



Air conditioner Installation manual

AC*FCU*CG**

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

SAMSUNG





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Safety Information

California Proposition 65 Warning (US)

WARNING:

Cancer and Reproductive Harm -
www.P65Warnings.ca.gov.

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.

IMPORTANT – This product has been designed and manufactured to meet ENERGY STAR criteria for energy efficiency when matched with appropriate coil components.

However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency.

Installation of this product should follow the manufacturer's refrigerant charging and air flow instructions.

Failure to confirm proper charge and airflow may reduce energy efficiency and shorten equipment life.

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 may result in severe personal injury or death.

CAUTION

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

IMPORTANT

- Information of special interest

NOTE

- Supplementary information that may be useful

Symbol	Meaning
	Flammable gas
	Flammable materials
	Refrigerant safety group
	Read installation manual
	Refer to installation manual
	Read 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 to be able to use it as a 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.
- The manufacturer shall not be responsible for damage originating from unauthorized changes or the improper connection of electricity and requirements outlined 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.
- All pipe work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service and comply with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. Any field joints shall be accessible for inspection before being covered or enclosed.
- Do not use the units if damaged. If problems occur, switch the unit off and disconnect it from the power supply.
- 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 air conditioner contains a refrigerant that must be disposed of as special waste. At the end of its life cycle, the air conditioner must be disposed of in authorized centers 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 work. Installation/repair technicians may be injured if improper protective equipment is worn.
- 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 odor.
- 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 the 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.



Installing the unit

WARNING

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

- Connecting one indoor unit to this product is prohibited.
- 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 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 releases free flames to avoid the occurrence of fires, explosions or injuries.
- 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.
- Make sure that the condensed water runs well out of the unit at low ambient temperature. The base heater can frost/ice cannot grow. If drain work is not effective for releasing condensed water, it can make the units get damaged by massive ice and the system can be stopped, covered by ice.
- Do not disassemble and alter the heater at your discretion.
- The outdoor unit shall be installed in an open space that is always ventilated.
- Please adhere to the local gas regulations.
- To handle, purge, and dispose of the refrigerant, or to break into the refrigerant circuit, the technician 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 piping.
- Use clean parts such as manifold gauge, vacuum pump, and charging hose for the refrigerant.
- Installation must be carried out by qualified personnel handling the refrigerant. Additionally, reference local and national regulations and laws.
- Be careful not to let foreign substances (lubricating oil, refrigerant, water, etc.) enter the pipes.
- 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 secured to only allow access by the technician(s).
- The refrigerant pipes shall be installed in a position where there are no substances that may result in corrosion.
- The following checks shall be performed for installation:
 - The charge 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 the generation of toxic gases.
- Make sure that the work area is safe from flammable substances.
- To purge air in the refrigerant pipes, be sure to use a vacuum pump.



Safety Information

- Note that the refrigerant has no odor.
- The units are not explosion proof so they must be installed with no risk of explosion.
- This product contains fluorinated gases that contribute to the global greenhouse effect. Accordingly, do not vent gases into the atmosphere.
- Servicing shall be performed as recommended by the manufacturer. In case other skilled persons are joined for servicing; it shall be carried out under the supervision of the person who is competent in handling flammable refrigerants.
- For servicing the units containing flammable refrigerants, safety checks are required to minimize the risk of ignition.
- Servicing shall be performed following the controlled procedure to minimize the risk of flammable refrigerants or gases.
- Do not install where there is a risk of combustible gas leakage.
- Do not place near heat sources
- Be cautious not to generate a spark as follows:
 - Do not remove fuses with power on.
- If the indoor unit is not R-454B compatible, an error signal appears and the unit will not operate.
- After installation, check for leakage. Toxic gas may be generated if it comes into contact with an ignition source such as a fan heater or stove.
- Never directly touch any accidental leaking refrigerant. It could result in severe wounds caused by frostbite.

Preparation of fire extinguisher

- If flammable work is to be done, appropriate fire extinguishing equipment should be available.
- Have a dry CO₂ fire extinguisher adjacent to the charging area and workspace.

Ignition source safety

- 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 technician 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 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 while detecting refrigerant leaks.
- 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 hot work.
- Ventilation shall be made even during work.
- The ventilation should safely disperse any released gases and preferably expel them into the atmosphere.

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 piping.



- If leakage is suspected, naked flames shall be removed.
- If a leakage is found while brazing, the entire refrigerant charge 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.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.
- The evacuation process shall be performed before sending the compressor to the suppliers.
- Never install a motor-driven equipment to prevent ignition.
- Empty recovery cylinders shall be evacuated and cooled before recovery.

Labelling

- The parts shall be labelled to ensure that they have been decommissioned and emptied of refrigerant.
- The labels shall note the date of application.
- 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.
- Ensure that the correct number of cylinders for holding the total system charge is available.
- 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.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.
- The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

Power supply line, fuse or circuit breaker

WARNING

- Always make sure that the power supply is compliant with current safety standards. Always install the air conditioner in compliance with current local safety standards.
- Always verify that a suitable grounding 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 following 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.

Safety Information

- Be sure not to perform power cable modification, extension wiring, and multiple wire connections.
 - It may cause electric shock or fire due to poor connection, poor insulation, or current limit override.

Precautions for using R-454B 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.
- The appliance shall be stored in a room without continuously operating ignition sources, like open flames or 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 be in compliance with 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 field joints shall be accessible for inspection prior to 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.
- Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0.25 times the maximum allowable pressure. No leak shall be detected;
- 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.
- 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 1300 °F (700 °C) and electric switching devices.
- Any auxiliary device installed must be approved by Samsung 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 3.9 inch (100mm) above the floor. The exhaust location outside the building must be at least 9.84 ft (3 m) 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 areas such as false ceilings not being used as return air plenum if the conditioned air does not mix with the air in the false ceilings.
- For ducted appliances false ceiling 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 are competent to carry out 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 Samsung, 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 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 in page 12.
- 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 that 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 the cabling is not worn, corroded or damaged in any manner.

Electrical repair safety measures

- All electrical components used or replaced must be to Samsung'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.

Refrigerant Detection System

- This system may include a refrigerant detection system (RDS) and automatic leak mitigation controls. Refer to the air handler or coil manufacturer's documentation to confirm all RDS details and requirements.
- When a leak is detected, the RDS will stop the compressor and energize the indoor unit(s) fan for air circulation to disperse the leaked gas and display an error code when using a Samsung wired controller on the system.
- The sensor should be replaced upon end of life. Refer to the air handler or coil manufacturer's documentation for details.
- For complete replacement instructions, please refer to the air handler or coil manufacturer's service documentation.
- The RDS sensor must only be replaced with sensors as specified by the air handler or coil manufacturer.

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 breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

- safely remove refrigerant following local and national regulations;
- evacuate;
- purge the circuit with inert gas (optional for A2L);
- evacuate (optional for A2L);
- continuously flush or purge with inert gas when using flame to open circuit; and
- open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes.

For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants.

Safety Information

This process might need to be repeated several times.

Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L).

This process shall be repeated until no refrigerant is within the system (optional for A2L).

When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.

The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Repair to intrinsically safe components

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

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

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



NOTE

- The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

Repairs to sealed components

During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

Charging procedure

- Follow industry standard refrigerant charging best practices.
- Before recharging the system, it 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 grounded before 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 before commissioning.

Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- that no live electrical components and wiring are exposed while charging, recovering or purging the system;
- that there is continuity of earth bonding.



Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely.

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

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically.
- c) Before attempting the procedure, ensure that:
 - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - all personal protective equipment is available and being used correctly;
 - the recovery process is supervised at all times by a competent person;
 - recovery equipment and cylinders conform to the appropriate standards.
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with instructions.
- h) Do not overfill cylinders (no more than 80 % volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

Checks to the refrigerating equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed.

If in doubt, consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

- the actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;
- the ventilation machinery and outlets are operating adequately and are not obstructed;
- if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
- refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.





Installation Procedure

Step 1 Choosing the installation location

⚠ WARNING

- If appliances contain R-454B 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 the table below A_{min} , [ft²(m²)].

📖 NOTE

- Observe the minimum floor areas specified in the indoor unit guide. Refer to the below table if no indoor unit guide is available.

