

VRF SYSTEM OUTDOOR UNIT

AJ□A72LALH AJ□126LALH
AJ□A90LALH AJ□144LALH
AJ□108LALH


CAUTION

**R410A
REFRIGERANT**

This Air Conditioner contains and operates with refrigerant R410A.

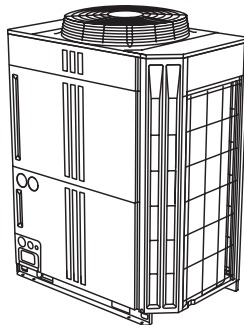
THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.

Refer to Commonwealth, State, Territory and local legislation, regulations, codes, installation & operation manuals, before the installation, maintenance and/or service of this product.

English

INSTALLATION MANUAL

For authorized personnel only.



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1. SAFETY PRECAUTIONS

- Be sure to read this Installation manual thoroughly before installation.
- The warnings and precautions indicated in this Installation manual contain important information pertaining to your safety. Be sure to observe them.
- After installing the unit, perform a test run to make sure the unit operates normally. Then, explain to the customer how to operate and maintain the unit.
- Please pass this Installation manual together with the Operating manual to the customer.
Please ask the customer to keep the Operating manual and Installation manual at hand for future reference during the moving or repair of the main unit.

 WARNING!	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
• Consult the retail store or professional technicians to install the main unit according to the Installation manual. Improper installation will cause serious accidents such as refrigerant leakage, water leakage, electric shock, and fire. Manufacturer's guarantee will be invalid when instructions in the Installation manual are ignored during installation.	
• For installation purposes, be sure to use the parts supplied by the manufacturer or other prescribed parts. Using non-specified parts will cause serious accidents such as falling unit, refrigerant leakage, water leakage, electric shock, and fire.	
• To install a unit that uses the R410A refrigerant, use dedicated tools and piping materials that have been manufactured specifically for R410A use. Because the pressure of the R410A refrigerant is approximately 1.6 times higher than the R22, failure to use dedicated piping material or improper installation can cause rupture or injury. It will also cause serious accidents such as refrigerant leakage, water leakage, electric shock, and fire.	
• Do not introduce any substance other than the prescribed refrigerant into the refrigeration cycle. If air enters the refrigeration cycle, the pressure in the refrigeration cycle will become abnormally high and cause the piping to rupture.	
• Be sure to install the unit as prescribed, so that it can withstand earthquakes and typhoons or other strong winds. Improper installation can cause the unit to topple or fall, or other accidents.	
• Ensure that the outdoor unit is securely installed at a place that can withstand the weight of the unit. Improper installation will cause injuries caused by falling unit.	
• If there is a refrigerant leakage, make sure that it does not exceed the concentration limit. If a refrigerant leakage exceeds the concentration limit, it can lead to accidents such as oxygen starvation.	
• If a refrigerant leakage occurs during operation, immediately vacate the premises and thoroughly ventilate the area. If the refrigerant is exposed to fire, it will create a hazardous gas.	
• Electrical work must be performed in accordance with this Installation manual by a person certified under the national or regional regulations. Be sure to use a dedicated circuit for the unit. An insufficient power supply circuit or improperly performed electrical work can cause serious accidents such as electric shock or fire.	
• For wiring, use the prescribed type of wires, connect them securely, making sure that there are no external forces of the wires applied to the terminal connections. Improperly connected or secured wires can cause serious accidents such as overheating the terminals, electric shock, or fire.	
• Securely install the electrical box cover on the unit. An improperly installed electrical box cover can cause serious accidents such as electric shock or fire through exposure to dust or water.	
• Do not turn ON the power until all work has been completed. Turning ON the power before the work is completed can cause serious accidents such as electric shock or fire.	
• After the installation, make sure there is no refrigerant leakage. If the refrigerant leaks into the room and becomes exposed to a source of fire such as a fan heater, stove, or burner, it will create a hazardous gas.	
• Use a wall hole pipe. Otherwise, it may cause a short circuit.	

- Do not place the outdoor unit near the handrail of the balcony.
Children may climb onto the outdoor unit, lean over the handrail and fall over.
- Use only a specified power cable. Poor connection, poor insulation, and exceeding the allowable current will lead to electric shock and fire.
- Attach the connecting cables securely to the terminal. Or secure it firmly with a "wiring suppressor".
Loose connection will lead to malfunction, electric shock, and fire.
- Install a breaker (earth leakage breaker) to cut off all AC main current at the same time.
If you do not install a breaker (earth leakage breaker), it may cause electric shock and fire.
- Be sure to install the refrigerant pipe before operating the compressor. If the refrigerant pipe is not installed and you operate the compressor while the valve is open, air will be sucked into the system and abnormal pressure will occur in the cooling cycle. This will damage the unit and cause injuries.

**CAUTION!**

This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

- Do not install the unit in the following areas:
 - Area with high salt content, such as at the seaside.
It will deteriorate metal parts, causing the parts to fall or the unit to leak water.
 - Area filled with mineral oil or containing a large amount of splashed oil or steam, such as a kitchen.
It will deteriorate plastic parts, causing the parts to fall or the unit to leak water.
 - Area that generates substances that adversely affect the equipment, such as sulfuric gas, chlorine gas, acid, or alkali.
It will cause the copper pipes and brazed joints to corrode, which can cause refrigerant leakage.
 - Area containing equipment that generates electromagnetic interference.
It will cause the control system to malfunction, preventing the unit from operating normally.
 - Area that can cause combustible gas to leak, contains suspended carbon fibers or flammable dust, or volatile inflammables such as paint thinner or gasoline.
If gas leaks and settles around the unit, it can cause a fire.
- Avoid installing the unit at places where it will come into contact with animals' urine or ammonia.
- Do not use the unit for special purposes, such as storing food, raising animals, growing plants, or preserving precision devices or art objects. It can degrade the quality of the preserved or stored objects.
- Ground the unit. Do not connect the ground wire to a gas pipe, water pipe, lightning rod, or a telephone ground wire. Improper grounding may cause electric shock.
- Perform draining for the unit according to the Installation manual. Check that the water is properly drained.
If the drain processing is improperly installed, water may drip down from the unit, wetting the furniture.
- Do not touch the fins with bare hands.

Regulation

- This unit must be connected to a power supply with impedance of 0.33 ohm and below. If the power supply does not satisfy this requirement, please consult the power supplier.
- This product is intended for professional use.
Be sure to use a dedicated power circuit.
Never use a power supply shared by another appliance.

2. ABOUT THE PRODUCT

2.1. Caution when using R410A refrigerant

Pay careful attention to the following points :

- Since the working pressure is 1.6 times higher than that of R22 models, some of the piping and installation and service tools are special. (See the table in the SPECIAL TOOLS FOR R410A section.)
Especially, when replacing a conventional refrigerant (other than R410A) model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.
- Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with R22, R407C and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]
- Be more careful than the installation of the refrigerant (other than R410A) models, not to enter foreign matters (oil, water, etc.) and other refrigerant into the piping. Also, when storing the piping, securely seal the openings by pinching, taping, etc.
- When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.

2.2. Special tools for R410A

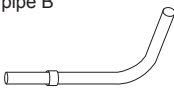
Tool name	Contents of change for R22 tool
Gauge manifold	Pressure is huge and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended to use a gauge manifold with a high pressure display range -0.1 to 5.3 MPa and a low pressure display range -0.1 to 3.8 MPa.
Charging hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

2.3. Accessories

Use connecting parts as required.

Do not throw away the connecting parts until the installation has been complete.

Name and shape	Q'ty	Application
Specifications manual 	1	—
Installation manual 	1	(This book)
Joint pipe A 	1	For connecting gas pipe (Straight type)

Name and shape	Q'ty	Application
Joint pipe B 	1	For connecting gas pipe (L type)
Binder 	9	For binding power cable and transmission cable

2.4. Combinations

A maximum of three outdoor units can be connected to one refrigerant system.

The combination of outdoor units per refrigerant system and the number of indoor units that can be connected are as follows:

Outdoor Unit	
Model Name	Nominal System Capacity (HP)
AJ□A72LALH	8
AJ□A90LALH	10
AJ□108LALH	12
AJ□126LALH	14
AJ□144LALH	16

Installation space combination

Combination (HP)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Outdoor Unit 1 (HP)	8	10	12	14	16	10	12	12	12	14	16	16	16	12	12	14	16	16	16	16	16
Outdoor Unit 2 (HP)	-	-	-	-	-	8	8	10	12	12	12	14	16	12	12	12	12	14	16	16	16
Outdoor Unit 3 (HP)	-	-	-	-	-	-	-	-	-	-	-	-	-	10	12	12	12	12	12	14	16
Maximum Connectable Indoor Unit	15	16	17	21	24	32	32	32	35	39	42	45	48	48	48	48	48	48	48	48	48

When connecting outdoor units, install the outdoor unit with the largest nominal system capacity nearest to the refrigerant pipe and indoor unit, followed by those with lesser nominal system capacities. (Outdoor unit 1 ≥ Outdoor unit 2 ≥ Outdoor unit 3)

Energy-saving combination

Combination (HP)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Outdoor Unit 1 (HP)	-	-	-	-	8	-	-	14	8	10	12	14	12	14	14	-	14	14	16	-	-
Outdoor Unit 2 (HP)	-	-	-	-	8	-	-	8	8	8	8	8	12	12	14	-	14	14	14	-	-
Outdoor Unit 3 (HP)	-	-	-	-	-	-	-	-	8	8	8	8	8	8	8	-	12	14	14	-	-
Maximum Connectable Indoor Unit	*	*	*	*	30	*	*	33	36	39	42	45	48	48	48	*	48	48	48	*	*

* means that the energy-saving combination is unavailable.

When connecting outdoor units, install the outdoor unit with the largest nominal system capacity nearest to the refrigerant pipe and indoor unit, followed by those with lesser nominal system capacities. (Outdoor unit 1 ≥ Outdoor unit 2 ≥ Outdoor unit 3)

2.5. Option parts

⚠ CAUTION

The following parts are optional parts specific to R410A refrigerant.
Do not use parts other than those listed below.

2.5.1. Separation tube kit

Table A indicates the separation tube to be used when installing multiple outdoor units.

Table B indicates the separation tube to be used for connecting the outdoor and indoor units.

Refer to the installation instruction sheet for the outdoor unit branch kit and the separation tubes for installation specifications.

Table.A Separation tube for installing multiple outdoor units

Separation tube	Total cooling capacity of indoor unit (kw)
UTR-CP567X	ALL

Table.B Selection of separation tubes

Separation tube	Total cooling capacity of indoor unit(kW)
UTR-BP090X	28.0 or less
UTR-BP180X	28.1 to 56.0
UTR-BP567X	56.1 or more

2.6. Header

A header is used for connecting the indoor units. Refer to the installation instruction sheet for the header for installation specifications.

Table.C Selection of header

Header		Total cooling capacity of indoor unit (kw)
3-6 Branches	3-8 Branches	
UTR-H0906L	UTR-H0908L	28.0 or less
UTR-H1806L	UTR-H1808L	28.1 to 56.0

3. INSTALLATION WORK

Please obtain the approval of the customer when selecting the location of installation and installing the main unit.

3. 1. Selecting an installation location

⚠ WARNING

- Install the unit in a location that can withstand its weight, and where it will not topple or fall.
- Calculate the proper refrigerant concentration if you will be installing it in an enclosed location.

$$\frac{\text{Total amount of replenished refrigerant in refrigerant facility (kg)}}{\text{Capacity of smallest room where unit is installed (m}^3\text{)}} \cong \text{Refrigerant concentration(kg/m}^3\text{)} (0.3\text{kg/m}^3)$$
- If the results of the calculation exceed the concentration limit, increase the room surface area or install a ventilation duct.

⚠ CAUTION

Select an installation location by observing the following precautions:

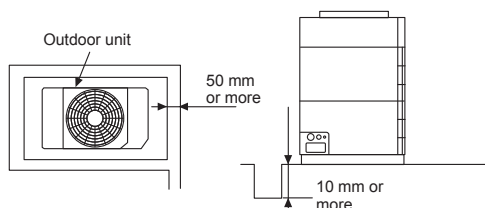
- Install the unit horizontally.(within 3 degrees)
- Install this unit in a location with good ventilation.
- If the unit must be installed in an area within easy reach of the general public, install as necessary a protective fence or the like to prevent their access.
- Install the unit in an area that would not inconvenience your neighbors, as they could be affected by the airflow coming out from the outlet, noise, or vibration.
If it must be installed in proximity to your neighbors, be sure to obtain their approval.
- If the unit is installed in a cold region that is affected by snow accumulation, snow fall, or freezing, take appropriate measures to protect it from those elements.
To ensure a stable operation, install inlet and outlet ducts.
- Install the unit in an area that would not cause problems even if the drain water is discharged from the unit.
Otherwise, provide drainage that would not affect people or objects.
- Install the unit in an area that has no heat sources, vapors, or the risk of the leakage of flammable gas in the vicinity.
- Install the unit in an area that is away from the exhaust or vent ports that discharge vapor, soot, dust, or debris.
- Install the indoor unit, outdoor unit, power supply cable, transmission cable and remote control cable at least 1 meter away from a television or radio.
The purpose of this is to prevent TV reception interference or radio noise. (Even if they are installed more than 1 meter apart, you could still receive noise under some signal conditions.)
- Keep the length of the piping of the indoor and outdoor units within the allowable range.
- For maintenance purposes, do not bury the piping.

3. 2. Drain processing

- The drain water is discharged from the bottom of the equipment. Construct a drain ditch around the base and discharge the drain water properly.
- When installing on a roof, perform floor waterproofing properly.

Drain processing:

- The drain water from the base of the outdoor unit may generate during operations.
Perform drain processing, as necessary.
- When you want to prevent the drain water from leaking at the perimeter, construct a ditch for the drain water as shown in the figure.
- Provide a central drain pan, as necessary.



3.3. Installation dimensions

⚠ CAUTION

When installing the outdoor unit, pay attention to the following items.

- Provide sufficient installation space, such as transportation route, maintenance space, ventilation space, refrigerant piping space, and passageways.
- Pay attention to the specifications of the installation space as shown in the figure. If the unit is not installed according to specifications, it may cause short circuit or poor performance. The unit may be prone to lapse into non-operation due to high pressure protection.
- Do not place obstructions in the air flow outlet direction. If there is an obstruction in the outlet direction, install an outlet duct.
- When there is a wall in front of the unit, provide a space of 500mm or more as maintenance space.
- When there is a wall at the left side of the unit, provide a space of 30mm or more as maintenance space.
- An outdoor temperature of 35 degrees in air-conditioned operation is assumed for the installation space in this item. If the outdoor temperature exceeds 35 degrees and the outdoor unit is operating at a load exceeding its rated ability, provide a larger inlet space.
- If you are installing more outdoor units than indicated here, please ensure sufficient space or consult your distributing agent as it may affect the performance due to short circuit and other problems.

3.3.1. When install near by limited height wall

(1) Single and multiple installations

- There are no restrictions on the height of the side wall.
- Provide installation spaces L1 and L2 in accordance with the table below according to the wall height (front side, rear side) conditions.
- Provide installation spaces other than L1 and L2 in accordance with the conditions shown in the figure below.
- Ventilation resistance can be ignorable when the distance from a wall or product, etc. is larger than 2m.

Wall height condition	Necessary installation space
When H1 is 1500(mm) or less	$L1 \geq 500(\text{mm})$
When H1 is 1500(mm) or more	$L1 \geq 500 + h1 \div 2(\text{mm})$
When H2 is 500(mm) or less	$L2 \geq 100(\text{mm})$
When H2 is 500(mm) or more	$L2 \geq 100 + h2 \div 2(\text{mm})$

Fig. 1

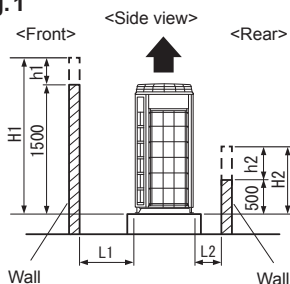


Fig.2 Single installation

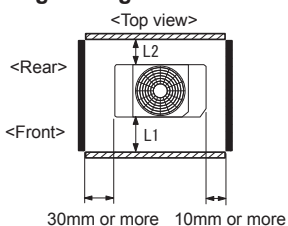
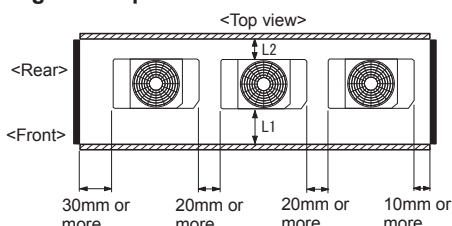


Fig.3 Multiple installations



(2) Concentrated installation

- Provide installation spaces L3, L4, and L5 in accordance with the table below according to the wall height (front side, rear side) conditions.
- Provide installation spaces other than L3, L4, and L5 in accordance with the conditions shown in the figure below.
- Ventilation resistance can be ignorable when the distance from a wall or product, etc. is larger than 2m.

