HITACHI

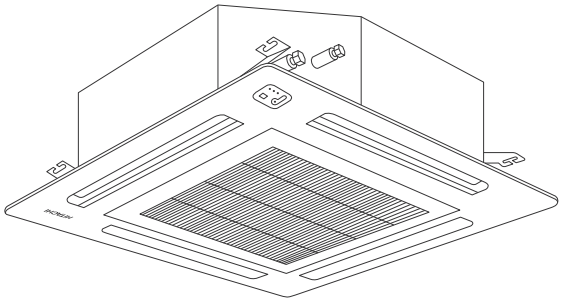
INSTALLATION & MAINTENANCE MANUAL

PRIMAIRY
MONO SPLIT
DC-INVERTER SERIES

INDOOR UNITS

CASSETTE UNIT

RCI-3.0UFE1NH
RCI-3.5UFE1NH
RCI-4.0UFE1NH
RCI-5.0UFE1NH
RCI-6.0UFE1NH
RCI-6.5UFE1NH



Cooling & Heating

HO2019289HA

IMPORTANT NOTICE

- We pursue a policy of continuous improvement in design and performance of products. Company reserves the right to vary specifications without prior notice.
- We cannot anticipate every possible circumstance that might involve a potential hazard.
- This air conditioner is designed for standard air conditioning only. Do not use this air conditioner for other purposes such as drying clothes, refrigerating foods or for any other cooling or heating process.
- The installer and system specialist shall secure safety against leakage according to local regulations or standards.
- No part of this manual may be reproduced without written permission.
- Signal words (DANGER, WARNING and CAUTION) are used to identify levels of hazard seriousness.
  Definitions for identifying hazard levels are provided below with their respective signal words.

⚠ DANGER	***Immediate hazards which WILL result in severe personal injury or death.***
⚠ WARNING	*Hazards or unsafe practices which COULD result in severe personal injury or death.*
⚠ CAUTION	*Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.*
NOTE	*Useful information for operation and/or maintenance.*

- It is assumed that this air conditioner will be operated and serviced by English-speaking personnel.
  If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your dealer.
- This manual gives the common description and information of the air conditioner you operate and of other models.
- Storage condition: Temperature -25~60ºC
  Humidity 30%~80%
- Heating and electric heating functions are not available for cooling only models.
- This manual should be considered as a permanent part of the air conditioner equipment and should be kept with it.
- The numbers in the model represent the cooling capacity (HP).
  For example, 3.0HP represents RCI-3.0UFE1NH.

CHECKING PRODUCT RECEIVED

- Upon receiving this product, inspect it for any shipping damage. Claims for damage, either apparent or concealed, should be filed with the shipping company immediately.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct.
  The standard utilization of the unit is explained in this manual.
  Therefore, utilization other than that specified in this manual is not recommended.
  Please contact your dealer as the occasion arises.
- We recommend that this air conditioner should be installed properly by qualified personnel in accordance with the installation instructions provided with the unit.
- Before installation, check if the voltage of the power supply at installation site is the same as the voltage shown on the nameplate.

⚠ DANGER

- ***Do not perform any alteration to this product, otherwise, it may cause water leakage, breakdown, short circuit, electric shock, fire, etc.***
- ***Piping, welding and other such works should be carried out far away from the flammable and explosive materials, including the air conditioner refrigerant, to guarantee the security of the site.***
- ***To protect the air conditioner from heavy corrosion, avoid installing the outdoor unit in a place where sea water can splash directly onto or in sulphurous air near a spa. Do not install the air conditioner where excessively high heat-generating objects are placed.***

⚠ WARNING

- *If the supply cord is damaged, it must be replaced by the factory or its service department to avoid danger.*
- *The place where this product is installed must have the reliable electrical grounding facilities and protections. Please do not connect the grounding of this product to various kinds of air feeding ducts, drain pipes, lightning protection facilities as well as other piping lines to avoid an electric shock and damage caused by other factors.*
- *Wiring must be done by a qualified electrician. All the wiring operations must be conducted according to the local electrical codes.*
- *You should consider the capacity of the electric current of your electrical meter and socket before installation.*
- *The power wire where this product is installed should have the independent leakage protection device and the electric current over-load protection device provided for this product.*
- *This appliance can be used by children over 8 years old and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.*
- *Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.*
- *Means for providing complete disconnection in all poles, must be incorporated in the fixed wiring in accordance with the wiring regulations.*
- *When any abnormality like burnt smell, deformation, fire, smoke, etc. is found, you should stop using the air conditioner, immediately cut off the main power supply and contact the dealer.*
- *The method of connection of the appliance to the electrical supply and interconnection of separate components are detailed below. The wiring diagram with a clear indication of the connections and wiring to external control devices and supply cord are detailed below.*
- *Power connection and interconnection between outdoor unit and indoor unit should be conducted with the power cord of the H07RN-F type or the electrically equivalent type. The size of the power cord is detailed below.*
- *Type and rating of circuit breakers / ELB are detailed below.*
- *The information on dimensions of the space necessary for correct installation of the appliance including the minimum permissible distances to adjacent structures is detailed below.*

Contents

Safety precautions

Symbols in this Installation Manual are interpreted as shown below:

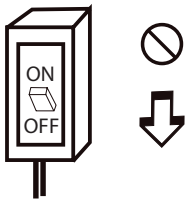
Be sure not to do.

Be sure to follow the instruction.

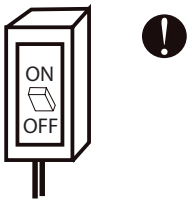
Pay attention to such a situation.

Grounding is necessary.

Warning: Incorrect handling could cause a serious hazard, such as death, serious injury, etc.



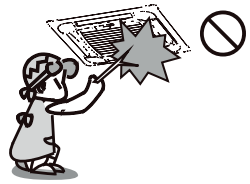
Do not use the power supply circuit breaker or pull off the plug to turn it off during operation. This may cause a fire due to spark, etc.



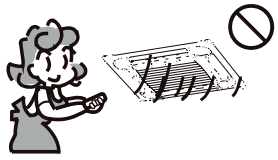
Avoid dirt accumulation on power supply circuit breaker. Connect the power supply cord to it firmly and correctly. Otherwise it may lead to electric shock or fire due to insufficient contact.

Provide accurate power supply in accordance with the rating plate requirement. Otherwise, serious faults or fire may occur.

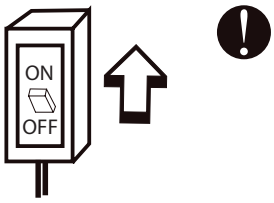
Do not pull or press the power supply cord too strong, otherwise, the power supply cord may be broken, which may result in electric shock or fire.



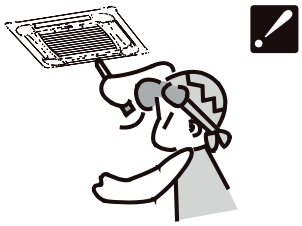
Never insert a stick or similar object to the unit. This may result in injury because the fan is rotating at high speed.



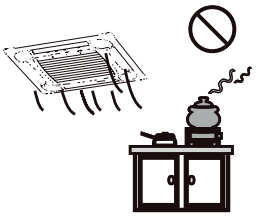
It is harmful for your health if you are exposed to cold air for a long period of time. Therefore, it is recommended to ensure the uniform distribution of airflow in the room.



