

INSTALLATION INSTRUCTIONS

Air Conditioner

Panasonic[®]

This air conditioner uses the refrigerant R32 or R410A.

Model No.

Indoor Units		Rated Capacity	
Type	Indoor Units Type	200	250
E3	High Static Pressure Ducted	S-200PE3E5B	S-250PE3E5B



ENGLISH

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

FRANÇAIS

Lisez les instructions d'installation avant de commencer l'installation.
En particulier, vous devez lire la section “IMPORTANT!” en haut de la page.

ESPAÑOL

Lea las Instrucciones de instalación antes de proceder con la instalación del equipo.
En concreto, deberá leer detenidamente la sección “¡IMPORTANTE!” situada al principio de la página.

DEUTSCH

Lesen Sie die Einbauanleitung, bevor Sie mit der Installation beginnen.
Insbesondere die Hinweise im Abschnitt “WICHTIG!” oben auf der Seite müssen unbedingt gelesen werden.

ITALIANO

Leggere le Istruzioni di installazione prima di procedere con l'installazione.
Prestare particolare attenzione alla sezione “IMPORTANTE!” all'inizio della pagina.

NEDERLANDS

Lees de installatie-instructies zorgvuldig door voor u begint met de installatie.
U moet vooral het gedeelte waar “BELANGRIJK!” boven staat heel goed lezen.

PORTUGUÊS

Leia cuidadosamente as instruções de instalação antes de prosseguir com a instalação.
Em particular, é necessário ler as informações na secção “IMPORTANTE!” na parte superior da página.

ΕΛΛΗΝΙΚΑ

Διαβάστε τις Οδηγίες εγκατάστασης πριν συνεχίσετε με την εγκατάσταση.
Συγκεκριμένα, θα χρειαστεί να διαβάσετε την ενότητα «ΣΗΜΑΝΤΙΚΟ!» στο πάνω μέρος της σελίδας.

БЪЛГАРСКИ

Прочетете инструкциите за инсталиране преди да продължите с инсталирането.
В частност, ще трябва да прочетете раздела „ВАЖНО!“ в горната част на страницата.

TÜRKÇE

Montaja başlamadan önce tüm Montaj Talimatlarını okuyun.
Özellikle sayfanın üstünde yer alan “ÖNEMLİ!” başlıklı bölümünü okumanız gerekir.

ENGLISH

FRANÇAIS

ESPAÑOL

DEUTSCH

ITALIANO

NEDERLANDS

PORTUGUÊS

ΕΛΛΗΝΙΚΑ

БЪЛГАРСКИ

TÜRKÇE

IMPORTANT!

Please Read Before Starting

This air conditioner must be installed by the sales dealer or installer.

This information is provided for use only by authorized persons.

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

- This Installation Instructions is for the indoor unit and read the Installation Instructions of the outdoor unit as well.
- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- This air conditioner shall be installed in accordance with National Wiring Regulations.
- That compliance with national gas regulations shall be observed.
- The product meets the technical requirements of EN/IEC 61000-3-3.
- 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.



WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).


- Auxiliary devices which may be a **potential ignition source** shall not be installed in the duct work. Examples of such **potential ignition sources** are hot surfaces with a temperature exceeding 700°C and electric switching devices.
- For appliances connected via an air duct system to one or more rooms, only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork. The manufacturer can list in the instructions all approved auxiliary devices by the manufacturer and model number for use with the specific appliance, if those devices have a potential to become an ignition source.
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- The following checks shall be applied to installations using flammable refrigerants.
Appliance shall be installed, operated and stored in a room with a floor area larger than $[A_{min}] \text{ m}^2$.
As for $[A_{min}]$, see Section "17. Check of Density Limit".

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**.
- 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.
- Provide a power outlet exclusively for each unit, and full disconnection means having a contact separation by 3 mm 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. 
- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.
- This equipment is strongly recommended to be installed with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case of equipment breakdown or insulation breakdown.

When Transporting

- It may need two or more people to carry out the installation work.
- 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 storing...

WARNING

- The appliances shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- The appliances shall be stored in a room without continuously operating open flames (for example: an operating gas appliance) and ignition sources (for example: an operating electric heater).
- The appliances shall be stored so as to prevent mechanical damage from occurring.

When Installing...

- Select an installation location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.
- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.
- An unventilated area where the appliance using flammable refrigerants is installed shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard.
- Ducts connected to appliances shall not contain a **potential ignition source**.

- Connected via an air duct system to one or more rooms, the supply and return air shall be directly ducted to the space. Open areas such as false ceilings shall not be used as a return air duct.

...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.



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.

...At Least 2.5 m

Indoor unit of this air conditioner shall be installed in a height of at least 2.5 m.

...In Laundry Rooms

Do not install in laundry rooms. Indoor unit is not drip proof.

When Connecting Refrigerant Tubing

Pay particular attention to refrigerant leakages.



- When performing piping work, do not mix air except for specified refrigerant in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigerant cycle.
- If the refrigerant comes in contact with a flame, it produces toxic gases and fire.

- Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury, etc.

- Ventilate the room immediately, in the event that is refrigerant gas leaks during the installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of toxic gases and fire.
- 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.
- Under no circumstances shall potential sources of ignition be used in the searching or detection of refrigerant leaks.
- A halid torch (or any other detector using a naked flame) shall not be used.
- Electronic leak detectors may be used to detect refrigerant leaks but, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)
- Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
- Leak detection equipment shall be set at a percentage of the Lower Flammable Limit (LFL) of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

- Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
- If a leak is suspected, all naked flames shall be removed/extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen Free Nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

When Servicing

- Contact the sales dealer or service dealer for a repair.
- Be sure to turn off the power before servicing.
- Turn the power OFF at the main power box (mains), wait at least 5 minutes until it is discharged, then open the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit.



WARNING

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

CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Leaked refrigerant gas, on contact with fire or heat, can produce dangerously toxic gases.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of toxic gases and fire.

Others

When disposing of the product, do follow the precautions in "16.RECOVERY" and comply with national regulations.

WARNING

- Do not sit or step on the unit. You may fall down accidentally.



CAUTION

- Do not touch the air inlet or the sharp aluminum fins of the outdoor unit. You may get injured.
- Do not stick any object into the FAN CASE. You may be injured and the unit may be damaged.



NOTICE

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





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1. GENERAL

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










The installation of pipe-work shall be kept to a minimum.

	WARNING	This symbol shows that this equipment uses a flammable refrigerant. If the refrigerant is leaked, together with an external ignition source, there is a possibility of ignition.
	CAUTION	This symbol shows that the Operating Instructions should be read carefully.
	CAUTION	This symbol shows that a service personnel should be handling this equipment with reference to the Technical Manual.
	CAUTION	This symbol shows that there is information included in the Operating Instructions and/or Installation Instructions.

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

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

1-2. Accessories Supplied with Unit

Part Name	Figure	Q'ty	Remarks
Special washer		8	For indoor unit suspension
Insulator		2	For gas and liquid tubes
Drain hose		1	
Hose band		1	For securing drain hose
Drain insulator		1	
Connection tubing		1	ø19.05 → ø25.4
Clamper		2	Type 200: ø12.7 → ø9.52 For power supply code / control wiring
Operating Instructions		1	
Installation Instructions		1	

↓Use M10 or 3/8" suspension bolt (field supply)

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. Insulation material thickness must be 10 mm or greater.
3. Use insulated copper wire for field wiring. Wire size varies with the total length of wiring. See section "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

2. SELECTING THE INSTALLATION SITE

2-1. Indoor Unit

AVOID:

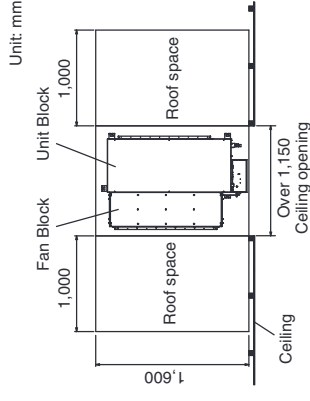
- areas where leakage of flammable gas may be expected.
- places where large amounts of oil mist exist.
- direct sunlight.
- locations near heat sources which may affect the performance of the unit.
- locations where external air may enter the room directly. This may cause "condensation" on the air discharge 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.
- places where blocked air passages.
- places where the false ceiling is not noticeably on an incline.

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.
- make sure to install protective guards on the suction and discharge side to prevent somebody from touching the fan blades or heat exchanger.
- select a location where tubing and drain pipe have the shortest run to the outdoor unit.
- allow room for operation and maintenance as well as unrestricted air flow around the unit.
- install the unit within the maximum elevation difference above or below the outdoor unit and within a total tubing length (L) from the outdoor unit as detailed in the Installation Instructions packed with the outdoor unit.
- allow room for mounting the remote controller about 1 m off the floor, in an area that is not in direct sunlight or in the flow of cool air from the indoor unit.
- places where optimum air distribution can be ensured.
- places where sufficient clearance for maintenance and service can be ensured.

