

INSTALLATION MANUAL

airHome Ducted

SPLIT TYPE AIR CONDITIONER

INDOOR UNIT
RAD-GJ18QHAA
RAD-GJ24QHAA



EN INSTRUCTION MANUAL

FOR SERVICE PERSONNEL ONLY

- 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
 - Allen Key (0.16" (4mm))
 - Wrench (9/16" (14mm), 3/4" (17mm), 7/8" (19mm), 7/8" (22mm), 15/16" (24mm), 1-1/8" (27mm))
 - Gas Leakage Detector
 - Pipe Cutter
 - Plastic Tape
 - Pliers
 - Flare Tool

Refrigerant pipe size (outer diameter): Narrow pipe, Liquid (ø1/4"(6.35mm)); Wide pipe, Gas (ø1/2"(12.70mm))

SAFETY PRECAUTION

Read the safety precautions carefully before operating the unit. This appliance is filled with R32.

- 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.
 - Make sure to connect earth line.
 - This sign in the figures indicates prohibition.
- Be sure that the unit operates in proper condition after installation. Explain to customer the proper operation and maintenance of the unit as described in the user's guide. Ask a customer to keep this installation manual together with the instruction manual.

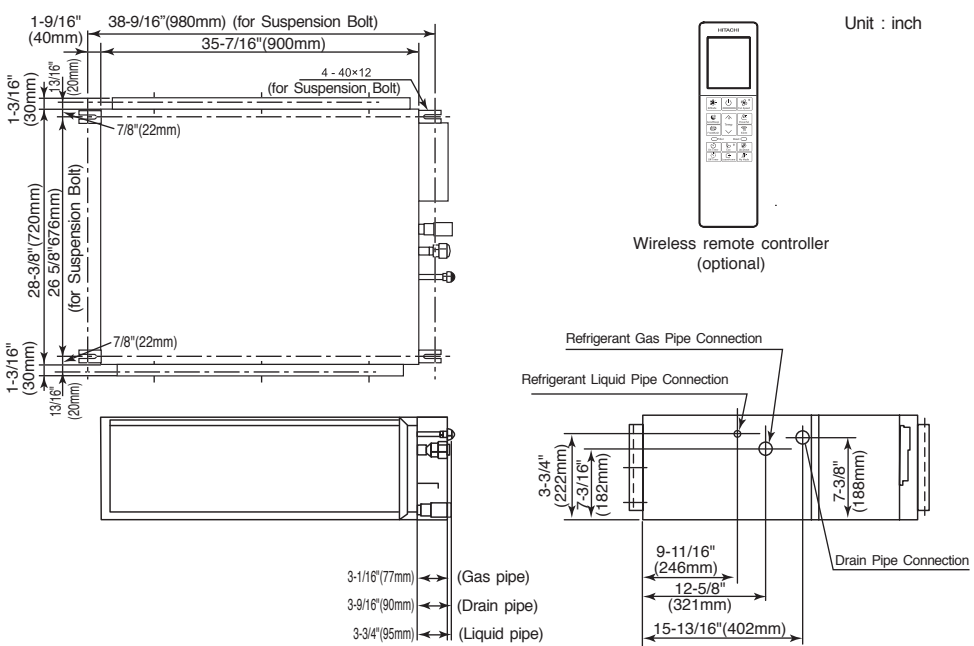


Access the full version of the User Installation Manual by scanning the code.

Cooling & Heating

<IA2711: (A)>

1 Opening on ceiling & suspension bolt

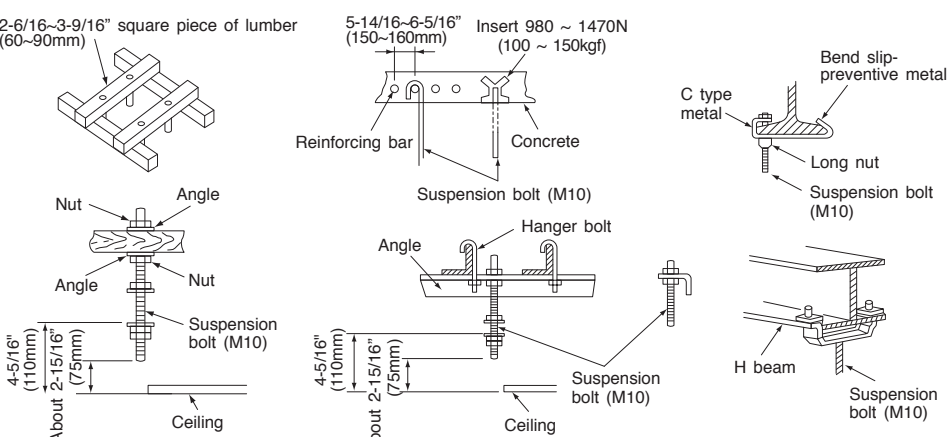


- Need a connect for refrigerant pipe, drain pipe and F cable in the ceiling after suspending the indoor unit. Arrange the drain pipe, refrigerant pipe and F cable in their installation position.
- For finishing the opening on the ceiling, arrange with the builder in detail.
- If the ceiling is already completed, connecting cables between indoor and outdoor, piping and drain piping must be done before the fitting indoor unit.

