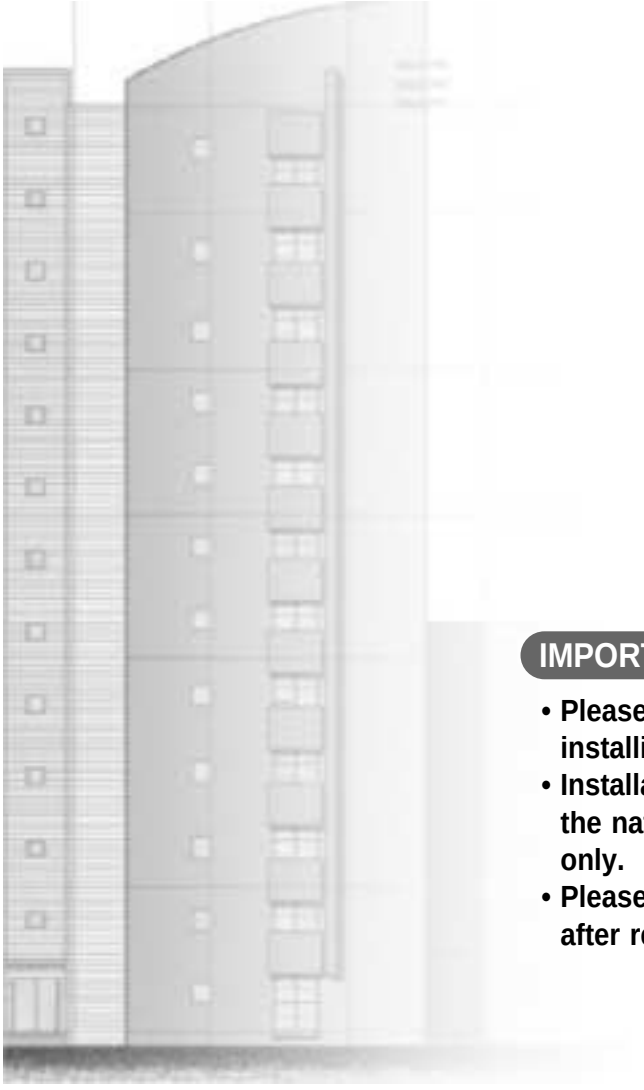
website http://www.lgservice.com

LG

MULTI V™ PLUS System
Outdoor Unit

INSTALLATION MANUAL

MODELS: LRUV Series
LRUN Series



IMPORTANT

- **Please read this installation manual completely before installing the product.**
- **Installation work must be performed in accordance with the national wiring standards by authorized personnel only.**
- **Please retain this installation manual for future reference after reading it thoroughly.**

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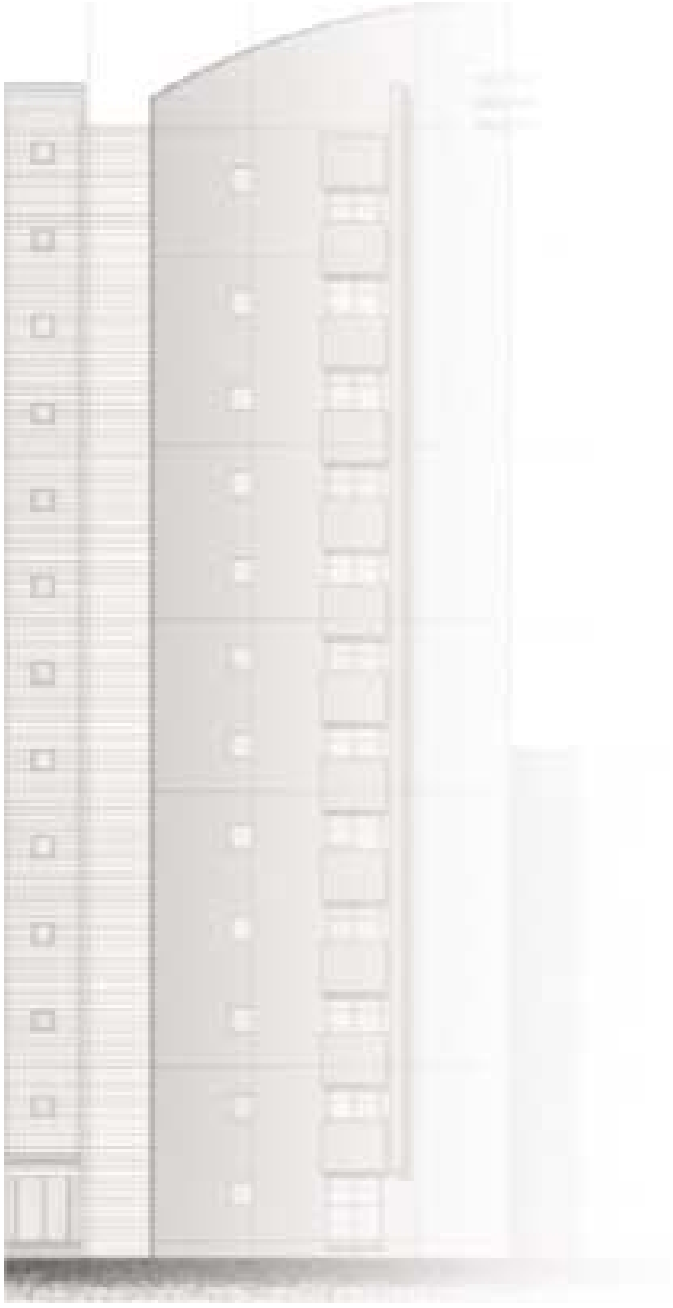

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Safety Precautions

To prevent injury to the user or other people and property damage, the following instructions must be followed.

■ Incorrect operation due to ignoring instruction will cause harm or damage. The seriousness is classified by the following indications.

⚠WARNING	This symbol indicates the possibility of death or serious injury.
⚠CAUTION	This symbol indicates the possibility of injury or damage to properties only.

■ Meanings of symbols used in this manual are as shown below.

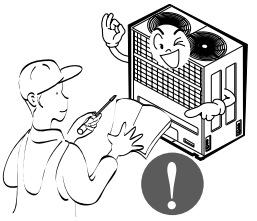
⃠	**Be sure not to do.**
!	**Be sure to follow the instruction.**

⚠WARNING

■ Installation

Have all electric work done by a licensed electrician according to "Electric Facility Engineering Standard" and "Interior Wire Regulations" and the instructions given in this manual and always use a special circuit.

- If the power source capacity is inadequate or electric work is performed improperly, electric shock or fire may result.

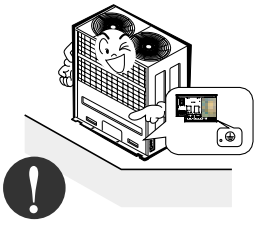


Ask the dealer or an authorized technician to install the air conditioner.

- Improper installation by the user may result in water leakage, electric shock, or fire.

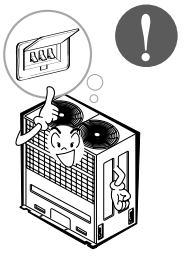
Always ground the product.

- There is risk of fire or electric shock.



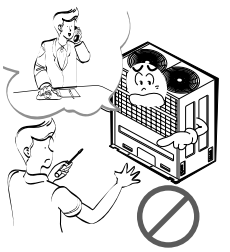
Always intstall a dedicated circuit and breaker.

- Improper wiring or installation may cause fire or electric shock.



For re-installation of the installed product, always contact a dealer or an Authorized Service Center.

- There is risk of fire, electric shock, explosion, or injury.

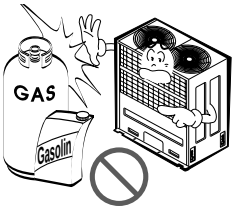


Do not install, remove, or re-install the unit by yourself (customer).

- There is risk of fire, electric shock, explosion, or injury.

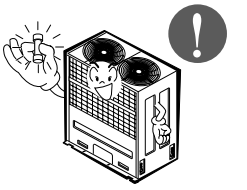
Do not store or use flammable gas or combustibles near the air conditioner.

- There is risk of fire or failure of product.



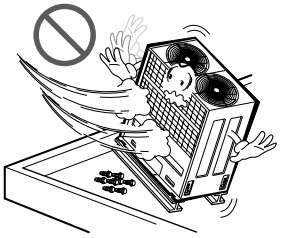
Use the correctly rated breaker or fuse.

- There is risk of fire or electric shock.



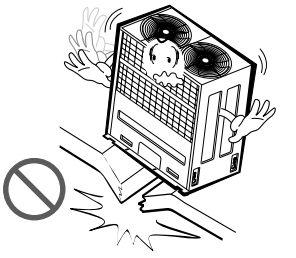
Prepare for strong wind or earthquake and install the unit at the specified place.

- Improper installation may cause the unit to topple and result in injury.



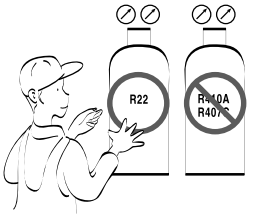
Do not install the product on a defective installation stand.

- It may cause injury, accident, or damage to the product.



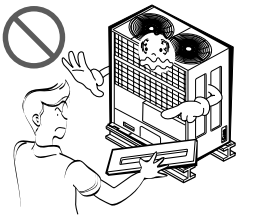
When installing and moving the air conditioner to another site, do not charge it with a different refrigerant from the refrigerant specified on the unit.

- If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.



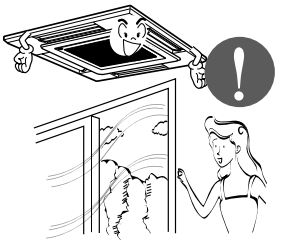
Do not reconstruct to change the settings of the protection devices.

- If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by LGE are used, fire or explosion may result.



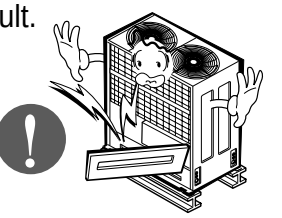
Ventilate before operating air conditioner when gas leaked out.

- It may cause explosion, fire, and burn.



Securely install the cover of control box and the panel.

- If the cover and panel are not installed securely, dust or water may enter the outdoor unit and fire or electric shock may result.



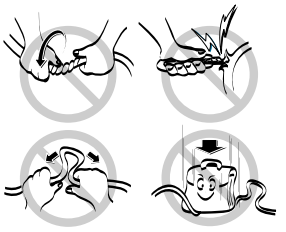
If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit when the refrigerant leaks.

- Consult the dealer regarding the appropriate measures to prevent the safety limit from being exceeded. Should the refrigerant leak and cause the safety limit to be exceeded, harzards due to lack of oxygen in the room could result.

■ Operation

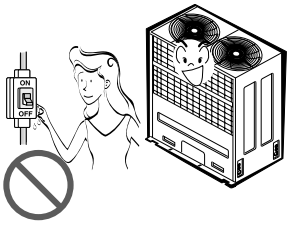
Do not damage or use an unspecified power cord.

- There is risk of fire, electric shock, explosion, or injury.



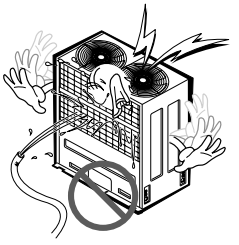
Use a dedicated outlet for this appliance.

- There is risk of fire or electrical shock.



Be cautious that water could not enter the product.

- There is risk of fire, electric shock, or product damage.

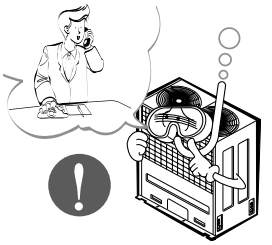


Do not touch the power switch with wet hands.

- There is risk of fire, electric shock, explosion, or injury.

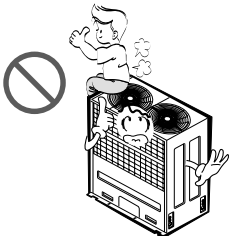
When the product is soaked (flooded or submerged), contact an Authorized Service Center.

- There is risk of fire or electric shock.



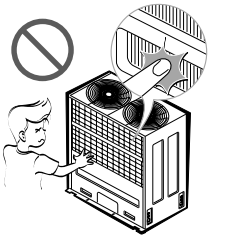
Take care to ensure that nobody could step on or fall onto the outdoor unit.

- This could result in personal injury and product damage.



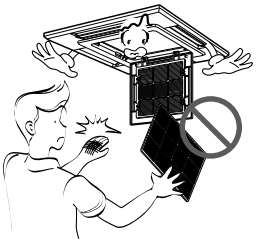
Be cautious not to touch the sharp edges when installing.

- It may cause injury.



Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)

- There is risk of physical injury, electric shock, or product failure.

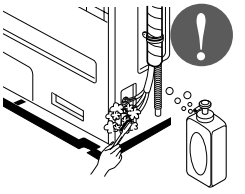


⚠ CAUTION

■ Installation

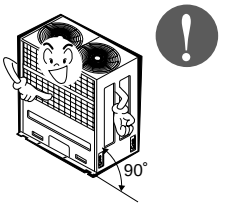
Always check for gas (refrigerant) leakage after installation or repair of product.

- Low refrigerant levels may cause failure of product.



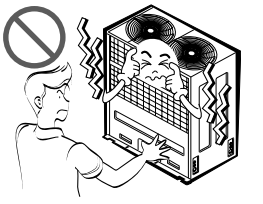
Keep level even when installing the product.

- To avoid vibration or water leakage.



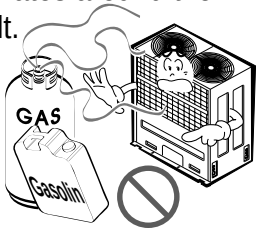
Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.

- It may cause a problem for your neighbors.



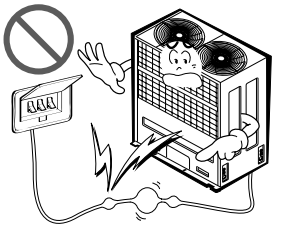
Do not install the unit where combustible gas may leak.

- If the gas leaks and accumulates around the unit, an explosion may result.



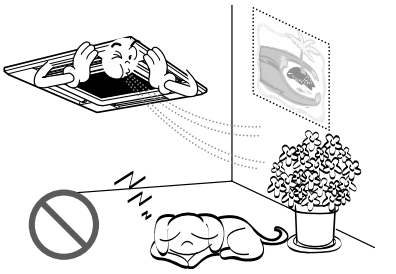
Use power cables of sufficient current carrying capacity and rating.

- Cables that are too small may leak, generate heat, and cause a fire.



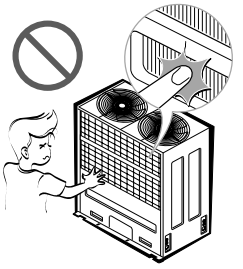
Do not use the product for special purposes, such as preserving foods, works of art, etc. It is a consumer air conditioner, not a precision refrigeration system.

- There is risk of damage or loss of property.



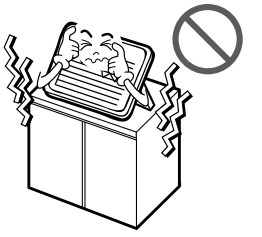
Keep the unit away from children. The heat exchanger is very sharp.

- It can cause the injury, such as cutting the finger. Also the damaged fin may result in degradation of capacity.



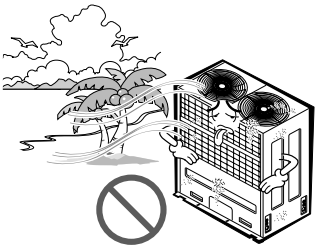
When installting the unit in a hospital, communication station, or similar place, provide sufficient protection against noise.

- The inverter equipment, private power generator, high-frequency medical equipment, or radio communication equipment may cause the air conditioner to operate erroneously, or fail to operate. On the other hand, the air conditioner may affect such equipment by creating noise that disturbs medical treatment or image broadcasting.



Do not install the product where it is exposed to sea wind (salt spray) directly.

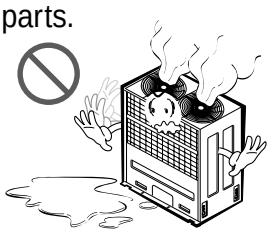
- It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.



■ Operation

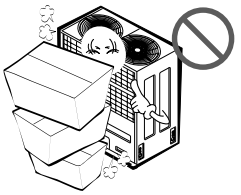
Do not use the air conditioner in special environments.

- Oil, steam, sulfuric smoke, etc. can significantly reduce the performance of the air conditioner or damage its parts.



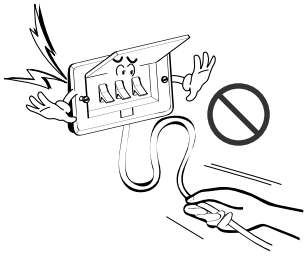
Do not block the inlet or outlet.

- It may cause failure of appliance or accident.



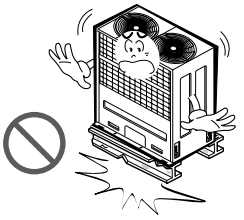
Make the connections securely so that the outside force of the cablemay not be applied to the terminals.

- Inadequate connection and fastening may generate heat and cause a fire.



Be sure the installation area does not deteriorate with age.

- If the base collapses, the air conditioner could fall with it, causing property damage, product failure, or personal injury.

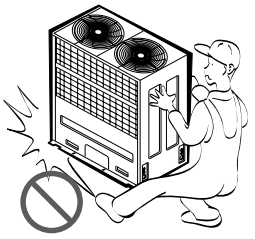


Install and insulate the drain hose to ensure that water is drained away properly based on the installation manual.

- A bad connection may cause water leakage.

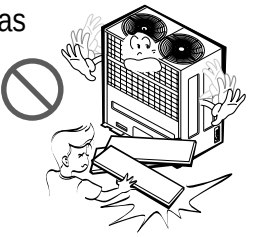
Be very careful about product transportation.

- Only one person should not carry the product if it weighs more than 20 kg.
- Some products use PP bands for packaging. Do not use any PP bands for a means of transportation. It is dangerous.
- Do not touch the heat exchanger fins. Doing so may cut your fingers.
- When transporting the Outdoor Unit, suspending it at the specified positions on the unit base. Also support the Outdoor Unit at four points so that it cannot slip sideways.



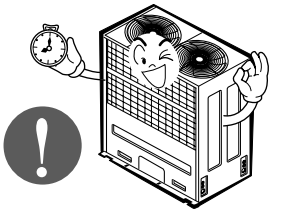
Safely dispose of the packing materials.

- Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.
- Tear apart and throw away plastic packaging bags so that children may not play with them. If children play with a plastic bag which was not torn apart, they face the risk of suffocation.



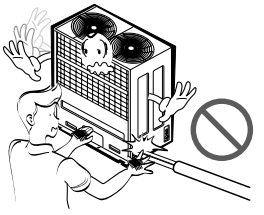
Turn on the power at least 12 hours before starting operation.(In case of outdoor temperature 5°C below)

- Starting operation immediately after turning on the main power switch can result in severe damage to internal parts. Keep the power switch turned on during the operational season.



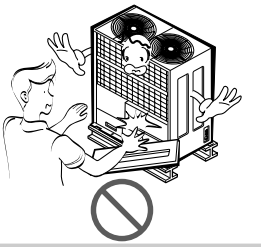
Do not touch any of the refrigerant piping during and after operation.

- It can cause a burn or frostbite.



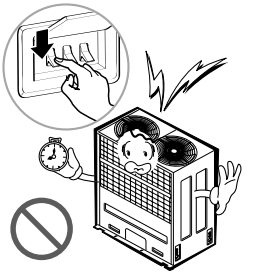
Do not operate the air conditioner with the panels or guards removed.

- Rotating, hot, or high-voltage parts can cause injuries.

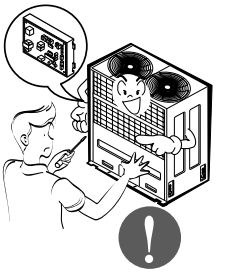


Do not directly turn off the main power switch after stopping operation.

- Wait at least 5 minutes before turning off the main power switch. Otherwise it may result in water leakage or other problems.

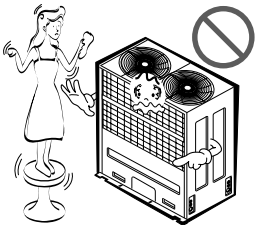


Auto-addressing should be done in condition of connecting the power of all indoor and outdoour units. Auto-addressing should also be done in case of changing the Indoor Unit board(PCB).



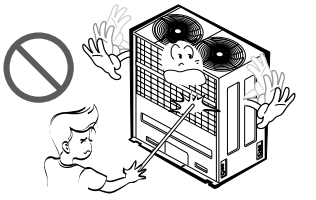
Use a firm stool or ladder when cleaning or maintaining the air conditioner.

- Be careful and avoid personal injury.

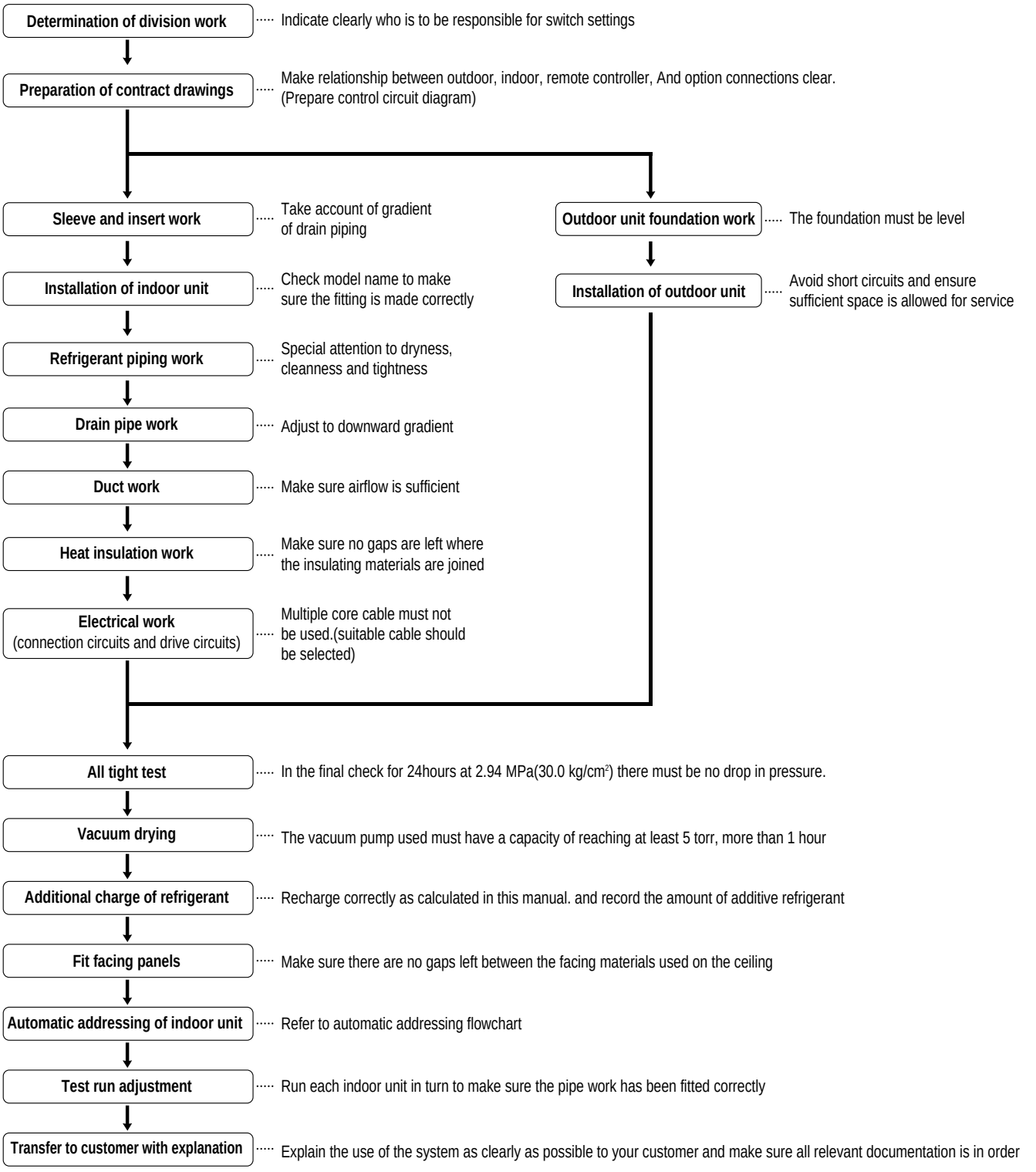


Do not insert hands or other objects through the air inlet or outlet while the air conditioner is plugged in.

- There are sharp and moving parts that could cause personal injury.



Installation Process



The above list indicates the order in which the individual work operations are normally carried out but this order may be varied where local conditions warrants such change.

Outdoor Units Information

CAUTION: A ratio of the connectable Indoor Units with the Outdoor Unit : within 50 ~ 130%

Power Supply: Outdoor Unit (3Ø, 380 ~ 415V, 50Hz)

■ Cooling Only

Unit		1 Outdoor Unit(Half size)			1 Outdoor Unit		
System(HP)		5	6	8	10	12	14
Model		LRUV508T0	LRUV608T0	LRUV808T0	LRUV1008T0	LRUV1208T0	LRUV1408T0
Product Charge	kg	5	5	6	10	10	10
CF(Correction Factor)	kg	0	0	0	-1	-1	-1
Max. Connectable No. of Indoor Units		6	8	13	16	16	16
Net Weight	kg(lbs)	150(330.7)	150(330.7)	150(330.7)	300(661.4)	300(661.4)	300(661.4)
Dimensions (W x H x D)	mm(inch)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)
Pipe Connections	Liquid Pipes(mm(inch))	Ø9.52(3/8)	Ø9.52(3/8)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)
	Gas Pipes(mm(inch))	Ø19.05(3/4)	Ø22.2(7/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)

Unit		2 Outdoor Units					3 Outdoor Units
System(HP)		16	18	20	22	24	26
Model		LRUV1608TS0	LRUV1808TS0	LRUV2008TS0	LRUV2208TS0	LRUV2408TS0	LRUV2608TR0
		LRUV808TS0	LRUV1008TS0	LRUV1008TS0	LRUV1208TS0	LRUV1208TS0	LRUV1008TR0
		LRUC808TS0	LRUC808TS0	LRUC1008TS0	LRUC1008TS0	LRUC1208TS0	LRUC808TR0
							LRUC808TR0
Product Charge	kg	10 x 2	10 x 2	10 x 2	10 x 2	10 x 2	10 x 3
CF(Correction Factor)	kg	-2	-2	-2	-2	-2	0
Max. Connectable No. of Indoor Units		20	20	20	22	24	26
Net Weight	kg(lbs)	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 3
Dimensions (W x H x D)	mm(inch)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)
Pipe Connections	Liquid Pipes(mm(inch))	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø22.2(7/8)
	Gas Pipes(mm(inch))	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø44.5(1 3/4)

Unit		3 Outdoor Units						
System(HP)		28	30	32	34	36	38	40
Model		LRUV2808TR0	LRUV3008TR0	LRUV3208TR0	LRUV3408TR0	LRUV3608TR0	LRUV3808TR0	LRUV4008TR0
		LRUV808TR0	LRUV1008TR0	LRUV1208TR0	LRUV1408TR0	LRUV1208TR0	LRUV1408TR0	LRUV1608TR0
		LRUC1008TR0	LRUC1008TR0	LRUC1008TR0	LRUC1008TR0	LRUC1208TR0	LRUC1208TR0	LRUC1208TR0
		LRUC1008TR0	LRUC1008TR0	LRUC1008TR0	LRUC1008TR0	LRUC1208TR0	LRUC1208TR0	LRUC1208TR0
Product Charge	kg	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3
CF(Correction Factor)	kg	0	0	0	1	1	2	2
Max. Connectable No. of Indoor Units		32	32	32	34	36	38	40
Net Weight	kg(lbs)	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3
Dimensions (W x H x D)	mm(inch)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)
Pipe Connections	Liquid Pipes(mm(inch))	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)
	Gas Pipes(mm(inch))	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)

■ Heat Pump

Unit		1 Outdoor Unit(Half size)		1 Outdoor Unit			
System(HP)		**5**	**6**	**8**	**10**	**12**	**14**
Model		LRUN508T0	LRUN608T0	LRUN808T0	LRUN1008T0	LRUN1208T0	LRUN1408T0
Product Charge	kg	5	5	10	10	10	10
CF(Correction Factor)	kg	0	0	-1	-1	-1	-1
Max. Connectable No. of Indoor Units		6	8	13	16	16	16
Net Weight	kg(lbs)	150(330.7)	150(330.7)	300(661.4)	300(661.4)	300(661.4)	300(661.4)
Dimensions (W x H x D)	mm(inch)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)
Pipe Connections	Liquid Pipes(mm(inch))	Ø9.52(3/8)	Ø9.52(3/8)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)
	Gas Pipes(mm(inch))	Ø19.05(3/4)	Ø22.2(7/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)

Unit		2 Outdoor Units					3 Outdoor Units
System(HP)		**16**	**18**	**20**	**22**	**24**	**26**
Model		LRUN1608TS0	LRUN1808TS0	LRUN2008TS0	LRUN2208TS0	LRUN2408TS0	LRUN2608TR0
		LRUN808TS0	LRUN1008TS0	LRUN1008TS0	LRUN1208TS0	LRUN1208TS0	LRUN1008TR0
		LRUH808TS0	LRUH808TS0	LRUH1008TS0	LRUH1008TS0	LRUH1208TS0	LRUH808TR0
							LRUH808TR0
Product Charge	kg	10 x 2	10 x 2	10 x 2	10 x 2	10 x 2	10 x 3
CF(Correction Factor)	kg	-2	-2	-2	-2	-2	0
Max. Connectable No. of Indoor Units		20	20	20	22	24	26
Net Weight	kg(lbs)	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 3
Dimensions (W x H x D)	mm(inch)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)
Pipe Connections	Liquid Pipes(mm(inch))	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø22.2(7/8)
	Gas Pipes(mm(inch))	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø44.5(1 3/4)

Unit		3 Outdoor Units						
System(HP)		**28**	**30**	**32**	**34**	**36**	**38**	**40**
Model		LRUN2808TR0	LRUN3008TR0	LRUN3208TR0	LRUN3408TR0	LRUN3608TR0	LRUN3808TR0	LRUN4008TR0
		LRUN808TR0	LRUN1008TR0	LRUN1208TR0	LRUN1408TR0	LRUN1208TR0	LRUN1408TR0	LRUN1608TR0
		LRUH1008TR0	LRUH1008TR0	LRUH1008TR0	LRUH1008TR0	LRUH1208TR0	LRUH1208TR0	LRUH1208TR0
		LRUH1008TR0	LRUH1008TR0	LRUH1008TR0	LRUH1008TR0	LRUH1208TR0	LRUH1208TR0	LRUH1208TR0
Product Charge	kg	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3
CF(Correction Factor)	kg	0	0	0	1	1	2	2
Max. Connectable No. of Indoor Units		32	32	32	34	36	38	40
Net Weight	kg(lbs)	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3
Dimensions (W x H x D)	mm(inch)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)
Pipe Connections	Liquid Pipes(mm(inch))	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)
	Gas Pipes(mm(inch))	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)

Power Supply: Outdoor Unit (3Ø, 380V, 60Hz)

■ Cooling Only

Unit		1 Outdoor Unit(Half size)			1 Outdoor Unit		
System(HP)		**5**	**6**	**8**	**10**	**12**	**14**
Model		LRUV509T0	LRUV609T0	LRUV809T0	LRUV1009T0	LRUV1209T0	LRUV1409T0
Product Charge	kg	5	5	6	10	10	10
CF(Correction Factor)	kg	0	0	0	-1	-1	-1
Max. Connectable No. of Indoor Units		6	8	13	16	16	16
Net Weight	kg(lbs)	150(330.7)	150(330.7)	150(330.7)	300(661.4)	300(661.4)	300(661.4)
Dimensions (W x H x D)	mm(inch)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)
Pipe Connections	Liquid Pipes(mm(inch))	Ø9.52(3/8)	Ø9.52(3/8)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)
	Gas Pipes(mm(inch))	Ø19.05(3/4)	Ø22.2(7/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)

Unit		2 Outdoor Units					
System(HP)		**16**	**18**	**20**	**22**	**24**	**26**
Model		LRUV1609TS0	LRUV1809TS0	LRUV2009TS0	LRUV2209TS0	LRUV2409TS0	LRUV2609TS0
		LRUV809TS0	LRUV1009TS0	LRUV1009TS0	LRUV1209TS0	LRUV1209TS0	LRUV1409TS0
		LRUC809TS0	LRUC809TS0	LRUC1009TS0	LRUC1009TS0	LRUC1209TS0	LRUC1209TS0
Product Charge	kg	10 x 2	10 x 2	10 x 2	10 x 2	10 x 2	10 x 2
CF(Correction Factor)	kg	-2	-2	-2	-2	-2	-1
Max. Connectable No. of Indoor Units		20	20	20	22	24	26
Net Weight	kg(lbs)	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2
Dimensions (W x H x D)	mm(inch)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2) ((50.4 x 61.2 x 28.7) x 2)
Pipe Connections	Liquid Pipes(mm(inch))	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)
	Gas Pipes(mm(inch))	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)

Unit		3 Outdoor Units						
System(HP)		**28**	**30**	**32**	**34**	**36**	**38**	**40**
Model		LRUV2809TR0	LRUV3009TR0	LRUV3209TR0	LRUV3409TR0	LRUV3609TR0	LRUV3809TR0	LRUV4008TR0
		LRUV809TR0	LRUV1009TR0	LRUV1209TR0	LRUV1409TR0	LRUV1209TR0	LRUV1409TR0	LRUV1609TR0
		LRUC1009TR0	LRUC1009TR0	LRUC1009TR0	LRUC1009TR0	LRUC1209TR0	LRUC1209TR0	LRUC1209TR0
		LRUC1009TR0	LRUC1009TR0	LRUC1009TR0	LRUC1009TR0	LRUC1209TR0	LRUC1209TR0	LRUC1209TR0
Product Charge	kg	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3
CF(Correction Factor)	kg	0	0	0	1	1	2	2
Max. Connectable No. of Indoor Units		32	32	32	34	36	38	40
Net Weight	kg(lbs)	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3
Dimensions (W x H x D)	mm(inch)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)
Pipe Connections	Liquid Pipes(mm(inch))	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)
	Gas Pipes(mm(inch))	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)