2-2. When transporting the indoor unit to the roof space through the ceiling opening

Transport is possible without separation with a ceiling opening dimension of over 500 x 1,150 mm and a roof space dimension as shown below. After transporting the unit, see section "3. HOW TO INSTALL THE INDOOR UNIT".

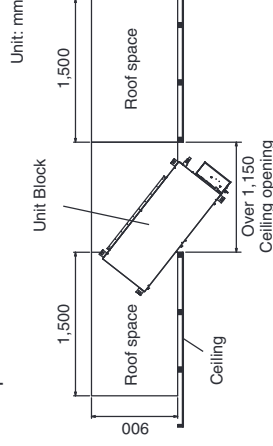


It is possible to separate the indoor unit into Fan Block and Unit Block.

Separated transport if necessary

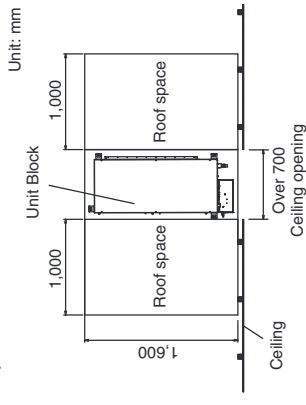
<Case 1 >

If a ceiling opening dimension is over 500 x 1,150 mm and a roof space dimension is shown below, the indoor unit can be separated to fit through the space. For separating procedure, see section "2-3. How to separate the indoor unit".



<Case 2 >

If a ceiling opening dimension is over 500 x 700 mm and a roof space dimension is shown below, the indoor unit can be separated to fit through the space. For separating procedure, see section "2-3. How to separate the indoor unit".



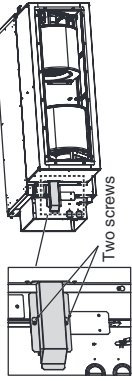
Criteria for ceiling opening dimension and height of roof space

Width of ceiling opening	Height of roof space	Necessity of separating indoor unit	Unit: mm
1,150	1,600	Unnecessary	
1,150	900	Necessary	
700	1,600	Necessary	

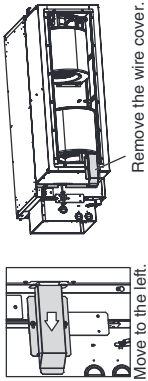
2-3. How to separate the indoor unit

1. Remove the wire cover.

(1) Loosen two screws.

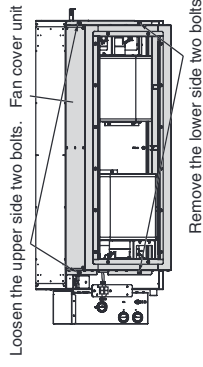


(2) Move to the left and remove the wire cover through the round hole.



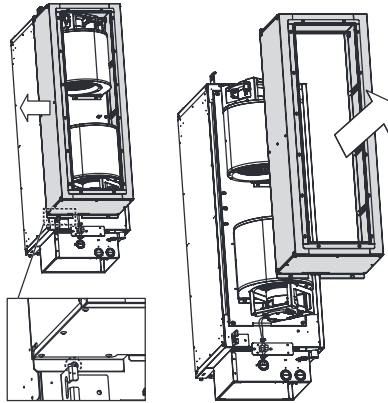
2. Remove the fan cover unit.

(1) Loosen the upper side two bolts and remove the lower side two bolts.



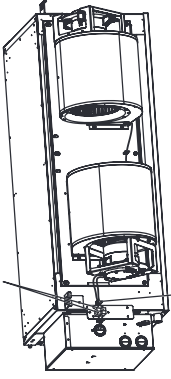
Remove the lower side two bolts.

(2) Move the fan cover unit upward and remove it through the round hole.



3. Remove the motor relay connector.

Remove two motor relays connectors.



Remove the wire from the fixed mounting bracket.

4. Separate the fan motor unit and heat exchanger unit.

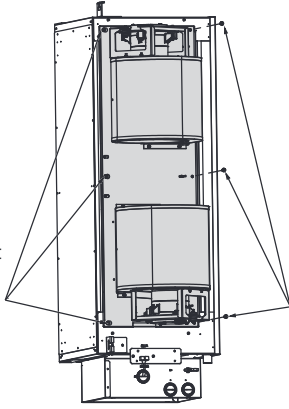
(1) Loosen the upper side three bolts and remove the lower side three bolts.



WARNING

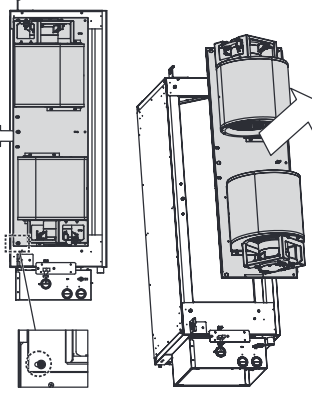
Do not remove the upper side three bolts. The motor unit may drop during work of unit separation and can lead to personal injury or death.

Loosen the upper side three bolts.



Remove the lower side three bolts.

(2) Move upward and remove the fan motor unit through the round hole.

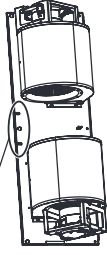


2-4. How to assemble the indoor unit

1. Attach the fan motor unit.

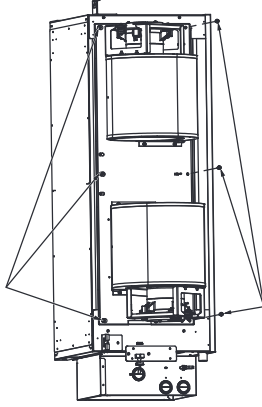
(1) Pass the bolts for the heat exchanger unit through the round holes.

Mount the unit with three holes located in the center of the upper side.



(2) Attach three bolts in the lower side and then fasten three bolts in the upper side. (Tightening torque : 2.45 ~ 3.4 N · m)

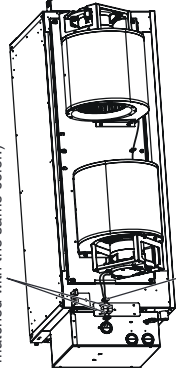
Fasten three bolts.



Attach three bolts.

(3) Attach the motor wire.

Attach two motor connectors. (Connectors at each end should be matched with the same color.)



Wire with the fixed mounting bracket.

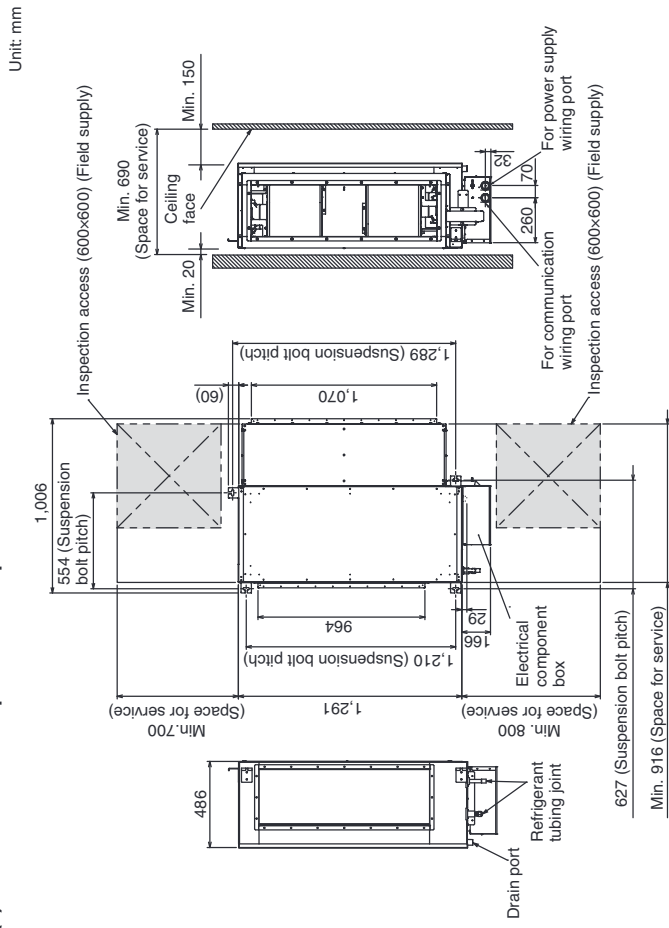
2. Attach the fan cover unit and wire cover. Attach the fan cover unit and wire cover in reverse order of separating unit.