2 Preparation for installing indoor unit

Installation of suspension bolts

- Make sure to reinforce furring of ceiling (frame : ceiling joints and supporter) to maintain level of ceiling and prevent vibration of ceiling plate.
- Suspension bolts should be purchased in the field.
- Refer to diagrams shown below for length of suspension bolts.
- In case of wooden frame
- In case of steel frame



<IA2711: (A)>

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

- CAUTION**
- A circuit breaker must be installed in the house distribution box for the direct connected power supply cables to the outdoor unit. In case of other installations a main switch with a contact gap or more than 4/32" (3mm) has to be installed. Without a circuit breaker, the danger of electric shock exists.
 - 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.
 - Please ensure smooth flow of water when installing the drain hose. Improper installing may wet your furniture.
 - Piping shall be suitable supported with a maximum spacing of 3-9/32" (1m) between the supports.
 - Please ensure field selected electrical components (switches, wires, etc) are following approved local regulation requirements.

WARNING

This appliance is filled with R32

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.

- NOTE**
- This air conditioner is an appliance that should not be accessible to the general public.
 - One ducted unit shall be supplying to one room.

- 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.
 - No nearby leakage risk of flammable gas, and no nearby source of vapor or oil smoke.
 - To avoid interference from noise, please place the unit and its remote controller at least 3.28ft(1m) from the radio and television.
 - 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 should be at least 90-18/32" (2300mm) or more from the floor.
 - The distance from the air outlet to the fire alarm must be at least 59-2/32" (1500mm) and there must be no fire alarm in the front direction of the indoor unit.
 - Do not install the indoor unit in a machine shop, kitchen and laundry rooms when 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.

California Proposition 65

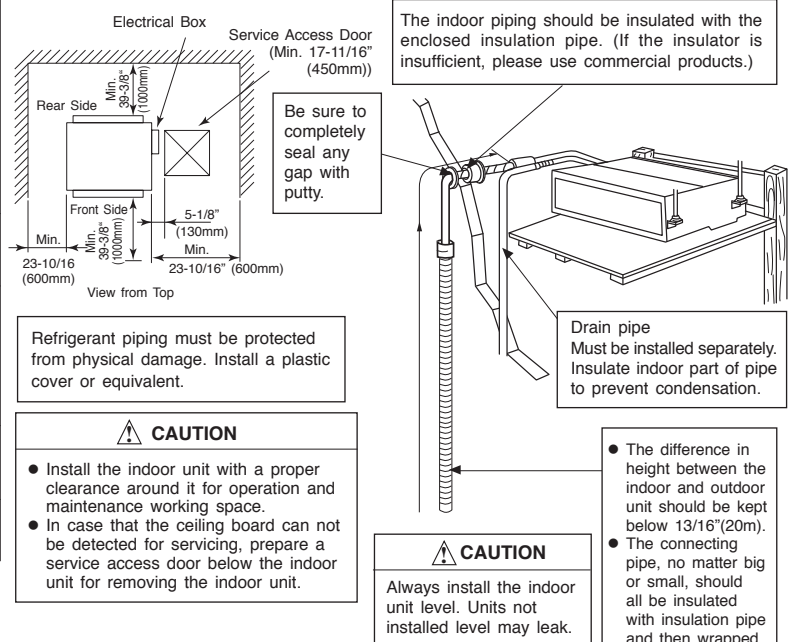


Proposition 65: This product contains chemicals known to the state of California to cause cancer, birth defects, and other reproductive harm. For more information, go to www.P65Warnings.ca.gov

Accessories to indoor Unit:

No.	Component's Name	Q'ty
①	Washer (M10)	8
②	Screw 3/16" (4mm)	16
③	Hose Clamp	1
④	Insulation (22IDx130)	1
⑤	Insulation (43IDx130)	1
⑥	Binder	10
⑦	Filter Holder	2
⑧	Screw for Filter Holder	2
⑨	Remote controller kit (wired)	1

Figure showing the Installation of Indoor Unit.



- The indoor piping should be insulated with the enclosed insulation pipe. (If the insulator is insufficient, please use commercial products.)
- Be sure to completely seal any gap with putty.
- Refrigerant piping must be protected from physical damage. Install a plastic cover or equivalent.
- CAUTION**
- Install the indoor unit with a proper clearance around it for operation and maintenance working space.
- In case that the ceiling board can not be detected for servicing, prepare a service access door below the indoor unit for removing the indoor unit.
- CAUTION**
- Always install the indoor unit level. Units not installed level may leak.
- The difference in height between the indoor and outdoor unit should be kept below 13/16"(20mm).
- The connecting pipe, no matter big or small, should all be insulated with insulation pipe and then wrapped with vinyl tape. (The insulator will deteriorate if it is not wrapped with tape.)