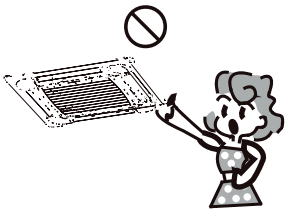
Turn off the appliance first and then cut off power supply in case of appliance malfunctions.



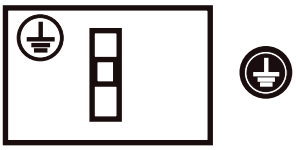
Do not repair the appliance on your own because this may lead to electric shock, etc.



Prevent the air flow from reaching the gas burners and stove.



Do not operate the unit with wet hands.



It is the user's responsibility to make the appliance grounded according to local codes or ordinances by a licensed person.

Operating condition

The protective device may stop if it is operated beyond allowed temperature range.

If the air conditioner runs in "COOLING" or "DRY" mode with door or window open for a long time when relative humidity is above 85%, dew may drip down from the air outlet.

Features of protector

The protective device will work at following cases:

Turning off the appliance and restarting it at once or changing mode during operation will take at least 3 minutes.

Noise pollution

Install the air conditioner at a place that can bear its weight and ensure the quiet operation.

Inspection

After operating for a long time, the air conditioner should be inspected for the following items:

- Overheat of the power supply cord and plug or even a burnt smell.
- Abnormal operating sound or vibration.
- Water leakage from indoor unit.
- Electrification of metal cabinet.

☑ Stop the air conditioner if any of the previous trouble occurs. It is advisable to have a detailed inspection after using the appliance for 5 years even if none of the above condition occurs.

Features of HEATING mode

Preheating

At the beginning of HEATING operation, the airflow from indoor unit is discharged 2-5 minutes later.

Defrosting

During HEATING operation the appliance will defrost automatically to improve efficiency. This procedure usually lasts for 2-10 minutes. During defrosting, fans stop operation. After defrosting is completed, it returns to "HEATING" mode automatically.

☑ It is hard to increase the room temperature when outdoor temperature is very low. It might take longer time if the working temperature range is not close to the operation limits.

Precautions for using R32 refrigerant

The basic installation work procedures are the same as the conventional refrigerant (R22 or R410A).

However, pay attention to the following points:

⚠ WARNING

1 Transportation of equipment containing flammable refrigerants

Pay attention to the fact that additional transportation regulations may exist with respect to equipment containing flammable gas. The maximum number of pieces of equipment or the configuration of the equipment permitted to be transported together will be determined by the applicable transport regulations.

2 Equipment signs

Signs for similar appliances (containing flammable refrigerants) used in a work area generally are addressed by local regulations and give the minimum requirements for the provision of safety and/or health signs for a work location. All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in accordance with these signs.

The effectiveness of signs should not be diminished by too many signs being placed together. Any pictograms used should be as simple as possible and contain only essential details.

3 Disposal of equipment containing flammable refrigerants

In compliance with national regulations.

4 Storage of equipment/appliances

The storage of equipment should be in accordance with the manufacturer's instructions.

5 Storage of packed (unsold) equipment

Storage package protection should be constructed so that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant.

The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

6 Information on servicing

6.1. Checking the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. To repair the refrigerating system, the following precautions should be complied with prior to conducting work on the system.

6.2. Work procedure

Work shall be undertaken following a controlled procedure so as to minimise the risk of flammable gas or vapour being leaked while the work is being performed.

6.3. General working area

- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.
- The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by controlling flammable material.

6.4. Checking for leakage of refrigerant

- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potential flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

6.5. Fire extinguisher

- If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available.
- Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

6.6. No ignition sources

- No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion.
- All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space.
- Prior to working, the area around the equipment should be checked to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

6.7. Ventilated area

- Ensure that the installation area is outdoors or that it is adequately ventilated before dismantling the system or conducting any hot work.
- Ventilation shall be kept during the period that the work is carried out.
- The ventilation should safely disperse any released refrigerant and preferably discharge it externally into the atmosphere.

6.8. Checking the refrigeration equipment

- Where electrical components are being changed, they shall be fit for the purpose and the correct specification.
- At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.
- The following checks shall be applied to installations using flammable refrigerants:
  - The charge amount is in accordance with the room size within which the refrigerant containing parts are installed;
  - The ventilation machinery and outlets are operating adequately and are not obstructed;
  - If an indirect refrigerating circuit is used, the secondary circuit shall be checked for the leak of refrigerant;
  - Marking of the equipment should be visible and legible. Illegible markings and signs shall be corrected;

- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

6.9. Checking electrical devices

- Repair and maintenance of electrical components shall include initial safety checks and component inspection procedures.
- If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily solved.
- If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used.
- This shall be reported to the owner of the equipment so all parties are advised.
- Initial safety checks shall include:
  - That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
  - That no live electrical components and wiring are exposed while charging, recovering or purging the system;
  - That there is continuity of earth bonding.

7 Repairing sealed components

- During repairs of sealed components, all electrical supplies shall be disconnected prior to any removal of sealed covers, etc.
- If it is absolutely necessary to have an electrical supply for equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn a potentially hazardous situation.
- Particular attention shall be paid to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected.
- This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
- Ensure that the device is mounted securely.
- Ensure that seals or sealing materials have not degraded in such a manner that they no longer serve the purpose of preventing the ingress of flammable atmospheres.
- Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE: *The use of silicone sealants may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.*

8 Repairing intrinsically safe components

- Do not apply any permanent inductive or capacitive loads to the circuit without ensuring that this will not exceed the permissible voltage and current for the equipment in use.
- Intrinsically safe components are the only types that can work in the presence of a flammable atmosphere. The test device shall be at the correct rating.
- Replace components only with parts specified by the manufacturer.
- Other parts may result in the ignition of refrigerant leaked in the atmosphere.

9 Cabling

- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.
- The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

10 Detection of flammable refrigerants

- Under no circumstances shall potential sources of ignition be used in the search or detection of refrigerant leaks.
- A halide torch (or any other detector using a naked flame) shall not be used.

11 Leak detection methods

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants:

- Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need recalibration. (Detection equipment shall be calibrated in a refrigerant-free area.)
- Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.

- Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (maximum 25%) is confirmed.
- Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
- If a leak is suspected, all naked flames shall be removed/ extinguished.
- If a leakage of refrigerant which requires brazing is found, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.
- Oxygen free nitrogen (OFN) shall be purged through the system both before and during the brazing process.

12 Removal and evacuation

- When breaking into the refrigerant circuit to make repairs – or for any other purpose conventional procedures shall be used.
- However, it is important that best practice is followed since flammability is a consideration.
- The following procedure shall be adhered to:
  Remove refrigerant;
  Purge the circuit with inert gas;
  Evacuate;
  Purge again with inert gas;
  Open the circuit by cutting or brazing.
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- The system shall be “flushed out” with OFN to render the unit safe.
- This process may need to be repeated several times.
- Compressed air or oxygen shall not be used for this task.
- Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum.
- This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable working.
- This operation is absolutely vital if brazing operations on the pipe-work are to take place.
- Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

13 Charging procedures

- In addition to conventional charging procedures, the following requirements shall be followed:
  - Ensure that contamination of different refrigerants does not occur when using charging equipment.
  - Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
  - Cylinders shall be kept upright.
  - Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
  - Label the system when charging is complete (if not already).
  - Extreme care shall be taken not to overfill the refrigeration system.
  - Prior to recharging the system pressure shall be tested with OFN.
- The system shall be leak tested on completion of charging but prior to commissioning.
- A follow up leak test shall be carried out prior to leaving the site.