Wall height condition	Necessary installation space
When H3 is 1500(mm) or less	$L3 \geq 500(\text{mm})$
When H3 is 1500(mm) or more	$L3 \geq 500 + h3 \div 2(\text{mm})$
When H4 is 500(mm) or less	$L4 \geq 200(\text{mm})$
When H4 is 500(mm) or more	$L4 \geq 200 + h4 \div 2(\text{mm})$
When H5 is 500(mm) or less	$L5 \geq 200(\text{mm})$
When H5 is 500(mm) or more	$L5 \geq 200 + h5 \div 2(\text{mm})$

Fig.4

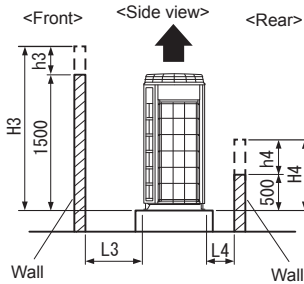


Fig.5

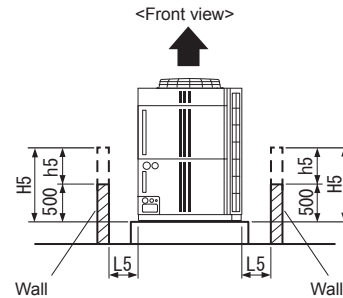


Fig.6

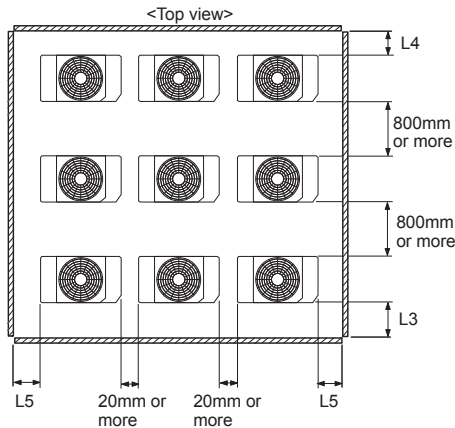
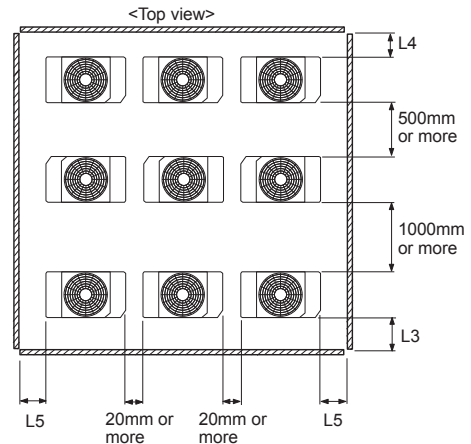


Fig.7



3. 3. 2. When install near by unlimited height wall

(1) Single and multiple installations

- There are no restrictions on the height of the wall.
- The wall (without height restrictions) must not exist on the both sides (left / right) of outdoor unit. Also, must not exist on the both sides (front / rear) of outdoor unit.
- Provide installation spaces other than L6 in accordance with the conditions shown in the figure below.
- Ventilation resistance can be ignorable when the distance from a wall or product, etc. is larger than 2m.

When installing with the REAR of the outdoor unit facing the wall side

Condition	Necessary installation space
When $B \geq 400$ (mm)	$L6 \geq 200$ (mm)
When $20 \leq B < 400$ (mm)	$L6 \geq 200 + (400 - B) \times 3$ (mm)

Fig.8 Single installation

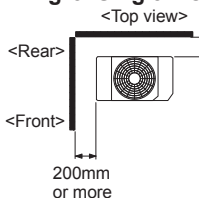
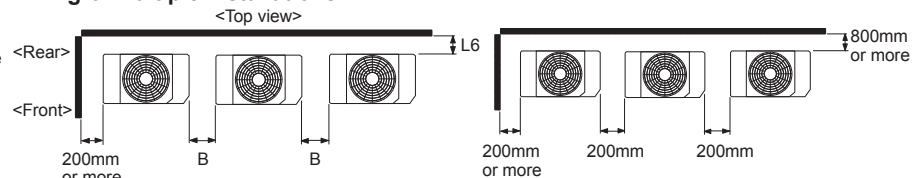


Fig.9 Multiple installations



Example :
When B is made 200mm
 $L6 \geq 200 + (400 - 200) \times 3 = 800\text{mm}$

When installing with the FRONT of the outdoor unit facing the wall side

Fig.10

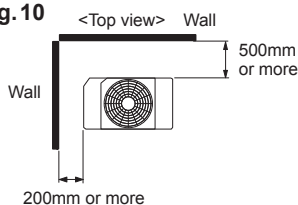
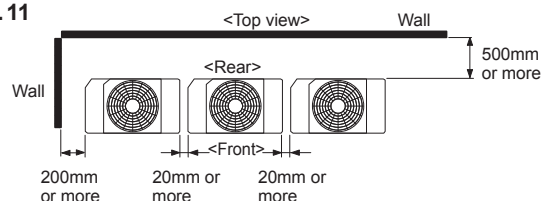


Fig.11



(2) Concentrated Installation

- The wall (without height restrictions) must not exist on the both sides (left / right) of outdoor unit. Also, must not exist on the both sides (front / rear) of outdoor unit.
- Ventilation resistance can be ignorable when the distance from a wall or product, etc. is larger than 2m.

Fig. 12

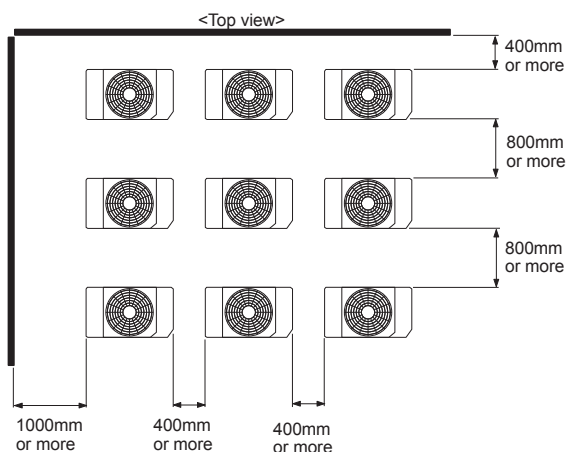
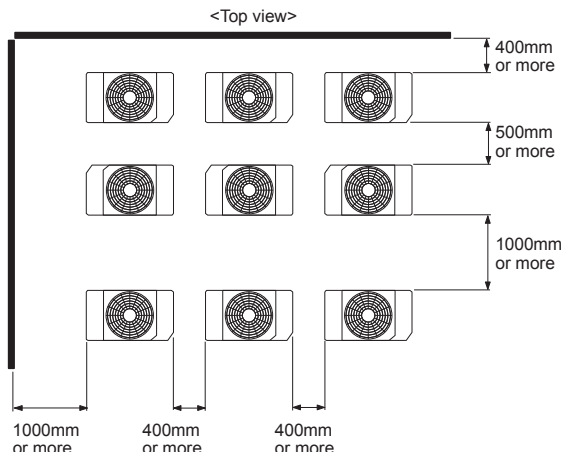


Fig. 13



3. 3. 3. When there are obstacles above the product

When there are obstacles above the product, keep the minimum installation height as shown in the figure and install the outlet duct.

When installing the outlet duct, you must set the high static pressure mode with the push-button switch.

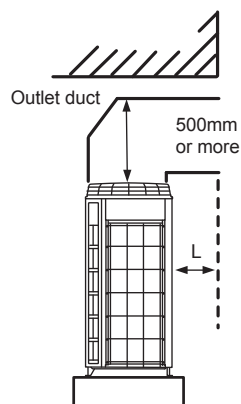
(Similar when installing anti-snow hood)

Setting high static pressure mode

Follow the instructions in the table below to set the high static pressure mode.

Condition	High static pressure mode setting ^{*1}
When $L \leq 150\text{mm}$ and other resistance is not at the air flow outlet (30Pa or less)	Set to Mode 1
When $L > 150\text{mm}$ or other resistance is at the air flow outlet (80Pa or less)	Set to Mode 2

*1. Refer to the section on Push Switch Setting in "Chapter 7 Field Setting".



3. 4. Transportation the outdoor unit

Hoisting method (Fig. A)

- When hanging the outdoor unit and conveying it to installation location, hang the unit with rope by passing through the 4 opening holes on bottom of front and rear side as shown in figure.
- Use 2 ropes at least 8m long. If used shorter length, it may cause to damage the unit.
- Use the sufficiently strong rope to bear the unit's weight.
- Place the protective board or filler cloth at the place where the cabinet may come into contact with rope to prevent from damages. Without using them, cabinet may cause to damage or deform.
- During the hanging unit, make sure to keep the unit horizontally to prevent the drop.
- Be careful not to shock the impacts during the hanging.

Conveying by forklift (Fig.B)

- When using the forklift to convey the unit, pass the forklift arms through the opening space as shown in below.
Front : Bottom of the wooden delivery pallet.
Side : Space between pallet and cabinet.
- Enable to remove the pallet from cabinet.
- Be careful not to be damaged.

Conveying by forklift (Manual forklift: hand-fork)

- When using the manual forklift to convey the unit, pass the forklift arms through the opening space between pallet and cabinet from side.

Fig.A

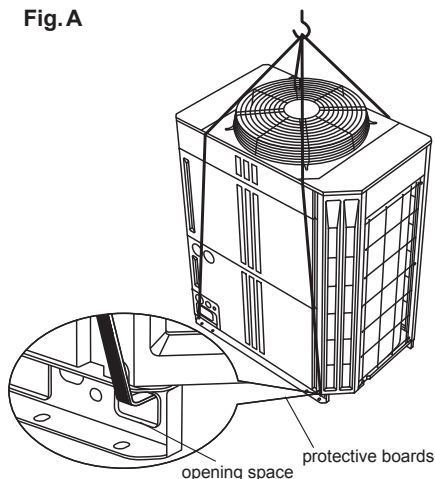
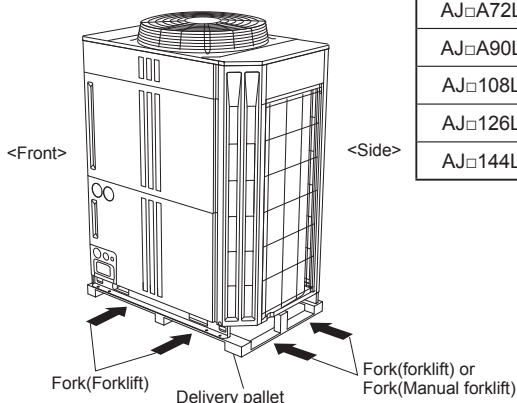


Fig.B



Product mass (kg)	
AJ□A72LALH	220
AJ□A90LALH	220
AJ□108LALH	275
AJ□126LALH	296
AJ□144LALH	296

3. 5. Installation the unit

- Install the unit horizontally.(within 3 degrees).
- Install 4 or more anchor bolts at the 8 locations indicated by arrows (Fig. A).
- Place the left and right anchor bolts at a distance further away than the dimensions of A in the Table A.
(Excluding the case where anchor bolts are installed at 8 locations.)
- To minimize vibration, do not install the outdoor unit directly on the ground.
Instead, install it on top of a firm platform (such as concrete block).
(Fig. B)
- The foundation base should be able to support the product and the foot width of the product should be more than 46.5mm.
- Depending on the installation condition, vibration during the operation of the unit may cause noise and vibration.
Install vibration-proofing materials (such as rubber pads).
- Consider the removal space of the connection piping when installing the foundation.
- Secure the equipment firmly with anchor bolts, washers, and nuts.

Fig.A

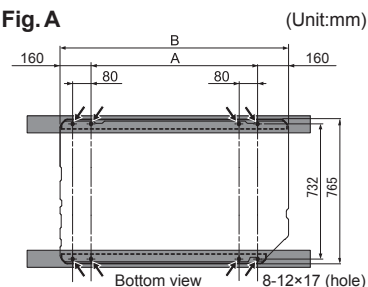


Table.A

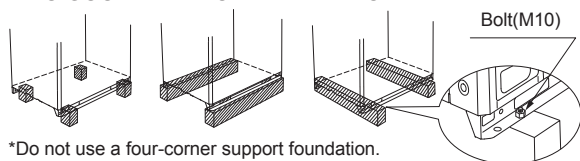
Model name	A	B
AJ□A72LALH	610	930
AJ□A90LALH	610	930
AJ□108LALH	610	930
AJ□126LALH	920	1240
AJ□144LALH	920	1240

Fig.B

NO GOOD

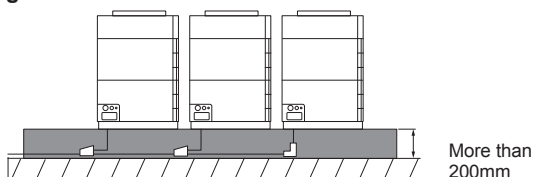
OK

OK



*Do not use a four-corner support foundation.

Fig.C



When installing piping from the bottom of the outdoor units, the required space under the outdoor unit $\geq 200\text{mm}$.

*Install the branch kit horizontally.

4. SYSTEM CONFIGURATION

4.1. System configuration

CAUTION

- When connecting multiple outdoor units, set the nearest outdoor unit to the indoor unit on the refrigerant pipe as the master unit.
- When connecting multiple outdoor units, install the outdoor unit with the largest nominal system capacity nearest to the indoor unit and on the refrigerant pipe, followed by those with less nominal system capacities.
- Always keep to the limit on the total amount of refrigerant. Exceeding the limit on the total amount of refrigerant when charging will lead to malfunction.

English

A) In case of one outdoor unit connected

- From outdoor unit to the farthest indoor unit:
 $a+f \leq 150\text{m}$, $a+p \leq 150\text{m}$ (actual pipe length)
- From the first separation tube to the farthest indoor unit:
 $f \leq 60\text{m}$, $p \leq 60\text{m}$ (actual pipe length)
- Difference in height between outdoor units and indoor units (H1)
50m: For the indoor unit stated below
40m: For the outdoor unit stated below
- Difference in height between indoor units and indoor units
 $H2 \leq 15\text{m}$, $H3 \leq 15\text{m}$
- Total pipe length
 $a+f+h+j+l+n+p+q+s+u \leq 700\text{m}$
- Total refrigerant amount $\leq 31.5\text{kg}$

B) In case of two outdoor unit connected

- From outdoor unit to the farthest indoor unit:
 $a+e+f \leq 150\text{m}$, $a+e+p \leq 150\text{m}$ (actual pipe length)
- Difference in height between outdoor units and indoor units (H1)
50m: For the indoor unit stated below
40m: For the outdoor unit stated below
- From the first separation tube to the farthest indoor unit
 $f \leq 60\text{m}$, $p \leq 60\text{m}$ (actual pipe length)
- Difference in height between indoor units and indoor units (H2, H3)
 $H2 \leq 15\text{m}$, $H3 \leq 15\text{m}$
- Difference in height between outdoor unit and outdoor units (H4)
 $H4 \leq 0.5\text{m}$
- From outdoor unit to outdoor unit branch kit
 $a \leq 3\text{m}$, $b \leq 3\text{m}$
- Total pipe length
 $a+b+e+f+h+j+l+n+p+q+s+u \leq 1000\text{m}$
- Total refrigerant amount $\leq 63\text{kg}$
- Outdoor unit capacity
Master $\geq$ slave

C) In the case of three outdoor units connected

- From outdoor unit to the farthest indoor unit:
 $a+e+f \leq 150\text{m}$, $a+e+p \leq 150\text{m}$ (actual pipe length)
- From the first separation tube to the farthest indoor unit:
 $f \leq 60\text{m}$, $p \leq 60\text{m}$ (actual pipe length)
- Difference in height between outdoor units and indoor units (H1)
50m: For the indoor unit stated below
40m: For the outdoor unit stated below
- Difference in height between indoor units and indoor units (H2, H3)
 $H2 \leq 15\text{m}$, $H3 \leq 15\text{m}$
- Difference in height between outdoor unit and outdoor units (H4)
 $H4 \leq 0.5\text{m}$
- From outdoor unit to outdoor unit branch kit
 $a \leq 3\text{m}$, $b \leq 3\text{m}$, $c \leq 3\text{m}$
- Between the farthest outdoor unit to the first outdoor unit branch kit
 $b+d \leq 12\text{m}$, $c+d \leq 12\text{m}$
- Total pipe length
 $a+b+c+d+e+f+h+j+l+n+p+q+s+u \leq 1000\text{m}$
- Total refrigerant amount $\leq 94.5\text{kg}$
- Outdoor unit capacity
Master $\geq$ slave 1 $\geq$ slave 2

NOTE) • If the outdoor temperature during cooling operation is expected to be -5°C or less, do not install the outdoor unit lower than the indoor unit.
• Please refer to "8.3.2. Checking total amount of refrigerant and calculating the amount of refrigerant charge to be added" for the total amount of refrigerant.

Fig. A

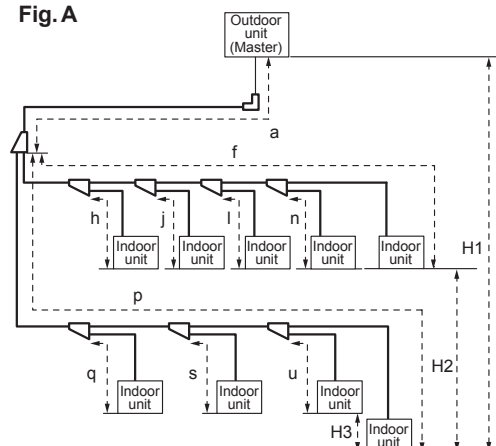


Fig. B

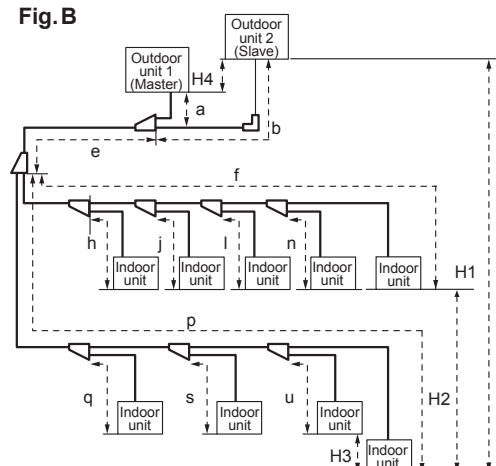
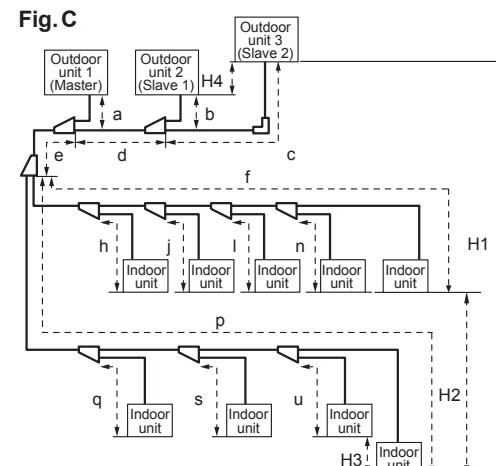


Fig. C



4.2. Pipe selection

⚠ CAUTION

- This unit is designed specifically for use with the R410A refrigerant.
- Pipes for R407C or R22 may not be used with this unit.
- Do not use existing pipes.
- Improper pipe selection will degrade performance.

