

INSTALLATION MANUAL

airHome Ducted

SPLIT TYPE AIR CONDITIONER

INDOOR UNIT  
RAD-GJ07QHAA  
RAD-GJ09QHAA  
RAD-GJ12QHAA



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
  - Pipe Cutter
  - Hexagonal Wrench Key (5/32"(4mm))
  - Power Drill (ø2-18/32"(65mm) ~ ø3-5/32"(80mm))
  - Vacuum Pump
  - Pliers or Wrench
  - Torque Wrench
  - Vacuum Pump Adaptor
  - Flare Tool
  - Gas Leakage Detector
  - Manifold Valve
  - Charge Hose
  - Reamer
  - File

- 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.
  - 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 cables which are officially approved in your country. Be sure to use the specified circuit. A short circuit and fire may occur due to the use of low quality wire or improper work.
  - Be sure to use the specified cables 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 to prevent the external force is being applied to the connection section of the terminal base. 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, fire or stronger vibration 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 transferring an air conditioner to another location, make sure that air other than the specified refrigerant(R32) does not enter the refrigeration cycle. If other air should enter, the pressure level of the refrigeration cycle may increase abnormally which could result in a rupture and injury.
  - 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.
  - Be sure to connect the earth line from the power supply wire to the outdoor unit and between the outdoor and indoor unit. Do not connect the earth line to the gas tube, water pipe, lightning rod or the earth line of the telephone unit. Improper earthing may cause electric shocks.
  - When finishing the refrigerant collection (pumping down), stop the compressor and then remove the coolant pipe. If you remove the refrigerant pipe while the compressor is operating and the service valve is released, air is sucked and a pressure in the freezing cycle system will build up steeply, causing an explosion or injury.
  - When installing the unit, be sure to install the refrigerant pipe before starting the compressor. If the refrigerant pipe is not installed and the compressor is operated with the service valve released, air is sucked and the pressure level of the refrigeration cycle may increase abnormally which could result in a rupture and injury.
  - The electric cables should neither be reworked nor added. Make sure to use an exclusive circuit breaker. Otherwise fire or electric shock might occur by connection failure, isolation failure or over current.
  - Make sure to connect cables to terminal properly and terminal cover should close firmly. Otherwise, over heating at terminal contact, fire or electric shock might occur.
  - Make sure that there is no dust on any connected points of electric cables and fix firmly. Otherwise, fire or electric shock might occur.
  - This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
  - Appliance shall be installed in accordance with national wiring regulations and is not intended for use at altitudes exceeding 2000m (6561-2232ft).

Refrigerant pipe size (outer diameter): Narrow pipe, Liquid (ø1/4"(6.35mm)); Wide pipe, Gas (ø3/8"(9.52mm))

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

<IA2709: (A)>

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.

**WARNING**

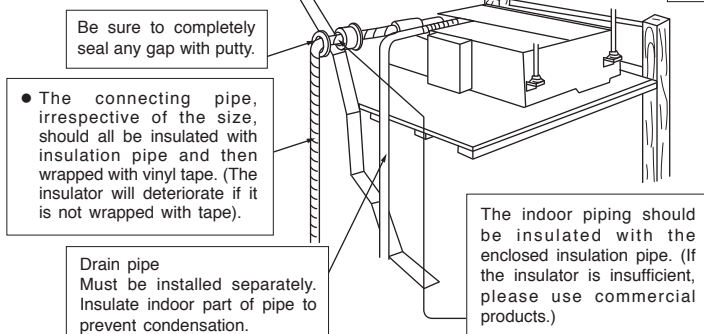
- No nearby heat source and no obstruction near the air outlet is allowed.
- The clearance distances from top, right and left are specified in figure below.
- The location must be convenient for water drainage and pipe connection with the Outdoor unit.
- No nearby leakage risk of flammable gas, and no 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

**WARNING**

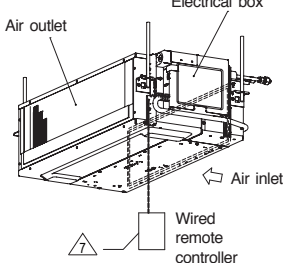
Proposition 65: This product contains chemicals known to the state of California to cause cancer, birth defects, and other reproductive harm. For more information, go to www.P65Warnings.ca.gov

[Indoor unit installation]



**CAUTION**

Always install the indoor unit at level. If the indoor unit is inclined, water may leak.