Table 1

Refrigerant charge [m, lbs(kg)]	With R-454B sensor		Without R-454B sensor	
	Reference Height [h ₀ , ft(m)]		Reference Height [h ₀ , ft(m)]	
	1.97(0.6)	7.2(2.2)	1.97(0.6)	7.2(2.2)
	Minimum required room area [A _{min} , ft ² (m ²)]		Minimum required room area [A _{min} , ft ² (m ²)]	
≤ 3.915(1.776)	- no room area restrictions -		- no room area restrictions -	
3.918(1.777)	215(20.0)	58.8(5.46)	317(29.4)	58.7(5.46)
4.19(1.9)	218(20.3)	59.5(5.53)	325(30.2)	59.5(5.53)
4.41(2.0)	242(22.5)	66.1(6.14)	401(37.3)	66.1(6.14)
4.85(2.2)	267(24.8)	72.8(6.76)	486(45.1)	72.7(6.76)
5.29(2.4)	291(27.0)	79.3(7.37)	578(53.7)	79.3(7.37)
5.73(2.6)	315(29.3)	86(7.99)	678(63)	86.0(7.99)
6.17(2.8)	339(31.5)	92.6(8.6)	787(73.1)	92.6(8.60)
6.61(3.0)	364(33.8)	99.1(9.21)	903(83.9)	99.2(9.21)
7.05(3.2)	388(36.0)	106(9.83)	1028(95.5)	106(9.83)
7.50(3.4)	412(38.3)	112(10.4)	1160(108)	112(10.4)
7.94(3.6)	436(40.5)	119(11.1)	1301(121)	119(11.1)
8.38(3.8)	461(42.8)	126(11.7)	1449(135)	126(11.7)
8.82(4.0)	485(45.0)	132(12.3)	1606(149)	132(12.3)
9.26(4.2)	509(47.3)	139(12.9)	1770(164)	139(12.9)
9.70(4.4)	533(49.5)	145(13.5)	1943(181)	145(13.5)

Table 1 (cont.)

Refrigerant charge [m, lbs(kg)]	With R-454B sensor		Without R-454B sensor	
	Reference Height [h ₀ , ft(m)]		Reference Height [h ₀ , ft(m)]	
	1.97(0.6)	7.2(2.2)	1.97(0.6)	7.2(2.2)
	Minimum required room area [A _{min} , ft ² (m ²)]		Minimum required room area [A _{min} , ft ² (m ²)]	
10.14(4.6)	558(51.8)	152(14.1)	2124(197)	158(14.7)
10.58(4.8)	582(54.1)	158(14.7)	2312(215)	172(16.0)
11.02(5.0)	606(56.3)	166(15.4)	2509(233)	187(17.3)
11.46(5.2)	630(58.6)	172(16.0)	2714(252)	202(18.8)
11.90(5.4)	655(60.8)	179(16.6)	2926(272)	218(20.2)
12.35(5.6)	679(63.1)	185(17.2)	3147(292)	234(21.7)
12.79(5.8)	703(65.3)	192(17.8)	3376(314)	251(23.3)
13.23(6.0)	727(67.6)	198(18.4)	3613(336)	269(25.0)
13.67(6.2)	752(69.8)	205(19.0)	3858(358)	287(26.7)
14.11(6.4)	776(72.1)	212(19.7)	4111(382)	306(28.4)
14.55(6.6)	800(74.3)	219(20.3)	4372(406)	325(30.2)
14.99(6.8)	824(76.6)	225(20.9)	4641(431)	345(32.1)
15.43(7.0)	849(78.8)	231(21.5)	4918(457)	366(34.0)
15.87(7.2)	873(81.1)	238(22.1)	5203(483)	387(36.0)
16.31(7.4)	897(83.3)	244(22.7)	5496(511)	409(38.0)
16.76(7.6)	921(85.6)	251(23.3)	5797(539)	431(40.1)
17.20(7.8)	945(87.8)	258(24.0)	6106(567)	454(42.2)
17.64(8.0)	970(90.1)	265(24.6)	6423(597)	478(44.4)

- m : Total refrigerant charge in the system
- A_{min} : Minimum required room area
- Calculated in accordance with UL 60335-2-40 Annex GG
- The actual refrigerant charge shall be per the room size within which the refrigerant-containing parts are installed.
- When the appliance includes a refrigerant detector, the aggregate room area of spaces connected to the ductwork may be considered when determining the minimum room area. When no refrigerant detector is used, only the smallest room area may be considered.



- The ventilation machinery and outlets shall be operating adequately and not obstructed.
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
- Marking the equipment shall continue to be visible and legible. Markings and signs that are illegible shall be corrected.
- Refrigerating pipe or components shall be installed in a position where they are unlikely to be exposed to any substance that may corrode refrigerant-containing components unless the components are constructed of materials that are inherently resistant to being corroded or are suitably protected against being so corroded.
- **IMPORTANT:** It's mandatory to either follow the table above or follow the federal, state, and/or local regulations regarding the minimum room area allowed for the total refrigerant charge in the system.
- Minimum installation height depends on indoor unit specifications. Please refer to the indoor unit installation manual.
- Do not install the air conditioner in the 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 is generated from the vent pipe or air outlet. The copper pipe or connection pipe may corrode, and the refrigerant may leak.
 - The place where there is a machine that generates electromagnetic waves. The air conditioner may not operate normally due to the 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 that is close to heat sources.
- Do not use the indoor unit for the preservation of food items, plants, equipment, and artwork. This may cause deterioration of their quality.
- Do not install the indoor unit if it has any drainage problems.
- 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 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.

Installation location requirements

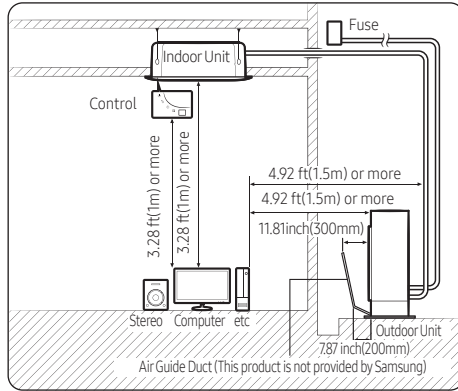
- The outdoor unit shall be installed in an open space that is always ventilated.
- All national, state, and local codes and regulations shall be observed.
- For installation inside a building (this applies either to indoor or outdoor units installed inside) a minimum room floor area of space conditioned is mandatory according to EN378-1:2017 (see the reference table in the indoor unit installation manual).
- To handle, purge, and dispose of the refrigerant, or to break into the refrigerant circuit, the technician should have a certificate from an industry-accredited authority.



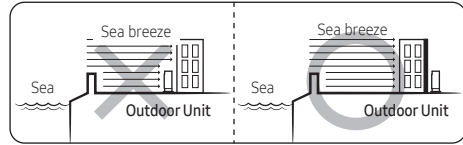
Installation Procedure

Installation Procedure

- 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.



- If you operate the cooling operation of the air conditioner in the condition where the ambient temperature is lower than 23 °F(-5°C) DB(Dry bulb), or the outdoor unit might be faced with strong wind directly, the wind baffle should be installed to prevent the outdoor unit fan from operating in reverse way.
- When installing the outdoor unit at the seaside, 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 protected from sea breeze. Failure to do so may cause damage to the outdoor unit.

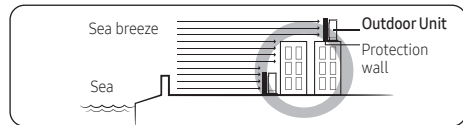


- Install the unit at a height where its base can be firmly fixed in place.
- Make sure that the water dripping from the drain hose runs away correctly and safely.

CAUTION

- You have just purchased a system air conditioner and it has been installed by your installation specialist.
- This device must be installed according to the national electrical codes.
- If your outdoor unit exceeds a net weight of 132.2 lbs(60 kg), do not install it on a suspended wall, but stand it on the floor.
- The reliability of our product cannot be guaranteed when the ambient temperature is less than -13°F(-25°C).

- If you cannot avoid installing the outdoor unit at the seaside, construct a protection wall around it 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 27.6 inches(700mm) between the protection wall and the outdoor unit for exhausted air to ventilate.



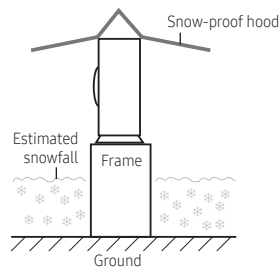


CAUTION

- Depending on the condition of the power supply, unstable power or voltage may cause malfunction of parts or control systems (for example : on a boat or places using power supplied from an electric generator, etc.).
 - Install the unit in a place where water can drain smoothly.
 - If you have any difficulty finding the installation location as prescribed above, contact your manufacturer for details.
 - Consider that the salinity particles clinging to the external panels should be sufficiently washed out. Be sure to clean seawater and dust from the outdoor unit heat exchanger and apply a corrosion inhibitor on it at least once a year.
 - Because the residual water at the bottom of the outdoor unit significantly promotes corrosion, make sure that the slope does not disturb drainage.
 - Keep the floor level so that rain does not accumulate.
 - Be careful not to block the drain hole due to foreign substances.
 - 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 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 time, such as off-peak hours, take appropriate measures like covering the product.
 - If the product is installed within 1640.4 ft (500 m) of the seashore, a special anti-corrosion treatment is required.
 - ※ Please contact your local Samsung representative for further details.