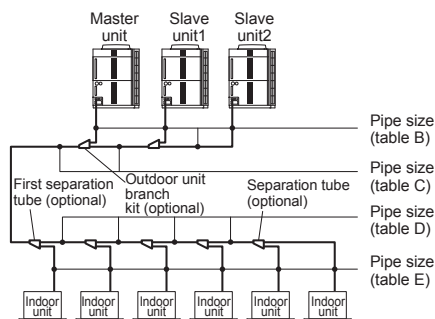


Table.A (Wall thickness and pipe material for each diameter)

Outside Diameter	mm	6.35	9.52	12.70	15.88	19.05	22.22	28.58	34.92	41.27
Wall Thickness ³	mm	0.8	0.8	0.8	1.0	1.2	1.0	1.0	1.2	1.43
Material	COPPER ¹ JIS H3300 C1220T-O or equivalent					COPPER ² JIS H 3300 C1220T-H or equivalent				

Please select the pipe size in accordance with local rules.

Table.B (Between outdoor unit to outdoor unit branch kit)

HP	Outdoor unit cooling capacity (kW)	Outside diameter (mm)		Branch kit ⁴
		Liquid pipe	Gas pipe	
8	22.4	12.70	22.22	UTR-CP567X
10	28.0	12.70	22.22	
12	33.5	12.70	28.58	
14	40.0	12.70	28.58	
16	45.0	12.70	28.58	

*1. Allowable tensile stress ≥ 33 (N/mm²)

*2. Allowable tensile stress ≥ 61 (N/mm²)

*3. Endurance pressure of the pipes 4.2MPa

*4. For the installation method, refer to "5.4. Multiple connections".

Table.C (Between outdoor unit branch kits or outdoor unit branch kit to first separation tube)

Total cooling capacity of outdoor unit (kW)	Outside diameter (mm)	
	Liquid pipe	Gas pipe
22.4 to 28.0	12.70	22.22
28.1 to 45.0	12.70	28.58
45.1 to 56.0	15.88	28.58
56.1 to 80.0	15.88	34.92
80.1 to 96.0	19.05	34.92
96.1 or more	19.05	41.27

If the pipe diameter between separation tubes (based on Table D) is larger than the pipe diameter between outdoor unit branch kit and the first separation tube (based on Table C), select the pipe whose diameter is equal to the one between the outdoor unit branch kit and the first separation tube. (If pipe diameter $D > C$, select pipe size from table C)

Table.D (Between separation tubes)

Total cooling capacity of indoor unit (kW)	Outside diameter (mm)		Separation tube ⁵	Header ⁵
	Liquid pipe	Gas pipe		
4.4 to 11.1	9.52	15.88	UTR-BP090X	UTR-H0906L UTR-H0908L
11.2 to 13.9	9.52	19.05		
14.0 to 28.0	12.70	22.22		
28.1 to 44.7	12.70	28.58	UTR-BP180X	UTR-H1806L UTR-H1808L
44.8 to 56.0	15.88	28.58		
56.1 to 80.0	15.88	34.92	UTR-BP567X	—
80.1 to 95.0	19.05	34.92		
95.1 or more	19.05	41.27		

Use a standard separation tube for pipe branching. Do not use a T tube as it does not separate the refrigerant evenly.

*5. For the installation method, refer to the installation manuals for indoor unit piping connection, separation tubes, and header.

Table.E (Between separation tube to indoor unit)

Cooling capacity of indoor unit (kW)	Outside diameter (mm)	
	Liquid pipe	Gas pipe
2.2, 2.8, 3.6, 4.0, 4.5	6.35	12.70
5.6, 7.1, 8.0, 9.0	9.52	15.88
11.2, 12.5, 14.0, 18.0		19.05
22.4, 25.0	12.70	22.22

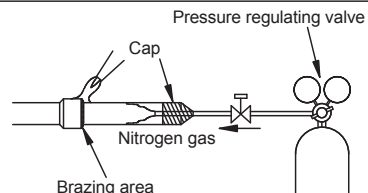
5. PIPE INSTALLATION

5.1. Brazing

CAUTION

- If air or another type of refrigerant enters the refrigeration cycle, the internal pressure in the refrigeration cycle will become abnormally high and prevent the unit from exerting its full performance.
- Apply nitrogen gas while brazing the pipes.
Nitrogen gas pressure: 0.02 MPa (= pressure felt sufficiently on the back of your hand)
- If a pipe is brazed without applying nitrogen gas, it will create an oxidation film.
This can degrade performance or damage the parts in the unit (such as the compressor or valves).
- Do not use flux to braze pipes. If the flux is the chlorine type, it will cause the pipes to corrode.
In addition, if the flux contains fluoride, it will affect the refrigerant piping system due to deterioration of refrigerant oil.
- For brazing material, use phosphor copper that does not require flux.

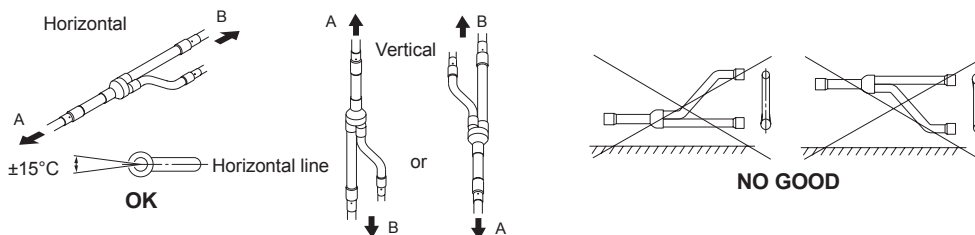
Fig.



5.2. Indoor unit pipe connections

CAUTION

Separation tube



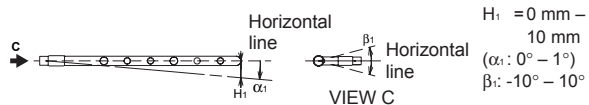
A : Outdoor unit or Refrigerant branch kit

B : Indoor unit or Refrigerant branch kit

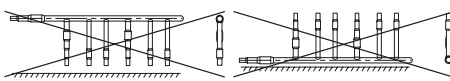
Header

Gas pipe

Outdoor unit side

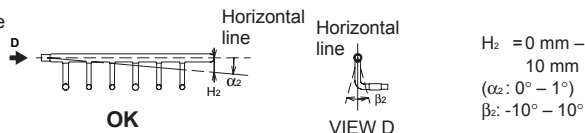


$H_1 = 0 \text{ mm} - 10 \text{ mm}$
 $(\alpha_1: 0^\circ - 1^\circ)$
 $\beta_1: -10^\circ - 10^\circ$

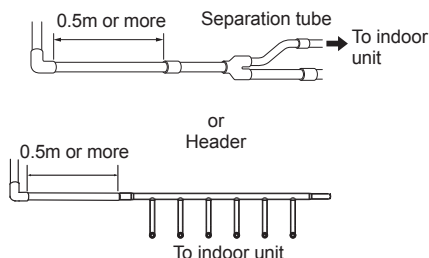
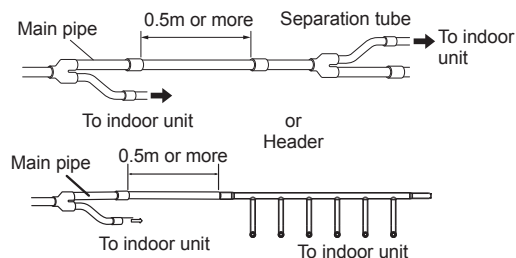
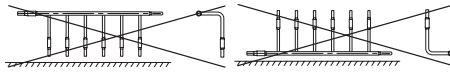


Liquid pipe

Outdoor unit side



$H_2 = 0 \text{ mm} - 10 \text{ mm}$
 $(\alpha_2: 0^\circ - 1^\circ)$
 $\beta_2: -10^\circ - 10^\circ$



- Do not connect a separation tube after a header.
- Leave the distance 0.5 m or more for straight part to branch tube and header.
- For details, refer to the Installation Instruction Sheet of each part.

5. 3. Piping method

5. 3. 1. Opening the knockout hole

⚠ CAUTION

- Be careful to prevent panel deformed or damaged while opening the knockout hole.
- To prevent cutting of the wiring after the knockout hole was opened, remove the burrs along the edge.
- In addition, to prevent rusting, painting the edge with rust preventive paint is recommended.

The piping can be connected from two directions; the front or the bottom.

(Knockout holes are provided so that the piping can be connected from two different directions.)

Use the front knockout hole, as required.

Fig.A Knockout position

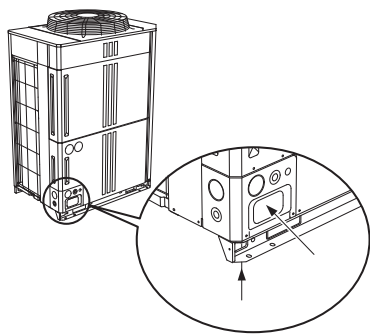


Fig.B Detail of knockout position (bottom)

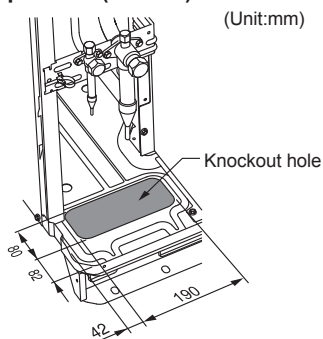
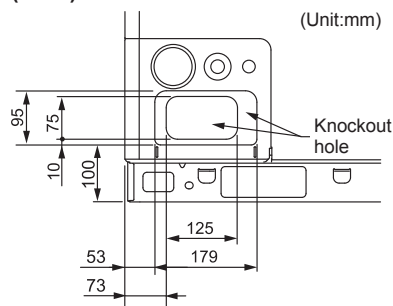


Fig.C Detail of knockout position (front)



5. 3. 2. Removing the pinch pipe

⚠ WARNING

Remove the pinch pipe only when the internal gas is completely drained.

If gas still remains inside, the piping may crack if you melt the brazing filler metal of the junction area with a burner.

Before connecting the piping, remove the pinch pipe in accordance with the following instructions:

- 1) Verify that the liquid side and gas side 3-way valves are closed. (Fig. A)
- 2) Cut the end of the liquid side and gas side pinch pipe and vent the gas inside the pinch pipe. (Fig. B)
- 3) After all the gas is vented, melt the brazing filter metal on connecting part using a burner and remove the pinch pipe. (Fig. C)

Fig.A

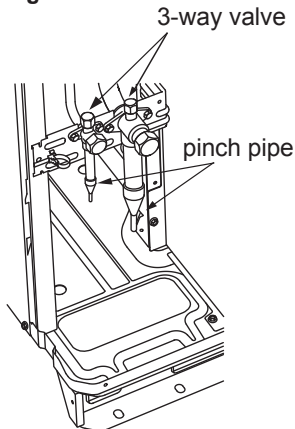


Fig.B

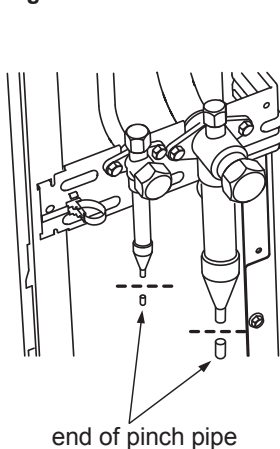
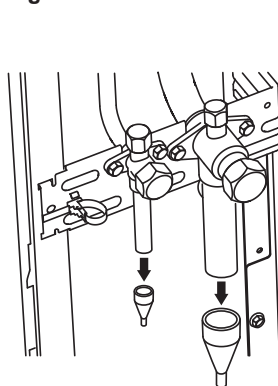


Fig.C



5. 3. 3. Pipe connection

⚠ CAUTION

- Seal the pipe route hole with putty (field supply) such that there are no gaps.
Small insects or animals that are trapped in the outdoor unit may cause a short circuit in the electrical component box.
- To prevent pipe damage; do not make sharp bends in the pipe.
Bend the pipe at a radius of 70mm or greater.
- Do not bent pipe many times at same part to prevent break.
- Do not use flare connection on the indoor unit pipe until the connection piping has been connected.
- Wait until the 3-way valve is completely cooled down before removing the pinch pipe or brazing the joint pipe.
Otherwise, the 3-way valve may be damaged.

- Blaze the joint pipe onto the 3-way valves at the liquid and gas side.
Process the joint pipe appropriately so that it can be connected easily with the main pipe.
- Blaze the joint pipe at the liquid and gas side with the main pipe.
* Be sure to supply nitrogen when blazing.

Fig. A

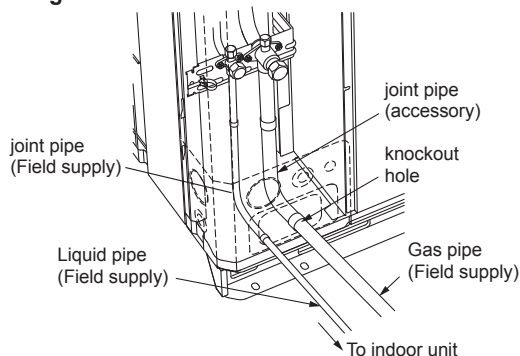
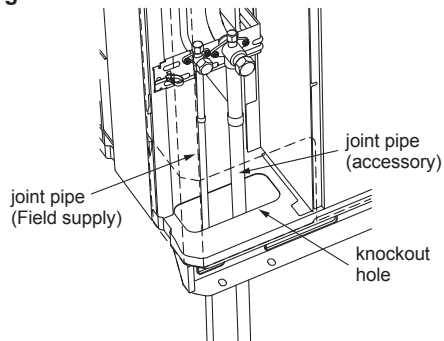


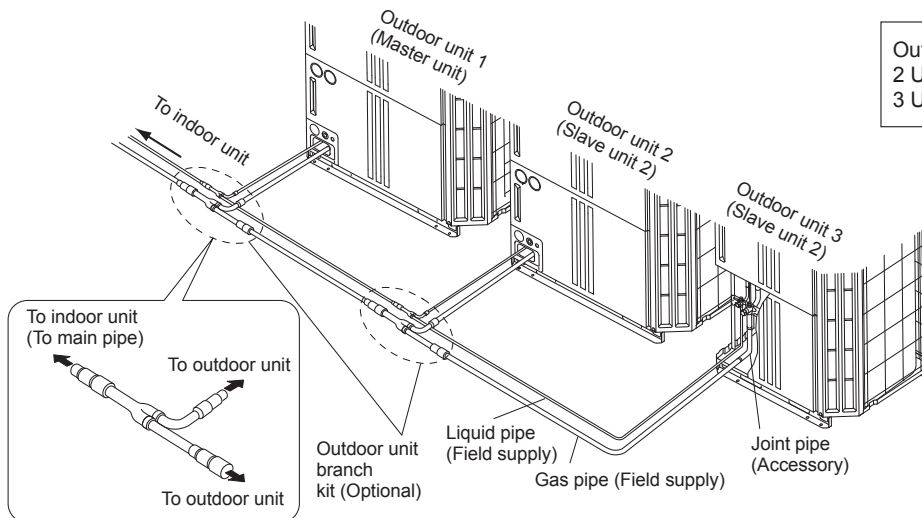
Fig. B



5. 4. Multiple connections

⚠ CAUTION

- When connecting multiple (maximum three) units, be sure to install the unit with the largest capacity nearest to the indoor unit.
For example) AJ□126LALH (Outdoor Unit1) + AJ□126LALH (Outdoor Unit2) + AJ□A90LALH (Outdoor Unit3)
- When connecting multiple units, set the unit with the largest capacity as the master unit, and the rest as the slave units.
(Refer to 7. Field Setting)
- When connecting multiple units, use the optional outdoor unit branch kit.

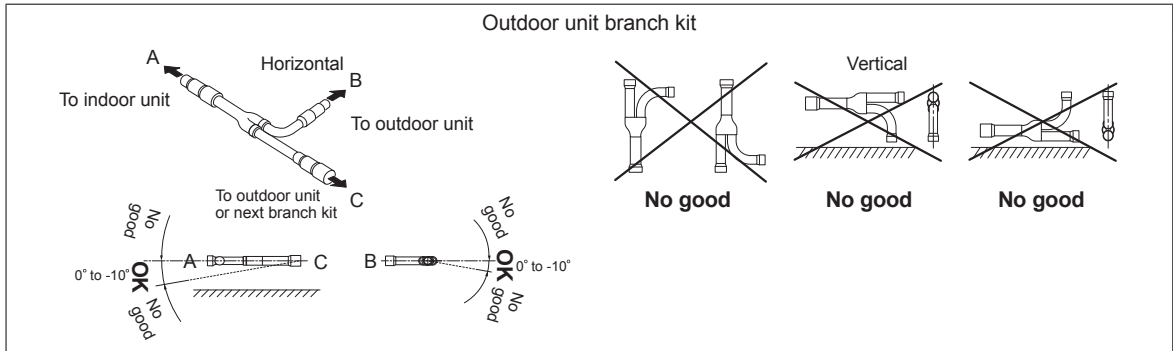


Outdoor Capacity
2 Unit : Unit1 ≧ Unit2
3 Unit : Unit1 ≧ Unit2 ≧ Unit3

Restriction when install

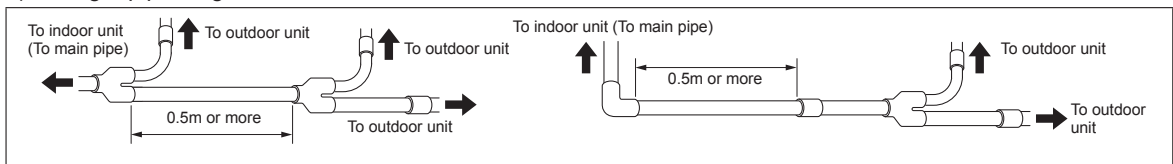
Be sure following restriction.

1) Installation angle



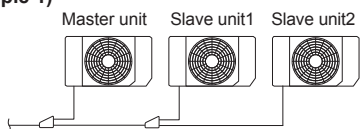
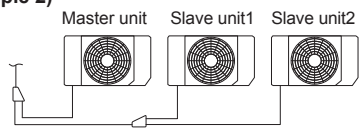
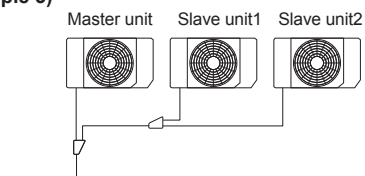
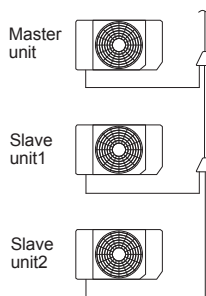
- Install the outdoor unit branch kit horizontally, within 0° to -10°, so that the refrigerant separates evenly.
- Do not install the outdoor unit branch kit vertically.