- "Height difference" and "Piping length" of Indoor and Outdoor unit are different by Outdoor unit. Please refer to the installation manual in Outdoor unit.

<IA2709: (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**

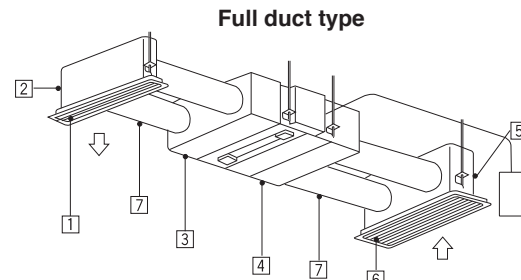
This symbol shows that there is information included in the Operation Manual and/or Installation Manual.

**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.

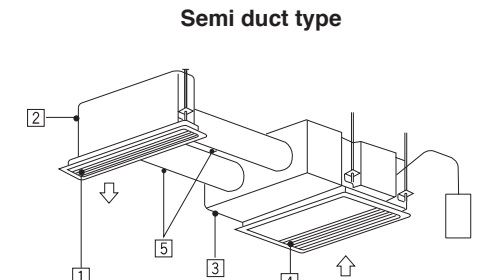
1. RECOMMENDATION FOR INSTALLATION

- The figures below are the recommended installation type for this duct model.
- All the optional parts mentioned for each installation type and screws should be purchased locally prior to the installation.



Need optional parts when installing full duct type (Local purchase)

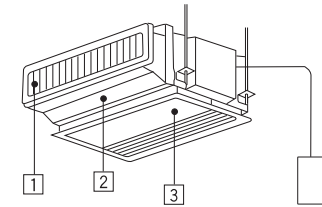
1	Discharge grille
2	Chamber of discharge grille ø5-29/32"(150mm)
3	Chamber of discharge of unit side ø5-29/32"(150mm)
4	Chamber of suction of unit side ø5-29/32"(150mm)
5	Chamber of suction grille ø5-29/32"(150mm)
6	Suction grille with filter
7	Flexible duct ø5-29/32"(150mm) 3-9/32"(1m) Flexible duct ø5-29/32"(150mm) 6-18/32"(2m)



Need optional parts when installing semi duct type (Local purchase)

1	Discharge grille
2	Chamber of discharge grille ø5-29/32"(150mm)
3	Chamber of discharge of unit side ø5-29/32"(150mm)
4	Suction grille
5	Flexible duct ø5-29/32"(150mm) 3-9/32"(1m) Flexible duct ø5-29/32"(150mm) 6-18/32"(2m)

Non duct type



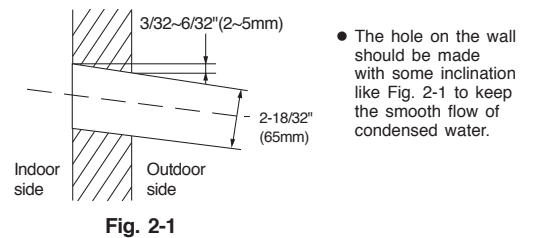
Need optional parts when installing non duct type (Local purchase)

1	Discharge grille
2	Discharge duct
3	Suction grille

2. Installation procedure and notice

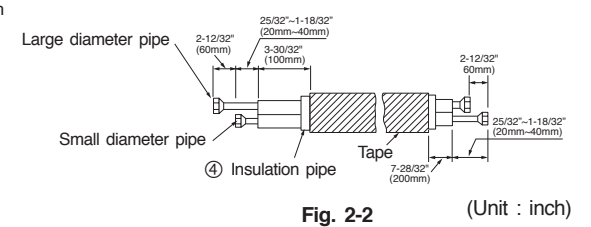
Select the installation location carefully for the split type air conditioner. It is very difficult to move a split type air conditioner after the first installation.

2.1 Make a hole on the wall as shown in Fig. 2-1.



2.2 Connecting pipe installation

- Seal the end of the pipes to prevent damage from moisture and water.



2.3 Drain pipe installation

- Use PVC pipe VP20 (O.D. 1"(25mm)) for drain pipe.
- You must roll an insulation (thickness 13/32"(10mm) or more) over the indoor section of the drain pipe.
- Position the drain pipe in the downward direction to enable free-flow of water. Fix it with a hanger and avoid twisting the pipe as shown in Fig. 2-3.



