

FOR SERVICE PERSONNEL ONLY

HITACHI Inspire the Next HITACHI CEILING UNIT AIR CONDITIONER INSTALLATION MANUAL

Indoor Unit
RPC-30MH1

Outdoor Unit
RAC-30MH1

- 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

- ⊕ ⊖ Screwdriver
- Measuring Tape
- Knife
- Saw
- ∅ 65mm Power Drill
- Hexagonal Wrench Key (□ 4mm)
- Wrench (14, 17, 19, 22, 26, 27mm)
- Gas Leakage Detector
- Pipe Cutter
- Vinyl Tape
- Pliers
- Flare Tool

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

- 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.
- Make sure that 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 specified wire for the connection 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 R-22. Otherwise, this may result in broken copper pipes or faults.
- When installing or removing an air conditioner, only specified refrigerant (R-22) 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 (20A time delay) must be installed. Without a circuit breaker or fuse the danger of electric shock exists. A main switch with a contact gap of more than 3.5mm has to be installed in the power supply line to the outdoor unit.
- Piping shall be suitable supported with a maximum spacing of 1m between the supports.
- 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.
- For installation of front panel RAI-ZCPM, please follow exactly the instruction in the manual.
- Please ensure smooth flow of water when installing the drain hose.

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 2.3 to 3 meters.

WARNING

- The Outdoor unit must be mounted at a location which can support heavy weight. Otherwise, noise and vibration will increase.

CAUTION

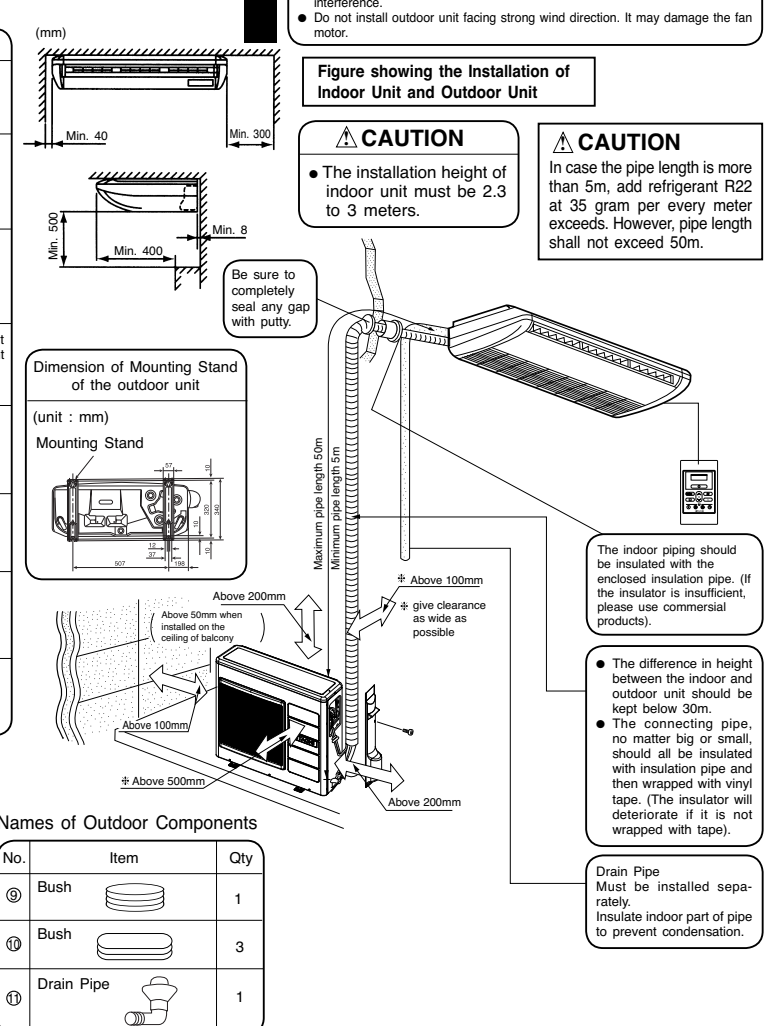
- Do not expose the unit under direct sunshine or rain. Besides, ventilation must be good and clear of obstruction.
- The air blown out of the unit should not point directly to animals or plants.
- The clearances of the unit from top, left, right and front are specified in figure below. At least 3 of the above sides must be open air.
- Be sure that the hot air blown out of the unit and noise do not disturb the neighbourhood.
- Do not install at a location where there is flammable gas, steam, oil and smoke.
- The location must be convenient for water drainage.
- Place the Outdoor unit and its connecting cord at least 1m away from the antenna or signal line of television, radio or telephone. This is to avoid noise interference.
- Do not install outdoor unit facing strong wind direction. It may damage the fan motor.

