

FOR SERVICE PERSONNEL ONLY

HITACHI

SPLIT UNIT AIR CONDITIONER INSTALLATION MANUAL

Indoor Unit

RAS-S50YHAB
RAS-S60YHAB

Outdoor Unit

RAC-S50YHAB
RAC-S60YHAB

- Carefully read through the procedures of proper installation before starting installation work.
- The sales agent should inform customers regarding the correct operation of installation.

Tools Needed For Installation Work

- () mark is tool exclusive use for R32
- Screwdriver
- Measuring Tape
- Knife
- Saw
- Pipe Cutter
- Hexagonal Wrench Key (4mm)
- Power Drill (ø 65mm ~ ø 80mm)
- Vacuum Pump
- Pliers or Wrench
- Torque Wrench
- Vacuum Pump Adaptor
- Flare Tool
- Gas Leakage Detector
- Manifold Valve
- Charge Hose
- Reamer
- File

Refrigerant pipe size (outer diameter): Narrow pipe, Liquid (ø6.35mm); Wide pipe, Gas (ø12.70mm)

SAFETY PRECAUTION

- Read the safety precautions carefully before operating the unit.
- The contents of this section are vital to ensure safety. Please pay special attention to the following sign.

WARNING Incorrect methods of installation may cause death or serious injury.

CAUTION Improper installation may result in serious consequence.

Be sure that the unit operates in proper condition after installation. Explain to customer the proper way of operating the unit as described in the user's guide.

WARNING

- Flare nut must use a torque wrench without fail. Tighten with the specified tightening torque. If the flare nut is tightened too much, after a long period of time, the flare nut breaks, Gas leakage, stagnation, touching fire, rarely cause ignition.
- Sharp bending of the pipe use the polyethylene rod, bend not crushed the pipe. Gas leakage from the crushed part, stagnation, touching fire, rarely cause ignition.
- Please request your sales agent or qualified technician to install your unit. Water leakage, short circuit or fire may occur if you do the installation work yourself.
- Please observe the instructions stated in the installation manual during the process of installation. Improper installation may cause water leakage, electric shock and fire.
- A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts. A vacuum valve shall be provided to evacuate the interconnecting pipe and/or any uncharged refrigerating system part.
- Mechanical connectors used indoors shall comply with ISO 14903. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be re-fabricated.
- Refrigerant tubing shall be protected or enclosed to avoid damage.
- Make sure the units are mounted at locations which are able to provide full support to the weight of the units. If not, the units may collapse and impose danger.
- Observe the rules and regulations of the electrical installation and the methods described in the installation manual when dealing with the electrical work. Use power cables approved by the authorities of your country.
- Be sure to use the specified wire for connecting the indoor and outdoor units. Please ensure that the connections are tight after the conductors of the wire are inserted into the terminals. Improper insertion and loose contact may cause over-heating and fire.
- Please use the specified components for installation work. Otherwise, the units may collapse or water leakage, electric shock and fire may occur.
- Be sure to use the specified piping set for R32. Otherwise, this may result in broken copper pipes or faults.
- When installing or removing an air conditioner, only specified refrigerant (R32) shall be allowed, do not allow air or moisture to remain in the refrigeration cycle. Otherwise, pressure in the refrigeration cycle may become abnormally high so that a rupture may be caused.
- Be sure to ventilate fully if a refrigerant gas leak while at work. If the refrigerant gas comes into contact with fire, a poisonous gas may occur.
- After completion of installation work, check to make sure that there is no refrigeration gas leakage. If the refrigerant gas leaks into the room, coming into contact with fire in the fan-driven heater, space heater, etc., a poisonous gas may occur.
- Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician. Improper repairs may result in water leakage, electric shock and fire, etc.

CAUTION

- A circuit breaker or fuse must be installed. Without a circuit breaker or fuse the danger of electric shock exists. The external switch shall be incorporated to completely disconnect from power supply. It should disconnect all poles, and a contact separation of at least 3mm must be present.
- Do not install the unit near a location where there is flammable gas. The outdoor unit may catch fire if flammable gas leaks around it.
- Do not install the indoor unit in a machine shop or kitchen where vapor from oil or its mist flows to the indoor unit. The oil will deposit on the heat exchanger, thereby reducing the indoor unit performance and may deform and in the worst case, break the plastic parts of the indoor unit.
- Please ensure smooth flow of water when installing the drain hose.
- Piping shall be suitable supported with a maximum spacing of 1m between the supports.