2) Straight pipe length



- Leave the distance 0.5m or more for straight part to outdoor unit branch kit.

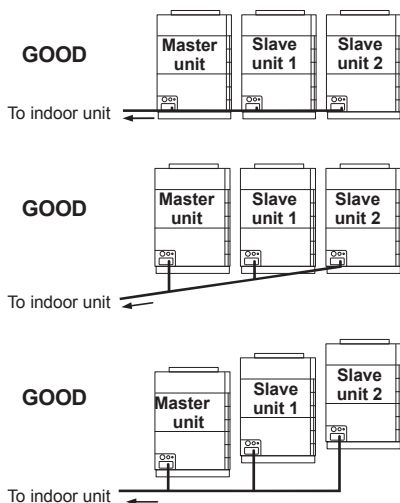
3) For details, refer to the Installation Instruction Sheet of the outdoor unit branch kit.

Fig. Examples of multiple unit installation**(Example 1)****(Example 2)****(Example 3)****(Example 4)****CAUTION**

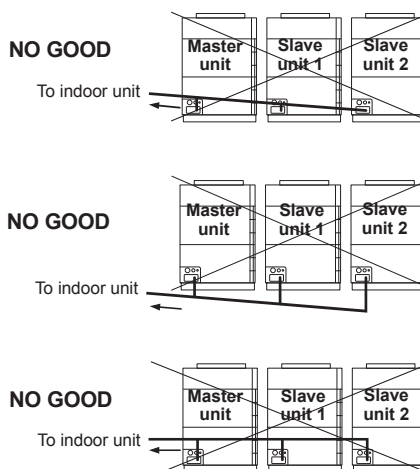
To prevent the oil from settling in the stopped unit, install the pipes between the outdoor units so that they are level or are tilted upward to the outdoor units.

(1) Examples of multiple unit installation are shown below.

a) Installable patterns

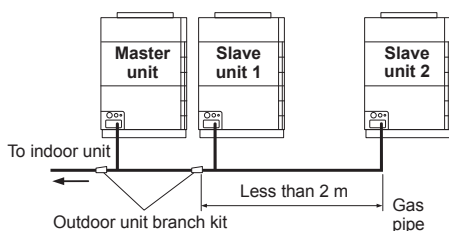


b) Non-installable patterns

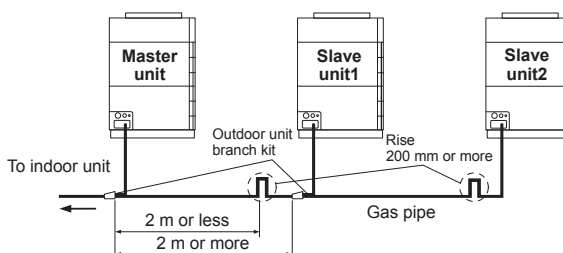


(2) When the length between branch kits and the length of the branch kit and outdoor units is more than 2m, provide a rise of 200mm or more on the gas pipe. However, there is no need to provide a rise on the pipe connecting to the master unit even if the length exceeds 2m.

a) In case of less than 2m



b) In case of 2m or more



6. ELECTRICAL WIRING

6. 1. The precautions of electrical wiring

WARNING

- Wiring connections must be performed by a qualified person in accordance with specifications.
The rated supply of this product is 50Hz, 400V of 3-phase, 4-wire. Use a voltage within the range of 342-456V.
- Before connecting the wires, make sure the power supply is OFF.
- Select a breaker (earth leakage breaker) of appropriate capacity and install one at every power supply of an outdoor unit. Wrong selection of breakers (earth leakage breakers) or transition wiring will lead to electric shock and fire.
- Do not connect AC power supply to the transmission line terminal board.
Improper wiring can damage the entire system.
- Install a breaker (earth leakage breaker) in accordance with the related laws and regulations.
- Connect the connector cord securely to the terminal.
Faulty installation can cause a fire.
- Make sure to secure the insulation portion of the connector cable with the cord clamp. A damaged insulation can cause a short circuit.
- Never install a power factor improvement condenser. Instead of improving the power factor, the condenser may overheat.
- Before servicing the unit, turn the power supply switch OFF. Then, do not touch electric parts for 10 minutes due to the risk of electric shock.
- Make sure to perform grounding work. Improper grounding work can cause electric shocks.

CAUTION

- The primary power supply capacity is for the air conditioner itself, and does not include the concurrent use of other devices.
- Connect the power cables in positive phase sequence. If they are connected in negative phase sequence, an error will be displayed. If there is a missing phase connection, the unit will not operate normally. Do not connect a N phase (neutral phase) cable to other phases (misconnection). Wrong wiring will lead to parts damage.
- Do not use crossover power supply wiring for the outdoor unit.
- If the electrical power is inadequate, contact your electric power company.
- Install a breaker (earth leakage breaker) in a location that is not exposed to high temperatures.
If the temperature surrounding the breaker (earth leakage breaker) is too high, the amperage at which the breaker (earth leakage breaker) cuts out may decrease.
- Use a breaker (earth leakage breaker) that is capable of handling high frequencies. Because the outdoor unit is inverter controlled, a high-frequency earth leakage breaker is necessary to prevent a malfunction of the breaker itself.
- When the electrical switchboard is installed outdoors, place it under lock and key so that it is not easily accessible.
- Do not fasten the power supply cable and transmission cable together.
- Always keep to the maximum length of the transmission cable. Exceeding the maximum length may lead to erroneous operation.
- The static electricity that is charged to the human body can damage the control PC Board when handling the control PC Board for address setting, etc.
Please keep caution to the following points.
Provide the grounding of Indoor unit, Outdoor unit and Option equipment.
Cut off the power supply (breaker).
Touch the metal section (such as the unpainted control box section) of the indoor or outdoor unit for more than 10 seconds. Discharge the static electricity in your body.
Never touch the component terminal or pattern on the PC Board.

6. 2. Knockout hole

⚠ CAUTION

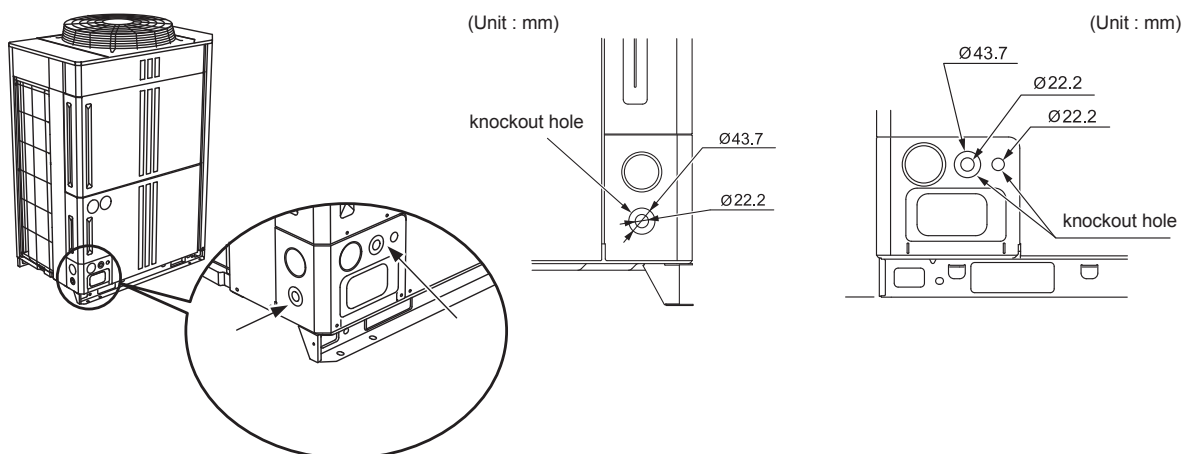
- Be careful not to deform or scratch the panel while opening the knockout holes.
- After opening the knockout hole, remove the burr on the edges to prevent snapping of wires.
It is recommended to apply rust proof paint on the edges to prevent rust.

Electric wires can be connected from the front or from the left.

(Knockout holes are prepared so that wiring can be made from two different directions.)

Use the knockout holes on the front and the left separately when necessary.

English



6. 3. Selecting power supply cable and breaker

⚠ CAUTION

- Regulation of wire size and circuit breaker differs from each locality, please refer in accordance with local rules.

Refer to the table for the wiring and breaker specifications of each installation condition.

(1) Selecting power supply cable and breaker when connecting one outdoor unit

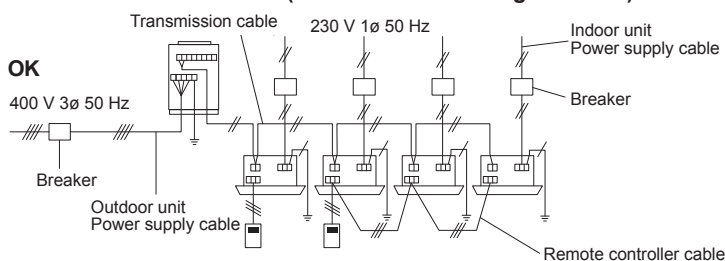
MODEL	Breaker (Time delay fuse or circuit capacity)		Outdoor unit power supply cable		
	Capacity (A)	leakage current	Power supply cable (mm ²)	Ground wire (mm ²)	Critical wiring length (m)
AJ□A72LALH	30	100mA 0.1sec or less	4	4	30
AJ□A90LALH	30		4	4	30
AJ□108LALH	50		10	6	42
AJ□126LALH	50		10	6	42
AJ□144LALH	50		10	6	42

1) These values are recommended data.

2) Specification: Use conformed cord with Type 245 IEC57

3) Max. wire length: Set a length so that the voltage drop is less than 2%. Increase the wire diameter when the wire length is long.

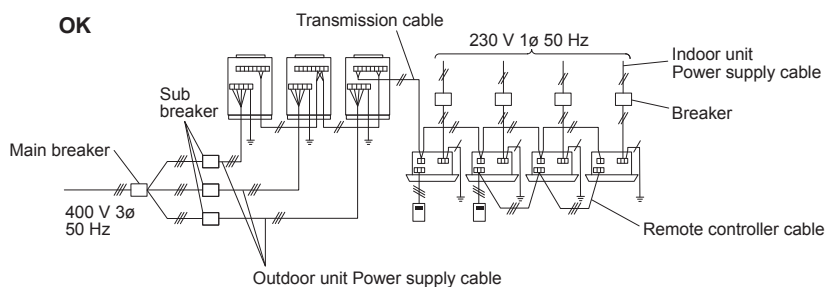
Fig. In case of connected outdoor unit (breaker : earth leakage breaker)



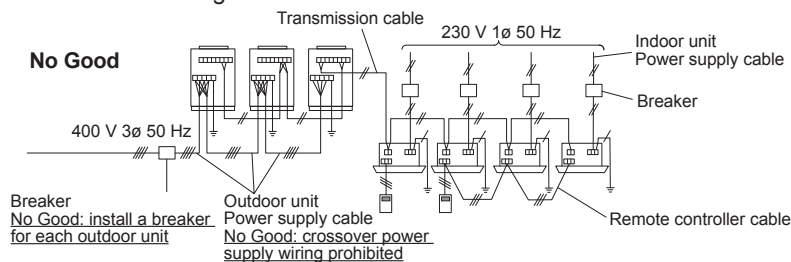
(2) Selecting main breaker and main power supply cable when connecting multiple outdoor units

Main breaker: Main breaker $\geq$ Total Sub breaker (Refer to the table in item (1) for the sub breaker capacity)

Fig. In case of connected three outdoor unit (breaker : earth leakage breaker)



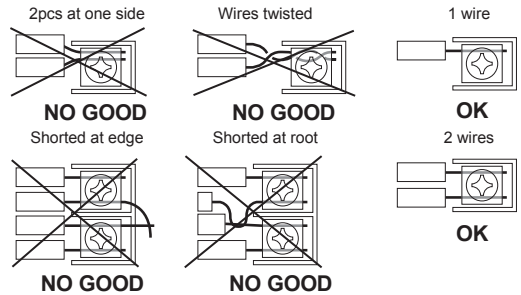
(3) Example of bad breaker wiring



6. 4. Transmission line

⚠ CAUTION

- Caution when wiring cable
When stripping off the coating of lead wire, always use the exclusive tool such as a wire stripper. If there is no exclusive tool available necessarily, carefully strip the coating by a cutter etc. so that the conductive wire is not damaged.
If it is damaged, it may lead to an open circuit and a communication error.
- Pay attention to the following points while attaching wires on the terminal board.
Do not attach 2 wires on one side.
Do not twist wires.
Do not cross the wires.
Do not shorted at edge at root.



6. 4. 1. Transmission wiring specifications

Follow the specifications below for the transmission cable.

Use	Size	Wire type	Remarks
Transmission cable	0.33mm ²	22AWG LEVEL 4 (NEMA) non-polar 2core, twisted pair solid core diameter 0.65mm	LONWORKS® compatible cable

6. 4. 2. Wiring rules

(1) Total length of transmission cable

Total transmission line length : MAX 3600m
 $EF + EG + GH + HJ + HK + KL < 3600m$ (Fig.2)

In the following cases , Signal Amplifier is required.

- ① When the total length of the transmission line exceeded 500m.

$$AB + BC + BD > 500m \text{ (Fig.1)}$$

- ② When the total number of units* is over 64.

- ③ Transmission line length between each unit* $\geq 400m$

(2) Length of transmission cable between one network segment (NS)

$$EF + EG + GH + HJ + HK \leq 500m \text{ (Fig.2)}$$

$$KL \leq 500m \text{ (Fig.2)}$$

(3) Length of transmission cable between outdoor units in a refrigerant system

$$MN \leq 18m$$

$$NP \leq 18m$$

NOTE) Unit* means indoor unit, outdoor unit, Touch Panel Controller and System Controller, Signal Amplifier, single split adaptor, Network Converter etc..

Do not use loop wiring. This may lead to parts damage and erroneous operation.

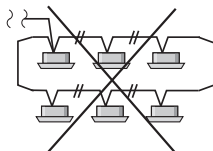


Fig. 1

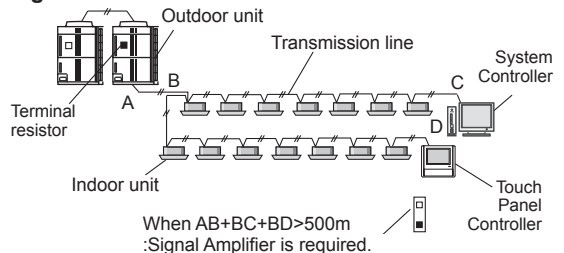
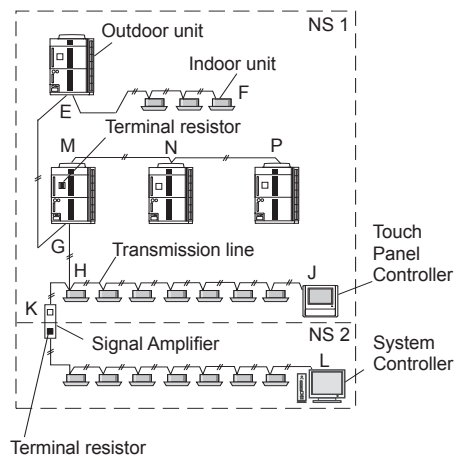


Fig. 2

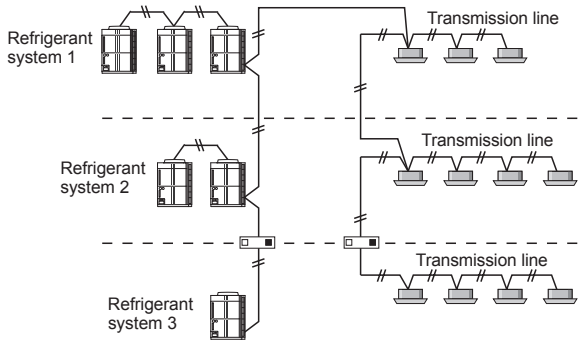


6. 4. 3. Enabling/Disabling automatic address setting

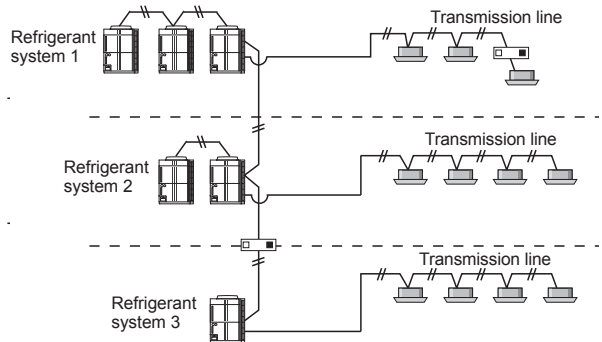
You can enable/disable automatic address setting for the indoor unit and the signal amplifier.