3. HOW TO INSTALL THE INDOOR UNIT

■ High Static Pressure Ducted Type (Type E3)

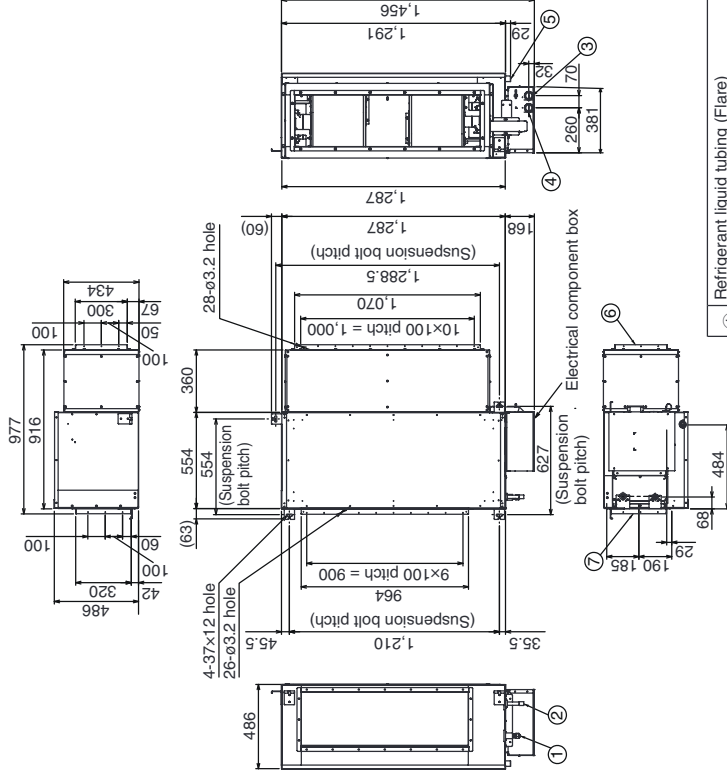
3-1. Required Minimum Space for Installation and Service

(1) Dimensions of suspension bolt pitch and unit



(2) Dimensions of indoor unit Types 200 / 250

Unit: mm



①	Refrigerant liquid tubing (Flare) ø12.7 (Type 200 : Connection Tubing ø12.7 → ø9.52)
②	Refrigerant gas tubing (Brazing) ø19.05 (Connection Tubing ø19.05 → ø25.4)
③	Power supply port
④	Communication port
⑤	Drainport/VP25
⑥	Air intake duct connecting side flange
⑦	Air discharge duct connecting side flange

3-2. Suspending the Indoor Unit

Depending on the ceiling type:

1. Check the suspension bolt pitch.
2. Ensure that the ceiling is strong enough to support the weight of the unit.
3. To prevent the unit from dropping, firmly fasten the suspension bolts as shown in the figure below.

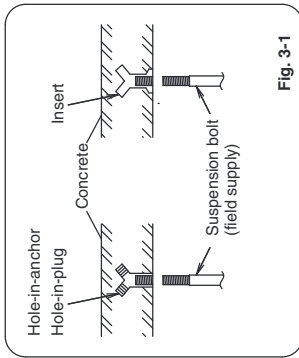


Fig. 3-1

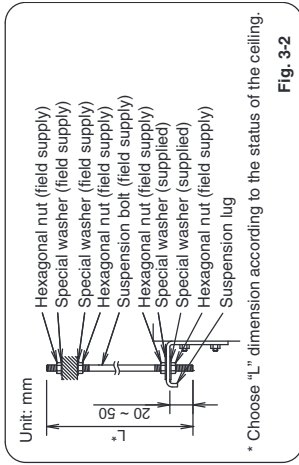


Fig. 3-2

NOTE

Suspension bolt (field supply)	M10 or 3/8"
--------------------------------	-------------

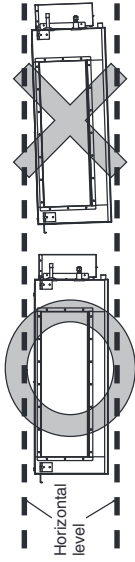
It is important that you use extreme care in supporting the indoor unit inside the ceiling.

WARNING Before suspending the unit, test the strength of each attached suspension bolt.

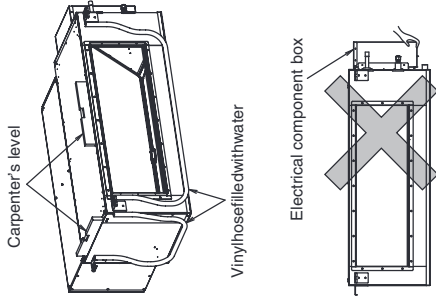
- (1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts referring to the dimensional data given previously. Tubing must be laid and connected inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the tubing into position for connection 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. 3-1. (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. 3-2.

CAUTION

The top of the unit must be installed horizontally.



- Check the unit is placed horizontally. 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 make horizontal adjustment on all 4 corners of the unit. If the air discharge side of the unit is installed downward, splashing water or water leak may occur. Also, the dust may accumulate inside the drain pan.
- When lifting the unit, do not attempt to hold the electrical component box in hand.



3-3. Installing the Refrigerant Tubing

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

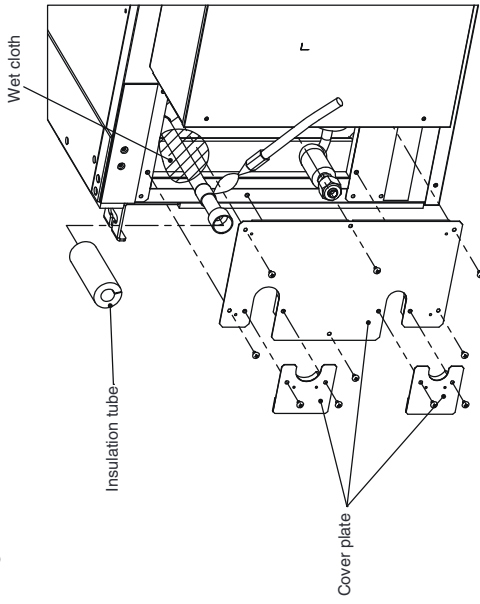
Table 3-1

Type	200	250
Gas tube	ø25.4 (Braze connection)	ø25.4 (Braze connection)
Liquid tube	ø9.52 (Braze connection) [Connection Tubing ø12.7 → ø9.52 ø12.7 (Flare connection) Tightening torque (approximate) : 49~55N·m Thickness of connecting tube : 0.8 mm]	ø12.7 (Flare connection) Tightening torque (approximate) : 49~55N·m Thickness of connecting tube : 0.8 mm

NOTE

To fasten the flare nuts, apply specified torque.

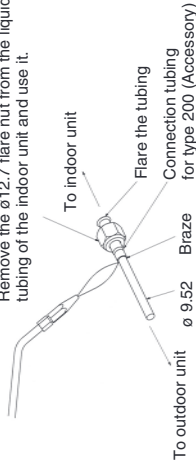
- When brazing, must be cool the pipe by wet cloths after removing the insulation tube and the cover plate.
- When brazing the gas tubing, cool the tubing with dampened shopcloths as you work, as shown in the figure below, to protect the unit's thermostat from the heat generated by brazing.
- When brazing, be careful not to heat the electrical component box. Doing so may cause the unit to be damaged.



- The type 200 indoor unit comes with a connection tubing that is for liquid tubing. Configure as shown in the illustration and connect it.

When flaring the tube, put the flare nut onto it first and then flare it.

Remove the $\phi 12.7$ flare nut from the liquid tubing of the indoor unit and use it.



- Pipe insulation must be made after leak detection for tubing connection area was performed.
- 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.

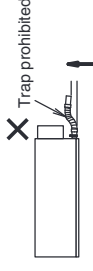
3-4. Installing the Drain Piping

3-4-1. Before Performing the Installation Drain Piping

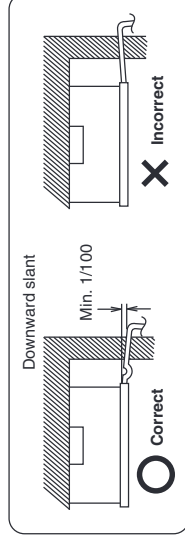
- (1) Prepare standard hard PVC pipe (O.D. 32mm) for the drain and use the supplied drain socket to prevent water leaks. The PVC pipe must be purchased separately. When doing this, apply adhesive for the PVC pipe at the connection point. See section "3-4-2. Installing the Drain Pipe".
- (2) Limitations of Drain Hose Connection

CAUTION

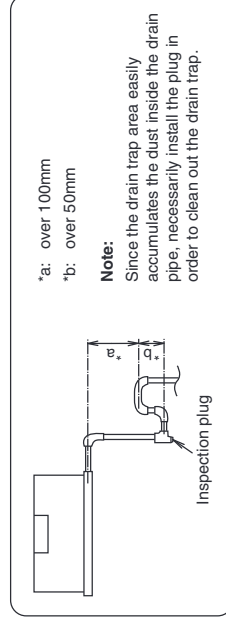
- Do not make a trap in the middle of the supplied drain pipe. Doing so will cause abnormal sound.



- (3) Ensure the drain pipe has a downward slant (1/100 or more).



