HITACHI

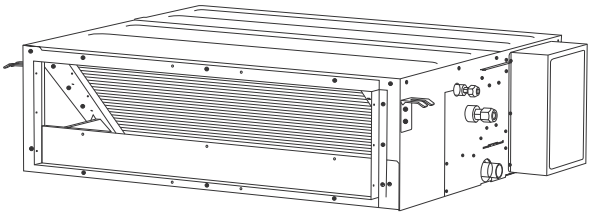
INSTALLATION & MAINTENANCE MANUAL

PRIMAIRY
MONO SPLIT
DC-INVERTER SERIES

INDOOR UNITS

DUCTED UNIT

RPIL-3.0UFE1NH
RPIH-3.5UFE1NH
RPIH-4.0UFE1NH
RPIH-5.0UFE1NH
RPIH-6.0UFE1NH
RPIH-6.5UFE1NH



Cooling & Heating

HO2019290HA

Contents

Caution Statements

Alert Symbols

⚠ DANGER	***The symbol refers to a hazard which can result in severe personal injury or death.***
⚠ WARNING	*The symbol refers to a hazard or an unsafe practice which may result in severe personal injury or death.*
⚠ CAUTION	*The symbol refers to a hazard or an unsafe practice which may result in minor personal injury, product or property damage.*
NOTE	*It refers to remarks and instructions to the operation, maintenance and service.*

- 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 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 should be supervised to ensure that they do not play with the appliance.*
- *Means for providing complete disconnection in all poles, must be incorporated in the fixed wiring in accordance with the wiring regulations.*

- **Read this manual carefully before using this air conditioner. If you still have any difficulties or problems, consult your dealer for help.**
- **The air conditioner is designed to provide you with comfortable room conditions. Use this unit only for its intended purpose as described in this instruction manual.**

Caution Statements

⚠ WARNING

- *Never use gasoline or other flammable gas near the air conditioner to avoid danger.*
- *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.*

⚠ CAUTION

- *Do not turn the air conditioner on and off from the main power switch. Use the ON/OFF operation button.*
- *Do not stick anything into the air inlet and air outlet of both the indoor and outdoor units. This is dangerous because the fan is rotating at a high speed.*
- *Do not cool or heat the room too much if babies or invalids are present.*
- *Type and rating of circuit breakers / ELB are detailed below.*
- *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.*
- *The information of dimensions of the space necessary for correct installation of the appliance, including the minimum permissible distances to adjacent structures, is detailed below.*
- *The range of external static pressures for ducted appliances is detailed below.*

NOTE

- ***Storage condition: Temperature -25~60ºC***
  Humidity 30%~80%
- ***The numbers in the model represent the cooling capacity (HP).***
- ***For example, 3.0HP represents RPIL-3.0UFE1NH.***
- ***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 and should remain with it.***

Safety Precautions

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 are generally 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 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 the following 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 capacitance 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 searching 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 re-calibration. (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, 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 de-commissioned 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 that is 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.*

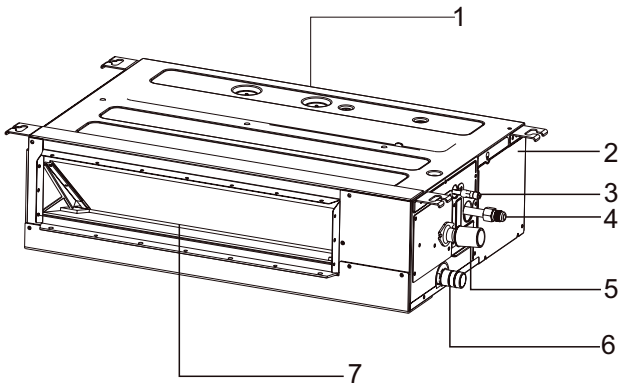
CAUTION *This symbol shows that a service personnel should handle this equipment with reference to the installation manual.*