- 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.

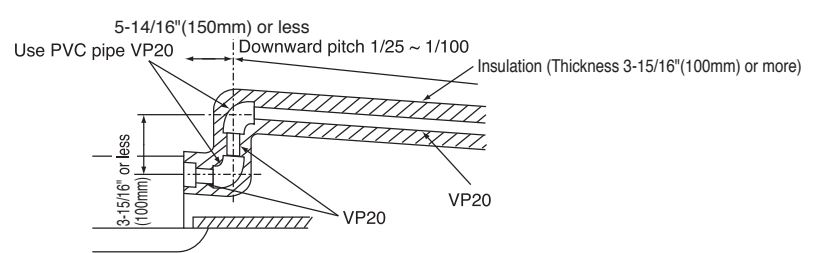
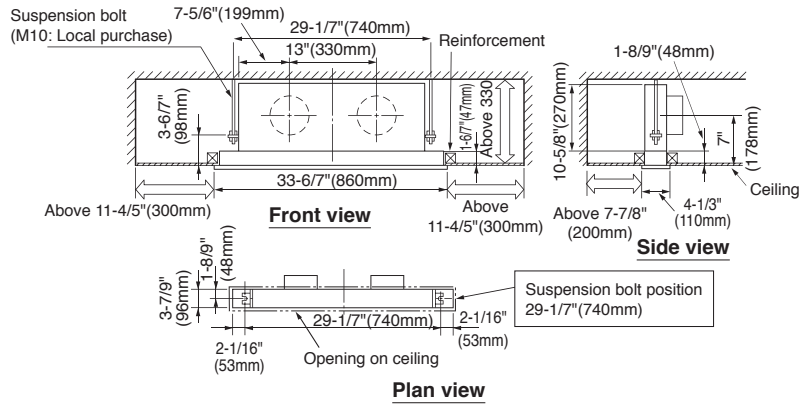


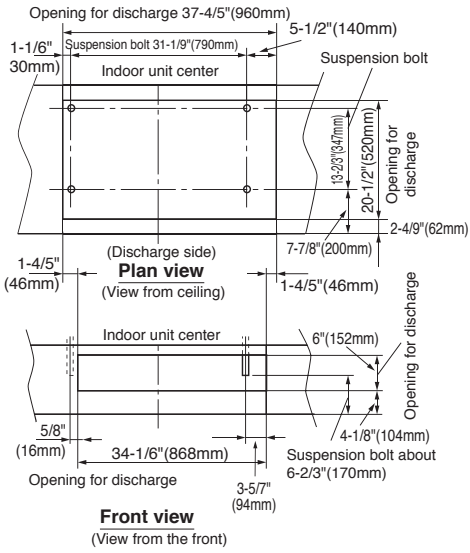
Fig. 2-3



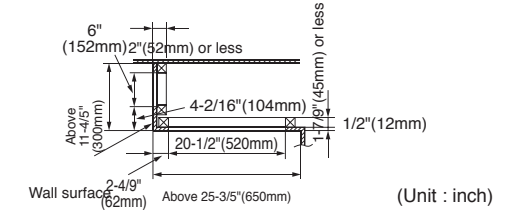
**Chamber of discharge grille**



**(2) Opening on ceiling and suspension bolt position**



- Use M10 bolt for suspension.
- Opening of ceiling and suspension bolt position are as shown on the left.
- Before installing the indoor unit, prepare opening 37-4/5(960mm) x 20-1/2"(520mm) on ceiling, and 34-1/6(868mm) x 6"(152mm) on wall and arrange drain pipe, refrigerant pipe and connecting cord in their installation positions.
- For finishing of opening on ceiling and wall arrange with builder in detail.
- Be sure to reinforce furring of ceiling (frame: ceiling joist and joist supporter) to maintain level of ceiling and prevent vibration of ceiling plate.

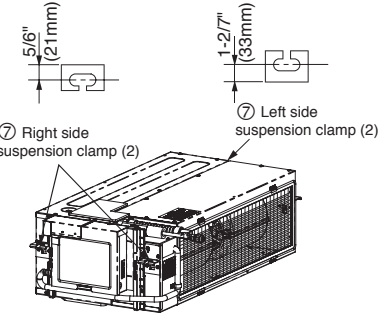


**(3) Installation of suspension bolt**

- This is the same as for discharge/suction duct type. Follow instructions for discharge/suction duct type.