The Choice of Mounting Site (Please note the following matters and obtain permission from customer before installation).

WARNING

- The unit should be mounted at stable, non-vibratory location which can provide full support to the unit.

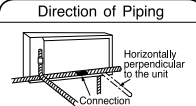
CAUTION

- No nearby heat source and no obstruction near the air outlet is allowed.
- The clearance distances from top, right and left are specified in figure below.
- The location must be convenient for water drainage and pipe connection with the Outdoor unit.
- To avoid interference from noise please place the unit and its remote controller at least 1m from the radio, television and inverter type fluorescent lamp.
- To avoid any error in signal transmission from the remote controller, please put the controller far away from high-frequency machines and high-power wireless systems.
- The installation height of indoor unit must be 2.3m or more.

INDOOR UNIT

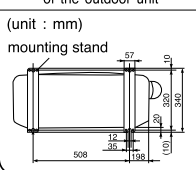
Names of Indoor Components

No.	Component's Name	Qty
①	Mounting Plate	1
②	Screw for Mounting Plate (4.1 x 32)	6
③	Holder for Remote Controller	1
④	AAA Size Battery	2
⑤	Screw for holder of Remote Controller (3.1x16)	2
⑥	Remote Controller	1
⑦	Purifying Filter	2



There are 6 directions allowed, namely, horizontally perpendicular to the unit, vertically down from right, horizontally out from right and horizontally out to left. Don't form the piping downward at the left of the unit.

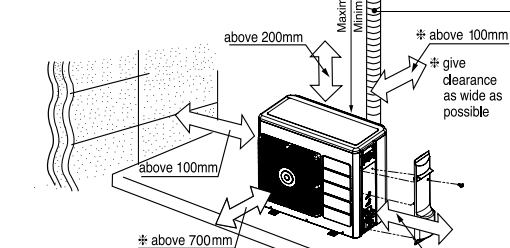
Dimension of Mounting Stand of the outdoor unit



WARNING
Flare connection only at outside of building

Names of Outdoor Components

No.	Item	Qty
⑧	Bush	3
⑨	Drain Pipe	1
⑩	Bush	1



WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer. Any unit method or using incompatible material may cause product damage, burst and serious injury.
- The appliance/pipe-work shall be stored in a well ventilated room with indoor floor area larger than A_{min} [refer to Table 1] and without any continuously operating ignition source. Keep away from open flames, any operating gas appliances or any operating electric heater. Else, it may explode and cause injury or death.
- The appliance/pipe-work shall be installed, and/or operated in a room with floor area larger than A_{min} [refer to Table 1] and keep away from ignition sources, such as heat/spark/open flame or hazardous areas such as gas appliances, gas cooking, reticulated gas supply systems or electric cooking appliances, etc.
- Do not pierce or burn as the appliance/pipe-work is pressurized. Do not expose the appliance/pipe-work to heat, flame, sparks, or other sources of ignition. Else, it may explode and cause injury or death.

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 Operation Instructions should be read carefully.

CAUTION



This symbol shows that a service personnel should be handling this equipment with reference to the Installation Manual.

CAUTION



This symbol shows that there is information included in the Operation Manual and/or Installation Manual.

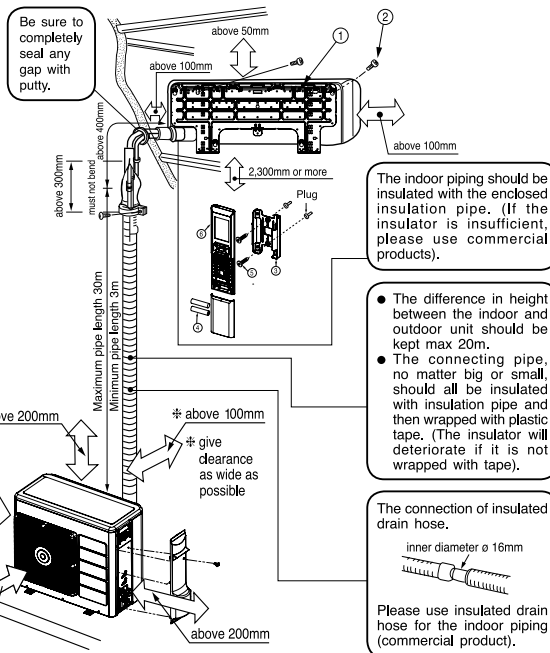
Figure showing the Installation of Indoor and Outdoor Unit.

