOTICE

The English text is the original instructions. Other languages are translations of the original instructions.

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).

In a room where the density may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device. The density is as given below.

Total amount of refrigerant (kg)

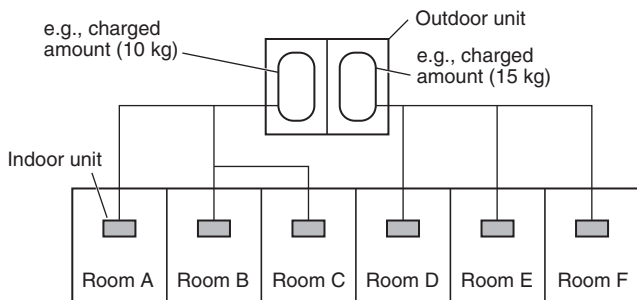
$$\text{Min. volume of the indoor unit installed room (m}^3\text{)} \leq \text{Density limit (kg/m}^3\text{)}$$

The density limit of refrigerant which is used in multi air conditioners is 0.3 kg/m³ (ISO 5149).

NOTE

- If there are 2 or more refrigerating systems in a single refrigerating device, the amount of refrigerant should be as charged in each independent device.

For the amount of charge in this example:

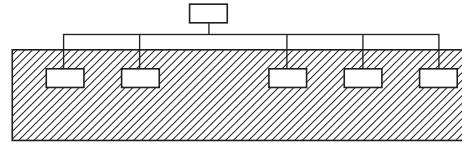


The possible amount of leaked refrigerant gas in rooms A, B and C is 10 kg.

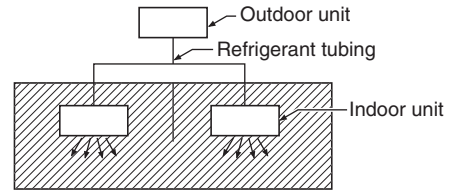
The possible amount of leaked refrigerant gas in rooms D, E and F is 15 kg.

- The standards for minimum room volume are as follows.

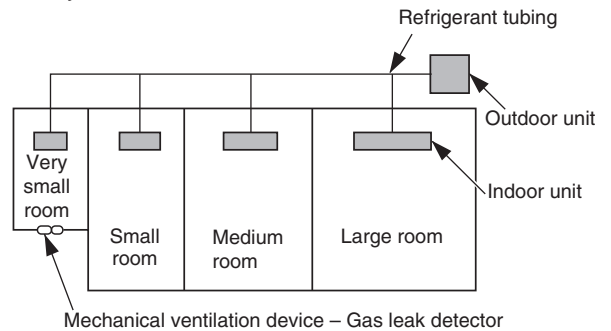
- (1) No partition (shaded portion)



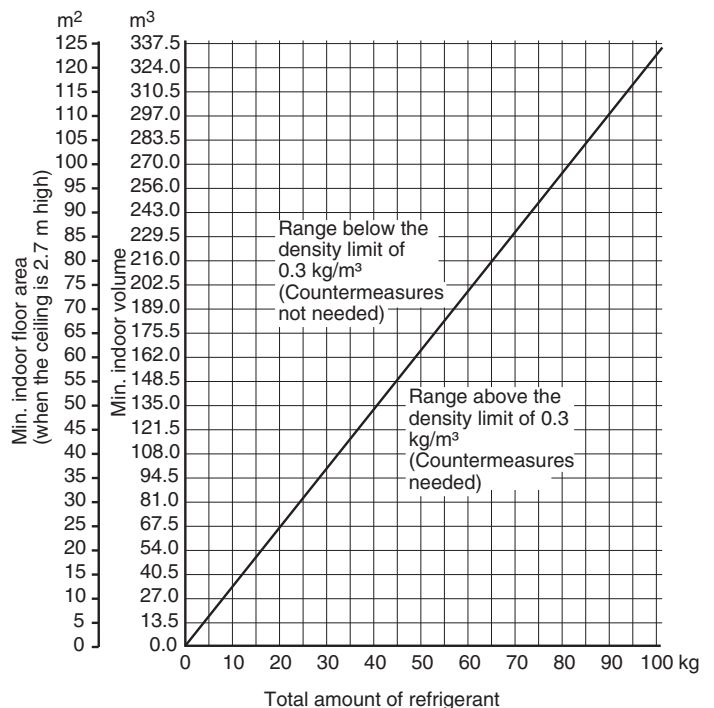
- (2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).



- (3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest room of course becomes the object. But when 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.



3. The minimum indoor floor space compared with the amount of refrigerant is roughly as follows: (When the ceiling is 2.7 m high)



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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 units and make sure all accessory parts listed are with the indoor units 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 key hole saw
7. Hack saw
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

See Tables 1-1 to 1-4.

Table	Type
1-1	1-Way Cassette
1-2	2-Way Cassette
1-3	Wall Mounted
1-4	Floor Standing & Concealed Floor Standing

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 +30 cm to 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 8 mm.
3. Use insulated copper wire for field wiring. Wire size varies with the total length of wiring. Refer to **4. ELECTRICAL WIRING** for details.



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

Table 1-1 (1-Way Cassette)

Part Name	Figure	Q'ty	Remarks
Installation gauge (Use the packaging side pad.)		1	Gauge A (Install on tubing side.)
		1	Gauge B (Install on opposite side of tubing.)
Washer		8	Suspension brackets, upper/lower
Screw		4	For full-scale installation diagram
Insulating tape		2	For gas and liquid tube flare nuts
Flare insulator		1	For liquid tubes
		1	For gas tubes
Drain hose		1	For drain joint
Hose band		1	For drain joint
Packing		1	For drain joint
Drain insulator		1	For drain joint

- Use 3/8" or M10 for suspending bolts.
- Field supply for suspending bolts and nuts.

Table 1-2 (2-Way Cassette)

Part Name	Figure	Q'ty	Remarks
Flare insulator		2	For gas and liquid tubes
Insulating tape		2	For gas and liquid tube flare nuts
Vinyl clamp		8	For flare insulator and drain insulator
Hose band		1	For securing drain hose
Packing		1	For drain joint
Drain insulator		1	For drain joint
Installation gauge (Use the packaging side pad.)		1	Gauge A (Install on tubing side.)
		1	Gauge B (Install on opposite side of tubing.)
M5 x L40 (Black screw, with washer)		4	For fastening installation gauges
Special washer		8	For suspension bolts
Drain hose (L = 25cm)		1	For securing drain hose
Putty		1	For sealing recessed portion of power supply

Table 1-3 (Wall Mounted)

22, 28, 36 types

Part Name	Figure	Q'ty
Tapping screw	Truss-head Phillips 4 x 30 mm 	8
Clamp		1

45, 56, 73, 106 types











Part Name	Figure	Q'ty
Tapping screw	Truss-head Phillips 4x20 mm 	8
Tapping screw	Truss-head Phillips 4x10 mm 	2
Flare insulation		1

Table 1-4 (Floor Standing & Concealed Floor Standing)

Part Name	Figure	Q'ty	Remarks
Connection pipe		1	For connecting gas tubes
Flare insulator		2	For gas and liquid tubes
Insulating tape	 (White)	2	For gas and liquid tube flare nuts
Insulating tape	 (Black)	2	For gas and liquid tubes
Vinyl clamp		7	For ends of flare insulator
Insulating tape (black and long)		1	For drain pipe
Drain insulator		1	For drain hose joint

- Use M12 for suspending bolts.
- Field supply for suspending bolts and nuts.

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 "sweating" on the air discharge ports, causing them to spray or drip.
- 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.
- 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 1 m off the floor, in an area that is not in direct sunlight nor 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 3 m (for D1 type, greater than 3.5 m).

2-Way Cassette

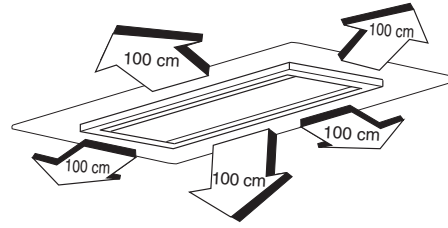


Fig. 2-1

1-Way Cassette

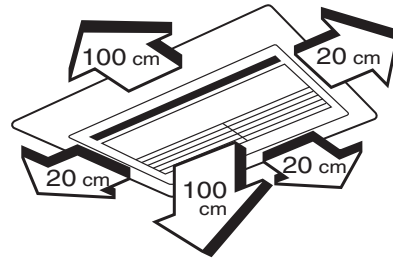


Fig. 2-2

Floor Standing, Concealed Floor Standing

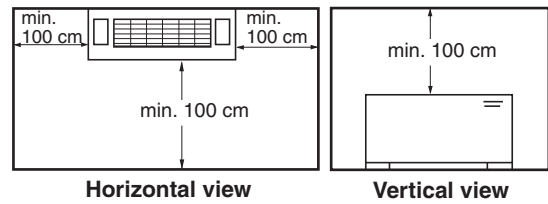
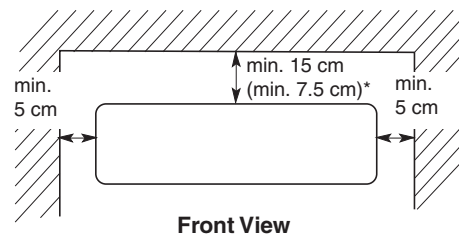


Fig. 2-3

Wall Mounted



* For 45, 56, 73, 106 types

Fig. 2-4

3. HOW TO INSTALL THE INDOOR UNIT

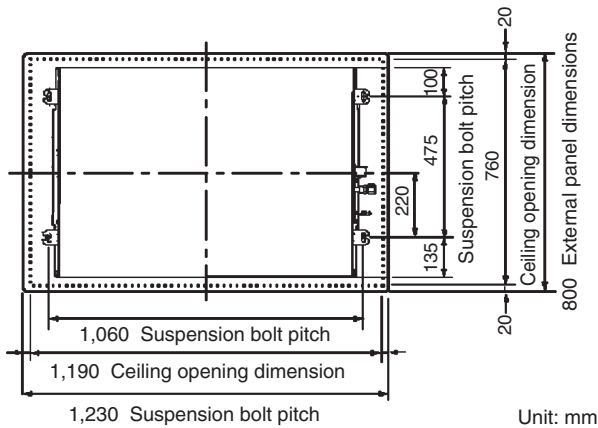
■ 1-Way Cassette Type (D1 Type)

3-1. Preparation for Suspending

This unit uses a drain pump. Use a carpenter's level to check that the unit is level.

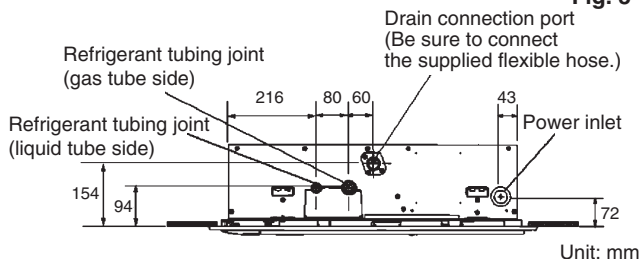
3-2. Suspending the Indoor Unit

- (1) The measurements of the ceiling hole and suspension bolt positions should be as shown in Fig. 3-1. The length of the suspension bolts should extend a minimum of 15 mm beyond the bottom of the unit suspension bracket. Refer to Fig. 3-6.
- (2) Use the full-scale installation diagram (printed on the package) to determine the suspension bolt pitch. The positional relationships between the suspension brackets and the unit, and between the brackets and the ceiling panel, should be as shown in Figs. 3-1 & 3-2.



Unit: mm

Fig. 3-1



Unit: mm

Fig. 3-2

- (3) Depending on the ceiling type:

- Insert suspension bolts as shown in Fig. 3-3

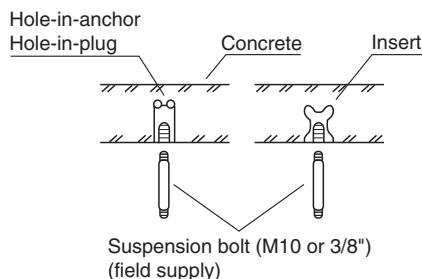


Fig. 3-3

or

- Use existing ceiling supports or construct a suitable support as shown in Fig. 3-4.

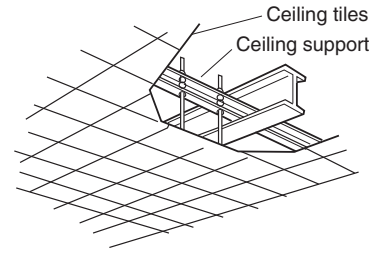
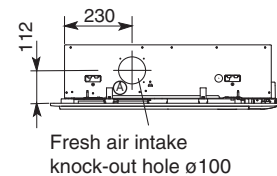


Fig. 3-4



It is important that you use extreme care in supporting the indoor unit from the ceiling. Ensure that the ceiling is strong enough to support the weight of the unit. Before hanging the unit, test the strength of each attached suspension bolt.

- (4) Cut the ceiling material, if necessary. (Figs. 3-1 and 3-2)
- (5) If the system requires fresh air to be drawn into the unit, cut and remove the insulation (both externally and internally) at the location shown as (A) in Fig. 3-5.



Fresh air intake
knock-out hole \varnothing 100

Fig. 3-5

3-3. Placing the Unit Inside the Ceiling

- (1) When suspending the unit, attach gauges A and B (with packaging pad) to the indoor unit suspension brackets using the supplied M5 screws (2 for each bracket) to create the ceiling opening dimensions.



- Tubing and wiring work will be necessary inside the ceiling after the unit has been suspended. Therefore, if the ceiling is already installed, perform tubing and wiring up to the connection position before suspending the unit.

- (2) Attach the special washers (supplied) and nuts (field supply) to the suspension bolts (4 locations).



- Use 3/8" or M10 nuts.
- The length of the suspension bolts should be such that there is clearance of at least 15 mm below the bottom of the bracket, as shown in Fig. 3-7. If the suspension bolts are too long, they will contact the ceiling panel and louver motor cover, making installation impossible.

- (3) Thread the 3 hexagonal nuts and 2 washers (field supply) onto each of the the 4 suspension bolts as shown in Fig. 3-7. Use 1 nut and 1 washer for the upper side, and 2 nuts and 1 washer for the lower side, so that the unit will not fall off the suspension lugs.

- (4) The indoor unit should be suspended from the suspension bolts (Fig. 3-7) so that the distance between the bottom of the suspension lug and the bottom surface of the ceiling is 17 to 22 mm. (Fig. 3-6) Clearance between the indoor unit and the bottom surface of the ceiling is adjustable after the ceiling panel is attached to the unit.

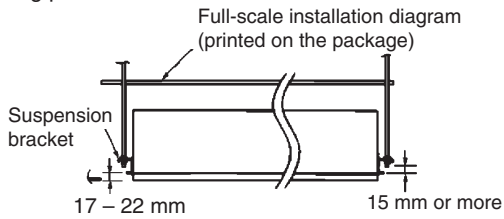


Fig. 3-6

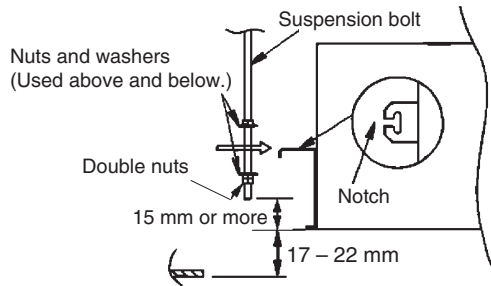


Fig. 3-7

Use gauges A and B to adjust the height of the indoor unit. (Gauges shown in Table 1-2.)

- (5) The unit should be adjusted using water level or as shown in Fig. 3-8 so that the drain pipe side is slanted 5 mm lower than the opposite side.

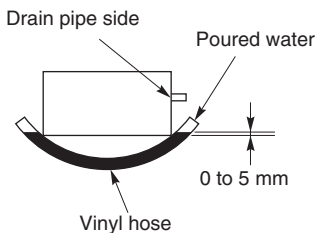


Fig. 3-8

- (6) After completing the adjustment of the clearance, fasten all upper and lower suspension nuts tightly.

3-4. Installing the Drain Piping

- (1) Prepare standard hard PVC pipe (O.D. 32 mm) for the drain and use the supplied drain hose and hose band to prevent water leaks. The PVC pipe must be purchased separately. The unit's transparent drain port allows you to check drainage. (Fig. 3-9)

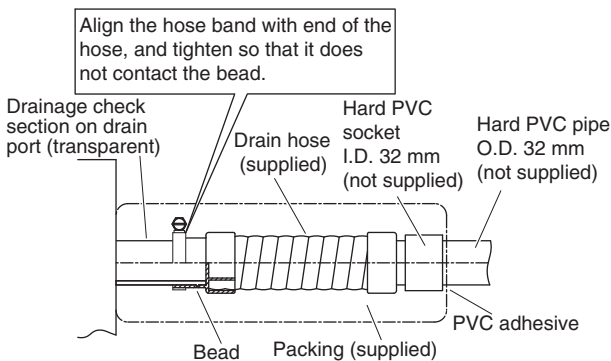


Fig. 3-9

CAUTION

- Do not use adhesive at the drain connection port on the indoor unit.
 - Insert the drain pipe until it contacts the socket, as shown in Fig. 3-9, then secure it tightly with the hose band.
 - Tighten the hose clamps so their locking nuts face upward. (Fig. 3-9)
 - Do not use the supplied drain hose bent at a 90° angle. (The maximum permissible bend is 45°.)
- (2) After checking the drainage, wrap the supplied packing and drain pipe insulator around the pipe, then secure it with the clamps. (Fig. 3-10)

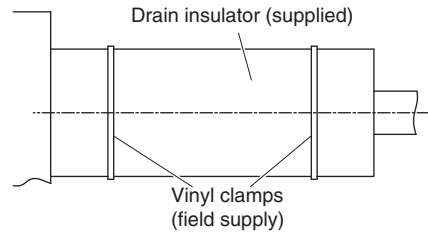


Fig. 3-10

NOTE

Make sure the drain pipe has a downward gradient (1/100 or more) and that there are no water traps.

CAUTION

- Do not install an air bleeder as this may cause water to spray from the drain pipe outlet. (Fig. 3-11)

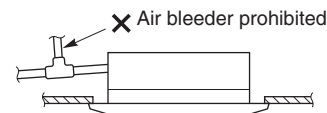


Fig. 3-11

- If it is necessary to increase the height of the drain pipe, the pipe can be raised a maximum of 590 mm from the bottom of the ceiling. Do not raise it any higher than 590 mm, as this could result in water leaks. (Fig. 3-12)

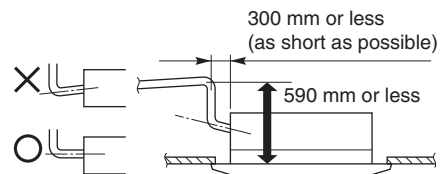


Fig. 3-12

- Do not install the pipe with an upward gradient from the connection port. This will cause the drain water to flow backward and leak when the unit is not operating. (Fig. 3-13)

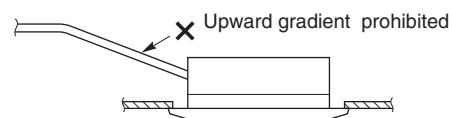


Fig. 3-13

- Do not apply force to the piping on the unit side when connecting the drain pipe. The pipe should not be allowed to hang unsupported from its connection to the unit. Fasten the pipe to a wall, frame, or other support as close to the unit as possible. (Fig. 3-14)

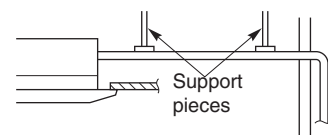


Fig. 3-14

- Provide insulation for any pipes that are run indoors.

3-5. Checking the Drainage

After wiring and drain piping are completed, use the following procedure to check that the water will drain smoothly. For this, prepare a bucket and wiping cloth to catch and wipe up spilled water.

- (1) Connect power to the power terminal board (R, S terminals) inside the electrical component box.
- (2) Short the check pin (CHK) on the indoor control board and operate the drain pump.



