



# INSTALLATION INSTRUCTIONS

— VRF System Air Conditioner —  
for Refrigerant R410A

■ R410A Models

Model No.

Indoor Units		Rated Capacity			
	Indoor Unit Type	90	112	140	160
E1	Ducted	S-90ME1R5A	S-112ME1R5A	S-140ME1R5A	S-160ME1R5A

P07-T13410

## 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:

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

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

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

#### If Necessary, Get Help

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

#### In Case of Improper Installation


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

### SPECIAL PRECAUTIONS

#### **WARNING** When Wiring



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

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidental injury or death**.
- 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 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...

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

##### ...In a Room

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

 **CAUTION** Keep the fire alarm and the air outlet at least 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 room 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



**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.




### WARNING

- This product must not be modified or disassembled under any circumstances. Modified or disassembled unit may cause fire, electric shock or injury.







### CAUTION

- 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



### CAUTION

- 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.

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**NOTE**

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

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**NOTE**

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

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- 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. 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

See Table 1-1.

Table	Type
1-1	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.








#### CAUTION

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

### 1-4. Additional Materials Required for Installation

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

Table 1-1 (Ducted)

Part Name	Figure	Q'ty	Remarks
Washer		8	For suspending indoor unit from ceiling
Flare insulator		2	For gas and liquid tubes
Hose band		5	For securing drain hose
Foam drain socket		1	For drain hole (another side of drain hose)
Drain hose		1	

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

## 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.

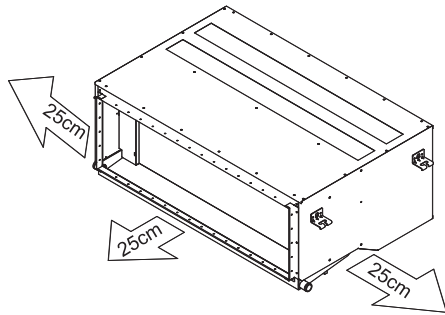


Fig. 2-1

### 3. SELECTING THE LOCATION FOR THE INDOOR UNIT

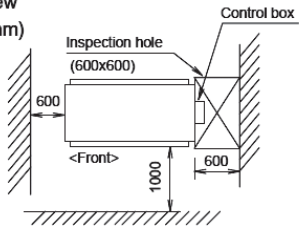
#### 3-1. Required Minimum Space for Installation and Service.

Provide a check port on the piping side ceiling for repair and maintenance.

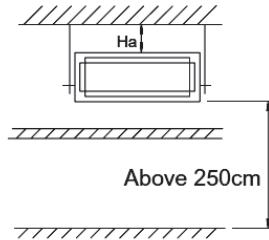
- Install the indoor unit once the following conditions are satisfied and after receiving the customer approval.

1. The indoor unit must be within a maintenance space.
2. The indoor unit must be free from any obstacles in path of the air inlet and outlet, and must allow spreading of air throughout the room.

Top view  
(Unit:mm)



Front view



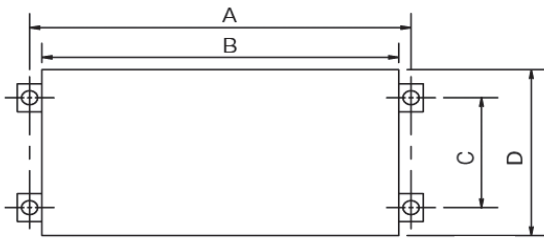
TYPE	Ha
S-90ME1R5A	360
S-112ME1R5A	360
S-140ME1R5A	430
S-160ME1R5A	430

\*The Ha is necessary for the access to the top of the unit for repair.

\* If the height from the floor to ceiling exceeds three meters, air flow distribution deteriorates and the effect is decreased.

### INSTALLATION OF INDOOR UNIT

#### POSITION OF SUSPENSION BOLT



(unit: mm)

TYPE	A	B	C	D
S-90ME1R5A	1160	1100	540	700
S-112ME1R5A				
S-140ME1R5A				
S-160ME1R5A				

- Apply a joint-canvas between the unit and duct to absorb unnecessary vibration.
- Install the unit leaning to a drainage hole side as a figure for easy water drainage.