To enable automatic address setting for the indoor unit, connect the indoor unit to outdoor units under the same refrigerant system.(Fig.4)

Example : Disable Automatic Address setting

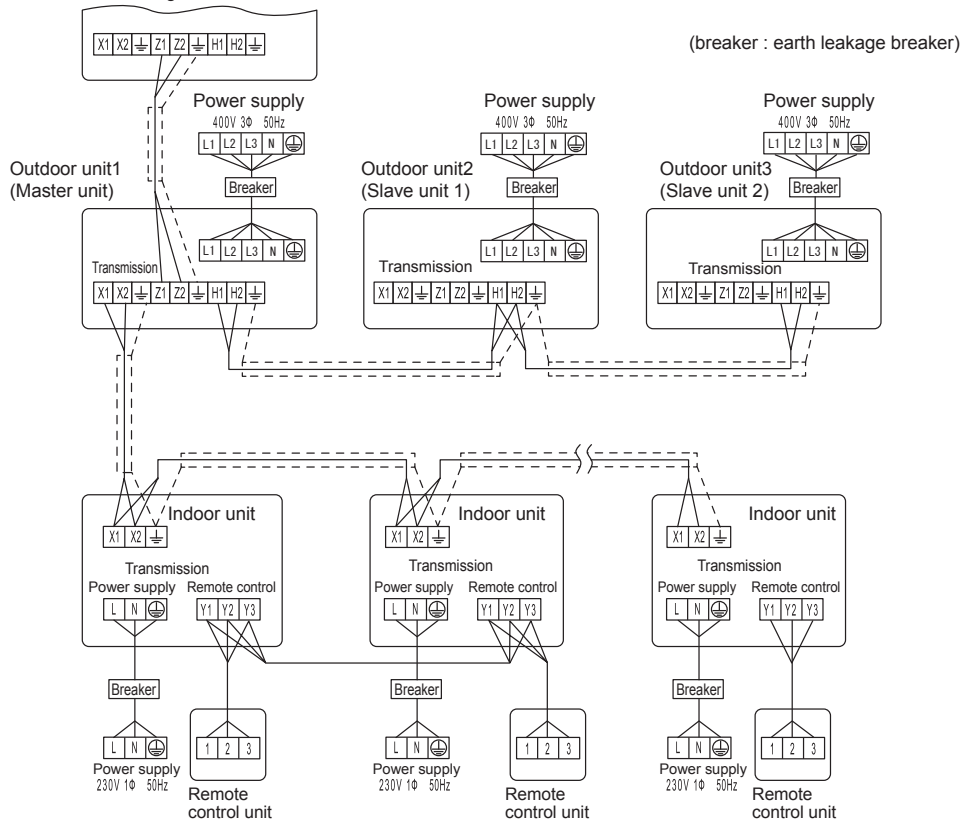


Example : Enable Automatic Address setting



6. 5. Wiring method

To other refrigerant circuit Outdoor unit



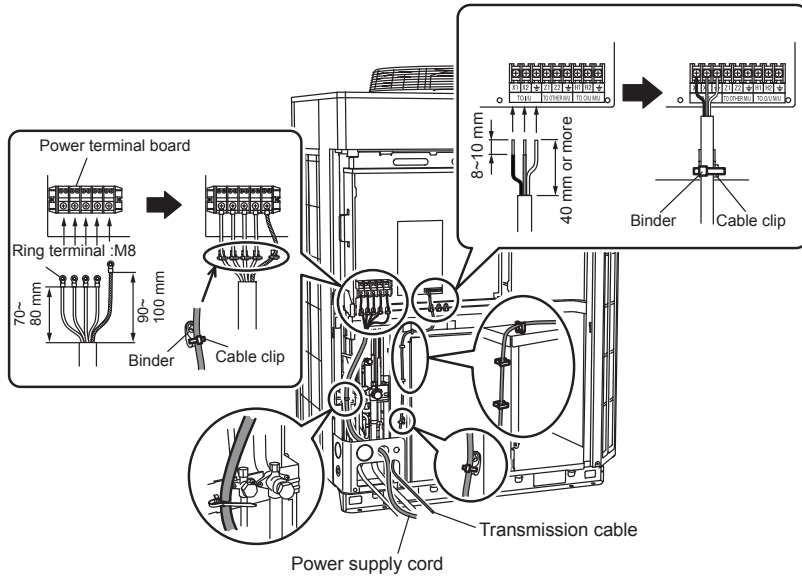
The wiring example for outdoor and indoor units is shown in figure.

Remove the cover of the electrical component box and follow the terminal plate to connect the electric wires to the terminal.

After connecting the electric wires, secure them with a cable clamp.

Connect the wires without applying excessive tension.

Secure with a cable clamp as shown in the figure below.



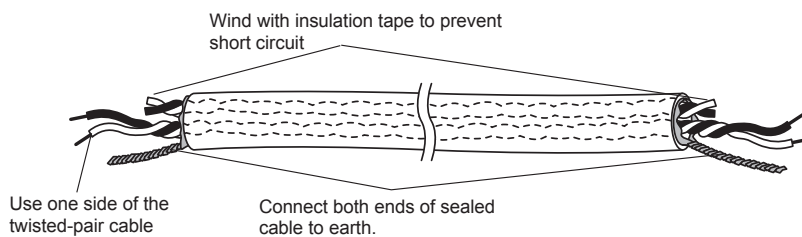
Tightening torque	
M3 screw	0.5 to 0.6 N·m (5 to 6 kgf·cm)
M8 screw	5.0 to 7.0 N·m (50 to 70 kgf·cm)

* Use a ring terminal to connect the electric wires to the power supply terminal board.

Sealing transmission cable

Connect both ends of the sealed wires of the transmission cable to the earth terminal of the equipment or to the earth screw near the terminal.

Be very careful that the screws are not overly tightened as the wires may snap and the terminal may be damaged.



Be sure to use one side of a twisted-pair cable when using transmission cable with two sets of twisted-pair cables.

7. FIELD SETTING

⚠ CAUTION

Discharge the static electricity from your body before setting up the DIP switches.
Never touch the terminals or the patterns on the parts that are mounted on the board.

7.1. Field setting switches

Remove the front panel of the outdoor unit and the cover of the electrical component box to access the print circuit board of the outdoor unit.

Print circuit board switches for various settings and LED displays are shown in the figure.

7.2. DIP switch setting

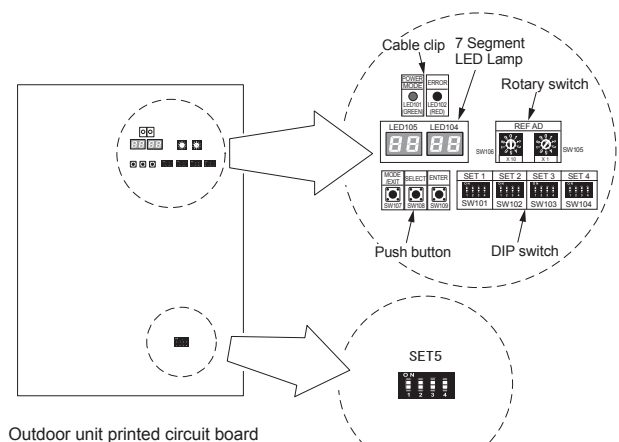
7.2.1. List of Settings

SET3 and SET5 must be set for the DIP switch.

Configure the settings before turning on the power.

Settings for SET1, SET2, and SET4 DIP switches are factory default ones. Do not change them.

DIP Switch		Function
SET1	1-4	Forbidden
SET2	1-4	Forbidden
SET3	1	Outdoor unit address setting
	2	
	3	Setting for number of slave units
	4	
SET4	1-4	Forbidden
SET5	1-2	Number of outdoor units installed
	3	Forbidden
	4	Terminal resistor setting



7.2.2. Settings to be configured locally

(1) Outdoor unit address setting

When two or three outdoor units are installed to one refrigerant system, set the address for each outdoor unit.

Set the address for all outdoor units.

SET3		Outdoor unit address	Remarks
1	2		
OFF	OFF	0	Master unit only (Factory setting)
OFF	ON	1	Slave unit 1
ON	OFF	2	Slave unit 2
ON	ON	-	Forbidden

(2) Number of slave units setting for outdoor unit

Set the number of slave units connected to one refrigerant system.

Set only the master unit.

SET3		Number of connectable outdoor units	Remarks
3	4		
OFF	OFF	0	Master unit only (Factory setting)
OFF	ON	1	1 slave unit connected
ON	OFF	2	2 slave unit connected
ON	ON	-	Forbidden

Do not change the factory default settings for SET1 and SET2.

SET1				Outdoor Unit Model (HP)
1	2	3	4	
OFF	OFF	OFF	OFF	8HP model
OFF	OFF	ON	OFF	10HP model
OFF	ON	OFF	OFF	12HP model
OFF	ON	ON	OFF	14HP model
ON	OFF	OFF	OFF	16HP model

SET2				Model Type
1	2	3	4	
OFF	OFF	OFF	OFF	Air-conditioner/Heater fixed type

(3) Number of outdoor units installed

The number of outdoor units installed in one refrigerant system must be set.

Set for all outdoor units.

SET5		Number of outdoor units	Remarks
1	2		
OFF	OFF	1	(Factory setting)
OFF	ON	2	-
ON	OFF	3	-
ON	ON	-	Forbidden

7.2.3. Terminating resistor setting

⚠ Caution

Be sure to set the terminal resistor according to specifications.

Set the terminal resistor for every network segment (NS).

If terminal resistor is set in multiple devices, the overall communication system may be damaged.

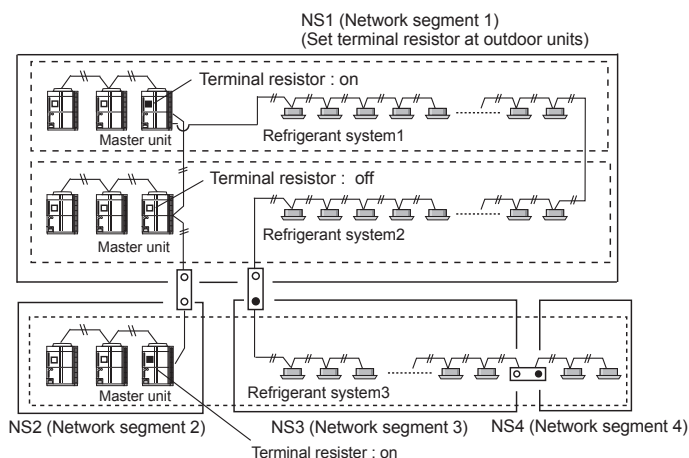
If terminal resistor is not set in a device, abnormal communication may occur.

- Be sure to set one terminal resistor in a network segment. You can set the terminal resistor at the outdoor unit or signal amplifier.
- When setting the terminal resistor of a signal amplifier, refer to the installation manual of the signal amplifier.
- When setting multiple terminal resistors, take note of the following items.
 - ① How many network segments are there in a VRF system?
 - ② Where will you set the terminal resistors in a network segment?(Condition for 1 segment: Total number of outdoor and indoor units and signal amplifiers is less than 64, or the total length of the transmission cable is less than 500m)
 - ③ How many outdoor units are connected to one refrigerant system?

Configure the setting (DIP switch SET5) of the terminal resistor of the outdoor units as shown below from conditions ① to ③.

SET5	Terminal resistor	Remarks
4		
OFF	Disable	(Factory setting)
ON	Enable	-

Figure: Terminal resistor setting



About the setting of terminal resistor

Outdoor unit(Master unit)

■ :on

□ :off

Signal amplifier

● Install

○ Do not install

7.3. Rotary switch setting

The rotary switch (REF AD) sets the refrigerant circuit address of the outdoor unit. Configure the settings only on the master unit of a refrigerant system.

If multiple refrigerant systems are connected, set the rotary switch (REF AD) as shown in the table below.

Refrigerant circuit address	Rotary Switch Setting	
	REF AD	
	×10	×1
0	0	0
1	0	1
2	0	2
3	0	3
4	0	4
5	0	5
•	•	•
•	•	•
•	•	•
97	9	7
98	9	8
99	9	9

Setting	Setting range	Type of switch	
Refrigerant circuit address	0–99	Setting example 63	
			
		REF AD × 10	REF AD × 1

Rotary Switch (REF AD×1) : Factory setting "0"

Rotary Switch (REF AD×10) : Factory setting "0"

7.4. Push switch setting

Various functions can be set. Set when necessary.

Perform settings after all indoor units have stopped operation.

Refer to Table A for the items that can be set.

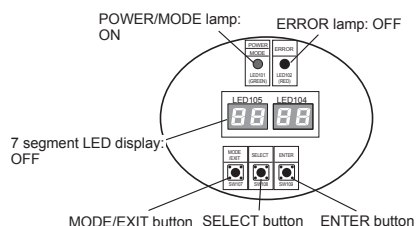
Table A: List of Settings

No	Setting Item		7 segment LED		Factory default	Content
			First 2 digits	Last 2 digits		
0	Pipe length setting	Standard pipe (40-65m)	0	0	0	This item allows you to adjust the cooling cycle loss due to the length of the connected pipe. Set according to the length of the connected pipe. Set only the master unit for this item. * The pipe length is the nearest distance from the outdoor unit to the indoor unit on the pipe line.
		Short pipe (less than 40m)		0	1	
		Long pipe 1 (65-90m)		0	2	
		Long pipe 2 (90-120m)		0	3	
		Long pipe 3 (120-151m)		0	4	
10	Compressor sequential start shift	No shift	1	0	0	This item allows you to delay the start timing of the outdoor units for every refrigerant system when multiple refrigerant systems have been configured. You can also limit the start current when multiple refrigerant systems are activated at the same time. Set only the master unit for this item.
		Shift 1 (21 seconds)		0	1	
		Shift 2 (42 seconds)		0	2	
		Shift 3 (63 seconds)		0	3	
				0	4	
11	Cooling capacity shift	Standard	1	1	0	Set this item when necessary.
		Save energy mode		0	1	
		High power mode 1		0	2	
		High power mode 2		0	3	
				0	4	
12	Heating capacity shift	Standard	1	2	0	Set this item when necessary.
		Save energy mode		0	1	
		High power mode 1		0	2	
		High power mode 2		0	3	
				0	4	
13	(Setting disabled)		1	3	0	(Factory default)
20	Emergency stop/ Forced stop toggle	Forced stop	2	0	0	This item allows you to stop the outdoor/indoor units of the same refrigerant system when a stop signal is received at the external input terminal "CN134". • Forced stop: Operation can be resumed using a remote control. • Emergency stop: Once emergency stop is cancelled, you can start operation with a remote control. Set only the master unit for this item.
		Emergency stop		0	1	

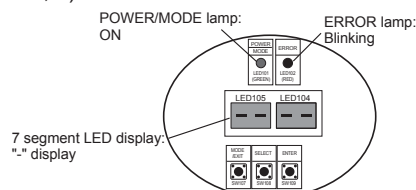
21	Priority mode setting	First press priority	2	1	0	0	O	This item allows you to set the priority item in the cooling cycle operation mode. • First press priority: The operation mode that is configured first will be given priority. • Outdoor unit external input priority: The operation mode that is configured through the external input terminal "CN132" will be given priority. • Administrative indoor unit priority: The operation mode of the "administrative indoor unit" that is configured using a wired remote control will be given priority. Set only the master unit for this item.
		Outdoor unit external input priority			0	1		
		Administrative indoor unit priority			0	2		
22	Snowfall mode setting	Normal operation	2	2	0	0	O	This item allows you to operate the outdoor unit fan regularly in order to prevent the device from being disabled when the outdoor unit is buried in snow. Set only the master unit for this item.
		Snowfall mode			0	1		
23	Snowfall operation interval setting	Standard (30 mins)	2	3	0	0	O	This item allows you to configure the interval of the outdoor unit fan operation when "Snowfall mode" is selected. Set only the master unit for this item.
		Short 1 (5 mins)			0	1		
		Short 2 (10 mins)			0	2		
		Short 3 (20 mins)			0	3		
24	High static pressure mode setting	Standard	2	4	0	0	O	Set the high static pressure mode under the following conditions. High static pressure mode 1: When a duct is attached, the length of this duct is 150mm or less from the main unit and other resistive materials are not at the air flow outlet (30Pa or less). High static pressure mode 2: When a duct is attached, the length of this duct is 150mm or more from the main unit or there are other resistive materials at the air flow outlet (80Pa or less). Refer to "3.3.3. When there are obstacles above the product" for setting the high static pressure mode. Set both the master and slave units for this item.
		High static pressure mode 1			0	1		
		High static pressure mode 2			0	2		
25	(Setting disabled)		2	5	0	0	O	(Factory default)
26	(Setting disabled)		2	6	0	0	O	(Factory default)
27	(Setting disabled)		2	7	0	0	O	(Factory default)
28	(Setting disabled)		2	8	0	0	O	(Factory default)
29	(Setting disabled)		2	9	0	0	O	(Factory default)
30	Energy-saving level	Level 1 (stop operation)	3	0	0	0	O	This item allows you to limit the nominal system capacity or stop the operation when an "energy-saving peak cut" signal is received at the external input terminal "CN133". Set only the master unit for this item.
		Level 2 (Limited at 40%)			0	1		
		Level 3 (Limited at 60%)			0	2		
		Level 4 (Limited at 80%)			0	3		
40	Capacity priority setting during low noise operation	Low noise priority	4	0	0	0	O	When "capacity priority" is selected, low noise operation mode will be canceled temporarily if the cooling/heating capacity is insufficient during low noise operation. (Once insufficient capacity is canceled, the unit will resume low noise operation mode) Set only the master unit for this item.
		Capacity priority			0	1		
41	Low noise operation setting	Normal operation	4	1	0	0	O	When "low noise operation ON" is selected, the operating noise will be suppressed. Set only the master unit for this item.
		Low noise operation	4	1	0	1		
42	Low noise operation level setting	Level 1 (55dB)	4	2	0	0	O	This item allows you to configure the noise level when the unit operates under low noise operation mode. Set only the master unit for this item.
		Level 2 (50dB)	4	2	0	1		
70	(Setting disabled)		7	0	0	0	O	(Factory default)
90	(Setting disabled)		9	0	0	0	O	(Factory default)

(1) Turn on the power of the outdoor unit and enter standby mode.