CAUTION

- In areas with heavy snowfall, piled snow could block the air intake. To avoid this incident, install a frame that is higher than the estimated snowfall. In addition, install a snow-proof hood to prevent snow from piling on the outdoor unit.





Installation Procedure

Outdoor unit dimensions

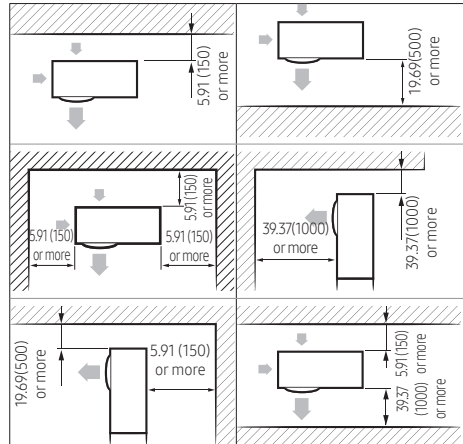
Unit : inch (mm)

A Type	
AC024/036FCUDCG	
B Type	
AC048FCUDCG, AC024FCUPCG	
C Type	
AC060FCUDCG, AC036/048/060FCUPCG	

Minimum clearances for the outdoor unit

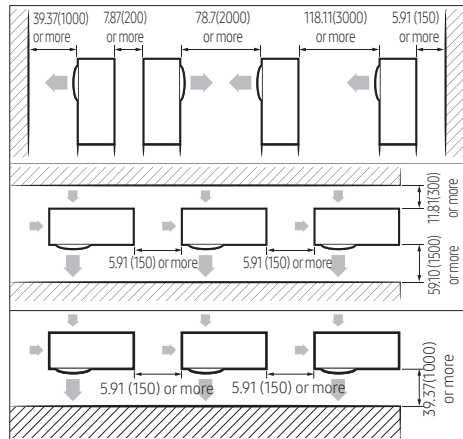
When installing 1 outdoor unit

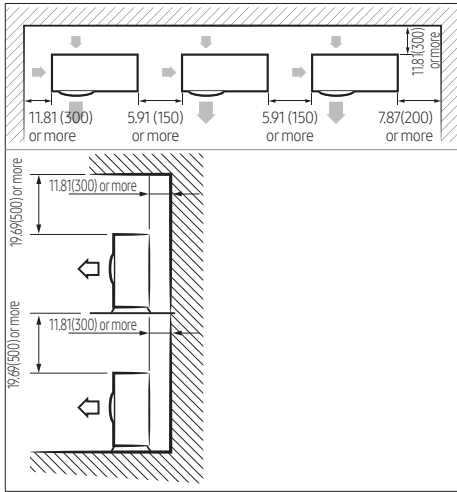
Unit : inch (mm)



When installing more than 1 outdoor unit

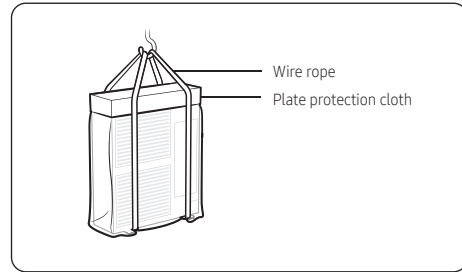
Unit : inch (mm)





Moving the outdoor unit with wire rope

- 1 Before carrying the outdoor unit, fasten two wire ropes of 26.25 ft (8m) or longer, as shown in the figure.
- 2 To prevent damage or scratches effectively, insert a piece of cloth between the outdoor unit and the ropes.
- 3 Move the outdoor unit.

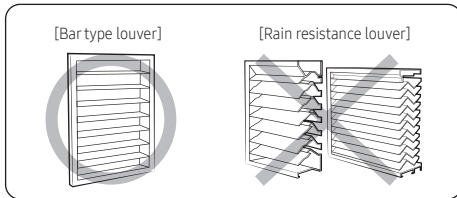


CAUTION

- The outdoor unit must be installed according to the specified clearance distances to permit accessibility from each side, and to guarantee correct operation, maintenance, and repair of the unit. The components of the outdoor unit must be accessible 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%

Step 2 Checking and preparing accessories and tools

Energy Label (1)	Rubber Leg (4)
Installation Manual (1)	

NOTE

- Wire assembly cables are optional. If they are not supplied, use standard cables.
- The drain plugs and the rubber legs are included only when the air conditioner is supplied without assembly pipes.
- If these accessories are supplied, they are in the accessory package or outdoor unit package.



Installation Procedure

Step 3 Fixing the outdoor unit in place

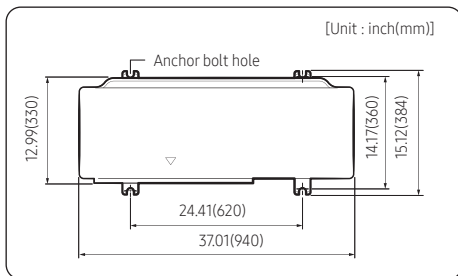
Install the outdoor unit on a rigid and stable base to prevent disturbance from any noise caused by vibration. When installing the unit on tall stands or in a location exposed to strong winds, fix the unit securely to the ground or structure.

- 1 Position the outdoor unit so that the air flow is directed towards the outside, as indicated by the arrows on the top of the unit.
 - Attach the outdoor unit to the appropriate support using anchor bolts.
- 2 The ground wire for the telephone line cannot be used to ground the air conditioner.
- 3 If the outdoor unit is exposed to strong winds, install shield plates around the outdoor unit, so that the fan can operate correctly.



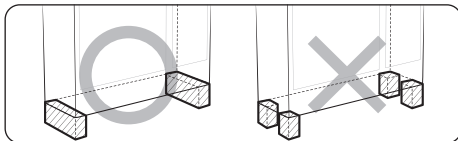
NOTE

- Install provided rubber legs to prevent vibration and noise.

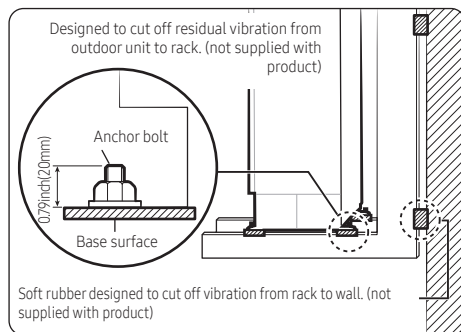


CAUTION

- 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.



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



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



CAUTION

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

Step 4 Connecting the power cables, communication cable, and controllers

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

- The main power cable between the auxiliary circuit breaker and the outdoor unit.
- The communication cable between the outdoor unit and AHU Control Unit(ACU).





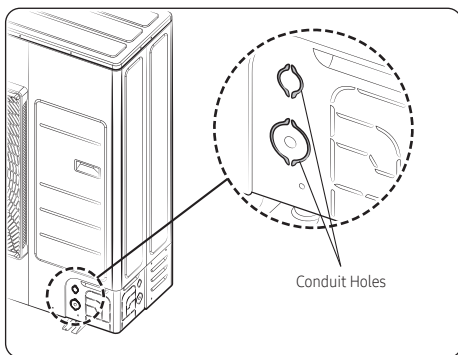
⚠ CAUTION

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

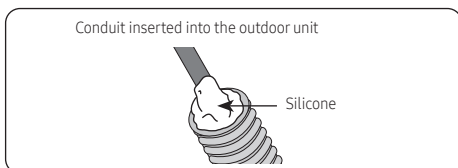
Connecting wire conduits

When connecting the power supply cables and communication cable, use conduits to protect the cables.

- 1 Drill holes on the conduit plate per their use and quantity.
 - Use a nipper to remove conduit holes from the lower part of the cabinet. (Do not remove it by hammering.)



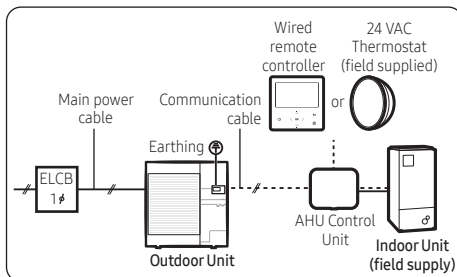
- 2 Insert the cables through the conduits, and then fix the conduits to the conduit plate with the lock nuts.
- 3 Apply silicone to the end of the hose to prevent rain from entering the hose.



- 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.

Air conditioning system examples

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



※ The appearance of the unit may be different from the picture depending on the model.

