

## 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. / No. de modèle / Modell Nr. / Modello N. / N° do modelo / Ap. μοντέλου / N°. de modelo / No. Model

Indoor Units / Unités intérieures / Inneneinheiten / Unità interne / Unidades interiores / Εσωτερικές Μονάδες / Unidades interiores / Unit Dalam Ruang									
	22	28	36	45	56	73	106	140	160
U1	S-22MU1E5 (CZ-KPU2)**	S-28MU1E5 (CZ-KPU2)**	S-36MU1E5 (CZ-KPU2)**	S-45MU1E5 (CZ-KPU2)**	S-56MU1E5 (CZ-KPU2)**	S-73MU1E5 (CZ-KPU2)**	S-106MU1E5 (CZ-KPU2)**	S-140MU1E5 (CZ-KPU2)**	S-160MU1E5 (CZ-KPU2)**
Y1	S-22MY1E5 (CZ-KPY2)**	S-28MY1E5 (CZ-KPY2)**	S-36MY1E5 (CZ-KPY2)**	S-45MY1E5 (CZ-KPY2)**	S-56MY1E5 (CZ-KPY2)**				
T1			S-36MT1E5	S-45MT1E5	S-56MT1E5	S-73MT1E5	S-106MT1E5	S-140MT1E5	
F1	S-22MF1E5	S-28MF1E5	S-36MF1E5	S-45MF1E5	S-56MF1E5	S-73MF1E5	S-106MF1E5	S-140MF1E5	S-160MF1E5
						90 S-90MF1E5			
M1	S-22MM1E5	S-28MM1E5	S-36MM1E5	S-45MM1E5	S-56MM1E5				

	73	106	140	224	280
E1	S-73ME1E5	S-106ME1E5	S-140ME1E5	S-224ME1E5	S-280ME1E5

\*\* Panel (optional parts)

U1: 4-Way Cassette / Cassette 4 voies / Vierweg-Kassette / A cassetta a 4 vie / Cassete de 4 vias / Κασέτα 4 οδών / Cassete de 4 vias / Kaset 4-Arah

Y1: 4-Way Cassette 60x60 / Cassette 4 voies 60x60 / Vierweg-Kassette 60x60 / A cassetta a 4 vie, 60x60 / Cassete de 4 vias 60x60 / Κασέτα 4 οδών 60x60 / Cassette de 4 vias 60x60 / Kaset 4-Arah 60x60

T1: Ceiling / Plafond / Decke / Soffitto / Tecto / Οροφής / Techo / Plafon

F1: Low Silhouette Ducted / Conduit discret / Niedrige Bauhöhe mit Kanal / A condotto sottile /

Com condotta de silhueta baixa / Αγωγός χαμηλής σιλουέτας / Conductos de baja silueta / Bersaluran Siluet Rendah

M1: Slim Low Static Ducted / Conduit conducteur mince / Slim, niedriger statischer Druck, mit Kanal / Tipo slim a condotto, bassa pressione statica / Com condotta estática baixa e delgada / Αγωγός χαμηλής στατικής πίεσης λεπτού τύπου / Delgado conductos baja presión estática / Bersaluran Statis Rendah Ramping

E1: High Static Pressure Ducted / Conduit à pression statique élevée / Hoher statischer Druck, mit Kanal / A condotto, alta pressione statica / Com condotta de pressão estática alta / Αγωγός υψηλής στατικής πίεσης / Conductos presión estática alta / Bersaluran Tekanan Statis Tinggi

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 U1, Y1, T1, F1, M1, E1 Types

##### ■ R410A Models

Model No.

Indoor Units		22	28	36	45	56	73	106	140	160
U1	4-Way Cassette	S-22MU1E5 (CZ-KPU2)**	S-28MU1E5 (CZ-KPU2)**	S-36MU1E5 (CZ-KPU2)**	S-45MU1E5 (CZ-KPU2)**	S-56MU1E5 (CZ-KPU2)**	S-73MU1E5 (CZ-KPU2)**	S-106MU1E5 (CZ-KPU2)**	S-140MU1E5 (CZ-KPU2)**	S-160MU1E5 (CZ-KPU2)**
Y1	4-Way Cassette 60x60	S-22MY1E5 (CZ-KPY2)**	S-28MY1E5 (CZ-KPY2)**	S-36MY1E5 (CZ-KPY2)**	S-45MY1E5 (CZ-KPY2)**	S-56MY1E5 (CZ-KPY2)**				
T1	Ceiling			S-36MT1E5	S-45MT1E5	S-56MT1E5	S-73MT1E5	S-106MT1E5	S-140MT1E5	
F1	Low Silhouette Ducted	S-22MF1E5	S-28MF1E5	S-36MF1E5	S-45MF1E5	S-56MF1E5	S-73MF1E5	S-106MF1E5	S-140MF1E5	S-160MF1E5
							90 S-90MF1E5			
M1	Slim Low Static Ducted	S-22MM1E5	S-28MM1E5	S-36MM1E5	S-45MM1E5	S-56MM1E5				

Indoor Unit Type	73	106	140	224	280	** Panel (optional parts)
E1 High Static Pressure Ducted	S-73ME1E5	S-106ME1E5	S-140ME1E5	S-224ME1E5	S-280ME1E5	

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 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)

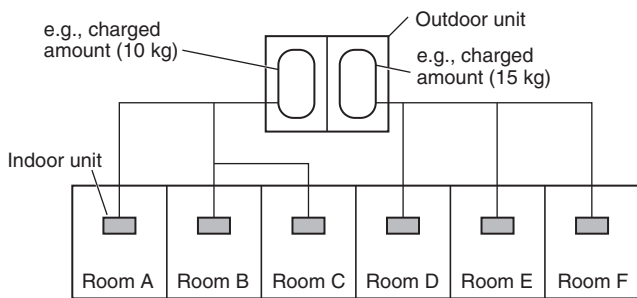
$$\text{Min. volume of the indoor unit installed room (m}^3\text{)} \leq \text{Density limit (kg/m}^3\text{)}$$

The density limit of refrigerant which is used in multi air conditioners is 0.3 kg/m<sup>3</sup> (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:

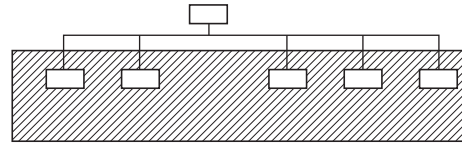


The possible amount of leaked refrigerant gas in rooms A, B and C is 10 kg.

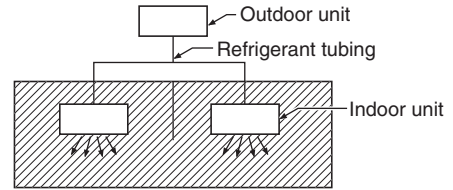
The possible amount of leaked refrigerant gas in rooms D, E and F is 15 kg.

- The standards for minimum room volume are as follows.

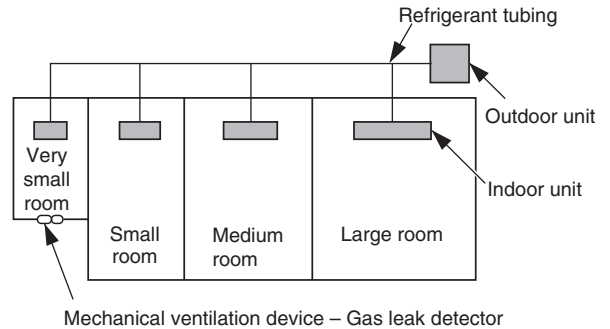
- (1) No partition (shaded portion)



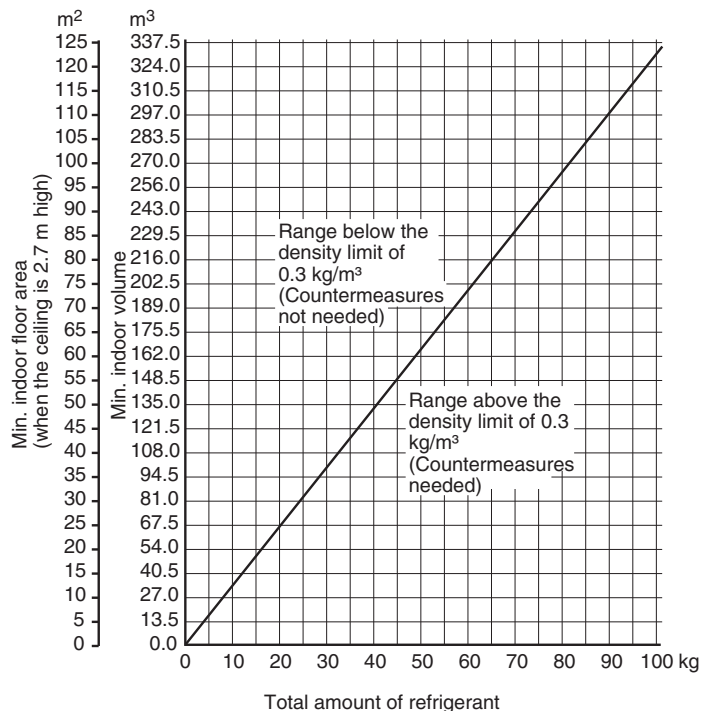
- (2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).



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

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- Name of Parts
- Care and Cleaning
- Troubleshooting
- Tips for Energy Saving

# 1. GENERAL

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

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

1. Flathead screwdriver
2. Phillips head screwdriver
3. Knife or wire stripper
4. Tape measure
5. Carpenter's level
6. Sabre saw or 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 1-6.

Table	Type
1-1	4-Way Cassette
1-2	4-Way Cassette 60x60
1-3	Ceiling
1-4	Low Silhouette Ducted
1-5	Slim Low Static Ducted
1-6	High Static Pressure Ducted

## 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.
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 (4-Way Cassette)

Part Name	Figure	Q'ty	Remarks
Full-scale installation diagram		1	Printed on container box
Washer		8	For suspension bolts
Screw		4	For full-scale installation diagram
Insulating tape		2	For gas and liquid tube flare nuts
Flare insulator		1	For liquid tube
Flare insulator		1	For gas tube
Drain hose		1	
Hose band		1	
Packing		1	
Drain insulator		1	
Instruction Manual		1	
Installation Instruction		1	


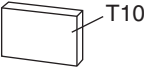
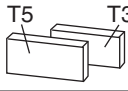



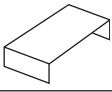
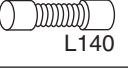

Table 1-2 (4-Way Cassette 60x60)

Part Name	Figure	Q'ty	Remarks
Washer		8	For temporarily suspending indoor unit from ceiling
Flare insulation		2 set	For gas / liquid tube / flare nut connection
Insulation tie		2	For gas / liquid tube / flare nut connection
Vinyl tie		8	For flare / drain insulating connection
Drain hose insulation		1	For drain tube connection
Full-scale installation diagram		1	Printed on container box
Washer head screw		4	For full-scale installation diagram
Drain hose		1	For unit & PVC tube connection
Hose band		2	For drain hose connection











- Use M10 for suspension bolts.
- Field supply for suspension bolts and nuts.



**Table 1-3 (Ceiling)**

Part Name	Figure	Q'ty	Remarks
Special washer		4	For temporarily suspending indoor unit from ceiling
Drain insulator		1	For drain hose joint
Flare insulator		2 sets	For gas and liquid tube joints
Insulating tape		2	For gas and liquid flare joints
Vinyl clamp		8	For flare and drain insulator (Field supply for Spanish version)
Eyelet		1	For power supply inlet
Full-scale installation diagram		1	Printed on container box
Drain hose		1	For main unit + PVC pipe joints
Hose band		2	For drain hose connection






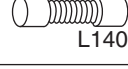


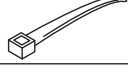

**Table 1-4 (Low Silhouette Ducted)**

Part Name	Figure	Q'ty	Remarks
Washer		8	For suspending indoor unit from ceiling
Flare insulator		2	For gas and liquid tubes
Insulating tape		2	For gas and liquid tubes flare nuts
Drain insulator		1	For drain hose joint
Hose band		1	For securing drain hose
Packing		1	For drain joint
Drain hose		1	
Sealing putty		1	For sealing recessed portion of power supply
Vinyl clamp		8	For flare and drain insulators (Field supply)
Booster cable*		1	Connector for changeover to HT tap

\* Booster cable is housed inside the electrical component box.





- Use M10 for suspension bolts.
- Suspension bolts and nuts are field supply.

**Table 1-5 (Slim Low Static Ducted)**

	Part Name	Figure	Q'ty	Remarks
Unit suspension	Washer		8	For suspension fitting
Refrigerant tubing	Flare insulation		2	For gas pipe / liquid pipe connection
			2	For gas pipe / liquid pipe connection
	Insulation tape		2	For gas pipe / liquid pipe / flare nut connection
	Vinyl tie		8	For flare / drain insulating connection
Drain piping	Drain hose		1	For unit & PVC pipe connection
	Hose band		2	For drain hose connection
	Drain hose insulation		1	For drain pipe connection
Others	Clamper		1	For power supply cord
		Be sure to fix the power supply cord with the clamper.		
	Short circuit connection		1	For high static pressure (Located on the back of the electrical component box lid.)

- Use M10 for suspending bolts.
- Field supply for suspending bolts and nuts.

**Table 1-6 (High Static Pressure Ducted)**

Part Name	Figure	Q'ty	Remarks
Special washer		8	For suspending indoor unit from ceiling
Flare insulator		2	For gas and liquid tubes
Drain socket		1	For drain pipe connection
Tube connector		1	For increasing size of liquid tube from ø6.35 to ø9.52 mm (only for 73 type)

## 2. SELECTING THE INSTALLATION SITE

### 2-1. Indoor Unit

#### AVOID:

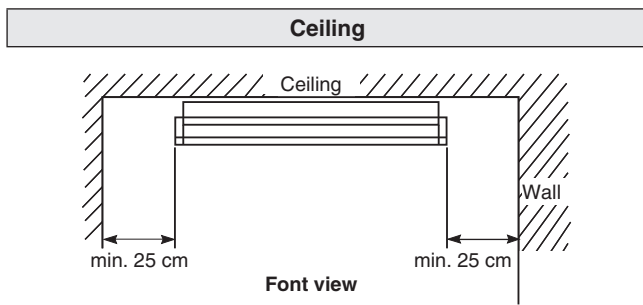
- areas where leakage of flammable gas may be expected.
- places where large amounts of oil mist exist.
- direct sunlight.
- locations near heat sources which may affect the performance of the unit.
- locations where external air may enter the room directly. This may cause "condensation" on the air discharge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

#### DO:

- select an appropriate position from which every corner of the room can be uniformly cooled.
- select a location where the ceiling is strong enough to support the weight of the unit.
- 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 manual packed with the outdoor unit.
- allow room for mounting the remote controller about 1m off the floor, in an area that is not in direct sunlight or in the flow of cool air from the indoor unit.

#### NOTE

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



#### NOTE

The rear of the indoor unit can be installed flush against the wall.

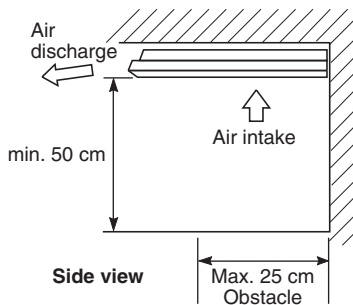


Fig. 2-1

### 4-Way Cassette Type

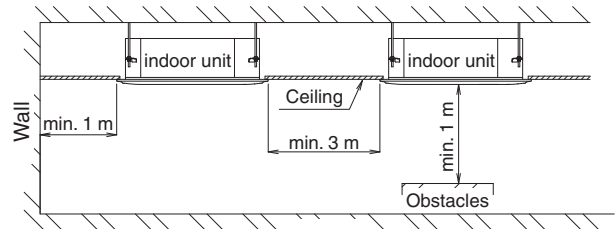
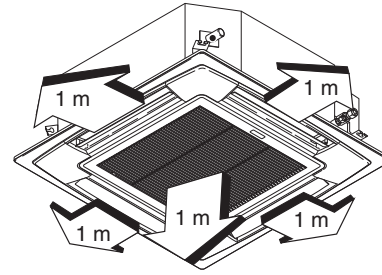


Fig. 2-2

### Low Silhouette Ducted, Slim Low Static Ducted, High Static Pressure Ducted, 4-Way Cassette 60x60

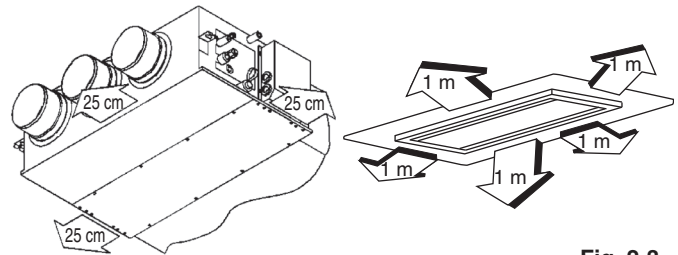


Fig. 2-3

## 3. HOW TO INSTALL THE INDOOR UNIT

### ■ 4-Way Cassette 60x60 Type (Y1 Type)

#### 3-1. Preparation for Ceiling Suspension

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

#### 3-2. Mounting the Suspension Bolts

- (1) Fix the suspension bolts securely to the ceiling using the method shown in the diagrams (Figs. 3-1 and 3-2), by attaching them to the ceiling support structure, or by any other method that ensures that the unit will be securely and safely suspended.
- (2) Follow the diagram to make the holes in the ceiling. (Refer to Fig. 3-2)

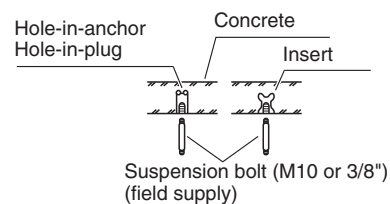
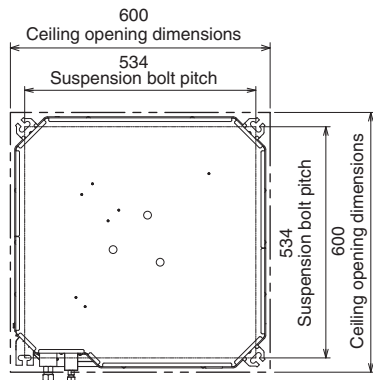


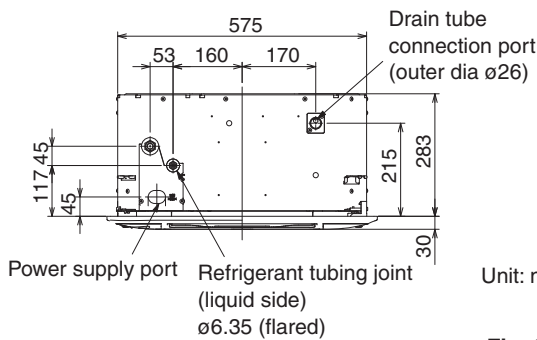
Fig. 3-1



Unit: mm

**Fig. 3-2**

- (3) Determine the pitch of the suspension bolts using the supplied full-scale installation diagram. The diagram shows the relationship between the positions of the suspension fitting, the unit, and the panel.



Unit: mm

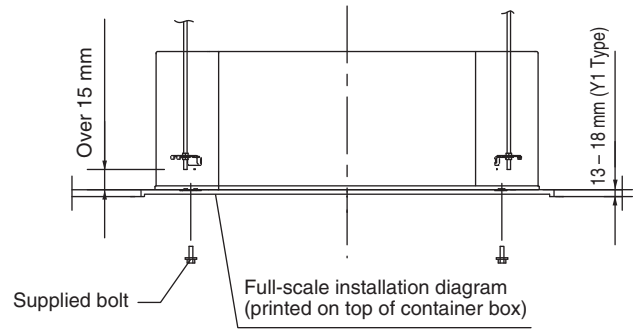
**Fig. 3-3**

### 3-3. Placing the Unit Inside the Ceiling

- (1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts using the supplied full-scale installation diagram. (Fig. 3-4)

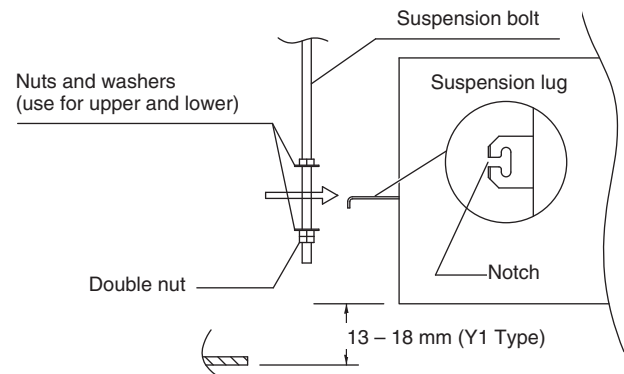
Tubing and wiring must be laid inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the tubing and wiring into position for connection to the unit before placing the unit inside the ceiling.

- (2) The length of suspension bolts must be appropriate for a distance between the bottom of the bolt and the bottom of the unit of more than 15 mm. (Fig. 3-4)



**Fig. 3-4**

- (3) Thread the 3 hexagonal nuts and 2 washers (field supply) onto each of the 4 suspension bolts (Fig. 3-5). 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.



**Fig. 3-5**

- (4) Adjust so that the distance between the unit and the ceiling bottom is 13 to 18 mm. Tighten the nuts on the upper side and lower side of the suspension lug.
- (5) Remove the protective polyethylene used to protect the fan parts during transport.

### 3-4. Installing the Drain Pipe

- Prepare a standard hard PVC pipe (O.D. 26 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.
- Installing the drain hose

- To install the drain hose, first place 1 of the 2 hose bands over the unit drain port and the other hose band over the hard PVC pipe (not supplied). Then connect both ends of the supplied drain hose. (Fig. 3-6)

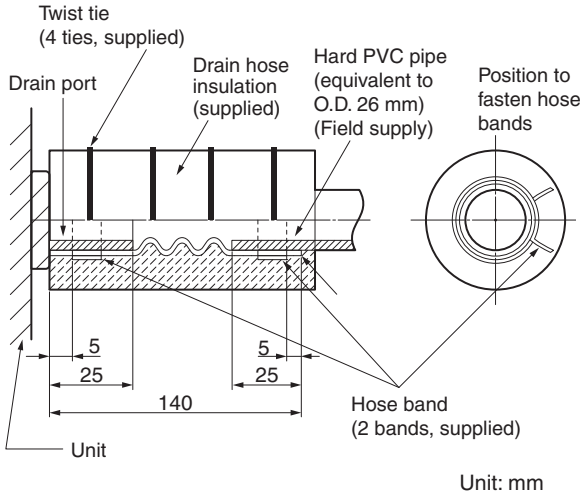


Fig. 3-6

- On the unit drain side, grasp the hose band with pliers and insert the drain hose all the way to the base.
- If other commercially available hose bands are used, the drain hose may become pinched or wrinkled and there is danger of water leakage. Therefore be sure to use the supplied hose bands. When sliding the hose bands, be careful to avoid scratching the drain hose.
- Do not use adhesive when connecting the supplied drain hose to the drain port (either on the main unit or the PVC pipe).  
Reasons: 1. It may cause water to leak from the connection. Since the connection is slippery just after the adhesive has been applied, the pipe easily slips off.  
2. The pipe cannot be removed when maintenance is needed.
- Wrap the hose with the supplied drain hose insulation and use the 4 twist ties so that the hose is insulated with no gaps.
- Do not bend the supplied drain hose 90° or more. The hose may slip off.

#### CAUTION

- Attach so that the hose band fastener is on the side of the drain port.
- Attach the hose bands so that each is approximately 5 to 25 mm from the end of the supplied drain hose.

#### 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. 3-7)

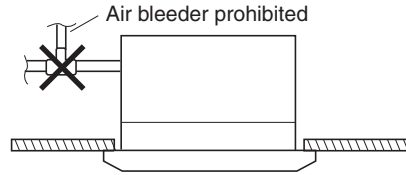


Fig. 3-7

- In cases where it is necessary to raise the height of the drain piping, the drain piping can be raised to a maximum height of 850 mm above the bottom surface of the ceiling. Under no conditions attempt to raise it higher than 850 mm above the bottom surface of the ceiling. Doing so will result in water leakage. (Fig. 3-8)

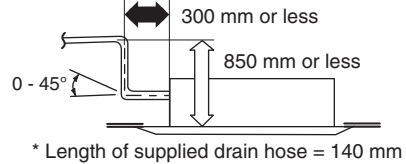


Fig. 3-8

- Do not use natural drainage.
- 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. 3-9)

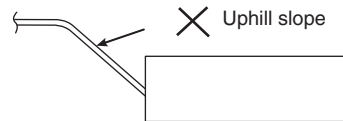


Fig. 3-9

- 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. 3-10)

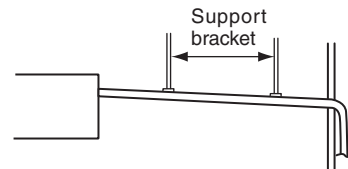


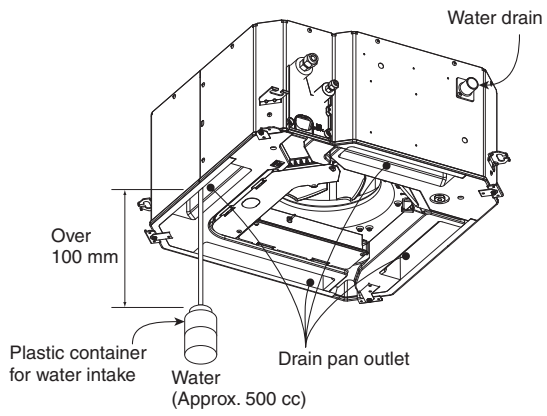
Fig. 3-10

- 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.

- Connect power to the power terminal board (R, S terminals) inside the electrical component box.
- Slowly pour about 500 cc of water into the drain pan to check drainage. (Fig. 3-11)



**Fig. 3-11**

- (3) Short the check pin (CHK) on the indoor control board and operate the drain pump. 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 tube cover.