Names of Indoor Components

No.	Accessory	Qty	Purpose
①	Drain Hose	1	
②	Hose Clamp	2	For Drain Hose Connection
③	Insulation (10T x 50 x 200)	2	For Drain Pipe Connection
④	Insulation	2	For Flare Nut of Refrigerant Pipe
⑤	Cord Clamp (Large)	6	For Fixing Insulation
⑥	Cord Clamp (Small)	1	For Fixing Drain Piping
⑦	Remote Controller	1	
⑧	Screw for holder of Remote Controller	1	

Other optional parts for display panel & wireless remote control SPX-RCK4

No.	Item	Quantity
⚠	Display panel	1
⚠	Panel installation plate	1
⚠	Panel cover	1
⚠	Remote controller (wireless)	1
⚠	Holder for remote control	1
⚠	3.1 x 16 screw	2



1 Installation

(1) Mounting of Suspension Bolts

Step 1
Select final location and installation direction of the indoor unit paying careful attention to the space for the piping, wiring and maintenance.

Step 2
Mount suspension bolts, as shown in Fig. 1-1.

- * For Concrete Slab
- * For Steel Beam

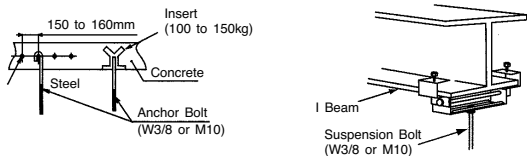


Fig. 1-1 Mounting the Suspension Bolts

(2) Installation Pattern

When installing the indoor unit, use the installation pattern which is printed on the inner side of the carton box.

- Installation Pattern:
 - Hole Positions of Sling Bolts
 - Hole Positions of Refrigerant Piping
 - Hole Positions of Drain Piping

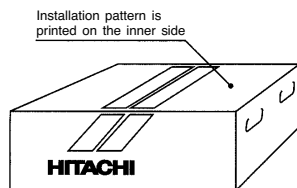


Fig. 1-2 Installation Pattern

(3) For Hanging Type Installation

Mount the suspension brackets to the suspension bolts and secure them with nuts (*Field-Supplied), as shown in Fig. 1-3, 1-4 and 1-5.

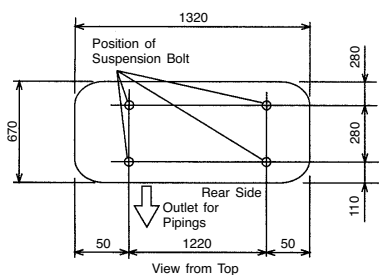


Fig. 1-3 Position of Suspension Bolts

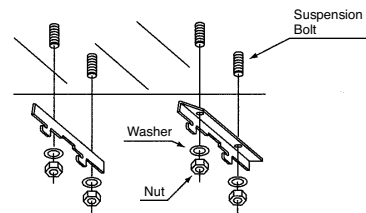
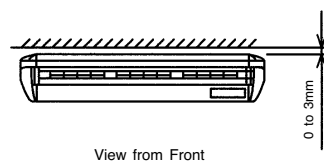
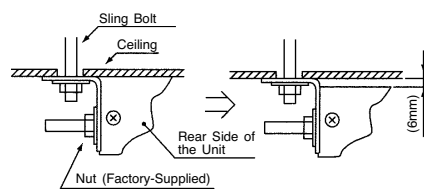
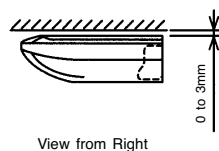


Fig. 1-4 Nuts and Washer



View from Front



View from Right

Fig. 1-5 Inclination of Unit for Drain

2 Piping Connection

(1) Position of piping connection is shown in Fig 2-1.

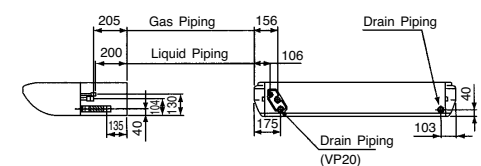
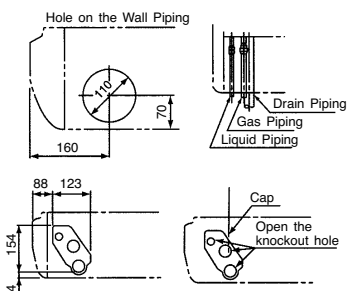
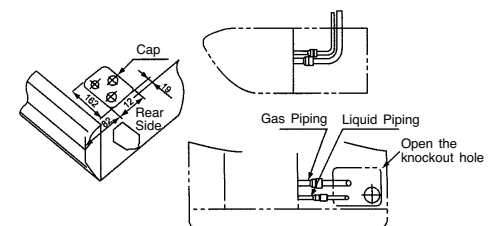


