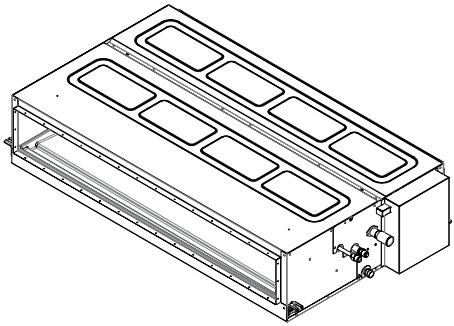
HITACHI

OPERATION INSTALLATION & MAINTENANCE MANUAL

airCore 700
SINGLE SPLIT
INVERTER SERIES
INDOOR UNITS



MODELS
MEDIUM ESP DUCTED TYPE

PPIM-2.0UFA1NQ
PPIM-2.5UFA1NQ
PPIM-3.0UFA1NQ
PPIM-4.0UFA1NQ
PPIM-5.0UFA1NQ
PPIM-6.0UFA1NQ

Scan the code to get the electronic manual.

EN INSTRUCTION MANUAL

Cooling & Heating

P02170Q

IMPORTANT NOTICE

- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.
- Hitachi strives for a continuous improvement in design and performance of products and reserves the right to change the specifications without notice.
- Hitachi is not liable for occasional damage or accidents pertaining to the air conditioning due to its operation in a specific environment.
- Signal words (DANGER, WARNING, CAUTION, NOTICE, NOTE) are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

DANGER : **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING : **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION : **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE : **NOTICE** is used to address practices not related to physical injury.

NOTE: NOTE is useful information for operation and/or maintenance.

- This air conditioner is designed for human comfort air conditioning only. Do not use this air conditioning for other purposes such as drying clothes, refrigerating food or for any other cooling or heating applications.
- Installing the air conditioner at the following places may cause fire, product damage or failure:
  - ○ Places where oil splashes (including machine oil).
  - ○ Presence of inflammable gas exists.
  - ○ Presence of sulphide gas or silicon presence (such as hot springs).
  - ○ Coastal areas where saline, acid and alkaline contents are higher (corrodes the unit body).
- Both installation and service operations must adhere to local standards, laws, and regulations.
- Mount with the lowest moving parts at least 2.5m(8ft) above floor or grade level.
- Installation of this air conditioning must be done by the dealer or professionals to avoid water leakage, electric shock or fire.
- In case of any questions, please contact the designated dealer or service center.
- For environmental benefit, please do not discard this product. Hitachi provides replaceable parts as per relevant national and local laws, regulations and standard requirements.
- This system has been designed and tested to operate within the indoor temperature limits as stated below. The manufacturer cannot guarantee satisfactory performance if the unit is operated for prolonged periods outside of these limits.

°C

Temperature Range	Maximum	Minimum
Cooling Operation	32 DB/23 WB	21 DB/15 WB
Heating Operation	27 DB	20 DB

DB: Dry Bulb , WB: Wet Bulb

⚠ DANGER

- Before reading the installation manual, please do not conduct installation works such as connections of refrigerant piping, drain pipes and wiring. Any violation may lead to system leakage, electrical failure or fire.
- Do not pour water into the indoor/outdoor unit. This product contains electrical components and if wet, can cause serious electrical shock.
- Opening the indoor unit's maintenance cover without disconnecting the main power supply may lead to fatal accident.
- Tamper with or adjusting the indoor unit's safety device may lead to serious accident.
- Use the ELB (Earth Leakage Breaker) which is above medium reaction speed (residual-current circuit breaker, action time of 0.1s or less). Otherwise, it may lead to electric shock or fire.
- During installation, refrigerant pipes must be securely connected before compressor starts running. During maintenance, refrigerant pipes must be moved, handled, and removed only after the compressor stops running.
- When the machine is running, please do not short-circuit the protection device (such as pressure switch). Otherwise, it may cause fire or explosion.
- Do not install pipe work with diameters that are not specified for that model.
- Do not ground units to water pipes, gas pipes, telephone wires, or lightning rods as incomplete grounding can cause a severe shock hazard resulting in severe injury or death. Additionally, grounding to gas pipes could cause a gas leak and potential explosion causing severe injury or death.
- Do not install unit in an area where flammable materials are present due to risk of explosions that can cause serious injury or death.
- Safely dispose all packing and transportation materials in accordance with federal/state/local laws or ordinances. Packing materials such as nails and other metal or wood parts, including plastic packing materials used for transportation may cause injuries or death by suffocation.
- Refrigerant gas is heavier than air and replaces oxygen. A massive leak can lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.
- If refrigerant gas leaks during installation, ventilate the area immediately. Refrigerant gas may produce toxic gas if it comes into contact with fire. Exposure to this gas could cause severe injury or death.

⚠ WARNING

- Do not use sprays such as pesticide, oil paint, hair spray or other flammable gases within 1 meter of the machine.
- If the circuit breaker trips frequently, stop the system and contact local dealer or service provider.
- Ensure if the grounding wires are securely connected. Incorrect grounding may lead to electrical failure of the machine.
- Before brazing, ensure no flammable materials are placed in the periphery. Before charging refrigerant, wear leather gloves to prevent injury due to freezing.
- Wiring and electrical elements shall be protected from being damaged by rats or other animals. Damages(caused by bites) on the unprotected part may lead to fire.
- Ensure the wires are connected firm and secure. External forces on the wiring terminal may loosen such terminals and lead to fire.
- Install the air conditioner on surfaces with sufficient strength to withstand the load. Otherwise, the air conditioner may topple and fall causing machine damage or personal injuries.
- Before turning on the system, ensure that the outdoor unit is not covered by snow or ice.
- Assure that the maximum operating pressure is checked when connecting to Outdoor UNIT.
- This unit <PPIM-UFA1NQ> is a PARTIAL UNIT AIR CONDITIONER, shall only be connected to an appliance suitable for the same refrigerant.

- This unit <PPIM-UFA1NQ> is a PARTIAL UNIT AIR CONDITIONER, complying with PARTIAL UNIT requirements of IEC 60335-1 and IEC 60335-2-40, and must only be connected to other units that have been confirmed as complying to corresponding PARTIAL UNIT requirements of IEC 60335-1 and IEC 60335-2-40.
- Pipe work and installation shall be also in compliance with national codes.
- Use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shock, fire, or the unit falling.
- Install the air conditioner or heat pump on a foundation strong enough that it can withstand the weight of the unit. A foundation of insufficient strength may result in the unit falling and causing injuries.
- Take into account strong winds, typhoons, or earthquakes when installing. Improper installation may result in the unit falling and causing accidents.
- Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel licensed or certified in their jurisdiction according to local, state, and national regulations. An insufficient power supply capacity or improper electrical construction may lead to electric shock or fire.
- Make sure that all wiring is secured, that specified wires are used, and that no external forces act on the terminal connections or wires. Improper connections or installation may result in fire.
- When wiring, position the wires so that the electrical wiring box cover can be securely fastened. Improper positioning of the electrical wiring box cover may result in electric shock, fire, or the terminals overheating.
- Before touching electrical parts, turn off the unit.
- The circuit must be protected with safety devices in accordance with local and national codes, i.e. a circuit breaker.
- Securely fasten the outdoor unit terminal cover (panel). If the terminal cover/panel is not installed properly, dust or water may enter the outdoor unit causing fire or electric shock.
- When a fire occurs, cut off the power supply immediately.

⚠ CAUTION

- Do not touch the switch with wet fingers. Touching a switch with wet fingers can cause electric shock.
- This appliance can be used by children aged from 8 years and above 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. Cleaning and user maintenance shall not be made by children without supervision.
- Wear adequate personal protective equipment (protective gloves, safety glasses,…) when installing, maintaining or servicing the system.
- The heat exchanger fins are sharp enough to cut. To avoid injury, wear gloves or cover the fins while working around them.
- Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear proper gloves.
- Install drain piping to ensure proper drainage. Improper drain piping may result in water leakage and property damage.
- Insulate piping to prevent condensation.
- Be careful when transporting the product.
- Do not install the air conditioner or heat pump in the following locations:

  (a) Where a mineral oil mist or oil spray or vapor is produced, for example, in a kitchen. Plastic parts may deteriorate and fall off or result in water leakage.

  (b) Where corrosive gas, such as sulfurous acid gas, is produced. Corroding copper pipes or soldered

parts may result in refrigerant leakage.

(c) Near machinery emitting electromagnetic waves. Electromagnetic waves may disturb the operation of the control system and cause the unit to malfunction.

(d) Where flammable gas may leak, where there is carbon fiber, or ignitable dust suspension in the air, or where volatile flammables such as thinner or gasoline are handled. Operating the unit in such conditions can cause a fire.