⚠ CAUTION

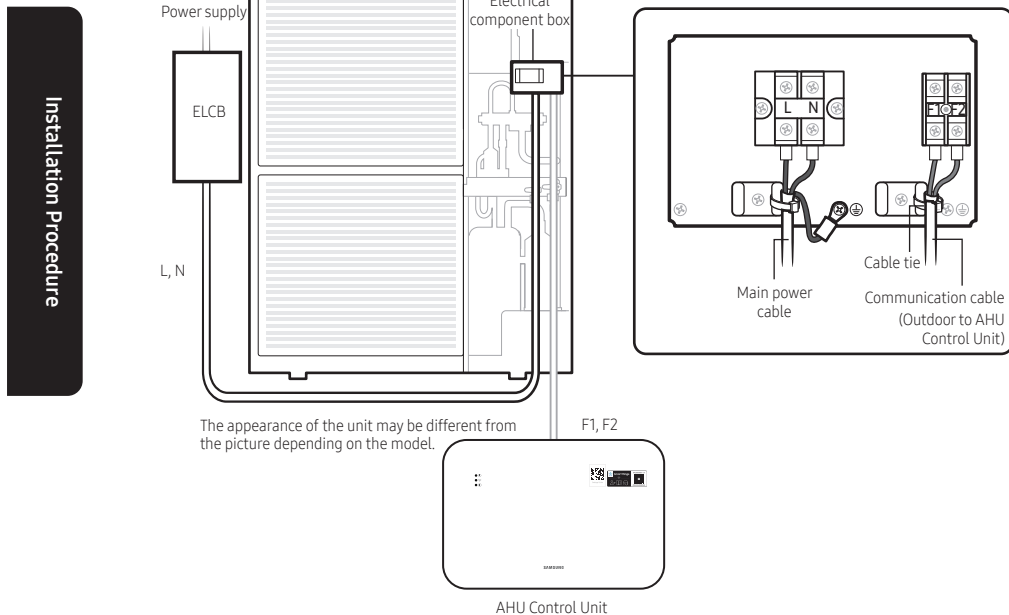
- Make sure to install an ELCB (RCD or RCCB) or ELB and MCB combination, according to local regulations.
- If the outdoor unit is installed in a location vulnerable to an electric leak or submergence, make sure to install an ELCB.
- ELCB must be installed since this product is equipped with a base heater.
- This product uses the R-454B refrigerant, be cautious not to generate any sparks near the product.





Installation Procedure

Connecting the main power cable



⚠ CAUTION

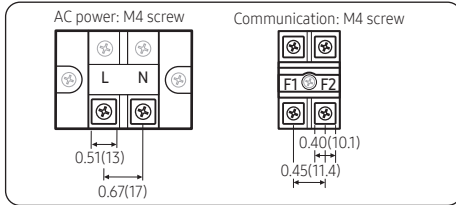
- You should connect the power cable to the power cable terminal and fasten it with a clamp.
- To protect the product from water and possible shock, you should keep the power cable and the connection cord of the indoor and outdoor units within ducts. (with appropriate IP rating and material selection for your application)
- Ensure that the main supply connection is made through a switch that disconnects all poles, with a contact gap of at least 0.12 inches(3mm).
- Devices disconnected from the power supply should be completely disconnected in the condition of overvoltage category.
- Keep distances of 1.97 inches(50 mm) or more between the power cable and communication cable. If a distance of 1.97 inches(50 mm) or more cannot be kept, a double shielded cable (FROHH2R or LiYCY type) must be used, connected to the earth on a single side.





Main power terminal block specifications

[Unit : inch(mm)]



Main power cable specifications

The power cable is not supplied with the air conditioner.

- Select the power supply cable following relevant local and national regulations.
- Wire size must comply with the applicable local and national codes.
- Specifications for local power cord wiring and branch wiring must comply with local codes.

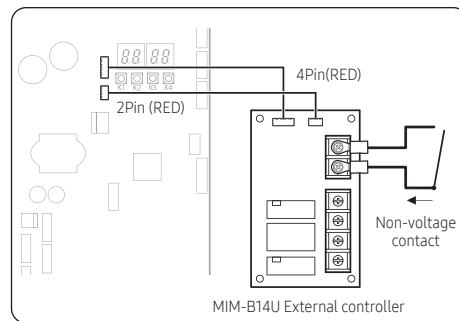
Model	Power Source	RLA(A)
Outdoor		
AC024FCUDCG	208-230V/60Hz	17.6
AC036FCUDCG		17.6
AC048FCUDCG		24.0
AC060FCUDCG		24.0
AC024FCUPCG		17.6
AC036FCUPCG		24.0
AC048FCUPCG		24.0
AC060FCUPCG		24.0

Model	MOC		MCA(A)	MOP(A)
	FAN1(A)	FAN2(A)		
Outdoor				
AC024FCUDCG	1.2	0	24.1	30
AC036FCUDCG	1.2	0	24.1	30
AC048FCUDCG	1.2	1.2	33.3	40
AC060FCUDCG	1.2	1.2	33.3	40
AC024FCUPCG	1.2	1.2	25.3	30
AC036FCUPCG	1.2	1.2	33.3	40
AC048FCUPCG	1.2	1.2	33.3	40
AC060FCUPCG	1.2	1.2	33.3	40

NOTE

- Outdoor units are installed using different power sources from that of indoor units, and this installation manual only provides the MCA/MOP values for outdoor units. For the MCA/MOP values for indoor units, refer to the installation manual for the indoor unit installed.
- RLA is based on AHRI 210/240 cooling standard condition [Indoor temp.: 26.7 °C / 80 °F(DB) / 19.46 °C / 67 °F(WB), Outdoor temp.: 35 °C / 95 °F(DB)]
- Voltage tolerance is $\pm 10\%$.
- Symbols
 - RLA: Rated Load Ampere (A)
 - MOC: Maximum Operating Current (A)
 - MCA: Minimum Circuit Ampacity (A)
 - MOP: Maximum Overcurrent Protection Device (A)
- Voltage range
 - Units are suitable for use on electrical systems where the voltage supplied to the unit terminal is not below or above listed range limits.
- Wire size & type must comply with the applicable local and national codes.
 - Wire size: Based on the value of MCA.
 - Wire type: 1-phase: 60245 IEC57(IEC) or H05RN-F(CENELEC) grade or more

Silence mode controller wiring diagram with External controller

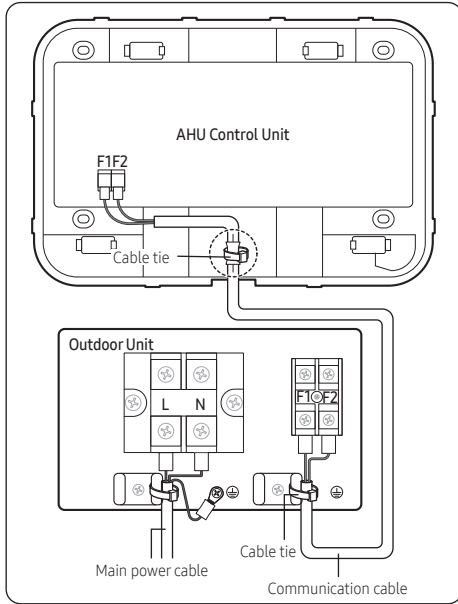




Installation Procedure

Connecting the main power cable and outdoor-to-ACU communication cable

Installation Procedure



NOTE

- Lay the electrical wiring so that the front cover does not rise up when doing wiring work and attach the front cover securely.
- The ground wire for ACU 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.

Outdoor-to-ACU communication cable

- 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.
- Connect the rated cables only.
- Connect using a driver which can 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	
	lbf•ft	N•m
M4	0.87 to 1.30	1.2 to 1.8
M5	1.45 to 2.17	2.0 to 3.0

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 AHU Control Unit (ACU) 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 electrical insulation such as rubber and so on.
- Must keep the cable in a protection tube.
- When the cables are connected through the hole, remove the knock-out piece.