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

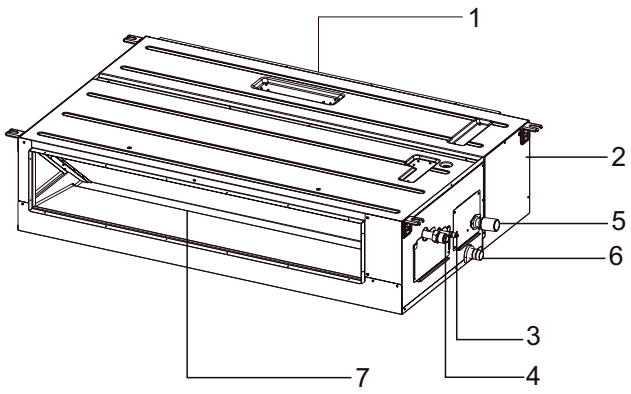
Composition of the Air conditioner

Indoor unit

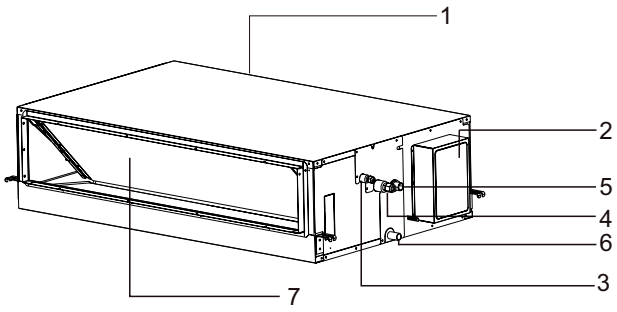
3.0HP



3.5HP~4.0HP



5.0HP~6.5HP



1 Air inlet
2 Electric box
3 Refrigerant pipe (Liquid)
4 Refrigerant pipe (Gas)
5 Drain pipe (Connect with pump)
6 Drain pipe
7 Air outlet

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 instruction 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

NOTE: ***The figures are based on the external views of the standard model. Consequently, the shape may differ for the air conditioner model you have selected.***

Operation Manual

◆ 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 the 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 in cooling operation. It continues to operate 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 on 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 stopping the air conditioner in normal operation, the fan motor will run with low speed for a while to blow out the 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.

◆ 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.

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

2 No Operation

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

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 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 melts 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.

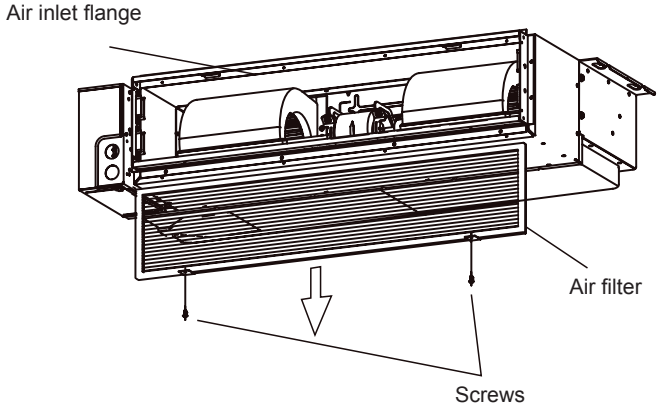
◆ Filter Cleaning

⚠ CAUTION

Turn OFF the main power switch before taking filter out.

1 Take out the filter

Remove the fixed screws of the filter and pull the filter down along the rail of the flange as indicated in the figure below.



2 Clean the filter

Clean the air filter with a vacuum cleaner or clean water.

a. Use a vacuum cleaner with the air inlet side facing the nozzle of the vacuum.

b. Use clean water with the air inlet back side facing the faucet.

If there is more dirt on the air filter, please use a soft brush and neutral detergent to clean it and the dry the water and set it in a cool place to dry.

⚠ CAUTION

- *Do not use hot water with a temperature higher than 40ºC.*
- *Do not use light oil essence, diluent, powder or other similar solvents for cleaning.*
- *Air filter can remove dust or other particles in the air. If blocked, the performance of air conditioner will be greatly reduced. therefore, during long-term use, always clean the air filter.*
- *If the indoor machine is installed in the place with a lot of air dust, the frequency of cleaning the air filter should be increased.*

3 Reinstall the filter

Reinstall the air filter in the reverse order of the steps described above.