CAUTION

- This unit is chargeless up 30m pipe length.
- Installation of pipe length less than minimum pipe length requirement (3 meters) may generate an abnormal sound.

Table 1: Minimum Floor area of the room A_{min} (m²)

Outdoor Model	Max Piping Length (m)	Max refrigerant charge amount (g)	Minimum Floor area of the room A _{min} (m ²)
			RAS-S**YHAB
RAC-S50YHAB	30	1500	2.15
RAC-S60YHAB	30	1500	2.15



The indoor piping should be insulated with the enclosed insulation pipe. (If the insulator is insufficient, please use commercial products).

- The difference in height between the indoor and outdoor unit should be kept max 20m.
- The connecting pipe, no matter big or small, should all be insulated with insulation pipe and then wrapped with plastic tape. (The insulator will deteriorate if it is not wrapped with tape).

The connection of insulated drain hose.
inner diameter ø 16mm
Please use insulated drain hose for the indoor piping (commercial product).

WARNING

BURST HAZARD

Do not allow air, etc. to get into refrigerant cycle (piping)

RISK OF EXPLOSION

Compressor must be stopped before removing refrigerant pipes.
All service valve must be fully closed after pumping down operation.

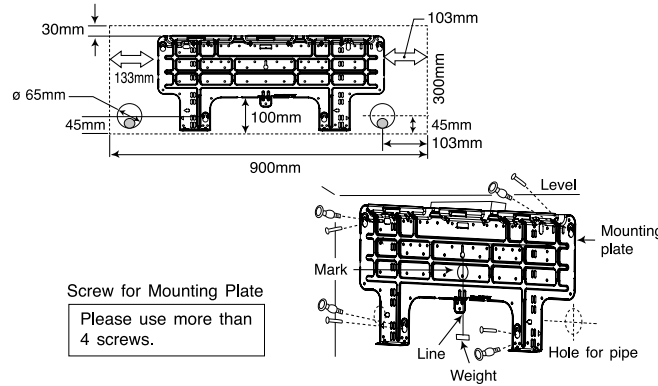
1 Installation of Mounting Plate, Wall Penetration and Installation of Protection Pipe

CAUTION

- The draining of the water container inside the indoor unit can be done from the left. Therefore the mounting plate must be fixed horizontally or slightly tilted towards the side of drain hose. Otherwise, condensed water may overflow the water container.

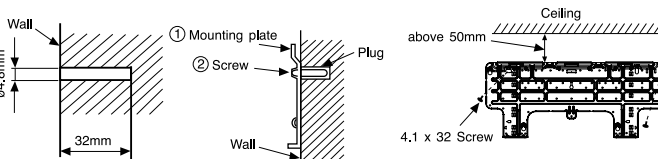
Direct Mounting On The Wall

- Please use hidden beams in the wall to hold the mounting plate.

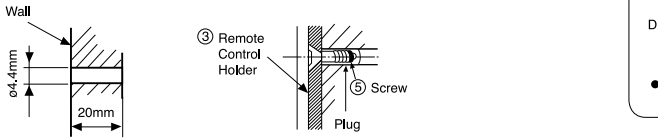


Procedures of Installation and Precautions

- Procedures to fix the mounting plate.
- 1. Drill holes on wall. (As shown below)
- 2. Push plug into the holes. (As shown below)
- 3. Fix the mounting plate on wall with 4.1 x 32 screw (As shown in figure below)

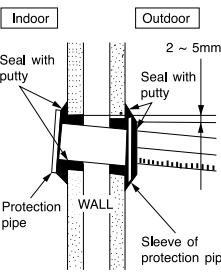


- Procedures to fix the holder of remote control.
- 1. Drill holes on wall. (As shown below)
- 2. Push plug into the holes. (As shown below)



Wall Penetration and Installation of Protection Pipe

- Drill a ø 65mm hole on wall which is slightly tilted towards the outdoor side. Drill the wall at a small angle.
- Cut the protection pipe according to the wall thickness.
- Empty gap in the sleeve of protection pipe should be completely sealed with putty to avoid dripping of rain water into the room.