■ Heat Pump

Unit		1 Outdoor Unit(Half size)		1 Outdoor Unit			
System(HP)		**5**	**6**	**8**	**10**	**12**	**14**
Model		LRUN509T0	LRUN609T0	LRUN809T0	LRUN1009T0	LRUN1209T0	LRUN1409T0
Product Charge	kg	5	5	10	10	10	10
CF(Correction Factor)	kg	0	0	-1	-1	-1	-1
Max. Connectable No. of Indoor Units		6	8	13	16	16	16
Net Weight	kg(lbs)	150(330.7)	150(330.7)	300(661.4)	300(661.4)	300(661.4)	300(661.4)
Dimensions (W x H x D)	mm(inch)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7
Pipe Connections	Liquid Pipes(mm(inch))	Ø9.52(3/8)	Ø9.52(3/8)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)
	Gas Pipes(mm(inch))	Ø19.05(3/4)	Ø22.2(7/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)

Unit		2 Outdoor Units					
System(HP)		**16**	**18**	**20**	**22**	**24**	**26**
Model		LRUN1609TS0	LRUN1809TS0	LRUN2009TS0	LRUN2209TS0	LRUN2409TS0	LRUN2609TS0
		LRUN809TS0	LRUN1009TS0	LRUN1009TS0	LRUN1209TS0	LRUN1209TS0	LRUN1409TS0
		LRUH809TS0	LRUH809TS0	LRUH1009TS0	LRUH1009TS0	LRUH1209TS0	LRUH1209TS0
Product Charge	kg	10 x 2	10 x 2	10 x 2	10 x 2	10 x 2	10 x 2
CF(Correction Factor)	kg	-2	-2	-2	-2	-2	-1
Max. Connectable No. of Indoor Units		20	20	20	22	24	26
Net Weight	kg(lbs)	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2	300(661.4) x 2
Dimensions (W x H x D)	mm(inch)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730)) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)
Pipe Connections	Liquid Pipes(mm(inch))	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)	Ø19.05(3/4)
	Gas Pipes(mm(inch))	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)	Ø38.1(1 1/2)

Unit		3 Outdoor Units						
System(HP)		**28**	**30**	**32**	**34**	**36**	**38**	**40**
Model		LRUN2809TR0	LRUN3009TR0	LRUN3209TR0	LRUN3409TR0	LRUN3609TR0	LRUN3809TR0	LRUN4009TR0
		LRUN809TR0	LRUN1009TR0	LRUN1209TR0	LRUN1409TR0	LRUN1209TR0	LRUN1409TR0	LRUN1609TR0
		LRUH1009TR0	LRUH1009TR0	LRUH1009TR0	LRUH1009TR0	LRUH1209TR0	LRUH1209TR0	LRUH1209TR0
		LRUH1009TR0	LRUH1009TR0	LRUH1009TR0	LRUH1009TR0	LRUH1209TR0	LRUH1209TR0	LRUH1209TR0
Product Charge	kg	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3	10 x 3
CF(Correction Factor)	kg	0	0	0	1	1	2	2
Max. Connectable No. of Indoor Units		32	32	32	34	36	38	40
Net Weight	kg(lbs)	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3	300(661.4) x 3
Dimensions (W x H x D)	mm(inch)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)
Pipe Connections	Liquid Pipes(mm(inch))	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)	Ø22.2(7/8)
	Gas Pipes(mm(inch))	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)	Ø44.5(1 3/4)

Power Supply: Outdoor Unit (3Ø, 220V, 60Hz)

■ Cooling Only

Unit		1 Outdoor Unit(Half size)		1 Outdoor Unit			2 Outdoor Units	3 Outdoor Units
System(HP)		5	6	8	10	12	20	30
Model		LRUV50BT0	LRUV60BT0	LRUV80BT0	LRUV100BT0	LRUV120BT0	LRUV200BTS0	LRUV300BTR0
							LRUV100BTS0	LRUV100BTR0
							LRUC100BTS0	LRUC100BTR0
								LRUC100BTR0
Product Charge	kg	5	5	10	10	10	10 x 2	10 x 3
CF(Correction Factor)	kg	0	0	-1	-1	-1	-2	0
Max. Connectable No. of Indoor Units		6	8	13	16	16	20	32
Net Weight	kg(lbs)	150(330.7)	150(330.7)	300(661.4)	300(661.4)	300(661.4)	300(661.4) x 2	300(661.4) x 3
Dimensions (W x H x D)	mm(inch)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)
Pipe Connections	Liquid Pipes(mm(inch))	Ø9.52(3/8)	Ø9.52(3/8)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)	Ø19.05(3/4)	Ø22.2(7/8)
	Gas Pipes(mm(inch))	Ø19.05(3/4)	Ø22.2(7/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)	Ø28.58(1 1/8)	Ø38.1(1 1/2)	Ø44.5(1 3/4)

■ Heat Pump

Unit		1 Outdoor Unit(Half size)		1 Outdoor Unit			2 Outdoor Units	3 Outdoor Units
System(HP)		5	6	8	10	12	20	30
Model		LRUN50BT0	LRUN60BT0	LRUN80BT0	LRUN100BT0	LRUN120BT0	LRUN200BTS0	LRUN300BTR0
							LRUN100BTS0	LRUN100BTR0
							LRUH100BTS0	LRUH100BTR0
								LRUH100BTR0
Product Charge	kg	5	5	10	10	10	10 x 2	10 x 3
CF(Correction Factor)	kg	0	0	-1	-1	-1	-2	0
Max. Connectable No. of Indoor Units		6	8	13	16	16	20	32
Net Weight	kg(lbs)	150(330.7)	150(330.7)	300(661.4)	300(661.4)	300(661.4)	300(661.4) x 2	300(661.4) x 3
Dimensions (W x H x D)	mm(inch)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	806 x 1555 x 730 (31.7 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	1280 x 1555 x 730 (50.4 x 61.2 x 28.7)	(1280 x 1555 x 730) x 2 ((50.4 x 61.2 x 28.7) x 2)	(1280 x 1555 x 730) x 3 ((50.4 x 61.2 x 28.7) x 3)
Pipe Connections	Liquid Pipes(mm(inch))	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)	Ø12.7(1/2)	Ø19.05(3/4)	Ø22.2(7/8)
	Gas Pipes(mm(inch))	Ø19.05(3/4)	Ø19.05(3/4)	Ø28.58(9/8)	Ø28.58(9/8)	Ø28.58(9/8)	Ø38.1(1 1/2)	Ø44.5(1 3/4)

Select the Best Location

Select space for installing Outdoor Unit, which will meet the following conditions:

- No direct thermal radiation from other heat sources
- No possibility of annoying the neighbors by noise from unit
- No exposition to strong wind
- With strength which bears weight of unit
- Note that drain flows out of unit when heating
- With space for air passage and service work shown next
- Because of the possibility of fire, do not install unit to the space where generation, inflow, stagnation, and leak of combustible gas is expected.
- Avoid unit installation in a place where acidic solution and spray (sulfur) are often used.
- Do not use unit under any special environment where oil, steam and sulfuric gas exist.
- It is recommended to fence round the Outdoor Unit in order to prevent any person or animal from accessing the Outdoor Unit.
- If installation site is area of heavy snowfall, then the following directions should be observed.
  - Make the foundation as high as possible.
  - Fit a snow protection hood.

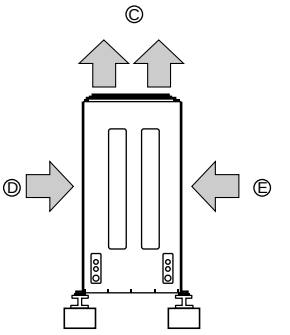
Installation Space

Individual Installation

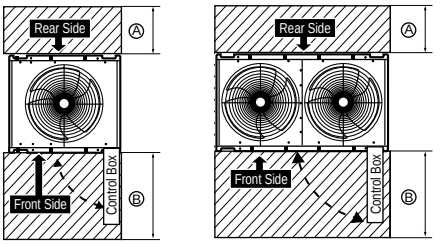
■ Basic space required

A space of at least 250 mm is necessary at the back for inlet air. Taking servicing, etc. from the rear into account, a space of about 900 mm should be provided, the same as at the front.

Ⓐ 250 mm or more
Ⓑ 900 mm or more (Control box is of a open/close type)
Ⓒ Top discharge (open in principle)
Ⓓ Front inlet (open in principle)
Ⓔ Rear inlet (open in principle)



< Side view >



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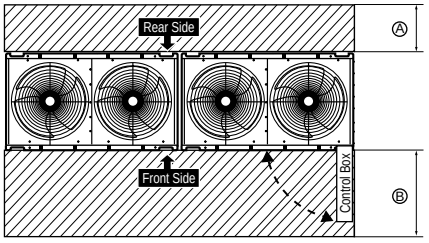
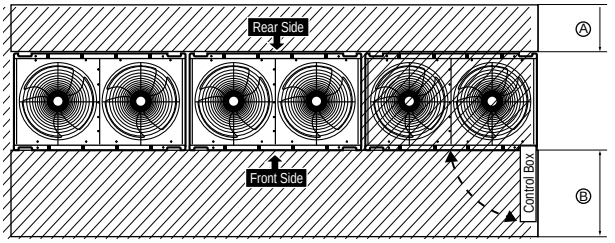


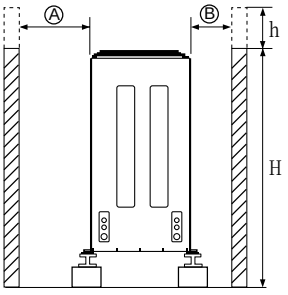


■ When inlet air enters from right and left sides of unit

Ⓐ 900 mm or more(Control box is of a open/close type)
Ⓑ 250 mm or more
Ⓒ 150 mm from the wall

CAUTION

Wall height(H) must not exceed height of the product. If the wall height is higher than the whole height of product by (h), Add (h) to Ⓐ, Ⓑ.



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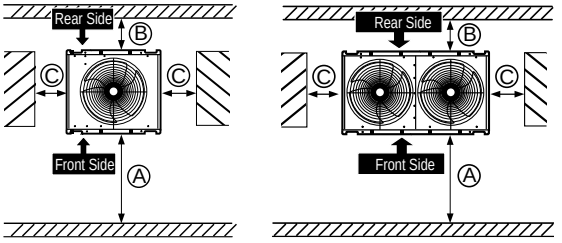

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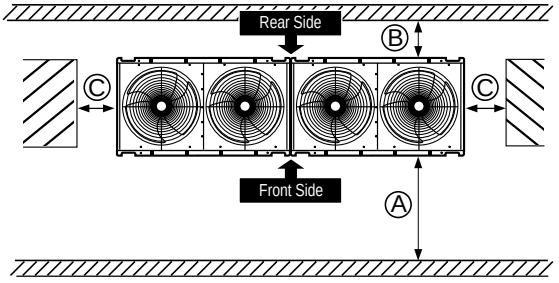
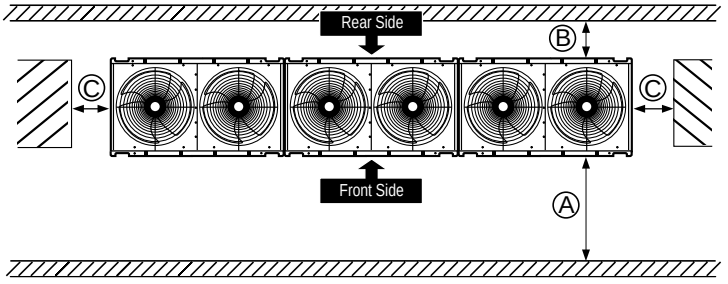
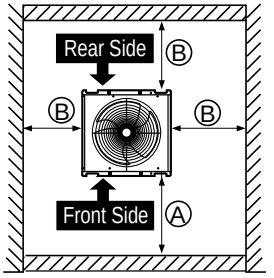


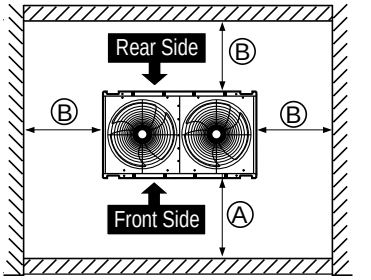


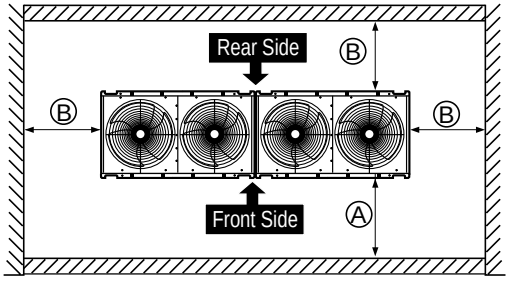
■ When unit is surrounded by walls

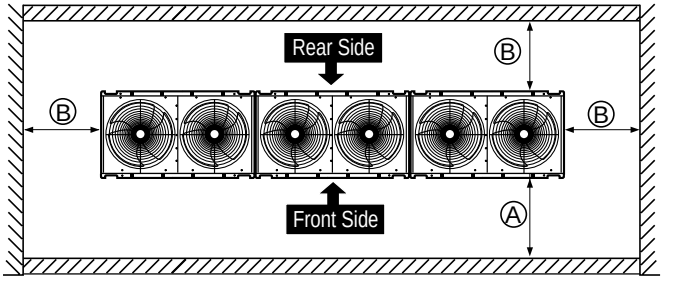
Ⓐ 900 mm or more (Control box is of a open/close type)

Ⓑ 250 mm or more







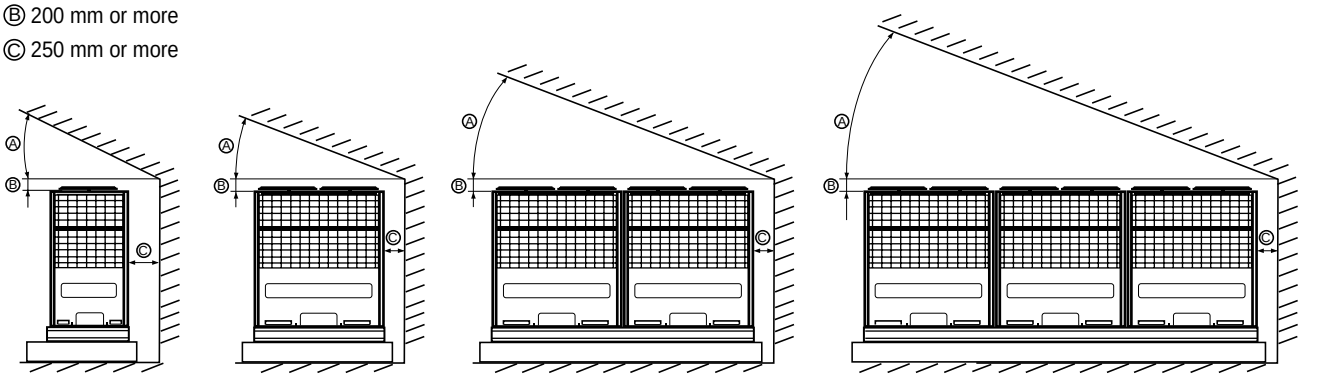


■ When there is an obstruction above the unit

Ⓐ 45° or more

Ⓑ 200 mm or more

Ⓒ 250 mm or more

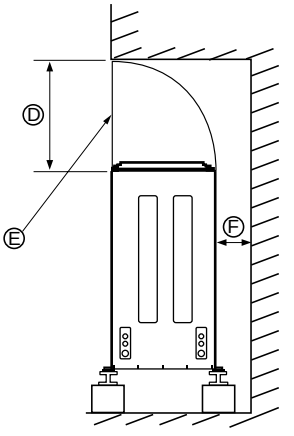


< Front view >

Ⓓ 1000 mm or more

Ⓔ Air outlet guide (Procured at the site)

Ⓕ 250 mm or more



< Side view >

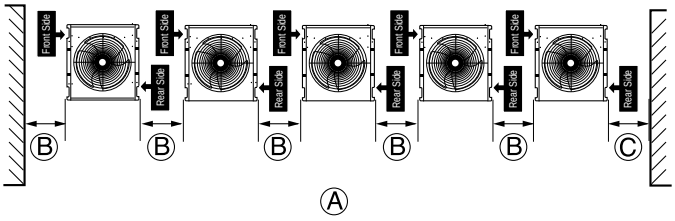
Collective / Continuous installation

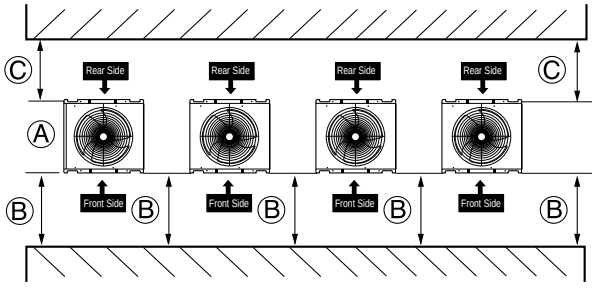
Space required for collective installation and continuous installation:When installing several units, leave the space between each block as shown below considering passage for air and people.

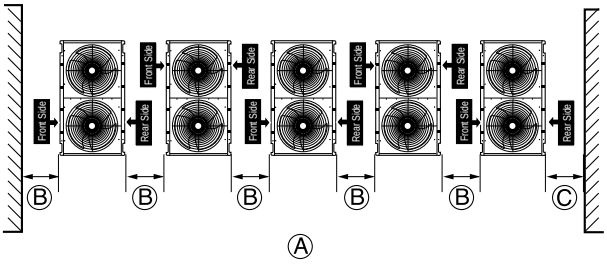
Ⓐ (Be opened)

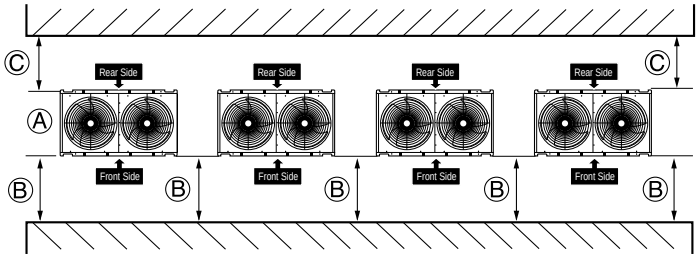
Ⓑ 900mm or more (control box is of a open/close type)

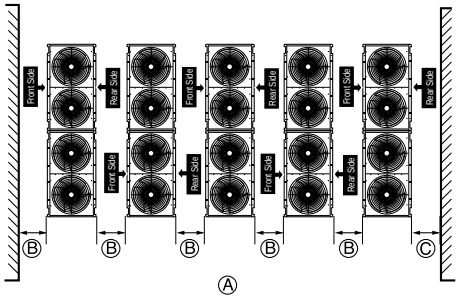
Ⓒ 250 mm or more

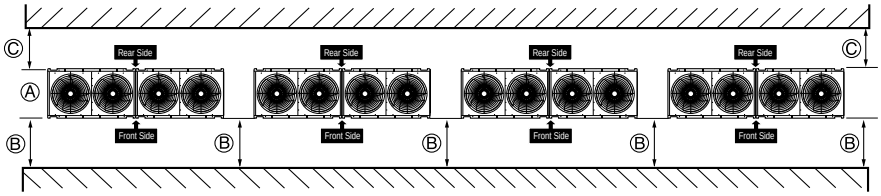


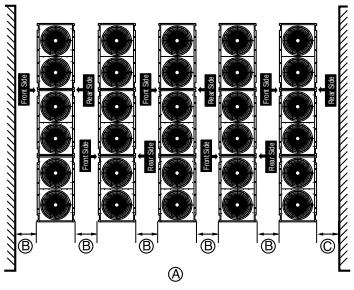


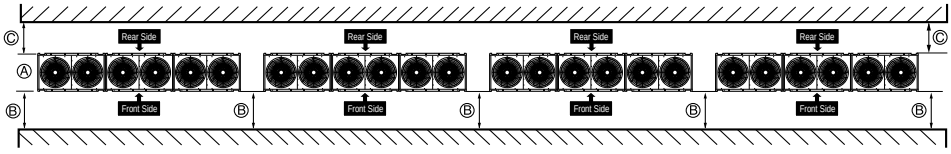












Seasonal wind and cautions in winter

- Sufficient measures are required at a snow area or severe cold area in winter so that product can be operated well.
- Get ready for seasonal wind or snow in winter even in other area.
- Install a suction and discharge duct not to let in snow or rain when the product operates at outdoor temperature of less than 10°C.
- Install the outdoor unit not to come in contact with snow directly. If snow piles up and freezes on the air suction hole, the system may malfunction. If it is installed at snowy area, attach the hood to the system.
- Install the outdoor unit at the higher installation console by 50cm than the average snowfall (annual average snowfall) if it is installed at the area with much snowfall.
- Where snow accumulated on the upper part of the Outdoor Unit by more than 10cm, always remove snow for operation.

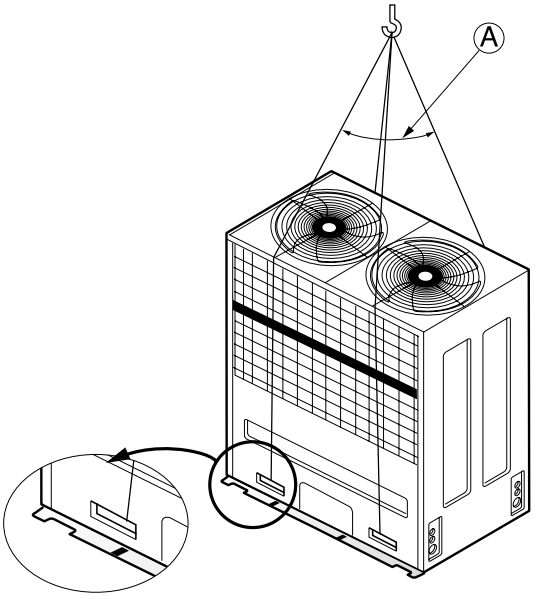
1. The height of H frame must be more than 2 times the snowfall and its width shall not exceed the width of the product. (If width of the frame is wider than that of the product, snow may accumulate)
2. Don't install the suction hole and discharge hole of the Outdoor Unit facing to the seasonal wind.

Lifting method

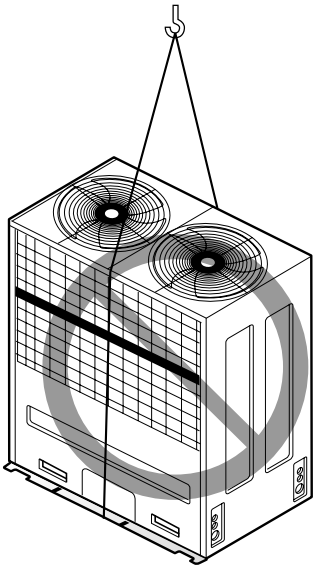
• When carrying the unit suspended, pass the ropes under the unit and use the two suspension points each at the front and rear.

• Always lift the unit with ropes attached at four points so that impact is not applied to the unit.

• Attach the ropes to the unit at an angle of 40° or less.



Ⓐ 40° or less



WARNING

CAUTION

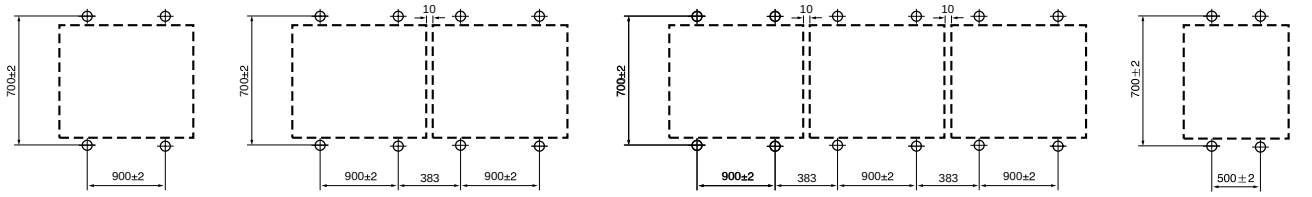
Be very careful to carry product.

- Do not have only one person carry product if it is more than 20 kg.
- PP bands are used to pack some products. Do not use them as a mean for transportation because they are dangerous.
- Do not touch heat exchanger fins with your bare hands. Otherwise you may get a cut in your hands.
- Tear plastic packaging bag and scrap it so that children cannot play with it. Otherwise plastic packaging bag may suffocate children to death.
- When carrying in Outdoor Unit, be sure to support it at four points. Carrying in and lifting with 3-point support may make Outdoor Unit unstable, resulting in a fall of it.

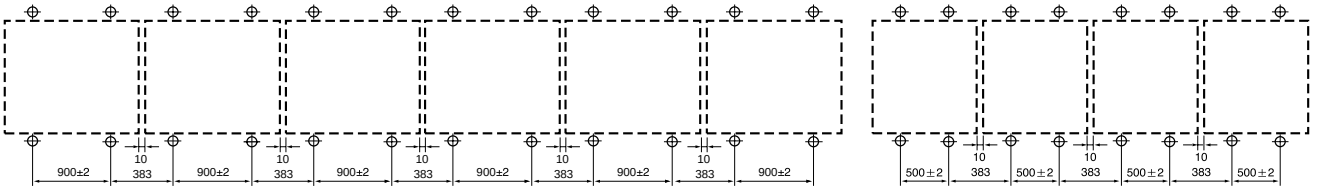
Installation

Location of anchor bolt

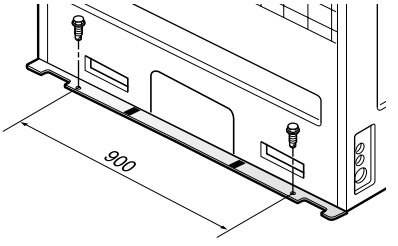
■ Individual installation

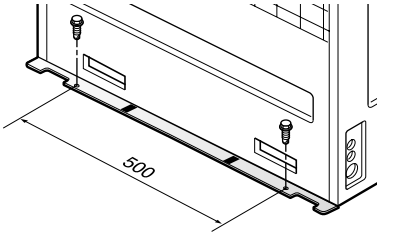


■ Example of collective installation



■ Installation foot (Location of anchor bolt)

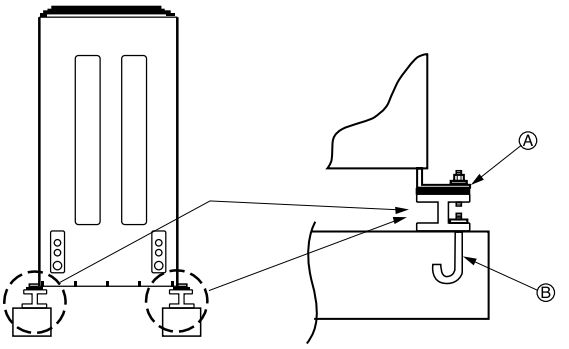


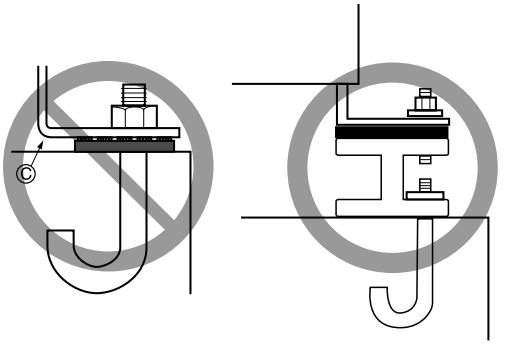


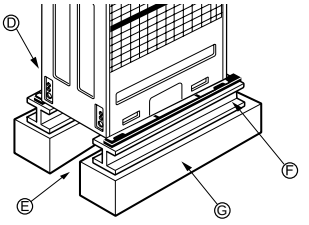
Half size

Foundation for Installation

- Fix the unit tightly with bolts as shown below so that unit will not fall down due to earthquake or gust.
- Use the H-beam support as a base support
- Noise and vibration may occur from the floor or wall since vibration is transferred through the installation part depending on installation status. Thus, use anti-vibration materials (cushion pad) fully (The base pad shall be more than 200mm).







Ⓐ Ensure that the corner part can be securely mounted. Otherwise, the support for installation may be bent.

Ⓑ Obtain and use the M10 anchor bolt.

Ⓒ The corner was not properly mounted.

Ⓓ Outdoor unit (Insert the cushion pad between outdoor unit and base support to ensure that anti-vibration may be done in a wide area)

Ⓔ Pipe and wiring space (in case of piping and wiring on the floor surface)

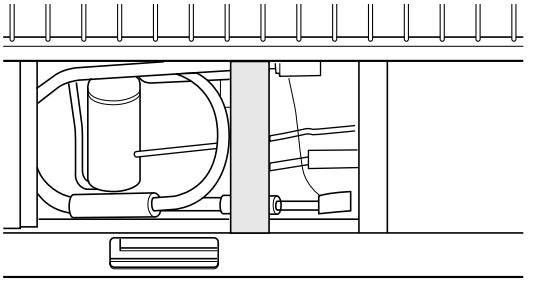
Ⓕ H-Beam support

Ⓖ Concrete base support

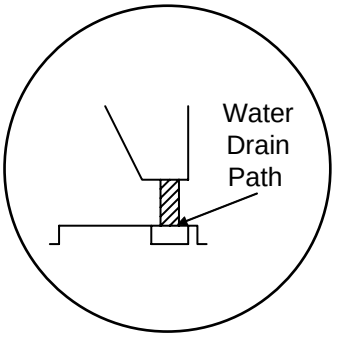
WARNING

- **Be sure to install unit in a place strong enough to withstand its weight.**
  Any lack of strength may cause unit to fall down, resulting in a personal injury.
- **Have installation work in order to protect against a strong wind and earthquake. Any installation deficiency may cause unit to fall down, resulting in a personal injury.**
- **Especially take care for support strength of the floor surface, water drain processing (processing of water flown out from the Outdoor Unit during operation) and paths of the pipe and wiring when making a base support.**
- **Don't use a tube or pipe for water drain in the base pan and perform water drain processing by using the drain path. Water drain may not be done due to freezing of a tube or pipe.**

Rear Side



Side Side

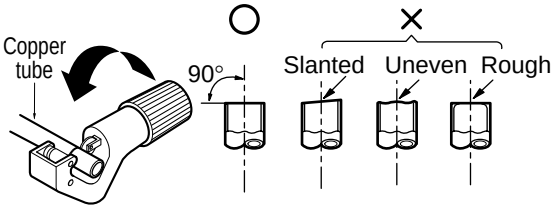


Preparation of Piping

Main cause of gas leakage is defect in flaring work. Carry out correct flaring work in the following procedure.

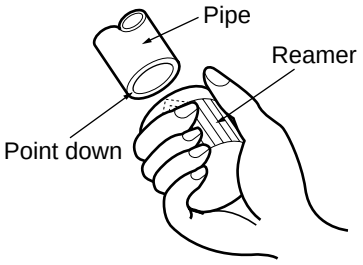
1) Cut the pipes and the cable.

- Use the accessory piping kit or the pipes purchased locally.
- Measure the distance between the indoor and the Outdoor Unit.
- Cut the pipes a little longer than measured distance.
- Cut the cable 1.5m longer than the pipe length.



2) Burrs removal

- Completely remove all burrs from the cut cross section of pipe/tube.
- Put the end of the copper tube/pipe to downward direction as you remove burrs in order to avoid to let burrs drop in the tubing.



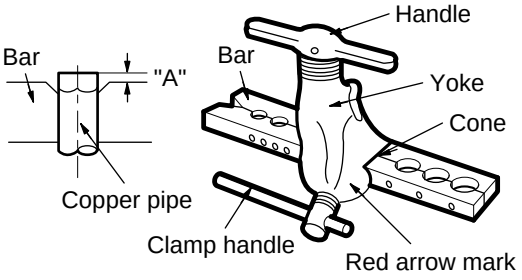
3) Flaring work

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

Indoor Unit [kW(Btu/h]	Pipe		" A "	
	Gas	Liquid	Gas	Liquid
~4.0(13,600)	1/2"	1/4"	0.5~0.8	0~0.5
~9.0(30,700)	5/8"	3/8"	0.8~1.0	0.5~0.8
~15.0(51,200)	3/4"	3/8"	1.0~1.3	0.5~0.8

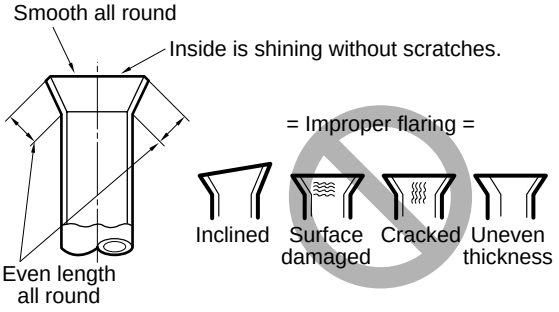
Exception)
Wide Art Cool(4.0kW(13,600 Btu/h): Gas pipe(5/8"), Liquid pipe(3/8")

Firmly hold copper tube in a bar(or die) as indicated dimension in the table above.



4) Check

- Compare the flared work with figure below.
- If flare is noted to be defective, cut off the flared section and do flaring work again.



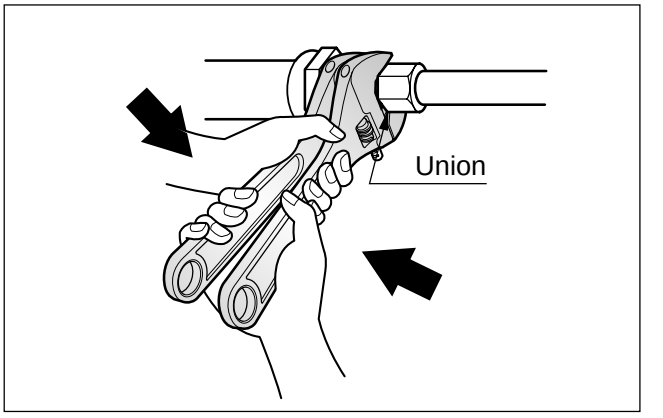
Piping Connection

1. Form the piping according to its routing. Avoid bending and bending back the same piping point more than three times. (This will result in hardening the pipe.)
2. After deforming the piping, align centers of the union fitting of the Indoor Unit and the piping, and tighten them firmly with wrenches.
3. Connect pipe to the service valve or ball valve which is located below the Outdoor Unit.
4. After completing the piping connection, be sure to check if there is gas leakage in indoor and outdoor connection.