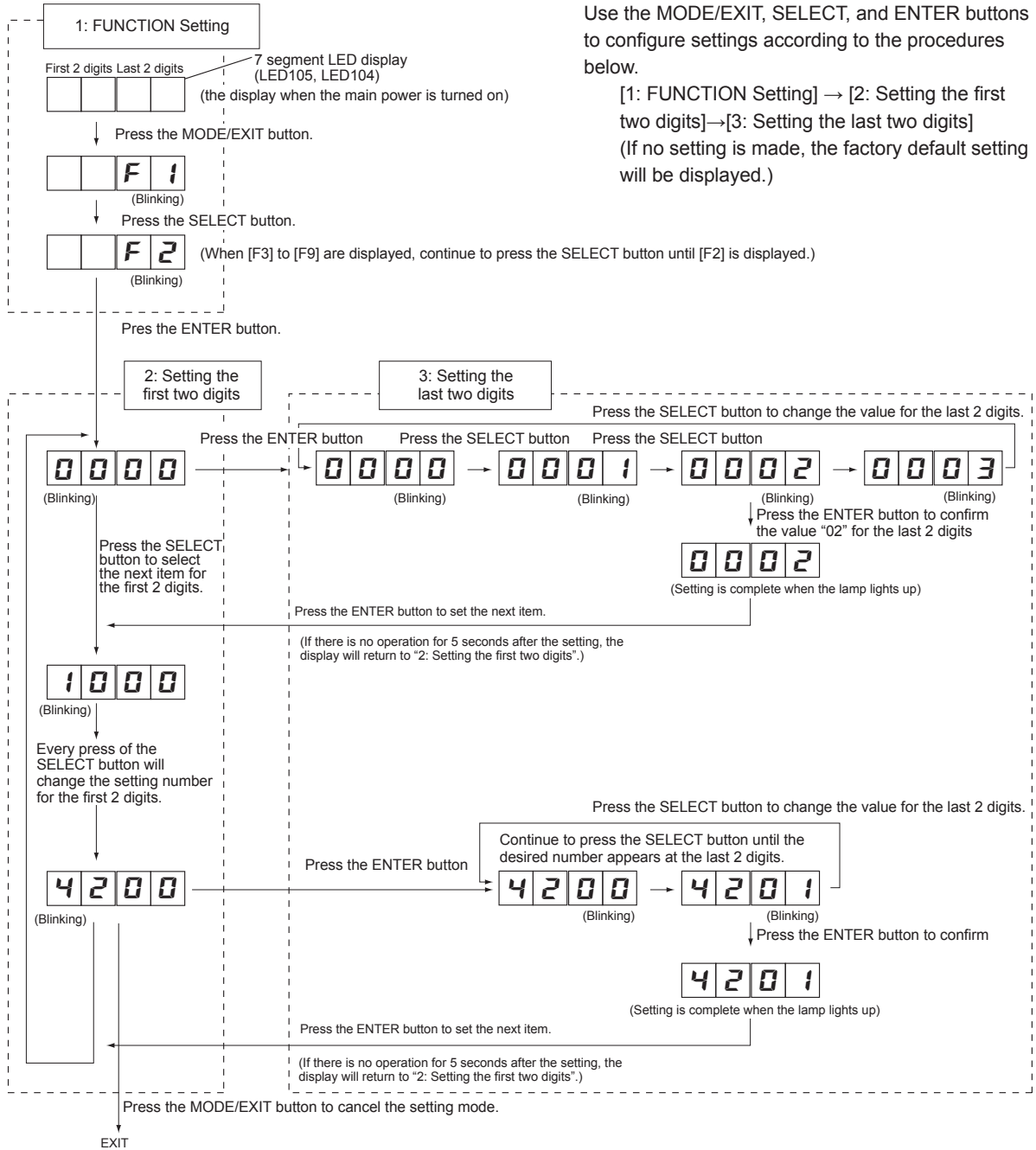
- When system is normal
POWER/MODE lamp lights up. (ERROR lamp is off.)



- When system is abnormal
Check the settings as there is an error in the settings for outdoor unit address (DIP switch SET3-1, 2) or number of connected slave units (DIP switch SET3-3, 4).



(2) Setting method



Use the MODE/EXIT, SELECT, and ENTER buttons to configure settings according to the procedures below.

[1: FUNCTION Setting] → [2: Setting the first two digits] → [3: Setting the last two digits]
(If no setting is made, the factory default setting will be displayed.)

7. 5. Address setting for signal amplifiers

7. 5. 1. Address setting for signal amplifiers

When using signal amplifiers, the address for signal amplifiers must be set.

The address for signal amplifiers can be set automatically from one outdoor unit (master unit) on the network.

Refer to the next section "Fig. Wiring example for automatic address setting" for the wiring example.

(For manual setting of address, refer to the signal amplifier installation manual.)

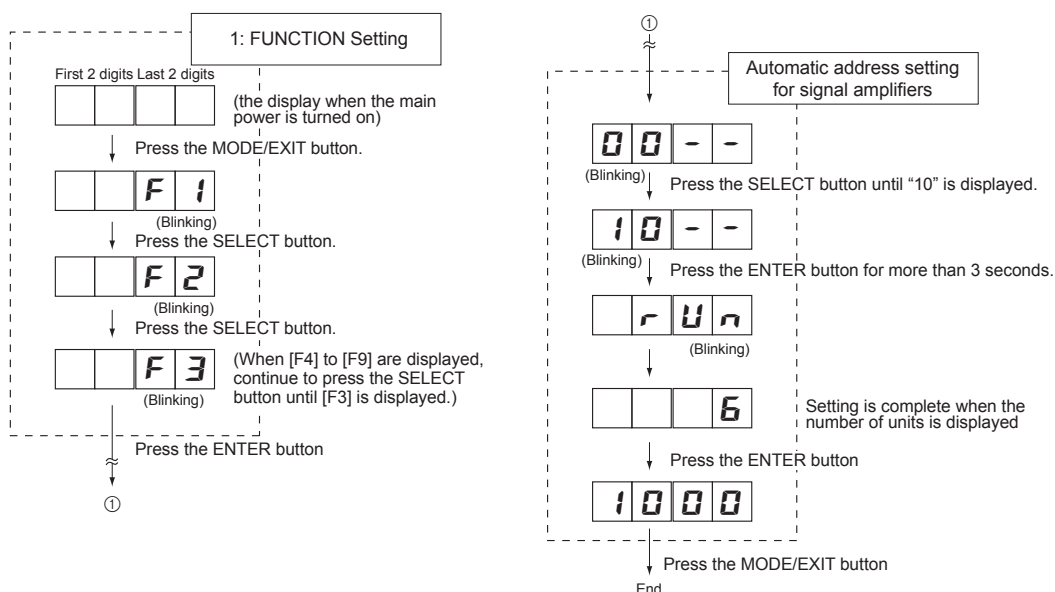
7. 5. 2. Automatic address setting for signal amplifiers

When setting the address of the signal amplifier, please use the factory setting. (See the installation manual of the signal amplifier)

When the system is normal, nothing will be displayed on the 7 segment LED display.

When ERROR is displayed, inspect the units.

Use the MODE/EXIT, SELECT, and ENTER buttons on the outdoor unit print circuit board to configure settings according to the procedures below.



7. 6. Indoor unit address setting

7. 6. 1. Indoor unit address setting

Address must be set for the indoor unit.

Manual setting → •When setting with the switch inside the indoor unit, refer to the indoor unit operating manual.

Automatic setting → •When setting with a remote control, refer to the remote control operating manual.

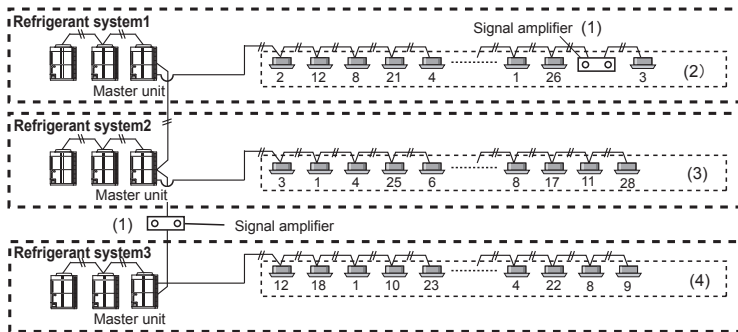
→ •Check that the wiring is as shown in the figure below. Operate using the outdoor master unit of each refrigerant system.

Fig. Wiring example for automatic address setting

(1) Signal amplifier wiring example

(2)(3)(4) Indoor unit wiring example

(Connect the indoor and outdoor units of the same refrigerant system as shown below.)



NOTE) • The automatic address function can be used for a maximum of 48 indoor units installed to the same refrigerant system. When network is connected to other refrigerant systems, the automatic address function cannot be used.
• The addresses of indoor units that have been configured automatically cannot be assigned in the order when they are installed.(Refer to the indoor unit installation manual for the procedures to check the addresses.)

7. 6. 2. Procedures to enable automatic address setting on indoor units

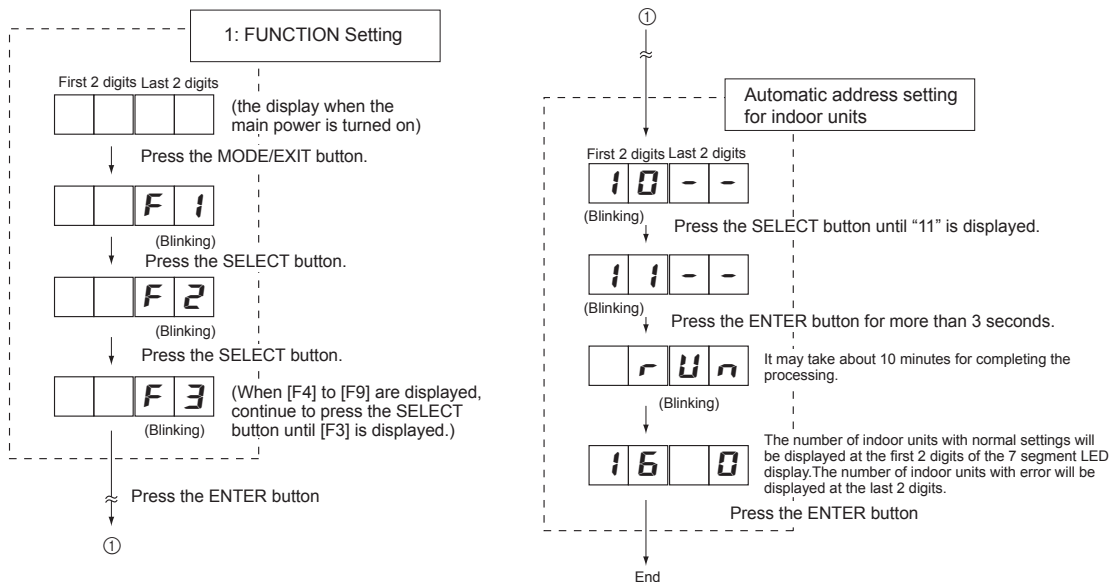
Check that the rotary switch IU AD on the indoor unit circuit board is set to "00".If it is not set to "00", it means the address of that device is not set.(factory default is "00").

Turn on the power of the indoor and outdoor units.

When the system is normal, nothing will be displayed on the 7 segment LED display.

When ERROR is displayed, inspect the units.

Use the MODE/EXIT, SELECT, and ENTER buttons on the outdoor unit print circuit board to configure settings according to the procedures below.



NOTE) After the ENTER button is pressed, the end processing will occur for about 30 seconds.During this period, the 7 segment LED will blink.

7.7. Resistance measurement of transmission cable (Measure with breaker OFF)

⚠ Caution

Do not turn on the power if the resistance between the terminals of the transmission cable is abnormal. Otherwise, the circuit board may be damaged.

Measure the resistance between two terminals of a transmission cable.

(1) Transmission cable connecting indoor units, outdoor units, and signal amplifiers

Measure the resistance of the signal amplifier terminal and the terminal of the indoor and outdoor units connected farthest away from the device where terminal resistor is measured. A value from the table is displayed, depending on the distance from the signal amplifier and the device where the terminal resistor is set. This value is an estimate.

(2) Transmission cable connecting outdoor units in a refrigerant system

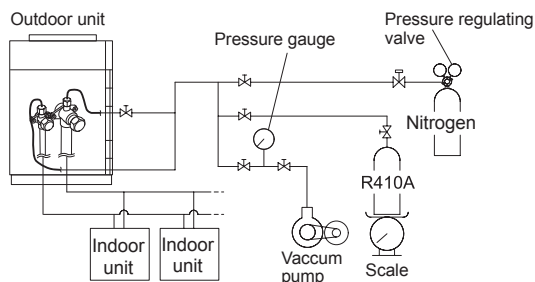
The resistance between the terminals of the transmission cable is 45-60Ω. This value is an estimate.

		Distance from termination resistor (m)				
		0 ~ 100	~ 200	~ 300	~ 400	~ 500
Approximate resistance (Ω)	0 ~ 50	A short circuit somewhere or 2 or more termination resistors are connected				
	50	■				
	60					
	70	■				
	80		■			
	90			■		
	100		■		■	
	110					■
	120			■		
	130				■	
	140					■
	150				■	
	160					■
	170					■
	180					■
	190 ~	Faulty contact or wiring length over 500 m				
	1K ~ ∞	Faulty contact, open circuit, or no termination resistor				

8. PIPE INSTALLATION II

Fig. A Connection system

A) In case of connected one outdoor unit



B) In case of connected many outdoor units

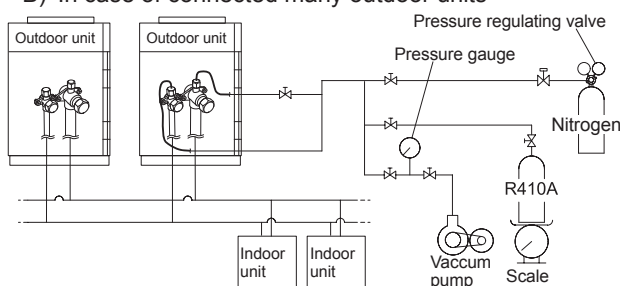


Fig. B

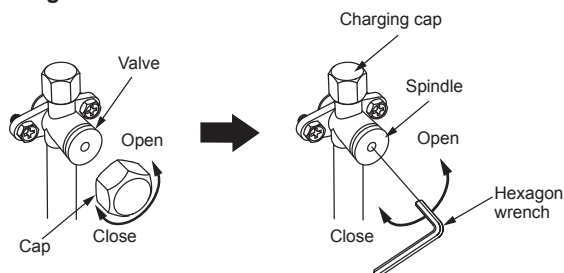


Table. A

Pipe	Spindle	Cap	Charging cap
Liquid valve	9.0 to 12.0 N·m (90 to 120 kgf·cm)	20.0 to 24.0 N·m (200 to 240 kgf·cm)	12.5 to 16.0 N·m (125 to 160 kgf·cm)
Gas valve	27.0 to 33.0 N·m (270 to 330 kgf·cm)	25.0 to 30.0 N·m (250 to 300 kgf·cm)	12.5 to 16.0 N·m (125 to 160 kgf·cm)

8. 1. Sealing test

⚠ CAUTION

- Do not apply shock during sealing test. It can rupture the pipes and cause serious injury.
- Do not turn on the power unless all operations are complete.
- Do not block the walls and the ceiling until the sealing test and the charging of the refrigerant gas have been completed.

After connecting the pipes, perform an sealing test.

Recheck that the spindle of the 3-way valve are closed before performing a sealing test. (Fig. B)

Pour nitrogen gas through both the liquid pipe and the gas pipe.

Pressurize nitrogen gas to 4.2 MPa to perform the sealing test.

Check all flare connection areas and welded areas.

Then, check that the pressure has not decreased.

Compare the pressures after pressurizing and letting it stand for 24 hours, and check that the pressure has not decreased.

* When the outdoor temperature changes 5 °C, the test pressure changes 0.05 MPa.
If the pressure has dropped, the pipe joints may be leaking.

If a leakage is found, immediately repair it and perform a sealing test again.

* Decrease the pressure of nitrogen gas before blazing

After completing the sealing test, release the nitrogen gas from both valves.

Release the nitrogen gas slowly.

8.2. Vacuum process

CAUTION

- Do not turn on the power unless all operations are complete.
- If the system is not evacuated sufficiently, its performance will drop.

Evacuation procedure

- 1) Remove the caps of the gas pipe and liquid pipe and check that the valves are closed.
- 2) Remove the charging cap.
- 3) Connect a vacuum pump and a pressure gauge to a charging hose and connect it to the charging port.
- 4) Activate the vacuum pump and vacuum the indoor unit and connection piping until the pressure gauge becomes -76cmHg.

Evacuate from both the gas pipe and the liquid pipe.

- 5) Continue evacuating the system for 1 hour after the pressure gauge reads -76 cmHg.
- 6) Remove the charging hose and reinstall the charging cap.

8.3. Additional charging

CAUTION

- Do not turn on the power unless all operations are complete.
- After evacuating the system, add refrigerant.
- Do not charge the system with a refrigerant other than R410A.
- Always keep to the limit on the total amount of refrigerant. Exceeding the limit on the total amount of refrigerant will lead to malfunction during charging of refrigerant.
- Do not reuse recovered refrigerant.
- Use an electronic scale to measure the charging amount of refrigerant.
Adding more refrigerant than the specified amount will cause a malfunction.
- Charge refrigerant using the liquid pipe.
Adding refrigerant through the gas pipe will cause a malfunction.
- Add refrigerant by charging the system with the refrigerant in the liquid state. If the refrigerant cylinder is equipped with a siphon, it is not necessary to place the cylinder upright.

8.3.1. Procedure for charging the system with refrigerant

- 1) Remove the charging cap from the liquid pipe.
- 2) Attach a charging hose to the refrigerant cylinder, and connect it to the charging port.
- 3) Add refrigerant by calculating the additional refrigerant volume in accordance with the calculation formula indicated below.
- 4) Remove the charging hose and install the charging cap.
- 5) Remove the body caps (gas pipe, liquid pipe, and oil pipe {if multiple units are installed}), and open the valves.
- 6) Close the body caps.
- 7) After adding refrigerant, indicate the added charging volume on the unit.

* Tighten the body caps and charging caps to the torque values specified in the Table A.

To open and close the valves,

Use an M4 hexagon wrench for liquid and oil pipes.

Use an M10 hexagon wrench for gas pipes.

8.3.2. Checking total amount of refrigerant and calculating the amount of refrigerant charge to be added

- The amount of refrigerant charge to be added is the total value of the basic refrigerant charge amount and the value calculated from the length of the liquid pipe.
- Round up the value to two decimal places.