**⚠ CAUTION**

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

■ Ceiling Type (T1 Type)

3-6. Required Minimum Space for Installation and Service

(1) Dimensions of suspension bolt pitch and unit

Type	Length	A	B	C
36, 45, 56		855	910	210
73		1125	1180	210
106, 140		1540	1595	210

Unit: mm

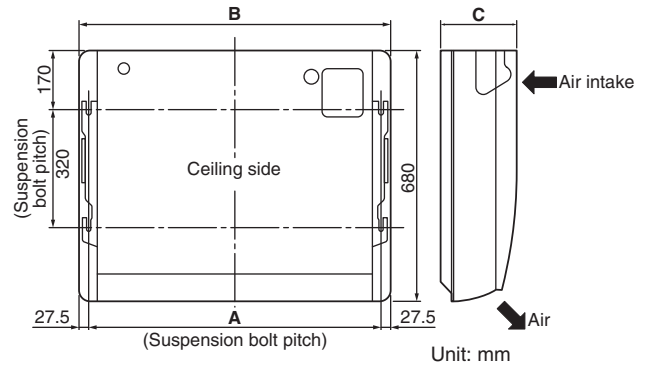


Fig. 3-12

(2) Refrigerant tubing • drain hose position

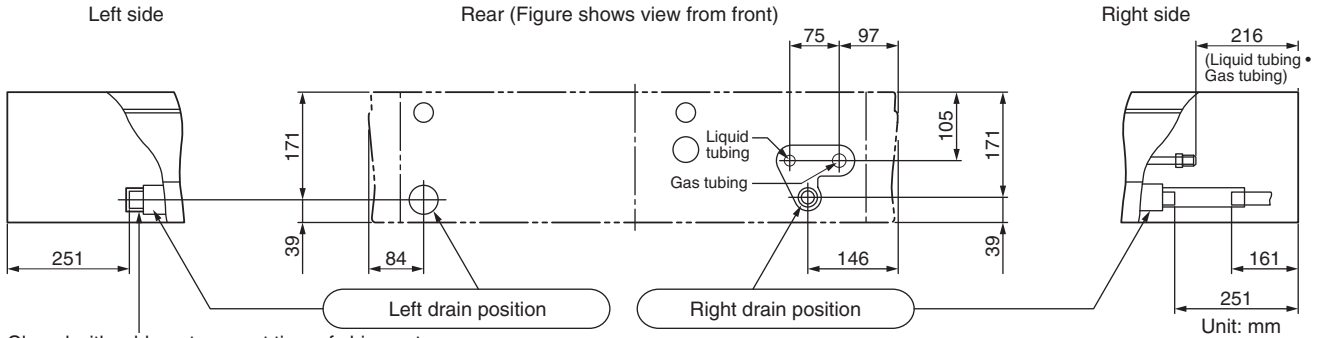
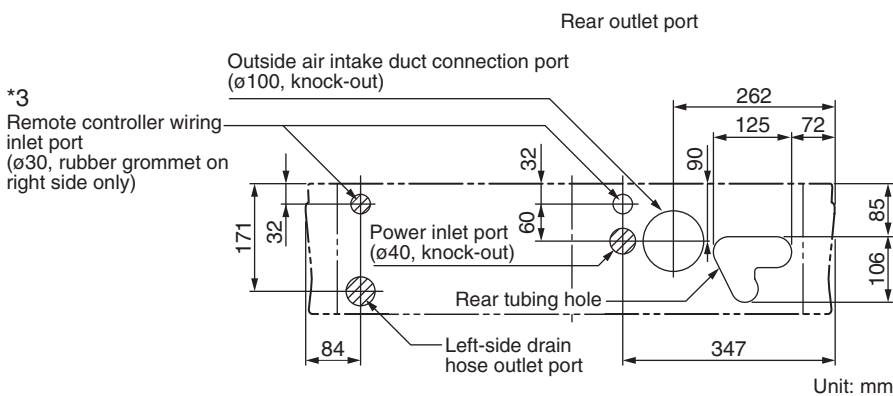
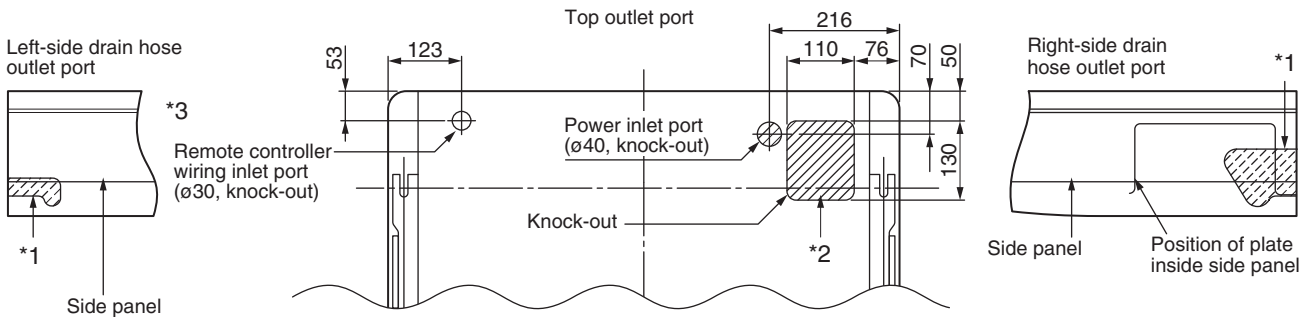


Fig. 3-13

(3) Unit opening position (Refrigerant tubing • drain hose • power inlet port • remote controller wiring inlet port)



Unit: mm

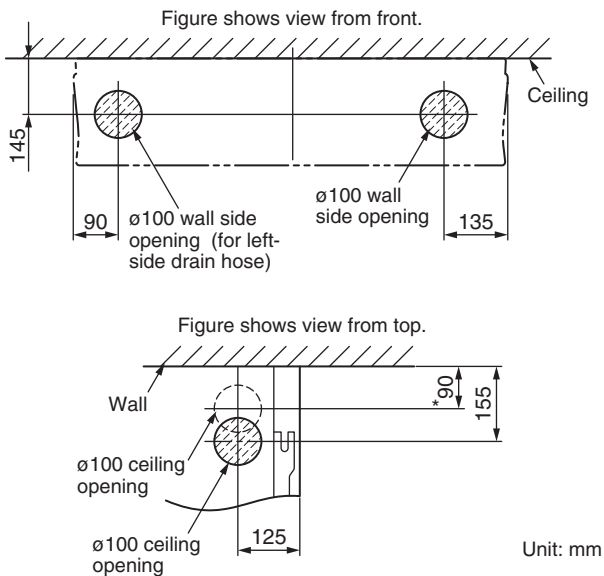
\*1 Use a compass saw, jig saw or similar tool and cut along the indented portion of the side panel.

\*2 If the optional drain up kit is installed, this becomes the upper tubing outlet port. For details, refer to the manual for the optional part.

\*3 If the remote controller wiring inlet port is changed to the left side or the left top side, relocate the rubber grommet to the left side. Use aluminum tape or similar material to seal the unused inlet port on the right side.

Fig. 3-14

#### (4) Wall and ceiling side opening position



Unit: mm

\* If the optional drain up kit is installed, create a  $\phi 100$  hole along the dotted line (part marked with \* in figure).

Fig. 3-15

### 3-7. Suspending the Indoor Unit

- Place the full-scale diagram (supplied) on the ceiling at the location where you want to install the indoor unit. Use a pencil to mark the drill holes (Fig. 3-16).

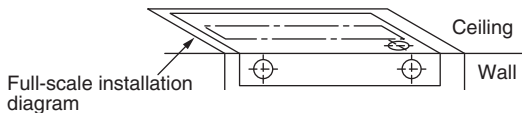


Fig. 3-16

#### NOTE

Since the diagram is made of paper, it may shrink or stretch slightly because of high temperature or humidity. For this reason, before drilling the holes maintain the correct dimensions between the markings.

- Drill holes at the 4 points indicated on the full-scale diagram.
- Depending on the ceiling type:
  - Insert suspension bolts (Fig. 3-17).  
or
  - Use existing ceiling supports or construct a suitable support (Fig. 3-18).

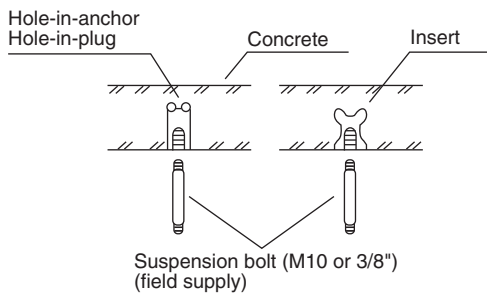


Fig. 3-17

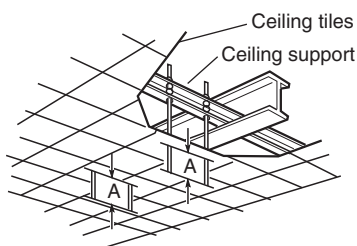


Fig. 3-18

#### WARNING

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 ceiling unit, test the strength of each attached suspension bolt.

- Screw in the suspension bolts, allowing them to protrude from the ceiling (Figs. 3-17 and 3-18). The distance of each exposed bolt must be of equal length within 50 mm. (Fig. 3-19)

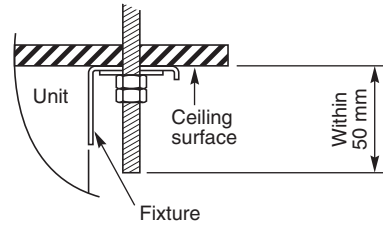


Fig. 3-19

- Before suspending the indoor unit, remove the 2 or 3 screws on the latch of the air-intake grilles, open the grilles, and remove them by pushing the claws of the hinges (Fig. 3-20). Then remove both side panels sliding them along the unit toward the front after removing the 2 attachment screws. (Fig. 3-21)

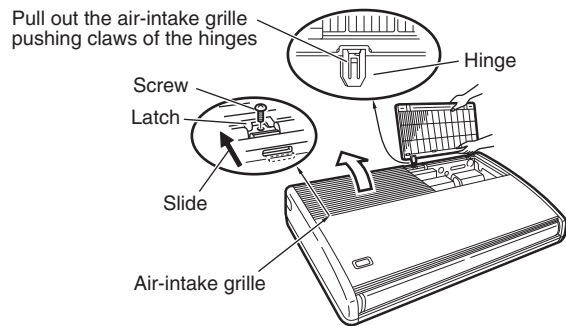


Fig. 3-20

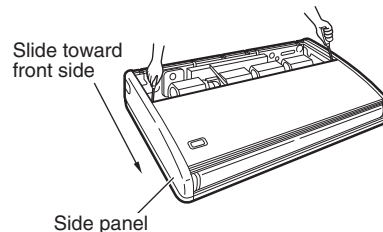


Fig. 3-21

- Carry out the preparation for suspending the indoor unit. The suspension method varies depending on whether there is a suspended ceiling or not. (Figs. 3-22 and 3-23)
- Suspend the indoor unit as follows:
  - Mount 1 washer and 2 hexagonal nuts on each suspension bolt (Fig. 3-24).

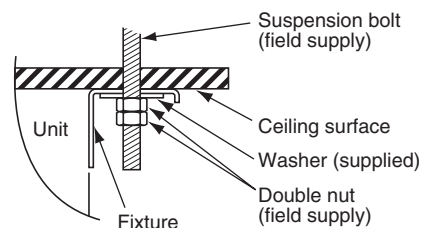


Fig. 3-22

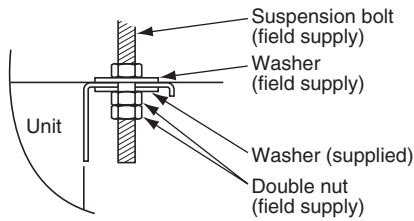


Fig. 3-23

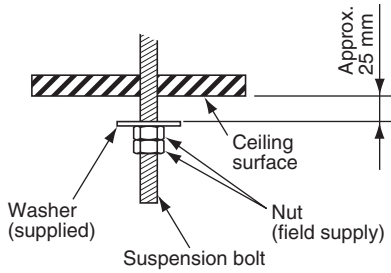


Fig. 3-24

b) Lift the indoor unit, and place it on the washers through the notches, in order to fix it in place. (Fig. 3-25)

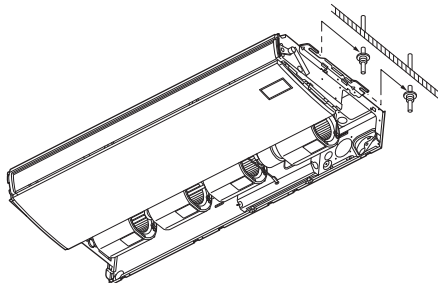


Fig. 3-25

c) Tighten the 2 hexagonal nuts on each suspension bolt to suspend the indoor unit as shown in Fig. 3-26.

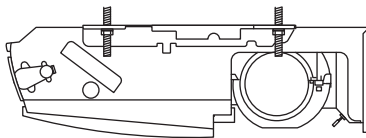


Fig. 3-26

**NOTE**

The ceiling surface is not always level. Confirm that the indoor unit is evenly suspended. For the installation to be correct, leave a clearance of about 10 mm between the ceiling panel and the ceiling surface and fill the gap with an appropriate insulation or filler material.

- (8) If the tubing and wiring are to go towards the rear of the unit, make holes in the wall. (Fig. 3-27)
- (9) Measure the thickness of the wall from the inside to the outside and cut PVC pipe at a slight angle to fit. Insert the PVC pipe in the wall. (Fig. 3-28)

**NOTE**

The hole should be made at a slight downward slant to the outside.

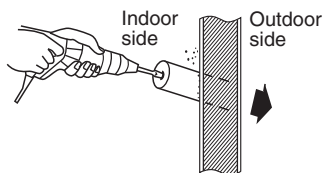


Fig. 3-27

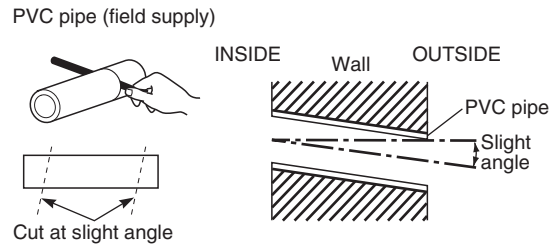
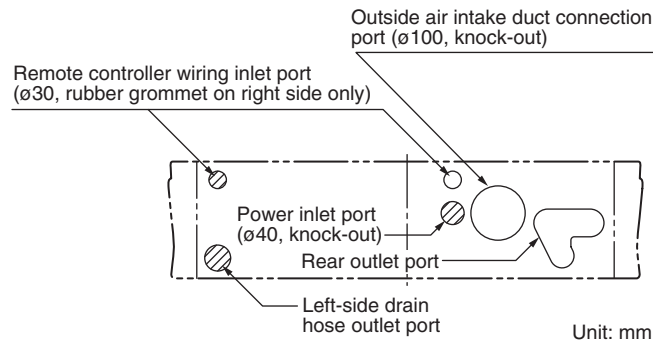


Fig. 3-28

**3-8. Duct for Fresh Air**

There is a duct connection port (knock-out hole) at the right-rear of the top panel of the indoor unit for drawing in fresh air. If it is necessary to draw in fresh air, remove the cover by opening the hole and connecting the duct to the indoor unit through the connection port. (Fig. 3-29)



Unit: mm

Fig. 3-29

**3-9. Shaping the Tubing**

- The positions of the refrigerant tubing connections are shown in the figure below. (The tubing can be routed in 3 directions.) (Fig. 3-30)
- \* When routing the tubing out through the top or right sides, knock out the appropriate parts in the top panel and cut notches in the side panel (Fig. 3-29).
- \* When routing the tubing out through the top, the optional L-shape tubing kit is required.

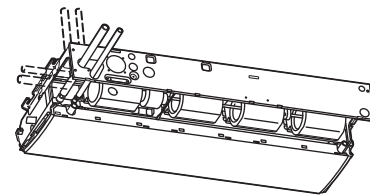


Fig. 3-30

If the tubing is to be routed out together, use a box cutter or similar tool to cut out the part of the rear cover indicated by the marked area (Fig. 3-31), to match the positions of the tubes. Then draw out the tubing.

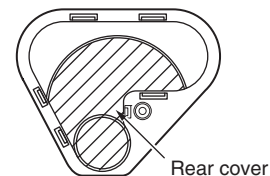


Fig. 3-31



### 3-10. Installing the Drain Pipe

- Prepare standard PVC pipe for the drain and connect it to the indoor unit drain pipe with the supplied hose clamps to prevent water leaks.

#### (1) Drain hose connection

- The drain hose is connected below the refrigerant tubing.

#### (2) Installing the drain hose

- To install the drain hose, first place 1 of the 2 hose bands over the unit drain port and the other hose band over the hard PVC pipe (not supplied). Then connect both ends of the supplied drain hose.
- On the unit drain side, grasp the hose band with pliers and insert the drain hose all the way to the base.

#### CAUTION

- Attach so that the hose band fastener is on the side of the drain port. (Fig. 3-33)
- Attach the hose bands so that each is approximately 5 to 25 mm from the end of the supplied drain hose.
- If other commercially available hose bands are used, the drain hose may become pinched or wrinkled and there is danger of water leakage. Therefore be sure to use the supplied hose bands. When sliding the hose bands, be careful to avoid scratching the drain hose.
- Do not use adhesive tape when connecting the supplied drain hose to the drain port (either on the main unit or the PVC pipe).
- Wrap the hose with the supplied drain hose insulation and use the 4 twist ties so that the hose is insulated with no gaps.
- Connect the drain pipe so that it slopes downward from the unit to the outside. (Fig. 3-32)

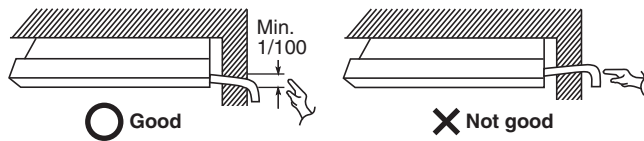
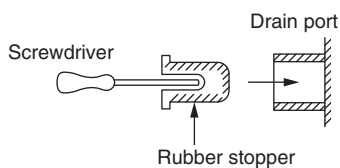


Fig. 3-32

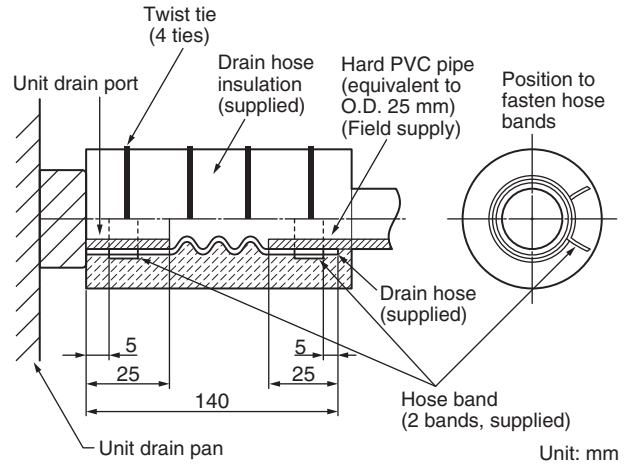
- Never allow water traps to occur in the course of the piping.
  - Insulate any piping inside the room to prevent dripping.
  - After the drain piping, pour water into the drain pan to check that the water drains smoothly.
  - If the drain hose is to be raised, use the optional drain up kit. The drain hose can be raised 60 cm above the top of the main unit. (For details, refer to the manual for the optional part.)
- \* If the drain hose is routed through the left side, refer to Fig. 3-30, and follow the procedure above to install the hose. Reattach the rubber stopper removed earlier onto the right side.

The rubber stopper can be inserted easily by using a screwdriver or similar tool to press the stopper into the drain port on the main unit. Press the stopper into the main unit drain port as far as it will go.



#### CAUTION

Check local electrical codes and regulations before wiring. Also, check any specified instruction or limitations.



Unit: mm

Fig. 3-33

### How to carry out power supply wiring

#### (1) Wiring connection ports

The power inlet ports are located at the rear and top.

The remote controller wiring inlet ports are located at the rear and top (for use with the wired remote controller). For details, refer to Fig. 3-29. For the method used to insert the wiring, refer to Fig. 3-34.

Attach the supplied eyelet to the power wiring inlet port with adhesive material (field supply). (Refer to Fig. 3-34)

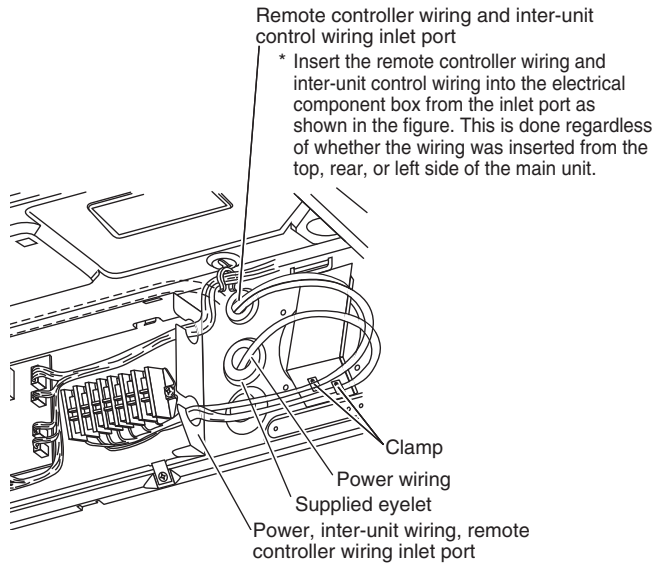


Fig. 3-34

#### CAUTION

When removing the fastening bracket from the cover of the electrical component box, use caution to avoid dropping the bracket.

#### (2) How to carry out wiring

- Open the knock-out hole on the rear or top of the main unit. Attach the supplied rubber grommet and pull the power wiring into the main unit.
- Feed the wiring into the wiring inlet port on the electrical component box. Connect the wiring to the terminal plate and fasten in place with the supplied clamp.
- Perform electrical and grounding work in accordance with the package A/C power specifications, and following local electrical codes and regulations.

■ Low Silhouette Ducted Type (F1 Type)

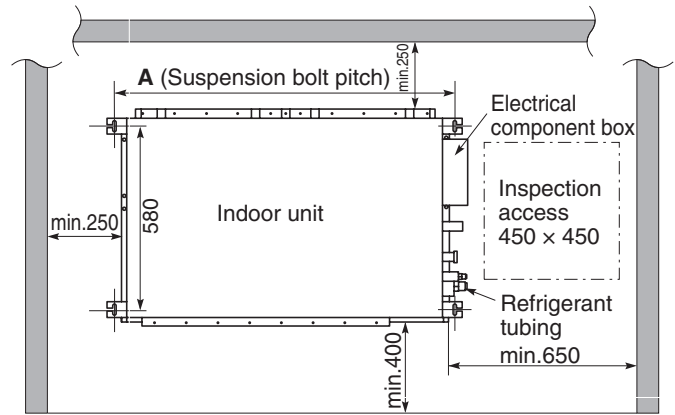
3-11. Required Minimum Space for Installation and Service

- This air conditioner is usually installed above the ceiling so that the indoor unit and ducts are not visible. Only the air intake and air outlet ports are visible from the unit bottom.
- The minimum space for installation and service is shown in Fig. 3-35 and Table 3-1.

Table 3-1 Unit: mm

Type	22, 28, 36, 45, 56	73, 90	106, 140, 160
A (Length)	780	1,080	1,560

- It is recommended that space be provided (450 × 450 mm) for checking and servicing the electrical system.
- The detailed dimensions of the indoor unit is shown in Fig. 3-36 and Table 3-2.



Unit: mm

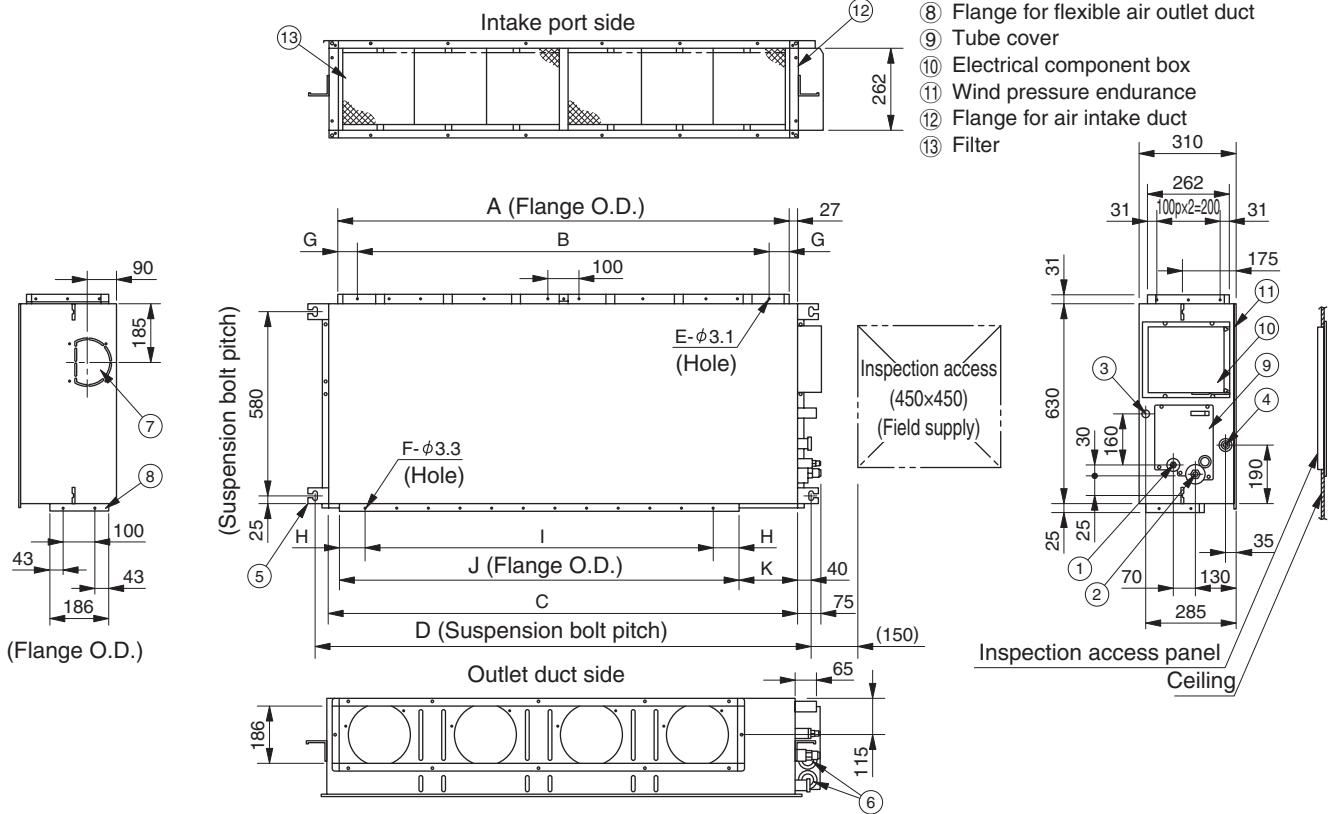
Fig. 3-35

Table 3-2 Unit: mm

Dimension / Type	A	B	C	D	No. of holes		G	H	I	G	K
					E	F					
22, 28, 36, 45, 56	646	500 (100 × 5)	700	780	18	12	73	96	300 (100 × 3)	492	161
73, 90	946	900 (100 × 9)	1,000	1,080	26	20	23	41	700 (100 × 7)	782	171
106, 140, 160	1,426	1,300 (100 × 13)	1,480	1,560	26	28	63	81	1,100 (100 × 11)	1,262	182

Power, inter-unit wiring

- ① Refrigerant tubing joint (liquid tube)
- ② Refrigerant tubing joint (gas tube)
- ③ Upper drain port VP25 (O.D. 32 mm)  
∅200 flexible hose supplied
- ④ Bottom drain port VP25 (O.D. 32 mm)
- ⑤ Suspension lug (4 – 12 × 37 mm)
- ⑥ Power supply outlet (2 – ∅30 mm)
- ⑦ Fresh air intake port (∅150 mm)
- ⑧ Flange for flexible air outlet duct
- ⑨ Tube cover
- ⑩ Electrical component box
- ⑪ Wind pressure endurance
- ⑫ Flange for air intake duct
- ⑬ Filter



Unit: mm

Fig. 3-36

### 3-12. Suspending the Indoor Unit

Depending on the ceiling type:

- Insert suspension bolts (Fig. 3-37) or
- Use existing ceiling supports or construct a suitable support (Fig. 3-38).