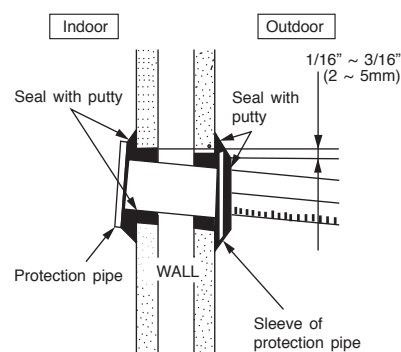
Other optional parts for display panel wired remote controller & wireless remote controller SPX-RKDN1

No.	Item	Quantity
⚠	Display panel	1
⚠	Panel installation plate	1
⚠	Panel cover	1
⚠	Remote controller kit (wireless)	1

- CAUTION**
- Discharge grille and suction grille shall be covered by insulation material to prevent water drop.

Wall Penetration and Installation of Protection Pipe

- Drill a ø 2.56" 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 gaps in the sleeve of protection pipe should be completely sealed with putty to avoid dripping of rain water into the room.

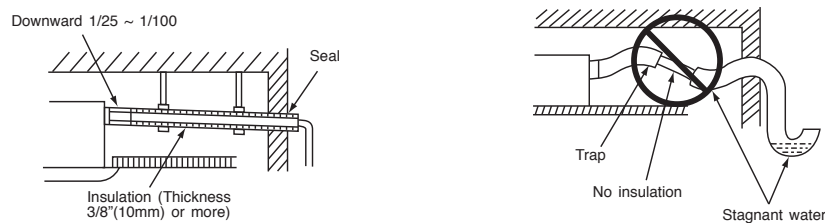


- CAUTION**
- Make sure that the wire is not in contact with any metal in the wall. Please use the protection pipe as wire passing through the hollow part of the wall so as to prevent the possibility of damaged by mouse.

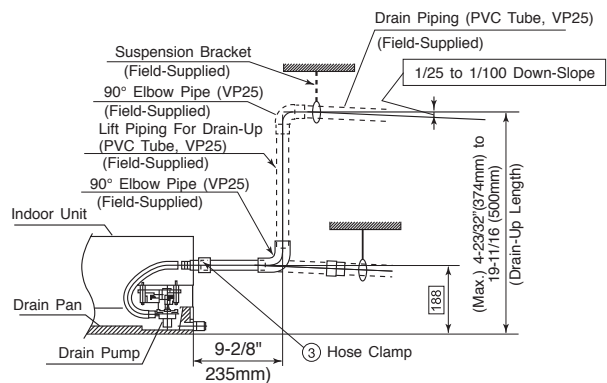
- WARNING**
- Use a protection pipe (commercial product) to protect against the following:
 - Connecting cables touching the metal lath inside the wall.
 - A possibility where a mouse can bite the cables, as these can cause an electrical shock or fire.
 - Incomplete sealing, as high humidity can cause the water to drip.

Drain pipe installation

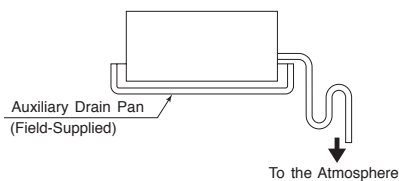
- Prepare polyvinyl chloride pipe with a 1-2/8"(32mm) outer diameter.
- Be sure to roll an insulation (thickness 3/8"(10mm) or more) for the drain pipe at indoor side.
- Always draw the drain pipe downward so that water flows smoothly. Fix it (ex. by hanger) to prevent a peak and trap.



- In case drain piping cannot be done smoothly due to obstacles, it can also be arranged outside of the main unit as shown in the drawing below.
- Maximum drain-up length shall not more than 19-11/16"(500mm) height.



- When the relative humidity of inlet or ambient air exceeds 80%, apply an (field-supplied) auxiliary drain pan beneath the indoor unit as shown below:



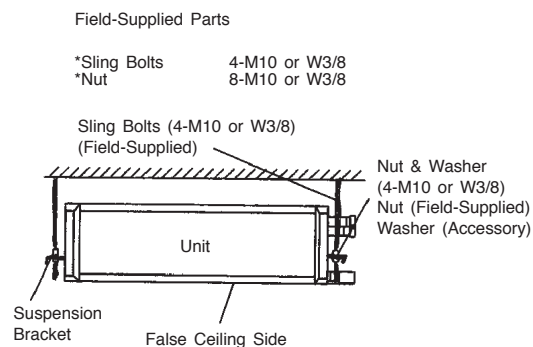
3 Installation of Indoor Unit

Marking of the Positions of the Sling bolts and Piping Connections

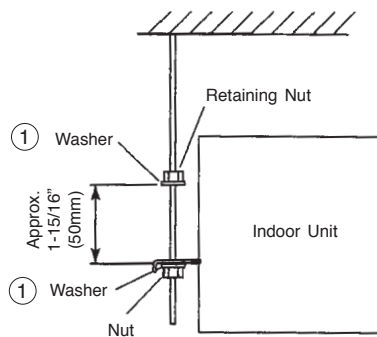
1. Mark the positions of the sling bolts, refrigerant piping connections and drain connection.
2. Ceiling Work: it basically varies according to the building structure. Consult with the architect or interior finish worker for more information on this.
 - (a) To maintain the appropriate levelness of the ceiling and preventing the vibration, the additional reinforcement in the ground of ceiling (Building Frame) is essential. Also, rubber cushion can be applied for the insufficient strength of the frame around the sling part on the ceiling.
 - (b) Provide a space for the air inlet grille, air outlet grille and maintenance work.
 - (c) Do not suspend the indoor unit and electric light units from the same auxiliary supporting beams, and do not connect the suspension bolts on the indoor units. If connected, the light may flicker or the light unit may be rattled by the vibration of the indoor units.

