

Air conditioner

Installation manual

AC***HCA**G, Universal outdoor

- Thank you for purchasing this Samsung air conditioner.
- Before operating this unit, please read this manual carefully and retain it for future reference.



DB68-13835A-00

SAMSUNG

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Correct Disposal of This Product (Waste Electrical & Electronic Equipment)

(Applicable in countries with separate collection systems)

This marking on the product, accessories or literature indicates that the product and its electronic accessories (e.g. charger, headset, USB cable) should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product and its electronic accessories should not be mixed with other commercial wastes for disposal.

Safety Information



WARNING: Read This Manual

- Read and follow all safety information and instructions before installation, use, or maintenance of this appliance. Incorrect installation, use, or maintenance of this appliance can result in death, serious injury, or property damage. Keep these instructions with this appliance. This manual is subject to change. For the latest version, visit www.samsung.com.

Notices and notes

To make you aware of safety messages and highlighted information, we use the following notices and notes throughout this manual:



WARNING

Hazards or unsafe practices that may result in severe personal injury or death.



CAUTION

Hazards or unsafe practices that may result in minor personal injury or property damage.



IMPORTANT

Information of special interest



NOTE

Supplementary information that may be useful

	WARNING: Low burning velocity material (This appliance is filled with R-32.)
	Refer to operating manual
	Read operating manual
	Read installation and service manual



WARNING

The installation and testing of this appliance must be performed by a qualified technician.

- The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe installation of the appliance.

Always install the air conditioner in compliance with current local, state, and federal safety standards.

Safety Information

General information



WARNING

- Carefully read the content of this manual before installing the air conditioner and store the manual in a safe place in order to be able to use it as reference after installation.
- For maximum safety, installers should always carefully read the following warnings.
- Store the operation and installation manual in a safe location and remember to hand it over to the new owner if the air conditioner is sold or transferred.
- This manual explains how to install an indoor unit with a split system with two SAMSUNG units. The use of other types of units with different control systems may damage the units and invalidate the warranty. The manufacturer shall not be responsible for damages arising from the use of non compliant units.
- The manufacturer shall not be responsible for damage originating from unauthorized changes or the improper connection of electric and requirements set forth in the "Operating limits" table, included in the manual, shall immediately invalidate the warranty.
- The air conditioner should be used only for the applications for which it has been designed: the indoor unit is not suitable to be installed in areas used for laundry.
- Do not use the units if damaged. If problems occur, switch the unit off and disconnect it from the power supply.
- In order to prevent electric shocks, fires or injuries, always stop the unit, disable the protection switch and contact SAMSUNG's technical support if the unit produces smoke, if the power cable is hot or damaged or if the unit is very noisy.
- Always remember to inspect the unit, electric connections, refrigerant tubes and protections regularly. These operations should be performed by qualified personnel only.
- The unit contains moving parts, which should always be kept out of the reach of children.
- Do not attempt to repair, move, alter or reinstall the unit. If performed by unauthorized personnel, these operations may cause electric shocks or fires.
- Do not place containers with liquids or other objects on the unit.
- All the materials used for the manufacture and packaging of the air conditioner are recyclable.
- The packing material and exhaust batteries of the remote controller(optional) must be disposed of in accordance with current laws.
- The air conditioner contains a refrigerant that has to be disposed of as special waste. At the end of its life cycle, the air conditioner must be disposed of in authorized centres or returned to the retailer so that it can be disposed of correctly and safely.
- Wear protective equipment (such as safety gloves, goggles, and headgear) during installation and maintenance works. Installation/repair technicians may be injured if protective equipment is not properly equipped.
- 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.
- Do not use means to accelerate the defrost operation or to clean, other than those recommended by Samsung.
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- 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).
- Only be connected to an appliance suitable for the same refrigerant.

Installing the unit



WARNING

IMPORTANT: When installing the unit, always remember to connect first the refrigerant tubes, then the electrical lines.

- Upon receipt, inspect the product to verify that it has not been damaged during transport. If the product appears damaged, DO NOT INSTALL it and immediately report the damage to the carrier or retailer (if the installer or the authorized technician has collected the material from the retailer.)

- After completing the installation, always carry out a functional test and provide the instructions on how to operate the air conditioner to the user.
- Do not use the air conditioner in environments with hazardous substances or close to equipment that release free flames to avoid the occurrence of fires, explosions or injuries.
- Do not install the product in a place where thermostat is needed (such as server room, machinery room, computer room, etc.) Those places do not provide guaranteed operation condition of the product therefore performance can be poor in these places.
- Do not install the product in a ship or a vehicle (such as a campervan).
Salt, vibration or other environmental factor may cause the product malfunction, electric shock or fire.
- Our units should be installed in compliance with the spaces shown in the installation manual, to ensure accessibility from both sides and allow repairs or maintenance operations to be carried out. The unit's components should be accessible and easy to disassemble without endangering people and objects.
- For this reason, when provisions of the installation manual are not complied with, the cost required to access and repair the units (in SAFETY CONDITIONS, as set out in prevailing regulations) with harnesses, ladders, scaffolding or any other elevation system will NOT be considered part of the warranty and will be charged to the end customer.
- The outdoor unit shall be installed in an open space that is always ventilated.
- The local gas regulations shall be observed.
- To handle, purge, and dispose the refrigerant, or break into the refrigerant circuit, the worker should have a certificate from an industry-accredited authority.
- While in installation or relocation of the product, do not mix the refrigerant with other gases including air or unspecified refrigerant. Failure to do so may cause pressure increase to result in rupture or injury.
- Do not cut or burn the refrigerant container or pipings.
- Use clean parts such as manifold gauge, vacuum pump, and charging hose for the refrigerant.
- Installation must be carried out by qualified personnel for handling the refrigerant. Additionally, reference the regulations and laws.
- Be careful not to let foreign substances (lubricating oil, refrigerant, water, etc.) enter the pipings.
- When mechanical ventilation is required, ventilation openings shall be kept clear of obstruction.
- For disposal of the product, follow the local laws and regulations.
- Do not work in a confined place.
- The work area shall be blocked.
- The refrigerant pipings shall be installed in the position where there are no substances that may result in corrosion.
- The following checks shall be performed for installation:
 - The charging amount depends on the room size.
 - The ventilation devices and outlets are operating normally and are not obstructed.
 - Markings and signs on the equipment shall be visible and legible.
- Upon leakage of the refrigerant, ventilate the room. When the leaked refrigerant is exposed to flame, it may cause generation of toxic gases.
- Make sure that the work area is safe from flammable substances.
- To purge air in the refrigerant, be sure to use a vacuum pump which is compatible with R-32.
- Note that the refrigerant has no odour.
- The units are not explosion proof so they must be installed with no risk of explosion.
- This product contains fluorinated gases that contribute to global greenhouse effect. Accordingly, do not vent gases into the atmosphere.
- For installation with handling the refrigerant(R-32), use dedicated tools and piping materials. Working pressure of R-32 is higher than R410A, So failure to use the dedicated tools and piping materials may cause rupture or injury. Furthermore, it may cause serious accidents such as water leakage, electric shock or fire.
- Servicing shall be performed as recommended by the manufacturer. In case other skilled persons are joined for servicing, it shall be carried out under supervision of the person who is competent in handling flammable refrigerants.
- For servicing the units containing flammable refrigerants, safety checks are required to minimise the risk of ignition. R-32 is slightly more flammable than R410A hence additional precautions are required when dealing with it.
- Servicing shall be performed following the controlled procedure to minimize the risk of flammable refrigerant or gases.
- Do not install where there is a risk of combustible gas leakage.
- Do not place heat sources.

Safety Information

- Be cautious not to generate a spark as follows:
- Do not remove the fuses with power on.
- Do not disconnect the power plug from the wall outlet with power on.
- It is recommended to locate the outlet in a high position. Place the cords so that they are not tangled.
- If the indoor unit is not R-32 compatible, an error signal appears and the unit will not operate.
- After installation, check for leakage. Toxic gas may be generated and if it comes into contact with an ignition source such as fan heater, stove, and cooker, cylinders, make sure that only the refrigerant recovery cylinders are used.
- Never directly touch any accidental leaking refrigerant. It could result in severe wounds caused by frostbite.

Preparation of fire extinguisher

- If a hot work is to be done, an appropriate fire extinguishing equipment should have been available.
- A dry powder or CO₂ fire extinguisher shall be equipped near the charging area.

Ignition sources free

- Make sure to store the units in a place without continuously operating ignition sources (for example, open flames, an operating gas appliance or an operating electric heater).
- The service engineers shall not use any ignition sources with the risk of fire or explosion.
- Potential ignition sources shall be kept away from the work area where the flammable refrigerant can possibly be released to the surrounding.
- The work area should be checked to ensure that there are no flammable hazards or ignition risks. The "No Smoking" sign shall be attached.
- Under no circumstances shall potential sources of ignition be used while in detection of leakage.
- Make sure that the seals or sealing materials have not degraded.
- Safe parts are the ones with which the worker can work in a flammable atmosphere. Other parts may result in ignition due to leakage.

- Replace components only with parts specified by Samsung. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

Area ventilation

- Make sure that the work area is well ventilated before performing a hot work.
- Ventilation shall be made even during the work.
- The ventilation should safely disperse any released gases and preferably expel them into the atmosphere.
- Ventilation shall be made even during the work.

Leakage detection methods

- The leakage detector shall be calibrated in a refrigerant-free area.
- Make sure that the detector is not a potential source of ignition.
- The leakage detector shall be set to the LFL (lower flammability limit).
- The use of detergents containing chlorine shall be avoided for cleaning because the chlorine may react with the refrigerant and corrode the pipings.
- If leakage is suspected, naked flames shall be removed.
- If a leakage is found while in brazing, the entire refrigerant shall be recovered from the product or isolated (e.g. using shut-off valves). It shall not be directly released to the environment. Oxygen free nitrogen (OFN) shall be used for purging the system before and during the brazing process.
- The work area shall be checked with an appropriate refrigerant detector before and during work.
- Ensure that the leakage detector is appropriate for use with flammable refrigerants.

Labelling

- The parts shall be labelled to ensure that they have been decommissioned and emptied of refrigerant.
- The labels shall be dated.
- Make sure that the labels are affixed on the system to notify it contains flammable refrigerant.

Recovery

- When removing refrigerant from the system for servicing or decommissioning, it is recommended to remove the entire refrigerant.
- When transferring refrigerant into cylinders, make sure that only the refrigerant recovery cylinders are used.
- All cylinders used for the recovered refrigerant shall be labelled.
- Cylinders shall be equipped with pressure relief valves and shut-off valves in a proper order.
- Empty recovery cylinders shall be evacuated and cooled before recovery.
- The recovery system shall operate normally according to the specified instructions and shall be suitable for refrigerant recovery.
- In addition, the calibration scales shall operate normally.
- Hoses shall be equipped with leak-free disconnect couplings.
- Before starting the recovery, check for the status of the recovery system and sealing state. Consult with the manufacturer if suspected.
- The recovered refrigerant shall be returned to the supplier in the correct recovery cylinders with the Waste Transfer Note attached.
- Do not mix refrigerants in the recovery units or cylinders.
- If compressors or compressor oils are to be removed, make sure that they have been evacuated to the acceptable level to ensure that flammable refrigerant does not remain in the lubricant.
- The evacuation process shall be performed before sending the compressor to the suppliers.
- Only the electrical heating to the compressor body is allowed to accelerate the process.
- Oil shall be drained safely from the system.
- For installation with handling the refrigerant (R-32), use dedicated tools and piping materials. Because the pressure of the refrigerant, R-32 is approximately 1.6 times higher than that of R-22, failure to use the dedicated tools and piping materials may cause rupture or injury. Furthermore, it may cause serious accidents such as water leakage, electric shock, or fire.
- Never install a motor-driven equipment to prevent ignition.

Power supply line, fuse or circuit breaker



WARNING

- Always install the air conditioner in compliance with current local, state, and federal safety standards.
- Always verify that a suitable earthing connection is available.
- Verify that the voltage and frequency of the power supply comply with the specifications and that the installed power is sufficient to ensure the operation of any other domestic appliance connected to the same electric lines.
- Always verify that the cut-off and protection switches are suitably dimensioned.
- Verify that the air conditioner is connected to the power supply in accordance with the instructions provided in the wiring diagram included in the manual.
- Always verify that electric connections (cable entry, section of leads, protections...) are compliant with the electric specifications and with the instructions provided in the wiring scheme. Always verify that all connections comply with the standards applicable to the installation of air conditioners.
- Devices disconnected from the power supply should be completely disconnected in the condition of overvoltage category.
- Be sure not to perform power cable modification, extension wiring, and multiple wire connection.
 - It may cause electric shock or fire due to poor connection, poor insulation, or current limit override.
 - When extension wiring is required due to power line damage, refer to "Step 4 Optional: Extending the power cable" in the installation manual.

Precautions for using R-32 refrigerant

General

- This product is pre-charged with mildly flammable gas classified as A2L by ASHRAE. The following precautions and instruction manuals must be followed during installation, operation, servicing and decommissioning of the product.

Safety Information

- The appliance shall be stored in a room without continuously operating ignition sources, like open flames, a gas appliance, or an electric heater.
- All national and local regulations shall be observed at all times.
- All pipe work including piping material, pipe routing and installation shall include protection from physical damage in operation and service, and comply national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All filed joints shall be accessible for inspection before being covered or enclosed.
- All field piping and joints shall be pressure tested with an inert gas according to prevalent industry standards prior to refrigerant charging and system commissioning.
- Where additional field charging is required. The installer shall write with a permanent marker the field charge added on the ODU label provided, such that the Total Charge = Factory 'Pre-charge' + field charge.
- Minimum floor area of the room shall be in compliance with the min. room area according to the total charge of the installation according to Table 1.
- For ducted systems, any auxiliary systems that are potential ignition sources shall not be installed in the duct work. Examples of ignition sources are hot surfaces with temperatures exceeding 700°C and electric switching devices.
- Any auxiliary device installed must be approved by Lennox and must be suitable for operating with the refrigerant marked on the label.
- For mechanical ventilation the lower edge of the air extraction opening shall not be more than 100mm above the floor. The exhaust location outside the building must be at least 3m away from the building opening and mechanical air intake openings.
- To handle, purge, and dispose of the refrigerant, or break into the refrigerant circuit, the worker should have a certificate from an industry-accredited authority.
- Non-ducted systems may be installed in the areas such as false ceilings not being used as return air plenum as long as the conditioned air does not mix with the air in the false ceilings.
- For ducted appliances false ceilings or drop ceilings may be used as return air plenum if a refrigerant leak detection system is provided in the system and any external connections are also provided with a sensor immediately below the return air plenum duct joint.
- Installation, servicing and any type of maintenance or repair must be performed by certified personnel that is competent to carry such activity in accordance with national and local regulations.

General Information on Servicing

- Do not work in a confined space. Ensure adequate ventilation is provided at the workspace during the entirety of the duration of the work to safely disperse any released refrigerant.
- All maintenance staff and others working in the local area shall be instructed on the nature of the work being performed and instructed to follow all instructions provided by Lennox, national and local authorities.
- The area shall be checked with an approved refrigerant detector before and during any work on the system.
- Have a dry CO₂ fire extinguisher adjacent to the charging area and workspace.
- The service personnel shall not use any ignition sources in a manner that it may lead to the risk of fire or explosion.
- Potential ignition sources shall be kept away from the work area where the flammable refrigerant can be released into the surrounding area.
- The work area should be checked to ensure that there are no flammable hazards or ignition risks. The "No Smoking" sign shall be attached.
- Under no circumstances shall potential sources of ignition be used upon detection of leakage.

The following checks shall be applied to installations and maintenance operations.

- The actual total refrigerant charge is in accordance with the room size in accordance with Table 1.
- The ventilation machinery and outlets are operating adequately and are not obstructed.
- Markings on the equipment are visible and legible.
- Refrigerant pipes or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components.

Initial checks of electrical devices shall include the following.

- That capacitors are discharged in a safe manner to avoid sparking.
- That no live electrical components and wiring are exposed while charging, recovering or purging the system.
- That there is continuity to earth bonding.
- Check that cabling is not worn, corroded or damaged in any manner.

Electrical repair safety measures

- All electrical components used or replaced must be to Lennox's specifications.
- If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with.
- Sealed electrical components and intrinsically safe components shall be replaced and not repaired.
- Cabling should be protected from excessive vibration, pressure, sharp edges, and other adverse environmental factors.

Detection of 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.)
- Make sure that the detector is not a potential source of ignition.
- Leak detection equipment shall be set at a percentage of the LFL (Lower flammable limit) of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25% maximum) is confirmed.
- The use of detergents containing chlorine shall be avoided for cleaning because the chlorine may react with the refrigerant and corrode the piping.
- If leakage is suspected, naked flames shall be removed.
- If a leakage is found while brazing, the entire refrigerant shall be recovered from the product or isolated (e.g. using shut-off valves). It shall not be directly released into the environment. Oxygen-free nitrogen (OFN) shall be used for purging the system before and during the brazing process.
- The work area shall be checked with an appropriate refrigerant detector before and during work.
- Ensure that the leakage detector is appropriate for use with flammable refrigerants.

Removal and Evacuation

- When removing refrigerant for servicing it is recommended to remove the entire quantity.
- When removing refrigerant follow local and national regulations and follow best practices including;
 - evacuate;
 - purge the circuit with inert gas (optional for A2L);
 - evacuate (optional for A2L);

- continuously flush or purge with inert gas when using flame to open circuit; and
- open the circuit.
- Use proper recovery cylinders appropriate for the type of refrigerant.
- Follow prescribed industry best practices for purging and evacuation.
- Oxygen free nitrogen shall be used for purging the system.

