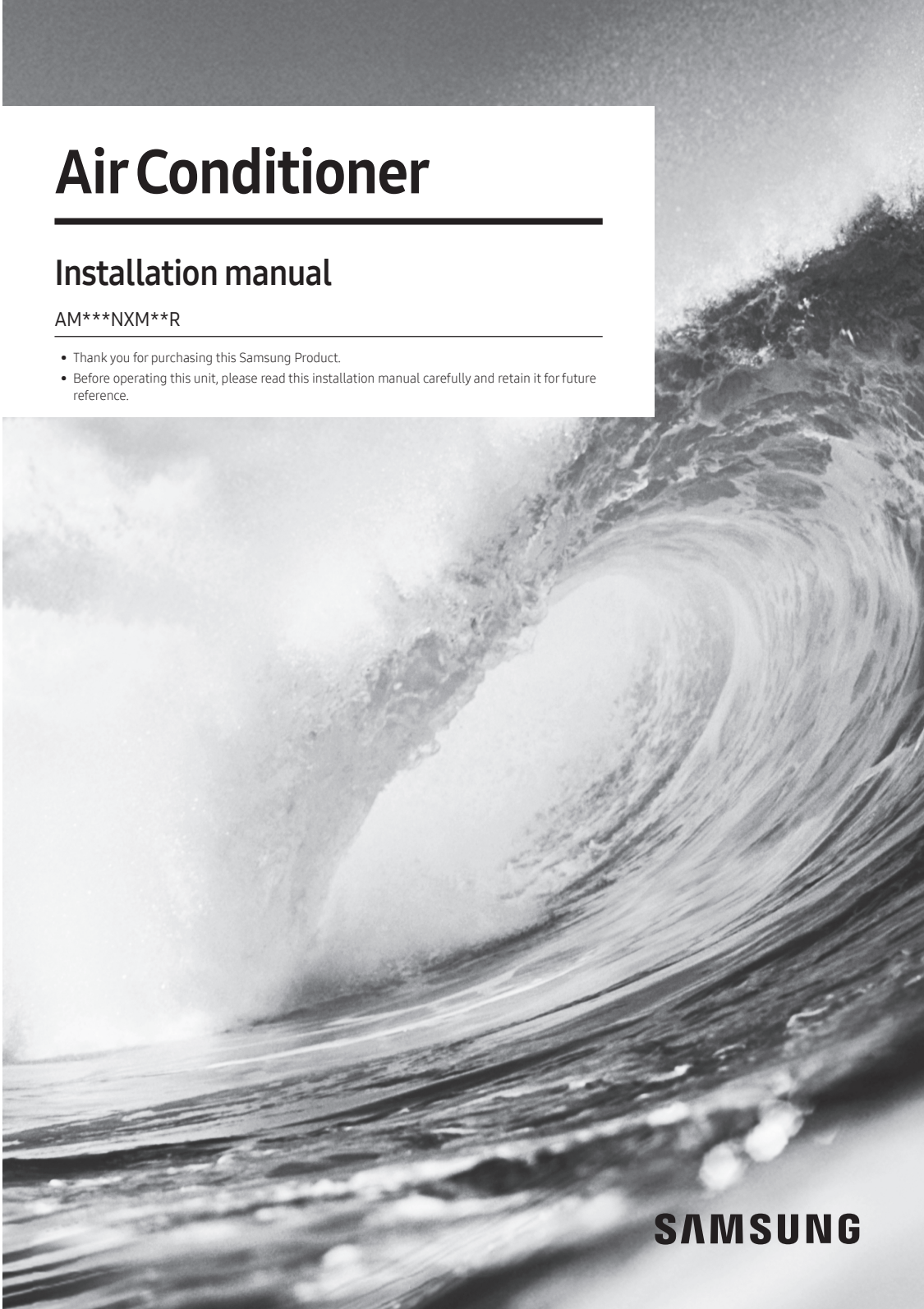
Air Conditioner

Installation manual

AM***NXM**R

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



SAMSUNG

Contents

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

(Applicable in countries with separate collection systems)

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

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

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

For information on Samsung's environmental commitments and product-specific regulatory obligations, e.g. REACH, WEEE, Batteries, visit : samsung.com/uk/aboutsamsung/samsungelectronics/corporatecitizenship/data_corner.html

Safety precautions

Carefully follow the precautions listed below because they are essential to guarantee the safety of the equipment.

WARNING

- Always disconnect the air conditioner from the power supply before servicing it or accessing its internal components.
- Verify that installation and testing operations are performed by qualified personnel.
- Verify that the air conditioner is not installed in an easily accessible area.

General information

- Carefully read the content of this manual before installing the air conditioner and store the manual in a safe place in order to be able to use it as reference after installation.
- For maximum safety, installers should always carefully read the following warnings.
- Store the operation and installation manual in a safe location and remember to hand it over to the new owner if the air conditioner is sold or transferred.
- This manual explains how to install an indoor unit with a split system with two SAMSUNG units. The use of other types of units with different control systems may damage the units and invalidate the warranty. The manufacturer shall not be responsible for damages arising from the use of non compliant units.
- The manufacturer shall not be responsible for damage originating from unauthorized changes or the improper connection of electric and requirements set forth in the “Operating limits” table, included in the manual. Making such changes or improper connections may damage the units and invalidate the warranty.
- The air conditioner should be used only for the applications for which it has been designed: the indoor unit is not suitable to be installed in areas used for laundry.
- Do not use the units if damaged. If problems occur, switch the unit off and disconnect it from the power supply.
- In order to prevent electric shocks, fires or injuries, always stop the unit, disable the protection switch and contact SAMSUNG’s technical support if the unit produces smoke, if the power cable is hot or damaged or if the unit is very noisy.
- Always remember to inspect the unit, electric connections, refrigerant tubes and protections regularly. These operations should be performed by qualified personnel only.
- The unit contains moving parts, which should always be kept out of the reach of children.
- Do not attempt to repair, move, alter or reinstall the unit. If performed by unauthorized personnel, these operations may cause electric shocks or fires.
- Do not place containers with liquids or other objects on the unit.
- All the materials used for the manufacture and packaging of the air conditioner are recyclable.
- The packing material and exhaust batteries of the remote controller(optional) must be disposed of in accordance with current laws.
- The air conditioner contains a refrigerant that has to be disposed of as special waste. At the end of its life cycle, the air conditioner must be disposed of in authorized centers or returned to the retailer so that it can be disposed of correctly and safely.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Safety precautions

- **For use in Europe :** This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- When the product operates in heat mode during winter time, it operates protection mode when the outdoor temperature drops below 0°C. Therefore, supply the power during winter time. If the power is not supplied, compressor protection mode will not operate and cause product malfunction.

Installing the unit

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

- Upon receipt, inspect the product to verify that it has not been damaged during transport. If the product appears damaged, DO NOT INSTALL it and immediately report the damage to the carrier or retailer (if the installer or the authorized technician has collected the material from the retailer.)
- After completing the installation, always carry out a functional test and provide the instructions on how to operate the air conditioner to the user.
- Do not use the air conditioner in environments with hazardous substances or close to equipment that release free flames to avoid the occurrence of fires, explosions or injuries.
- 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.

Power supply line, fuse or circuit breaker

- 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 in accordance with the instructions provided in the wiring diagram included in the manual.
- Always verify that electric connections (cable entry, section of leads, protections...) are compliant with the electric specifications and with the instructions provided in the wiring scheme. Always verify that all connections comply with the standards applicable to the installation of air conditioners.
- Devices disconnected from the power supply should be completely disconnected in the condition of overvoltage category.

Preparing for installation

Outdoor unit classification

Shape			
Model	Heat Recovery	1phase	AM040*XMDER AM050*XMDER AM060*XMDER
		3phase	AM040*XMDGR AM050*XMDGR AM060*XMDGR

Installation combination

- You must install the indoor unit that uses R-410A only.
- If sum capacity of the combined indoor units exceeds the capacity of an outdoor unit, the capacity of each indoor unit is reduced below the rated capacity. Therefore, keeping the combination of indoor units within the capacity of an outdoor unit is recommended.

Outdoor unit	Outdoor unit capacity (HP)	The maximum number of connectable indoor units	Total capacity of the connected indoor units (kW)
AM040*XMD*R Series	4	8	6.0~15.7
AM050*XMD*R Series	5	9	7.0~18.2
AM060*XMD*R Series	6	10	7.8~20.2

Accessories

- You must keep the following accessories until the installation is finished.
- Hand over the installation manual to the customer after finishing the installation.

Manual (2)	Tube Socket (1) for 4/5 HP only	Drain plug (1)	Rubber Leg (4)	Drain cap (3)
				

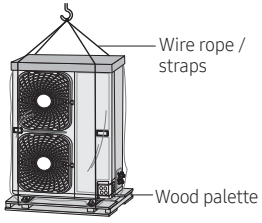
Preparing for installation

Moving the Outdoor Unit

- ▶ Select the moving route in advance.
- ▶ Be sure that moving route is safe from the weight of the outdoor unit.
- ▶ Do not slant the product more than 30˚ when carrying it. (Do not lay the product down sideways.)
- ▶ The surface of the heat exchanger is sharp. Be careful not to get injured while moving and installing.

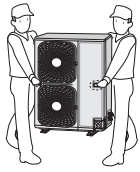
When moving with a crane or wire rope

- ▶ When moving an outdoor unit to a higher place such as the rooftop.
  - Fasten the wire rope as seen in the picture.
  - Move the outdoor unit with the product packed to prevent possible product damage during the transportation.



When moving an outdoor unit with hands

- ▶ Moving the outdoor unit by lifting up and carrying due to the short travel distance.
  - Two people should carry the outdoor unit by holding transportation handle.
  - Be careful not to damage the heat exchanger of the rear side of the outdoor unit during transportation.
  - Be careful not to get hurt by the sharp surface of the heat exchanger.



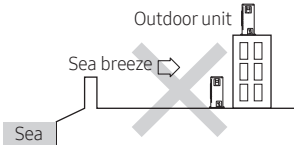
Selecting installation location

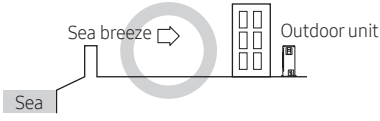
Decide the installation location based on the following condition and obtain the user's approval.

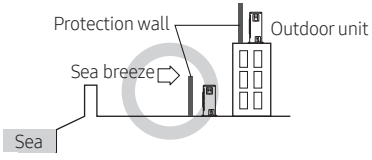
- ▶ Avoid a place that may disturb your neighbor. Noise may occur from the outdoor unit and the discharged air may run into the neighborhood. (Be careful of the operation time in a residential area)
- ▶ Install the outdoor unit on a hard and even area that can support its weight.
- ▶ Choose a flat place where rainwater does not settle or leak.
- ▶ Choose a place that will avoid strong winds.
- ▶ Choose a place that is well ventilated and allows enough space for repairs and service. (Discharge duct can be purchased privately.)
- ▶ Choose a place where the connection of refrigerant pipe between an indoor unit and outdoor unit is within allowed distance.
- ▶ Make sure that the condensed water dripping from the drain hose runs out properly and safely.
- ▶ Choose a place where flammable gas does not leak.
- ▶ Choose a place where the unit could not come into contact with snow and rain.
- ▶ When installing the outdoor unit near sea shore, make sure it is not directly exposed to sea breeze.
  - When installing the outdoor unit near sea shore, consult the qualified installer since the places above require additional measures for corrosion resistance. (You should remove salt and dust of a heat exchanger at least once a year.)

When installing an outdoor unit near sea shore

- ▶ When installing an outdoor unit near sea shore, it should be placed behind a building or surrounded by wind protection wall.
- ▶ Install the outdoor unit in a place where water can drain smoothly.





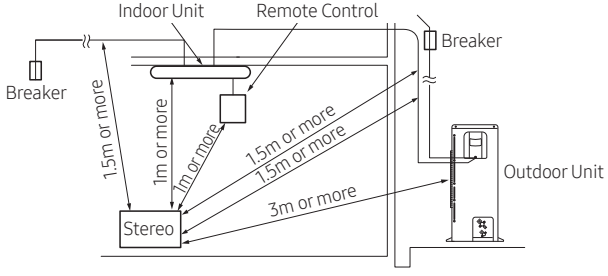


※ Protection wall should be constructed with a solid material such as concrete to block the sea breeze and the height and the width of the wall should be 1.5 times larger than the size of the outdoor unit. (Also, allow over 700mm space between the protection wall and the outdoor unit for ventilation of exhaust air.)

Space requirement for installation

CAUTION

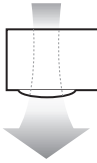
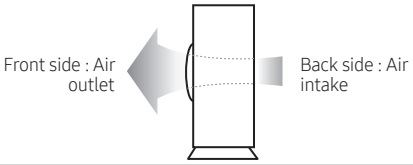
- Install the indoor unit away from any interfering sources such as radio, computer, stereo equipment and also select a place where the electrical wiring work and an indoor unit installation are possible.
  - Especially keep the unit at least 3m away from the electrical equipment in an area where weak electromagnetic waves are generated and install the protection tube to protect the main power cable and communication cable.
  - Make sure that there is no equipment that genetrates electromagnetic waves. If so, malfunction of the control system may occur due to the effect of the electromagnetic wave. (For example: The remote control sensor of the indoor unit may not have good reception in an area with fluorescent lamp style lighting.)
- Make sure the outdoor unit is installed in a safe place where it will not be obstructed by snowfall. The frame should be installed in a place where the air inlet and heat exchanger of the unit are not buried in the snow.
- A ventilation system may be required when the outdoor unit is installed in a closed space or room, even though R-410a is not poisonous or flammable.
- Install railing around the outdoor unit to prevent it falling when the unit is installed on a high place such as the roof of the building.
- Avoid installing the units in places near an exhaust pipe and ventilating opening exposed to corrosive gas, oxides of sulfur, ammonia gas or sulfur gas herbicides. (These places need additional anticorrosive treatments. Please contact manufacture to avoid corroding copper pipes or soldered parts.)
- There shouldn't be any inflammable material such as wood and oil around the indoor unit. Otherwise, external fire may spread to the product.
- According to the condition of power supply, electric noise or unstable voltage can occur malfunction of electric parts or control system. (At the ship or places using power supply from electric generator... etc)



▶ Make sure that the water dripping from the drain hose runs away correctly and safely.

▶ You should repaint or protect the damaged part so that the paint of the cabinet does not peel off and become rusty during installation. When the cabinet becomes rusty, the life of an outdoor will be reduced.

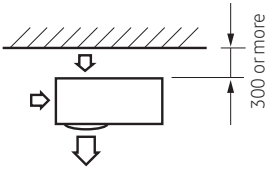
- ▶ Make a space for ventilation and service as seen in the picture.
- ▶ When multiple outdoor units are combined for installation, allow enough space for ventilation against a wall. If the ventilation space is not allowed, product malfunction may occur.
- ▶ The side with logo is the front side of the outdoor unit.
- ※ Figure Description

Top view	Side view
	

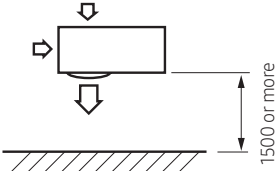
-  Air flow direction.

