



INSTALLATION MANUAL MANUAL DE INSTALACIÓN MANUEL D'INSTALLATION INSTALLAZIONE MANUALE INSTALLATIONSHANDBUCH

Heat pump
RVMH060GDM3
RVMH100GCM3

Heat recovery
RVMR100GCM0

ENGLISH

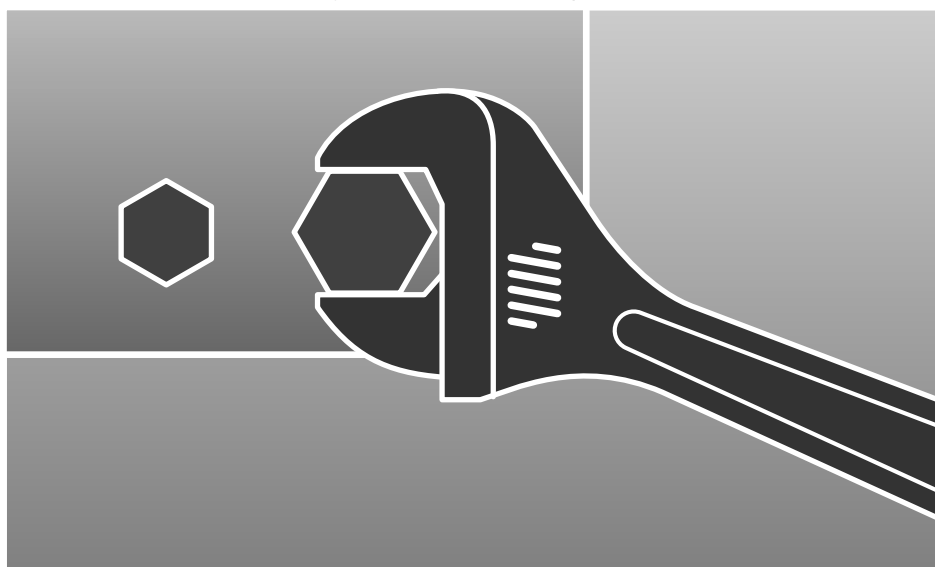
ESPAÑOL

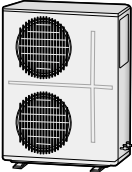
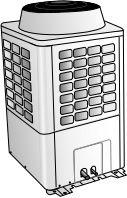
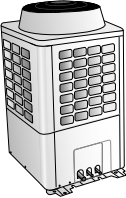
FRANÇAIS

ITALIANO

DEUTSCH

System Air Conditioner
Sistema Acondicionador de aire
Equipement pour air conditionné
Sistema Area Condizionata
System Klimaanlage



Type of outdoor unit		Type A	Type B	Type C
Design				
Model	Heat pump	RVMH060GDM3	RVMH100GCM3	
	Heat recovery			RVMR100GCM0

◆ R407C type outdoor unit

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National Safety Precautions

The following safety precautions must be taken when using your air conditioner.



WARNING

Risk of electric shock. • Can cause injury or death. • Disconnect all remote electric power supplies before servicing, installing or cleaning. • This must be done by the manufacturer or its service agent or a similar qualified person in order to avoid a hazard.

INSTALLING THE UNIT

- ◆ The unit should not be installed by the user. Ask the dealer or authorized company to install the units except room air conditioners for the U.S.A and Canada area.
- ◆ If the unit is installed improperly, water leakage, electric shock or fire may result.
- ◆ The air conditioner must be installed in accordance with national wiring regulations and safety regulations wherever applicable.
- ◆ Mount with the lowest moving parts at least 2.5 m above the floor or grade level. (If applicable)
- ◆ The manufacturer does not assume responsibility for accidents or injury caused by an incorrectly installed air conditioner. If you are unsure about installation, contact an installation specialist.
- ◆ When installing the built-in type air conditioner, keep all electrical cables such as the power cable and the connection cord in pipe, ducts, cable channels e.t.c to protect them against liquids, outside impacts and so on.

POWER SUPPLY LINE, FUSE OR CIRCUIT BREAKER

- ◆ If the power cord of this air conditioner is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- ◆ The unit must be plugged into an independent circuit if applicable or connect the power cable to the auxiliary circuit breaker. An all pole disconnection from the power supply must be incorporated in the fixed wiring with a contact opening of >3mm.
- ◆ Do not use an extension cord with this product.
- ◆ If the unit is equipped with a power supply cord and a plug, the plug must be accessible after installation.
- ◆ This appliance must be installed accordance with the national wiring regulations.

Locating the Units

You should observe the following restrictions when you decide the installation place.

- ◆ NEVER place the outdoor unit on its side or upside down. The compressor lubricating oil may run into the circuit and damage the outdoor unit compressor.
- ◆ Choose a dry and sunny place avoiding direct sunlight or strong winds.
- ◆ Do not obstruct passageways.
- ◆ Avoid a place that may disturb your neighbour. A noise may occur from the outdoor unit and the discharged air may run into the neighborhood.
- ◆ Install the outdoor unit on a flat and stable surface. Otherwise it may slant and make some noise and vibration.
- ◆ Install the outdoor unit on a hard and even place that can support its weight.
- ◆ Place the outdoor unit so as to let the discharged air out properly.
- ◆ Maintain sufficient space around the outdoor unit as seen in the picture on pages 6~10.
- ◆ When you install the outdoor unit at a height, you should firmly fix it in its place.
- ◆ Make sure that the water dripping from the drain hose runs off correctly and safely.
- ◆ Do not install the outdoor unit on the place that can't support its weight.
If the surface is weak, the outdoor may fall and may occur an accident.
- ◆ When you install the outdoor unit at a height, regulations/laws follow local safety.
- ◆ Build a support so that the air inlet is not blocked by snow.
- ◆ Noise may heard when listening to AM radio.
Maintain proper distance and decide the installation place to install the air conditioner and electric wire.
 - Maintain more than 3m in the place that electromagnetic waves is weak and install the wire pipe for a power vessel and communication cable. Earth the wire pipe.
 - Before installing the outdoor unit, check if there is device that generates electromagnetic waves.
If so, the control system operates abnormally and cause malfunction under the influence of the electromagnetic waves. In this case, install the wired remote controller.
(For example: The wireless remote controller may receive a faulty signal. In this case, install the wired remote controller)
- ◆ Install separate ventilating system if you install the air conditioner in a small room.

CAUTION

- ◆ **The air conditioner must be installed according to the national electrical rules.**
- ◆ **Max input power & current is measured according to IEC standard and input power & current is measured according to ISO standard.**

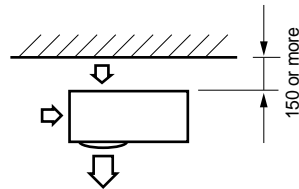
Locating the Units (Continued)

Space Requirements for Outdoor Unit

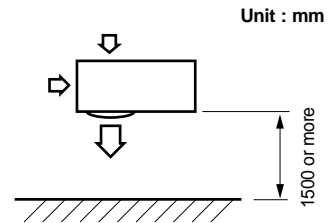
- ◆ Observe the clearances and dimensions as seen below when installing the air conditioner.
- ◆ If you install several outdoor units simultaneously, observe the space for ventilation and free airflow. If the space for ventilation is insufficient, the air conditioner may be inefficient.
- ◆ SAMSUNG logo is attached on the front side of the outdoor unit.

Installation space of Type A

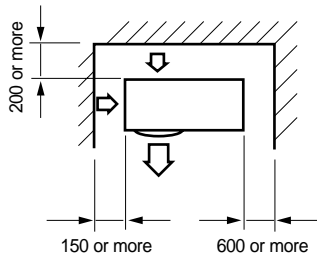
- ◆ When installing 1 outdoor unit



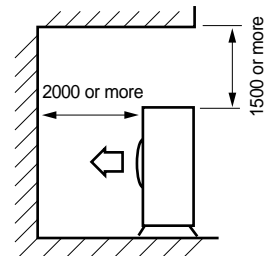
* When the air outlet is opposite the wall



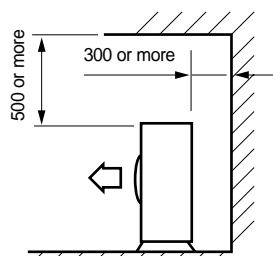
* When the air outlet is toward the wall



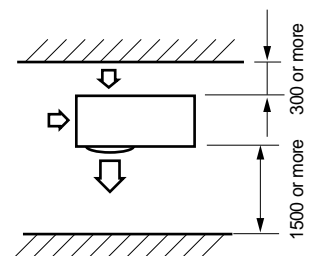
* When 3 sides of the outdoor unit are blocked by the wall



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

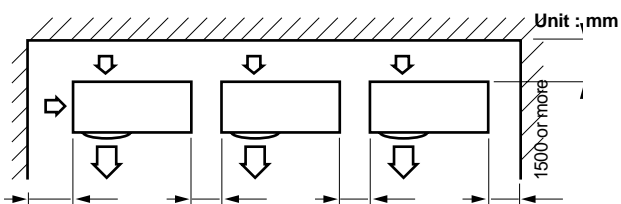


* The upper part of the outdoor unit and the air outlet is opposite the wall

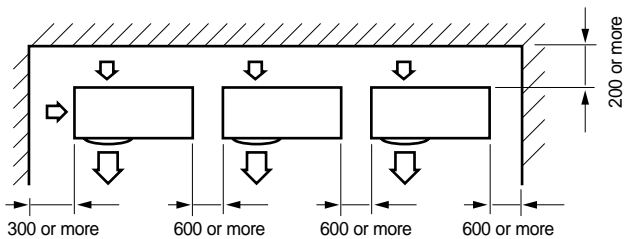


* When front and rear side of the outdoor unit is toward the wall

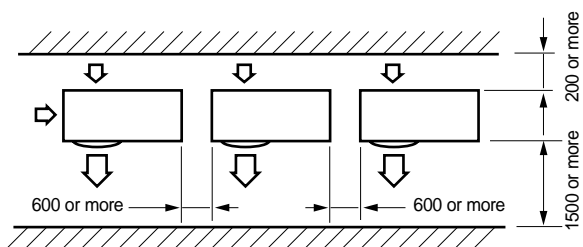
◆ When installing more than 1 outdoor unit



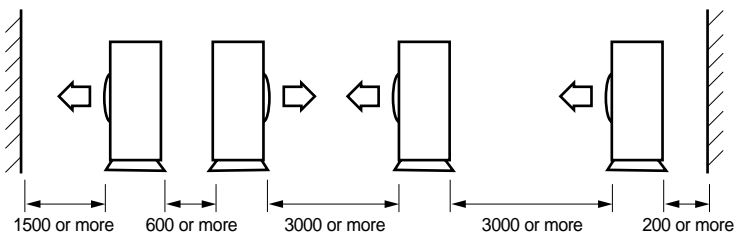
* When the air outlet is toward the wall