CAUTION

Use two wrenches and tighten with regular torque.

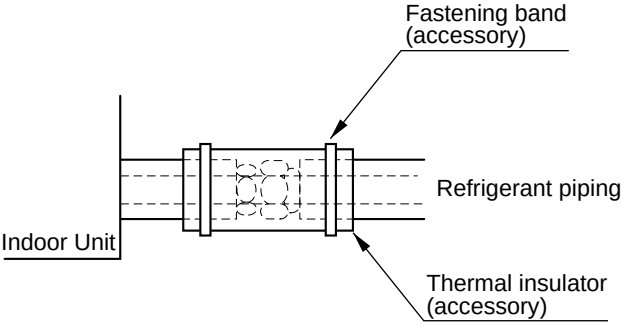
Pipe size	Flare nut fastening torque (N·m)
Ø6.35mm	14~18
Ø9.52mm	35~42
Ø12.7mm	50~57.5
Ø15.88mm	75~80
Ø19.05mm	100~140



HEAT INSULATION

1. Use the heat insulation material for the refrigerant piping which has an excellent heat-resistance (over 120°C).

2. Precautions in high humidity circumstance:
   This air conditioner has been tested according to the "KS Standard Conditions with Mist" and confirmed that there is not any default. However, if it is operated for a long time in high humid atmosphere (dew point temperature: more than 23°C), water drops are liable to fall. In this case, add heat insulation material according to the following procedure:
   - Heat insulation material to be prepared... Adiabatic glass wool with thickness 10 to 20mm.
   - Stick glass wool on all air conditioners that are located in ceiling atmosphere.
   - In addition to the normal heat insulation (thickness: more than 8mm) for refrigerant piping (gas piping: thick piping) and drain piping, add further 10mm to 30mm thickness material.



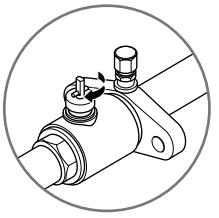
Refrigerant piping installation

The method of connection consists of flare connections at the Indoor Units, flange connections for the piping of the Outdoor Unit and flare connections for the liquid piping. Note that the branched sections are brazed.

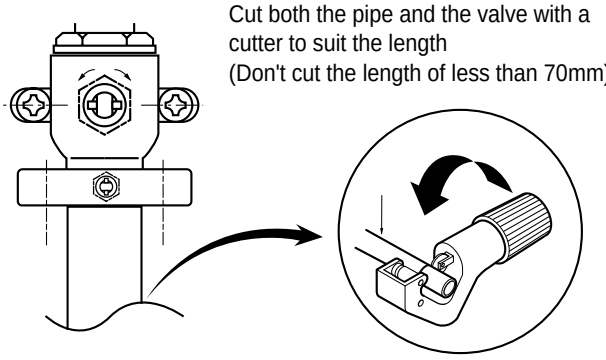
WARNING

Always use extreme care to prevent the refrigerant gas (R22) from the leakage while using fire or flame. If the refrigerant gas comes in contact with the flame from any source, such as a gas stove, it breaks down and generates a poisonous gas which can cause gas poisoning. Never weld in an unventilated room. Always conduct an inspection for gas leakage after installation of the refrigerant piping has been completed.

Cautions in pipe connection/valve operation



Open status when both the pipe and the valve are in a straight line.



Cut both the pipe and the valve with a cutter to suit the length
(Don't cut the length of less than 70mm)

WARNING

After completing work, securely tighten both service ports and caps so that gas does not leak.

① Pipe joint (auxiliary parts): Securely perform welding by passing nitrogen through the service valve port.

② Flare nut: Loose or tighten flare nut by using the wrench with both ends. Coat the flare connection part with oil for a refrigerator.

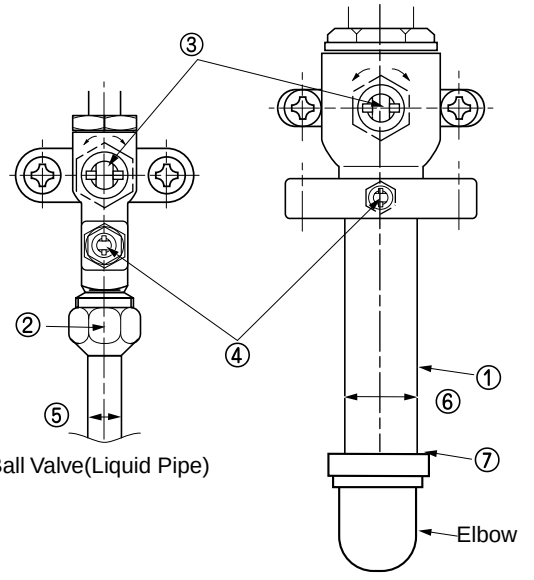
③ Cap: Remove caps and operate valve, etc. After operation, always reattach caps (tightening torque of valve cap: 25Nm (250kg-cm) or more).

④ Service port: Make the refrigerant pipe empty and use the service port for filling additional refrigerant. Always reattach caps after completing work (tightening torque of service cap: 14Nm (140kg-cm) or more).

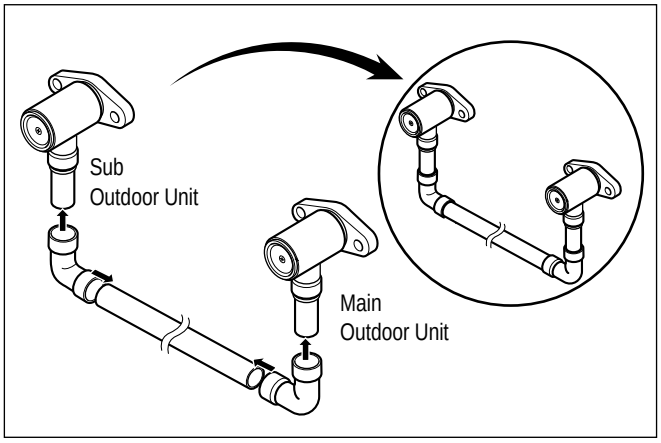
⑤ Liquid pipe

⑥ Gas pipe

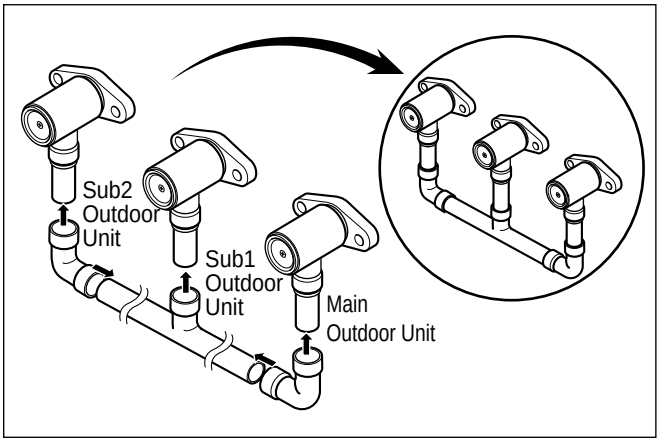
⑦ Elbow joint: Elbow welding (Non-acid welding in welding)



Connection of High/Low Pressure Common pipe



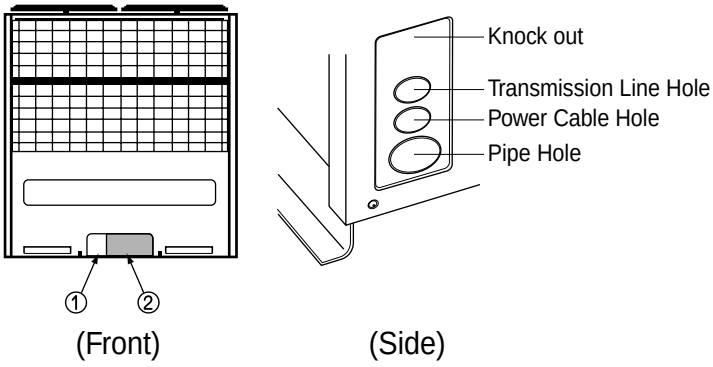
2 Outdoor Units



3 Outdoor Units

1. For the High/Low Pressure Common pipe, connect both Main Outdoor Unit and Sub (1, 2) Outdoor Unit to the pipe by using elbows supplied field.
2. For cutting the pipe, connect the High/Low Pressure Common pipe after removing burrs, dusts and foreign materials within the pipe. Otherwise, the product may not operate due to sludge within the pipe.
3. For leakage inspection of the work part, pressurize nitrogen gas by 2.94MPa (30kgf/cm^2).
4. Continue vacuum work after the vacuum degree reaches to 5Torr
5. Open side bar with the hex wrench.

Connect the pipe by using Gas pipe Pressure connection elbow. For installing the pipe in the front after cutting ① part in a saw, install the only ② pipe knock out hole part. For installing the pipe in side, install the whole of pipe knock out.



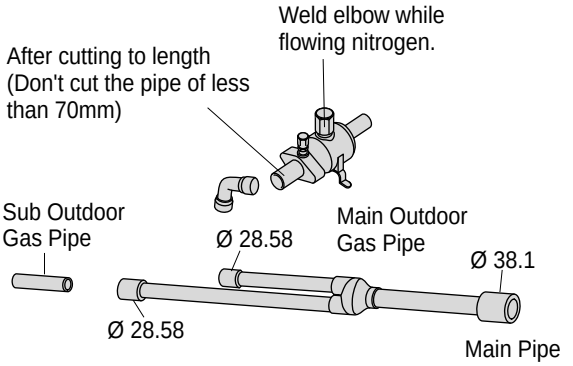
WARNING

After installing the pipe, clog the pipe excavation inlet of the front panel and the side panel (Wire may be damaged due to entering of rats, animals, etc).

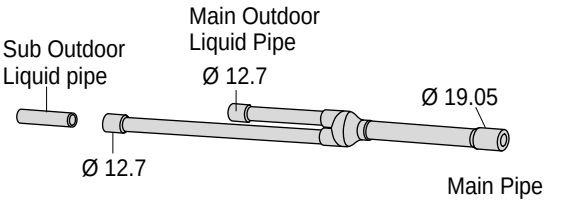
Connection of Liquid(Gas) pipe

2 Outdoor Units

Connection of Gas pipe



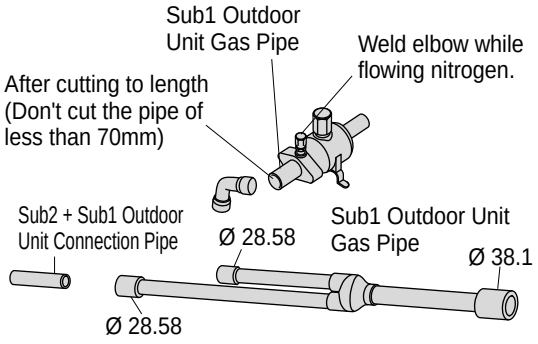
Connection of Liquid pipe



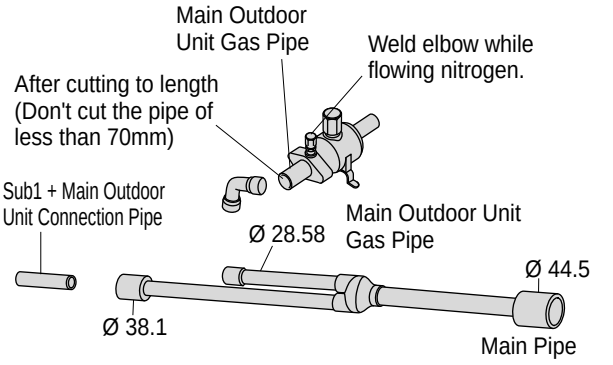
❋ Branch Pipe for Connection between Outdoor Units: ARBL202C

3 Outdoor Units

Connection of Gas pipe

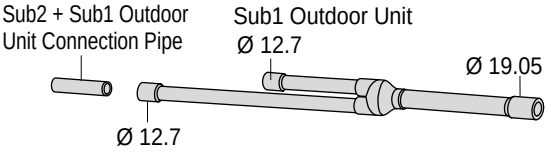


❋ Branch Pipe for Connection between Outdoor Units: ARBL202C

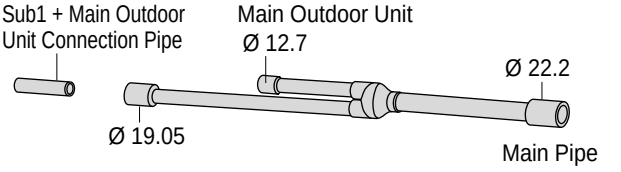


❋ Branch Pipe for Connection between Outdoor Units: ARBL302C

Connection of Liquid pipe



❋ Branch Pipe for Connection between Outdoor Units: ARBL202C



❋ Branch Pipe for Connection between Outdoor Units: ARBL302C

⚠ CAUTION

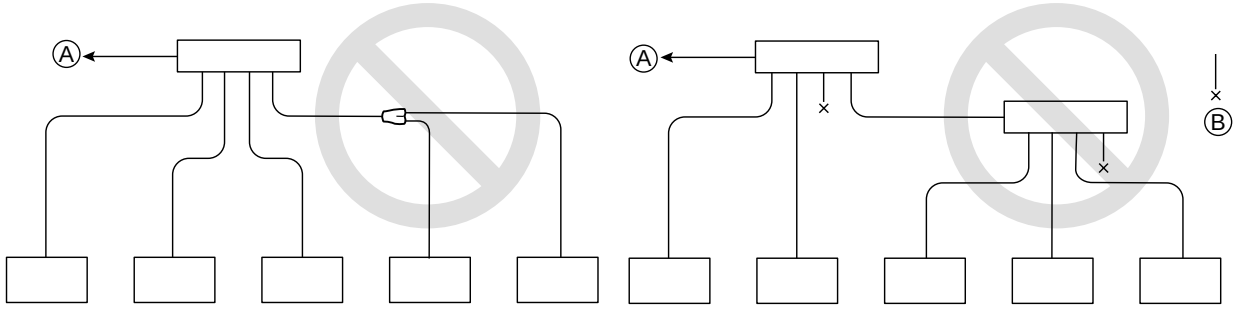
Both the High/Low Pressure Common pipe and the Liquid pipe shall be insulated by insulation material.

Caution

1. Use the following materials for refrigeration piping.
   • Material: Seamless phosphorous deoxidized copper pipe
2. Commercially available piping often contains dust and other materials. Always blow it clean with a dry inert gas.
3. Use care to prevent dust, water or other contaminants from entering the piping during installation.
4. Reduce the number of bending portions as much as possible, and make bending radius as big as possible.
5. Always use the branch piping set shown below, which are sold separately.

Y branch				Header		
				4 branch	7 branch	10 branch
ARBL052S	ARBL102S	ARBL202S	ARBL302S	ARBL054	ARBL057	ARBL1010
ARBL052L	ARBL102L	ARBL202L	ARBL302L	ARBL104	ARBL107	ARBL2010
	ARBL102G	ARBL202M				

6. If the diameters of the branch piping of the designated refrigerant piping differs, use a pipe cutter to cut the connecting section and then use an adapter for connecting different diameters to connect the piping.
7. Always observe the restrictions on the refrigerant piping (such as rated length, the difference between high/low pressures and piping diameter).
   Failure to do so can result in equipment failure or a decline in heating/cooling performance.
8. A second branch cannot be made after a header. (These are shown by ⃠.)



Ⓐ To Outdoor Unit
Ⓑ Capped Piping

9. The Multi V will stop due to an abnormality like excessive or insufficient refrigerant. At such a time, always properly charge the unit. When servicing, always check the notes concerning pipe length and amount of additional refrigerant at both locations.
10. **Never perform a pump down. This will not only damage the compressor but also deteriorate the performance.**
11. **Never use refrigerant to perform an air purge. Always evacuate using a vacuum pump.**
12. Always insulate the piping properly. Insufficient insulation will result in a decline in heating/cooling performance, water drops from condensation and other such problems.
13. When connecting the refrigerant piping, make sure the service valves of the Outdoor Unit is completely closed (the factory setting) and do not operate it until the refrigerant piping for the Outdoor and Indoor Units has been connected, a refrigerant leakage test has been performed and the evacuation process has been completed.
14. Always use a non-oxidizing brazing material for brazing the parts. If a non-oxidizing brazing material is used, it could cause clogging or damage to the compressor unit.

WARNING

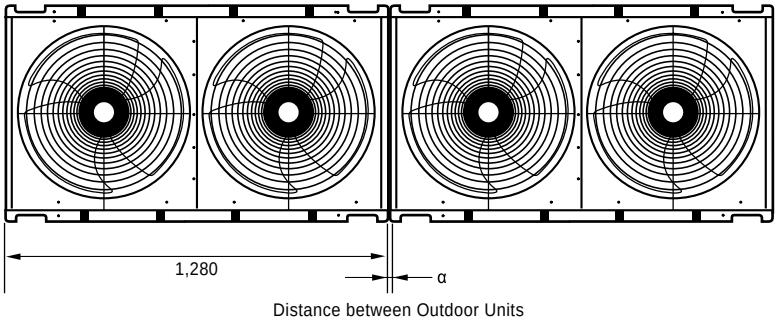
When installing and moving the air conditioner to another site, be sure to make recharge refrigerant after perfect evacuation.

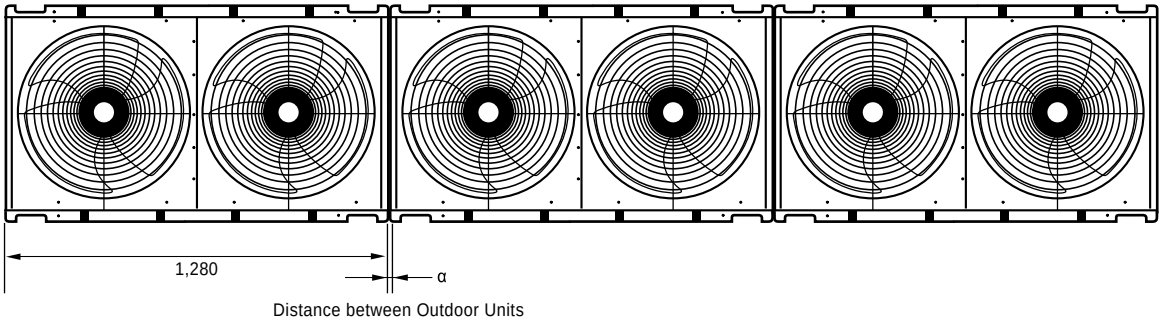
- If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.
- After selecting diameter of the refrigerant pipe to suit total capacity of the Indoor Unit connected after branching, use an appropriate branch pipe set according to the pipe diameter of the Indoor Unit and the installation pipe drawing.

Pipe length between Outdoor Units (Gas pipe, Liquid pipe, High/Low Pressure Common pipe)

= Product length (1,280) + α (distance between Outdoor Units)

Unit: mm





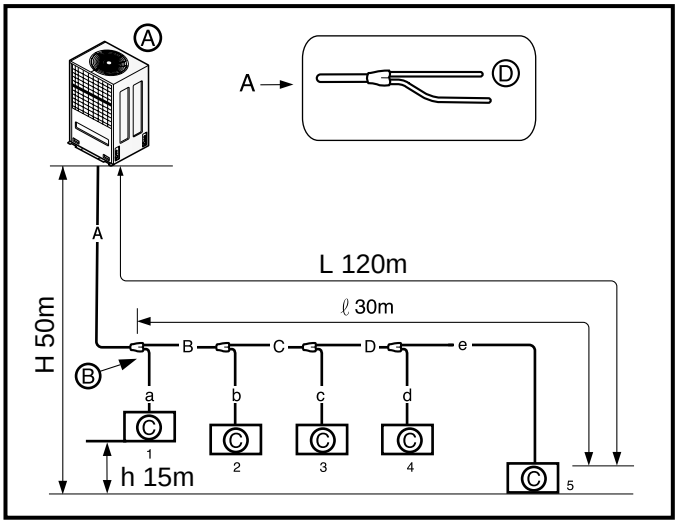
Refrigerant piping system

◆ Y branch method

1 Outdoor Unit(Half size)

Example : 5 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : 1st branch (Y branch)
Ⓒ : Indoor Units
Ⓓ : Downward Indoor Unit



◐ Main pipe diameter (A)

◐ Refrigerant pipe diameter from branch to branch (B,C,D)

Downward Indoor Unit total capacity [kW(Btu/h)]	Liquid pipe (mm)	Gas pipe (mm)
~8.3(28,300)	Ø9.52(3/8 inch)	Ø15.88(5/8 inch)
~17.8(60,700)	Ø12.7(1/2 inch) / ※9.52(3/8 inch)	Ø19.05(3/4 inch)
~27.9(95,200)	Ø12.7(1/2 inch)	Ø25.4(1 inch)
~42.4(144,700)	Ø12.7(1/2 inch)	Ø28.58($1^1/_8$ inch)
~58.5(199,600)	Ø15.88(5/8 inch)	Ø31.8($1^1/_4$ inch)
~75.4(257,300)	Ø19.05(3/4 inch)	Ø38.1($1^1/_2$ inch)
75.5(257,600)~	Ø22.2(7/8 inch)	Ø44.5($1^3/_4$ inch)

※ Apply 5, 6HP model only

◐ Total piping length = A+B+C+D+a+b+c+d+e ≤ 220m

***L**	Longest piping length	**Equivalent piping length
	A+B+C+D+e ≤ 120m	A+B+C+D+e≤ 140m
l	Longest piping length after 1st branch	
	B+C+D+e ≤ 30m	
H	Difference in height(Outdoor Unit ↔ Indoor Unit)	
	H ≤ 50m (40m : Outdoor Unit is lower than Indoor Units)	
h	Difference in height (Indoor Unit ↔ Indoor Unit)	
	h ≤ 15m	

**: Assume equivalent pipe length of Y branch to be 0.5m, that of header to be 1m, calculation purpose.

*: Must be satisfied both conditions

WARNING

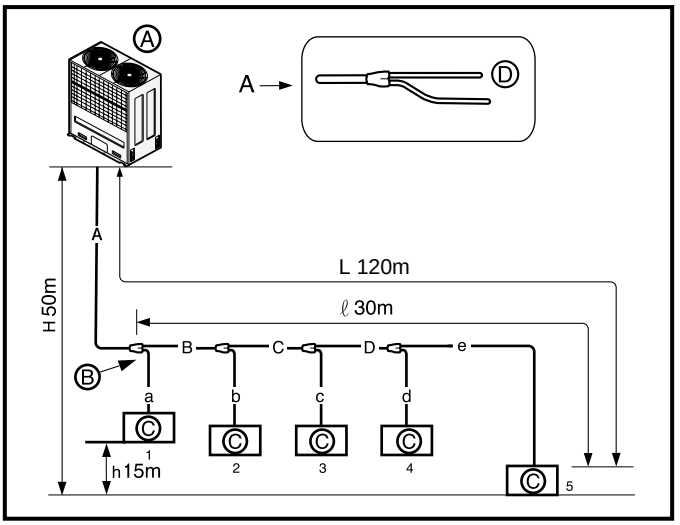
Install the same main pipe diameter as those connected after the initial branch where the pipe diameter connected after the initial branch.

Ex) Where connecting the Indoor Unit to 24HP (67.2kW) to the 120%.
Main pipe diameter of Outdoor Unit: Ø 38.1 (Gas pipe) Ø 19.05(Liquid pipe)
Main pipe diameter of Outdoor Unit: Ø 44.5 (Gas pipe) Ø 22.2 (Liquid pipe)
depending on 120% Indoor Unit combination
Therefore, Ø 44.5 (Gas pipe), Ø 22.2 (Liquid pipe) as pipe diameter of the large side is selected as main pipe diameter.

1 Outdoor Unit

Example : 5 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : 1st branch (Y branch)
Ⓒ : Indoor Units
Ⓓ : Downward Indoor Unit



◐ Main pipe diameter (A)

- Liquid pipe : Ø12.7mm(1/2 inch)
- Gas pipe : Ø28.58mm((1 1/8 inch)

◐ Refrigerant pipe diameter from branch to branch (B,C,D)

Downward Indoor Unit total capacity [kW(Btu/h)]	Liquid pipe (mm)	Gas pipe (mm)
~8.3(28,300)	Ø9.52(3/8 inch)	Ø15.88(5/8 inch)
~17.8(60,700)	Ø12.7(1/2 inch)	Ø19.05(3/4 inch)
~27.9(95,200)	Ø12.7(1/2 inch)	Ø25.4(1 inch)
~42.4(144,700)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)
~58.5(199,600)	Ø15.88(5/8 inch)	Ø31.8(1 1/4 inch)
~75.4(257,300)	Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)
75.5(257,600)~	Ø22.2(7/8 inch)	Ø44.5(1 3/4 inch)

◐ Total piping length = A+B+C+D+a+b+c+d+e ≤ 220m

***L**	Longest piping length	**Equivalent piping length
	A+B+C+D+e ≤ 120m	A+B+C+D+e ≤ 140m
l	Longest piping length after 1st branch	
	B+C+D+e ≤ 30m	
H	Difference in height(Outdoor Unit ↔ Indoor Unit)	
	H ≤ 50m (40m : Outdoor Unit is lower than Indoor Units)	
h	Difference in height (Indoor Unit ↔ Indoor Unit)	
	h ≤ 15m	

**: Assume equivalent pipe length of Y branch to be 0.5m, that of header to be 1m, calculation purpose.

*: Must be satisfied both conditions

⚠ WARNING

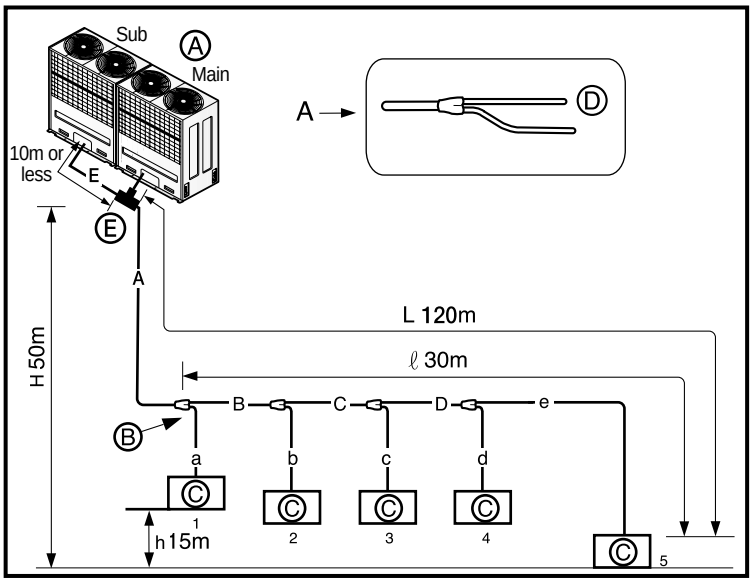
Install the same main pipe diameter as those connected after the initial branch where the pipe diameter connected after the initial branch.

Ex) Where connecting the Indoor Unit to 24HP (67.2kW) to the 120%.
Main pipe diameter of Outdoor Unit: Ø 38.1 (Gas pipe) Ø 19.05(Liquid pipe)
Main pipe diameter of Outdoor Unit: Ø 44.5 (Gas pipe) Ø 22.2 (Liquid pipe)
depending on 120% Indoor Unit combination
Therefore, Ø 44.5 (Gas pipe), Ø 22.2 (Liquid pipe) as pipe diameter of the large side is selected as main pipe diameter.

2 Outdoor Units

Example : 5 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : 1st branch (Y branch)
Ⓒ : Indoor Units
Ⓓ : Downward Indoor Unit
Ⓔ : Connection branch pipe between Outdoor units: ARBL202C



◐ Sub Outdoor Unit ~ Connection branch pipe Ⓔ Pipe diameter (E)

High/Low Pressure Common pipe (mm)	Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)

◐ Connection branch pipe Ⓔ ~ Main pipe diameter (A)

Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)

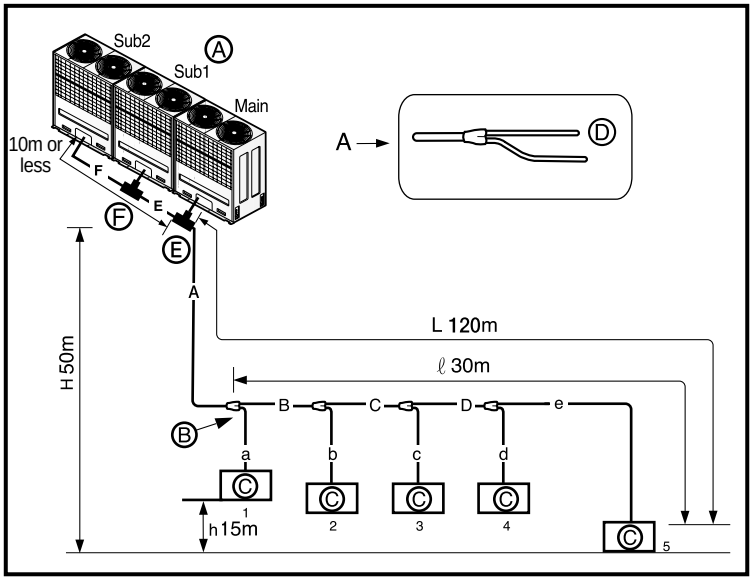
WARNING

- **Main pipe must be always come out to direction of the Main Outdoor Unit in installation.**
- **For installing the refrigerant pipe system between Outdoor Units, use the connection branch pipe between Outdoor Units.**

3 Outdoor Units

Example : 5 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : 1st branch (Y branch)
Ⓒ : Indoor Units
Ⓓ : Downward Indoor Unit
Ⓔ : Connection branch pipe between Outdoor units: ARBL302C
Ⓕ : Connection branch pipe between Outdoor units: ARBL202C



◐ Sub2 Outdoor unit ~ Connection branch pipe Ⓕ Pipe diameter (F)

High/Low Pressure Common pipe (mm)	Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)

◐ Connection branch pipe Ⓕ ~ Connection branch pipe Ⓔ Pipe diameter (E)

High/Low Pressure Common pipe (mm)	Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)

◐ Connection branch pipe Ⓔ ~ Main pipe diameter (A)

Liquid pipe (mm)	Gas pipe (mm)
Ø22.2(7/8 inch)	Ø44.5(1 3/4 inch)

WARNING

- **Main pipe must be always come out to direction of the Main Outdoor Unit in installation.**
- **For installing the refrigerant pipe system between Outdoor Units, use the connection branch pipe between Outdoor Units.**

◐ Refrigerant pipe diameter from branch to branch (B,C,D)

Downward Indoor Unit total capacity [kW(Btu/h)]	Liquid pipe (mm)	Gas pipe (mm)
~8.3(28,300)	Ø9.52(3/8 inch)	Ø15.88(5/8 inch)
~17.8(60,700)	Ø12.7(1/2 inch)	Ø19.05(3/4 inch)
~27.9(95,200)	Ø12.7(1/2 inch)	Ø25.4(1 inch)
~42.4(144,700)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)
~58.5(199,600)	Ø15.88(5/8 inch)	Ø31.8(1 1/4 inch)
~75.4(257,300)	Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)
75.5(257,600)~	Ø22.2(7/8 inch)	Ø44.5(1 3/4 inch)

◐ Total piping length = A+B+C+D+a+b+c+d+e ≤ 220m

***L**	Longest piping length	**Equivalent piping length
	A+B+C+D+e ≤ 120m	A+B+C+D+e ≤ 140m
l	Longest piping length after 1st branch	
	B+C+D+e ≤ 30m	
H	Difference in height(Outdoor Unit ↔ Indoor Unit)	
	H ≤ 50m (40m : Outdoor Unit is lower than Indoor Units)	
h	Difference in height (Indoor Unit ↔ Indoor Unit)	
	h ≤ 15m	

*: Must be satisfied both conditions

**: Assume equivalent pipe length of Y branch to be 0.5m, that of header to be 1m, calculation purpose.

- Piping length from outdoor branch to outdoor unit ≤ 10m, equivalent lengh : max 13m (for 16HP or more)

WARNING

Install the same main pipe diameter as those connected after the initial branch where the pipe diameter connected after the initial branch.

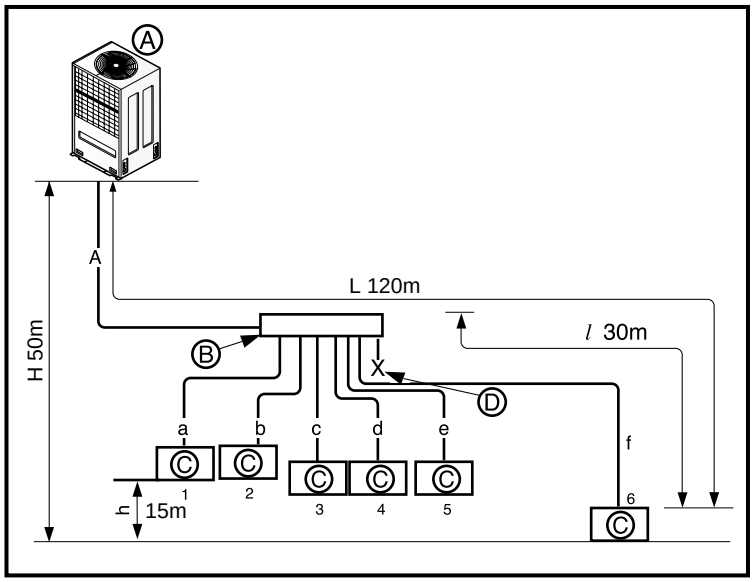
Ex) Where connecting the Indoor Unit to 24HP (67.2kW) to the 120%.
Main pipe diameter of Outdoor Unit: Ø 38.1 (Gas pipe) Ø 19.05(Liquid pipe)
Main pipe diameter of Outdoor Unit: Ø 44.5 (Gas pipe) Ø 22.2 (Liquid pipe) depending on 120% Indoor Unit combination
Therefore, Ø 44.5 (Gas pipe), Ø 22.2 (Liquid pipe) as pipe diameter of the large side is selected as main pipe diameter.