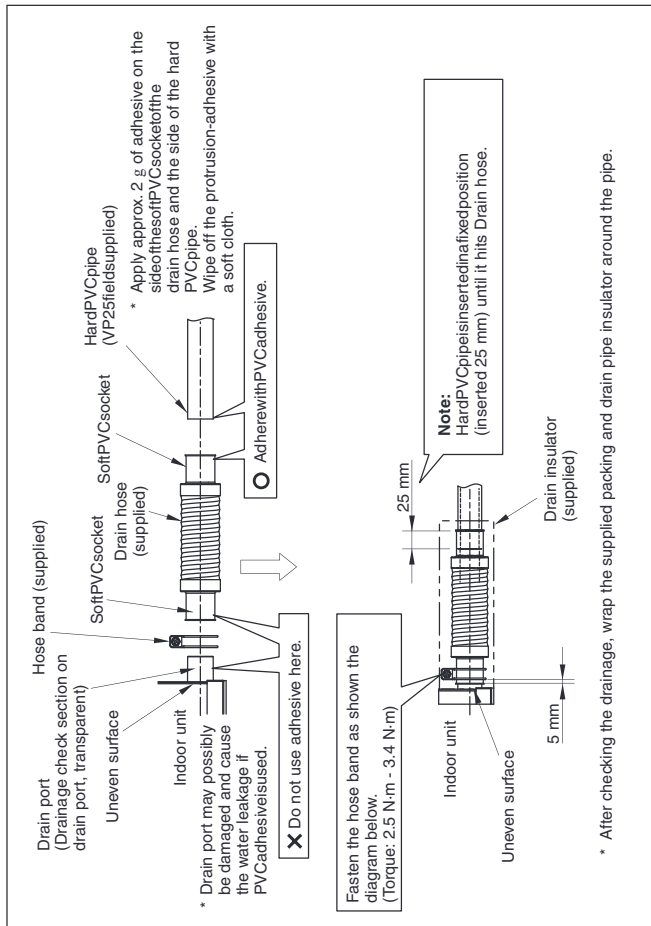
- (4) The drain pipe with a trap should be installed away from the indoor unit.
- (5) Do not attach any air purge equipment. If attached, drain water may result in splashing out of the drain pipe.
- (6) When the drain piping is completed, perform the water leak test and check for a water leak. If detected, it may result in water leakage or condensation.
- (7) When the drain piping is completed, perform the drainage test if the water drains smoothly. If not draining smoothly, it may result in water leakage or condensation.
- (8) When the drain piping work is finished securely, wrap the insulation material around the indoor side drain pipe. At this time, do not wrap together with the refrigerant tubing. If wrapped together, the drain pipe is lifted and water drainage will not be operated. Consequently, the water comes out of the drain pan and it can lead to water leakage.



3-4-2. Installing the Drain Pipe

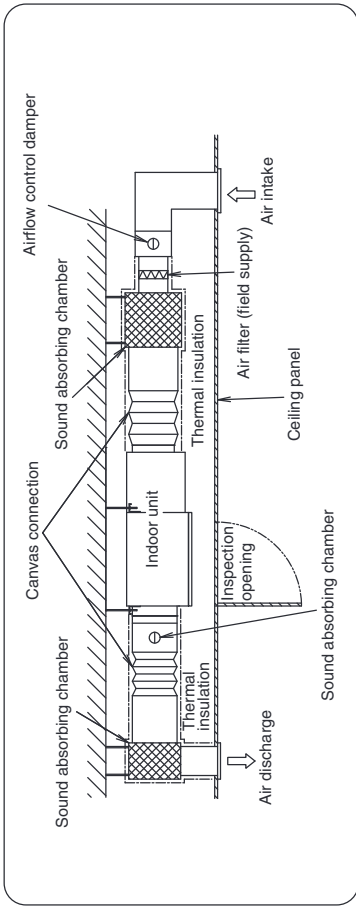


- (1) How to Connect Drain Port and Drain Hose
 - First insert the supplied hose band into the drain port pipe. Then make sure the head of the screw is facing toward a technical engineer when placing the screw of the hose band at an upward angle.
 - Insert the soft PVC socket of the supplied drain hose to the drain port pipe. **Never apply the adhesive to the both ends of the soft PVC socket and the drain port pipe.**
 - Insert the drain hose to the point where there is a difference in level as shown in the figure below and fasten it with the hose band 5 mm away from that position. Tightening torque must be 2.5 ~ 3.4 N·m.
 - Tightening position of the hose band must be upward.
- (2) How to Install the Drain Pipe
 - Connect the hard PVC pipe (O.D. 32mm) to the side of the soft PVC socket of the drain hose and the side of the hard PVC pipe.
 - Apply approx. 2 g of adhesive on the side of the soft PVC socket of the drain hose and the side of the hard PVC pipe.
 - 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.



3-5. Caution for Ducting Work

- This unit has high static pressure. In case of small pressure resistance (for instance, a short duct), install an airflow control damper (field supply) for adjusting airflow volume as airflow volume / airflow 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 sound absorption chamber with an acoustic liner.
- Use a flexible canvas connection or vibration isolation hanger (field supply) to break transmission of mechanical vibration of the unit.



- Use incombustible duct materials.
- Use thermal insulation to prevent duct condensation.
- An air filter (field supply) must be installed at the air intake side. If not installed, the heat exchanger will get dirty and the unit will reduce the quality.
- Obtain and install an air filter (field supply) which can easily wash away the dust by lukewarm, soapy water or suck up with a vacuum cleaner.
- Clean the air filter periodically to collect dust and other particles from the air.
- Use duct static pressure within a range of specification value.

4. ELECTRICAL WIRING

4-1. General Precautions on Wiring

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



- This equipment is strongly recommended to be installed with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case of equipment breakdown or insulation breakdown. Earth Leakage Circuit Breaker (ELCB) must be incorporated in the fixed wiring in accordance with the wiring regulations. The Earth Leakage Circuit Breaker (ELCB) must be an approved 10-16 A, having a contact separation in all poles.
- To prevent possible hazards from insulation failure, the unit must be grounded.
- Each wiring connection must be done in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.
- Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.
- 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.
- 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.
- 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 power supply wiring.
 - Use shielded wires for inter-unit control wiring between units and ground the shield on both sides.



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

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

Indoor unit

Type	(B) Power supply Min. 2.5 mm ² *1 Max. 30 m*2	Time delay fuse or circuit capacity
E3		10-16 A

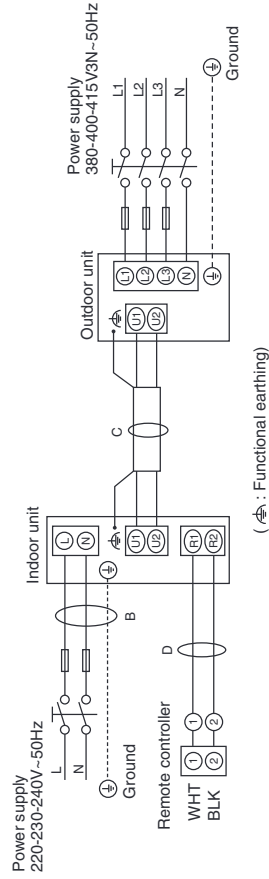
Control wiring

(C) Inter-unit (between outdoor and indoor units) control wiring	(D) Remote control wiring
Use shielded wiring*3 0.75 mm ² Max. 1,000 m	0.75 mm ² Max. 500 m

NOTE

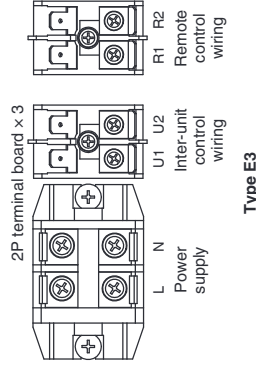
- *1 Maximum applicable wire for terminal board of indoor unit : 2.5 mm²
- *2 Maximum length shows a 2% voltage drop.
- *3 With ring-type wire terminal

4-3. Wiring System Diagrams



NOTE

- See section "4-2. Wire Length and Wire Diameter for Power Supply System" for the explanation of "B", "C" and "D" in the above diagram.
- The basic connection diagram of the indoor unit shows the terminal boards, so the terminal boards in your equipment may differ from the diagram.
- Refrigerant Circuit (R.C.) address should be set before turning the power on.
- Regarding R.C. address setting, refer to the installation instructions supplied with the outdoor unit. Auto address setting can be executed by remote controller automatically. Refer to the installation instructions supplied with the remote controller (optional).

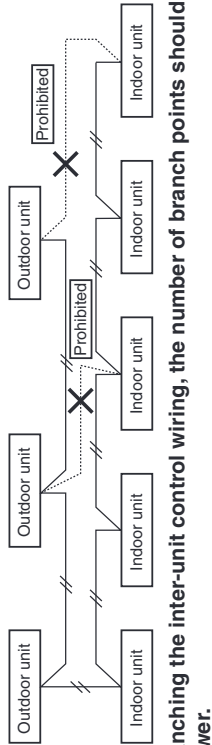


CAUTION

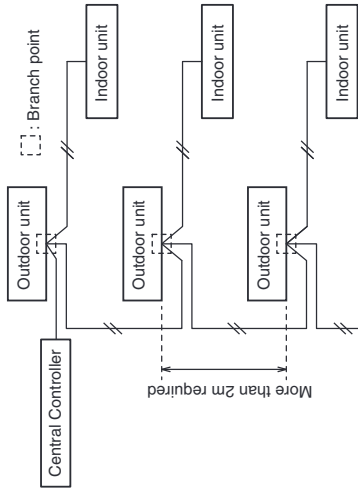
(1) When linking the outdoor units in a network, disconnect the terminal extended from the short plug from all outdoor units except any one of the outdoor units.
(When shipping: In shorted condition.)