Mounting the indoor unit

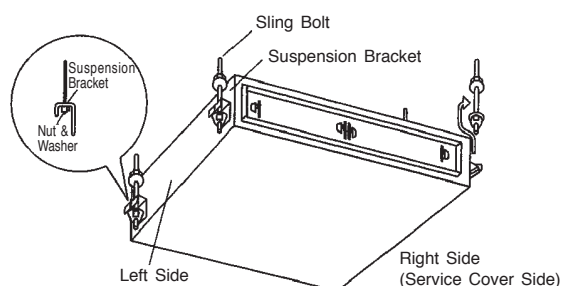
Hanging indoor unit.



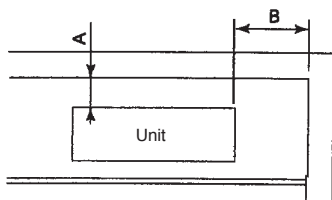
1. How to put Nuts or Sling Bolts
Put nuts on each of the four hanging bolts.



2. Hanging the Indoor unit
 - Hook suspension bracket to the nut and washer of each hanging bolt, as shown, starting at the opposite side to service cover side.
 - After checking that the nut and washer are correctly fixed by the retainers of the suspension bracket, hook the suspension bracket of the service cover side to the nut and washer. (Put the sling bolts away from the unit when hooking.)
 - Piping and wiring work will be required in the ceiling after hanging the unit. Therefore, determine the drawing direction of the pipe after selecting the installation location, particularly if the ceiling has existing piping. Wiring work should be carried out up to the connecting positions before hanging the unit.

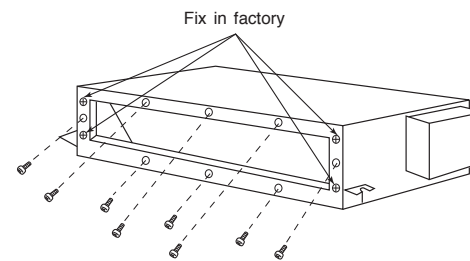


3. For reasons of disaster prevention, the distance between under the roof and the wall surface should be followed as shown in the figure below.
 - Use the nonflammable material for the duct.



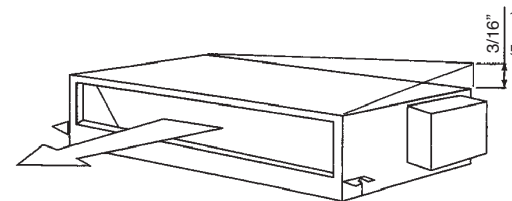
	Material of the Wall, Frame	
	Flammable	Nonflammable
A	Min. 39-3/8"(1000mm)	Min. 3-15/16"(100mm)
B	Min. 23-5/8"(600mm)	Min. 1-15/16"(50mm)

4. If decided to keep the flange at discharge side, fix screw ② at 8 positions. However, if decided not to keep the flange, remove 4 screws that fixed to the flange.



Adjusting of the Unit Level

1. Check to ensure that the foundation is flat, taking into account the maximum foundation gradient. If not, it will occur malfunction of float switch or not operation. Then it will drop the drain water from the ceiling.



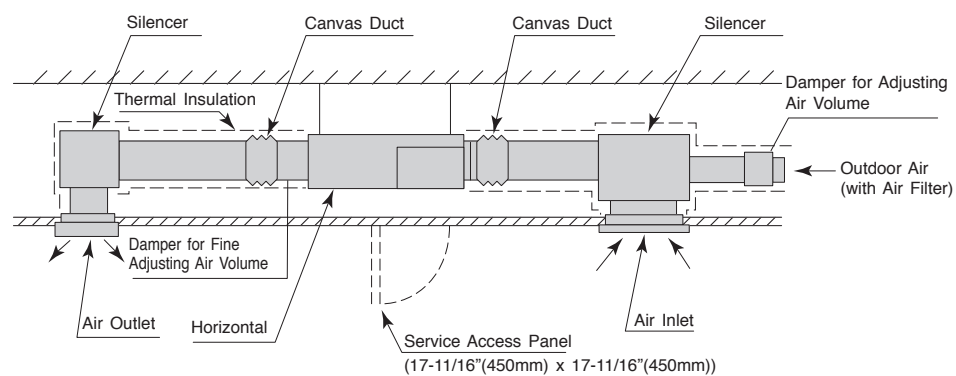
2. The unit should be installed so that the rear side of the unit is slightly (0mm to 3/16"(5mm)) lower than the front side, in order to avoid the incorrect position of the drain discharge.
3. Tighten the bolts of the sling nuts with the suspension brackets after adjustment is completed. Special plastic paint must be applied to the bolts in order to prevent them from loosening. Keep the unit as well as relevant equipment covered with the vinyl cover during installation work.