- Take adequate measures to prevent the outdoor unit from being used as a shelter by small animals. Small animals making contact with electrical parts can cause malfunctions, smoke, or fire. Instruct the user to keep the area around the unit clean.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

NOTICE

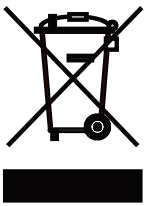
- It is forbidden to tread or place sundries on the unit.
- Do not place any additional materials on top or inside the air conditioner.

NOTES:

- The heat pump air conditioning may fail to work normally under the following circumstances:
  - The power supplied by the power transformer is not higher than the air conditioner's minimum power requirement.
  - High-power electric equipment close to the air conditioner's power cord. This may lead to a huge induced surge voltage.
- The indoor unit should be positioned where the unit and interunit wires (outdoor to indoor) are at least 3.3ft (1m) away from any televisions or radios. (The unit may cause interference with the picture or sound.) Depending on the radio waves, a distance of 3.3ft (1m) may not be sufficient to eliminate the noise.
- Dismantling the unit, treatment of the refrigerant, oil and additional parts must be done in accordance with the relevant local, state, and national regulations.
- As maximum allowable pressure is 4.15MPa, minimum allowable pressure is 2.21MPa, the wall thickness of field-installed pipes should be selected in accordance with the relevant local, state, and national regulations.

Explanation of symbols displayed on the indoor unit or outdoor unit

	**WARNING**	These symbols shows that 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 be handling this equipment with reference to the installation manual.
	**CAUTION**	This symbol shows that information is available such as the operating manual or installation manual.



Correct Disposal of this product

This marking indicates that this product should not be disposed with other household wastes. To prevent possible harm to 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.

Precautions for R32

This air conditioner uses R32 flammable refrigerant. Air conditioner with R32 refrigerant, if not be treated carefully, may cause serious harm to the human body or surrounding things. Please read the following instructions carefully before installing, using and maintaining.

⚠ WARNING

- 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 the refrigerant system to avoid the leakage.
- Be aware that refrigerants might not contain an odour.
- Do not charge R32 into system other than those designated for R32.
  Do not charge R32 system with oil other than those designated for R32.
- Do not use a reclaim cylinder other than an R32 reclaim cylinder.
- Be sure to only use refrigerant piping approved for use with R32 refrigerant. The use of unapproved piping may result in explosive rupture.
- The pipe-work shall be securely mounted and guarded from physical damage.
- The national gas regulations shall also be observed when field-installed refrigerant pipes are required.
- Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure. No leak shall be detected; Mechanical connections shall be accessible for maintenance purposes.
- The joints shall not be reused, unless after re-flaring the pipe.
- Joints made in the installation between parts of the refrigerating system, with outdoor part charged, shall be made in accordance with the following.
  - A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts. A vacuum valve shall be provided to evacuate the interconnecting pipe and/or any uncharged refrigerating system part.
  - 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.
  - Refrigerant tubing shall be protected or enclosed to avoid damage.
- That after completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements:
  - The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system, cannot be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.
- The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified.
- The appliances are designed for use at altitudes less than 2000m, may cause serious harm to the human body or surrounding things if used at altitudes 2000m and above.
- Keep any required ventilation openings clear of obstruction, don’t block air inlet or air outlet,

Otherwise, the cooling or heating capacity will be weakened, even cause system stop operating or safety hazard.

- Maintenance or repair of air conditioner using R32 refrigerant must be carried out after security check to minimize risk of incidents.
- Ensure no following objects under the indoor unit:
  - Microwaves, ovens and other hot objects.
  - Computers and other high electrostatic appliances.
  - Sockets that plug frequently.
- Installation, maintenance, service, repairing, removing and disposal operations, shall only be performed by the qualified personnel or recommended by the manufacturer.
- Every working procedure that affects safety means shall only be carried out by competent persons. Examples for such working procedures are:
  - breaking into the refrigerating circuit;
  - opening of sealed components;
  - opening of ventilated enclosures.
- Precautions shall be taken to avoid excessive vibration or pulsation to refrigerating piping for the transport and installation.
- Protection devices, piping and fittings shall be protected as far as possible against adverse environmental effects, for example the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris.
- When installing or repairing the air conditioner and the connecting line is not long enough, the entire connecting line shall be replaced with the connecting line of the original specification; extension is not allowed.
- Refrigerating systems shall be so installed as to minimize the likelihood of hydraulic shock damaging the system.
- The appliance shall be stored and installed so as to prevent mechanical damage from occurring.
- Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.
- 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 shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the non-existence of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. nonsparking, adequately sealed or intrinsically safe.
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.
- No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it can 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 refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it

externally into the atmosphere.

- Anti-static precautions is necessary for installing and maintenance, for example, wear pure cotton clothes and gloves.
- If R32 refrigerant leakage occurs during the installation, operators shall immediately detect the concentration in indoor environment until it reaches a safe level. If the leakage affects the performance of the machine, please immediately stop the operation, and the air conditioner must be vacuumed firstly and be returned to the maintenance station for processing.
- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the maintenance and service guidelines of this manual shall be followed. If in doubt, consult the manufacturer's technical department for assistance. The following checks shall be applied to installations using R32:
  - The refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
  - The ventilation machinery and inlets and outlets are operating adequately and are not obstructed; and shall keep away from heat source, inflammable or explosive conditions.
  - Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
  - Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which can 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.
- Repair and maintenance to 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 dealt with. 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.
- Sealed electrical components shall not be repaired.
- 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.
- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.
- Air-tightness test shall be carried out as guaranteed. Charging oxygen, acetylene or other inflammable and toxic gases during leakage inspection and air-tightness test may lead to explosions. It recommended to use nitrogen gas for this test.
- The following leak detection methods are deemed acceptable for all refrigerant systems.
  - Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity can be inadequate, or can 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 (no more than 25 %) is confirmed.
  - The fluid used in leak detection is applicable to most refrigerants. But do not use chloride solvents to prevent the reaction between chlorine and refrigerants and the corrosion of copper pipeline.

- If a leak is suspected, all naked flames shall be removed/extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated in a part of the system remote from the leak. Removal of refrigerant shall be according to this manual.

- When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:
  - safely remove refrigerant following local and national regulations;
  - evacuate;
  - purge the circuit with inert gas;
  - continuously flush with inert gas when using flame to open circuit;
  - open the circuit.
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- Purging of the refrigerant circuit shall be achieved by breaking the vacuum in the system with inert gas 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. The system shall be vented down to atmospheric pressure to enable work to take place.
- Ensure that the outlet of the vacuum pump is not close to any potential ignition sources and that ventilation is available.
- 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 in an appropriate position according to the instructions.
  - Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
  - Label the system when charging is complete (if not already labelled).
  - Extreme care shall be taken not to overfill the refrigerating system.
- Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. 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.
- Before carrying out the decommissioning procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.
  - Become familiar with the equipment and its operation.
  - Isolate system electrically.
  - Before attempting the procedure, ensure that:
    (a) mechanical handling equipment is available, if required, for handling refrigerant cylinders;
    (b) all personal protective equipment is available and being used correctly;
    (c) the recovery process is supervised at all times by a competent person;
    (d) recovery equipment and cylinders conform to the appropriate standards.
  - Pump down refrigerant system, if possible.
  - If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
  - Make sure that the cylinder is situated on the scales before recovery takes place.
  - Start the recovery machine and operate in accordance with instructions.
  - Do not overfill cylinders (no more than 80% volume liquid charge).
  - Do not exceed the maximum working pressure of the cylinder, even temporarily.
  - 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.
  - Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

- Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.
- When removing refrigerant from a system, either for servicing or decommissioning, it is required to follow good practice so that all refrigerants are 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 occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. Consult manufacturer if in doubt. 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.
- The recovered refrigerant shall be processed according to local legislation 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 compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. Draining of oil from a system shall be carried out safely.
- Disposal of equipment shall follow the national regulations.
- The storage of the appliance should be in accordance with the applicable regulations or instructions, whichever is more stringent.
- The maximum number of pieces of equipment permitted to be stored together notes by each product package information and standard following ISO 780-2015.
- After completing the installation work, check that the refrigerant gas does not leak throughout the system.
- When installing the unit in a small room, take measures to keep the refrigerant concentration from exceeding allowable safety limits. Excessive refrigerant leaks, in the event of an accident in a closed ambient space, can lead to oxygen deficiency.
- When installing or relocating the air conditioner, do not let any other substances besides R32, such as air, enter the refrigerant circuit. The presence of air or foreign matter in the refrigerant circuit causes an abnormal pressure rise, which may result in equipment damage and even injury.
- Refrigerant R32 in the system must be kept clean, dry, and tight.
  - Clean and Dry -- Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting into the system.
  - Tight -- R32 does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth's protection again harmful ultraviolet radiation. R32 can contribute to the greenhouse effect if it is released.
- Only use tools for R32, such as a gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, or refrigerant recovery equipment.
- If the conventional refrigerant and refrigerator oil are mixed in R32, the refrigerant may deteriorate.
- For Ducts indoor units, it shall not contain a potential ignition source in the duct system, such as electrical heating.
- For Duct indoor units, when connected via an air duct system to one or more rooms, the supply and

return air shall be directly ducted to the space. Open areas such as false ceilings shall not be used as a return air duct.