14 Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail.

It is recommended that all refrigerants are recovered safely.

Prior to the task being carried out, an oil and refrigerant sample shall be taken in case that an analysis is required prior to the re-use of recovered refrigerant. It is essential that electrical power is available before the task.

a. Become familiar with the equipment and its operation.

b. Isolate system electrically.

c. Before attempting the procedure ensure that:

- Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
- All personal protective equipment is available and being used correctly;
- The recovery process is supervised at all times by a competent person;
- Recovery equipment and cylinders conform to the appropriate standards.

d. Pump down refrigerant system, if possible.

e. If a vacuum is not possible, use the manifolds so that refrigerant can be removed from various parts of the system.

f. Make sure that cylinder is situated on the scales before recovery.

g. Start the recovery machine and operate in accordance with manufacturer's instructions.

h. Do not overfill cylinders. (No more than 80 % volume liquid charge.)

i. Do not exceed the maximum working pressure of the cylinder, even temporarily.

j. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

k. Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

15 Labelling

Equipment shall be labelled stating that it has been decommissioned and empty of refrigerant.

The label shall be dated and signed.

Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

16 Recovery

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended that all refrigerant is removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed.
- Ensure that the correct number of cylinders for holding the total system charge is available.
- All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant).
- Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order.
- Empty recovery cylinders are evacuated and, if possible, cooled before recovery.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment available and shall be suitable for the recovery of flammable refrigerants.
- In addition, a set of calibrated weighing scales shall be available and in good working order.
- Hoses shall be complete with leak-free disconnect couplings and in good condition.
- Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release.
- Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged.
- Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant.
- The evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.
- When oil is drained from a system, it shall be carried out safely.
- Appliance shall be installed, operated and stored in a room with a floor area larger than X (X see below).
- The installation of pipe-work shall be kept to a room with a floor area larger than X (X see below).
- The pipe-work shall be compliant with national gas regulations.
- When moving or relocating the air conditioner, consult experienced service technicians for disconnection and reinstallation of the unit.

- Do not place any other electrical products or household belongings under indoor unit or outdoor unit. Condensation dripping from the unit might get them wet, and may cause damage or malfunction of your property.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- To keep ventilation openings clear of obstruction.
- The appliance shall be stored in a well-ventilated area where the room size meets requirements as specified for operation.
- The appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater).
- Any person involved with a refrigerant circuit should hold a valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with required specification.
- Service shall only be performed as recommended by the equipment manufacturer.
- Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- The appliance shall be installed and stored so as to prevent mechanical damage.
- Mechanical connectors used indoors shall comply with ISO 14903. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be re-fabricated.
- The installation of pipe-work shall be kept to a minimum.
- Mechanical connections shall be accessible for maintenance purposes.

Required minimum room area X (m^2)

Model	Installation height (m)			
	0.6	1.0	1.8	2.2
3.0HP	37.5	13.5	4.2	2.8
3.5HP	62.5	22.5	6.9	4.6
4.0HP	91.2	32.8	10.1	6.8
5.0HP	120.3	43.3	13.4	8.9
6.0HP	155.7	56.1	17.3	11.6
6.5HP	184.6	66.5	20.3	13.8

Explanation of symbols displayed on the indoor unit or outdoor unit

WARNING *This symbol shows that this appliance uses a flammable refrigerant.*
If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.

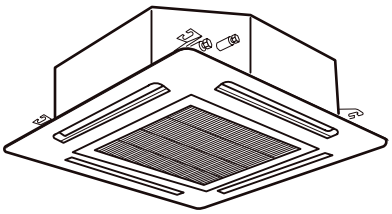
CAUTION *This symbol shows that the operation manual should be read carefully.*

CAUTION *This symbol shows that a service personnel should handle this equipment with reference to the installation manual.*

CAUTION *This symbol shows that information is available such as the operating manual or installation manual.*

Identification of Parts

Indoor Unit



Remote controller (optional)

You can control the air conditioner with the wired controller or remote controller.

It is used for power ON/OFF, setting the operation mode, temperature, fan speed, etc.

There are different types of remote controllers that can be used.

Operation instructions will be further specified in remote controller's manual.

Please read it carefully before using this appliance and keep it for future reference.

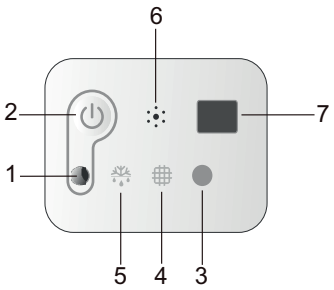
Wired controller

HCWA21NEWH

Remote controller

HCRA31NEWH

Display panel



1 Run indicator (Red)

It lights on in operation. It lights off in SLEEP mode.

2 Emergency switch

The filter clean indicator is reset when the switch is pressed. The unit will be started or stopped once the switch is pressed. The unit will be operated in forced cooling mode if the switch is pressed continuously for more than 5s when the unit is off.

3 Timer indicator (Green)

It lights on when timer is in use. It lights off when timer completes.

4 Filter clean (Yellow)

It lights on when the filter needs to be cleaned.

5 Defrost indicator (Green)

It lights on during defrosting and it lights off when defrosting is completed.

6 Buzzer

It rings when the signal from remote controller is received.

7 Infrared receiver

Receives signal from the remote controller.

NOTE: *The figures in this manual are based on the external view of a standard model. Consequently, the shape may differ for the air conditioner model you have selected. For multi-split type, the unit will not be started when emergency switch is pressed.*

Operation Manual

Before operation

⚠ CAUTION

- *Supply electrical power to system for approximately 6 hours before start-up after long time shutdown.*
- *Do not start the system once power supplied, otherwise, it may cause a compressor failure since it is not heated well.*
- *Make sure that the outdoor unit is not covered with snow or ice. If covered, remove it with hot water (approximately 50ºC). If the water temperature is higher than 50ºC, it will damage the plastic parts.*
- *When the system is started after a long time of shutdown for more than 3 months, it is recommended that the system be checked by your service dealer.*
- *Turn OFF the main switch when the system is stopped for a long period of time. If the main switch is not turned OFF, electricity is consumed because the oil heater is always energised when compressor is stopped.*

1 Special Remarks

- **3-minute protection after compressor stop**

  To protect compressor, it will be off for at least 3 minutes once it is stopped.
- **5-minute protection**

  Compressor must run for at least 5 minutes once it is operated. During these 5 minutes, compressor will not stop even if the room temperature reaches the set temperature unless you use remote controller to turn off the unit (all indoor units can be turned off by user).
- **Cooling operation**

  The fan of the indoor unit will never stop running during the cooling operation. It remains running even if the compressor stops working.
- **Heating operation**

  Heating capacity depends on external factors like outdoor unit temperature. Heating capacity might decrease if outdoor ambient temperature is too low.
- **Anti-freezing function during cooling**

  When the air temperature from the indoor outlet is too low, the unit will run for some time in the ventilating mode, to avoid frost or ice forming in the indoor heat exchanger.
- **Cold air prevention**

  During several minutes after the heating mode is started, the fan of the indoor unit will not run until the heat exchanger of the indoor unit reaches a certain temperature to prevent cold draft.
- **Defrosting**

  When the outdoor temperature is too low, frost or ice may generate on the outdoor heat exchanger, affecting heating performance. When this happens, the defrosting system of the air conditioner will operate. At the same time the fan in the indoor unit stops (or runs at a very low speed in some cases) to prevent cold draft. After defrosting is over, the heating operation and the fan speed resume.
- **Blowing out the residual heating air**

  When air conditioner is stopped during normal operation, the fan motor would run at low speed for a while to blow out residual heating air.
- **Auto restart from Power Break**

  When the power supply is recovered after power break, all presets are still effective and the air conditioner will run according to the previous setting.