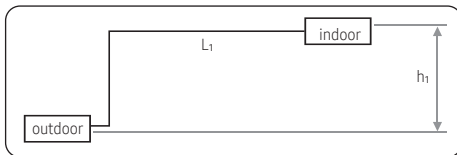
Communication cable
AWG18†(0.75mm²†), 60245 IEC57(IEC) or H05RN-F(CENELEC) grade or more



Step 5 Connecting the refrigerant pipe

Maximum allowable pipe length [ft(m)]

	Model name	Main pipe Length(L1)	Max pipe height difference between outdoor and indoor unit(h1)
2Ton(Single fan)	AC024FCUDCG	164(50)	98(30)
3Ton(Single fan)	AC036FCUDCG	164(50)	98(30)
4Ton	AC048FCUDCG	164(50)	98(30)
5Ton	AC060FCUDCG	164(50)	98(30)
2Ton(Dual fan)	AC024FCUPCG	164(50)	98(30)
3Ton(Dual fan)	AC036FCUPCG	164(50)	98(30)
4Ton	AC048FCUPCG	164(50)	98(30)
5Ton	AC060FCUPCG	164(50)	98(30)



Recommended liquid and gas pipe diameters [inch(mm)]

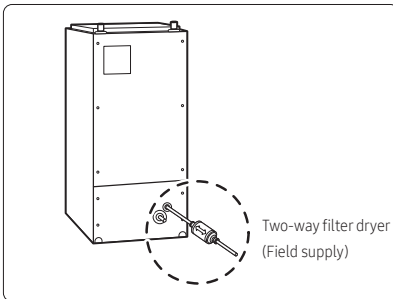
	Model name	Liquid pipe diameter	Gas pipe diameter		
			Rated	Min	Max
2Ton(Single fan)	AC024FCUDCG	Φ3/8(9.52)	Φ3/4(19.05)	Φ5/8(15.88)	Φ7/8(22.23)
3Ton(Single fan)	AC036FCUDCG	Φ3/8(9.52)	Φ3/4(19.05)	Φ5/8(15.88)	Φ7/8(22.23)
4Ton	AC048FCUDCG	Φ3/8(9.52)	Φ7/8(22.23)	Φ3/4(19.05)	Φ1-1/8(28.58)
5Ton	AC060FCUDCG	Φ3/8(9.52)	Φ7/8(22.23)	Φ3/4(19.05)	Φ1-1/8(28.58)
2Ton(Dual fan)	AC024FCUPCG	Φ3/8(9.52)	Φ7/8(22.23)	Φ5/8(15.88)	Φ7/8(22.23)
3Ton(Dual fan)	AC036FCUPCG	Φ3/8(9.52)	Φ7/8(22.23)	Φ3/4(19.05)	Φ1-1/8(28.58)
4Ton	AC048FCUPCG	Φ3/8(9.52)	Φ7/8(22.23)	Φ3/4(19.05)	Φ1-1/8(28.58)
5Ton	AC060FCUPCG	Φ3/8(9.52)	Φ7/8(22.23)	Φ3/4(19.05)	Φ1-1/8(28.58)



Reuse existing refrigerant lines

To retrofit the outdoor unit by using the existing piping, be sure to:

- Confirm that the existing pipe diameter, length, and height difference between outdoor and indoor unit meet the requirements list above.
- Confirm that the maximum pressure for the indoor unit is equal or higher than the maximum pressure for the outdoor unit.
- Confirm that the indoor unit is compatible with R-454B, and utilizes a Thermostatic Expansion Valve (TXV). If existing indoor unit utilizes an orifice plate, replace the orifice plate with a R-454B TXV.
- Flush the inside of the piping to remove moisture, oil and any other foreign matter.
- If the unit will be configured as a heat pump, a heat pump TXV must be installed.
- For newly installed pipes or when using existing refrigerant pipes, always install a new, two-way filter dryer on the liquid pipe at the indoor or outdoor unit.

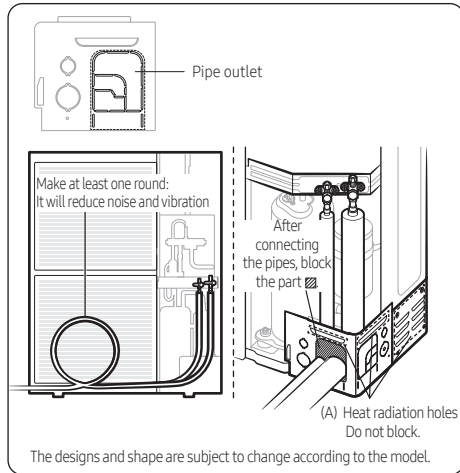


NOTE

- Make sure to remove the transparent covers at the edge of the pipes before connecting the pipes.

CAUTION

- While on site and prior to installation, protect or enclose refrigerant tubing to avoid mechanical damage.



- The refrigerant pipe can be pulled out from front, side, rear and bottom side, so install it depending on the installation site condition.

CAUTION

- Cut the pipe outlet to the exact pipe size. In addition, remove foreign substances and burr around the outlet.
- Make sure not to damage the exterior of the outdoor unit.
- 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 block the space around the pipes where they enter the outdoor unit chassis to prevent small animals from entering. However, the radiant heat hole (A) should be able to intake air.



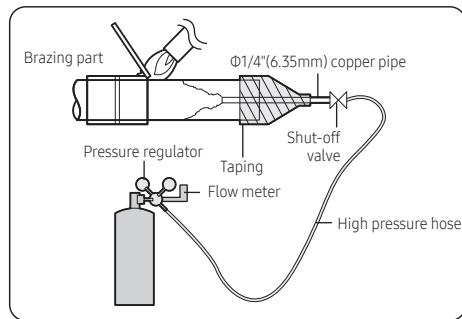
Step 6 Brazing the refrigerant pipe

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 installing the pipe.

Nitrogen flushing while brazing

- Use dry 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 pipes which can cause damage to the compressor, valves, etc.
- Adjust the flow rate of the Nitrogen flushing with a pressure regulator to maintain 1.77 ft³/hr (0.05m³/hr) or less.

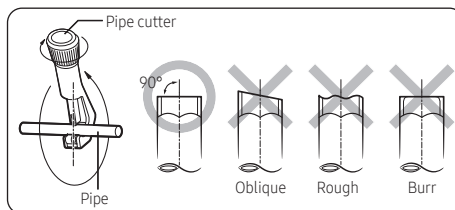


Direction of the pipe when brazing

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

Cutting the pipes

- Make sure that you prepared the required tools.
 - Pipe cutter, reamer, flaring tool and pipe holder, etc.
- If you want to shorten the pipe, cut it using a pipe cutter ensuring that the cut edge remains at 90° with the side of the pipe.
 - There are some examples of correctly and incorrectly cut edges below.



- To prevent a gas leak, remove all burrs at the cut edge of the pipe using a reamer.





Installation Procedure

Step 7 Vacuum drying the refrigerant circuit

HIGH PRESSURE LEAK TEST WITH DRY NITROGEN(before opening valves)

In order to determine if there are any leaks in the refrigerant piping system prior to vacuum drying, the system must be pressure tested using a dry nitrogen leak test.

First, pressurize the system with dry nitrogen up to 100 psi. Hold for 5 minutes and observe if the pressure decreases. If the pressure does decrease, a leak is likely present and should be repaired before repeating the high pressure leak test.

If the system holds pressure at 100 psi for 5 minutes, then proceed to increase the pressure to 300 psi and again determine if there may be leaks by waiting 5 minutes and observing if there is a pressure drop in the system.

If the system holds pressure at 300 psi, then proceed to increase the pressure to 500 psi. Hold for one hour and observe if there is any loss in pressure after 1 hour. Repair any leaks, if necessary, and repeat the high pressure leak check, or proceed to evacuate and vacuum dry the system as indicated in the next steps.



CAUTION

- Perform this triple evacuation procedure to remove all noncondensables and moisture from the system before charging. Failure to do so will result in reduced performance and shorter equipment life.

The time required to perform each evacuation will depend on the capacity (CFM) of the vacuum pump used.

- 1 Use a micron gauge to measure the degree of vacuum during the evacuation step. The micron gauge should be placed as far as possible from the pump in order to ensure an accurate reading.
- 2 Install the high and low side hoses to the manifold gauge, and to the high and low service ports of the outdoor unit service valves.
- 3 Attach a vacuum pump to the common hose of the manifold set.
- 4 To ensure optimal performance, verify that the vacuum pump's oil has been changed recently.
- 5 If desired, first verify the manifold gauge and hoses are leak free.
- 6 Energize the vacuum pump and begin vacuuming.
- 7 Evacuate until 4000 microns is achieved, for at least 10 minutes.
- 8 Close the gauge manifold valve, shut off the vacuum pump, and remove the common hose.
- 9 Connect the hose to the nitrogen pressure regulator of the dry nitrogen cylinder and bleed the hose by opening the end of the common hose closest to the manifold.
- 10 Open the manifold valves and slowly bring the system pressure to atmosphere (0 psig). Hold the system at atmospheric pressure for 15 minutes.
- 11 Close the manifold and nitrogen cylinder and remove the common hose.

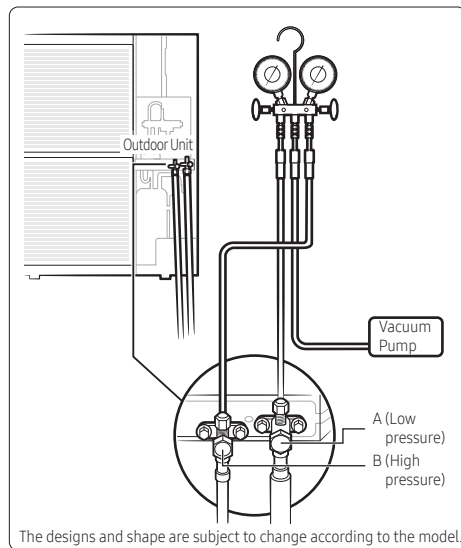




- 12 Reconnect the common hose to the vacuum pump. Repeat steps 6 through 11, alternating between breaking the vacuum with dry nitrogen and evacuating, until system evacuation has occurred three times, to the following vacuum levels:

Evacuation	Microns
First	4000
Second	2000
Third	500

- 13 After evacuating to at least 500 microns for the third time, close the gauge manifold valve and wait 60 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.