◆ Header Method

1 Outdoor Unit(Half size)

Example : 6 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : 1st branch
Ⓒ : Indoor Units
Ⓓ : Sealing



Branch pipe can not be used after header

◐ Main pipe diameter (A)

◐ Total piping length = A+a+b+c+d+e+f ≤ 220m

***L**	Longest piping length	**Equivalent piping length
	A+f ≤ 120m	A+f ≤ 140m
l	Longest pipeing length after 1st branch	
	f ≤ 30m	
H	Difference in height(Outdoor Unit ↔ Indoor Unit)	
	H ≤ 50m (40m : Outdoor Unit is lower)***	
h	Difference in height (Indoor Unit ↔ Indoor Unit)	
	h ≤ 15m	

**: Assume equivalent pipe length of Y branch to be 0.5m, that of header to be 1m, calculation purpose.

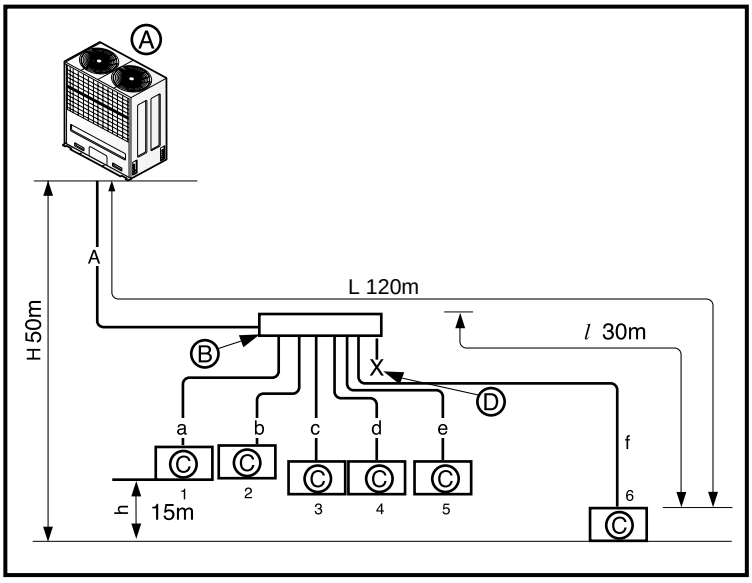
*: Must be satisfied both conditions

Caution : ***:Indoor Unit should be installed at lower position than the header.

1 Outdoor Unit

Example : 6 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : 1st branch
Ⓒ : Indoor Units
Ⓓ : Sealing



Branch pipe can not be used after header

◐ Main pipe diameter (A)

- Liquid pipe : Ø12.7mm(1/2 inch)
- Gas pipe : Ø28.58mm($1^1/_8$ inch)

◐ Total piping length = A+a+b+c+d+e+f ≤ 220m

***L**	Longest pipingngth	**Equivalent piping length
	A+f ≤ 120m	A+f ≤ 140m
l	Longest piping length after 1st branch	
	f ≤ 30m	
H	Difference in height(Outdoor Unit ↔ Indoor Unit)	
	H ≤ 50m (40m : Outdoor Unit is lower)***	
h	Difference in height (Indoor Unit ↔ Indoor Unit)	
	h ≤ 15m	

**: Assume equivalent pipe length of Y branch to be 0.5m, that of header to be 1m, calculation purpose.

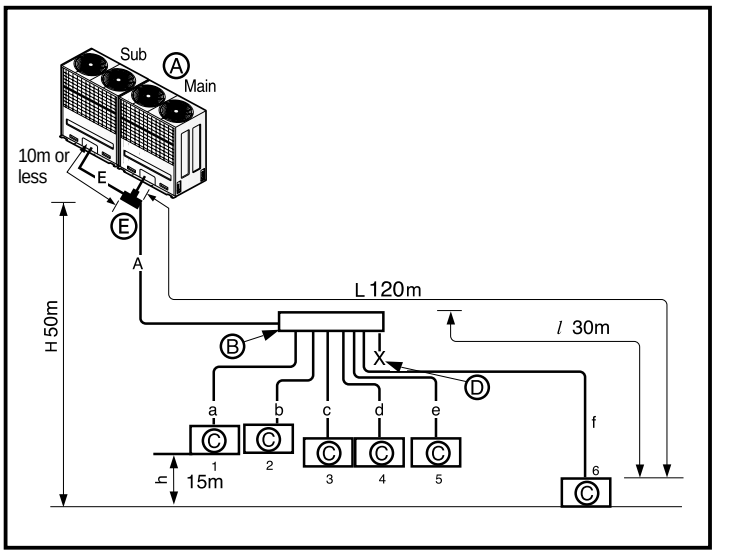
*: Must be satisfied both conditions

Caution : ***:Indoor Unit should be installed at lower position than the header.

2 Outdoor Units

Example : 6 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : Header branch
Ⓒ : Indoor Units
Ⓓ : Sealing
Ⓔ : Connection branch pipe between Outdoor units: ARBL202C



Branch pipe can not be used after header

◐ Sub Outdoor Unit ~ Connection branch pipe Ⓕ Pipe diameter (E)

High/Low Pressure Common pipe (mm)	Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)

◐ Connection branch pipe Ⓔ ~ Main pipe diameter (A)

Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)

◐ Total piping length = A+a+b+c+d+e+f ≤ 220m

***L**	Longest piping length	**Equivalent piping length
	A+f ≤ 120m	A+f ≤ 140m
l	Longest piping length after 1st branch	
	f ≤ 30m	
H	Difference in height(Outdoor Unit ↔ Indoor Unit)	
	H ≤ 50m (40m : Outdoor Unit is lower)***	
h	Difference in height (Indoor Unit ↔ Indoor Unit)	
	h ≤ 15m	

*: Must be satisfied both conditions

Caution : ***:Indoor Unit should be installed at lower position than the header.

WARNING

Piping length after header branching (a~f)
It is recommended that difference of the piping length connected to the Indoor Unit is minimized. Performance difference between Indoor Units may occur.

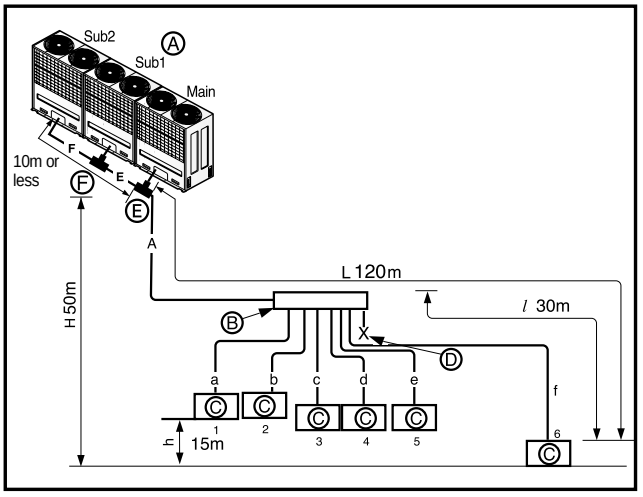
**: Assume equivalent pipe length of Y branch to be 0.5m, that of header to be 1m, calculation purpose.

• Piping length from outdoor branch to outdoor unit ≤ 10m, equivalent lengh : max 13m (for 16HP or more)

3 Outdoor Units

Example : 6 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : Header branch
Ⓒ : Indoor Units
Ⓓ : Sealing
Ⓔ : Connection branch pipe between Outdoor units: ARBL302C
Ⓕ : Connection branch pipe between Outdoor units: ARBL202C



Branch pipe can not be used after header

◐ Sub2 Outdoor unit ~ Connection branch pipe Ⓕ Pipe diameter (F)

High/Low Pressure Common pipe (mm)	Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)

◐ Connection branch pipe Ⓕ ~ Connection branch pipe Ⓔ Pipe diameter (E)

High/Low Pressure Common pipe (mm)	Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)

◐ Connection branch pipe Ⓔ ~ Main pipe diameter (A)

Liquid pipe (mm)	Gas pipe (mm)
Ø22.2(7/8 inch)	Ø44.5(1 3/4 inch)

◐ Total piping length = A+a+b+c+d+e+f ≤ 220m

***L**	Longest pipeinglength	**Equivalent piping length
	A+f ≤ 120m	A+f ≤ 140m
l	Longest piping length after 1st branch	
	f ≤ 30m	
H	Difference in height(Outdoor Unit ↔ Indoor Unit)	
	H ≤ 50m (40m : Outdoor Unit is lower)***	
h	Difference in height (Indoor Unit ↔ Indoor Unit)	
	h ≤ 15m	

WARNING

Piping length after header branching (a~f)
It is recommended that difference of the piping length connected to the Indoor Unit is minimized.
Performance difference between Indoor Units may occur.

*: Must be satisfied both conditions

Caution : ***:Indoor Unit should be installed at lower position than the header.

**: Assume equivalent pipe length of Y branch to be 0.5m, that of header to be 1m, calculation purpose.

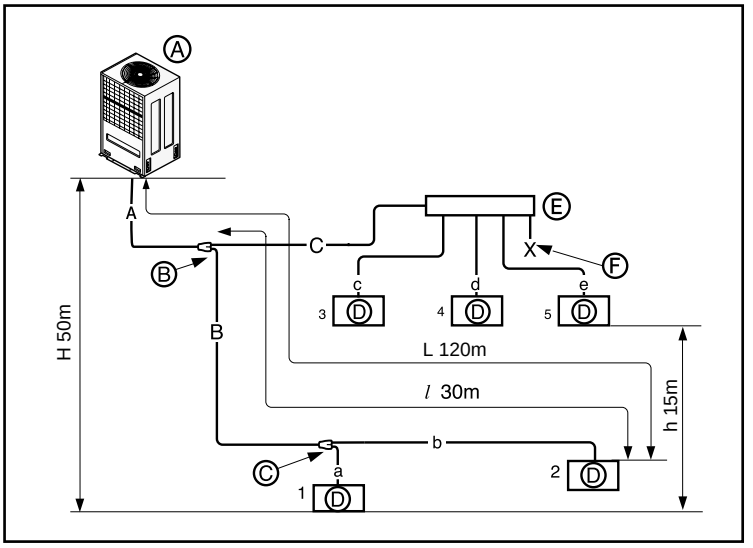
• Piping length from outdoor branch to outdoor unit ≤ 10m, equivalent lengh : max 13m (for 16HP or more)

◆ Combination of Y branch/header method

1 Outdoor Unit(Half size)

Example : 5 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : 1st branch (Y branch)
Ⓒ : Y branch
Ⓓ : Indoor Unit
Ⓔ : Header
Ⓕ : Sealing



Branch pipe can not be used after header

◐ Main pipe diameter (A)

◐ Refrigerant pipe diameter from branch to branch (B,C)

Downward Indoor Unit total capacity [kW(Btu/h)]	Liquid pipe (mm)	Gas pipe (mm)
~8.3(28,300)	Ø9.52(3/8 inch)	Ø15.88(5/8 inch)
~17.8(60,700)	Ø12.7(1/2 inch) / ※9.52(3/8 inch)	Ø19.05(3/4 inch)
~27.9(95,200)	Ø12.7(1/2 inch)	Ø25.4(1 inch)
~42.4(144,700)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)
~58.5(199,600)	Ø15.88(5/8 inch)	Ø31.8(1 1/4 inch)
~75.4(257,300)	Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)
75.5(257,600)~	Ø22.2(7/8 inch)	Ø44.5(1 3/4 inch)

※ Apply 5, 6HP model only

◐ Total piping length = A+B+C+a+b+c+d+e ≤ 220m

***L**	Longest piping length	**Equivalent piping length
	A+B+b ≤ 120m	A+B+b ≤ 140m
l	Longest piping length after 1st branch	
	B+b ≤ 30m	
H	Difference in height(Outdoor Unit ↔ Indoor Unit)	
	H ≤ 50m (40m : Outdoor Unit is lower than Indoor Units)***	
h	Difference in height (Indoor Unit ↔ Indoor Unit)	
	h ≤ 15m	

**: Assume equivalent pipe length of Y branch to be 0.5m, that of header to be 1m, calculation purpose.

*: Must be satisfied both conditions

Caution : ***:Indoor Unit should be installed at lower position than the header.

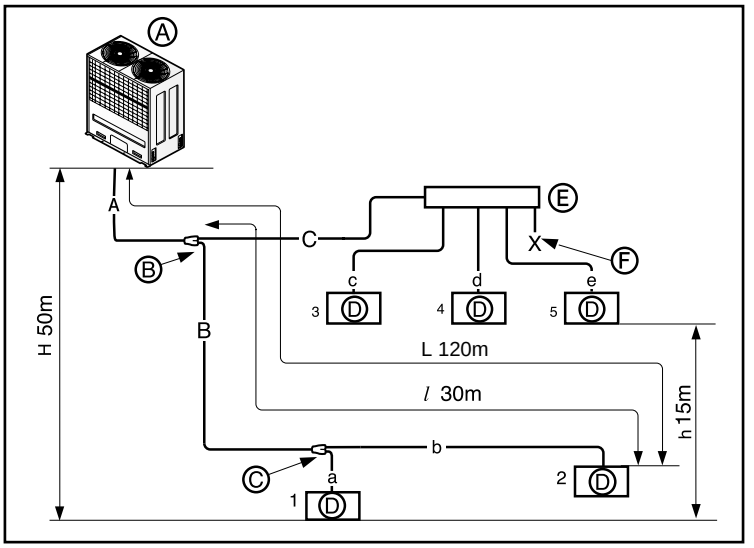
WARNING

Piping length after header branching (a~f)
It is recommended that difference of the piping length connected to the Indoor Unit is minimized. Performance difference between Indoor Units may occur.

1 Outdoor Unit

Example : 5 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : 1st branch (Y branch)
Ⓒ : Y branch
Ⓓ : Indoor Unit
Ⓔ : Header
Ⓕ : Sealing



Branch pipe can not be used after header

Main pipe diameter (A)

- Liquid pipe : Ø12.7mm(1/2 inch)
- Gas pipe : Ø28.58mm($1^1/_8$ inch)

Refrigerant pipe diameter from branch to branch (B,C)

Downward Indoor Unit total capacity [kW(Btu/h)]	Liquid pipe (mm)	Gas pipe (mm)
~8.3(28,300)	Ø9.52(3/8 inch)	Ø15.88(5/8 inch)
~17.8(60,700)	Ø12.7(1/2 inch)	Ø19.05(3/4 inch)
~27.9(95,200)	Ø12.7(1/2 inch)	Ø25.4(1 inch)
~42.4(144,700)	Ø12.7(1/2 inch)	Ø28.58($1^1/_8$ inch)
~58.5(199,600)	Ø15.88(5/8 inch)	Ø31.8($1^1/_4$ inch)
~75.4(257,300)	Ø19.05(3/4 inch)	Ø38.1($1^1/_2$ inch)
75.5(257,600)~	Ø22.2($^7/_8$ inch)	Ø44.5($1^3/_4$ inch)

Total piping length = A+B+C+a+b+c+d+e ≤ 220m

***L**	Longest piping length	**Equivalent piping length
	A+B+b ≤ 120m	A+B+b ≤ 140m
l	Longest piping length after 1st branch	
	B+b ≤ 30m	
H	Difference in height(Outdoor Unit ↔ Indoor Unit)	
	H ≤ 50m (40m : Outdoor Unit is lower than Indoor Units)***	
h	Difference in height (Indoor Unit ↔ Indoor Unit)	
	h ≤ 15m	

**: Assume equivalent pipe length of Y branch to be 0.5m, that of header to be 1m, calculation purpose.

*: Must be satisfied both conditions

Caution : ***:Indoor Unit should be installed at lower position than the header.

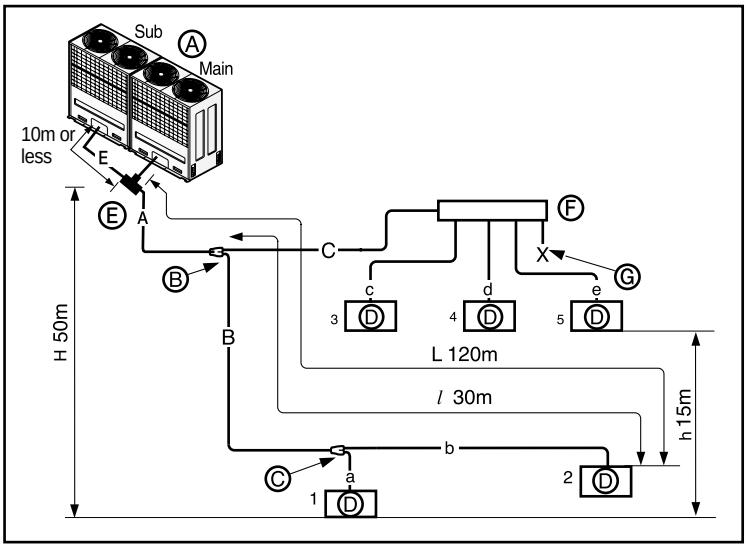
WARNING

Pipe length after header branching (a~f)
It is recommended that difference of the pipe length connected to the Indoor Unit is minimized.
Performance difference between Indoor Units may occur.

2 Outdoor Units

Example : 5 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : 1st branch(Y branch)
Ⓒ : Y branch
Ⓓ : Indoor Unit
Ⓔ : Connection branch pipe between Outdoor units: ARBL202C
Ⓕ : Header
Ⓖ : Sealing



Branch pipe can not be used after header

◐ Sub Outdoor Unit ~ Connection branch pipe Ⓔ Pipe diameter (E)

High/Low Pressure Common pipe (mm)	Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)

◐ Connection branch pipe Ⓔ ~ Main pipe diameter (A)

Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)

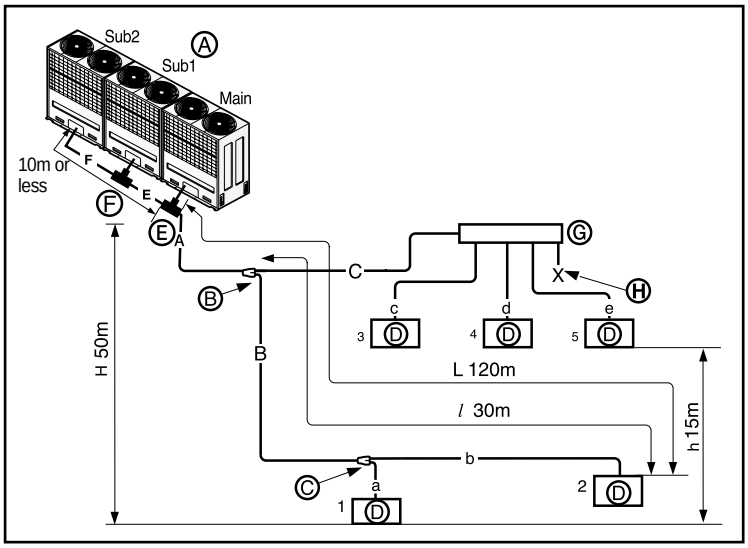
◐ Refrigerant pipe diameter from branch to branch (B,C)

Downward Indoor Unit total capacity [kW(Btu/h)]	Liquid pipe (mm)	Gas pipe (mm)
~8.3(28,300)	Ø9.52(3/8 inch)	Ø15.88(5/8 inch)
~17.8(60,700)	Ø12.7(1/2 inch)	Ø19.05(3/4 inch)
~27.9(95,200)	Ø12.7(1/2 inch)	Ø25.4(1 inch)
~42.4(144,700)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)
~58.5(199,600)	Ø15.88(5/8 inch)	Ø31.8(1 1/4 inch)
~75.4(257,300)	Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)
75.5(257,600)~	Ø22.2(7/8 inch)	Ø44.5(1 3/4 inch)

3 Outdoor Units

Example : 5 Indoor Units connected

Ⓐ : Outdoor Unit
Ⓑ : 1st branch(Y branch)
Ⓒ : Y branch
Ⓓ : Indoor Unit
Ⓔ : Connection branch pipe between Outdoor units: ARBL302C
Ⓕ : Connection branch pipe between Outdoor units: ARBL202C
Ⓖ : Header
Ⓗ : Sealing



Branch pipe can not be used after header

◐ Sub2 Outdoor unit ~ Connection branch pipe Ⓕ Pipe diameter (F)

High/Low Pressure Common pipe (mm)	Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)

◐ Connection branch pipe Ⓕ ~ Connection branch pipe Ⓔ Pipe diameter (E)

High/Low Pressure Common pipe (mm)	Liquid pipe (mm)	Gas pipe (mm)
Ø19.05(3/4 inch)	Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)

◐ Connection branch pipe Ⓔ ~ Main pipe diameter (A)

Liquid pipe (mm)	Gas pipe (mm)
Ø22.2(7/8 inch)	Ø44.5(1 3/4 inch)

◐ Refrigerant pipe diameter from branch to branch (B,C)

Downward Indoor Unit total capacity [kW(Btu/h)]	Liquid pipe (mm)	Gas pipe (mm)
~8.3(28,300)	Ø9.52(3/8 inch)	Ø15.88(5/8 inch)
~17.8(60,700)	Ø12.7(1/2 inch)	Ø19.05(3/4 inch)
~27.9(95,200)	Ø12.7(1/2 inch)	Ø25.4(1 inch)
~42.4(144,700)	Ø12.7(1/2 inch)	Ø28.58(1 1/8 inch)
~58.5(199,600)	Ø15.88(5/8 inch)	Ø31.8(1 1/4 inch)
~75.4(257,300)	Ø19.05(3/4 inch)	Ø38.1(1 1/2 inch)
75.5(257,600)~	Ø22.2(7/8 inch)	Ø44.5(1 3/4 inch)

◐ Total piping length = A+B+C+a+b+c+d+e ≤ 220m

***L**	Longest piping length	Equivalent piping length
	A+B+b ≤ 120m	A+B+b ≤ 140m
l	Longest piping length after 1st branch	
	B+b ≤ 30m	
H	Difference in height(Outdoor Unit ↔ Indoor)	
	H ≤ 50m (40m : Outdoor Unit is lower than Indoor Units)**	
h	Difference in height (Indoor Unit ↔ Indoor Unit)	
	h ≤ 15m	

*: Must be satisfied both conditions

Caution : ***:Indoor Unit should be installed at lower position than the header.

**: Assume equivalent pipe length of Y branch to be 0.5m, that of header to be 1m, calculation purpose.

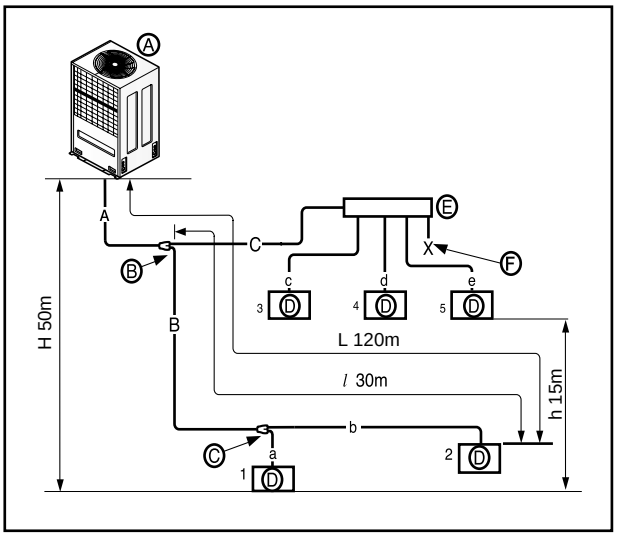
- Piping length from outdoor branch to outdoor unit ≤ 10m, equivalent lengh : max 13m (for 16HP or more)

WARNING

Piping length after header branching (a~f)
It is recommended that difference of the piping length connected to the Indoor Unit is minimized.
Performance difference between Indoor Units may occur.

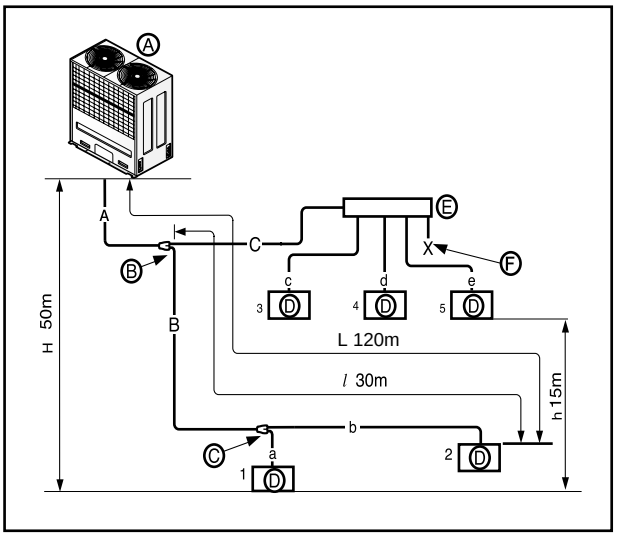
◆ Indoor Unit Connection

1 Outdoor Unit(Half size)



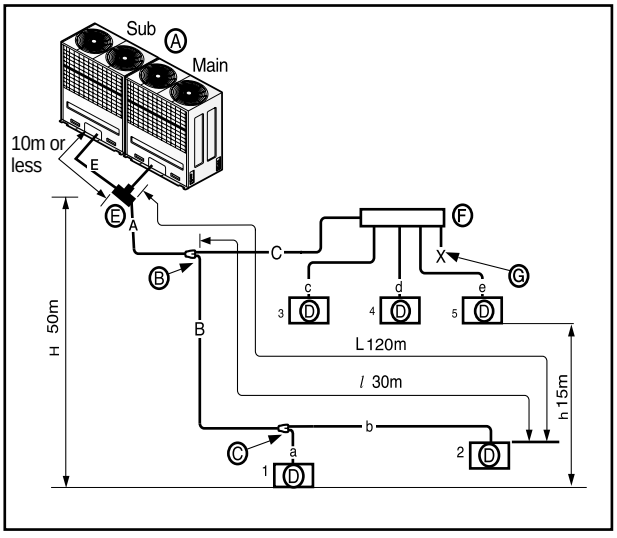
Total piping length ≤ 220m

1 Outdoor Unit



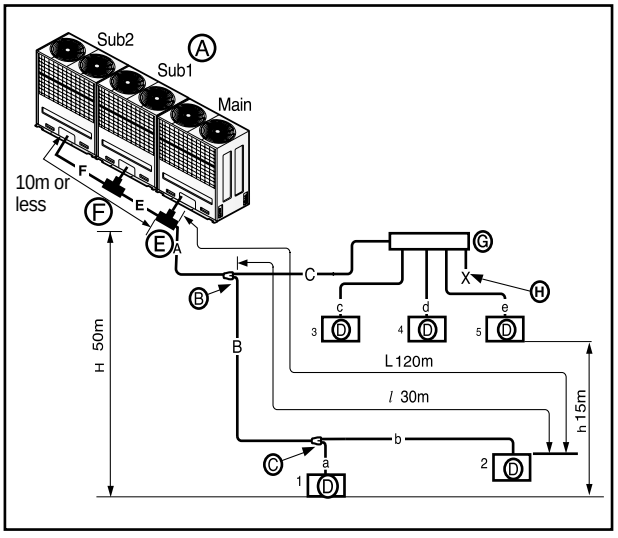
Total piping length ≤ 220m

2 Outdoor Units



Total piping length ≤ 220m

3 Outdoor Units



Total piping length ≤ 220m

◐ Indoor Unit connecting pipe from branch (a,b,c,d,e)

Indoor Unit capacity [kW(Btu/h)]	Liquid pipe [mm(inch)]	Gas pipe [mm(inch)]
~4.0(13,600)	Ø6.35(1/4 inch)	Ø12.7(1/2 inch)
~9.0(30,700)	Ø9.52(3/8 inch)	Ø15.88(5/8 inch)
~15.0(51,200)	Ø9.52(3/8 inch)	Ø19.05(3/4 inch)

Exception:

Wide Art Cool(4.0kW(13,600 Btu/h)): Liquid pipe(Ø9.52(3/8 inch)), Gas pipe(Ø15.88(5/8 inch))

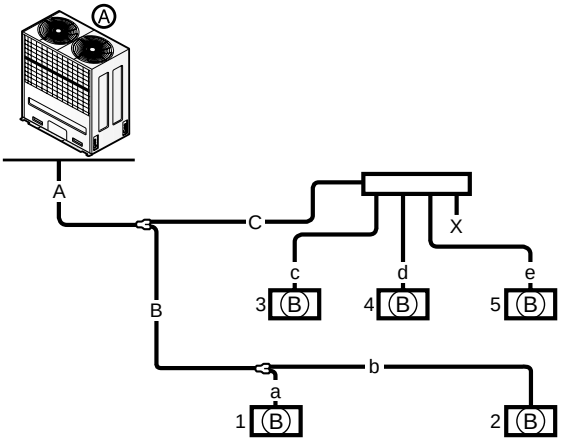
◆ The Amount of Refrigerant

The calculation of the additional charge should take account of the length of pipe.

Ⓐ	Product Charge(1Unit)=10kg	
Ⓑ	Additional charge (kg)	
=	Total liquid pipe (m): Ø22.2mm	x 0.4(kg/m)
+	Total liquid pipe (m): Ø19.05mm	x 0.3(kg/m)
+	Total liquid pipe (m): Ø15.88mm	x 0.2(kg/m)
+	Total liquid pipe (m): Ø12.7mm	x 0.12(kg/m)
+	Total liquid pipe (m): Ø9.52mm	x 0.06(kg/m)
+	Total liquid pipe (m): Ø6.35mm	x 0.025(kg/m)
+	CF(kg) (Correction Factor)	

Total amount(kg) = Ⓐ + Ⓑ

Ex) 10HP



Ⓐ Outdoor Unit
Ⓑ Indoor Unit
A : ø12.7, 60m
B : ø9.52, 20m
C : ø12.7, 20m

a : ø6.35, 10m
b : ø6.35, 10m
c : ø6.35, 10m
d : ø6.35, 10m
e : ø6.35, 10m

Additional Charge = A x 0.12 + B x 0.06 + C x 0.12
+ (a+b+c+d+e) x 0.025 + CF
= 60 x 0.12 + 20 x 0.06 + 20 x 0.12
+ (10 x 5) x 0.025 - 1(CF)
= 11.05 (kg)

CAUTION

▶ Refer to Outdoor Units Information due to differ CF(Correction Factor) as the Outdoor Units

WARNING

▶ Regulation for refrigerant leakage
: the amount of refrigerant leakage should satisfy the following equation for human safety.

$$\frac{\text{Total amount of refrigerant in the system}}{\text{Volume of the room at which Indoor Unit of the least capacity is installed}} \leq 0.3\ (kg/m^3)$$

❒ **If the above equation can not be satisfied, then follow the following steps.**

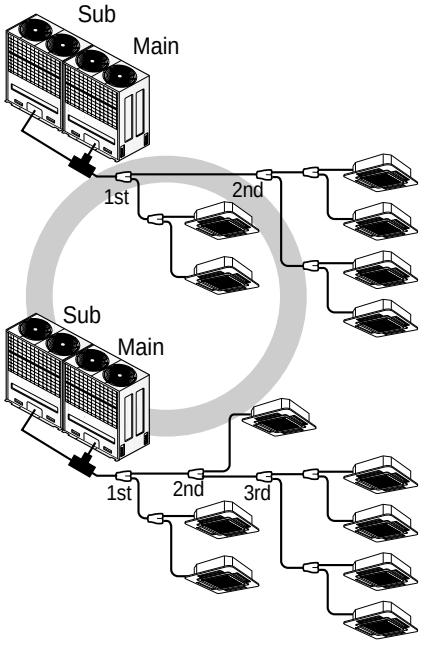
- Selection of air conditioning system: select one of the next
  1. Effective opening part Installation
  2. Reconfirmation of Outdoor Unit capacity and piping length
  3. Reduction of the amount of refrigerant
  4. 2 or more security device installation of alarm for gas leakage
- Change Indoor Unit type
  : installation position should be over 2m from the floor (Wall mounted type → Cassette type)
- Adoption of ventilation system
  : choose ordinary ventilation system or building ventilation system
- Limitation in piping work
  : design for earthquake-proof and prevention against thermal stress

◆ Distribution Method

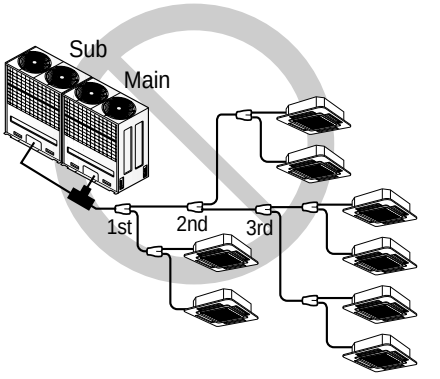
1. Line Distribution

With line distribution method, it is possible to make the first or the second main pipe distribution within the third branch, and do not make the main pipe distribution, at or after the fourth branch.