2 Setting of Automatic Swing Louver

For more details, please refer to the Manual of Remote Controller.

⚠ CAUTION

Do not adjust the air louver by hand, to avoid damage to the louver mechanism.

3 Filter Cleaning

⚠ CAUTION

Do not operate the system without air filter to protect the indoor unit heat exchanger against being clogged.
Turn OFF the main power switch before taking filter out. (The previous operation mode may appear.)

3.1 Reset the filter alarm

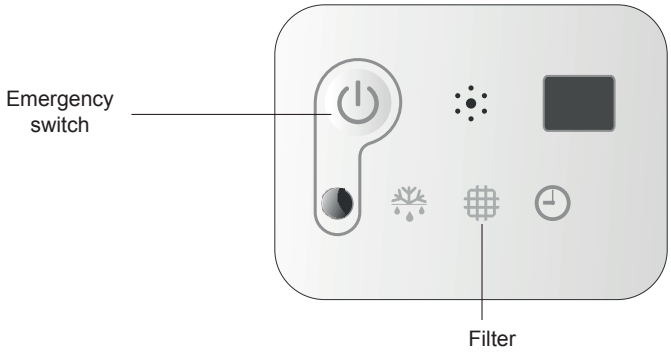
Step 1

It is time to clean the filter when the filter icon is turned on.

Step 2

Cancel the filter alarm.

Press Emergency switch to return to the standard state.



3.2 Take Out the Filter

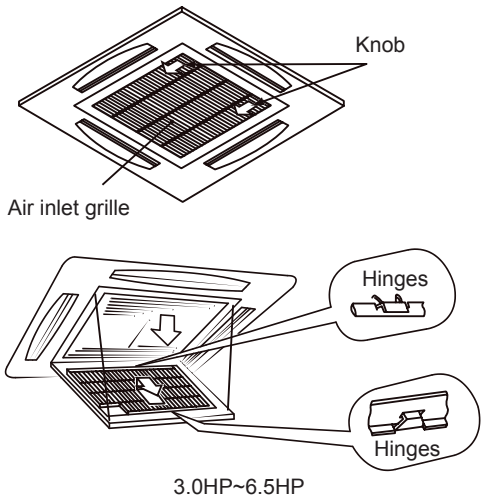
Take out the air filter according to the following steps.

Step 1

Open the air inlet grille after pushing the two knobs as the arrow mark.

Step 2

Take out the air filter from the air inlet grille by supporting the air grille and lifting the air filter after detaching the filter from the hinges.



3.0HP~6.5HP

3.3 Clean the Filter

Clean the air filter according to the following steps.

Step 1

Use a vacuum cleaner or let water flow onto the air filter for removing the dirt from the air filter.

⚠ CAUTION

Do not use hot water with temperature higher than 40ºC.

Step 2

Dry the air filter in order to remove excess moisture.

3.4 Reset of Filter Indication

After cleaning the air filter, press the “Emergency switch” button. The FILTER indication will disappear and the next filter cleaning time will be set.

4 Troubleshooting

⚠ CAUTION

When drain water overflows from the indoor unit, stop the operation and contact your dealer.
When you smell or see white smoke coming out of the unit, turn OFF the main power supply and contact your dealer.

4.1 If Trouble Still Exists

If the trouble still exists even after checking the following, contact your dealer and inform them of the following items:

(1) Unit Model Name

(2) Content of Trouble

4.2 No Operation

Check whether the SET TEMP is set at the correct temperature.

4.3 Not Cooling or Heating Properly

- Check for obstruction of air flow of outdoor or indoor units.
- Check if there are too many heating sources in the room.
- Check if the air filter is clogged with dust.
- Check if the doors or windows are open.
- Check if the temperature condition is within the operation range.

4.4 This is Not Abnormal

- **Odour from Indoor Unit**

  Unpleasant odour diffuses from indoor unit after a long period of shutdown. Clean the air filter and panels or allow a good ventilation.
- **Sound from Deforming Parts**

  When start or stop the system, a sound might be heard. However, this is due to thermal deformation of plastic parts. It is not abnormal.
- **Steam from Outdoor Heat Exchanger**

  During defrosting operation, ice on the outdoor heat exchanger is melted, resulting in steam.
- **Dew on Air Panel**

  When the cooling operation continues for a long period of time under high humidity conditions, dew can form on the air panel.
- **Refrigerant Flow Sound**

  While the system is being started or stopped, the refrigerant flow sound may be heard.

Installation and Maintenance

1 Safety Notice

⚠ WARNING

- *Installation should be performed by qualified personnel. (Improper installation may cause water leakage, electrical shock or fire.)*
- *Install the unit according to the instructions given in this manual. (Incomplete installation may cause water leakage, electrical shock or fire.)*
- *Be sure to use the supplied or specified installation parts. (Using other parts may cause unit looseness, water leakage, electrical shock or fire.)*
- *Install the air conditioner on a solid base that can support the unit weight. (An inadequate base or incomplete installation may cause injury due to falling off from the base.)*
- *Electrical work should be carried out in accordance with the installation manual and the local and national electrical wiring rules or code. (Insufficient capacity or incomplete electrical work may cause electrical shock or fire.)*
- *Be sure to use a dedicated power circuit. (Never use the power supply shared by another appliance.)*
- *For wiring, use a cable long enough for the entire distance, and do not use an extension cord.*
- *Do not put other loads on the power supply, and please use a dedicated power circuit.*
- *Use the specified types of wires for electrical connections between the indoor and outdoor units. (Firmly clamp the interconnecting wires so that the terminals receive no external stresses.)*
- *Incomplete connections or clamping may cause terminal overheating or fire.*
- *After establishing connection between all the wires, fix the cables to prevent undue force on the electrical covers or panels. (Install covers over the wires, incomplete cover installation may cause terminal overheating, electrical shock or fire.)*
- *When installing or relocating the system, be sure to keep the refrigerant circuit free from air. (Air in the refrigerant circuit may cause an abnormal pressure rise or rupture, resulting in injury.)*
- *If any refrigerant leakage occurs during the installation work, ventilate the room.*
- *After all installations are completed, make sure that there is no refrigerant leakage. (The refrigerant produces a toxic gas if exposed to flames.)*
- *When carrying out piping connection, do not to let air substances other than the specified refrigerant get into refrigeration cycle. (Otherwise, it will cause decreased performance, abnormal high pressure in the refrigeration cycle, explosion and injury.)*
- *Make sure that the installation has a proper earth connection. Do not ground the unit to a utility pipe, arrester, or telephone grounding. Incomplete grounding may cause electrical shock. (A high surge current from lightning or other sources may cause damage to the air conditioner.)*
- *An earth leakage circuit breaker may be required depending on the site condition to prevent electrical shock.*
- *Disconnect the power supply before wiring, piping, or checking the unit.*
- *When moving the indoor unit and outdoor unit, please be careful, and do not incline the outdoor unit over 45 degree. Pay attention to the sharp edges of the air conditioner to avoid any injury.*
- *During remote controller installation, ensure that the length of the wire between the indoor unit and remote controller is within 40 meters.*