When installing 1 outdoor unit

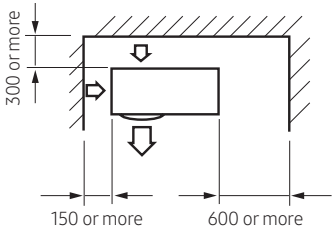
※ When the air outlet is opposite the wall



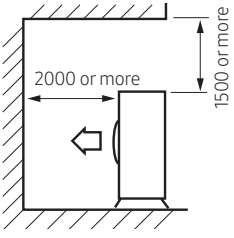
※ When the air outlet is toward the wall (Unit : mm)



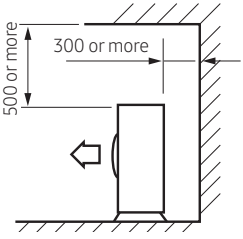
※ When 3 sides of the outdoor unit are blocked by the wall



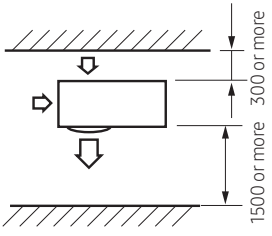
※ The upper part of the outdoor unit is blocked and the air outlet is toward the wall



※ The upper part of the outdoor unit is blocked and the air outlet is opposite the wall



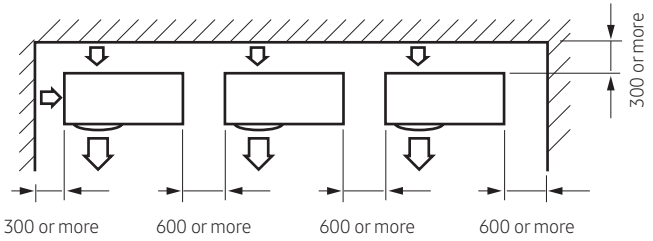
※ When the walls are blocking front and the rear of the outdoor unit



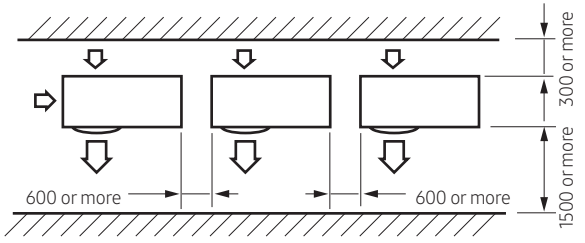
Space requirement for installation

When installing more than 1 outdoor unit

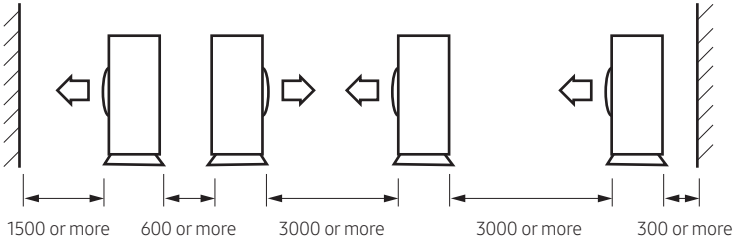
※ When 3 sides of the outdoor unit are blocked by the wall (Unit : mm)



※ When the walls are blocking front and the rear of the outdoor units



※ When front and rear side of the outdoor unit is toward the wall

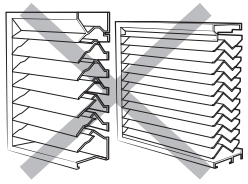


WARNING

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

[Bar type louver]

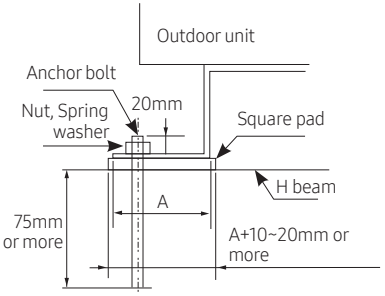
[Rain resistance louver]



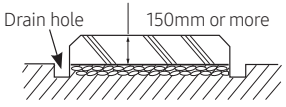
- Louver specifications.
  - Angle criteria : less than 20˚
  - Opening ratio criteria : greater than 80%

Installation and base ground work for an outdoor unit

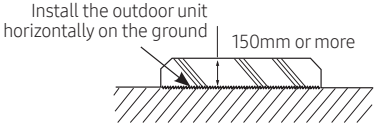
- Install the outdoor unit 150mm higher than the base ground and install the drain hole to connect the pipe to the drainage.
- When the front fan of an outdoor unit is installed in a place where the average snowfall is more than 150mm, the discharge duct should be attached to the outdoor unit.
- The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



Base ground work



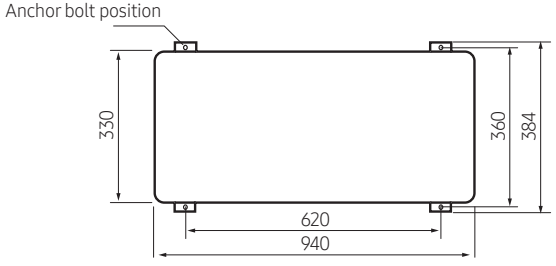
‹ When installing on the ground ›



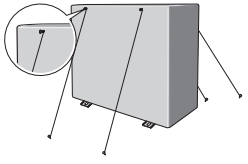
‹ When installing on the roof ›

- The outdoor unit should be supported within the range of measurement below for base ground work.

(Unit : mm)



- When the outdoor unit needs to be supported, fix it with wire as shown in the picture.
  - Slightly unwind the four screws on the cover top of the outdoor unit.
  - Wind wires round the four screws and fasten the screws again.
  - Fix the wires to the ground.



ENGLISH

Installation and base ground work for an outdoor unit

CAUTION

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

Refrigerant pipe installation

Refrigerant pipe work

- The length of refrigerant pipe should be as short as possible and the height difference between an indoor unit and outdoor unit should be minimized.
- The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length, height difference, and the allowable length after branching is done.
- The pressure of the R-410A is high. Use only certified refrigerant pipe and follow the installation method.
- After pipe installation, charge the refrigerant according to the length of the pipe and R-410A refrigerant should be used.
- Use clean refrigerant pipe and there shouldn't be any harmful ion, oxide, dust, iron content or moisture inside pipe.
- Use tools and accessories that fit on R-410A only.

WARNING

- When installing, make sure there is no leakage. When collecting the refrigerant, stop the compressor first before removing the connection pipe. If the refrigerant pipe is not properly connected and the compressor works with the service valve open, the pipe inhales the air and it makes the pressure inside of the refrigerant cycle abnormally high. It may cause explosion and injury.

<table>
<tr><th>Tool</th><th colspan="2">Work</th><th>If compatible with conventional tool</th></tr>
<tr><td>Pipe cutter</td><td rowspan="5">Refrigerant pipe work</td><td>Pipe cutting</td><td rowspan="2">Compatible</td></tr>
<tr><td>Flaring tool</td><td>Pipe flaring</td></tr>
<tr><td>Refrigerant oil</td><td>Apply refrigerant oil on flared part</td><td>Exclusive ether oil, ester oil, alkali benzene oil or synthetic oil</td></tr>
<tr><td>Torque wrench</td><td>Connect flare nut with pipe</td><td rowspan="4">Compatible</td></tr>
<tr><td>Pipe bender</td><td>Pipe bending</td></tr>
<tr><td>Nitrogen gas</td><td rowspan="2">Air tightening test</td><td>Inhibition of oxidization</td></tr>
<tr><td>Brazing tool</td><td>Pipe brazing</td></tr>
<tr><td>Manifold gauge</td><td rowspan="2">Air tightening test ~ additional refrigerant charging</td><td rowspan="2">Vacuuming, charging and checking operation</td><td>Need exclusive one to prevent mixture of R-22 refrigerant oil use and also the measurement is not available due to the high pressure.</td></tr>
<tr><td>Refrigerant charging hose</td><td>Need exclusive one due to the refrigerant leakage or inflow of impurities.</td></tr>
</table>

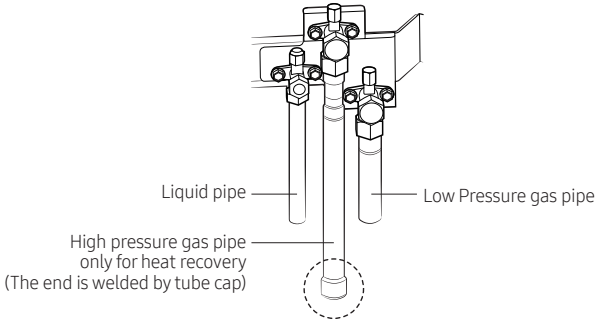
Tool	Work	If compatible with conventional tool
Vacuum pump	Vacuum drying	Compatible (Use products which contain the check valve to prevent the oil from flowing backward into the outdoor unit.) Use the one that can be vacuumed up to 100.7kpa(5Torr.-755mmHg).
Scale for refrigerant charging	Charging refrigerant	Compatible
Gas leak detector	Gas leak test	Need exclusive one (The one for R-134a can be used)
Flare nut	You must use the flare nut equipped with product. Refrigerant leakage may occur when the conventional flare nut for R-22 is used.	

Temper grade and minimum thickness of the refrigerant pipe

Outer diameter [mm]	Minimum thickness [mm]	Temper grade
ø6.35	0.7	Annealed
ø9.52	0.7	
ø12.70	0.8	
ø15.88	1.0	
ø19.05	0.9	Drawn
ø22.23	0.9	

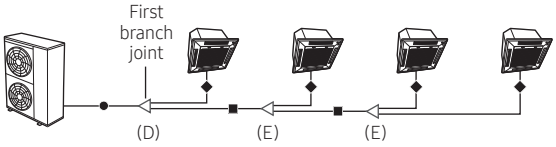
⚠ CAUTION

- For pipes larger than Ø 19.05, drawn type (C1220T-1/2H or C1220T-H) type copper pipe must be used. If a annealed type (C1220T-O) copper pipe is used, pipe may break due to its low pressure resistance and cause personal injury.
- There are three pipes, liquid pipe, low pressure gas pipe and high pressure gas pipe. Be careful not to use high pressure gas pipe when using for heat pump.
- The end of high pressure gas pipe only for heat recovery is welded by the tube cap. So if you use the heat recovery, please remove the tube cap and then connect the pipe to that.



Refrigerant pipe installation

Selecting refrigerant pipe and branch joint for Heat Pump



- ▶ Install the refrigerant pipe according to the main pipe size of each outdoor unit capacity.
- ▶ When the pipe length between an outdoor unit and the farthest indoor unit including elbow exceeds 90m, the gas pipe size should be upgraded one step among the main pipes from the outdoor unit to the first branch joint. (The liquid pipe size will be maintained.)
- ▶ If the capacity of the outdoor unit can decline due to the pipe length, upgrade the pipe size one step (gas pipe).

※ For the case that the diameter of the default pipe of an outdoor unit does not match that of the pipe installed on the site, use a socket provided by default together with the outdoor unit of 4/5 HP.

The size of the pipe between an outdoor unit and the first branch joints (A)

Select the size of the main pipe according to the table below.

Outdoor unit capacity (HP)	Maximum pipe length within 90 m		Maximum pipe length over 90 m	
	Liquid pipe (mm)	Gas pipe (mm)	Liquid pipe (mm)	Gas pipe (mm)
4	ø9.52	ø15.88	ø9.52	ø19.05
5	ø9.52	ø15.88	ø9.52	ø19.05
6	ø9.52	ø19.05	ø9.52	ø22.22

* Maximum pipe length : The pipe length between an outdoor unit and the farthest indoor unit.

The size of the pipe between the branch joints (B)

Select the pipe size according to the sum of indoor unit capacity which will be connected after the branch.

※ However, if the size of the pipe between branch joints (B) is bigger than the size of the pipe connected to the outdoor unit (A), select the pipe size (A).

Indoor unit total capacity (kW)	Liquid pipe (mm)	Gas pipe (mm)
15.0 kW and below	ø9.52	ø15.88
15.1 kW ~ 20.2 kW	ø9.52	ø19.05

The size of the pipe between the branch joint and the indoor unit (C)

Make a selection according to indoor unit capacity.

Indoor unit capacity (kW)	Liquid pipe (mm)	Gas pipe (mm)
6.0 kW and below	ø6.35	ø12.70
6.1 kW ~ 16.0 kW	ø9.52	ø15.88
16.1 kW ~ 23.0 kW	ø9.52	ø19.05

Selecting the first branch joint (D)

Make a selection according to the outdoor unit capacity.

Classification	Outdoor unit capacity (HP)	Model name
Y-joint (D)	4	MXJ-YA1509M
	5	MXJ-YA1509M
	6	MXJ-YA2512M

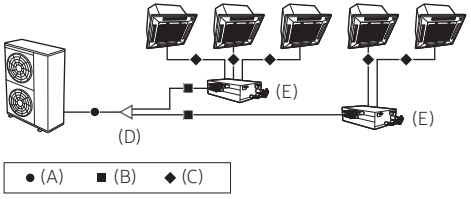
Selecting the other branch joints (E)

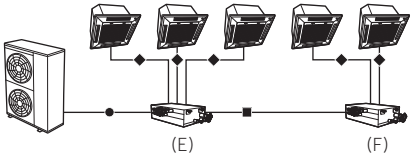
Select a branch joint according to the sum of indoor unit capacity which will be connected after the branch.

Classification	Indoor unit total capacity after branch (kW)	Model name
Y-joint (E)	15.0 kW and below	MXJ-YA1509M
	15.1 kW ~ 20.2 kW	MXJ-YA2512M
Distribution header (E)	20.2 kW and below	MXJ-HA2512M

Refrigerant pipe installation

Selecting refrigerant pipe and branch joint for Heat Recovery





- ▶ Install the refrigerant pipe according to the main pipe size of each outdoor unit capacity.
- ▶ When the pipe length between an outdoor unit and the farthest indoor unit including elbow exceeds 90m, the gas pipe size should be upgraded one step among the main pipes from the outdoor unit to the first branch joint. (The liquid pipe size will be maintained.)
- ▶ If the capacity of the outdoor unit can decline due to the pipe length, upgrade the pipe size one step (gas pipe).

※ For 4/5 HP, don't need to increase the size of the liquid pipe if the pipe length exceeds 90m.

The size of the pipe between an outdoor unit and the first branch joints (A)

Select the size of the main pipe according to the table below.

Outdoor unit capacity (HP)	Maximum pipe length within 90 m			Maximum pipe length over 90 m		
	Liquid pipe (mm)	Low Pressure gas pipe (mm)	High Pressure gas pipe (mm)	Liquid pipe (mm)	Low Pressure gas pipe (mm)	High Pressure gas pipe (mm)
4	ø9.52	ø19.05	ø15.88	ø9.52	ø19.05	ø15.88
5	ø9.52	ø19.05	ø15.88	ø9.52	ø19.05	ø15.88
6	ø9.52	ø19.05	ø15.88	ø9.52	ø22.22	ø19.05

* Maximum pipe length : The pipe length between an outdoor unit and the farthest indoor unit.

The size of the pipe between the branch joints and HR Changer, between HR Changer and MCU (B)

Select the pipe size according to the sum of indoor unit capacity which will be connected after the branch.

Indoor unit total capacity (kW)	Liquid pipe (mm)	Low Pressure gas pipe (mm)	High Pressure gas pipe (mm)
20.2 kW and below	ø9.52	ø19.05	ø15.88

The size of the pipe between HR Changer(E)/MCU(F) and the indoor unit (C)

Make a selection according to indoor unit capacity.

Indoor unit capacity (kW)	Liquid pipe (mm)	Gas pipe (mm)
6.0 kW and below	ø6.35	ø12.70
6.1 kW ~ 16.0 kW	ø9.52	ø15.88
16.1 kW ~ 23.0 kW	ø9.52	ø19.05

Selecting the first branch joint (D)

The first Y-joint(D) for liquid and low pressure gas pipes is MXJ-YA2512M regardless of the outdoor unit capacity.
The first Y-joint(D) for high pressure gas pipes is MXJ-YA1500M regardless of the outdoor unit capacity.

Keeping refrigerant pipe

To prevent foreign materials or water from entering the pipe, storing method and sealing method (especially during installation)is very important. Apply correct sealing method depending on the environment.

Exposure place	Exposure time	Sealing type
Outdoor	Longer than one month	Pipe pinch
	Shorter than one month	Taping
Indoor	-	Taping

Refrigerant pipe welding and safety information

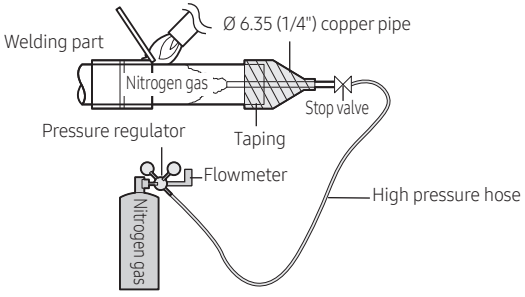
CAUTION

Important information for refrigerant pipe work

- Make sure there is no moisture inside the pipe.
- Make sure there are no foreign substances and impurities in the pipe.
- Make sure there is no leakage.
- Make sure to follow the instruction when welding or storing the pipe.

Nitrogen flushing welding

- When welding the refrigerant pipes, flush them with nitrogen gas as shown in the picture.
- If you do not perform nitrogen flushing when welding the pipes, oxide may form inside the pipe. It can cause the damage of the important parts such as compressor and valves etc.
- Adjust the flow rate of the nitrogen flushing with a pressure regulator to maintain 0.05m³/h or less.



Direction of the pipe when welding

- Direction of the pipe should be headed downward or in a sideways when welding.
- Avoid welding the pipe with pipe direction heading upward.

CAUTION

- When you test gas leakage after welding the pipes, use a designated solution for gas leakage detection. If you use the detection solution that includes sulfuric ingredient, it may cause corrosion to the pipes.

Refrigerant pipe installation

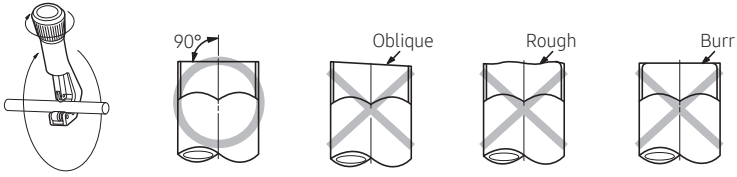
Cutting or flaring the pipes

1. Make sure that you prepared the required tools.

▶ Pipe cutter, Deburring tool, flaring tool and pipe holder, etc.

2. If you want to shorten the pipe, cut it with a pipe cutter ensuring that the cut edge remains at 90° with the side of the pipe.

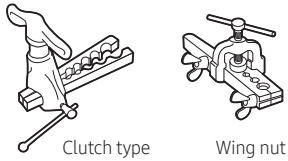
▶ Refer to below illustrations for correct and incorrect examples of cut edges.

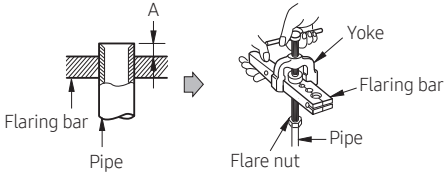


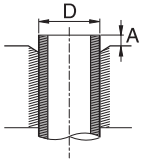
3. To prevent a gas leak, remove all burrs at the cut edge of the pipe using a Deburring tool.