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



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

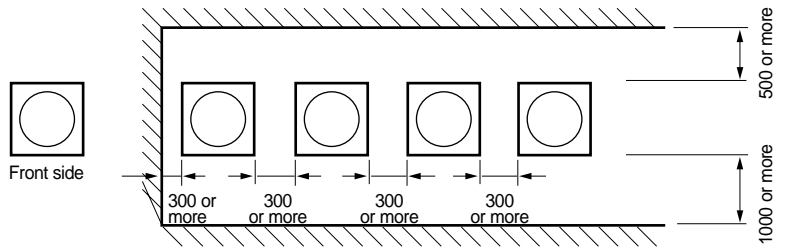


* When front and rear side of the outdoor unit is toward the wall

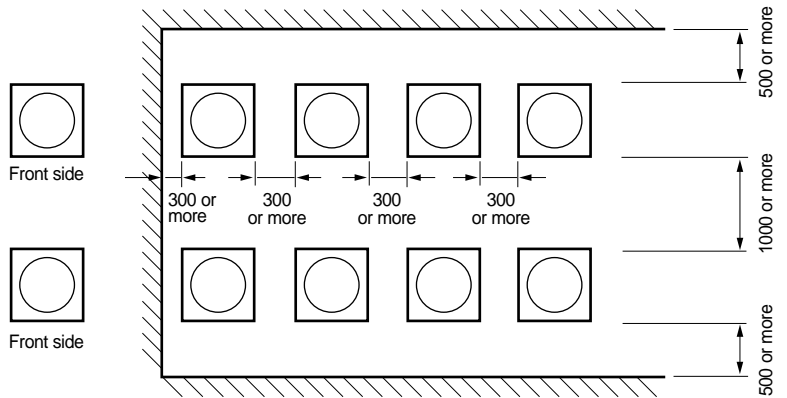
Locating the Units (Continued)

Installation space of Type B, C

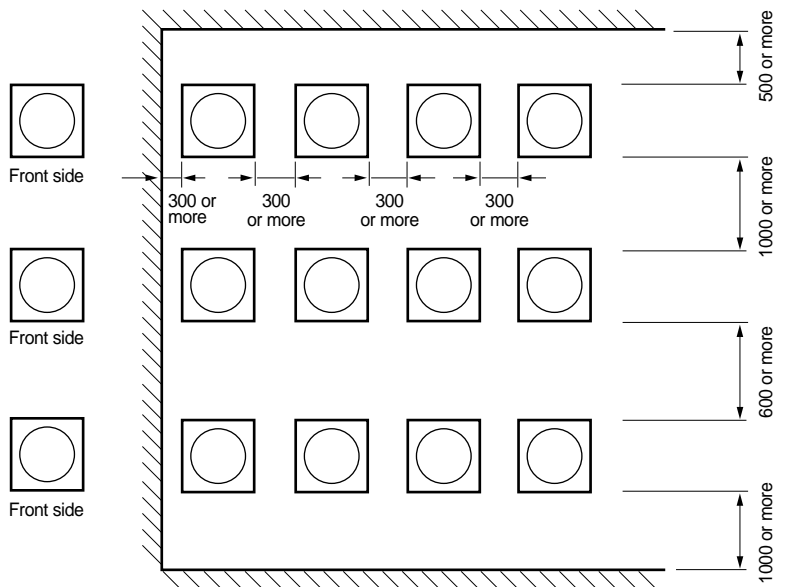
Unit : mm



* When installing in a row



* When installing in two rows

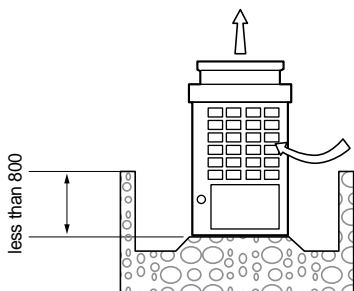


* When installing in three rows

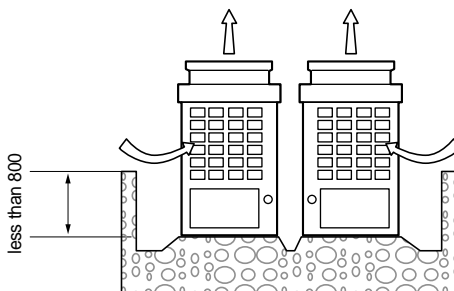
When there is high obstacle near the outdoor unit (Installation space of Type B, C)

- ◆ If the outer wall is lower than the outdoor unit

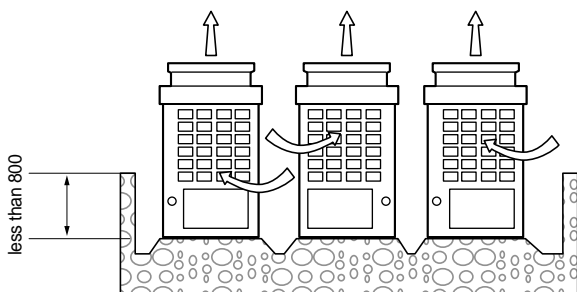
Unit : mm



* When installing in a row



* When installing in two rows

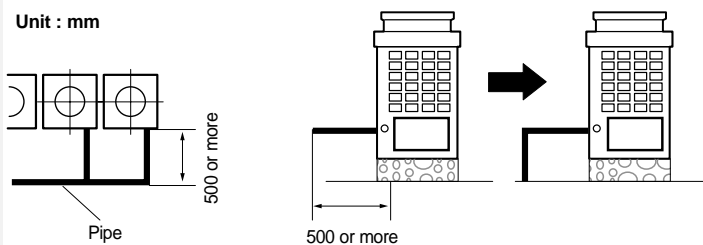


* When installing in three rows

CAUTION

- ◆ ***When installing the pipe horizontally from the front side of the outdoor unit, observe the space of 500mm or more between the outdoor unit and the pipe. (When replacing the compressor, sufficient space is required) If you install the pipe lower than the bottom of the outdoor unit, the space is not required.***

Unit : mm

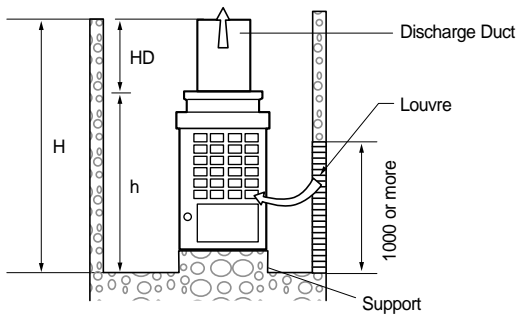


Locating the Units (Continued)

- ◆ If the outer wall is higher than the outdoor unit

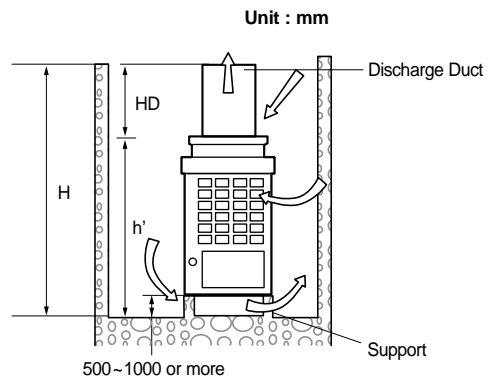
- * When installing louvre

- Set the inlet fan speed less than 1.5m/s from the louvre.
- Set the height (HD) of the discharge duct H-h.



- * When installing no louvre

- Install the outdoor unit support of 500~1000mm high.
- Set the height (HD) of the discharge duct H-h'.



CAUTION

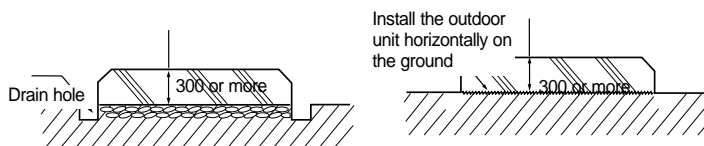
- ◆ **Space must be allowed for free airflow and access to the system. Poor performance could otherwise result.**

Installing the Outdoor Unit

When installing Type A outdoor unit

- ◆ Install the outdoor unit higher than 300mm from the base surface and install the drain hole to connect the pipe to the drainage.
- ◆ The concrete foundation should be 1.5 times larger than bottom of the outdoor unit.
- ◆ When heating, condensed water may be generated. Pay attention to waterproof and drainage of the concrete foundation where the outdoor unit is installed. (An ice road may form on the base surface in winter)

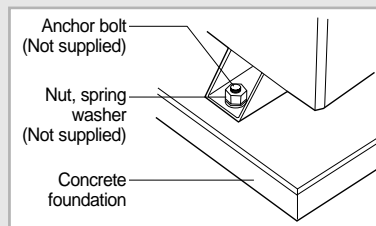
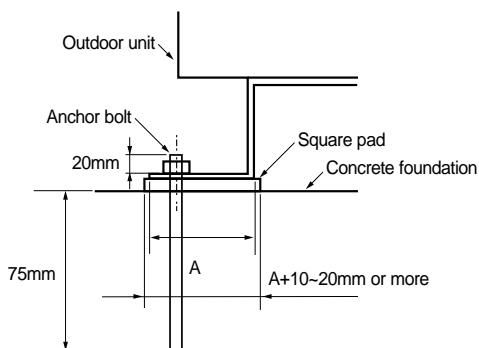
Unit : mm



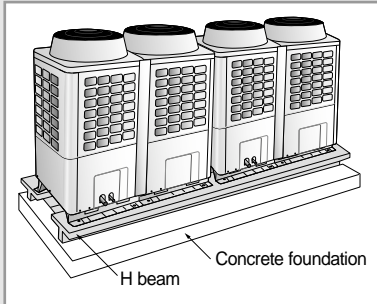
* When installing on the ground

* When installing on the roof

- ◆ Install a square pad($t=10\text{mm}$ or more) to prevent vibration of the outdoor unit delivering to the base surface when installing the concrete for the outdoor unit.
- ◆ Fix the outdoor unit more than 4 places using the anchor bolt(M12) after placing it on the concrete foundation.

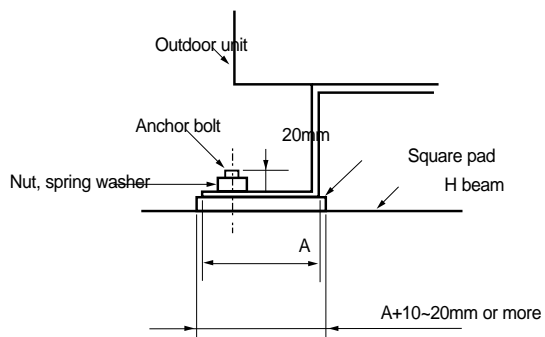


Locating the Units (Continued)



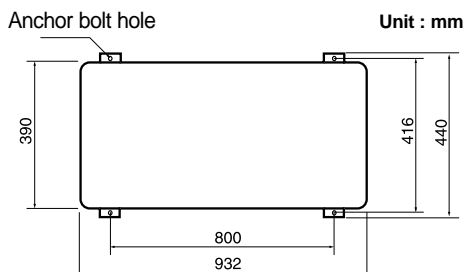
When installing Type B, C outdoor unit

- ◆ Install the outdoor unit higher than 200mm from the base surface and install the drain hole to connect the pipe to the drainage.
- ◆ The concrete foundation should be 1.5 times larger than bottom of the outdoor unit.
- ◆ When heating, condensed water may be generated. Pay attention to waterproof and drainage of the concrete foundation where the outdoor unit is installed. (An ice road may form on the base surface in winter)
- ◆ Make up for wire mesh or steel bar so that the outdoor unit is not damaged or broken when installing concrete foundation.
- ◆ When installing the outdoor units in same place simultaneously, install the H beam inside concrete foundation. (When installing a number of outdoor unit, you can install it on the concrete foundation)
- ◆ Install the H beam(150mm x 150mm x t10: basic specification) to jut out from the concrete foundation.
- ◆ After installing the H beam, apply corrosion protection.
- ◆ Install a square pad($t=20\text{mm}$ or more) to prevent vibration of the outdoor unit delivering to the base surface when installing the concrete for the outdoor unit.
- ◆ Place the outdoor unit on the H beam and fix it with the bolt, nut and washer.