Step 8 Adjusting refrigerant (R-454B)

Precautions on adding the R-454B 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 grounded before charging.
- Label the system after charging, if necessary.
- Extreme care is required not to overcharge the system.
- Before charging, 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 comes with an optimized amount of refrigerant for the outdoor unit when connected to the AHRI listed indoor unit used as part of the tested basic model group (tested combination).

If the outdoor unit has been retrofitted to third-party air handler, be sure to adjust the amount of refrigerant to the amount calculated by using the internal coil volume of the indoor unit and the length of the installed piping.

If the internal coil volume of the indoor unit cannot be determined, calculate the total refrigerant amount by using following tables.

The calculated total refrigerant amount cannot exceed the maximum refrigerant amount shown on page 28.

CAUTION

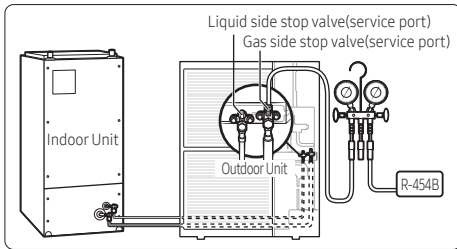
- Charging an excessive amount of refrigerant may damage the compressor.





Installation Procedure

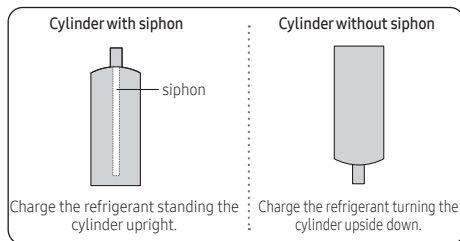
- 1 Check if the stop valve is closed completely.
- 2 Charge the refrigerant through the service port of the gas stop valve
- 3 If you have any difficulty charging the refrigerant as described in the steps above, take the following steps:
 - a Open the liquid stop valve and gas stop valve.
 - b Operate the air conditioner by pressing the K2 button once on the outdoor unit PCB.
 - c After the system has stabilized, charge the refrigerant through the service port of the gas service valve.



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 weigh-in operation of refrigerant quantity added use an electronic balance. If the cylinder doesn't have a siphon, invert it.

Calculating the additional refrigerant charge

When connecting to an AHRI listed indoor unit used as part of the tested basic model group (tested combination).

Total refrigerant amount = Amount charged at factory + Additional refrigerant amount due to fit piping length

Additional refrigerant amount by total liquid piping length

	0~24.6ft	24.6ft over
All Model	0	0.5 oz/ft

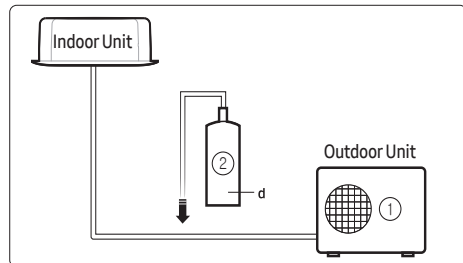
Total maximum refrigerant amount

Capa.	Model name	Factory Charging	Total maximum refrigerant amount (Factory charging + additional charging)
2Ton	AC024FCUDCG	6.4 lbs	10.75 lbs
3Ton	AC036FCUDCG	6.4 lbs	10.75 lbs
4Ton	AC048FCUDCG	8.4 lbs	12.73 lbs
5Ton	AC060FCUDCG	8.8 lbs	13.17 lbs
2Ton	AC024FCUPCG	7.1 lbs	11.41 lbs
3Ton	AC036FCUPCG	9.9 lbs	14.28 lbs
4Ton	AC048FCUPCG	12.1 lbs	16.48 lbs
5Ton	AC060FCUPCG	12.1 lbs	16.48 lbs

CAUTION

Please fill in the following with indelible ink on the refrigerant charge label supplied with this product and on this manual.

- ① the factory refrigerant charge of the product,
- ② the additional refrigerant amount charged in the field and
- ① + ② the total refrigerant charge. on the refrigerant charge label supplied with the product.





Unit	oz(g)
①, a	
②, b	
① + ②, c	

NOTE

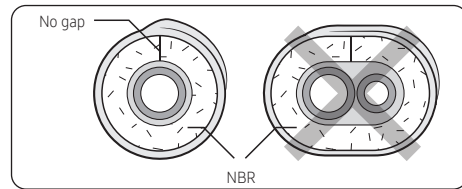
- Factory refrigerant charge of the product: see unit nameplate
- Additional refrigerant amount charged in the field (Refer to the above information for the quantity of refrigerant replenishment.)
- Total refrigerant charge
- Refrigerant cylinder and manifold for charging

CAUTION

- Make sure that the total refrigerant charge does not exceed "Total maximum refrigerant amount" in the table.
- After filling out the refrigerant charge label, attach it adjacent to the nameplate of the compressor bearing unit.

Step 10 Insulating the refrigerant pipes

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

**NOTE**

- When insulating the pipe, be sure to overlap the insulation.
- Only use insulation that meets all applicable national, state, and local code requirements.

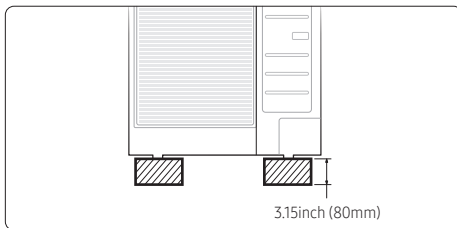
CAUTION

- When insulating the pipe, use a non-slit insulator.

Step 9 Draining the water naturally

When using the air conditioner in the heating mode, frost may accumulate. During defrost operation, the defrosting water must be drained off safely.

- Do not install a drain hose, a drain plug and a cap. (Let the water drain naturally).
- Ice may form on the ground. Take appropriate measures to prevent ice formation.





Installation Procedure

2 Select the insulation of the refrigerant pipe.

- Insulate the gas side pipe referring to the thickness according to the pipe size.
- Less than Indoor temperature of 86°F(30°C) and humidity of 85% is the standard condition. If installing in a high humidity condition, use one grade thicker insulator by referring to the table below. If installed in unfavorable conditions, use a thicker one.
- The insulator's heat-resistance temperature should be more than 248°F(120°C).

Pipe	Outer diameter		Insulation Type (Cooling, Heating)				Remarks
			General [86°F(30°C), 85%]		High humidity [86°F(30°C), over 85%]		
			EPDM, NBR				
	mm	inch	mm	inch	mm	inch	
Gas pipe	6.35	1/4	13	1/2	19	3/4	Heating resisting temperature over 248°F(120°C)
	9.52 ~ 25.4	3/8-1	19	3/4	25	1	
	28.58 ~ 44.45	1 1/8-1 3/4	19	3/4	32	1 1/4	
	50.8	2	25	1	38	1 1/2	

- When installing insulation in places and conditions below, use the same insulation that is used for high humidity conditions.
 <Geological condition>
 - High humidity places such as shorelines, hot springs, near lakes or rivers, 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>
 - The ceiling is frequently exposed to moisture and cooling is not covered.
 - e.g. The pipe installed in a corridor of a dormitory and studio or near an exit that opens and closes frequently.
 - The place where the pipe is installed is highly humid due to the lack of a ventilation system.

Step 11 Checking the grounding

If the power distribution circuit does not have a ground or the grounding does not comply with specifications, a grounding electrode must be installed according to the applicable national, state, and local code requirements. The corresponding accessories are not supplied with the air conditioner.

Step 12 Performing final check and trial operation

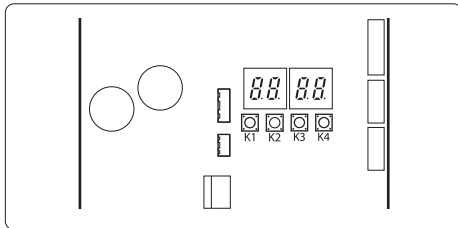
- 1 Check the power supply between the outdoor unit and the auxiliary circuit breaker.
 - 1 phase power supply : L, N
- 2 Check the indoor unit and the ACU(AHU Control Unit).
 - Check that you have connected the power and communication cables correctly.
- 3 Press K1 or K2 on the outdoor unit PCB to start and end the test modes.