Be careful since the fan will start when you short the pin on the indoor control board.

- (3) Pour about 1,200 cc of water into the drain pan using a siphon pump through the air outlet grille. (Fig. 3-15)

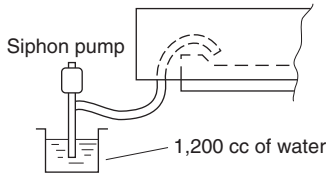


Fig. 3-15

Check the water flow through the transparent drain pipe and see if there is any leakage.

- (4) When the check of drainage is complete, open the check pin (CHK) and remount the insulator.



Use 4 × 8 tapping screws to fasten the drainage cover. If the screws used are longer than 8 mm, it may make a hole in the drain pan and cause leakage.

Removing the side panel

- (1) Push the tab on both sides of the side panel inward (a) to disengage the tab (first stage) and move the panel horizontally (b).

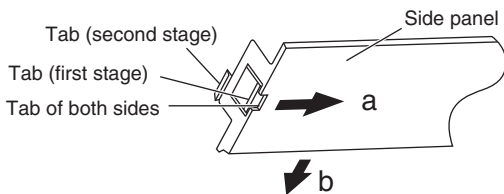


Fig. 3-16

- (2) Push the area in the vicinity of the tab (second stage) inward while holding both sides of the side panel to remove the side panel.

2-Way Cassette Type (L1 Type)

3-6. Preparation for Suspending

This unit uses a drain pump. Use a carpenter's level to check that the unit is level.

3-7. Suspending the Indoor Unit

- (1) Follow the diagrams to make the holes in the ceiling.
- (2) Depending on the ceiling type:

- Insert suspension bolts as shown in Fig. 3-17

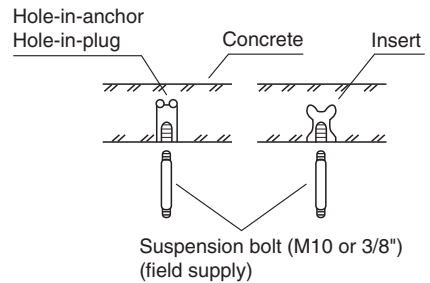


Fig. 3-17

or

- Use existing ceiling supports or construct a suitable support as shown in Fig. 3-18.

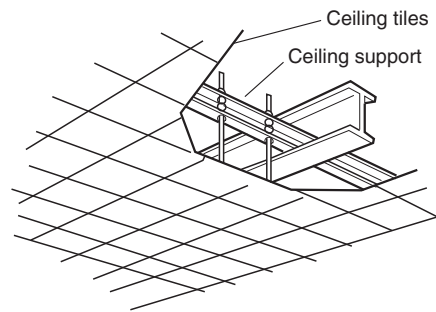


Fig. 3-18



It is important that you use extreme care in supporting the indoor unit from the ceiling. Ensure that the ceiling is strong enough to support the weight of the unit. Before hanging the unit, test the strength of each attached suspension bolt.

- (3) Cut the ceiling material, if necessary.
(Refer to Figs. 3-19 and 3-20, and Table 3-1.)

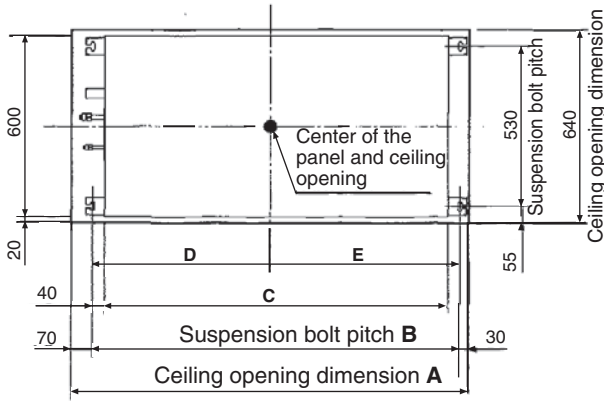


Fig. 3-19

Table 3-1 Unit: mm

	A	B	C	D	E
22, 28, 36, 45, 56	1,020	920	840	440	480
73	1,320	1,220	1,140	550	590

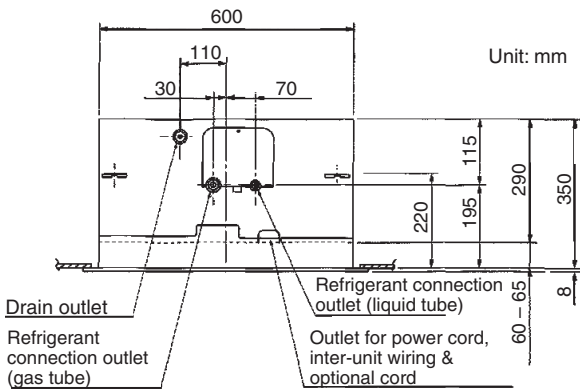


Fig. 3-20

Adjust so that the distance between the indoor unit and the bottom surface of the ceiling is 60 to 65 mm.

- (4) If the system requires fresh air to be drawn into the unit, cut and remove the insulation (both externally and internally) at the location shown as (A) in Fig. 3-21.

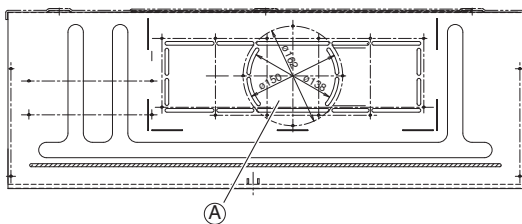


Fig. 3-21

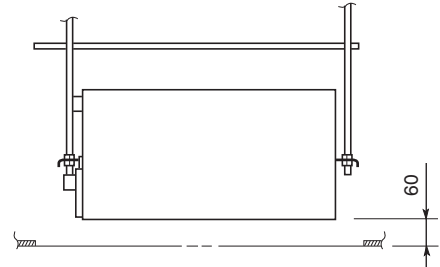


When making the cuts to the insulation, be careful not to damage the drain pan.

3-8. Placing the Unit Inside the Ceiling

- (1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts.
Tubing must be laid and connected inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the tubing into position for connection to the unit before placing the unit inside the ceiling.

- (2) Thread the 3 hexagonal nuts and 2 washers (field supply) onto each of the the 4 suspension bolts as shown in Fig. 3-23. Use 1 nut and 1 washer for the upper side, and 2 nuts and 1 washer for the lower side, so that the unit will not fall off the suspension lugs.
(3) The distance between the unit and the opening in the ceiling and the distance between the bottom surface of the ceiling and the bottom surface of the flange of the unit should follow the dimensions given in Fig. 3-22. Use the supplied installation gauge to check.



Unit: mm

Fig. 3-22

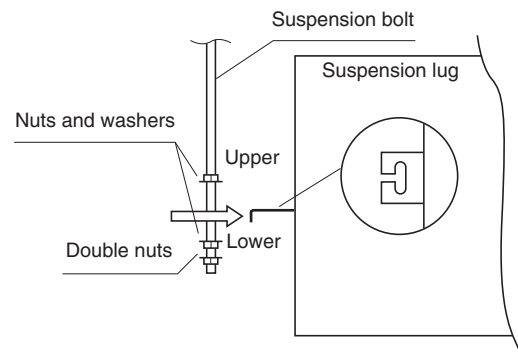


Fig. 3-23

3-9. Installing the Drain Piping

- (1) Prepare a standard hard PVC pipe (O.D. 32 mm) for the drain and use the supplied drain hose and hose band to prevent water leaks. The PVC pipe must be purchased separately.

When doing this, leave a gap between the drain socket and the PVC pipe to allow the drainage to be checked. The unit's transparent drain port allows you to check the drainage. (Fig. 3-24)

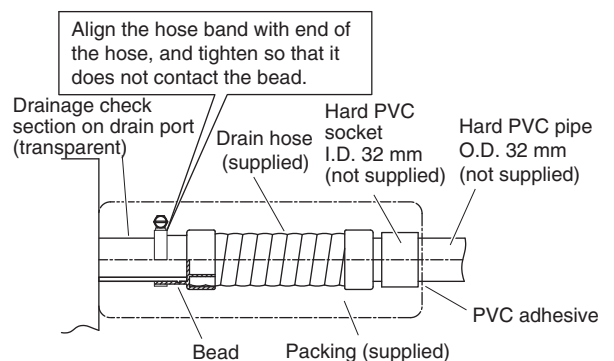


Fig. 3-24



- Do not use adhesive at the drain connection port on the indoor unit.
- Insert the drain pipe until it contacts the socket, as shown in Fig. 3-24, then secure it tightly with the hose band.
- Tighten the hose clamps so their locking nuts face upward. (Fig. 3-24)
- Do not use the supplied drain hose bent at a 90° angle. (The maximum permissible bend is 45°.)

- After checking the drainage, wrap the supplied packing and drain pipe insulator around the pipe, then secure it with the supplied clamps. (Fig. 3-25)

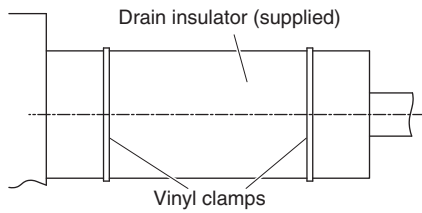


Fig. 3-25

NOTE

Make sure the drain pipe has a downward gradient (1/100 or more) and that there are no water traps.

CAUTION

- Do not install an air bleeder as this may cause water to spray from the drain pipe outlet. (Fig. 3-26)

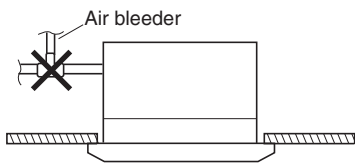


Fig. 3-26

- If it is necessary to increase the height of the drain pipe, the section directly after the connection port can be raised a maximum of 500 mm. Do not raise it any higher than 500 mm, as this could result in water leaks. (Fig. 3-27)

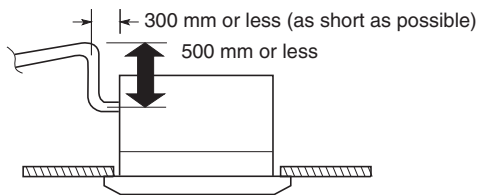


Fig. 3-27

- Do not install the pipe with an upward gradient from the connection port. This will cause the drain water to flow backward and leak when the unit is not operating. (Fig. 3-28)

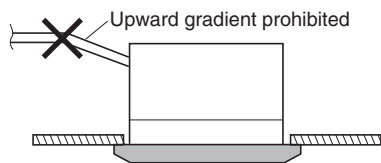


Fig. 3-28

- Do not apply force to the piping on the unit side when connecting the drain pipe. The pipe should not be allowed to hang unsupported from its connection to the unit. Fasten the pipe to a wall, frame, or other support as close to the unit as possible. (Fig. 3-29)

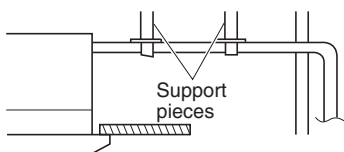


Fig. 3-29

- Provide insulation for any pipes that are run indoors.

3-10. Checking the Drainage

After wiring and drain piping are completed, use the following procedure to check that the water will drain smoothly. For this, prepare a bucket and wiping cloth to catch and wipe up spilled water.

- Connect power to the power terminal board (R, S terminals) inside the electrical component box.
- Remove the tube cover and through the opening, slowly pour about 1,200 cc of water into the drain pan to check the drainage.
- Short the check pin (CHK) on the indoor control board and operate the drain pump. Check the water flow through the transparent drain port and see if there is any leakage.

CAUTION

Be careful since the fan will start when you short the pin on the indoor control board.

- When the check of drainage is complete, open the check pin (CHK) and remount the tube cover. (Fig. 3-30)

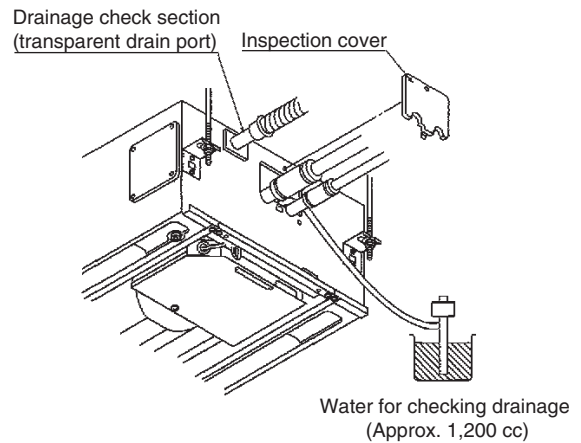


Fig. 3-30

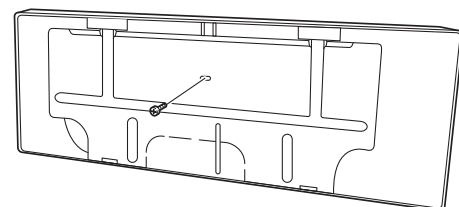
CAUTION

To mount the tube cover, use 4 × 8 tapping screws. (Fig. 3-30) Do not use long screws as they may puncture the drain pan and cause water leakage.

**Wall Mounted Type (K1 Type)
22, 28, 36 types**

3-11. Remove the Rear Panel from the Unit

- Remove and discard the set screw on the rear panel. (Fig. 3-31)



Set screw only for transportation

Fig. 3-31

- Press the 2 Δ marks on the frame cover and disengage the stationary tabs from the frame. (Fig. 3-32)

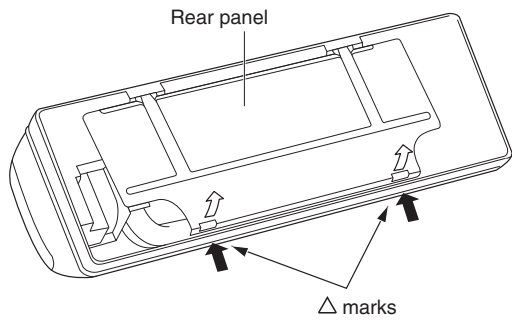


Fig. 3-32

- Remove the rear panel.

NOTE

Tubing can be extended in 5 directions as shown in Fig. 3-33. Select the direction you need providing the shortest run to the outside unit.

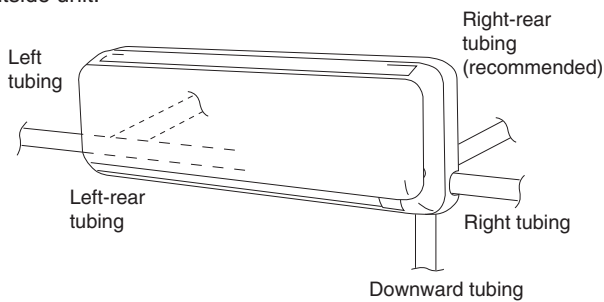


Fig. 3-33

- When left tubing is to be done, switch the drain hose and drain cap. (For details, refer to “Switching drain hose and drain cap”.)

3-12. Make a Hole

- 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.
- Determine which side of the unit you should make the hole for tubing and wiring. (Fig. 3-34)

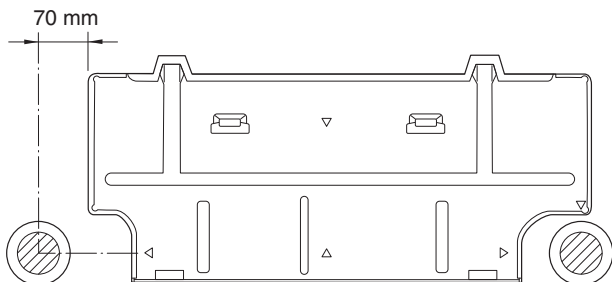


Fig. 3-34

NOTE

In the case of left-rear tubing, use the measurement points from the edge of the rear panel for precise placement of the hose outlet. (Fig. 3-34)

- 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.

- Using a sabre saw, key hole saw or hole-cutting drill attachment, cut a hole in the wall. (Fig. 3-35)

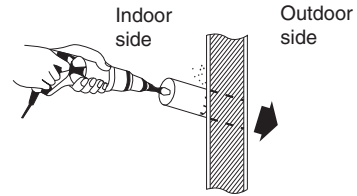


Fig. 3-35

NOTE

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

Table 3-2

Hole Dia. (mm)
S-22MK1E5 / S-28MK1E5 / S-36MK1E5
65

- Measure the thickness of the wall from the inside edge to the outside edge and cut PVC pipe at a slight angle 6 mm shorter than the thickness of the wall. (Fig. 3-36)
PVC pipe (Locally purchased)

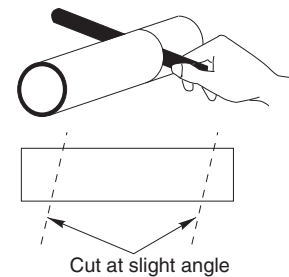


Fig. 3-36

- Place the plastic cover over the end of the pipe (for indoor side only) and insert the pipe in the wall. (Fig. 3-37)

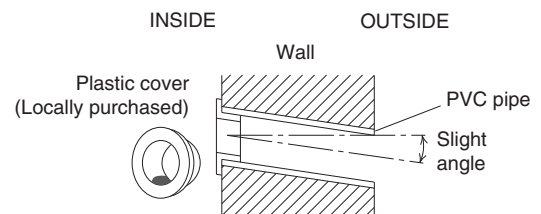


Fig. 3-37

3-13. Install the Rear Panel on the Wall

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

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. 3-38)

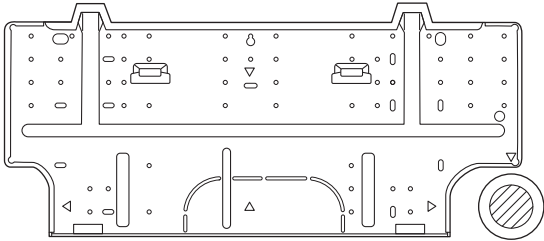


Fig. 3-38

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 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. 3-39)

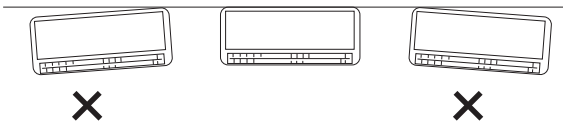


Fig. 3-39

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

3-14. Remove the Grille to Install the Indoor Unit

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) Grasp both ends of the air intake grille, and remove it by opening towards the front and pulling towards you. (Fig. 3-40)

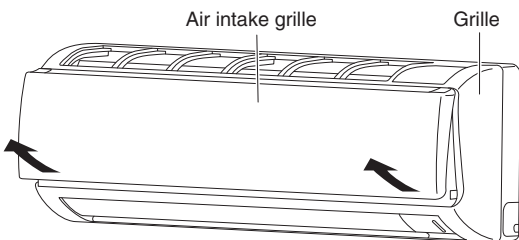


Fig. 3-40

- (2) Remove the 2 screws. (Fig. 3-41)

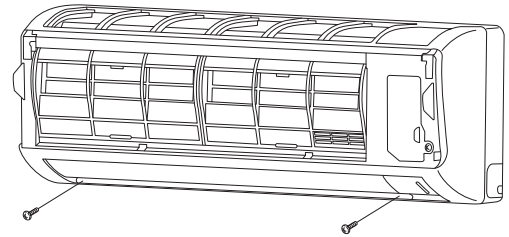


Fig. 3-41

- (3) Press the 3 tabs at the top of the grille and the 3 tabs on the front face to separate the grille from the frame. (Fig. 3-42)

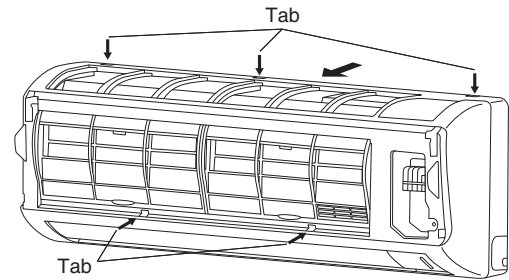


Fig. 3-42

- (4) Pull the grille toward you to remove it.