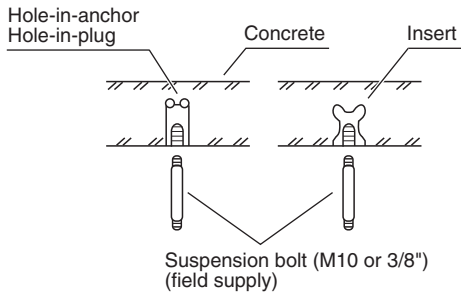


Fig. 3-37

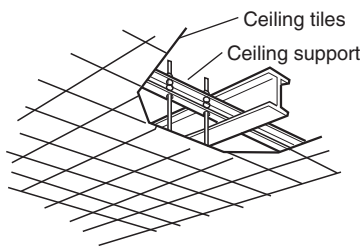


Fig. 3-38

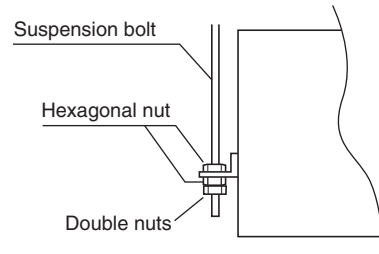


Fig. 3-40

- This shows an example of installation.

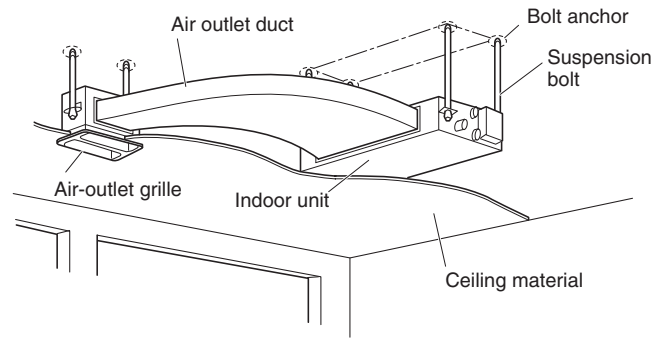


Fig. 3-41



#### WARNING

It is important that you use extreme care in supporting the indoor unit inside 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.

- (1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts referring to the dimensional data as shown in Fig. 3-35 and Table 3-2. 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) Screw in the suspension bolts allowing them to protrude from the ceiling (Fig. 3-37). (Cut the ceiling material, if necessary.)
- (3) Thread the 3 hexagonal nuts and 2 washers (field supply) onto each of the 4 suspension bolts (Figs. 3-39 and 3-40). Use 1 nut and 1 washer for the upper part, and 2 nuts and 1 washer for the lower part, so that the unit will not fall off the suspension lugs.

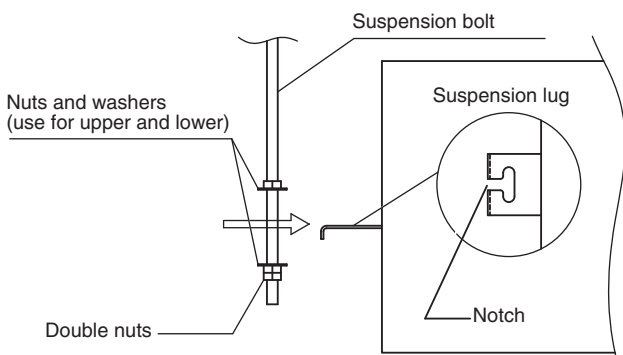


Fig. 3-39

### 3-13. Installing the Drain Pipe

- Prepare standard hard PVC pipe (O.D. 32 mm) for the drain and use the supplied hose band to prevent water leaks.  
The PVC pipe must be purchased separately.  
The transparent drain part on the unit allows you to check drainage. (Fig. 3-42)

#### CAUTION

- Do not use adhesive tape at the drain connection port on the indoor unit.
- Insert the drain pipe until it contacts the socket, and then secure it tightly with the hose band.
- Do not use the supplied drain hose bent at a 90° angle. (The maximum permissible bend is 45°.)
- Tighten the hose clamps so their locking nuts face upward. (Fig. 3-42)

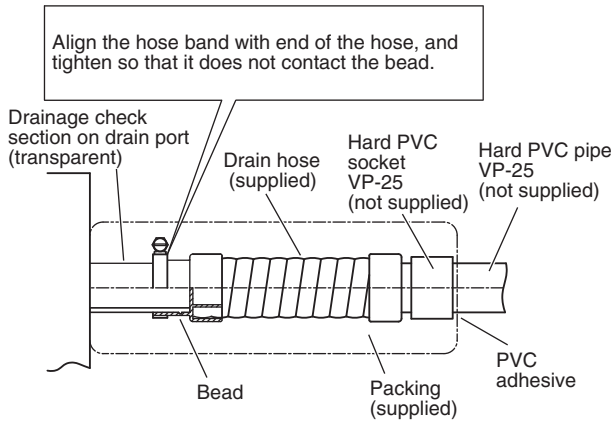


Fig. 3-42

- After connecting the drain pipe securely, wrap the supplied packing and drain pipe insulator around the pipe, then secure it with the vinyl clamps. (Fig. 3-43)

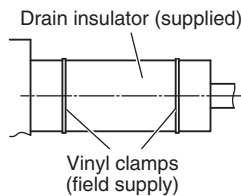


Fig. 3-43

#### 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. 3-44)

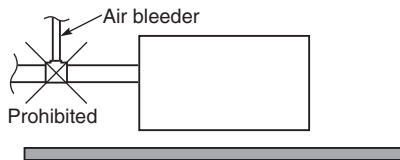


Fig. 3-44

- 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. 3-45)

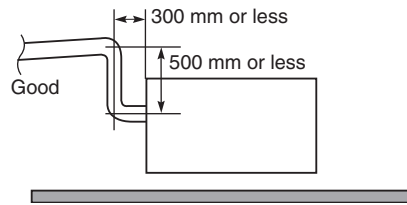


Fig. 3-45

- 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. 3-46)

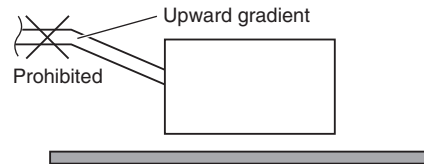


Fig. 3-46

- 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. 3-47)

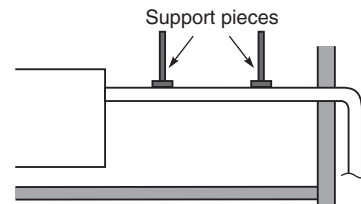


Fig. 3-47

### 3-14. 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 slowly pour about 1,200 cc of water through the opening into the drain pan to check drainage.
- Short-circuit the check pin (CHK) on the indoor control circuit 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 drainage check is complete, open the check pin (CHK) and remount the insulator and drain cap onto the drain inspection port.

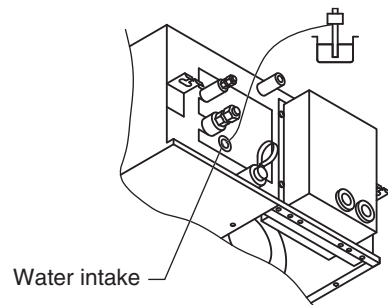


Fig. 3-48

### 3-15. Installing the Air-intake Filter

(1) Standard installation

Install the filter onto the intake port. (Fig. 3-49)

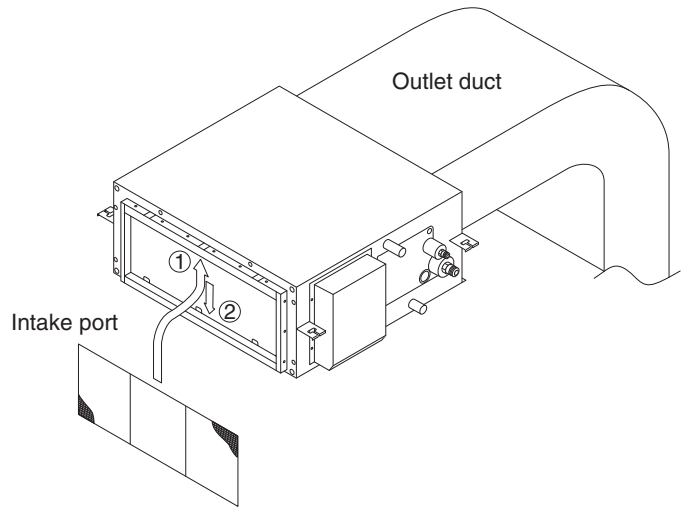
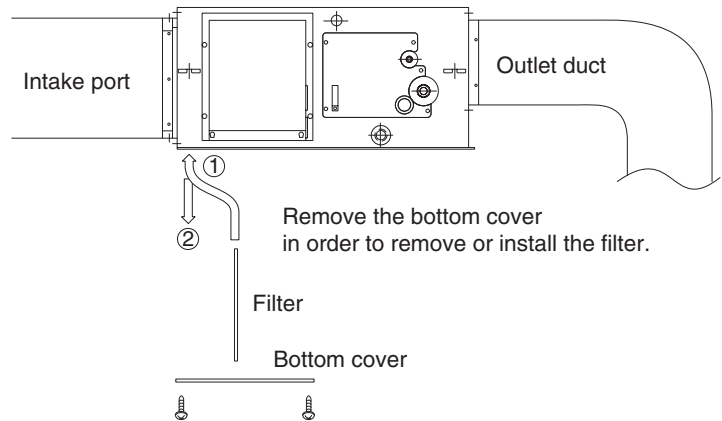


Fig. 3-49

(2) If a duct is connected to the intake port:

First remove the bottom cover, then install the filter inside the unit. (Fig. 3-50)

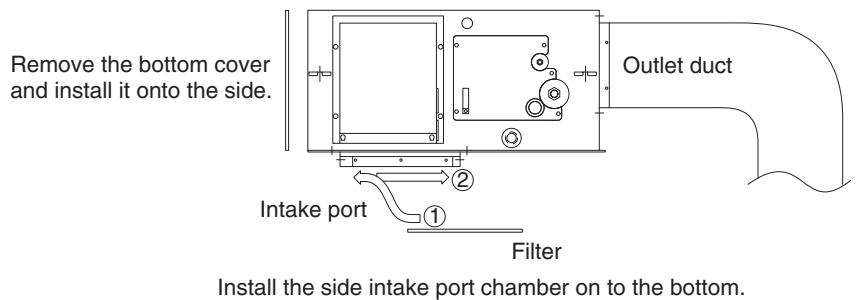


Remove the bottom cover in order to remove or install the filter.

Fig. 3-50

(3) If the intake is on the bottom:

Remove the intake port chamber from the side, then reattach the chamber onto the bottom of the unit. (Fig. 3-51)



Remove the bottom cover and install it onto the side.

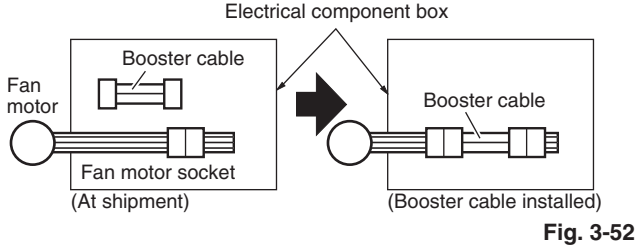
Install the side intake port chamber on to the bottom.

Fig. 3-51

### 3-16. Increasing the Fan Speed

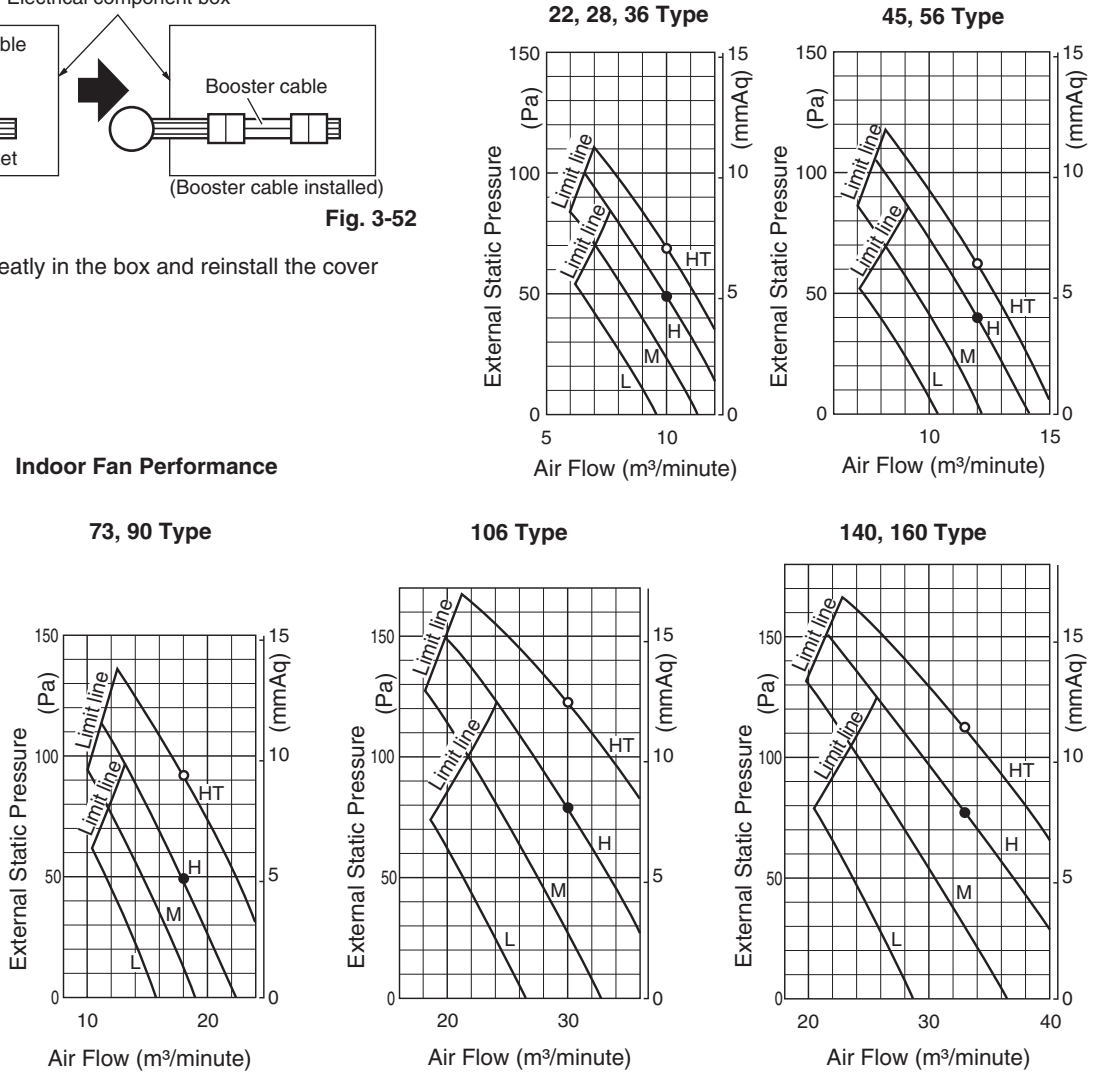
If external static pressure is too great (due to long extension of ducts, for example), the air flow volume may drop too low at each air outlet. This problem may be solved by increasing the fan speed using the following procedure:

- (1) Remove 4 screws on the electrical component box and remove the cover plate.
- (2) Disconnect the fan motor sockets in the box.
- (3) Take out the booster cable (sockets at both ends) clamped in the box.
- (4) Securely connect the booster cable sockets between the disconnected fan motor sockets in step 2 (Fig. 3-52).



- (5) Place the cable neatly in the box and reinstall the cover plate.

**Indoor Fan Performance**



**NOTE** HT: Using the booster cable  
 H: At shipment



**Fig. 3-53**

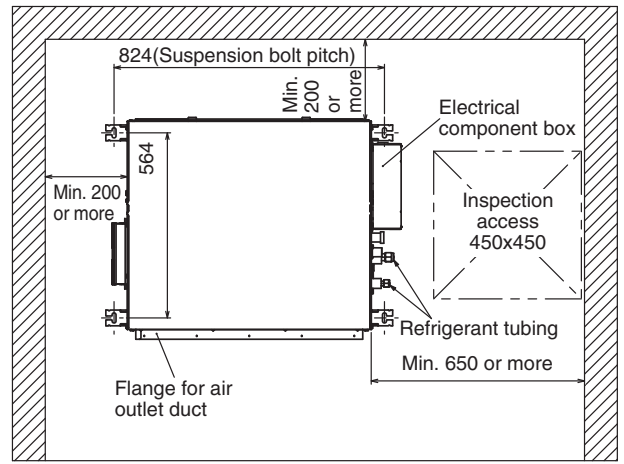
#### How to read the diagram

The vertical axis is the external static pressure (Pa) while the horizontal axis represents the air flow ( $m^3/minute$ ). The characteristic curves for “HT”, “H”, “M” and “L” fan speed control are shown. The nameplate values are shown based on the “H” air flow. For the 73 type, the air flow is  $18 m^3/minute$ , while the external static pressure is 49 Pa at “H” position. If external static pressure is too great (due to long extension of ducts, for example), the air flow volume may drop too low at each air outlet. This problem may be solved by increasing the fan speed as explained above.

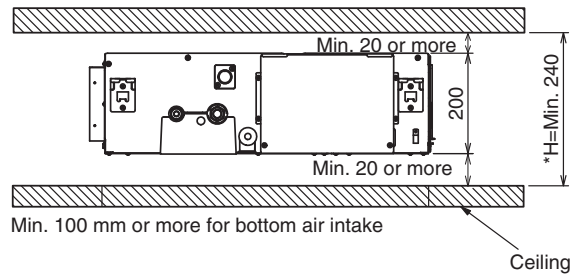
■ Slim Low Static Ducted Type (M1 Type)

3-17. Required Minimum Space for Installation and Service

- This air conditioner is usually installed above the ceiling so that the indoor unit and ducts are not visible. Only the air intake and air outlet ports are visible from below.
- The minimum space for installation and service is shown in the diagram. (Fig. 3-54)
- \*H dimension means the minimum height of the unit.
- Select the \*H dimension such that a downward slope of at least 1/100 is ensured as indicated in "3-22. Installing the Drain Pipe".



Unit: mm



Ceiling

Fig. 3-54

- The diagram shows the detailed dimensions of the indoor unit. (Fig. 3-55)

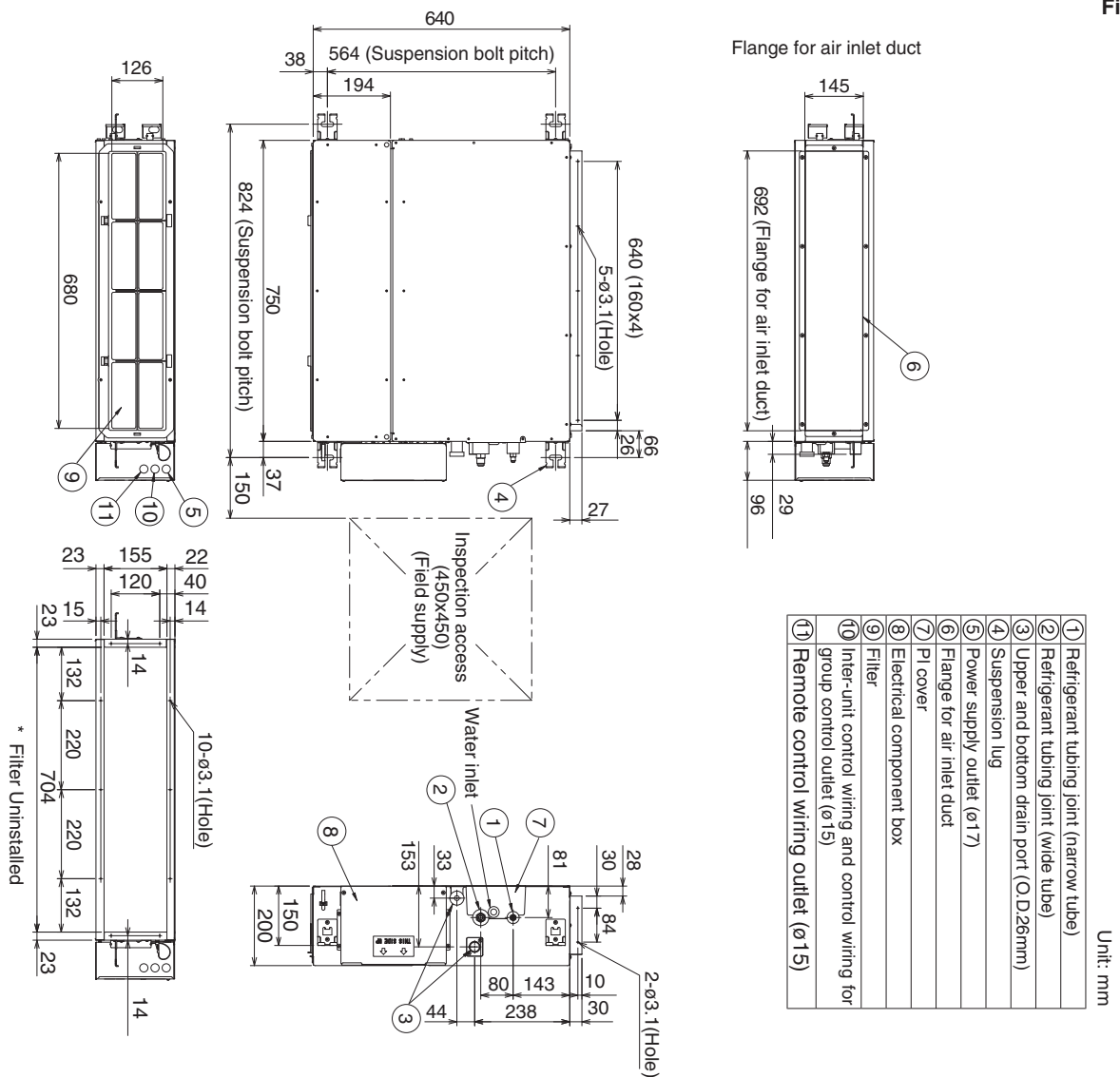


Fig. 3-55

### 3-18. Preparations Before Installation

- (1) Confirm the positional relationship between the unit and suspension bolts. (Fig. 3-56)
- Install the inspection opening on the control box side where maintenance and inspection of the control box and drain pump are easy. Install the inspection opening also in the lower part of the unit.

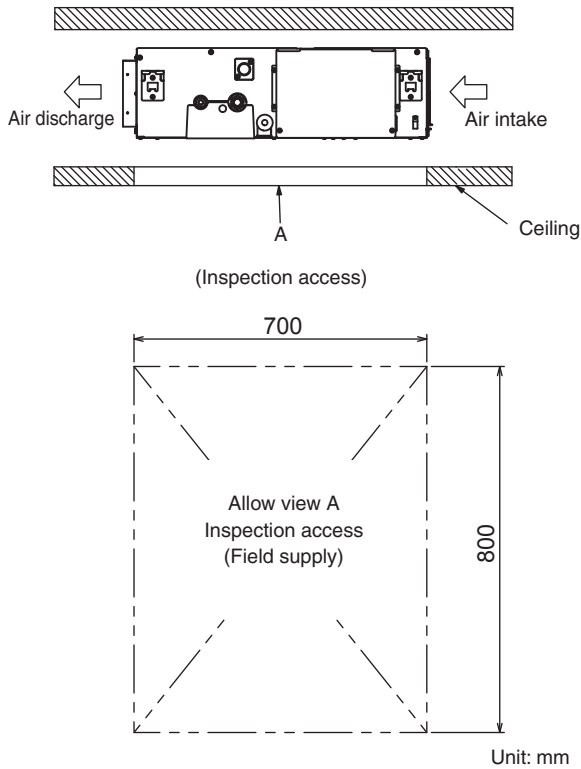


Fig. 3-56

- (2) Make sure the range of the unit's external static pressure is not exceeded. (See the technical documentation for the range of the external static pressure setting.)
- (3) Open the installation hole. (Pre-set ceilings)
  - Once the installation hole is opened in the ceiling where the unit is to be installed, pass refrigerant piping, drain piping, transmission wiring, and remote controller wiring (It is not necessary if using a wireless remote controller) to the unit's piping and wiring holes. See "5. HOW TO PROCESS TUBING", "3-22. Installing the Drain Pipe" and "4. ELECTRICAL WIRING".
  - After opening the ceiling hole, make sure ceiling is level if needed. It might be necessary to reinforce the ceiling frame to prevent shaking. Consult an architect or carpenter for details.

### 3-19. For Bottom Intake

For bottom intake, replace the chamber lid and protection net in the procedure shown in the diagram.

- (1) Remove the frame filter assy.  
Remove the chamber lid. (Fig. 3-57-1)

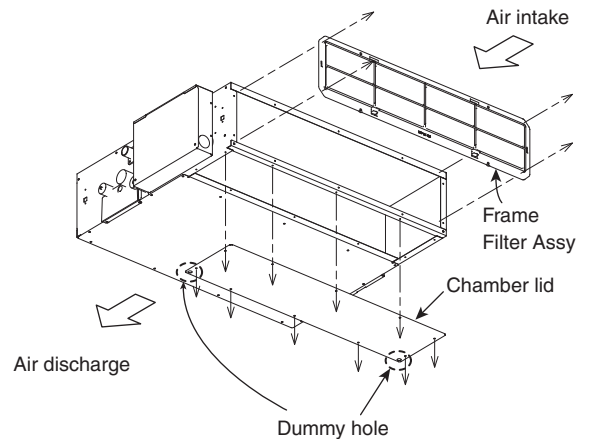


Fig. 3-57-1

- (2) Refer to the diagram to attach the chamber lid and frame filter assy in the direction of the arrow. (Fig. 3-57-2)  
Note: Attach the lid with the dummy holes downward.