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.



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



(4) Use shielded wires for inter-unit control wiring (C) and ground the shield on both sides, otherwise misoperation from noise may occur.

Connect wiring as shown in Section "4-3. Wiring System Diagrams".



(5) 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. (60245 IEC57, 60245 IEC66)

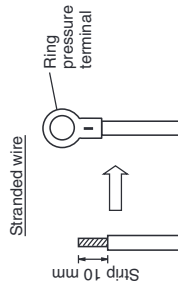
WARNING

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.

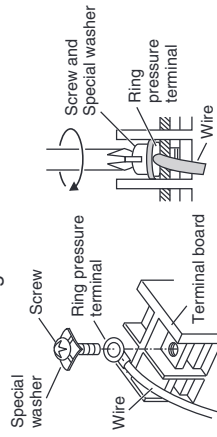
How to connect wiring to the terminal

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. Then attach the ring pressure terminal.



(2) Using a Phillips head screwdriver, remove the terminal screw(s) on the terminal board.



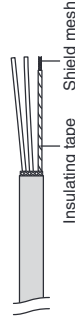
(3) Using a ring connector fastener or pliers, securely clamp each stripped wire end with a ring pressure terminal.
(4) Place the ring pressure terminal, and replace and tighten the removed terminal screw using a screwdriver.

Examples of shield wires

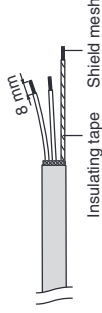
(1) Remove cable coat not to scratch braided shield.



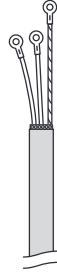
(2) Unbraid the braided shield carefully and twist the unbraided shield wires tightly together. Insulate the shield wires by covering them with an insulation tube or wrapping insulating tape around them.



(3) Remove coat of signal wire.



(4) Attach ring pressure terminals to the signal wires and the shield wires insulated in Step (2).



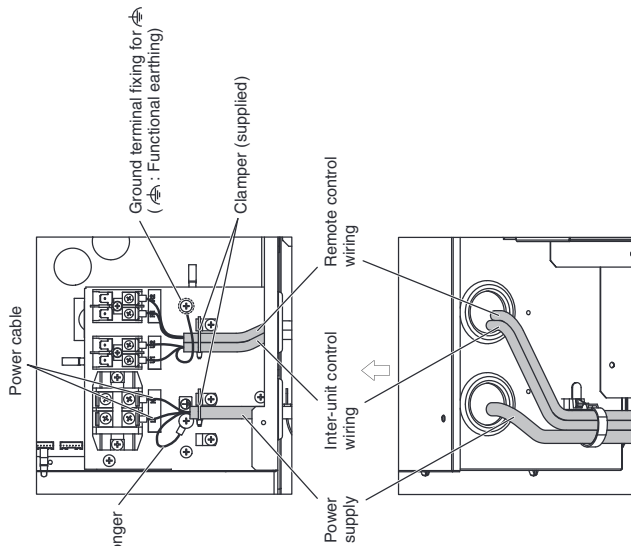
Earth wire for power supply

The earth wire should be longer than the other lead wires for electrical safety.

■ Wiring samples

Earth wiring:

Make the earth wiring 25 - 30 mm longer than power cable.



5. HOW TO PROCESS TUBING

Must ensure mechanical connections be accessible for maintenance purposes. The liquid tubing side is connected by a flare nut, and the gas tubing side is connected by brazing.

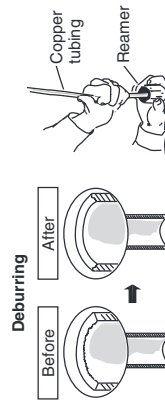
5-1. Connecting the Refrigerant Tubing

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

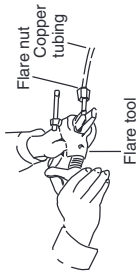
- (1) Cut the copper tube to the required length with a tube cutter. It is recommended to cut approx. 30 – 50 cm longer than the tubing length you estimate.
- (2) Remove burrs at each end of the copper tubing with a tube reamer or a similar tool. This process is important and should be done carefully to make a good flare. Be sure to keep any contaminants (moisture, dirt, metal filings, etc.) from entering the tubing.



NOTE

When reaming, hold the tube end downward and be sure that no copper scraps fall into the tube.

- (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.



NOTE

When flared joints are reused, the flare part shall be re-fabricated.

A good flare should have the following characteristics:

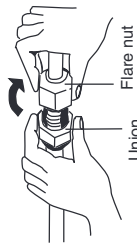
- inside surface is glossy and smooth
- edge is smooth
- tapered sides are of uniform length

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.



- (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.



- 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.

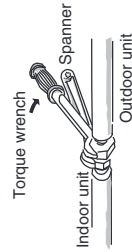
5-2. Connecting Tubing Between Indoor and Outdoor Units

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

Indoor Unit Tubing Connection

Indoor unit type	200	250
Gas tubing (mm)	ø25.4	ø25.4
Liquid tubing (mm)	ø9.52	ø12.7

- (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 a torque wrench and a spanner. If the flare nuts are over-tightened, the flare may be damaged, which could result in refrigerant leakage and cause injury or asphyxiation to room occupants.



- For the flare nuts at tubing connections, be sure to use the flare nuts that were supplied with the unit, or else flare nuts for R410A, R32 (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
ø9.52 (3/8")	34 - 42 N · m {340 - 420 kgf · cm}	0.8 mm
ø12.7 (1/2")	49 - 55 N · m {490 - 550 kgf · cm}	0.8 mm

Because the pressure is approximately 1.6 times higher than conventional refrigerant R22 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

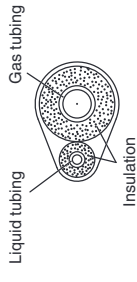
Must ensure that pipe-work shall be protected from physical damage.

- 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.

Two tubes arranged together



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.

Additional Precautions For R32 Models.

Ensure to do the re-flaring of pipes before connecting to units to avoid leaking.

To prevent the ingress of moisture into the joint which could have the potential to freeze and then cause leakage, the joint must be sealed with suitable silicone and insulation material. The joint should be sealed on both liquid and gas side.

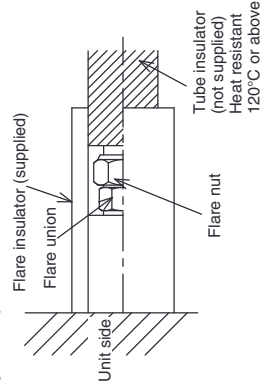


Insulation material and silicone sealant. Please ensure there are no gaps where moisture can enter the joint.

Silicone Sealant must be neutral cure and ammonia free. Use of silicon containing ammonia can lead to stress corrosion on the joint and cause leakage.

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 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.



Insulation material

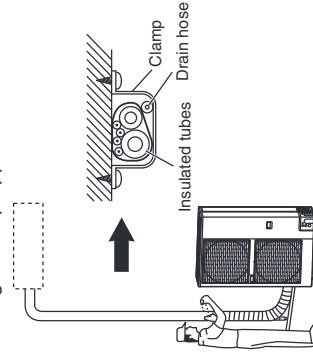
The material used for insulation must have good insulation characteristics, be easy to use, be age resistant, and must not easily absorb moisture.

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.

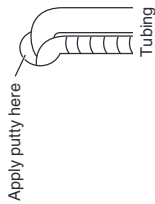


NOTE

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.



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

NOTE

Refer to the Installation Instructions attached to the optional Timer Remote Controller or optional High-spec Wired Remote Controller.

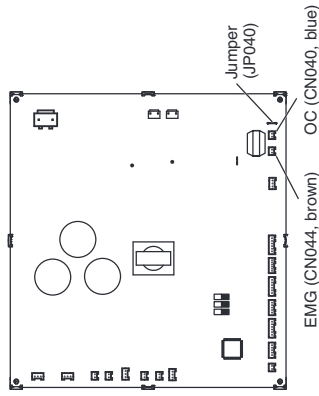
7. HOW TO INSTALL WIRELESS REMOTE CONTROLLER

NOTE

Refer to the Installation Instructions attached to the optional Wireless Remote Controller.

8. PRECAUTIONS ON TEST RUN

- Request that the customer be present when the test run is performed. At this time, explain the operation manual and have the customer perform the actual steps.
- Check that the 220–240V AC power is not connected to the inter-unit control wiring connector terminal.
* If 220–240V AC is accidentally applied, the indoor unit control PCB fuse will blow in order to protect the PCB.
In this case, make the wiring correctly. Then disconnect the 2P connectors (OC) that are connected to the indoor unit PCB, and replace them with 2P connectors (EMG). If operation is still not possible after changing the brown connectors, cut the jumper on the indoor unit PCB.
(Be sure to turn the power OFF before performing this work.)