Model	HP	d Factory charged amount (kg)	a Additional amount for outdoor unit (kg)	Diameter of liquid pipe (mm)	b Additional amount for pipe length (kg/m)
AJ□A72LALH	8HP	11.20	0	Ø6.35	0.021
AJ□A90LALH	10HP	11.20	0	Ø9.53	0.058
AJ□108LALH	12HP	11.80	1.20	Ø12.70	0.114
AJ□126LALH	14HP	11.80	3.30	Ø15.88	0.178
AJ□144LALH	16HP	11.80	3.30	Ø19.05	0.268

(1) Calculation of additional amount for outdoor unit

A =

a Outdoor unit1 additional amount for outdoor unit	+	a Outdoor unit2 additional amount for outdoor unit	+	a Outdoor unit3 additional amount for outdoor unit	=	Total
kg		kg		kg		kg

(2) Calculation of additional amount for pipe length

B =

Total length of Ø19.05 mm liquid pipe	b × 0.268 (kg/m)	+	Total length of Ø15.88 mm liquid pipe	b × 0.178 (kg/m)	+	Total length of Ø12.70 mm liquid pipe	b × 0.114 (kg/m)	+
m			m			m		
kg			kg			kg		

Total length of Ø9.53 mm liquid pipe	b × 0.058 (kg/m)	+	Total length of Ø6.35 mm liquid pipe	b × 0.021 (kg/m)	=	Total
m			m			kg
kg			kg			

(3) Calculation of additional charge refrigerant

C=A+B =

kg

 (Round up C to 2 decimal place)

(4) Calculation of factory charged amount

D =

d Outdoor unit1 factory charged amount	+	d Outdoor unit2 factory charged amount	+	d Outdoor unit3 factory charged amount	=	Total
kg		kg		kg		kg

(5) Total refrigerant amount check

E=C+D=

kg

Note : Check the total refrigerant amount under the following conditions

Condition	Computational formula
For 1 outdoor unit per refrigerant system : Total amount of refrigerant ≤ 31.5kg	E ≤ 31.5kg
For 2 outdoor units per refrigerant system : Total amount of refrigerant ≤ 63kg	E ≤ 63kg
For 3 outdoor units per refrigerant system : Total amount of refrigerant ≤ 94.5kg	E ≤ 94.5kg

<Calculation>

- When there are three outdoor units (AJ□144LALH, AJ□126LALH, AJ□108LALH) connected to one system

(1) Calculation of additional amount for outdoor unit

$$A=3.30(\text{kg})+3.30(\text{kg})+1.20(\text{kg})=7.80(\text{kg})$$

(2) Calculation of additional amount for pipe length

If liquid pipe piping length is the following

φ19.05 : 50m, φ15.88 : 25m, φ12.70 : 0m, φ9.53 : 20m, φ6.53 : 15m

$$\begin{aligned}\text{Additional charge volume } B &= 50(\text{m}) \times 0.268(\text{kg/m}) + 25(\text{m}) \times 0.178(\text{kg/m}) + 0(\text{m}) \times 0.114(\text{kg/m}) \\ &\quad + 20(\text{m}) \times 0.058(\text{kg/m}) + 15(\text{m}) \times 0.021(\text{kg/m}) \\ &= 19.325\text{kg}\end{aligned}$$

(3) Calculation of additional charge refrigerant

$$C=A+B=7.80(\text{kg})+19.33(\text{kg})=27.13(\text{kg})$$

(4) Calculation of factory charged amount

$$D=11.8(\text{kg})+11.8(\text{kg})+11.8(\text{kg})=35.4(\text{kg})$$

(5) Check the total amount of refrigerant

When three outdoor units are connected to one system, the following condition must be satisfied.

$$\text{Condition: } E=C+D \leq 94.5(\text{kg})$$

$$\text{Calculation: } 27.13(\text{kg})+35.4(\text{kg})=62.53(\text{kg}) < 94.5(\text{kg})$$

→No problem if the above condition is satisfied.

8. 4. Installing insulation

- Install insulation material after conducting the "8.1 Sealing Test".
- To prevent condensation and water droplets, install insulation material on the refrigerant pipe.
- Refer to the table to determine the thickness of the insulation material.
- If the outdoor unit is installed at a level that is higher than the indoor unit, the water that has condensed in the 3-way valve of the outdoor unit could travel to the indoor unit. Therefore, use putty in the space between the pipe and the insulation to prevent the entry of water.

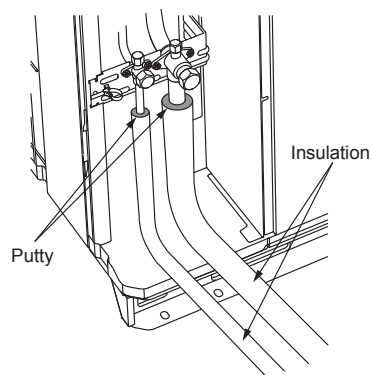


Table. Selection of insulation

(for using an insulation material with equal heat transmission rate or below 0.040W/(m·k))

		Insulation material			
		Minimum thickness (mm)			
Relative humidity		≤ 70%	≤ 75%	≤ 80%	≤ 85%
Pipe diameter (mm)	6.35	8	10	13	17
	9.52	9	11	14	18
	12.70	10	12	15	19
	15.88	10	12	16	20
	19.05	10	13	16	21
	22.22	11	13	17	22
	28.58	11	14	18	23
	34.92	11	14	18	24
	41.27	12	15	19	25

* When an ambient temperature and relative humidity exceed 32 °C, please strengthen heat insulation of refrigerant pipe.

9. TEST RUN

9.1. Pre-test run check items

Before the test operation, refer to the figure and check the following items.

- ① Is there a gas leakage? (At pipe connections {flange connections and brazed areas})
- ② Is the system charged with the specified volume of refrigerant?
- ③ Is the refrigerant circuit address correct?
- ④ Is a breaker installed at the power supply cable of every outdoor unit?
- ⑤ Are the wires connected to the terminals without looseness, and in accordance with the specifications?
- ⑥ Are the initial settings of the switches of the outdoor unit correctly configured?
- ⑦ Is the 3-way valve of the outdoor unit open? (Gas pipe and liquid pipe)
- ⑧ Is power supplied to the crank case heater for more than 12 hours?



After checking that the above items are all in order, refer to "9.2 Test operation method" to test operation the unit.

If there are problems, adjust immediately and recheck.

9.2. Test operation method

Be sure to configure test run settings only when the outdoor unit has stopped operating.

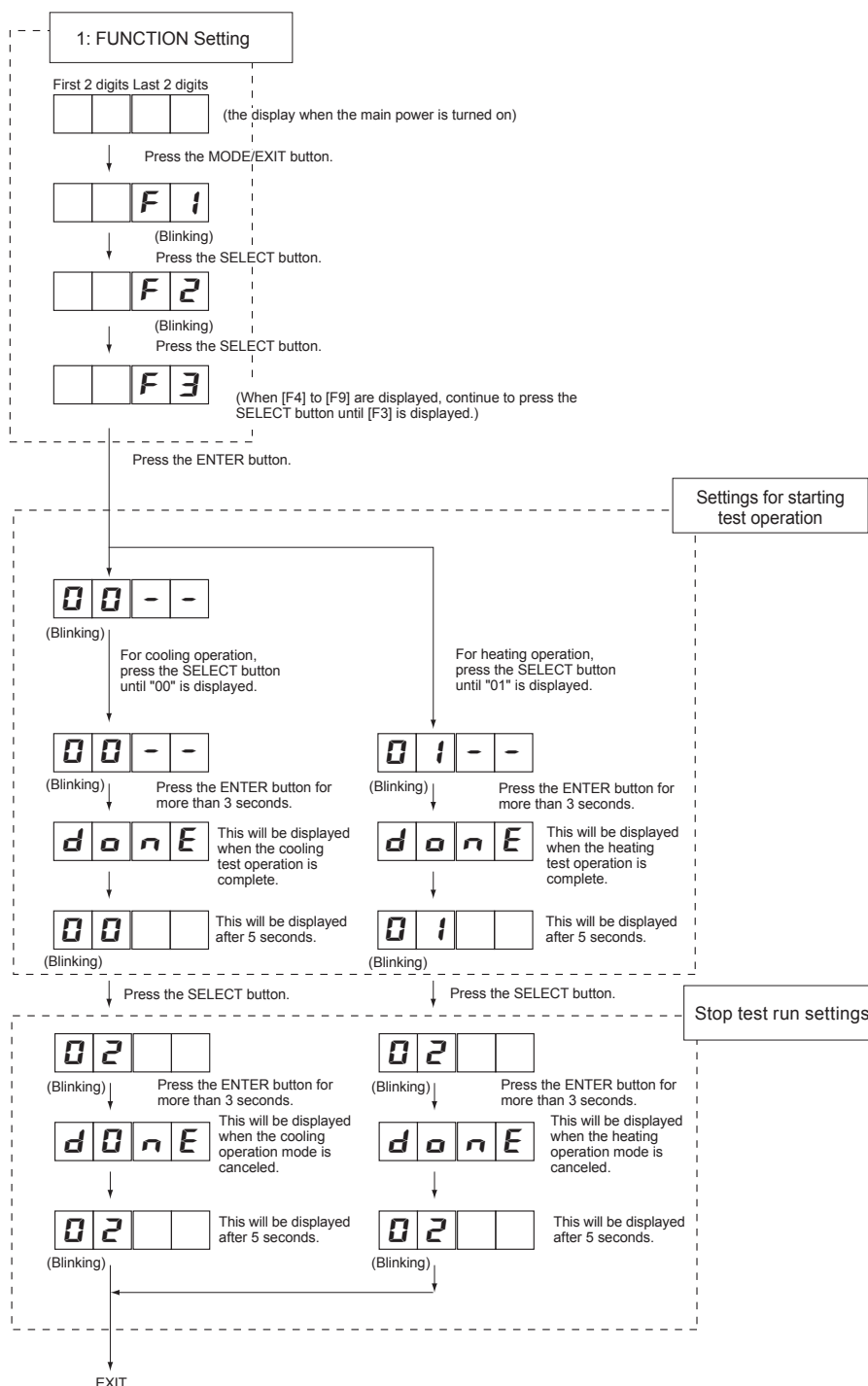
- Depending on the communication status between the indoor and outdoor units, it may take several minutes for the system to start operating after settings for the test run are complete.
- After the test run settings are complete, all the outdoor units and the connected indoor units will start operating. Room temperature control will not activate during test operation (continuous operation).

Perform test operation for each refrigerant system.

You can set "cooling test operation" or "heating test operation" with the push-button switch on the outdoor unit print circuit board.

Test operation setting method

Use the MODE/EXIT, SELECT, and ENTER buttons on the indoor unit print circuit board to configure settings according to the procedures below.



After the test operation is complete, turn off the power. Attach the cover of the electrical component box and the front panel of the outdoor unit.

Note

- Check that the indoor and outdoor units connected to the same refrigerant system are operating normally.
- When indoor or outdoor units are not operating, or when the indoor and outdoor units of other refrigerant systems are operating, the indoor/outdoor unit address or DIP switch for the number of connected slave units are not configured correctly.
- The system will not operate normally with an incorrect DIP switch setting.
 Stop the system immediately and recheck the DIP switch setting.

9.3. Checklist

	Check description	Check method	Criteria
1	High and low pressure values are normal.	Check it with a pressure gauge.	Cooling: low pressure approx. 0.8 MPa Heating: high pressure approx. 3.0 MPa
2	Drain water is discharged smoothly through the drain hose.	Check it by pouring water.	—
3	Indoor and outdoor unit fans are operating.	Check them visually.	—
4	Compressor operates after the indoor unit operates.	Check the operating sound.	—
5	Difference between inlet and outlet temperatures is normal.	Measure the inlet and outlet temperatures.	Temperature difference 10 degrees
6	Error is not displayed	Check the 7 segment LED display	Error blinking or no error code display

10. LED Display

You can determine the operating status by the lighting up and blinking of the LED lamp.
Check the status using the table below.

10.1. Normal operation mode

Mode	CODE	DESCRIPTION
Operation	C L	Cooling
	H t	Heating
	o r	During oil recovery operation
	d F	During defrosting operation
	P C	During power saving operation
	L n	During low noise operation
	S n	During setting of snowfall mode

10.2. Error display mode

Mode	CODE	DESCRIPTION	Mode	CODE	DESCRIPTION
Communication error	E 1 2. 1	Wired remote controller communication error	Outdoor unit actuator error	E 9 2. 1	Compressor 2 error
	E 1 2. 2	Wired remote controller signal error		E 9 2. 2	Compressor 2 overcurrent error
	E 1 3. 1	Communication error between Outdoor unit		E 9 3. 1	Inverter compressor start up error
	E 1 4. 1	Outdoor unit network communication 1 error		E 9 4. 1	Trip detection
	E 1 4. 2	Outdoor unit network communication 2 error		E 9 5. 5	Compressor motor loss of synchronization
	E 1 4. 3	Indoor unit network communication error		E 9 7. 1	Outdoor unit fan motor lock error
	E 1 4. 4	Peripheral device network communication error		E 9 7. 4	Outdoor unit fan motor undervoltage
	E 1 5. 1	Initial setting scan error		E 9 7. 5	Outdoor unit fan motor
	E 1 5. 2	Number of indoor units excessive (400 exceeded)		E 9 9. 1	4-way valve error
	E 1 5. 3	Number of outdoor units excessive (100 exceeded)		E 9 U. 1	Outdoor unit error
	E 1 5. 4	Data acquisition error		E 9 U. 2	Slave unit error
	E 1 5. 5	Setting range error	Refrigerant system abnormal	E A 1. 1	Discharge temperature 1 abnormal
	E 1 6. 1	Transmission PCB connection error		E A 2. 1	Discharge temperature 2 abnormal
	E 1 6. 2	Adaptor/Convector connection error		E A 3. 1	Compressor1 temperature abnormal
	E 1 6. 3	LAN communication error		E A 3. 2	Compressor2 temperature abnormal
Function setting error	E 2 1. 1	Initial setting error		E A 4. 1	High pressure abnormal
	E 2 6. 1	Duplicate address error		E A 4. 2	High pressure protection1
	E 2 6. 2	Refrigerant circuit address setting error		E A 4. 3	High pressure protection2
	E 2 6. 3	Node address setting error		E A 5. 1	Low pressure abnormal
	E 2 7. 1	Master unit,slave unit set-up error		E A A. 2	Pump down error
	E 2 8. 1	Auto address setting error		E A C. 4	Heat sink temperature abnormal
	E 2 8. 2	Node setting error	Peripheral device PCB/ component trouble	E C 1. 1	Main PCB error
	E 2 8. 3	Manual store 2 error		E C 2. 1	Transmission PCB error
Indoor unit PCB/ Switch error	E 2 8. 4	Signal amplifier auto address error		E C 3. 1	PCB 1 error
	E 3 1. 3	Indoor unit Power frequency abnormal		E C 4. 1	PCB 2 error
	E 3 2. 1	Indoor unit PCB Model information error		E C 5. 1	PCB 3 error
	E 3 2. 3	Indoor unit EEPROM access error		E C 6. 1	PCB 4 error
	E 3 5. 1	Manual auto switch error		E C 7. 1	PCB 5 error
	E 3 7. 1	Indoor unit transmission PCB Parallel communication error		E C 8. 1	Input device error
	E 3 8. 1	Network convector PCB error 1		E C 9. 1	Display device error
	E 3 8. 2	Network convector PCB error 2		E C A. 1	EEPROM error
	E 3 8. 3	Network convector PCB error 3		E C C. 1	Sensor error
				E C J. 1	Other parts error

Indoor unit sensor error	E 4 1. 1	Room temp. sensor error	System tool error	E F 1. 1	Database access error
	E 4 2. 1	Indoor unit Heat Ex. inlet temp. sensor error		E F 1. 2	Database connection error
	E 4 2. 2	Indoor unit Heat Ex. Middle temp. sensor error		E F 1. 3	Software restart error
	E 4 2. 3	Indoor unit Heat Ex. outlet temp. sensor error		E F 1. 4	Program runtime error
Indoor unit actuator error	E 5 1. 2	Indoor unit fan motor error		E F 1. 5	Special operation error
	E 5 3. 1	Drain pump error		E F 2. 1	Communication adaptor connection error
	E 5 U. 1	Indoor unit error		E F 2. 2	Communication error (No data)
outdoor unit PCB/Electrical component/ Switch error	E 6 1. 5	Outdoor unit reverse phase,missing phase wire error		E F 2. 3	External input power meter error
	E 6 2. 2	Outdoor unit PCB microcomputer communication error		E F 3. 1	Inter-process communication error
	E 6 2. 3	Outdoor unit EEPROM access error		E F 3. 2	Software protection key error (including WIBU Key error)
	E 6 2. 6	Inverter communication error		E F 3. 3	Server/client communication error
	E 6 3. 1	Inverter error		E F 4. 1	Hard disk drive capacity error
	E 6 7. 2	Inverter PCB short interruptions detection		E F 4. 2	System requirements error
	E 6 8. 1	Magnetic relay error		E F 4. 3	Time error
	E 6 8. 2	Rush current limiting resistor temp rise protection			
	E 6 9. 1	Outdoor unit transmission PCB Parallel communication error			
outdoor unit sensor error	E 7 1. 1	Discharge Temp Sensor1 Error			
	E 7 1. 2	Discharge Temp Sensor2 Error			
	E 7 2. 1	Compressor Temp Sensor1 Error			
	E 7 2. 2	Compressor Temp Sensor2 Error			
	E 7 3. 3	Outdoor unit Heat Ex. liquid temp. sensor error			
	E 7 4. 1	Outdoor Temp Sensor Error			
	E 7 5. 1	Suction Gas Temp Sensor Error			
	E 7 7. 1	Heat sink temp. sensor error			
	E 8 2. 1	Sub-cool Heat Ex. gas inlet temp. sensor error			
	E 8 2. 2	Sub-cool Heat Ex. gas outlet temp. sensor error			
	E 8 3. 1	Liquid pipe temp. sensor1 error			
	E 8 3. 2	Liquid pipe temp. sensor2 error			
	E 8 4. 1	Current sensor error			
	E 8 6. 1	Discharge pressure sensor error			
	E 8 6. 3	Suction pressure sensor error			
	E 8 6. 4	High pressure switch 1 error			
	E 8 6. 5	High pressure switch 2 error			

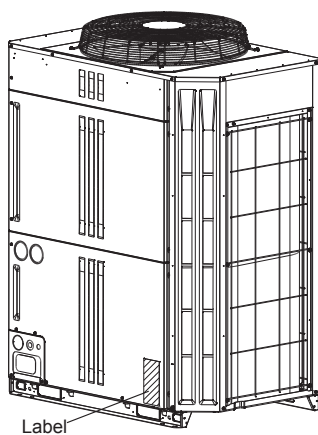
LED lamp :

A: **A**, C: **C**, E: **E**, F: **F**, H: **H**, J: **J**, L: **L**, 1: **1**, 2: **2**, 3: **3**, 4: **4**, 5: **5**
 6: **6**, 7: **7**, d: **d**, n: **n**, o: **o**, r: **r**, t: **t**, S: **S**, P: **P**, U: **U**, 8: **8**, 9: **9**