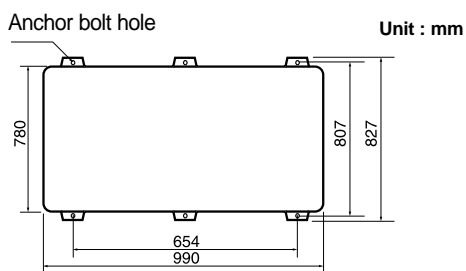


Example of the place of the base and shape of the anchor bolt

◆ Type A

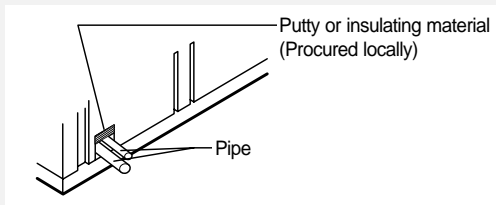


◆ Type B, C



CAUTION

- ◆ ***To protect the internal components of the outdoor unit from small animals, secure the pipework entrance to the unit.***



Electrical Connections

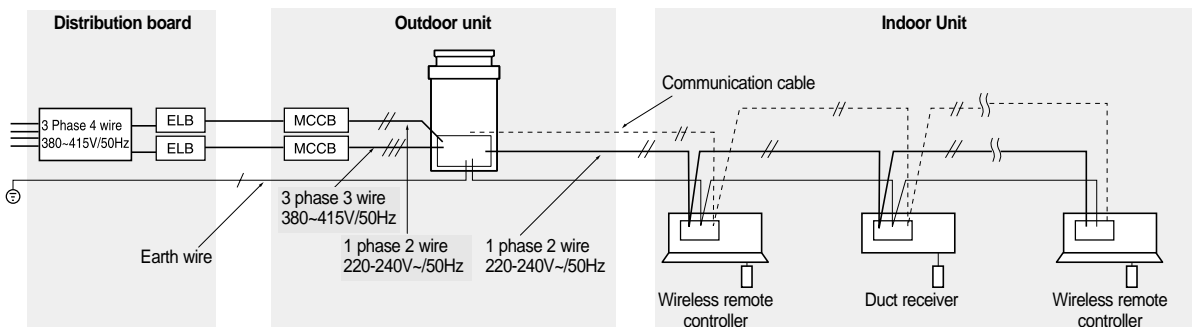
CAUTION

- ◆ All wiring and parts shall be the rated and sized accordingly.
- ◆ For details of wiring, refer to the circuit diagram attached on to the outdoor unit.
- ◆ The electric work should be performed by qualified electrical technicians.
- ◆ The circuit diagram for wiring shows only the concept and so the details for actual work is not described.
- ◆ Be sure to install the circuit breakers and fuses on the power supply cable of each equipment.
- ◆ Connect the wires to the terminals without excessive force and arrange the wires with the cover or other parts so that it may not be loosened. Loose connections may cause the overheating, electrical shock and fire.
- ◆ Be sure to install the Earth Leakage Circuit Breaker (ELB).
- ◆ Install the Molded Case Circuit Breaker (MCCB) to protect the air conditioner from an excess current.

Overall System Configuration

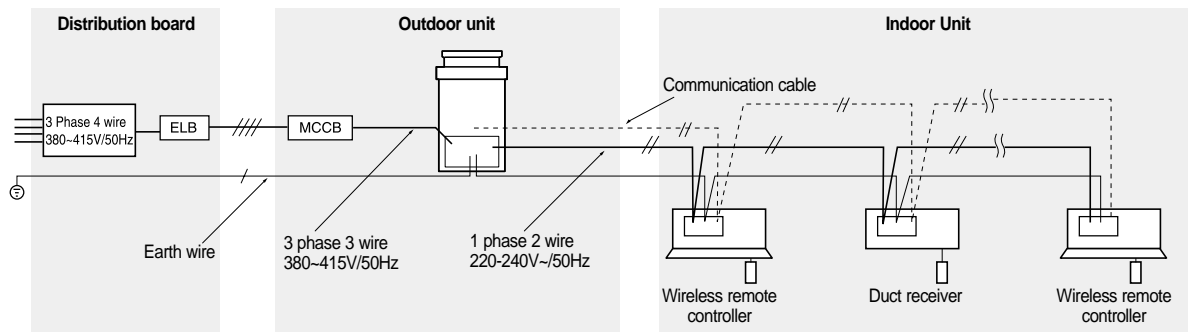
Connection of the power cable (3 phase 3 wire)

- Power supply cable: 3 phase 380-415V
- Power supply cable: 1 phase 220-240V~
- Signal cable: Communication cable/
Home server



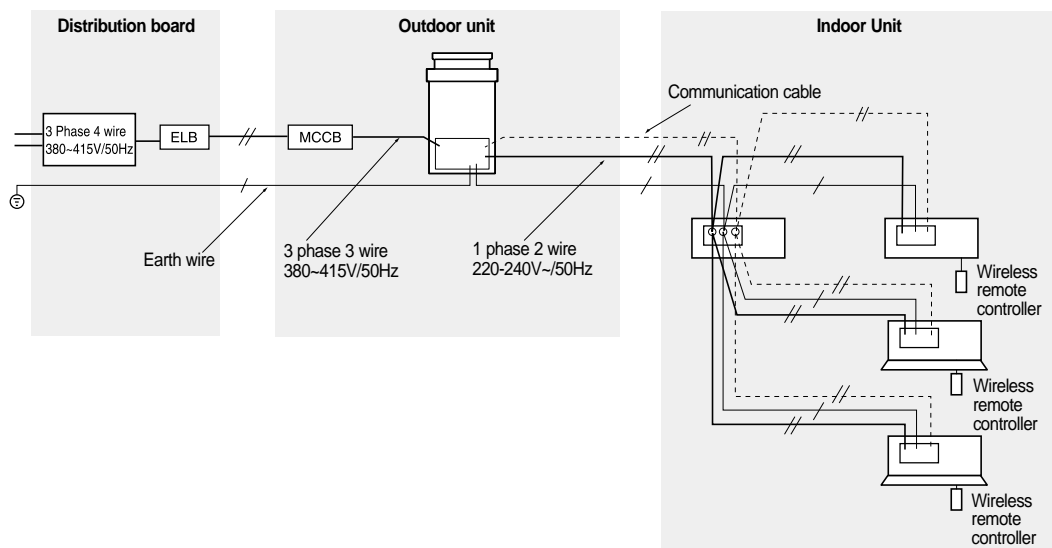
Connection of the power cable (3 phase 4 wire)

- Power supply cable: 3 phase 380~415V
- Power supply cable: 1 phase 220~240V~
- - - Signal cable: Communication cable/
Home server



Connection of the power cable (3 phase 4 wire distributor kit, MCU)

- Power supply cable: 1 phase 220~240V~
- - - Signal cable: Communication cable/
Home server



Electrical Connections (Continued)

Specification of electronic wire of the outdoor unit

Outdoor unit Type	Power Supply									
	3 Phase					Single Phase				
	Power Supply(V)	Max/Min (V)	MCCB/ELB	Power cable	Length	Power Supply(V)	Max/Min (V)	MCCB/ELB	Power cable	Length
A	380~415V/50Hz	456/342	30A	3.5mm, 4 wires	18m or less	220-240V~/50Hz	264/198	15A	2.0 mm ² , 3 wires	-
				5.5mm, 4 wires	18m~28m					
B/C	380~415V/50Hz	456/342	40A	5.5mm, 4 wires	18m or less	220-240V~/50Hz	264/198	20A	2.0 mm ² , 3 wires	-
				8.0mm, 4 wires	18m~28m					

- ◆ The power cable is not supplied with the air conditioner.
- ◆ For the power cable, use the grade H07RN-F or H05RN-F materials.

Specification of electronic wire of the indoor unit

Power Supply (Single Phase)			Earth Cable	Communication Cable	Home server Cable
Power Supply	Max/Min(V)	Power cable			
220-240V~/50Hz	264/198	2.0mm ² 2 wires	Ø 1.6mm 1 wire	0.75~1.25mm ²	0.75~1.25mm ²

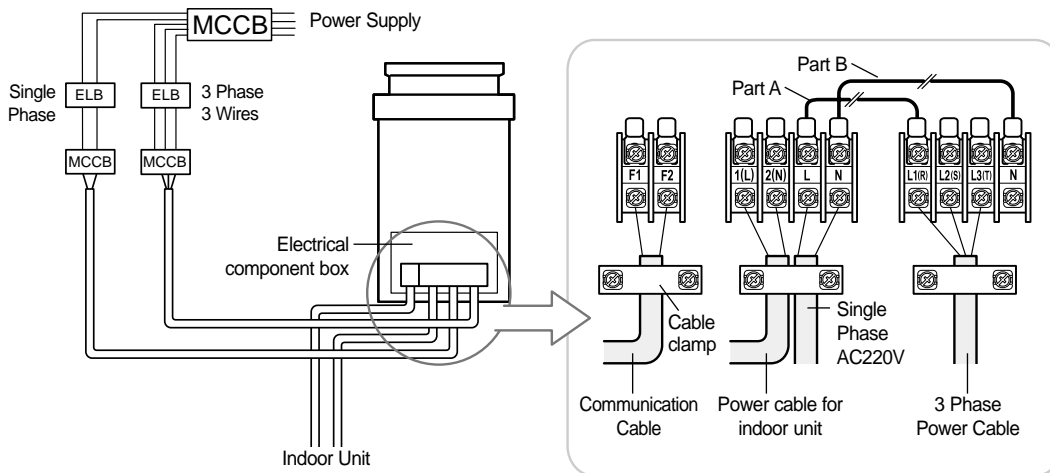
CAUTION

- ◆ **You should connect the power cable into the power cable terminal and fasten it with a clamp.**
- ◆ **The unbalanced power must be maintained within 2% of supply rating.**
- **If the power is unbalanced greatly, it may shorten the life of the condenser. If the unbalanced power is exceeded over 4% of supply rating, the indoor unit is protected, stopped and the error mode indicates.**
- ◆ **To protect the product from water and possible shock, you should keep the power cable and the connection cord of the indoor and outdoor units in the iron pipe.**
- ◆ **Connect the power cable to the auxiliary circuit breaker. An all pole disconnection from the power supply must be incorporated in the fixed wiring(≥3mm).**
- ◆ **Must keep the cable in a protection tube.**
- ◆ **Keep distances of 50mm or more between power cable and communication cable.**

Power Wiring Diagram

- You can use 3 phase 3 wires and single phase ELB with the outdoor unit or 3 phase 4 wires ELB separately.

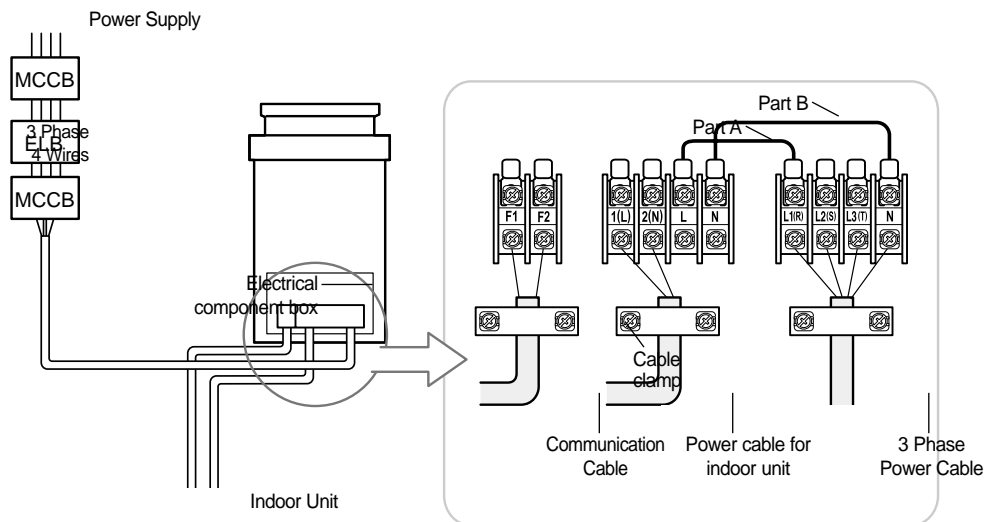
When using 3 phase and single phase ELB



CAUTION

- The connection cables A and B are for drawing 220V power supply from the 3 phase 4 wires.
- The single phase is supplied to the outdoor unit, detach the connection cables A and B terminal.