⚠ CAUTION

- *Do not install the air conditioner in a place where there is a danger of exposure to flammable gas leakage. (If the gas leaks and builds up around the unit, it may catch fire.)*
- *Establish drain piping according to the instructions in this manual. (Inadequate piping may cause flooding.)*
- *Tighten the flare nut according to the specifications with a torque wrench. (If the flare nut is tightened beyond specified torque, the flare nut may crack after a long time and cause refrigerant leakage.)*

2 Tools and Instruments for Installation

Number	Tool	Number	Tool
1	Standard screwdriver	8	Knife or wire stripper
2	Vacuum pump	9	Leveler
3	Charge hose	10	Hammer
4	Pipe bender	11	Churn drill
5	Adjustable wrench	12	Pipe expander
6	Pipe cutter	13	Inner hexagon spanner
7	Cross head screwdriver	14	Measuring tape

3 Installation of the Indoor Unit

⚠ DANGER

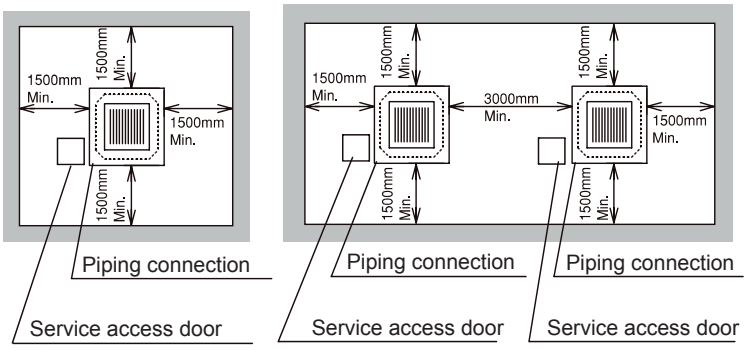
Do not install the indoor unit in a flammable environment to avoid fire or an explosion.

⚠ WARNING

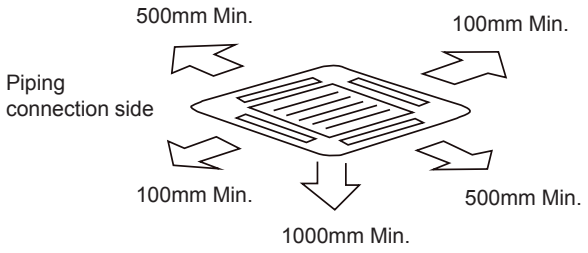
- *Check to ensure that the ceiling slab is strong enough. Otherwise the indoor unit may topple, and fall down causing injury.*
- *Do not install the indoor unit outdoors. If done, an electric hazard or electric leakage will occur.*

3.1 Initial Check

- Install the indoor unit with a proper clearance around it for operation and maintenance space, as shown in Fig.3.1.
- Provide a service access door near the unit piping connection area on the ceiling.
- Ensure that the ceiling has a sufficient strength to hang the indoor unit.
- Check that the ceiling surface is flat for the air panel installation work.



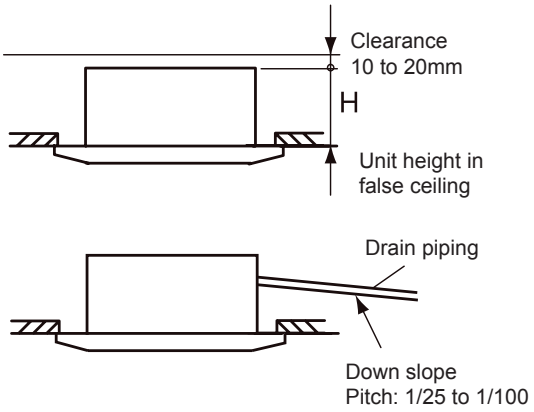
Distance from Wall Side



Service space

Fig. 3.1 Space around Indoor Unit

- Select the installation location as shown in Fig 3.2:
  - **a.** Minimum Space
  - **b.** Down Slope Pitch of Drain Piping: 1/25~1/100



(Unit: mm)

Model	H
3.0HP~4.0HP	248
5.0HP~6.5HP	298

Fig. 3.2 Installation Location of Indoor Unit

- Consider the air distribution from the indoor unit to the space of the room, and select a suitable location so that uniform air temperature distribution can be obtained in the room. It is recommended that the indoor unit should be installed 2.5 to 3 meters high from the floor level.
- Do not install flammable parts in the service space for the indoor unit.
- Avoid obstacles which may hamper the air intake or the air discharge flow.
- Do not install the indoor unit in a machinery shop or kitchen where oil vapour 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 severe case, break the plastic parts of the indoor unit.
- Pay attention to the following points when the indoor unit is installed in a hospital or other facilities where there are electromagnetic waves from medical equipment:
  - **a.** Do not install the indoor unit where the electromagnetic wave is directly radiated to the electrical box, remote control cable or remote control switch.
  - **b.** Install the indoor unit and components at least 3 meters away from the electromagnetic wave radiator.
  - **c.** Prepare a steel box and install the remote control switch in it. Prepare a steel conduit tube and wire the remote control cable in it. Then, connect the ground wire with the box and the tube.
  - **d.** Install a noise filter when the power supply emits harmful noises.
- To avoid any corrosive action to the heat exchanger, do not install the indoor unit in an acid or alkaline environment. If the indoor unit has to be installed in such environments, use corrosion-proof type unit.

⚠ WARNING

Ensure that the number calculated below is lower than or equal to 0.3kg/m³. Otherwise it may cause danger situation if the refrigerant in the outdoor unit leaks into the room where the indoor unit is installed.

$$\frac{\textbf{(Total Refrigerant Quantity per one Outdoor Unit)}}{\textbf{(Volume of the room where the Indoor unit is installed)}} \leq \textbf{0.3kg/m}^3$$

3.2 Installation

3.2.1 Opening of False Ceiling and Suspension Bolts

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

Pattern board for installation is printed on the packing. Cut off the pattern for opening the false ceiling and installation of suspension bolts.