Fig. 2-1 Piping Connection of Indoor Unit

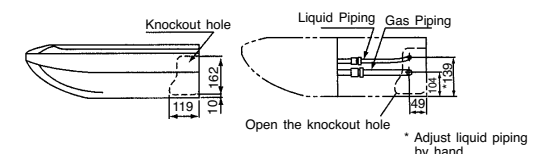
• Piping from Backward Side



• Piping from Upper Side

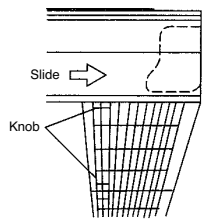


• Piping from Right Side Cover

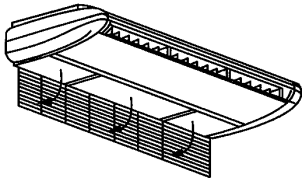


(2) Piping work should be performed from the bottom side of the unit. Remove the air inlet grille before the piping work, according to the following steps.

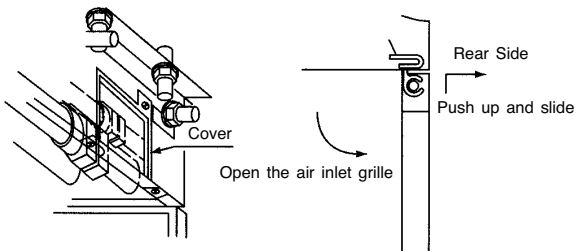
Step 1
Slide the knobs to the rear side.



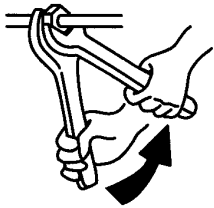
Step 2
Open the air inlet grille.



Step 3
Push up and slide the air inlet grilles to the rear side.



(3) When tightening the flare nut, use two spanners as shown in Fig. 2-2.



Pipe Size	Tightening Torque (N.m)
ø6.35 mm	20
ø9.53 mm	40
ø15.88 mm	80 *2)
ø19.05 mm	100

*2) In case of 4.0 and 5.0HP, tighten the flare nut with a torque of 100N.m.

Fig 2-2 Tightening Work of Flare Nut

(4) Insulate the refrigerant pipes as shown in Fig. 2-3

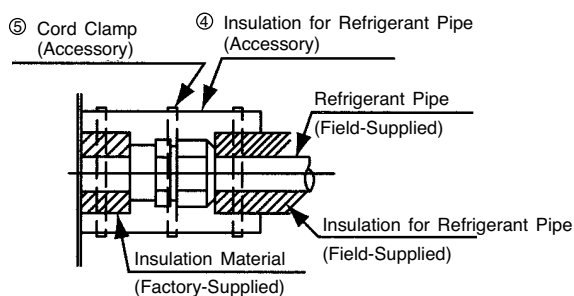


Fig. 2-3 Insulation on Pipes

(5) The piping connection for the indoor unit shall be performed inside of the unit, and the piping connection can be performed from three (3) directions, rear, right side and upward. In case of the piping connection from the rear or upward, the plastic cap with knockout holes is attached at the position of the unit for the refrigerant and drain pipings.

Therefore, cut out the knockout holes of the cap for the piping, and attach the cap again after leading the refrigerant piping through the cap.

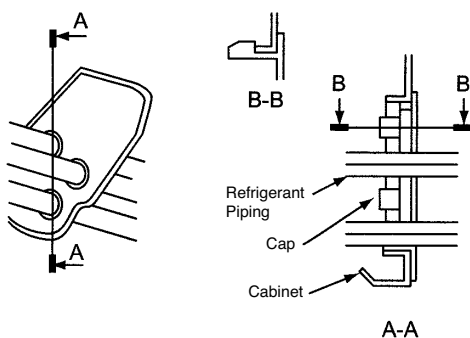
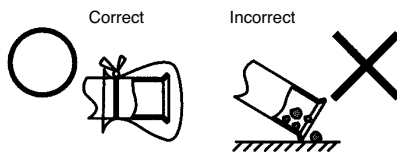


Fig. 2-4 Position of Piping Connection

(6) Evacuation and refrigerant charging procedures should be performed according to "Installation & Maintenance Manual" of the outdoor unit.

CAUTION

- Cap the end of the pipe when the pipe is to be inserted through a hole.
- Do not put pipes on the ground directly without a cap or vinyl tape at the end of the pipe.



3 Drain Piping

CAUTION

- Do not create an upper-slope or rise for the drain piping, since drain water can flow back to the indoor unit and leakage into the room will occur when the system operation is stopped.
- Do not connect the drain pipe with sanitary or sewage piping or any other drainage piping.
- When the common drain piping is connected with other indoor units, the connected position of each indoor unit must be higher than the common piping. The pipe size of the common drain pipe must be large enough according to the unit size and number of units.