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

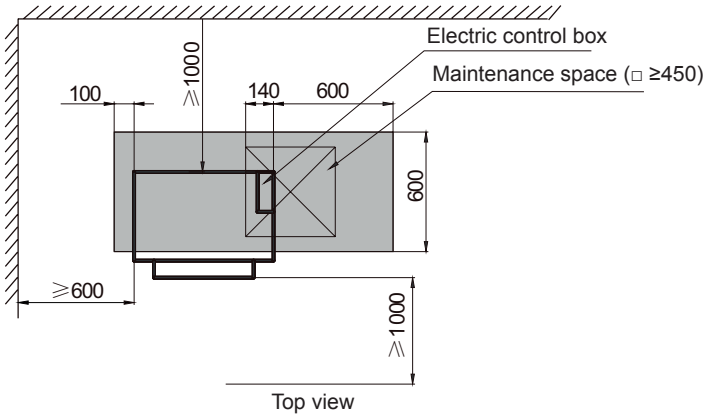
⚠ CAUTION

During installation, do not damage the insulation material on the surface of the indoor unit.

3.1 Initial Check

⚠ CAUTION

- *When moving the unit after unpacking, make sure to lift it by holding its lifting lugs. Do not exert any pressure on other parts, especially on refrigerant piping, drain piping and flange parts.*
- *Wear protective equipment when installing the unit.*

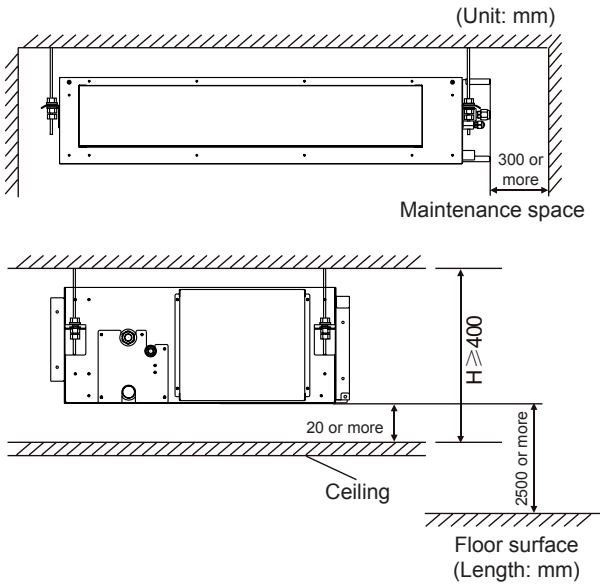


1 Reserve necessary maintenance space when the ceiling is not detachable.

2 The location of the maintenance port should ensure removal of the electric box cover and internal components is easy to perform.

3.0HP~4.0HP

Fig. 3.1.1



5.0HP~6.5HP

Fig. 3.1.2

- Optimum air distribution must be ensured.
- The air path must not be blocked.
- Condensation has to drain properly.
- The ceiling must be strong enough to bear the weight of the indoor unit.
- The false ceiling must not incline.
- Ensure sufficient clearance for maintenance and servicing. (See Fig. 3.1.1, Fig. 3.1.2.)
- Piping between the indoor and outdoor units should be within the allowable limits. (Refer to the installation manual of the outdoor unit.)
- The indoor unit, outdoor unit, power supply wiring and transmission wiring should be kept at least 1 meter away from televisions and radio to prevent image interference and noise in these electrical appliances. (Noise may be generated depending on the conditions under which the electric wave is generated, even if a one-meter distance is maintained.)
- Do not install the indoor unit in a machinery room or kitchen where vapor from oil or its mist flows to the indoor unit. The oil will deposit on the heat exchanger, thereby reducing the performance of the indoor unit, and may deform and, in the worst case, break the plastic parts of the indoor unit.
- Use suspension bolts to install the unit and check whether the ceiling is strong enough to support the weight of the unit. If there is a risk that the ceiling is not strong enough, reinforce the ceiling before installing the unit. For bottom intake (5.0HP~6.5HP), replace the chamber lid and the intake-side flange in the procedure listed in the figures below.