Correct

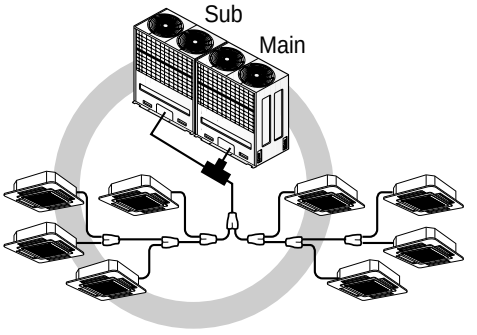


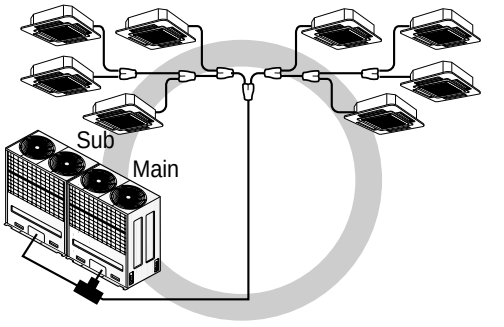
Incorrect



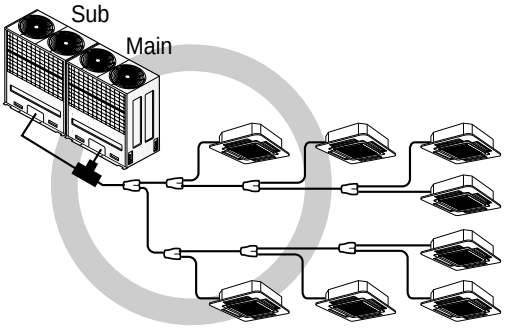
2. Vertical Distribution

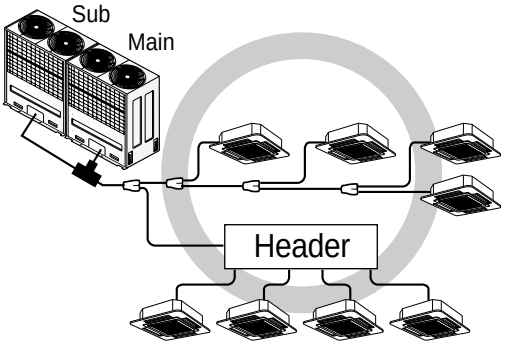
Ensure that the branch pipes are attached vertically.





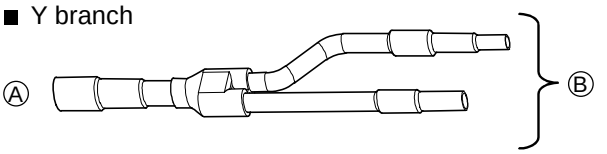
3. The others





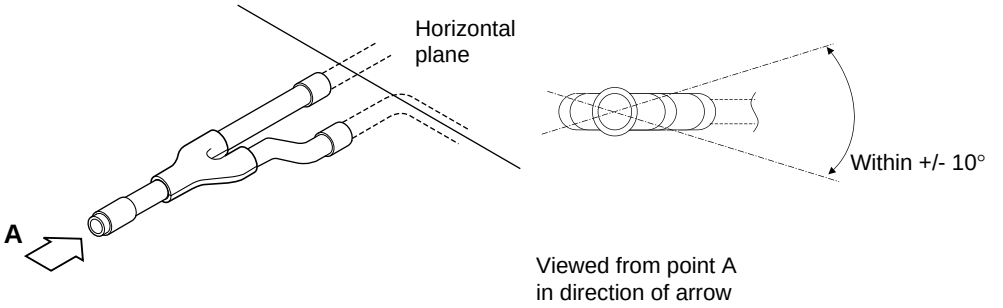
Branch pipe Fitting

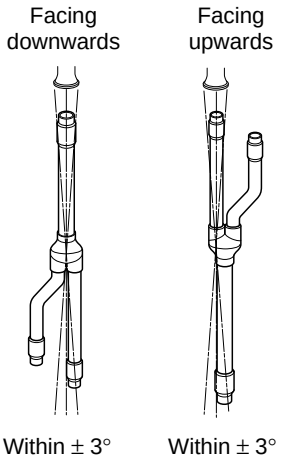
■ Y branch



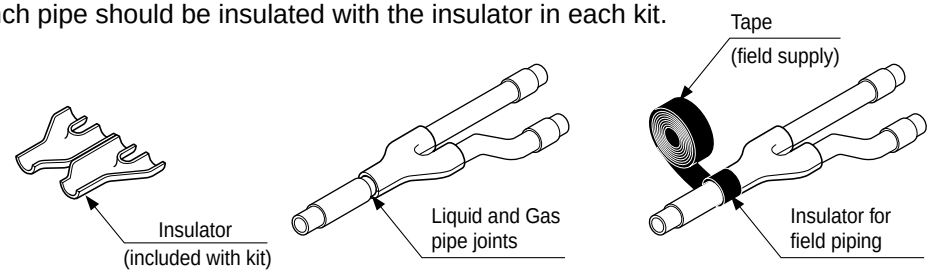
Ⓐ To Outdoor Unit
Ⓑ To Branch Piping or Indoor Unit

- Ensure that the branch pipes are attached horizontally or vertically (see the diagram below.)

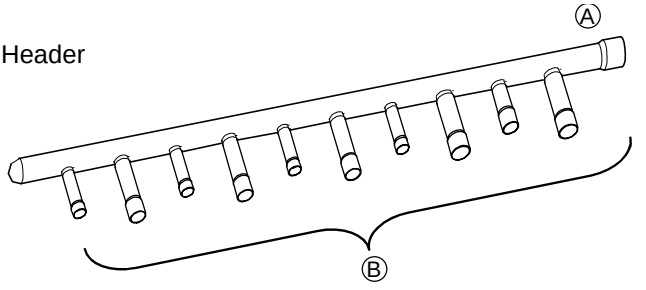




- There is no limitation on the joint mounting configuration.
- If the diameter of the refrigerant piping selected by the procedures described is different from the size of the joint, the connecting section should be cut with a pipe cutter.
- Branch pipe should be insulated with the insulator in each kit.

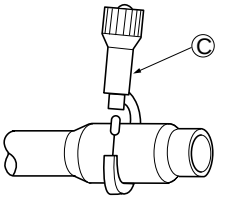


■ Header



Ⓐ To outdoor unit
Ⓑ To indoor unit

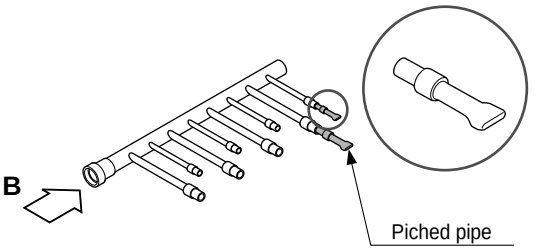
- The Indoor Unit having larger capacity must be installed closer to Ⓐ than smaller one.
- If the diameter of the refrigerant piping selected by the procedures described is different from the size of the joint, the connecting section should be cut with a pipe cutter.



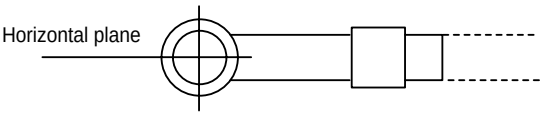
ⓒ Pipe cutter

- When the number of pipes to be connected is smaller than the number of header branches, install a cap to the unconnected branches.

- When the number of Indoor Units to be connected to the branch pipes is less than the number of branch pipes available for connection then cap pipes should be fitted to the surplus branches.

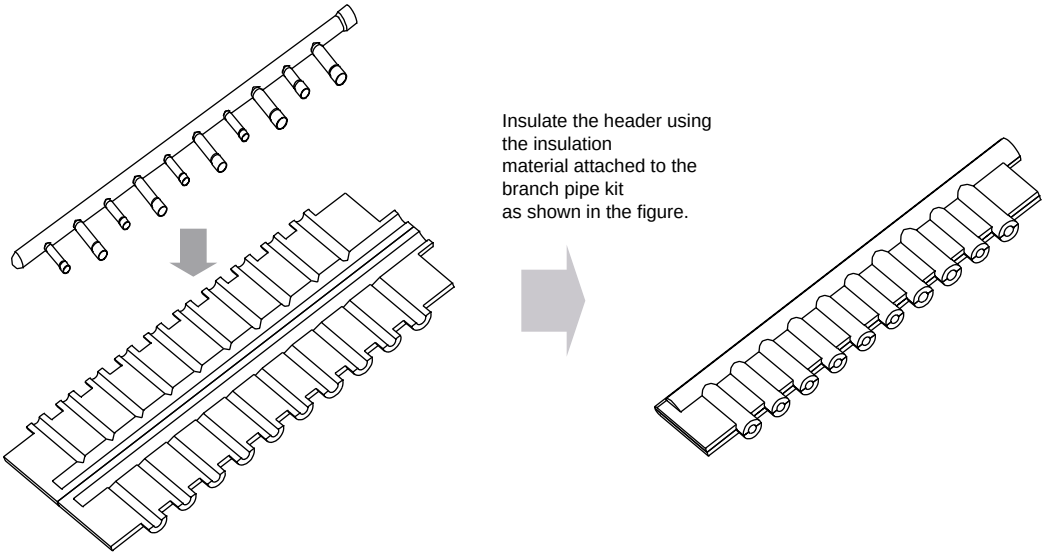


- Fit branch pipe lie in a horizontal plane.

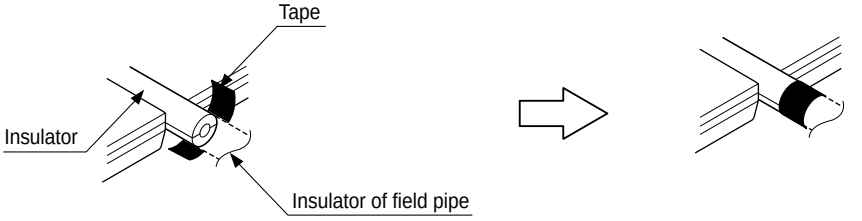


View from point B in the direction of the arrow

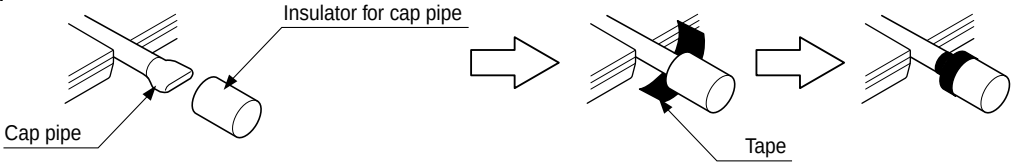
- Header should be insulated with the insulator in each kit.



- Joints between branch and pipe should be sealed with the tape included in each kit.

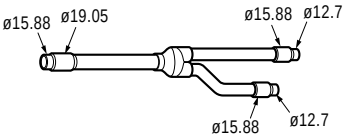
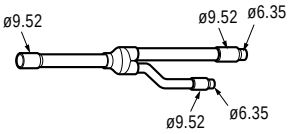
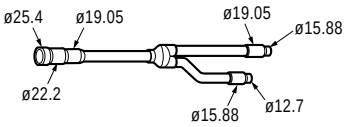
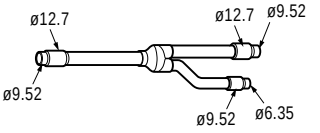
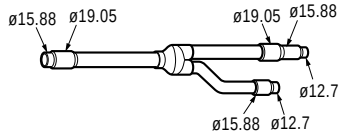
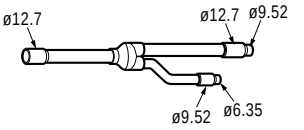
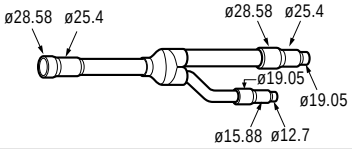
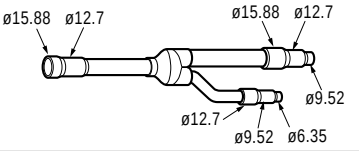
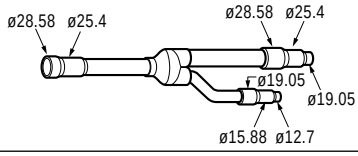
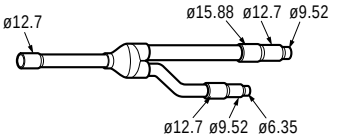
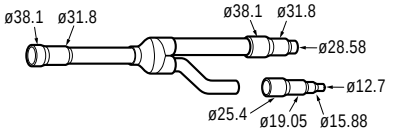
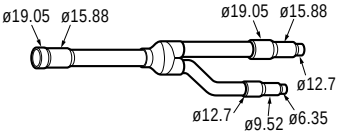
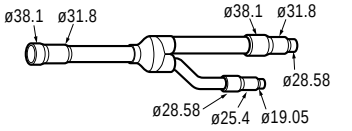
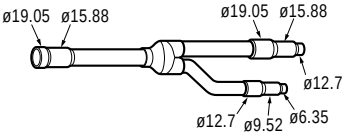
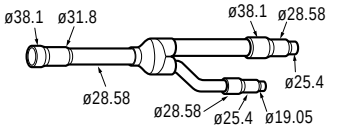
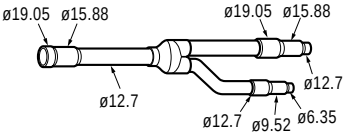
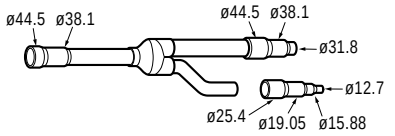
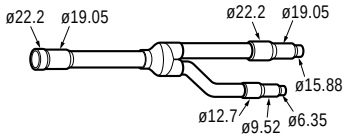
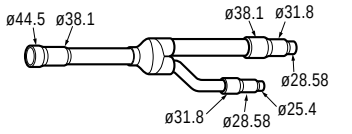
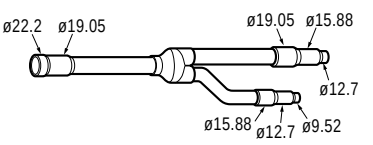
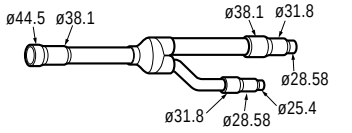
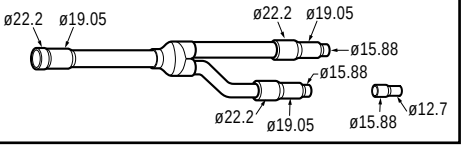


- Any cap pipe should be insulated using the insulator provided with each kit and then taped as described above.



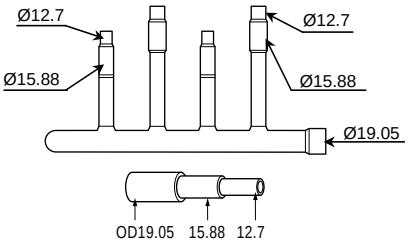
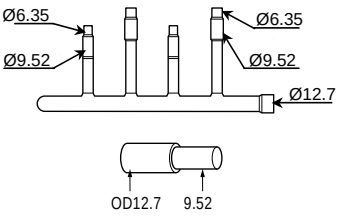
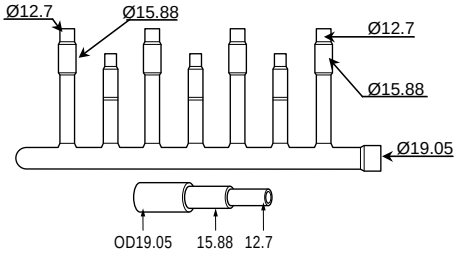
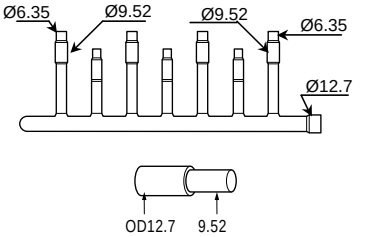
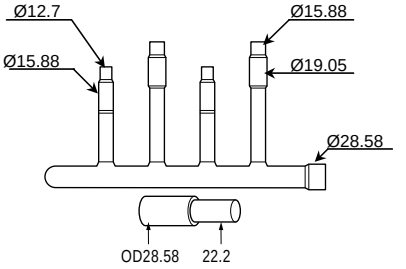
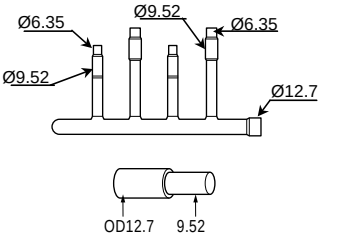
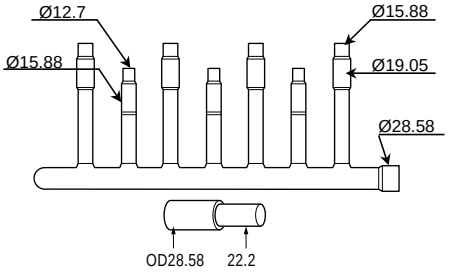
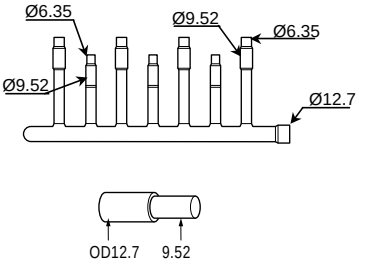
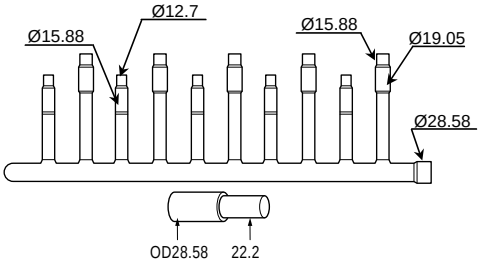
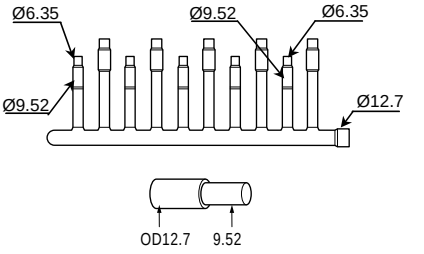
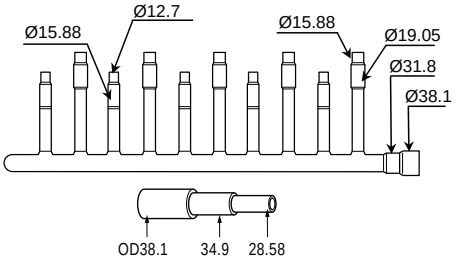
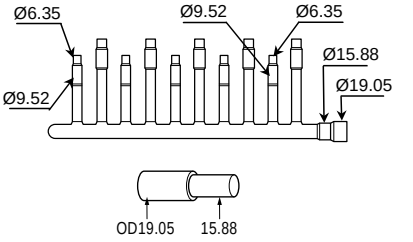
◆ Y branch pipe

[unit:mm]

Models	Gas pipe	Liquid pipe
ARBL052S		
ARBL052L		
ARBL102S		
ARBL102L		
ARBL102G		
ARBL202S		
ARBL202L		
ARBL202M		
ARBL302S		
ARBL302L		
ARBL302M		

◆ Header

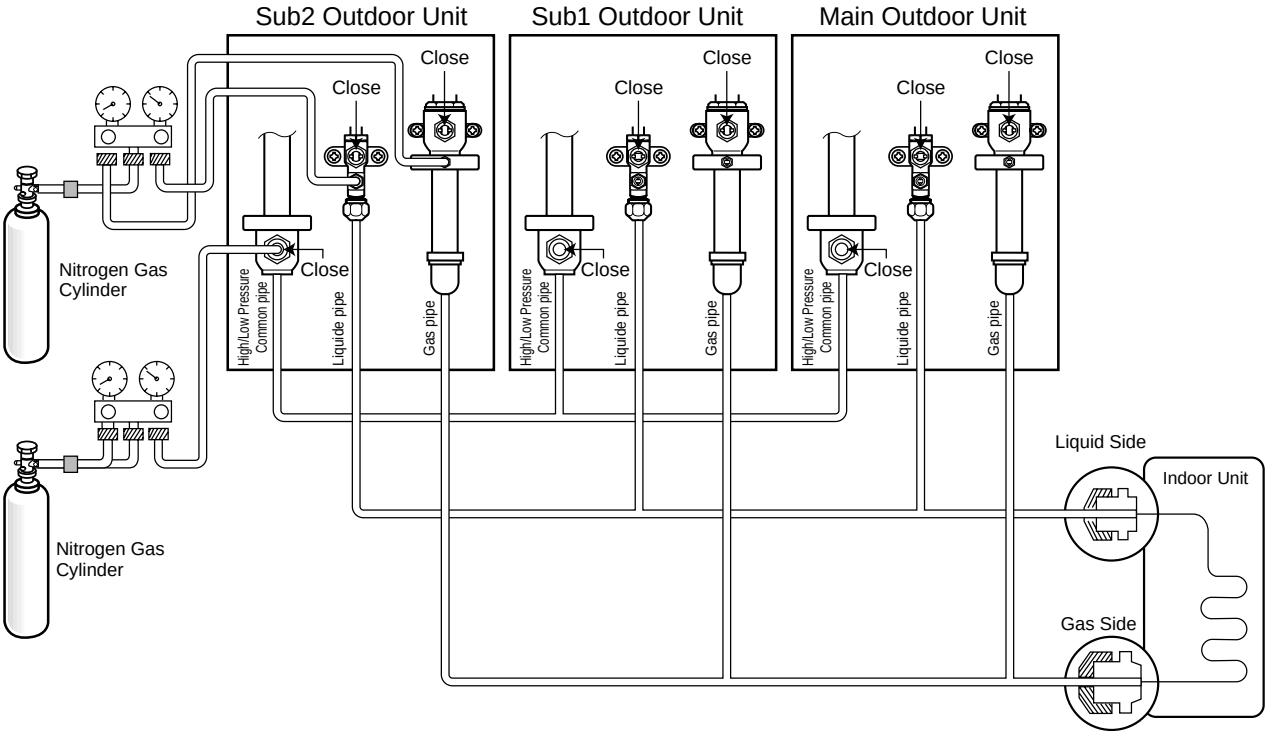
[unit:mm]

Models	Gas pipe	Liquid pipe
4 branch ARBL054		
7 branch ARBL057		
4 branch ARBL104		
7 branch ARBL107		
10 branch ARBL1010		
10 branch ARBL2010		

Leak Test and Vacuum

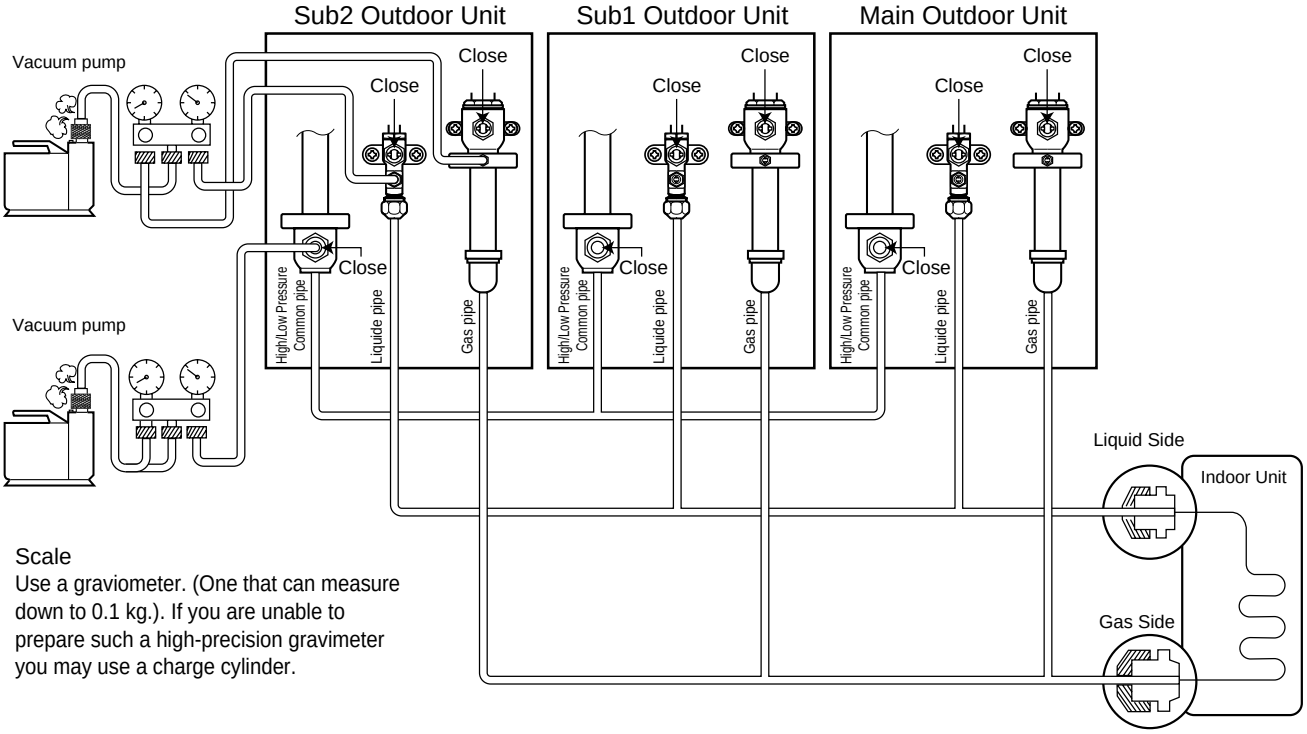
(1) Leak test

Leak test should be made by pressurizing nitrogen gas to 2.94 MPa(30.0kg/cm^2). For the test method, refer to the following figure. (Make a test with the service valves closed. Be also sure to pressurize Liquid pipe, Gas pipe and High/Low Pressure Common pipe)
The test result can be judged good if the pressure has not be reduced after leaving for about one day after completion of nitrogen gas pressurization.



(2) Vacuum

Vacuum should be made from the service port provided on the Outdoor Unit's service valve to the vacuum pump commonly used for Liquid pipe, Gas pipe and High/Low Pressure Common pipe. (Make Vacuum from Liquid pipe, Gas pipe and High/Low Pressure Common pipe with the service valve closed.)
* Never perform air purging using refrigerant.



• Vacuum should be done for 3 hours or more after the pressure is under 5 torr.

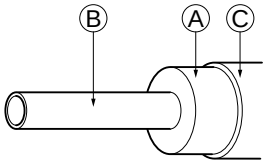
Note : Always add an appropriate amount of refrigerant. (For the refrigerant additional charge)
Too much or too little refrigerant will cause trouble.

WARNING

When installing and moving the air conditioner to another site, recharge after perfect evacuation.
- If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.

Thermal insulation of refrigerant piping

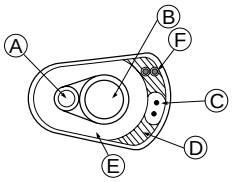
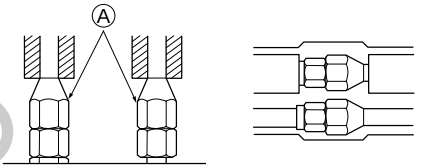
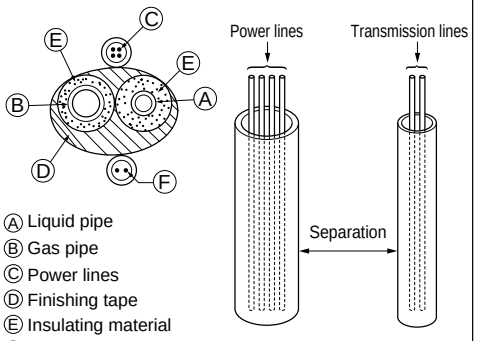
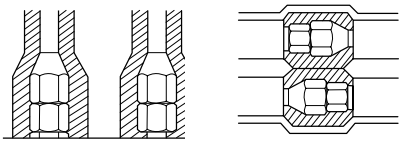
Be sure to give insulation work to refrigerant piping by covering liquid pipe and gas pipe separately with enough thickness heat-resistant polyethylene, so that no gap is observed in the joint between Indoor Unit and insulating material, and insulating materials themselves. When insulation work is insufficient, there is a possibility of condensation drip, etc. Pay special attention to insulation work to ceiling plenum.



Ⓐ Heat insulation material
Ⓑ Pipe
Ⓒ Outer covering
(Wind the connection part and cutting part of heat insulation material with a finishing tape.)

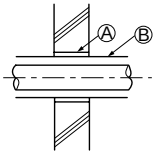
Heat insulation material	Glass fiber	
	Adhesive + Heat - resistant polyethylene foam + Adhesive tape	
Outer covering	Indoor	Vinyl tape
	Floor exposed	Water-proof hemp cloth + Bronze asphalt
	Outdoor	Water-proof hemp cloth + Zinc plate + Oily paint

Note:
When using polyethylene cover as covering material, asphalt roofing shall not be required.

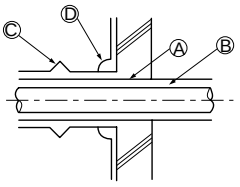
Bad example	• Do not insulate gas or low pressure pipe and liquid or high pressure pipe together.  Ⓐ Liquid pipe Ⓑ Gas pipe Ⓒ Power lines Ⓓ Finishing tape Ⓔ Insulating material Ⓕ Transmission lines	• Be sure to fully insulate connecting portion.  Ⓐ These parts are not insulated.
Good example	 Ⓐ Liquid pipe Ⓑ Gas pipe Ⓒ Power lines Ⓓ Finishing tape Ⓔ Insulating material Ⓕ Transmission lines	

Penetrations

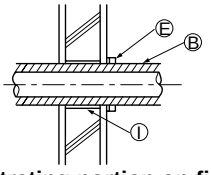
Inner wall (concealed)



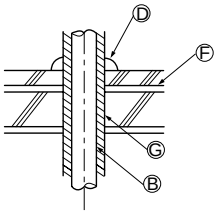
Outer wall



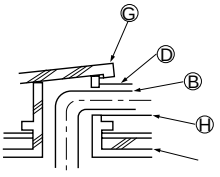
Outer wall (exposed)



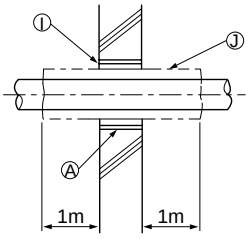
Floor (fireproofing)



Roof pipe shaft



Penetrating portion on fire limit and boundary wall



Ⓐ Sleeve
Ⓑ Heat insulating material
Ⓒ Lagging
Ⓓ Caulking material
Ⓔ Band
Ⓕ Waterproofing layer
Ⓖ Sleeve with edge
Ⓗ Lagging material
Ⓘ Mortar or other incombustible caulking
Ⓙ Incombustible heat insulation material

When filling a gap with mortar, cover the penetration part with steel plate so that the insulation material will not be caved in. For this part, use incombustible materials for both insulation and covering.(Vinyl covering should not be used.)

Electrical Wiring

Areas of Caution

1. Follow ordinance of your governmental organization for technical standard related to electrical equipment, wiring regulations and guidance of each electric power company.

WARNING

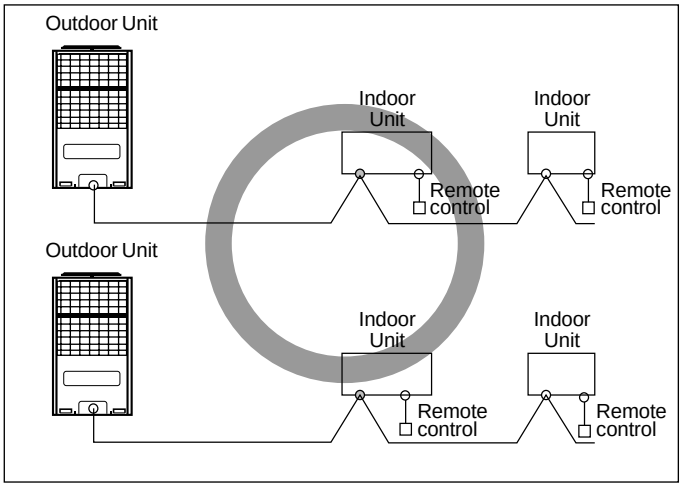
Be sure to have authorized electric engineers do electric work using special circuits in accordance with regulations and this installation manual. If power supply circuit has a lack of capacity or electric work deficiency, it may cause an electric shock or fire.

2. Install the Outdoor Unit transmission line away from the power source wiring so that it is not affected by electric noise from the power source. (Do not run it through the same conduit.)
3. Be sure to provide designated grounding work to Outdoor Unit.

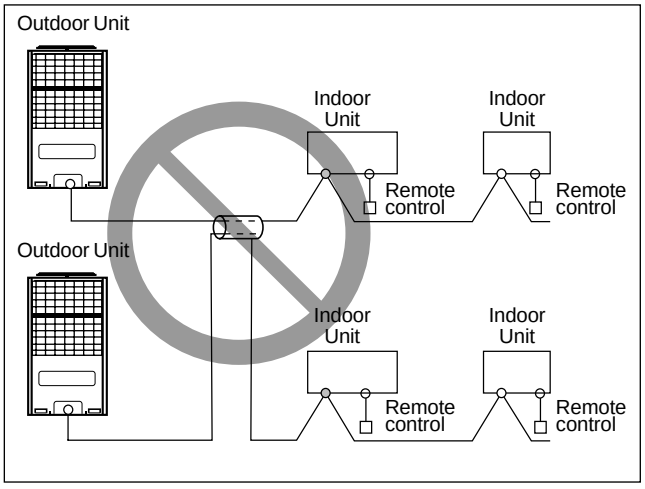
CAUTION

Be sure to put Outdoor Unit to earth. Do not connect earth line to any gas pipe, water pipe, lightening rod or telephone earth line. If earth is incomplete, it may cause an electric shock.

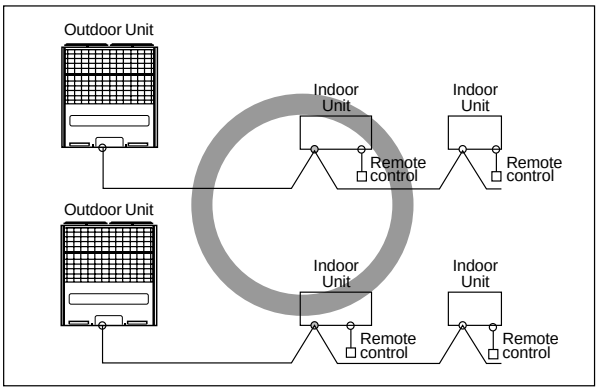
4. Give some allowance to wiring for electrical part box of Indoor and Outdoor Units, because the box is sometimes removed at the time of service work.
5. Never connect the main power source to terminal block of transmission line. If connected, electrical parts will be burnt out.
6. Use 2-core shield cable for transmission line.(O mark in the figure below) If transmission lines of different systems are wired with the same multiplecore cable, the resultant poor transmitting and receiving will cause erroneous operations. (⃠ mark in the figure below)
7. Only the transmission line specified should be connected to the terminal block for Outdoor Unit transmission.