Charging procedure

- Follow industry standard refrigerant charging best practices.
- Prior to recharging the system shall be pressure tested with oxygen free nitrogen gas.
- Ensure that contamination of different refrigerants does not occur when charging.
- Cylinders shall be kept in the appropriate position as per instructions.
- The refrigerant system should be earthed prior to charging the system.
- Label the system when charging is completed.
- Take extreme care not to overfill the refrigeration system.
- The system shall be leak tested on completion of charging prior to commissioning.

Decommissioning

- Only qualified licensed professionals shall perform refrigerant recovery and decommissioning.
- Isolate the system electrically.
- All recovery equipment and cylinders shall conform to appropriate standards. Only approved cylinders, with pressure relief valves, for the type of refrigerant shall be used.
- Recover refrigerant following industry standard procedure for flammable refrigerants.
- When draining compressors oil care must be taken that there is no flammable refrigerant in the compressor and that the compressor is not hot. Oil should be handled according to local and federal regulations.
- After decommissioning, the system shall be labeled stating that it has been decommissioned. The label shall be dated and signed. The label should state that it "contains flammable refrigerant".
- Ensure that there are labels on the equipment indicating the equipment contains flammable refrigerant.
- Recovered refrigerant shall not be mixed or reused. It shall be processed according to national, state and local regulations.

Installation Procedure

Step1 Choosing the installation location



WARNING

- If appliances contain R-32 refrigerant, then the floor area of the room in which the appliances are installed, operated and stored must be larger than the minimum floor area defined in table below A (m²).

m (kg)	Minimum required room area (A, m ²)	
	Ceiling-mounted type	
	Without Refrigerant Detection Sensor	With Refrigerant Detection Sensor
≤1.836	No requirement	
1.837	3.7	3.7
2.0	4.0	4.0
2.2	4.4	4.4
2.4	4.8	4.8
2.6	5.2	5.2
2.8	5.6	5.6
3.0	6.0	6.0
3.2	6.6	6.4
3.4	7.4	6.8
3.6	8.3	7.2
3.8	9.3	7.6
4.0	10.3	8.0
4.2	11.3	8.4
4.4	12.4	8.8
4.6	13.6	9.2
4.8	14.8	9.6
5.0	16.0	10.0
5.2	17.3	10.3
5.4	18.7	10.7
5.6	20.1	11.1
5.8	21.5	11.5
6.0	23.0	11.9
6.2	24.6	12.3
6.4	26.2	12.7
6.6	27.9	13.1
6.8	29.6	13.5
7.0	31.3	13.9
7.2	33.1	14.3
7.4	35.0	14.7
7.6	36.9	15.1
7.8	38.9	15.5
8.0	40.9	15.9
8.5	46.2	16.9
9.0	51.7	17.9
9.5	57.6	18.9
10.0	63.9	19.9
10.5	70.4	20.8
11.0	77.3	21.8
11.5	84.5	22.8
12.0	92.0	23.8

- m : Total refrigerant charge in the system
- A : Minimum required room area

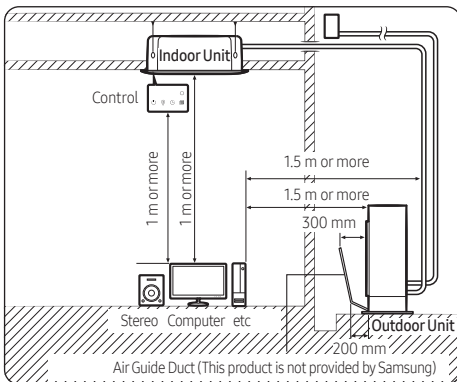
- IMPORTANT: it's mandatory to consider either the "Minimum required room area" tabel or taking into consideration the local law regarding the minimum living space of the premises.

- Minimum installation height of indoor unit is 2.2 m for ceiling-mount type.

Installation location requirements

- The outdoor unit shall be installed in an open space that is always ventilated.
- The local gas regulations shall be observed.
- Never install the outdoor unit in a location such as on a high external wall where it could fall.
 - If the outdoor unit falls, it may result in injury, death or property damage.
- Install your appliance on a level and hard floor that can support its weight.
 - Failing to do so may result in abnormal vibrations, noise, or problems with the product.
- When installing the outdoor unit, make sure to connect the drain hose so that draining is performed correctly.
 - The water generated during the heating operation in the outdoor unit may overflow and result in property damage. In particular, in winter, if a block of ice falls, it may result in injury, death or property damage.
- For installation inside a building (this applies either to indoor or outdoor units installed inside) a minimum room floor area of space conditioned is mandatory according to EN378-1:2017 (see the reference table into the indoor unit installation manual).
- To handle, purge, and dispose the refrigerant, or break into the refrigerant circuit, the worker should have a certificate from an industry-accredited authority.
- Do not install the air conditioner in following areas.
 - The place where there is mineral oil or arsenic acid. Resin parts flame and the accessories may drop or water may leak. The capacity of the heat exchanger may reduce or the air conditioner may be out of order.
 - The place where corrosive gas such as sulfurous acid gas generates from the vent pipe or air outlet. The copper pipe or connection pipe may corrode and refrigerant may leak.
 - The place where there is a machine that generates electromagnetic waves. The air conditioner may not operate normally due to control system.
 - The place where there is a danger of existing combustible gas, carbon fiber or flammable dust.
 - The place where animals may urinate on the product. Ammonia may be generated.
 - The place where thinner or gasoline is handled. Gas may leak and it may cause fire.
 - The place where is close to heat sources.
- Do not use the indoor unit for preservation of food items, plants, equipment, and art works. This may cause deterioration of their quality.
- Do not install the indoor unit if it has any drainage problem.

- Do not place the outdoor unit on its side or upside down. Failing to do so may cause the compressor lubrication oil to run into the cooling circuit and lead to a serious damage to the unit.
- Install the unit in a well-ventilated location away from direct sunlight or strong winds.
- Install the unit in a location that would not obstruct any passageways or thoroughfares.
- Install the unit in a location that would not inconvenience or disturb your neighbors, as they could be affected by the noise or the airflow coming from the unit.
- Install the unit in a location where the pipes and the cables can be easily connected to the indoor unit.
- Install the unit on a flat, stable surface that can withstand the weight of the unit. Otherwise, the unit can generate noise and vibration during operation.
- Install the unit so that the air flow is directed towards the open area.
- Maintain sufficient clearance around the outdoor unit, especially from a radio, computer, stereo system, etc.



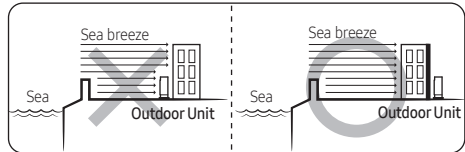
- Install the unit at a height where its base can be firmly fixed in place.
- Make sure that the water dripping from the drain hose runs away correctly and safely.



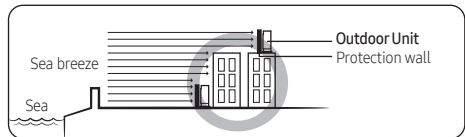
CAUTION

- This device must be installed according to the national electrical rules.
- If your outdoor unit exceeds a net weight of 60 kg, do not install it on a suspended wall, but stand it on a floor.
- When installing the outdoor unit at the seaside, an additional protective coating (third party) may be required, make sure that it is not directly exposed to sea breeze. If you cannot find an adequate place free from direct sea breeze, construct a protection wall or a protective fence.

- Install the outdoor unit in a place (such as near buildings etc.) where it can be prevented from sea breeze. Failure to do so may cause a damage to the outdoor unit.



- If you cannot avoid installing the outdoor unit at the seaside, construct a protection wall around to block the sea breeze.
- Construct a protection wall with a solid material such as concrete to block the sea breeze. Make sure that the height and the width of the wall are 1.5 times larger than the size of the outdoor unit. Also, secure a space larger than 700 mm between the protection wall and the outdoor unit for exhausted air to ventilate.



CAUTION

- Depending on the condition of power supply, unstable power or voltage may cause malfunction of the parts or control system. (At the ship or places using power supply from electric generator...etc)
- Install the unit in a place where water can drain smoothly.
- If you have any difficulty finding installation location as prescribed above, contact your manufacturer for details.
- Be sure to clean the heat exchanger and base plate of the outdoor unit regularly from any collected sand and salt.
- Touch up the additional protective coating (third party) if needed, at least once in a year or according to the third party's product requirements.
- Check the condition of the product periodically.
 - Check the installation site every 3 months and perform anti-corrosion treatment such as R-Pro supplied by SAMSUNG (Code : MOK-220SA) or commercial water repellent grease and wax, etc., based on the product condition.
 - When the product is to be shut down for a long period of time, such as off-peak hours, take appropriate measures like covering the product.
- If the product installed within 500m of seashore, special anti-corrosion treatment is required.
 - ※ Please contact your local SAMSUNG representative for further details.

Installation Procedure

Outdoor unit dimensions

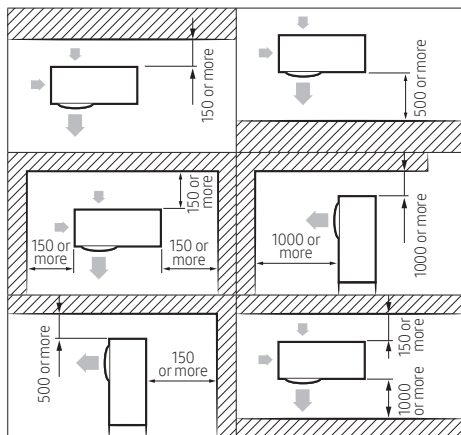
(Unit: mm)

Type A AC071HCADKG	
Type B AC090/100/120HCAD*G	
Type C AC140/160/180HCAD*G, AC100/120/140/160HCAPKG	
Type D AC200HCADNG, AC180HCAPKG	

Minimum clearances for the outdoor unit

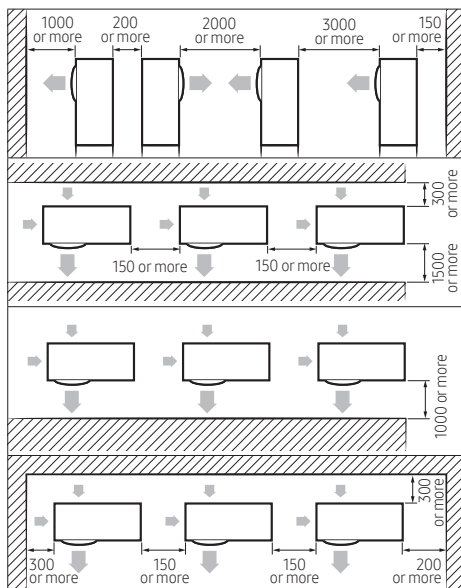
When installing 1 outdoor unit

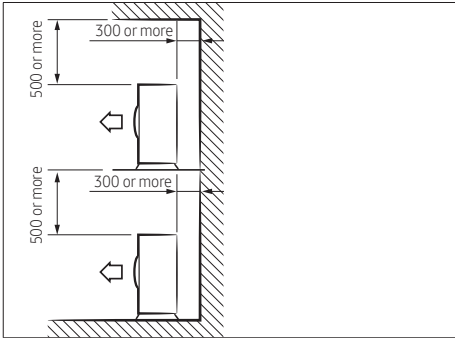
(Unit: mm)



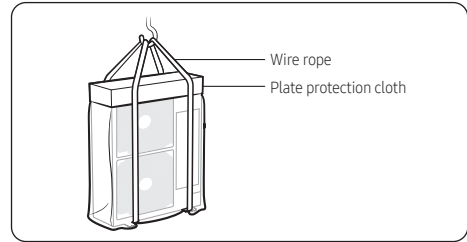
When installing more than 1 outdoor unit

(Unit: mm)





AC071/090/100/120 140/160/180HCAD*G,
AC100/120/140/160HCAPKG

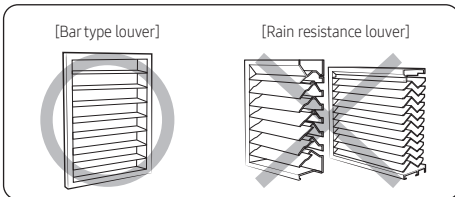


CAUTION

- The outdoor unit must be installed according to the specified distances in order to permit accessibility from each side, to guarantee correct operation, maintenance, and repair of the unit.
The components of the outdoor unit must be reachable and removable under safe conditions for people and the unit.

WARNING

- Should adopt bar type louver. Don't use a type of rain resistance louver.



- Louver specifications.
 - Angle criteria : less than 20°
 - Opening ratio criteria : greater than 80%

Moving the outdoor unit with wire rope

- Before carrying the outdoor unit, fasten two wire ropes of 8 m or longer, as shown in the figure.
- To prevent damages or scratches effectively, insert a piece of cloth between the outdoor unit and the ropes.
- Move the outdoor unit.

AC200HCADNG, AC180HCAPKG

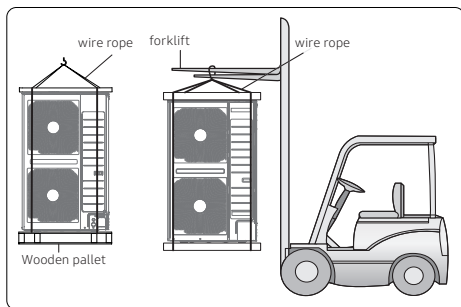
- Select the moving path in advance.
- Be sure that moving path can support weight of the outdoor unit.
- Do not slant the product more than 30° when carrying it. (Do not lay the product down in sideways.)
- Surface of the heat exchanger is sharp. Be careful not to get injured while moving the product.

CAUTION

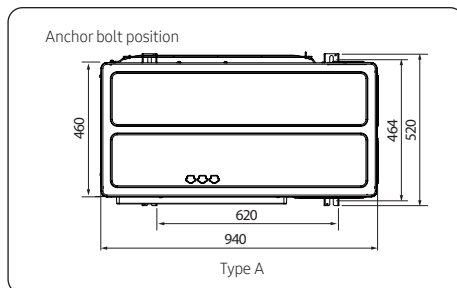
- You must use certain part of the product when moving the product.

- When moving with a crane
 - Fasten the wire rope as shown in the figure.
 - To protect damage or scratches, insert a piece of cloth between the outdoor unit and the wire rope.
- When moving with a forklift
 - Carefully insert the forklift forks into the forklift holes at the bottom of the outdoor unit.
 - Be careful with the forklift from damaging the product.
- When moving the product without wooden pallet and the crane is not available for use
 - Connect a wire rope to the outdoor unit as you would move it with a crane.
 - Hang the wire rope to the forklift fork to move the outdoor unit.

Installation Procedure



AC180HCAPKG, AC200HCADNG

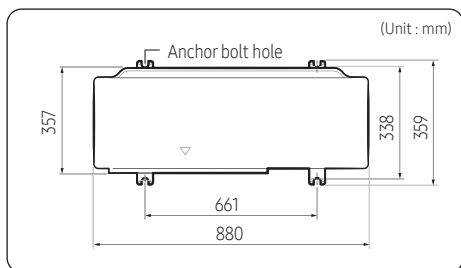


Step 2 Fixing the outdoor unit in place

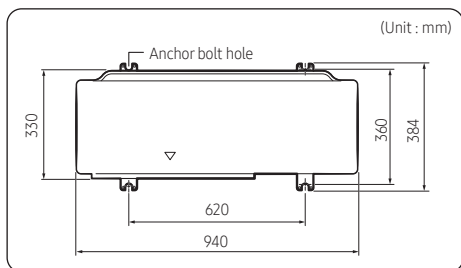
Install the outdoor unit on a rigid and stable base to prevent disturbance from any noise caused by vibration. When installing the unit at a height or in a location exposed to strong winds, fix the unit securely to a support (i.e., a wall or a ground).

Fix the outdoor unit with anchor bolts. Make sure that the anchor bolts are 20 mm or higher from the base surface.

AC071HCADKG

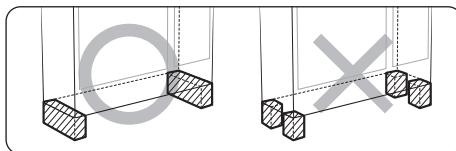


AC090/100/120 140/160/180HCAD*G,
AC100/120/140/160HCAPKG



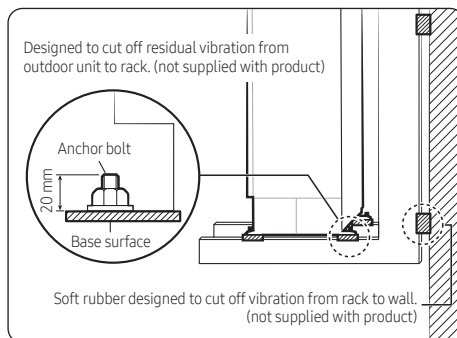
CAUTION

- Install a drain outlet at the lowest end around the base for outdoor unit drainage
- When installing the outdoor unit on the roof, waterproof the unit and check the ceiling strength.



- Make sure that the wall can support the weights of the rack and the outdoor unit.
- Install the rack close to the column as much as possible.

Optional: Fixing the outdoor unit to a wall with a rack



- Install a proper grommet in order to reduce noise and residual vibration transferred by the outdoor unit towards the wall.