4. Carry out flaring work using flaring tool as shown below.

[Flaring tools]







Pipe diameter [D (mm)]	Depth of flaring part [A (mm)]		
	Using flaring tool for R-410A	Using conventional flaring tool	
		Clutch type	Wing nut type
Ø 6.35	0~0.5	1.0~1.5	1.5~2.0
Ø 9.52	0~0.5	1.0~1.5	1.5~2.0
Ø 12.70	0~0.5	1.0~1.5	1.5~2.0
Ø 15.88	0~0.5	1.0~1.5	1.5~2.0

5. Check that you flared the pipe correctly.

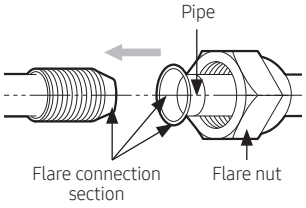
▶ Refer to below illustrations for correct and incorrect examples of flared pipe.

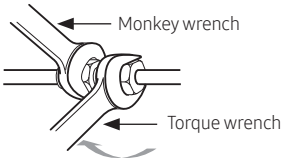
CAUTION

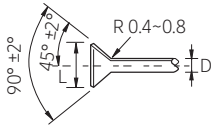
- If foreign matters or burrs are not removed after cutting pipe, refrigerant gas may leak.
- If foreign matters enter inside the pipe, important interior parts of the unit may get damaged or product efficiency will be reduced. So, the direction of pipe should be downward during pipe cutting or flaring.

Connecting the flared pipes

- Check if the flaring is properly done according to the standard size.
- Align the center of the piping and tighten the flare nut with your hands. Then, tighten the flare nut with torque wrench in a direction of the arrow indicated in below illustration.
- Make sure to use ester oil to coat the flare connection section.





Outer diameter (D, mm)	Connection torque (N·m)	Flare dimension (L, mm)	Flare shape (mm)
Ø 6.35	14~18	8.7~9.1	
Ø 9.52	34~42	12.8~13.2	
Ø 12.70	49~61	16.2~16.6	
Ø 15.88	68~82	19.3~19.7	
Ø 19.05	100~120	23.6~24.0	

CAUTION

- Blowing Nitrogen gas should be done when welding the pipe.
- Make sure to use the provided flare nut.
- Make sure that there are no cracks or twisted part when you need to bend the pipe.
- Do not fasten the flare nut with excessive strength.
- R-410A is a high pressure refrigerant and there is a risk of refrigerant leakage if the flare connection is not coated with ester oil. Therefore, apply ester oil to coat the flare connection area.

Refrigerant pipe installation

Pipe installation for an outdoor unit

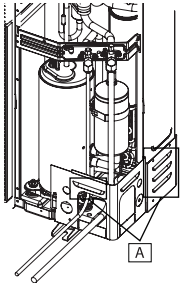
Pipe direction

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

CAUTION

Caution for using knock-out hole

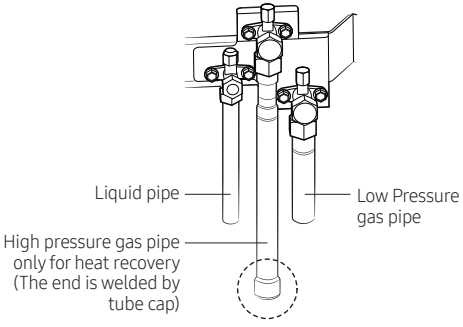
- Make sure not to damage the exterior of the outdoor unit.
- Remove all burrs at the edge of the knock-out hole and apply the paints it to prevent rust.
- Use a cable tube and bushing to prevent a cable from being damaged when passing through a knock-out hole.
- After installing pipes, block the unused knock hole to prevent small animal from entering. However, the radiant heat hole (A) should be able to intake air.



CAUTION

Caution for connecting the pipe

- When brazing the pipe, the unit may get damaged by a brazing fire and a flame. Use a flame proofing cloth to protect the unit from a brazing fire or flame.
- The O-ring and Teflon packing inside service valve may get damaged by a brazing fire. Wrap the bottom side of the service valve with a wet cloth and braze it as shown above. Make sure not to interrupt the brazing with the drips from the wet cloth.
- The connecting pipes of liquid side and gas side should not contact each other nor should they contact to the product. Vibration may cause damage to the pipes.



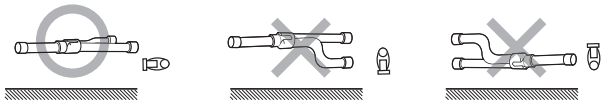
Outdoor unit refrigerant pipe connection

Classification	Front, flank, rear side of pipe connection	Bottom side of pipe connection
Working process	• First, remove the pipe cover from unit. • Separate the knock-out hole to use. If the hole is open, small animals such as squirrels and rats may get into the unit through the hole and the unit may be damaged.	• Separate the knock-out hole at the bottom side of the unit and install the pipe. • After installing and insulating the pipe, close up the remaining gap. If the gap remains open, small animals such as rats and squirrels may get inside the unit and cause damage to the unit.

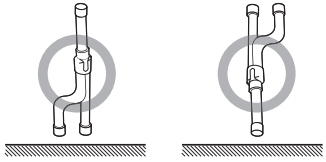
Installing the branch joints

Branch joints must be installed 'horizontally' or 'vertically'.

Horizontal installation

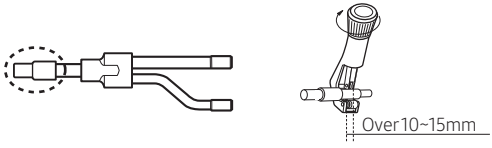


Vertical installation



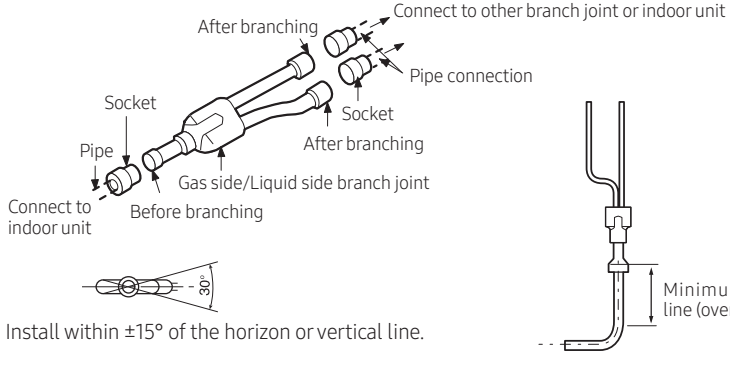
NOTE

- For A~J type branch joints : Connect the branch joint to the connection pipe with the provided reducer.
- For K~Z type branch joints : Cut the connection part of the branch joint or the provided socket, according to the diameter of the connection pipe, before connecting them.



CAUTION

- Install the branch joint within ±15° of the horizon or vertical line.
- Make sure that the pipe is not bent at where it is connected to the branch joint.
- Keep a minimum straight line distance of 500mm or more before connecting branch joint.

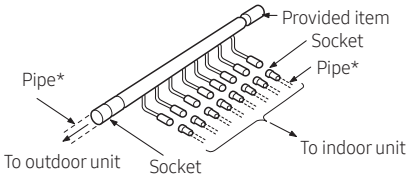


※ Install within ±15° of the horizon or vertical line.

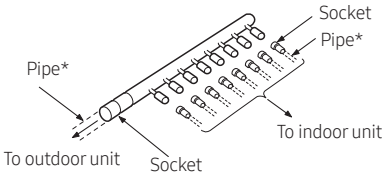
Refrigerant pipe installation

Installing the distribution header

1. Select the reducer that fits the diameter of the pipe.



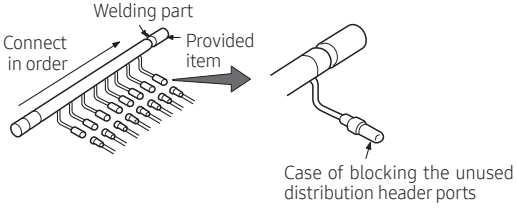
<Liquid side>



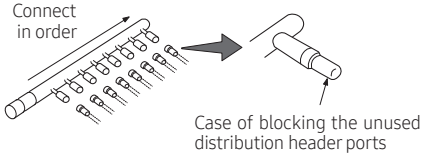
<Gas side>

* Pipe : Separately purchased item

2. If the number of connected indoor unit is fewer than ports on the distribution header, block the unused ports with caps.



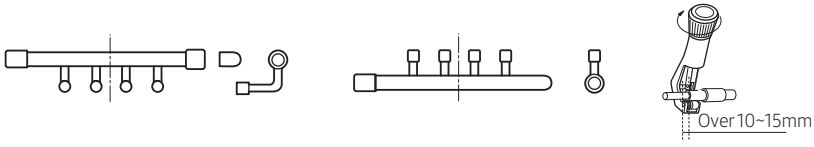
<Liquid side>



<Gas side>

NOTE

- For A~J type distribution header :
  Connect the distribution header to the connection pipe with the provided reducer.
- For K~Z type distribution headers :
  Cut the provided socket, according to the diameter of the connection pipe, before connecting it.

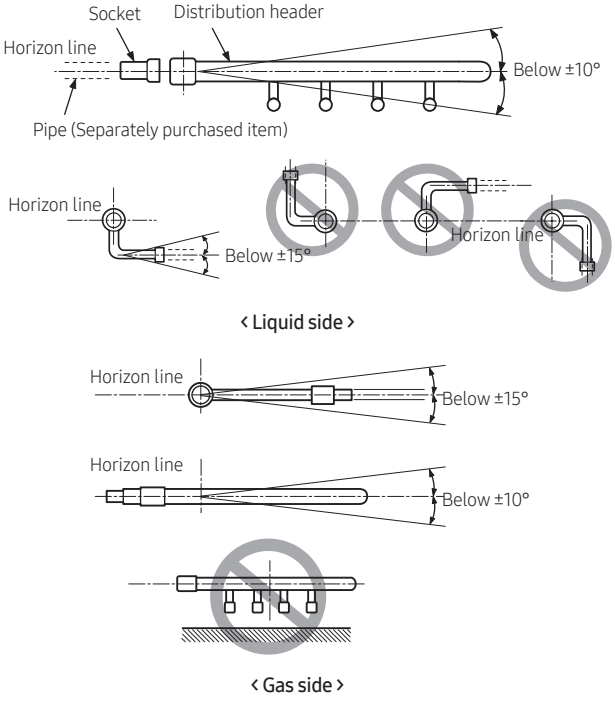


CAUTION

- Connect the indoor units in order, while respecting the direction of the arrow shown in the illustration.
- When indoor units are connected to same distribution head, indoor unit must be connected in order of their capacity, from largest to smallest.

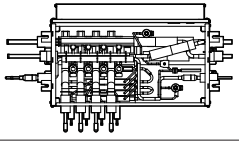
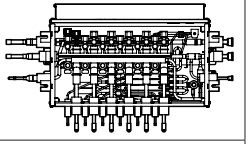
3. Install the distribution header horizontally.

▶ Install the distribution header horizontally so that its ports does not face down.



Installing the HR Changer (E) and the MCU (F)

The HR Changer and the MCU specification

Classification	Unit	HR Changer (E)	MCU (F)
Model name	-	MCU-R4NEK0N	MCU-S6NEK3N
The exterior	-		
The number of branches	EA	4	6
The maximum number of the connectable indoor unit per branch	EA	3	3
The maximum capacity of the connectable indoor unit per branch	kW	5.6	5.6
The maximum capacity of connectable indoor units	kW	22.4	22.4
The maximum capacity of connectable indoor units per branch (Using Y-Joint)	kW	14.0	14.0

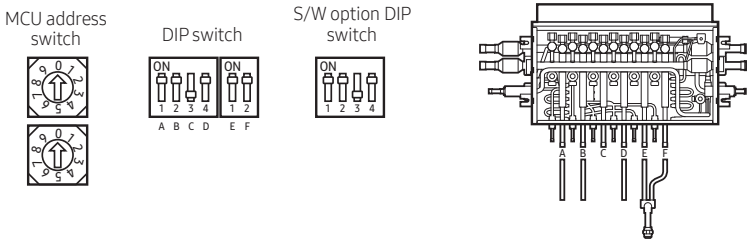
Refrigerant pipe installation

CAUTION

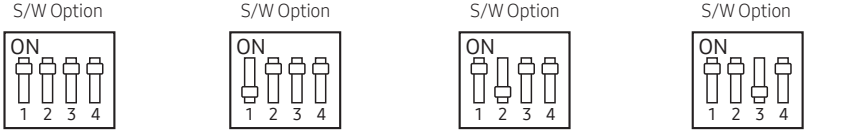
- Indoor units without internal EEV (AM****NTD**, AM****NAD**) can not be connected directly to the HR Changer or the MCU
- Please connect theses indoor units using EEV Kit (MEV-E**SA, MXD-E**K***A)
- You can connect the previous MCU (MCU-S4NEK3N, MCU-S2NEK2N, MCU-S1NEK1N) If you use those MCUs, please refer to those MCUs' installation manual.

Installing indoor units using Y-connector

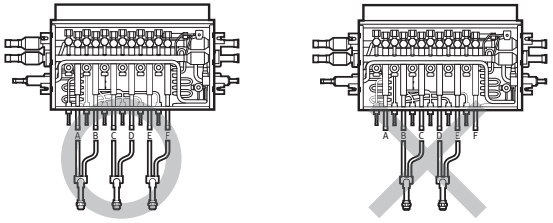
- ▶ If the capacity of the indoor unit is under 5.6kW, don't use Y-connector.
- ▶ If the capacity of the indoor unit is between 5.6 kW and 14.0 kW, use Y-connector for the gas and liquid line.
- ▶ In case of using Y-connector, it is only connectable for port combination as the followings;
  - Connectable port combination for Y-connector : A + B port, C + D port, E + F port
  - Non-connectable port combination for Y-connector : B + C port, D + E port, non-continuous port
- ▶ Set Dip Switch option on the HR Changer/MCU PBA for using Y-Connector(See page 58 for the detailed instructions)



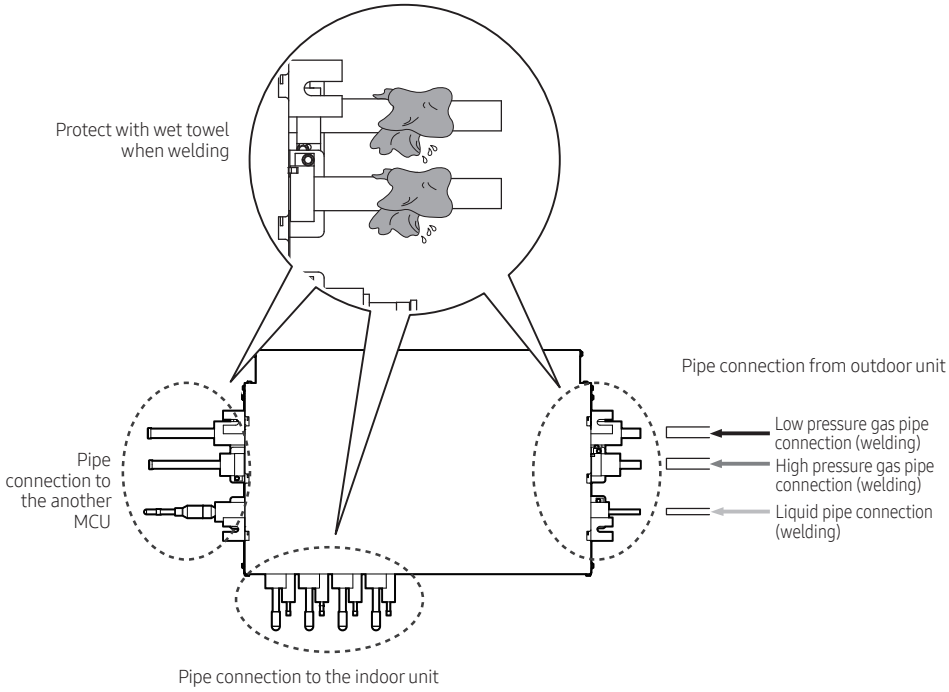
S/W option DIP switch No.	ON (Individual connection)	OFF (Shared connection)
1	Each of ports A and B	Both ports A and B
2	Each of ports C and D	Both ports C and D
3	Each of ports E and F	Both ports E and F



※ You cannot make a shared connection for the two ports B and C, and D and E at the same time.



How to connect the pipes



※ When installing the HR Changer and the MCU, use the pattern sheet for installation that is provided with the product.

※ When welding the gas pipes, protect the product with the flame-proof sheet.