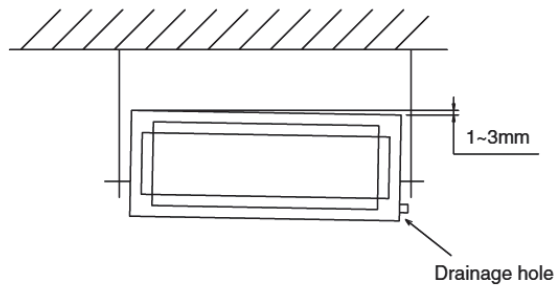
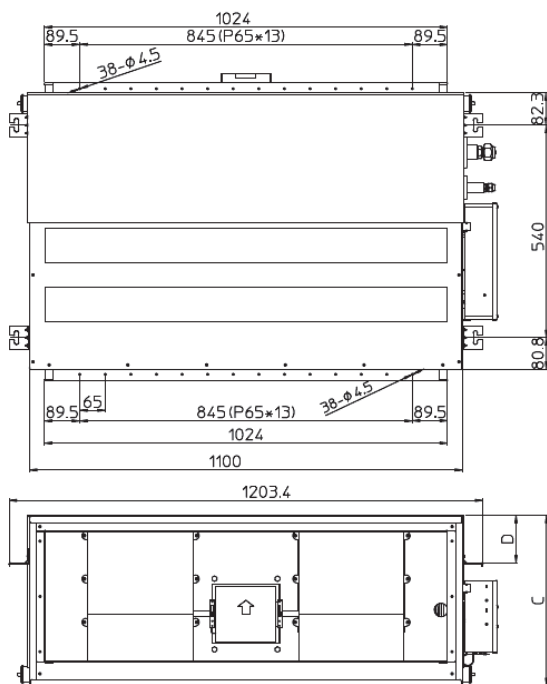
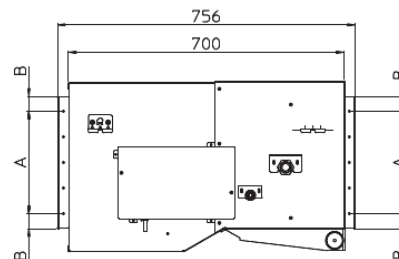


Fig. 3-1

Fig.3-1.1



TYPE	A	B	C	D
S-90ME1R5A	195	35.7	360	50
S-112ME1R5A				
S-140ME1R5A	260	38.2	430	121.5
S-160ME1R5A				



Unit: mm

Fig. 3-2

### 3-2. Suspending the Indoor Unit

Depending on the ceiling type:

- Insert suspension bolts (Fig. 3-3)  
or
- Use existing ceiling supports or construct a suitable support (Fig. 3-4).

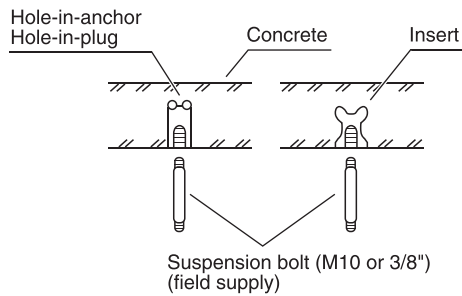


Fig. 3-3

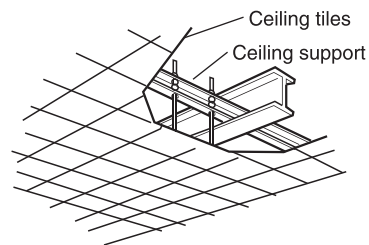


Fig. 3-4

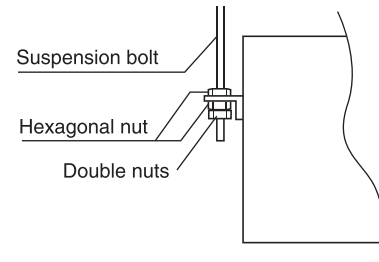


Fig. 3-6

- This shows an example of installation.

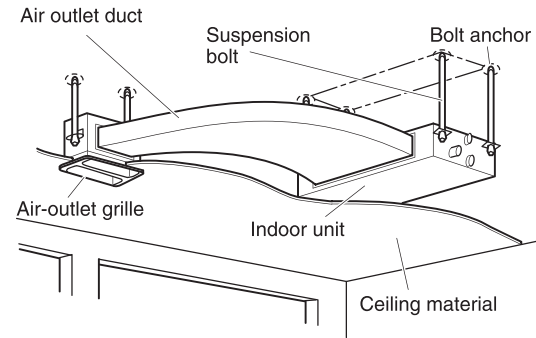


Fig. 3-7

#### ⚠ 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. 3-1 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. 3-3). (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. 3-5 and 3-6). 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.