2 Cut out the area for the indoor unit in the false ceiling and install suspension bolts, as shown in Fig. 3.3.

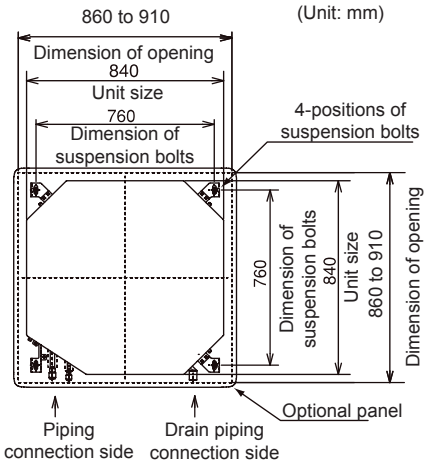


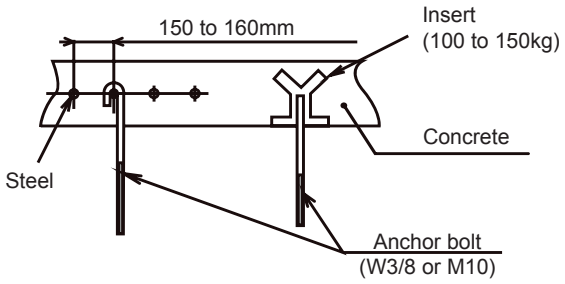
Fig. 3.3 Opening of False Ceiling and Suspension Bolts

3 Ensure that the ceiling is in horizontally level, otherwise drainage flow cannot be achieved.

4 Strengthen the opening parts of the false ceiling.

5 Mount suspension bolts, as shown in Fig. 3.4.

- For Concrete Slab



- For Steel Beam

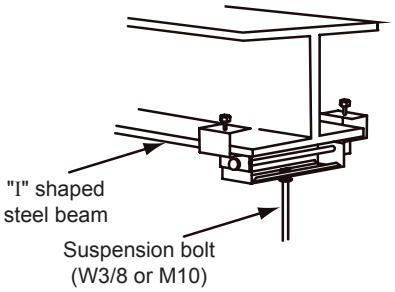
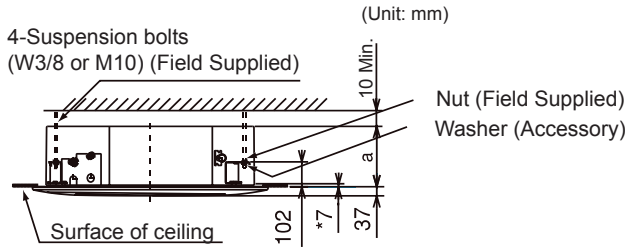


Fig. 3.4 Mounting Suspension Bolts

3.2.2 Mounting Position of the Indoor Unit



* Indicates the dimension between a lower face of indoor unit and surface of ceiling.

Model	a
3.0HP~4.0HP	248
5.0HP~6.5HP	298

Fig. 3.5 Mounting Position

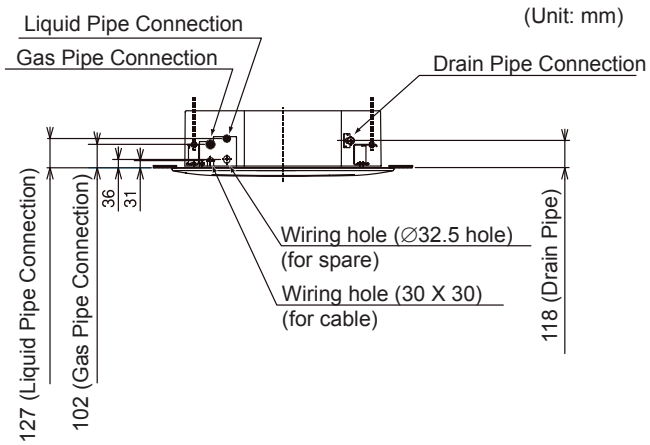
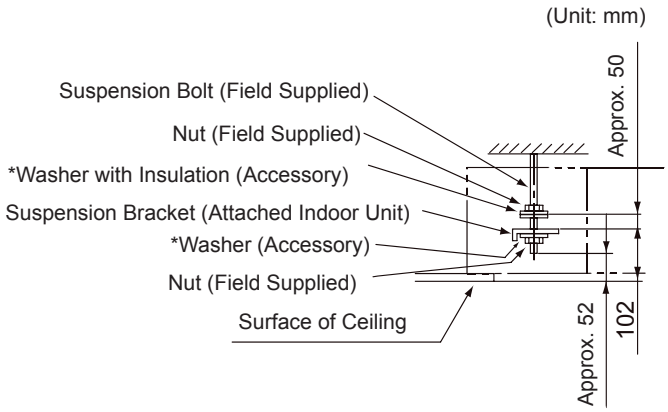


Fig. 3.6 Indoor Unit and Air Panel

3.2.3 Mounting the Indoor Unit

1 Mount the nuts and washers into the suspension bolts.



** Place the washer so that the surface with insulation faces downwards.*

Fig. 3.7 Mounting Nuts and washer

2 Lift the indoor unit by hoist, and do not apply any force on the drain pan.

3 Secure the indoor unit using the nuts and washer.

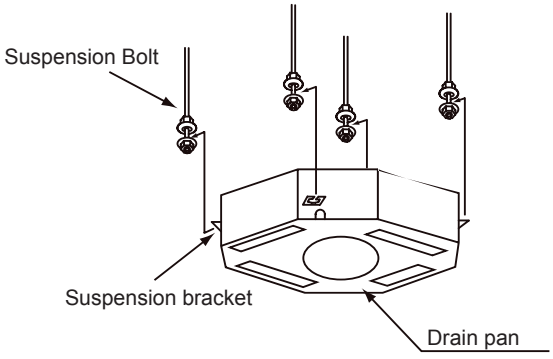


Fig. 3.8 Mounting the Indoor Unit

NOTE: *If a false ceiling is already constructed, complete all piping and wiring work inside the ceiling before fixing the indoor unit.*

3.2.4 Adjusting the Space between Indoor Unit and False Ceiling Opening

⚠ CAUTION

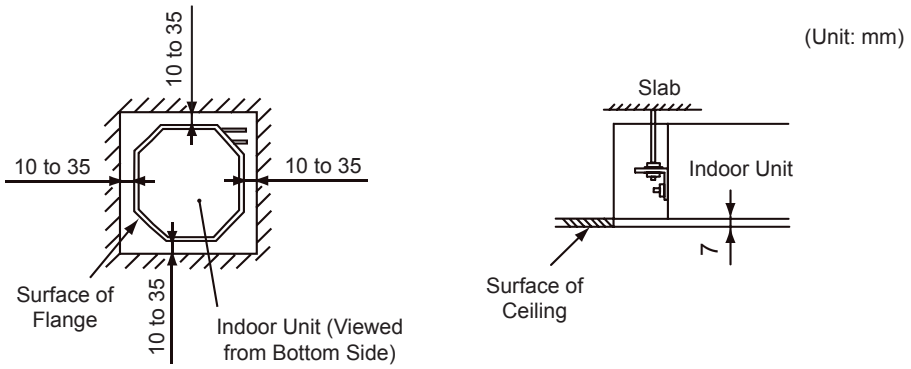
- *Check the level of the drain pan using a leveler to avoid incorrect operation of the drain discharge mechanism in the indoor unit. The drain piping side of the indoor unit must be approximately 5mm lower than the other part.*
- *Tighten the nuts of the suspension brackets after the adjustment is completed. Apply LOCK-TIGHT paint* to the bolts and nuts to prevent them from loosening, otherwise, abnormal noises or sounds may occur and the indoor unit may fall down.*

LOCK-TIGHT paint*: Paint the lock bolts and nuts. Adjust the indoor unit to the correct position while checking with the scale (factory-supplied).