WARNING

Be sure that the wire is not in contact with any metal in the wall. Please use the protection pipe as wire passing through the hollow part of the wall so as to prevent the possibility of damaged by mouse. Unless it seals completely, any air with high humidity flows from outdoor and any dew may drop.

2 Installation of the Indoor Unit

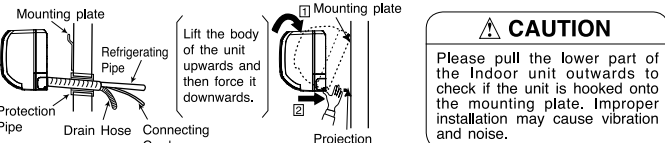
VERTICALLY DOWNWARD PIPING

Preparation

- Connect connecting cord.
- Pull out the pipe, connecting cord and drain hose.

Installation

- The upper part of the Indoor unit is hanged on the mounting plate.
- The projection at the lower part of the Indoor unit is hooked onto the mounting plate.

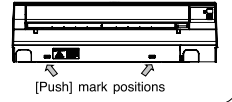


CAUTION

Please pull the lower part of the Indoor unit outwards to check if the unit is hooked onto the mounting plate. Improper installation may cause vibration and noise.

HOW TO REMOVE INDOOR UNIT

- Push up the (PUSH) sections at the bottom of the indoor unit and pull the bottom plate towards you. Then the claws are released from the stationary plate. (The (PUSH) sections are indicated by 2 arrows in the right figure)



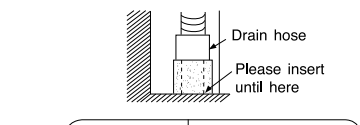
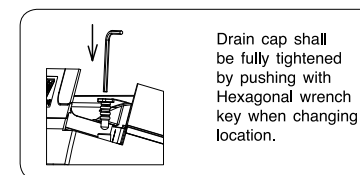
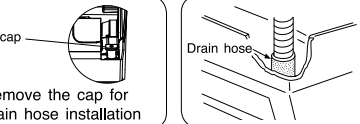
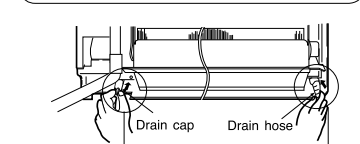
HORIZONTAL PIPING

Preparation

Change of Drain Hose and Installation Procedures.

- Exchange the location of drain hose and drain cap during horizontal piping as shown in figure below. Be sure to plug in the drain hose until the insulating material folds upon itself.

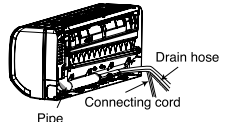
- Please use pliers to pull out the drain cap. (This is an easier way to remove the drain cap).



CAUTION
Condensed water may leak out if not inserted properly.

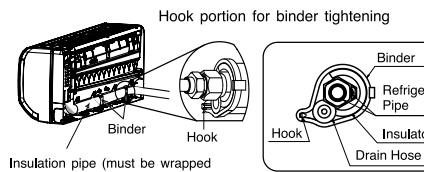
INSTALLATION OF REFRIGERATING PIPES AFTER CONNECTION

- The refrigerating pipes should be adjusted to fit into the hole on the wall and then ready for further connection.
- The terminals of 2 connected pipes must be covered with insulator used for terminal connection. Then the pipes are wrapped with insulation pipe.
- Connect the connecting cord after removing electrical cover. (Refer to "CONNECTION OF POWER CORD")
- After adjustment, fit the connecting cord and pipes into the space available under the indoor unit.
- When connection is at left side, refrigerating pipe and cabinet shall be tied together.
- Failing to do so may cause the unit bottom side become warping. Excess binder shall be cut to prevent abnormal sound and water dripping.



CAUTION

- The rubber strap used for fixing the insulator should not be tied with great force. Otherwise, this will damage heat insulation and causes water condensation.



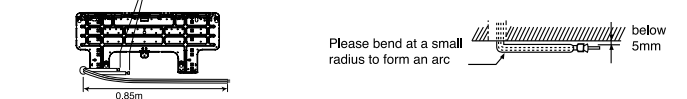
THE CONNECTION OF REFRIGERATING PIPE DURING THE INSTALLATION OF INDOOR UNIT

Preparation To Install Refrigerating Pipes

- Refer to below diagram for the connecting refrigerating pipes and cord arrangement.
- The end of the refrigerating pipes are at locations marked with "▽" symbol.