1 Remove the intake-side flange, then remove the chamber lid. Refer to Fig. 3.1.3 for directions.

2 Reattach the removed chamber lid in the orientation shown in Fig. 3.1.4.

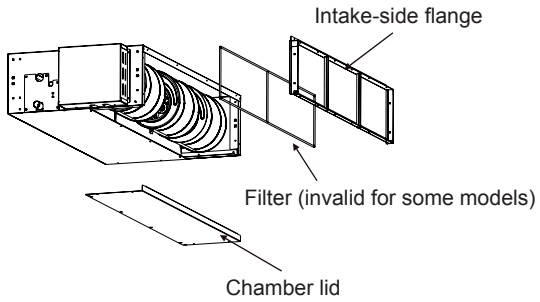


Fig. 3.1.3

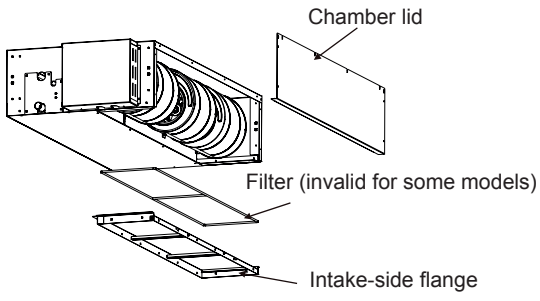


Fig. 3.1.4

3.2 Installation

3.2.1 Suspension bolts

1 Consider the pipe direction, wiring and maintenance carefully, and choose the proper direction and location for installation.

2 Install the suspension bolts as shown in Fig. 3.2.1 below.

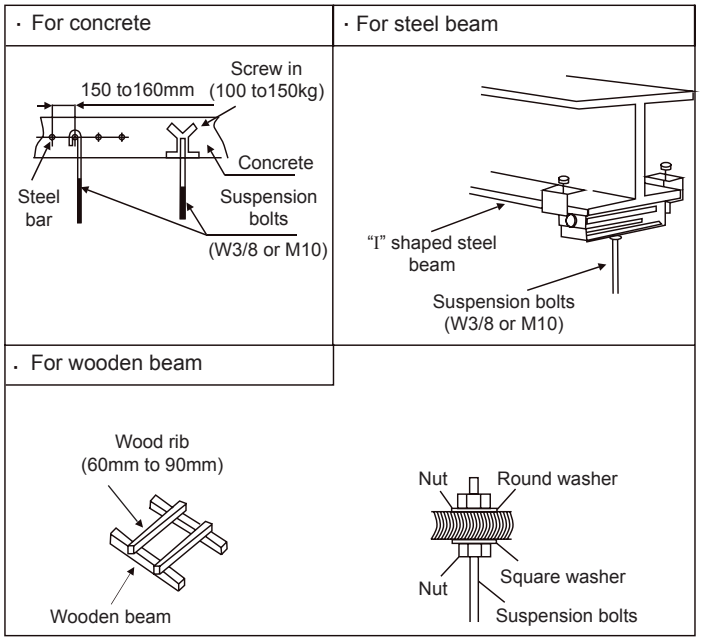
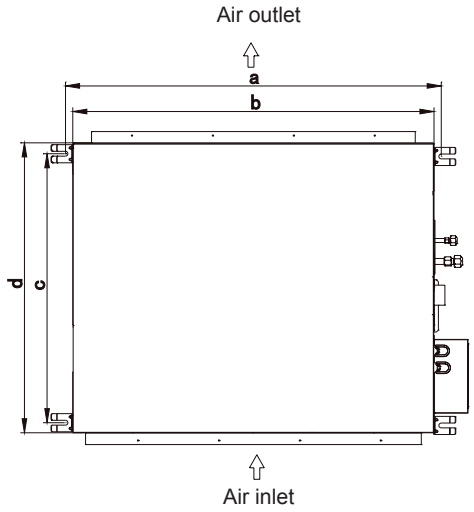


Fig. 3.2.1 Fixing the suspension bolts

3.2.2 Position of the suspension bolts and pipes

1 Mark the positions of suspension bolts, refrigerant pipes and drain pipes.

2 The dimensions are shown below.



(Unit:mm)

Model	a	b	c	d
3.0HP	1231	1180	375	447
3.5/4.0HP	1177	1140	666	720
5.0/6.0/6.5HP	1334	1300	756	800

Fig. 3.3 Suspension bolts

3.2.3 Installation of the indoor unit

The installation of the indoor unit is shown in Fig. 3.4.