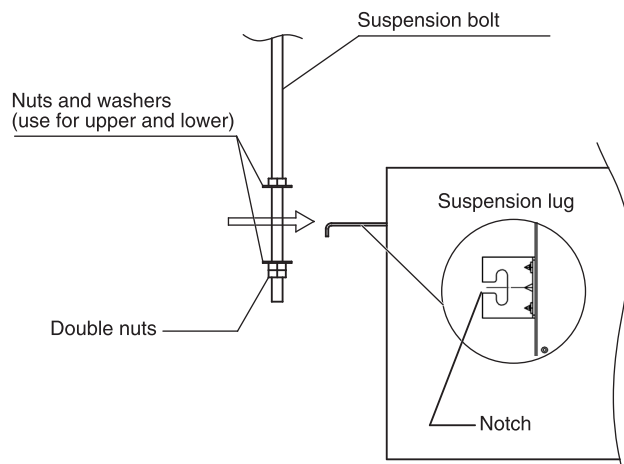


Fig. 3-5



### 3-3. 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.

#### 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. 3-8)

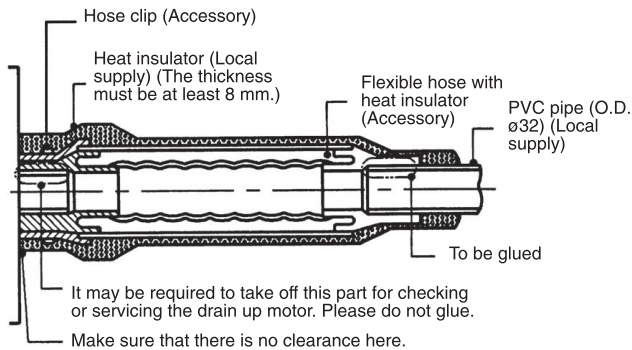


Fig. 3-8

- 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. 3-9)

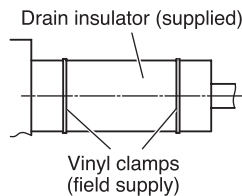


Fig. 3-9

#### 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. 3-10)

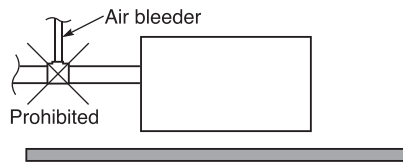


Fig. 3-10

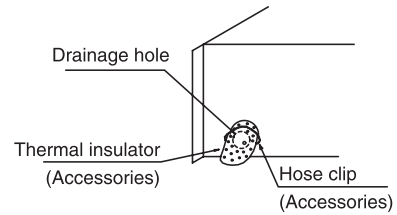


Fig. 3-11

- 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. 3-12)

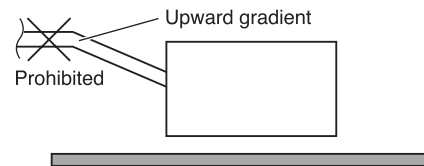


Fig. 3-12

- 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. 3-13)

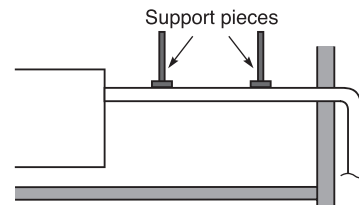


Fig. 3-13

### 3-4. Connecting Duct to indoor Unit

- Install the duct (local supply) for the Dimension of the installation hole.  
Use M5 self-tapp Screws for installation see the figure3-2.
- The duct connection of the air outlet needs thermal insulation.

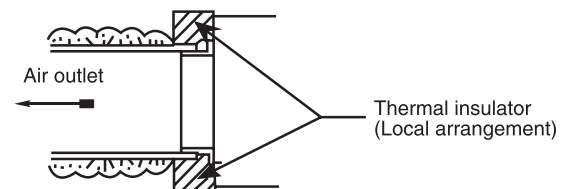


Fig. 3-14

#### NOTE

- Select an air-intake grille with a filter at a local shop.
- 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.