How to replace the grille

- (1) When installing the grille, place the bottom of the grille into the frame first. (Fig. 3-43)

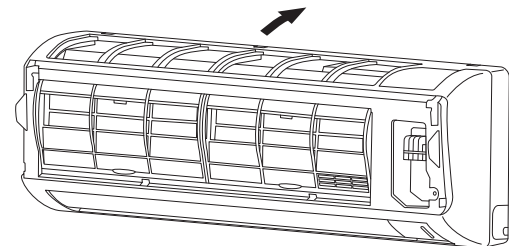


Fig. 3-43

Then insert the tabs on the top of the grille and on the front face into the frame.

- (2) Make sure that the grille and frame are firmly fitted together by engaging the tabs.
- (3) Affix the grille with the 2 previously removed screws. (Fig. 3-41)
- (4) Install the air intake grille.
 - (a) Allow the edge of the air intake grille to slide into the top of the indoor unit, and then insert it all the way inside. (Fig. 3-44)

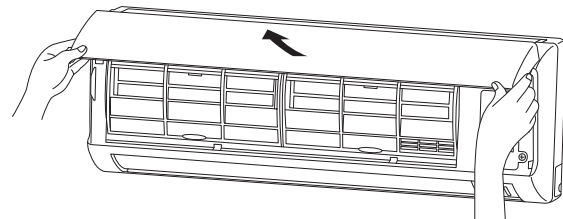


Fig. 3-44

- (b) Press the bottom right and left corners and center of the air intake grille to attach it to the indoor unit. (Fig. 3-45)

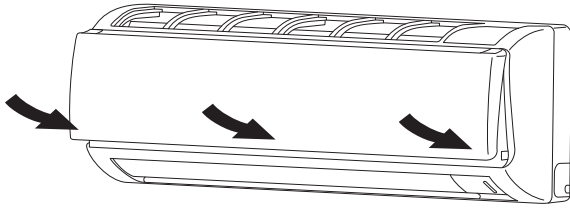


Fig. 3-45

NOTE

Attach so that the round pins at the top right and left corners of the air intake grille are inserted into the grooves at the top right and left of the indoor unit.

3-15. Shape the Indoor Side Tubing

- (1) Arrangement of tubing by directions
- a) Right or left tubing
Cut out the corner of the right/left frame with a hacksaw or the like. (Figs. 3-46 and 3-47)
 - b) Right-rear or left-rear tubing
In this case, the corner of the frame need not be cut.

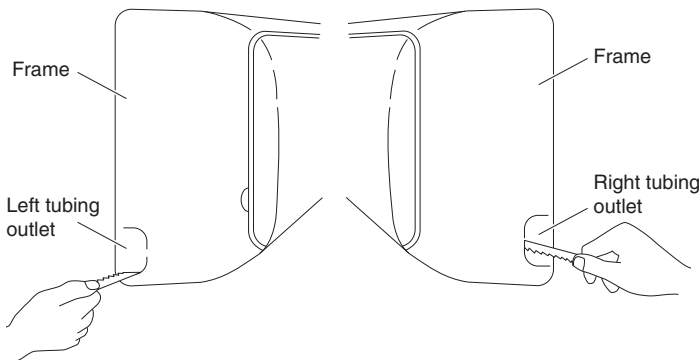


Fig. 3-46

Fig. 3-47

- (2) To mount the indoor unit on the rear panel:
Hang the 2 mounting slots of the unit on the upper tabs of the rear panel. (Fig. 3-48)

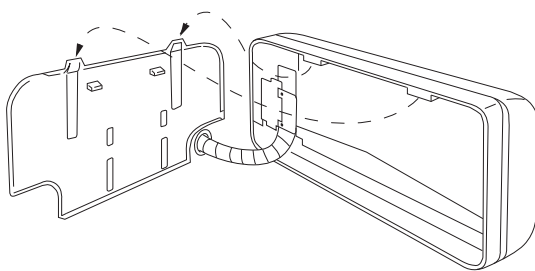


Fig. 3-48

3-16. 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 hazard 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.

3-17. Wiring Instructions for Inter-unit Connections

- (1) Grasp both ends of the air intake grille, and remove it by opening toward the front and pulling it toward you.
- (2) Remove the screw on the right side cover plate and open the cover. (Fig. 3-49)

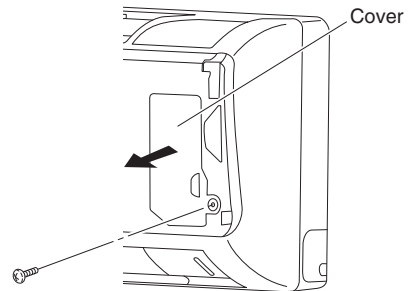


Fig. 3-49

- (3) Insert the inter-unit wiring into the through-the-wall PVC pipe. Lead the power wiring into the room allowing approx. 25 cm to extend from the wall face. (Fig. 3-50)

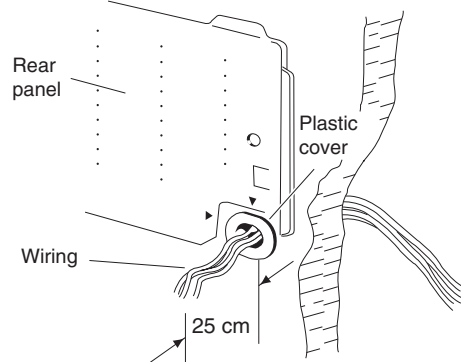


Fig. 3-50

- (4) Route the inter-unit wiring from the back of the indoor unit and pull it toward the front for connection. (Fig. 3-51)
- (5) Connect the inter-unit wiring to the corresponding terminals on the terminal plate (Fig. 3-51) while referring to the wiring diagram.

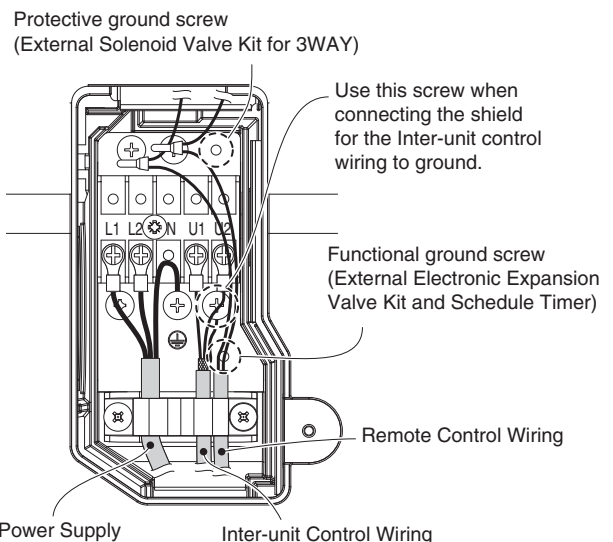


Fig. 3-51

(6) Be sure to secure the wiring with the provided clamp.

NOTE

When closing the air intake grille, press the bottom right and left corners and center. (Fig. 3-52)

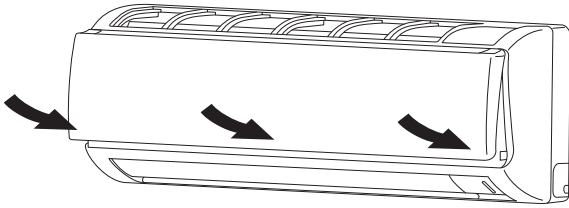


Fig. 3-52

Please refer to “How to replace the grille” for installing the air intake grille.

WARNING

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

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

How to connect wiring to the terminal

a) For Indoor Unit

(1) Cut the wire end with a cutting pliers, then strip the insulation to expose the wire about 8 mm. See the label (Fig. 3-53) near the terminal plate.

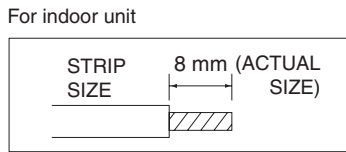


Fig. 3-53

- (2) Using a screwdriver, loosen the terminal screw on the terminal plate.
- (3) Insert the wire and tighten the terminal screw completely using a screwdriver.

b) For Outdoor Unit

■ For solid core wiring (or F-cable)

(1) Cut the wire end with a cutting pliers, then strip the insulation to expose the solid wire about 25 mm. (Fig. 3-54)

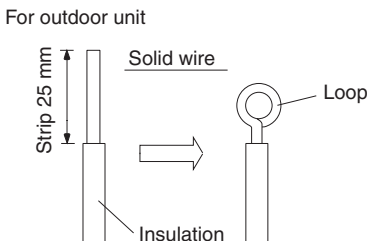


Fig. 3-54

- (2) Using a screwdriver, remove the terminal screw(s) on the terminal plate.
- (3) Using the pliers, bend the solid wire to form a loop suitable for the terminal screw.
- (4) Shape the loop wire properly, place it on the terminal plate and fix it securely with the removed terminal screw using a screwdriver.

■ For stranded wiring

(1) Cut the wire end with a cutting pliers, then strip the insulation to expose the stranded wiring about 10 mm and tightly twist the wire ends. (Figs. 3-55 and 3-56)

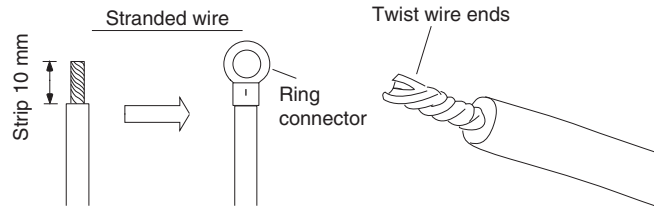


Fig. 3-55

Fig. 3-56

- (2) Using a screwdriver, remove the terminal screw(s) on the terminal plate.
- (3) Using a ring connector fastener or pliers, securely clamp each stripped wire end with a ring connector. (Fig. 3-55)
- (4) Place the ring connector wire, and replace and tighten the removed terminal screw using a screwdriver. (Fig. 3-57)

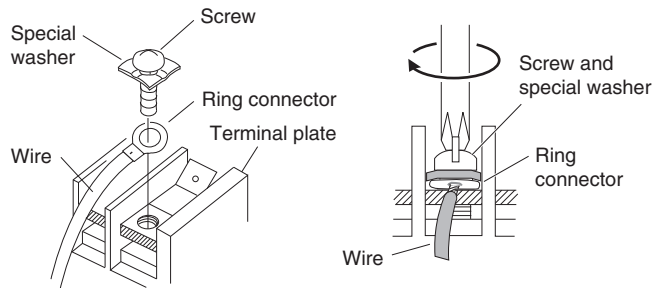


Fig. 3-57

3-18. Mounting

- (1) To install the indoor unit, mount the indoor unit onto the 2 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. 3-58)

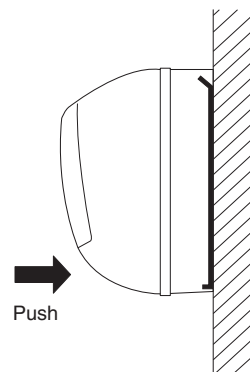


Fig. 3-58

NOTE

For tubing, choose either the right or left tubing direction and follow the steps below. This work can be made easier by placing padding material (such as styrofoam) at the rear right side of the indoor unit. (Fig. 3-59)

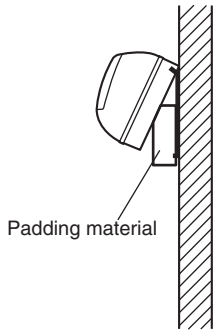


Fig. 3-59

Right-side tubing

(1) Shape the refrigerant tubing so that it can easily go into the wall hole. (Fig. 3-60)

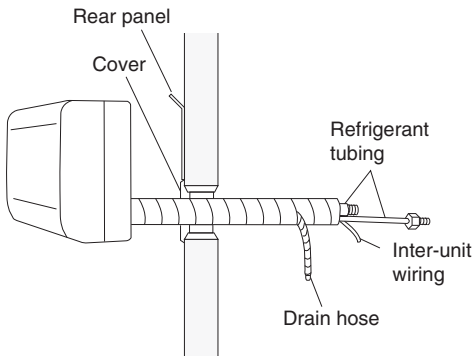


Fig. 3-60

(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. 3-61)

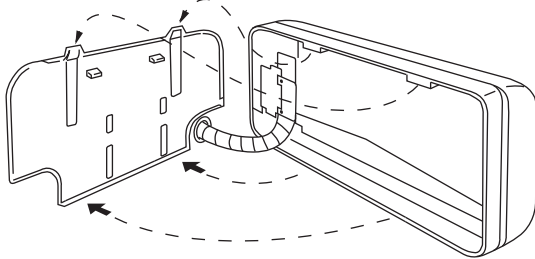


Fig. 3-61

- (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. 3-62)

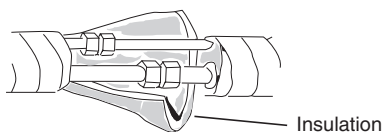


Fig. 3-62

(5) Assemble the refrigerant tubing, drain hose, and inter-unit wiring as shown in Fig. 3-62.

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. 3-63)

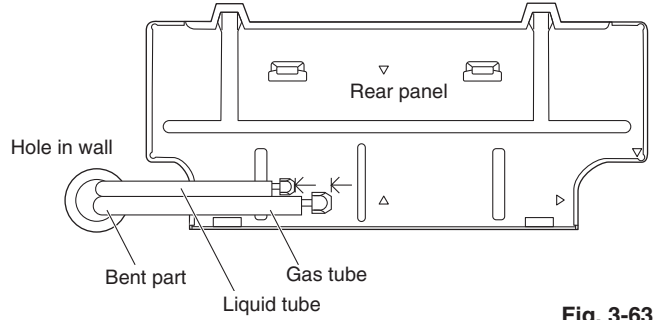


Fig. 3-63

(2) Switch the drain hose and drain cap.

Switching drain hose and drain cap

(a) Locate the drain hose and the drain cap. (Fig. 3-64)

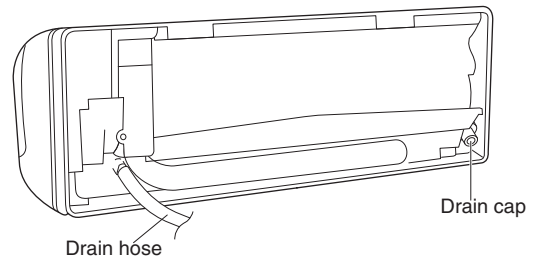


Fig. 3-64

(b) Remove the screws fastening the drain hose on the right side, and pull out the drain hose to remove it. (Fig. 3-64)

(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. 3-65)

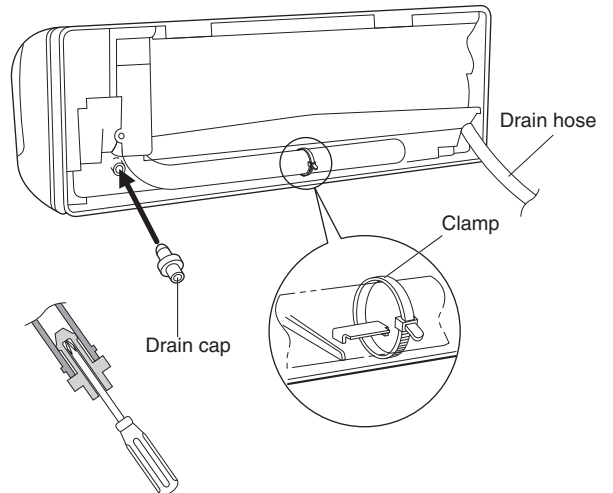


Fig. 3-65

Drain hose

Slide the drain hose fully onto the drain pan outlet until the drain hose edge is pushed into the insulation. 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. 3-66)

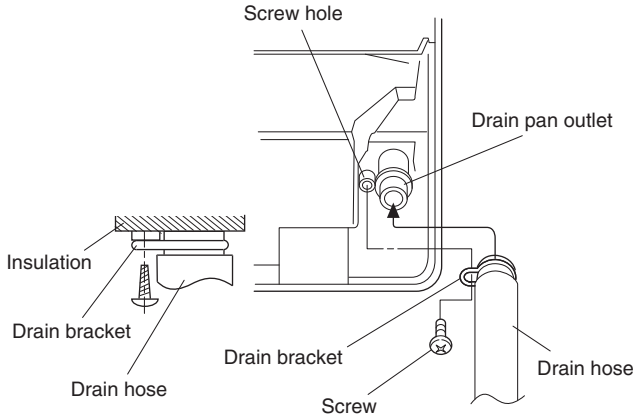


Fig. 3-66

Drain cap

Use a Phillips 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. (Fig. 3-67)

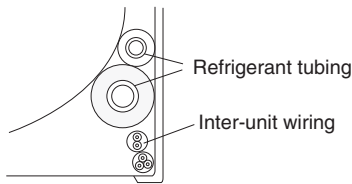


Fig. 3-67

To unmount indoor unit

Press the 2 Δ marks on the lower part of the indoor unit and unlatch the tabs. Then lift the indoor unit and unmount. (Fig. 3-68)

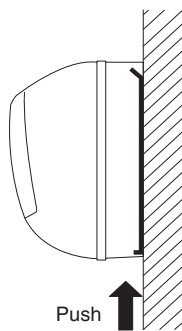


Fig. 3-68

3-19. Drain Hose

- a) The drain hose should be slanted downward to the outdoors. (Fig. 3-69)

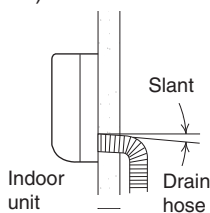


Fig. 3-69

- b) Never allow a trap to form 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. 3-70)

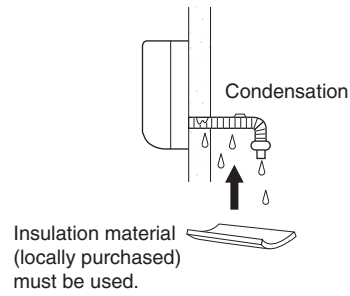


Fig. 3-70

* Foamed polyethylene or its equivalent is recommended.



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

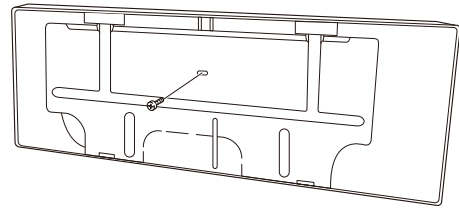


Risk of Electric Shock

■ **Wall Mounted Type (K1 Type)**
45, 56, 73, 106 types

3-20. Remove the Rear Panel from the Unit

- (1) Remove and discard the set screw on the rear panel. (Fig. 3-71)
- (2) Press the 2 Δ marks on the frame cover and disengage the stationary tabs from the frame. (Fig. 3-72)
- (3) Remove the rear panel by grasping the sections shown in Fig. 3-73 and pulling it in the direction shown by the arrow.



Set screw only for transportation

Fig. 3-71

NOTE

Tubing can be extended in 6 directions as shown in Fig. 3-75. 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, refer to "Switching drain hose and drain cap" on page 24.)

3-21. 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. 3-76)

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. 3-76)

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

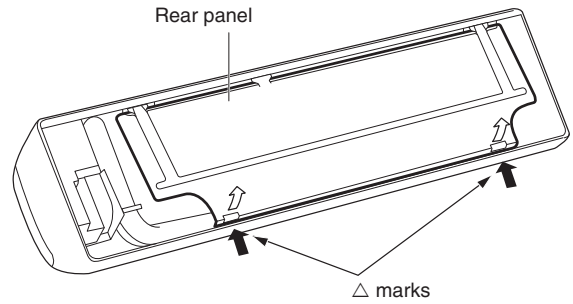


Fig. 3-72

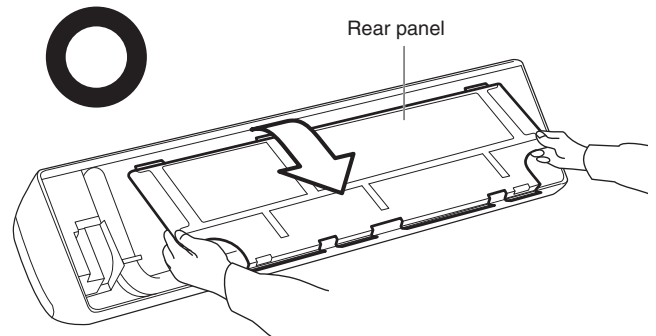


Fig. 3-73



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.