- Duct indoor units that connected via an air duct system to one or more rooms, auxiliary devices which can be a potential ignition source shall not be installed in the ductwork. Examples of such potential ignition sources are hot surfaces and electric switching devices.
- Duct indoor units that connected via an air duct system to one or more rooms are installed in a room with an area less than A_{min} [$A_{min}(m^2)$ - see table below], that room shall be without continuously operating open flames (for example an operating gas appliance) or other potential ignition sources (for example an operating electric heater, hot surfaces). A flame-producing device may be installed in the same space if the device is provided with an effective flame arrestor.
- Appliance shall be installed, operated and stored in a room with a floor area larger than A_{min} (m^2) [$A_{min}(m^2)$ - see table below].
- The installation of pipe-work shall be kept to a room with a floor area larger than $A_{min}(m^2)$ [$A_{min}(m^2)$ - see table below].
- The unit has requirements on the minimum required room area (A_{min}) used with different refrigerant charging amount (m). The total amount of refrigerant charged in the system corresponds to the room area installed in the table below. The calculation result is based on the Ducted-mounted unit, and the installation height is no less than 2.2m.

Minimum required room area for each refrigerant amount charged

Ducted-mounted units (No sensor, each room shall be assessed separately)			
Installation Height:2.2m			
m(kg)	$A_{min}(m^2)$	m(kg)	$A_{min}(m^2)$
≤1.842	-	3.40	10.068
1.843	5.458	3.60	10.660
2.00	5.922	3.80	11.253
2.20	6.515	4.00	11.845
2.40	7.107	4.20	12.437
2.60	7.699	4.40	13.029
2.80	8.291	4.60	13.622
3.00	8.884	4.80	14.585
3.20	9.476	5.00	15.826

CHECKING PRODUCT RECEIVED

- Upon receiving this product, inspect it for any shipping damage. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company in written format.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct. The standard operation procedure of the unit is explained in this manual. In case of any problem, please contact local dealer. Hitachi shall not be liable for defects arising due to alterations made by the customer without Hitachi's consent in a written form.

The standard utilization of the unit shall be explained in these instructions. Therefore, the utilization of the unit other than those indicated in these instructions is not recommended. Please contact your local agent, as the occasion arises.
Hitachi's liability shall not cover defects arising from the alteration performed by a customer without Hitachi's consent in a written form.

Table of Contents

Operation Manual

1. Safety Summary

DANGER

- Preventing water into indoor/outdoor unit , otherwise the water may lead to short circuit.
- Do not tamper with or adjust safety devices inside the indoor/outdoor unit as it may cause serious accidents.
- Do not open the cover of indoor/outdoor unit before disconnecting the main power supply.

WARNING

- Refrigerant leakage may lead to dyspnea due to air deficiency.
- Do not apply any sprayed flammable gases (such as pesticide, paint, hair spray, etc.) within 1 meter of the unit's periphery.
- If the power distribution panel or fuse for indoor unit is cut off frequently, stop using the air conditioner and contact the company dealer.
- Connect a fuse of specified capacity. If the fuse is damaged, replace it with an explosion-proof ceramic fuse of the same type specified by the manufacturer. Fuse capacity refers to “9. Safety and Control Device Setting”.

NOTE:

- It is suggested to run room ventilation once every 3 to 4 hours.

2. Introduction to Units

This air conditioner unit consists of one outdoor unit. Specific and detailed configurations can be referenced in the Installation and Maintenance Manual for the outdoor unit matched. This heat pump air conditioner is used in cooling, heating, dehumidification and fan modes. All these functions are controlled by wired remote controller or wireless controller (optional part).

Table 2.1 Indoor Unit Capacity Table

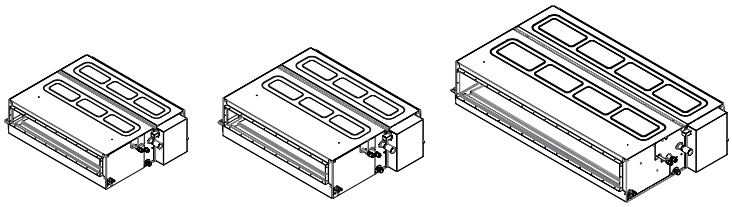
Indoor Unit Type	Standard Capacity (HP)					
Medium ESP Ducted Indoor Unit	2.0	2.5	3.0	4.0	5.0	6.0
	○	○	○	○	○	○

○ : Available

3. Component Name

3.1 Indoor Unit

Refer to figure 3.1 Medium ESP Ducted Indoor Unit.



2.0~2.5HP 3.0HP 4.0~6.0HP

Figure 3.1 Medium ESP Ducted Indoor Unit

3.2 Wired remote controller or Wireless Controller

For detailed operations, please refer to the user manual of the wired remote controller (PC-ARFG2-Z) or wireless controller (PC-LH8QE).

4. Before Operation

⚠ CAUTION

- Supply electrical power to the system for approximately 12 hours before start-up after long shut down. Do not start the system immediately after power supply, it may cause a compressor failure, because the compressor is not heated well.
- Make sure that the outdoor unit is not covered with snow or ice. If covered, remove it by using hot water (approximately 50°C). If the water temperature is higher than 50°C, it will cause damage to plastic parts.

When the system is started after a shutdown longer than approximately 3 months it is recommended that the system be checked by your service contractor.

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 energized during compressor stopping.

5. Operation Method

Refer the manual for PC-ARFG2-Z or PC-LH8QE.

6. Automatic Control

The system is equipped with the following functions.

NOTE

- Except for a long period of shutdown, keep the main power switch ON. The drain discharge mechanism is operated if the drain level is higher than the setting.

Three Minute Guard (Enforced Stoppage)

The compressor remains off for at least 3 minutes once it has stopped. If the system is started within approximately 3 minutes after it has stopped, the RUN indicator is activated. However, the cooling operation or the heating operation remains off and does not start until after 3 minutes has elapsed.

Three Minute Guard (Enforced Operation)

If all indoor units of the system are Thermo-OFF within approximately 3 minutes after compressor has started, compressor is operated during 3 minutes continuously. However, if all indoor units of the system are stopped by wired remote controller, compressor is stopped.

Frost Prevention During Cooling Operation

When the indoor unit is operated at low discharge air temperature, the cooling operation may be changed to fan operation for a while to avoid frost formation on the indoor heat exchanger.

Hot Start During Heating Operation

To prevent cold air discharge in the room, the fan speed is controlled from the slow position and the low position and then to the set position according to the discharge air temperature.

Slow Air Control During Defrosting Operation

When the outdoor unit is performing the automatic defrosting operation, the indoor fan is stopped.

Cooling of Indoor Unit

When the heating operation is stopped, the indoor fan operation is maintained at the slow position for the maximum of 2 minutes to lower temperature of the inside unit.

Prevention of Overload Operation

When the indoor temperature is high during heating operation, compressor is stopped due to activation of the indoor thermistor until the temperature becomes low.

7. Filter Cleaning

Turn off the main power switch before taking out the filter.

The indication, "  " is shown on the display of the wired remote controller after passing the time set on the wired remote controller. (Default Setting Time of PPIM: 1,200 hours)

After cleaning the air filter, perform filter sign reset according to the chapter of the wired remote controller PC-ARFG2-Z.

8. Troubleshooting

⚠ CAUTION

- When overflow of drain water from the indoor unit occurs, stop the operation and contact your contractor.
- When you smell or see white smoke coming from the unit, turn OFF the main power supply and contact your contractor.

8.1 If Trouble Still Remains

If the trouble still remains even after checking the following, contact your contractor and inform them of the following items.

(1) Unit Model Name

(2) Content of Trouble

(3) Alarm Code No. on Liquid Crystal Display

8.2 No Operation

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

8.3 Not Cooling or Heating Well

- Check for obstruction of air flow of the outside or inside units.
- Check if too much heat source exists in the room.
- Check if the air filter is clogged with dust.
- Check to see if the doors or windows are opened or not.
- Check if the temperature condition is not within the operation range.