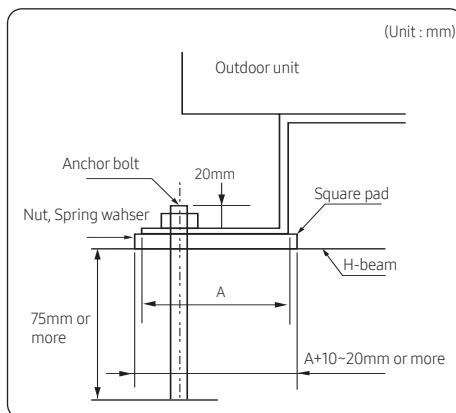
⚠ CAUTION

- When installing an air guide duct, be sure to check the following:
 - The screws do not damage the copper pipe.
 - The air guide duct is fixed firmly on the guard fan.

⚠ WARNING

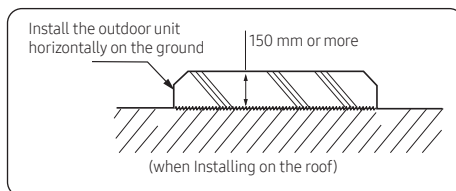
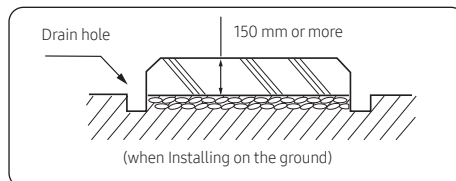
- Make sure to remove the wooden pallet before installing the outdoor unit. If you do not remove the wooden pallet, there is risk of fire during welding the pipes.
- If the outdoor unit is installed with wooden pallet on, and it was used for long period time, wooden palette may break and cause electrical hazard or high pressure may damage the pipes.

- 1 Install the outdoor unit 150mm higher than the base ground and install the drain hole to connect the pipe to the drainage.
- 2 When the front fan of an outdoor unit is installed in a place where the average snowfall is more than 150mm, the discharge duct should be attached to the outdoor unit.
- 3 The concrete foundation should be 1.5 times larger than bottom of the outdoor unit.
- 4 It is necessary to install wire mesh or steel bar when outdoor units are installed on a soft foundation.
- 5 When installing multiple outdoor units at the same place, install the H beam on the base ground. (When installing a number of outdoor units, you can install it on the base ground.)
- 6 Install the H beam(150mm x 150mm x t10 : basic specification) or vibration absorption frame to jut out from the base ground.
- 7 After installing the H beam, apply corrosion protection.
- 8 Install a square pad(t=20mm or more) to prevent vibration from the outdoor unit onto the base ground. Place the outdoor unit on the H beam and fix it with the bolt, nut and washer. (Fix with M10 basic anchor bolt, nut and washer.)



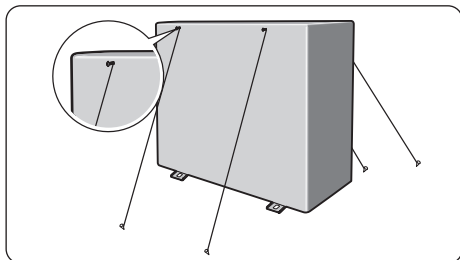
Base construction and installation of the outdoor unit

Base ground construction



- The outdoor unit should be supported within the range of measurement below for base ground work.
- When the outdoor unit needs to be supported, fix it with wire as shown in the picture.
 - Slightly unwind the four screws on the cover top of the outdoor unit.
 - Wind wires round the four screws and fasten the screws again.
 - Fix the wires to the ground.

Installation Procedure



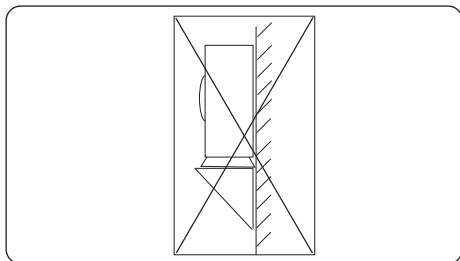
CAUTION

- If the outdoor unit is not fixed securely, product may fall and it might cause loss of life or property damage.
- Do not install the outdoor unit on the wooden pallet.
- Fix the outdoor unit securely to the base ground with anchor bolts.
- The manufacturer is not responsible for the damage occurred by not adhering to the standard of the installation.
- To protect the outdoor unit from external condition such as rain, install it on the base ground and connect the drain pipe to the drainage.



CAUTION

- Please firstly ensure the strength and levelness of the platform, ground and the support so as to lower the noise and vibration for fear of human injuries.
- The hanging mount on the wall is prohibited due to the heavy machine. The improper installation shall lead to the fall of the machine as well as human injuries.



The machine shall be installed on the ground or on the high platform

- As shown in Figure 1, to ensure the shadow part is on the bearing surface without suspension.
- As shown in Figure 1, the four installation footings shall be firmly fastened on the base platform by the bolts (preparing four sets of M10 bolts with fitful nuts and washer which are used on site)
- In order to reduce the vibration of the noisemeter, the vibration absorber (offer on site) shall be used between the contact of machine and base platform.
- It is optimal that anchor bolt is 20mm above the surface. (See Figure 2)

The base of the outdoor unit and the position of foundation bolts

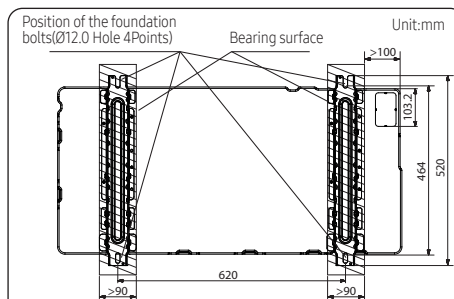


Figure 1

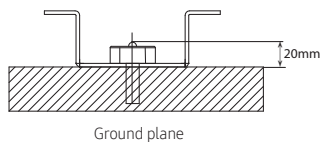
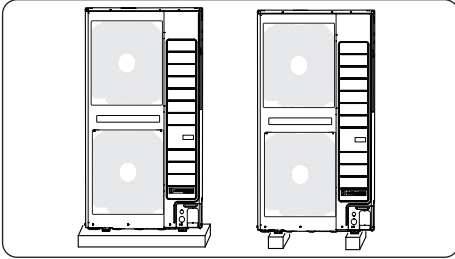


Figure 2

- Please ensure the shadow part in Figure 1 is really installed on the bearing surface without any suspension.
- The ground base that is larger than the standing leg of the air-conditioner (90mm in width and 520mm in length) shall be used to support the air-conditioner (See Figure 1), and the rubber mat shall be fully placed on the whole bearing surface.

- The base platform shall be at least 150mm above the ground.



⚠ CAUTION

- When the grounding pipe comes out from the below, please reserve the place for the connection pipe.
- The installation mode mentioned above shall ensure that the shadow part in Figure 1 is really on the installation surface.

Step 3 Connecting the power cables, communication cable, and controllers

You must connect the following three electrical cables to the outdoor unit:

- The main power cable between the auxiliary circuit breaker and the outdoor unit.
- The outdoor-to-indoor power cable between the outdoor unit and the indoor unit.
- The communication cable between the outdoor unit and the indoor unit.

⚠ CAUTION

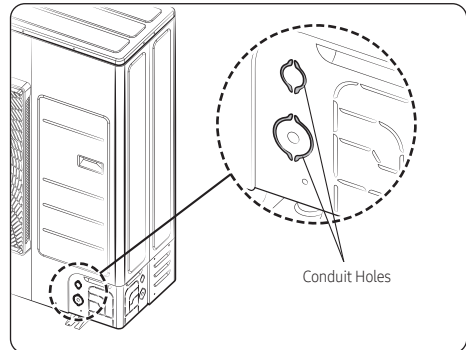
- During installation, make first the refrigerant connections and then the electrical connections. If the unit is uninstalled, first disconnect the electrical cables and then the refrigerant connections.
- Connect the air conditioner to the earthing system before making the electrical connections.

Connecting wire conduits

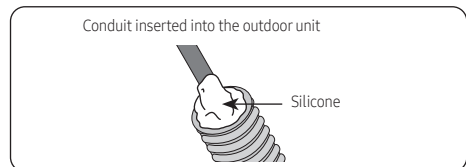
When connecting the power supply cables and communication cable, use conduits to protect the exposed cables from outside of product.

(for AC090/100/120/140/160/180/200HCAD*G, AC100/120/140/160/180HCAPKG models)

- 1 Remove conduit knock-outs.
 - Use a nipper to remove conduit holes from the lower part of the cabinet. (Do not remove it by hammering.)



- 2 Insert the cables through the conduits, and then fix the conduits to the conduit plate with the lock nuts.
 - Connect the cables through a conduit to protect against external forces, and feed the conduit through the wall together with refrigerant piping.
- 3 Apply silicone to the end of the hose to prevent rain from entering the hose.

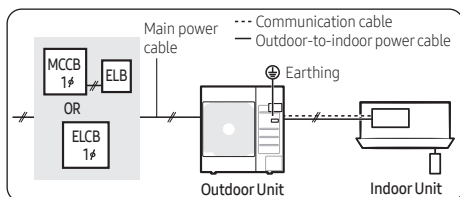


- 4 Connect the cables to the outdoor units. For how to connect the cables, refer to the next page.
- 5 Attach the conduit plate to the product.

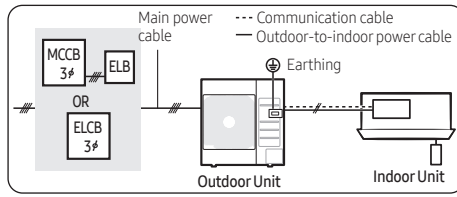
Installation Procedure

Air conditioning system examples

When using earth leakage circuit breaker (ELCB) for a single phase



When using earth leakage circuit breaker (ELCB) for a 3-phase, 4-wire system (3P4W)

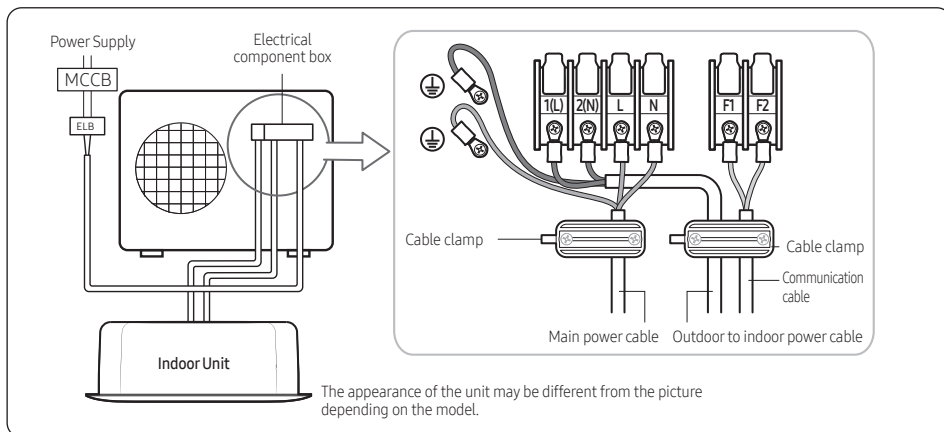


⚠ CAUTION

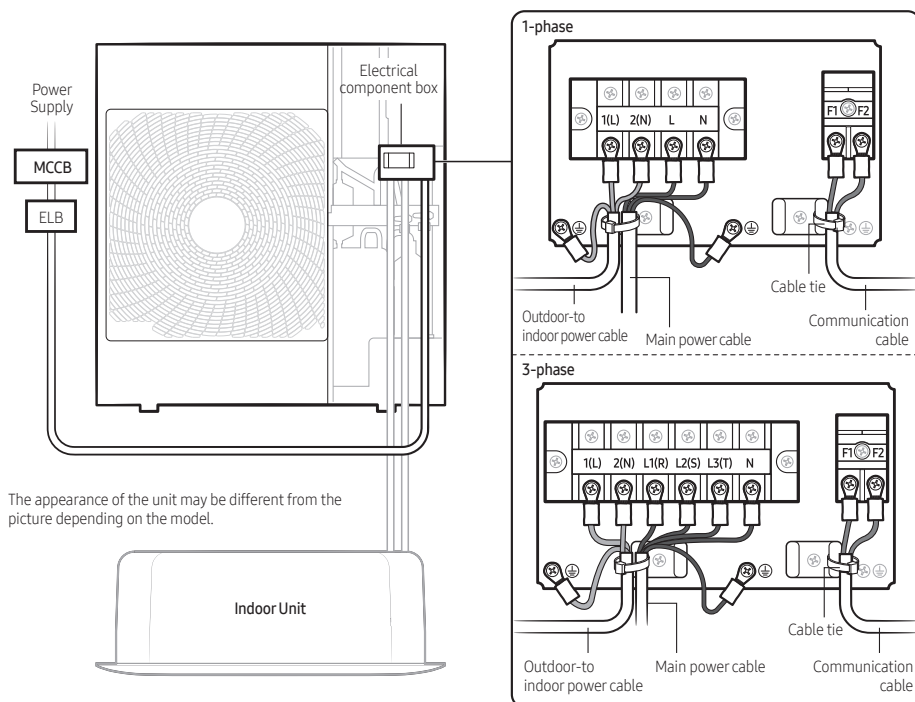
- Make sure to install an ELCB (RCD or RCCB) or ELCB and MCB combination, according local regulations.
- If the outdoor unit is installed in a location vulnerable to an electric leak or submergence, make sure to install an ELCB.
- For the product that uses the R-32 refrigerant, be cautious not to generate any sparks near the product.
 - Do not remove the fuses with power on.
 - Do not disconnect the power plug from the wall outlet with power on.
 - It is recommended to locate the outlet in a high position. Place the cords so that they are not tangled.

Connecting the main power cable

When using ELB for 1 phase



When using ELB for 1 phase and 3 phase



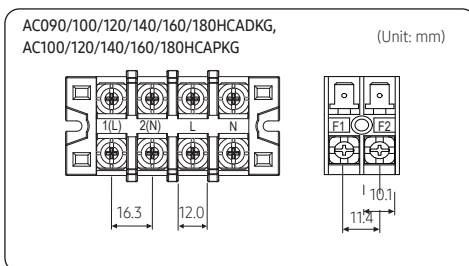
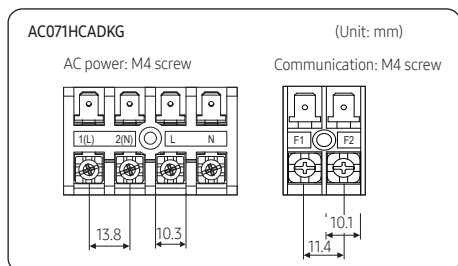
⚠ CAUTION

- You should connect the power cable into the power cable terminal and fasten it with a clamp.
- The unbalanced power must be maintained within 2% of supply rating. If the power is unbalanced greatly, it may shorten the life of the condenser. If the unbalanced power is exceeded over 4% of supply rating, the indoor unit is protected, stopped and the error mode indicates.
- To protect the product from water and possible shock, you should keep the power cables and the communication cable of the indoor and outdoor units within ducts. (with appropriate IP rating and material selection for your application)
- Ensure that main supply connection is made through a switch that disconnects all poles, with contact gap of at least 3 mm.
- Devices disconnected from the power supply should be completely disconnected in the condition of overvoltage category.
- Keep distances of 50 mm or more between power cable and communication cable. If the distance of 50mm or more cannot be kept, a double shielded cable (FROHH2R or LiYCY type) must be used, connected to earth on a single side.
- Do not let the power cable come into contact with the pipes inside the outdoor unit. If the power supply cable touches the pipes, the vibration of the compressor is transferred to the pipes and can damage the power supply cables or pipes, creating the danger of fire or explosion.
- Make sure that the place where the sheath of power supply cable is removed is inside the power supply box. If it is impossible, you should connect the protection tube for power cable to the power supply box.

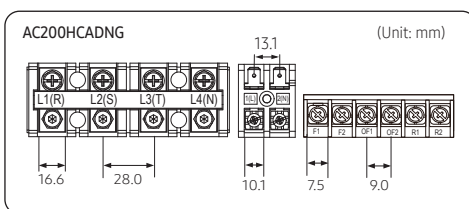
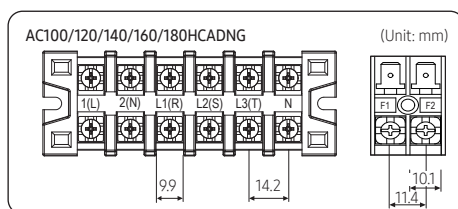
Installation Procedure

Main power terminal block specifications

- 1-phase terminal block specifications



- 3-phase terminal block specifications



Main power cable specifications

The power cable is not supplied with air conditioner.

- Select the power supply cable in accordance with relevant local and national regulations.
- Wire size must comply with the applicable local and national code.
- Specifications for local wiring power cord and branch wiring are in compliance with local cord.