Connecting Return Duct and Supply Duct

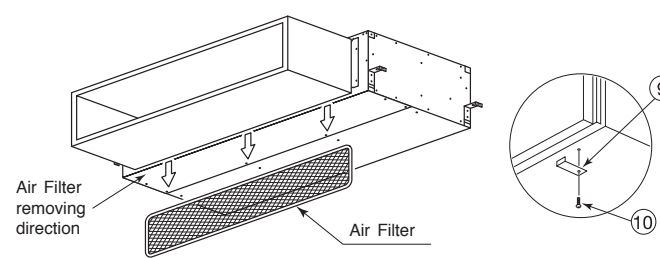
1. The return duct should be connected with the indoor through canvas ducts between inlet side of the indoor unit and ceiling of the room. The supply duct should be connected with the indoor unit through canvas ducts, in order to avoid abnormal sound vibration. The unit is equipped with a pre-drilled duct flange for the return and supply duct connection.
2. Attach the vibration proof rubber to Sling Bolt in order to avoid abnormal sound vibration.
3. Undamped natural frequency is 9 to 21 Hz.
4. Duct material should be non-flammable material.
5. Perform the heat insulation work over the duct and the duct flange for dew protection.

CAUTION

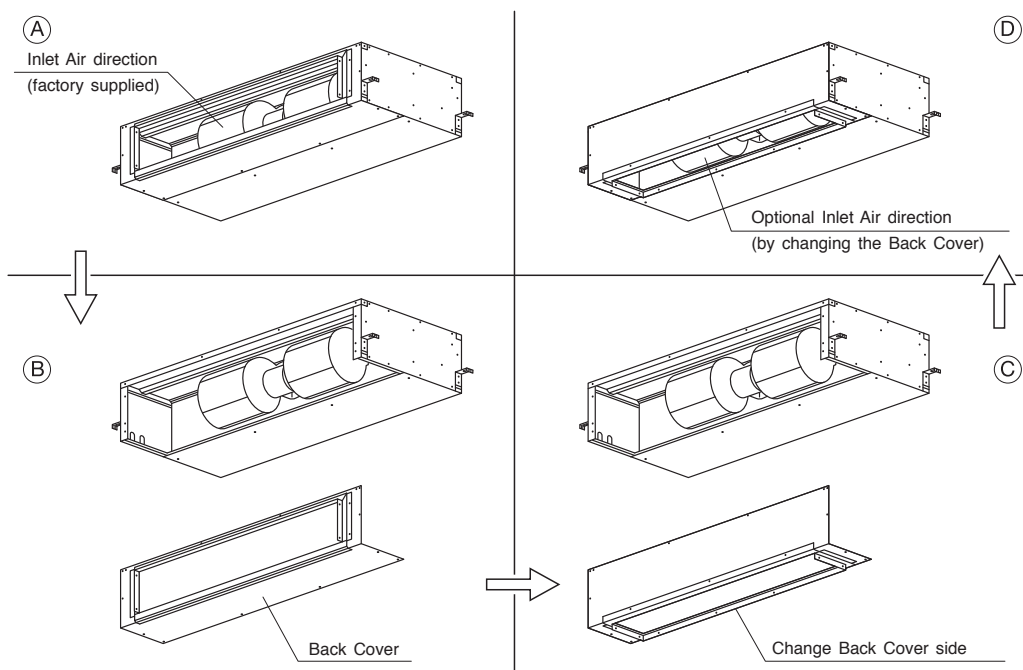
- If a lower sound level is still required, install a silencer (field-supplied).
- The facility design should be "Unit External static Pressure = Duct Pressure Loss Suction / Discharge Loss". If the duct pressure loss becomes under to the unit external static pressure, air speed will get larger and lead to the occurrence of louder noise, splashing water and activation of motor protection circuit, and if the unit external static pressure becomes under to the duct pressure loss, some problems such as inability to change the air speed may occur. Set the airflow control damper or shift the static pressure control switch to adjust to get almost equal level between the external static pressure and the duct pressure loss. (See "Setting of External Pressure" section for the details.)
- Basically this unit is designed to install the ducts on the inlet side and the outlet side.



- Select the indoor unit position, fixing the direction of air outlet so that the cool/hot air reaches all around the room. The standard position of the indoor unit is with the wall side on the ceiling.
- Remove the factory fitted filter and filter holders before installing of full duct type.



Inlet air direction change instructions



4 Connection of drain pipe

(1) Securely glue connection part of drain hose and PVC pipe, using PVC adhesive.

CAUTION

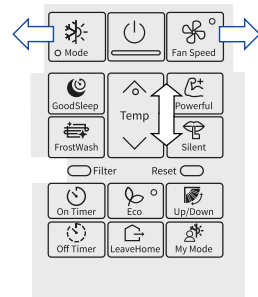
- If the glue between the drain hose and PVC pipe is too weak, water leakage may occur.

- Be sure to wrap generally-available insulator (10mm or more of foamed polyethylene) around drain hose, inside the house, for insulation heat.
- Checking drain and water leakage.
Perform after connecting power.
 - Add water to water pan of indoor unit.
- Test run method.
 - Turn the power on.
 - By using HHRC service setting mode under installation category, select value 02 (layer 3) for drain pump test.
 - After checking, the drainage, return the HHRC service setting to NORMAL.
 - * Please refer the figure (How to Operate the HHRC method) for how to operate HHRC service setting.