8.4 This is Not Abnormal

- **Smells from Indoor Unit**
  Smell adheres on indoor unit after a long period of time. Clean the air filter and panels or allow a good ventilation.
- **Sound from Deforming Parts**
  During system starting or stopping, an abrading 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 making steam.
- **Dew on Air Panel**
  When the cooling operation continues for a long period of time under high humidity conditions (Higher than 27°C/80% R.H.), dew can form on the air panel.
- **Refrigerant Flow Sound**
  While the system is being started or stopped, sound from the refrigerant flow may be heard.

NOTE

- Except for a long period of shutdown, keep the main switch ON, since the oil heater is energized when the compressor is stopping.

Installation and Maintenance Manual

1. Safety Summary

⚠ WARNING

- Do not conduct installation works such as connections of refrigerant piping, drain pipes and wiring before reading the installation manual.
- Ensure that the grounding wires are connected properly and firmly.

NOTICE

- Do not install the indoor unit, outdoor unit, wired remote controller and cable within 3 meters distance from any strong electromagnetic radiation sources like medical devices.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- Means for disconnection from the supply mains, which have a contact separation in all poles that provide full disconnection under overvoltage category III conditions, must be incorporated in the fixed wiring in accordance with AS/NZS 3000.
- The appliance shall be installed in accordance with relevant local and national wiring regulations.

2. Tools and Instruments Necessary for the Installation

No.	Tool	No.	Tool	No.	Tool
1	Screwdriver	7	Pipe cutter	13	Cutter for Wires
2	Vacuum pump	8	Brazing tools	14	Gas Leak Detector
3	Charging hose	9	Hexagon wrench	15	Leveler
4	Megohmmeter	10	Charging Cylinder	16	Clamper for Solderless Terminals
5	Copper Pipe Bender	11	Spanner	17	Hoist (for Indoor Unit)
6	Adjustable wrench	12	Weigher	18	Ammeter

NOTE:

- In case of direct contact with refrigerant, please use installation tools and instruments dedicated to the new refrigerant.

⚠ DANGER

- Moisture, oxide, grease, and other foreign particles can easily affect the performance of the system. Hence, it is necessary to remove the moisture, dust, other refrigerant or refrigerant oil from the refrigeration system.
- Failure in not in using the specified materials and tools may lead to explosion, personal injury, refrigerant leakage, electrical failure or fire.

3. Transportation and Handling

3.1 Transportation

Before opening the package, transport the indoor unit as close to the installation location as possible.

⚠ WARNING

- The maximum number of pieces of equipment or the configuration of the equipment permitted to be transported together will be determined by the applicable local transport regulations.

NOTICE

- Do not place anything on the unit.

3.2 Handling of the Indoor Unit

⚠ WARNING

- Before the installation and commissioning, do not place any irrelevant materials inside the indoor unit and ensure there are no sundries in the indoor unit as it may lead to fire or accident.

NOTICE

- During handling, do not damage the thermal insulation materials on the surface of the unit.

4. Indoor Unit Installation

Install the indoor unit as per national and local regulations.

⚠ DANGER

- Do not install the indoor unit in an inflammable environment and keep it far away from combustive sources or explosive substances.
- Do not install the indoor unit in the laundry.
- The indoor unit should be positioned in a place where:

  (1) both the air inlet and air outlet are unobstructed,

  (2) the unit is not exposed to direct sunlight,

  (3) drainage occurs easily,

  (4) the unit is away from sources of heat or steam,

  (5) there is no source of machine oil vapor (this may shorten the indoor unit service life),

  (6) cool/warm air is circulated throughout the room,

  (7) the unit is away from electronic ignition type fluorescent lamps (inverter or rapid start type) as they may affect the remote controller range,

⚠ WARNING

- Do not install the indoor unit outdoors as it may lead to electric leakage or shock. Mount with the lowest moving parts at least 2.5m(8ft) above floor or grade level.

4.1 Supplied Accessories

Ensure that the indoor unit is accompanied by the following accessories:

NOTICE

- Contact the dealer if the machine is not accompanied by these accessories in transport.
- The number of random attachments is detailed at the end of the packing list.

Table 4.1 Accessories

Accessory	Q'ty	Purpose	Accessory	Q'ty	Purpose
Pipe Clamp 	1	For flexible drain hose connection	Fixed washer 	8	For the body suspension fixation
Magnet Ring 	1	For anti-electromagnetic interference of transmission wires between outdoor and indoor units	Screw 	16	For flange fixation
Cord Clamp 	1	For Fixing Thermal Insulation for Refrigerant Pipings			

4.2 Initial Inspection

- Install the indoor unit in a place that facilitates operation and maintenance as shown in figure 4.1.

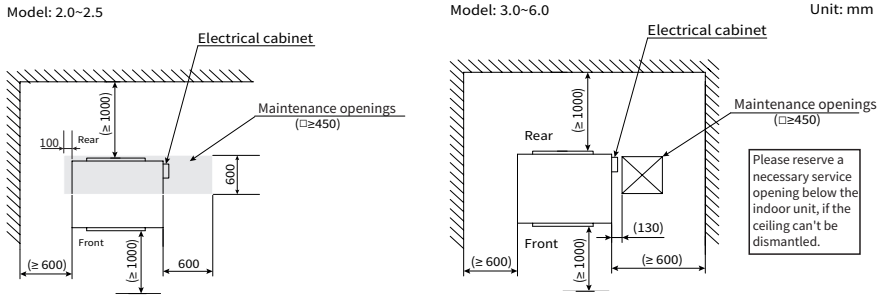


Figure 4.1 Operation and Maintenance Space

- Mount the indoor unit at the proper position for even distribution of indoor air temperature.
- Ensure that there are no obstructions near the air vent of the indoor unit to stop air flow.
- Ensure that the indoor unit is not installed in the equipment room or kitchen as the oil, gas or mist may enter into the indoor unit. If oil is attached to the heat exchanger, it may degrade the indoor unit's performance and even damage the unit's plastic parts.
- When the indoor unit is installed in a hospital or near other medical facilities with electromagnetic waves, the following precautions must be highlighted:
  (a) Ensure that the indoor unit is not mounted at a position where the electromagnetic waves can be directly irradiated on the electric cabinet, wired remote controller, wireless controller, wireless infrared receiver and transmission wire.
  (b) The indoor unit must be installed far away (with at least three-meter distance in-between) from the sources of electromagnetic source.
  (c) The wired remote controller must be installed inside iron box, and the transmission wire is routed in an iron pipe with both the box and pipe reliably grounded.
  (d) In case of any clutter wave in the power supply, a filter must be installed to eliminate the same.
- Ensure that the indoor unit is not installed under an environment with acid or alkali as both are corrosion to the heat exchanger.

4.3 Installation

4.3.1 Suspension Bolt

1. Carefully consider piping, wiring and maintenance and select appropriate installation position and direction.
2. The installation of hanging bolts is shown in figure 4.2.

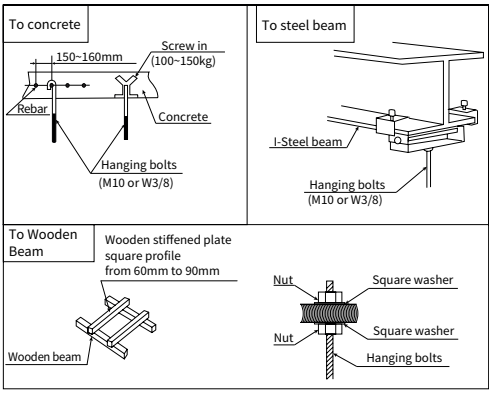
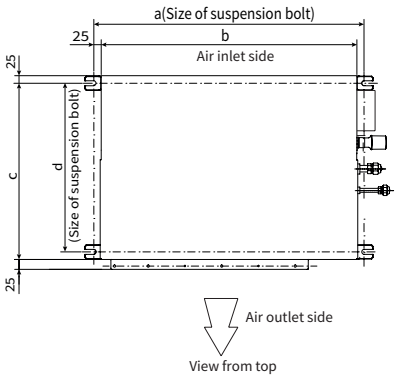


Figure 4.2 Fixation of Hanging Bolts

4.3.2 Position of Hanging Bolt and Pipe Connection

1. This indicates the position of hanging bolt, connecting position of the refrigerant pipe as well as that of the drain pipe.
2. Installation size is shown in figure 4.3.