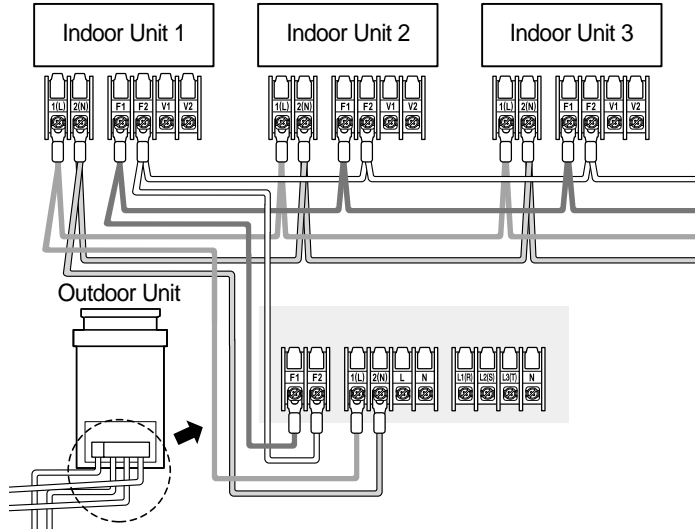
When using 3 phase and 4 wire ELB



CAUTION

- You don't have to supply single phase 220V to the outdoor unit.
- The single phase is not supplied to the outdoor unit, maintain the cables A and B terminal.

Wiring Diagram of the indoor and outdoor unit

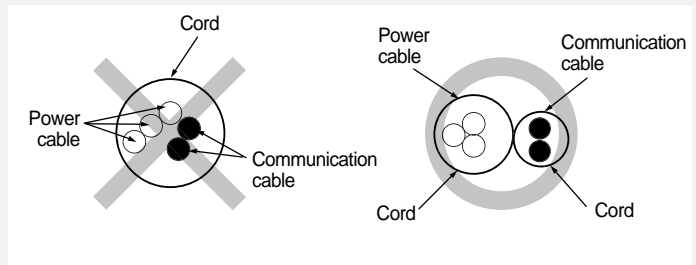


CAUTION

- ◆ *When the communication cable exceeds the specified length, the air conditioner may not operate due to the trouble of communication between indoor and outdoor unit.*

- *Maximum length of wiring: less than 120m*
- *Total length of wiring: less than 240m*
- *Maximum communication branch cable: 10 branches*

- ◆ *Use separate power supply and communication cables.*

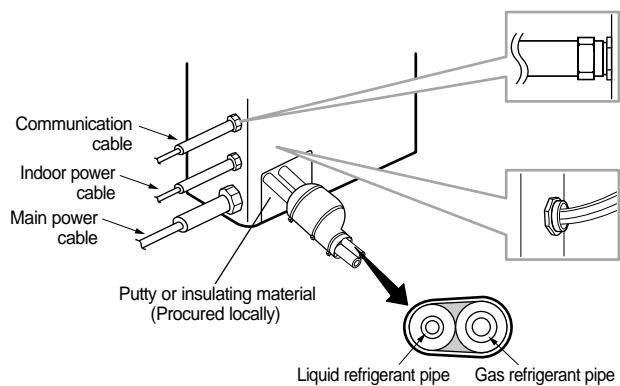


- ◆ *Connect the power cable applying the following torque.*

Size of terminal screw	Tightening Torque
M4	25~40kgf•cm
M5	35~40kgf•cm
M6	40~80kgf•cm
M9	50~100kgf•cm

Power wiring and communication wiring configuration

- ◆ Be sure to run the power supply cable and the communication cable through the electrical conduit as seen in the picture.
- ◆ Install the communication cable, indoor power cable and the main power cable in the cable tube.



Installing the Refrigerant Pipework

Specification of the refrigerant pipe

Type	Outdoor unit	Pipe size [mm/(inch)]			Maximum allowable length of pipe (m)	Maximum allowable difference of height(m)
		Liquid pipe	Low pressure gas pipe	High pressure gas pipe		
Heat Pump	RVMH060GDM3	Ø 9.52 (3/8)	Ø 22.23 (7/8)	-	70	30(25)
	RVMH100GCM3	Ø 12.70 (1/2)	Ø 28.58 (1 1/8)	-	100	50(40)
Heat Recovery	RVMR100GCM0	Ø 12.70 (1/2)	Ø 28.58 (1 1/8)	Ø 19.05 (3/4)	100	50(40)

Note ♦ The value in brackets indicates the length when the outdoor unit is lower than the indoor unit.

Size and thickness of refrigerant pipe

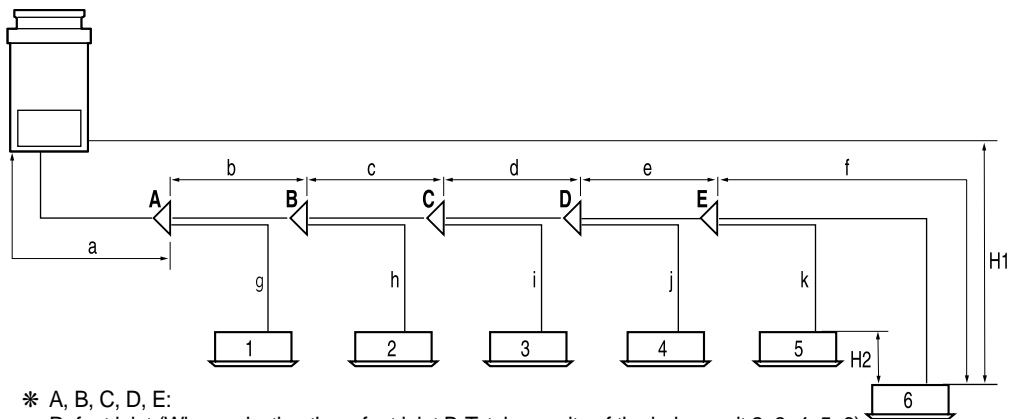
Temper grade of piping material	Minimal thickness (mm)	Pipe size [mm/(inch)]
1/2H	1.0	Ø 22.23(7/8)
	1.2	Ø 25.40(1)
	1.2	Ø 28.58(1 1/8)
O	0.8	Ø 6.35(1/4)
	0.8	Ø 9.52(3/8)
	0.8	Ø 12.70(1/2)
	1.0	Ø 15.88(5/8)
	1.0	Ø 19.05(3/4)

Selecting the refrigerant pipe and the allowable length of the pipe

- The refrigerant pipe should be short as much as possible and minimize the maximum allowable difference of height.

When installing 6 indoor units using only the refnet joint (Outdoor unit Type A, B)

Outdoor unit

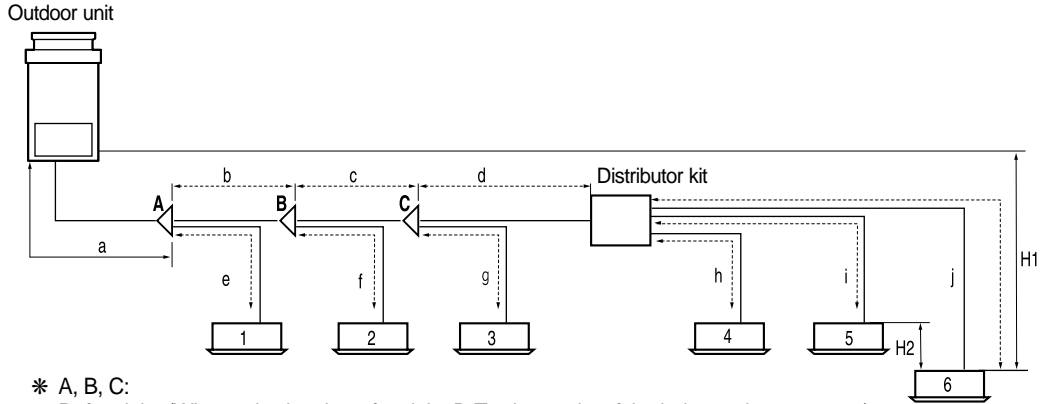


* A, B, C, D, E:
Refnet joint (When selecting the refnet joint B: Total capacity of the indoor unit 2, 3, 4, 5, 6)

Section		Outdoor unit		
		Type A	Type B	
Maximum allowable length of pipe	Total length of pipe (m)		140	200
	The distance between the outdoor unit and the furthest indoor unit	Actual length (m)	70	100
		For example) In case of Type B : $a + b + c + d + e + f \leq 100\text{m}$		
Maximum allowable height	Difference of height between the outdoor and indoor unit (m)=H1		30(25)	50(40)
	Difference of height between the indoor units (m)=H2		15	
Maximum allowable length after the first branch pipe		First refnet joint ~ Indoor unit : less than 30m For example) $b + c + d + e + f \leq 30\text{m}$, $b + c + i \leq 30\text{m}$		
		The distance of the shortest and longest indoor pipe from the refnet joint : less than 20m		

Installing the Refrigerant Pipework (Continued)

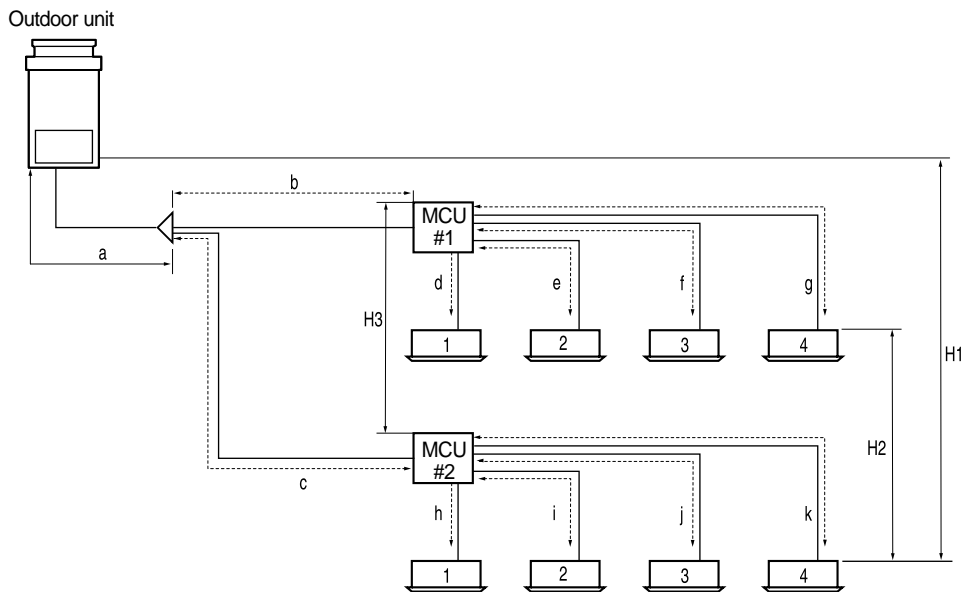
When installing 6 indoor units using distributor kit (Outdoor unit Type A, B)