The standard direction of drain piping connection is right side as viewed from the discharge grilles. However, it can be performed from the left side when the left side connection is required due to the building construction.

(1) For Right Side Connection

- Insert the hose into the hose clamp.
- Push the drain hose onto the drain boss until the hose reaches the end of the drain pan.
- Tighten the screw for the hose clamp in order to hold the hose around the drain connection without any leakage of drain water as shown in Fig. 3-1.
- Insulate the drain hose around the hose clamp to prevent any condensation as shown in Fig. 3-1.

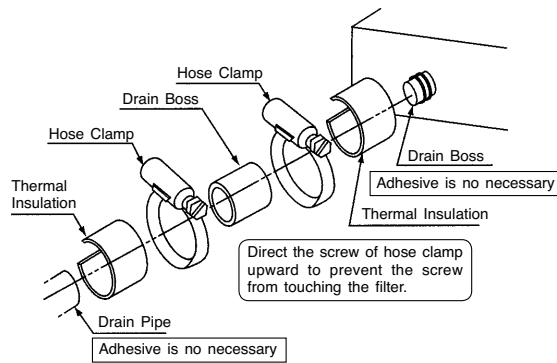


Fig. 3-1 Connecting Drain Piping

(2) For Left Side Connection

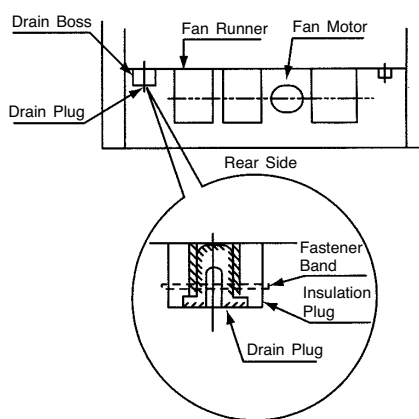


Fig. 3-2 Drain Plug

Remove the drain plug of the left-side drain boss as indicated in the following procedure.

- Cut the fastener.
- Remove the insulation material.
- Remove the drain plug.
- Insert the drain plug into the right-side drain boss by using a driver as shown in Fig. 3-3.

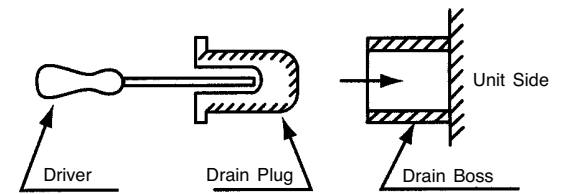


Fig. 3-3 Inserting Drain Plug

- After inserting the drain plug into the right-side drain boss, seal the jointed part by using a water-proof chloride type sealing material and secure it with fastener.

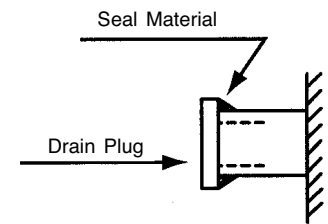


Fig. 3-4 Sealing Joint Part

- Wrap the insulation material around the drain connection.
- Connect the drain hose to the left-side drain connection as the same as the right side drain connection procedure.

(3) Connecting a Drain Piping

- Prepare a Polyvinyl chloride (P.V.C) tube with an outer diameter of 32mm. (VP20)
- Pay attention to the position of the drain pipe. Keep the down-slope, 1/25 to 1/100. Do not create an upper slope or rise for the drain piping.
- Wrap the insulation material around the connecting part perfectly.
- Fasten the drain pipe to the connecting part with the factory-supplied clamp.