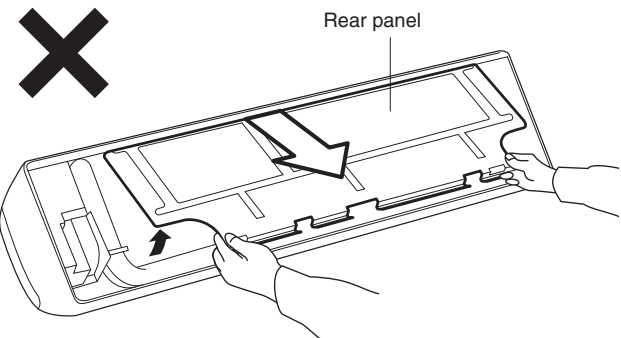
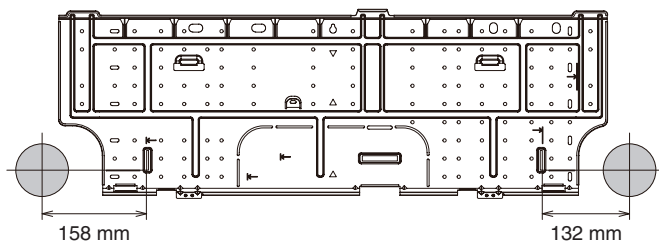


Fig. 3-74



Unit: mm

Fig. 3-76

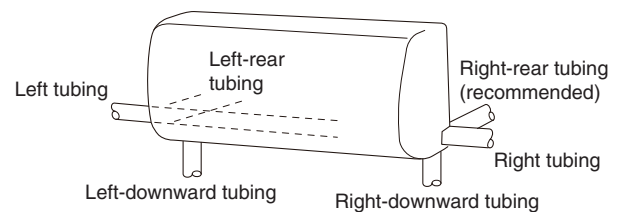


Fig. 3-75

- (4) Using a sabre saw, key hole saw or hole-cutting drill attachment, cut a hole in the wall. See Table 4 and Fig. 3-77.

Table 4

Hole Dia.
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 6 mm shorter than the thickness of the wall. (Fig. 3-78)
- (6) Place the plastic cover over the end of the pipe (for indoor side only) and insert the pipe in the wall. (Fig. 3-79)

3-22. 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. 3-80)
- 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 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. 3-81)
- (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.

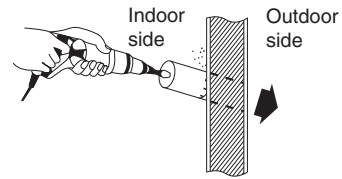
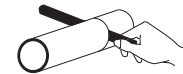


Fig. 3-77

PVC pipe (Locally purchased)



Cut at slight angle

Fig. 3-78

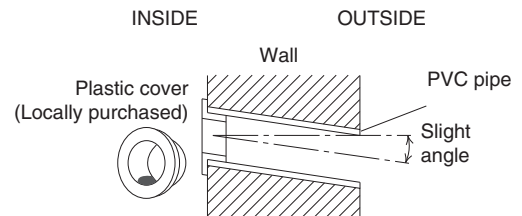


Fig. 3-79

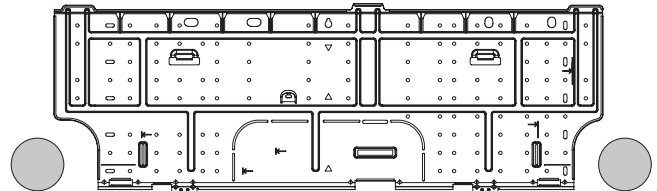


Fig. 3-80

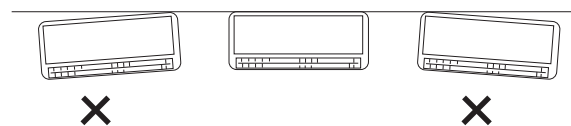


Fig. 3-81

3-23. 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. 3-82)
- (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. 3-82)
- (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. 3-83)
- (4) Remove the screw on the right side cover plate and remove the cover. (Fig. 3-83)
- (5) Remove the lower flap by disengaging 4 pins of the lower flap in order. (Figs. 3-84 and 3-85)
(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. 3-86)

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. 3-87)
- (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. 3-85))
- (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. 3-88)

NOTE

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

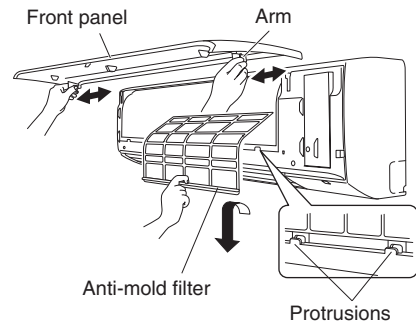


Fig. 3-82

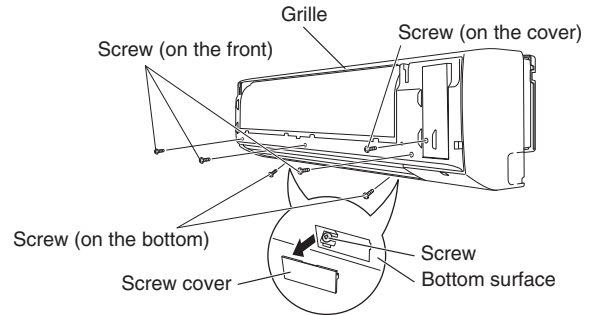


Fig. 3-83

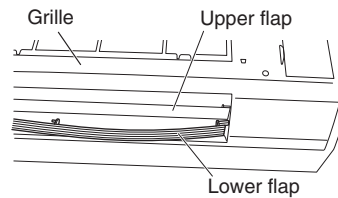


Fig. 3-84

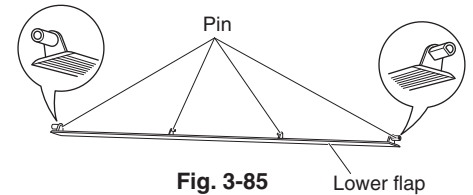


Fig. 3-85

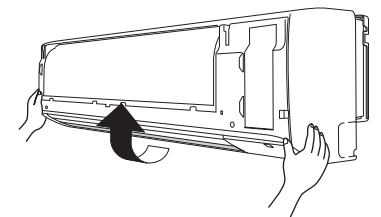


Fig. 3-86

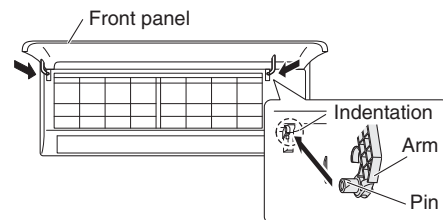


Fig. 3-87

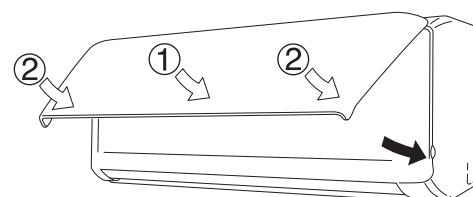


Fig. 3-88

3-24. 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. 3-89 and 3-90)
 - 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. 3-91)

3-25. 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.

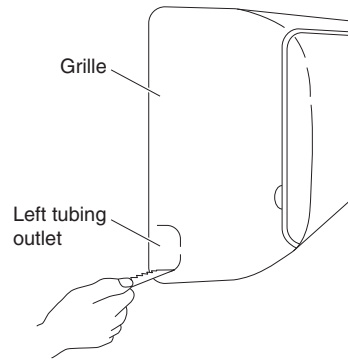


Fig. 3-89

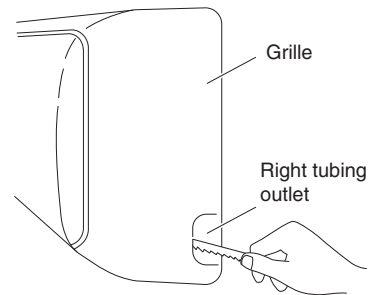


Fig. 3-90

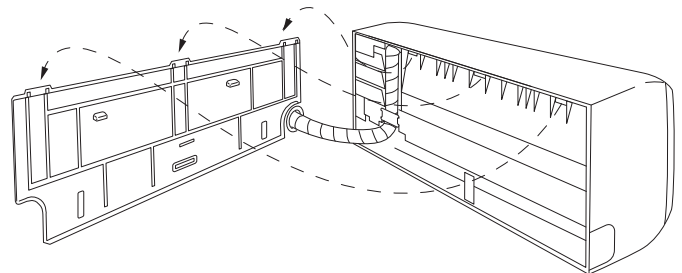


Fig. 3-91

3-26. 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. 3-92)

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. 3-93)

Right-side tubing

- (1) Shape the refrigerant tubing so that it can easily go into the wall hole. (Fig. 3-94)
- (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. 3-95)
- (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 with the tubing insulation. (Fig. 3-96)).
- (5) Assemble the refrigerant tubing, drain hose, and conduit (including inter-unit wiring) as shown in Fig. 3-97.

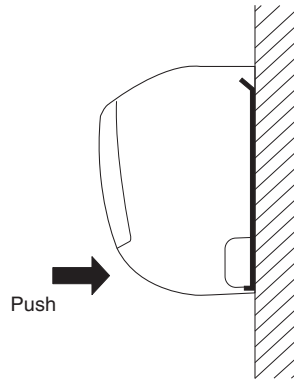


Fig. 3-92

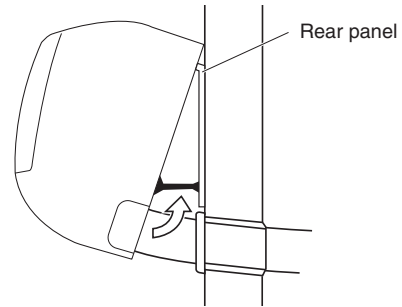


Fig. 3-93

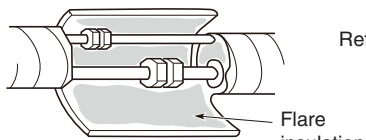


Fig. 3-96

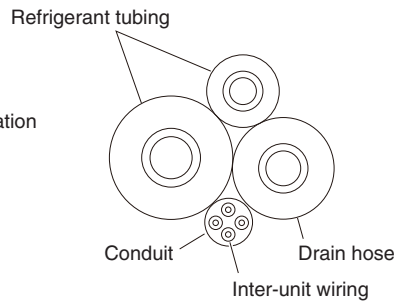


Fig. 3-97

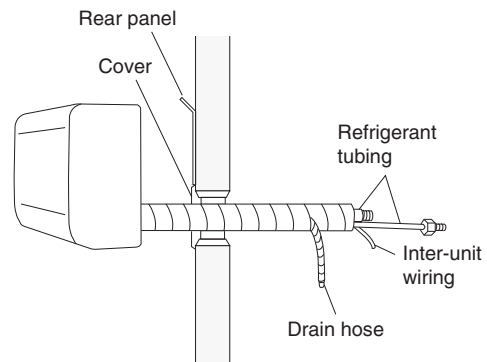


Fig. 3-94

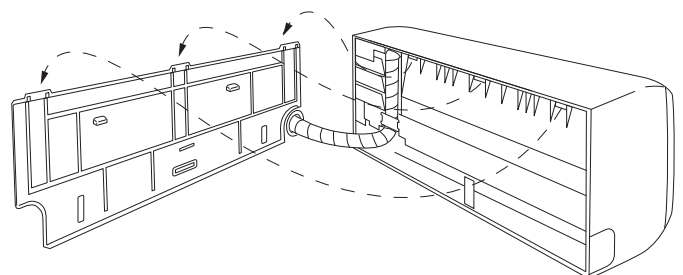


Fig. 3-95

■ **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. 3-98)
- (2) Switch the drain hose and drain cap.

Switching drain hose and drain cap

- (a) Locate the drain hose and the drain cap. (Fig. 3-99)
- (b) Remove the screw fastening the drain hose on the right side, and pull out the drain hose to remove it. (Fig. 3-99)
- (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. 3-100)

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. 3-101)

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. 3-100 and 3-102)

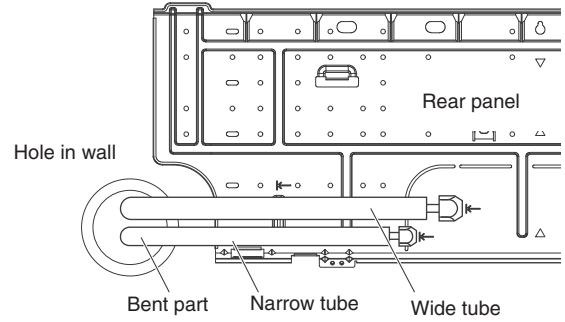


Fig. 3-98

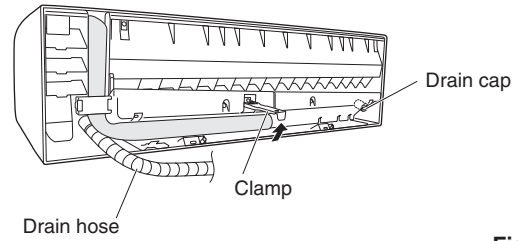


Fig. 3-99

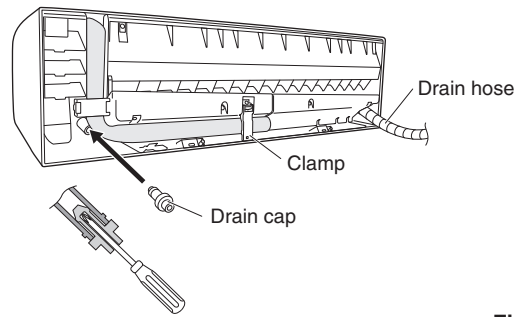


Fig. 3-100

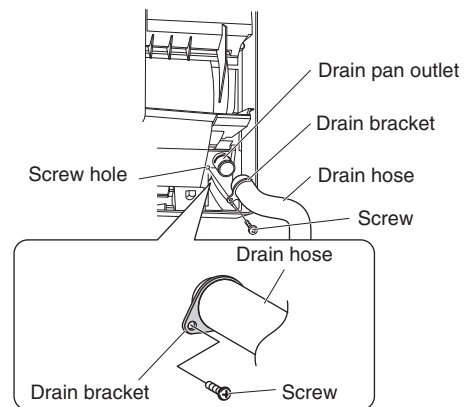


Fig. 3-101

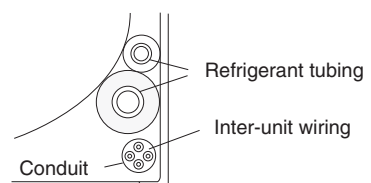


Fig. 3-102

To unmount indoor unit

- (1) Remove the screw cover on the bottom surface. (Fig. 3-104)
- (2) Fasten the frame to the rear panel using the 2 supplied tapping screws 4 x 10 mm. (Fig. 3-104)
- (3) Press the 2 Δ marks on the lower part of the indoor unit and unlatch the tabs. Then lift the indoor unit and unmount. (Fig. 3-103)

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 2 mm).

3-27. Drain Hose

- a) The drain hose should be slanted downward to the outdoors. (Fig. 3-105)
 - 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. 3-106)
- *Foamed polyethylene or its equivalent is recommended.

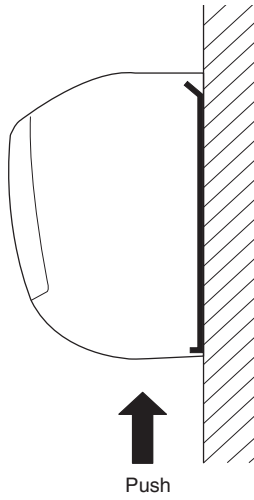


Fig. 3-103

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

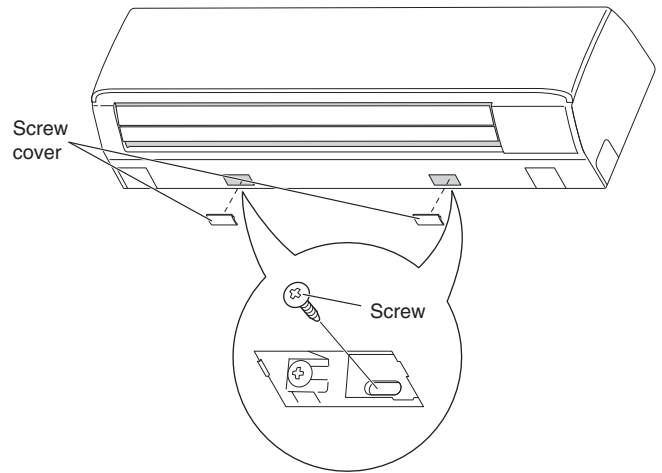


Fig. 3-104

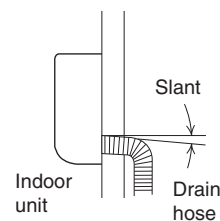


Fig. 3-105

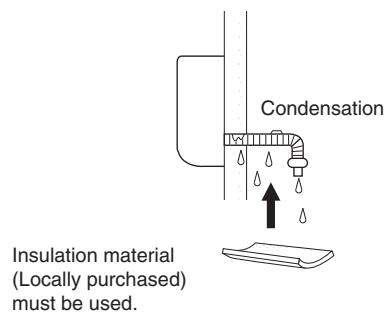


Fig. 3-106

■ Floor Standing Type (P1 Type)
 Concealed Floor Standing Type (R1 Type)

3-28. Required Minimum Space for Installation and Service

Install the unit where cooled or heated air from the unit can circulate well in the room. Do not put obstacles which may obstruct the air flow in front of the air intake and outlet grilles.

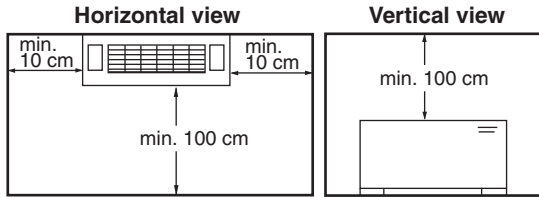


Fig. 3-107

NOTE

Ensure there is adequate space for maintenance of the electrical component box, air filter, and refrigerant tubes.