**(4) Preparation for installing indoor unit**

- Remove the filter at the backside of indoor unit by unscrew 8 screws at the filter holders (4 portion).
- Remove 6 screws at back plate of indoor unit. Then install the back plate at the backside of indoor unit using 6 screws.
- Install 4 suspension clamps at both sides of indoor unit, 2 clamps at each side, using 8 tapping screws ⑧.
- (Since sizes of left and right clamps are different for certain parts, refer to diagram on the right.)
- Install chamber of discharge of unit side on the indoor unit using 10 tapping screws.

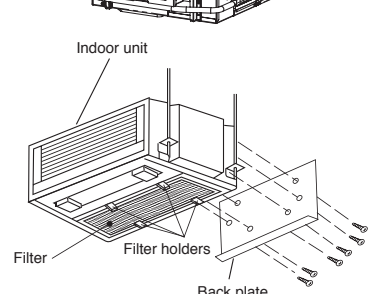
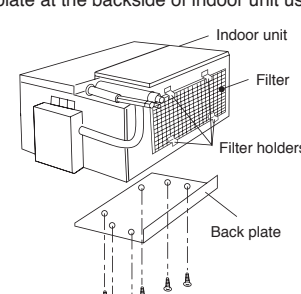
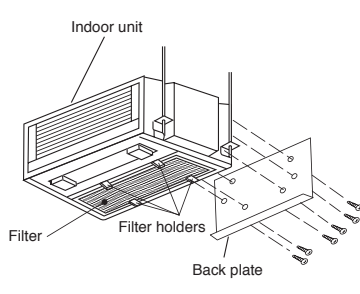
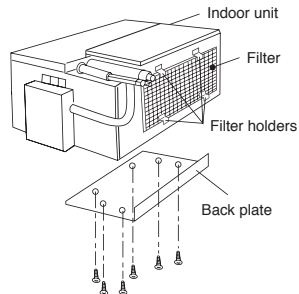
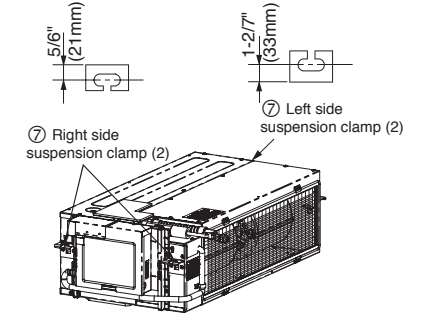


**(3) Installation of suspension bolt**

- This is the same as for discharge/suction duct type. Follow instructions for discharge/suction duct type.

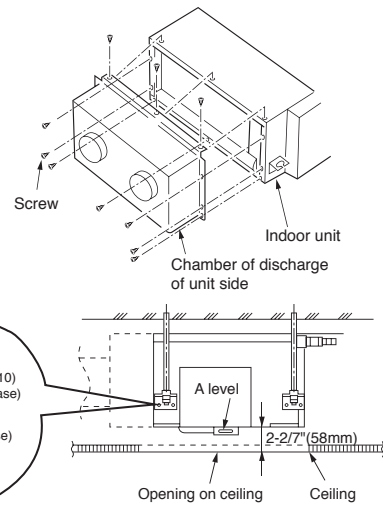
**(4) Preparation for installing indoor unit**

- Install 4 suspension clamps at both sides of indoor unit, 2 clamps at each side, using 8 tapping screws ⑧. (Since sizes of left and right clamps are different for certain parts, refer to diagram on the right.)
- Remove the filter at the backside of indoor unit by unscrew 8 screws at the filter holders. (4 portions).
- Remove 6 screws at back plate of indoor unit. Then install the back plate at the backside of indoor unit using 6 screws.



**(5) Installation of indoor unit**

- Set nut and washer on suspension bolt and hook it to suspension clamp by lifting the indoor unit.
- Make sure that indoor unit is kept at level using a level or vinyl hose with water.
- Fix the indoor unit so that the space between bottom surfaces of ceiling and indoor unit is 58mm.