## 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>	
E 1 SERIES	Max. 130 m	10-16 A

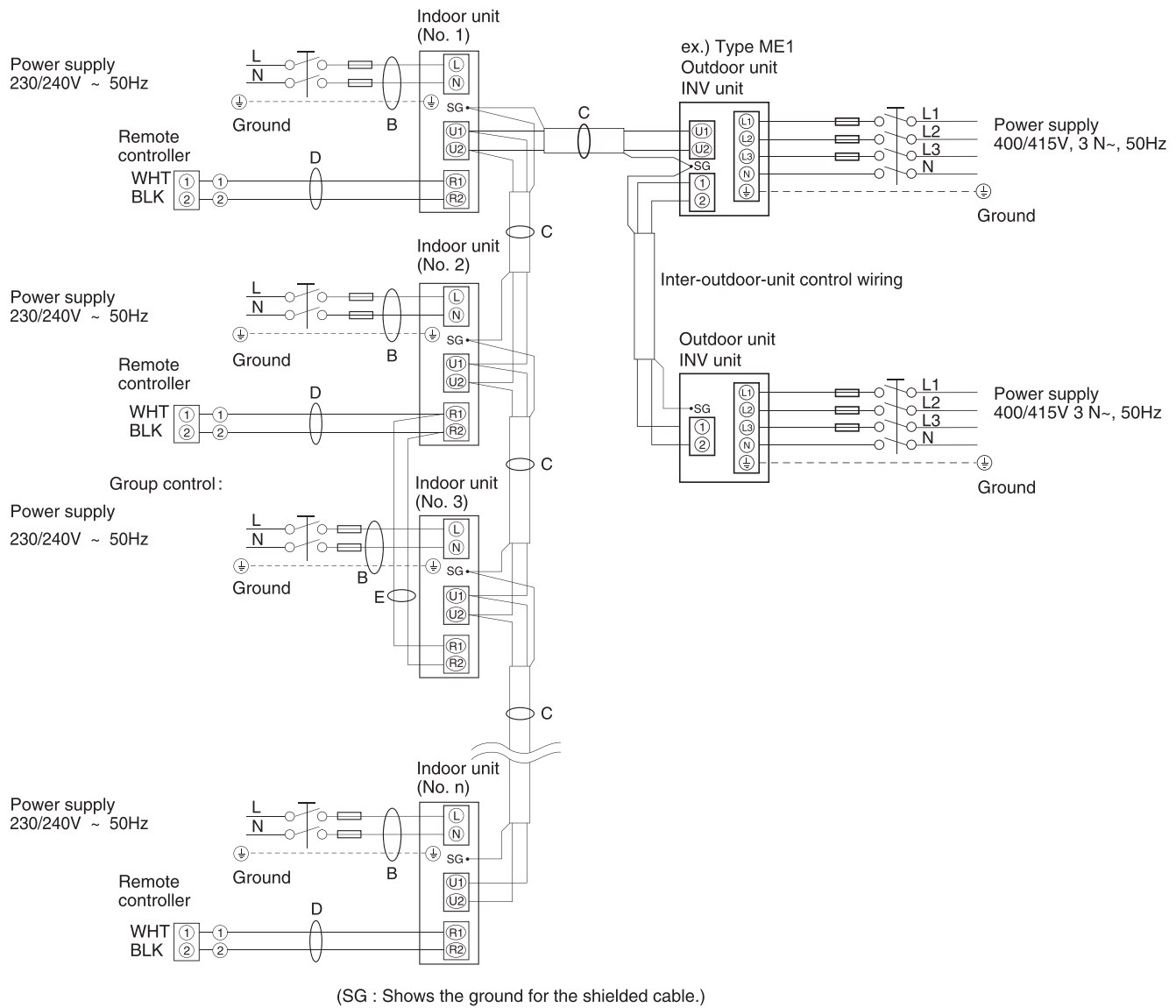
#### Control wiring

(C) Inter-unit (between outdoor and indoor units) control wiring	(D) Remote control wiring	(E) Control wiring for group control
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)
Max. 1,000 m	Max. 500 m	Max. 200 m (Total)

#### NOTE

- \* With ring-type wire terminal.

### 4-3. Wiring System Diagrams



#### 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" and "E" 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).