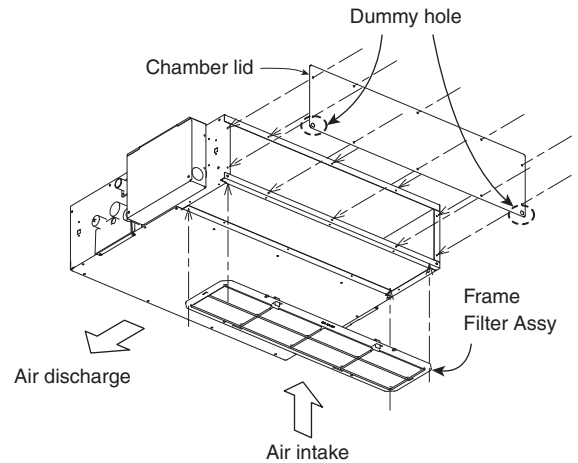


Fig. 3-57-2

- (3) Attach the frame filter assy (supplied) in the manner shown in the diagram. (Fig. 3-57-3)

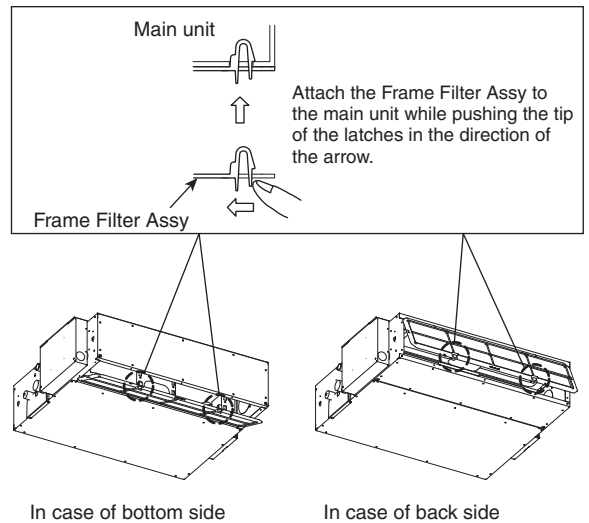


Fig. 3-57-3



### 3-20. Installing the Duct

Connect the duct supplied in the field as shown in Fig. 3-58.

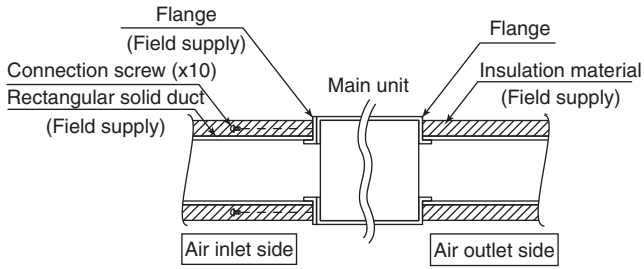


Fig. 3-58

#### Air inlet side

- Attach the duct and intake-side flange (field supply).
- Connect the flange to the main unit with 10 -  $\phi 3.1$  (Hole) screws.
- Wrap the intake-side flange and duct connection area with aluminum tape or something similar to prevent air escaping.

#### CAUTION

When attaching a duct to the intake-side, be sure to attach an air filter inside the air passage on the intake-side. (Use an air filter whose dust collecting efficiency is at least 50% in a gravimetric technique.) The included filter is not used when the intake duct is attached.

#### Air outlet side

- Connect the duct according to the air outside of the outlet-side flange.
- Wrap the outlet-side flange and the duct connection area with aluminum tape or something similar to prevent air escaping.

#### CAUTION

- Be sure to insulate the duct to prevent condensation from forming. (Material: glass wool or polyethylene foam, 25 mm thick)
- Use electric insulation between the duct and the wall when using metal ducts to pass metal laths of the net or fence shape or metal plating into wooden buildings.
- Be sure to explain about the way of maintaining and cleaning local procurements (air filter, grille [both air outlet and suction grille], etc.) to your customer.

### 3-21. Suspending the Indoor Unit

Depending on the ceiling type:

- Insert suspension bolts as shown in the diagram. (Fig. 3-59) or
- Use existing ceiling supports or construct a suitable support as shown in the diagram. (Fig. 3-60)

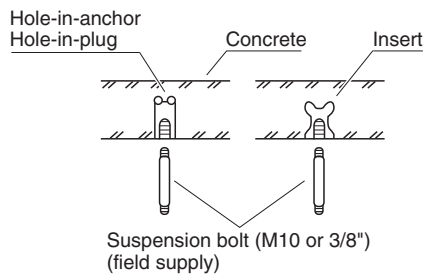


Fig. 3-59

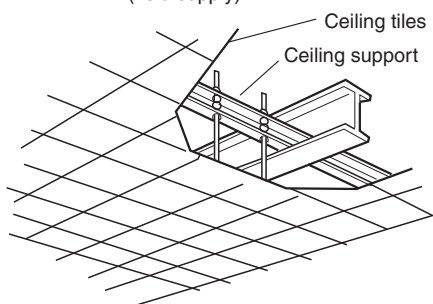


Fig. 3-60

#### WARNING

It is important that you use extreme care in supporting the indoor unit inside 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.

- (1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts referring to the dimensional data as shown in Fig. 3-54. 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) Screw in the suspension bolts allowing them to protrude from the ceiling as shown in Fig. 3-59. (Cut the ceiling material, if necessary.)
- (3) Thread the 3 hexagonal nuts and 2 washers (field supply) onto each of the 4 suspension bolts as shown in Fig. 3-61 and 3-62. Use 1 nut and 1 washer for the upper part, and 2 nuts and 1 washer for the lower part, so that the unit will not fall off the suspension lugs.

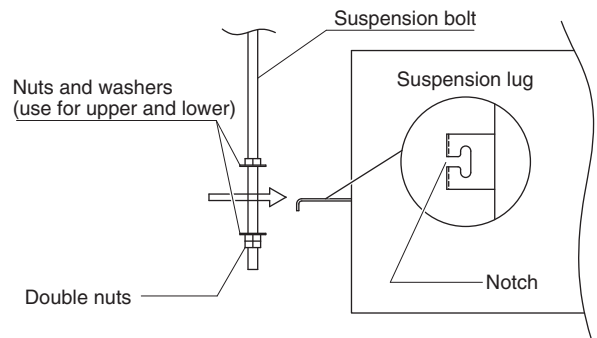


Fig. 3-61

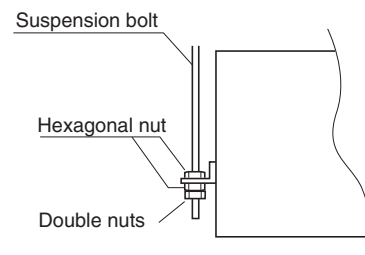


Fig. 3-62

- (4) Adjust the height of the unit.
- (5) Check the unit is horizontally level.

#### CAUTION

- Make sure the unit is installed level using a level or a vinyl hose filled with water. In using a vinyl hose instead of a level, adjust the top surface of the unit to the surface of the water at both ends of the vinyl hose and adjust the unit horizontally. (One thing to watch out for in particular is if the unit is installed so that the slope is not in the direction of the drain piping, this might cause leaking.) (Fig. 3-63)

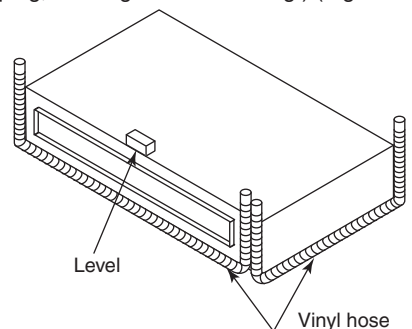
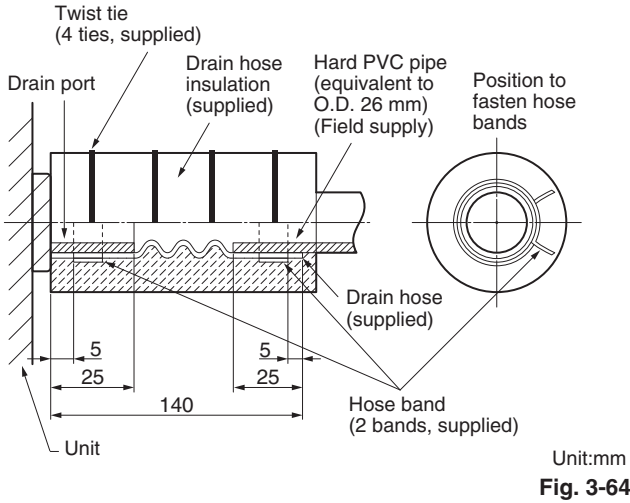


Fig. 3-63

- (6) Tighten the upper nut.

### 3-22. Installing the Drain Pipe

- Prepare standard hard PVC pipe (O.D. 26 mm) for the drain and use the supplied hose band to prevent water leaks. (Fig. 3-64)  
The PVC pipe must be purchased separately.  
The transparent drain part on the unit allows you to check drainage.



Unit:mm  
Fig. 3-64

#### CAUTION

- Attach so that the hose band fastener is on the side of the drain port. (Fig. 3-64)
- Attach the hose bands so that each is approximately 5 to 25 mm from the end of the supplied drain hose. (Fig. 3-64)
- 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 the figure above, then secure it tightly with the hose band.
- Do not use the supplied drain hose bent at a 90° angle. (The maximum permissible bend is 45°.)
- Tighten the hose clamps so their locking nuts face in the horizontal direction.
- Make sure that the drain port is not a downward gradient from the joint section (may lead to abnormal noise).

#### 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. 3-65-1)

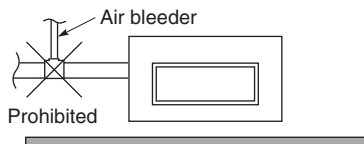


Fig. 3-65-1

- 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. 3-65-2)

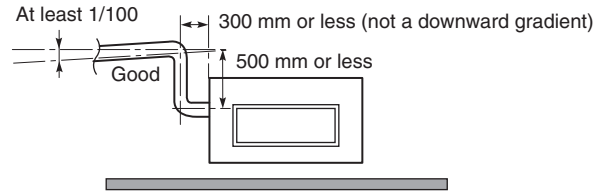


Fig. 3-65-2

- 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. 3-65-3)

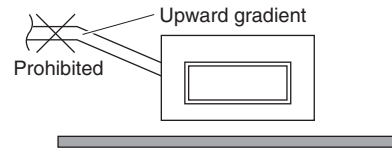


Fig. 3-65-3

- 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. 3-65-4)

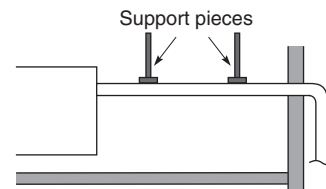


Fig. 3-65-4

### 3-23. 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 eyelet cap and through the opening, slowly pour about 500 cc of water into the drain pan to check 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 insulator and drain cap onto the drain inspection port.

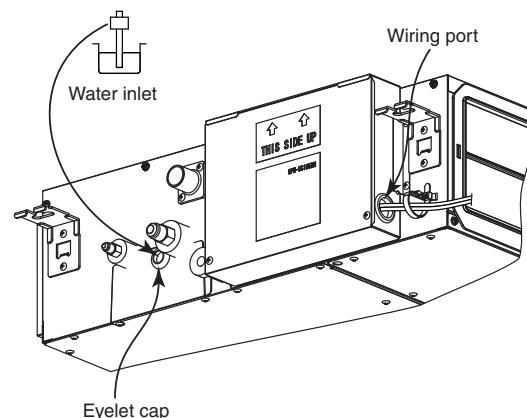


Fig. 3-66

### 3-24. Increasing the Fan Speed

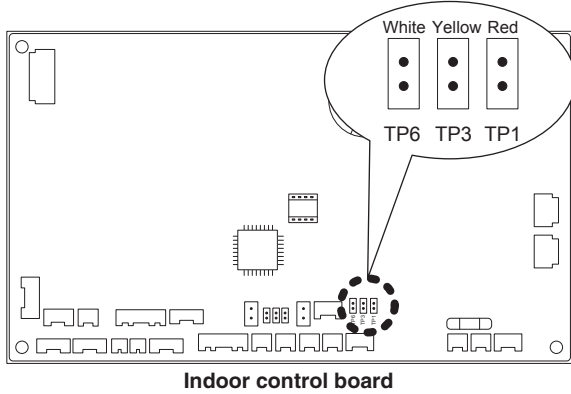
#### ■ For Short Circuit Connection

- The standard (before shipment) external static pressure is shown in the table below.
- When using with a higher static pressure, it is necessary to change to the high static pressure mode.

External static pressure

Type	22	28	36/45/56
Standard (Pa)	10	15	15
High static pressure (Pa)	30	30	40

When using with high static pressure mode, set the indoor unit control board as shown in Fig. 3-67.

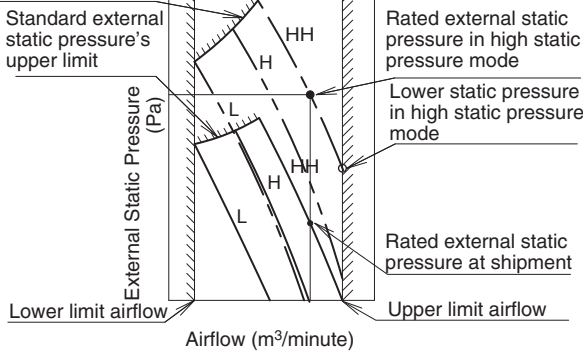


**Fig. 3-67**

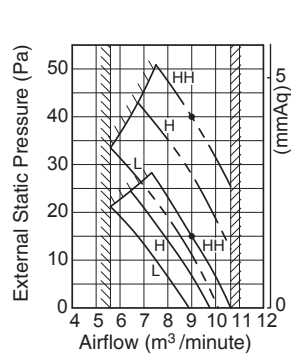
Follow the below procedure while the unit is turned off.

- (1) Open the cover of the electrical box and confirm that it is the indoor unit control board.
  - (2) Connect the short circuit connector to the short circuit pin TP3 (2P: Yellow) of the indoor unit control board.
- In case of wired remote control setting, do not use the short circuit connector.

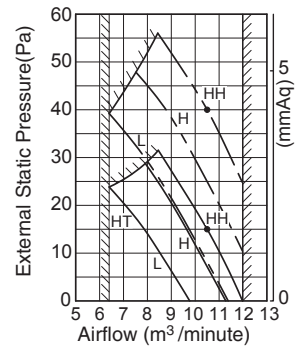
External static pressure's upper limit in high static pressure mode



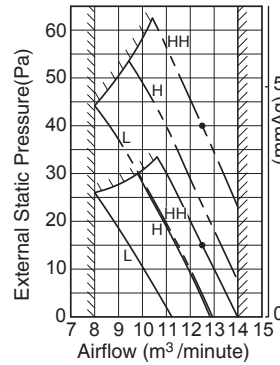
**S-36MM1E5**



**S-45MM1E5**

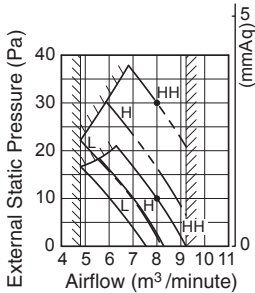


**S-56MM1E5**

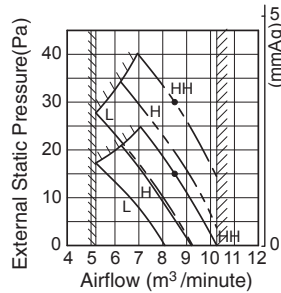


**Fig. 3-68**

**S-22MM1E5**



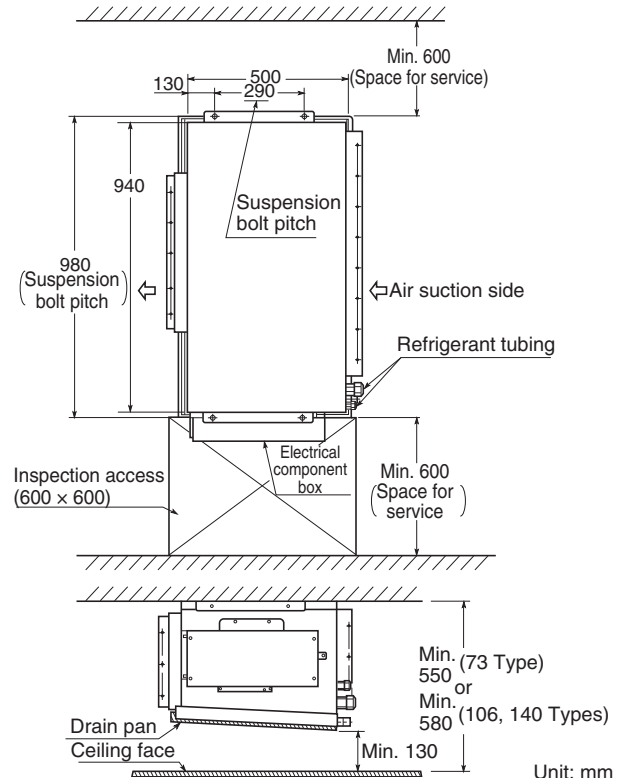
**S-28MM1E5**



■ High Static Pressure Ducted Type (E1 Type)

3-25. Required Minimum Space for Installation and Service (73, 106, 140 Types)

- This air conditioner is usually installed above the ceiling so that the indoor unit and ducts are not visible. Only the air intake and air outlet ports are visible from below.
- The minimum space for installation and service is shown in Fig. 3-69.
- It is recommended that space be provided (600 × 600 mm) for checking and servicing the electrical system.
- Fig. 3-70 and Table 3-3 show the detailed dimensions of the indoor unit.



Unit: mm  
Fig. 3-69

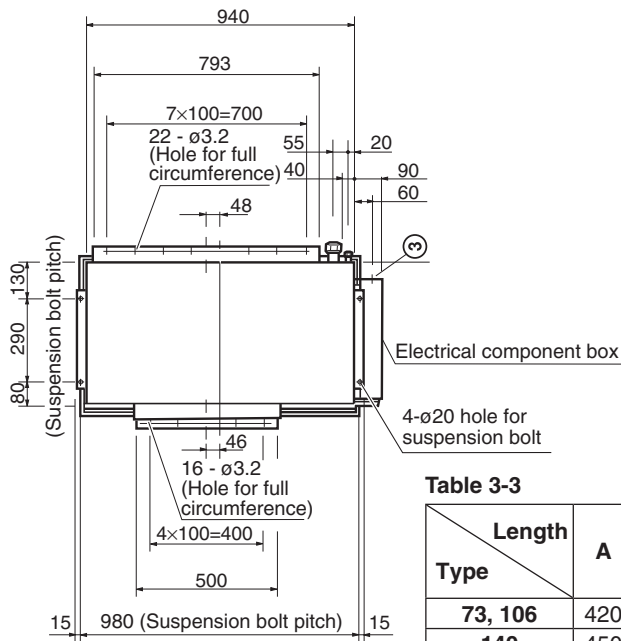
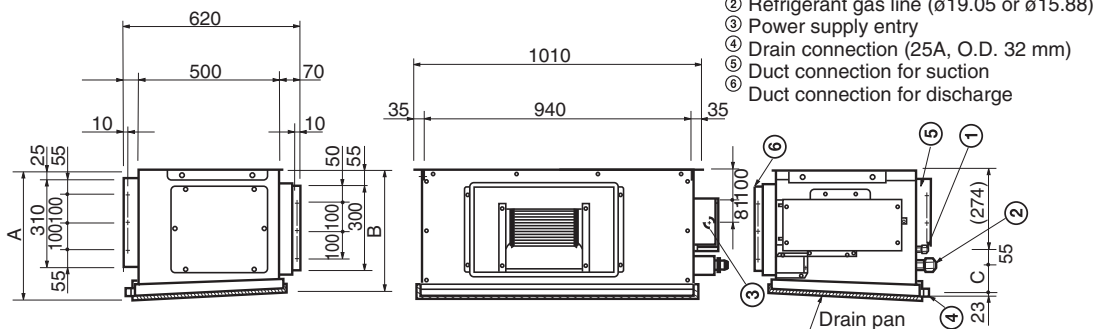


Table 3-3 Unit: mm

Type \ Length	A	B	C
	73, 106	420	395
140	450	425	98

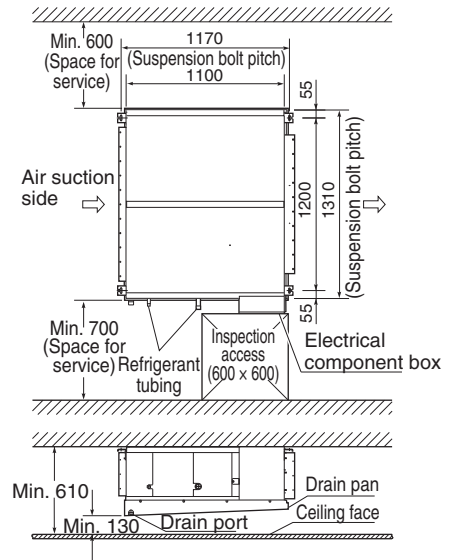


- ① Refrigerant liquid line (ø9.52 or ø6.35)
- ② Refrigerant gas line (ø19.05 or ø15.88)
- ③ Power supply entry
- ④ Drain connection (25A, O.D. 32 mm)
- ⑤ Duct connection for suction
- ⑥ Duct connection for discharge

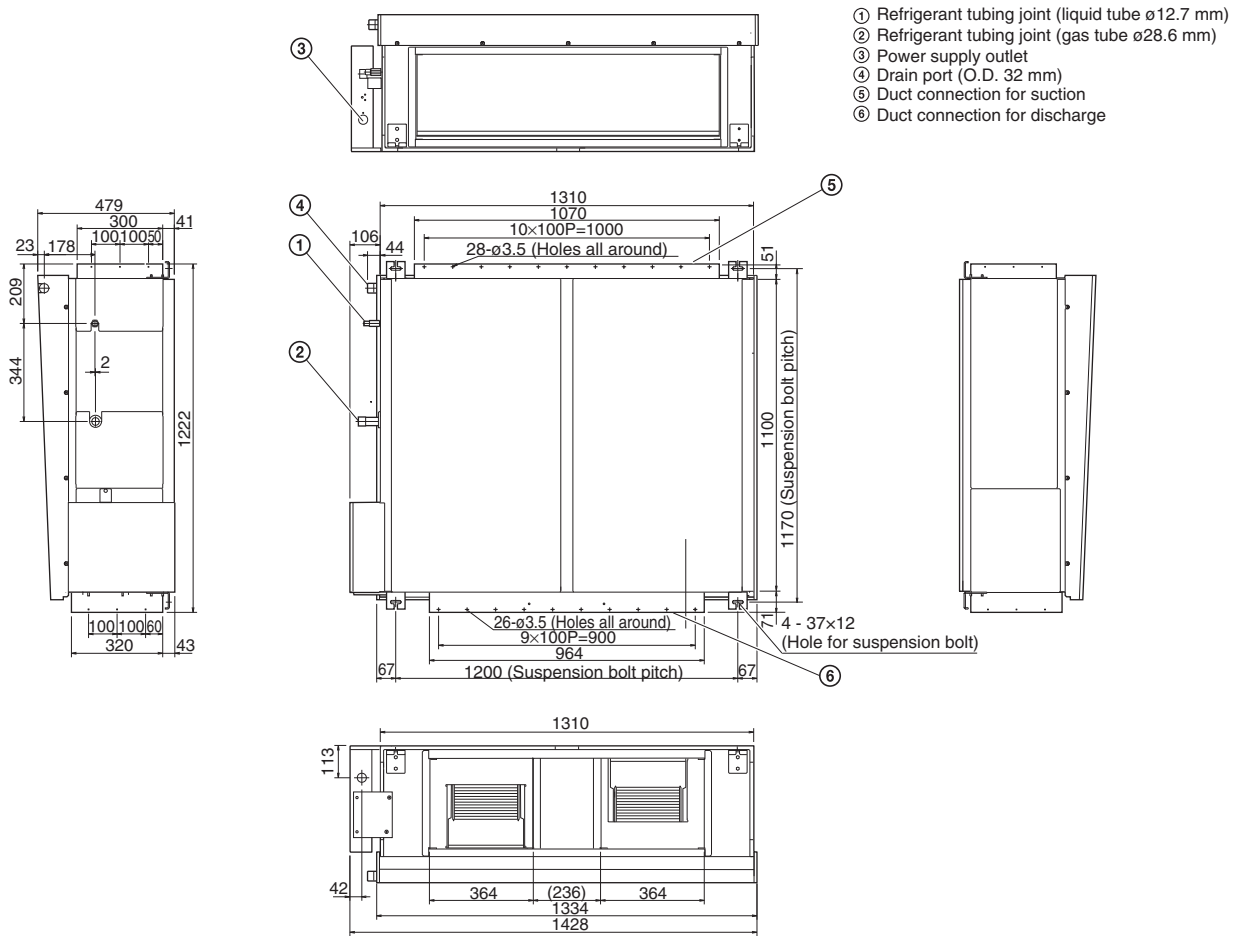
Unit: mm  
Fig. 3-70

### 3-26. Required Minimum Space for Installation and Service (224, 280 Types)

- This air conditioner is usually installed above the ceiling so that the indoor unit and ducts are not visible. Only the air intake and air outlet ports are visible from below.
- The minimum space for installation and service is shown in Fig. 3-71.
- It is recommended that space be provided (600 × 600 mm) for checking and servicing the electrical system.
- Fig. 3-72 shows the detailed dimensions of the indoor unit.



Unit: mm  
Fig. 3-71



Unit: mm  
Fig. 3-72

### 3-27. Suspending the Indoor Unit

Depending on the ceiling type:

- Insert suspension bolts as shown in Fig. 3-73

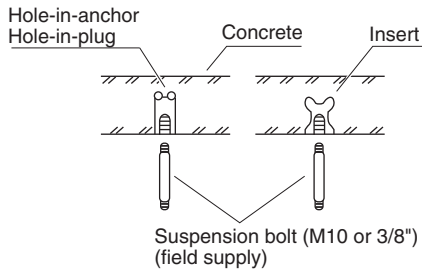


Fig. 3-73

or

- Use existing ceiling supports or construct a suitable support as shown in Fig. 3-74.