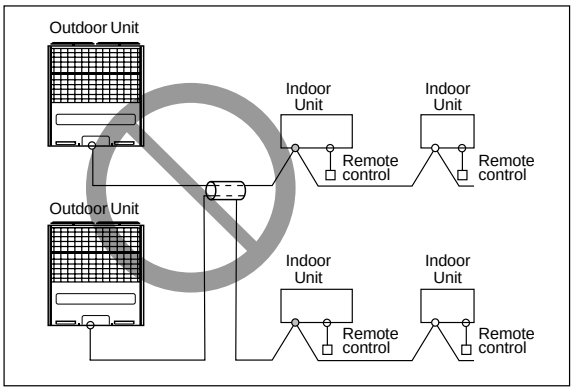
2-Core Shield Cable



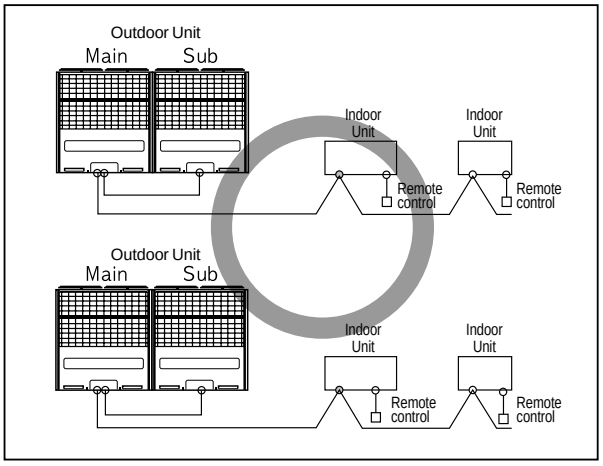
Multi-Core Cable



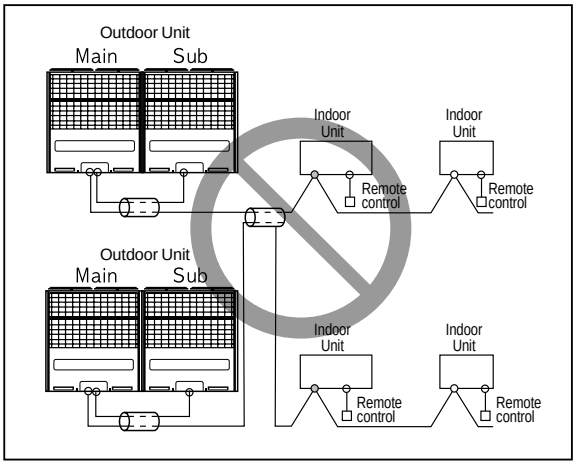
2-Core Shield Cable



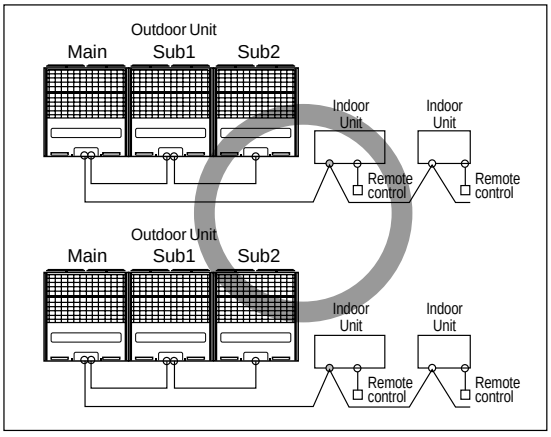
Multi-Core Cable



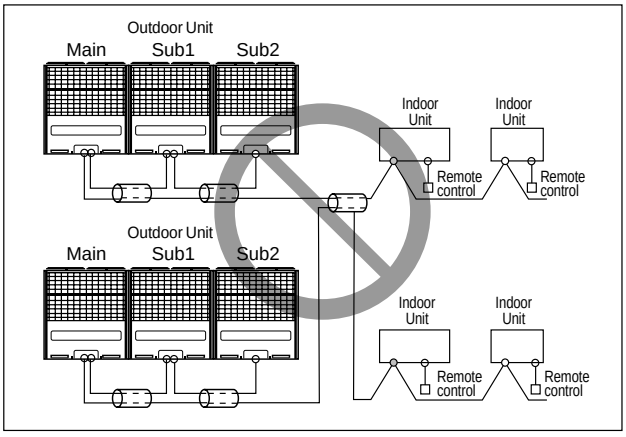
2-Core Shield Cable



Multi-Core Cable



2-Core Shield Cable



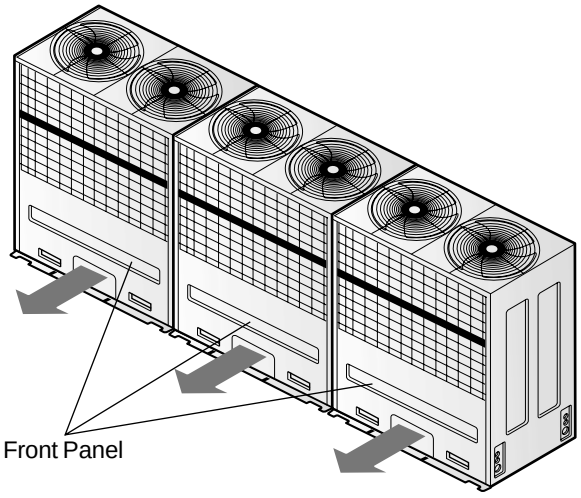
Multi-Core Cable

CAUTION

- **Use the 2-core shield cables for transmission lines. Never use them together with power cables.**
- **Never use multi-core cable**
- **As this unit is equipped with an inverter, to install a phase leading capacitor not only will deteriorate power factor improvement effect, but also may cause capacitor abnormal heating. Therefore, never install a phase leading capacitor.**
- **Keep power imbalance within 2% of the supply rating. Large imbalance will shorten the life of the smoothing capacitor.**

Control box and connecting position of wiring

- Remove all of the screws on front panel by pulling it forward.

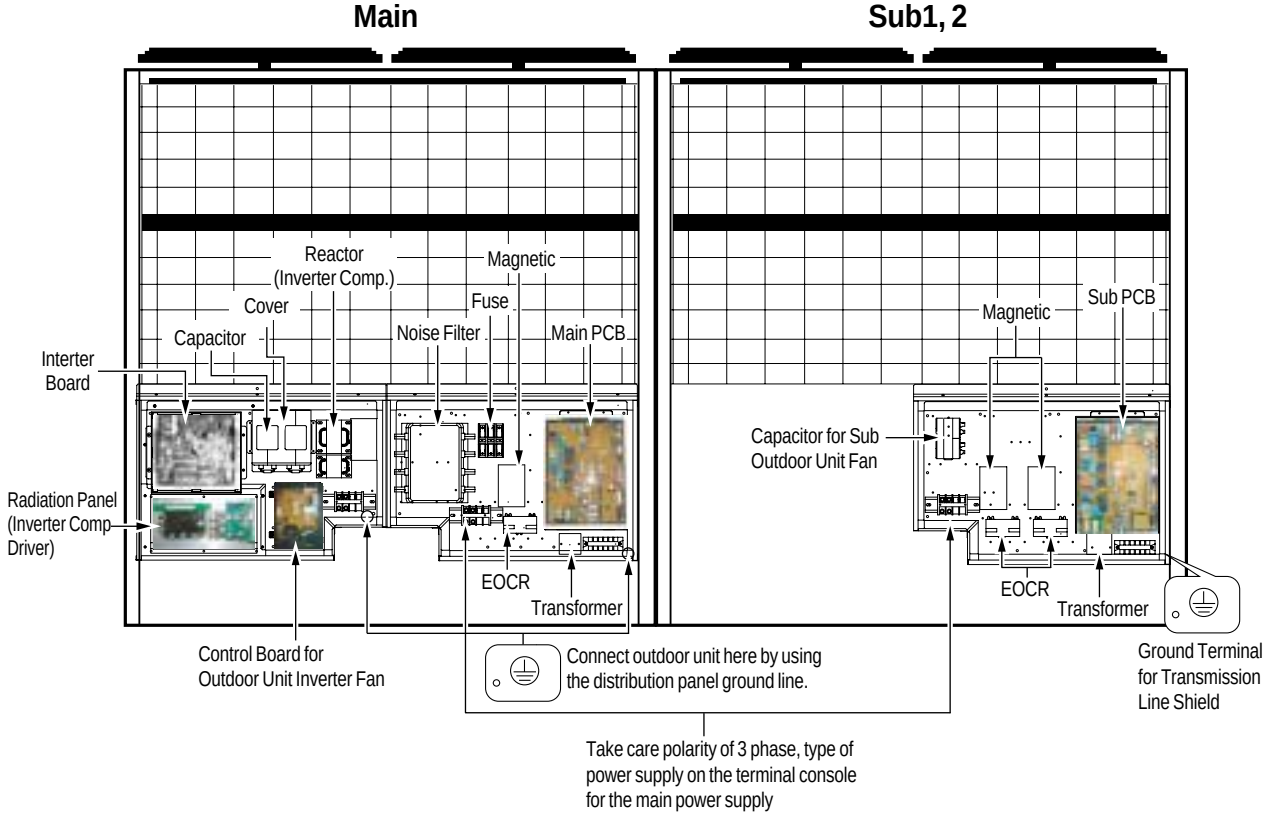


- Connect Main Outdoor Unit with Sub Outdoor Units, and Main Outdoor with Indoor Units through the terminal block for transmission lines.
- When making an indoor/outdoor connection with shielded wiring, connect the shield ground to the earth screw. When making a central control system connection with shielded wiring, use the terminal block for central control.

WARNING

The temperature sensor for outdoor air should not be exposed to direct sunlight.

- Provide an appropriate cover to intercept direct sunlight.



Transmission and Power Lines

1) Transmission cable

- Types : shielding wire CVVS or CPEVS
- Diameter : over 1.25mm^2
- Insulation material : PVC
- Maximum allowable temperature: 60°C
- Maximum allowable line length: under 220m

2) Remote control cable

- Types : 3-core cable

3) Simple central control cable

- Types : 4-core cable (Shielding wire)
- Diameter : over 1.25mm^2
- Insulation material : PVC

4) Separation of transmission and power lines

- If transmission and power lines are run alongside each other then here is a strong likelihood of operational faults developing due to interference in the signal wiring caused by electrostatic and electromagnetic coupling.
  The tables below indicates our recommendation as to appropriate spacing of transmission and power lines where these are to be run side by side

Current capacity of power line		Spacing
100V or more	10A	300mm
	50A	500mm
	100A	1000mm
	100A or more	1500mm

Note:

1. The figures are based on assumed length of parallel cabling up to 100m. For length in excess of 100m the figures will have to be recalculated in direct proportion to the additional length of line involved.
2. If the power supply waveform continues to exhibit some distortion the recommended spacing in the table should be increased.

- If the lines are laid inside conduits then the following point must also be taken into account when grouping various lines together for introduction into the conduits

- power lines(including power supply to air conditioner) and signal lines must not be laid inside the same
- In the same way, when grouping the lines power and signal lines should not be bunched together.

CAUTION

■ If apparatus is not properly earthed then there is always a risk of electric shocks, the earthing of the apparatus must be carried out by a qualified person.

■ Use a power wire pipe for the power wiring

◆ Wiring of Main Power Supply and Equipment Capacity

Schematic Drawing of Wiring (Example)

Outdoor Unit ((3Ø, 380 ~415V, 50Hz)(3Ø, 380V, 60Hz))
Indoor Unit(1Ø, 220V, 50Hz)(1Ø, 220V, 60Hz))

Model	Minimum Wire Thickness(mm^2)			Breaker for Wiring (NFB)	Breaker for Current Leakage(ELB)
	Main Cable	Branch	Ground		
1 Outdoor Unit((5, 6HP)	5.5	–	5.5	30A	30A 100mA 0.1 sec. or less
Indoor Unit (All Models)	2	2	2	30A	30A 30mA 0.1 sec. or less

Model	Minimum Wire Thickness(mm^2)			Breaker for Wiring (NFB)	Breaker for Current Leakage(ELB)
	Main Cable	Branch	Ground		
1 Outdoor Unit	8	–	8	50A	50A 100mA 0.1 sec. or less
Indoor Unit (All Models)	4	2	4	30A	30A 30mA 0.1 sec. or less

Model	Minimum Wire Thickness(mm^2)			Breaker for Wiring (NFB)	Breaker for Current Leakage(ELB)
	Main Cable	Branch	Ground		
2 Outdoor Units	14	–	14	75A(50Hz), 85A(60Hz)	30A 100mA 0.1 sec. or less
Indoor Unit (All Models)	4	2	4	30A	20A 30mA 0.1 sec. or less

❋ Power line between Main Outdoor Unit and Sub Outdoor Unit: 8mm^2

Model	Minimum Wire Thickness(mm^2)			Breaker for Wiring (NFB)	Breaker for Current Leakage(ELB)
	Main Cable	Branch	Ground		
3 Outdoor Units	38	–	38	110A(50Hz), 120A(60Hz)	125A 200mA 0.1 sec. or less
Indoor Unit (Outdoor Unit 30HP)	5.5	2	5.5	50A	50A 50mA 0.1 sec. or less
Indoor Unit (Outdoor Unit 40HP)	8	2	8	60A	60A 60mA 0.1 sec. or less

❋ Power line between Main Outdoor Unit and Sub Outdoor Unit: 14mm^2

❋ Power line between Sub 1 Outdoor Unit and Sub 2 Outdoor Unit: 8mm^2.

1. Use a separate power supply for the Outdoor Unit and Indoor Unit.
2. Bear in mind ambient conditions (ambient temperature,direct sunlight, rain water,etc.) when proceeding with the wiring and connections.
3. The wire size is the minimum value for metal conduit wiring. The power cord size should be 1 rank thicker taking into account the line voltage drops. Make sure the power-supply voltage does not drop more than 10%.
4. Specific wiring requirements should adhere to the wiring regulations of the region.
5. Power supply cords of parts of appliances for outdoor use should not be lighter than polychloroprene sheathed flexible cord.
6. Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.
7. All the wiring should comply with the local electrical legislations.

WARNING

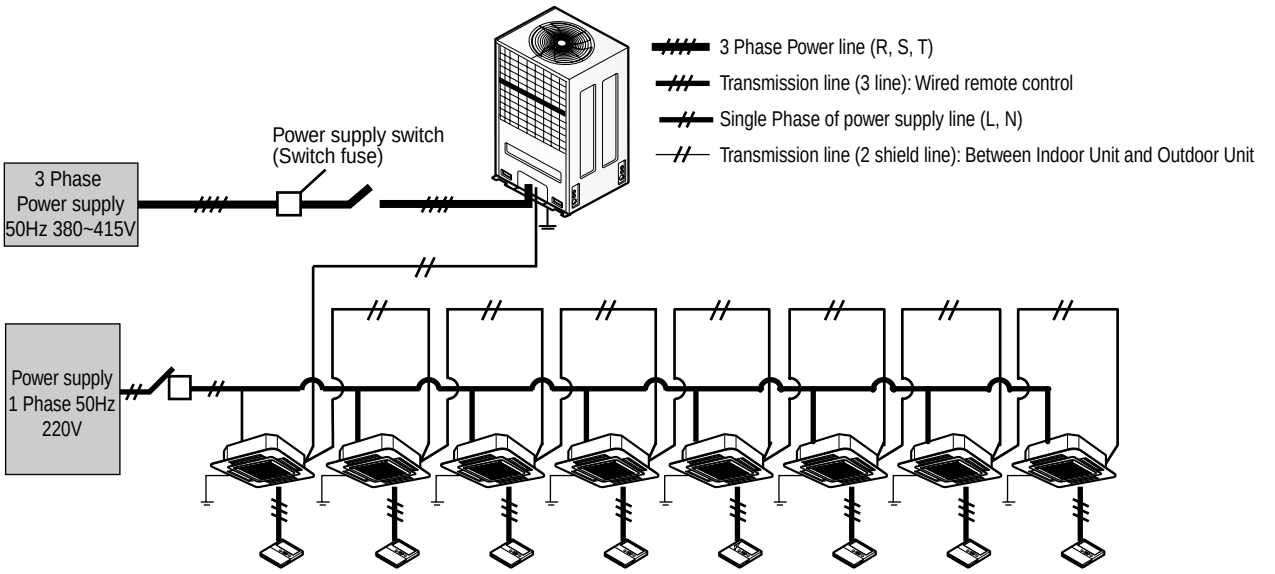
- **Be sure to use specified wires for connections so that no external force is imparted to terminal connections. If connections are not fixed firmly, it may cause heating or fire.**
- **Be sure to use the appropriate type of overcurrent protection switch. Note that generated overcurrent may include some amount of direct current.**

CAUTION

- **Some installation site may require attachment of an earth leakage breaker. If no earth leakage breaker is installed, it may cause an electric shock.**
- **Do not use anything other than breaker and fuse with correct capacity. Using fuse and wire or copper wire with too large capacity may cause a malfunction of unit or fire.**

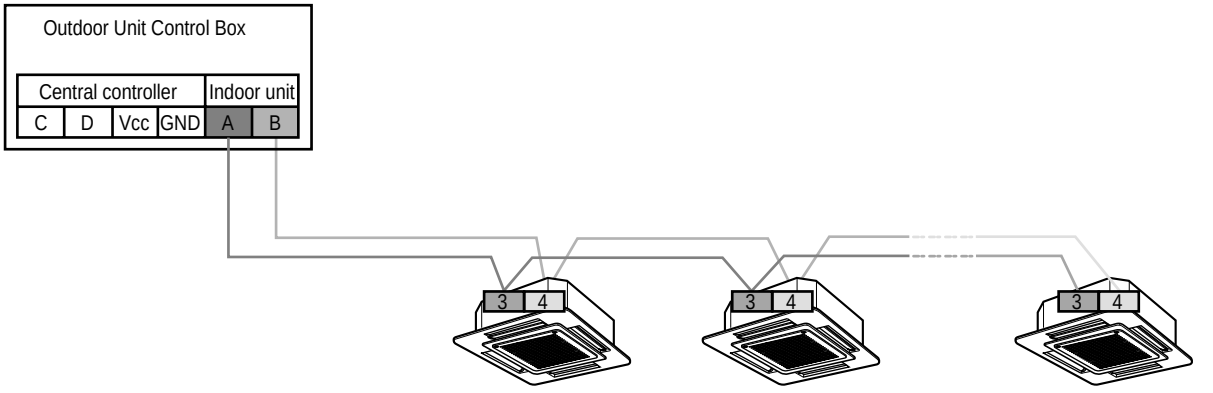
◆ Example Connection of Transmission Cable

1 Outdoor Unit(Half size)



WARNING

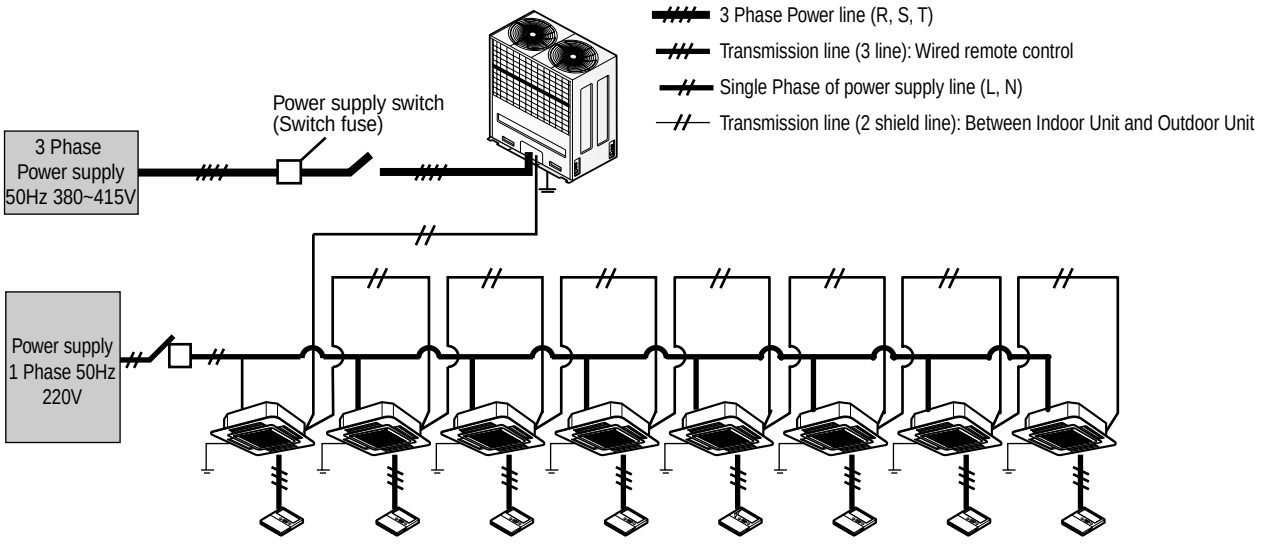
- **Indoor Unit ground Lines are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor current leakage (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



The GND terminal is a '–' terminal for the central controller, not Ground Line

◆ Example Connection of Transmission Cable

1 Outdoor Unit



WARNING

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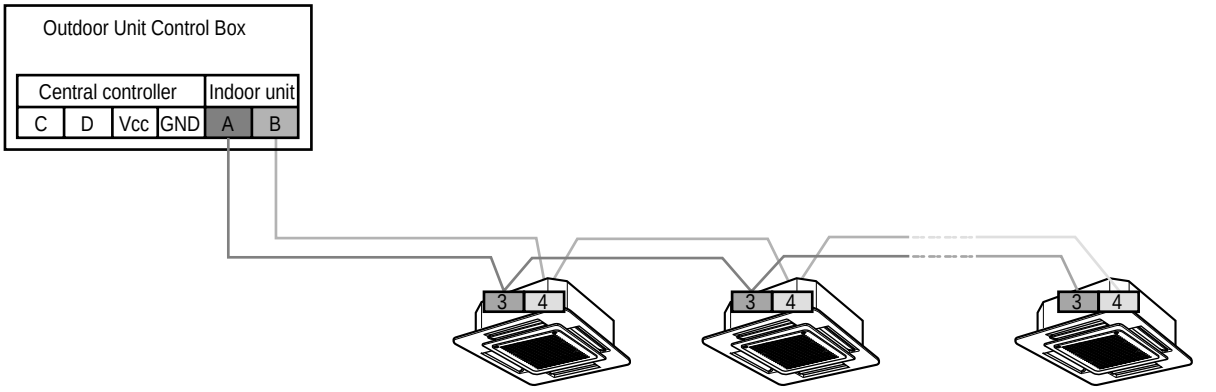

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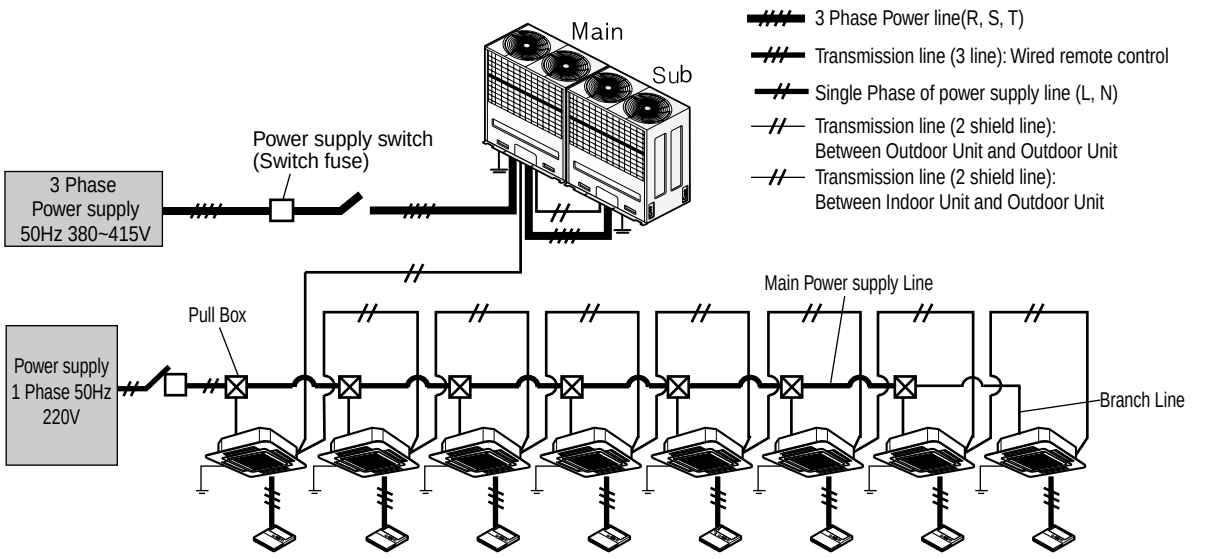
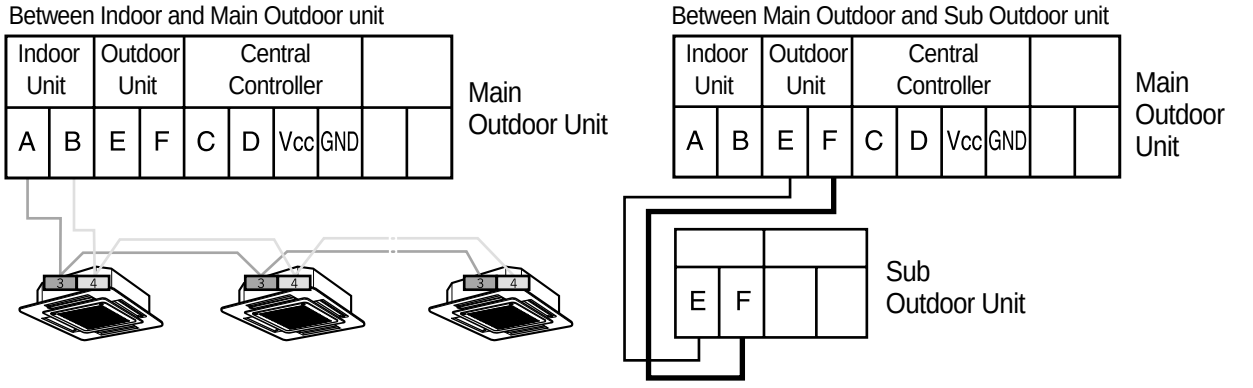
◆ Example Connection of Transmission Cable

2 Outdoor Units



WARNING

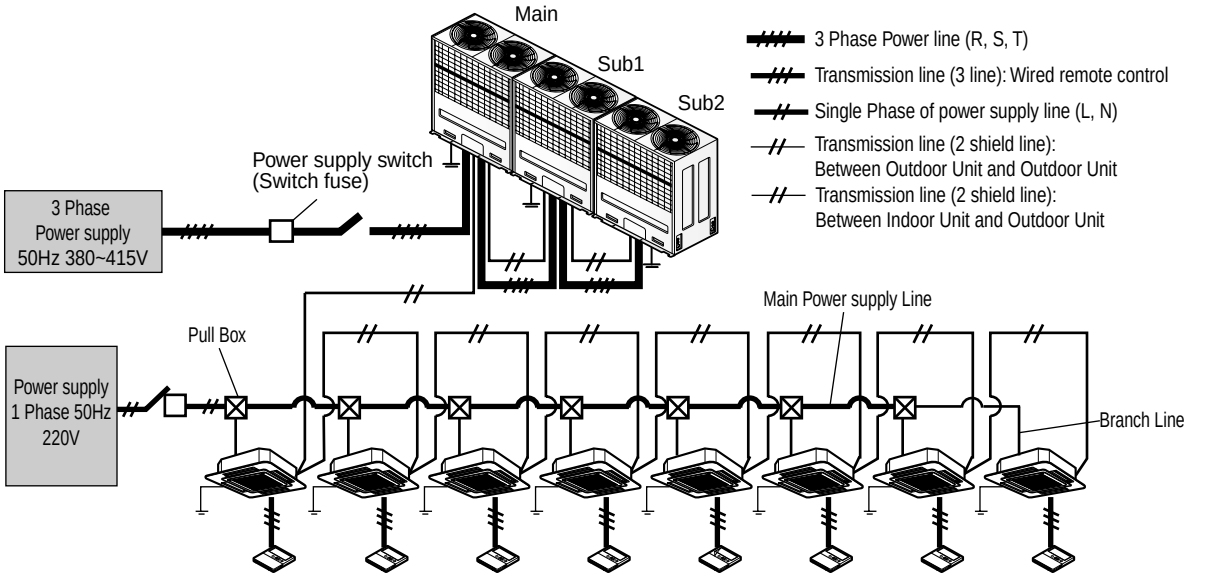
- **Indoor Unit ground Lines are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor current leakage (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



The GND terminal is a '–' terminal for the central controller, not Ground Line

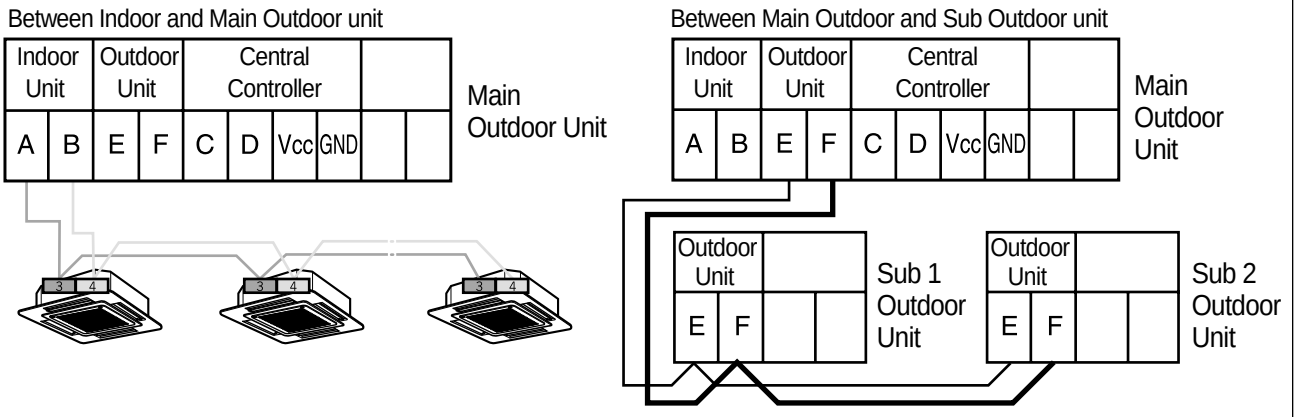
◆ Example Connection of Transmission Cable

3 Outdoor Units



WARNING

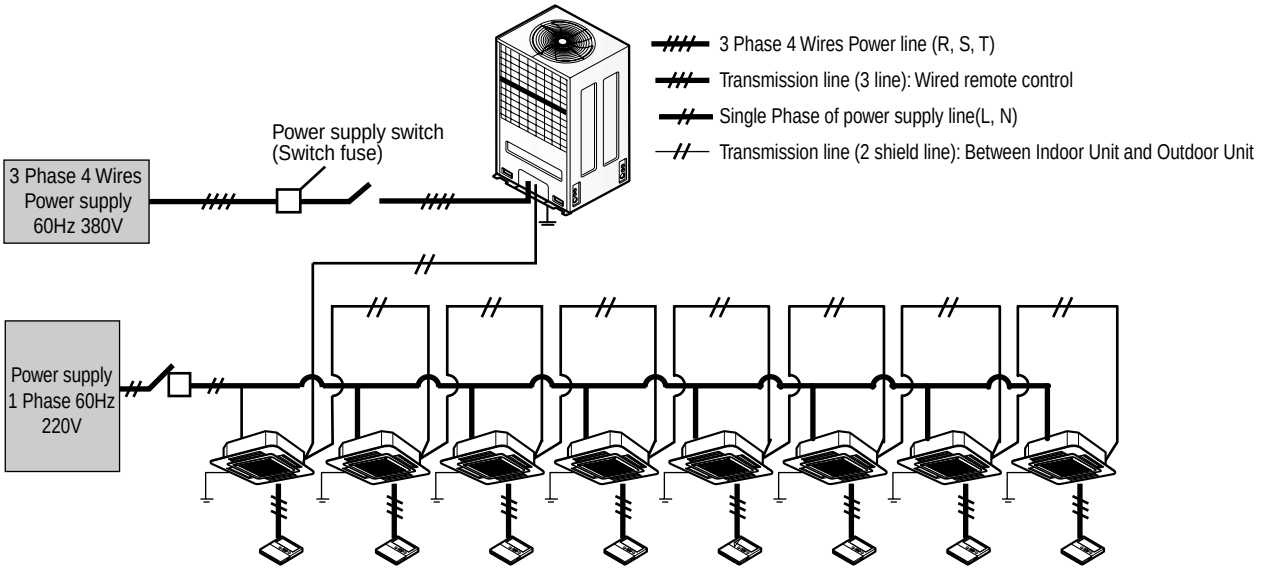
- **Indoor Unit ground Lines are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor current leakage (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



The GND terminal is a '–' terminal for the central controller, not Ground Line

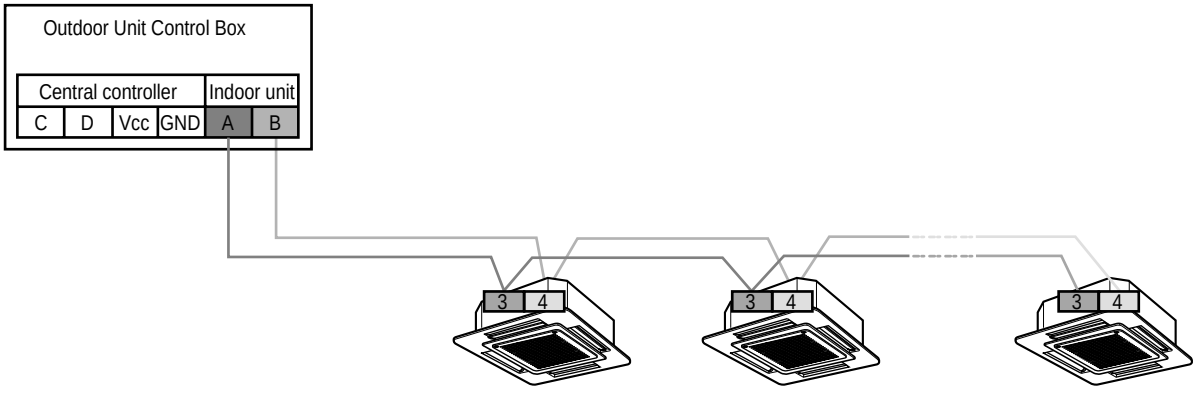
◆ Example Connection of Transmission Cable