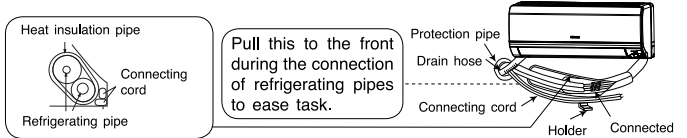
CAUTION

- Please fix in the plastic core after flaring to avoid copper chips entering the pipes.



Installation

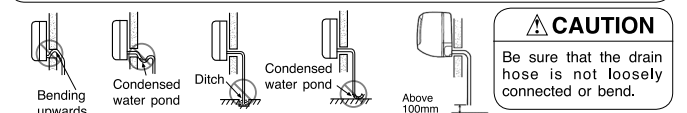
- Hang the Indoor unit onto the mounting plate. Use the temporary stand at the back of the Indoor unit to push its lower part 15cm forwards.
- Place the drain hose through the hole on the wall.
- Wrap the refrigerating pipes with insulation pipe after connecting refrigerating pipe.
- Connect the connecting cord after removing electrical cover. (Refer to "Connection of Power Cord")
- After adjustment, the connecting cord and refrigerating pipes are placed into the space available under the Indoor unit.
- The projection of Indoor unit must hook to the mounting plate.



3 Installation of Drain Hose

CAUTION

- Do not guide the drain hose to places where corrosive gases (sulfur, ammonia, etc.) are generated, such as septic tanks and sewer. Corrosive gas may flow backward from the drain hose to the indoor unit, corrode the copper pipe, or it may cause offensive odors in the room.
- Cut the drain hose at a position 100 mm higher than the floor surface. It may cause water leakage due to air lock or clogging of foreign matter.

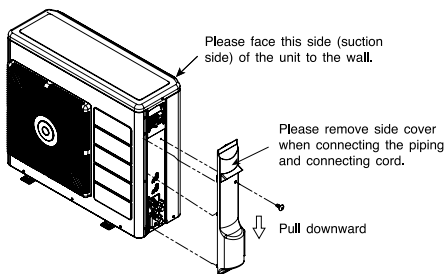


CAUTION

- Be sure that the drain hose is not loosely connected or bend.

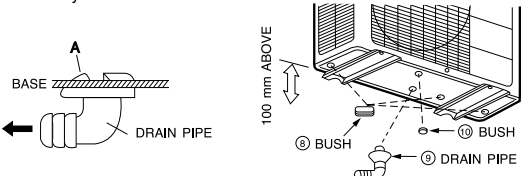
CAUTION
You are free to choose the side (left or right) for the installation of drain hose. Please ensure the smooth flow of condensed water of the Indoor unit during installation. (Carelessness may result in water leakage.)

- Please mount the Outdoor unit on stable ground to prevent vibration and increase of noise level.
- Decide the location for piping after sorting out the different types of pipe available.
- When removing side cover, please pull the handle after undoing the hook by pulling it downward.



CONDENSED WATER DISPOSAL OF OUTDOOR UNIT

- There are holes on the base of Outdoor unit for condensed water to exhaust.
- In order to flow condensed water to the drain, the unit is installed on a stand or a block so that the unit is 100mm above the ground as shown figure. Join the drain pipe to one hole.
- At first insert one portion of the hook to the base (Portion A), then pull the drain pipe in the direction shown by the arrow while inserting the hook into the base. After installation, check whether the drain pipe cling to the base firmly.



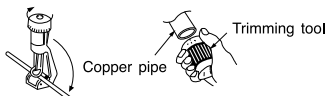
When Using and Installing in Cold Areas

When the air conditioner is used in low temperature and in snowy conditions, water from the heat exchanger may freeze on the base surface to cause poor drainage. When using the air conditioner in such areas, do not install the bushings. Keep a minimum of 250mm between the drain hole and the ground. When using the drain pipe, consult your sales agent.

※ For more details, refer to the installation Manual for Cold Areas.

1 Preparation of Pipe

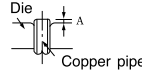
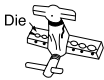
- Use a pipe cutter to cut the copper pipe.



CAUTION

- Jagged edge will cause leakage.
- Point the side to be trimmed downwards during trimming to prevent copper chips from entering the pipe.