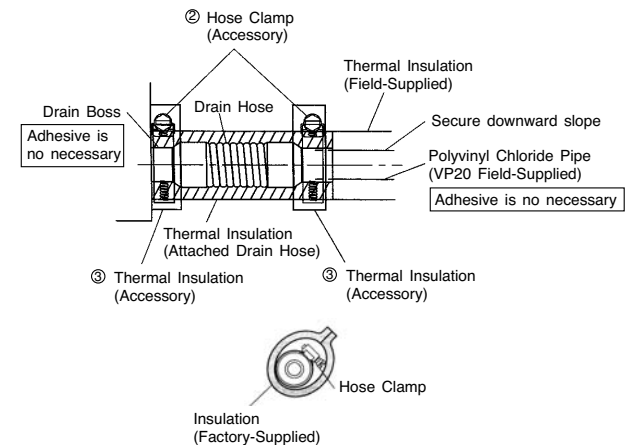


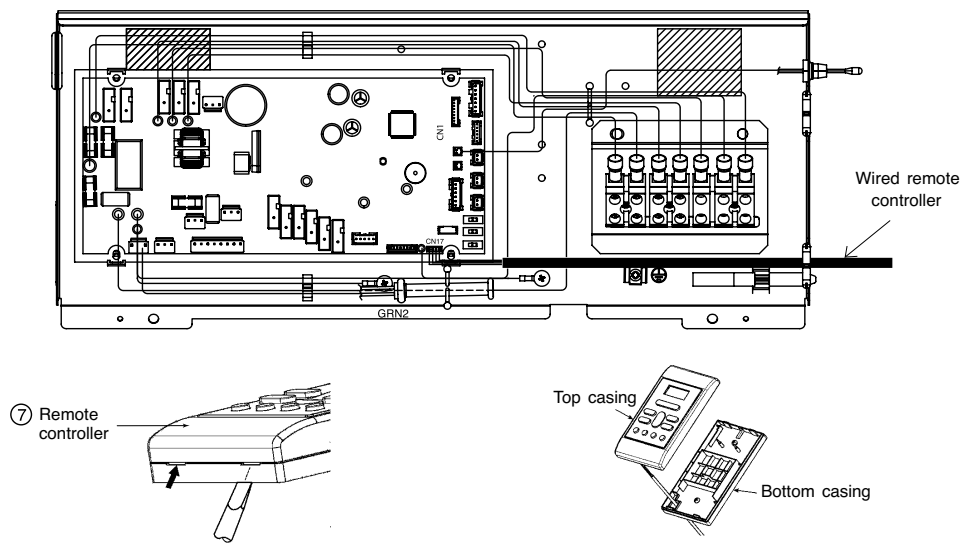
Fig. 3-5 Wrapping Insulation Material

- Do not connect the drain pipes with sanitary or sewage or any other drainage pipe.
- when installing the pipe, do not tie the drain pipe and refrigerant pipe together.
- After completing the drain pipe work, pour water into the drain pan and check to ensure that water can flow smoothly.

4 Installation of wired remote controller

- (a) Connection to the electrical box;
- Remove the cover of electric box
 - Connect the connector of wired remote controller to CN17
 - Assemble back the cover of electrical box

- (b) Wiring installation for wired remote controller (2 methods);
- Wired remote controller casing can be opened by pressing the slots with minus screw driver (see below diagram)



- Decide the fixing location of remote controller so that the length of wire shall be within 5 meters.

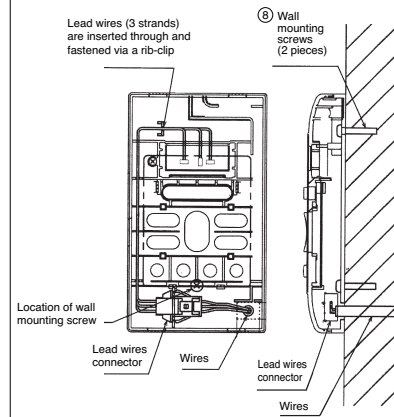
CAUTION

- Do not cut the provided wire. Excess wire should be properly wound and fitted at safe place.
- Do not join the wire with additional wire.

Wiring installation illustrations

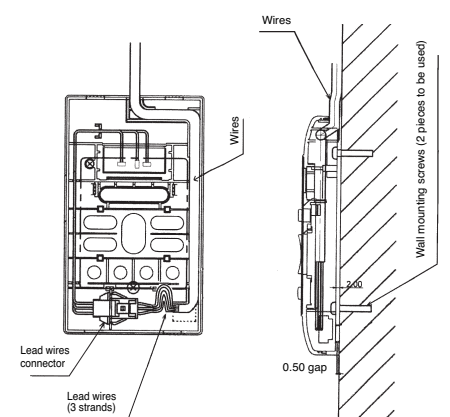
Wall recessed wiring installation (Supplied)

- When connecting the wires via the wall's recessed slot;
 1. Fix the bottom casing to the wall by provided screw.
 2. Assemble the top casing to the fixed bottom casing. (Refer to the illustration below for detail installation)



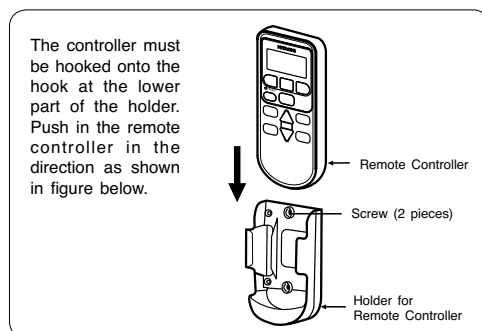
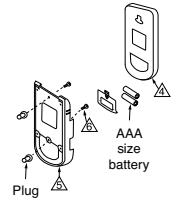
Inside top wiring installation (Alternative)

- When the wires to be connected from the inside top portion of top casing;
 1. Break off a perforated aperture located at the top portion of the bottom casing by nipper. Smoothen the aperture by cutter.
 2. Fix the bottom casing to the wall by provided screw.
 3. Connect the wires to the lead wires connector.
 4. Mount the wires through the provided slot on top casing.
 5. Assemble the top casing to the fixed bottom casing (Refer to the illustration below for detail installation)



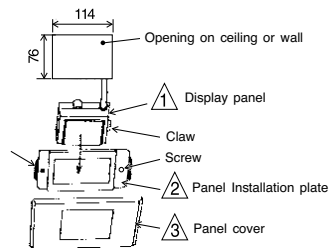
5 Installation of wireless remote controller (optional)

- 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.