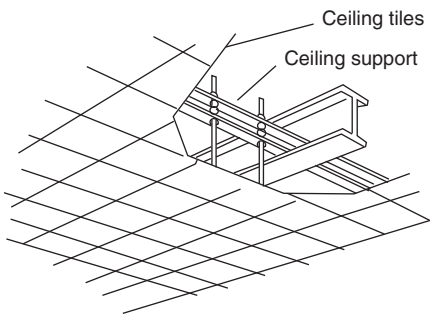


Fig. 3-74



**WARNING**

It is important that you use extreme care in supporting the indoor unit inside 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.

- (1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts referring to the dimensional data given previously. (Figs. 3-69 and 3-70)  
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) Screw in the suspension bolts allowing them to protrude from the ceiling as shown in Fig. 3-73. (Cut the ceiling material, if necessary.)
- (3) Suspend and fix the indoor unit using the 2 hexagonal nuts (field supply) and special washers (supplied with the unit) as shown in Fig. 3-75.

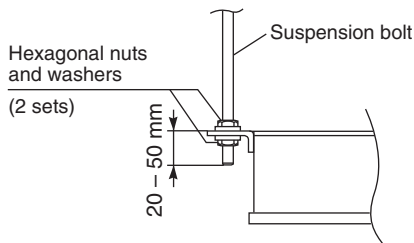
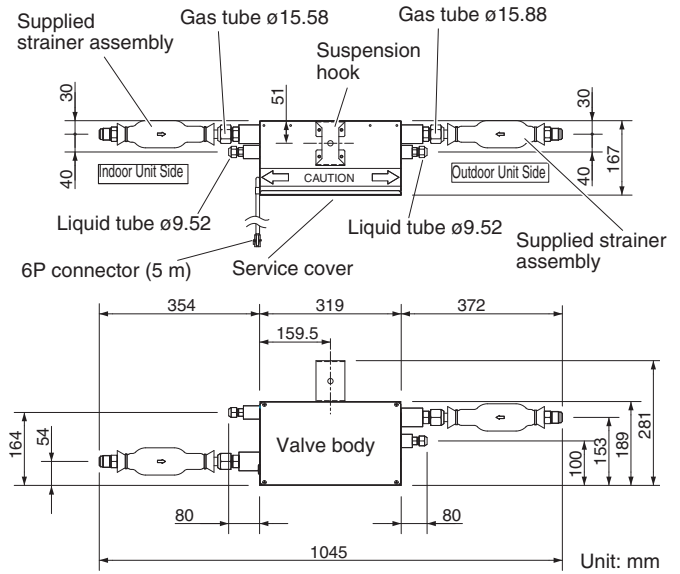


Fig. 3-75

### ■ RAP Valve Kit (Refrigerant Accumulation Protector Valve Kit) (CZ-P160RVK2)

When installing a E1 type indoor unit (either the 8-hp 224 type or 10-hp 280 type), you must also install the RAP Valve Kit (CZ-P160RVK2).

- Connect 2 RAP valve kits in parallel for 224 or 280 type.
- Secure the RAP valve kit using suspension bolts, etc. within 30 meters from the indoor unit.
- Do not place the RAP valve kit directly on the ceiling.



**Note:** This figure shows the valve body with the suspension hook and strainer assemblies installed.

Fig. 3-76

### 3-28. Installing the Refrigerant Tubing

The size of the refrigerant tubing is as shown in the table below.

Table 3-4

	224 Type	280 Type
Gas tube	ø19.05 (Brazing connection)	ø22.22 (Brazing connection)
Liquid tube	ø9.52 (Flare connection)	ø9.52 (Flare connection)

- When brazing the gas tubing, cool the tubing with dampened shopcloths as you work, as shown in the figure below, to protect the unit's thermistor from the heat generated by brazing.

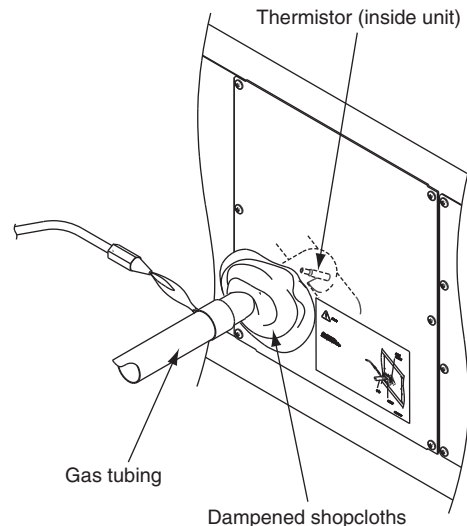


Fig. 3-77

- Be sure to insulate both the gas tubing and liquid tubing. In addition, wrap the supplied insulation material around the tubing joints, and fasten in place with vinyl tape or other means. Failure to insulate the tubing may result in water leakage from condensation.
- Plug all gaps at tube through-holes in the unit with insulation or a similar substance to prevent air leakage.
- When connecting an embedded ceiling type unit (like this one) to a refrigerant system where individual operation is possible, install 2 RAP valve kits (CZ-P160RVK2) in parallel. (For details on connecting the RAP valve kit, refer to the manual that came with the kit.)

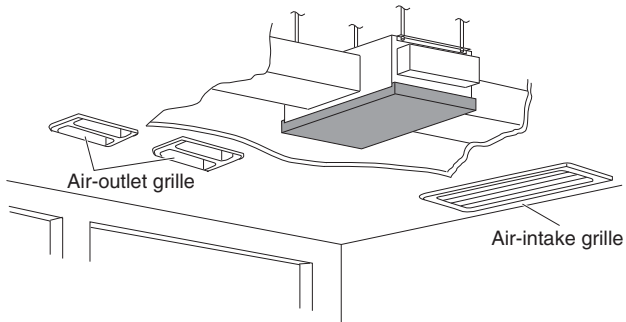


Fig. 3-78

### 3-29. Installing the Drain Piping

- (1) Prepare standard hard PVC pipe (O.D. 32 mm) for the drain and use the supplied drain socket to prevent water leaks. The PVC pipe must be purchased separately. When doing this, apply adhesive for the PVC pipe at the connection point.
- (2) If connecting a drain joint (supplied) to the threaded drain port, first wrap the drain port threads with sealing tape, then connect the joint. (Fig. 3-79)

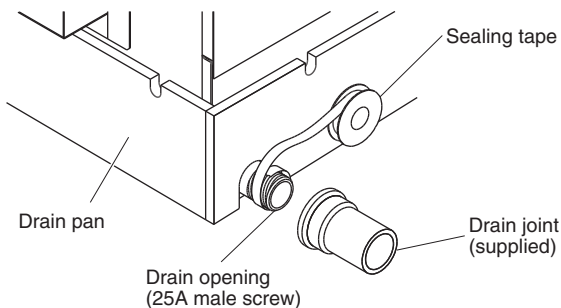


Fig. 3-79

- (3) After connecting the drain pipe securely, wrap insulator (field supply) around the pipe.
- (4) Ensure the drain pipe has a downward gradient (1/100 or more) and prepare traps as indicated in Fig. 3-80.

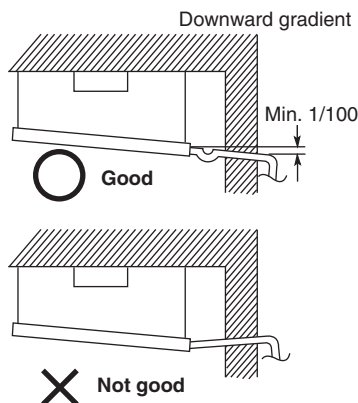


Fig. 3-80

- (5) Also, in another part of the pipe arrangement, prepare traps with an inspection plug to clean dust or debris that may cause leaking of water. (Fig. 3-81)

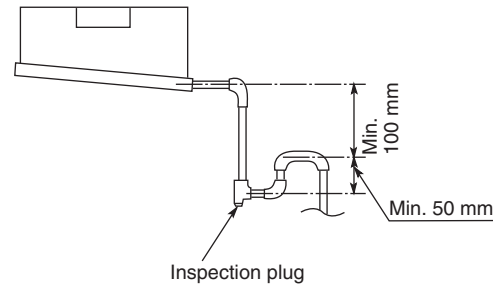


Fig. 3-81

- (6) After connecting the drain piping, slowly pour water into the drain pan to check that the water drains smoothly.

### 3-30. Caution for Ducting Work

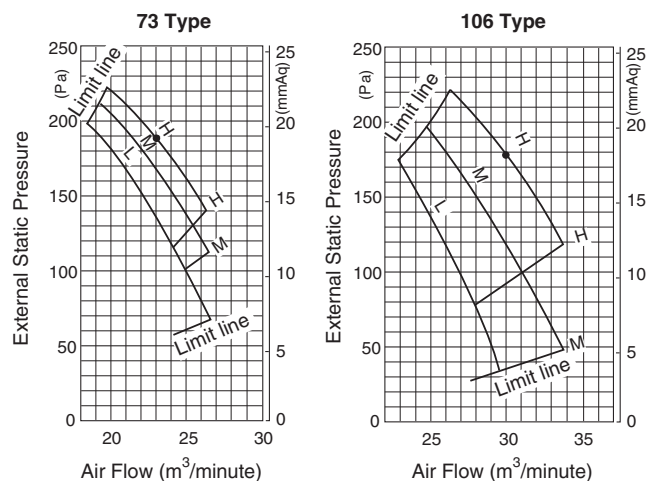
- This unit has high static pressure (applicable external static pressure Max. 167 to 216 Pa (17–22 mm Aq)). In the case of small pressure resistance (for instance, a short duct), install a damper for adjusting air flow volume as air flow volume / air flow noise increases.
- If the air conditioner is to be installed in a room such as an office or meeting room which needs a low sound level, provide a supply and return noise absorption chamber with an acoustic liner.
- Include an air filter (field supply) at the return duct.

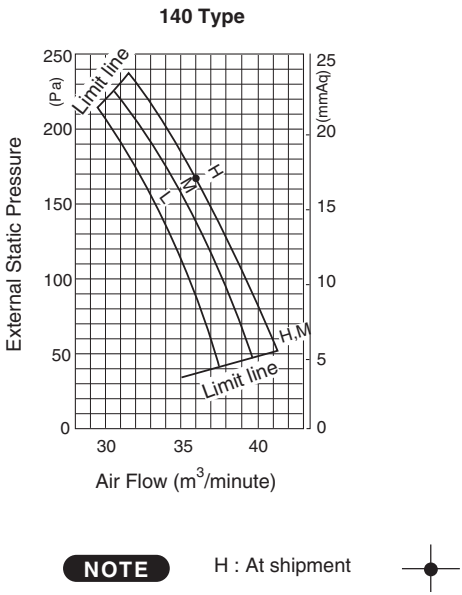
### Indoor Fan Performance

#### How to Read the Diagram

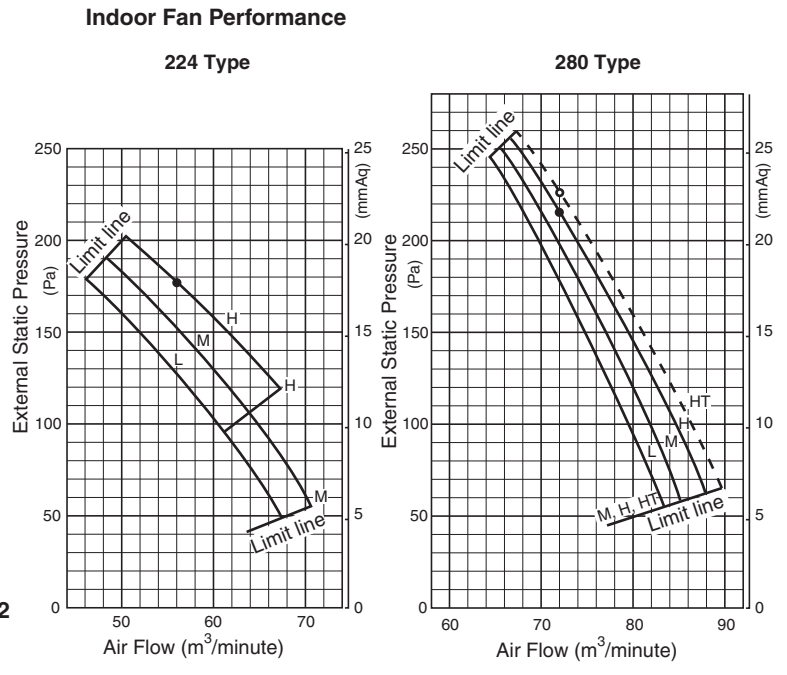
The vertical axis is the External Static Pressure (Pa) while the horizontal axis represents the Air Flow (m<sup>3</sup>/minute). The characteristic curve for the "H," "Med," and "Lo" fan speed control.

The nameplate values are shown based on the "H" air flow. Therefore in the case of 73 Type, the flow is 23 m<sup>3</sup>/minute, while the External Static Pressure is 190 Pa at "H" position. If the external static pressure is too great (due to long extension of duct, for example), the air flow volume may drop too low at each air outlet.





**Fig. 3-82**

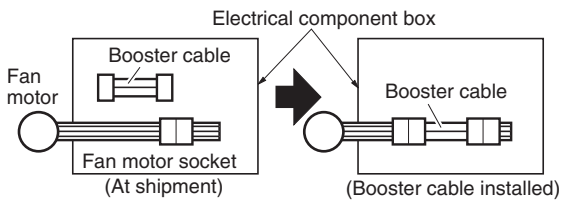


**Fig. 3-84**

**3-31. Increasing the Fan Speed (280 Type Only)**

If external static pressure is too great (due to long extension of ducts, for example), the air flow volume may drop too low at each air outlet. This problem may be solved by increasing the fan speed using the following procedure:

- (1) Remove 4 screws on the electrical component box and remove the cover plate.
- (2) Disconnect the fan motor sockets in the box.
- (3) Take out 2 booster cables from option carton box (sockets at both ends).
- (4) Securely connect the booster cable's 2 sockets between the disconnected fan motor sockets in step 2 as shown in Fig. 3-83.



**Fig. 3-83**

- (5) Place the cable neatly in the box and reinstall the cover plate.



**4-Way Cassette Type (U1 Type)**

**3-32. Preparation for Suspending**

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

**3-33. Suspending the Indoor Unit**

- Fix the suspension bolts securely in the ceiling using the method shown in the diagrams (Figs. 3-85 and 3-86), by attaching them to the ceiling support structure, or by any other method that ensures that the unit will be securely and safely suspended.
- Follow Fig. 3-86 and Table 3-5 to make the holes in the ceiling.

Note: For DC Fan Tap Change Procedure for 4-Way Cassette, see page 47.

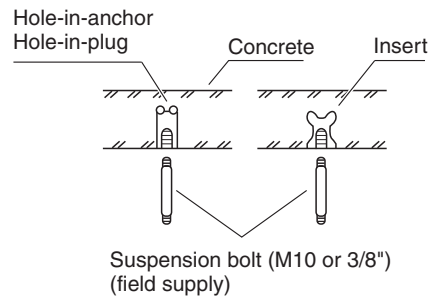


Fig. 3-85

Table 3-5 Unit: mm

Type \ Length	A	B	C	D
22, 28, 36, 45, 56, 73, 106, 140, 160	786	745	860 to 910	860 to 910

- Determine the pitch of the suspension bolts using the supplied full-scale installation diagram. The diagram and table (Fig. 3-87 and Table 3-6) show the relationship between the positions of the suspension fitting, unit, and panel. Use the nut (field supply) and washer (supplied) for upper and lower position of the suspension lug.

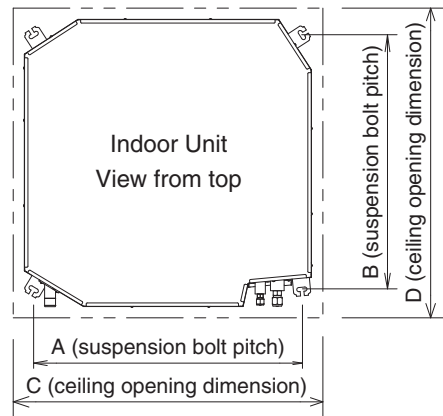


Fig. 3-86

Table 3-6 Unit: mm

Type \ Length	A	B	C	D	E
22, 28, 36, 45, 56	121	171	256	180	130
73, 106, 140, 160	121	171	319	180	130

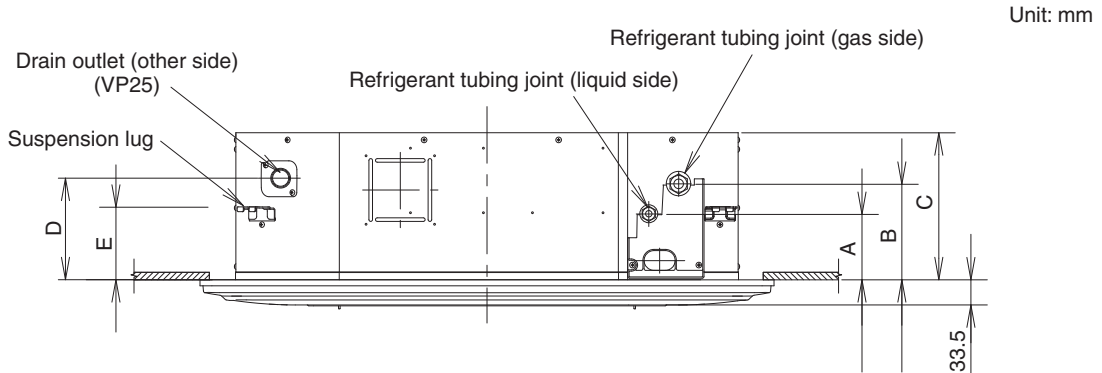


Fig. 3-87

**3-34. Placing the Unit Inside the Ceiling**

This unit is equipped with the drain pump. Check a tape measure or carpenter's level.

Before installing the ceiling panel, complete the work of drain pipe and refrigerant pipe installation.

- When placing the unit inside the ceiling, determine the pitch of the suspension bolts using the supplied full-scale installation diagram. (Fig. 3-88) Tubing and wiring must be laid inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the tubing and wiring into position for connection to the unit before placing the unit inside the ceiling.

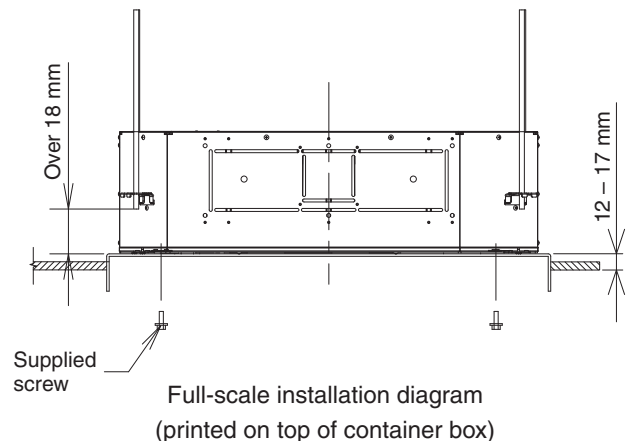
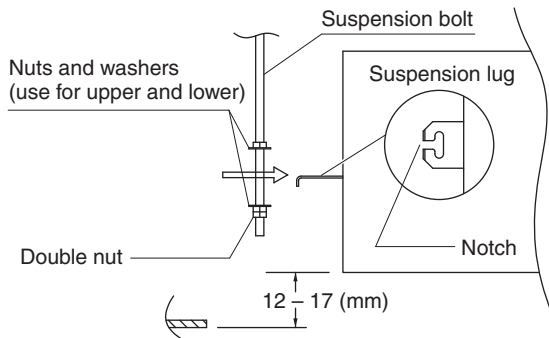


Fig. 3-88

- (2) The length of suspension bolts must be appropriate for a distance between the bottom of the bolt and the bottom of the unit of more than 18 mm as shown in Fig. 3-88.
- (3) Thread the 3 hexagonal nuts and 2 washers (field supply) onto each of the 4 suspension bolts as shown in Fig. 3-89. 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) Adjust so that the distance between the unit and the ceiling bottom is 12 to 17 mm. Tighten the nuts on the upper side and lower side of the suspension lug.
- (5) Remove the protective polyethylene used to protect the fan parts during transport.
- (6) Check with a tape measure or carpenter's level.



**Fig. 3-89**

### 3-35. How to Process Tubing

Refer to the section "5. HOW TO PROCESS TUBING".

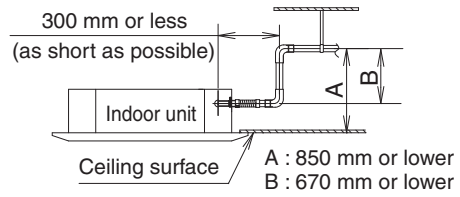
### 3-36. Installing the Drain Pipe

#### 3-36-1. Before Performing the Installation Drain Piping

##### (1) Limitations of Raising the Drain Pipe Connection



- The drain pipe can be raised to a maximum height of 850 mm from the bottom surface of the ceiling. Do not attempt to raise it higher than 850 mm. Doing so will result in water leakage. (Fig. 3-90)



\* Length of supplied drain pipe = 250 mm

Fig. 3-90

##### (2) Limitations of Drain Pipe Connection



- Do not install the drain pipe with an upward gradient from the drain port connection. This will cause the drain water to flow backward and leak when the unit is not operating. (Fig. 3-91)
- Do not install an air bleeder as this may cause water to spray from the drain pipe outlet. (Fig. 3-91)
- Do not provide U-trap or bell-shaped trap in the middle of the drain pipe. Doing so will cause abnormal sound. (Fig. 3-91)
- Make sure the drain pipe has a downward gradient (1/100 or more; downward from drain port connection). (Fig. 3-92)

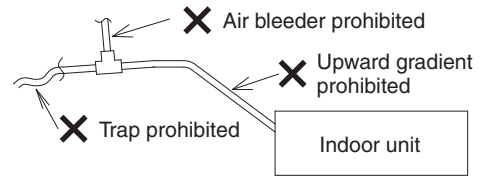


Fig. 3-91

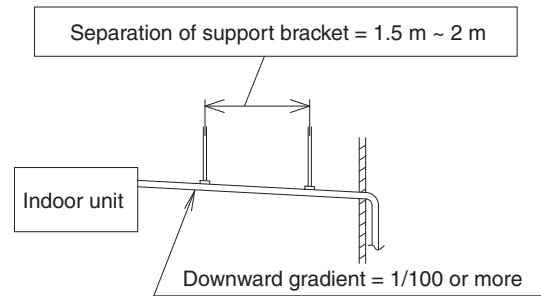


Fig. 3-92

##### (3) Limitations of Drain Hose Connection



- Do not bend the supplied drain hose 90° or more. Bend it less than 45°. (Fig. 3-93)
- Do not make a trap in the middle of the supplied drain hose. Doing so will cause abnormal sound. (Fig. 3-94)

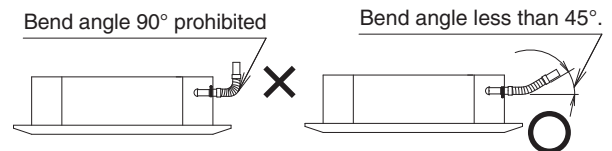


Fig. 3-93

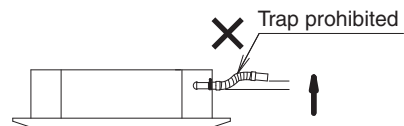


Fig. 3-94

### 3-36-2. Installing the Drain Pipe



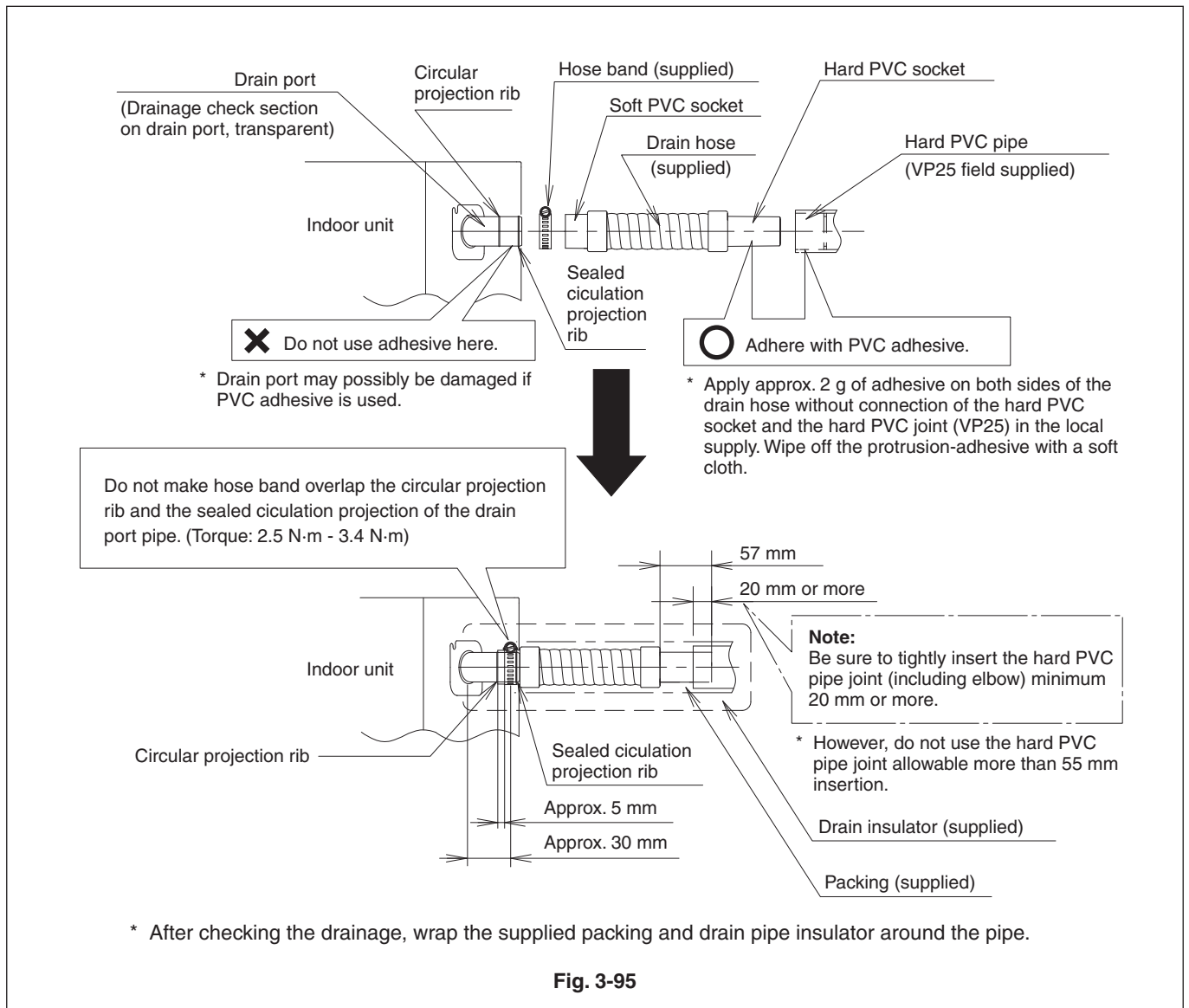
**CAUTION**

- Do not apply force to the drain port when connecting the drain pipe. Install and fix it near the indoor unit as close as possible.
- Do not use adhesive when connecting the drain port pipe and the drain hose.