CAUTION

- If checking of drainage is omitted, water loss may occur.
- If drain pump test run is left set to TEST RUN, drain pump may malfunction.

How to operate the HHRC method



Temp $\Delta \nabla$: Selection (in the same layer)
 Mode : Move to previous layer
 Fan Speed : Move to next layer
 ON/OFF : Decision/Send (at layer 3)
 Filter : Current setting check (at layer 2)
 Filter + ON/OFF : Category initialization (at layer 1)
 * To exit from this setting mode, you need to either not operate the HHRC panel for 30 seconds or press and hold the UP/Down key for 5 seconds.

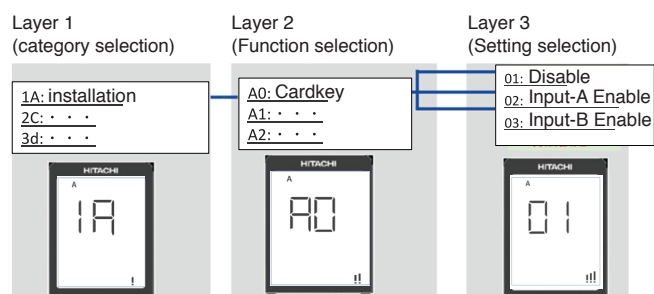
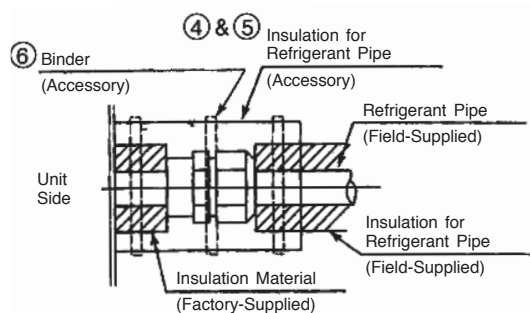


Fig. 2-5 How to Operate the HHRC method

Category	Function Name	Value	HHRC LCD display		
			Layer 1 Category	Layer 2 Function	Layer 3 Value
Installation	Drain Pump Test (Duct, Cassette)	Normal	1A	A7	01
		Test			02
		Reserved			03-99

5 Pipe Connection

After connecting the refrigerant piping, seal the refrigerant pipes by using the factory supplied insulation material.



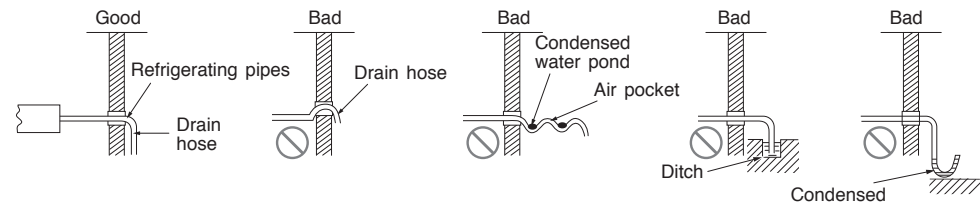
CAUTION

- 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.



6 Checking of drawing drain hose

- Connect the separate drain hose to the drain hose that is attached to the indoor unit.
- For keeping the smooth flowing of condensed water the drain hose should be inclined as shown in figure below.



CAUTION

Please ensure the smooth flow of condensed water of the indoor unit during installation. (Carelessness may result in water leakage.)

CAUTION

Be sure that the hose is not loosely connected or bent.

7 Checking procedure after installation

- Confirm the smooth water flowing from the drain hose by pouring some water into the evaporator pan.
- Arrange the penetrating part of the wall presentably with the bushing for refrigerating pipes and sealer which is belonging to the pipe set as shown in Fig. 7-1.

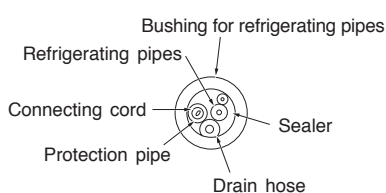


Fig. 7-1

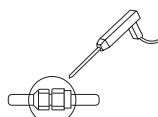


Fig. 7-2

CAUTION

Be sure that the wire is not in contact with any metal in the wall. Please use the protection pipe around the wire passing through the hollow part of the wall so as to prevent the possibility of the wire being damaged by a mouse.

7.3 Wind the inadhensive vinyl tape which is belonged to the pipe set round the refrigerating pipes and the connecting cord.

7.4 Leakage checking of refrigerant at the coupling by gas leak detector or soapsuds, as shown in Fig. 7-2.

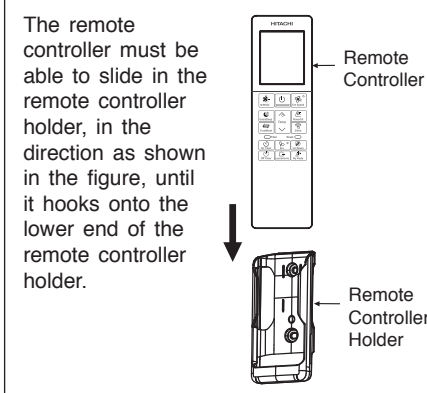
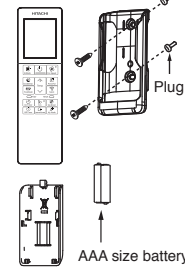
7.5 Checking of evaporator coldness (cooling operation).