Size Unit: mm

Indoor Unit Capacity (HP)	a	b	c	d	h
2.0~2.5	950	900	720	676	270
3.0	1150	1100	800	756	300
4.0~6.0	1450	1400	800	756	300

Model	Flange Dimension (H x W, mm)	
	Air-return Inlet	Air-discharge Outlet
PPIM-2.0UFA1NQ	857×227	834×140
PPIM-2.5UFA1NQ		
PPIM-3.0UFA1NQ	1049×258	1038×197
PPIM-4.0UFA1NQ	1350×258	1338×197
PPIM-5.0UFA1NQ		
PPIM-6.0UFA1NQ		

Figure 4.3 Hanging Bolts

NOTICE

- The relative dimensions of the suspension bolts should be as per the installation size requirements to ensure that the rear suspension bolts are installed vertically, otherwise the unit may cause abnormal noise and vibration due to non-vertical pulling.

4.3.3 Indoor Unit Installation

See the installation of indoor unit in figure 4.4.

Installation of filed-supplied parts:

Hanging bolts	4-M10 or W3/8
Nuts	8-M10 or W3/8
Washer	8-M10 or W3/8

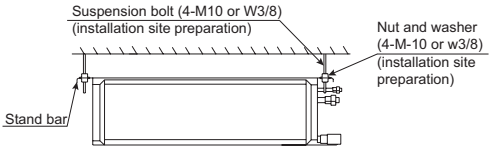


Figure 4.4 Indoor Unit Installation

(1) How to install hanging bolt and nut

As shown in figure 4.5, install the nut into four bolts.

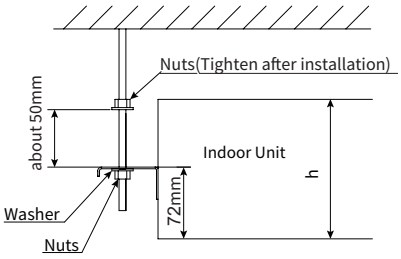


Figure 4.5 Hanging Bolt and Nut

(2) Indoor unit installation

* As shown in the following figure, install the left bracket into nut and gasket of hanging bolt.
* After ensuring that the left bracket is correctly installed on the nut and gasket, install the right bracket of the indoor unit on the nut and washer.

(When mounting the indoor unit, the hanging bolt can be moved slightly.)

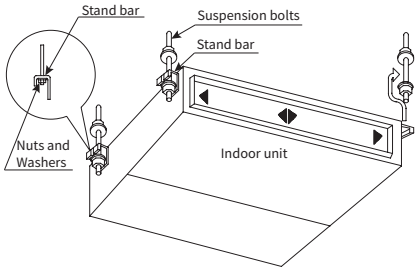


Figure 4.6 Hoisting method

4.3.4 Horizontal Adjustment of the Indoor Unit

(1) Ensure that the top is even and measure the largest top gradient.

(2) As shown in figure 4.7, the back of the indoor unit is slightly lower than its front (0mm-5mm), which facilitates drainage work.

(3) Once the position is adjusted, tighten the hanging nut. Apply the thread locking agent to prevent loosing the hanging nut.

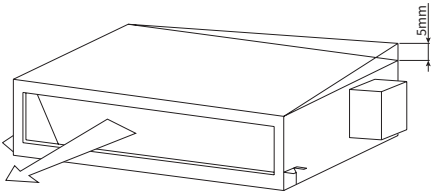


Figure 4.7 Gradient of the Top Surface

NOTICE

- Cover the machine with plastic cloth during the installation to keep it clean.

4.3.5 Connection of Air Duct

The air duct is connected with the indoor unit by a canvas hose which insulates noise and shake effectively. The indoor unit is equipped with a hole flange, to connect the air duct.

Ducted IDU machine must be connected with the return air duct, direct inhalation of high temperature air in the attic is prohibited.

(Example):

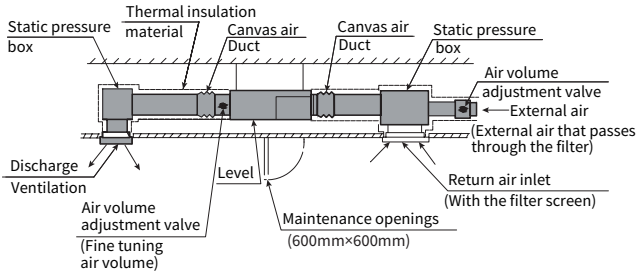


Figure 4.8 Gradient of the Top Surface

⚠ CAUTION

- If a lower sound level is further required, install silencer (field-supplied).
- Design duct arrangement as “Unit External Static Pressure=Pressure Drop of Duct+Pressure Drop of Air Outlet and Air Inlet”. If duct design is not appropriate, big sound and splash will occur.
- Before unit starting up, use wired controller to operate auto ESP function or ensure the setting ESP is almost same with field duct pressure. If are not appropriate, big sound and splash will occur.

4.3.6 Air Return Modification

Air supply at side and return at rear:

If there is enough installation space adopt side air supply and rear return, to reduce the noise effectively. Set the maintenance port as per requirement to carry out the maintenance smoothly.

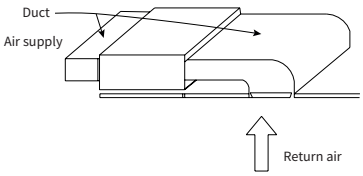


Figure 4.9 Side Supply and Rear Return

NOTICE

- This duct unit return air outside need to be connected 1 meter duct at least in field.
- It is recommended to adopt the installation way of side supply and rear return that has lower noise.
- Air inlet and outlet of the units need to be connected with air duct, and insulation treatment need to be applied to the flange connection of the inlet and outlet and air duct of inlet & outlet so as to prevent condensation.
- If air duct is not installed, perform insulation treatment to the sheet metal part of the outlet.
- Use aluminum tape to seal the side air duct of inlet and outlet and connection part of the units, so a s to prevent air leakage.
- Air filter must be installed inside the side duct of air inlet. (Select filter with dust collection efficiency (weighing method) of more than 50%).
- Heat insulation material must be used to prevent condensation on the air duct. (Material: glass wool or EPE, with thickness of more than 25mm).
- Air resistance pressure reduction for the unit type air duct should be not more than the maximum ESP that can be selected.
- Distance from the air outlet to the ground should be appropriate, and air flow from the outlet should not blow toward personnel for long term.
- To reduce the vibration and noise and the condensation caused by the inappropriate connection method of the air outlet, it is suggested to adopt flexible connection for the air supply and return duct and the units, and perform sealing and insulation work to air outlet and flexible connection. Air outlet flange needs to be tightly sealed and well insulated.
- It is suggested to use plastic material (PVC, ABS) or wooden outlet grill so as to prevent air outlet grill from being condensed. If metal air outlet grill is used, condensation may occur.

5. Refrigerant Piping Work

DANGER

- Use only R32 refrigerant. During leakage and air tight test, no oxygen, acetylene, flammable or poisonous gases must be charged, as these gases may cause explosion. It is recommended to use dry nitrogen for test.

5.1 Piping Materials

1. Prepare copper pipes suitable for use with R32 refrigerant and comply with local regulations on installation site.
2. Choose clean copper pipe with no dust and moisture within. Before installation, remove any dust and impurities with nitrogen gas or dry air.
3. Select the copper pipes as per figure 5.2.

5.2 Piping Connection

1. See positions of the pipe connection in figure 5.1.

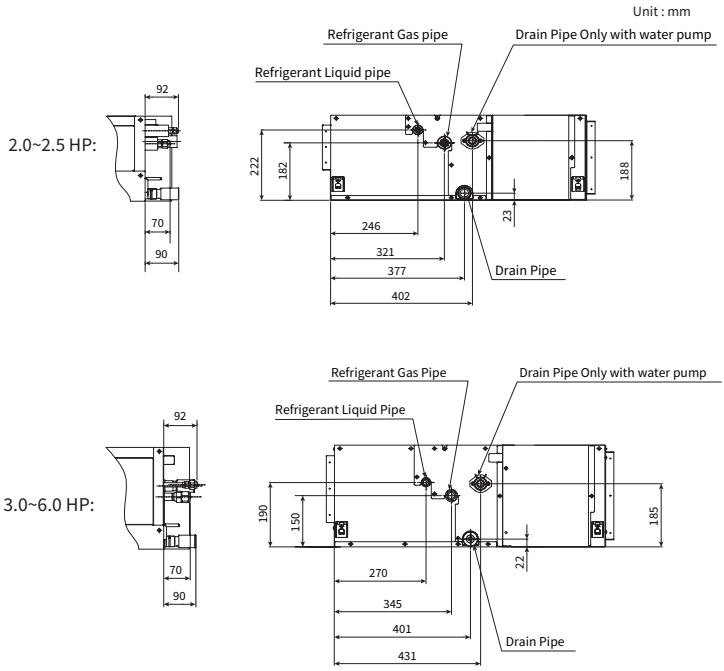


Figure 5.1 Positions of the Pipe Connection

NOTE:

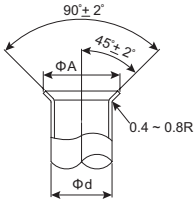
- Position for the selected drain pipe is shown in figure 5.1 and the drain hole below is blocked with a rubber plug.