- Before flaring, please put on the flare nut.



- Recommend to use R32 flaring tool.

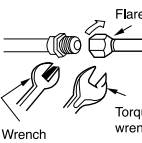
Outer Diameter mm (inch)	Thickness (mm)	A (mm)		
		Flare tool for R32 Clutch type	Conventional flare tool Clutch type	Wing nut type
6.35 (1/4")	0.8	0.0 ~ 0.5	1.0 ~ 1.5	1.5 ~ 2.0
9.52 (3/8")	0.8	0.0 ~ 0.5	1.0 ~ 1.5	1.5 ~ 2.0
12.70 (1/2")	0.8	0.0 ~ 0.5	1.0 ~ 1.5	1.5 ~ 2.5
15.88 (5/8")	1.0	0.0 ~ 0.5	1.0 ~ 1.5	1.5 ~ 2.5

2 Pipe Connection



- When removing flare nut from the Indoor unit, please ensure to use proper tooling.
- Prevent pipe from coming in contact with water or working in wet area.

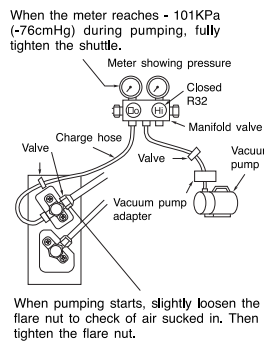
		Outer diameter of pipe	Torque N.m (kgf • cm)
Small dia. side	Flare nut	6.35 (1/4")	13.7 ~ 18.6 (140 ~ 190)
	Valve head cap	6.35 (1/4")	19.6 ~ 24.5 (200 ~ 250)
Large dia. side	Flare nut	9.52 (3/8")	34.3 ~ 44.1 (350 ~ 450)
	Valve head cap	9.52 (3/8")	19.6 ~ 24.5 (200 ~ 250)
Valve core cap	Valve core cap	12.7 (1/2")	29.4 ~ 34.3 (300 ~ 350)
	Valve core cap	12.7 (1/2")	12.3 ~ 15.7 (125 ~ 160)



3 Removal Of Air From The Pipe And Gas Leakage Inspection

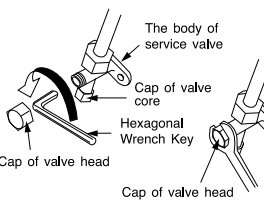
Procedures of using Vacuum Pump for Air Removal

- As shown in right figure, remove the cap of valve core. Then, connect the charge hose. Remove the cap of valve head. Connect the vacuum pump adapter to the vacuum pump and connect the charge hose to the adapter.
- Fully tighten the "Hi" knob of the manifold valve and completely unscrew the "Lo" knob. Run the vacuum pump for about 10~15 minutes, then completely tighten the "Lo" knob and switch off the vacuum pump.
- Remove the charge hose and tighten the cap of valve core. Check the cap's periphery if there is any gas leakage.
- Completely unscrew the spindle of the service valve (at 2 places) in anti-clockwise direction to allow the flow of refrigerant (using Hexagonal Wrench key).
- Re-cap the service valve and tighten using wrench. Check the cap's periphery if there is any gas leakage. The task is then completed.



When the meter reaches - 101KPa (-76cmHg) during pumping, fully tighten the shuttles.

When pumping starts, slightly loosen the flare nut to check of air sucked in. Then tighten the flare nut.

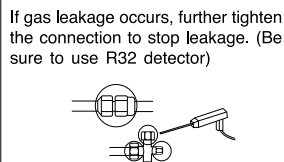


CAUTION

- Prevent moisture from entering pipe connection.
- Refrigerating machine oil not be applied to the outside of the flare. When refrigerating machine oil is applied to the outside of the flare, excessive tightening of the flare nut, cracking of the flare nut, destruction of the flare and gas leakage may occur.
- When using the control valve, do not use deteriorated packing. And, do not overtighten the steering wheel. Gas leakage from the service valve part, stagnation, touching fire, rarely cause ignition.

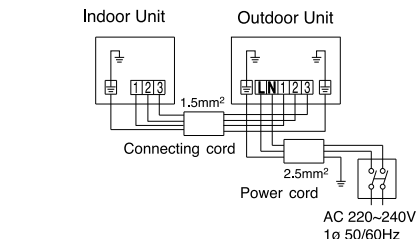
Gas Leakage Inspection

Please use gas leakage detector to check if leakage occurs at the connection of Flare nut as shown on the right.