#### (1) How to Install the Drain Pipe

- 1) First insert the supplied hose band into the drain port pipe. Then make sure the head of the screw is facing toward a technical engineer when placing the screw of the hose band at an upward angle.
- 2) Insert the soft PVC socket of the supplied drain hose to the drain port pipe. Do not use adhesive when connecting the drain hose to the drain port pipe. Insert it until the tip of the drain hose contacts the circular projection rib of the drain port pipe.

- 3) Move the hose band so that the center position of the hose band can be placed approx. 30 mm away from the external plate of the indoor unit. (Fig. 3-95)
- 4) Screw the drain hose tightly facing the screw of the hose band upward. (Torque: 2.5 N·m - 3.4 N·m) (If the screw is tightened beneath the drain hose, the troubles will be generated.) Pay attention not to make hose band overlap the circular projection rib and the sealed circulation projection of the drain port pipe.
- 5) Apply approx. 2 g of adhesive on both sides of the drain hose without connection of the hard PVC socket and the hard PVC joint (VP25) in the local supply.
- 6) Connect the drain hose and the hard PVC joint so that the adhesive area of both sides can be overlapped. Wipe off the protrusion-adhesive with a soft cloth.



**Fig. 3-95**

**3-36-3. Checking the Drainage**

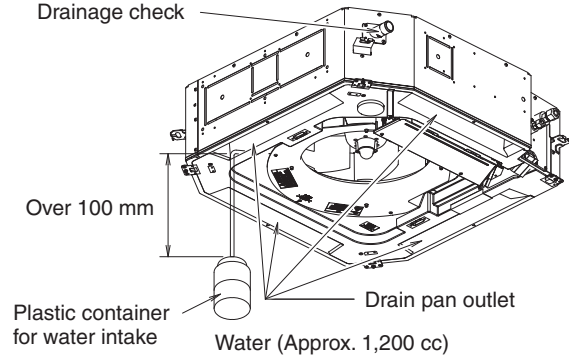


**CAUTION**

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

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) Slowly pour about 1,200 cc of water into the drain pan to check drainage. (Fig. 3-96)
- (3) Short the check pin (CHK) on the indoor control board and operate the drain pump. 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 tube cover.
- (5) Checkpoint after installation

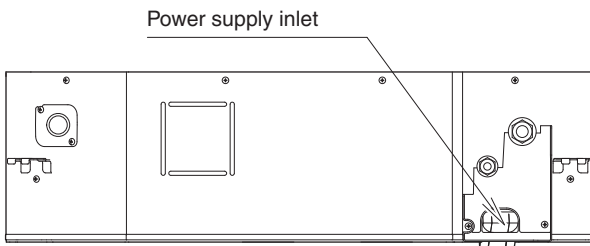


**Fig. 3-96**

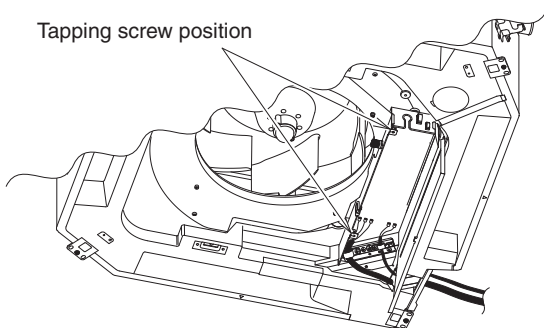
After installation of indoor and outdoor units, panels and electrical wiring, check the following items.

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

### 3-37. Important Note for Wiring 4-Way Cassette Type



- (1) The power supply inlet is located at the lower area of the refrigerant tubing side of the unit. The electrical component box is located at the air intake of the bottom of the unit.
- (2) Before installing the ceiling panel, be sure to carry out the wiring connection.
- (3) Remove the lid located on the bottom of the indoor unit attaching the electrical component box by unscrewing the philip head tapping screws (x2).



- (4) Lead the wires from the power supply inlet to the unit. Be sure to lead the wires through the power supply inlet. Make sure that no wire is caught between the indoor unit and ceiling panel. Otherwise, the unit may cause a fire.
- (5) Connect the wires into the terminals through the power supply inlet for the electrical component box. Fix the wires with a clamping clip.
- (6) Reinstall the lid of the electrical component box in its original position with paying attention not to have the wires caught in the lid. Refer to "4. ELECTRICAL WIRING".

## 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 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 designated by the manufacturer, because special-purpose tools are required.

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

#### Indoor unit

Type	(B) Power supply	Time delay fuse or circuit capacity
	2.5 mm <sup>2</sup>	
U1, Y1, T1, F1, M1	Max. 130 m	10-16 A
E1 (73, 106, 140)	Max. 60 m	10-16 A
E1 (224 / 280)	Max. 50 / 30 m	10-16 A

#### Control wiring

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

#### NOTE

\* With ring-type wire terminal.

### 4-3. Wiring System Diagrams

ex.) MF1 Type

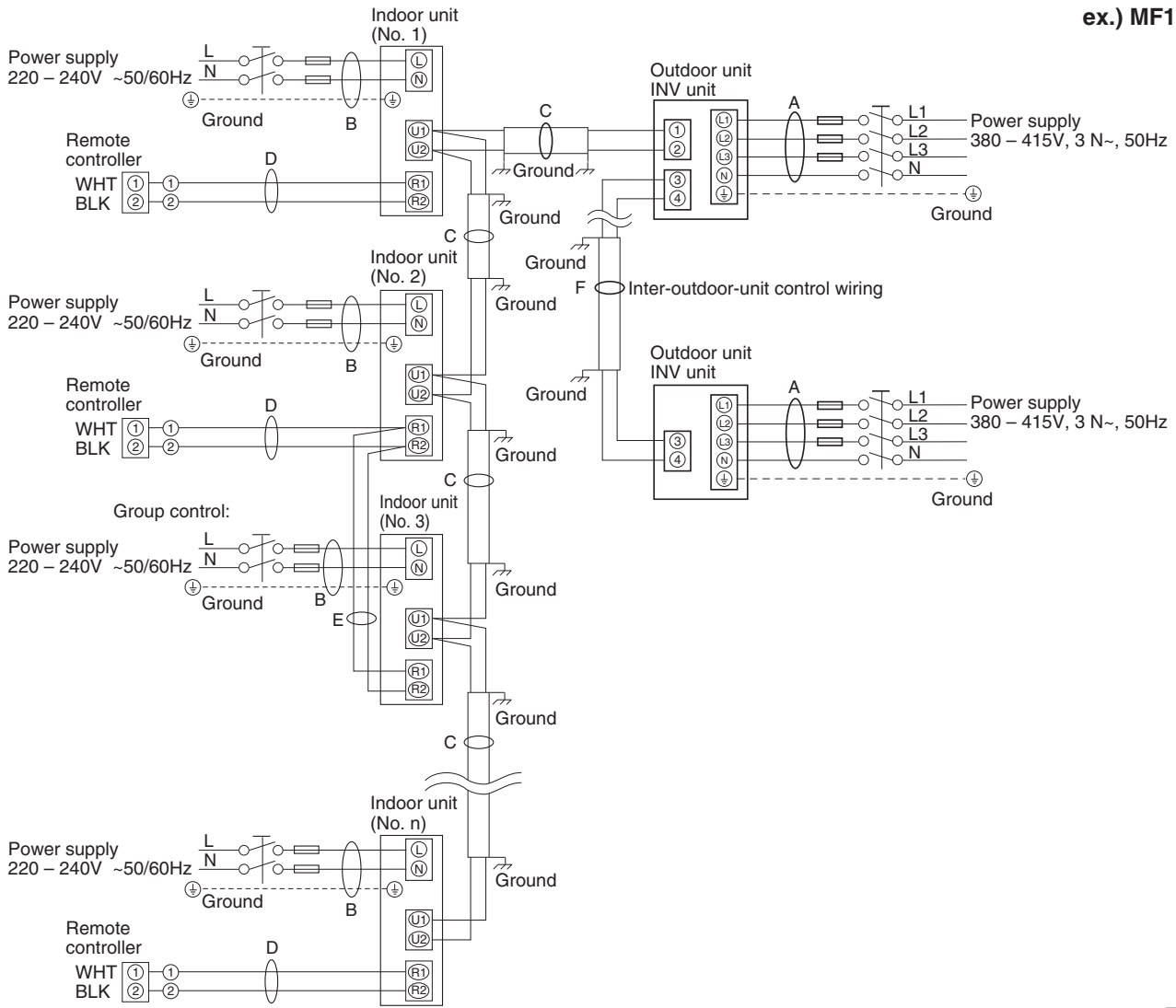


Fig. 4-1

**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. (Fig. 4-2)
- (3) Refrigerant Circuit (R.C.) address should be set before turning the power on.
- (4) Regarding R.C. address setting, refer to the installation instructions supplied with the remote controller unit (Optional). Auto address setting can be executed by remote controller automatically. Refer to the installation instructions supplied with the remote controller unit (optional).

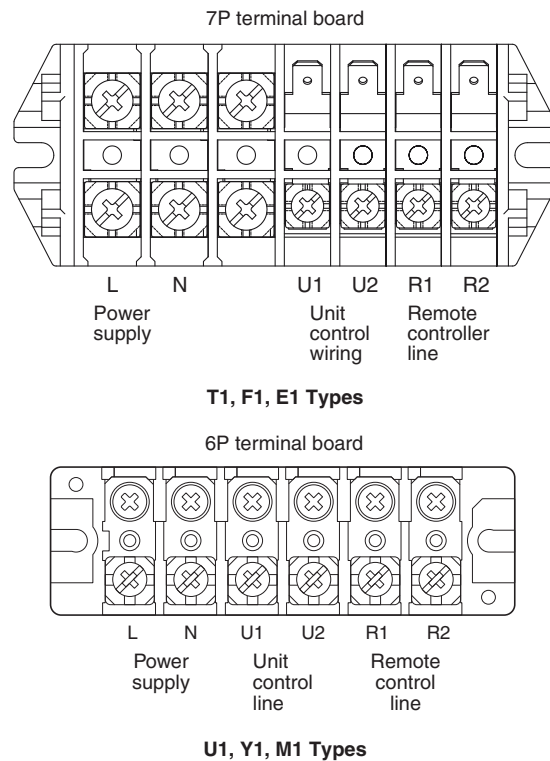


Fig. 4-2

**CAUTION**

- (1) When linking the 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 wiring connection between outdoor units), do not remove the short plug.
- (2) Do not install the inter-unit control wiring in a way that forms a loop. (Fig. 4-3)

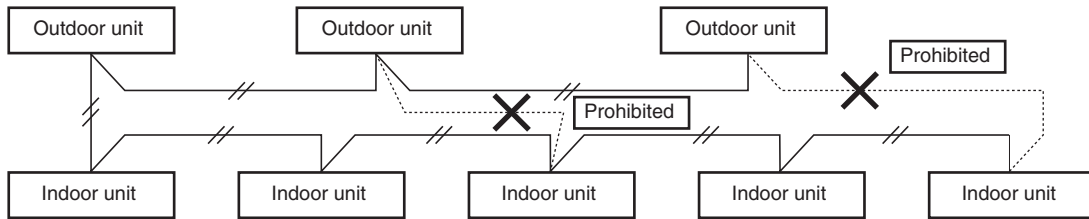


Fig. 4-3

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

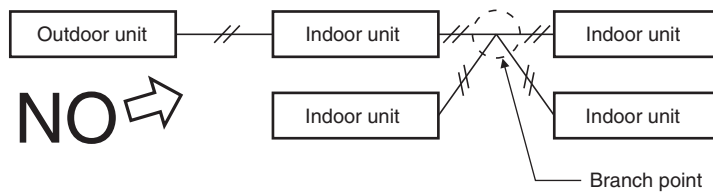


Fig. 4-4

- (4) If branching the inter-unit control wiring, the number of branch points should be 16 or fewer.  
(Branches that are less than 1 m are not included in the total branch number.) (Fig. 4-5)

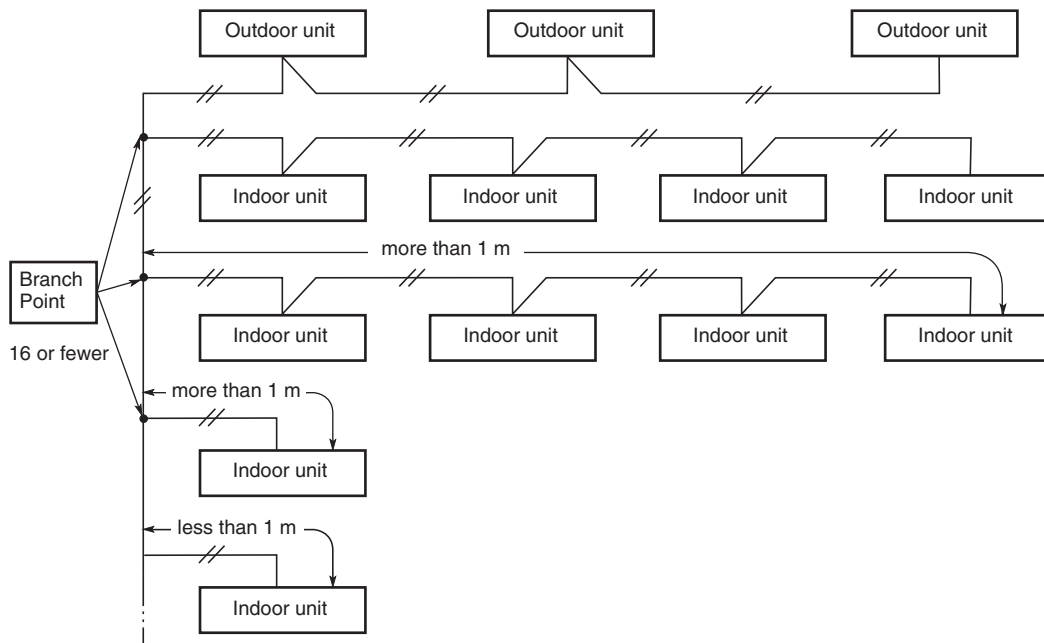


Fig. 4-5

- (5) Use shielded wires for inter-unit control wiring (c) and ground the shield on both sides, otherwise misoperation from noise may occur. (Fig. 4-6)  
Connect wiring as shown in Section "4-3. Wiring System Diagrams".

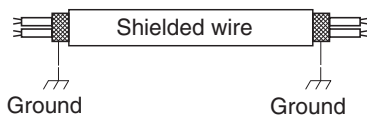


Fig. 4-6

**WARNING**

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

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

- (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. 4-7)
- (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. 4-8)

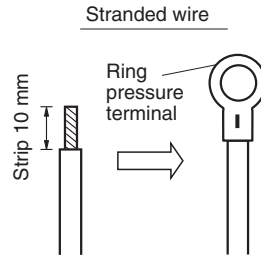


Fig. 4-7

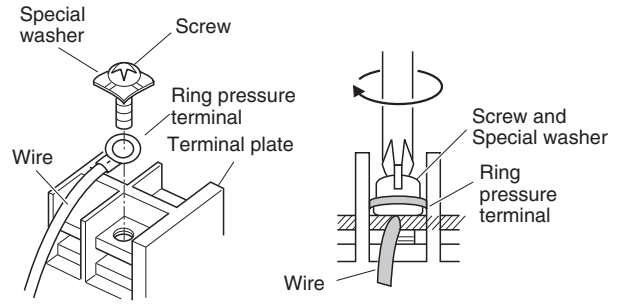


Fig. 4-8

### ■ Examples of shield wires

- (1) Remove cable coat not to scratch braided shield. (Fig. 4-9)
- (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. 4-10)
- (3) Remove coat of signal wire. (Fig. 4-11)
- (4) Attach ring pressure terminals to the signal wires and the shield wires insulated in Step (2). (Fig. 4-12)



Fig. 4-9

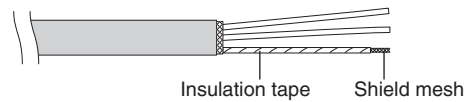


Fig. 4-10

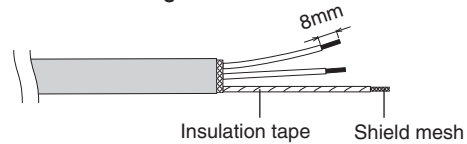


Fig. 4-11

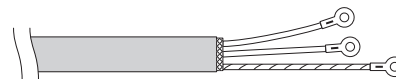
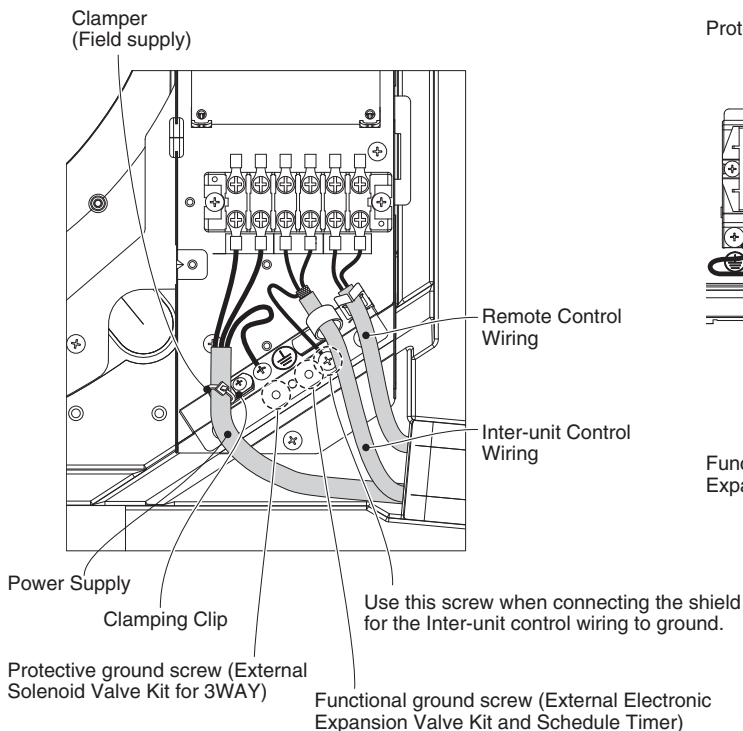


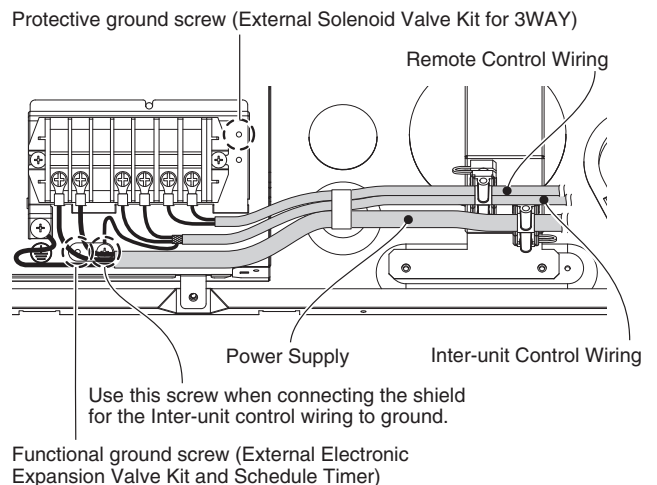
Fig. 4-12

### ■ Wiring samples

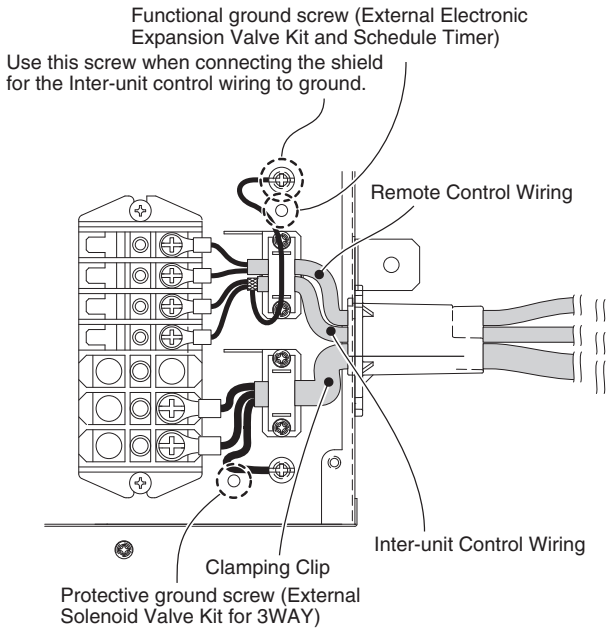
#### U1 type



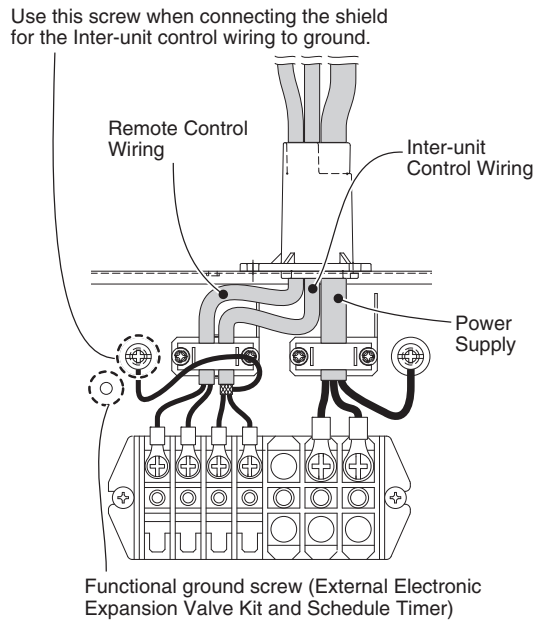
#### T1 type



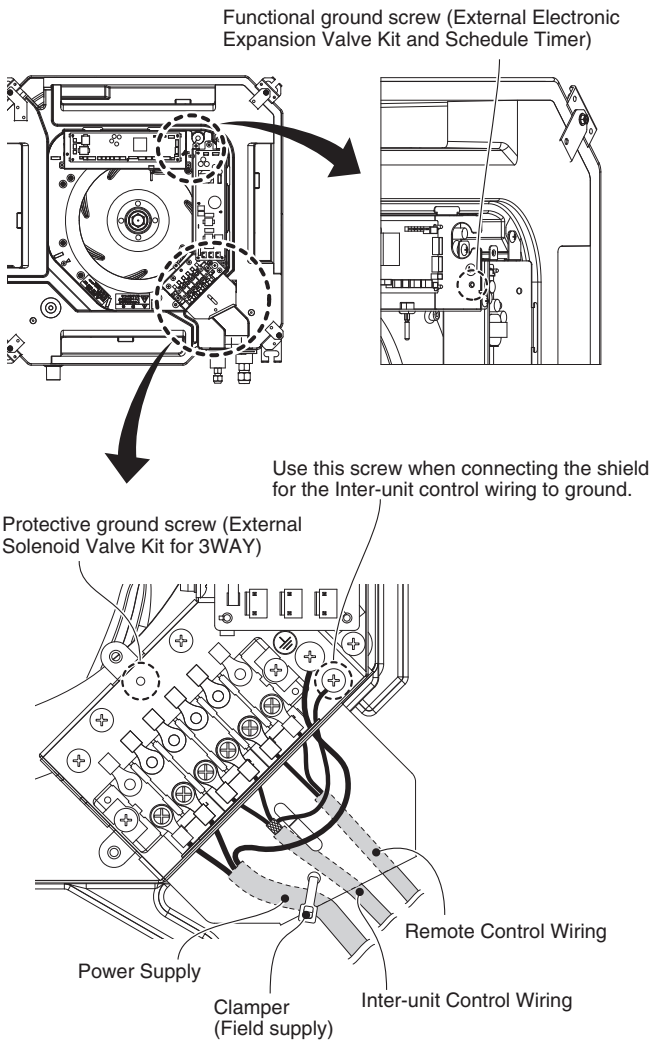
**E1 type (73, 106, 140)**



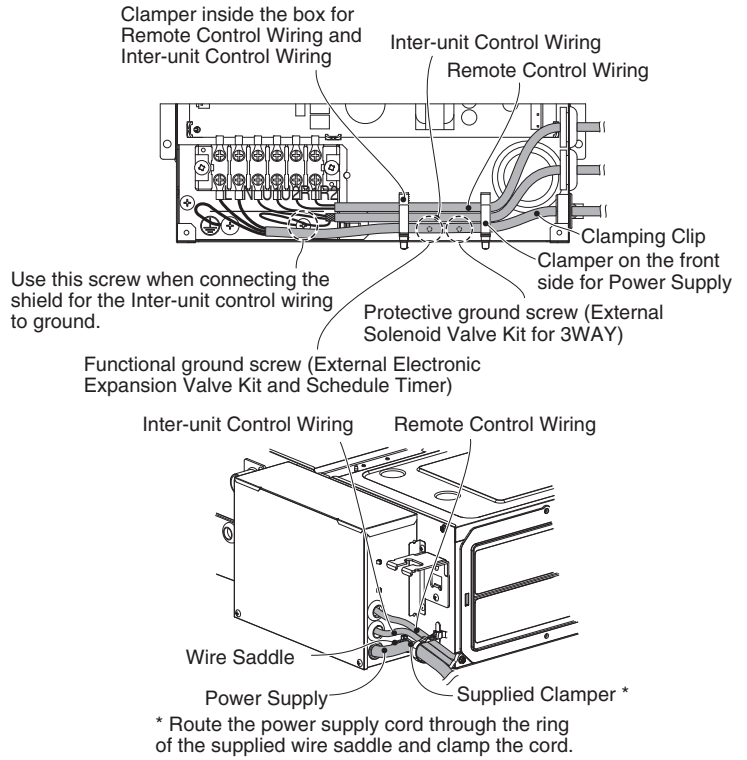
**E1 type (224, 280)**



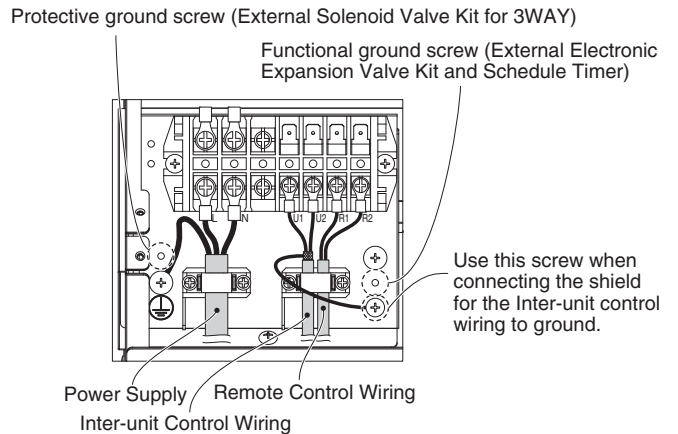
**Y1 type**



**M1 type**



**F1 type**



## 5. HOW TO PROCESS TUBING

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

### 5-1. Connecting the Refrigerant Tubing

#### Use of the Flaring Method

Many of conventional split system air conditioners employ the flaring method to connect refrigerant tubes that 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 each end of the copper tubing 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)

#### Deburring

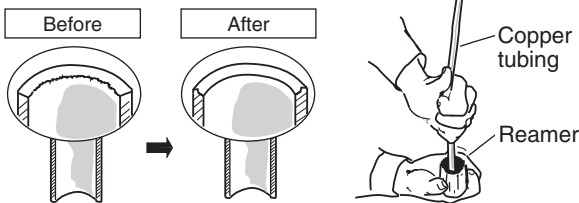


Fig. 5-1

Fig. 5-2

#### NOTE

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

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

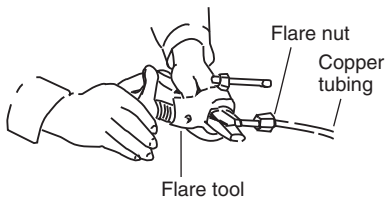


Fig. 5-3

#### 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 inside of the flare nut before making piping connections. This is effective for reducing gas leaks. (Fig. 5-4)

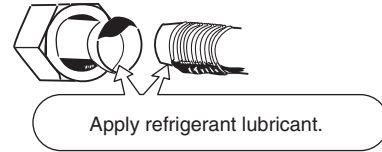


Fig. 5-4

- (3) For proper connection, align the union tube and flare tube straight with each other, then screw on the flare nut lightly at first to obtain a smooth match. (Fig. 5-5)

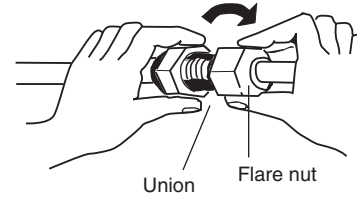


Fig. 5-5

- 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.