* A, B, C:
Refnet joint (When selecting the refnet joint B: Total capacity of the indoor unit 2, 3, 4, 5, 6)

Section		Outdoor unit	
		Type A	Type B
Maximum allowable length of pipe	Total length of pipe (m)	140	200
	The distance between the outdoor unit and the furthest indoor unit	70	100
		Actual length (m)	
		For example) In case of Type B : $a + b + c + d + e + f \leq 100\text{m}$	
Maximum allowable height	Difference of height between the outdoor and indoor unit (m)=H1	30(25)	50(40)
	Difference of height between the indoor units (m)=H2	15	
Maximum allowable length after the first branch pipe		First refnet joint ~ Indoor unit : less than 30m For example) $b + c + d + e + f \leq 30\text{m}$, $b + c + i \leq 30\text{m}$	
		Allowable length between distributor kit and indoor unit : less than 20m For example) $h, j, k < 20\text{m}$	

When installing 8 indoor units using branch pipe and MCU(Outdoor unit Type C)



Section		Outdoor unit	Type C
Maximum allowable length of pipe	Total length of pipe (m)		200
	The distance between the outdoor unit and the furthest indoor unit	Actual length (m)	100 For example) $a + c + k \leq 100m$
Maximum allowable height	Difference of height between the outdoor and indoor unit (m)=H1		50(40)
	Difference of height between the indoor units (m)=H2		15
	Difference of height between the MCU (m)=H3		15
Maximum allowable length after the first branch pipe			First refnet joint ~ Indoor unit : less than 30m For example) $b + g \leq 30m, c + k \leq 30m$
			Allowable length between MCU and indoor unit : less than 20m For example) $h, i, j, k < 20m$

- Note**
- ◆ 3 pipes are connected between the outdoor unit and MCU and 2 pipes are connected between indoor unit and MCU.
 - ◆ You can install up to 4 MCU of the Type C outdoor unit.

Installing the Refrigerant Pipework (Continued)

Selecting the size of the refrigerant pipe after the first refnet joint

◆ Outdoor unit Type A, B

Liquid pipe	Total capacity of the indoor unit	16,000W or more	Ø 12.70(1/2)×t0.8
		4,700W ~ 16,000W or less	Ø 9.52(3/8)×t0.8
		4,700W or less	Ø 6.35(1/4)×t0.8
Low pressure gas pipe	Total capacity of the indoor unit	21,000W or more	Ø 28.58(1 ¹ / ₈)×t1.2
		16,000W ~ 21,000W or less	Ø 25.40(1)×t1.2
		9,000W ~ 16,000W or less	Ø 19.05(3/4)×t1.0
		5,000W ~ 9,000W or less	Ø 15.88(5/8)×t1.0
		5,000W or less	Ø 12.70(1/2)×t0.8

◆ Outdoor unit Type C

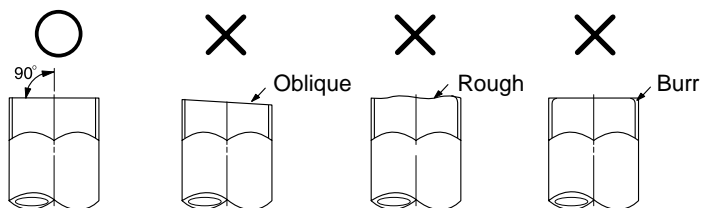
Liquid pipe	Total capacity of the indoor unit	16,000W or more	Ø 12.70(1/2)×t0.8
		4,700W ~ 16,000W or less	Ø 9.52(3/8)×t0.8
		4,700W or less	Ø 6.35(1/4)×t0.8
Low pressure gas pipe	Total capacity of the indoor unit	21,000W or more	Ø 28.58(1 ¹ / ₈)×t1.2
		16,000W ~ 21,000W or less	Ø 25.40(1)×t1.2
		9,000W ~ 16,000W or less	Ø 19.05(3/4)×t1.0
		5,000W ~ 9,000W or less	Ø 15.88(5/8)×t1.0
		5,000W or less	Ø 12.70(1/2)×t0.8
High pressure gas pipe		All	Ø 19.05(3/4)×t1.0

Note ◆ When installing pipe between the refnet joint, the minimum size of the liquid pipe is Ø9.52(3/8) and the minimum size of the gas pipe is Ø15.88(5/8).

Cutting or Extending the Pipe

1 Always utilize the correct tools.
(pipe cutter, reamer, flaring tool and pipe holder)

2 If you want to shorten the pipe, cut it using a pipe cutter ensuring that the cut edge remains at 90° with the side of the pipe. There are some examples of correctly and incorrectly cut edges below.

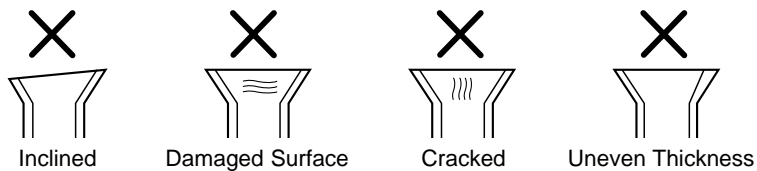


3 To prevent a gas leak, remove all burrs at the cut edge of the pipe using a reamer.

4 Put a flare nut slightly into the pipe and modify the flare.

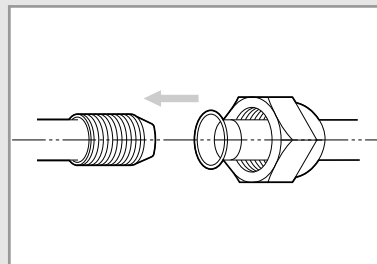
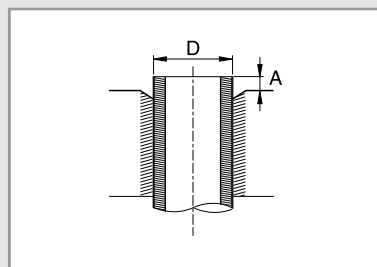
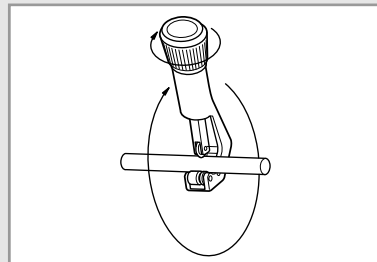
Outer Diameter(D)	Depth (A)
6.35 mm (1/4")	8.3~8.7mm
9.52 mm (3/8")	12.0~12.4mm
12.70 mm (1/2")	15.4~15.8mm
15.88 mm (5/8")	18.6~19.0mm
19.05 mm (3/4")	22.9~23.3mm
22.23 mm (7/8")	22.9~23.3mm

5 Check if you flared the pipe correctly. There are some examples of incorrectly flared pipes below.



6 Align the pipes to connect them easily. Tighten the flare nuts first with your hands, and then with a torque wrench applying the following torque.

Outer Diameter	Torque (kgf•cm)
6.35 mm (1/4")	140~170
9.52 mm (3/8")	250~280
12.70 mm (1/2")	380~420
15.88 mm (5/8")	440~480
19.05 mm (3/4")	990~1210
22.23 mm (7/8")	990~1210

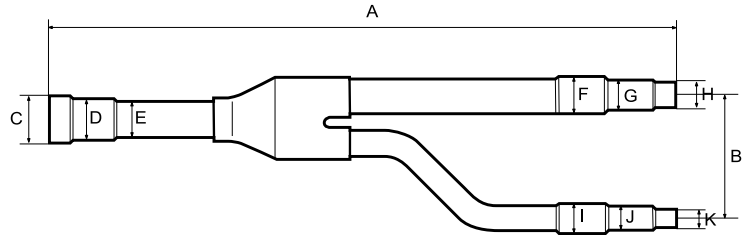


Installing the Refrigerant Pipework (Continued)

Selecting the Refnet Joint

Selecting the first refnet joint

- ◆ Select the refnet joint separately for connecting the indoor and outdoor unit.
- ◆ Select the first refnet joint model from the outdoor unit referring to the table below.



Refnet joint model	Length (mm)		Diameter [mm(inch)]								
	A	B	C	D	E	F	G	H	I	J	K
MXJ-Y2209A	420	80	9.52 (3/8)	-	-	9.52 (3/8)	6.35 (1/4)	-	9.52 (3/8)	6.35 (1/4)	-
	460	90	22.23 (7/8)	19.05 (3/4)	15.88 (5/8)	19.05 (3/4)	15.88 (5/8)	12.70 (1/2)	15.88 (5/8)	12.70 (1/2)	-
MXJ-Y3112A	420	80	12.70 (1/2)	-	-	12.70 (1/2)	9.52 (3/8)	6.35 (1/4)	12.70 (1/2)	9.52 (3/8)	6.35 (1/4)
	460	90	31.75 (5/4)	28.58 (1 1/8)	25.40 (1)	25.40 (1)	19.05 (3/4)	15.88 (5/8)	19.05 (3/4)	15.88 (5/8)	12.70 (1/2)

Selecting the remaining refnet joints

- ◆ Select the refnet joints according to the total capacity of the indoor units.

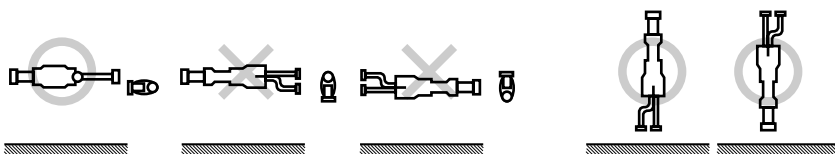
Total capacity of indoor units	Refnet joint
16000W less	MXJ-2209A
16000W or more	MXJ-3112A

CAUTION

- ◆ *Cut or extend the pipe according to the size of the connected pipe after selecting the refnet joint.*
- ◆ *Remove all burrs from the refnet joint cut surface after cutting the pipe.*

Installing the Refnet Joint

- ◆ Install the refnet joint 'horizontally' or 'vertically'.

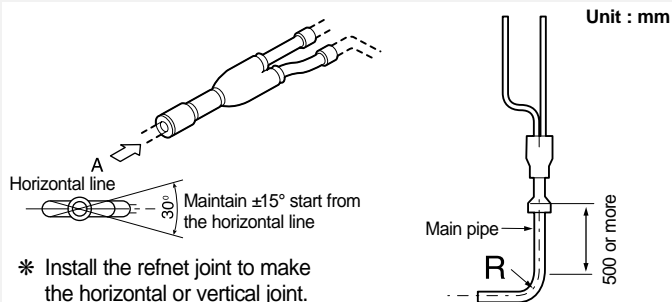


* Horizontal joint

* Vertical joint

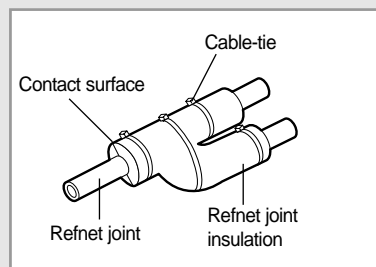
CAUTION

- ◆ Install the refnet joint maintaining $\pm 15^\circ$ start from the horizontal line.
- ◆ When installing the refnet joint, do not bend the main pipe in the connection part. If it is unavoidably bent, install the refnet joint horizontally and the length is to be more than 500mm from the connection part to the main part.