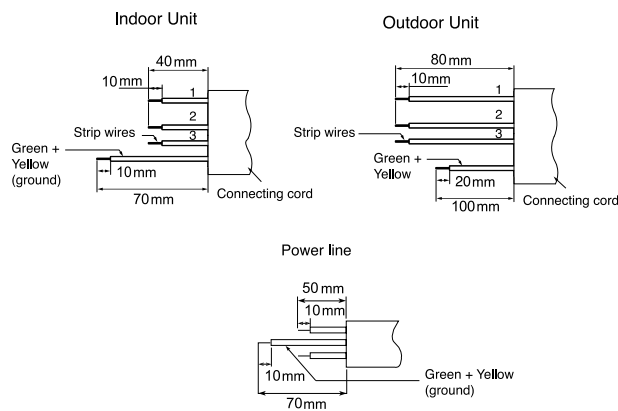


WARNING • THIS APPLIANCE MUST BE EARTHED.

Procedures of Wiring



Detail of Cutting the Connecting Cord

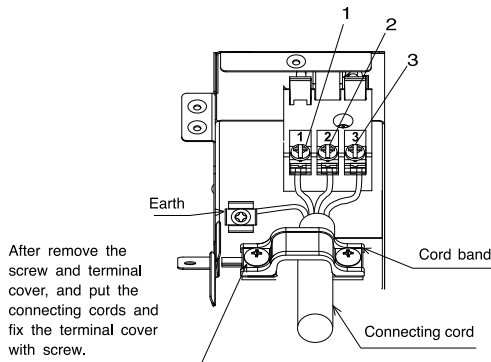


WARNING

- The naked part of the wire core should be 10 mm and fix it to the terminal tightly. Then try to pull the individual wire to check if the contact is tight. Improper insertion may burn the terminal.
- Be sure to use only wire specified for the use of air-conditioner.
- Please refer to the manual for wire connection and the wiring technique should meet the standard of the electrical installation.
- There is an AC voltage drop between the LN terminal if the power is on. Therefore, be sure to remove the plug from its socket.

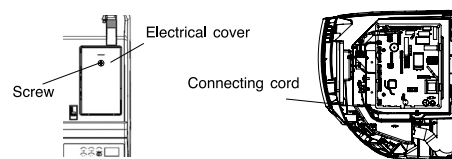
Wiring Of The Indoor Unit

- For wire connection of the indoor unit, you need to remove the front cover, the low cover under the body of the unit and terminal cover.
- Remove the cover from the terminal base and screw the cable.



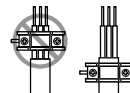
Method to remove electrical cover

- Remove the screw and electrical cover.
- Insert the connecting cord (1, 2, 3) from the back of unit.
- Fixed the wire to terminal wires firmly as shown as below.



WARNING

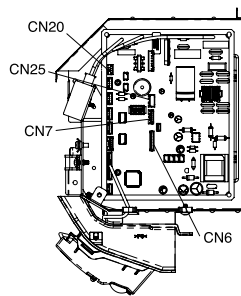
- Leave some space in the connecting cord for maintenance purpose and be sure to secure it with the cord band.
- Secure the connecting cord along the coated part of the wire using the cord band. Do not exert pressure on the wire as this may cause overheating or fire.



How to connect the optional parts

(Dry contact, H-Link/Wi Fi (optional), Wired remote, Run status)

- For cable connection to control P.W.B., you need to remove front cover and electrical box cover. Each connecting location is as below.
 - ① Dry contact: CN6
 - ② H-LINK/Wi Fi: CN7
 - ③ Wired Remote Controller: CN20
 - ④ Run status: CN25
- Please check and confirm manuals attached to each optional parts for more connection details.
- You can refer to this installation manual how to remove and re-attach the front cover.
- Please be careful not to damage lead wires by edge of plate when connecting the optional parts.



Wiring of The Outdoor Unit

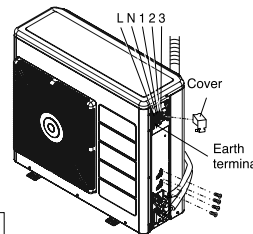
- Please remove the side plate for wire connection.