Model		Outdoor Unit				Input current (A)				Power supply	
Indoor Unit	Outdoor Unit	Hz	Voltage range (V)			Outdoor Unit		Indoor Unit	Total	MCA(A)	MFA(A)
			Rated	Min.	Max.	Cooling	Heating				
AC071HEHDKG	AC071HCADKG	50	220 to 240	198	264	16.0	16.0	2.8	18.8	18.8	20.0
AC071HE4DKG						16.0	16.0	1.5	17.5	17.5	20.0
AC071HE6DKG						16.0	16.0	2.0	18.0	18.0	20.0
AC090HEHDKG	AC090HCADKG					24.0	24.0	2.8	26.8	26.8	30.0
AC100HEHDKG	AC100HCADKG					24.0	24.0	3.8	27.8	27.8	30.0
AC100HEHPKG						24.0	24.0	3.9	27.9	27.9	30.0
AC100HE4DKG						24.0	24.0	2.0	26.0	26.0	30.0
AC100HE6DKG						24.0	24.0	2.0	26.0	26.0	30.0
AC100HEHFKG	AC100HCAPKG					24.0	24.0	3.9	27.9	27.9	30.0
AC120HEHDKG	AC120HCADKG					32.0	32.0	3.8	35.8	35.8	40.0
AC120HEHPKG						32.0	32.0	3.9	35.9	35.9	40.0
AC120HE4DKG						32.0	32.0	2.0	34.0	34.0	40.0
AC120HE6DKG						32.0	32.0	2.0	34.0	34.0	40.0
AC120HEHFKG	AC120HCAPKG					32.0	32.0	3.9	35.9	35.9	40.0
AC140HEHDKG	AC140HCADKG					32.0	32.0	3.8	35.8	35.8	40.0
AC140HEHPKG						32.0	32.0	3.9	35.9	35.9	40.0
AC140HE4DKG						32.0	32.0	2.0	34.0	34.0	40.0
AC140HE6DKG						32.0	32.0	2.0	34.0	34.0	40.0
AC140HEHFKG	AC140HCAPKG					32.0	32.0	3.9	35.9	35.9	40.0
AC160HEHPKG	AC160HCADKG					32.0	32.0	4.2	36.2	36.2	40.0
AC160HEHFKG	AC160HCAPKG					32.0	32.0	3.9	35.9	35.9	40.0
AC180HEHPKG	AC180HCADKG					32.0	32.0	3.9	35.9	35.9	40.0
AC180HEHFKG	AC180HCAPKG					32.0	32.0	3.9	35.9	35.9	40.0
AC100HEHDKG	AC100HCADNG	380 to 415	342	456.5	16.1	16.1	3.8	19.9	19.9	20.0	
AC100HEHPKG					16.1	16.1	3.9	20.0	20.0	20.0	
AC120HEHDKG	AC120HCADNG				16.1	16.1	3.8	19.9	19.9	20.0	
AC120HEHPKG					16.1	16.1	3.9	20.0	20.0	20.0	
AC140HEHDKG	AC140HCADNG				16.1	16.1	3.8	19.9	19.9	20.0	
AC140HEHPKG					16.1	16.1	3.9	20.0	20.0	20.0	
AC160HEHPKG	AC160HCADNG				16.1	16.1	4.2	20.3	20.3	20.3	
AC180HEHPKG	AC180HCADNG				16.1	16.1	3.9	20.0	20.0	20.0	
AC200HEHPKG	AC200HCADNG				25.0	25.0	3.9	28.9	28.9	30.0	

NOTE

1 Voltage range

- Units are suitable for use on electrical systems where voltage supplied to unit terminal is not below or above listed range limits.

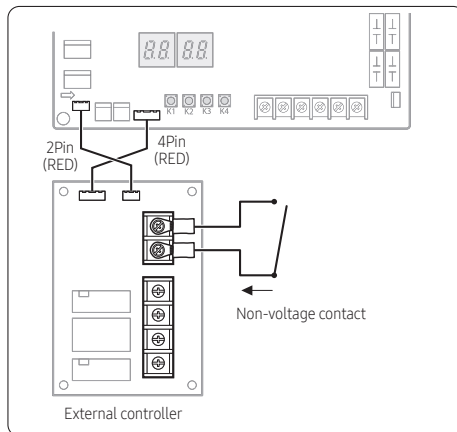
Installation Procedure

- 2 Maximum allowable voltage variation between phases is 2%.
- 3 Wire size & type must comply with current local, state, and federal safety standards.
 - Wire size: Based on the value of MCA.
 - Wire type: 60245 IEC57(IEC) or H05RN-F(CENELEC) grade or more.
- 4 MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker).
- 5 MCA represents maximum input current.
 - MFA represents capacity which may accept MCA
 - Abbreviations
MCA: Min. Circuit Amps. (A)
MFA: Max. Fuse Amps. (A)
- 6 This equipment complies with IEC 61000-3-12 provided that the short-circuit power S_{sc} is greater than or equal to $S_{sc} (*2)$ at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power S_{sc} greater than or equal to $S_{sc} (*2)$.

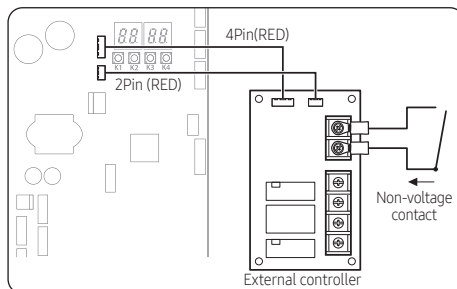
Model	$S_{sc}[MVA]$
AC071HCADKG	-
AC090HCADKG	0.5936
AC100HCADKG	0.5936
AC120HCADKG	0.7833
AC140HCADKG	0.7378
AC160HCADKG	0.7378
AC180HCADKG	0.7378
AC100HCAPKG	0.7378
AC120HCAPKG	0.7378
AC140HCAPKG	0.7378
AC160HCAPKG	0.7378
AC180HCAPKG	0.7568
AC100HCADNG	3.1598
AC120HCADNG	3.9028
AC140HCADNG	3.9028
AC160HCADNG	4.0861
AC180HCADNG	4.0861
AC200HCADNG	4.4265

Silence mode controller wiring diagram

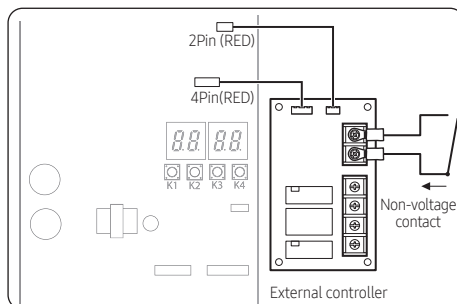
AC071HCADKG



AC090/100/120/140/160/180HCAD*G, AC100/120/140/160/180HCAPKG



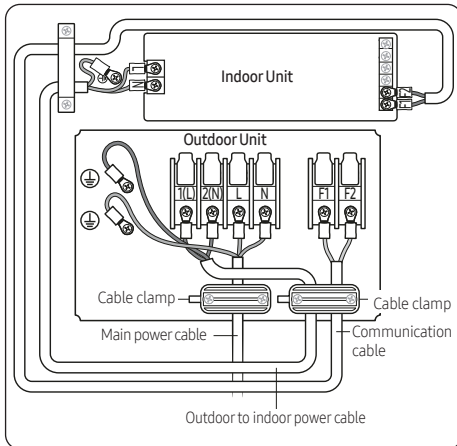
AC200HCADNG



Connecting the outdoor-to-indoor power cable and the communication cable

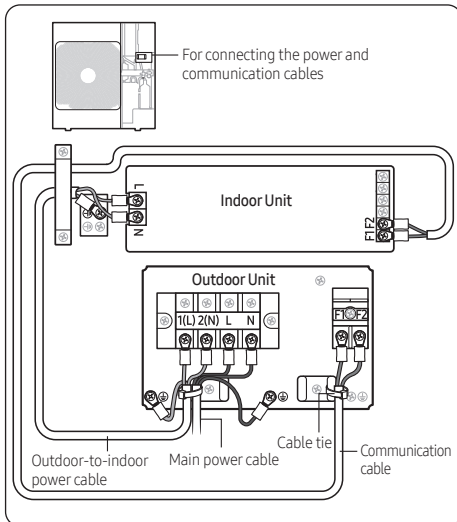
1-phase

AC071HCADKG



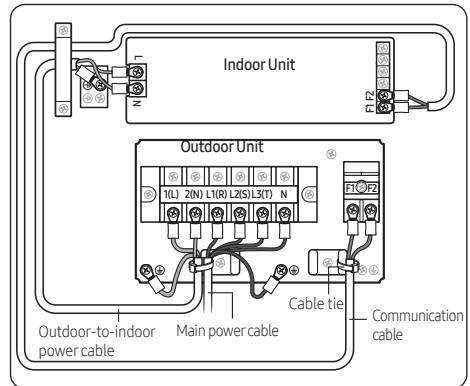
AC090/100/120/140/160/180HCADKG

AC100/120/140/160/180HCAPKG

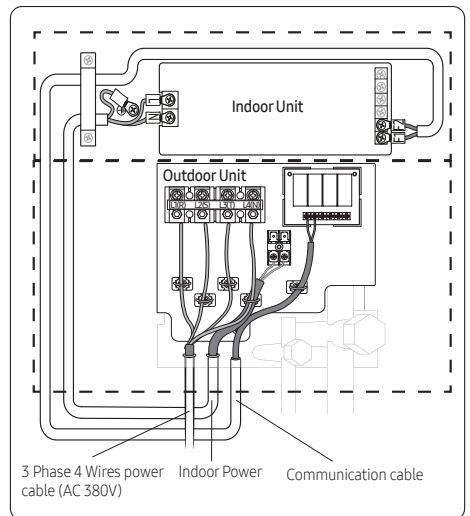


3-phase

AC100/120/140/160/180HCADNG



AC200HCADNG



NOTE

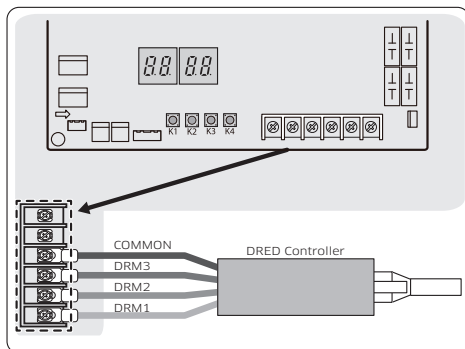
- After connecting the power cable to the terminal as seen in the illustration, fix it with cable tie. (Cable ties are not provided.)
- Lay the electrical wiring so that the front cover does not rise up when doing wiring work and attach the front cover securely.

Installation Procedure

- Ground wire for the indoor unit and outdoor unit connection cable must be clamped to a soft copper tin-plated eyelet terminal with M4 screw hole (NOT SUPPLIED WITH UNIT ACCESSORIES).
The appearance of the unit may be different from the picture depending on the model.

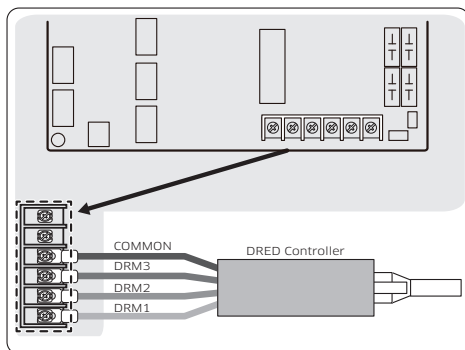
DRED wiring diagram

AC071HCADKG

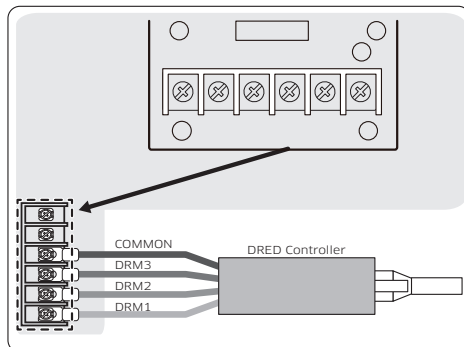


AC090/100/120/140/160/180HCAD*G

AC100/120/140/160/180HCAPKG

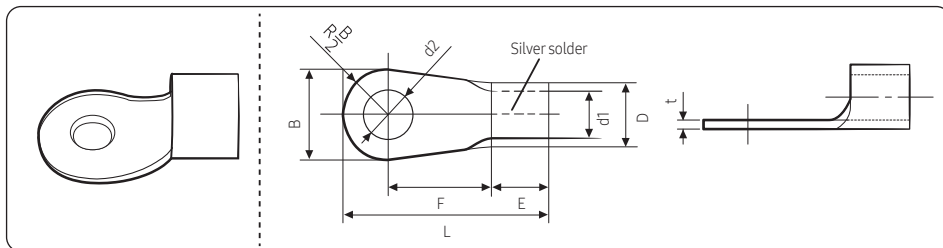


AC200HCADNG



Outdoor-to-indoor power terminal specifications

- Connect the cables to the terminal board using the compressed ring terminal.
- Cover a solderless ring terminal and a connector part of the power cable and then connect it.



Nominal dimensions for cable (mm ²)	Nominal dimensions for screw (mm)	B		D		d1		E	F		L	d2		t
		Standard dimension (mm)	Allowance (mm)	Standard dimension (mm)	Allowance (mm)	Standard dimension (mm)	Allowance (mm)	Min. (mm)	Min. (mm)	Max. (mm)		Standard dimension (mm)	Allowance (mm)	Min. (mm)
4/6	4	9.5	±0.2	5.6	+0.3 -0.2	3.4	±0.2	6.0	5	20.0		4.3	+0.2 0	0.9
	8	15.0							9	28.5		8.4	+0.4 0	
10	8	15.0	±0.2	7.1	+0.3 -0.2	4.5	±0.2	7.9	9	30.0		8.4	+0.4 0	1.15
16	8	16.0	±0.2	9.0	+0.3 -0.2	5.8	±0.2	9.5	13	33.0		8.4	+0.4 0	1.45
25	8	12.0	±0.3	11.5	+0.5 -0.2	7.7	±0.2	11.0	15	34.0		8.4	+0.4 0	1.7
	8	16.5							13			8.4	+0.4 0	
35	8	16.0	±0.3	13.3	+0.5 -0.2	9.4	±0.2	12.5	13	38.0		8.4	+0.4 0	1.8
	8	22.0							13	43.0		8.4	+0.4 0	
50	8	22.0	±0.3	13.5	+0.5 -0.2	11.4	±0.3	17.5	14	50.0		8.4	+0.4 0	1.8
70	8	24.0	±0.4	17.5	+0.5 -0.4	13.3	±0.4	18.5	20	51.0		8.4	+0.4 0	2.0

- Connect the rated cables only.
- Connect using a driver which is able to apply the rated torque to the screws.
- If the terminal is loose, fire may occur caused by arc. If the terminal is connected too firmly, the terminal may be damaged.

Tightening torque (kgf•cm)	
M4	12.0 to 18.0
M5	20.0 to 30.0
M6	25.0 to 37.0

- 1 N·m = 10 kgf•cm

Installation Procedure



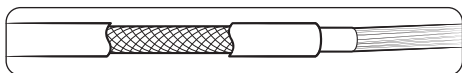
CAUTION

- When connecting cables, you can connect the cables to the electrical part or connect them through the holes below depending on the spot.
- Connect the communication cable between the indoor and outdoor units through a conduit to protect against external forces, and feed the conduit through the wall together with refrigerant piping.
- Remove all burrs at the edge of the knock-out hole and secure the cable to the outdoor knock-out using lining and bushing with an electrical insulation such as rubber and so on.
- Must keep the cable in a protection tube.
- Keep distances of 50mm or more between power cable and communication cable.
- When the cables are connected through the hole, remove the knock-out piece.

Outdoor-to-indoor power and communication cables specifications

Indoor power supply		
Power supply	Max/Min (V)	Indoor power cable
1Ø, 220-240V, 50 Hz	±10%	Cassette: 0.75mm²†, 3wires
		AC071/090/100/120/140HEHDKG
		AC100/120/140/160/180HEHPKG
		AC100/120/140/160HEHFKG
		:1.5mm²†, 3wires
		AC180HEHFKG
		AC200HEHPKG
		: 2.5mm²†, 3wires
Communication cable		
	0.75 to 1.5mm², 2 wires	

- Power supply cords of parts of appliances for outdoor use shall not be lighter than polychloroprene sheathed flexible cord. (Code designation IEC:60245 IEC 57 / CENELEC: H05RN-F or IEC:60245 IEC 66 / CENELEC: H07RN-F)
- When installing the indoor unit in a computer room or net work room, use the double shielded (tape aluminium /polyester braid + copper) cable of FROHH2R or LiYCY type.

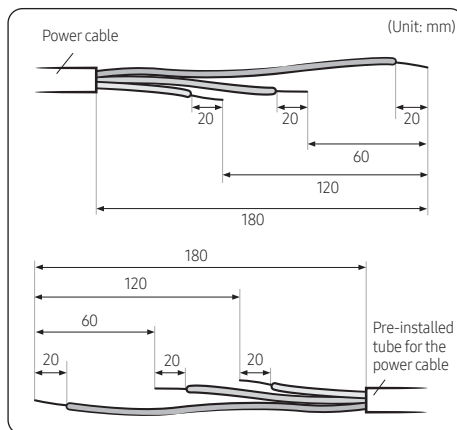


Step 4 Optional: Extending the power cable

- Prepare the following tools.

Tools	Spec	Shape
Crimping pliers	MH-14	
Connection sleeve (mm)	20 x Ø6.5 (H x OD)	
Insulation tape	Width 19 mm	
Contraction tube (mm)	70 x Ø8.0 (L x OD)	

- As shown in the figure, peel off the shields from the rubber and wire of the power cable.
 - Peel off 20 mm of cable shields from the pre-installed tube.