1 Outdoor Unit(Half size)



WARNING

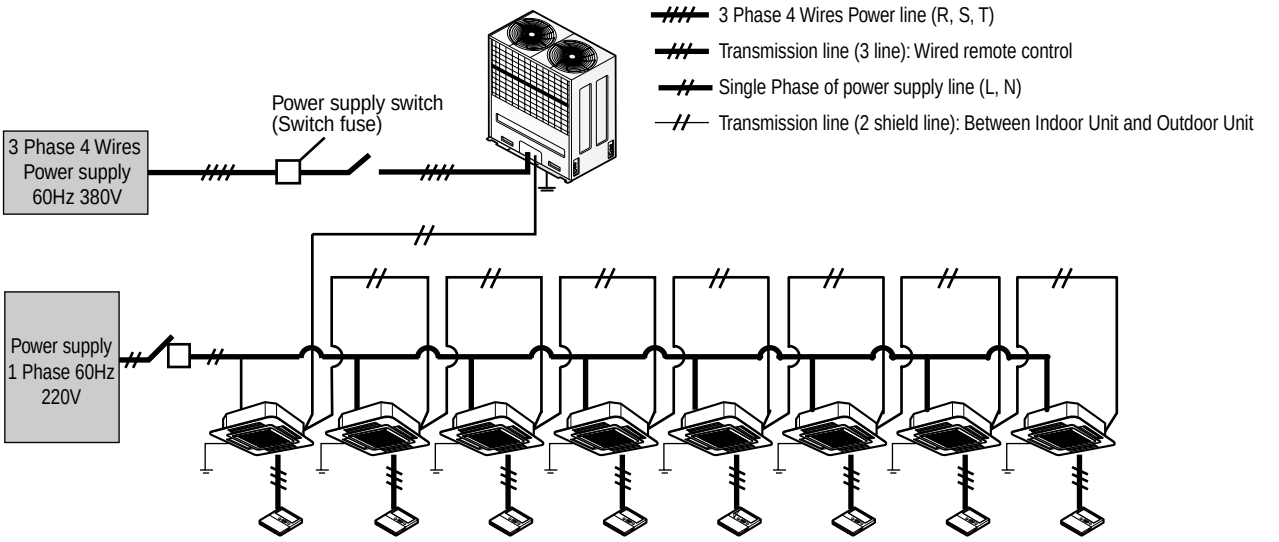
- **Indoor Unit ground Lines are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor current leakage (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



The GND terminal is a '–' terminal for the central controller, not Ground Line

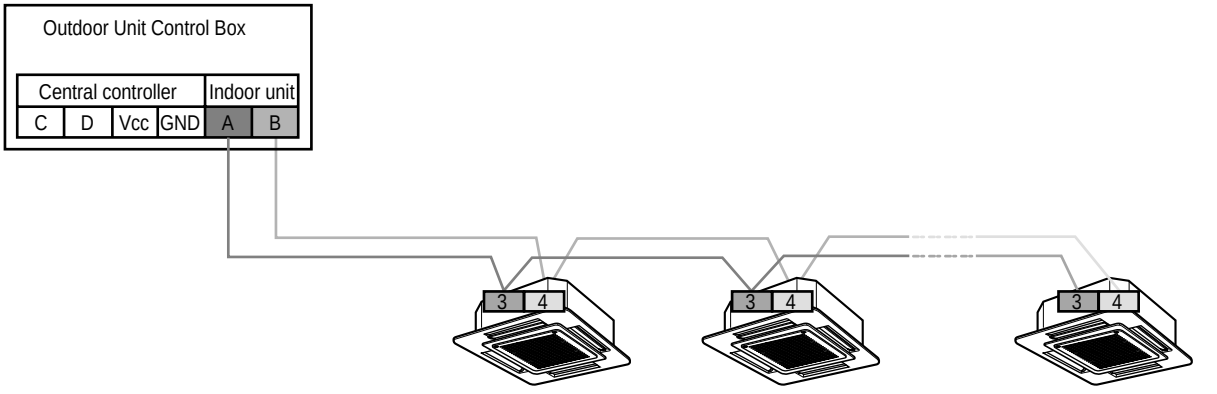
◆ Example Connection of Transmission Cable

1 Outdoor Unit



WARNING

- **Indoor Unit ground Lines are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor current leakage (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



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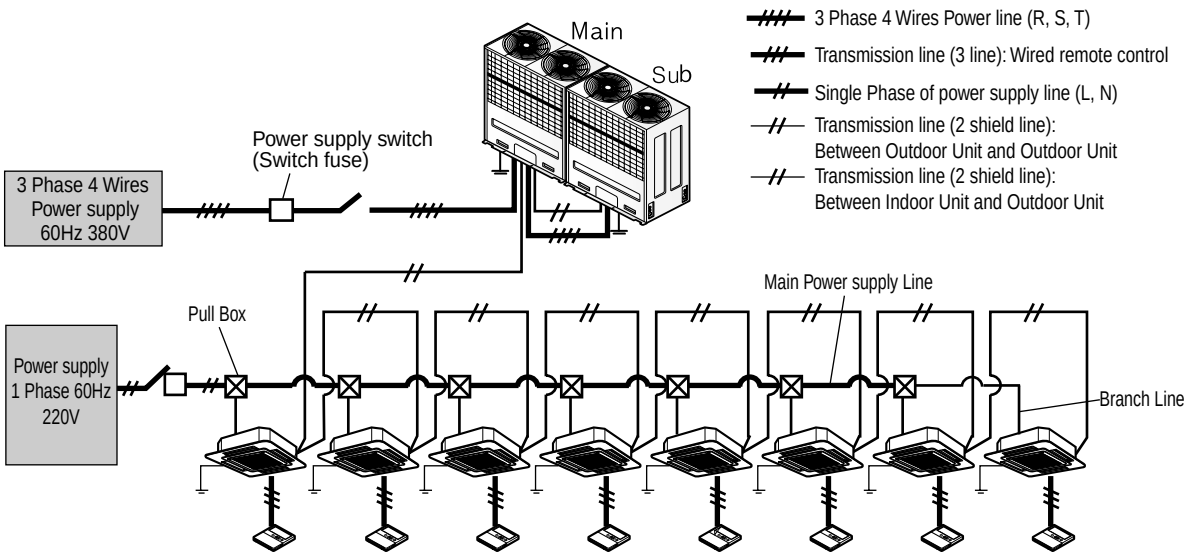
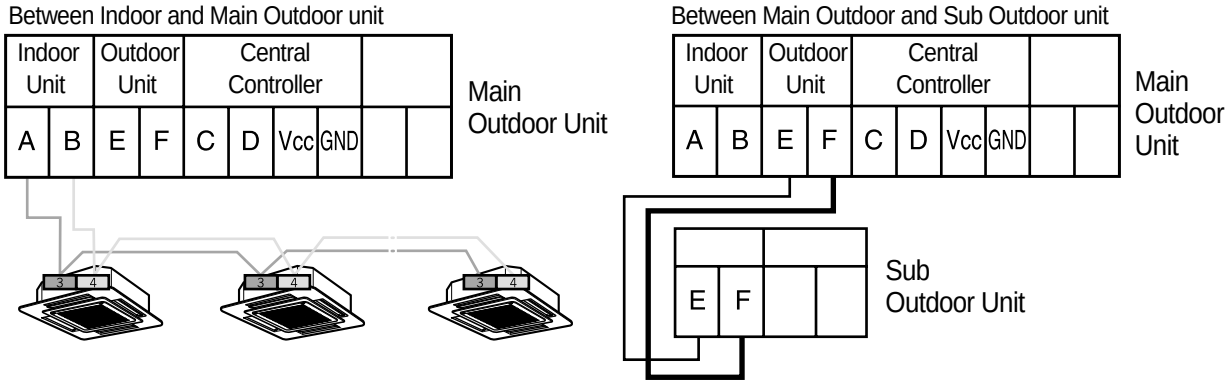
◆ Example Connection of Transmission Cable

2 Outdoor Units



WARNING

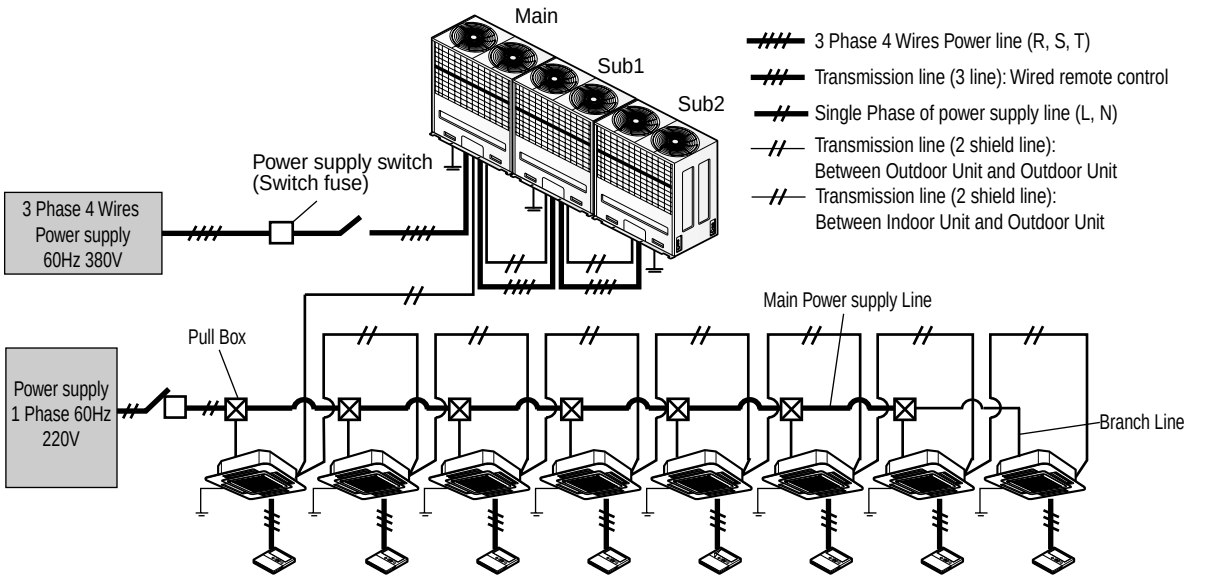
- **Indoor Unit ground Lines are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor bearing leakage (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



The GND terminal is a '–' terminal for the central controller, not Ground Line

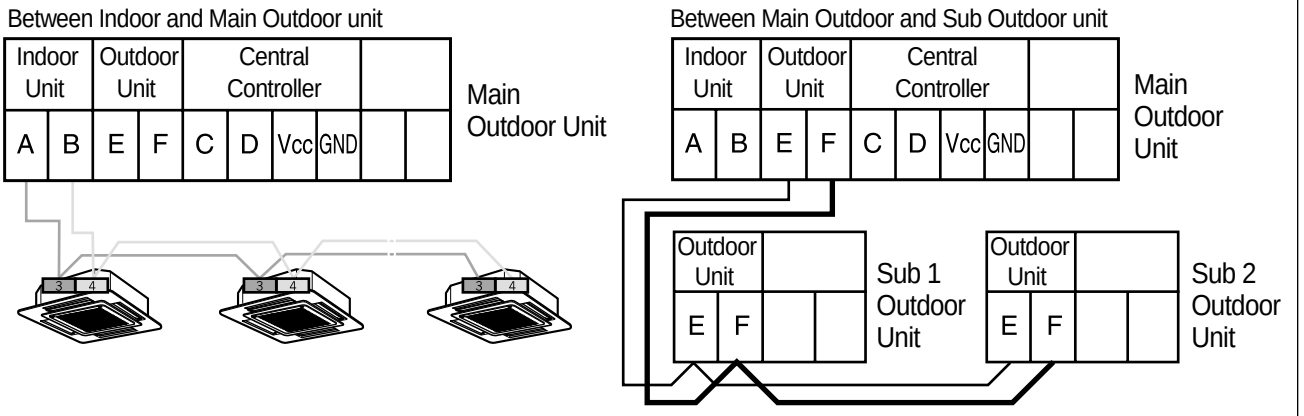
◆ Example Connection of Transmission Cable

3 Outdoor Units



WARNING

- **Indoor Unit ground Lines are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor current leakage (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



The GND terminal is a '–' terminal for the central controller, not Ground Line

◆ Wiring of Main Power Supply and Equipment Capacity

Schematic Drawing of Wiring (Example)

Outdoor Unit(3Ø, 220V, 60Hz)
Indoor Unit(1Ø, 220V, 60Hz)

Model	Minimum Wire Thickness(mm^2)			Breaker for Wiring (NFB)	Breaker for Current Leakage(ELB)
	Main Cable	Branch	Ground		
1 Outdoor Unit(Half size)	8	–	8	50A	50A 100mA 0.1 sec. or less
Indoor Unit (All Models)	2	2	2	25A	30A 30mA 0.1 sec. or less

Model	Minimum Wire Thickness(mm^2)			Breaker for Wiring (NFB)	Breaker for Current Leakage(ELB)
	Main Cable	Branch	Ground		
1 Outdoor Unit	22	–	22	75A	75A 100mA 0.1 sec. or less
Indoor Unit (All Models)	4	2	4	30A	30A 30mA 0.1 sec. or less

Model	Minimum Wire Thickness(mm^2)			Breaker for Wiring (NFB)	Breaker for Current Leakage(ELB)
	Main Cable	Branch	Ground		
2 Outdoor Units	60	–	60	150A	150A 100mA 0.1 sec. or less
Indoor Unit (All Models)	4	2	4	30A	20A 30mA 0.1 sec. or less

❋ Power line between Main Outdoor Unit and Sub Outdoor Unit: 8mm^2

Model	Minimum Wire Thickness(mm^2)			Breaker for Wiring (NFB)	Breaker for Current Leakage(ELB)
	Main Cable	Branch	Ground		
3 Outdoor Units	100	–	100	200A	200A 100mA 0.1 sec. or less
Indoor Unit (Outdoor Unit 30HP)	5.5	2	5.5	50A	50A 50mA 0.1 sec. or less
Indoor Unit (Outdoor Unit 40HP)	8	2	8	60A	60A 60mA 0.1 sec. or less

❋ Power line between Main Outdoor Unit and Sub Outdoor Unit: 14mm^2

❋ Power line between Sub 1 Outdoor Unit and Sub 2 Outdoor Unit: 8mm^2.

1. Use a separate power supply for the Outdoor Unit and Indoor Unit.
2. Bear in mind ambient conditions (ambient temperature,direct sunlight, rain water,etc.) when proceeding with the wiring and connections.
3. The wire size is the minimum value for metal conduit wiring. The power cord size should be 1 rank thicker taking into account the line voltage drops. Make sure the power-supply voltage does not drop more than 10%.
4. Specific wiring requirements should adhere to the wiring regulations of the region.
5. Power supply cords of parts of appliances for outdoor use should not be lighter than polychloroprene sheathed flexible cord.
6. Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.
7. All the wiring should comply with the local electrical legislations.

WARNING

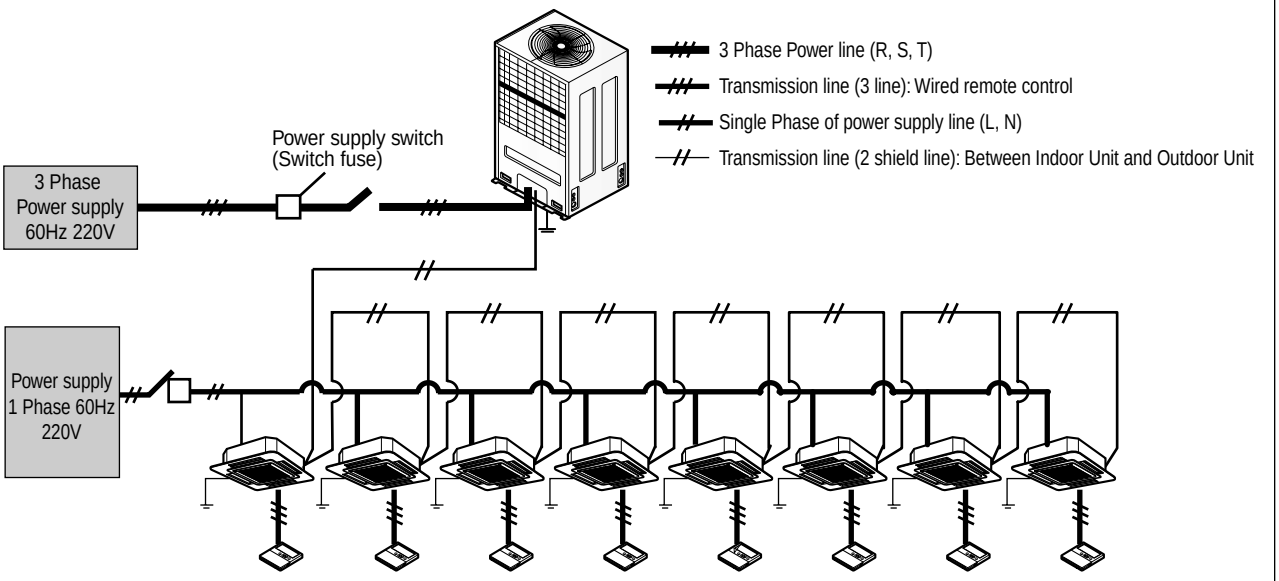
- **Be sure to use specified wires for connections so that no external force is imparted to terminal connections. If connections are not fixed firmly, it may cause heating or fire.**
- **Be sure to use the appropriate type of overcurrent protection switch. Note that generated overcurrent may include some amount of direct current.**

CAUTION

- **Some installation site may require attachment of an earth leakage breaker. If no earth leakage breaker is installed, it may cause an electric shock.**
- **Do not use anything other than breaker and fuse with correct capacity. Using fuse and wire or copper wire with too large capacity may cause a malfunction of unit or fire.**

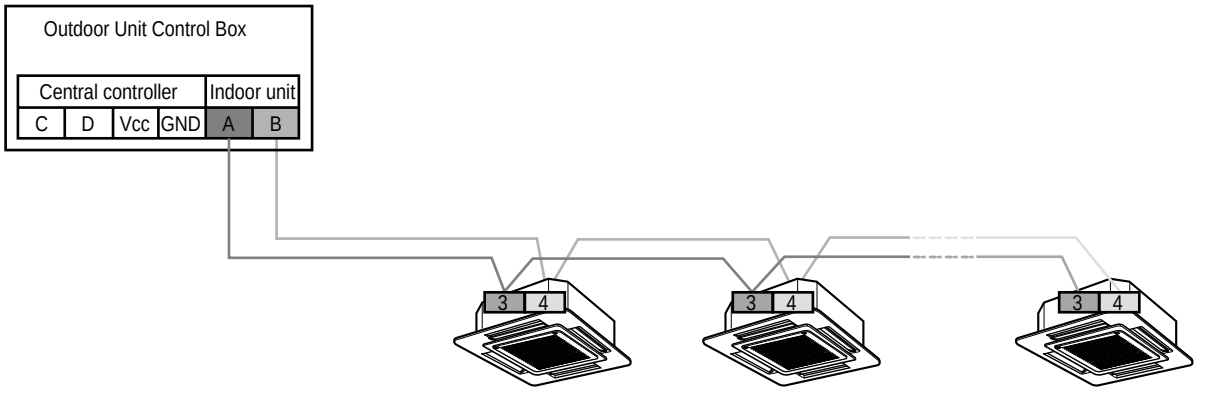
◆ Example Connection of Transmission Cable

1 Outdoor Unit(Half size)



WARNING

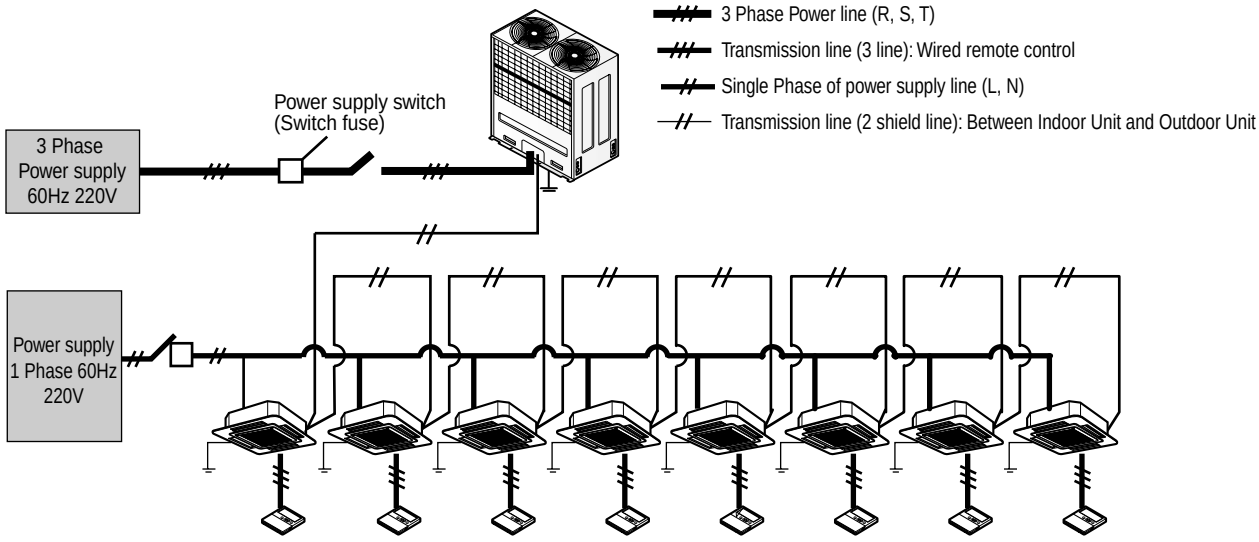
- **Indoor Unit ground Line are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor leakage current (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



The GND terminal is a '–' terminal for the central controller, not Ground Line

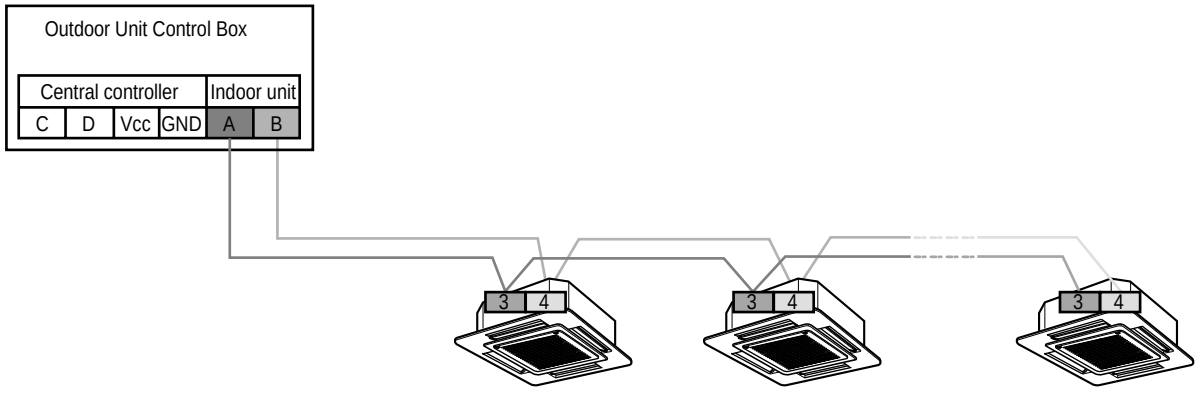
◆ Example Connection of Transmission Cable

1 Outdoor Unit



WARNING

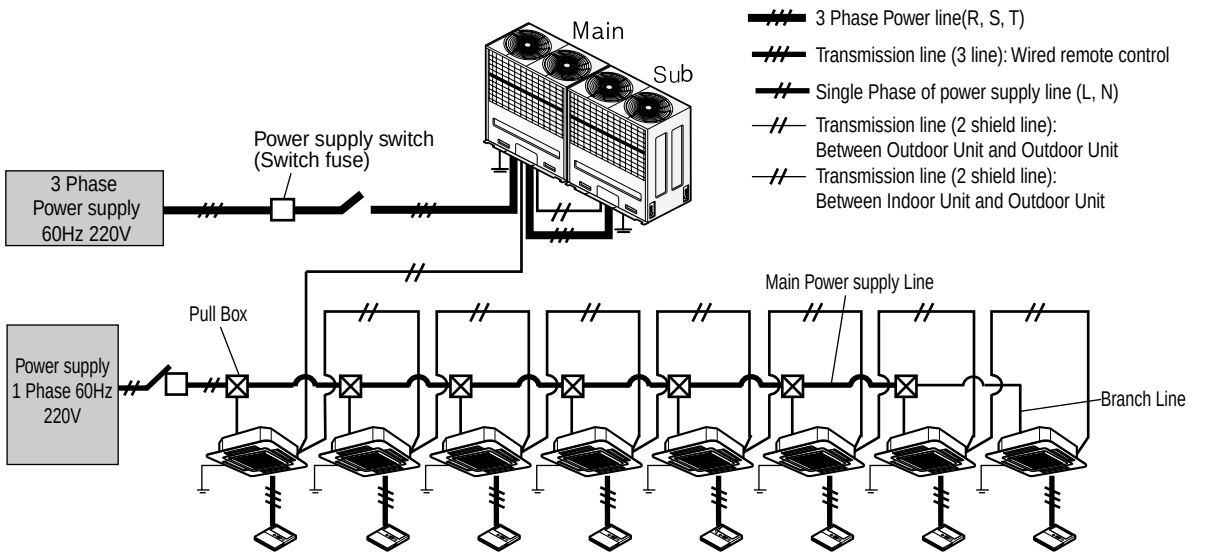
- **Indoor Unit ground Line are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor leakage current (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



The GND terminal is a '–' terminal for the central controller, not Ground Line

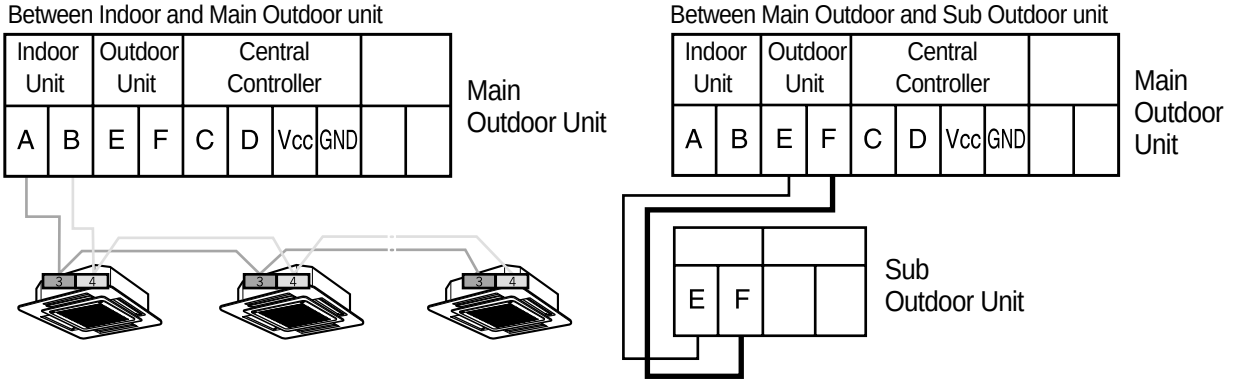
◆ Example Connection of Transmission Cable

2 Outdoor Units



WARNING

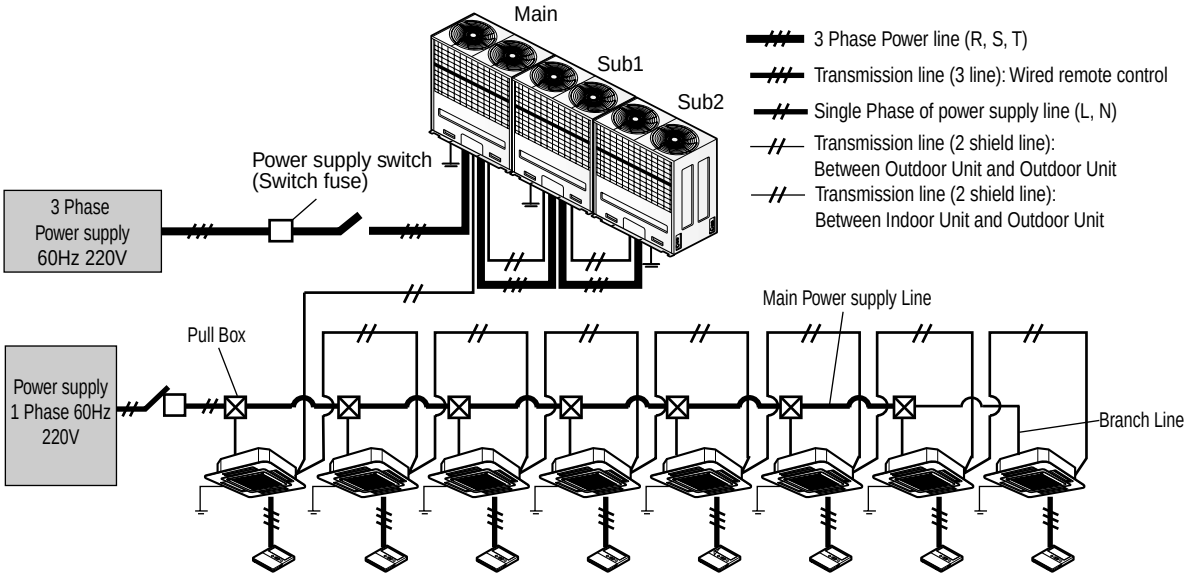
- **Indoor Unit ground Line are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor leakage current (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



The GND terminal is a '–' terminal for the central controller, not Ground Line

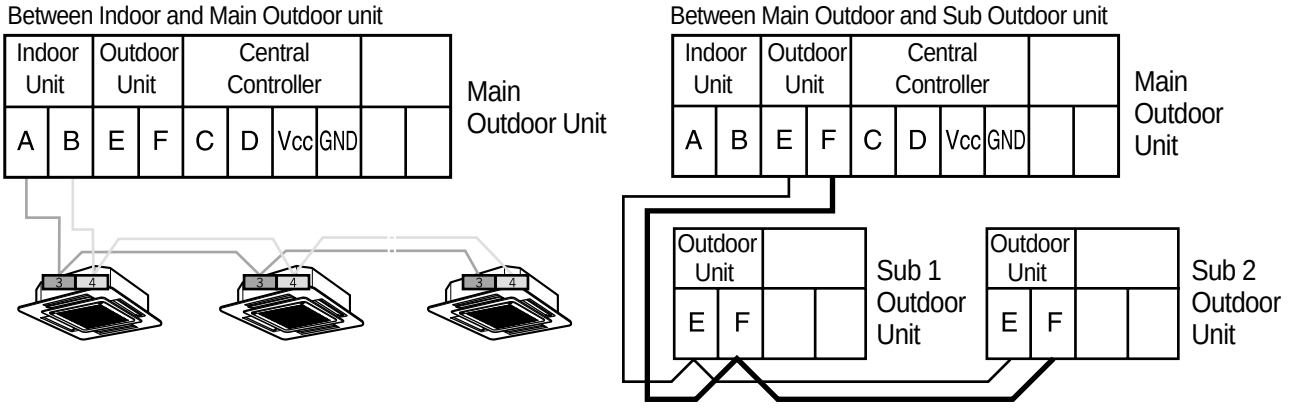
◆ Example Connection of Transmission Cable

3 Outdoor Units



WARNING

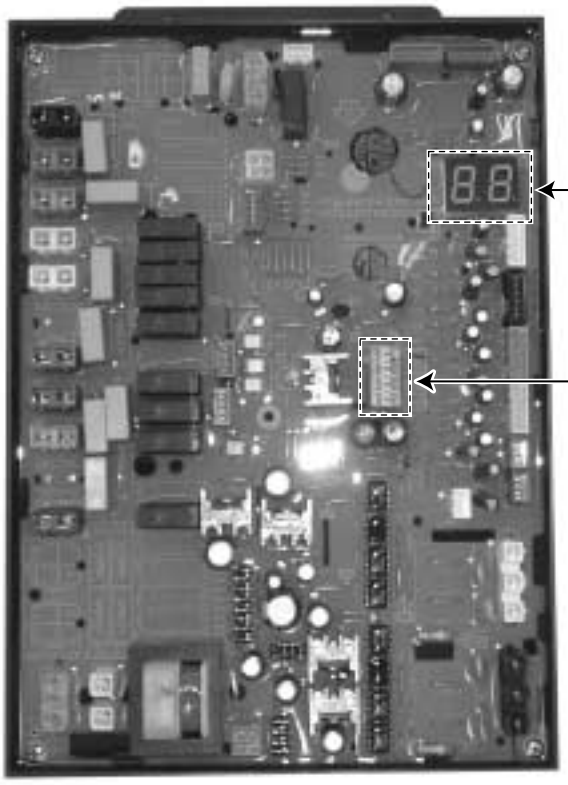
- **Indoor Unit ground Line are required for preventing electrical shock accident in current leakage, Transmission disorder by noise effect and motor leakage current (without connection to pipe).**
- **Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.**



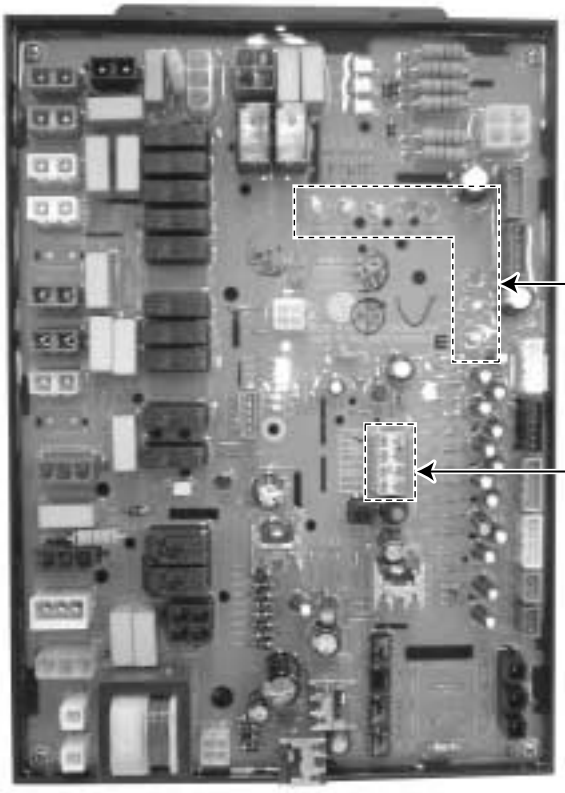
The GND terminal is a '–' terminal for the central controller, not Ground Line

Location of setting Switch

Main PCB



Sub1, 2 PCB



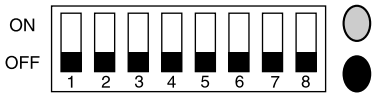
DIP switch setting

- The Sub Outdoor Unit numbers must be setup as No.1 from the near side from the Main Outdoor Unit.
- For the DIP switch, that far from the button switch becomes number 1.
- Setting check depending on setting of the DIP switch.
  (1) You can check that setting values are properly setup as the Main Outdoor Unit is set to 7 segment, the Sub Outdoor Unit to LED if turning the power of the Outdoor Unit on after setting up the DIP switch.
  (2) This function is shown only for 2 seconds after powering up.
  (3) It is function to check that input is properly done due to a poor contact of the DIP switch.