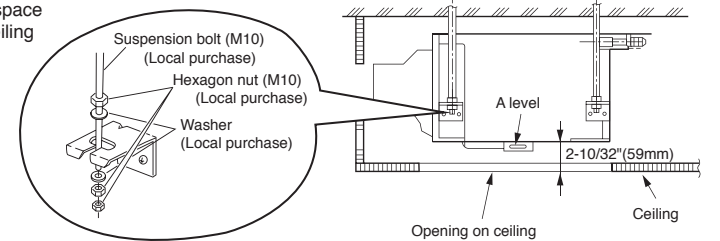
Refer to the installation manual of optional parts for installation of:  
 --Discharge grille chamber  
 --Suction grille  
 --Discharge grille  
 --Flexible duct

**CAUTION**

- Install the indoor unit in a straight level. If the indoor unit is inclined, water may leak.
- If space between bottom surfaces of indoor unit and ceiling is not correct, there may be a gap between grille and ceiling surface, with consequent leakage of condensed water.

**CAUTION**

- Be sure to install the indoor unit level. If the indoor unit is inclined, water may leak.
- If space between bottom surfaces of indoor unit and ceiling is not correct, there may be a gap between grille and ceiling surface, with consequent dripping of condensed water.



**(5) Installation of indoor unit**

- Set nut and washer on suspension bolt and hook it to suspension clamp by lifting the indoor unit.
- Make sure that indoor unit is kept at a straight level using a level or vinyl hose with water.
- Fix the indoor unit so that the space between bottom surfaces of ceiling and indoor unit is 58mm.

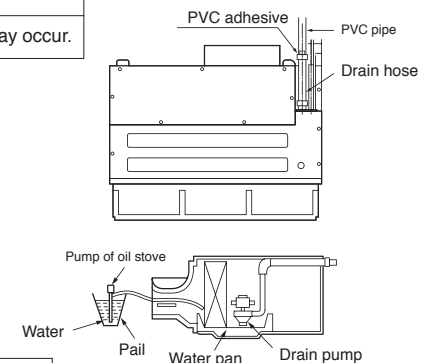
**2.5 Connection of the drain pipe**

- Securely glue connection part of drain hose and PVC pipe, using PVC adhesive.
- Make sure to wrap generally-available insulator (10m or more of foamed polythene) around drain hose inside the house for insulation.

**CAUTION**

- If gluing of drain hose and PVC pipe is too weak, water leakage may occur.

- To check the drain and water leakage, after connecting power:
  - Add water to the water pan of the indoor unit as shown below.
- Test run method
  - Turn 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.
- Perform test running of drain pump to check drainage operation.