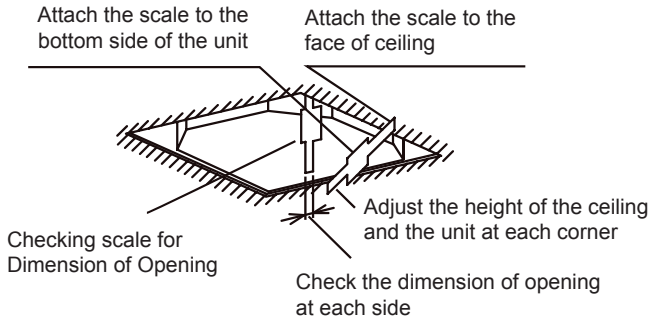
1 Pattern board for installation is attached with the packing.

2 Adjust the position of indoor unit, according to the dimensions.

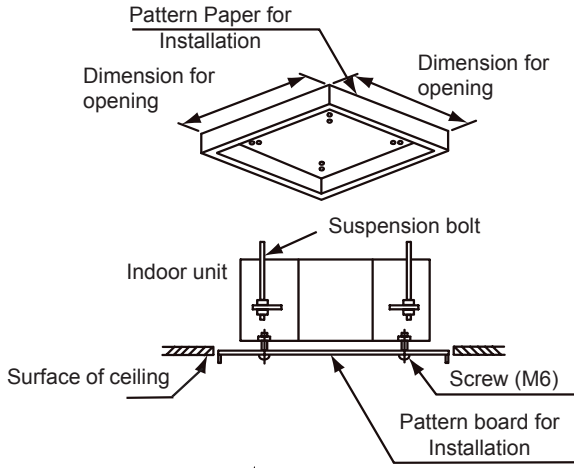
(Unit: mm)



a. For Ceiling already Completed with Panels



b. For Ceiling not Completed with Panels yet



3.3 Installation Details for Air Panels

- Installation work for air panel should be done according to the Installation Manual for Air Panel.
- Ensure that the connector between indoor unit and the air panel is properly connected.

4 Refrigerant Pipe

⚠ DANGER

Use refrigerant R32 in the refrigerant cycle (refer to outdoor nameplate). Do not charge oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air-tight test. This type of gases are extremely dangerous, which may cause an explosion. It is recommended to use nitrogen to perform these tests.

4.1 Pipe Material

1 Prepare locally-supplied copper pipes.

2 Select the piping size from the following table.

Model	Gas pipe (mm)	Liquid pipe (mm)
3.0HP~3.5HP	∅15.88	∅9.52
4.0HP~6.5HP	∅19.05	∅9.52

3 Select clean copper pipes. Make sure that there is no dust and moisture inside. Blow the pipes with nitrogen or dry air to remove dust and foreign materials before connecting pipes.

4.2 Piping Connection

1 Position of piping connection is shown in Fig. 4.1 (Indoor Unit).

(Unit: mm)

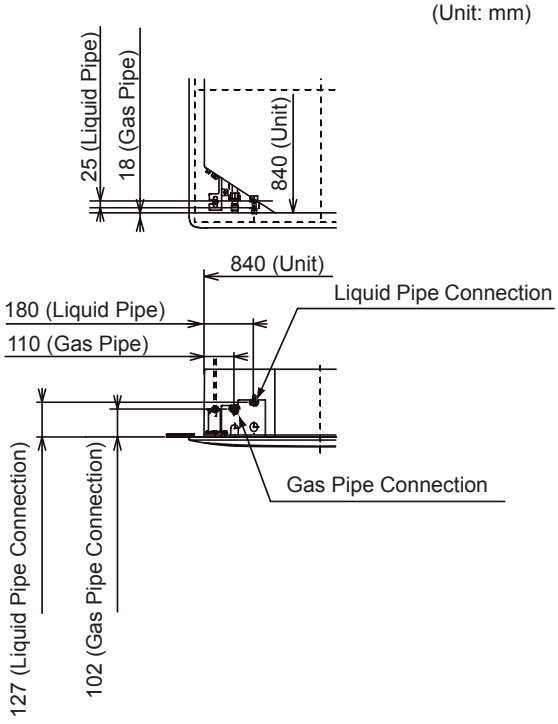


Fig. 4.1 Position of Piping Connection

2 When tightening the flare nut, use two spanners as shown in Fig. 4.2.

Pipe Size (mm)	Tightening Torque (Nm)
∅6.35	20
∅9.52	40
∅12.7	60
∅15.88	80
∅19.05	100

Fig. 4.2 Tightening Work of Flare Nut

5 Drain Piping

⚠ CAUTION

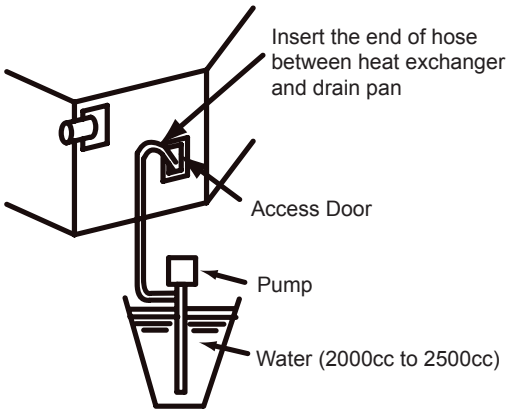
- *Do not create an upper-slope or rise for the drain piping, since drain water can flow back to the indoor unit causing leakage into the room when the system operation is stopped.*
- *Do not connect the drain pipe with sanitary or sewage piping or any other drainage piping.*
- *When the common drain piping is connected with other indoor units, the connection position of each indoor unit must be higher than the common drain pipe, meanwhile, the pipes must be large enough according to the unit size and number of nuts.*
- *After performing drain piping work and electrical wiring, check to ensure that water flows smoothly as in the following procedure.*
- *Checking the Float Switch:*

  a Switch ON the power supply.

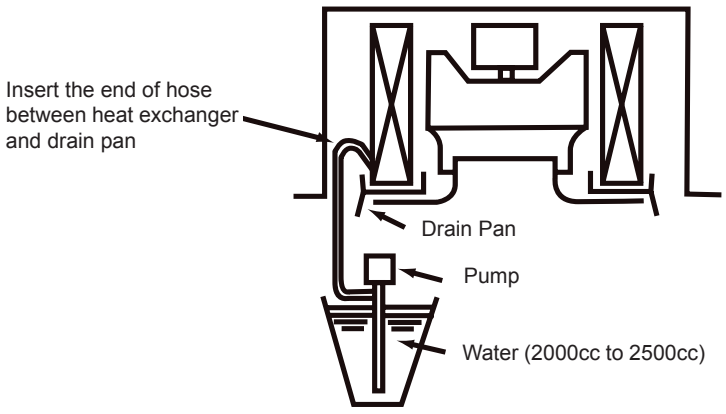
  b Pour 1.8 liters of water into the drain pan.

  c Check to ensure that the water flows smoothly or whether no water leakage occurs. When water cannot be found at the end of the drain piping, pour another 1.8 liters of water into the drain.

  d Switch ON the power supply and press the RUN/STOP button.
- *In case of pouring water through the access door.*