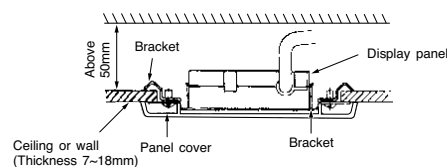


Installation of display panel (Optional)

- Select an installation position on ceiling or wall where there is no obstacle to interrupt signal reception.
- Loosen screws of panel installation plate so that bracket can be slightly moved.
- Match the display panel to panel installation plate so the fixing claws on the panel are securely hooked.
- Match brackets to the opening on ceiling or wall and tighten screws until bracket is firmly secured to ceiling material.
- Install the panel cover so inside claws are securely hooked to the panel installation plate.
- Conduct the indoor unit side housing of display panel cord to the electric box of the indoor unit and connect it with the housing at the side of the unit.



CROSS SECTION

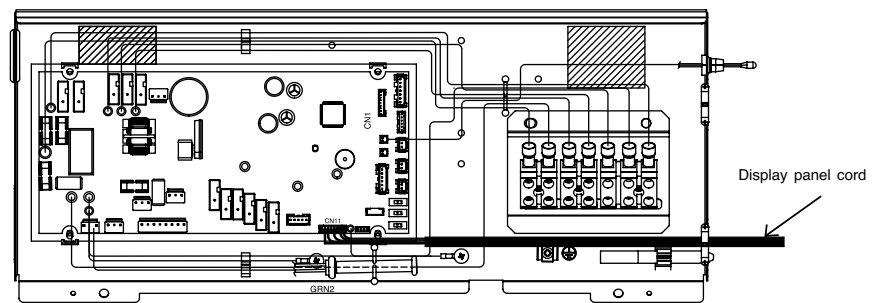


CAUTION

Please disconnect wired remote controller connector at CN17 if to use wireless remote controller.

Connection of display panel lead wires (Optional)

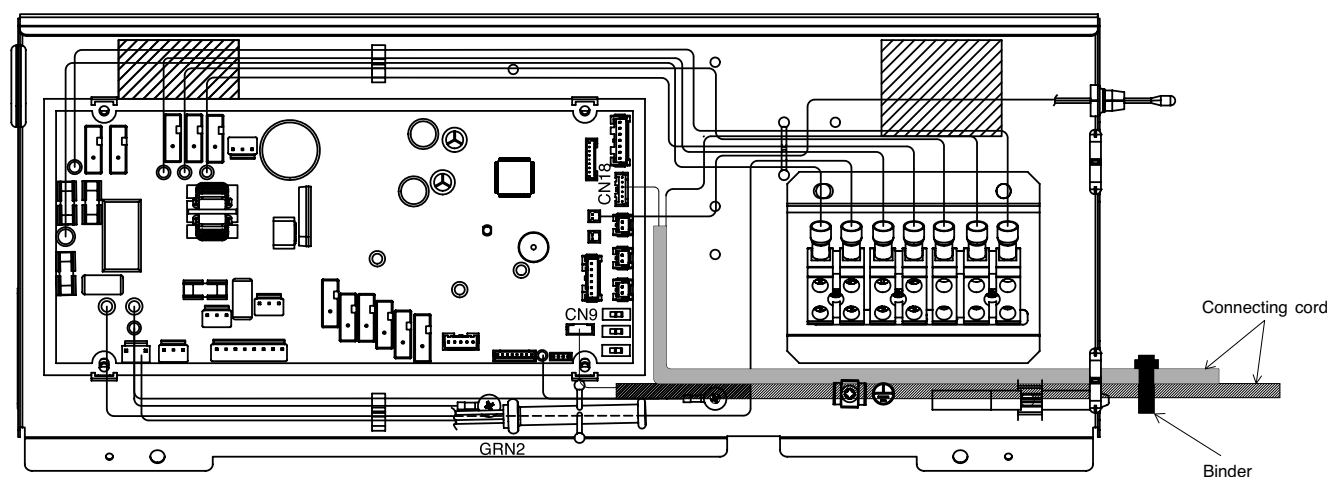
- Attach the connector of this panel to the connector CN11 on the control PWB.