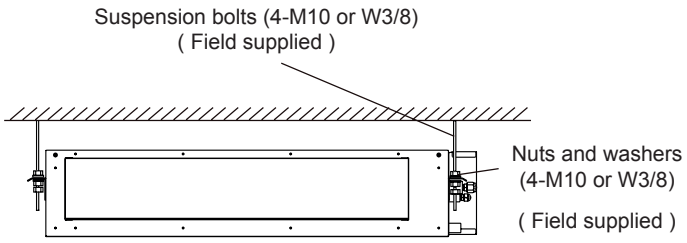


Fig. 3.4 Installation of the indoor unit

1 Fix the suspension bolts and the nuts as shown in Fig. 3.5. Nuts are fixed by four bolts.

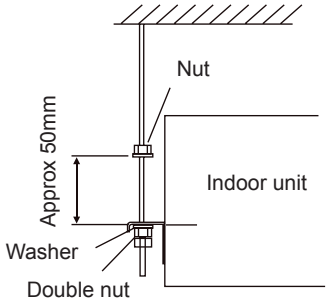


Fig. 3.5 Suspension bolts and nuts

2 Install the indoor unit

- As shown in the following figure, place the left hanger bracket on the nuts and washers of the suspension bolts.
- Make sure that the left hanger bracket has been fixed on the nuts and washers securely. Install the right hanger bracket suspension hook on the nuts and washers.

  (When installing the indoor unit, you can slightly loosen the suspension bolts.)

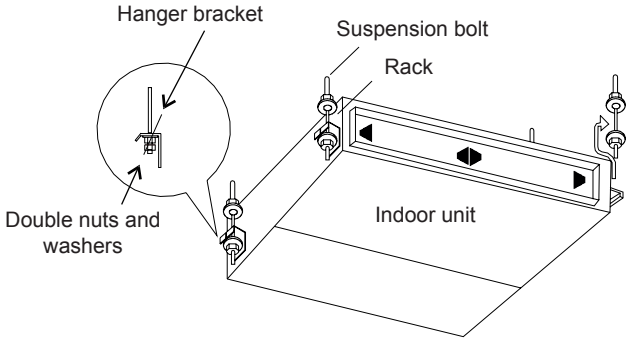


Fig. 3.6

3.2.4 Adjusting of the unit level

1 Check to ensure that the foundation is flat, taking into account the maximum foundation gradient.

2 The unit should be installed that the drainage side is slightly (0mm~5mm) lower than other sides for adequate drainage.

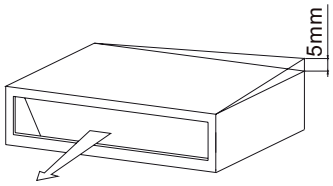


Fig. 3.7

3 After the adjustment, tighten the nuts and smear the thread locker on the suspension to prevent the nuts from loosening.

⚠ CAUTION

1 During the installation, please cover the unit with the plastic cloth to keep it clean.

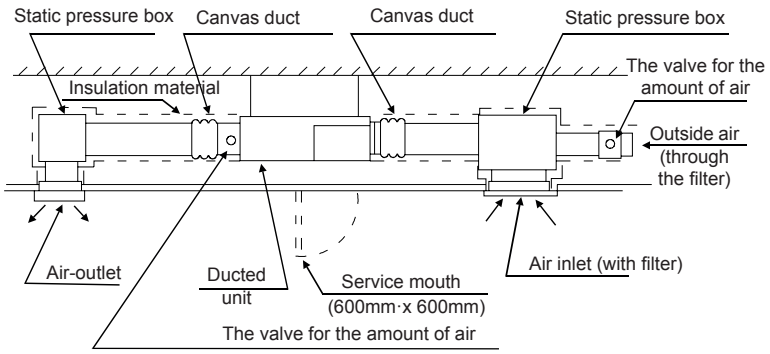
2 Make sure that the unit is installed levelled by using a level or a plastic tube filled with water in instead of a level. Adjust the top surface of the unit to the surface of the water at both ends of the plastic tube and adjust the unit horizontally. (One thing to watch out for in particular is if it is installed so that the slope is not in the direction of the drain piping, as this might cause leakage.)

3.2.5 Installation of the duct

⚠ CAUTION

- *Make sure that the external static pressure of the unit is within range.*
- *Connect the duct and intake-side flange.*
- *Connect the duct and outlet-side flange.*
- *The connection of indoor unit and air duct must be well sealed and kept warm with insulation material.*

<Example>



4 Refrigerant Pipe

⚠ DANGER

Use the refrigerant according to outdoor nameplate. When carrying out the leakage check and test, do not mix in the oxygen, the acetylene and the flammable and the reactive gas, because these gases may result in explosion. It is suggested to use compressed air, nitrogen or refrigerant to perform these experiments.