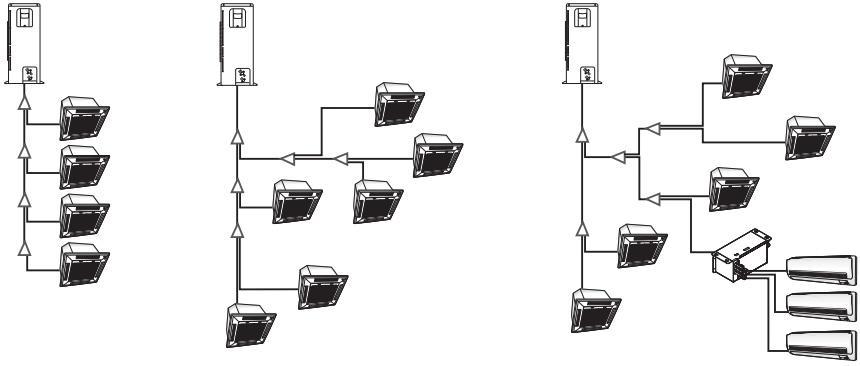
CAUTION

- When connecting the HR Changer with outdoor units, be attention to the direction. Please connect the pipes to the HR Changer referring to the label with the direction of connection on the HR Changer.
- When connecting the MCU with outdoor units, the default direction is set in the MCU. If installing opposite direction, weld the enclosed copper cap in each high pressure, low pressure and liquid pipes.

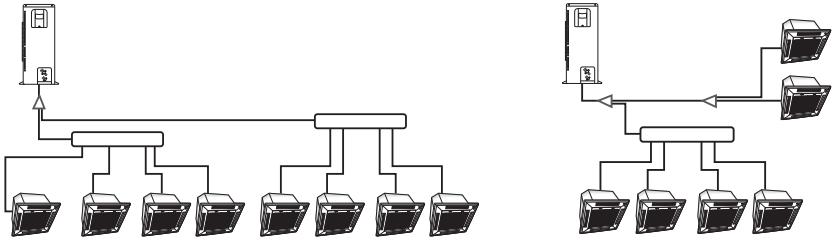
Refrigerant pipe installation

Examples of the refrigerant pipe installation for Heat Pump

Using Y-Joint

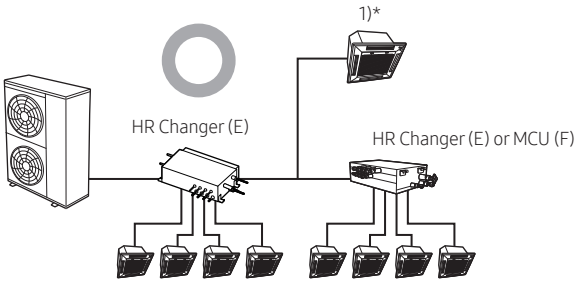


Using Distribution header



Examples of the correct refrigerant pipe installation for Heat Recovery

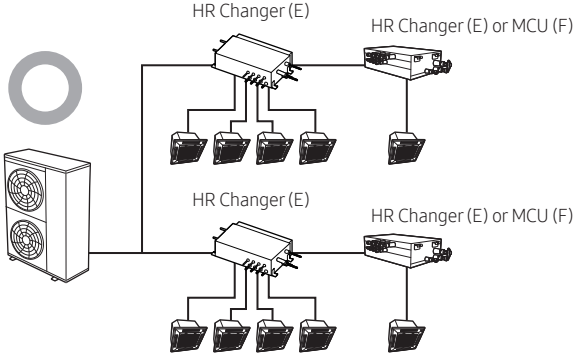
For serial installation



1)* Direct-connected indoor unit without HR Changer/MCU (for HR only)

- This indoor unit can only be used for cooling operation. (Heating operation is not possible.)
- Connect indoor unit to liquid and low pressure gas pipe.
- Change the installation option for direct-connected indoor unit without HR Changer/MCU. (refer to the indoor unit installation manual)
- Be sure to combine the cooling only indoor units so that their total capacity becomes 50% or less of the total capacity of all indoor units.

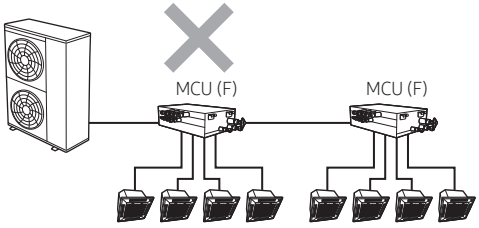
For parallel installation



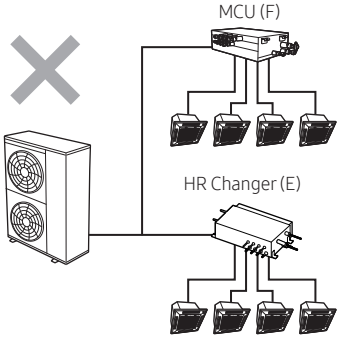
Refrigerant pipe installation

Examples of the incorrect refrigerant pipe installation for Heat Recovery

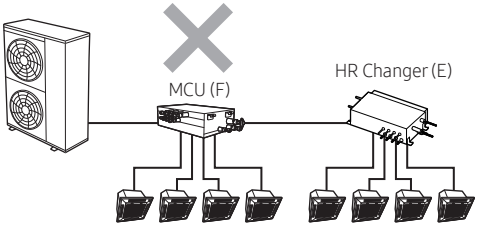
Missing HR Changer for serial installation



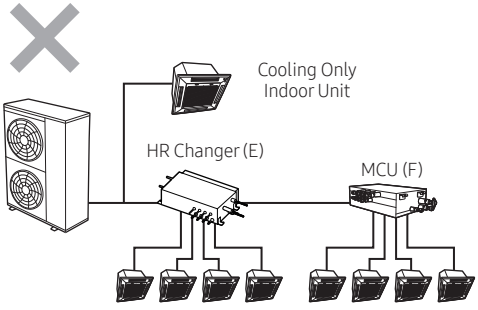
Missing HR Changer for parallel installation



Incorrect order



Branch location error



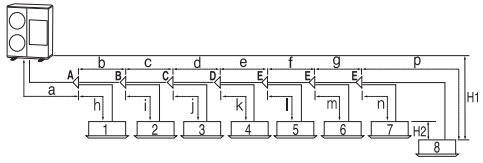
CAUTION

- HR Changer(E) can be installed in series or in parallel.
- For serial installation, the order of HR Changer(E) and MCU(F) is very important.
  HR Changer(E) must be installed after the outdoor unit.
  If MCU(F) is installed first after the outdoor unit, it will not work properly.
- For parallel installation, HR Changer(E) must be installed after the Y-joint.
  If you don't install HR Changer(E) after the Y-joint, it will not work properly.
- If you install only MCU(F) without HR Changer (E), it happen to occur the error(E214).
  Cooling only indoor units must be installed behind the HR Changer.

Allowable length of the refrigerant pipe and the installation examples for Heat Pump

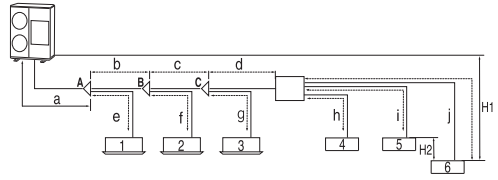
Connection by Y-joint

Outdoor unit



Connection by Y-joint/EEV kit

Outdoor unit



Classification			Y-joint connection	Y-joint / EEV kit connection
Maximum allowable length of pipe	Outdoor unit ~ Indoor units	Actual Length	The distance between the outdoor unit and the farthest indoor unit ≤ 150m Ex) 8 indoor units a+b+c+d+e+f+g+p≤ 150m	Ex) 6 indoor units a+b+c+d+j ≤ 150m
		Equivalent length	The distance between an outdoor unit and the farthest indoor unit ≤ 175m	
		Main pipe length	The main pipe(a) from the outdoor unit to the first Y-joint should be less than 110m.	
		Total length	The sum of the total length of pipes should be less then 300m.	
Maximum allowable height	Outdoor unit ~ Indoor units	Height	H1: The difference of height between an outdoor unit and indoor unit < 50/40m Note1)	
		Height	H2: The difference of height between indoor units ≤ 50m But, when wall mounted type indoor units (AM****NQD**, AM****NV***) are installed, H2 is 15m or less	
Maximum allowable length after Y-joint		Actual Length	The distance between the first Y-joint and the farthest indoor unit ≤ 40m Ex) 8 indoor units b+c+d+e+f+g+p≤ 40m	Allowable length between EEV kit and an indoor unit ≤ 20m Ex) h, l, j ≤ 20m

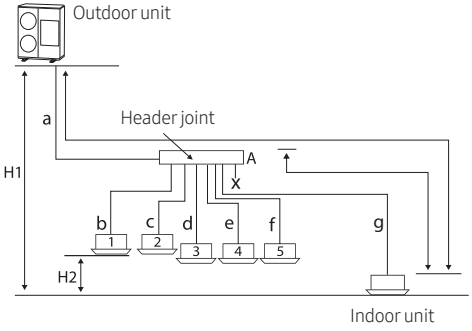
EEV Kit			Model name		Remarks
EEV Kit ~ Indoor units	Actual pipe lengh	2m or less	MEV-E24SA	1 indoor	Apply to products without EEV (Wall mounted & ceiling)
			MEV-E32SA		
		20m or less	MXD-E24K132A	2 indoor	
			MXD-E24K200A		
			MXD-E32K200A		
			MXD-E24K232A	3 indoor	
			MXD-E24K300A		
			MXD-E32K224A		
			MXD-E32K300A		

※ When the equivalent length between an outdoor unit and the farthest indoor unit exceeds 90m, upgrade the low pressure pipe of the main pipe one step.

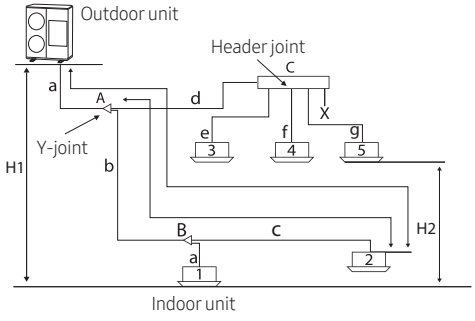
Note 1) When indoor unit is located at higher level than outdoor unit, allowable height difference is 40m, but when the indoor unit is located at lower level than outdoor unit, allowable height difference is 50m.

Refrigerant pipe installation

Connection by header joint



Connection by Y-joint/header joint



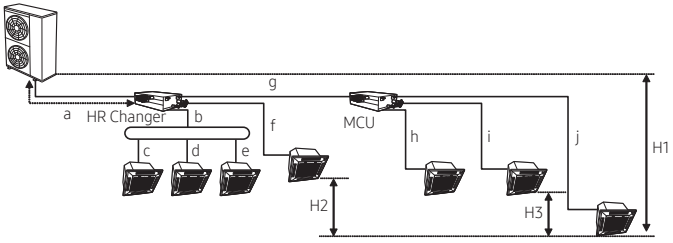
Classification			Y-joint connection	Y-joint / EEV kit connection
Maximum allowable length of pipe	Outdoor unit ~ Indoor units	Actual Length	The distance between the outdoor unit and the farthest indoor unit ≤ 150m	
			Ex) 8 indoor units a+b+c+d+e+f+g+p≤150m	Ex) 6 indoor units a+b+c+d+j ≤150m
		Equivalent length	The distance between an outdoor unit and the farthest indoor unit ≤175m	
		Main pipe length	The main pipe(a) from the outdoor unit to the first Y-joint should be less than 110m.	
		Total length	The sum of the total length of pipes should be less then 300m.	
Maximum allowable height	Outdoor unit ~ Indoor units	Height	H1: The difference of height between an outdoor unit and indoor unit < 50/40m Note1)	
		Height	H2: The difference of height between indoor units ≤ 50m But, when wall mounted type indoor units (AM****NQD**, AM****NV***) are installed, H2 is 15m or less	
Maximum allowable length after Y-joint		Actual Length	The distance between the first Y-joint and the farthest indoor unit ≤ 40m Ex) 8 indoor units b+c+d+e+f+g+p≤ 40m	Allowable length between EEV kit and an indoor unit ≤ 20m Ex) h, l, j ≤ 20m

※ When the equivalent length between an outdoor unit and the farthest indoor unit exceeds 90m, upgrade the low pressure pipe of the main pipe one step.

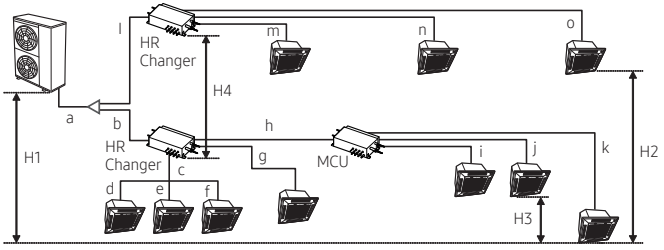
Note 1) When indoor unit is located at higher level than outdoor unit, allowable height difference is 40m, but when the indoor unit is located at lower level than outdoor unit, allowable height difference is 50m.

Allowable length of the refrigerant pipe and the installation examples for Heat Recovery

Installing with MCU only



Installing with MCU and Y-joint



Classification			Installing with MCU only	Installing with MCU and Y-joint
Maximum allowable length of pipe	Outdoor unit ~ Indoor units	Actual Length	The distance between the outdoor unit and the farthest indoor unit ≤ 150 m	
			Ex) a+g+j ≤ 150 m	Ex) a+b+h+k ≤ 150 m
		Equivalent Length	The distance between an outdoor unit and the farthest indoor unit ≤ 175 m	
		Total Length	The sum of the total length of pipes should be less then 300 m.	
			Ex) a+b+c+d+e+f+g+h+i+j ≤ 300 m	Ex) a+b+c+...+o ≤ 300 m
	HR Changer ~ Indoor units	Pipe Length	The distance between HR Changer and the farthest indoor unit ≤ 40 m	
			Ex) b+c, b+d, b+e, f, g+h, g+i, g+j ≤ 40 m	Ex) c+d, c+e, c+f, g, h+i, h+j, h+k, m, n, o ≤ 40 m
Maximum allowable height difference	Outdoor unit ~ Indoor units	Pipe Length	H1 : The difference of height between an outdoor unit and indoor unit ≤ 50/40m Note1)	
	Indoor unit ~ Indoor units		H2 : The difference of height between indoor units ≤ 25m But when wall mounted type indoor units (AM****NQD**, AM****NV***) are installed, H2 is 15 m or less.	
	Indoor unit ~ Indoor units (in one HR Changer or MCU)		H3 : The difference of height between indoor units in one HR Changer or MCU ≤ 15m	
	HR Changer ~ HR Changer		H4 : The difference of height between HR Changers ≤ 20m	
Maximum allowable length after branch joint	First branch joint ~ Fartherst Indoor unit	Pipe Length	The distance between the first branch joint and the farthest indoor unit ≤ 40 m	
			Ex) g+j ≤ 40 m	Ex) b+h+k, l+o ≤ 40 m

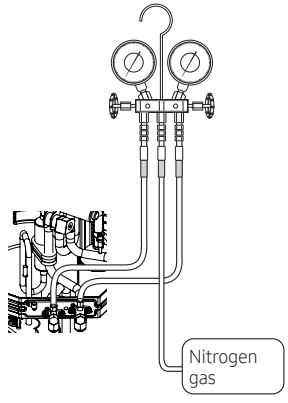
Note 1) When indoor unit is located at higher level than outdoor unit, allowable height difference is 40m, but when the indoor unit is located at lower level than outdoor uint, allowable height difference is 50m.

Refrigerant pipe installation

Performing air tightening test

- ▶ Use tools for R-410A only to prevent the inflow of foreign substances and to resist the internal pressure.
- ▶ Use dry Nitrogen gas to do an airtight test as below.

Apply pressure to the liquid side pipe, gas side pipe with Nitrogen gas of 4.1MPa (gauge pressure).	If you apply pressure more than 4.1MPa (gauge pressure), the pipes may be damaged. Apply pressure using pressure regulator.
Continue to apply pressure for minimum 24 hours to check if the pressure drops.	After applying Nitrogen gas, check the change of pressure using pressure regulator.
If the pressure drops, check if there is a gas leak.	If the pressure is changed, apply soapy water to check the leak. Check the pressure of the gas again.
Maintain 1.0 MPa (gauge pressure) of the pressure before performing vacuum drying and check for further gas leak.	After checking first gas leak, maintain 1.0 MPa (gauge pressure) to check for further gas leaks.

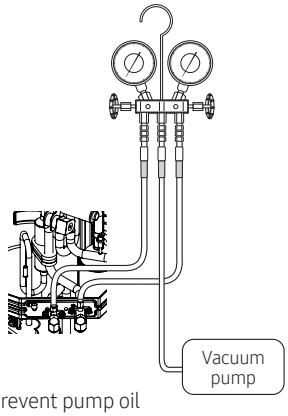


CAUTION

- If the joint of high pressure side is disconnected and the nitrogen gas come into contact with human body, injury may occur. Tighten the joint connection firmly to prevent dangerous situation.

Vacuuming a pipe and an indoor unit

- Use the tools for R-410A only to prevent the inflow of foreign substances and resist against the internal pressure.
- Use the vacuum pump with the check valve to prevent pump oil from flowing backward while the vacuum pump is stopped suddenly.
- Use the vacuum pump that can be vacuumed up to 666.6Pa(5mmHg).
- Close the service valve of the liquid side pipe, gas side pipe completely when performing air tightening test or vacuum drying.



Connect the manifold gauge to the liquid pipe and gas pipe.

Vacuum the liquid pipe and gas pipe using the vacuum pump.

Make sure to install check valve to prevent pump oil from flowing into the pipe.

Vacuum those pipes for more than 2 hours and 30 minutes.