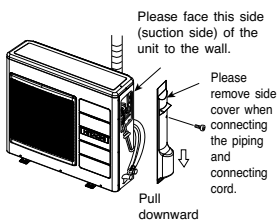
6 When connecting the HA System / H-Link

(Refer diagram below)

- A separately purchased HA Connection Cord (Service part component part number (RAS-N22V100)) is required to get connect to the HA-System.
- As for connecting to H-Link, a separately purchased RAC adapter is required.
- To install the wiring, the electrical box cover must be opened. (As for HA-System, connect to CN9 whereas for the RAC adapter, connect to CN18).
- The connection cord and power cables are to be arranged and tied up as per the diagram as shown below.
- Please refer to the respective user manuals of the H-System and the RAC adapter, for further details.
- Please refer to the user manual for instructions on the removal and installation of the electrical box.

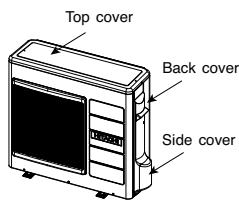


- Please mount the outdoor unit on stable ground to prevent vibration and increase of noise level.
- Decide the location for piping after sorting out the different types of pipe available.
- Open the side plate by unscrewing the screws as shown below.



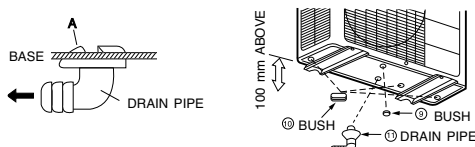
CAUTION

- Please make sure to remove all spacers inside the unit.
- Open the Top, Back and Side cover of the unit.
 - Pull out the spacers inside. (Spacers are only for transportation purpose). If not remove, vibration and noise will occur.



CONDENSED WATER DISPOSAL OF OUTDOOR UNIT

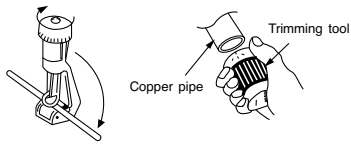
- There are holes on the base of Outdoor unit for condensed water to exhaust.
- In order to flow condensed water to the drain, the unit is installed on a stand or a block so that the unit is 100mm above the ground as shown figure. Join the drain pipe to one hole.
- At first insert one portion of the 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 in cold region, etc. In cold region with severe cold climate and heavy snow, water discharged from heat exchanger freeze on the base surface and this may affect drainage. In such a region, remove bush on the bottom face of outdoor unit for better drainage. When using drainpipe, consult our dealer.

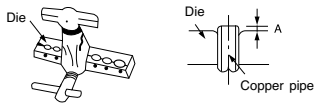
1 Preparation of Pipe

- Use a pipe cutter to cut the copper pipe.



CAUTION

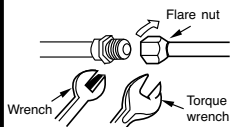
- Jagged edge will cause leakage.
- Point the side to be trimmed downwards during trimming to prevent copper chips from entering the pipe.
- Before flaring, please insert the flare nut into the pipe.



Outer Diameter (mm)	A (mm)	
	Imperial flaring tool	Rigid flaring tool
6.35	0.8 ~ 1.5mm	0 ~ 0.5mm
15.88	1.0 ~ 2.0mm	0 ~ 1.0mm

2 Pipe Connection

- Please be careful when bending the copper pipe.
- Applied frozen grease to the connection points and then screw in manually. After that, use a torque wrench to tighten the connection.

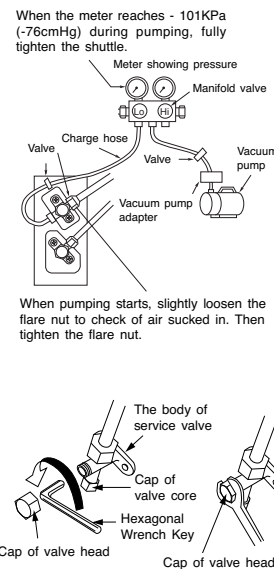


	Outer dia. of pipe	Torque N·m (kgf·cm)
Small dia. side	6.35 (1/4")	13.7 ~ 18.6 (140 ~ 190)
Large dia. side	15.88 (5/8")	49.0 ~ 58.8 (500 ~ 600)
Valve head cap	Small dia. side 6.35 (1/4")	19.6 ~ 24.5 (200 ~ 250)
	Large dia. side 15.88 (5/8")	29.0 ~ 31.0 (296 ~ 316)
Valve core cap		12.3 ~ 15.7 (125 ~ 160)

3 Removal Of Air From The Pipe And Gas Leakage Inspection

Procedures of using Vacuum Pump for Air Removal

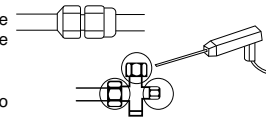
- 1 As shown in figure on the right, remove the cap of valve head and valve core and then connect them to the vacuum pump and manifold valve.
- 2 Fully tighten the "Hi" shuttle of the manifold valve and completely unscrew the "Lo" shuttle. Run the vacuum pump for about 10-15 minutes, then completely tighten the "Lo" shuttle and switch off the vacuum pump.
- 3 Completely unscrew the spindle of the service valve (at 2 places) in anti-clockwise direction to allow the flow of coolant (using Hexagonal Wrench key).
- 4 Remove the Charge hose and tighten the cap of valve head. The task is then completed.