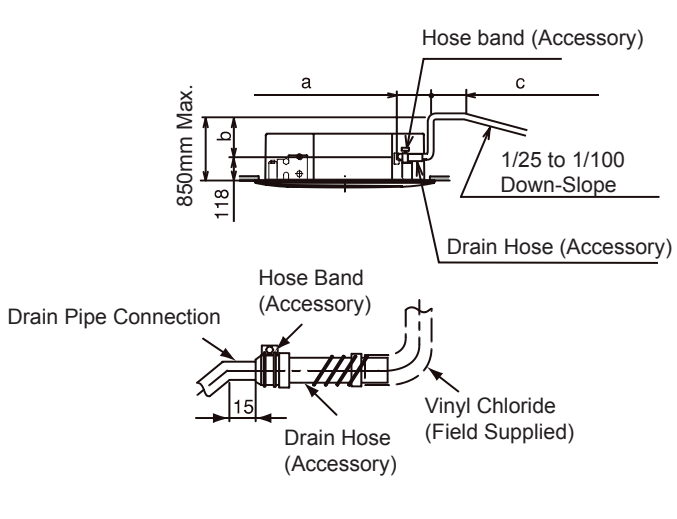


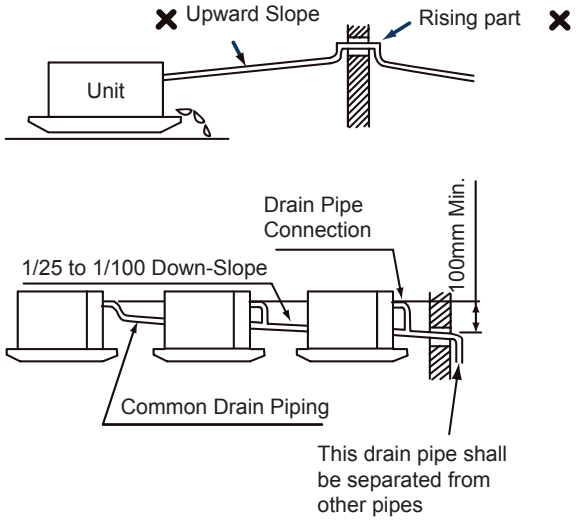
- *In case of pouring water through the air outlet.*



1 Prepare a polyvinyl chloride pipe with a 32mm outer diameter.

2 Fasten the tubing to drain hose with the adhesive agent and factory-supplied clamp. The drain piping must be performed with a down-slope pitch of 1/25 to 1/100.



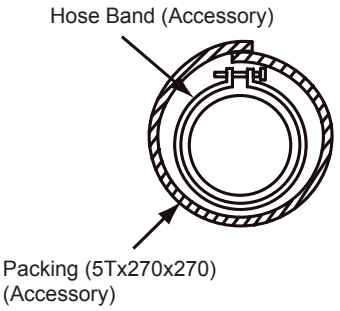


* Total length of a+b+c(mm) : a≤300, b≤850, c≤50, a+b+c≤1100

* In case of lifting the drain pipe at outlet part, perform the drain piping work as shown in the above figure.

3 Insulate the drain pipe after connecting the drain hose.

(Unit: mm)



6 Electrical Wiring

⚠ WARNING

- *Turn OFF the main power switch to the indoor unit and the outdoor unit before electrical wiring work or a periodical check is performed.*
- *Check to ensure that the indoor fan and the outdoor fan have stopped before electrical wiring work or a periodical check is performed.*
- *Protect the wires, drain pipe, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and at the worst, a fire will occur.*
- *Check the item below before turning ON the main switch.*
- *Tighten screws according to the following torque.*

  M3.5: 1.2Nm

  M5: 2.0~2.4Nm

⚠ CAUTION

- *Wrap the accessory packing around the wires, and plug the wiring connection hole with the seal material to protect the product from any condensate water or insects.*
- *Tightly secure the wires with the cord clamp inside the indoor unit.*
- *Secure the cable of the remote control switch using the cord clamp inside the electrical box.*

6.1 General Check

1 Make sure that the field-selected electrical components (main power switches, circuit breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data given in “7. Electrical Installation”. Make sure that the components comply with National Electrical Code (NEC).

2 Check to ensure that the power supply voltage is within ±10% of the rated voltage.

3 Check the capacity of the electrical wires. If the power source capacity is too low, the system cannot be started due to the voltage drop.

4 Check to ensure that the ground wire is connected.

5 Power source main switch: install a multi-pole main switch with a space of 3.5mm or more between each phase.

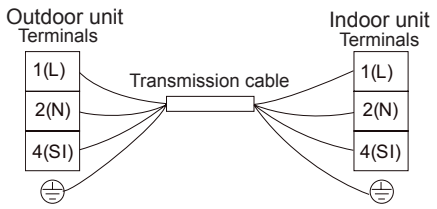
6.2 Electrical Wiring Connection

The intermediate connection between the indoor unit and the air panel should be conducted by referring to Installation Manual for Air Panel.

1 Connect the power supply and earth wires to the terminals in the electrical box.

2 Connect the wires between the indoor unit and the outdoor unit to the terminals in the electrical box.

Electrical Wiring Diagram



7 Electrical Installation

⚠ WARNING

- *Use an ELB (Electric Leakage Breaker). If not used, it will cause an electric shock or a fire.*
- *Do not operate the system until all the check points have been cleared.*

  a Ensure that the insulation resistance is more than 2MΩ, by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired.

  b Ensure that the stop valves of the outdoor unit are fully opened and then start the system.

Model	Transmission Cable Size
	EN60335-1
3.0/3.5/4.0/5.0/6.0/6.5HP	4x1.5mm^2

NOTE:

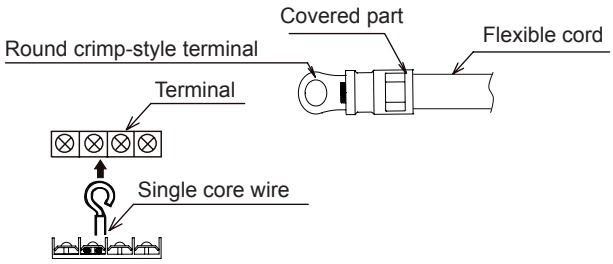
1 Follow local codes and regulations when selecting field wires, and all above are the minimum size.

2 The wire sizes marked in the table are selected at the maximum current of the unit according to the European Standard, EN60335-1. Use the wires which are not lighter than the ordinary polychloroprene sheathed flexible cord (code designation H07RN-F).

When connecting the terminal block with flexible cord, make sure to use the round crimp-style terminal for connection to the power supply terminal block.

Place the round crimp-style terminals on the wires up to the covered part and secure them in place.

When connecting the terminal block with a single core wire, be sure to perform curing.



3 When transmission cable length is more than 15 meters, a larger wire size should be selected.

4 Use a shielded cable for the transmitting circuit and connect it to ground.

5 If power cables are connected in series, add each unit maximum current and select wires below:

Selection According to EN60335-1

Current i (A)	Wire Size (mm^2)
i≤6	0.75
6<i≤10	1
10<i≤16	1.5
16<i≤25	2.5
25<i≤32	4
32<i≤40	6
40<i≤63	10
63<i	*

* If current exceeds 63A, do not connect cables in series.

8 Test Run

Please perform test run according to installation manual of outdoor unit.

HITACHI

Correct Disposal of this product
This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

Specifications in this document are subject to change without notice, in order that Hitachi-Johnson Controls Air Conditioning, Inc. may bring the latest innovations to their customers.

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