The time of vacuum drying may differ depending on the length of the pipe or outdoor temperature.
Perform vacuum drying for at least 2 hours and 30 minutes.

Close the valve after checking the vacuum gauge pressure has reached at -100.7 kPa (gauge pressure).

Check the vacuum pressure using the vacuum gauge.

Check whether the pressure is maintained as -100.7 kPa (gauge pressure), 5 torr. for an hour.

Pressure Increase

Yes

Check the gas leak.

Vacuum destruction due to the moisture inside the pipe
- Apply pressure with Nitrogen gas of 0.05 MPa (gauge pressure).

Perform vacuum drying again up to -100.7 kPa (gauge pressure), 5 torr (for 2 hours or longer) and evaluate the vacuum

Pressure Increase

Yes

No

Charging additional refrigerant according to piping length

No

CAUTION

- If the pressure rises in an hour, either water remains inside the pipe, or there will be a leak.

Refrigerant pipe installation

Selecting additional refrigerant charging

▶ Basic refrigerant

The basic amount of additional refrigerant charged at a factory

Model	Refrigerant	Factory charge(kg)
AM040*XMDER	R-410A	3.2
AM050*XMDER		3.2
AM060*XMDER		3.3
AM040*XMDGR		3.2
AM050*XMDGR		3.2
AM060*XMDGR		3.3

▶ Charging additional refrigerant

The amount of additional refrigerant charging	=	The amount of refrigerant charging for pipe + the amount of refrigerant correction charging for an indoor unit.

1. The amount of additional refrigerant depending on the liquid pipe size(HP/HR).
   - Amount of additional refrigerant has to be calculated based on the sum of all liquid pipe length.

Size of liquid pipe (mm)	6,35	9,52	12,7	15,88
Additional amount (kg/m)	0,02	0,06	0,125	0,18

Additional refrigerant charging calculation = The sum of total length of Ø 9.52 liquid pipe(m) x 60g + the sum of total length of Ø 6.35 liquid pipe(m) x 20g

Ex) a(Ø 9.52)=40m, b+c+d(Ø 9.52)=15m, e+f+g(Ø 6.35)=15m

The amount of additional refrigerant = 55m x 60g + 15m x 20g = 3600g

2. The amount of additional refrigerant depending on the connection of high pressure gas pipe(HR only)
   - In case of HR system amount of additional refrigerant has to be calculated based on the sum of high pressure gas pipe length from outdoor unit to MCU.

Size of high pressure gas pipe (mm)	15.88/19.05
Additional amount (kg/m)	0.01

(Unit : kg)

Product		Capacity (kW)															
		1.5	1.7	2.2	2.8	3.2	3.6	4.5	5.6	6.0	7.1	8.2	9.0	9.3	11.2	12.8	14.0	16.0
1Way CST (Fluid/ Wind Free)	(AM***FN1DE**) (AM***NN1DE**)			0.25	0.25		0.25		0.32		0.32							
1Way CST (Fluid/ Wind Free)	(AM***HN1DE**) (AM***NN1PE**)		0.15	0.15														
2Way CST	(AM***FN2DE**)								0.31		0.47							
4Way CST	(AM***FN4DE**)							0.45	0.45		0.45		0.45		0.57	0.69	0.69	
360 CST	(AM***KN4DE**)							0.45	0.45		0.45		0.45		0.69	0.69	0.69	
4Way CST (600X600)	(AM***FNNDE**)	0.29		0.29	0.29		0.29	0.37	0.37	0.37								
Duct S	(AM***HNMPK**)						0.22	0.22	0.22		0.22		0.31		0.38	0.38	0.38	
	(AM***HNMPK*9*)					0.31	0.31	0.38	0.38		0.38							
	(AM***HNHPK*/*)														0.38	0.38	0.38	
Slim Duct	(AM***FNLDE**)		0.17	0.17	0.17		0.26	0.35	0.35		0.45		0.42		0.42	0.62	0.62	
MSP Duct	(AM****NMDE**)			0.24	0.24		0.24	0.28	0.28		0.28		0.32		0.54	0.68	0.68	0.91
HSP Duct	(AM***FNHDE**)														0.68	0.68	0.68	
Home Duct	(AM***KNLDE**)		0.13	0.13	0.13		0.17											
	(AM***MNLDE**)							0.26	0.26		0.33							
Ceiling	*(AM***FNCDE**) (AM***JNCDK**)								0.39		0.39				0.56		0.95	
Console	(AM****NJDE**)			0.16	0.27		0.27	0.27	0.27									
Concealed Floor Standing	(AM***FNFDE**)						0.22		0.32		0.32							
Neo Forte	*(AM***FNTDE**)	0.24		0.24	0.24		0.24		0.36		0.36							
Neo Forte (with EEV)	(AM***FNQDE**)	0.34		0.34	0.34		0.34	0.51	0.51		0.51							
Boracay	*(AM***KNTDE**)	0.24		0.24	0.32		0.32	0.49	0.49		0.49							
Boracay (with EEV)	(AM***KNQDE**)	0.24		0.24	0.32		0.32	0.49	0.49		0.49							
Max (with EEV)	(AM***MNQDE**)													0.49				
AR5000	*(AM***JNADK**)	0.16		0.16	0.19		0.25	0.25	0.52		0.52	0.52						
AR5000 (with EEV)	(AM***JNVDK**)	0.22		0.22	0.25		0.34	0.34	0.71		0.71	0.71						
MCU	(MCU-**NEK**)	0.5																

Ex) When the indoor unit AM022FN1DEH and AM056FN4DEH are combinated

Additional refrigerant charging = 250g + 450g = 700g

3. The total amount of additional refrigerant charging = the amount of refrigerant charging for pipe + the amount of refrigerant for each indoor unit.

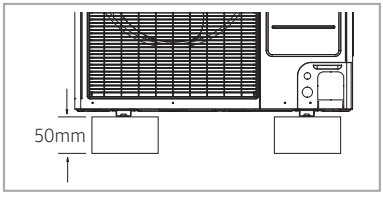
Ex) The amount of additional refrigerant charging = 3600g + 700g = 4300g

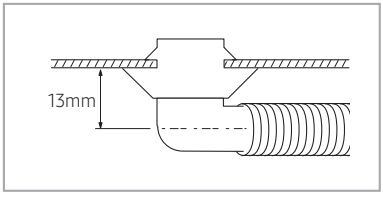
Refrigerant pipe installation

Connecting the drain hose to the outdoor unit

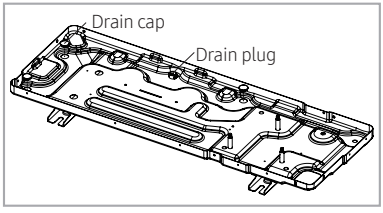
When using the air conditioner in the heating mode, ice may accumulate . During de-icing (defrost operation), the condensed water must be drained off safely. Consequently, you must install a drain hose on the outdoor unit, following the instructions below.

- Leave space of more than 50mm between the bottom of the outdoor unit and the ground for installation of the drain hose, as shown in figure.
- Insert the drain plug into the hole on the underside of the outdoor unit.
- Connect the drain hose to the drain plug.
- Ensure that the drained water runs off correctly and safely.





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



Insulating refrigerant pipe or Y-joint

- You must check if there is a gas leak before completing all the installation process. After you check that the gas does not leak, you must insulate the pipe and hose.
- Use EPDM insulation which meets the following condition.

Item	Unit	Standard
Density	g/cm³	0.048~0.096
Dimension change route by heat	%	-5 or less
Water absorption rate	g/cm³	0.005 or less
Thermal conductivity	kcal/m·h·˚C	0.032 or less
Moisture transpiration factor	ng/(m²·s·Pa)	15 or less
Moisture transpiration grade	g/(m²·24h)	15 or less
Formaldehyde dispersion	mg/L	-
Oxygen rate	%	25 or more

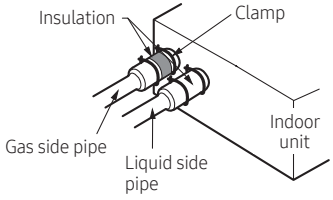
Selecting the insulation of refrigerant pipe

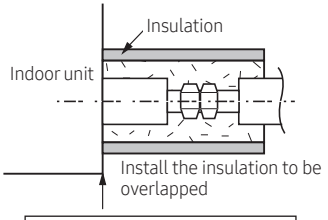
- Insulate the gas pipe and liquid pipe by referring to the thickness of insulator for each pipe size.
- The standard condition is 30°C, with humidity less than 85%. In the conditions of high humidity, use one grade thicker.

Pipe	Pipe size (mm)	Insulation(Cooling, Heating)		Remarks
		Standard [30°C, 85%]	High humidity [30 °C, 85% or more]	
		EPDM, NBR		
Liquid pipe	Ø6.35~Ø9.52	9t	9t	Heat resisting temperature is more than 120°C
	Ø12.70~Ø50.80	13t	13t	
Gas pipe	Ø6.35	13t	19t	
	Ø9.52	19t	25t	
	Ø12.70			
	Ø15.88			
	Ø19.05			
	Ø22.23			

Insulating refrigerant pipe

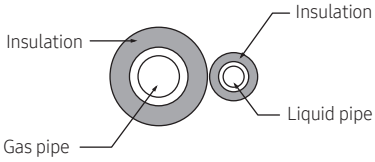
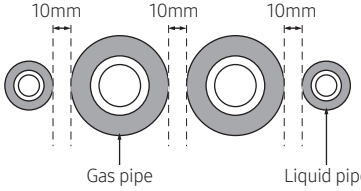
- You must insulate refrigerant pipe, Y-joint, header joint, and pipe connection area.
- If you insulate the pipes, the condensed water does not fall from the pipes.
- Check if there are any insulation cracks on the bent pipe.





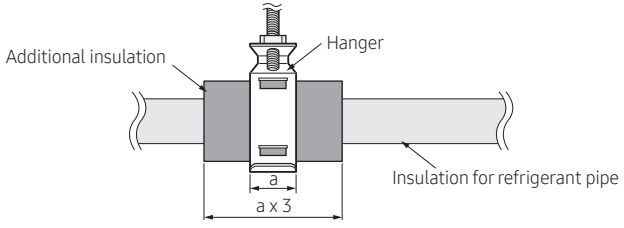
Fix securely without any gap.

Refrigerant pipe installation

Pipe insulation	Pipe insulation after insulating EEV kit
• The insulation of the gas and liquid pipes can be in contact with each other but they should not press excessively against each other. • When contacting the gas side and liquid side pipe, use thicker insulation.	• When installing the gas side and liquid side pipes, leave 10mm of space. • When contacting the gas side and liquid side pipe, use thicker insulation.
	

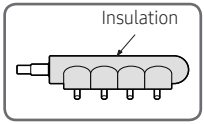
CAUTION

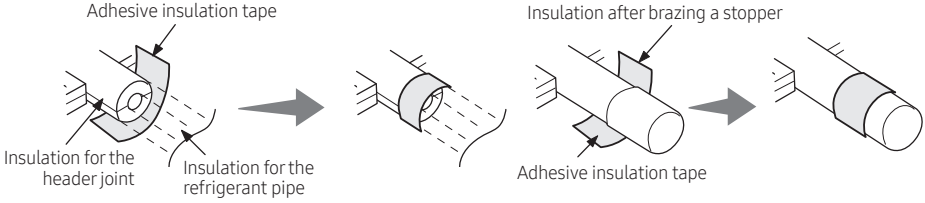
- Install the insulation not to be get wider and use adhesive on the connection part of it to prevent moisture entering.
- Bind the refrigerant pipe with insulation tape if it is exposed to outside sunlight. (When binding the pipe with finishing tape, be careful not to reduce the thickness of the insulation.)
- Install the refrigerant pipe respecting that the insulation does not get thinner on the bent part or hanger of pipe.
- When the thickness of insulation is reduced, supplement the reduced thickness with additional insulation.



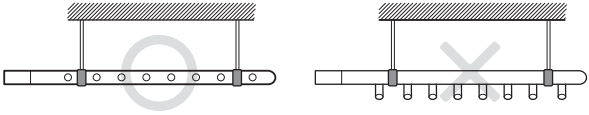
Insulating the header joint

- Fasten the header joint using a cable tie and cover the connected part.
- Insulate the header joint and the brazing part and wrap the connected part with an adhesive insulation tape to prevent dew formation.



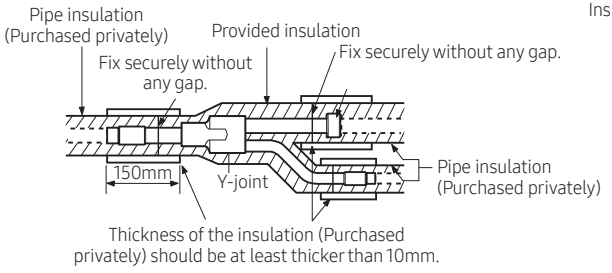


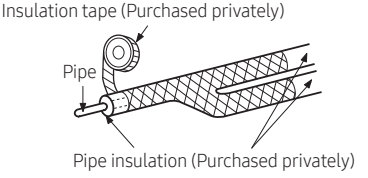
- Fix the header joint with a hanger after insulating it.



Insulating the Y-joint, liquid & gas side connecting pipe

- Attach the insulation provided with the Y-joint to the insulation purchased privately without a gap. Wrap the connected part with insulation (Purchased privately) of a thickness of at least 10mm.
- Use insulation that should be able to handle an interior temperature of over 120°C. Wrap the Y- joint with insulation of a thickness of at least 10mm.

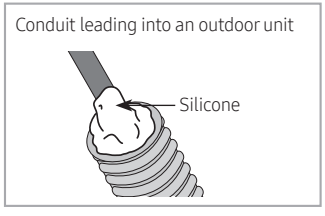




※ Attach the adhesive insulation tape to the pipe as shown in the picture after insulating the pipe.

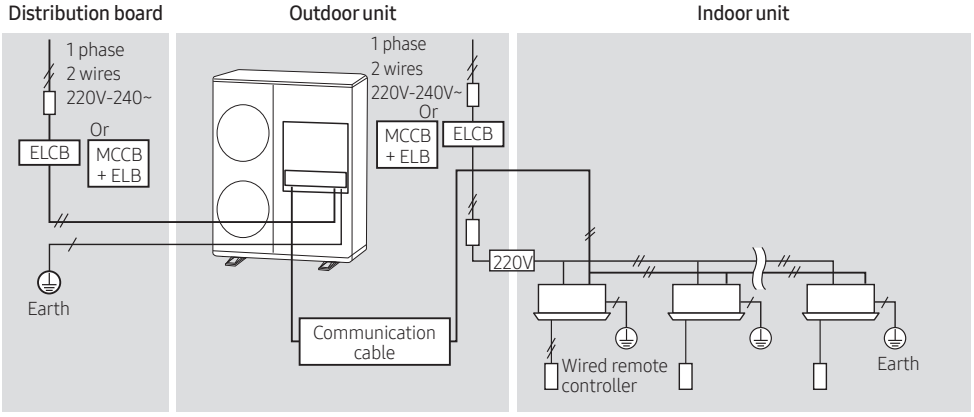
Wiring work

- Wiring work should be performed in accordance with related laws such as 'Technical specification on electric installation', 'Wiring regulations' or 'Installation manual'.
- Copper cable should be used for wiring work and all the wires or parts should be rated products.
- Wiring work should be performed by a company certified by an electric power company.
- Refer to the circuit diagram attached to the outdoor unit for detailed wiring work.
- Wiring work should be performed after disconnecting main circuit breaker and Y-joint switch.
- You must perform grounding work .
  (Grounding resistance value should be less than 100Ω.)
  When ELCB is installed, protective grounding resistance value can be applied.
  (When the ELCB is 100mA, 0.1sec, protective grounding resistance value should be less than 250Ω at a place where electric danger is high and should be less than 500Ω at other places.)
- Electric wiring circuit diagram displays outline only.
- Do not connect a heater to an outdoor unit and do not install a duct which you arbitrarily remodeled.
  - Failure to do so may result in reduced capacity of an air conditioner, electric shock, and fire.
- Do not connect the grounding wire to that of gas pipe, water pipe, lightning rod, or telephone.
  - Gas pipe: If the gas leaks, explosion or ignition may occur.
  - Water pipe: If rigid vinyl pipe is used, grounding effect will not work.
  - Grounding wire and lightning rod of telephone: The electric potential of grounding wire may rise abnormally in the falling of a thunderbolt.
- The ELB for ground-fault protection only should be combined with MCCB or fuse equipped load breaker switch. In this case, you should use the one that has at least the same or more capcity as fuse capacity or the rated current of MCCB.
- Use the wires that comply with regulated specification and firmly connect to the terminal board. Then tighten it with the screws provided so that the terminal board cannot be moved by external force. (The connecting cable and the grounding terminal should be locally procured). When wiring, the connection cable shouldn't be too tight.
- Apply silicon at the end of CD pipe so that rainwater does not enter.