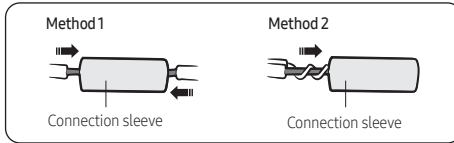


CAUTION

- For information about the power cable specifications for indoor and outdoor units, refer to the installation manual.
- After peeling off cable wires from the pre-installed tube, insert a contraction tube.

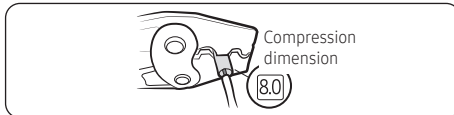
3 Insert both sides of core wire of the power cable into the connection sleeve.

- Method 1: Push the core wire into the sleeve from both sides.
- Method 2: Twist the wire cores together and push it into the sleeve.

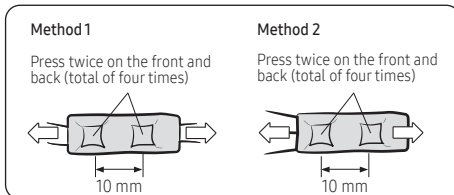


CAUTION

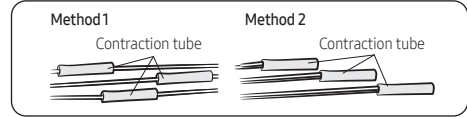
- If cable wires are connected without using connecting sleeves, their contact area becomes reduced, or corrosion develops on the outer surfaces of the wires (copper wires) over a long time. This may cause an increase of resistance (reduction of passing current) and consequently may result in a fire.
- 4 Using a dedicated crimping tool, compress the two points and flip it over and compress another two points in the same location.
- The compression dimension should be 8.0 mm².



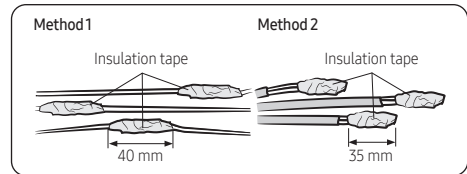
- After compressing it, pull both sides of the wire to make sure it is firmly pressed.



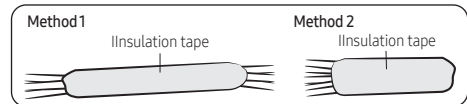
5 Apply heat to the contraction tube to contract it.



6 Wrap it with the insulation tape twice or more and position your contraction tube in the middle of the insulation tape.



7 After tube contraction work is completed, wrap it with the insulation tape to finish.
Three or more layers of insulation are required.



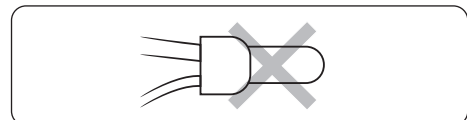
CAUTION

- Make sure that the connection parts are not exposed to outside.
- Be sure to use insulation tape and a contraction tube made of approved reinforced insulating materials that have the same level of withstand voltage with the power cable. (Comply with the local regulations on extensions.)



WARNING

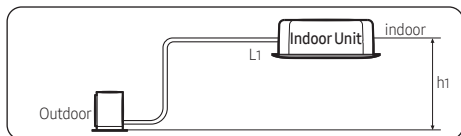
- In case of extending the electric wire, please DO NOT use a round-shaped Pressing socket.
 - Incomplete wire connections can cause electric shock or a fire.



Installation Procedure

Step 5 Connecting the refrigerant pipe

Items	Maximum allowable length	
	Single Installation	
Applicable outdoor unit models	AC071HCADKG AC090HCADKG AC100HCAD*G AC120HCAD*G	AC140HCAD*G AC160HCAD*G AC180HCAD*G AC200HCADNG AC100HCAPKG AC120HCAPKG AC140HCAPKG AC160HCAPKG AC180HCAPKG
Main pipe length (L ₁)	50m	85m
Max. height difference between outdoor and indoor units (h ₁)	30m	30m



- Temper grade and minimum thickness of the refrigerant pipe

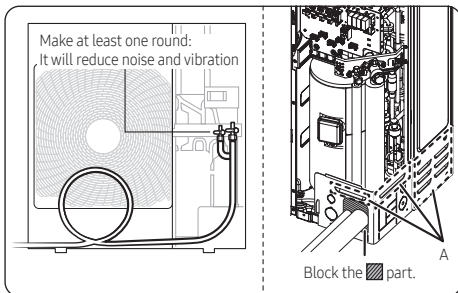
Outer diameter [mm]	Minimum thickness [mm]	Temper grade
Ø 6.35	0.7	C1220T-O
Ø 9.52	0.7	
Ø 12.70	0.8	
Ø 15.88	1.0	
Ø 15.88	0.8	C1220T-1/2H OR C1220T-H
Ø 19.05	0.9	
Ø 22.23	0.9	

The material specification (thickness) of the refrigerant pipes must be in accordance with local legislation and standards.



CAUTION

- Be sure to use C1220T-1/2H (Semi-hard) pipe for more than Ø19.05 mm. If you use C1220T-O (Soft) pipe for Ø19.05 mm, the pipe may be broken, which can result in an injury.
- Provision shall be made for expansion and contraction of long runs of piping.



- The appearance of the unit may be different from the diagram depending on the model.

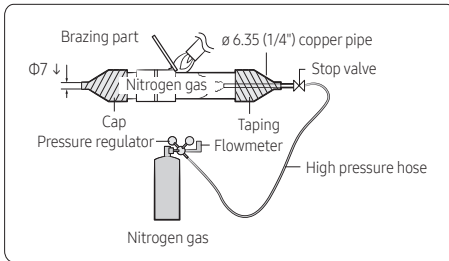
Storing refrigerant pipe

To prevent foreign materials or water from entering the pipe, it is important to keep the refrigerant pipe sealed in clean and dry condition during installation. Apply correct sealing method depending on the environment.

Stored place	Stored time	Sealing type
Outside	Longer than one month	Pipe pinch
	Shorter than one month	Taping
Inside	-	Taping

Refrigerant pipe brazing and safety information

- Important information for refrigerant pipe work
 - Make sure that there is no moisture inside the pipe
 - Make sure that there are no foreign materials and impurities in the pipe.
 - Make sure that there is no leak.
 - Make sure to follow the instruction when brazing and keeping the pipe.
- Nitrogen flushing brazing
 - Use nitrogen gas when brazing the pipes as shown in the picture.
 - If you do not perform nitrogen flushing when brazing the pipes, oxide may form inside the pipe. It can cause the damage of the important parts such as compressor, valves.
 - Adjust the flow rate of the nitrogen flushing with a pressure regulator to maintain 0.05m³/h or less.
 - Wrap the bottom side of the service valve with a wet cloth and weld it as shown in the figure. Since water will evaporate during welding, pour some water time to time. If not, O-ring and packing inside the service valve may get damaged by a welding fire and cause critical leakage.



Direction of the pipe when brazing

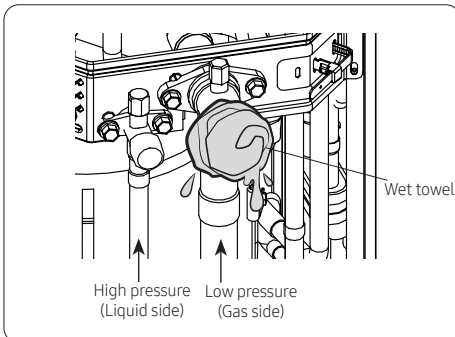
- Brazing the pipe should be done with the pipe headed downward or horizontally.
- Avoid brazing with the pipe headed upward.



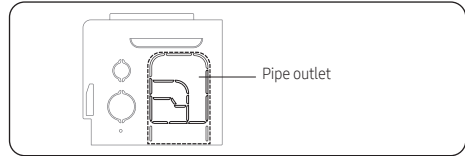
CAUTION

Caution for welding the pipe to an outdoor unit (Only for AC180HCPKG, AC200HCADNG):

- When welding the pipe, the unit may get damaged by the heat and flame from welding. Specifically outdoor's pipe near by EEV, the fire would damage the EEV. Use a flame proofing cloth to protect the unit from a welding fire or flame.
- The O-ring and Teflon packing inside service valve may get damaged by the heat from welding. Wrap the bottom side of the service valve with a wet cloth and weld it as shown in the illustration. Also, water dripping from the wet cloth may interrupt the welding. Make sure the water does not drip from the wet cloth.
- Make sure that connected pipes does not interrupt each other or make contact with the product. (Vibration may cause damage to the pipes.)



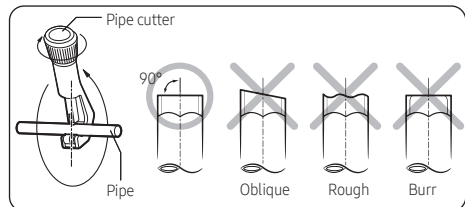
CAUTION



- Cut the pipe outlet to the exact pipe size. In addition, remove foreign substances and burrs around the outlet.
- Perform cutting with only a cutter (ex. nipper) and never tap with a hammer near the pipe outlet. Otherwise, it may cause product damage such as warping of the cabinet.
- After connecting the pipes with pipe outlet, plug the space around the pipes.
- After connecting the pipes, proceed exactly as directed in the guide to prevent interference with the internal parts.
- Tighten the nuts to the specified torques. If overtightened, the nuts could be broken so refrigerant may leak.
- Protect or enclose refrigerant tubing to avoid mechanical damage.
- After installing pipes, block the unused knock hole to prevent small animal from entering. However, the radiant heat hole(A) should be able to intake air.

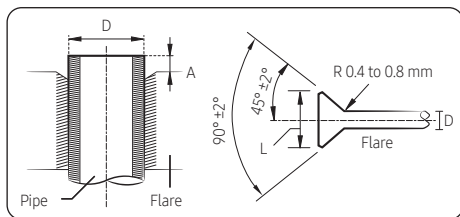
Step 6 Optional: Cutting and flaring the pipes

- 1 Make sure that you have the required tools available. (pipe cutter, reamer, flaring tool, and pipe holder)
- 2 If you wish to shorten the pipes, cut it with a pipe cutter, taking care to ensure that the cut edge remains at a 90° angle with the side of the pipe. Refer to the illustrations below for examples of edges cut correctly and incorrectly.



Installation Procedure

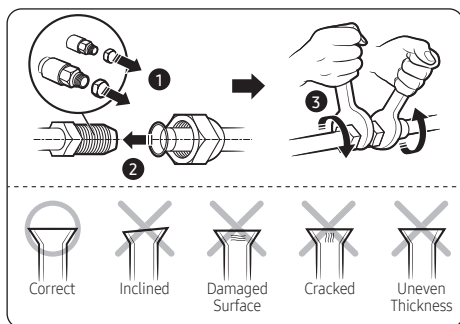
- To prevent any gas from leaking out, remove all burrs at the cut edge of the pipe, using a reamer.
- Slide a flare nut on to the pipe and modify the flare.



Outer diameter (D)	Depth (A)	Flare dimension (L)
Ø6.35 mm	1.3 mm	8.7 to 9.1 mm
Ø9.52 mm	1.8 mm	12.8 to 13.2 mm
Ø12.70 mm	2.0 mm	16.2 to 16.6 mm
Ø15.88 mm	2.2 mm	19.3 to 19.7 mm
Ø19.05 mm	2.2 mm	23.6 to 24.0 mm

- 1 N·m = 10 kgf·cm

- Check that the flaring is correct, referring to the illustrations below for examples of incorrect flaring.



CAUTION

- Keep the piping length at a minimum to minimize the additional refrigerant charge due to piping extension.
- When connecting the pipes, make sure that surrounding objects do not interfere with or contact them to prevent refrigerant leakage due to physical damage.

- Make sure that the spaces where the refrigerant pipes are installed comply with national gas regulations.
- Be sure to perform works such as additional refrigerant charging and pipe welding under the conditions of good ventilation.
- Be sure to perform welding and piping works for mechanical connections under the conditions that the refrigerant does not circulate.
- When reconnecting the pipes, make sure to perform flared-jointing newly to prevent refrigerant leakage.
- When working on the refrigerant pipes and the flexible refrigerant connectors, be careful that they are not damaged physically by surrounding objects.
- For installation with handling the R-32 refrigerant, use the special tools for the R-32 refrigerant (manifold gauge, vacuum pump, charging hose, etc.).
- During tests never pressurize the appliances with a pressure higher than the maximum allowable pressure (as indicated on the nameplate of the unit).
- Never directly touch any accidental leaking refrigerant. This could result in severe wounds caused by frostbite.
- Never install a dryer to this unit in order to guarantee its lifetime.
- If the pipes require brazing ensure that OFN (Oxygen Free Nitrogen) is flowing through the system.
- Nitrogen blowing pressure range is 0.02 to 0.05 MPa.
- If you need a pipe longer than specified in piping codes and standards, you must add refrigerant to the pipe. Otherwise, the indoor unit may freeze.
- While removing burrs, put the pipe face down to make sure that the burrs do not get in to the pipe.

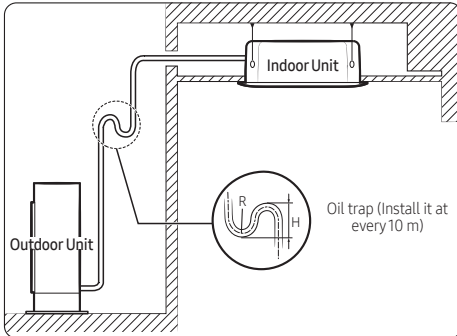
Step 7 Installing oil traps

Check the following list and install an oil trap.

- Based on cooling operation, install it on the gas side pipe only.
- Install the oil trap only in between the outdoor unit and the first branch joint and it should be installed at every 10 m.
- Radius of curvature (R) on the oil trap are as follows;

Pipe diameter (D, mm)	12.70	15.88	19.05	22.23	25.40	28.60	31.75
Radius of curvature (R, mm)	25 and over	32 and over	38 and over	41 and over	51 and over	57 and over	60 and over

- Height of the oil trap (H): $4R \leq H \leq 6R$
- When the indoor unit is installed at a higher place than the outdoor unit

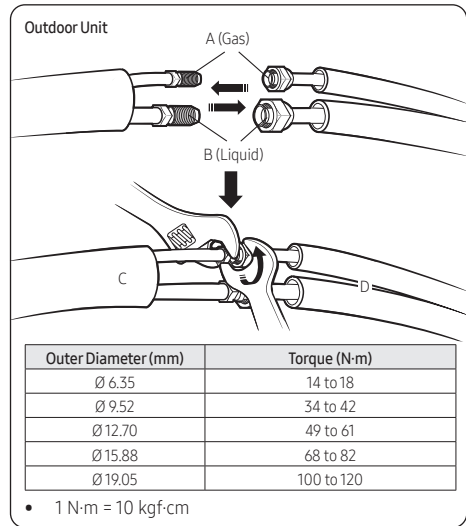


Step 8 Connecting up and removing air in the circuit



CAUTION

- When installing, make sure there is no leakage. When recovering the refrigerant, ground the compressor first before removing the connection pipe. If the refrigerant pipe is not properly connected and the compressor works with the service valve open, the pipe inhales the air and it makes the pressure inside of the refrigerant cycle abnormally high. It may cause explosion and injury.
 - The air in the indoor unit and in the pipe must be evacuated. If air remains in the refrigerant pipes, it will affect the compressor either reduce cooling/heating capacity or lead to a malfunction.
 - Use manifold gauge and vacuum pump as shown at the right figure.
 - Make sure that both manifold gauge and vacuum pump are compatible with R-32.
 - The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length and height difference.
 - Use clean refrigerant pipe with no harmful ion, oxide, dust, iron content or moisture inside pipe.
- 1 Connect each assembly pipe to the appropriate valve on the outdoor unit and tighten the flare nut.
 - 2 Referring to the illustration below, tighten the flare nut on section D first manually and then with a torque wrench, applying the following torque.



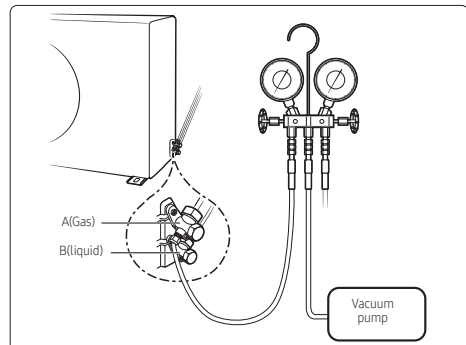
- 3 Connect the charging hose of low pressure side of manifold gauge to the packed valve having a service port as shown at the figure.



CAUTION

- The designs and shape are subject to change according to the model.
- 4 Open the valve of the low pressure side(A) of manifold gauge anticlockwise.