Unit: mm (in.)

Capacity(HP)	Gas Pipe	Liquid Pipe
2.0~3.0	Ø12.70(1/2)	Ø6.35(1/4)
4.0~6.0	Ø15.88(5/8)	Ø9.53(3/8)

Figure 5.2 Pipe Diameter

Perform the flaring work as shown below.

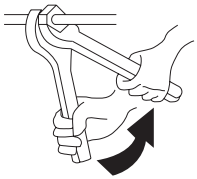


Unit: mm (in.)

Diameter Ød	$A^{+0}_{-0.4}$
	R32
Ø6.35(1/4)	9.1
Ø9.53(3/8)	13.2
Ø12.7(1/2)	16.6
Ø15.88(5/8)	19.7

Figure 5.3 Flaring Processing

2. As shown in figure 5.4, use two wrenches to fasten nuts.



Pipe Diameter (mm (in.))	Torque (N·m)
Ø6.35(1/4)	20
Ø9.53(3/8)	40
Ø12.7(1/2)	60
Ø15.88(5/8)	80

Figure 5.4 Torques in Fastening Nuts

3. After connecting the refrigerant pipe, perform heat insulation to the cooling pipeline using the thermal insulation pipe.

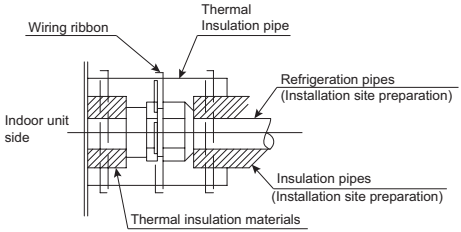
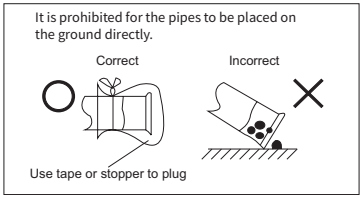


Figure 5.5 Heat Preservation

NOTICE

- When a pipe passes the hole, seal its opening by a sealing cap.
- Insert sealing caps at the ends of the tubes or fasten tightly with ethylene belt. The pipes cannot be placed on the ground directly.



4. Discharge and charge the refrigerant pipelines by following the Installation and Maintenance Manual of the outdoor unit.

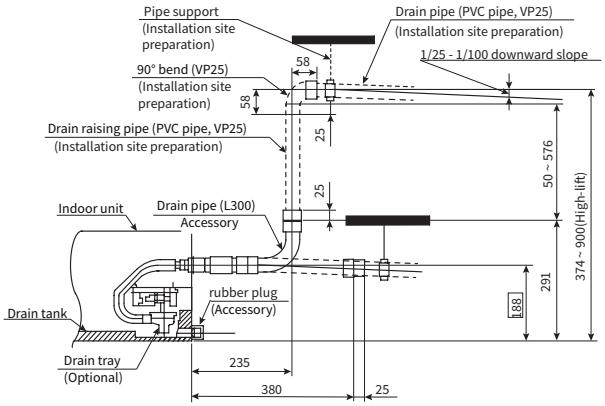
NOTICE

- Excessive or insufficient refrigerant is the major reason for system abnormalities. Please fill in the refrigerant with appropriate amount.

6. Drain Piping

1. The drain pipe connection position is shown in figure 6.1.
2. Prepare a PVC pipe (Outer diameter: 32mm).
3. Fix PVC pipe to the drain pipe with the adhesion agent and clamps provided by the factories, the downward slope of the drain pipe is 1/25 - 1/100.
4. Perform the heat preservation work on the drain pipe after it is connected.

(When choosing drain pump) Unit: mm



(When no drain pump is selected)

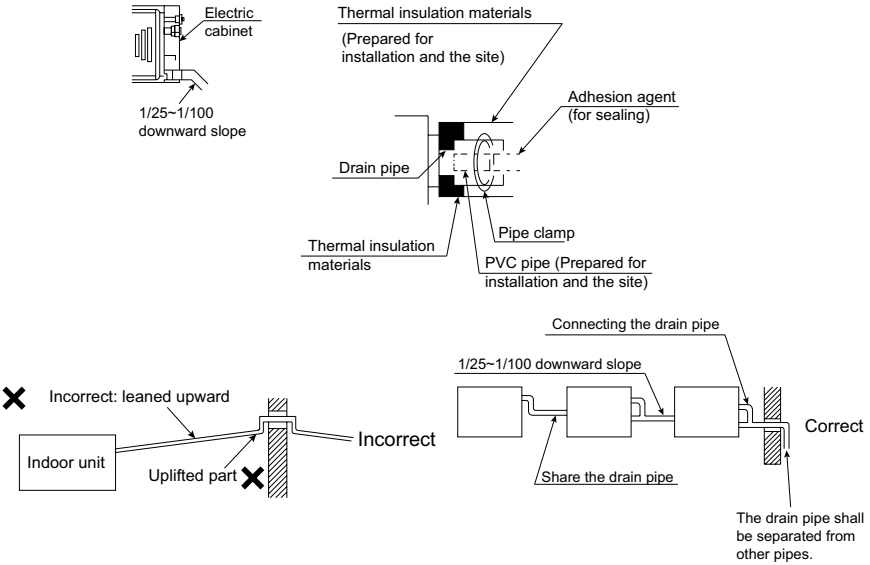


Figure 6.1 Drain Pipe

NOTICE

- When the relative humidity of inlet or ambient air exceeds 80%, apply an (field-supplied) auxiliary drain pan beneath the indoor unit as shown in Fig.6.2.

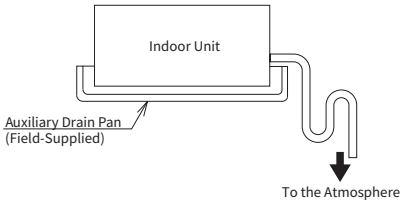


Figure 6.2 Auxiliary Drain Pan

NOTICE

- Install the drain pipe at a downward slope, as the condensate water may flow backwards and leak into the room in case of close up of the indoor unit.
- Do not connect the drain pipe to the sewage pipe or other drain pipe.
- When the main drain pipe is connected to the other indoor unit, each indoor unit must be higher in position than the main pipe. Choose the drain pipe with sufficient size in accordance with the cooling capacity of the indoor unit.
- After the electric wire and drain pipe are well connected, ensure the smooth flow of water.

  (a) Power on.

  (b) Pour 2 or 2.5 L of water into the drain tray.

  (c) Ensure the smooth flow of water and that there are no water leakages. Pour another 2L of water more when no water flows out of the pipe's end.

7. Electrical Wiring

⚠ WARNING

- The electrical wiring work must be performed by authorized installers. If not, it may cause an electric shock or a fire.
- Perform the electrical work according to the regulation of each region and “Installation & Maintenance Manual”, and the dedicated electrical circuit must be used. If the electrical wiring work is performed incorrectly or there is a capacity shortage of the power circuit, it will cause an electric shock or a fire.
- Use the specified cables for wiring between the outdoor unit and indoor units. Selecting incorrect cables will cause an electric shock or a fire.
- Install an ELB (Earth Leakage Breaker) in the power source. If it is not used, it will cause an electric shock or a fire.
- Turn OFF the main power switch of the indoor unit and the outdoor unit and wait for more than 10 minutes before electrical wiring work or a periodical check is performed. If not, it will cause an electric shock or a fire.
- Check to ensure that the indoor fan and the outdoor fan have stopped before electrical wiring work or a routine check is performed.
- Protect the wires, drain pipe, electrical parts, etc. from rodents or other pests.
- Tighten screws according to the following torque.

  M3.5: 1.2 N·m
  M4: 1.0 to 1.3 N·m
  M5: 2.0 to 2.4 N·m
  M6: 4.0 to 5.0 N·m
  M8: 9.0 to 11.0 N·m
  M10: 18.0 to 23.0 N·m
- Connect earth wires for the outdoor / indoor unit to prevent an electrical shock or an unexpected accident. The earth work must be performed by authorized installers.