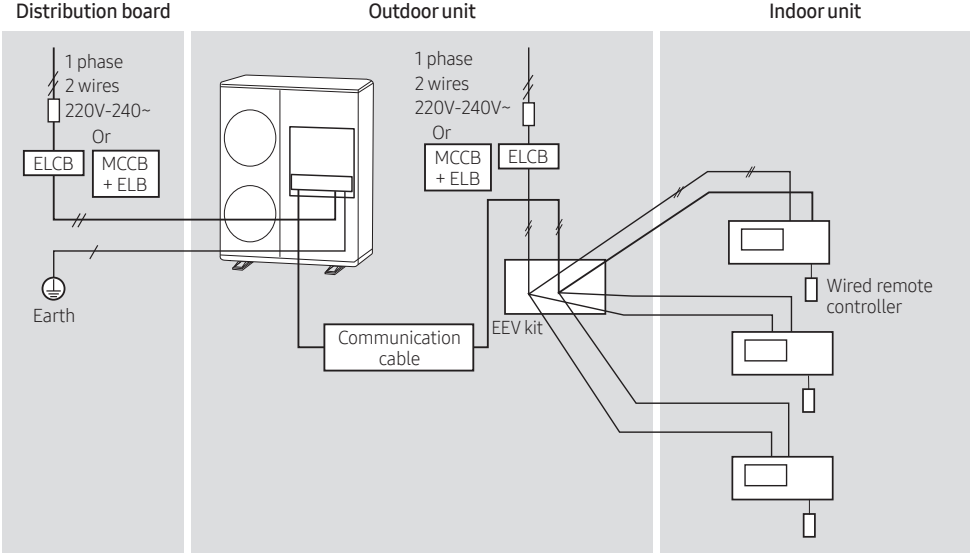


Overall System Configuration

Connection of the power cable (1 phase 2 wires)

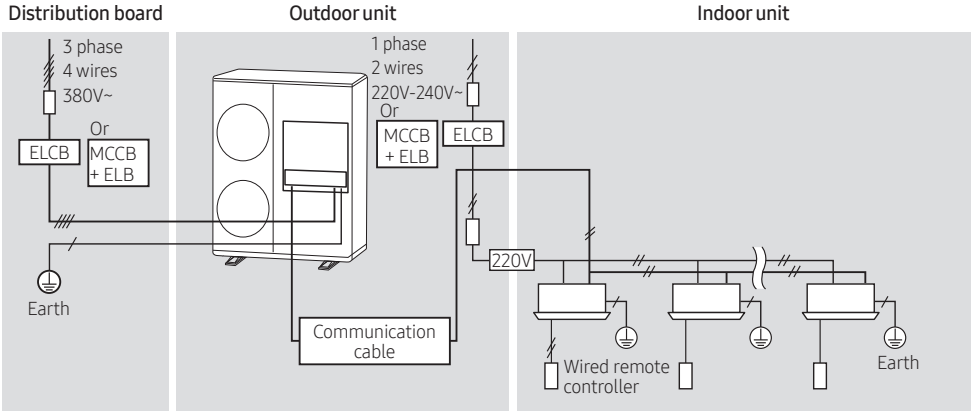


Connection of the power cable (1 phase 2 wires using EEV kit)

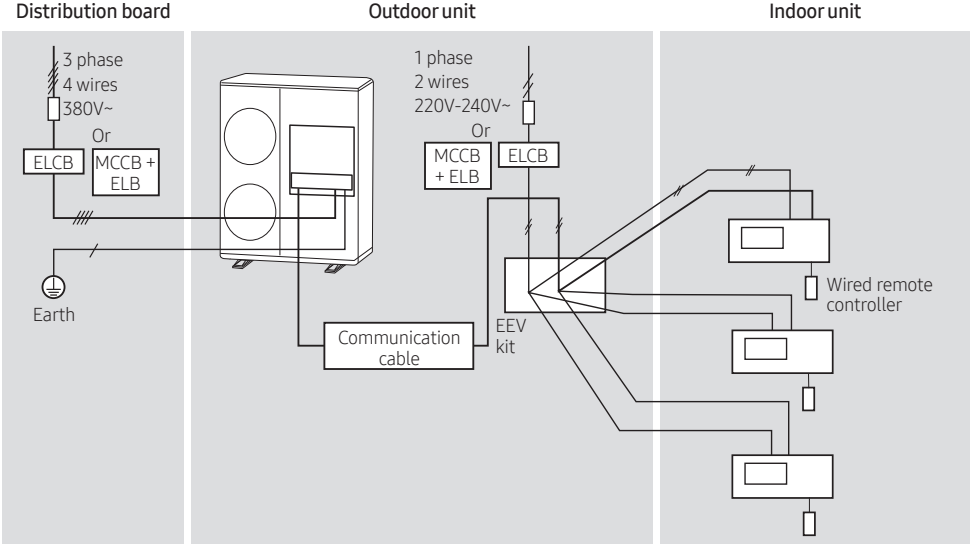


Wiring work

Connection of the power cable (3 phase 4 wires)



Connection of the power cable (3 phase 4 wires using EEV kit)



CAUTION

- You must install an earth leakage breaker.
  - ELCB(Earth Leakage Circuit Breaker)
  - MCCB(Molded Case Circuit Breaker)
  - ELB(Earth Leakage fuse breaker)
- Manufacturers are not responsible for fire caused by not installing ELCB or MCCB.
- Install the cabinet panel near the outdoor unit for service convenience and emergency operation switch off.
- You must install a circuit breaker that can prevent excess current and shut off the electric leakage on the outdoor unit.

Specification for circuit breaker and power supply cord

- Power supply cord is not supplied with air conditioner.
- Select the power supply cord in accordance with relevant local and national regulations.
- Wire size must comply with the applicable local and national code.
- The appliance shall be provided with a certified power supply cord and interconnection cord complying with the national regulations of the countries in which the appliance is to be sold.
- Power supply cords of parts of appliances for outdoor use shall not be lighter than polychloroprene sheathed flexible cord. (Code designation IEC : 60245 IEC 57 / CENELEC : H05RN-F)

Model	Voltage	MCA	MFA	S_{sc} value (MVA)
AM040*XMDER	1phase, 220~240V/50Hz	22	25	(Note1)
AM050*XMDER		24	32	(Note1)
AM060*XMDER		30	40	(Note1)

(Note1) Equipment complying with IEC 61000-3-12.

Model	Voltage	MCA	MFA	S_{sc} value (MVA) (Note2)
AM040*XMDGR	3phase, 380~415V/50Hz	16.1	20	3.9
AM050*XMDGR		16.1	20	3.9
AM060*XMDGR		16.1	20	3.9

(Note2) This equipment complies with IEC 61000-3-12 provided that the short-circuit power S_{sc} is greater than or equal to S_{sc} value at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power S_{sc} greater than or equal to S_{sc} value.

Tightening power terminal

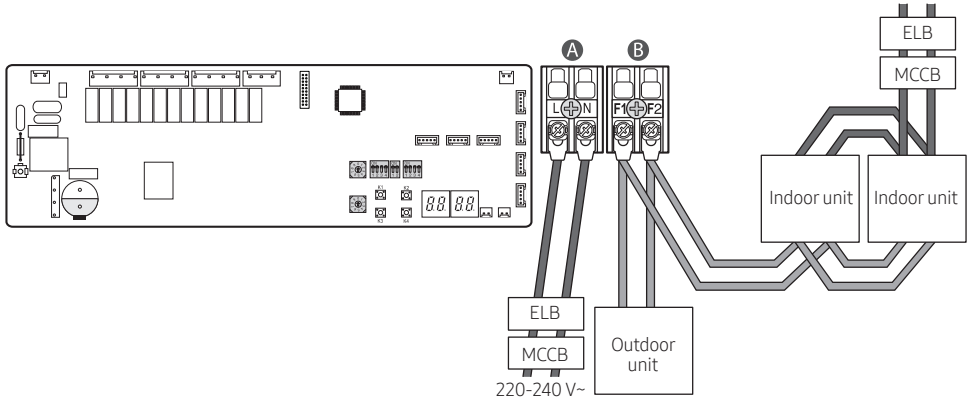
- Connect the cables to the terminal board using the compressed ring terminal.
- Use rated cables only.
- Connect the cables with driver and wrench that can apply the rated torque to the screws.
- Make sure that appropriate tightening torque is applied for cable connection. If the terminal is loose, arc heat may occur and cause fire and if the terminal is connected too firmly, terminal may get damaged.

Tightening torque (kgf•cm)		
M4	12.0~18.0	Communication : F1, F2 3 phase AC power: 1(L), 2(N), L, N, L1(R), L2(S), L3(T), N
M5	20.0~30.0	1 phase AC power : 1(L), 2(N), L, N

Wiring work

Connecting the HR Changer/MCU (MCU-R4NEK0N, MCU-S6NEK3N)

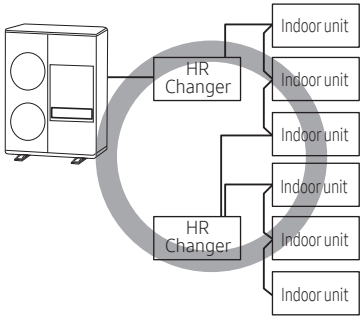
Example



- ▶ Ⓐ Power must be supplied to the HR Changer/MCU separately from the outdoor unit.
- ▶ Ⓑ Connect the communication cable of the outdoor unit (F1, F2) to the communication cable of the HR Changer/MCU (F1, F2)

CAUTION

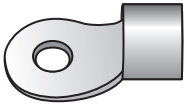
- Power cable connection should be done with the solderless ring terminal.

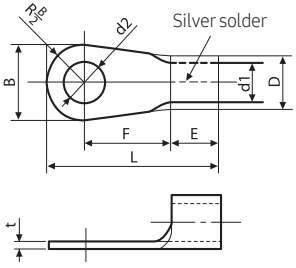


- When installing the HR Changer, communication cable can be connected as shown above.

Selecting compressed ring terminal

- Select a compressed ring terminal of a connecting power cable based on a nominal dimensions for cable.
- Cover a compressed ring terminal and a connector part of the power cable and then connect it.





Nominal dimensions for cable (mm²)		4/6		10	16	25		35		50	70
Nominal dimensions for screw (mm)		4	8	8	8	8	8	8	8	8	8
B	Standard dimension (mm)	9.5	15	15	16	12	16.5	16	22	22	24
	Allowance (mm)	±0.2		±0.2	±0.2	±0.3		±0.3		±0.3	±0.4
D	Standard dimension (mm)	5.6		7.1	9	11.5		13.3		13.5	17.5
	Allowance (mm)	+0.3 -0.2		+0.3 -0.2	+0.3 -0.2	+0.5 -0.2		+0.5 -0.2		+0.5 -0.2	+0.5 -0.4
d1	Standard dimension (mm)	3.4		4.5	5.8	7.7		9.4		11.4	13.3
	Allowance (mm)	±0.2		±0.2	±0.2	±0.2		±0.2		±0.3	±0.4
E	Min.	6		7.9	9.5	11		12.5		17.5	18.5
F	Min.	5	9	9	13	15	13	13		14	20
L	Max.	20	28.5	30	33	34		38	43	50	51
d2	Standard dimension (mm)	4.3	8.4	8.4	8.4	8.4		8.4		8.4	8.4
	Allowance (mm)	+ 0.2 0	+0.4 0	+0.4 0	+0.4 0	+0.4 0		+0.4 0		+0.4 0	+0.4 0
t	Min.	0.9		1.15	1.45	1.7		1.8		1.8	2.0

Wiring work

Installing grounding wire

- ▶ Grounding must be done by a qualified installer for your safety.
- ▶ Use the grounding wire by referring to the specification of the electric cable of the outdoor unit.

Grounding the power cable

- ▶ The standard of grounding may vary according to the rated voltage and installation place of the air conditioner.
- ▶ Ground the power cable according to the following.

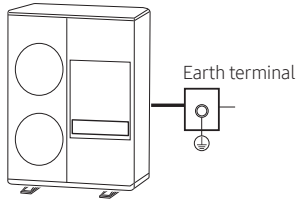
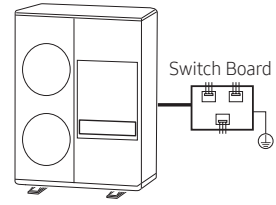
<table>
<tr><th>Installation place / Power condition</th><th>High humidity</th><th>Average humidity</th><th>Low humidity</th></tr>
<tr><td>Voltage of lower than 150V</td><td rowspan="2"></td><td>Perform the grounding work 3. Note 1)</td><td>Perform the grounding work 3 if possible for your safety. Note 2)</td></tr>
<tr><td>Voltage of higher than 150V</td><td colspan="2">Must perform the grounding work 3. Note 1)
(In case of installing circuit breaker as well)</td></tr>
</table>

NOTE

1. **Grounding work 3**
   - Grounding must be done by your installation specialist.
   - Check if the grounding resistance is lower than 100Ω. When installing a circuit breaker that can cut the electric circuit within 0.5 second in case of a short circuit, the allowable grounding resistance should be 30~500Ω.
2. **Grounding at dry place**
   - The grounding resistance is should be lower than 100Ω. (It should not be higher than 250Ω)
     - Use the rated grounding wire by referring to the specification of the electric cable of the outdoor unit.

Performing the grounding work

- ▶ Use the grounding wire by referring to the specification of the electric cable for the outdoor unit.

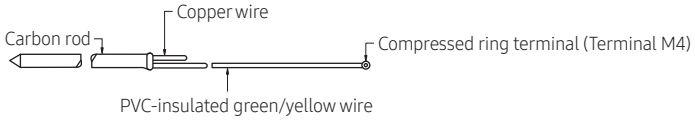
When using the terminal for grounding only	When using grounding of the switch board
	

Grounding work

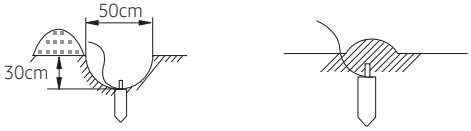
If the power distribution circuit does not have a grounding or the grounding does not comply with specifications, a ground rod must be installed.

The corresponding accessories are not supplied with the air conditioner.

1. Select a grounding rod that complies with the specifications given in the illustration.



2. Select a proper place for the grounding rod installation.
   - In damp hard soil rather than loose sandy or gravel soil that has a higher grounding resistance.
   - Away from underground structures or facilities, such as gas pipes, water pipes, telephone lines and underground cables.
   - At least two meters away from lightening(as in a storm) conductor.



CAUTION • The grounding wire for the telephone line cannot be used to ground the air conditioner.

3. Install a green/yellow coloured grounding wire :
   - Refer to the 'Wiring work' for the specification of grounding wire.
   - When the grounding wire is too short, extend the grounding wire but bind the connection part with insulation tape. (Do not bury the connection).
   - Secure the grounding wire in position with staples.

CAUTION • When the grounding rod is installed in a place where many people pass by, you must fix it firmly.

4. Carefully check the installation, by measuring the grounding resistance with a ground resistance tester.
   - If the resistance is above required level, drive the grounding rod deeper into the ground or increase the number of grounding rods.
5. Connect the grounding wire to the electrical component box inside of the outdoor unit.

Charging refrigerant

- ▶ The R-410A refrigerant is blended refrigerant. Add only liquid refrigerant.
- ▶ Measure the quantity of the refrigerant according to the length of the liquid side pipe. Add quantity of the refrigerant using a scale.

Important information: regulation regarding the refrigerant used

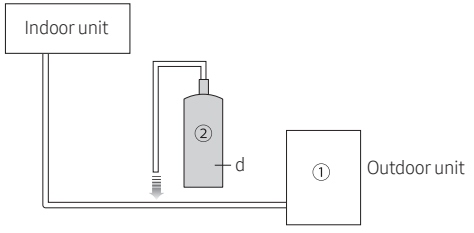
This product contains fluorinated greenhouse gases. Do not vent gases into the atmosphere.

CAUTION

- Inform user if the system contains 5tCO_2e or more fluorinated greenhouse gases. In this case, it must be checked for leakage at least once every 12 months, according to regulation No. 517/2014. This activity must be covered by qualified personnel only. In the case of the situation above, the installer (or authorized person with responsibility for final check) must provide a maintenance book, with all the information recorded, according to REGULATION (EU) No. 517/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014 on fluorinated greenhouse gases.

Please fill in the following with indelible ink on 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.
- ▶ ①+② : The total refrigerant charge.



Refrigerant type	GWP value
R-410A	2088

- GWP=Global Warming Potential
- Calculating tCO_2e : kg x GWP / 1000

NOTE

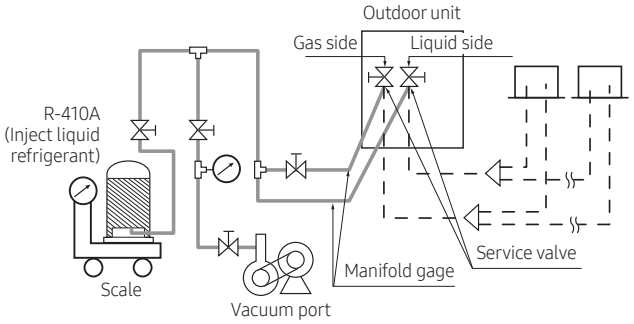
a Factory refrigerant charge of the product: see unit name plate.
b Additional refrigerant amount charged in the field. (Refer to the above information for the quantity of refrigerant replenishment.)
c Total refrigerant charge.
d Refrigerant cylinder and manifold for charging.