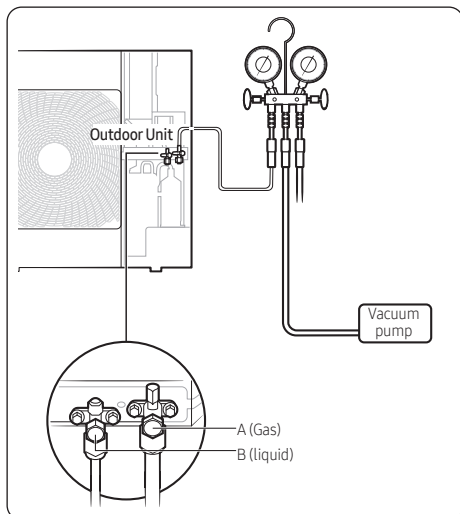
AC071HCADKG



Installation Procedure

AC090/100/120/140/160/180/200HCAD*G

AC100/120/140/160/180HCAPKG



- 5 Purge the air from the system using a vacuum pump for about 10 minutes.
 - 1) Evacuate until 4000 microns is achieved, for at least 10 minutes.
 - 2) Close the gauge manifold valve, shut off the vacuum pump, and remove the common hose.
 - 3) Connect the hose to the nitrogen pressure regulator and bleed the hose by opening the end of the common hose closest to the manifold.
 - 4) Open the high-pressure manifold valve and slowly bring the system pressure to the atmosphere (101 kPa (14.64 psi)).
 - 5) Close the manifold and nitrogen cylinder and remove the common hose.
 - 6) Reconnect the common hose to the vacuum pump. Repeat steps 1) through 6), alternating between breaking the vacuum with dry nitrogen and evacuating, until system evacuation has occurred three times, to the following vacuum levels: Evacuation Microns

Evacuation	Microns
First	4000
Second	2000
Third	500

- 7) After evacuating to at least 500 microns for the third time, close the gauge manifold valve and wait 10 minutes, making sure that the vacuum level in the system does not decrease. If it does, a small leak is likely. Repair the leak and repeat the evacuation process.

- 6 Remove the hose of the low pressure side of the manifold gauge.
- 7 Open the stop valve of both liquid and gas sides.
- 8 Mount the valve stem nuts and the service port cap to the valve, and tighten them at the torque of 183 kgf•cm with a torque wrench.
- 9 Check for gas leakage.
 - At this time, especially check for gas leakage from the 3-way valve's stem nuts(A port), and from the service port cap.



CAUTION

- Connect the indoor and outdoor units using pipes with flared connections (not supplied). For the lines, use insulated, unwelded, degreased and deoxidized copper pipe, (Cu DHP type to ISO 1337 or UNI EN 12735-1), suitable for operating pressures of at least 4.50 MPa and for a burst pressure of at least 17.0 MPa. Copper pipe for hydro sanitary applications is completely unsuitable.
- For sizing and limits (height difference, line length, max. bends, refrigerant charge, etc.) see "Connecting refrigerant pipe section".

Step 9 Adding refrigerant (R-32)

Precautions on adding the R-32 refrigerant

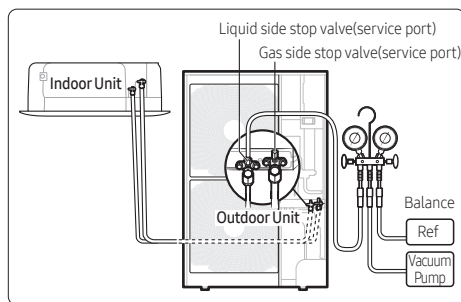
In addition to the conventional charging procedure, the following requirements shall be kept.

- Make sure that contamination by other refrigerants does not occur for charging.
- To minimize the amount of refrigerant, keep the hoses and lines as short as possible.
- The cylinders shall be kept upright.
- Make sure that the refrigeration system is earthed before charging.
- Label the system after charging, if necessary.
- Extreme care is required not to overcharge the system.
- Before recharging, the pressure shall be checked with nitrogen blowing.
- After charging, check for leakage before commissioning.
- Be sure to check for leakage before leaving the work area.
- The outdoor unit is loaded with sufficient refrigerant for the standard piping. Thus, refrigerant must be added if the piping is lengthened. This operation can only be performed by a qualified refrigeration specialist. To determine the quantity of refrigerant charge, see **Calculating the quantity of refrigerant to add** on page 34.

- 1 Check if the stop valve is closed completely.
- 2 Charge the refrigerant through the service port of the liquid stop valve.

NOTE

- Do not charge the refrigerant through the service port of the gas stop valve.
- 3 If you have any difficulty charging the refrigerant as described in the steps above, take the following steps:
 - a Open the liquid stop valve and gas stop valve.
 - b Operate the air conditioner by pressing the K2 button on the outdoor unit PCB.
 - c After about 30 minutes, charge the refrigerant through the service port of the gas stop valve.



Important information: regulation regarding the refrigerant used

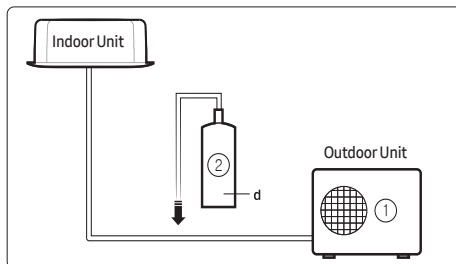
This product contains fluorinated greenhouse gases. Do not vent gases into the atmosphere.

CAUTION

- Inform user if the system contains 5 tCO₂e or more of fluorinated greenhouse gases. In this case, it must be checked for leakage at least once every 12 months, according to regulation No. 517/2014. This activity must be covered by qualified personnel only. In the case of the situation above, the installer (or authorized person with responsibility for final check) must provide a maintenance book, with all the information recorded, according to REGULATION (EU) No. 517/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014 on fluorinated greenhouse gases.

Please fill in the following with indelible ink on this manual.

- ①: The factory refrigerant charge of the product.
- ②: The additional refrigerant amount charged in the field.
- ① + ②: The total refrigerant charge.



Unit	kg	tCO ₂ e
①, a		
②, b		
① + ②, c		

Refrigerant type	GWP value
R-32	675

- GWP: Global Warming Potential
- Calculating tCO₂e : kg x GWP/1000

NOTE

- a Factory refrigerant charge of the product: see unit name plate
- b Additional refrigerant amount charged in the field (Refer to the above information for the quantity of refrigerant replenishment.)
- c Total refrigerant charge
- d Refrigerant cylinder and manifold for charging

CAUTION

- The filled-out label must be adhered in the proximity of the product charging port (e.g. onto the inside of the stop valve cover).
- Make sure that the total refrigerant charge does not exceed (C), the maximum refrigerant charge, which is calculated in the following formula: Maximum refrigerant charge (C) = factory refrigerant charge (A) + maximum additional refrigerant charge due to piping extension (B).

Installation Procedure

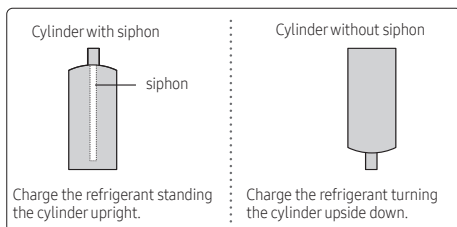
(Unit: g)

Model	A	B	C
AC071HCADKG	1700	750	2450
AC090HCADKG	2700	900	3600
AC100HCADKG	2700	900	3600
AC120HCADKG	2900	900	3800
AC140HCADKG	3100	2475	5575
AC160HCADKG	3500	2475	5975
AC180HCADKG	3500	2475	5975
AC100HCAPKG	3100	2475	5575
AC120HCAPKG	3500	2475	5975
AC140HCAPKG	3500	2475	5975
AC160HCAPKG	3500	2475	5975
AC180HCAPKG	5500	2750	8250
AC100HCADNG	2700	900	3600
AC120HCADNG	2900	900	3800
AC140HCADNG	3100	2475	5575
AC160HCADNG	3500	2475	5975
AC180HCADNG	3500	2475	5975
AC200HCADNG	5500	2750	8250

Charging the refrigerant under conditions of liquid by using a liquid pipe

It is necessary for recharging under conditions of liquid. When recharging refrigerant from the refrigerant cylinder to the equipment, follow the instructions below.

- Before recharging, check whether the cylinder has a siphon or not. There are two ways to recharge the refrigerant.



NOTE

- During the measuring operation of refrigerant quantity added use an electronic balance. If cylinder doesn't have siphon, upset it.

Calculating the quantity of refrigerant to add

The quantity of additional refrigerant is variable according to the installation situation. Thus, make sure the outdoor unit situation before adding refrigerant. This operation can only be performed by a qualified refrigeration specialist.

Single installation outdoor unit

Model	Factory Charging [g]	Additional refrigerant (g/m)				
		0 to 20	20 to 30	30 to 40	40 to 50	50 to 85
AC071HCADKG	1700	-	25 g/m over 20m			
AC090HCADKG	2700	-	45 g/m over 30m			
AC100HCADKG	2700	-	45 g/m over 30m			
AC100HCADNG	2700	-	45 g/m over 30m			
AC120HCADKG	2900	-	45 g/m over 30m			
AC120HCADNG	2900	-	45 g/m over 30m			
AC140HCADKG	3100	-	45 g/m over 30m			
AC140HCADNG	3100	-	45 g/m over 30m			
AC160HCADKG	3500	-	45 g/m over 30m			
AC160HCADNG	3500	-	45 g/m over 30m			
AC180HCADKG	3500	-	45 g/m over 30m			
AC180HCADNG	3500	-	45 g/m over 30m			
AC200HCADNG	5500	-	50 g/m over 30m			
AC100HCAPKG	3100	-	45 g/m over 30m			
AC120HCAPKG	3500	-	45 g/m over 30m			
AC140HCAPKG	3500	-	45 g/m over 30m			
AC160HCAPKG	3500	-	45 g/m over 30m			
AC180HCAPKG	5500	-	50 g/m over 30m			

Step 10 Performing the gas leak test

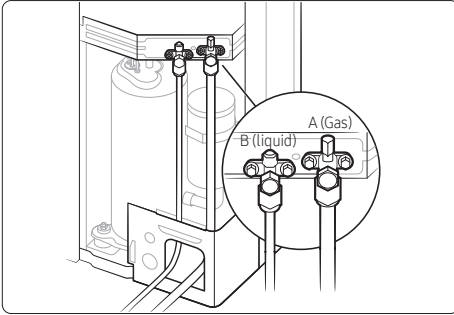
LEAK TEST WITH NITROGEN (before opening valves)

In order to detect basic refrigerant leaks, before recreating the vacuum and recirculating the R-32, it is the responsibility of the installer to pressurize the whole system with nitrogen (using a cylinder with pressure reducer) at a pressure above 0.2MPa, less than 4MPa (gauge).

LEAK TEST WITH R-32 (after opening valves)

Before opening valves, discharge all the nitrogen into the system and create vacuum. After opening valves check leaks using a leak detector for refrigerant R-32.

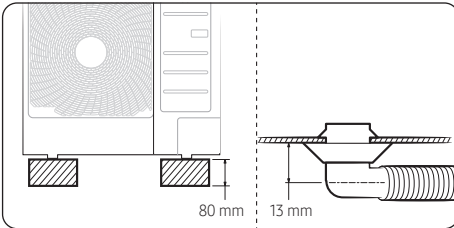
Once you have completed all the connections, check for possible leaks using leak detector specifically designed for HFC refrigerants.



- The designs and shape are subject to change according to the model.

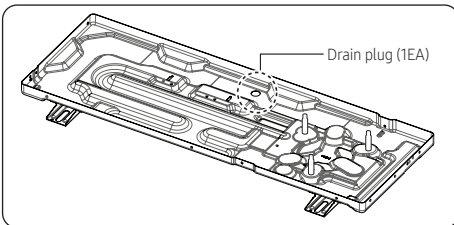
Step 11 Connecting the drain hose to the outdoor unit

- Make space more than 80 mm between the bottom of the outdoor unit and the ground for installation of the drain hose, as shown in figure.
- Insert the drain plug into the hole on the underside of the outdoor unit.
- Connect the drain hose to the drain plug.
- Ensure that the drained water runs off correctly and safely.



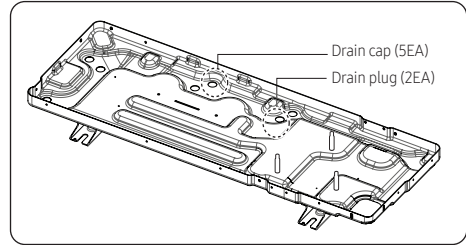
- Be sure to plug the rest of drain holes not connected with drain plugs using drain caps.

AC071HCADKG



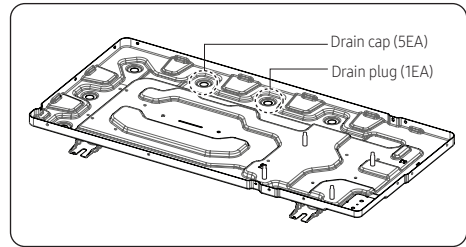
AC090/100/120/140/160/180HCAD*G

AC100/120/140/160HCAPKG



AC180HCAPKG

AC200HCADNG

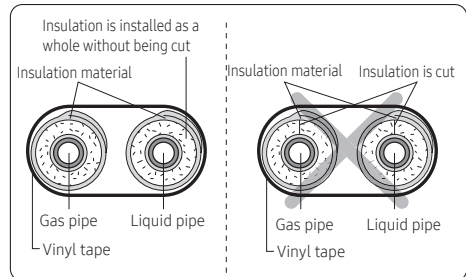


- When installing the product, make sure that the rack is not placed under the drain hole.
- If the product is installed in a region of heavy snow, allow enough separation distance between the product and the ground.

Step 12 Insulating the refrigerant pipes

Once you have checked that there are no leaks in the system, you can insulate the piping and hose.

To avoid condensation problems, place Acrylonitrile Butadiene Rubber separately around each refrigerant pipe.



Installation Procedure

⚠ CAUTION

Install an insulation material as a whole piece without cutting it.

📋 NOTE

- When insulate the pipe, be sure to overlap the insulation.

⚠ CAUTION

When insulating the pipe, use non-slit insulator. Confirm that there are no gas leaks in the refrigerant piping before insulating it.

- Choosing appropriate insulation materials for the refrigerant piping
- Insulate both the liquid and gas pipes, referring to the standard insulation thickness for each pipe diameter shown below.
- Normal Conditions 1 refers to temperatures under 27 °C and humidity levels under 80%. In places that meet Normal Conditions 2 or Highly Humid Conditions, use thicker insulation materials, as shown below.

Pipe	Refrigerant piping diameter (mm)	Insulation material thickness (cooling/heating (mm))			Remarks
		General Conditions 1 (under 27 °C and 80%) Airconditioned space	General Conditions 2, ¹⁾ (under 27 °C and 80%) Nonairconditioned space	Highly Humid Conditions, ²⁾ (27 °C and 80% or higher)	
		EPDM, NBR			
Liquid pipe	Ø6.35 to Ø9.52	9t	←	←	Heat resistant temperature: 120 °C
	Ø12.7 to Ø19.05	13t	←	←	
Gas pipe	Ø9.52 to Ø19.05	13t	19t	25t	

¹⁾ To install in any of the following places or environments, use insulation materials of a thickness specified under General Conditions 2.

- An air-conditioned place where humidity is high inside the ceiling tiles
- A space where temperature/humidity difference is large between the upper and lower air due to a high ceiling (e.g., a large chapel/church, cinema, split-level open lobby, lecture hall with theatre seating)
- A corridor or passageway with no air conditioning system
- An old building with poor insulation

※ In buildings with non-open ceilings (e.g. flats, houses, schools, offices, or commercial buildings), be sure to use insulation materials of a thickness specified under General Conditions 2.

²⁾ To install in any of the following places or environments, use insulation materials of a thickness specified under Highly Humid Conditions.

〈Geographical conditions〉

- A location with high humidity, such as a seaside area, a hot spring area, an area near a pond/river or a ridge (a building that is partially covered in earth and sand)
- A location where morning dew occurs frequently (e.g., once every three days)

〈Purpose of use〉

- Sauna, swimming pool or restaurant

〈Building structural conditions〉

- Installation inside a ceiling that is not airconditioned where there is inflow of a large amount of moisture (plumbing installed along a corridor or near the entrance of a hall of residence or studio flat)
- A place where humidity is high due to an insufficient ventilation system in the space where plumbing is installed
- A room on a semi-basement floor

※ If you are not sure which insulating material to use, choose material used in a place with high humidity.

※ If the purpose of the room is subject to change, reconsider the thickness of insulating material.

※ Use the specified insulating material only.

※ If installed in a location outside the above conditions, use insulation materials of a thickness specified under Highly Humid Conditions, taking into account the extremely high temperature and humidity in summer.

※ Use flame-retardant insulation materials.

※ When installing PE insulation materials or insulation materials made by HEATRON, make sure the thickness is 1.6 times greater than the standard thickness shown in the table above.

〈Geological condition〉

High humidity locations such as shorelines, hot springs, lake or riversides, and ridges (when part of the building is covered by earth and sand)

〈Operation purpose condition〉

Restaurant ceiling, sauna, swimming pool etc.

〈Building construction condition〉

Ceilings frequently exposed to moisture and cooling are not covered. For example, pipes installed at a corridor of a dormitory and studio or near an exit that opens and closes frequently.

Places (where the pipes are installed) that are highly humid due to a lack of ventilation.

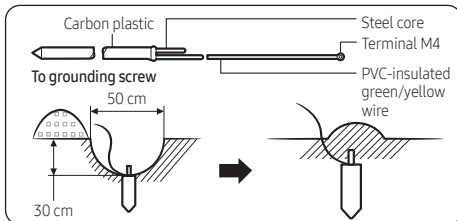
Step 13 Checking the earthing

If the power distribution circuit does not have a earthing or the earthing does not comply with specifications, an earthing electrode must be installed. The corresponding accessories are not supplied with the air conditioner.

- 1 Select an earthing electrode that complies with the specifications given in the illustration.
- 2 Connect the flexible hose to the flexible hose port.
 - In damp hard soil rather than loose sandy or gravel soil that has a higher earthing resistance.
 - Away from underground structures or facilities, such as gas pipes, water pipes, telephone lines and underground cables.
 - At least two metres away from a lightening conductor earthing electrode and its cable.