- Turn completely OFF the power source to prevent an electrical shock when opening the service cover to perform the electrical work or the maintenance.
- Take care not to pinch electrical wirings when attaching the service cover. It may cause an electrical shock or fire.
- The ground wire must be longer than the current-carrying conductor when installing the power cord.
- Using the air conditioner power terminal to transfer the power cord is strictly prohibited. A power distribution box can be used to expand the power distribution on the indoor unit.
- A switch that can ensure all-pole disconnection should be installed between the power supply and air conditioning unit, and the contact spacing of this switch should be no less than 3mm.

NOTICE

- The procedure of the wiring work shall be performed according to this manual and “Installation & Maintenance Manual” of the outdoor unit.
- The control cable (Field-Supplied) between the indoor unit and the outdoor unit does not have any polarity. Do not apply an excessively high voltage to the cable (Rated Voltage 5V). It may cause failure.
- The wired remote controller cable (Field-Supplied) does not have any polarity. Do not apply an excessively high voltage to the cable (Rated Voltage 15V). It may cause failure.
- Maintain the rated voltage for the power source. It may be harmful to the unit if the voltage is either too high or too low.
- Take enough capacity for the power source. If not, the operation cannot be started due to the wide voltage reduction.

7.1 General Check

1. Ensure that the electrical equipment used in the installation site (main power switch, circuit breakers, wires, conduit connectors and wires terminals) have been properly selected in accordance with local laws and regulations.
2. Use the shielded twist pair cable for the control cable between the outdoor unit and the indoor unit, the control cable between indoor units and the wired remote controller.
3. Check to ensure that the power supply voltage is within ±10% of the rated voltage.
4. 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.
5. Check to ensure that the earth wire is connected.

7.2 Field Minimum Wire Sizes for Power Source

- Use an ELB (Earth Leakage Breaker). If it is 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) Check to ensure that the electrical resistance is more than 1 megohm, by measuring the resistance between ground and the terminal of the electrical parts. If the electrical resistance is less than 1 megohm, do not operate the system until the electrical leakage is found and repaired.

(b) Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system.

Electrical parameters and cable specification of indoor unit

Model	Power Supply	Maximum Current (A)	Power Cord Specifications	Transmission Cable Specification
PPIM-2.0UFA1NQ	220-240V~50Hz	1.78	2.5 mm^2	0.75 mm^2
PPIM-2.5UFA1NQ		1.78		
PPIM-3.0UFA1NQ		2.07		
PPIM-4.0UFA1NQ		2.63		
PPIM-5.0UFA1NQ		2.76		
PPIM-6.0UFA1NQ		3.16		

NOTES:

- Follow the local codes and regulations when selecting field wires.
- Power cord selection shall not be lighter than IEC60245-1 provisions of the neoprene sheath cable 57 requirements, and the power cord should be copper wire.
- Use a shielded cable for the transmitting circuit and connect shielding layer to the ground.
- In the case that power cables are connected in series, add maximum current to each unit and select wires as follow table.

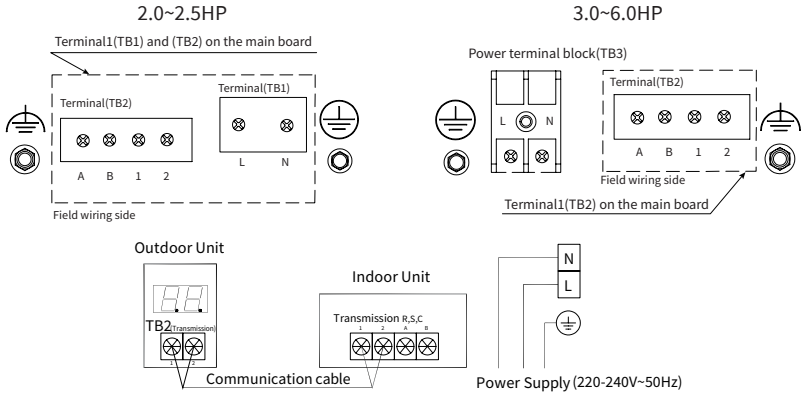
Total Current i (A)	Power Cord Specifications (mm^2)	Total Current i (A)	Power Cord Specifications (mm^2)
$i \leq 6$	2.5	$25 < i \leq 32$	6
$6 < i \leq 10$	2.5	$32 < i \leq 40$	10
$10 < i \leq 16$	2.5	$40 < i \leq 63$	16
$16 < i \leq 25$	4	$63 < i$	When the current exceeds 63A, can not be connected in series.

7.3 Position of Electrical Wiring Connection

⚠ WARNING

- Tightly secure wirings to the terminal block according to the specified torque. If tightening the terminals is not completed, heat generation, an electric shock or a fire will occur at the terminal connection.
- Make sure that the wires are securely fixed in order not to apply an external force to the terminal connection of the wirings. If fixing is not completed, heat generation or a fire will occur.
- Make sure that the terminals do not touch the surface of the electrical box. If the terminals are too close to the surface, it may cause the activation of ELB, heat generation and a fire at the terminal connection, and an electrical shock.

1. The electrical wiring connection at the terminal block for the indoor unit is shown in the figure below. Check the outdoor unit for the combination before starting the wiring work.



NOTES:

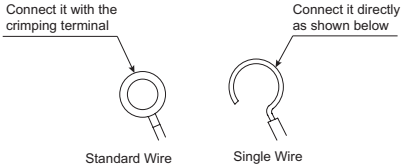
(1) Terminals TB2 is installed on the main board. Each connection hole can be connected to one or two $0.75mm^2$ transmission wires. Generally, each connection hole is connected to one wire, and is connected to two wires only when the center controller is connected.

(2) Connect the control cables between the indoor unit and the outdoor unit correctly.

(3) Use the shielded twist pair cable for control between the outdoor unit and the indoor units. They are connected to the terminals 1 and 2 of the terminal blocks(TB2) on the PCB. The Wired remote controller cable is connected to the terminals A and B of terminal block (TB2) on the PCB.

(4) Check to ensure that the shielded twist pair cable($0.75mm^2$) with total length of less than 1000m and size complying with local code are used for intermediate wiring between the outdoor unit and the indoor units to prevent noise obstacle.

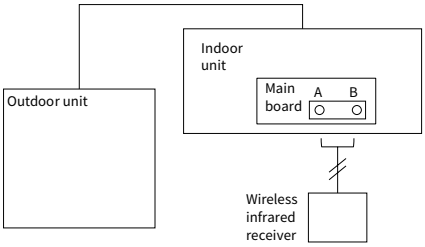
(5) When the standard wire is used for field-wiring connection, the M4 and M5 crimping terminal should be used. When a single wire is used, make it into the shape as shown in the figure below and connect it to tighten the washer uniformly. The screws at the terminal block should be rotated according to the tightening torque as shown in the table below:



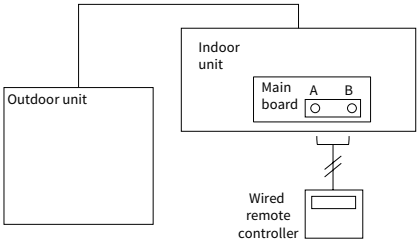
Tightening torque for terminals

	Size	Tightening torque
Power source	M4	1.0-1.3 (N·m)
Earth connection	M5	2.0-2.4 (N·m)

2. Connect the cable for the wired remote controller or the optional extension cable to the terminals inside the electric box through the connecting hole on the control box.
3. Connect the power cables and grounding cables to the terminals in the electric box.
4. Connect the wires between the indoor and outdoor units to the terminal in the electric box.
5. Connect cables correctly to match the terminal numbers with the mark band numbers.
6. Wireless infrared receiver connection:



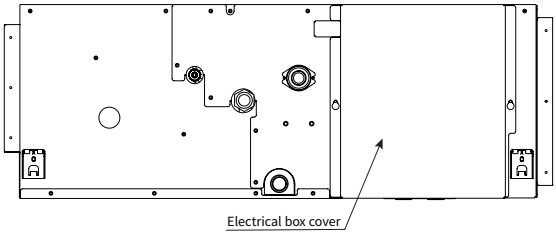
Wired remote controller connection:



7.4 Wiring Connection

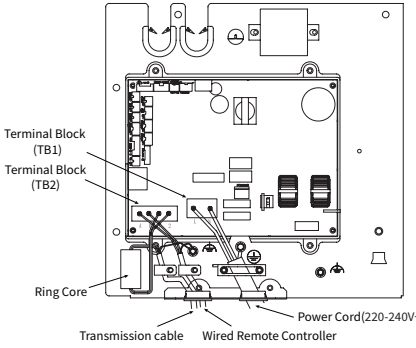
Wiring connection of the indoor unit is shown below.