7.6 Checking of warm wind from condenser (cooling operation).

8 Installation of wireless remote controller (optional)

■ The remote controller can be placed in its holder which is then fixed on a wall or beam.

- To operate the remote controller at its holder, please ensure that the unit can receive the signal transmitted from the controller at the place where the holder is to be fixed. The unit will beep when a 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.

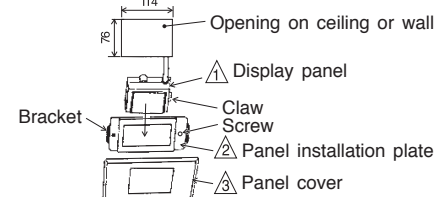


Installation of display panel (Optional)

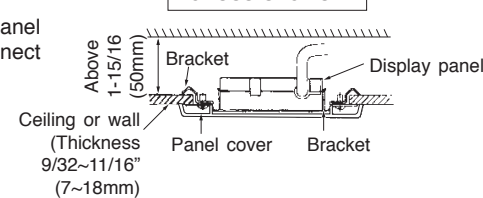
- Select an installation position on ceiling or wall where there is no obstacle to interrupt signal reception.
- Loosen screws of panel installation plate so that bracket can be slightly moved.
- Match the display panel to panel installation plate so the fixing claws on the panel are securely hooked.
- 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.

CAUTION

Please disconnect wired remote controller connector at CN20 if to use wireless remote controller.



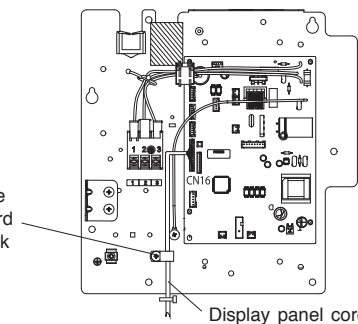
CROSS SECTION



Connection of display panel lead wires (Optional)

- Attach the connector of this panel to the connector CN16 on the control PWB.

After unscrewed the band, put the display panel cord and screw it back



9 Setting of static pressure selection using HHRC

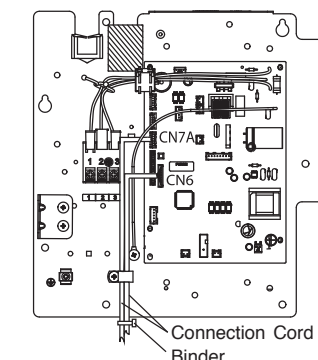
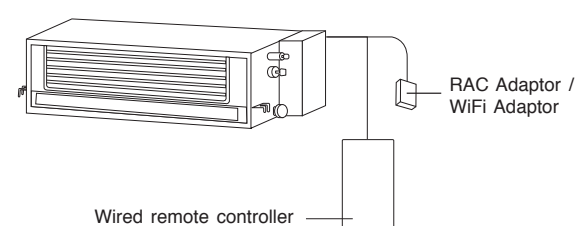
- Setting of External Pressure Remove lid of electric box and set the "STATIC PRESSURE" switch.

HIGH : 150pa
MEDIUM : 100pa
NORMAL : 50pa

- If not set to HIGH STATIC-PRESSURE, there will be reduction of cooling and heating capacities. (At the time of delivery, the switch is set as "NORMAL".)
- By using HHRC service setting mode under installation category, select value 02/03 (layer 3) for static pressure.
* Please refer the Fig. 2.5 (How to Operate the HHRC method) for how to operate HHRC service setting.

Category	Function Name	Value	HHRC LCD display		
			Layer 1 Category	Layer 2 Function	Layer 3 Value
Installation	Static Pressure Selection (Duct, Cassette)	Standard (Normal)	1A	A5	01
		Medium Pressure			02
		High Pressure			03
		Reserved			04-99

10 How To Connect The Optional Parts (RAC / WiFi Adapter, Wired Remote Control, ON/OFF Status or Alarm Signal, Motion Sensor)



EXTERNAL COMMUNICATION

7. When connecting the Dry Contact / External Communication / WiFi (Optional)

- To connect to Dry Contact, a separate purchase HA adaptor and Dry Contact Connecting Cord is required.
- To connect to External Communication, a separate purchase RAC adaptor is required.
- To connect to WiFi, a separate purchase WiFi adaptor is required.
- To install the wiring, the electrical box cover must be opened, (As for dry contact, connect to CN6 whereas for the RAC adaptor or WiFi adaptor, connect to CN7A).
- The connection cord and power cables are to be arranged and tied up as the diagram shown below.
- Please refer to the respective user manuals of the WiFi adaptor and RAC adaptor for further details.
- Please refer to the user manual for instruction on the removal and installation of the electrical box.
- For ordering all optional parts, please refer to the catalogue for part number.

WIRED REMOTE CONTROLLER

To connect to the electrical box:

- Remove the cover of electrical box.
- Connect the connector of wired remote controller to CN1102.
- Assemble back the cover of electrical box.
- Please refer to the respective user manual of wired remote controller for further details.
- Please be careful not to damage lead wires by edge of plate when connecting the optional parts.