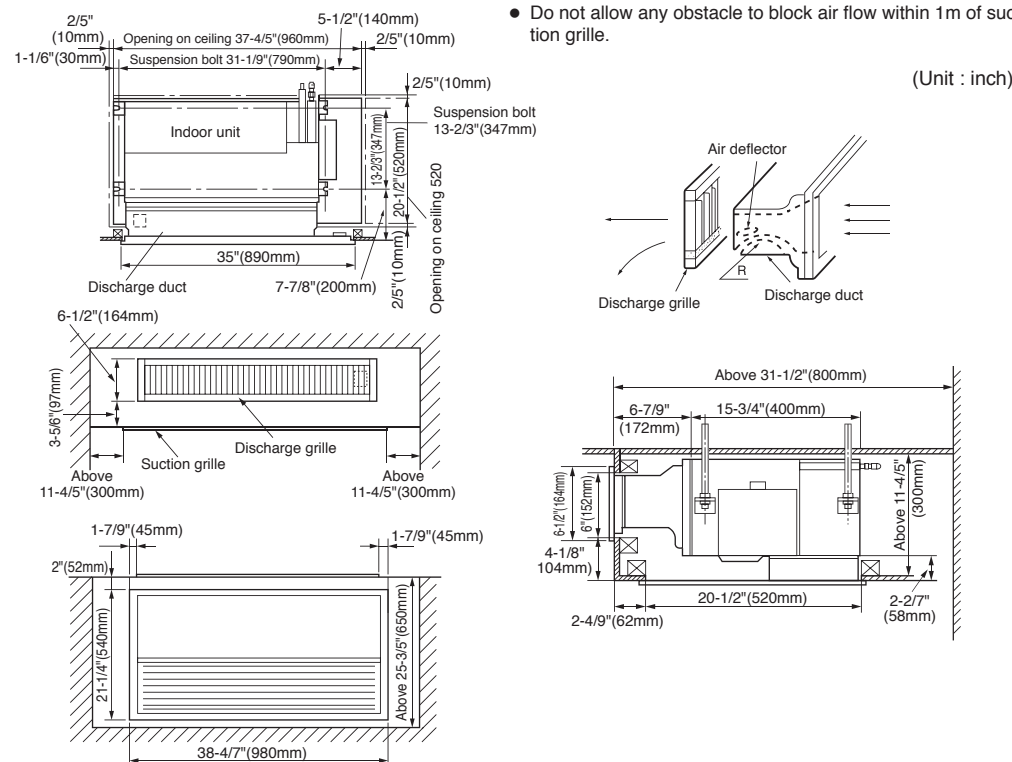
**CAUTION**

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

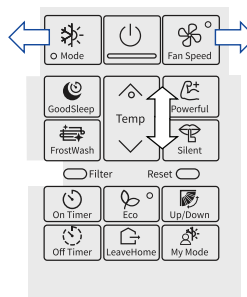
**INSTALLATION OF NON DUCT TYPE**

**(1) Installation figure**

- Select the indoor unit position, fixing direction of air outlet so that cool/hot air reaches all the room.
- Do not allow any obstacle to block air flow within 1m of suction grille.



**How to operate the HHRC method**



Temp  $\Delta \nabla$  : Selection (in the same layer)  
 Mode  $\Delta \nabla$  : Move to previous layer  
 Fan Speed  $\Delta \nabla$  : Move to next layer  
 ON/OFF  $\Delta \nabla$  : Decision/Send (at layer 3)  
 Filter  $\Delta \nabla$  : Current setting check (at layer 2)  
 Filter + ON/OFF  $\Delta \nabla$  : Category initialization (at layer 1)  
 Filter + ON/OFF  $\Delta \nabla$  : all 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.

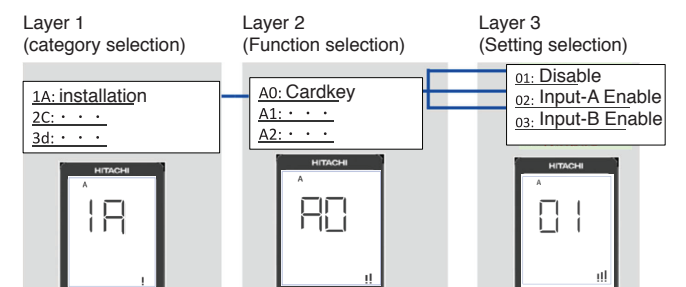
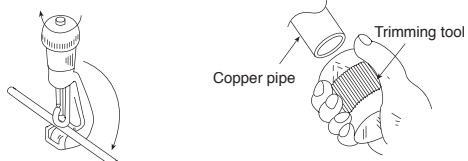


Fig. 2-5

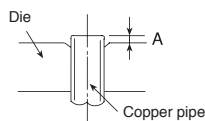
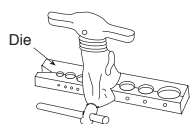
Category	Function Name	Value	HHRC LCD display		
			Layer 1 Category	Layer 2 Function	Layer 3 Value
Installation	Drain Pump Test (Duct, Cassette)	Normal			01
		Test	1A	A7	02
		Reserved			03-99

## 2.6 Preparation of pipe

- Use a pipe cutter to cut the copper pipe.



- Before flaring, please put on the flare nut.



- Please use exclusive tool.

### CAUTION

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

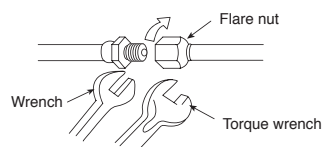
Outer Diameter inch(mm)	Thickness inch(mm)	A inch(mm)		
		Flare tool for R32 Clutch type	Conventional flare tool	
			Clutch type	Wing nut type
1/4"(6.35)	1/32(0.8)	0~1/64(0.0~0.5)	3/64~1/16(1.0~1.5)	1/16~5/64(1.5~2.0)
3/8"(9.52)	1/32(0.8)	0~1/64(0.0~0.5)	3/64~1/16(1.0~1.5)	1/16~5/64(1.5~2.0)
1/2"(12.70)	1/32(0.8)	0~1/64(0.0~0.5)	3/64~1/16(1.0~1.5)	1/16~5/64(1.5~2.0)

## 2.7 Pipe connection

### CAUTION

In case of removing flare nut of an indoor unit, first remove a nut of small diameter side, or a seal cap of big diameter side will fly out. Free from water into the piping when working.