1. Open the electrical box cover as shown in the figure below:

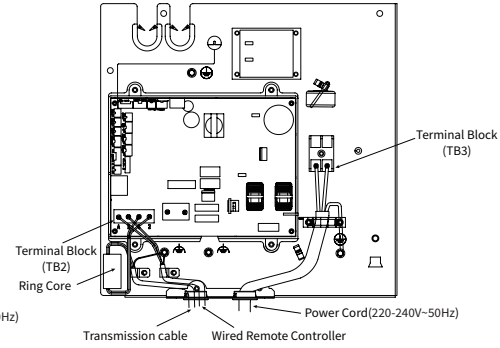


2. Perform the field electrical wiring work. Close the electrical box cover after the wiring work is completed.

2.0~2.5HP



3.0~6.0HP

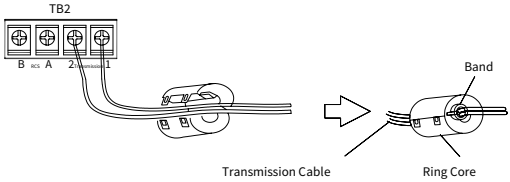


NOTE:

- The ring core needs to be installed on the transmission cable between the fixed wire clamp and TB2, where additional insulation rubber is peeled off.

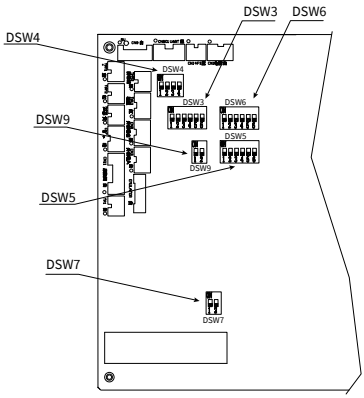
[Procedure]

Insert the transmission cable into the ring core as shown in the right figure before connecting to the terminal board. Fix the cable and the ring core by using the band (accessory) in the electrical box.



7.5 DIP Switch Setting

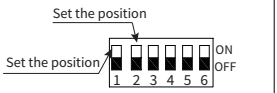
1. Turn OFF all the power supplies to both indoor and outdoor units before DIP switch setting. Otherwise, the setting is invalid.
2. The positions of the DIP switches on the PCB are shown in the figure right. Open the electrical box cover. After the DIP switches are set, attach the electrical box cover again.



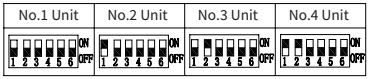
3. Unit number setting (DSW6)

The indoor unit numbers of all indoor units are not required. The indoor unit numbers are set by the auto-address function. If the indoor unit number setting is required, set the unit numbers of all indoor units respectively and serially by the following setting position.

DSW6 (1st , 2nd digit) Unit number setting



Before delivery, the 1st and 2nd digit of DSW6 are set to “0”.

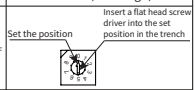


4. Region identification, human sensor and low air volume setting

DSW6 (4th digit), RSW1(Region Identification)

DSW6 (4th digit)

RSW1 (units digit)



Before delivery, DSW6 and RSW1 are set according to the region’s requirement, and the after-sales replacement of PCB needs to be set according to the region’s requirement.

ANZ

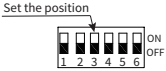
DSW6

Set No. 4 to OFF

RSW1

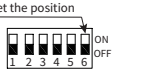
Set to “0”

DSW6 (3rd digit) Human sensor setting



Before delivery, the 3rd digit of DSW6 is set to “0”. Set the 3rd digit of DSW6 to “1” when installing human sensor.

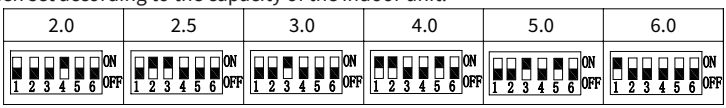
DSW6 (6th digit) Low air volume setting



Before delivery, the 6th digit of DSW6 is set to “0”. Set the 6th digit of DSW6 to“1” when setting low air volume.

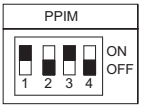
5. Capacity code setting (DSW3)

No setting is required as these have been preset at the factory at time of production. These switches have been set according to the capacity of the indoor unit.



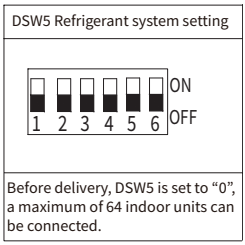
6. Unit type code setting (DSW4)

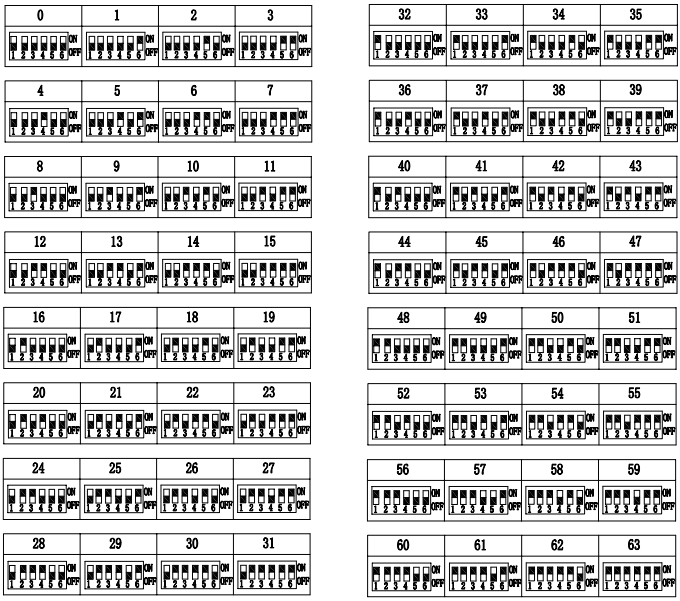
As this is already set before shipment, no setting is required. This switch is used for setting the unit type code which corresponds to the type of the indoor unit.



7. Refrigerant cycle No. setting (DSW5)

These switches set the refrigerant cycle number and need to be made only when connecting multiple systems together via H-Link (e.g. central control)





8. Fuse recover (DSW7)

* No setting is required. Setting positions before shipment are all OFF.

NOTICE

- The "■" mark indicates the positions of DIP switches. The figures show settings before shipment.
- When the unit no. and the refrigerant cycle no. are set, record them to facilitate maintenance and servicing activities in the future.
- Turn OFF all the power supplies of the indoor and outdoor units before DIP switch setting. Otherwise, the setting is invalid.

7.6 Setting of External Static Pressure

(1) This function is available for airCore 700 ducted indoor units, please refer to the " chapter25.ESP Setting " of Installation & Maintenance Manual of the wired remote controller for details.

(2) The air flow volume can be changed according to the external static pressure by setting the item code to “C5” from the wired remote controller, please refer to the " chapter6.Function Selection " of Installation & Maintenance Manual of the wired remote controller for details.

Model	External Static Pressure	Setting of Wired remote controller
PPIM-2.0UFA1NQ PPIM-2.5UFA1NQ PPIM-3.0UFA1NQ	35Pa	00
	100Pa	01
	150Pa	02
PPIM-4.0UFA1NQ	50Pa	00
	100Pa	01
	150Pa	02
PPIM-5.0UFA1NQ PPIM-6.0UFA1NQ	60Pa	00
	100Pa	01
	150Pa	02

8. Test Run

Test run should be performed according to "Installation & Maintenance Manual" of the outdoor unit or wired remote controller.

⚠ WARNING

- Start the machine only after satisfying all the check points.
  (a) Ensure that the terminal to the ground resistance is over 1 MΩ, if not, start the machine only after finding and repairing the leakage points.
  (b) Start the unit after ensuring that the stop valve of the outdoor unit has been opened.
  (c) Ensure that the main power supply has been connected for more than 12 hours so that the heater heats the compressor lubricant.
- When the system operates, please pay attention to the following situations.
  (a) Do not touch any parts of the exhaust end, as, while operating, the enclosure and pipeline of exhaust end of the compressor can reach over 90°C.
  (b) Do not press the AC contactor button, otherwise it will cause a serious accident.

9. Safety and Control Device Setting

Indoor Unit Capacity (HP)			2.0~6.0
The fuse capacity on the control circuit of an indoor unit	250V	A	10
Protective temperature for freeze-proofing protection	OFF ON	°C °C	0 14
Set the temperature difference		°C	2

Packing List

Item	Q'ty
Indoor Unit	1
Operation Installation and Maintenance Manual	1
Fixed washer	8
Screw	16
Pipe Clamp	1
Magnet Ring	1
Cord Clamp (big)	1

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