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

Indoor unit type	22	28	36	45	56	73	90	106	140	160
Gas tubing (mm)	ø12.7					ø15.88				
Liquid tubing (mm)	ø6.35					ø9.52				

- (2) To fasten the flare nuts, apply specified torque.
  - When removing the flare nuts from the tubing connections, or when tightening them after connecting the tubing, be sure to use 2 adjustable wrenches or spanners. (Fig. 5-6) If the flare nuts are over-tightened, the flare may be damaged, which could result in refrigerant leakage and cause injury or asphyxiation to room occupants.

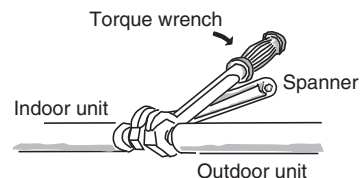


Fig. 5-6

- 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 below.

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 units tubing, including distribution joint (field supply).
  - \* 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.

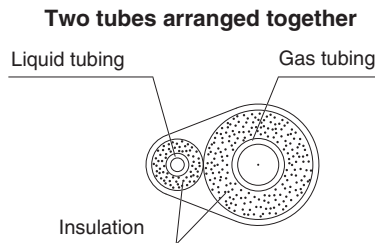


Fig. 5-7

#### CAUTION

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

#### Taping the flare nuts

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

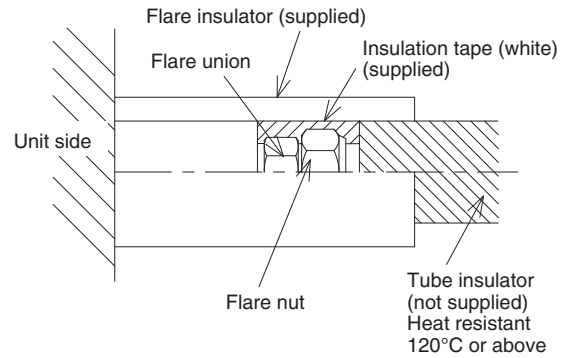


Fig. 5-8

#### Insulation material

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

#### CAUTION

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

#### 5-4. Taping the Tubes

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

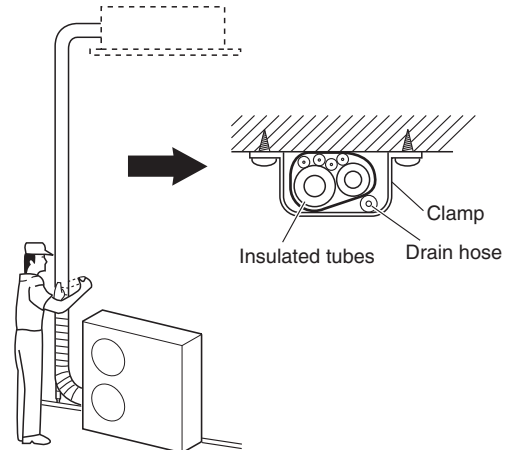


Fig.5-9

#### NOTE

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

### 5-5. Finishing the Installation

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

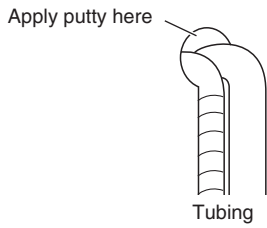


Fig.5-10

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

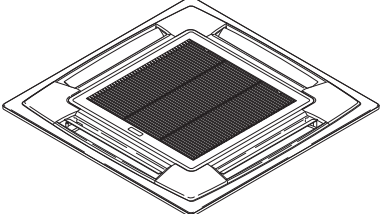
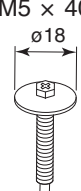
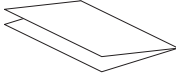
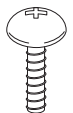
### NOTE

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

## 7. HOW TO INSTALL THE CEILING PANEL

### ■ 4-Way Cassette Type (U1 Type)

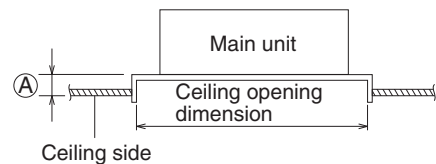
#### Accessories

<p>Ceiling panel ×1</p> 	<p>Washer head screws ×4</p> <p>M5 × 40</p> <p>ø18</p> 	<p>Installation notes ×1</p> 	<p>Screws ×4</p> <p>4 × 12</p> 
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### 7-1. Preparation for Ceiling Panel Installation

#### (1) Checking the unit position

- 1) Check that the ceiling hole is within this range:  
860 mm × 860 mm to 910 mm × 910 mm
- 2) Confirm that the position of the indoor unit and the ceiling as shown in the diagram. If the positions of the ceiling surface and unit do not match, air leakage, water leakage, flap operation failure, or other problems may occur.

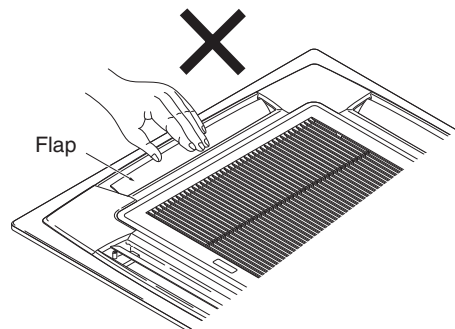


Ⓐ : Be sure to necessarily make a space within the range of 12 mm - 17 mm.

If not within this range, malfunction or other trouble may occur.



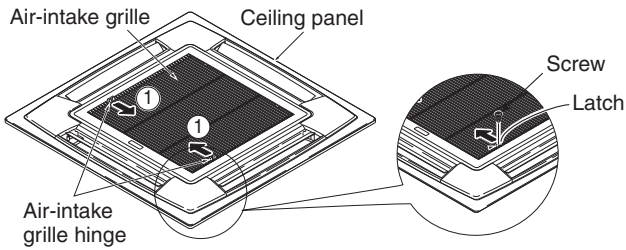
- Never place the panel face-down.  
Either hang it vertically or place it on top of a projecting object. Placing it face-down will damage the surface.
- Do not touch the flap or apply force to it.  
(This may cause flap malfunction.)



**7-2. How to Install the Ceiling Panel**

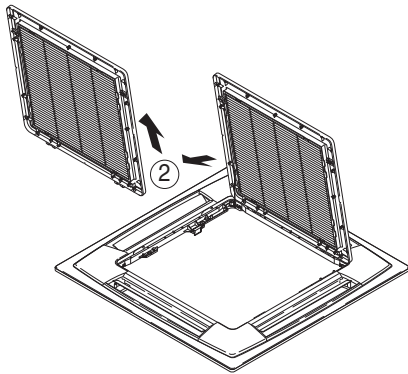
(1) Removing the air-intake grille

- 1) Remove the 2 screws on the latch of the air-intake grille. (Fig. 7-1) (Reattach the air-intake grille after installation of the ceiling panel.)
- 2) Slide the air-intake grille catches in the direction shown by the arrows ① to open the grille. (Fig. 7-1)



**Fig. 7-1**

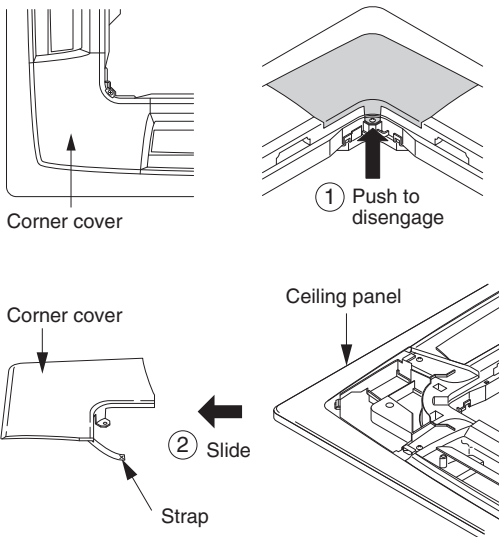
- 3) With the air-intake grille opened, remove the grille hinge from the ceiling panel by sliding it in the direction shown by the arrow ②. (Fig. 7-2) (Reattach the air-intake grille after installation of the ceiling panel.)



**Fig. 7-2**

(2) Removing the corner cover

Slide the corner cover in the direction of the arrow ① and remove it.

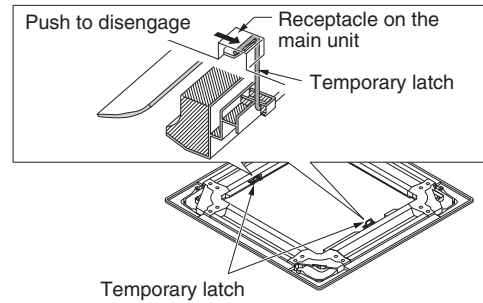


**Fig. 7-3**

(3) Installing the ceiling panel

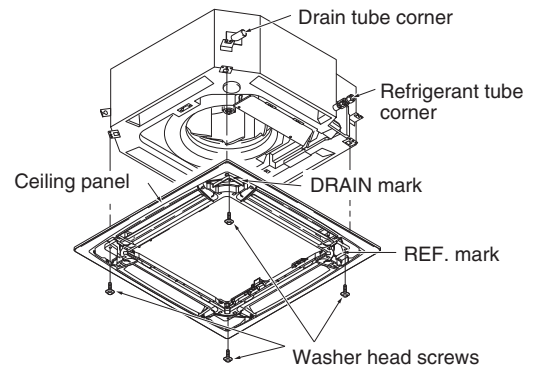
The power must be turned ON in order to change the flap angle. (Do not attempt to move the flap by hand. Doing so may damage the flap.)

- 1) Hang the temporary latches on the inside of the ceiling panel to the receptacle on the unit to temporarily attach the ceiling panel in place. (Fig. 7-4)
  - The ceiling panel must be installed in the correct direction relative to the unit. Align the REF. PIPE and DRAIN marks on the ceiling panel corner with the correct positions on the unit.
  - When removing the ceiling panel, push the temporary latches outward while holding the ceiling panel. (Fig. 7-4)



**Fig. 7-4**

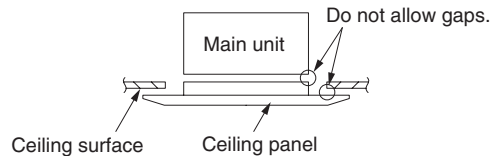
- 2) Align the panel installation holes and the unit screw holes.
- 3) Tighten the supplied washer head screws at the 4 panel installation locations so that the panel is attached tightly to the unit. (Fig. 7-5)



**Fig. 7-5**

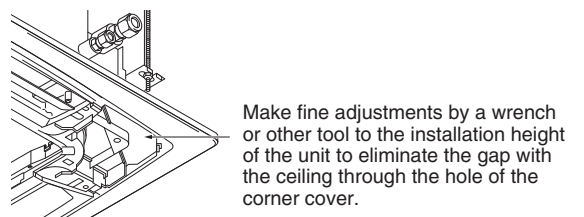
- 4) Check that the panel is attached tightly to the ceiling.

- At this time, make sure that there are no gaps between the unit and the ceiling panel, or between the ceiling panel and the ceiling surface. (Fig. 7-6)



**Fig. 7-6**

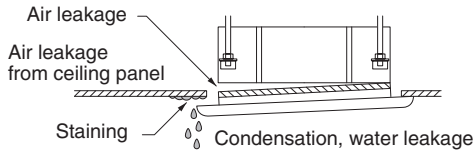
- If there is a gap between the panel and the ceiling, leave the ceiling panel attached and make fine adjustments to the installation height of the unit to eliminate the gap with the ceiling. (Fig. 7-7)



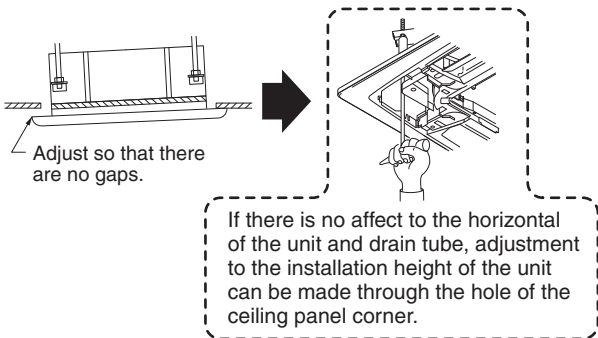
**Fig. 7-7**



- If the screws are not sufficiently tightened, trouble such as that shown in the figure below may occur. Be sure to tighten the screws securely.



- If a gap remains between the ceiling surface and the ceiling panel even after the screws are tightened, adjust the height of the unit again.



(4) Wiring the Ceiling Panel

- 1) Open the cover of the electrical component box for control PCB.
- 2) Connect the 22P connector (white) from the ceiling panel to the connector on the control PCB in the unit electrical component box. In this case, expose the cutout section of the tube for the wiring protection to the outside from the electrical component box and fix it with the clamber attached to the electrical component box.

- If the connectors are not connected, the Auto Flap will not operate. Be sure to connect them securely. (If not connected completely, "09" will be displayed on the remote controller.)
- Check that the wiring connector is not caught between the electrical component box and the cover.
- Check that the wiring connector is not caught between the unit and the ceiling panel.

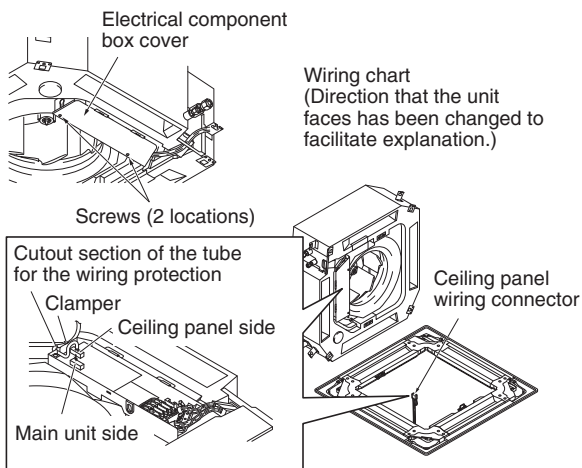
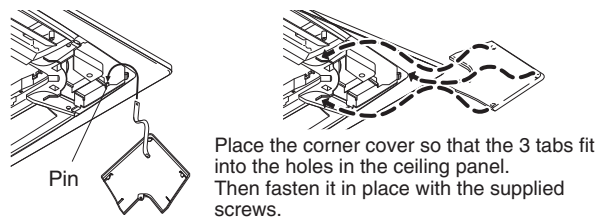


Fig. 7-8

(5) How to Attach the Corner & Air-Intake Grille

A. Attaching the corner cover

- 1) Check that the safety cord from the corner cover is fastened to the ceiling panel pin, as shown in the figure below.
- 2) Use the supplied screws to attach the corner cover to the ceiling panel.



B. Attaching the air-intake grille

- To install the air-intake grille, follow the steps for "Removing the grille" in the reverse order. By rotating the air-intake grille, it is possible to attach the grille onto the ceiling panel from any of 4 directions. Coordinate the directions of the air-intake grilles when installing multiple units, and change the directions according to customer's requests.
- When attaching the air-intake grille, be careful that the flap lead wire does not become caught.
- Be sure to attach the safety cord that prevents the air-intake grille from dropping off to the ceiling panel unit as shown in the figure below.
- With this ceiling panel, the directions of the air-intake grille lattices when installing multiple units, and the position of the label showing the company name on the corner panel, can be changed according to customer's requests, as shown in the figure below. However, the wireless signal receiver can only be installed at the refrigerant-tubing corner of the ceiling unit.

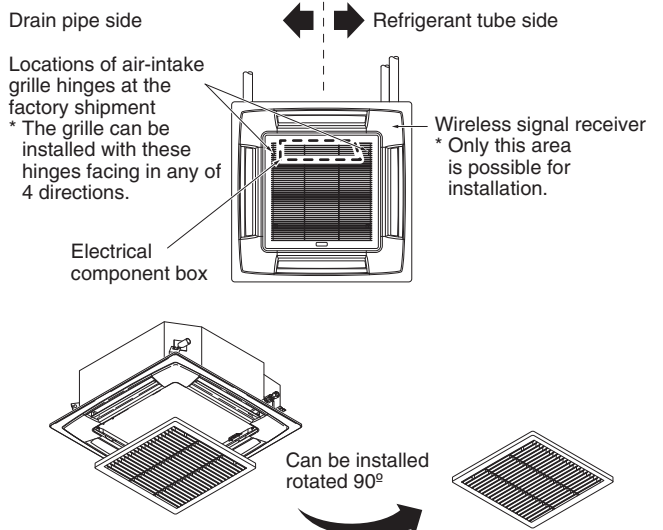
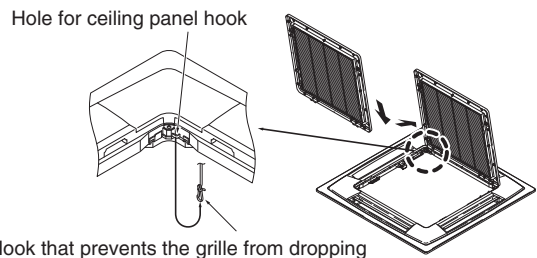


Fig. 7-9

### 7-3. Others

#### (1) Checking After Installation

- 1) Check that there are no gaps between the unit and the ceiling panel, or between the ceiling panel and the ceiling surface.
  - \* Gaps may cause water leakage and condensation.
- 2) Check that the wiring is securely connected.
  - \* If it is not securely connected, the auto flap will not operate.  
("P09" is displayed on the remote controller.)  
In addition, the water leakage and condensation may occur.

#### (2) Operating the Wireless Remote Controller

For details of installation, refer to the section "Wireless Signal Receiver" in the supplied installation instructions.

#### (3) Selecting DC Fan Motor Tap (4-Way cassette)

Check the optional parts accordingly in the following table.

**Table for DC Fan Motor Tap Setting**

Setting No.	Remote controller setting data Item code 5d	Contents & optional parts name
(3)	0003	Air-blocking material (for 3-way air discharge)
	0003	Air-blocking material (when a discharge duct is connected)
(6)	0006	Air-blocking material (for 2-way air discharge)

\*1 When using optional parts in different setting No. in combination with multiple units, conform it to the larger setting No.

#### 1) When setting from the P.C. Board

<Procedure>

**Stop the system before performing these steps.**

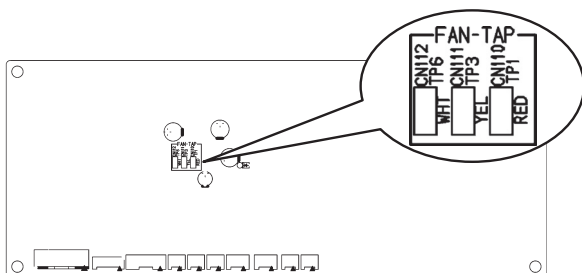
- ① Open the electrical component box cover, then check the indoor unit control PCB.
- ② Connect the jumper connector (2P: yellow) which was supplied with the accessory to the correct connector pin on the indoor unit control PCB according to the setting number which was confirmed in Table for DC Fan Motor Tap Settings.

Setting No. (3) :

Then connect the jumper connector to the connector pin TP3 (2P: yellow) on the indoor unit control PCB.

Setting No. (6) :

Then connect the jumper connector to the connector pin TP6 (2P: white) on the indoor unit control PCB.



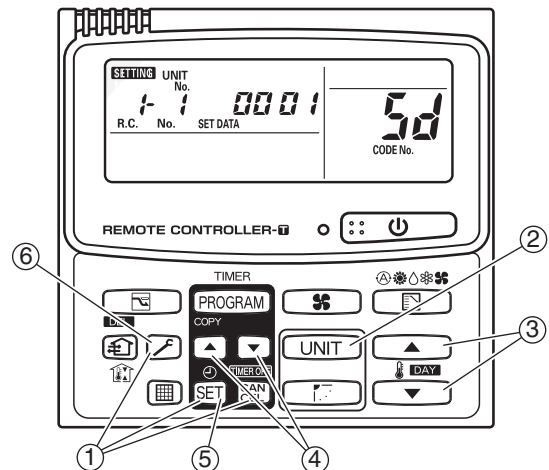
**Fig. 7-10**

#### 2) When setting with the Wired Remote Controller

<Procedure>

**Stop the system before performing these steps.**

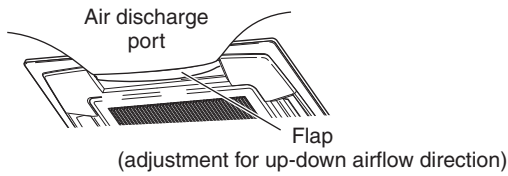
- ① Press and hold the (HOME), **SET** and **CAN** (CANCEL) buttons simultaneously for 4 seconds or longer.
- ② If group control is in effect, press the **UNIT** button and select the address (unit No.) of the indoor unit to set. At this time, the fan at the indoor unit begins operating.
- ③ Designate the item code **5d** by adjusting the Temperature Setting / buttons.
- ④ Press the timer time / buttons to select the desired setting data.
  - \* For item codes and setting data, refer to "Table for DC Fan Motor Tap Setting".
- ⑤ Press the **SET** button.  
(The display stops blinking and remains lit, and setting is completed.)
  - \* If air-blocking material is used, use the same procedure as in steps ③ – ⑤ above and change the setting for item code "62" to "0000."  
If you wish to change the selected indoor unit, follow the step ②.
- ⑥ Press the button to return to normal remote controller display.





(4) Setting the Flap Separately (When setting the CZ-RTC2)

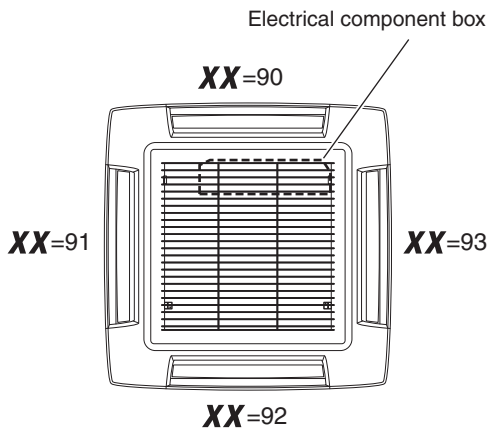
1) The 4-air outlet flap can be adjusted separately during operation. When not adjusted separately, all flaps operate in the same manner.



<Procedure>

**Stop the system before performing these steps.**

- ① Press and hold the , **SET** and **CAN CEL** buttons simultaneously for 4 seconds or longer.
- ② If group control is in effect, press the **UNIT** button and select the address (unit No.) of the indoor unit to set. At this time, the fan at the indoor unit begins operating.
- ③ "**SETTING**," unit No. "**! !**" (or "**ALL**" in the case of group control), item code "**XX**," and settings data "**YYYY**" are displayed blinking on the remote controller LCD display.
- ④ Designate the item code "**XX**" by adjusting the Temperature Setting / buttons.



- ⑤ Press the timer time / buttons to select the desired setting data.

Flap position

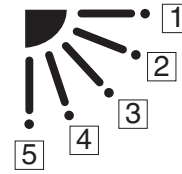


Fig. 7-11

\* Setting data "**YYYY**" (refer to Fig. 7-11)

Setting data	Flap position during operation
<b>0000</b>	Without separate setting
<b>0001</b>	Swing
<b>0002</b>	Move to position <b>1</b> and stay
<b>0003</b>	Move to position <b>2</b> and stay
<b>0004</b>	Move to position <b>3</b> and stay
<b>0005</b>	Move to position <b>4</b> and stay
<b>0006</b>	Move to position <b>5</b> and stay

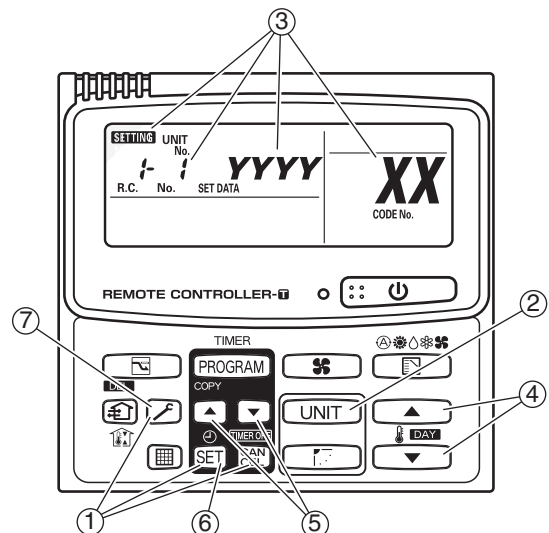
When the flap position is set to **4** or **5** and the unit is in the cooling or dry mode, the flap position is moved to **3** and the operation is started. (refer to Fig. 7-11)

**NOTE**

The flap swings during the operation under "Setting the Flap Separately".