- Please be careful when bending the copper pipe.
- Screw in the screws manually while adjusting the center. After that, use a torque wrench to tighten the connection.

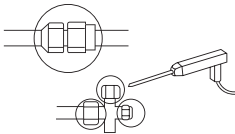


	Outer dia. of pipe	Tightening torque	
		N·m	lbf.ft
Small dia. side	1/4"(6.35)	14.0~18.0	10~13
	3/8"(9.52)	33.0~42.0	24~31
Large dia. side	1/2"(12.70)	50.0~62.0	37~46
	3/4"(19.05)	70.0~85.0	51~62
Valve head cap	Small dia. side	1/4"(6.35)	19.6~24.5
	Large dia. side	3/8"(9.52)	19.6~24.5
Valve core cap	Small dia. side	1/4"(6.35)	12.3~15.7
	Large dia. side	3/8"(9.52)	9~12
Spindle	Small dia. side	1/4"(6.35)	3.92~5.88
	Large dia. side	3/8"(9.52)	3~4
Spindle	Small dia. side	1/4"(6.35)	9.80~10.78
	Large dia. side	5/8"(15.87)	7~8

### Gas leakage inspection

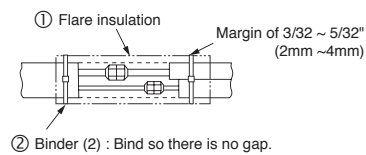
Use gas leakage detector to check if leakage occurs when flare nut is connected as shown in the figure.

If gas leakage occurs, tighten the connection to stop the leakage. (Use the detector provided for R32).



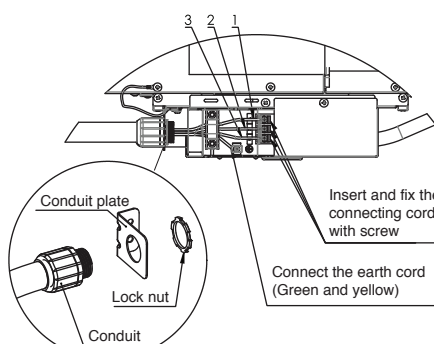
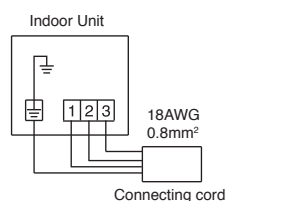
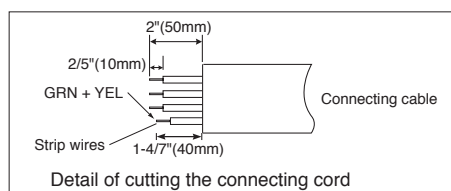
### Sealing the refrigerating pipe

Cover pipe connection section using flare insulation material and wrap a tape around it, leaving no gaps.



## 2.8 Connection of the connecting cord

- Remove the cover of the electric box.
- Connect the connecting cords.
- Assemble the cover of electric box.

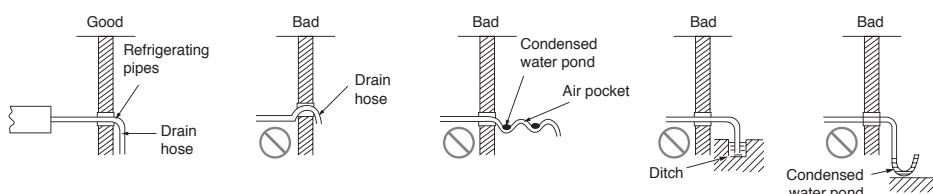


### WARNING

- This appliance must be earthed.
- Do not make any connection in the middle of the connecting cable. It may cause overheating, smoke emission, or fire.

## 3. Checking of drawing drain hose

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



### CAUTION

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

### CAUTION

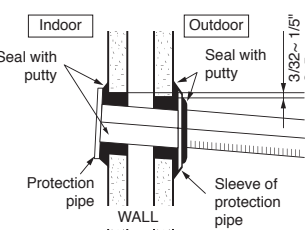
Be sure that the hose is not loosely connected or bent.

## 4. Checking procedure after installation

- Confirm the smooth flow of water from the drain hose by pouring some water into the evaporating pan.
- Use 'bushing' to arrange all the refrigerating pipes and sealer that belong to the pipe set, as shown in figures 4-1 and 4-2.

### Wall penetration and installation of protection pipe

- Drill a  $\phi 2-18/32"$  (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.