Key	Push type	Mode	Display			
			SEG1	SEG2	SEG3	SEG4
K1	Short	1st Heating test mode	F	1	8	8
		2nd Defrost test mode ¹⁾	F	3	8	8
		3rd End Key operation	8	8	8	8
K2	Short	1st Cooling test mode	F	2	8	8
		2nd Inverter check ²⁾	F	4	8	8
		3rd Pump down	F	6	8	8
		4th Unusual	F	8	8	8
		5th Inverter Fault Detection (Comp#1) ³⁾	F	A	8	8
		6th Auto trial operation	F	0	8	8
		7th Auto check (Install commissioning mode)	F	E	8	8
		8th End Key operation	8	8	8	8
K3	Short	1st Reset Release Eco mode	8	8	8	8



- ¹⁾ When the outdoor temperature is below 50°F(10°C) for 1 minute, defrost test mode can work.
- 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

	INV#1				Action to take
	SEG1	SEG2	SEG3	SEG4	
Fault detection is in progress					-
OK					-
NG					PBA defect: Replace the PBA
Check					Manual inspection is required
Going into fault detection mode failed					Try fault detection again



- 5** Reset the power supply of the outdoor unit and deactivate the eco mode (standby mode):
- Press the K3 button for 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

- 4** After 12 minutes of operation check the discharged air temperature of the indoor unit
- Cooling mode (indoor unit check) → Inlet air temp. - Outlet air temp.(ΔT): From 18°F(10.0 °C) to 22°F(12.2 °C)
 - Heating mode (indoor unit check) → Outlet air temp. - Inlet air temp.(ΔT): 20°F(11.1 °C) to 25°F(13.8 °C)
 - In heating mode, the indoor fan motor can remain off to avoid cold air blown into the air-conditioned space.





Installation Procedure

- 6 View mode: When the K4 switch is pressed, you can see information about the system status.
- 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 "-" ¹⁾	Tens digit	Units digit	°F or °C ²⁾
5	Compressor discharge sensor	5	Hundreds digit	Tens digit	Units digit	°F or °C ²⁾
6	Eva-Mid sensor	6	Hundreds digit or "-" ¹⁾	Tens digit	Units digit	°F or °C ²⁾
7	Condenser sensor	7	Hundreds digit or "-" ¹⁾	Tens digit	Units digit	°F or °C 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 "-" ¹⁾	Tens digit	Units digit	°F or °C 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	kBtu/h or kW 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	-
14	IPM temperature	E	Hundreds digit or "-" ¹⁾	Tens digit	Units digit	°F or °C ²⁾
15	The number of connected indoor units	F	0	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	°F or °C ²⁾
18	ESC OUT sensor	I	Hundreds digit or "-" ¹⁾	Tens digit	Units digit	°F or °C ²⁾
19	Suction sensor	J	+ / - Hundreds for Fahrenheit	Tens digit	Units digit	°F or °C ²⁾
20	Pressure sensor	K	+ / - Hundreds for Fahrenheit	Tens digit	Units digit	psi or kg/ cm ² ⁴⁾

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

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

³⁾ If the temperature unit is set to Celsius through Setting outdoor unit option switches, the value is expressed in the unit of kW.

⁴⁾ If the temperature unit is set to Celsius through Setting outdoor unit option switches, the value is expressed in the unit of kW.





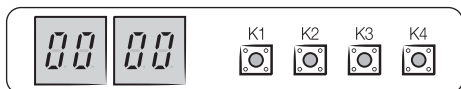
		Display contents	SEG1	SEG2	SEG3	SEG4
K4 long push	-	Main micom version	Year (Dec)	Month (Hex)	Date (Tens digit)	Date (Units digit)
	After short push 1	Inverter micom version	Year (Dec)	Month (Hex)	Date (Tens digit)	Date (Units digit)
	After short push 2	E2P version	Year (Dec)	Month (Hex)	Date (Tens digit)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

7 Setting outdoor unit option switch and address manually

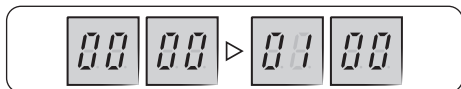
a Setting the option

- 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.



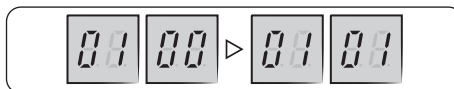
- Seg 1 and Seg 2 will display the number for selected option.
- Seg 3 and Seg 4 will display the number for set value of the selected option.
- If you have entered option setting, you can shortly press the K1 switch to adjust the value of the Seg 1, Seg 2 and select the desired option.

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.

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
Step for Silence mode	0	2	0	0	Disabled (Factory default)
			0	1	Step1
			0	2	Step2
			0	3	Step3
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
			0	1	Fahrenheit (default)



Installation Procedure

Installation Procedure

Option item	SEG1	SEG2	SEG3	SEG4	Function
Current restriction rate ¹⁾	0	6	0	0	100% (Factory default)
			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
Long-piping pressure calibration ²⁾	0	8	0	0	Within 98.4 ft (30 m) (Factory default)
			0	1	98.4 ~ 164.0 ft (30 ~ 50 m) (Cooling:-9.96psi, Heating:+4.27psi)
Target low pressure calibration for cooling ³⁾	0	9	0	0	Initial set pressure for cooling (Factory default)
			0	1	-2.84 psi
			0	2	-5.69 psi
			0	3	-8.53 psi
			0	4	-11.38 psi
			0	5	-14.22 psi
			0	6	+2.84 psi
			0	7	+5.69 psi
			0	8	+8.53 psi
			0	9	+11.38 psi
Target high pressure calibration for heating ⁴⁾	1	0	1	0	+14.22 psi
			0	0	Initial set pressure for heating (Factory default)
			0	1	+2.84 psi
			0	2	+5.69 psi
			0	3	+8.53 psi
			0	4	+11.38 psi
			0	5	+14.22 psi
			0	6	-2.84 psi
			0	7	-5.69 psi
			0	8	-8.53 psi
			0	9	-11.38 psi
			1	0	-14.22 psi

Option item	SEG1	SEG2	SEG3	SEG4	Function
Cumulative defrosting time	1	1	0	0	Disable(Factory default)
			0	1	90 min.
			0	2	60 min.
			0	3	40 min.
Defrosting frequency offset	1	2	0	0	Disable (Factory default)
			0	1	-5Hz
			0	2	-10Hz
			0	3	-15Hz
Defrosting-off temperature offset	1	3	0	0	Disable (Factory default)
			0	1	+5.4°F (3°C)
			0	2	+10.8°F (6°C)
			0	3	+16.2°F (9°C)
Outdoor fan settings when defrosting is ON ⁵⁾	1	5	0	0	100rpm(Factory default)
			0	1	Stop
			0	2	120rpm
			0	3	140rpm
			0	4	160rpm

- ¹⁾ Current restriction rate : When restriction option is set, cooling and heating performance may decrease.
- ²⁾ Set this value when the installed piping length exceeds 98 ft. Do NOT use it for performance enhancement purposes.
- ³⁾ Target low pressure for cooling can be set in a range of 113.79~170.68 psi.
- ⁴⁾ Target high pressure for heating can be set in a range of 284.47~526.26 psi.
- ⁵⁾ When the 'Fan operation during defrost' switch is ON, change the outdoor fan speed setting during defrost mode, as follows: select Stop if the frost does not melt even after operation using defrost mode; or increase the fan speed if the high-pressure switch is activated during defrost mode.

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.



Extra Procedures

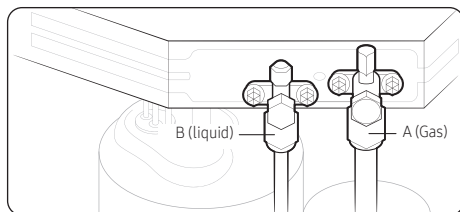
Pumping down refrigerant

⚠ WARNING

- After installing the product, perform a leak test on the piping connections. After pumping down refrigerant to inspect or relocate the outdoor unit, stop the compressor and 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 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 to avoid refrigerant loss to the atmosphere.

- Turn the system on in cooling with the 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.)
- Release the valve caps on Liquid and Gas Sides.
- Use an hexagonal wrench to close the valve on the liquid side.
- After approximately 2 minutes, close the valve on the gas side.
- Stop the air conditioner's operation by pressing the k3 switch on the outdoor unit PBA.
- Disconnect the pipes.



Relocating the indoor and outdoor units

- Pump down refrigerant. See Pumping down refrigerant on page 35.
- Disconnect the power supply only after rendering the system powerless from the main power.
- Disconnect the assembly cable from the indoor and outdoor units.
- If there are no flare nuts, remove 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.
- 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

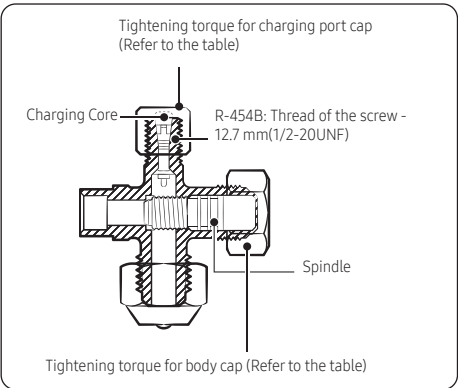
- Make sure you do not bend the connection pipes in the middle and store them with the cables.
- Move the indoor and outdoor units to a new location.
 - Remove the mounting plate for the indoor unit and move it to a new location.