9. CHECKLIST AFTER INSTALLATION WORK

Work List	No.	Content	Check	Possibility of Failure & Checkpoint
Installation	1	Are the indoor units installed following the content of the section "2. SELECTING THE INSTALLATION SITE"?	<input type="checkbox"/>	There is a possibility of light injury or loss of property.
	2	Is the earth leakage circuit breaker (air-pole switching function provided) installed?	<input type="checkbox"/>	
	3	Is there any wrong installation of optional parts or wrong wiring?	<input type="checkbox"/>	
	4	Was the ground wire work performed?	<input type="checkbox"/>	Power failure or short circuit may cause electric shock or fire. Check installation work and ground wire work.
	5	Are there any wrong power supply wiring, wrong connection wire, wrong signal wire or loose screw?	<input type="checkbox"/>	
	6	Is the thickness of wire in accordance with rule?	<input type="checkbox"/>	
	7	Is the power-supply voltage equal to the nameplate of the unit?	<input type="checkbox"/>	
	8	Was the check of the airtight test, flared tube fitting and gas leakage on the welded portion performed?	<input type="checkbox"/>	If the gas leakage occurs, the unit quality not only becomes inferior but affects environment. Repair it as quickly as possible.
Drain Check	9	Is there water leakage?	<input type="checkbox"/>	Since there is a possibility of water drain, repair the drain pipe if the drain failure or water drain occurs.
	10	Indoor unit drain pipe has a downward gradient (1/100 or more) by rule. Is the drain water flowing smoothly?	<input type="checkbox"/>	
Heat Insulation	11	Was the heat insulation work at a suitable location including the flared tube fitting (refrigerant tube & drain pipe) performed properly?	<input type="checkbox"/>	The quality of unit not only becomes inferior but there is a possibility of the water drain. So, perform the heat insulation work properly.
	12	Did the abnormal sound occur?	<input type="checkbox"/>	Check if there is a fan contact or distortion of the indoor unit. Check if the unit does not operate or there is a wrong tubing or wiring connection with another system.
Test Run	13	Did the cool and warm airflow discharge from the indoor unit?	<input type="checkbox"/>	

10. EXTERNAL STATIC PRESSURE SETTING

Choose one of the methods (selection of "a", "b", "c" within the range of dotted line as shown in the flowchart below) and make settings.

a. No setting changes:

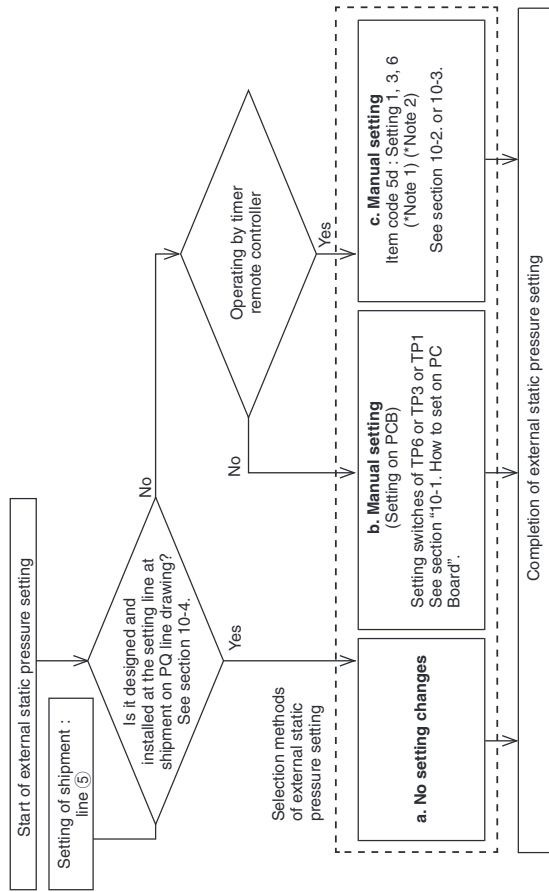
When using as it is factory preset at shipment.

b. Manual setting (on PCB):
 (If resetting after external static pressure setting once, it might be different from factory preset.)

c. Manual setting (by timer remote controller):
 This is static pressure setting excepting factory preset at shipment. Dip switch select method.

Static pressure setting excepting factory preset at shipment.

Flow of External Static Pressure



NOTE

(1) Refer to Tables 10-2, 10-3 and Fig. 10-2 for details on the relationship between the value of item code "5d" and the external static pressure.

(2) When set in group control (connecting multiple indoor units with one timer remote controller), set each indoor unit to item code "5d".
 When amending the setting after selecting [b. Manual setting] (due to airflow path changes, etc.), it is necessary to cancel [b. Manual setting] (switching OFF positions).
 When [b. Manual setting] has not been cancelled, [c. Manual setting] will be activated if selected, but [b. Manual setting] takes precedence when the power is switched back on after power outages, etc.

CAUTION

● **Make sure the external static pressure is in a range of specifications.**
 Then proceed the external static pressure setting.
 Improper settings can cause noise, a shortage of airflow volume and water leakage.

● **Refer to Fig. 10-2 for the external static pressure setting range.**
 ● **Be sure to set the [External Static Pressure Setting] once again after amending the airflow path for the duct or air outlet after setting the external static pressure.**

10-1. How to Set on PC Board

1. Turn off the power breaker to halt the supply of electricity to the PC board.
2. Open the lid of the electrical component box and confirm the location where the Select switch on the indoor unit control PCB is placed. (Fig. 10-1)

3. Set the On/Off switches in the Off position which are now set in the On position.

Select the positions of the Select SW001 switches respectively to make the desired external static pressure settings referring to the Table 10-1.

Table 10-1 External static pressure SW setting

External static pressure at the time of rated airflow volume	SW001					
	200	250	TP6	TP3	TP1	
180Pa		200Pa	ON	2	3	
120Pa		130Pa	ON	2	3	ON
75Pa		75Pa		1	2	3

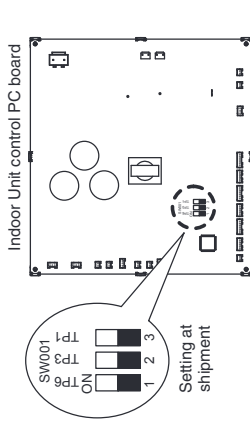


Fig. 10-1

10-2. Operating the Timer Remote Controller (CZ-RTC4)

How to set the external static pressure

1. Press and hold down the \leftarrow and \rightarrow buttons simultaneously for 4 or more seconds. (**SETTING**, the Unit No., Item Code and Detailed Data will blink on the LCD display.)

2. The indoor unit numbers in the group control will be sequentially displayed whenever the Unit Select button is pressed.

Only the fan motor for the selected indoor unit will operate during this time.

3. Specify the "5d" item code by pressing the ∇ / Δ buttons for the temperature setting buttons and confirm the values. ("5d" set at shipment)

4. Press the \leftarrow / \rightarrow buttons for the time to amend the values for the set data.

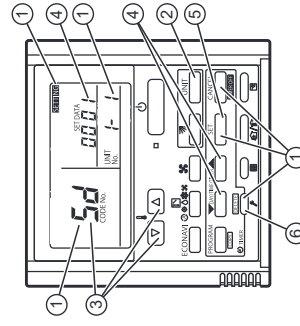
Refer to Table 10-2 and Fig. 10-2 and select a value "0005", "0003" or "0001".

5. Press the \leftarrow button.
 The display will stop blinking and remain illuminated.

6. Press the \rightarrow button. The fan motor will stop operating and the LCD display will return to the normal stop mode.

Table 10-2 Setting the external static pressure

Indoor unit	Item code
200	250
External static pressure of the rated air flow volume	
180 Pa	200 Pa
120 Pa	130 Pa
75 Pa	75 Pa



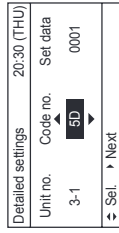
NOTE:

Failure to set this parameter may result in decreased airflow and condensation.

10-3. Operating the High-spec Wired Remote Controller (CZ-RTC5B)



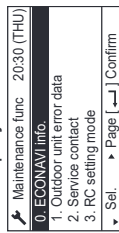
3. Select the "Code no." by pressing the or button. Change the "Code no." to "5D" by pressing the or button (or keeping it pressed).



How to set the external static pressure

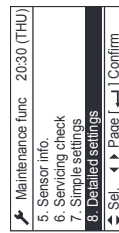
1. Keep pressing the , and buttons simultaneously for 4 or more seconds.

The "Maintenance func" screen appears on the LCD display.



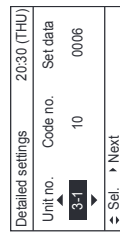
2. Press the or button to see each menu. If you wish to see the next screen instantly, press the or button.

Select "8. Detailed settings" on the LCD display and press the button.