CAUTION

- The filled-out label must be adhered in the proximity of the product charging port. (ex. onto the inside of the stop valve cover.)

Charging refrigerant

- ▶ Open the manifold gauge valve connected to the liquid side service valve and add the liquid refrigerant.
- ▶ If you cannot add the whole quantity of the refrigerant while the outdoor unit is stopped, open the gas side and liquid side service valve. Then, add remaining refrigerant by pressing the refrigerant adding button of the outdoor PCB.



CAUTION

- Open the gas side and liquid side service valve completely after charging the refrigerant. (If you operate the air conditioner with the service valve closed, the important parts may be damaged.)
- Put on safety equipment when charging refrigerant.
- Do not charge the refrigerant when you adjust or control other product such as indoor units or EEV kits.
- When the ambient temperature is low in winter time, do not heat the refrigerant container to speed up the charging process. There is risk of explosion.
- Beware for possibility of refrigerant leakage when you connect the manifold gauge to the charging port for heating.
- Close the valve of the refrigerant container immediately after charging the refrigerant. If not, there might be a change in entire amount of refrigerant.

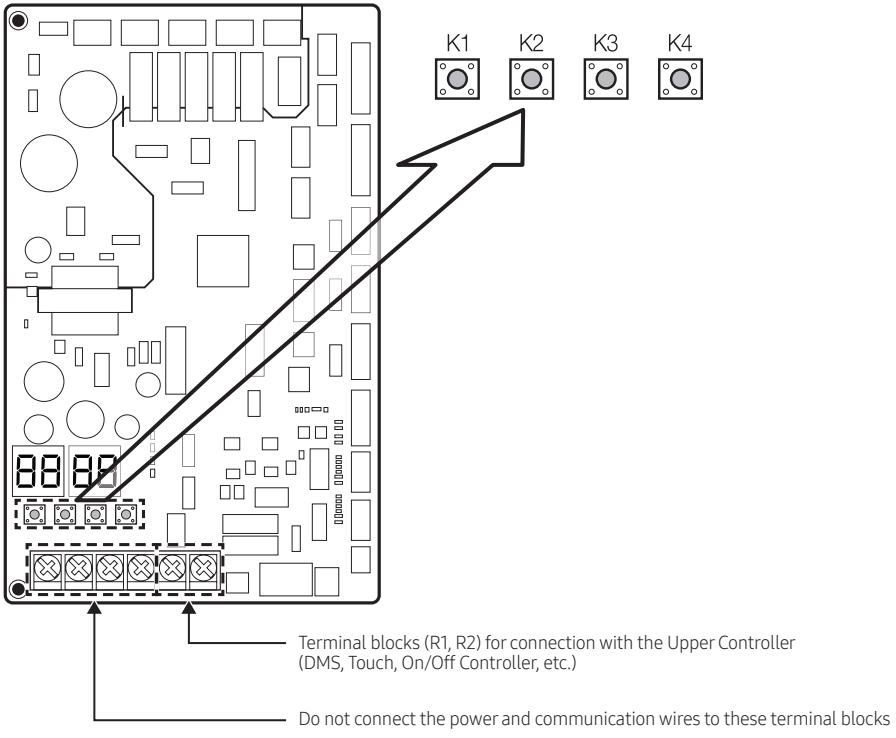
Basic segment display

Step	Display content	Display			
At initial power input	Checking segment display	SEG 1	SEG 2	SEG 3	SEG 4
		"8"	"8"	"8"	"8"
While setting communication between indoor and outdoor unit (Addressing)	Number of connected indoor units	SEG 1	SEG 2	SEG 3	SEG 4
		"A"	"d"	Number of communicated units ※ Refer to "View Mode" for communication address	
After communication setting (usual occasion)	MCU, Indoor unit address	SEG 1	SEG 2	SEG 3	SEG 4
		I/U: "A" MCU: "C"	I/U: "0" MCU: "1"	Reception address (in decimal number)	

※ I/U : Indoor unit, MCU : HR Changer & MCU

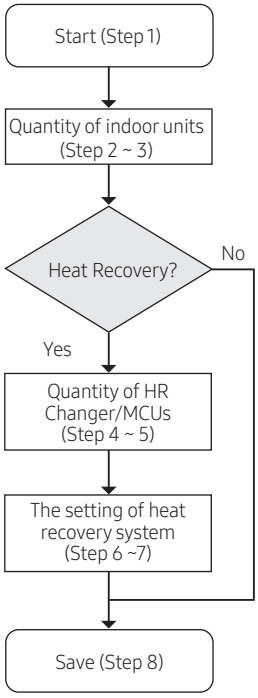
Setting outdoor unit option switch and key function

Setting outdoor unit option switches : A TYPE



▶ Setting outdoor install option

Step	Button	Display	Description	Note
Quantity of indoor units				
		Id nd	Setting required	
Step1	Press (K1+K2) for 2 seconds	Id 00	Ready to set	-
Step2	K2 x n times	IdX0	Tens digit (0 ~ 6)	Ex) 03 : 3 units 10 : 10 units
	K4 x n times	Id0X	Ones digit (0 ~ 9)	
	* K4 : Press for 2 seconds - automatic detection of indoor units' quantity			
Step3	If it is heat recovery model, go to step 4. Otherwise, press K2 button for 2 seconds to save & exit. (system will be reset)			
Quantity of HR Changer and MCUs * Heat recovery model only				
Step4	Press K1	nC 00	Ready to set	-
Step5	K2 x n times	nCX0	Tens digit (0 ~ 6)	Ex) 03 : 3 units 10 : 10 units
	K4 x n times	nC0X	Ones digit (0 ~ 9)	
	* K4: Press for 2 seconds - automatic detection of HR Changer and MCUs' quantity			
Step6	Press K1	HE 00	Ready to set	00 : Heat pump system 01 : Heat recovery system
Step7	Press K4	HE 01	Ones digit (0 ~ 1)	
Step8	K2 : long	Rd 00	Save	Restart
* Press K1 for 2 seconds to exit without save regardless of setting step.				

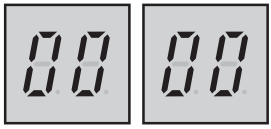


Setting outdoor unit option switch and key function

Installing and setting the option with tact switch and explanation of the functions

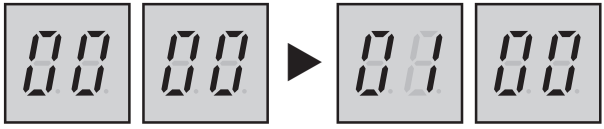
Setting the option

1. 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. (If you have set the 'Emergency operation for compressor malfunction', 1 or 2 will be displayed on Seg 4.)

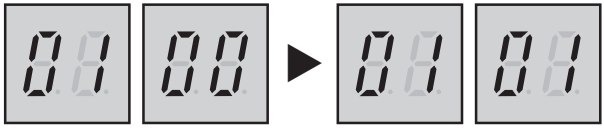


   - Seg 1 and Seg 2 will display the number for selected option.
   - Seg 3 and Seg 4 will display the number for set value of the selected option.
2. If you have entered option setting, you can shortly press the K1 switch to adjust the value of the Seg 1, Seg 2 and select the desired option.

   Example)



3. 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.



4. 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.

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.

Optional item	Input unit	SEG1	SEG2	SEG3	SEG4	Function of the option	Remarks
Unused option	Main	0	0	0	0	Unused option	Unused option by this model
Cooling capacity correction	Main	0	1	0	0	7-9	Targeted evaporation temperature [°C]. (When low temperature value is set, discharged air temperature of the indoor unit will decrease)
				0	1	5-7 (Factory default)	
				0	2	9-11	
				0	3	10-12	
				0	4	11-13	
				0	5	12-14	
				0	6	13-15	
Capacity correction for heating	Main	0	2	0	0	3.0 (Factory default)	Targeted high pressure [MPa]. (When low pressure value is set, discharged air temperature of the indoor unit will decrease)
				0	1	2.5	
				0	2	2.6	
				0	3	2.7	
				0	4	2.8	
				0	5	2.9	
				0	6	3.1	
				0	7	3.2	
				0	8	3.3	
Current restriction rate	Main	0	3	0	0	100% (Factory default)	When restriction option is set, cooling and heating performance may decrease.
				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	No restriction	
Oil collection interval	Main	0	4	0	0	Factory default	
				0	1	Shorten the interval by 1/2	
Temperature to trigger defrost operation	Main	0	5	0	0	Factory default	
				0	1	Apply setting when the product is being installed in humid area such as near river or lake	The defrost option shortens the starting time of the defrost operation

Setting outdoor unit option switch and key function

Optional item	Input unit	SEG1	SEG2	SEG3	SEG4	Function of the option	Remarks
Fan speed correction for outdoor unit	Main	0	6	0	0	Factory default	
				0	1	Increase fan speed	Increase the outdoor unit's fan speed to maximum value
Silent mode for night-time	Main	0	7	0	0	Disabled (Factory default)	
				0	1	LEVEL 1 / Auto	Enables the silent mode for night-time in cooling mode. (It operates automatically depending on the temperature.) However, if the external contact interface module (MIM-B14) is used, entering the silent mode is available with contact signal in cooling and heating mode.
				0	2	LEVEL 2 / Auto	
				0	3	LEVEL 3 / Auto	
				0	4	LEVEL 1/ External contact	
				0	5	LEVEL 2/ External contact	
				0	6	LEVEL 3/ External contact	
High-head condition setting	Main	0	8	0	0	Disabled (Factory default)	
				0	1	Level 1 of height difference type 1 (indoor unit is lower than outdoor unit)	When outdoor unit is located 40~80m above the indoor unit
				0	2	Not applicable	
				0	3	Height difference type 2 (outdoor unit is lower than indoor unit)	When indoor unit is over 30m above the outdoor unit
Long-pipng condition setting (Setting is unnecessary if high-head condition is set)	Main	0	9	0	0	Disabled (Factory Default)	
				0	1	LEVEL 1	When equivalent length of farthest indoor unit from the outdoor unit is over 100m
				0	2	Not applicable	
Energy saving setting	Main	1	0	0	0	Disabled (Factory default)	
				0	1	Energy saving mode	Energy saving mode triggers when the room temperature reaches desired temperature while operating in heating mode.
				0	2	Rapid cooling	This function increases cooling speed.
Unused option	Main	1	1	0	0	Unused option	Unused option by this model
Unused option	Main	1	2	0	0	Unused option	Unused option by this model

Optional item	Input unit	SEG1	SEG2	SEG3	SEG4	Function of the option	Remarks
Channel address	Main	1	3	A	U	Automatic setting (factory default)	Address for classifying the product from upper level controller(DMS,S-NET 3,etc.)
				0 - 15		Manual setting for channel 0 – 15	
Snow accumulation prevention control	Main	1	4	0	0	Enabled	During snow accumulation , the fan may spin even when the unit is not in operation
				0	1	Disabled (Factory default)	
Unused option	Main	1	5	0	0	Unused option	Unused option by this model
Unused option	Main	1	6	0	0	Unused option	Unused option by this model
Unused option	Main	1	7	0	0	Unused option	Unused option by this model
Max. capacity restriction	Main	1	8	0	0	Enabled (Factory default)	Restrict excessive capacity increase when operating indoor units with small capacity
				0	1	Disabled	
Gas leak pump down	Main	1	9	0	0	Disabled (Factory default)	If the gas leak occurred it should be entered in the pump down operation.
				0	1	Enabled	
Unused option	Main	2	0	0	0	Unused option	Unused option by this model
Unused option	Main	2	1	0	0	Unused option	Unused option by this model
Emergency operation for indoor unit communication error	Main	2	2	0	0	Disabled (Factory default)	When set, emergency operation is possible even if an indoor communication error occurs.
				0	1	Indoor high humidity condition (operating for up to 12hours)	
				0	2	Indoor low humidity condition (operating for up to 24hours)	
Base Heater	Main	2	3	0	0	Disabled	
				0	1	Enabled	

※ There is a risk of water leakage during emergency operation for indoor unit communication error. Please be careful when using it.

Setting outdoor unit option switch and key function

WARNING

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

Setting key operation and checking the view mode with tact switch

K1 Control	KEY operation	Display on segment
Press and hold 1 time	Auto trial operation	"K" "K" "BLANK" "BLANK"

K1(Number of press)	KEY operation	Display on segment
1 time	Refrigerant charging in Heating mode (Note 1)	"K" "1" "BLANK" "BLANK"
2 times	Trial operation in Heating mode (Note 1)	"K" "2" "BLANK" "BLANK"
3 times	Pump out in Heating mode (Note 1)	"K" "3" "BLANK" "1"
4 times	Vacuuming	"K" "4" "BLANK" "1"
5 times	End Key operation	—

K2(Number of press)	KEY operation	Display on segment
1 time	Refrigerant charging in Cooling mode	"K" "5" "BLANK" "BLANK"
2 times	Trial operation in Cooling mode	"K" "6" "BLANK" "BLANK"
3 times	Pump down in Cooling mode	"K" "7" "BLANK" "BLANK"
4 times	Automatic setting of operation mode (Cooling/Heating) for trial operation	"K" "8" "BLANK" "BLANK"
5 times	Checking the amount of refrigerant	"K" "9" "X" "X" (Display of last two digits may differ depending on the progress)
6 times	Discharge mode of DC link voltage	"K" "A" "BLANK" "BLANK"
7 times	Forced defrost operation	"K" "B" "BLANK" "BLANK"
8 times	Forced oil collection	"K" "C" "BLANK" "BLANK"
9 times	Inverter compressor check	"K" "D" "BLANK" "BLANK"
10 times	H/R : Auto pipe pairing H/P : Unused	"K" "H" "X" "X" (Display of last two digits may differ depending on the progress)
11 times	End Key operation	—

※ Even when the outdoor unit power is off, it is dangerous when you come in contact with inverter PCB since it is charged with high DC voltage.

※ When replacing/repairing the PCB, cut-off the power and wait until the DC voltage is discharged before replacing/repairing them. (Wait for more than 15 minutes to allow it to discharge naturally.)

※ When there were error, 'Discharge mode of DC link voltage' may not have been effective. Especially if error E464 has been occurred, power element might be damaged by fire and therefore, do not use the 'Discharge mode of DC link voltage'.

※ During "Discharge mode of DC link voltage", voltage of INV will be displayed.

K3(Number of press)	KEY operation	Display on segment
1 time	Initialize (Reset) setting	Same as initial state

K4(Number of press)	KEY operation	Display on segment	
		SEG1	SEG2, 3, 4
1 time	Outdoor unit model	1	5HP (AM050*XM*) → 0, 0, 5
2 times	Order frequency of compressor	2	120 Hz → 1,2,0
3 times	High pressure	3	1.52 MPa → 1, 5, 2
4 times	Low pressure	4	0.43 MPa → 0, 4, 3
5 times	Discharge temperature of compressor	5	188.6 °F(87 °C) → 0, 8, 7
6 times	IPM temperature of compressor	6	188.6 °F(87 °C) → 0, 8, 7
7 times	CT sensor value of compressor	7	2 A → 0, 2, 0
8 times	Suction temperature	8	-43.6 °F(-42 °C) → -, 4, 2
9 times	COND OUT temperature	9	-43.6 °F(-42 °C) → -, 4, 2
10 times	Liquid pipe temperature	A	-43.6 °F(-42 °C) → -, 4, 2
11 times	TOP temperature of compressor	B	188.6 °F(87 °C) → 0, 8, 7
12 times	Outdoor temperature	C	-43.6 °F(-42 °C) → -, 4, 2
13 times	EVI inlet temperature	D	-43.6 °F(-42 °C) → -, 4, 2
14 times	EVI outlet temperature	E	-43.6 °F(-42 °C) → -, 4, 2
15 times	Main EEV step	F	2000 steps → 2, 0, 0
16 times	EVI EEV step	G	300 steps → 3, 0, 0
17 times	Fan step	H	13 steps → 0, 1, 3
18 times	Current frequency of compressor	I	120 Hz → 1,2,0
19 times	Master indoor unit address (Master indoor unit can be selected by wired remote-controller)	J	Master indoor unit not selected → BLANK , N , D If indoor unit No.1 is selected as the master unit →0 , 0 , 1
20 times	MCU Bypass EEV Step	K	300 steps → 3, 0, 0

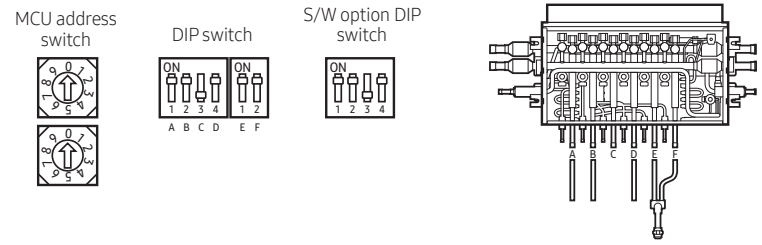
K4 (Press and hold for 2 seconds to enter the setting) → K4 press (Number of press)	Displayed content	Display on segment		
		Page 1	Page 2	
1 time	Main version	MAIN	Ver. (ex) 1412)	
2 times	Inverter version	INV1	Ver. (ex) 1412)	
3 times	EEP version	EEP	Ver. (ex) 1412)	
4 times	Assigned address of the units	AUTO	SEG 1,2	SEG 3,4
			Indoor unit: “A" , "0" HR Changer/MCU Unit : “C”, “1”	Address (ex) 07)
5 times	Manually assigned address of the units	MANU	SEG 1,2	SEG 3,4
			Indoor unit: “A" , "0"	Address (ex) 15)

Setting the HR Changer/MCU and Pipe Addresses (for HR Only)

You can set the HR Changer/MCU address, the HR Changer/MCU ports to use, and the address for each HR Changer/MCU port connected to each indoor unit.