4.1 Pipe Material

1 Prepare the copper pipe on site.

2 Choose dustless, non-humid, clean copper pipe. Before installing the pipe, use nitrogen or dry air to blow away the dust and impurities on the pipe.

3 Choose the copper pipe according to Fig. 4.2.

4.2 Piping Connection

1 The connection positions of the pipe are shown in Fig. 4.1.

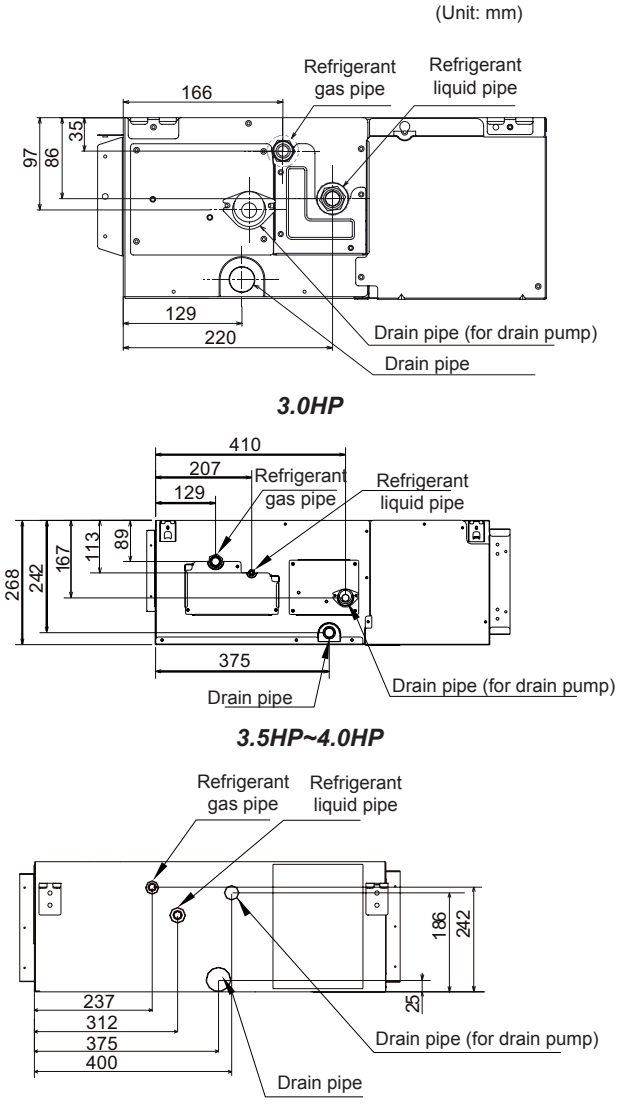
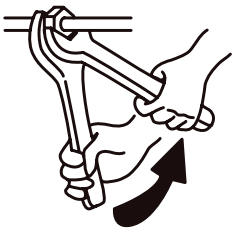


Fig. 4.1 Connection positions of the pipe

Model	Gas Pipe (mm)	Liquid Pipe (mm)
3.0/3.5HP	∅15.88	∅9.52
4.0/5.0/6.0/6.5HP	∅19.05	∅9.52

Fig. 4.2 Pipe diameter

2 As shown in Fig. 4.3, tighten the nuts with 2 spanners.



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

Fig. 4.3 Tightening torque for the nut

3 After finishing connecting the refrigerant pipes, keep it warm with insulation material.

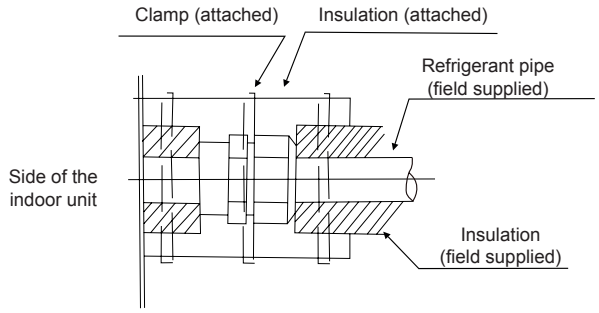
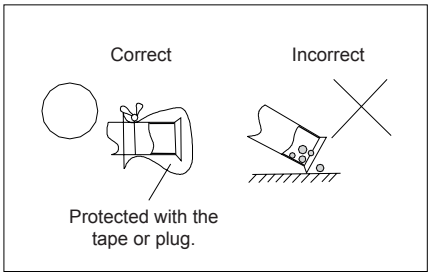