At this time, the unselected flaps are moved to the position **1**. (refer to Fig. 7-11)

- ⑥ Press the **SET** button.  
(The display stops blinking and remains lit, and setting is completed.)  
If you wish to change the selected indoor unit, follow the step ②.
- ⑦ Press the button to return to normal remote controller display.



## ■ 4-Way Cassette 60x60 Type (Y1 Type)

### Checking the unit position

- (1) Check that the ceiling hole is within this range:  
600 × 600 mm
- (2) Confirm that the positions of the indoor unit and the ceiling are as shown in the diagram. If the positions of the ceiling surface and unit do not match, air leakage, water leakage, flap operation failure, or other problems may occur.



- **Never place the panel face-down. Either hang it vertically or place it on top of a projecting object. Placing it face-down will damage the surface. (Fig. 7-12)**

- Ⓐ must be within the range of 13 – 18 mm. (Fig. 7-12)  
If not within this range, malfunction or other trouble may occur.

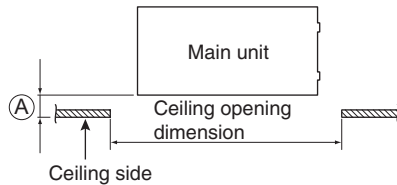


Fig. 7-12

- **Do not touch the flap or apply force to it. (Fig. 7-13) (This may cause flap malfunction.)**

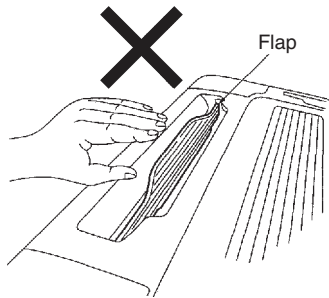


Fig. 7-13

### 7-4. Before Installing the Ceiling Panel

- (1) Remove the air-intake grille and air filter from the ceiling panel.
  - a) Remove the 2 screws on the latch of the air-intake grille. (Fig. 7-14) (Reattach the air-intake grille after installation of the ceiling panel.)

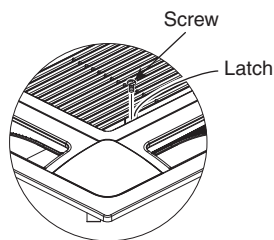


Fig. 7-14

- b) Slide the air-intake grille catches in the direction shown by the arrows ① to open the grille. (Fig. 7-15)

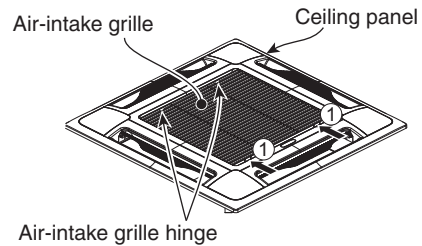


Fig. 7-15

- c) With the air-intake grille opened, remove the grille hinge from the ceiling panel by sliding it in the direction shown by the arrow ②. (Fig. 7-16)

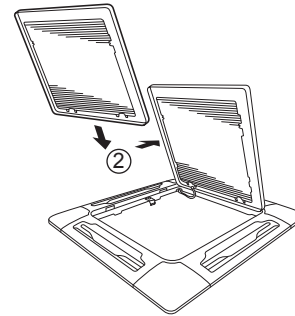


Fig. 7-16

- (2) Removing the corner cover.

- a) Remove the screws on the corner and slide the latches in the direction of the arrow ① to disconnect the hinges (3 locations). Then, remove the air-intake grille in the direction of the arrow ②. (Fig. 7-17)

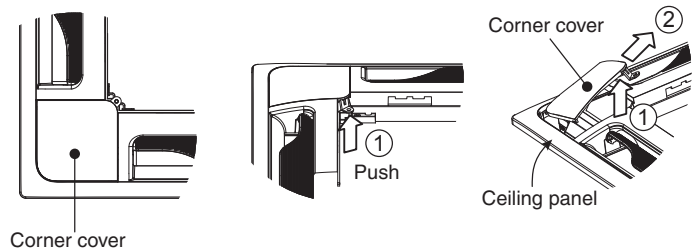


Fig. 7-17

### 7-5. Installing the Ceiling Panel

The power must be turned ON in order to change the flap angle. (Do not attempt to move the flap by hand. Doing so may damage the flap.)

- (1) Hang the temporary latches on the inside of the ceiling panel to the receptacle on the unit to temporarily attach the ceiling panel in place. (Fig. 7-18)
- The ceiling panel must be installed in the correct direction relative to the unit. Align the REF. PIPE and DRAIN marks on the ceiling panel corner with the correct positions on the unit.
- To remove the ceiling panel, support the ceiling panel while pressing the temporary latches toward the outside. (Fig. 7-18)

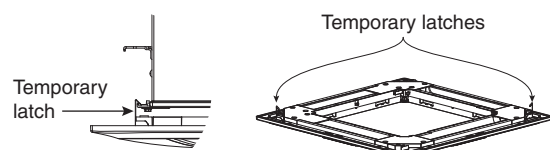


Fig. 7-18

- (2) Align the panel installation holes and the unit screw holes.

- (3) Tighten the supplied washer head screws at the 4 panel installation locations so that the panel is attached tightly to the unit. (Fig. 7-19)

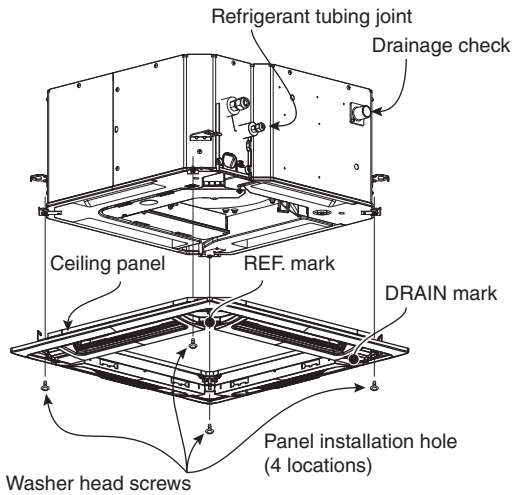


Fig. 7-19

- (4) Check that the panel is attached tightly to the ceiling.
  - At this time, make sure that there are no gaps between the unit and the ceiling panel, or between the ceiling panel and the ceiling surface. (Fig. 7-20)

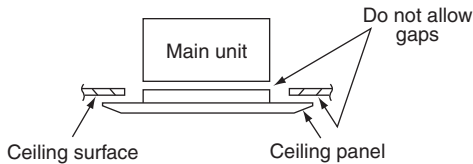


Fig. 7-20

- If there is a gap between the panel and the ceiling, leave the ceiling panel attached and make fine adjustments to the installation height of the unit to eliminate the gap with the ceiling. (Fig. 7-21)

**CAUTION** Can be installed rotated 90°

- If the screws are not sufficiently tightened, trouble such as that shown in the figure below may occur. Be sure to tighten the screws securely.
- If a gap remains between the ceiling surface and the ceiling panel even after the screws are tightened, adjust the height of the unit again.

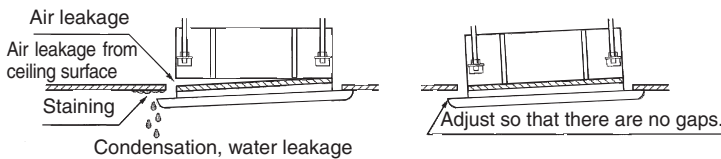
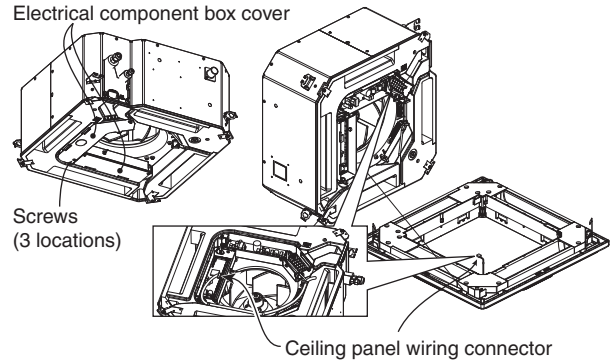


Fig. 7-21

## 7-6. Wiring the Ceiling Panel

- (1) Open the cover of the electrical component box.
- (2) Connect the 7P wiring connector (red) from the ceiling panel to the connector in the unit electrical component box. (Fig. 7-22)

(Direction that the unit faces has been changed to facilitate explanation.)



- \* Pass the wiring connector through the clamp to fasten it in place, as shown in the figure.

Fig. 7-22

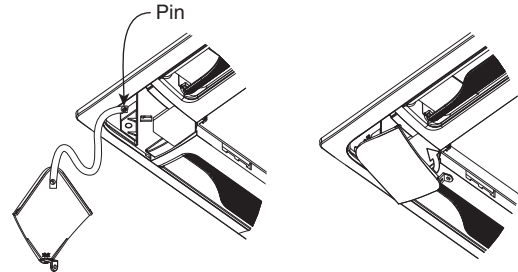
- If the connectors are not connected, the auto flap will not operate. Be sure to connect them securely.
- Check that the wiring connector is not caught between the electrical component box and the cover.
- Check that the wiring connector is not caught between the unit and the ceiling panel.

## 7-7. How to Attach the Corner and Air Intake Grille

### Attaching the corner cover and air-intake grille

#### A. Attaching the corner cover

- (1) Check that the safety cord from the corner cover is fastened to the ceiling panel pin. (Fig. 7-23).



Place the corner cover so that the 3 tabs fit into the holes in the ceiling panel. Then fasten it in place with the supplied screws.

Fig. 7-23

- (2) Use the supplied screws to attach the corner cover to the ceiling panel.

#### B. Attaching the air-intake grille

- To install the air-intake grille, follow the steps for **Removing the grille** in the reverse order. By rotating the air-intake grille, it is possible to attach the grille onto the ceiling panel from any of 4 directions. Coordinate the directions of the air-intake grilles when installing multiple units, and change the directions according to customer requests.
- **When attaching the air-intake grille, be careful that the flap lead wire does not become caught.**
- **Be sure to attach the safety cord to the ceiling panel unit. This keeps the air intake grille from accidentally dropping. (Fig. 7-24)**

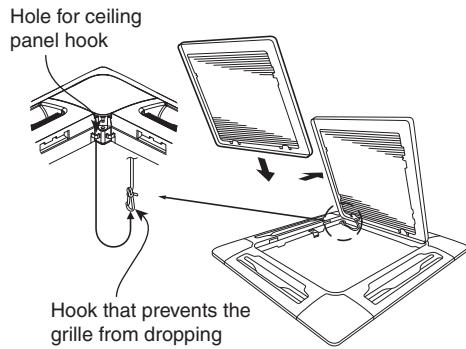


Fig. 7-24

- With this ceiling panel, the directions of the air-intake grille lattices when installing multiple units, and the position of the label showing the company name on the corner panel, can be changed according to customer requests. However, the optional wireless receiver kit can only be installed at the refrigerant-tubing corner of the ceiling unit. (Fig. 7-25)

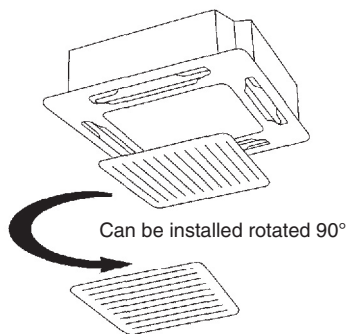
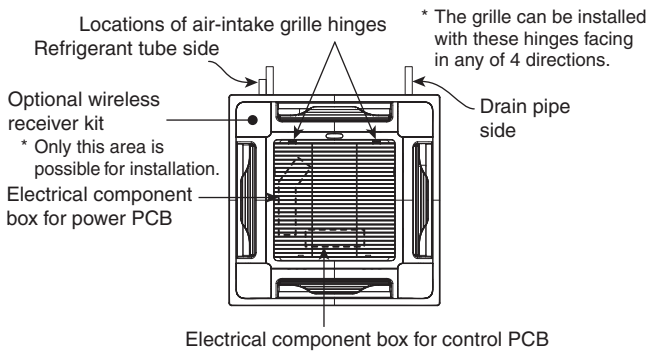


Fig. 7-25

### 7-8. Checking After Installation

- Check that there are no gaps between the unit and the ceiling panel, or between the ceiling panel and the ceiling surface. Gaps may cause water leakage and condensation.
- Check that the wiring is securely connected. If it is not securely connected, the auto flap will not operate. ("P09" is displayed on the remote controller.) In addition, water leakage and condensation may occur.

### 7-9. When 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.

### 7-10. Adjusting the Auto Flap

The air-direction louver on the ceiling panel outlet can be adjusted as follows.

- Adjust the louver to the desired angle using the remote controller. The louver also has an automatic air-sweeping mechanism.

#### NOTE

- Never attempt to move the louver by hand.
- Proper airflow depends on the location of the air conditioner, the layout of the room and furniture, etc. If cooling or heating seems inadequate, try changing the direction of the airflow.

## 8. HOW TO INSTALL WIRELESS REMOTE CONTROLLER RECEIVER

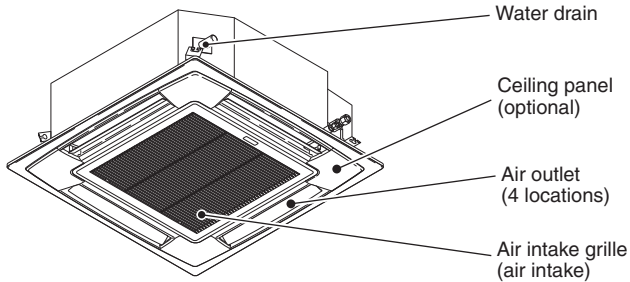
### NOTE

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

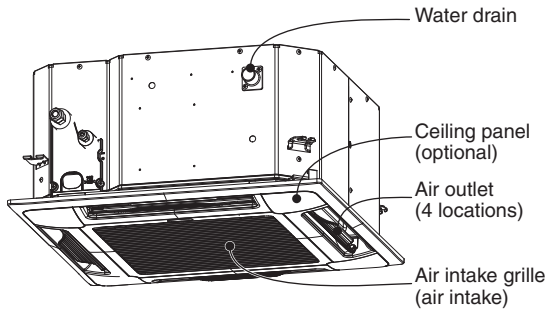
## 9. APPENDIX

### ■ Name of Parts

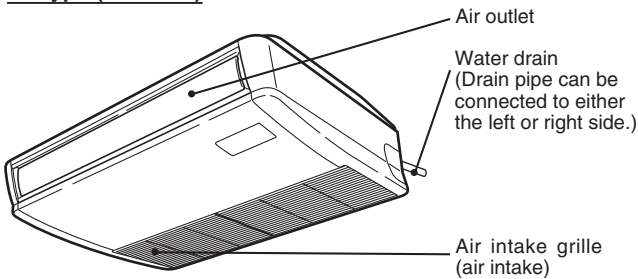
#### U1 Type (4-WAY CASSETTE)



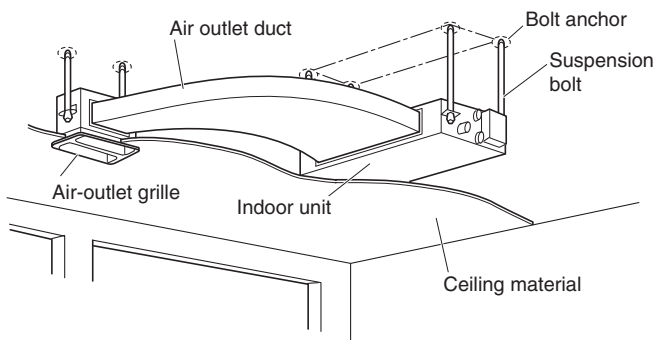
#### Y1 Type (4-WAY CASSETTE 60X60)



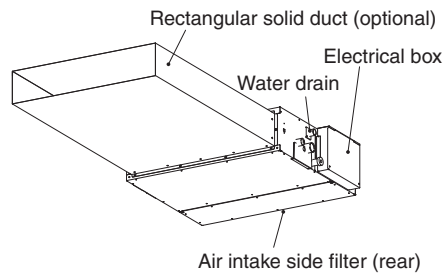
#### T1 Type (CEILING)



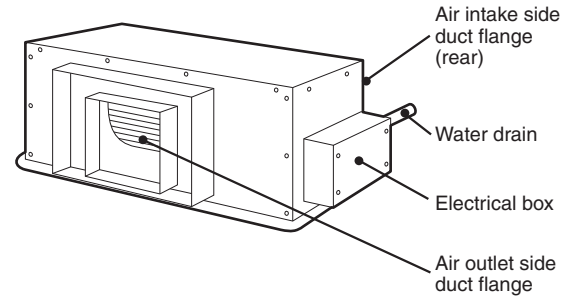
#### F1 Type (LOW SILHOUETTE DUCTED)



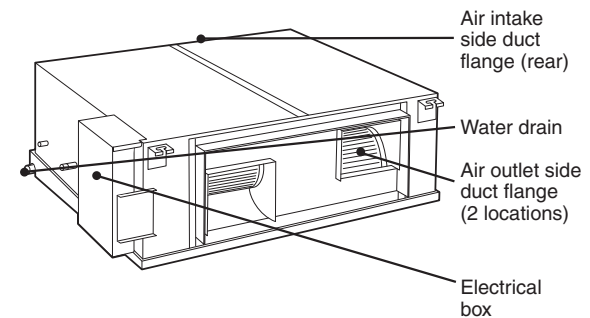
#### M1 Type (SLIM LOW STATIC DUCTED)



#### E1 Type (HIGH STATIC PRESSURE DUCTED) for 73, 106 & 140



#### E1 Type (HIGH STATIC PRESSURE DUCTED) for 224 & 280



### ■ Care and Cleaning

#### ⚠ WARNING

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

#### Air intake and 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

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

## Air filter

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

Type	U1, Y1	T1	F1, M1, E1*
Period	6 months	2 weeks	(Depends on filter specifications)

### \*Low Silhouette Ducted, Slim Low Static Ducted, High Static Pressure Ducted Type (F1, M1, E1):

An air filter is not provided with this air conditioner at the time of shipment. To get clean air and to extend the service life of the air conditioner, an air filter must be installed in the air intake. For installation and cleaning the air filter, consult your dealer or service center.

#### 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.

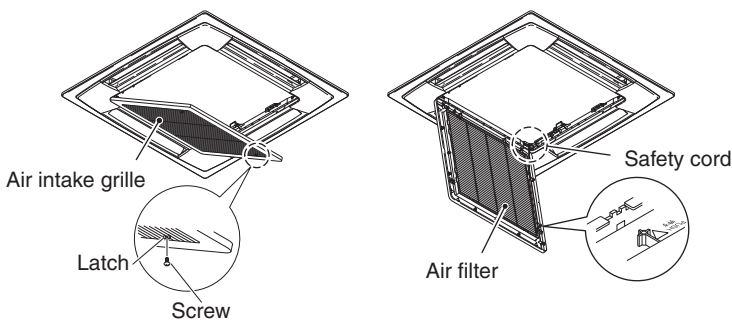
#### <How to remove the filter>

##### 4-Way Cassette Type (U1):

1. Use a screwdriver to remove the bolt screw on each side for the two latches. (Be sure to reattach the two bolt screws after cleaning.)
2. Slide the latches of the air intake grille in the direction of the inside to open the grille.
3. The air intake grille opens downward.

#### CAUTION

- When cleaning the air filter, never remove the safety chain. If it is necessary to remove it for servicing and maintenance inside, be sure to reinstall the safety chain securely (hook on the grille side) after the work.
  - When the filter has been removed, rotating parts (such as the fan), electrically charged areas, etc. will be exposed in the unit's opening. Bear in mind the dangers that these parts and areas pose, and proceed with the work carefully.
4. Push the side of the air filter marked with the indication arrow ▽ and pull it toward you. The air filter will be disengaged.

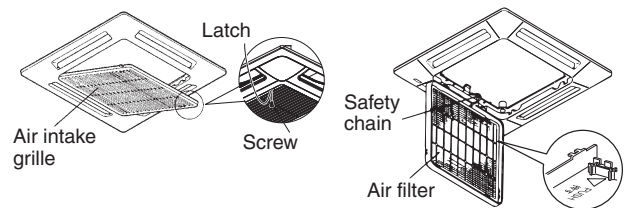


##### 4-Way Cassette 60x60 Type (Y1):

1. Use a screwdriver to remove the bolt screw on each side for the two latches. (Be sure to reattach the two bolt screws after cleaning.)
2. Press on the two latches of the air intake grille with your thumbs in the direction of the arrow to open the grille.
3. Open the air intake grille downward.

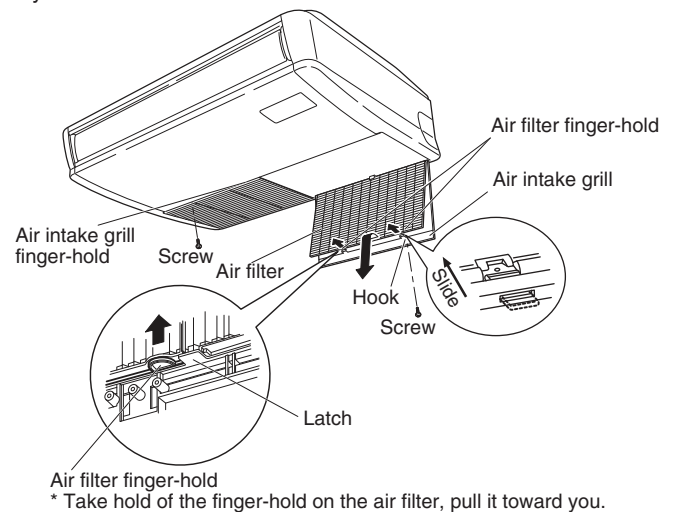
#### CAUTION

- When cleaning the air filter, never remove the safety chain. If it is necessary to remove it for servicing and maintenance inside, be sure to reinstall the safety chain securely (hook on the grille side) after the work.
  - When the filter has been removed, rotating parts (such as the fan), electrically charged areas, etc. will be exposed in the unit's opening. Bear in mind the dangers that these parts and areas pose, and proceed with the work carefully.
4. Remove the air filter attached to the air intake grille.



##### Ceiling Type (T1):

1. Take hold of the finger-hold on the air intake grille and press it to the rear, and the grille will open downward.
2. Take hold of the finger-hold on the air filter, pull it toward you.





- **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.**
- **Periodically check the outdoor unit to see if the air outlet or air intake is clogged with dirt or soot.**
- **The internal coil and other components must also be cleaned periodically. Consult your dealer or service center.**

**Care: After a prolonged idle period**

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

**Care: Before a prolonged idle period**

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

## ■ Troubleshooting

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

### ● Indoor unit

Symptom		Cause
Noise	Sound like streaming water during operation or after operation	<ul style="list-style-type: none"> <li>● Sound of refrigerant liquid flowing inside unit</li> <li>● Sound of drainage water through drain pipe</li> </ul>
	Cracking noise during operation or when operation stops.	Cracking sound due to temperature changes of parts
Odor	Discharged air is smelled during operation.	Indoor odor components, cigarette odor and cosmetic odor accumulated in the air conditioner and its air is discharged. Unit inside is dusty. Consult your dealer.
Dewdrop	Dewdrop gets accumulated near air discharge during operation	Indoor moisture is cooled by cool wind and accumulated by dewdrop.
Fog	Fog occurs during operation in cooling mode. (Places where large amounts of oil mist exist at restaurants.)	<ul style="list-style-type: none"> <li>● Cleaning is necessary because unit inside (heat exchanger) is dirty. Consult your dealer as technical engineering is required.</li> <li>● During defrost operation</li> </ul>
Fan is rotating for a while even though operation stops.		<ul style="list-style-type: none"> <li>● Fan rotating makes operation smoothly.</li> <li>● Fan may sometimes rotates because of drying heat exchanger due to settings.</li> </ul>
Wind-direction changes while operating. Wind-direction setting cannot be made. Wind-direction cannot be changed.		<ul style="list-style-type: none"> <li>● When air discharge temperature is low or during defrost operation, horizontal wind flow is made automatically.</li> <li>● Flap position is occasionally set up individually.</li> </ul>
When wind-direction is changed, flap operates several times and stops at designated position.		When wind-direction is changed, flap operates after searching for standard position.
Dust		Dust accumulation inside indoor unit is discharged.

### ● Outdoor unit

Symptom		Cause
No operation	When power is turned ON instantly.	Operation is not acticated for the first approx. 3 minutes because compressor protection circuit is activated.
	When operation is stopped and resumed immediately.	
Noise	Noise often occurs in heating mode.	During defrost operation
Steam	Steam often occurs in heating mode.	
When stopped by remote controller, outdoor unit fan is sometimes operating for a while even though outdoor compressor is stopped.		Fan rotating makes operation smoothly.



● **Check Before Requiring Services**

Symptom	Cause	Remedy
Air conditioner does not run at all although power is turned on.	Power failure or after power failure	Press ON/OFF operation button on remote control unit again.
	Operation button is turned off.	<ul style="list-style-type: none"> <li>● Switch on power if breaker is turned off.</li> <li>● If breaker has been tripped, consult your dealer without turning it on.</li> </ul>
	Fuse blow out.	If blown out, consult your dealer.
Poor cooling or heating performance	Air intake or air discharge port of indoor and outdoor units is clogged with dust or obstacles.	Remove dust or obstruction.
	Wind speed switch is set to "Low".	Change to "High" or "Strong".
	Improper temperature settings	Refer to "■ Tips for Energy Saving".
	Room is exposed to direct sunlight in cooling mode.	
	Doors and /or windows are open.	
	Air filter is clogged.	Refer to "■ CARE AND CLEANING".
	Too much heat sources in room in cooling mode.	Use minimum heat sources and in a short time.
	Too many people in room in cooling mode.	Reduce temperature settings or change to "High" or "Strong".

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

■ **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.