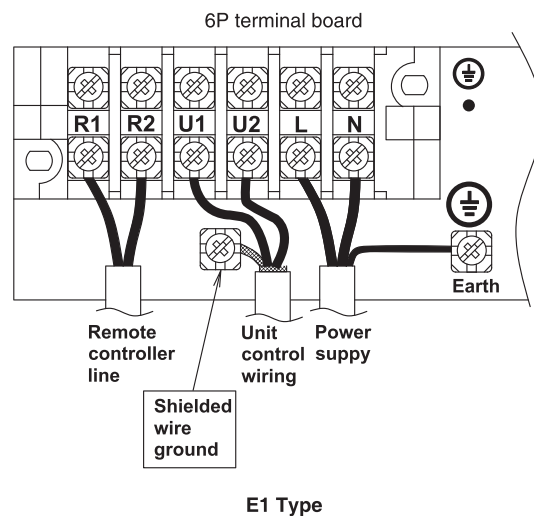


Fig. 4-2

**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)

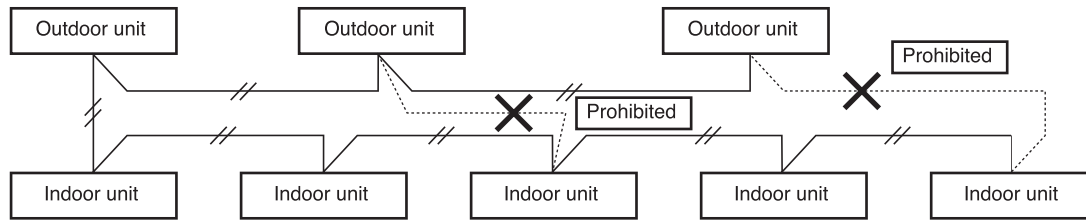


Fig. 4-3

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

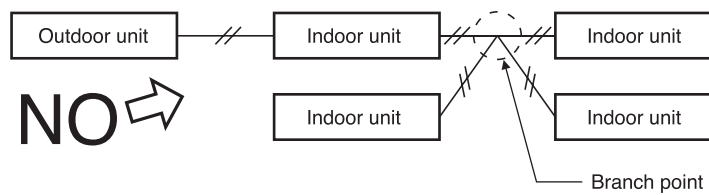


Fig. 4-4

- (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)

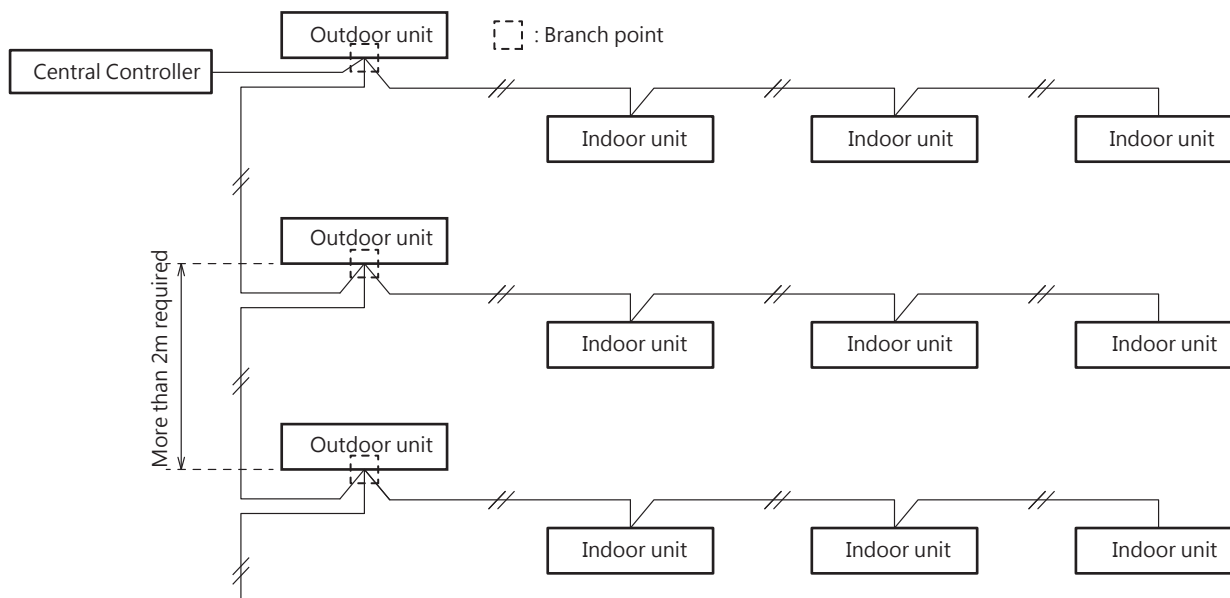


Fig. 4-5

- (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”.