Fig. 4.4 Piping insulation procedure

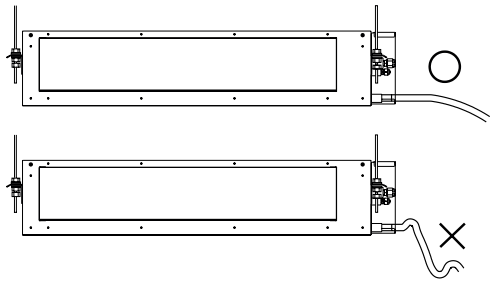
⚠ CAUTION

- The pipe goes through the hole with the sealing material.
- Do not place the pipes directly on the floor.



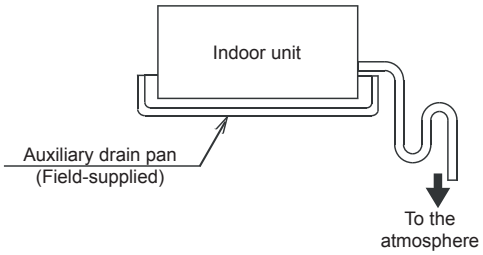
5 Drain Piping

- Install the drain piping.
- Make sure that the drain works properly.
- Prepare polyvinyl chloride pipe with a 32mm outer diameter.
- The diameter of drain pipe connection hole should be the same as that of the drain pipe.
- Keep the drain pipe short and sloping downwards at a gradient of at least 1/100 to prevent air bubbles.



NOTE

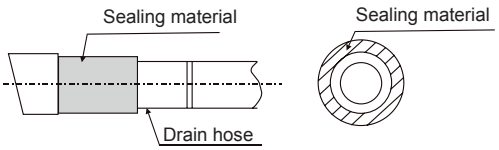
When the relative humidity of inlet or ambient air exceeds 80%, apply an auxiliary drain pan (field-supplied) beneath the indoor unit as shown below.



⚠ CAUTION

Water accumulating in the drain piping can cause the drain to clog.

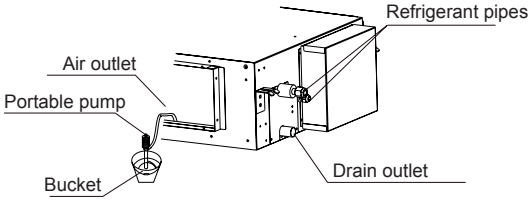
- To keep the drain pipe from sagging, space hanging wires every 1 to 1.5m.
- Use the drain hose and the clamp. Insert the drain hose fully into the drain socket and firmly tighten the drain hose and insulation material with the clamp.
- The two areas below should be insulated because condensation may happen causing water leakage.
  - Drain pipes passing indoors.
  - Drain sockets.
- Referring to the figure below, insulate the drain socket and drain hose using the included large sealing pad.



⚠ CAUTION

Drain piping connections:

- *Do not connect the drain pipes directly to sewage pipes to avoid ammonia odour. The ammonia in the sewage might enter the indoor unit through the drain pipes and corrode the heat exchanger.*
- *Do not twist or bend the drain hose, because excessive force is applied during twisting or bending and may also cause leakage.*
- *After piping work is finished, check whether drainage flows smoothly.*
- *Gradually pour approximately 1000cc of water from the outlet hole into the drain pan to check drainage flow.*
- *Check the drainage as shown below:*



6 Electrical Wiring

6.1 General Check

⚠ CAUTION

- *When clamping the wiring, use the included clamping material as shown in the Fig. 6.1 to prevent external pressure on the wiring connections, and then clamp firmly.*
- *While performing wiring work, make sure that the wiring is proper and cannot cause the control box lid to stick up, then close the cover firmly. When attaching the control lid, make sure that you do not pinch any wires.*
- *Outside the indoor unit and outdoor unit, separate the weak wiring (remote controller and transmission wiring) and strong wiring (ground and power supply wiring) at least 50mm so that they do not pass through the same place together. Proximity may cause electrical interference malfunction and breakage.*

⚠ WARNING

If the fuses burn up, please call the authorized service dealer. Please do not replace it by yourself, as it may result in accident or electric shock.