### CAUTION

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.

Fig. 4-1

Refrigerating pipes Bushing for refrigerating pipes

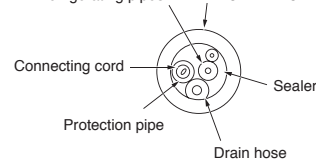


Fig. 4-2

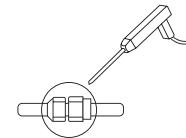


Fig. 4-3

- Wind the inadhensive vinyl tape which is belonged from the pipe set around the refrigerating pipes and the connecting cord.

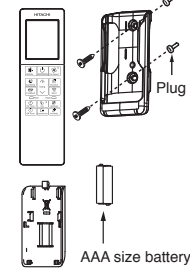
- Leakage checking of refrigerant at the coupling by gas leak detector or soapsuds, as shown in Fig. 4-3.

- Checking of evaporator coldness (cooling operation).

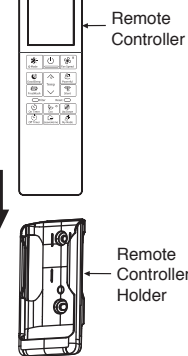
- Checking of warm wind from condenser (cooling operation).

## 5. Installation of wireless remote controller (Optional)

- The remote controller can be placed in its holder which is fixed on a wall or a 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 controller holder, please switch on the light, even during day time, to determine the mounting location of the holder.

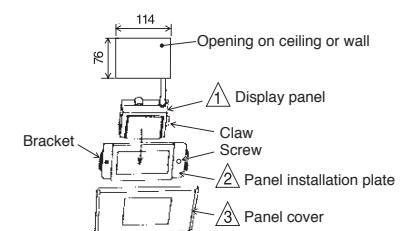


The remote controller must slide in the holder, in the direction as shown in the figure, until it hooks at the lower end of the remote controller holder.

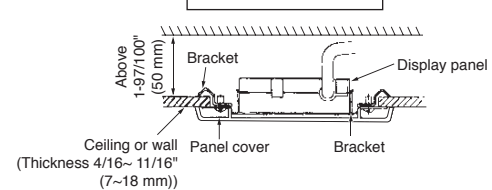


## Installation of display panel (Optional)

- Select an installation position on ceiling or wall where there is no obstacle to interrupt signal reception.
- Loosen the 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

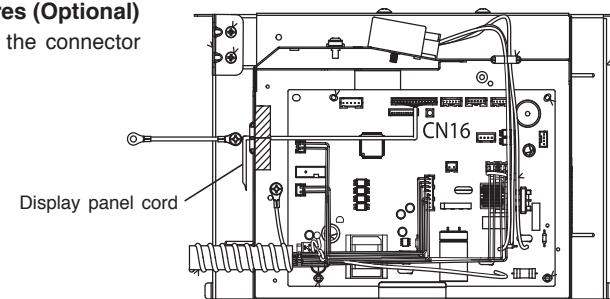


### CAUTION

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

## Connection of display panel lead wires (Optional)

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



## 6. Setting of static pressure selection using HHRC:

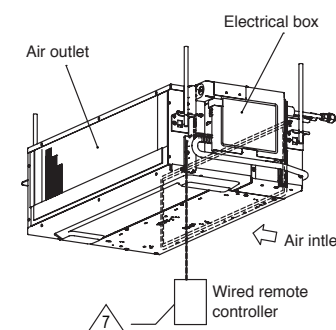
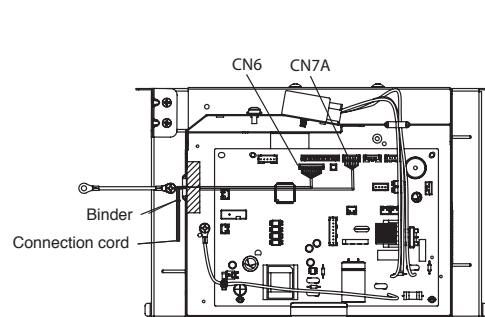
### (Full duct type and semi duct type)

- For full duct type, set the static-pressure switch to HIGH STATIC-PRESSURE.
- For semi duct type, set the static pressure switch to MED.
- If not set to HIGH or MED, there will be reduction of cooling and heating capacities. (At the time of delivery, it was 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

## 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.



## 8. 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.

### CAUTION

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