NOTE

- The earthing wire for the telephone line cannot be used to ground the air conditioner.



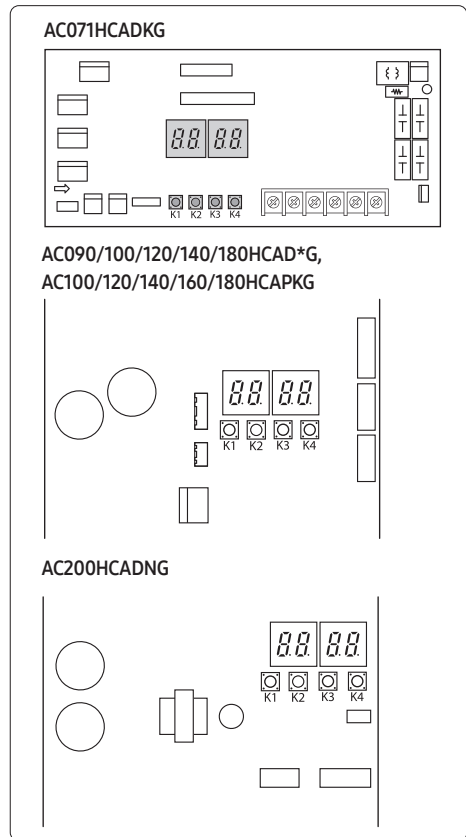
- 3 Finish wrapping insulating tape around the rest of the pipes leading to the outdoor unit.
- 4 Install a green/yellow coloured earthing wire:
 - If the earthing wire is too short, connect an extension lead in a mechanical way and wrap it with insulating tape (do not bury the connection).
 - Secure the earthing wire in position with staples.

NOTE

- If the earthing electrode is installed in an area with heavy traffic, its wire must be connected securely.
- 5 Carefully check the installation by measuring the earthing resistance with a earth resistance tester. If the resistance is above the required level, drive the electrode deeper into the ground or increase the number of earthing electrodes.
 - 6 Connect the earthing wire to the electrical component box inside of the outdoor unit.

Step 14 Performing final check and trial operation

<Main PCB>



- 1 Check the power supply between the outdoor unit and the auxiliary circuit breaker.
 - 1 phase power supply : L, N
 - 3 phase power supply : R, S, T, N
- 2 Check the indoor unit.
 - a Check that you have connected the power and communication cables correctly. (If the power cable and communication cables are mixed up or connected incorrectly, the PCB will be damaged.)
 - b Check that the thermistor sensor, drain pump/hose, and display are connected correctly.

Installation Procedure

3 Press K2 on the outdoor unit PCB to run the test mode and stop.

AC071HCADKG

Key	Push type	Mode	Display			
			SEG1	SEG2	SEG3	SEG4
K1	Short	1st	Heating test mode	F	1	B B
		2nd	Defrost test mode ¹⁾	F	3	B B
		3rd	End Key operation	B	B	B B
K2	Short	1st	Cooling test mode	F	2	B B
		2nd	Inverter check ²⁾	F	4	B B
		3rd	Pump down	F	6	B B
		4th	Unusual	F	B	B B
		5th	Inverter Fault Detection (Comp#1) ³⁾	F	A	B B
		6th	Auto trial operation	F	C	B B
		7th	Unusual	F	E	B B
		8th	Inverter Fault Detection (Fan#1) ³⁾	F	C	B B
		9th	End Key operation	B	B	B B
K3	Short	1st	Reset Release Eco mode	B	B	B B

AC090/100/120/140/180HCAD*G

AC100/120/140/160/180HCAPKG

Key	Push type	Mode	Display			
			SEG1	SEG2	SEG3	SEG4
K1	Short	1st	Heating test mode	F	1	B B
		2nd	Defrost test mode ¹⁾	F	3	B B
		3rd	End Key operation	B	B	B B
K2	Short	1st	Cooling test mode	F	2	B B
		2nd	Inverter check ²⁾	F	4	B B
		3rd	Pump down	F	6	B B
		4th	Unusual	F	B	B B
		5th	Inverter Fault Detection (Comp#1) ³⁾	F	A	B B
		6th	Auto trial operation	F	C	B B
		7th	Unusual	F	E	B B
		8th	End Key operation	B	B	B B
K3	Short	1st	Reset Release Eco mode	B	B	B B

AC200HCADNG

Key	Push type	Mode	Display			
			SEG1	SEG2	SEG3	SEG4
K1	Short	1st	Heating test mode	F	1	B B
		2nd	Defrost test mode ¹⁾	F	3	B B
		3rd	End Key operation	B	B	B B
K2	Short	1st	Cooling test mode	F	2	B B
		2nd	Inverter check ²⁾	F	4	B B
		3rd	Pump down	F	6	B B
		4th	Unusual	F	B	B B
		5th	Inverter Fault Detection (Comp#1) ³⁾	F	A	B B
		6th	Auto trial operation	F	C	B B
		7th	Auto check	F	E	B B
		8th	Inverter Fault Detection (Fan#1) ³⁾	F	C	B B
		9th	Inverter Fault Detection (Fan#2) ³⁾	F	1	B B
		10th	Discharge operation	F	F	B B
		11th	End Key operation	B	B	B B
K3	Short	1st	Reset Release Eco mode	B	B	B B

¹⁾ Defrost test mode

Condition 1: The outdoor temperature is below 10°C.

Condition 2: All the temperature conditions should meet the defrost conditions.

²⁾ To use the inverter check function, you must use the inverter checker.

³⁾ Indication on the display and action to take when an inverter fault is detected

	Comp#1(INV#1)				FAN#1 *				FAN#2 **				Action to take
	SEG1	SEG2	SEG3	SEG4	SEG1	SEG2	SEG3	SEG4	SEG1	SEG2	SEG3	SEG4	
Fault detection is in progress	F	I	E	E	F	I	E	E	F	2	E	E	-
OK	F	I	0	F	F	I	0	F	F	2	0	F	-
NG	F	I	A	0	F	I	A	0	F	2	A	0	PBA defect: Replace the PBA
Check	F	I	0	H	F	I	0	H	F	2	0	H	Manual inspection is required
Going into fault detection mode failed	F	I	F	L	F	I	F	L	F	2	F	L	Try fault detection again

* : It is displayed on AC071HCADKG and AC200HCADNG model.

** : It is only displayed on AC200HCADNG model

4 After 12 minutes operation check discharged air temperature of indoor unit

- Cooling mode (indoor unit check) → Inlet air temp. - Outlet air temp.: From 10°C to 12°C
- Heating mode (indoor unit check) → Outlet air temp. - Inlet air temp.: From 11°C to 14°C
- In heating mode, the indoor fan motor can remain off to avoid cold air blown into air-conditioned space.

5 How to reset the power supply of the outdoor unit and deactivate the eco mode (standby mode):

- Press K3 button over 1 sec to reset the power supply of the outdoor unit and deactivate the eco mode (standby mode).

※ Eco mode : Standby for minimizing power consumption

6 View mode: When the K4 switch is pressed, you can see information about our system state as below.

- For a function that is not supported, "-" is shown for SEG2, SEG3 or SEG4.

K4 short push	Display contents	SEG1	SEG2	SEG3	SEG4	Unit
1	Order frequency	1	Hundreds digit	Tens digit	Units digit	Hz
2	Current frequency	2	Hundreds digit	Tens digit	Units digit	Hz
3	The number of preset indoor units	3	Hundreds digit	Tens digit	Units digit	EA
4	Ambient temperature sensor	4	Hundreds digit or "-"	Tens digit	Units digit	°C or °F ²⁾
5	Compressor discharge sensor	5	Hundreds digit	Tens digit	Units digit	°C or °F ²⁾
6	Eva-Mid sensor	6	Hundreds digit or "-"	Tens digit	Units digit	°C or °F ²⁾
7	Condenser sensor	7	Hundreds digit or "-"	Tens digit	Units digit	°C or °F ²⁾
8	Current	8	Tens digit	Units digit	The first place of decimals	A
9	Outdoor fan RPM	9	Thousands digit	Hundreds digit	Tens digit	rpm
10	Target discharge temperature	A	Hundreds digit or "-"	Tens digit	Units digit	°C or °F ²⁾
11	EEV	B	Hundreds digit	Tens digit	Units digit	step
12	The capacity sum of indoor units	C	Tens digit	Unit digit	The first place of decimals	kW or kBtu/h ³⁾
13	Protective control	D	0: Cooling 1: Heating	Protective control 0: No Protective control 1: Freezing 2: Non-stop defrosting 3: Over-load 4: Discharge 5: Total electric current	Frequency status 0: Normal 1: Hold 2: Down 3: Up_limit 4: Down_limit	-

Installation Procedure

14	IPM temperature	E	Hundreds digit or "-" 1)	Tens digit	Units digit	°C or °F ²⁾
15	The number of connected indoor units	F	Hundreds digit	Tens digit	Units digit	EA
16	ESC EEV(CAM)	G	Hundreds digit	Tens digit	Units digit	step
17	ESC IN sensor	H	Hundreds digit or "-" 1)	Tens digit	Units digit	°C or °F ²⁾
18	ESC OUT sensor	I	Hundreds digit or "-" 1)	Tens digit	Units digit	°C or °F ²⁾
19	View mode end	BLANK	BLANK	BLANK	BLANK	

¹⁾ Sub-zero temperatures are expressed as a minus, instead of hundreds digit.

²⁾ The temperature unit can be switched between Celsius and Fahrenheit through Setting outdoor unit option switches. (Default value is Celsius.)

³⁾ If the temperature unit is set to Fahrenheit through Setting outdoor unit option switches, the value is expressed in the unit of kBtu/h.

AC071HCADKG

		Display contents	SEG1	SEG2	SEG3	SEG4
K4 long push	-	Main micom version	Year (Dec)	Month (Hex)	Date (Tens digit)	Date (Units digit)
	After short push 1	Inverter micom version	Year (Dec)	Month (Hex)	Date (Tens digit)	Date (Units digit)
	After short push 2	Fan SW version	Year (Dec)	Month (Hex)	Date (Tens digit)	Date (Units digit)
	After short push 3	E2P version	Year (Dec)	Month (Hex)	Date (Tens digit)	Date (Units digit)
	After short push 4	Page 1 - AUTO Page 2 - (SEG1,2 - Indoor : "A","0") (SEG3,4 - Address : ex) 00)				
	After short push 5	Page 1 - MANU Page 2 - (SEG1,2 - Indoor : "A","0") (SEG3,4 - Address : ex) 00)				

Long push K4 (Main micom ver.) → short push 1 more (Inv. micom ver.) → short push 1 more (Fan SW ver.) → short push 1 more (E2P ver.) → short push 1 more (Automatic address) → short push 1 more (Manual address) → short push 1 more (Main micom ver.) → → Long push K4 (View mode end)

AC090/100/120/140/180HCAD*G, AC100/120/140/160/180HCAPKG

		Display contents	SEG1	SEG2	SEG3	SEG4
K4 long push	-	Main micom version	Year (Dec)	Month (Hex)	Date (Tens digit)	Date (Units digit)
	After short push 1	Inverter micom version	Year (Dec)	Month (Hex)	Date (Tens digit)	Date (Units digit)
	After short push 2	E2P version	Year (Dec)	Month (Hex)	Date (Tens digit)	Date (Units digit)
	After short push 3	Page1 -AUTO Page2 - (SEG1,2 - Indoor unit: "A","0")(SEG3,4 - Address: ex) 00)				
	After short push 4	Page1 -MANU Page2 - (SEG1,2 - Indoor unit: "A","0")(SEG3,4 - Address: ex) 00)				

Long push K4 (Main micom ver.) → short push 1 more (Inv. micom ver.) → short push 1 more (E2P ver.) → short push 1 more (Automatic address) → short push 1 more (Manual address) → short push 1 more (Main micom ver.) → → Long push K4 (View mode end)

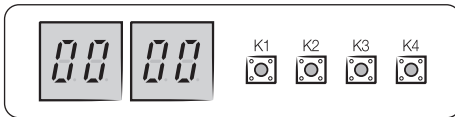
AC200HCADNG

		Display contents	SEG1	SEG2	SEG3	SEG4
K4 long push	-	Main micom version	Year (Dec)	Month (Hex)	Date (Tens' digit)	Date (Unit digit)
	After short push 1	Inverter micom version	Year (Dec)	Month (Hex)	Date (Tens' digit)	Date (Unit digit)
	After short push 2	Fan1 micom version	Year (Dec)	Month (Hex)	Date (Tens' digit)	Date (Unit digit)
	After short push 3	Fan2 micom version	Year (Dec)	Month (Hex)	Date (Tens' digit)	Date (Unit digit)
	After short push 4	E2P version	Year (Dec)	Month (Hex)	Date (Tens' digit)	Date (Unit digit)
	After short push 5	Auto address	Page1 -AUTO Page2 - (SEG1,2 - Indoor unit: "A","0")(SEG3,4 - Address: ex) 00)			
	After short push 6	Manual address	Page1 -MANU Page2 - (SEG1,2 - Indoor unit: "A","0")(SEG3,4 - Address: ex) 00)			

Long push K4 (Main micom ver.) → short push 1 more (Inv. micom ver.) → short push 1 more (Fan1 ver.) → short push 1 more (Fan1 ver.) → short push 1 more (E2P ver.) → short push 1 more (Automatic address) → short push 1 more (Manual address) → short push 1 more (Main micom ver.) → → Long push K4 (View mode end)

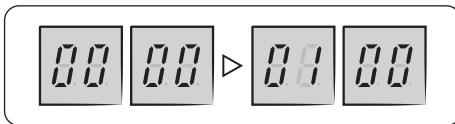
Setting outdoor unit option switch and address manually

- a Setting the option
 - Press and hold K2 to enter the option setting. (Only available when the operation is stopped)
 - If you enter the option setting, display will show the following.



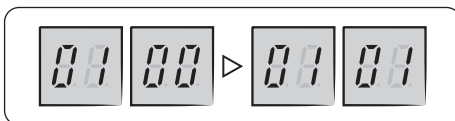
- Seg 1 and Seg 2 will display the number for selected option.
- Seg 3 and Seg 4 will display the number for set value of the selected option.
- If you have entered the option setting, you can shortly press the K1 switch to adjust the value of Seg 1, and Seg 2 and select the desired option.

Example)



- If you have selected desired option, you can shortly press the K2 switch to adjust the value of the Seg 3, Seg 4 and change the function for the selected option.

Example)



- After selecting the function for options, press and hold the K2 switch for 2 seconds. Edited value of the option will be saved when entire segments blinks and tracking mode begins.

Extra procedures

Option item	SEG1	SEG2	SEG3	SEG4	Function
Channel address	0	0	A	U	Automatic setting (Factory default)
			00~15		Manual setting
Snow accumulation prevention control	0	1	0	0	Disabled (Factory default)
			0	1	Enabled
			0	0	Disabled (Factory default)
Step for Silence mode	0	2	0	1	Step1
			0	2	Step2
			0	3	Step3
			0	0	Automatic Silence mode (Factory default)
Type of Silence mode	0	3	0	0	Automatic Silence mode (Factory default)
			0	1	Manual Silence mode
Temperature unit	0	4	0	0	Celsius (default)
			0	1	Fahrenheit
Compressor carrier frequency	0	5	0	0	Not applicable(default)
			0	1	Option1
			0	0	100 % (Factory default)
Current restriction rate ¹⁾	0	6	0	1	95%
			0	2	90%
			0	3	85%
			0	4	80%
			0	5	75%
			0	6	70%
			0	7	65%
			0	8	60%
			0	9	55%
			1	0	50%
			1	1	100%
Dedicated mode for cooling/heating	0	7	0	0	Cooling / Heating operation (default)
			0	1	Cooling operation only
			0	2	Heating operation only
Heating max. frequency- Temperature off set	0	8	0	0	Disable (Factory default)
			0	1	-5°C
			0	2	-10°C
			0	3	-15°C
			0	4	+5°C
			0	5	+10°C
			0	6	+15°C
Cumulative defrosting time	0	9	0	0	Disable (Factory default)
			0	1	90 min.
			0	2	60 min.
			0	3	40 min.
Defrosting frequency offset	1	0	0	0	Disable (Factory default)
			0	1	-5 Hz
			0	2	-10 Hz
			0	3	-15 Hz
Defrosting-off temperature offset	1	1	0	0	(Factory default)
			0	1	+3°C
			0	2	+6°C
			0	3	+9°C

¹⁾ Current restriction rate : When restriction option is set, cooling and heating performance may decrease.



CAUTION

- Edited option will not be saved if you do not end the option setting as explained in above instruction.
- ※ While you are setting the option, you may press and hold the K1 button to reset the value to previous setting.
- ※ If you want to restore the setting to factory default, press and hold the K4 button while you are in the option setting mode.
 - If you press and hold the K4 button, setting will be restored to factory default but it doesn't mean that restored setting is saved. Press and hold the K2 button. When the segments shows that tracking mode is in progress, setting will be saved.

Pumping down refrigerant



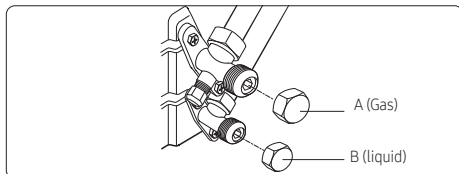
WARNING

- After installing the product, be sure to perform leak tests on the piping connections. After pumping down refrigerant to inspect or relocate the outdoor unit, be sure to stop the compressor and then remove the connected pipes.
 - Do not operate the compressor while a valve is open due to refrigerant leakage from a pipe or an unconnected or incorrectly connected pipe. Failure to do so may cause air to flow into the compressor and too a high pressure to develop inside the refrigerant circuit, leading to an explosion or product malfunction.