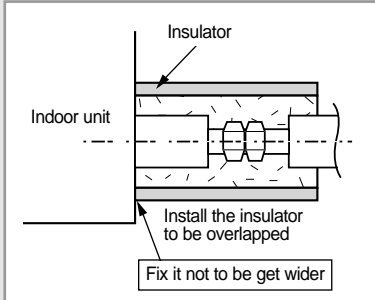
Fixing the Insulation to the Refnet Joint

- 1 Insulate the refnet joint with insulation material.
- 2 Assemble the insulation plate vertically to be horizontal.
- 3 Fix it with the cable tie(4) to seal the connection part of the insulation plate.



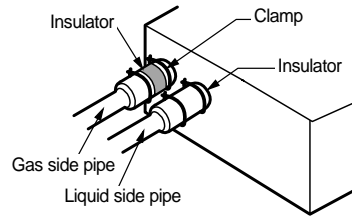
Performing the Gas Leak Tests and Insulation of Pipework

You must check if there is a gas leak before completing all the installation process.



Insulating the refrigerant pipe

- ◆ Be sure to insulate the refrigerant pipe, joint and connection part.
 - If you insulate the pipes, the condensed water does not fall from the pipes and the capacity of the air conditioner is improved.
- ◆ Check if there are any insulator cracks on the bent pipe.



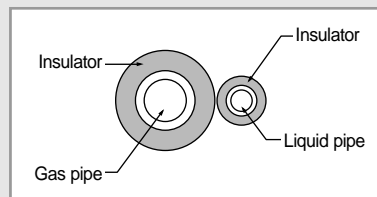
Selecting the insulator of the refrigerant pipe

- ◆ Insulate the gas side and liquid side pipe referring to the thickness according to the pipe size.
- ◆ The thickness according to the pipe size is a standard of the indoor temperature of 27°C and humidity of 80%. If installing in an unfavorable conditions from it, use thicker one.

Pipe size (mm)	Minimum thickness of insulator (mm)		Remarks
	PE foam	EPDM foam	
Ø 6.35~19.05	13	10	If you install the pipe underground, at the seaside, a spa or on the lake, use thicker one according to the pipe size.
Ø 22.2~28.58	19	13	
-	25	19	

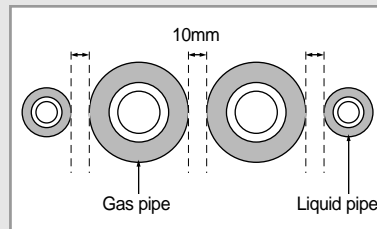
Refrigerant pipe before distributor and MCU or without distributor kit and MCU

- ◆ You can contact the gas side and liquid side pipes but the pipes should not be pressed.
- ◆ When contacting the gas side and gas side pipe, use thicker insulator.



Refrigerant pipe after distributor kit and MCU

- ◆ When installing the gas side and liquid side pipes, leave 10mm of space.
- ◆ When contacting the gas side and liquid side pipe, use thicker insulator.

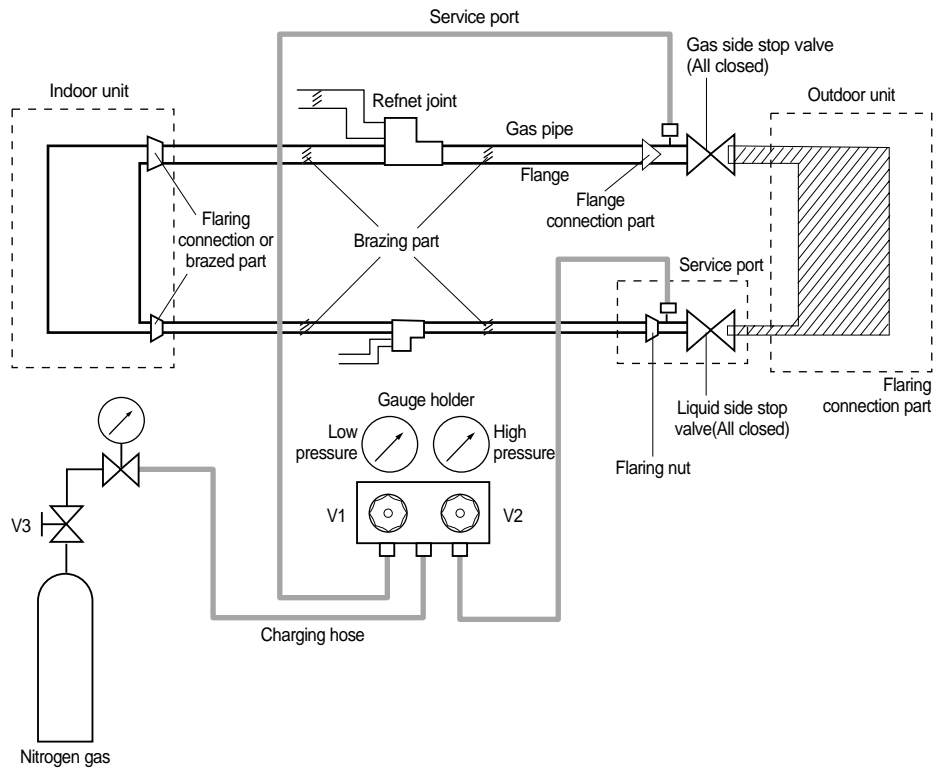


CAUTION

- ◆ **Install the insulator not to be get wider and use the adhesives on the connection part of it to prevent moisture entering.**
- ◆ **Wind the refrigerant pipe with insulation tape if it is exposed to outside sunlight.**
- ◆ **Install the refrigerant pipe respecting that the insulator does not get thinner on the bent part or hanger of pipe.**

Preparing and Charging the Refrigerant Pipework

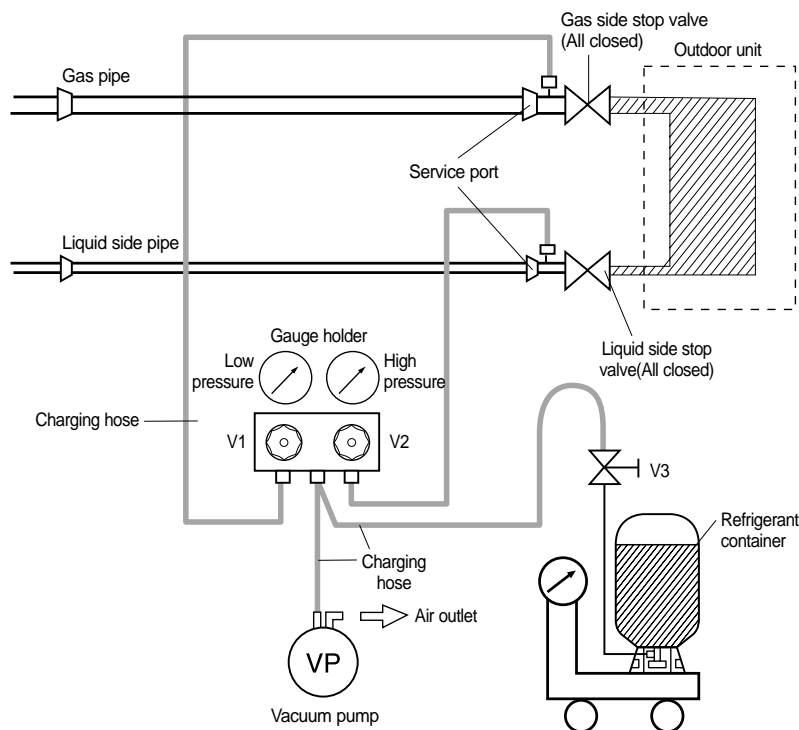
Performing the Refrigerant Gas Leak Test



- 1 Open the V1, V2 and V3 valve after closing the liquid side, gas side and stop valve. Charge the nitrogen gas in the refrigerant pipe of liquid, gas side and the indoor unit.
- 2 Perform pressure test to use oxygen free Nitrogen from 28kgf/cm² of pressure.
- 3 Close the V1, V2 and V3 valve and apply soapy water to the connection part of the flaring nut and brazing.
 - ◆ If it is foamy, repair the gas leak.
 - ◆ If the gas does not leak, check that the pressure drops for 24 hours. (If the pressure drops, the gas of connection part may leak)
- 4 Discharge the nitrogen gas once the test is completed.

Vacuum Drying with the Vacuum Pump

- ◆ To remove moisture inside of the pipe, perform vacuum drying after test of gas leak.



- 1 Connect the charging hose of low-pressure side of gauge holder to a gas service port and gauge holder to vacuum pump as seen in the picture.
- 2 Open the V1, V2 of gauge holder and operate the vacuum pump. Make sure that pressure gauge reaches -1kgf/cm^2 .
- 3 Close the V1, V2 valve and stop the vacuum pump after more than 2 hours.
- 4 Check if the pressure that the manifold gauge shows is changes. Check the connection part if the gauge pressure changes. It means that gas may leak.
 - ◆ After leaving the system in vacuum for 1 hour, confirm that the vacuum gauge does not rise.

CAUTION

- ◆ Do not use the refrigerant of the outdoor unit or refrigerant container for purging.
- ◆ Perform vacuum drying after closing liquid and gas side of stop valve.
- ◆ In case of the outdoor unit RVMR100***, the MCU power should be supplied to perform vacuum drying.

Preparing and Charging the Refrigerant Pipework (Continued)

Additional Refrigerant Charge

- ◆ You must add refrigerant to the liquid side.

Outdoor unit Type A

Size of the liquid pipe (mm)	Ø 6.35	Ø 9.52	Ø 12.70
Additional Refrigerant (kg/m)	0.05	0.08	0.12

Additional Refrigerant (kg/m) = $\{(L_1 \times 0.05) + (L_2 \times 0.08) + (L_3 \times 0.12)\}$ - Basic charging for pipes

Outdoor unit Type B

Size of the liquid pipe (mm)	Ø 6.35	Ø 9.52	Ø 12.70
Additional Refrigerant (kg/m)	0.05	0.08	0.14

Additional Refrigerant (kg/m) = $\{(L_1 \times 0.05) + (L_2 \times 0.08) + (L_3 \times 0.14)\}$ - Basic charging for pipes

Outdoor unit Type C

Size of the liquid pipe (mm)	Ø 6.35	Ø 9.52	Ø 12.70
Additional Refrigerant (kg/m)	0.05	0.08	0.14

Additional Refrigerant (kg/m) = $\{(L_1 \times 0.05) + (L_2 \times 0.08) + (L_3 \times 0.14) + (N \times 0.02)\}$ - Basic charging for pipes

- Note** ◆ L1: Total length of liquid pipe Ø 6.35(m)
 L2: Total length of liquid pipe Ø 9.52(m)
 L3: Total length of liquid pipe Ø 12.70(m)
 N: Installed MCU quantity

The amount of refrigerant of the distributor kit

Size of the liquid pipe (mm)	Ø 6.35	Ø 9.52
Additional Refrigerant (kg/m)	0.01	

- Note** ◆ Apply the rear side of the distributor kit refrigerant 0.01kg per meter when using MXD-*** and MCU-4ECEV.

The amount of basic charging for pipes

Type	Model of the outdoor unit	Factory charged (kg)	Basic charging for pipes (kg)
Heat pump	RVMH060GDM3	8.0	1.0
	RVMH100GCM3	14.0	1.1
Heat recovery	RVMR100GCM0	17.0	1.1

Installing MCU (Mode Change Unit)

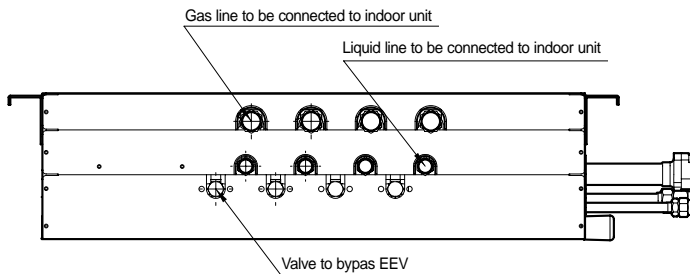
You must install MCU when using Type C outdoor unit.