Extra Procedures

Using the stop valve

Opening the stop valve

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



- 3 Tighten the cap securely.

Outer Diameter [inch (mm)]	Tightening torque	
	Body cap [(lbf·ft (N·m))]	Charging port cap [(lbf·ft (N·m))]
Φ1/4 (Ø 6.35)	14.8 to 18.4 (20 to 25)	7.4 to 8.9 (10 to 12)
Φ3/8 (Ø 9.52)		
Φ1/2 (Ø 12.70)	18.4 to 22.1 (25 to 30)	
Φ5/8 (Ø 15.88)	22.1 to 25.8 (30 to 35)	
Over Ø 3/4	25.81 ~ 29.50 (35~40)	

- (1 N·m=10 kgf·cm)

NOTE

- Do not apply excessive force to the stop valve 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, and then check for leaks again. If there is no leakage, 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 reaches 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.



Maintenance Procedures

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:

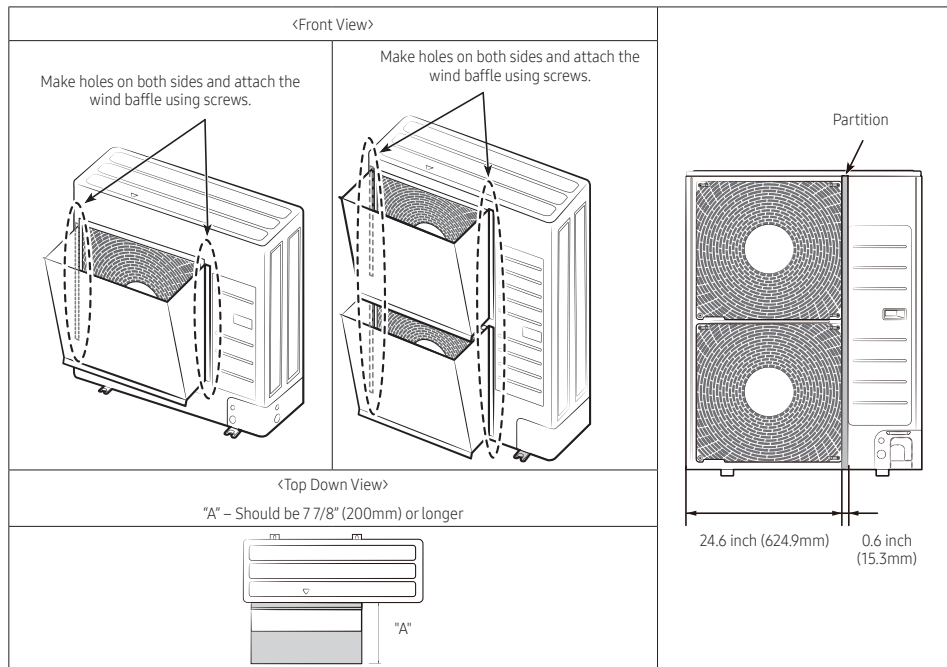
- Only qualified, licensed professionals shall perform refrigerant recovery and decommissioning. Before decommissioning, the worker shall become familiar with the product.
- The entire refrigerant charge shall be recovered safely.
- Before starting the process, oil and refrigerant samples shall be taken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



Installing the wind baffle

If you operate the cooling operation of the air conditioner in conditions where the ambient temperature is lower than 23°F (-5 °C) DB(Dry bulb), or the outdoor unit might be faced with strong wind directly, the wind baffle should be installed to prevent the outdoor unit fan from operating in reverse way.

※ Wind baffle is not supplied with the product.



CAUTION

- When attaching the wind baffle using screws, be careful that the screws do not damage the partition and the heat exchanger.

NOTE

- Install outdoor units with the back surface facing the wall side to eliminate the effects of external wind.





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	E121	Error on room temperature sensor of indoor unit (Short or Open)	Indoor unit Room Thermistor Open/Short
3	E122	Error on EVA IN sensor of indoor unit (Short or Open)	Indoor unit EVA_IN Thermistor Open/Short
4	E123	Error on EVA OUT sensor of indoor unit (Short or Open)	Indoor unit EVA_OUT Thermistor Open/Short
5	E153	Error on float switch (2nd detection)	Indoor unit Float Switch Open/Short Drain Pump operation Check
6	E154	Indoor fan error	Check on indoor unit indoor Fan operation
7	E198	Error on thermal fuse of indoor unit (Open)	Thermal Fuse Open Check of indoor unit Terminal Block
8	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
9	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
10	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
11	E221	Error on outdoor temperature sensor (Short or Open)	Check Outdoor sensor Open / Short
12	E231	Error on outdoor COND OUT sensor (Short or Open)	Check Cond-Out sensor Open / Short
13	E251	Error on discharge temperature sensor of compressor1 (Short or Open)	Check Discharge sensor Open / Short
14	E291	High pressure SENSOR ERROR (OPEN/SHORT)	While in operating COMP only, detect 1. Short Error : less than 0.4v, Error detect 2. Open Error : over 4.2v, Error detect
15	E308	Error on outdoor SUCTION sensor (Short or Open)	Check SUCTION sensor Short/Open
16	E320	Error on OLP sensor (Short or Open)	Check OLP sensor Open / Short
17	E321	Error on ESC IN temperature sensor (Short or Open)	Check ESC IN sensor Open / Short
18	E322	Error on ESC OUT temperature sensor (Short or Open)	Check ESC OUT sensor Open / Short
19	E381	INVERTER PCB overheat error	Check Outdoor Inverter PBA
20	E403	Compressor down due to freeze protection control	Check Outdoor Cond.
21	E404	System stops due to overload protection control	Check Comp. when it starts
22	E407	COMP down due to High Pressure Sensor Protection Control 1	Check refrigerant pipe line blockage Check high pressure sensor Check refrigerant amount





Appendix

No.	Error Code	Meaning	Remarks
23	E410	COMP down due to Low Pressure Sensor Protection Control 1	Check low pressure sensor Check refrigerant amount(leakage) Check that the indoor unit inlet and outlet are not covered by anything Check that the indoor unit motor is operating Check that the indoor heat exchanger is not frozen
24	E416	System stops due to discharge temperature	-
25	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
26	E425	Reverse phase or open phase	Check whether 3 phase is reversed or opened.
27	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
28	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
29	E458	Fan speed error	FAN1 ERROR
30	E461	Error due to operation failure of inverter compressor	-
31	E462	System stops due to full current control	-
32	E463	Over current trip / PFC over current error	Check OLP sensor
33	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
34	E465	Comp. Overload error	-
35	E466	DC-Link voltage under/over error	Check AC Power and DC Link Voltage
36	E467	Error due to abnormal rotation of the compressor or unconnected wire of compressor	Check Comp wire
37	E468	Error on current sensor (Short or Open)	Check Outdoor Inverter PBA.
38	E469	Error on DC-Link voltage sensor (Short or Open)	-
39	E470	Outdoor unit EEPROM Read/Write error (Option)	Check Outdoor EEPROM Data
40	E471	Outdoor unit EEPROM Read/Write error (H/W)	Check Outdoor EEPROM PBA
41	E474	Error on IPM Heat Sink sensor of inverter 1 (Short or Open)	Check Outdoor Inverter PBA.
42	E475	Error on inverter fan 2	FAN2 ERROR
43	E483	Overvoltage of H/W detect DC link	Check AC Power
44	E484	PFC Overload (Over current) Error	Check Outdoor Inverter PBA.





No.	Error Code	Meaning	Remarks
45	E485	Error on input current sensor of inverter1 (Short or Open)	Check Outdoor EEPROM PBA
46	E488	Inverter input voltage sensor error	Check Outdoor Inverter PBA
47	E500	IPM overheat error on inverter1	Check Outdoor Inverter PBA.
48	E507	Error due to high pressure switch open or compressor down by high pressure	-
49	E508	Smart install is not installed	-
50	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
51	E554	Gas leak detected	Check the refrigerant
52	E556	Error due to mismatching capacity of indoor and outdoor unit	Check the indoor and outdoor unit capacity
53	E557	DPM remote controller option error	Check the indoor option code
54	E563	Error due to mismatching indoor and outdoor unit	Check the outdoor EEPROM data and indoor option code
55	E590	Inverter EEPROM Checksum error	-
56	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)





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