The "Detailed settings" screen appears on the LCD display.

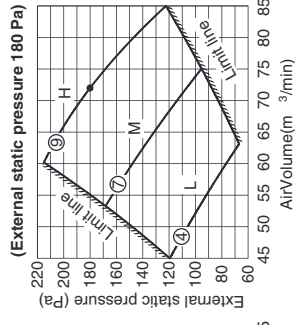
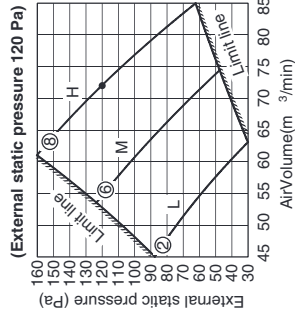
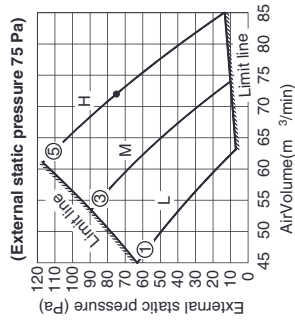
- Select the "Unit no." by pressing the or button for changes.



10-4. Indoor Fan Performance

Item code "5d"	BBB	Cooling	①	②	③	④	⑤	⑥	⑦	⑧	⑨
	BBB	Heating				L			M		H
	BBB	Cooling				L			M		H
	BBB	Heating				L			M		H
	BBB	Cooling				L			M		H
	BBB	Heating				L			M		H
	BBB	Cooling				L			M		H
	BBB	Heating				L			M		H
	BBB	Setting at shipment				L			M		H

Type 200



Type 250

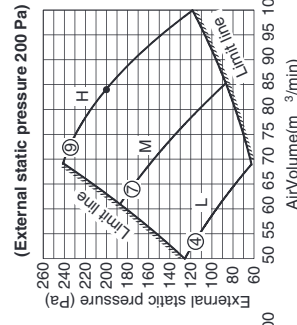
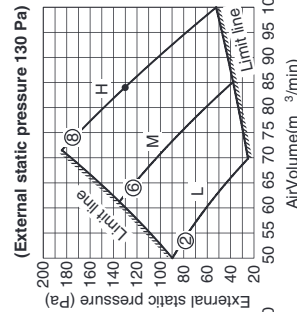
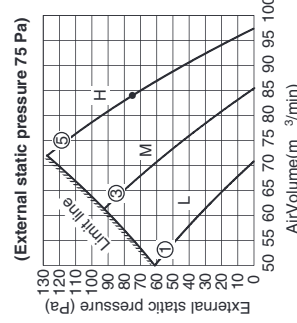


Fig. 10-2

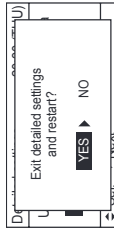
Table 10-3 Setting the external static pressure

Indoor unit	Item code
200	250
External static pressure of the rated air flow volume	5D
180 Pa	200 Pa
120 Pa	130 Pa
75 Pa	75 Pa
	0006
	0003
	0001

5. Select the "Unit no." by pressing the or button and press the button.

The "Exit detailed settings and restart?" (Detailed setting-end) screen appears on the LCD display.

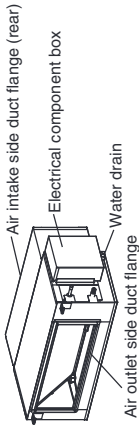
- Select "YES" and press the button.



11. APPENDIX

■ Name of Parts

Type E3 (HIGH STATIC PRESSURE DUCTED)



■ Care and Cleaning



- Engage authorized dealer or specialist for cleaning.
- 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.



- 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

- In case of Installing the Duct (field supply)

Type	E3
Period	(Depends on filter's specifications)

When cleaning the air filter, consult your dealer or service center.



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

Care: After a prolonged idle period

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

Care: Before a prolonged idle period

- Operate the fan for half a day to dry out the inside.
- Disconnect the power supply and also turn off the circuit breaker.
- Clean the air filter and replace it in its original position.

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.

Important Information Regarding The Refrigerant Used

NOTE

Refer to the Installation Instructions attached to the outdoor unit.

12. SERVICING



CAUTION

- Any qualified person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- Servicing shall be performed only as recommended by the manufacturer.
- Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, (2) to (6) shall be completed prior to conducting work on the system.
 - (1) Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.
 - (2) All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.
 - (3) The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.
 - (4) If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.
 - (5) No person carrying out work in relation to a refrigeration system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.
 - (6) Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
 - (7) Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.
 - ✦ The charge size is in accordance with the room size within which the refrigerant containing parts are installed.
 - ✦ The ventilation machinery and outlets are operating adequately and are not obstructed.
 - ✦ Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
 - ✦ Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

- (8) Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.
- Initial safety checks shall include:
- ▣ That capacitors are discharged. This shall be done in a safe manner to avoid possibility of sparking.
 - ▣ That no live electrical components and wiring are exposed while charging, recovering or purging the system.
 - ▣ That there is continuity of earth bonding.
- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc.
 - Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
 - Ensure that apparatus is mounted securely.
 - Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres.
 - Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE:

- The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.
- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.
 - Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere.
 - The test apparatus shall be at the correct rating.
 - Replace components only with parts specified by the manufacturer. Unspecified parts by manufacturer may result ignition of refrigerant in the atmosphere from a leak.

13. REMOVAL AND EVACUATION



CAUTION

- When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:
 - ▣ Remove refrigerant.
 - ▣ Purge the circuit with inert gas.
 - ▣ Evacuate.
 - ▣ Purge again with inert gas.
 - ▣ Open the circuit by cutting or brazing.
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- The system shall be “flushed” with Oxygen free nitrogen (OFN) to render the unit safe.
- This process may need to be repeated several times.
- Compressed air or oxygen shall not be used for this task.
- Flushing shall be achieved by breaking the vacuum in the system with Oxygen free nitrogen (OFN) and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum.
- This process shall be repeated until no refrigerant is within the system.
- When the final Oxygen free nitrogen (OFN) charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
- This operation is absolutely vital if brazing operations on the pipe work are to take place.
- Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

14. CHARGING PROCEDURES

NOTE

Refer to the Installation Instructions attached to the outdoor unit.

15. DECOMMISSIONING

CAUTION

- Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details.
- It is recommended good practice that all refrigerants are recovered safely.
- Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant.
- It is essential that electrical power is available before the task is commenced.
 - a) Become familiar with the equipment and its operation.
 - b) Isolate system electrically.
 - c) Before attempting the procedure ensure that:
 - Mechanical handling equipment is available, if required, for handling refrigerant cylinders.
 - All personal protective equipment is available and being used correctly.
 - The recovery process is supervised at all times by a competent person.
 - Recovery equipment and cylinders conform to the appropriate standards.
 - d) Pump down refrigerant system, if possible.
 - e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
 - f) Make sure that cylinder is situated on the scales before recovery takes place.
 - g) Start the recovery machine and operate in accordance with manufacturer's instructions.
 - h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
 - i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
 - j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
 - k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.
 - Electrostatic charge may accumulate and create a hazardous condition when charging or discharging the refrigerant.

To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before charging / discharging.

16. RECOVERY

NOTE

Refer to the Installation Instructions attached to the outdoor unit.

17. CHECK OF DENSITY LIMIT

The refrigerant (R32), which is used in the air conditioner, is a flammable refrigerant. So the requirements for installation space of appliance are determined according to the refrigerant charge amount [mc] used in the appliance.

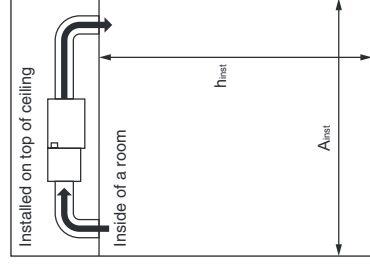
Regarding the refrigerant charge amount [mc] used in the appliance, refer to the installation instructions for the outdoor unit.

The minimum indoor floor space compared with the amount of refrigerant is roughly as follows:

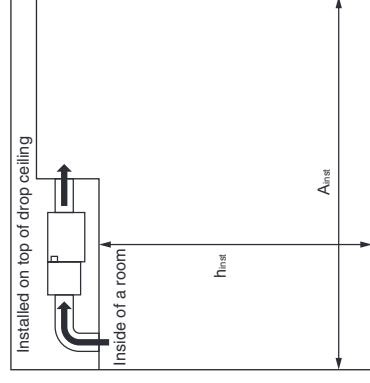
Table 1

Installation height of Indoor Unit: h_{inst}	Density Limit Line
$h_{inst} \geq 2.2 \text{ m}$	Line 1
$1.8 \text{ m} \leq h_{inst} < 2.2 \text{ m}$	Line 2
$h_{inst} < 1.8 \text{ m}$	Line 3

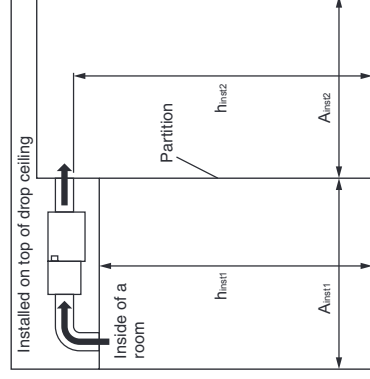
When connecting the duct to either inlet side or outlet side.