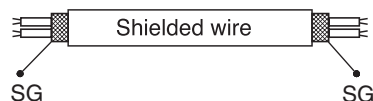


Fig. 4-6

- (6) • Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 5 or 3 \*1.5 mm<sup>2</sup> flexible cord. Type designation 60245 IEC 57 (H05RN-F, GP85PCP etc.) or heavier cord.  
• 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. (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)

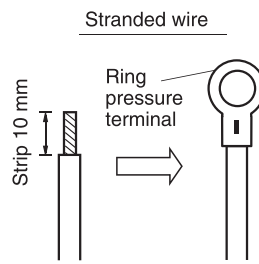


Fig. 4-7

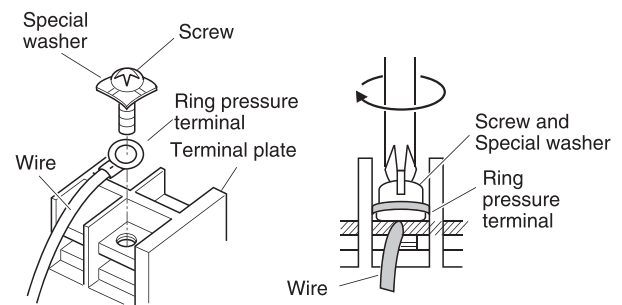


Fig. 4-8

### ■ 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

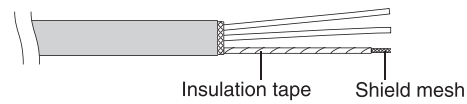


Fig. 4-10

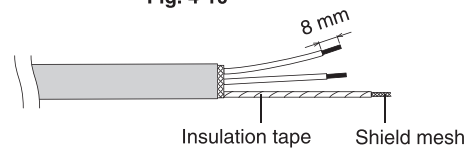


Fig. 4-11

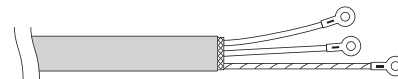


Fig. 4-12

## 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)

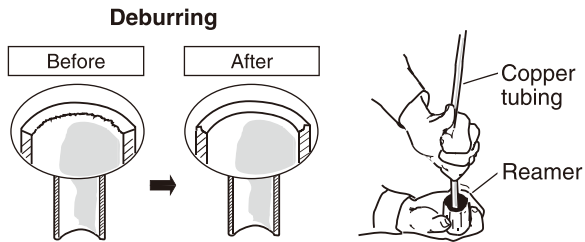


Fig. 5-1

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)

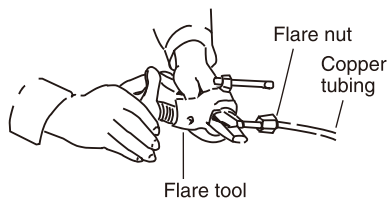


Fig. 5-3

#### 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)

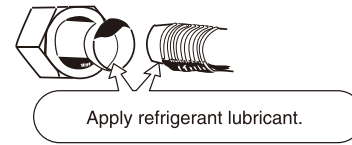


Fig. 5-4

- (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)

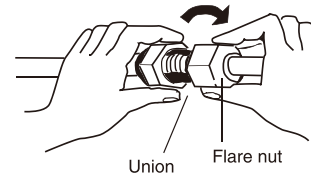


Fig. 5-5

- 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

#### NOTE

When connecting to the mini VRF 8HP,10HP(outdoor unit),select the main tube by using the following values. For details,refer to the installation in instructions of the outdoor unit.

Type	Indoor Unit	Rated Capacity			
		90	112	140	160
E1	Type E1	0.159	0.199	0.268	0.268

- (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	90	112	140	160
Gas tubing (mm)	ø15.88			
Liquid tubing (mm)	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.