- If you cannot attach the side plate due to the connection cord, please press the connecting cord in the direction to the front panel to fix it.
- Be sure that the hooks of the side plate is fixed in certainly. Otherwise water leakage may occur and this causes short circuit or faults.
- The connecting cord should not touch to service valve and pipes. (It becomes high temperature in heating operation.)

Checking for the electric source and the voltage range

- Before installation, the power source must be checked and necessary wiring work must be completed. To make the wiring capacity proper, use the wire gauge list below for the wiring from house distribution fuse box to the outdoor unit in consideration of the locked rotor current.
- Investigate the power supply capacity and other electrical conditions at the installing location. Depending on the model of room air conditioner to be installed, request the customer to make arrangements for the necessary electrical work etc. The electrical work includes the wiring work up the outdoor unit. In localities where electrical conditions are poor, use of a voltage regulation is recommended.
- Install outdoor for the room air conditioner within the reaching range of the line cord.



For (Power cord - L, N, Earth)

Wire cross-section
2.5 mm²

For (Connecting cord - 1, 2, 3, Earth)

Wire length	Wire cross-section
up to 30 m	1.5mm²

IMPORTANT

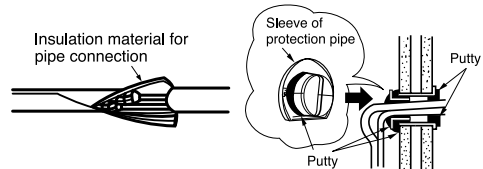
Circuit Breaker	Residual Current Device
20A	2 Poles 40A 30mA

CAUTION

Outdoor supply cords shall not be lighter than polychloroprene sheathed flexible cord with code designation 60245 IEC 57.

1 Insulation And Maintenance Of Pipe Connection

- The connected terminals should be completely sealed with heat insulator and then tied up with rubber strap.
- Please tie the pipe and power line together with vinyl tape as shown in the figure showing the installation of Indoor and Outdoor units. Then fix their position with holders.
- To enhance the heat insulation and to prevent water condensation, please cover the outdoor part of the drain hose and pipe with insulation pipe.
- Completely seal any gap with putty.



3 Power Source And Operation Test

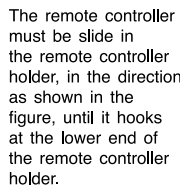
Power Source

CAUTION

- Please use a new socket. Accident may occur due to the use of old socket because of poor contact.
- Please plug in and then remove the plug for 2 - 3 times. This is to ensure that the plug is completely plugged into the socket.
- Keep additional length for the power cord and do not render the plug under external force as this may cause poor contact.
- Do not fix the power cord with U-shape nail.

2 Installation Of Remote Controller

- The remote controller can be placed in its holder which is fixed on wall or beam.
- To operate the remote controller at its holder, please ensure that the unit can receive signal transmitted from the controller at the place where the holder is to be fixed. The unit will beep when signal is received from the remote controller. The signal transmission is weakened by the fluorescent light. Therefore, during the installation of the remote control holder, please switch on the light, even during day time, to determine the mounting location of the holder.



Operation Test

- Please ensure that the air conditioner is in normal operating condition during the operation test.
- Explain to your customer the proper operation procedures as described in the user's manual.

How to remove the Front Cover

- Remove the front panel.
 - Pull up the front panel by holding it at both lower sides with both hands.
 - When the front panel full open, pull the inner part of the right arm outward and pull the panel forward while closing it gradually.
- Remove the pre-filters.
 - Push upward to release the claws and pull out the Pre-filter.
- After removing two caps and two screws, rotate the horizontal louver towards you a bit. Then, pull the center of the front cover to release the claws.
- Pull the side faces (lower sections) of the front cover towards you as shown in the figure and remove the cover.



How to attach the Front Cover

- Check to ensure that the drain pan is securely attached.
- To install the front cover onto the unit, push two points from the center to lock the two claws in the direction as shown in the image below. Then, hook the four claws at upper side of the front cover securely.
 - Claws
 - Before insertion
 - After insertion
- Tighten the two screws, then attach the two caps.
- Install the pre-filters.
- Slide the shafts on the left then on the right arms of the front panel along the step on the front cover. Please insert the shafts into the holes until they stop. After checking the shafts are securely inserted, close the front panel.
 - Cap
 - Screw
 - Hole
 - Shaft