Setting the HR Changer/MCU address and the HR Changer/MCU ports to use

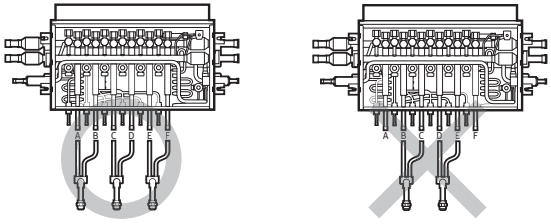
You can set the HR Changer/MCU address and the HR Changer/MCU ports on the HR Changer/MCU PBA.



1. Set the HR Changer/MCU address switch to a value. If two or more HR Changer/MCUs are installed, be sure to set a unique value for each HR Changer/MCU. For the HR Changer/MCU address, you can set a value from 0 to 15.
2. For each HR Changer/MCU ports that are connected to an indoor unit through piping, set their DIP switch to ON. For other HR Changer/MCU ports, set their DIP switches to OFF.
   You can find the address (A to F) of an HR Changer/MCU port on the indoor unit piping connection.
3. If two HR Changer/MCU ports are connected to an indoor unit through a Y-joint, set the relevant S/W option DIP switch to the settings given in the following table:

S/W option DIP switch No.	ON (Individual connection)	OFF (Shared connection)
1	Each of ports A and B	Both ports A and B
2	Each of ports C and D	Both ports C and D
3	Each of ports E and F	Both ports E and F

※ You cannot make a shared connection for the two ports B and C, and D and E at the same time.



4. Set the address of each HR Changer/MCU port that is connected to an indoor unit by taking the procedures in Setting the Pipe Addresses Manually or Setting the Pipe Addresses Automatically. (Auto pipe pairing operation)

CAUTION

- If the following models are connected, set the pipe addresses manually by referring to Setting the Pipe Addresses Manually.
  - AHU kit (MXD-K***AN)

Setting the Pipe Addresses Manually

You can use the wired or wireless remote control or the S-NET Pro 2 to set the pipe addresses for each indoor unit.

Setting by using the wired or wireless remote control (For how to operate the remote control buttons, see the remote control user manual.)

1. Turn on both the indoor unit and the remote control.
2. Enter the "Option setting mode" on the remote control.
3. Set the address of each HR Changer/MCU port that is connected to an indoor unit by referring to the following table. (You can also set the address of each indoor unit.)

Option	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6
Value	0	A: Address setting mode	0: The address of the indoor unit will not be set. 1: The address of the indoor unit will be set.	0 to 9: Hundreds digit of the indoor unit address	0 to 9: Tens digit of the indoor unit address	0 to 9: Units digit of the indoor unit address
Option	SEG7	SEG8	SEG9	SEG10	SEG11	SEG12
Value	1	0	0: The RMC address will not be set. 1: The RMC address will be set.	0	0 to F: RMC group channel	0 to F: RMC group address
Option	SEG13	SEG14	SEG15	SEG16	SEG17	SEG18
Value	2	0	0: The HR Changer/MCU address will not be set. 1: The HR Changer/MCU address will be set.	0 to 1: Tens digit of the HR Changer/MCU address	0 to 9: Units digit of the HR Changer/MCU address	A to F: HR Changer/MCU port address
Option	SEG19	SEG20	SEG21	SEG22	SEG23	SEG24
Value	3	0	0	0	0	0

Examples› If the indoor unit whose address is not yet set is connected to port A on the HR Changer/MCU 1, set 0A0000-100000-20101A-300000.

If the indoor unit whose address is set to 9 is connected to port B on the HR Changer/MCU 2, set 0A1009-100000-20102B-300000.

Setting by using S-NET Pro 2

▶ Set the pipe addresses by using Add-on › Change address on S-NET Pro 2. (For more information, see the S-NET Pro 2 Help.)

Setting the HR Changer/MCU and Pipe Addresses (for HR Only)

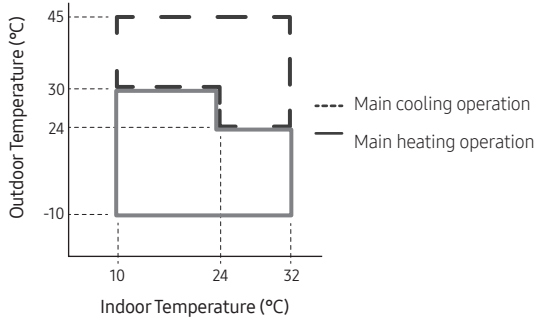
Setting the Pipe Addresses Automatically (Auto pipe pairing operation)

You can use the Automatic pipe-address setting operation to automatically set the address of each HR Changer/MCU port that is connected to an indoor unit.

If an HR Changer/MCU port is set incorrectly or a pipe between an HR Changer/MCU and an indoor unit is connected incorrectly, that indoor unit is indicated.

Check items before running the Auto pipe pairing operation

1. Ensure that the service valve of the outdoor unit is open.
2. Ensure that the power cables and communication cables of the indoor and outdoor units are correctly connected.
3. Turn on the indoor and outdoor units 6 hours before running the Automatic pipe-address setting operation to warm up both units sufficiently.
4. Before turning on the power, check whether the voltages and phases are correct by using a voltmeter and a phase tester.
5. After the power is turn on, set the devices (indoor unit, HR Changer/MCU, and others) that are connected to the outdoor unit, and set the options.
   Note that, before the HR Changer/MCU port addresses are set, HR Changer/MCU port setting errors (E216, 217, 218) may occur. You can run the Automatic pipe-address setting operation regardless of HR Changer/MCU port setting errors.
6. If AHU Kit unit is connected, set the pipe addresses manually referring to [Setting the Pipe Addresses Manually].
7. Check the operating temperature for the Automatic pipe-address setting operation:
   If this operation is run at a temperature out of the operating temperature range, the addresses set automatically may be incorrect. Set the pipe addresses manually by referring to Setting the Pipe Addresses Manually.
8. Auto pipe-pairing operation does not work within 3 minutes after power on and reset due to communication check.



[Operating temperature for the Auto pipe pairing operation]

To run the Auto pipe pairing operation, take the following steps:

1. Press the K2 button 10 times on the main PBA of the outdoor unit to start the Auto pipe pairing operation. (Display : [HH][ ].)

	Outdoor temperature < 24°C	24°C ≤ Outdoor temperature < 30°C	30°C ≤ Outdoor temperature
Indoor temperature < 24°C	Main heating operation	Main heating operation	Main cooling operation
Indoor temperature ≥ 24°C	Main heating operation	Main cooling operation	Main cooling operation

Each step is indicated on the outdoor unit display. (The whole operation takes about 25 to 55minutes normally, depending on the number of indoor units connected. However, it can be operated for up to 2 hours to protect the compressor.)

- Step 1 (Start [HH][01]) → Steps 2 to 8 (Setup [HH][08]) → Step 9 (Check [HH][09]) → Step 10 (Confirmation [HH][10])

2. When the Auto pipe pairing operation finishes, the following data is shown on the outdoor unit display.

Result	Outdoor unit display	Description
Setting completed	End	
Setting error	E191 ⟷ Indoor unit data (displayed alternately)	Indoor unit data - SEG 1,2 = indoor unit address / SEG 3,4 = error status 00: An HR Changer/MCU port is not disabled, or a pipe is not connected. 01: Cooling only indoor unit is connected to HR Changer/MCU. 02: The shared setting for two ports is incorrect. Example) When the HR Changer/MCU port connected to the indoor unit 12 is disabled, E191 and 1200 are displayed alternately - If two or more indoor units have setting errors, the data about the next indoor unit is displayed each time you press the K2 switch.

CAUTION

- If the MCU ports to use are set incorrectly, the Auto pipe pairing operation may stop due to high-pressure or low-pressure protection control or the data about the indoor unit that has a MCU port setting error may be incorrect. Ensure that the MCU ports to use are set correctly.
- Depending on the indoor and outdoor temperatures, the Auto pipe pairing operation may stop due to protection control.
- If an error occurs while the Auto pipe pairing operation is running, check the error code and take actions.
- If you cannot finish the Auto pipe pairing operation because of the previous reasons, set the pipe addresses manually by referring to Setting the Pipe Addresses Manually.

Inspection and check operation

CAUTION

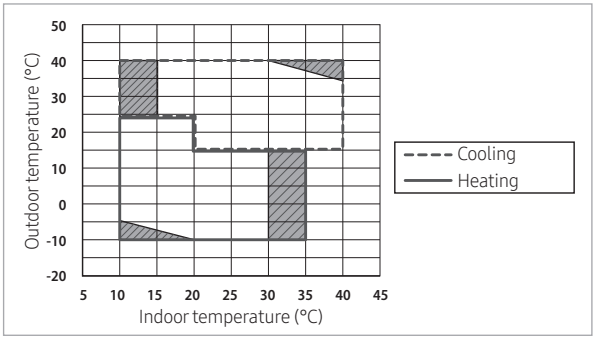
Precautions before check operation

- When the outdoor temperature is low, turn on the main power 3 hours before beginning the operation.
  - If you start the operation immediately after turning on the main power, it may cause serious damage to the part within the product.
- Do not touch the refrigerant pipe during or right after the operation.
  - Refrigerant pipe may be hot or cold during or right after the operation depending on the status of the refrigerant which flows through the refrigerant pipe, compressor and other parts of the refrigerant cycle. If you touch the refrigerant during or right after the operation, you may get burns or frostbite.
- Do not operate the product with its panel or protection nets off.
  - There is risk of personal injury from the parts that rotates, heated or with the high voltage.
- Do not turn off the main power immediately after stopping the operation.
  - Wait for at least 5 minutes before turning off the main power. If not, water leakage or other problems may occur.
- Connect all the indoor units and the power supply for the outdoor unit and run auto or manual address setting. Run auto or manual address setting after changing the indoor unit PCB.

Inspection before check operation

1. Check the power cable and communication cable of the indoor and outdoor unit.
2. Supply power to the outdoor unit 3 hours before check operation to preheat the compressor.
3. Before supplying the power, use a voltmeter and phase tester to check the voltage and the phase.
   - R,S,T terminal: check the 380 V ~ 415 V between wires (R-S, S-T, T-R) / 220V~240V between wires (L-N).
4. When the power is supplied, outdoor unit will execute tracking to check the indoor unit connection and other options.
5. Write down the installation report on the service history report paper attached on the front part of the control box.
6. Guaranteed range of check operation

   For correct judgment, you must perform check operation in below indoor/outdoor temperature condition.



- Check operation selects and operates cooling/heating mode automatically.
- In the temperature range marked with slashed pattern, system protection control may trigger during operation.(It may be hard to judge the check operation correctly due to protection control operation.)
- When the temperature is outside of guaranteed range, accuracy of judgment on check operation may decrease near boarder line area.Inspection and check operation.

Check operation

1. Use KEY MODE to run check operation.
   - When the check operation is not completed, UP (unprepared) will appear on the LED after the communication check and restrict compressor from operating. (UP Mode will be cleared automatically when check operation is completed.)
   - Check operation may proceed from 30 minutes maximum 50 minutes depending on the operation status.
   - During check operation, noise can be generated due to valve inspection. (Check the product if abnormal noise occurs continuously)
2. When error occurs during check operation, check the error code and take appropriate measures.
   - Refer to service manual if you need inspection or when other errors occur.
3. When check operation ends, use S-NET pro 2 or S-CHECKER to issue a result report.
   - Refer to service manual for further actions if you have any items with “inspection required” sign on the result report.
   - After taking appropriate measure for the items with “inspection needed” sign, run the check operation again.
4. Check the following items by running (cooling/heating) trial operation.
   - Check if cooling/heating operation performs normally.
   - Individual indoor unit control: Check for air flow direction and fan speed.
   - Check for abnormal operation noise from the indoor and outdoor unit.
   - Check for proper draining from the indoor unit during cooling operation.
   - Use S-NET pro 2 to check the detail operation status.
5. Explain to the user how to use the air conditioner according to the user’s manual.
6. Hand over the installation manual to the customer so they can keep it with them.

Automatic refrigerant amount detection function (Checking th amount of refrigerant)

Checking lists after finishing installation

▶ Before supplying power, measure the power terminal (L, N) and outdoor unit grounding using insulation-resistance tester.
- The measured value should be above 30MΩ.

CAUTION
- You must not measure the communication terminal since the communication circuit may get damaged.
- Check the short circuit using a circuit tester.

Installation	Outdoor unit	• Have you secured air discharge profile at the bottom of service cover? • Have you checked the external surface and the inside of the outdoor unit? • Is there any possibility of short circuit due to the heat of an outdoor unit? • Is the place well-ventilated and ensures space for service? • Is the outdoor unit fixed securely?
	Indoor unit	• Have you checked the external surface and the inside of the indoor unit? • Is the place well-ventilated and has enough space been allowed for service? • Have you checked if the center of the indoor unit is ensured and it is installed horizontally?
Refrigerant pipe work		• Have you selected correct pipes? • Are the liquid and gas valve open? • Is the total number of connecting indoor units within the allowable range? • Are the length and the height difference between the refrigerant pipes within the allowable range? • Is the refrigerant Y-joint properly installed? • Has the connection of liquid and gas pipes been correctly performed? • Have you chosen correct insulation for pipes and have you insulated them correctly? • Is the pipe or connection part properly insulated? • Is the quantity of the additional refrigerant correctly weighed in? (You must record the amount of additional refrigerant charging on the service record paper placed outside the outdoor unit.)

Installing the drain pipe	• Have you checked whether the drain pipes of the indoor unit and outdoor unit are connected together? • Have you completed the drain test? • Is the drain pipe properly insulated?
Wiring work	• Are the power cable and communication cable tightened firmly on the terminal board within the range of rated tightening torque? • Have you performed the earthing work 3 to the outdoor unit? • Is 2-core cable used for the communication cable? • Is the length of the wire is in the limited range? • Is the wiring route correct?
Setting ADDRESS	• Are the ADDRESSES of the indoor and outdoor units properly set? • Are the ADDRESSES of the remote controller properly set? (When using multiple remote controllers)
Option	• Have you checked whether the vibration-resistance frame is correctly installed if there is a possible vibration of the outdoor unit.

Trial operation

▶ Check the power supply between the outdoor unit and the cabinet panel.
- 1 phase power supply : L, N
- 3 phase power supply: R, S, T, N

▶ Check the indoor unit.
- Check whether you have connected the power and communication cables correctly. (The communication cables between an indoor unit and outdoor unit are F1, F2.)
- Check the thermistor sensor, drain pump/hose, and display are connected correctly.

▶ Check with Key mode or S-NET pro 2.
- At first, operate all the indoor units with Key mode and operate the indoor units individually with S-Net Pro.
- In the beginning of operation, check the compressor operation sound. If there is a boom sound, stop the trial operation.

▶ Check the operation status of indoor and outdoor unit.
- Check whether the cooling operation is done correctly.
- Check the individual indoor unit control, wind velocity, and wind flow direction.
- Check whether you can hear abnormal sound from indoor unit and outdoor unit.
- Check whether the drainage is done correctly in cooling.
- Check S-net Pro for detailed operation.

▶ Explain to the user the usage of the air conditioner by referring to the users manual.

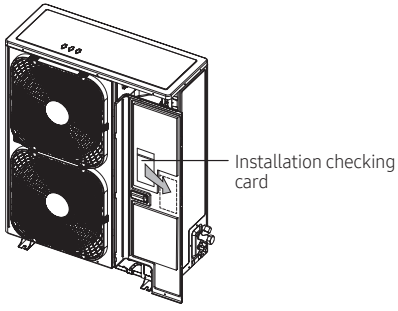
⚠ CAUTION • Turn on the outdoor unit 3 hours before the test operation to preheat the compressor.

Trial operation

Writing and keeping installation checking card

▶ Installation checking card is enclosed with the installation manual.
- Installer should fill out the front side of the card meticulously.
- Write basic information such as date of installation, name of an installer, contact information, supervision company etc.
- Write additional information such as the name of outdoor unit models, unusual, calculation of the additional amount of refrigerant etc.
- Write indoor unit related information such as indoor unit installation location, indoor unit model name etc.

▶ Keep the installation checking card in a designated place and do not lose it.



Product Information

Type	Model	Net weight (kg)	Net size (W × H × D, mm)
Outdoor unit	AM040NXMDER	97	940 × 1,210 × 330
	AM050NXMDER	97	940 × 1,210 × 330
	AM060NXMDER	100	940 × 1,210 × 330
	AM040NXMDGR	95	940 × 1,210 × 330
	AM050NXMDGR	95	940 × 1,210 × 330
	AM060NXMDGR	98	940 × 1,210 × 330

Memo

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