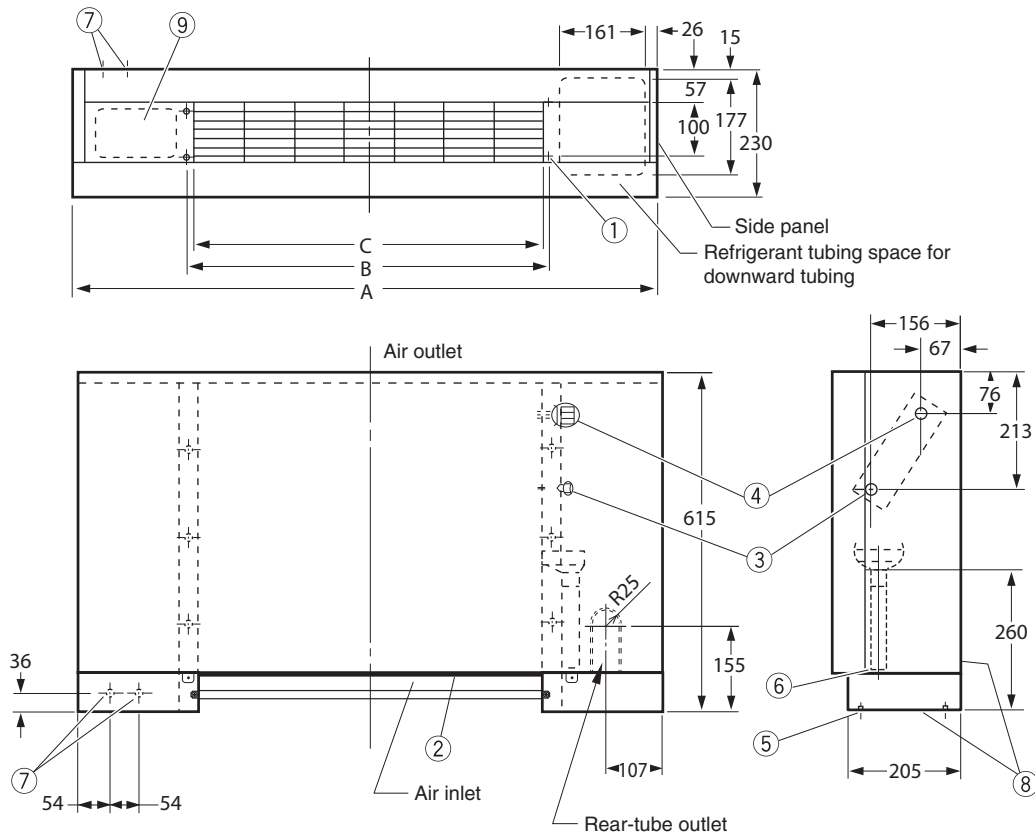
3-29. Dimensions and Part Names
 Floor Standing Type (P1 Type)

- ① 4- ϕ 12 holes (for fastening the indoor unit to the floor with screws)
- ② Air filter
- ③ Refrigerant connection outlet (liquid tube)
- ④ Refrigerant connection outlet (gas tube)
- ⑤ Level adjusting bolt
- ⑥ Drain outlet (20 A)
- ⑦ Power cord outlet (downward, rear)
- ⑧ Refrigerant tubing outlet (downward, rear)
- ⑨ Location for mounting the remote controller (remote controller can be attached within the room)

Table 3-3

Unit: mm

Length Type	A	B	C	Liquid tube	Gas tube
22, 28, 36	1065	665	632	ϕ 6.35	ϕ 12.7
45, 56	1380	980	947	ϕ 9.52	ϕ 15.88
73					



Unit: mm

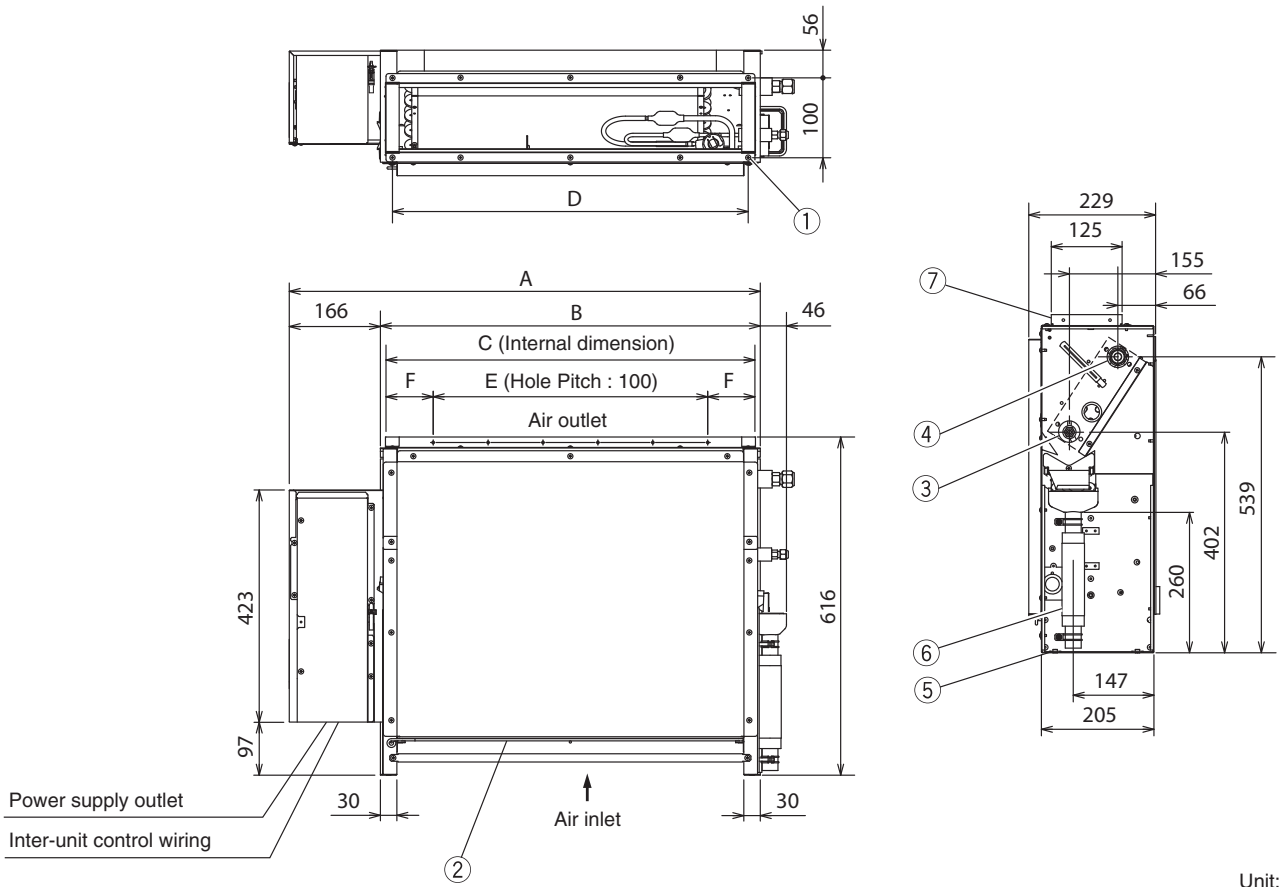
Fig. 3-108

Concealed Floor Standing Type (R1 Type)

- ① 4- ϕ 12 holes (for fastening the indoor unit to the floor with screws)
- ② Air filter
- ③ Refrigerant connection outlet (liquid tube)
- ④ Refrigerant connection outlet (gas tube)
- ⑤ Level adjusting bolt
- ⑥ Drain outlet (20A)
- ⑦ Flange for air-outlet duct

Table 3-4 Unit: mm

Length Type	A	B	C	D	E	F	Liquid tube	Gas tube
22, 28, 36	904	692	672	665	500	86	ϕ 6.35	ϕ 12.7
45, 56	1219	1007	1002	980	900	51	ϕ 9.52	ϕ 15.88
73								



Unit: mm

Fig. 3-109

NOTE

Make an opening in the housing of the unit so that maintenance service can be performed on the electrical component box, air filter, refrigerant tubing connection, and drain pipe.

3-30. Removing and Attaching the Front Panel (Floor Standing Type)

NOTE

A dew-prevention heater is secured behind the front panel. When removing or attaching the panel, take care not to damage the lead wire to the heater.

How to remove the front panel

- Remove the 2 screws at the lower part of the front panel.
- Holding **A** at the upper right of the unit, push up **B** at the lower right of the panel. The right side of the front panel is removed. Then remove the left side of the front panel following the same procedure.

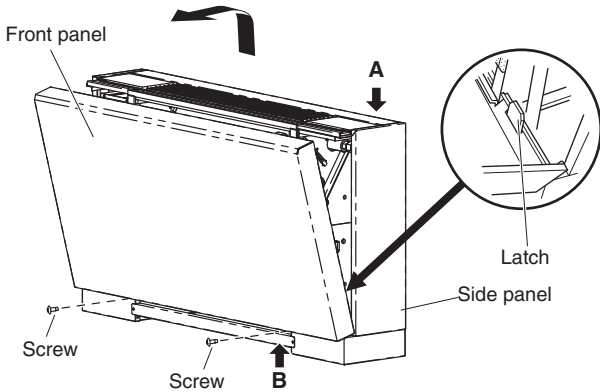


Fig. 3-110

- Disengage the lead wire connector (2P red) for the dew-prevention heater.
- Remove the string connecting the front panel of the unit by unhooking it from the fixture attached to the panel.

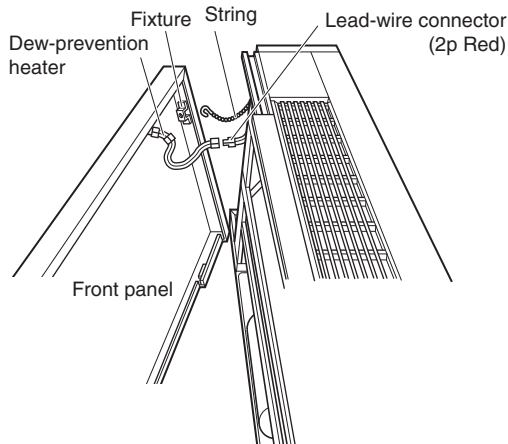


Fig. 3-111

How to attach the front panel

- Hook the string to the fixture of the front panel.
- Connect the lead wire connector.
- Align the slots at the lower part of the front panel to the tabs at the lower part of the indoor unit and put the upper trim tab of the front panel on the groove of the unit. Then press down the panel.
- Insert the 2 screws at the lower part of the front panel.

3-31. Installing the Refrigerant Tubing

- When connecting the gas tube use the supplied tubing.
- Tubes can be extended in 2 directions: downward and at rear.

For Floor Standing type

- When a rear tube is required, it can run through the rear-tube outlet of the rear panel.

- When a downward tube is required, refer to the opening dimensions shown in Fig. 3-112.

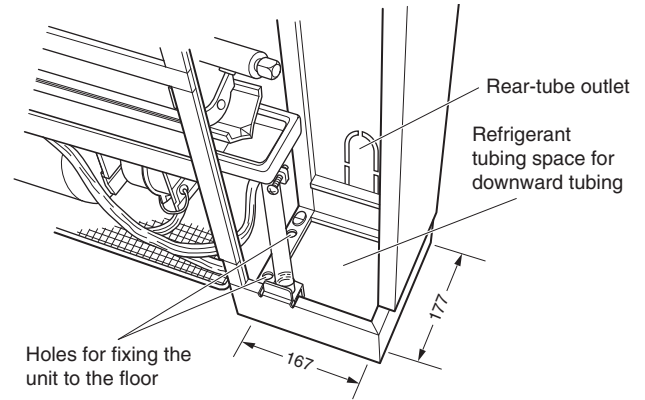


Fig. 3-112

CAUTION

Insulate both gas and liquid tubes.

- To insulate tubes

- Wrap the flare nuts with the supplied white insulating tape.
- Wrap the flare nuts with the supplied flare insulator.
- Fill the clearance between the union insulator and flare insulator with black insulating tape. Fasten both ends of the flare insulator with the supplied vinyl clamps.

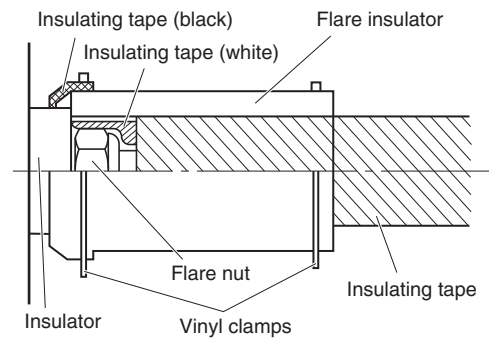


Fig. 3-113

3-32. Installing the Drain Piping

CAUTION

Water leaks may occur if the drain pipes are connected inadequately.

- When rear-side drain piping is required bend the drain hose attached to the indoor unit by 90°. Connect a drain pipe (field supply) to the drain hose through the rear tubing outlet in the rear panel. Use a hard PVC pipe (O.D. 25 mm) for the drain piping.

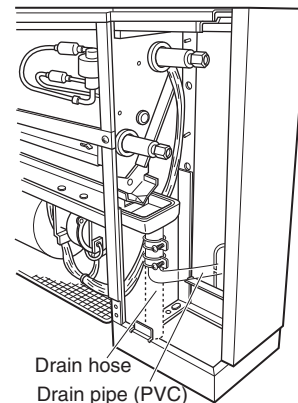


Fig. 3-114

- (2) Ensure that the drain pipe has a downward gradient of 1/100 or more and that there are no water traps.
- (3) Provide insulation for the drain pipe.
- (4) After the drain piping is completed, pour water into the drain pan to check that the water drains smoothly.
- (5) Remove any dust or debris in the drain pan so that the pipe is not clogged.

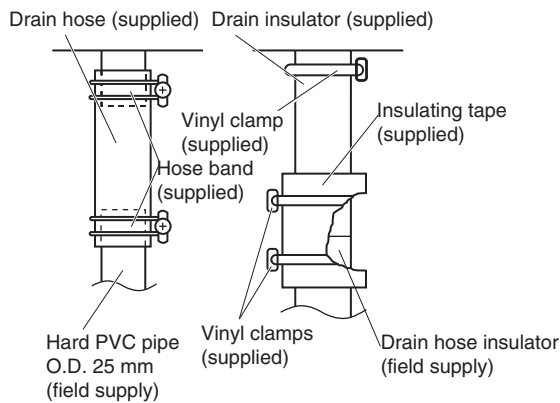


Fig. 3-115

3-33. Installing the Remote Controller

A remote controller (optional wired remote controller) can be mounted in the indoor unit (Floor Standing type).

- (1) Remove the cover of the optional wired remote controller. (Fig. 3-116)

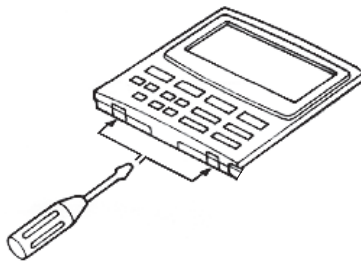


Fig. 3-116

To remove the cover from the remote controller, insert a screwdriver between the cover and the controller as shown in the figure above, and pry off the cover.

- (2) Remove the front panel. Remove the screws and fixture. (Fig. 3-117)
- (3) Place the remote controller into the space in the unit as shown in Fig. 3-117. Assemble the lead wires of the remote controller to its rear side center and route them to the lead wire guide.

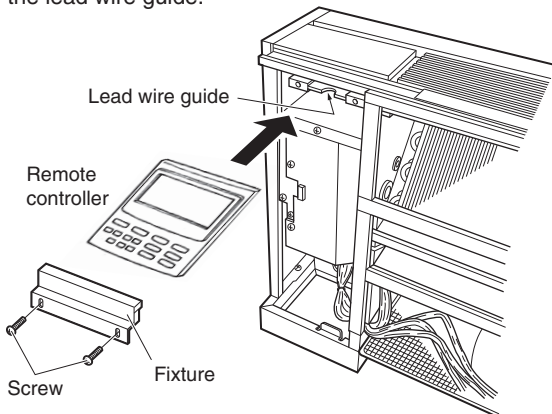


Fig. 3-117

- (4) Secure the fixture using the supplied screws.

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.
- (2) Provide a power outlet to be used exclusively for each unit, and a power supply disconnect and circuit breaker for overcurrent protection should be provided in the exclusive line.
- (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 both sides.
- (9) If the power supply cord of this appliance is damaged, it must be replaced by a repair shop appointed by the manufacturer, because special-purpose tools are required.

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

Indoor unit

Type	(B) Power supply	Time delay fuse or circuit capacity
	2.5 mm ²	
K1	Max. 150 m	10 – 16A
D1, L1, P1, R1	Max. 130 m	10 – 16A

Control wiring

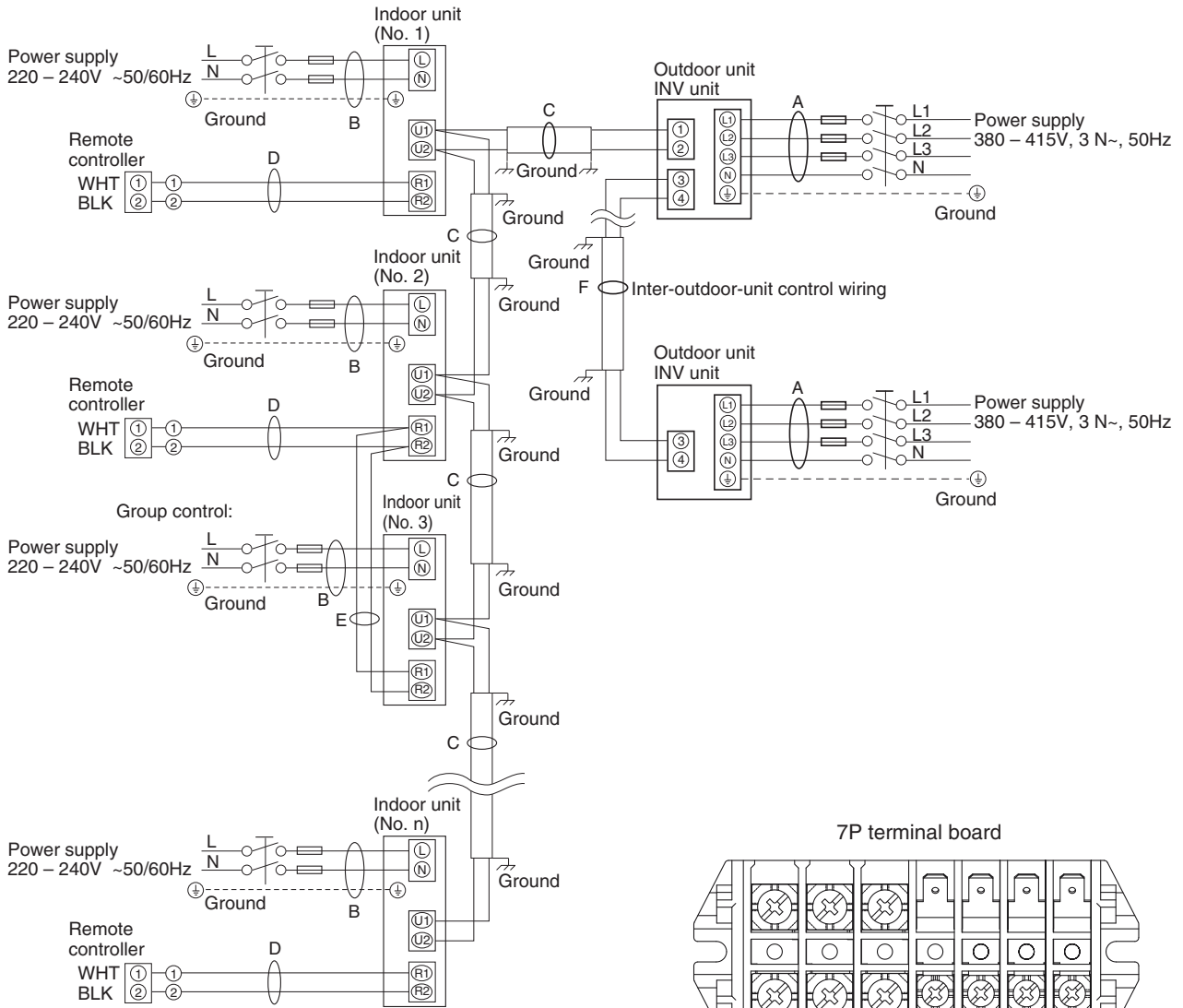
(C) Inter-unit (between outdoor and indoor units) control wiring	(D) Remote control wiring
0.75 mm ² (AWG #18) Use shielded wiring*	0.75 mm ² (AWG #18)
Max. 1,000 m	Max. 500 m
(E) Control wiring for group control	(F) Inter-outdoor unit control wiring
0.75 mm ² (AWG #18)	0.75 mm ² (AWG #18) Use shielded wiring
Max. 200 m (Total)	Max. 300 m

NOTE

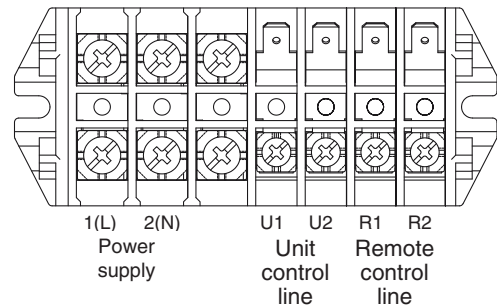
* With ring-type wire terminal.