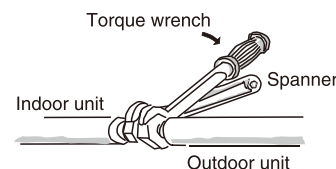


Fig. 5-6

- 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
∅9.52 (3/8")	34 – 42 N · m (340 – 420 kgf · cm)	0.8 mm
∅15.88 (5/8")	68 – 82 N · m (680 – 820 kgf · cm)	1.0 mm

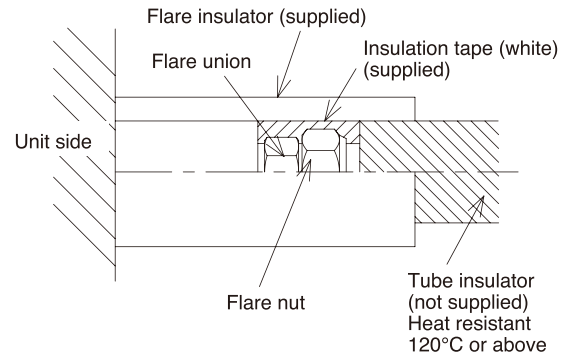


Fig. 5-8

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.

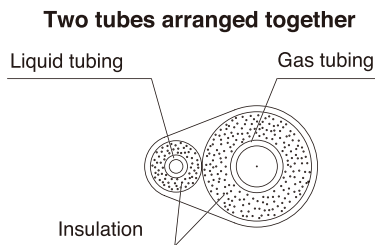


Fig. 5-7

#### 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)

#### 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)

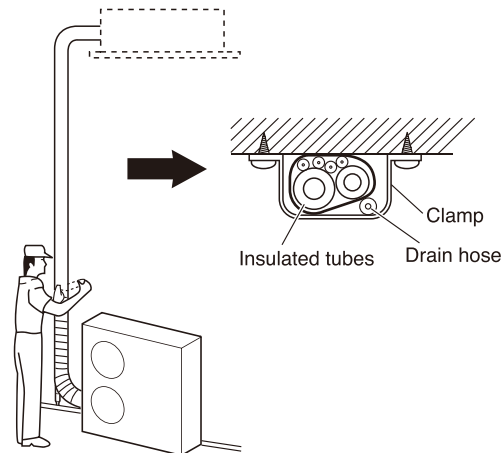


Fig.5-9

#### 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)

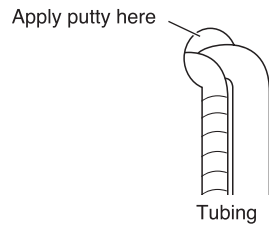


Fig.5-10

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

### NOTE

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

## 7. HOW TO INSTALL WIRELESS REMOTE CONTROLLER RECEIVER

### NOTE

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

## 8. APPENDIX

### ■ 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>
Water leakage		Heat exchanger dirty to block
Dust		Dust accumulation inside indoor unit is discharged.



● **Check Before Requiring Services**

Symptom	Cause	Action
<b>The air conditioner does not operate although the power is turned on.</b>	Power failure or after power failure.	Press the power ON/OFF button on the remote controller.
	The operation (power) button is turned off.	<ul style="list-style-type: none"> <li>• If the breaker is turned off, turn the power on.</li> <li>• If the breaker has been tripped, consult your dealer without turning it on.</li> </ul>
	Fuse blow out.	Contact your dealer.
<b>Poor cooling or heating performance</b>	The air intake or air outlet of indoor and outdoor units is clogged with dust.	Remove the dust.
	Improper temperature settings.	See "Tips for Energy Saving".
	The room is exposed to direct sunlight in cooling mode.	
	Doors or windows are open.	
	The air filter is clogged.	Contact your dealer.
	Too many heat sources in the room in cooling mode.	Use minimum heat sources and in a short time.
Too many people in the room in cooling mode.	Lower the temperature setting 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.

■ **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. 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.

**IMPORTANT INFORMATION REGARDING THE REFRIGERANT USED**

This product contains fluorinated greenhouse gases. Do not vent gases into the atmosphere.

Refrigerant type: R410A

GWP<sup>(1)</sup> value: 2088

<sup>(1)</sup>GWP = global warming potential

Periodical inspections for refrigerant leaks may be required depending on European or local legislation.

Please contact your local dealer for more information.