11 Protection of lead wire

Wrap aluminum tape around PVC tube between electric box and indoor unit (cord band).

12 Operation test

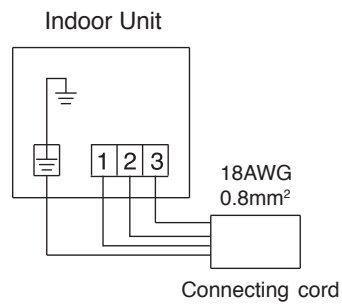
- Please ensure that the air conditioner is in normal operating condition during the operation test.
- Explain to your customer the proper operation procedures as described in the user's manual.
- If the indoor unit does not operate, check to see that the connections are correct.



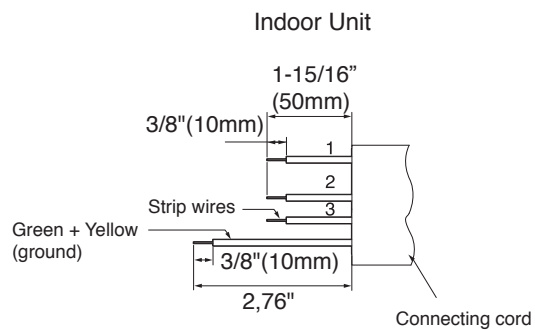
Trial run should be conducted on one unit at a time to check for incorrect wiring of connecting cord.

WARNING • THIS APPLIANCE MUST BE GROUNDED.

Procedures of Wiring



Detail of Cutting the Connecting Cord

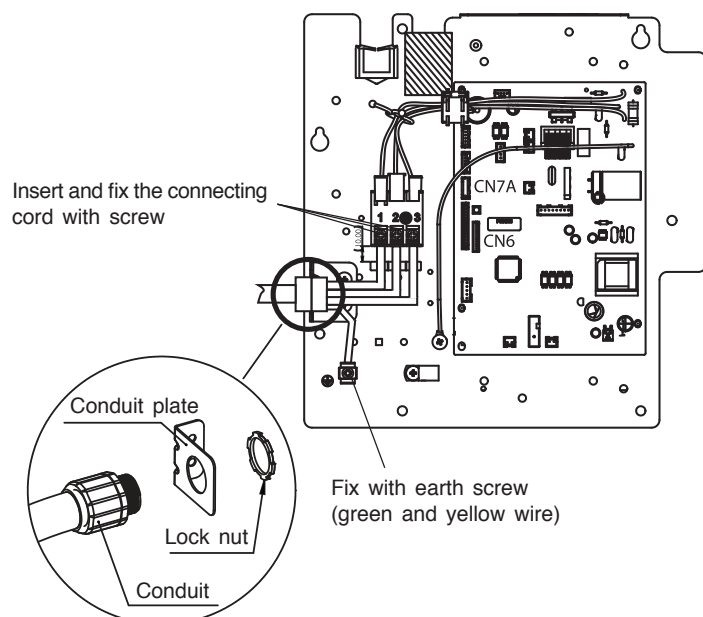


WARNING

- The naked part of the wire core should be 3/8"(10mm) 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 power cables approved from the authorities in your country.
- Please refer to the installation manual for wire connection to the terminals of the units. The cabling must meet the standards of electrical installation.
- There is an AC voltage of 220-240V between the L and N terminals. Therefore, before servicing, be sure to remove the plug from the AC outlet or switch off the main switch.
- Do not make any connection in the middle of the connecting cable. It may cause the wire to over heat, and emit smoke and fire.

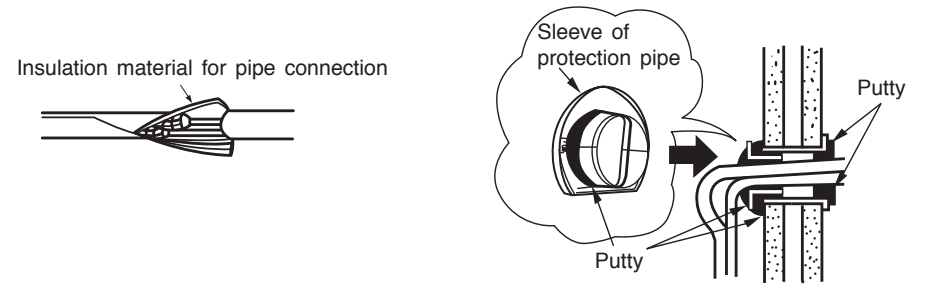
Wiring Of The Indoor Unit

For wire connection of the Indoor unit, you need to remove electrical cover.



1 Insulation And Maintenance Of Pipe Connection

- The connected terminals should be completely sealed with a heat insulator and then tied up with a rubber strap.
- Please tie the pipe and power line together with vinyl tape as shown in the figure showing the installation of the 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.



2 Power Source And Operation

Power Source

CAUTION

- Please use a new socket. An accident may occur while using an old socket because of the 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.

WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer. Any unfit method or using incompatible material may cause product damage, burst and serious injury.
- 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.