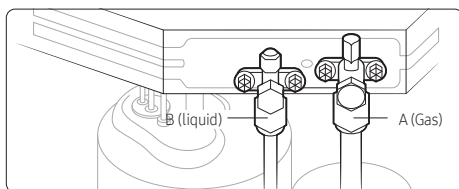
Pump-down is an operation intended to collect all the system refrigerant in the outdoor unit. This operation must be carried out before disconnecting the refrigerant pipe in order to avoid refrigerant loss to the atmosphere.

- 1 Turn the system on in cooling with fan operating at high velocity and then let the compressor run for more than 5 minutes. (Compressor will immediately start, provided 3 minutes have elapsed since the last stop.)
- 2 Release the valve caps on High and Low pressure side.
- 3 Use L-wrench to close the valve on the high pressure side.
- 4 After approximately 2 minute, close the valve on the low pressure side.
- 5 Stop operation of the air conditioner by pressing the (Power) button on the indoor unit or remote control.
- 6 Disconnect the pipes.

AC071HCADKG



AC090/100/120/140/180/200HCAD*G AC100/120/140/160/180HCAPKG



Relocating the indoor and outdoor units

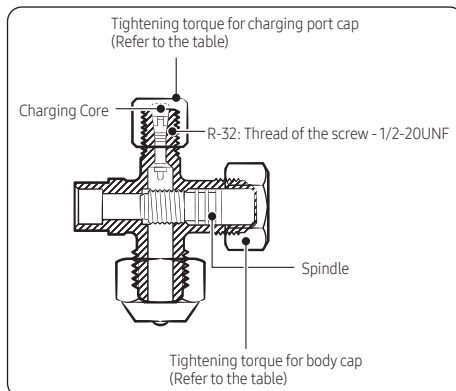
- 1 Pump down refrigerant. See **Pumping down refrigerant** on page 42.
- 2 Disconnect the power supply only after rendering the system powerless from the mains power.
- 3 Disconnect the assembly cable from the indoor and outdoor units.
- 4 Remove the flare nuts connecting the indoor units and the pipes. At this time, cover the pipes of the indoor unit and the other pipes using a cap or vinyl plug to avoid foreign material entering.
- 5 Disconnect the pipes connected to the outdoor units. At this time, cover the valve of the outdoor units and the other pipes using a cap or vinyl plug to avoid foreign material entering.
Note: Make sure you do not bend the connection pipes in the middle and store together with the cables.
- 6 Move the indoor and outdoor units to a new location.
- 7 Remove the mounting plate for the indoor unit and move it to a new location.

Using the stop valve

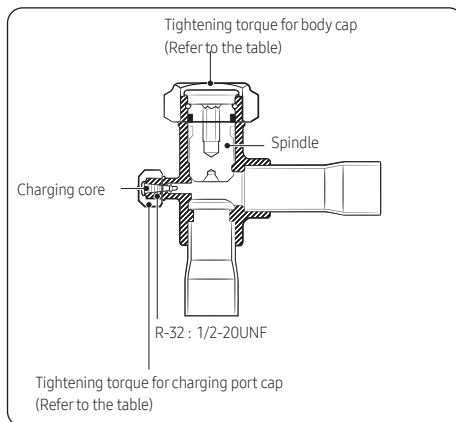
Opening the stop valve

- 1 Open the cap and turn the stop valve anticlockwise by using a hexagonal wrench.
- 2 Turn it until the axis is stopped.

AC071/090/100/120/140/180HCAD*G, AC100/120/140/160HCAPKG



AC180HCAPKG, AC200HCADNG



- 3 Tighten the cap securely.

Outer Diameter (mm)	Tightening torque	
	Body cap (N·m)	Charging port cap (N·m)
Ø 6.35	20 to 25	10 to 12
Ø 9.52	20 to 25	
Ø 12.70	25 to 30	
Ø 15.88	30 to 35	
Over Ø 19.05	35 to 40	

(1 N·m=10 kgf·cm)

Installation Procedure

NOTE

- Do not apply excessive force to the stop valve and always use special instruments. Otherwise, the stopping box can be damaged and the back sheet can leak.
- If the watertight sheet leaks, turn the axis back by half, tighten the stopping box, then check the leakage again. If there is no leakage any more, tighten the axis entirely.

Closing the stop valve

- 1 Remove the cap.
- 2 Turn the stop valve clockwise by using a hexagonal wrench.
- 3 Tighten the axis until the valve reached the sealing point.
- 4 Tighten the cap securely.



CAUTION

- When you use the service port, always use a charging hose, too.
- Check the leakage of refrigerant gas after tightening the cap.
- Must use a spanner and wrench when you open/tighten the stop valve.

Performing the gas leak tests for repair

When repairing the refrigerant circuit, the following procedure must be followed to avoid flammability.

- 1 Remove the refrigerant.
- 2 Flush the system with nitrogen.
- 3 Repeat the previous step several times until no refrigerant is within the system.
- 4 Perform the repair work.
- 5 Conduct a pressure test.
- 6 Purge the refrigerant circuit with inert gas.
- 7 Perform vacuuming.
- 8 Charge with refrigerant.
- 9 Perform a leak test.
- 10 It is recommended to perform a second leak test within one month.



CAUTION

- Compressed air or oxygen shall not be used.
- Flush the system with nitrogen, pressurize the refrigerant circuit until the working pressure is reached, ventilate to the atmosphere, and then pull down to a vacuum state.
- For the final nitrogen blowing charge, the system shall be ventilated down to atmospheric pressure.
- The procedure is vital in case of brazing on the piping.
- Make sure that the outlet of the vacuum pump is not close to any ignition sources and there is ventilation available.

- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the air conditioner.

Decommissioning

The following requirements must be fulfilled before and while taking the decommissioning procedure:

- Only qualified, licensed professionals shall perform refrigerant recovery and decommissioning. Before decommissioning, the worker shall become familiar with the product.
 - The entire refrigerant charge shall be recovered safely.
 - Before starting the process, oil and refrigerant samples shall be taken just in case analysis is required for reuse.
 - Before starting the process, a power supply must be available.
- 1 Be familiar with the equipment details.
 - 2 Isolate the system electrically.
 - 3 Before starting the process, make sure that:
 - Any mechanical equipment is available for handling refrigerant cylinders.
 - All PPE (personal protective equipment) is available for servicing.
 - The recovery process shall be supervised by a competent person.
 - The recovery equipment and cylinders comply with the standards. Only approved cylinders, with pressure relief valves, for the type of refrigerant shall be used.
 - 4 Pump down the refrigeration system, if possible.
 - 5 If vacuuming is not possible, make a manifold so that refrigerant can be easily removed from the parts of the system.
 - 6 Make sure that the cylinders are placed on the scales before recovery.
 - 7 Run the recovery system following the manufacturer's instructions.
 - 8 Do not overcharge the cylinders. (No more than 80 %)
 - 9 Keep the cylinder within the maximum working pressure, even temporarily.
 - 10 After charging, make sure that the cylinders and the equipment are promptly removed from the site and all isolation valves are closed.
 - 11 Recovered refrigerant shall not be mixed or reused. It shall be processed according to national, state, and local regulations.
 - 12 After decommissioning, the system shall be labeled stating that it has been decommissioned. The label shall be dated and signed.
 - 13 Ensure that there are labels on the equipment indicating the equipment contains flammable refrigerant.

Appendix

Troubleshooting

The table below lists the self-diagnostic routines. For some of the error codes, you must contact an authorized service center. If an error occurs during the operation, it is displayed on the outdoor unit PCB LED, both MAIN PCB and INVERTER PCB.

No.	Error Code	Meaning	Remarks
1	E108	Error due to duplicated communication address	Check on repeated indoor unit main address
2	E116	R-32 detection sensor 'Short' or 'Open' or 'Abnormal signal' error.	1. Check R-32 sensor connector. 2. Check R-32 sensor wire. 3. Check R-32 sensor. 4. Change R-32 sensor.
3	E118	Indoor fan controller PCB overheat error	Check Indoor fan controller PCB
4	E121	Error on room temperature sensor of indoor unit (Short or Open)	Indoor unit Room Thermistor Open/Short
5	E122	Error on EVA IN sensor of indoor unit (Short or Open)	Indoor unit EVA_IN Thermistor Open/Short
6	E123	Error on EVA OUT sensor of indoor unit (Short or Open)	Indoor unit EVA_OUT Thermistor Open/Short
7	E153	Error on float switch (2nd detection)	Indoor unit Float Switch Open/Short Drain Pump operation Check
8	E154	Indoor fan error	Check on indoor unit indoor Fan operation
9	E162	Outdoor unit EEPROM Read/Write error (H/W)	Check Outdoor EEPROM PBA
10	E163	Outdoor unit EEPROM Read/Write error (Option)	Check Outdoor EEPROM data
11	E198	Error on thermal fuse of indoor unit (Open)	Thermal Fuse Open Check of indoor unit Terminal Block
12	E201	Communication error between the indoor unit and outdoor unit (Pre-tracking failure or when the actual number of indoor units are different from the indoor unit quantity setting on the outdoor unit) Error due to communication tracking failure after initial power is supplied (The error occurs regardless of the number of units.)	Check indoor quantity setting in outdoor
13	E202	Communication error between indoor unit and outdoor unit (When there is no response from indoor units after tracking is completed)	Check electrical connection and setting between indoor unit and outdoor unit
14	E203	Communication error between the outdoor unit and main micom (For PF #4 to #6 controllers, error will be determined from the time when the compressor is turned on.)	Check electrical connection and setting between outdoor unit MAIN PBA - INVERTER PBA
15	E205	Main PBA - other PBA Communication error (All other PBA communication error)	1. Check Main PBA connectors 2. Check other PBA connectors 3. Change Main PBA
16	E206	Main PBA - other PBA communication error (Some of PBA communication) C002 : Fan PCB communication error C003 : INV1 communication error	1. Check Main PBA connectors 2. Check other PBA connectors 3. Change other PBA
17	E221	Error on outdoor temperature sensor (Short or Open)	Check Outdoor sensor Open / Short
18	E231	Error on outdoor COND OUT sensor (Short or Open)	Check Cond-Out sensor Open / Short
19	E251	Error on discharge temperature sensor of compressor 1 (Short or Open)	Check Discharge sensor Open / Short
20	E320	Error on OLP sensor (Short or Open)	Check OLP sensor Open / Short
21	E321	Error on ESC IN temperature sensor (Short or Open)	Check ESC IN sensor Open / Short
22	E322	Error on ESC OUT temperature sensor (Short or Open)	Check ESC OUT sensor Open / Short
23	E346	Error due to operation failure of Fan2	Fan2 error
24	E347	Motor wire of Fan2 is not connected	Fan2 error
25	E348	Lock error on Fan2 of outdoor unit	Fan2 error
26	E353	Error due to overheated motor of outdoor unit's Fan2	Fan2 error
27	E355	Error due to overheated IPM of Fan2	Fan2 error
28	E378	Error due to overcurrent of Fan2	Fan2 error
29	E381	INVERTER PCB overheat error	Check Outdoor Inverter PBA

Appendix

No.	Error Code	Meaning	Remarks
30	E383	Outdoor Fan#1 PCB overheat error	1. Change motor 2. Change INV PCB
31	E384	Outdoor Fan#2 PCB overheat error	1. Change motor 2. Change INV PCB
32	E386	Over-voltage/low-voltage error of Fan2	Fan2 error
33	E387	Hall IC connection error of Fan2	Fan2 error
34	E389	V-limit error on Fan2	Fan2 error
35	E391	Fan2 EEPROM CheckSum error	
36	E393	Output current sensor error of Fan2	Fan2 error
37	E396	DC voltage sensor error of Fan2	Fan2 error
38	E399	IPM temperature sensor error of Fan2	Fan2 error
39	E403	Compressor down due to freeze protection control	Check Outdoor Cond.
40	E404	System stops due to overload protection control	Check Comp. when it starts
41	E416	System stops due to discharge temperature	-
42	E422	Blockage detected on high pressure pipe during cooling operation	1. Check if the service valve is open 2. Check for refrigerant leakage (pipe connections, heat exchanger) and charge refrigerant if necessary 3. Check if there's any blockage on the refrigerant cycle (indoor unit/outdoor unit) 4. Check if additional refrigerant has been added after pipe extension
43	E425	Reverse phase or open phase	Check whether 3 phase is reversed or opened.
44	E440	Heating operation restricted at outdoor temperature over Theat_high value (default:30°C)	1. Check the range of temperature limited for heating operation 2. Check the outdoor temperature sensor
45	E441	Cooling operation restricted at outdoor temperature below Tcool_low value (default:0°C)	1. Check the range of temperature limited for cooling operation 2. Check the outdoor temperature sensor
46	E446	Outdoor Fan#1 motor Operation error	1. Change motor 2. Change INV PCB
47	E447	Outdoor Fan#1 motor wire disconnection error	1. Check motor connector 2. Change motor 3. Change INV PCB
48	E448	Lock error on Fan1 of outdoor unit	Fan1 error
49	E453	Error due to overheated motor of outdoor unit's Fan1	Fan1 error
50	E455	Outdoor Fan#1 IPM overheat error	1. Change motor 2. Change INV PCB
51	E458	Fan speed error	FAN1 ERROR
52	E461	Error due to operation failure of inverter compressor	-
53	E462	System stops due to full current control	-
54	E463	Over current trip / PFC over current error	Check OLP sensor
55	E464	IPM Over Current(O.C)	1. Check if the service valve is open 2. Check the state of refrigerant 3. Check if connecting wire and the pipe are OK 4. Check the compressor
56	E465	Comp. Overload error	-
57	E466	DC-Link voltage under/over error	Check AC Power and DC Link Voltage
58	E467	Error due to abnormal rotation of the compressor or unconnected wire of compressor	Check Comp wire
59	E468	Error on current sensor (Short or Open)	Check Outdoor Inverter PBA.
60	E469	Error on DC-Link voltage sensor (Short or Open)	-
61	E470	Outdoor unit EEPROM Read/Write error (Option)	Check Outdoor EEPROM Data
62	E471	Outdoor unit EEPROM Read/Write error (H/W)	Check Outdoor EEPROM PBA

No.	Error Code	Meaning	Remarks
63	E474	Error on IPM Heat Sink sensor of inverter1 (Short or Open)	Check Outdoor Inverter PBA.
64	E475	Error on inverter fan 2	FAN2 ERROR
65	E478	Outdoor Fan#1 motor overcurrent error	1. Change motor 2. Change INV PCB
66	E483	Overvoltage of H/W detect DC link	Check AC Power
67	E484	PFC Overload (Over current) Error	Check Outdoor Inverter PBA.
68	E485	Error on input current sensor of inverter1 (Short or Open)	Check Outdoor EEPROM PBA
69	E486	Outdoor Fan#1 high voltage or low voltage error	1. Change motor 2. Change INV PCB
70	E487	Hall IC connection error of Fan1	Fan1 error
71	E488	Inverter input voltage sensor error	Check Outdoor Inverter PBA
72	E489	FAN #1 motor current limiting error	1. Change motor 2. Change INV PCB
73	E491	Fan1 EEPROM CheckSum error	Fan1 error
74	E493	FAN #1 motor output current error	1. Change motor 2. Change INV PCB
75	E496	FAN #1 motor voltage sensor error	1. Change motor 2. Change INV PCB
76	E499	FAN #1 IPM temperature sensor error	1. Change motor 2. Change INV PCB
77	E500	IPM overheat error on inverter1	Check Outdoor Inverter PBA.
78	E507	Error due to high pressure switch open or compressor down by high pressure	-
79	E508	Smart install is not installed	-
80	E534	Blockage detected on high pressure pipe during heating operation.	1. Check if the service valve is open 2. Check if there's any blockage on the refrigerant cycle (indoor unit/outdoor unit) 3. Check the EEV connection and operation 4. Check if the connecting wire and the pipe are OK 5. Check the compressor
81	E554	Gas leak detected	Check the refrigerant
82	E556	Error due to mismatching capacity of indoor and outdoor unit	Check the indoor and outdoor unit capacity
83	E557	DPM remote controller option error	Check the indoor option code
84	E563	Error due to mismatching indoor and outdoor unit	Check the outdoor EEPROM data and indoor option code
85	E590	Inverter EEPROM Checksum error	-
86	E594	Fan EEPROM CheckSum error	1. Check Fan EEPROM
87	E601	Communication error between wired remote control and indoor unit	1. Check remote control wire connectors. 2. Change wired remote control.
88	E665	External Contact Input ERROR	1. Check the External float switch connection. 2. Check whether the drain has been filled with water. 3. Check the emergency alarm system (Emergency Stop)
89	E695	R-32 detection sensor life unpredictable error	1. Check R-32 sensor. 2. Change R-32 sensor.
90	E697	R-32 detection sensor 2nd detecting error	1. Open the window to ventilate. 2. Contact service center.
91	E698	R-32 detection sensor failure error	1. Check R-32 sensor connector. 2. Check R-32 sensor. 3. Change R-32 sensor.
92	E699	R-32 detection sensor replacement notification error	Change R-32 sensor.
93	E700	R-32 detection sensor Life-expiration error	Change R-32 sensor.

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