A_{inst} : Floor area of the room (m^2)
Satisfy the diagram for A_{inst}

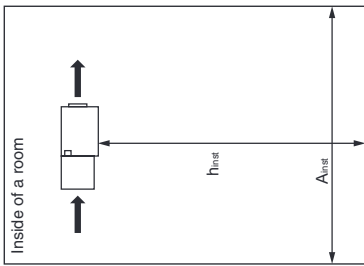


When not partitioning :
Satisfy the diagram for A_{inst}

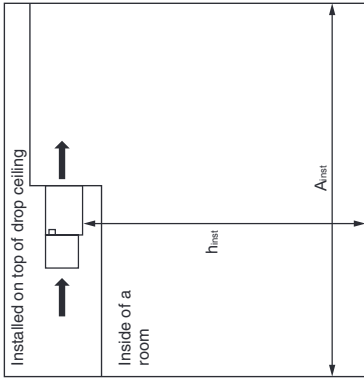


When there is a partition :
Satisfy the diagram for A_{inst1} and h_{inst1}
and satisfy the diagram for A_{inst2} and h_{inst2}

When not connecting the duct to either the inlet side or outlet side

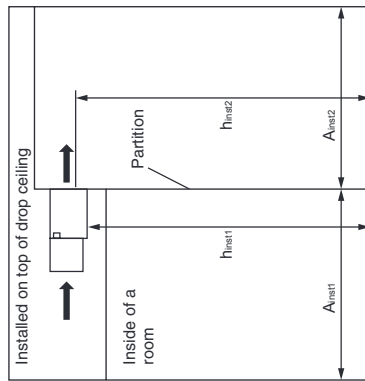


A_{net} : Floor area of the room (m²)
Satisfy the diagram for A_{net}

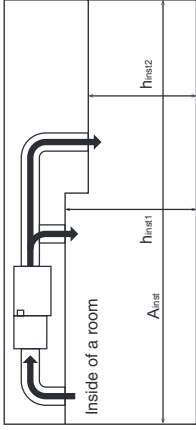


When not partitioning :
Satisfy the diagram for A_{net}

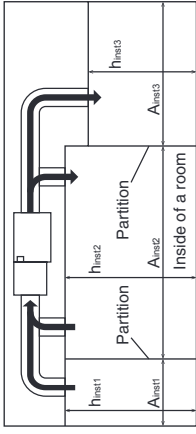
When there is a partition :
Satisfy the diagram for A_{net1} and h_{net1}
and satisfy the diagram for A_{net2} and h_{net2}



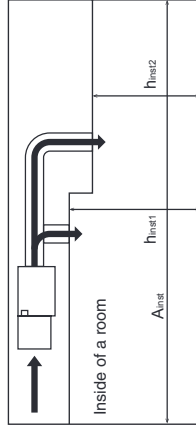
When providing outlets in multiple living rooms with outlet duct



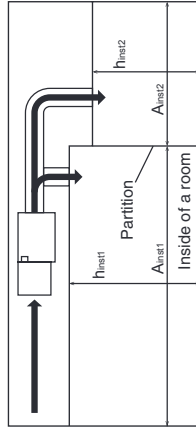
When not partitioning :
Satisfy the diagram for A_{net}
 $h_{net} = \text{Min. } (h_{net1}, h_{net2})$



When partitioning :
Satisfy the diagram for A_{net1} and h_{net1}
and satisfy the diagram for A_{net2} and h_{net2}
and satisfy the diagram for A_{net3} and h_{net3}



When not partitioning :
Satisfy the diagram for A_{net}
 $h_{net} = \text{Min. } (h_{net1}, h_{net2})$



When partitioning :
Satisfy the diagram for A_{net1} and h_{net1}
and satisfy the diagram for A_{net2} and h_{net2}

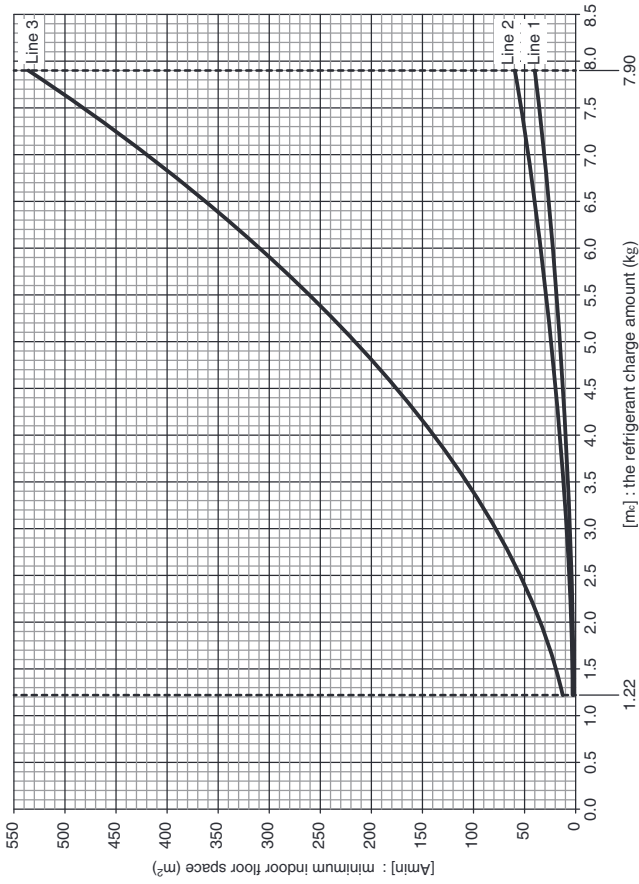


Table 2

[m _e] kg	[Amin] m ²		
	Line 1	Line 2	Line 3
1.22	2.5	3.0	12.8
1.3	2.6	3.2	14.5
1.4	2.8	3.4	16.8
1.5	3.0	3.7	19.3
1.6	3.2	3.9	22.0
1.7	3.4	4.2	24.8
1.8	3.6	4.4	27.8
1.9	3.8	4.6	31.0
2.0	4.0	4.9	34.3
2.1	4.2	5.1	37.8
2.2	4.4	5.4	41.5
2.3	4.6	5.6	45.4
2.4	4.8	5.8	49.4
2.5	5.0	6.1	53.6
2.6	5.2	6.5	58.0
2.7	5.4	7.0	62.6
2.8	5.6	7.5	67.3
2.9	5.8	8.1	72.2
3.0	6.0	8.6	77.2
3.1	6.2	9.2	82.5
3.2	6.6	9.8	87.9
3.3	7.0	10.4	93.4
3.4	7.4	11.1	99.2

[m _e] kg	[Amin] m ²		
	Line 1	Line 2	Line 3
3.5	7.9	11.7	105.1
3.6	8.3	12.4	111.2
3.7	8.8	13.1	117.5
3.8	9.3	13.8	123.9
3.9	9.8	14.6	130.5
4.0	10.3	15.3	137.3
4.1	10.8	16.1	144.2
4.2	11.3	16.9	151.4
4.3	11.9	17.7	158.7
4.4	12.4	18.5	166.1
4.5	13.0	19.4	173.8
4.6	13.6	20.2	181.6
4.7	14.1	21.1	189.5
4.8	14.8	22.0	197.7
4.9	15.4	22.9	206.0
5.0	16.0	23.9	214.5
5.1	16.7	24.8	223.2
5.2	17.3	25.8	232.0
5.3	18.0	26.8	241.0
5.4	18.7	27.9	250.2
5.5	19.4	28.9	259.6
5.6	20.1	29.9	269.1
5.7	20.8	31.0	278.8

[m _e] kg	[Amin] m ²		
	Line 1	Line 2	Line 3
5.8	21.5	32.1	288.6
5.9	22.3	33.2	298.7
6.0	23.0	34.4	308.9
6.1	23.8	35.5	319.3
6.2	24.6	36.7	329.8
6.3	25.4	37.9	340.6
6.4	26.2	39.1	351.5
6.5	27.0	40.3	362.5
6.6	27.9	41.6	373.8
6.7	28.7	42.8	385.2
6.8	29.6	44.1	396.8
6.9	30.4	45.4	408.5
7.0	31.3	46.8	420.4
7.1	32.2	48.1	432.5
7.2	33.1	49.5	444.8
7.3	34.1	50.9	457.3
7.4	35.0	52.3	469.9
7.5	35.9	53.7	482.7
7.6	36.9	55.1	495.6
7.7	37.9	56.6	508.7
7.8	38.9	58.1	522.0
7.9	39.9	59.6	535.5

m_e ≤ 1.22 : Can be installed
 1.22 < m_e ≤ m_{max} : Can be installed above "Density Limit Line" *1
 *1 Refer to Table 1 and the installation instructions of indoor unit when deciding "Density Limit Line".