Model of MCU

- ◆ Install appropriate MCU according to the specification and the number of the indoor unit.

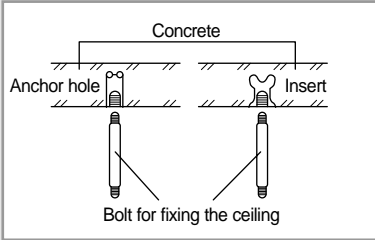
Model	Type	Remarks
MCU-6ECE*	MCU that the EEV is not included: 6 indoor units can be connected.	When installing the indoor unit that the EEV is included
MCU-4ECE*	MCU that the EEV is not included: 4 indoor units can be connected.	
MCU-4ECEV*	MCU that the EEV is included: 4 indoor units can be connected.	When installing the indoor unit that the EEV is not included: Wall-mounted Type, Ceiling Type

- Note**
- ◆ MCU-4ECEV* is the product that includes built in EEV to use the indoor unit(Wall-mounted type and Ceiling type) that does not include EEV.
 - ◆ Wall-mounted type and Ceiling type indoor unit should use MCU-4ECEV*, also the valve to bypass EEV should be closed.
 - ◆ If other type of indoor unit is connected to MCU-4ECEC*, the valve to bypass EEV should be opened.



Installing MCU (Continued)

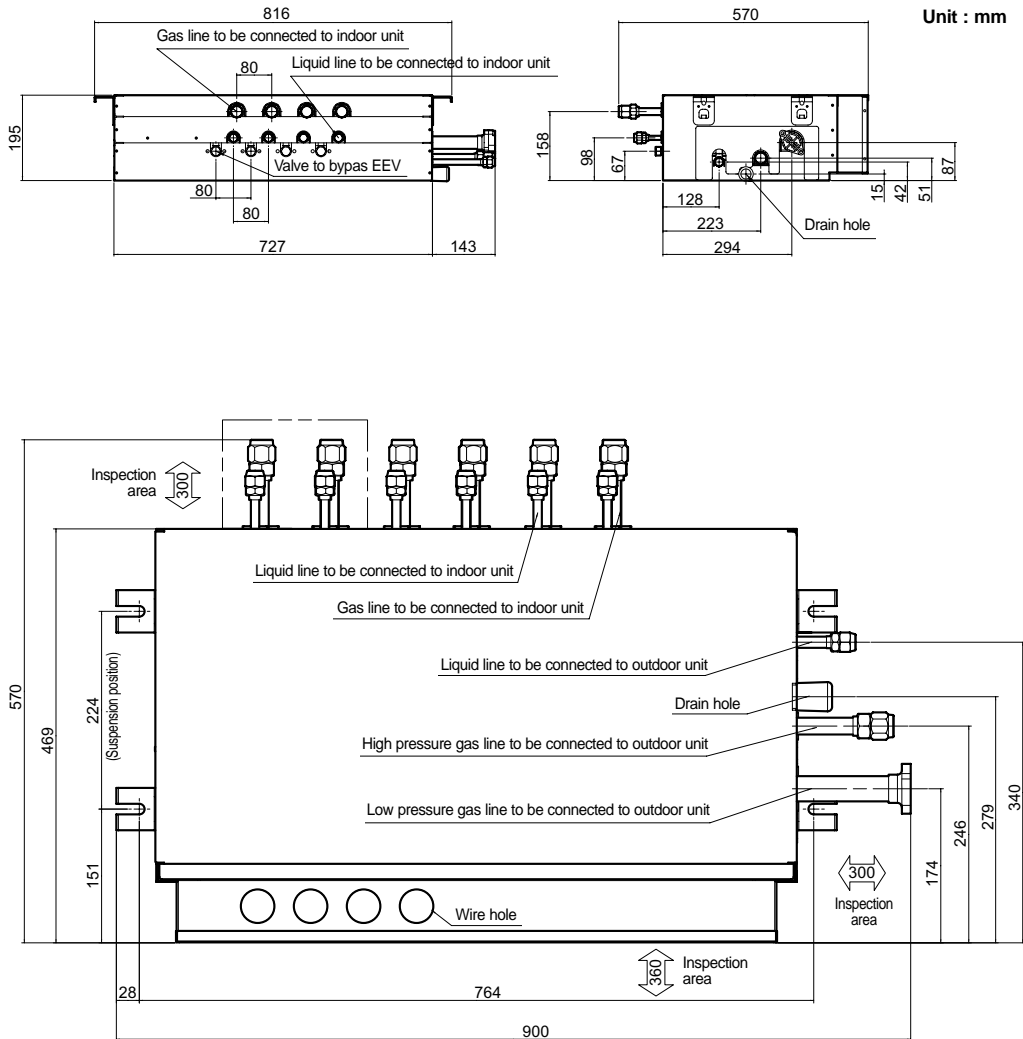
Preparation before installing MCU



1 Check the size of the MCU and installation place.

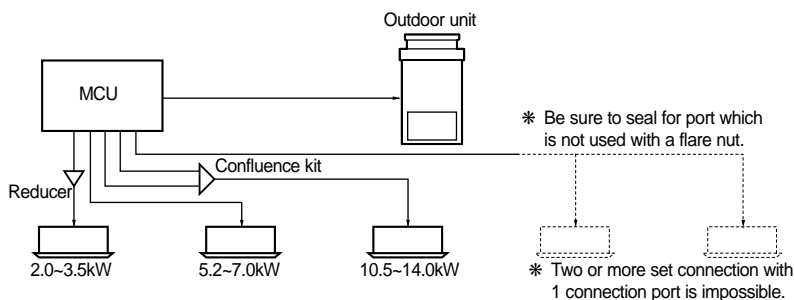
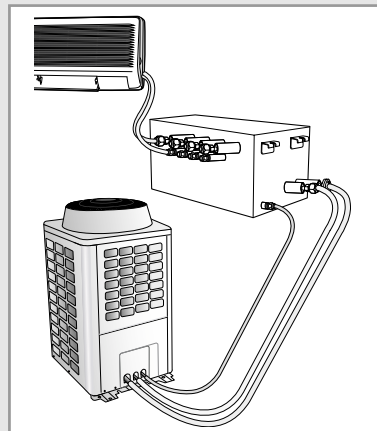
2 Check the condition of installation.

- ◆ Determine the position to install the MCU.
- ◆ Make a hole at the ceiling and maintain space between MCU and ceiling. To prevent vibration, you may have to strengthen the ceiling.



Fixing MCU and Connecting the Refrigerant Pipe

- 1 Install the MCU using bolts.
 - ◆ Use hole-in anchor to strengthen the ceiling for sustain the weight of the indoor unit in case of existing ceiling.
 - ◆ Use the sunken insert, sunken anchor or accessory purchased in the market incase of new ceiling.
- 2 Connect the pipe of the entrance of MCU to the outdoor unit.
 - ◆ Low-pressure gas pipe(Ø 28.58): Brazing connection
 - ◆ High-pressure gas pipe(Ø 19.05): Flaring connection
 - ◆ Liquid pipe(Ø 12.70): Flaring connection
- 3 Connect the pipe of the exit of MCU to the outdoor unit.



Type	Higher press gas pipe	Lower press gas pipe	Liquid pipe
Outdoor unit side	Ø 19.05 / Flare	Ø 28.58 / Brazing	Ø 12.70 / Flare
Indoor unit side	Ø 15.88 / Flare		Ø 9.52 / Flare

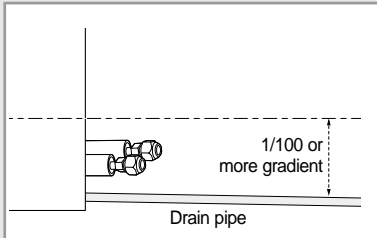
	Reducer (Not supplied)		Confluence kit (Supplied for MCU-6ECE and MCU-4ECE)	
	MCU side	Indoor side	MCU side	Indoor side
Liquid line	Ø 9.52(3/8") / Flare	Ø 6.35(1/4") / Brazing	Ø 9.52(3/8") / Flare	Ø 9.52(3/8") / Brazing
Gas line	Ø 15.88(5/8") / Flare	Ø 12.70(1/2") / Brazing	Ø 15.88(5/8") / Flare	Ø 19.05(3/4") / Brazing
Installed indoor unit capacity	2.0 ~ 3.5kW		10.5 ~ 14.0kW	

Installing MCU (Continued)

Insulating pipes and Connecting the Drain Hose

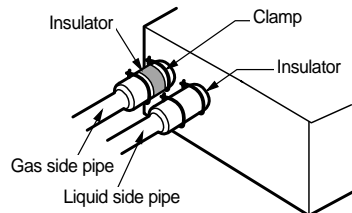
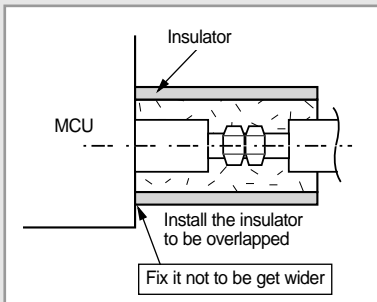
Connecting the drain pipe

- ◆ Connect the drain pipe to the connection part.
 - The connection port and PVC drain pipe must be fixed with PVC adhesive.
 - PVC drain pipe: VP25(Inside diameter: $\text{Ø}25$, Outside diameter: $\text{Ø}32$)
- ◆ Set the gradient of the drain pipe more than 1/100 and insulate the drain pipe.
- ◆ Test the drain pipework for leaks.
- ◆ Insulate drain pipe with proper insulator.

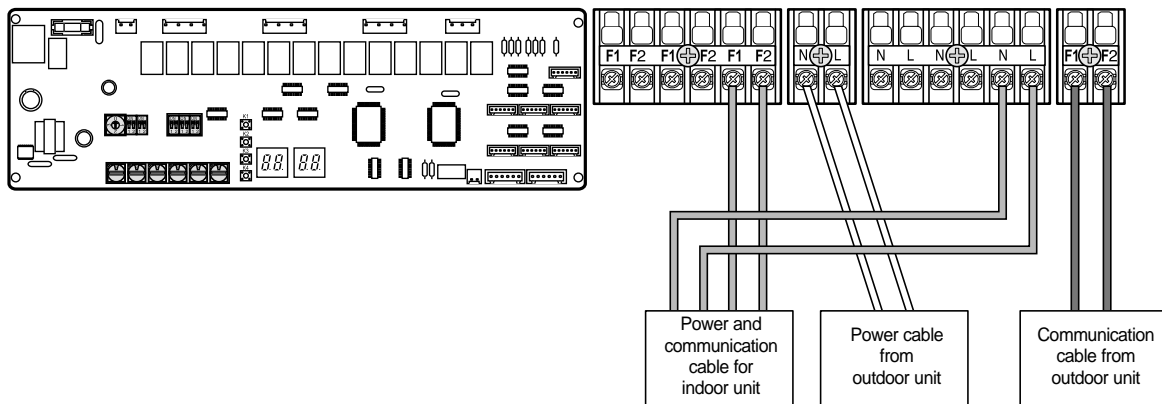


Insulating pipes

- ◆ Refrigerant pipes and MCU connection pipes should surely insulate liquid pipes, lower pressure gas pipes, and higher pressure gas pipes. It will become the cause of a water leak if it does not insulate.
- ◆ Select the insulator same as the way of installing the refrigerant pipe.