4-3. Wiring System Diagram

ex.) MF1 Type

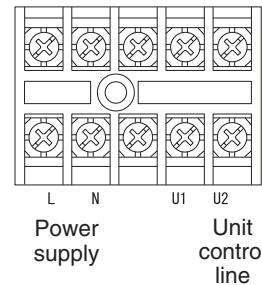


7P terminal board



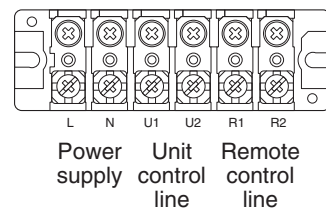
D1, L1 Type

5P terminal board



K1 Type

6P terminal board



P1, R1 Type

NOTE

- (1) Refer to Section 4-2. "Recommended Wire Length and Wire Diameter for Power Supply System" for the explanation of "A," "B," "C," "D," "E," and "F," in the above diagram.
- (2) The basic connection diagram of the indoor unit shows the terminal boards, 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 outdoor unit. Auto address setting can be executed by remote controller automatically.



- (1) When linking outdoor units in a network, disconnect the terminal extended from the short plug 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. 4-1)

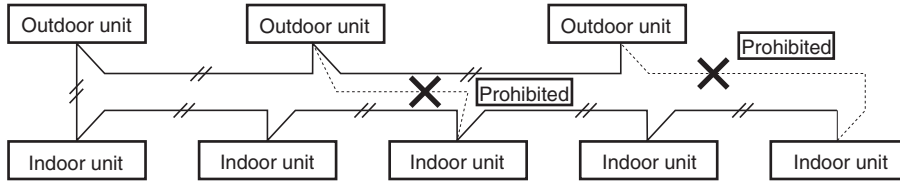


Fig. 4-1

- (3) Do not install inter-unit control wiring such as star branch wiring. Star branch wiring causes mis-address setting.

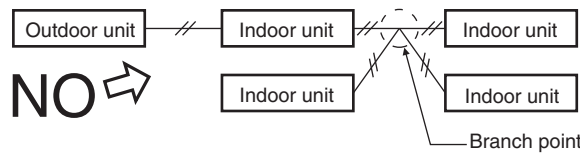


Fig. 4-2

- (4) If branching the inter-unit control wiring, the number of branch points should be 16 or fewer.
(Branches less than 1 m are not included in the total branch number.) (Fig. 4-3)

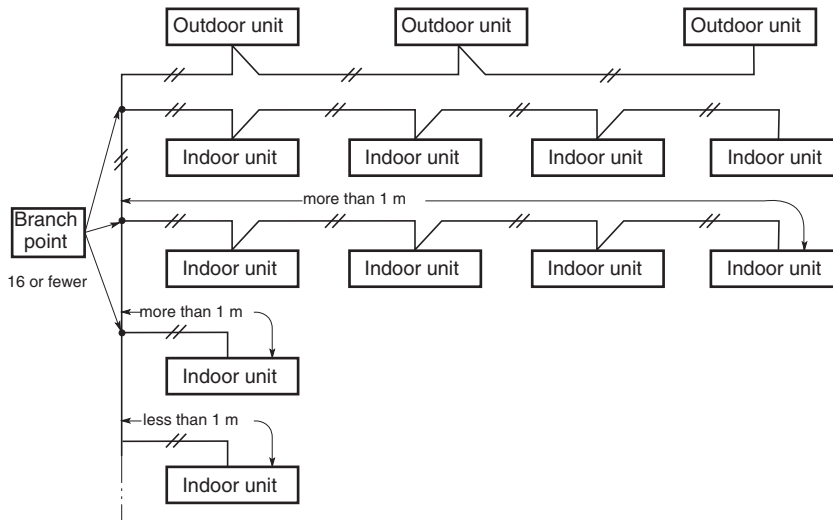


Fig. 4-3

- (5) Use shielded wires for inter-unit control wiring (c) and ground the shield on both sides, otherwise misoperation from noise may occur. (Fig. 4-4)
Connect wiring as shown in Section 4-3. "Wiring System Diagram."

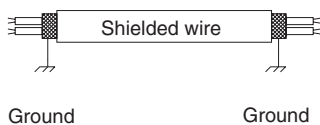


Fig. 4-4



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

When connecting each power wire to the terminal, follow the instructions in "How to connect wiring to the terminal" and fasten the wire securely with the fixing screw of the terminal plate.

- (6) Use the standard power supply cables for Europe (such as H05RN-F or H07RN-F which conform to CENELEC (HAR) rating specifications) or use the cables based on IEC standard. (245 IEC57, 245 IEC66)

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 about 10 mm and tightly twist the wire ends. (Fig. 4-5)
- (2) Using a Phillips head screwdriver, remove the terminal screw(s) on the terminal plate.
- (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. 4-6)

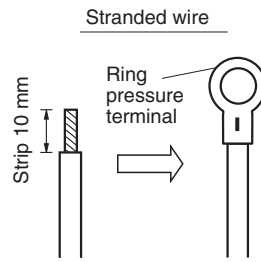


Fig. 4-5

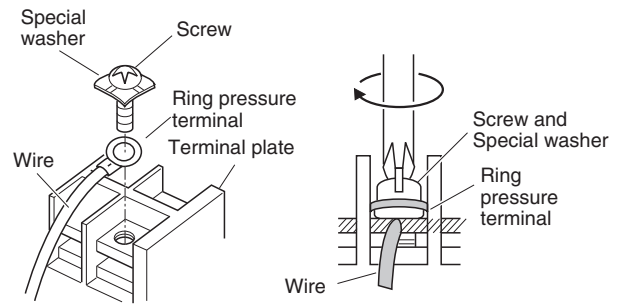


Fig. 4-6

■ Examples of shield wires

- (1) Remove cable coat not to scratch braided shield. (Fig. 4-7)
- (2) Unbraid the braided shield carefully and twist the unbraided shield wires tightly together. Insulate the shield wires by covering them with an insulation tube or wrapping insulation tape around them. (Fig. 4-8)
- (3) Remove coat of signal wire. (Fig. 4-9)
- (4) Attach ring pressure terminals to the signal wires and the shield wires insulated in Step (2). (Fig. 4-10)



Fig. 4-7

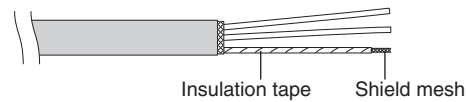


Fig. 4-8

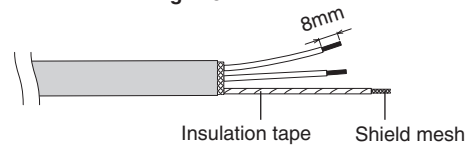


Fig. 4-9

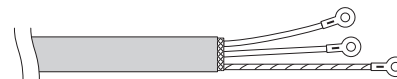
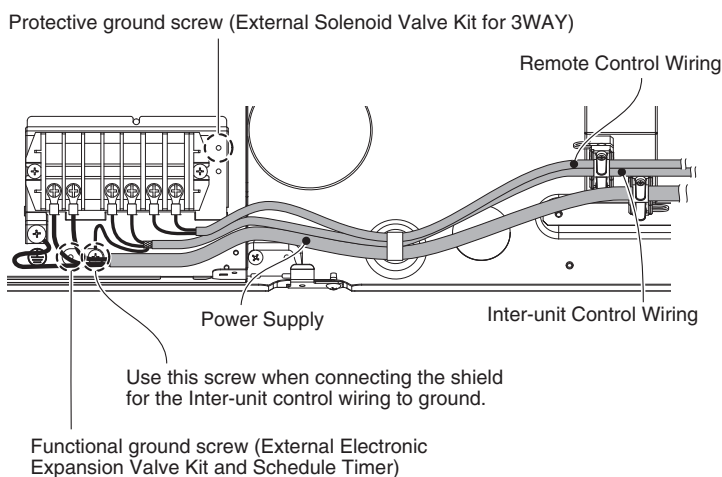


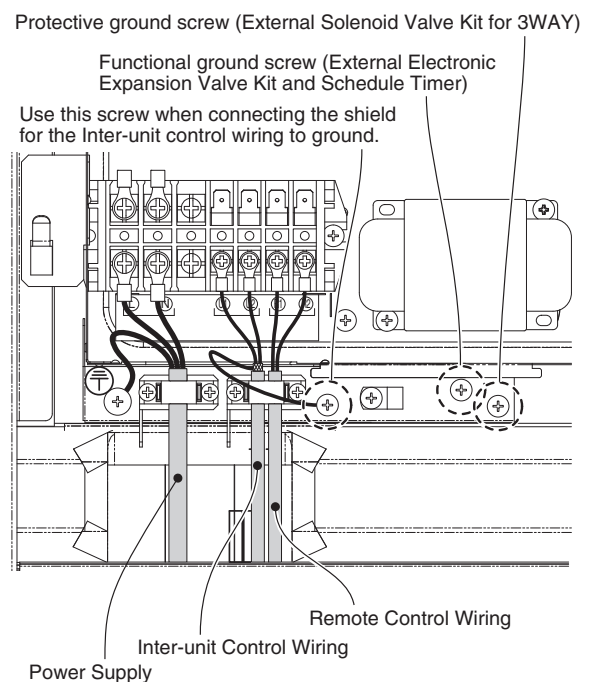
Fig. 4-10

■ Wiring samples

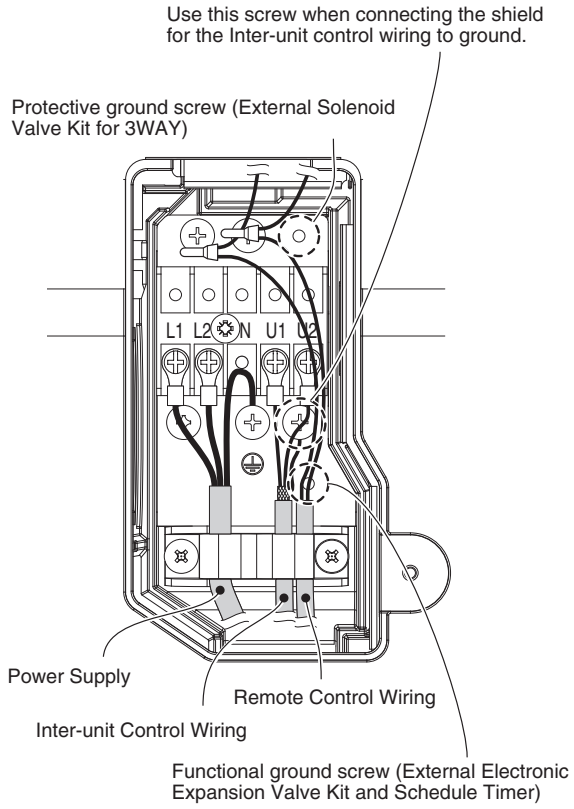
D1 type



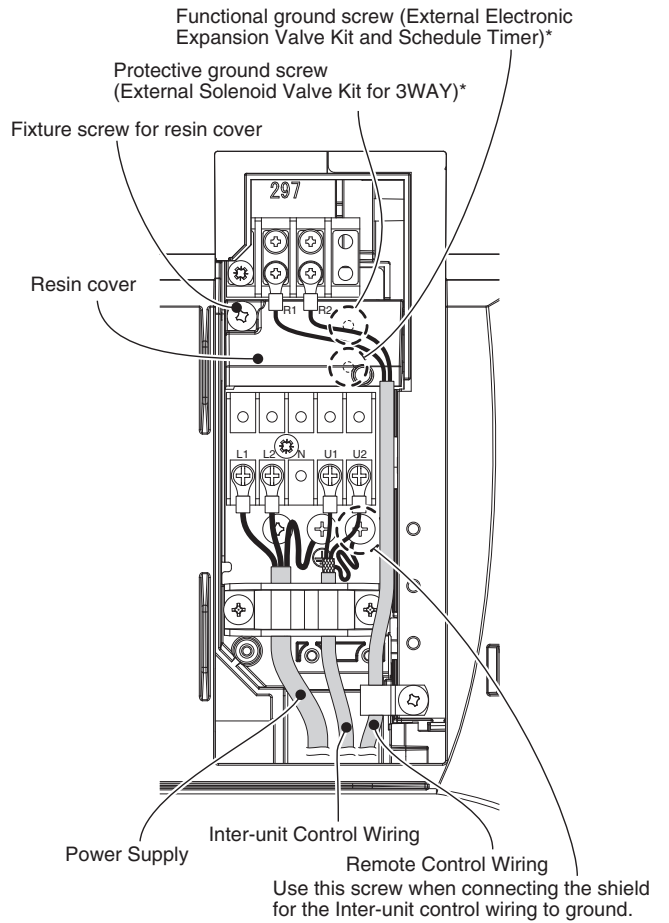
L1 type



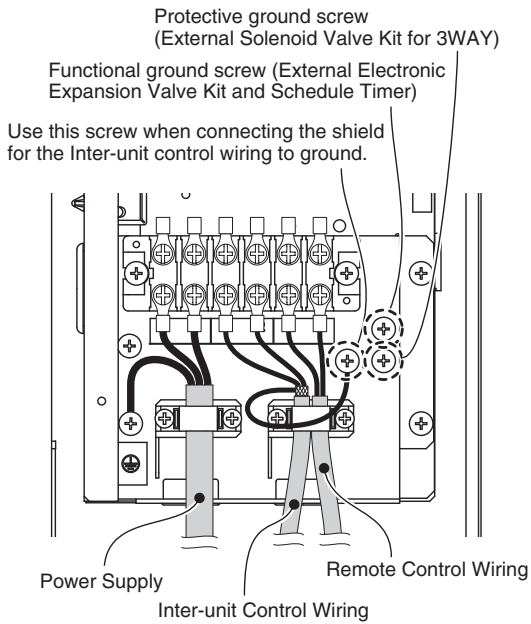
K1 type (22, 28, 36 types)



K1 type (46, 56, 73, 106 types)



P1, R1 types



* 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

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. 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 file. This process is important and should be done carefully to make a good flare. Be sure to keep any contaminants (moisture, dirt, metal filings, etc.) from entering the tubing. (Figs. 5-1 and 5-2)

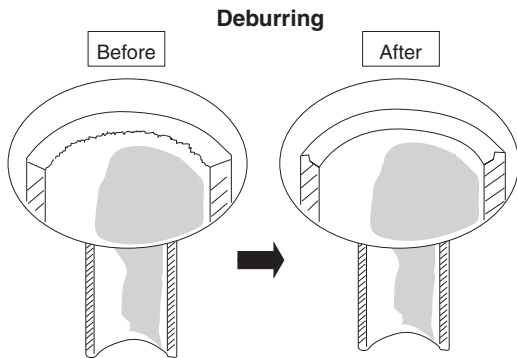


Fig. 5-1

NOTE

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

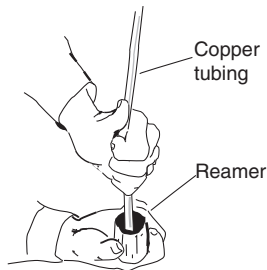


Fig. 5-2

- (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 copper tube with a flare tool. (Fig. 5-3)

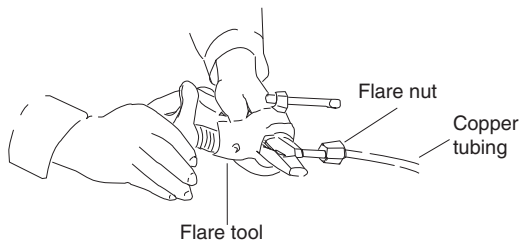


Fig. 5-3

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 (ether oil) to the surface of a flare before making piping connections. Pay attention not to attach the oil to the surface of screw. This is effective for reducing gas leaks. (Fig. 5-4)

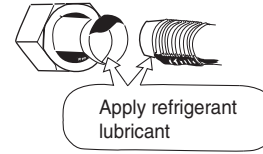


Fig. 5-4

- (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)

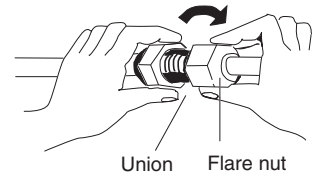


Fig. 5-5

- 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.

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.
- (2) To fasten the flare nuts, apply specified torque.

Indoor Unit Tubing Connection ($l_1, l_2 \dots l_{n-1}$)

Indoor unit type	22	28	36	45	56	73	106
Gas tubing (mm)			ø12.7			ø15.88	
Liquid tubing (mm)			ø6.35			ø9.52	

- When removing the flare nuts from the tubing connections, or when tightening them after connecting the tubing, be sure to use two adjustable wrenches or spanners as shown. (Fig. 5-6)

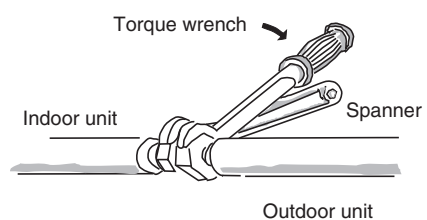


Fig. 5-6

If the flare nuts are over-tightened, the flare may be damaged, which could result 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.

Tube diameter	Tightening torque, approximate	Tube thickness
ø6.35 (1/4")	14 – 18 N · m (140 – 180 kgf · cm)	0.8 mm
ø9.52 (3/8")	34 – 42 N · m (340 – 420 kgf · cm)	0.8 mm
ø12.7 (1/2")	49 – 61 N · m (490 – 610 kgf · cm)	0.8 mm
ø15.88 (5/8")	68 – 82 N · m (680 – 820 kgf · cm)	1.0 mm
ø19.05 (3/4")	100 – 120 N · m (1000 – 1200 kgf · cm)	1.0 mm

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.

- 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 200 mm.

5-3. Insulating the Refrigerant Tubing

Tubing Insulation

- Thermal insulation must be applied to all unit tubing, including distribution joint (purchased separately).

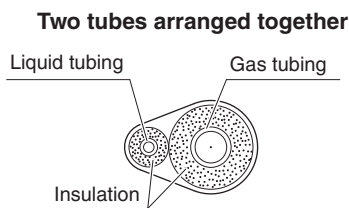


Fig. 5-7

* For gas tubing, the insulation material must be heat resistant to 120°C or above. For other tubing, it must be heat resistant to 80°C or above.

Insulation material thickness must be 10 mm or greater.

If the conditions inside the ceiling exceed DB 30°C and RH 70%, increase the thickness of the gas tubing insulation material by 1 step.



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

NOTE

Gas Leakage Detector

Note that the gas leakage detector should be capable of detecting the refrigerant R410A.

Air Purging

Refer to "AIR PURGING" in the separate Installation Instructions for the outdoor unit in regard to air purging with a vacuum pump (for test run) preparation.

Taping the flare nuts

Cover up the tubing connections with the supplied flare insulator. Then fasten the insulator at both ends with the vinyl clamps (field supply).

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.

Never grasp the drain or refrigerant connecting outlets when moving the unit.



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.

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 the 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. 5-8)

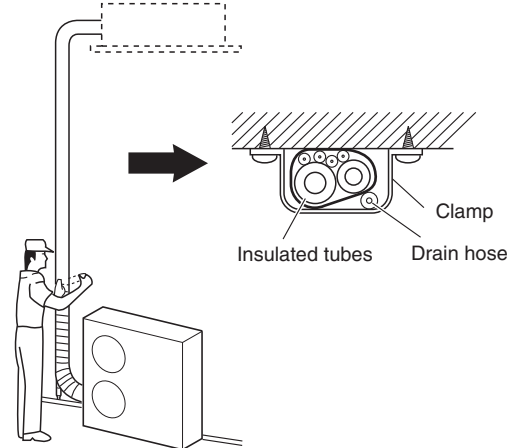


Fig. 5-8

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. 5-9)

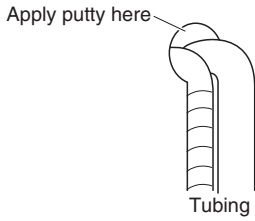


Fig. 5-9

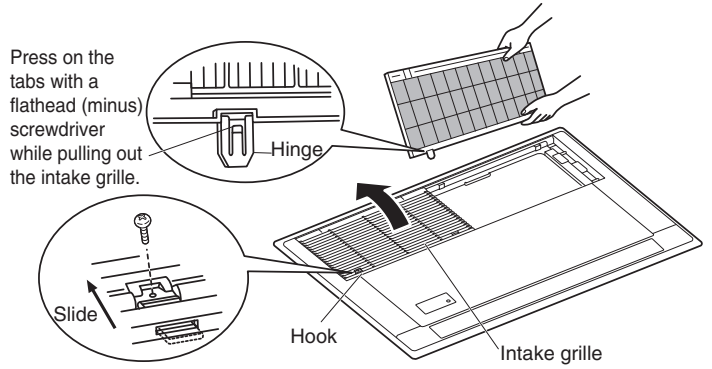


Fig. 7-1

6. HOW TO INSTALL THE REMOTE CONTROLLER (OPTIONAL PART)

NOTE

Refer to the Operating Instructions attached to the optional Remote Control Unit.