1 As shown in Fig. 6.1, remove the screws on the control box.

2 Connect the power cord and ground wire to the main terminal.

3 Connect the remote control wire to the subsidiary terminal box.

4 Connect the power supply of the indoor and outdoor units to the main terminal.

5 Tie the wire in the control box with the clamp tightly.

6 After completing the wiring, seal the wiring hole with the sealing material (with the lid) to prevent condensation and insects from entering the control box.

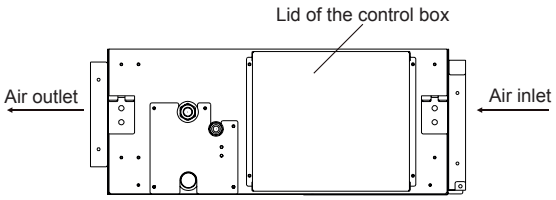
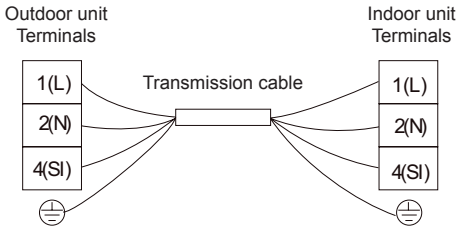


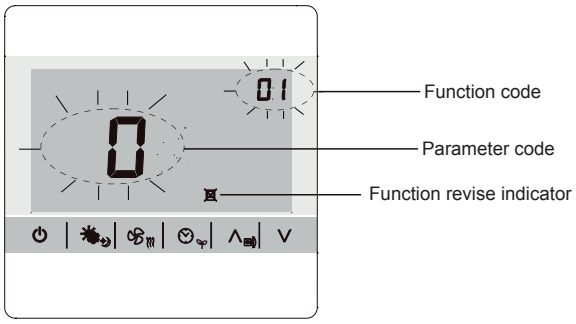
Fig. 6.1 Remove the screws on the control box

Electrical Wiring Diagram



6.2 Changing Static Pressure

The static pressure can be freely adjusted by using specific wired remote controller.



HCWA21NEWH

Model	Range of Static Pressure	Function Code Set
3.0HP	0-40Pa	0-40, function code value equals static pressure value, more than 40 is 40 Pa, [default: 0 (25Pa)]
3.5HP/4.0HP	0-120Pa	1-120, function code value equals static pressure value, more than 120 is 120 Pa, [default: 0 (37Pa)]
5.0/6.0/6.5HP	0-120Pa	1-120, function code value equals static pressure value, more than 120 is 120 Pa, [default: 0 (50Pa)]

Setting Static Pressure (HCWA21NEWH):

1 Press and hold "⏲", "∧" and "∨" buttons for 5 seconds. Symbol "☒" and parameter code starts blinking at the same time.

2 Press "∧ / ∨" button to adjust parameter number until "17" is displayed, and press "⚙" button to enter in the system parameter configuration status. Symbol "☒" stops blinking.

3 Select desired parameter code 10 by pressing "∧ / ∨" button and press "⚙" button to confirm.

4 Select desired function code to rewrite the parameter values by pressing "∧ / ∨" button and press "⚙" button to confirm.

5 Press "⏻" button to quit.

If you still have any trouble, please contact local service center of our company for further information.

6.3 Electrical Installation

⚠ WARNING

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

NOTES:

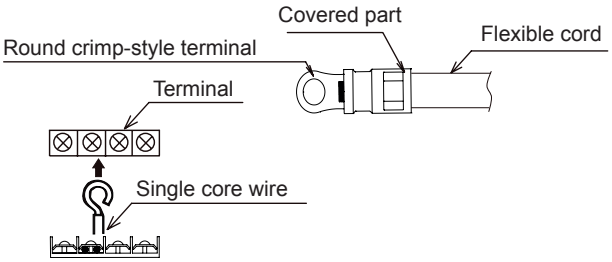
1 *Follow local codes and regulations when selecting field wires, and all above are the minimum size.*

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.

7 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.

Hitachi-Johnson Controls Air Conditioning, Inc.

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