CAUTION

Product may not properly operate if the relevant DIP switch is not properly setup.

Setting of Main Outdoor Unit

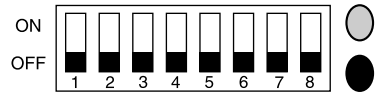
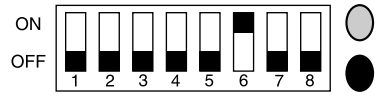
SW03M setting	
	Factory shipment status Normal mode

Check of Main Outdoor Unit setting

Numbers sequentially show on 7 segments after powering up.
These numbers show setting status.

Order	Number	Item
1st	1	Factory shipment status
2nd	7	Cooling Only
	9	H/P
3rd	5~40	Number showing capacity
4th	25	Nomal mode
	31	Operation check mode

Setting of Sub Outdoor Unit

SW03M setting	
	Factory shipment status Normal mode
	Sub1 Outdoor Unit
	Sub2 Outdoor Unit

Check of Sub Outdoor Unit setting

Shows setting status by using 8 LEDs of the Sub Outdoor Unit.

1) LED01Y, LED02Y
● ●: Factory shipment status

2) LED03Y, LED04Y
● ●: Cooling Only ○ ●: H/P

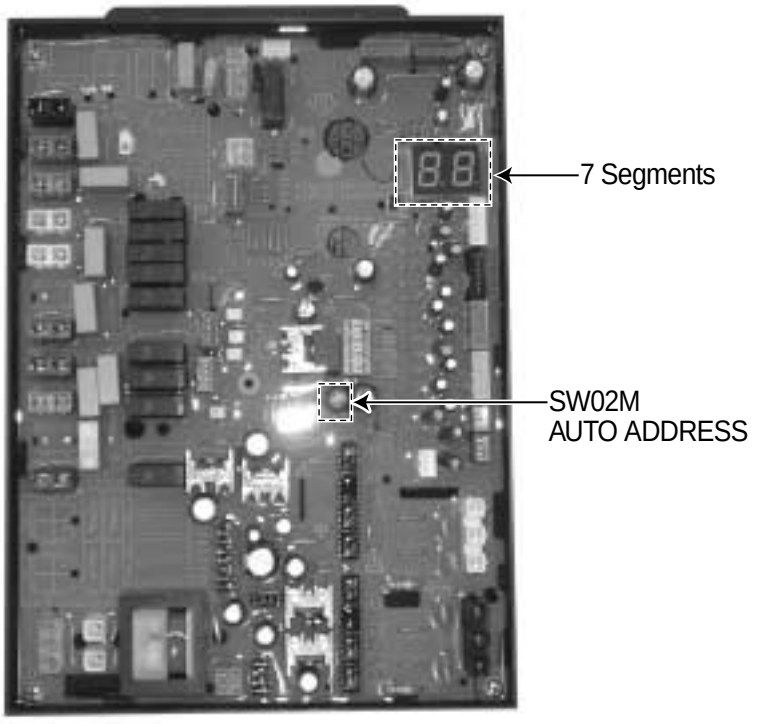
3) LED05Y, LED06Y
○ ●: Sub1 Outdoor Unit ● ○: Sub2 Outdoor Unit

4) LED07Y, LED08Y
● ●: Normal mode ○ ○: Operation check mode

Automatic Addressing

• The address of Indoor Units would be set by Automatic addressing

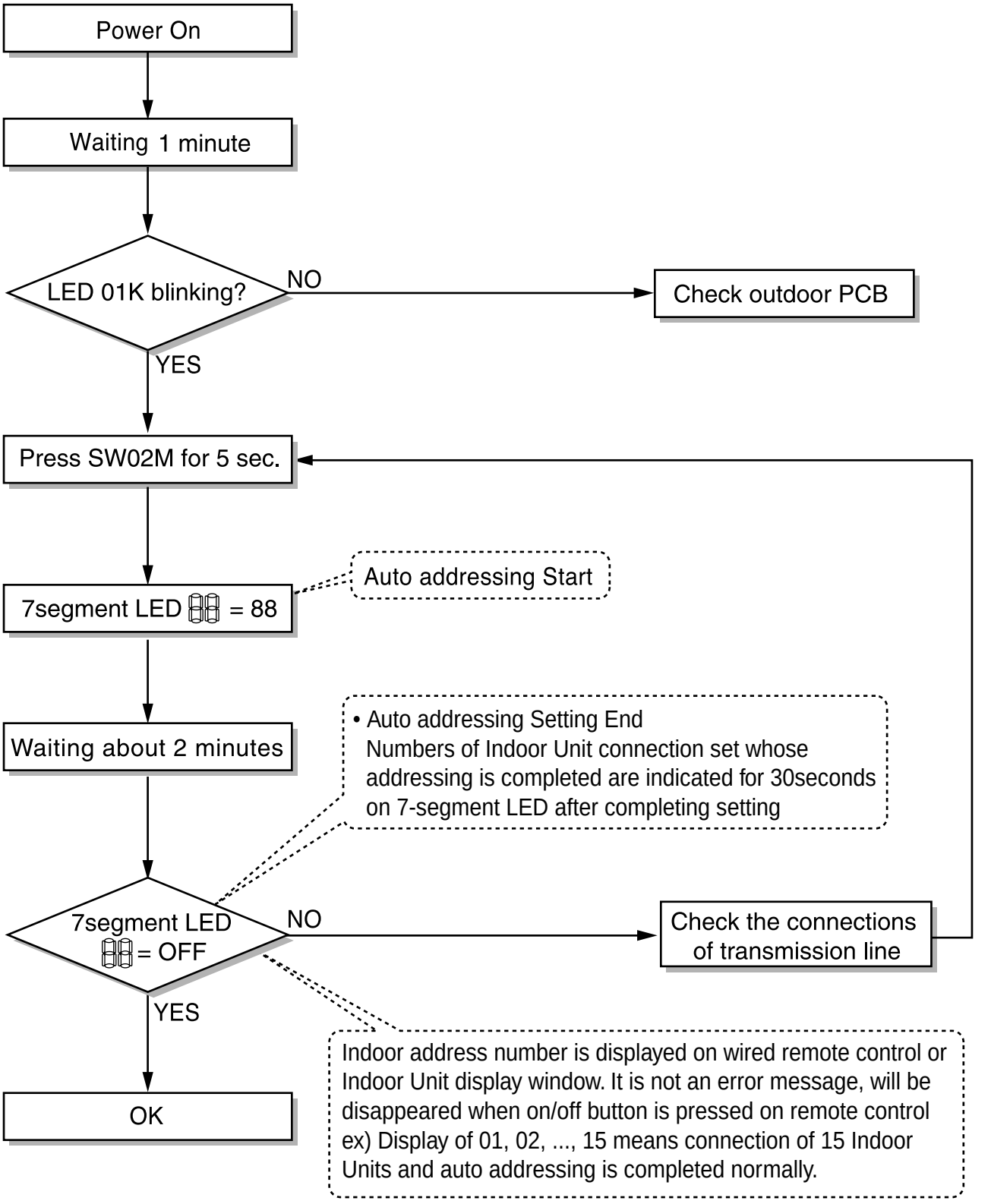
1) Wait for a minute after applying power supply
   (Main and Sub Outdoor Unit, Indoor Unit).
2) Press the switch of the Outdoor Unit (SW02M) for 5 seconds.
3) A "**88**" is indicated on 7-segment LED of the Outdoor Unit control board.
4) For completing addressing, 2~7 minutes are required depending on numbers of Indoor Unit connection set.
5) Numbers of Indoor Unit connection set whose addressing is completed are indicated for 30seconds on 7-segment LED of the Outdoor Unit control board.
6) After completing addressing, address of each Indoor Unit is indicated on the wired remote control display window. (CH01, CH02, CH03, ... CH06: Indicated as numbers of Indoor Unit connection set.)



CAUTION

- In replacement of the Indoor Unit PCB, always perform Automatic Address Setting again. If power supply is not applied to the Indoor Unit, operation error occurs.
- Automatic addressing is only possible on the main PCB

◆ The Procedure of Automatic Addressing



Group Number Setting for Indoor Units

① Confirm the power of whole system(Indoor Unit, Outdoor Unit) is OFF, otherwise turn off.

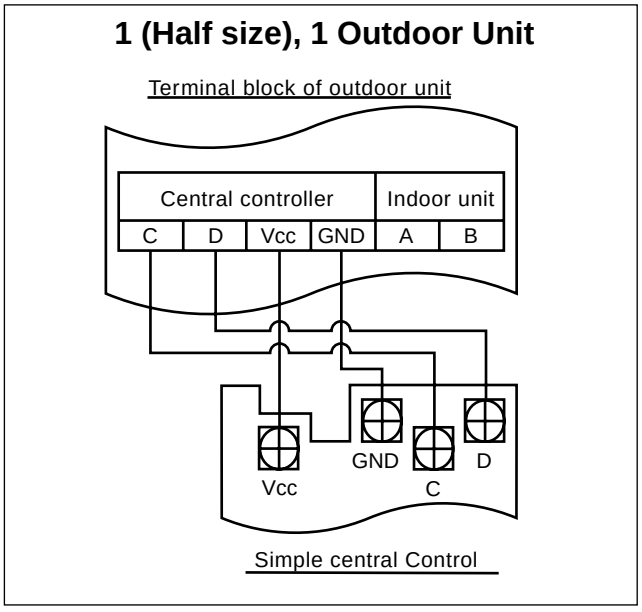
② The transmission lines connected to C, D of simple central controller should be connected to C,D terminal port for central control of Outdoor Unit with care for their polarity (C ➔ C, D ➔ D)

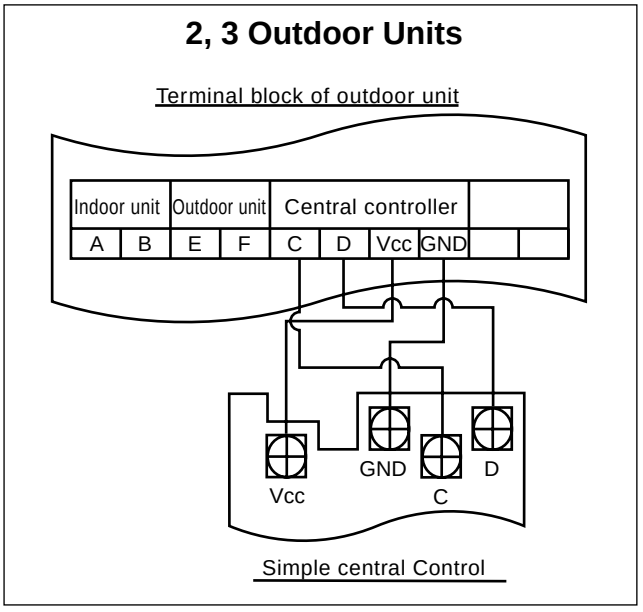
③ Both the DC power (Vcc) and the GND connect the simple central controller according to the polarity of Vcc terminal and GND.

④ Turn the whole system on.

⑤ Set the group and Indoor Unit number with a wired remote control.

⑥ To control several sets of Indoor Units into a group, set the group ID from 0 to F for this purpose.

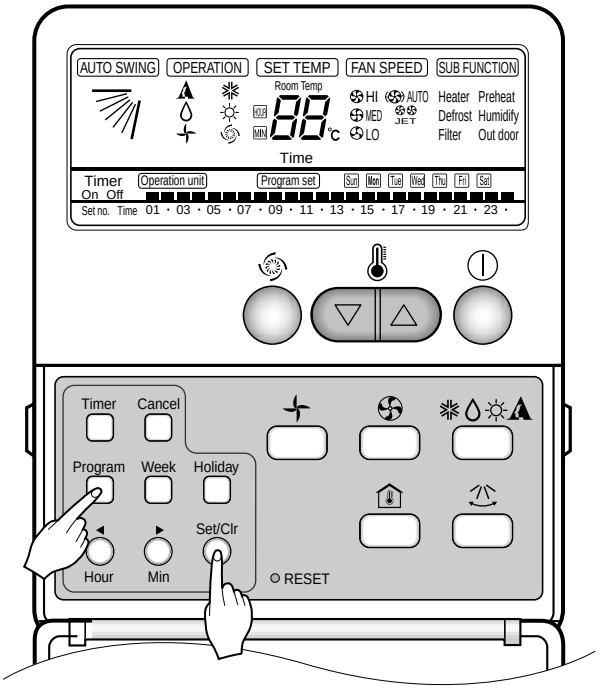




Group recognizing the simple central controller
No. 0 group (00~0F)
No. 1 group (10~1F)
No. 2 group (20~2F)
No. 3 group (30~3F)
No. 4 group (40~4F)
No. 5 group (50~5F)
No. 6 group (60~6F)
No. 7 group (70~7F)
No. 8 group (80~8F)
No. 9 group (90~9F)
No. A group (A0~AF)
No. B group (B0~BF)
No. C group (C0~CF)
No. D group (D0~DF)
No. E group (E0~EF)
No. F group (F0~FF)

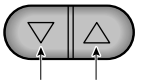
Group Setting and Check Method Using A Wired Remote Control

1. Press Weekly Reservation, setting/release button at the same time for 3 seconds
2. The current group and the Indoor Unit numbers are indicated on the "88" of the wired remote control.



3. Set numbers by using the Temperature Adjust Key.

EX) 3 A



Group No. Room(Indoor Unit) No.

4. Press Weekly Reservation, setting/release button at the same time for 3 seconds
5. If transmit recognition data are received from the Indoor Unit, it returns to the general operation mode.

Test Run

Checks Before Test Run

1	Check to see whether there is any refrigerant leakage, and slack of power or transmission cable.
2	Confirm that 500 V megger shows 2.0 MΩ or more between power supply terminal block and ground. Do not operate in the case of 2.0 MΩ or less. NOTE: Never carry out megaohm check over terminal control board. Otherwise the control board would be broken. Immediately after mounting the unit or after leaving it turned off for an extended length of time, the resistance of the insulation between the power supply terminal board and the ground may decrease to approx. 2 MΩ as a result of refrigerant accumulating in the internal compressor. If the insulation resistance is less than 2 MΩ, turning on the main power supply and energizing the crankcase heater for more than 12 hours will cause the refrigerant to evaporate, increasing the insulation resistance.
3	Check if High/Low Pressure Common pipe, Liquid pipe and Gas pipe valves are fully opened. NOTE: Be sure to tighten caps.
4	Turn on universal power supply at least 12 hours before the test running to ensure the crank case heater around heat up the compressor. If the turn-on hours of the heater are too short, it may result in a malfunction of compressor.
5	Check if there are any problems in automatic addressing or not: Check and confirm that there are no error messages in the display of Indoor Units or remote controls and LED in Outdoor Units.

WARNING

- **When you didn't inevitably use it and want to restart, be sure that at first power on before 12 hrs of starting it.**
  (It may damage on compressor unless giving enough power supply.)

How to Cope with Test Run Abnormality

The phenomena from main component failure

Component	Phenomenon	Cause	Check method and Trouble shooting
Compressor	Not operating	Motor insulation broken	Check resistance between terminals and chassis
	Stop during running	Motor insulation failure	Check resistance between terminals and chassis
	Loud noise during running	Phase sequence fault	Check wiring(R, S, T) sequence, or Inter change last two phase connection.
Outdoor fan	High pressure error at cooling	Motor failure, Bad ventilation around outdoor heat exchanger	Check the outdoor fan operation after being turned the Outdoor Unit off for some time. Remove obstacles around the Outdoor Unit
Outdoor LEV	Heating failure, frequent defrosting	Bad connector contact	Check connector
	No operating sound at applying power	Coil failure	Check resistance between terminals
	Heating failure, Frozen outdoor heat exchanger part	LEV clogged	Service necessary
	Low pressure error or discharge temperature error	LEV clogged	Service necessary

When system fault occurs, the error code is displayed at Indoor Unit display or remote control display, the trouble shooting guide is in the service manual

Self-Diagnosis Function

Error Indicator

- This function indicates types of failure in self-diagnosis and occurrence of failure for air condition.
- Error mark is displayed on display window of Indoor Units and wired remote controller, and 7-segment LED of Outdoor Unit control board as shown in the table.
- If more than two troubles occur simultaneously, lower number of error code is first displayed.
- After error occurrence, if error is released, error LED is also released simultaneously.

	Display		Title	Cause of Error
Indoor Unit related error	0	1	Indoor Unit air sensor	Indoor Unit air sensor open or short
	0	2	Indoor Unit sensor(inlet pipe)	Indoor Unit inlet pipe sensor open or short
	0	3	Wired remote control ↔ Indoor Unit transmission	In the case that Indoor Unit can not receive any signal from wired remote control successively for 3 minutes
	0	4	Drain pump	Malfunction of drain pump
	0	5	Outdoor unit ↔ Indoor Unit trans-mission	In the case that Indoor Unit can not receive any signal from Outdoor Unit successively for 3 minutes
	0	6	Indoor Unit outlet pipe sensor	Indoor Unit outlet pipe sensor open or short
	0	7	The other operation mode	In the case that an Indoor Unit is operated the other operation mode different from the operated Indoor Unit
	0	8	Not in use	Not in use
	0	9	Serial No. Error	In the case that the serial number marked on EEPROM of Indoor Unit is 0 or FFFFFF
Power related error	2	1	DC peak	IPM over temperature or compressor malfunction
	2	2	Excess of limited current of Main Outdoor Unit INV compressor	When current detection is over the maximum current limit
	2	3	Poor voltage charge for driving INV compressor	DC charging is not performed after starting relay turn on
	2	4	High Pressure Switch of Main Outdoor Unit	Suspension of compressor by the Main Outdoor Unit High Pressure switch
	2	5	Low/Over voltage	Input voltage is out of tolerance of rating voltage
Compressor related error	3	1	Not in use	Not in use
	3	2	Discharge temperature of Main Outdoor Unit (INV compressor)	Due to over rising of INV compressor discharge tempera-ture, Compressor off is occurred 3 times in 1 hour
	3	3	Discharge temperature of Main Outdoor Unit (constant speed compressor)	Due to over rising of constant speed compressor dis-charge temperature, Compressor off is occurred 3times in an hour
	3	4	High pressure of Main Outdoor Unit	Compressor Off by excessive increase of Main Outdoor Unit High Pressure
	3	5	Low pressure of Main Outdoor Unit	Compressor Off by excessive reduction of Main Outdoor Unit Low Pressure

	Display		Title	Cause of Error
Outdoor unit related error	4	0	Current detect a(CT) sensor of Main Outdoor Unit Inverter compressor	Current detect (CT) sensor of Main Outdoor Unit Inverter compressor open or short
	4	1	Discharge temperature sensor of Main Outdoor Unit Inverter compressor	Open or short of discharge temperature sensor of Main Outdoor Unit Inverter compressor
	4	2	Outdoor Low Pressure sensor of Main Outdoor Unit	Open or short of Outdoor Low Pressure sensor of Main Outdoor Unit
	4	3	Outdoor High Pressure sensor of Main Outdoor Unit	Open or short of Outdoor High Pressure sensor of Main Outdoor Unit
	4	4	Outdoor air sensor of Main Outdoor Unit	Open or short of Outdoor air sensor of Main Outdoor Unit
	4	5	Heat exchanger sensor of Main Outdoor Unit (front side)	Open or short of heat exchanger sensor of Main Outdoor Unit (front side)
	4	6	Suction temperature sensor of Main Outdoor Unit	Open or short of Suction temperature sensor of Main Outdoor Unit
	4	7	Discharge temperature sensor of the constant speed compressor of Main Outdoor Unit	Open or short of discharge temperature sensor of the constant speed compressor of Main Outdoor Unit
	4	8	Heat exchanger sensor of Main Outdoor Unit (rear side)	Open or short Heat exchanger sensor of Main Outdoor Unit (rear side)
Transmission related error	5	1	Connection of excessive capacity (excessive Indoor Unit capacity)	The displayed number of Indoor Units being connected is over rated capacity of Outdoor Unit
	5	2	IMV control part ➡ Main Outdoor Unit control part	Failing to receive signal of the Main Outdoor Unit control part from the INV control part
	5	3	Indoor Unit ➡ Main Outdoor Unit control part	Failing to receive signal of the Main Outdoor Unit control part from the Indoor Unit control part
	5	4	Reverse connection of the R,S,T power line of Main Outdoor Unit	Misconnection or disconnection of R,S,T power line of Main Outdoor Unit
	5	7	Transmission related error (Main control part ➡ INV control part)	Failing to receive signal of the INV control part from the Main control part
Outdoor Unit related error	6	2	Excessive temperature of INV control part radiation panel	Excessive temperature of INV control part radiation panel
	6	5	Fan temperature sensor	Open or short of fan temperature sensor

	Display			Title	Cause of Error
Compressor related error	1	0	0	Discharge temperature of Main Outdoor constant speed compressor 1 of Sub1 Outdoor Unit	Compressor Off by excessive increase of discharge temperature of constant speed compressor1 of the Sub1 Outdoor Unit
	1	0	1	Discharge temperature of Main Outdoor constant speed compressor 2 of Sub1 Outdoor Unit	Compressor Off by excessive increase of discharge temperature of constant speed compressor1 of the Sub2 Outdoor Unit
	1	0	2	Discharge temperature of Main Outdoor constant speed compressor 1 of Sub2 Outdoor Unit (3 units)	Compressor Off by excessive increase of discharge temperature of constant speed compressor1 of the Sub2 Outdoor Unit (3 units)
	1	0	3	Discharge temperature of Main Outdoor constant speed compressor 2 of Sub2 Outdoor Unit (3 units)	Compressor Off by excessive increase of discharge temperature of constant speed compressor2 of the Sub2 Outdoor Unit (3 units)
Transmission related error	1	0	4	Transmission related error between Outdoor Units (Sub1 Outdoor Unit ➡ Main Outdoor Unit)	If failing to receive signal of the Sub1 Outdoor Unit from the Main Outdoor Unit control part
	1	0	5	Transmission related error Main Outdoor Unit fan driving (fan ➡ Outdoor Unit)	If failing to receive signal of the fan driving control part from the Main Outdoor Unit control part
	1	0	6	Occurrence of over-current at Main Outdoor Unit fan motor (IPM Fault)	Occurrence of over-current at Main Outdoor Unit fan motor (IPM Fault)
	1	0	7	Low Voltage of Main Outdoor Unit fan motor	Occurrence of Low Voltage of Main Outdoor Unit fan motor
	1	0	8	Transmission related error of Main Outdoor Unit fan motor (Outdoor Unit ➡ fan)	If failing to receive signal of the Main Outdoor Unit control part from the fan driving control part
	1	0	9	High Pressure switch of Sub1 Outdoor Unit	Operation of High Pressure switch due to increase of Sub1 Outdoor Unit High Pressure increase
	1	1	0	Reverse connection of the R, S, T Power line of Sub1 Outdoor Unit	Misconnection or disconnection of R, S, T Power line of Sub1 Outdoor Unit
	1	1	1	Transmission related error between Outdoor Units (Main Outdoor Unit ➡ Sub1 Outdoor Unit)	If failing to receive signal of the Main Outdoor Unit control part from the Sub1 Outdoor Unit control part
Outdoor Unit related error	1	1	3	Main Outdoor Unit liquid pipe temperature sensor	Open or short of Main Outdoor Unit liquid pipe temperature sensor
	1	1	4	Main Outdoor Unit excessive cooling inlet temperature sensor	Open or short of Main Outdoor Unit excessive cooling inlet temperature sensor
	1	1	5	Main Outdoor Unit excessive cooling outlet temperature sensor	Open or short of Main Outdoor Unit excessive cooling outlet temperature sensor
	1	1	6	Sub1 Outdoor Unit High Pressure sensor	Open or short of Sub1 Outdoor Unit High Pressure sensor
	1	1	7	Sub1 Outdoor Unit Low Pressure sensor	Open or short of Sub1 Outdoor Unit Low Pressure sensor
	1	1	8	Sub1 Outdoor Unit air temperature sensor	Open or short of Sub1 Outdoor Unit air temperature sensor
	1	2	0	Sub1 Outdoor Unit suction temperature sensor	Open or short of Sub1 Outdoor Unit suction temperature sensor
	1	2	1	Sub1 Outdoor Unit constant speed compressor1 discharge temperature sensor	Open or short of Sub1 Outdoor Unit constant speed compressor1 discharge temperature sensor

	Display			Title	Cause of Error
Outdoor Unit related error	1	2	2	Sub1 Outdoor Unit constant speed compressor2 discharge temperature sensor	Open or short of Sub1 Outdoor Unit constant speed compressor2 discharge temperature sensor
	1	2	3	Sub1 Outdoor Unit heat exchanger sensor (front side)	Open or short of heat exchanger sensor of Sub1 Outdoor Unit (front side)
	1	2	4	Sub1 Outdoor Unit heat exchanger sensor (rear side)	Open or short of heat exchanger sensor of Sub1 Outdoor Unit (rear side)
	1	2	5	Sub1 Outdoor Unit liquid pipe temperature sensor	Open or short of Sub1 Outdoor Unit liquid pipe temperature sensor
	1	2	6	Sub1 Outdoor Unit excessive cooling inlet temperature sensor	Open or short of Sub1 Outdoor Unit excessive cooling inlet temperature sensor
	1	2	7	Sub1 Outdoor Unit excessive cooling outlet temperature sensor	Open or short of Sub1 Outdoor Unit excessive cooling outlet temperature sensor
	1	2	8	Sub2 Outdoor Unit High Pressure sensor (3Units)	Open or short of Sub2 Outdoor Unit High Pressure sensor (3Units)
	1	2	9	Sub2 Outdoor Unit Low Pressure sensor (3Units)	Open or short of Sub2 Outdoor Unit Low Pressure sensor (3Units)
	1	3	0	Sub2 Outdoor Unit air temperature sensor (3Units)	Open or short of Sub2 Outdoor Unit air temperature sensor (3Units)
	1	3	2	Sub2 Outdoor Unit suction temperature sensor (3Units)	Open or short of Sub2 Outdoor Unit suction temperature sensor (3Units)
	1	3	3	Sub2 Outdoor Unit constant speed compressor1 discharge temperature sensor (3Units)	Open or short of Sub2 Outdoor Unit constant speed compressor1 discharge temperature sensor (3Units)
	1	3	4	Sub2 Outdoor Unit constant speed compressor2 discharge temperature sensor (3Units)	Open or short of Sub2 Outdoor Unit constant speed compressor2 discharge temperature sensor (3Units)
	1	3	5	Sub2 Outdoor Unit heat exchanger temperature sensor (front side) (3Units)	Open or short of Sub2 Outdoor Unit heat exchanger temperature sensor(front side) (3Units)
	1	3	6	Sub2 Outdoor Unit heat exchanger temperature sensor (rear side) (3Units)	Open or short of Sub2 Outdoor Unit heat exchanger temperature sensor(rear side) (3Units)
	1	3	7	Sub2 Outdoor Unit liquid pipe temperature sensor (3Units)	Open or short of Sub2 Outdoor Unit liquid pipe temperature sensor (3units)
	1	3	8	Sub2 Outdoor Unit excessive cooling inlet temperature sensor (3Units)	Open or short of Sub2 Outdoor Unit excessive cooling inlet temperature sensor (3units)
	1	3	9	Sub2 Outdoor Unit excessive cooling outlet temperature sensor (3Units)	Open or short of Sub2 Outdoor Unit excessive cooling outlet temperature sensor (3units)
	1	4	0	Sub2 Outdoor Unit High Pressure sensor (3Units)	Open or short of Sub2 Outdoor Unit High Pressure sensor (3units)
	1	4	1	Reverse connection of the R, S, T Power line of Sub2 Outdoor Unit	Misconnection or disconnection of R, S, T Power line of Sub2 Outdoor Unit
	1	4	2	Transmission related error between Outdoor Units (Main Outdoor Unit ➡ Sub2 Outdoor Unit) (3Units)	If failing to receive signal of the central control part from the main control part
	1	4	3	High Pressure of Sub1 Outdoor Unit	Compressor Off by excessive increase of Sub1 Outdoor Unit High Pressure

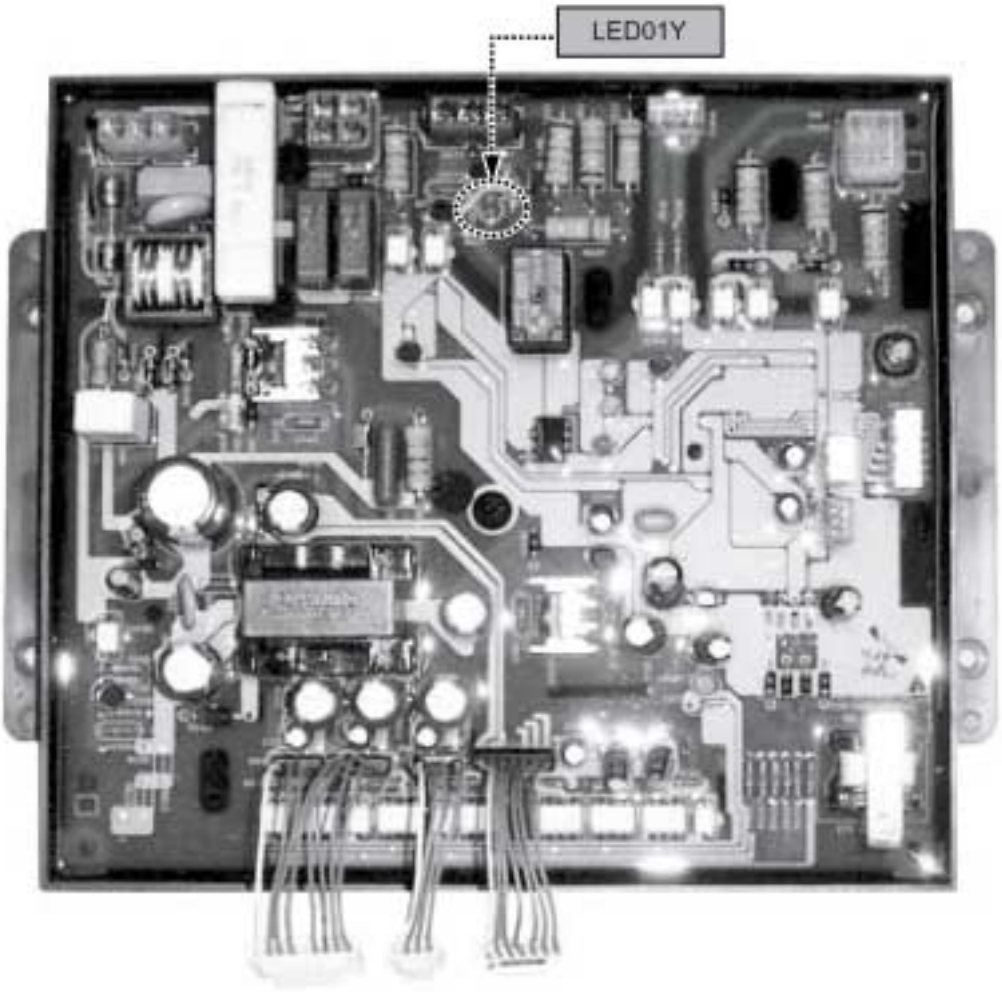
	Display			Title	Cause of Error
Outdoor Unit related error	1	4	4	Low Pressure of Sub1 Outdoor Unit	Compressor Off by excessive reduction of Sub2 Outdoor Unit Low Pressure
	1	4	5	High Pressure of Sub2 Outdoor Unit (3Units)	Compressor Off by excessive increase of Sub2 Outdoor Unit High Pressure
	1	4	6	Low Pressure of Sub2 Outdoor Unit (3Units)	Compressor Off by excessive reduction of Sub2 Outdoor Unit Low Pressure
	1	4	7	Short voltage/excess voltage of Sub1 Outdoor Unit	Input voltage of Sub1 Outdoor Unit is more than 487V or less than 270V
	1	4	8	Voltage sensor of Sub1 Outdoor Unit	Open or short of outdoor voltage sensor of Sub1 Outdoor Unit
	1	4	9	Short voltage/excess voltage of Sub2 Outdoor Unit (3Units)	Input voltage of Sub2 Outdoor Unit is more than 487V or less than 270V
	1	5	0	Voltage sensor of Sub2 Outdoor Unit (3Units)	Open or short of outdoor voltage sensor of Sub2 Outdoor Unit
	1	5	1	Failure of operation mode conversion	Pressure unbalance between Outdoor Units

■ **Please refer to trouble shooting guide in service manual for each error title**

CAUTION

In case that the control box is opened and before checking electrical parts, it should be checked that the LED 01Y (Refer to next page) turned off (wait 3 minutes after main power OFF), otherwise, it may cause electrical shock.

Position of the LED01Y in inverter board



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After reading this manual, keep it in a place easily accessible to the user for future reference.