7. HOW TO INSTALL THE CEILING PANEL

■ 1-Way Cassette Type (D1 Type)

Component Parts

Unit: mm

Part name	Quantity	Appearance
Ceiling panel	1	
Short-circuit connector	1	(2P, yellow) Used for high ceiling installation
Washer-head screw	4	M5 x 40
Screw	2	4 x 12 For fastening side panel
Screw	2	4 x 35 For fastening front/rear center of panel

7-1. Installing the Panel on the Indoor Unit

7-1-1. Removing the intake grille

- (1) Remove the 2 screws that fasten each of the 2 grilles in place. (Fig. 7-1)
- (2) Slide the intake grille hooks (2 locations) in the direction of the arrow to open the intake grille. (Fig. 7-1)
- (3) When the intake grille is open, use a flathead (minus) screwdriver to press on the rear hinge tabs (2 locations), then remove the intake grille. (Fig. 7-1)

7-1-2. Removing the side panels

- (1) Slide the side panels in the direction of the arrow ① to remove them (2 locations, left and right). (Fig. 7-2)

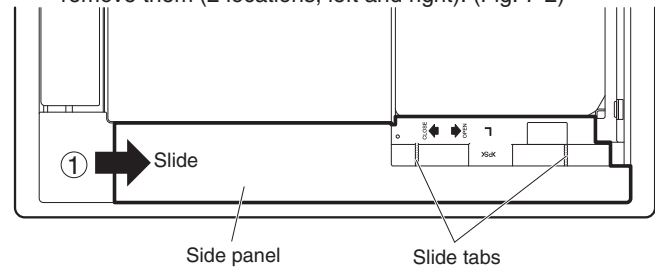


Fig. 7-2

7-1-3. Installing the ceiling panel

- (1) Fasten the hooks on both sides of the ceiling panel to the indoor unit. The hooks on one side (2 locations) are stationary, while the hook on the other side is movable. (Fig. 7-3)
 - (2) Place the panel at a slight angle, and fasten the panel stationary hooks onto the hook receivers on the side of the indoor unit.
 - (3) After verifying that the hooks are fastened, press the other side of the panel up so that it is level. Press up until the movable hook has fastened to the hook receiver on the indoor unit.
 - (4) Verify that the hooks on both sides of the ceiling panel have been securely fastened before removing your hands. At this point the panel is provisionally attached to the indoor unit.
- When removing the panel, press the movable hook toward the inside while being careful to support the panel. (Fig. 7-4)

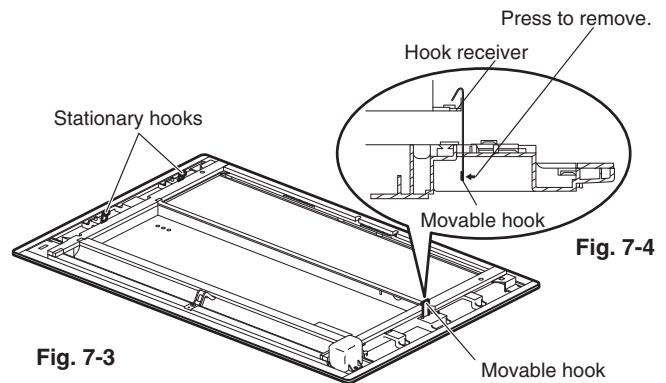


Fig. 7-3

Fig. 7-4

- (5) Align the panel installation holes with the screw holes in the indoor unit.
- (6) Fit the supplied washer-head screws into the 4 panel installation holes, and tighten them until the panel is tightly attached to the indoor unit. (Fig. 7-5)

- (7) Fit the supplied screws into the holes at the panel center (2 locations, front and rear), and tighten them. As shown in the Fig. 7-6, open the screw cover at the center of the discharge outlet, then insert and tighten the screw, and again close the cover.

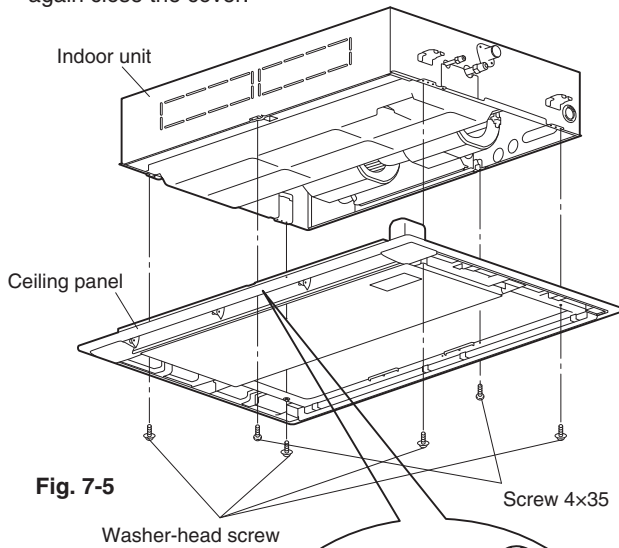


Fig. 7-5

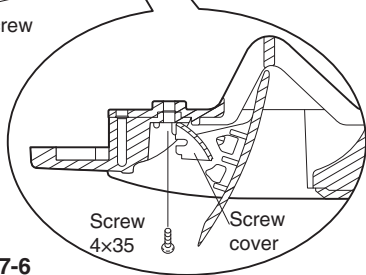


Fig. 7-6

- (8) Verify that the panel is tightly attached to the ceiling.
- At this time, make sure there is no gap between the indoor unit and the ceiling panel, or between the ceiling panel and the ceiling surface. (Fig. 7-7)

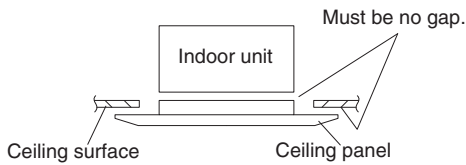


Fig. 7-7

- If there is a gap between the panel and the ceiling surface, leave the panel attached and make fine adjustments to the installation height of the indoor unit to eliminate the gap with the ceiling surface. (Fig. 7-8)

Insert a spanner or other general tool through the side panel installation hole and make fine adjustments to the indoor unit nuts.

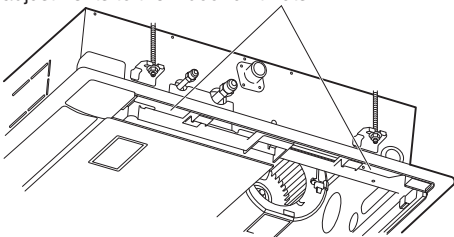
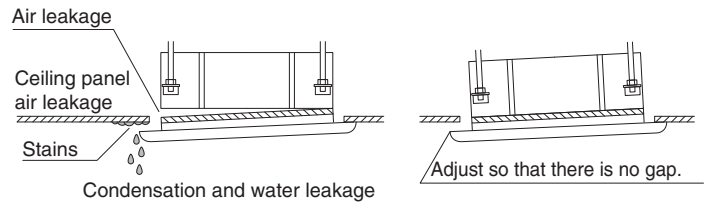


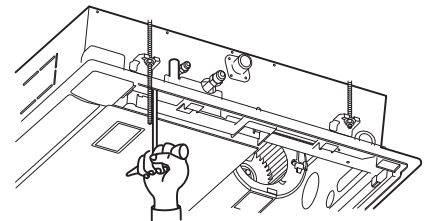
Fig. 7-8

CAUTION

- If the screws are not fully tightened, problems such as those shown below may occur. Be sure to tighten the screws securely.
- If there is a gap between the ceiling surface and the ceiling panel even when the screws are fully tightened, readjust the height of the indoor unit.



For small adjustments that do not affect the levelness of the indoor unit, drain piping or other key elements, the unit height can be adjusted through the ceiling side panel installation holes without removing the ceiling panel.



7-1-4. Wiring the ceiling panel

- (1) Remove the cover from the electrical component box. (Fig. 7-9)

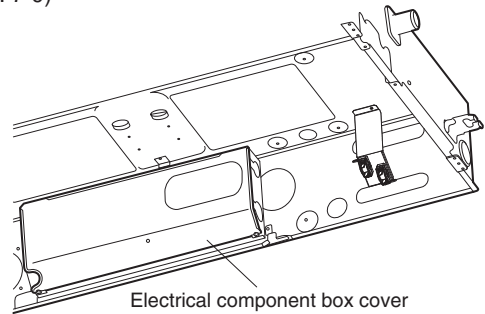


Fig. 7-9

- (2) Fasten the wiring connector (7P, red) that emerges from the ceiling panel using the lead wire clamps on the indoor unit side (2 locations). Then connect it to the connector in the indoor unit electrical component box. (Fig. 7-10)

* Fasten with the indoor unit lead wire clamps (2 locations).

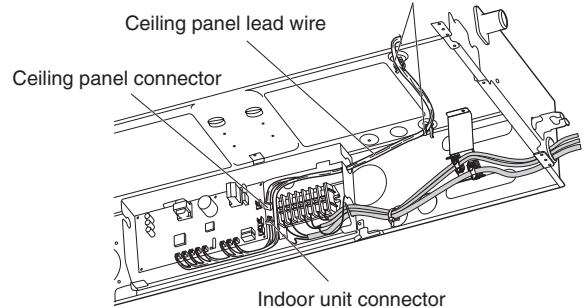


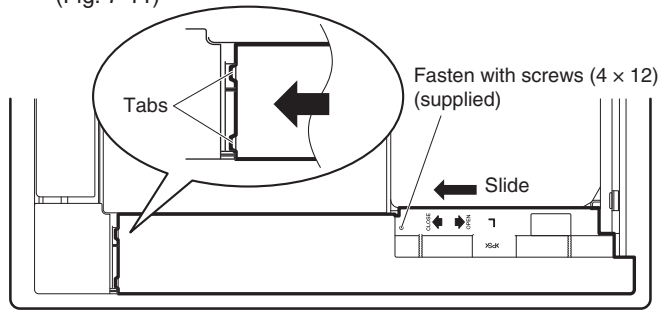
Fig. 7-10

- If the connector is not connected, the automatic flap will not operate. Connect the connector securely.
- Verify that the wiring connector is not pinched between the electrical component box and the cover.
- Verify that the wiring connector is not pinched between the indoor unit and the ceiling panel.

7-1-5. Installing the side panel and intake grille

A. Installing the side panel

- (1) Slide the side panel in the direction of the arrow to install it. (Fig. 7-11)



Slide the side panel so that the side panel tabs are fastened to the ceiling panel. Then fasten in place with the supplied screws (4 x 12).

Fig. 7-11

- (2) Use the supplied screws (4 x 12) to attach the side panel to the ceiling panel.

B. Installing the intake grille

- To install the intake grille, follow the steps for removing the intake grille in the reverse order.
- When installing the intake grille, take care that the flap lead wire does not become pinched. (Fig. 7-12)

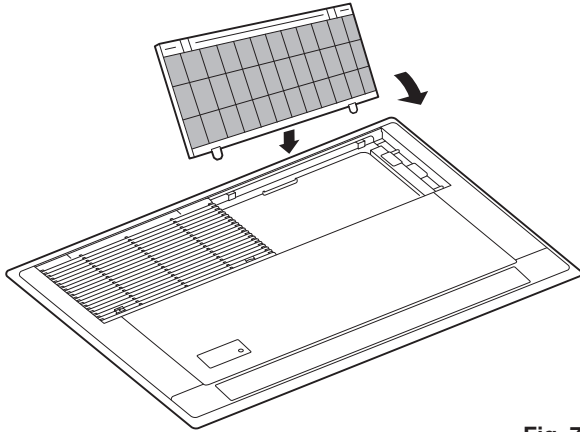


Fig. 7-12

7-2. Other

A. Check after installation

- Verify again that there is no gap between the indoor unit and the ceiling panel, or between the ceiling panel and the ceiling surface.
*If a gap is present, water leakage and condensation may occur.
- Verify that the wiring connections are secure.
*If the wiring is not connected, the automatic flap will not operate. (Alarm P09 will be displayed at the remote controller.) In addition, water leakage and condensation may occur.

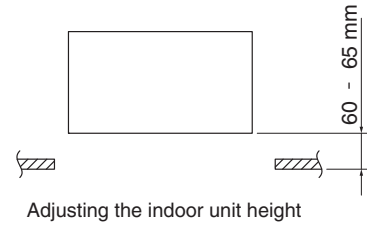
B. Units with wireless remote controllers

- For details of the installation procedure, refer to the installation instructions that was supplied with the optional wireless remote controller with receiver embedded in the indoor unit.

■ 2-Way Cassette Type (L1 Type) (For 22, 28, 36, 45, 56 Types)

7-3. Before Installing the Ceiling Panel

- (1) Be sure to create a ceiling opening with the dimensions shown in Fig. 3-19.
- (2) Use the suspension bolts to adjust the height of the indoor unit so that the distance between the bottom of the indoor unit or optional filter chamber and the ceiling surface is 60 – 65 mm. (Fig. 7-13)



Adjusting the indoor unit height

Fig. 7-13



CAUTION
Never touch or attempt to move the air-direction louver by hand or you may damage the unit. Instead, use the remote controller if you want to change the direction of air flow.

7-4. Installing the Ceiling Panel

- (1) Open the air intake panel and air filter.
[1] Push in. → (2) Slide. → (3) Pull. (→ (4) Remove.)

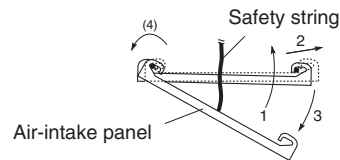


Fig. 7-14

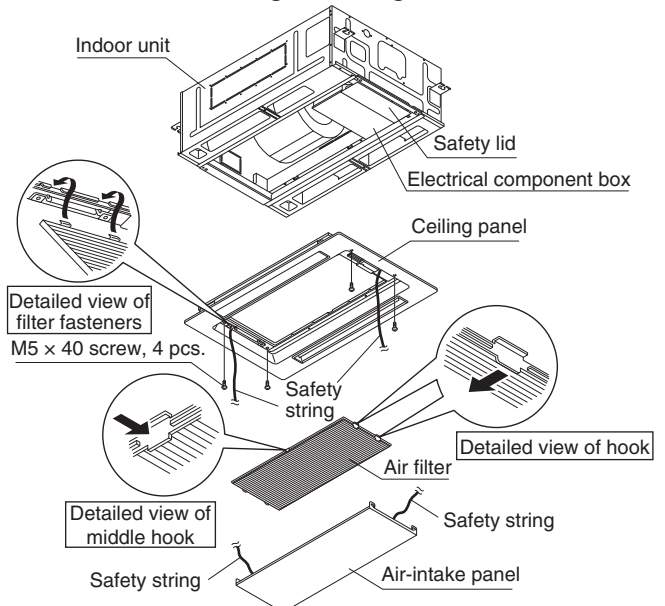
NOTE

If you wish to remove the air-intake panel, remove the strings attached to the air-intake panel. The air-intake panel is removed from the ceiling panel. Be sure to reattach the string to the air-intake panel when returning to the original position.

- [2] Removing the air filter

Press the hook by hand to remove the air filter. (Fig. 7-15)

Installing the Ceiling Panel



(2) Install the ceiling panel onto the indoor unit. (See Fig. 7-15. The connector is on the electrical component box.)

- [1] Fasten the stationary fasteners (opposite side of the connector) to the indoor unit. (Fig. 7-16a) Next, lift up the connector side and fasten the movable fastener onto the indoor unit. (Fig. 7-16b)

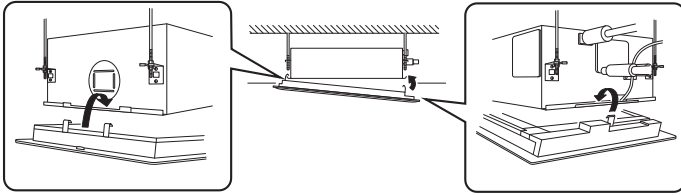


Fig. 7-16a

Fig. 7-16b

At this time, check that the movable fastener locks with a click sound onto the indoor unit.

The ceiling panel includes these provisional-fastening fasteners to facilitate installation onto the indoor unit.

- [2] Check that the ceiling panel is provisionally fastened to the indoor unit.
- [3] Next use the supplied screws (four M5 × L40 screws with washers) to fasten the ceiling panel in place.
- [4] When installation of the ceiling panel is completed, connect the 8P red connector inside the indoor unit electrical component box to the connector from the ceiling panel. (Fig. 7-17) (If this connector is not connected, the error message "P09" is displayed on the remote controller and the unit will not operate.)

Connecting the connector

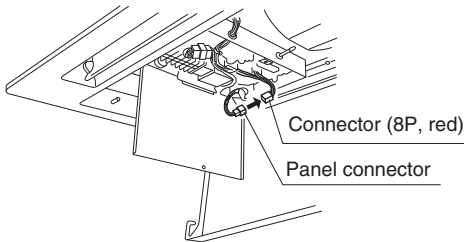


Fig. 7-17

Operating the movable fastener

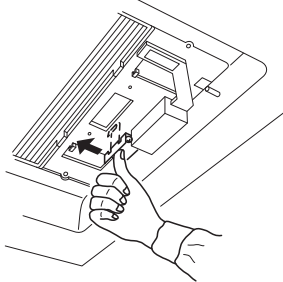


Fig. 7-18

- [5] Check that the ceiling panel and ceiling surface are in tight contact, then install the air filter and air intake panel.

7-5. Removing the Ceiling Panel for Servicing

When removing the ceiling panel for servicing, remove the air-intake grille and air filter, disconnect the wiring connector inside the electrical component box, and then remove the 4 mounting screws.

Release one side of the panel by pressing the panel catch in the direction of the arrow. (See Caution.) Completely remove the ceiling panel by disengaging the stationary catch. (Figs. 7-16a and 7-16b)



When the air filter is removed, the rotator and live parts are exposed at the openings and these can cause a danger. Therefore be particularly careful.

2-Way Cassette Type (L1 Type) (For 73 Type)

7-6. Before Installing the Ceiling Panel

- (1) Adjust the distance between the unit and the surface of the ceiling (60 mm) using the 2 hexagonal nuts as shown in Fig. 7-19 while following the installation gauge.

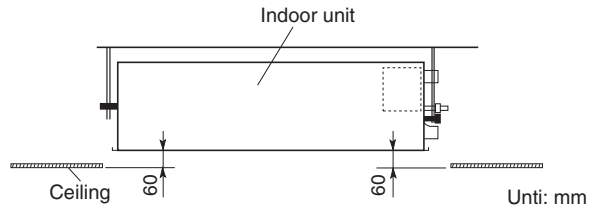


Fig. 7-19

- (2) Remove the air-intake panel and the air filter from the ceiling panel as shown in Figs. 7-20 and 7-21.