Gas Leakage Inspection

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

If gas leakage occurs, further tighten the connection to stop leakage.



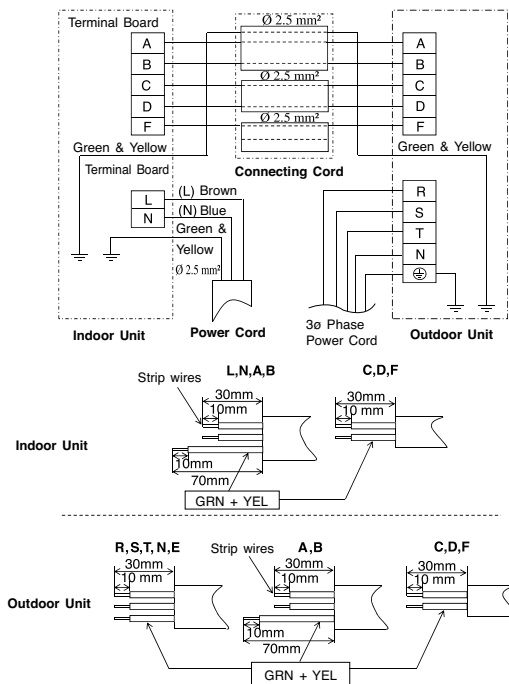
CAUTION

In case of removing Flare nut of a indoor unit, first remove a nut of small diameter side, or a seal cap of big diameter side will fly out.

WARNING • THIS APPLIANCE MUST BE EARTHED.

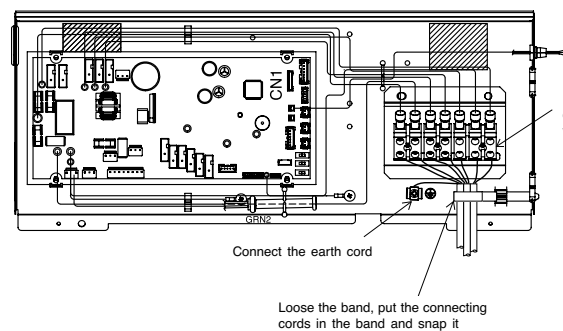
Power supply shall be connected at the rated voltage, otherwise the unit will be broken or could not reach the specified capacity.

Procedure of Wiring



Wiring Of The Indoor Unit

- (1) Remove the cover of the electric box.
- (2) Connect the connecting cords.
- (3) Assemble the cover of electric box.

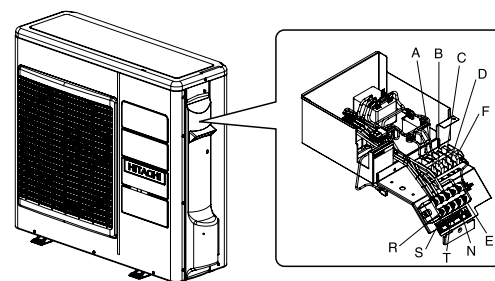


Wiring Of The Outdoor Unit

- Please remove the side cover for wire connection.

WARNING

- If you cannot attach the side cover due to the connecting cord, press the connecting cord in direction to the front panel to fix it.
- Be sure that the hooks of the side cover 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 a switch board of fuse box to the outdoor unit in consideration of the locked rotor current.

IMPORTANT

Cable length	Wire cross-section
up to 15m	2.5mm ²
up to 25m	4.0mm ²

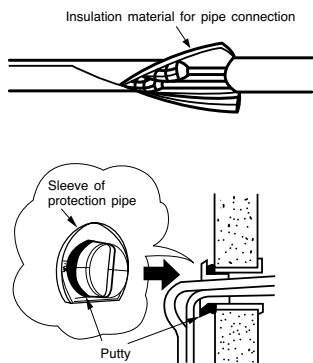
- Investigate the power supply capacity and other electrical conditions at the installation location. Depending on the model of room air conditioner to be installed, request the customer to make arrangements for the necessary electrical work etc. The electrical work includes the wiring work up the outlet. In localities where electrical conditions are poor, use of a voltage regulation is recommended.

IMPORTANT

Fuse Capacity
20A time delay fuse

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.
- If room humidity is high, cover the connecting pipe with additional 5mm thickness insulator. This insulator shall be purchased from field.
- Completely seal any gap with putty.



2 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.

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.