Connecting Electronic Wires and Setting Address



Connecting the Power and Communication Cable

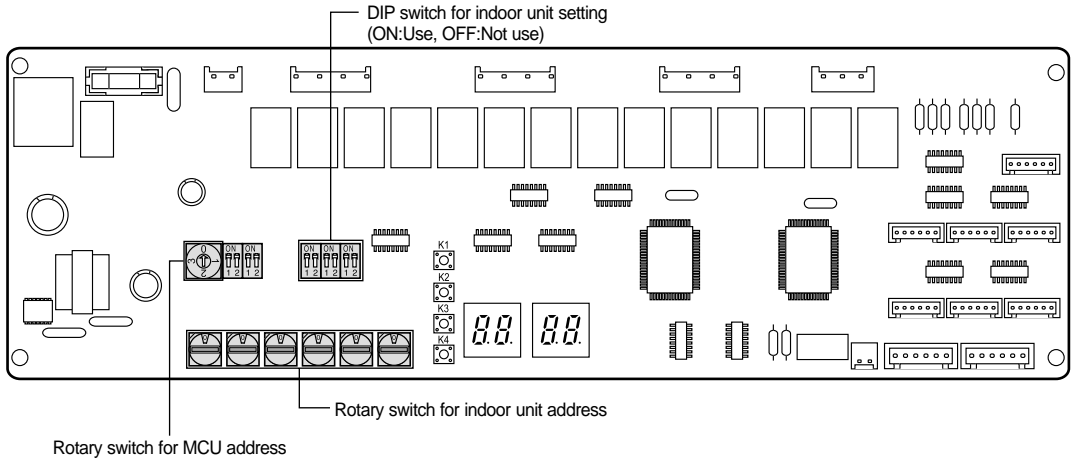
- ◆ Connect the 220V power cable from the outdoor unit to L, N of MCU.
- ◆ Connect the communication cable from the outdoor unit to F1, F2 of MCU.
- ◆ When connecting MCU additionally, connect the power cable and communication each MCU.
- ◆ Connect the power and communication cable to each indoor unit.

CAUTION

- ◆ **Connect the power cable and communication cable using the ring terminal.**

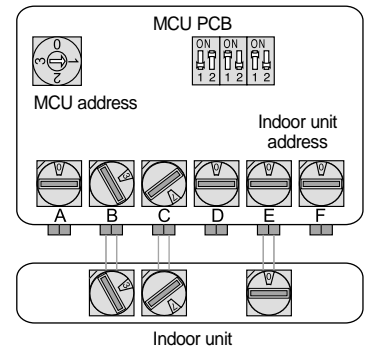
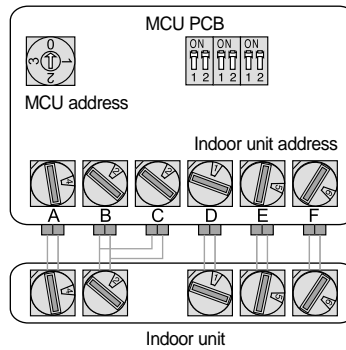
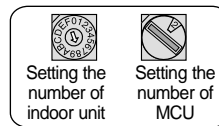
Installing MCU (Continued)

Setting MCU Address



- ◆ Set the rotary switch for the indoor unit address of MCU same as the indoor unit address of pipe of the indoor unit MCU.
- ◆ When installing more than 2 MCU, set each rotary switch for MCU address differently.
- ◆ Set the DIP switch for the indoor unit setting to OFF of the MCU indoor unit pipe that is not used.
- ◆ If you connect the indoor units with the Confluence kit, set the MCU address of the connection part same as the indoor unit address.

Outdoor unit PCB

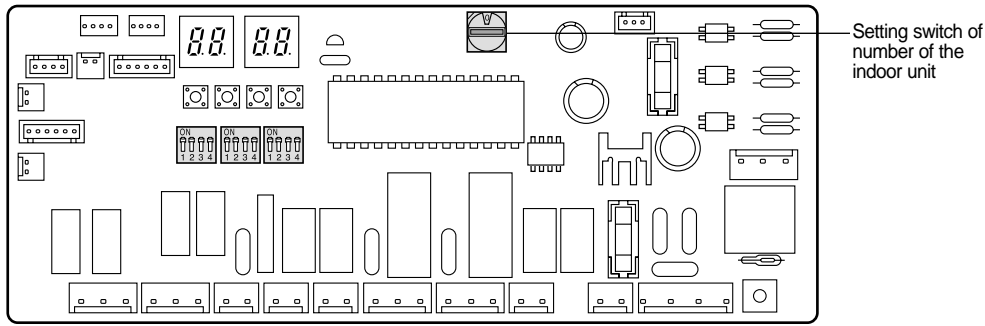


Setting the Option Switch and Function of the Key

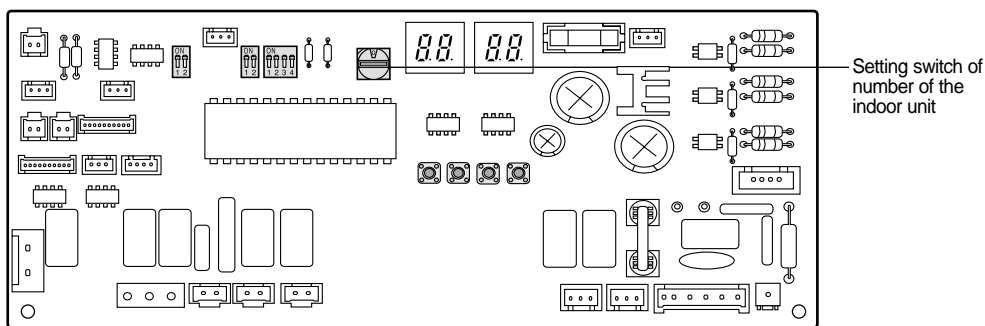
Setting the Option Switch

Setting part of the outdoor unit PCB

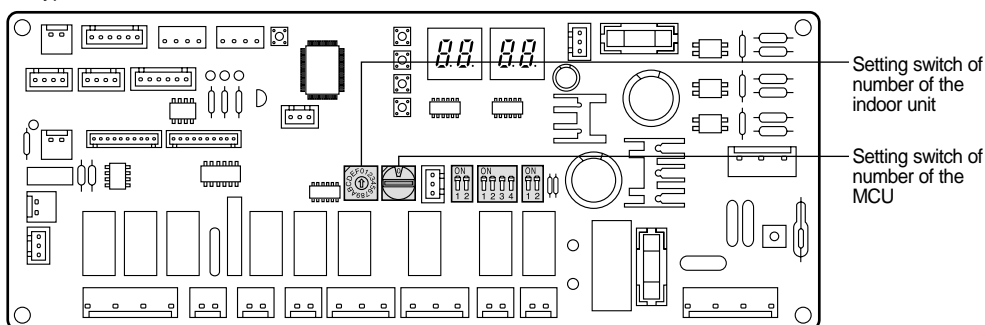
* Type A



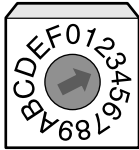
* Type B



* Type C



Setting the Option Switch and Function of the Key (Continued)



Setting switch of number of the indoor unit

Number of the indoor unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Number of the switch	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	0

* For example: Set the switch to '3' if 3 indoor units are installed.

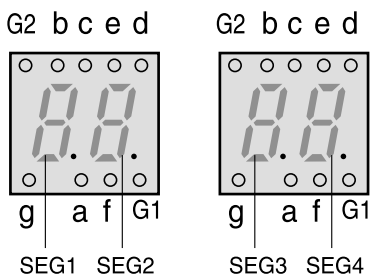
Note ◆ The way of displaying number and alphabet of the PCB display.

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H
I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

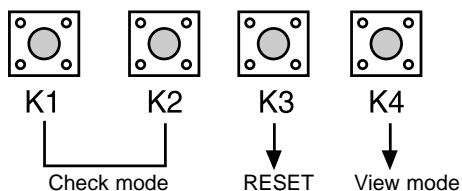
Key function of the outdoor unit PCB

Outdoor unit Type A, B

* PCB



* KEY



* Function of KEY

Number of press times	Function	KEY 1 (Displayed on SEG 3, 4)	KEY 2 (Displayed on SEG 3, 4)	KEY 3 (Displayed on SEG 3, 4)	KEY 4 (Displayed on SEG 3, 4)
1		Adding refrigerant in heating mode (┌─┐)	Adding refrigerant in cooling mode (└─┘)	Reset	Display data
2		Test operation for heating mode (┌─┐)	Test operation for cooling mode (└─┘)	-	-
3		End	Pump Down for recovery of refrigerant (└─┘)	-	-
4		-	End	-	-

- ◆ Adding refrigerant (┌─┐, └─┘): The operation for charging additional refrigerant after installing the outdoor unit.
- ◆ Test operation (┌─┐, └─┘): Checking the indoor and outdoor unit operation after completing installation.
- ◆ Recovery of refrigerant (└─┘): Operation for collecting refrigerant in the outdoor unit when moving or repairing the outdoor unit.

Setting the option switch of the indoor unit

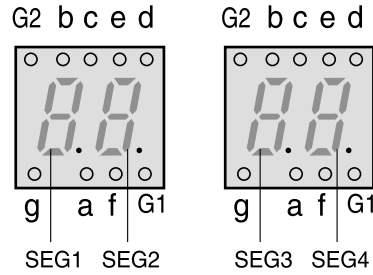
- ◆ The option switch is set to 'ON' when shipping. Set the option switch 'OFF' when you select the mode.

#	Function	Switch ON	Switch OFF
SW02	1 Set the indoor unit address Automatically/Manually	Set the address manually	Set the address automatically

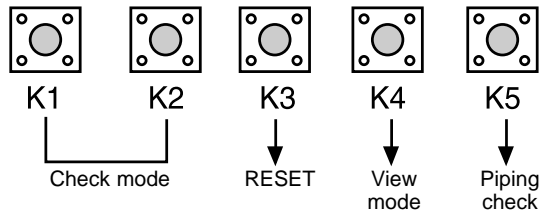
Setting the Option Switch and Function of the Key (Continued)

Outdoor unit Type C

* PCB



* KEY



* Function of KEY

Number of press times \ Function	KEY 1 (Displayed on SEG 3, 4)	KEY 2 (Displayed on SEG 3, 4)	KEY 3 (Displayed on SEG 3, 4)	KEY 4 (Displayed on SEG 3, 4)	KEY 5
1	Adding refrigerant in heating mode (1-1)	Adding refrigerant in cooling mode (1-3)	Reset	Displays data	Piping check
2	Test operation for heating mode (1-2)	Test operation for cooling mode (1-4)	-	-	-
3	End	Pump Down for recovery of refrigerant (1-5)	-	-	-
4	-	End	-	-	-

- ◆ Adding refrigerant (1-1, 1-3): The operation for charging additional refrigerant after installing the outdoor unit
- ◆ Test operation (1-2, 1-4): Checking the indoor and outdoor unit operation after completing installation
- ◆ Recovery of refrigerant (1-5): Operation for collecting refrigerant in the outdoor unit when moving or repairing the outdoor unit
- ◆ Piping check (K5): Operation for checking connection of pipes of the indoor unit and setting of address

Memo

A series of horizontal dotted lines for writing.

**THIS AIR CONDITIONER IS MANUFACTURED BY:
ESTE AIRE ACONDICIONADO HA SIDO FABRICADO POR:
CE CLIMATISEUR EST FABRIQUE PAR:
QUESTO CONDIZIONATORE D'ARIA È PRODOTTO DA:
DIESE KLIMAANLAGE IST FABRIZIERT VON:**



ELECTRONICS