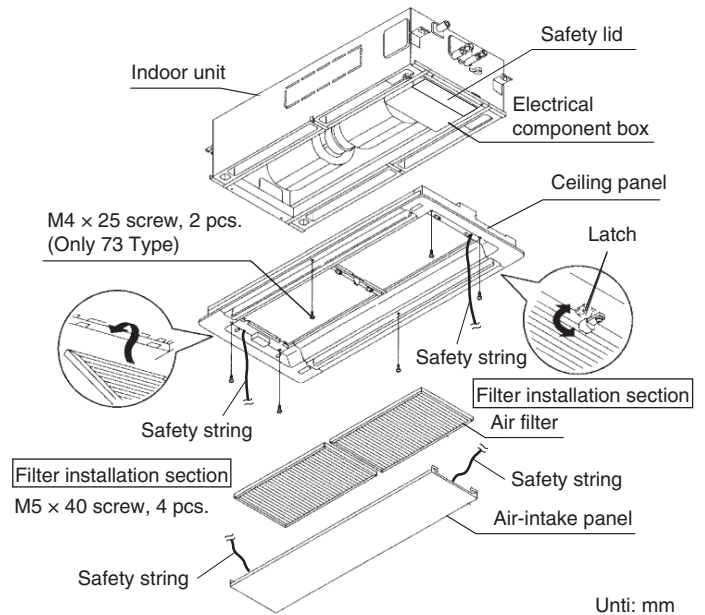


Fig. 7-20

How to open the air-intake panel (from either side)

- (1) Push in. → (2) Slide. → (3) Pull. → (4) Remove.

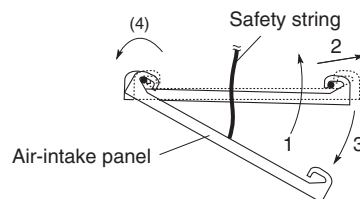


Fig. 7-21

NOTE

If you wish to remove the air-intake panel, remove the strings attached to the air-intake panel.

The air-intake panel is removed from the ceiling panel.

Be sure to reattach the string to the air-intake panel when returning to the original position.



Never touch or attempt to move the air-direction louver by hand or you may damage the unit. Instead, use the remote controller if you want to change the direction of air flow.

7-7. Installing the Ceiling Panel

- (1) Lift the ceiling panel and position it to align the panel catches with the catch recesses of the indoor unit.
- (2) Hook the stationary catch first and then press up on the opposite side to engage the level catch to install as shown in Fig. 7-22.

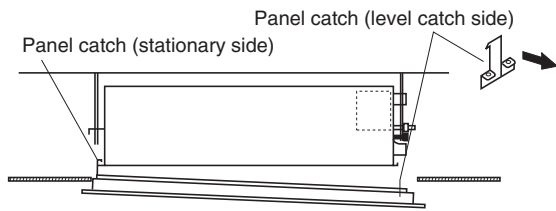


Fig. 7-22

NOTE

The ceiling panel must be mounted correctly. Listen for the click to determine it is securely shut.

- (3) Next, check to see that the ceiling panel is properly aligned with the seamline of the ceiling. If it is not, remove the ceiling panel and slightly readjust the indoor unit body to the proper suspension point.
- (4) When the ceiling panel has been properly aligned, use the 4 supplied mounting screws (M5) with washers to permanently fasten the ceiling panel.
- (5) Install the wiring connector from the ceiling panel to the connector in the electrical component box of the indoor unit (8P connector if heat pump model). After installing the connector, use the clamp on the body of the indoor unit to secure the wiring.

NOTE

If the connector is not connected, a misoperation signal ("P09" on the remote control display) will be displayed when the unit is turned on.

- (6) Install the air filter and air-intake grille by performing the steps in Figs. 7-20 and 7-21 in reverse.

7-8. Removing the Ceiling Panel for Servicing

When removing the ceiling panel for servicing, remove the air-intake grille and air filter, disconnect the wiring connector inside the electrical component box, and then remove the 4 mounting screws.

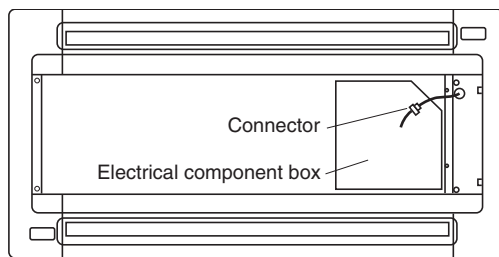


Fig. 7-23

Release one side of the panel by pressing the panel catch in the direction of the arrow. (See Caution.) Completely remove the ceiling panel by disengaging the stationary catch. (Fig. 7-22)

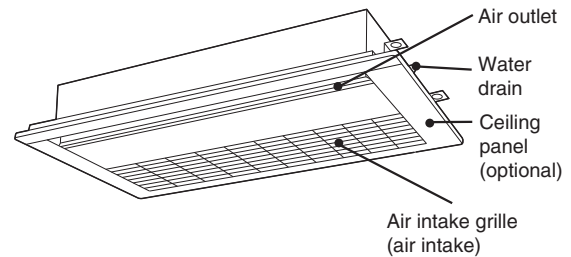


When the air filter is removed, the rotator and live parts are exposed at the openings and these can cause a danger. Therefore be particularly careful.

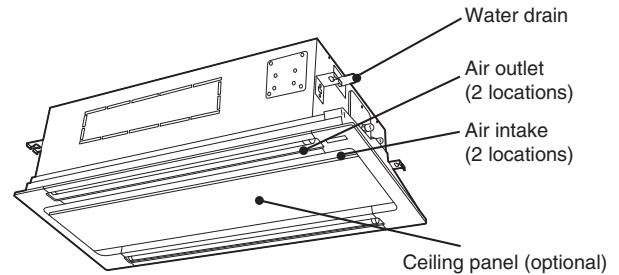
8. APPENDIX

■ Name of Parts

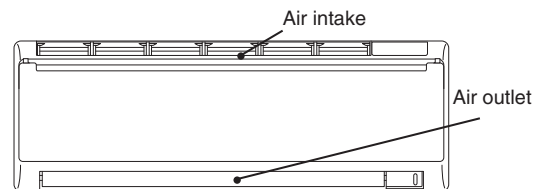
D1 Type (1-WAY CASSETTE)



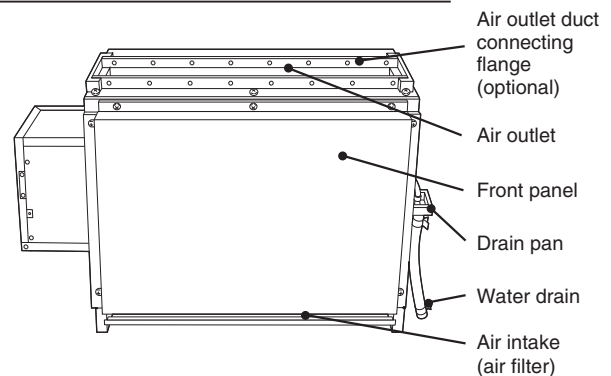
L1 Type (2-WAY CASSETTE)



K1 Type (WALL MOUNTED)



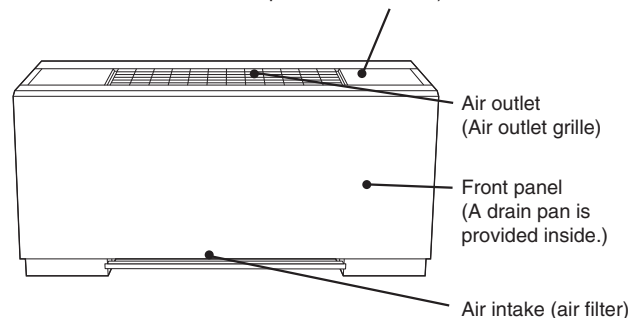
R1 Type (CONCEALED FLOOR STANDING)



P1 type (FLOOR STANDING)

Operation door

(The remote control unit (sold separately) can be placed inside here.)



■ Care and Cleaning

⚠ WARNING

1. For safety, be sure to turn the air conditioner off and also to disconnect the power before cleaning.
2. 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 outlet side (Indoor unit)

Clean the air intake and outlet 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 outlet side, be careful not to force the vanes out of place.

⚠ CAUTION

1. Never use solvents or harsh chemicals when cleaning the indoor unit. Do not wipe plastic parts using very hot water.
2. Some metal edges and the fins are sharp and may cause injury if handled improperly; be especially careful when you clean these parts.
3. The internal coil and other components of the 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 control unit (wired type) shows that the filter needs cleaning. If the filter gets blocked, the efficiency of the air conditioner drops greatly.

Type	Period
L1	6 months
D1	2 weeks
K1	2 weeks
P1, R1	2 weeks

NOTE

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

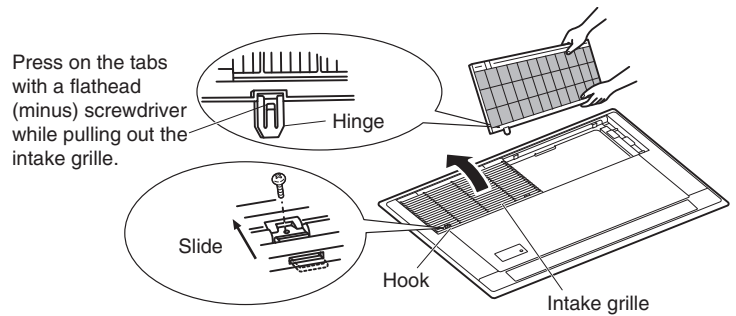
<How to clean the filter>

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>

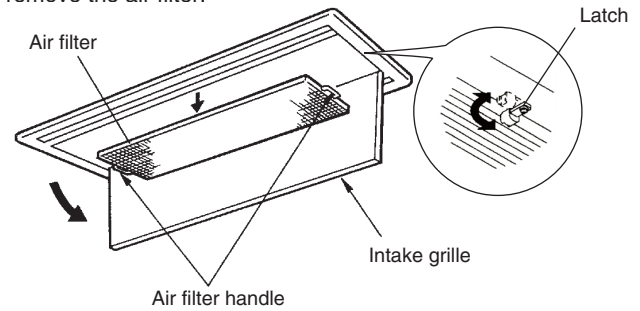
1-Way Cassette Type (D1):

1. Remove the 2 screws which fasten each of the 2 grilles in place. (Reattach the two screws after cleaning.)
2. Slide the intake grille hooks (2 locations) in the direction of the arrow to open the intake grille.
3. When the intake grille is open, use a flathead (minus) screwdriver to press on the rear hinge tabs (2 locations), then remove the intake grille.



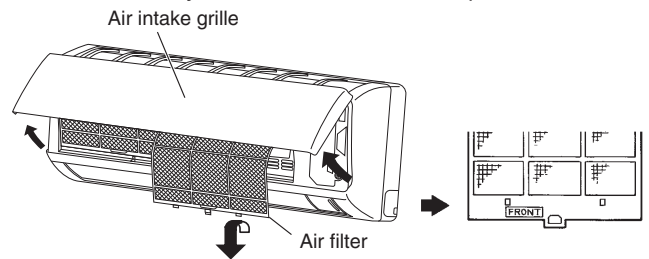
2-Way Cassette Type (L1):

Grasp the intake grille, then pull it forward and allow it to drop open. Release the latch of the filter, grasp the handles and remove the air filter.



Wall Mounted Type (K1): 22, 28, 36 types

1. Move the flap on the air outlet grille to its lowest position with the remote control unit.
2. The filter is disengaged by pushing the tab up gently. Hold the air filter by the tab at the bottom, and pull downward.



When replacing the filter, make sure that the FRONT mark is facing you. Push it up until you hear it click back into position.

Wall Mounted (K1): 45, 56, 73, 106 types

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.

⚠ CAUTION

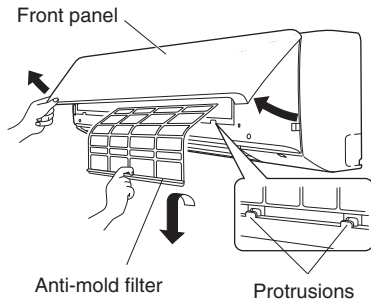
1. Never use solvents, or harsh chemicals when cleaning the indoor unit. Do not wipe the plastic casing using very hot water.
2. Some metal edges and the fins are sharp and may cause injury if handled improperly; be especially careful when you clean these parts.
3. The internal coil and other components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

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.



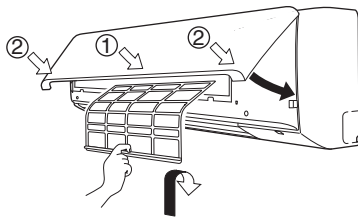
2. Lift the anti-mold filter up slightly to disengage it from the protrusions on the unit.
3. Pull downward to remove the filter from the unit.

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.



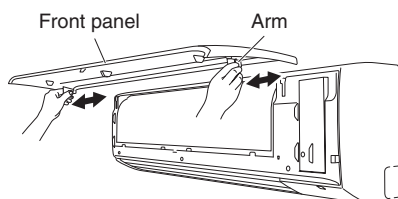
Cleaning the main unit and remote control unit

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

Removing and remounting the front panel

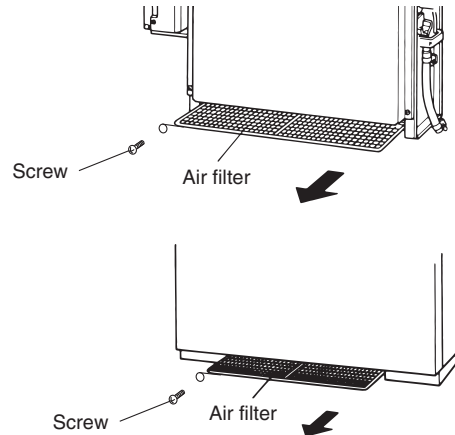
Removing

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.



Floor Standing, Concealed Floor Standing Type (P1, R1):

1. Remove the screw at the bottom left of the front panel using a Phillips head screwdriver. (Be sure to replace the screw when cleaning is finished.)
2. Remove the filter by pulling it toward you.



CAUTION

1. 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.
2. Periodically check the outdoor unit to see if the air outlet or air intake is clogged with dirt or soot.
3. The internal coil and other components of the outdoor unit 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.

<Cleaning the drain filter and drain pan>

Floor Standing Type (P1):

1. Removing the front panel

Open the front panel with a lifting motion to detach the latch.

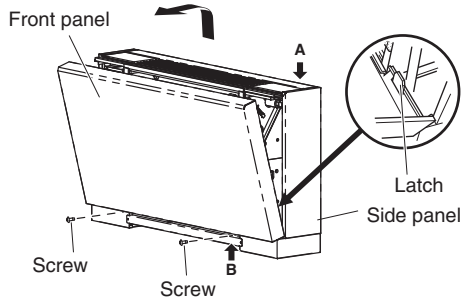
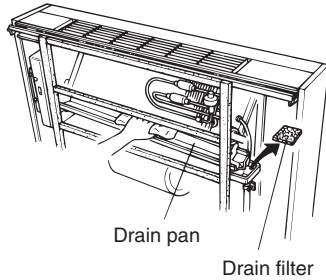
2. Cleaning

Remove any dirt accumulated in the drain pan, and then wipe it clean. Also, clean the drain filter in the same way as the air filter.

(1) Push up

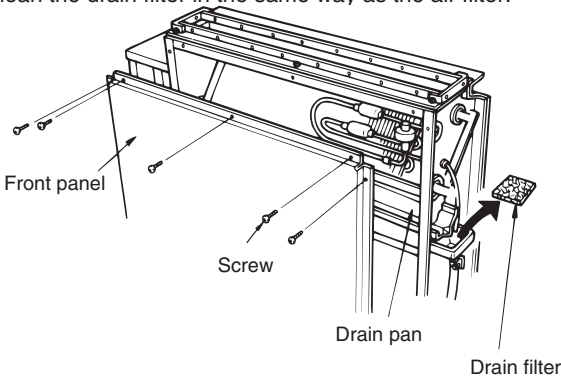
then

(2) Pull down



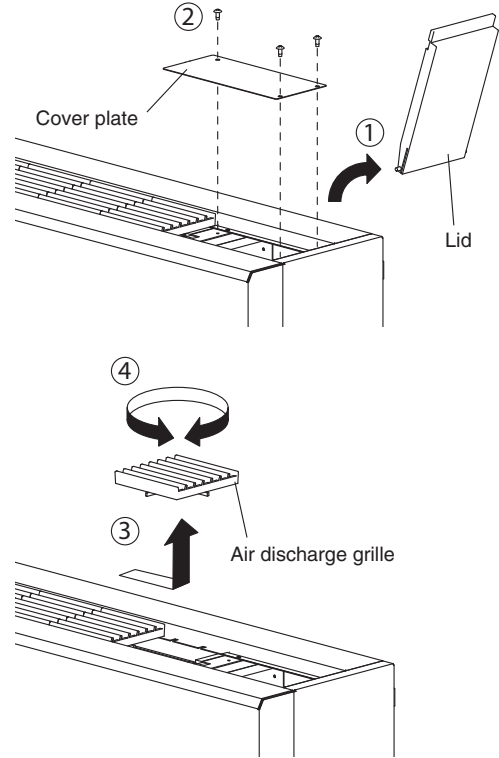
Concealed Floor Standing Type (R1):

Remove the screws, open the front panel, and then remove any dirt accumulated inside the drain pan and wipe it clean. Also, clean the drain filter in the same way as the air filter.



How to adjust the air direction

1. Remove the lid near the air discharge grille.
2. Remove the 3 screws and the cover plate.
3. Slide and lift up the air discharge grille.
4. Rotate the blades of the grille to select in the desired air discharge direction (90, 180 or 270 degrees).
5. Return the cover plate and screw it in place. Then return the lid to its original position.



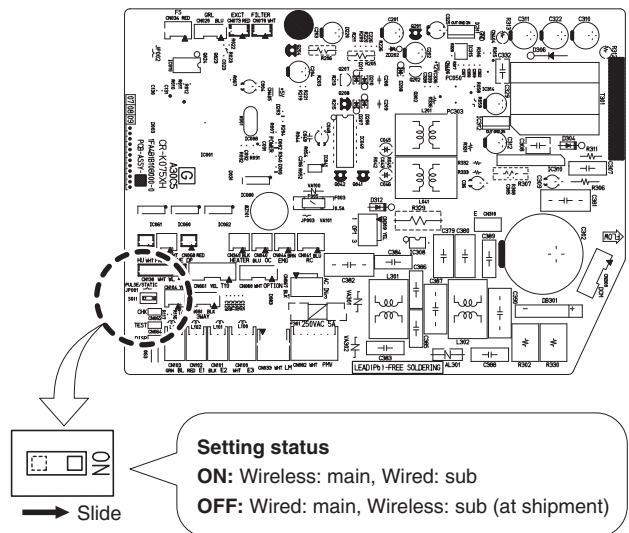
■ When Using Wireless Remote Controller Instead of Wired Remote Controller

Wall-Mounted (K1-Type)

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.)

Samples: S-22MK1E5, S-36MK1E5



■ 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.

Trouble	Possible Cause	Remedy
Air conditioner does not run at all	<ol style="list-style-type: none"> 1. Power failure. 2. Leakage circuit breaker has tripped. 3. Line voltage is too low. 4. Operation button is turned off. 5. The wired remote control unit or heat pump is malfunctioning. (The inspection mark Δ and the letters E, F, H, L, P in combination with numbers appear on the LCD of the wired remote control unit.) 	<ol style="list-style-type: none"> 1. After a power outage, press ON/OFF operation button on the wired remote control unit. 2. Contact service center. 3. Consult your electrician or dealer. 4. Press the button again. 5. Consult your dealer.
Compressor runs but soon stops	<ol style="list-style-type: none"> 1. Obstruction in front of condenser coil 	<ol style="list-style-type: none"> 1. Remove obstruction
Poor cooling (or heating) performance	<ol style="list-style-type: none"> 1. Dirty or clogged air filter. 2. Heat source or many people in room. 3. Doors and/or windows are open. 4. Obstacle near air intake or air discharge port. 5. Thermostat is set too high for cooling (or too low for heating). 6. (Defrosting system does not work.) 	<ol style="list-style-type: none"> 1. Clean air filter to improve the airflow. 2. Eliminate heat source if possible. 3. Shut them to keep the heat (or cold) out. 4. Remove it to ensure good airflow. 5. Set the temperature lower (or higher). 6. (Consult your dealer.)

■ 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. (Refer to "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.