11. INFORMATION

Main contents of label

Item	Detail
1. Model name	Model name
2. Serial number	Serial number
3. Electric characteristics	Phase, rated voltage, and frequency
4. Weight	Product weight
5. Capacity	Cooling/heating capacity under cooling/heating condition (refer to item 15)
6. Current	Electric current during cooling/heating operation under cooling/heating condition (refer to item 15)
7. Input power	Input during cooling/heating operation under cooling/heating condition (refer to item 15)
8. Max. Current	Maximum electric current (temperature condition is max. cooling condition [refer to item 16])
9. Air circulation	Air circulation
10. Noise level	Noise level
11. Refrigerant	Refrigerant type and initial charging amount
12. Max. pressure (HP/LP)	Means pressure of High Pressure side/Low Pressure side
13. Protection	Protection level against dust and water
14. Working temperature	Working temperature
15. Condition of cooling/heating	Dry-bulb temperature and wet-bulb temperature under standard cooling/heating condition
16. Condition of max. cooling	Dry-bulb temperature and wet-bulb temperature at maximum electric current and input
17. Manufacture year	Manufacture year
18. Origin	Origin country
19. Manufacturer	Manufacturer FUJITSU GENERAL LIMITED Address : 1116, Suenaga, Takatsu-ku, Kawasaki 213-8502, Japan



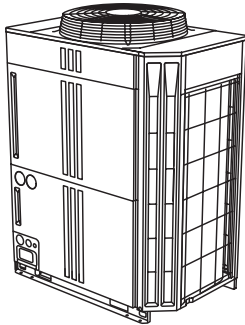
VRF系统 室外机

AJ□A72LALH
AJ□A90LALH
AJ□108LALH

AJ□126LALH
AJ□144LALH

安装说明书

仅针对授权的专业人员。



注意

**R410A
制冷剂**

本空调含有并使用制冷剂R410A。

本产品需由专业人员安装或维修。

在安装、保养及（或）维修本产品前，请先阅读联邦、州、地区及地方之法律、规则、法规、及安装手册。

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1. 安全注意事项

- 安装之前务必仔细阅读本说明书。
- 本说明书中指出的警告和注意事项包含与您的安全密切相关的重要信息。请务必遵守这些信息。
- 安装机组之后，请执行试运转以确保机组运行正常。然后向用户说明如何操作和维护机组。
- 请将本安装说明书与使用说明书一起交给用户。请用户将使用说明书和安装说明书收藏好，以便移动或修理主机组时作为参考。

 警告！	该标志表示如果步骤执行失当，可能会导致用户死亡或严重伤害。
• 按照安装说明书安装主机组时，请咨询经销商或专业技术人员。安装不适当可能造成严重的事故，如制冷剂泄漏、漏水、电击和火灾。 安装时如果没有依照安装说明书的说明进行，则制造商不会保用。	
• 安装时，请务必使用制造商供应的部件或其它规定部件。 使用非规定部件可能造成严重的事故，如机组坠落、制冷剂泄漏、漏水、电击和火灾。	
• 若安装使用R410A制冷剂的机组，请使用专门为R410A制造的专用工具和管道材料。 因为R410A制冷剂的压力大约比R22高1.6倍，所以未使用专用的管道材料或不适当的安装可能会导致破裂或伤害。 而且，可能造成严重的事故，如制冷剂泄漏、漏水、电击和火灾。	
• 请勿让除规定的制冷剂之外的其它物质进入制冷循环。 如果空气进入制冷循环，则其中的压力将变得异常之高，并且会造成管道破裂。	
• 务必按照规定安装机组，以便机组能承受地震、台风或其它强风。 不适当的安装可能造成机组倾倒、坠落或其它事故。	
• 请在能够承受机组重量的地方妥善安装室外机。不适当的安装可能会因机组坠落而造成伤害。	
• 如果发生制冷剂泄漏，确保其不超过浓度限制。 如果制冷剂泄漏量超过浓度限制，则可能造成缺氧等事故。	
• 如果运行过程中发生制冷剂泄漏，请立即离开建筑物，并对该区域彻底通风。 如果制冷剂接触火，就会产生有害气体。	
• 必须由持有证书的人员在国家或地方条例的规定下依照本说明书执行电气工作。务必对机组使用专用电路。 电源不足的电路或错误执行的电气工作可能造成严重的事故，例如电击或火灾。	
• 对于接线，使用指定类型的电线，牢固地连接电线，确保电线上没有外力施加到终端连接上。 错误连接或固定的电线可能造成严重的事故，例如终端过热、电击或火灾。	
• 将电气盒盖牢固地安装在机组上。 不适当安装的电气盒盖可能会因暴露于灰尘或水而导致严重的事故，例如电击或火灾。	
• 未完成所有工作之前请勿打开电源。 在工作完成之前打开电源可能造成严重的事故，例如电击或火灾。	
• 安装后，请确保没有制冷剂泄漏。 如果制冷剂泄漏到房间，并且接触火源（如暖风机、炉子或火炉），就会产生有害气体。	
• 请使用壁孔用管。否则可能会导致短路。	
• 请勿将室外机安装在阳台扶手附近。 小孩骑在室外机上，趴在扶手上，会造成跌落事故。	
• 请勿使用指定元件以外的电源电缆。否则可能会因接触不良、绝缘不良、超过额定电流而导致触电、火灾等事故发生。	
• 将连接电缆牢靠地连接到端子上。或使用“配线压头”加以固定。 如果连接电缆连接不牢靠，可能会导致故障、触电、火灾等事故发生。	
• 安装断路器（接地泄漏断路器）以保证同时切断所有交流主电流。如果不安装断路器（接地泄漏断路器），可能会导致电击和火灾。	
• 压缩机运转前，请务必安装制冷剂管道。如果没有安装制冷剂管道，且在阀门开放的状态下运转压缩机，系统将会吸入空气并在制冷循环中产生异常压力。这将导致机组损坏和伤害事故。	

 注意！	该标志表示，如果操作执行不当，可能会对用户造成人身伤害或财产损失。
• 请勿将机组安装在下列区域： • 盐含量高的区域，如海边。 这会损坏金属部件，使部件掉落或机组漏水。 • 充满矿物油或包含大量溅油或蒸气的区域，例如厨房。 这会损坏塑料部件，使部件掉落或机组漏水。 • 会产生对装置有负面影响的物质（如硫磺气体、氯气、酸或碱）的区域。 这会腐蚀铜管和铜焊接合，从而造成制冷剂泄漏。 • 有能产生电磁干扰的装置的区域。 这会使控制系统产生故障，使机组不能正常运转。 • 可能造成可燃气体泄漏、含有悬浮碳化纤维或易燃灰尘或挥发性易燃物（如涂料稀释剂或汽油等）的区域。 如果气体泄漏并沉积在机组周围，可能会造成火灾。 • 请避免安装在会接触动物尿液或氨的场所。	
• 请勿将机组用于特殊用途，例如存放食物、饲养动物、栽培植物或保存精密装置或艺术品。这可能降低保存或存放对象的质量。	
• 将机组接地。请勿将地线连接到气体管、水管、避雷针或电话地线。不适当的接地可能造成电击。	
• 请依照安装说明书执行机组的排水工作。检查以确保排水正常。如果不正确地安装了排水系统，则水可能从机组上滴落，淋湿家具。	
• 请勿用裸手接触散热片。	

规定

- 本机组必须连接到电阻小于0.33欧姆的电源上，如果电源无法满足该要求，请咨询电力公司。
- 本产品供专业人员使用。
务必使用专用的电源电路。
切勿使用与其它设备共用的电源。

2. 关于产品

2.1. 使用 R410A 制冷剂时的注意事项

请仔细注意以下几点：

- 由于工作压力要比R22型号高1.6倍，有些管道及安装和维修工具是专用的。（请参见“R410A的专用工具”部分的表格。）尤其是将传统制冷剂（除R410A之外）型号更换为新型制冷剂R410A型号时，必须将传统的管道和扩口螺母更换为R410A管道和扩口螺母。
- 使用制冷剂R410A的型号具有不同的充注接口螺纹直径，以防止错误地充注R22、R407C，并确保安全。因此，请预先检查。[R410A的充注接口螺纹直径为1/2 UNF每英寸20个螺纹。]
- 要比安装制冷剂（除R410A之外）型号时更小心，不要让杂质（油、水等）和其他制冷剂进入管道。此外，存储管道时，应通过夹紧和捆绑等方式将管口牢固密封。
- 充注制冷剂时，应考虑气相和液相组分的细微变化，必须从组分稳定的液相一侧充注。

2.2. R410A 的专用工具

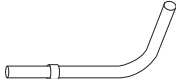
工具名称	用于 R22 工具的变更内容
压力表歧管	压力非常大，不能使用传统的压力计测量。为了防止与其它制冷剂错误混合，每个接口的直径已更改。 建议使用高压显示范围为-0.1至5.3 MPa、低压显示范围为-0.1至3.8 MPa的压力表歧管。
充注软管	为了增加抗压能力，软管材料和底座尺寸已变更。
真空泵	安装真空泵适配器即可使用传统的真空泵。
气体泄漏检测器	HFC制冷剂R410A的专用气体泄漏检测器。

2.3. 附属品

请按需要使用连接部件。

在完成安装之前，请勿丢弃连接部件。

名称和形状	数量	应用
规格说明书 	1	—
安装说明书 	1	(本书)
连接管A 	1	用于连接气体管 (直管型)

名称和形状	数量	应用
连接管B 	1	用于连接气体管 (L形)
绑扎件 	9	用于绑扎电源电缆和信号 电缆

2.4. 组装

一套制冷剂系统最多可以连接3台室外机。

每套系统的室外机台数和可连接的室内机台数如下：

室外机	
型号名称	标定的系统容量 (HP)
AJ□A72LALH	8
AJ□A90LALH	10
AJ□108LALH	12
AJ□126LALH	14
AJ□144LALH	16

安装面积优先的组装方式

组装方式 (HP)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
室外机 1 (HP)	8	10	12	14	16	10	12	12	12	14	16	16	16	12	12	14	16	16	16	16	16
室外机 2 (HP)	-	-	-	-	-	8	8	10	12	12	12	14	16	12	12	12	12	14	16	16	16
室外机 3 (HP)	-	-	-	-	-	-	-	-	-	-	-	-	-	10	12	12	12	12	12	14	16
可连接的室内机最大台数	15	16	17	21	24	32	32	32	35	39	42	45	48	48	48	48	48	48	48	48	48

连接室外机时，请将具有最大标定系统容量的室外机安装在最靠近制冷剂管道和室内机的地方，然后按照系统容量大小依次安装。(室外机1≥室外机2≥室外机3)

节能优先的组装方式

组装方式 (HP)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
室外机 1 (HP)	-	-	-	-	8	-	-	14	8	10	12	14	12	14	14	-	14	14	16	-	-
室外机 2 (HP)	-	-	-	-	8	-	-	8	8	8	8	8	12	12	14	-	14	14	14	-	-
室外机 3 (HP)	-	-	-	-	-	-	-	-	8	8	8	8	8	8	8	-	12	14	14	-	-
可连接的室内机最大台数	*	*	*	*	30	*	*	33	36	39	42	45	48	48	48	*	48	48	48	*	*

*表示不具备节能优先的组装方式。

连接室外机时，请将具有最大标定系统容量的室外机安装在最靠近制冷剂管道和室内机的地方，然后按照系统容量大小依次安装。(室外机1≥室外机2≥室外机3)

2.5. 配件

⚠ 注意

以下配件是R410A制冷剂专用的配件。
请勿使用除以下所列之外的其它配件。

2.5.1. 分歧管部件

表A是用于安装多台室外机的分歧管。

表B是用于连接室外机和室内机的分歧管。

有关室外机分流部件和分歧管的安装规格，请参见安装说明书。

Table.A 用于安装多台室外机的分歧管

分歧管	室内机制冷总容量(kW)
UTR-CP567X	全部

Table.B 分歧管选择

分歧管	室内机制冷总容量(kW)
UTR-BP090X	28.0 或以下
UTR-BP180X	28.1 至 56.1
UTR-BP567X	56.1 或以上

2.6. 分流接头

分流接头用于连接室内机。有关分流接头的安装说明，请参见安装说明书。

Table.C 分流接头选择

分流接头		室内机制冷总容量(kW)
3-6 支管	3-8 支管	
UTR-H0906L	UTR-H0908L	28.0 或以下
UTR-H1806L	UTR-H1808L	28.1 至 56.0

3. 安装工作

选择安装位置及安装主机组时，请获得用户的批准。

3.1. 选择安装位置

⚠ 警告

- 请在可以承受机组重量且不会倾倒或坠落的地方安装机组。
- 如果您将机组安装在封闭的场所，请计算合适的制冷剂浓度。
$$\frac{\text{制冷剂设备中补充制冷剂的总量 (kg)}}{\text{安装机组的最小房间的容量 (m}^3\text{)}} \geq \frac{\text{制冷剂浓度 (kg/m}^3\text{)}}{(0.3\text{kg/m}^3)}$$
- 如果计算结果超过了浓度限制，请增加房间表面积或安装通风管。

⚠ 注意

选择安装位置时，请遵循下列注意事项：

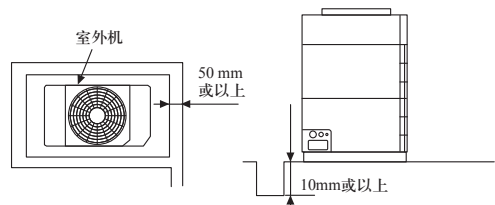
- 请水平安装。(3度以内)
- 请将本机组安装在通风良好的地方。
- 如果必须将机组安装在一般公众容易接触到的区域，请按需要安装防护栅栏或相似物，以防止他们接触。
- 将机组安装在不会打扰邻居的地方，因为来自出口的气流、噪音或振动可能影响邻居。
如果必须将机组安装在靠近邻居的地方，请务必获得他们的同意。
- 如果将机组安装在受积雪、降雪或冰冻影响的寒冷地区，请采取适当的措施保护机组免受这些因素的影响。
若要确保稳定运行，请安装进风和出风道。
- 将机组安装在机组排水时不会造成问题的地方。
否则，请提供不会影响人或物的排水装置。
- 将机组安装在附近没有热源、蒸气或易燃气体泄漏危险的地方。
- 将机组安装在远离排出蒸气、煤烟、灰尘或碎屑的排气装置或通风口的地方。
- 请在距离电视机或收音机1m以外的地方安装室内机、室外机、电源线、信号缆线和遥控缆线。
这样做的目的是防止电视接收干扰或收音机噪音。(即使将它们安装在1m以外的地方，在某些信号条件下可能仍会接收到噪音。)
- 将室内和室外机组的管道长度保持在允许范围内。
- 为了便于维护，请勿隐藏管道。

3.2. 排水处理

- 排水会从装置下方排出。请在基座周围设置排水槽，使冷凝水顺畅排出。
- 安装在屋顶上时，请切实做好地面防水处理。

排水处理：

- 在运转过程中，可能从室外机底座处产生排水。
请根据需要进行排水处理。
- 为了防止冷凝水流到机组周围，请如图所示安装排水槽。
- 请根据需要提供中央排水盘。



3.3. 安装尺寸

⚠ 注意

安装室外机时，请注意下列事项。

- 安装时要有足够空间，应考虑运输线路、维护空间、风路、制冷剂管道空间、行人通道等。
- 请遵循图中所示的安装空间规格。如果不按规格安装机组，有可能发生短路或性能不良。机组可能会在高压保护的作用下停止运行。
- 请勿在送风气流出口的方向上设置障碍物。如果出气口方向上有障碍物，请安装出风道。
- 如果机组前面有墙，请保留至少500mm的空间作为维护空间。
- 如果机组左面有墙，请保留至少30mm的空间作为维护空间。
- 本项目所示的安装空间，是根据外部温度35度制冷运转时而估算。如果外部温度超过35度，或在室外机负载超过额定能力的条件下运行，请进一步增大吸入侧的空间。
- 当室外机的安装台数超过本项目所示的数量时，可能会因短路而导致能力降低，请确保足够的空间，或咨询代理店。

3.3.1. 靠近高度有限的墙壁安装时

(1) 单机组安装和多重安装

- 对侧面墙壁的高度没有限制。
- 根据墙壁高度（正面、后面）的条件按照下表设置安装空间L1和L2。
- 按照下图所示的条件设置L1和L2以外的其它安装空间。
- 距离墙壁或产品等的距离大于2m时，通风阻力可以忽略不计。

墙壁高度条件	需要的安装空间
H1为1500（mm）或以下时	$L1 \geq 500$ （mm）
H1为1500（mm）或以上时	$L1 \geq 500 + h1 \div 2$ （mm）
H2为500（mm）或以下时	$L2 \geq 100$ （mm）
H2为500（mm）或以上时	$L2 \geq 100 + h2 \div 2$ （mm）

Fig.1

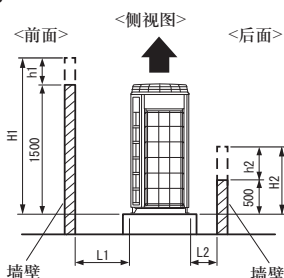


Fig.2 单机组安装

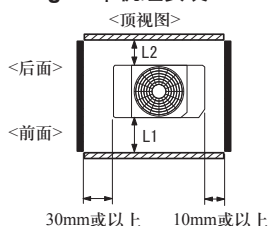
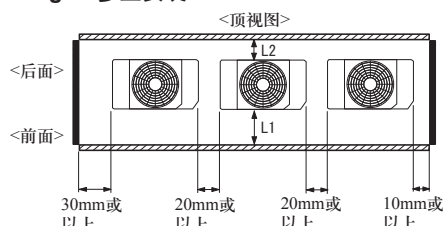


Fig.3 多重安装



(2) 集合安装

- 根据墙壁高度（正面、后面）的条件按照下表设置安装空间L3、L4和L5。
- 按照下图所示的条件设置L3、L4和L5以外的其它安装空间。
- 距离墙壁或产品等的距离大于2m时，通风阻力可以忽略不计。

墙壁高度条件	需要的安装空间
H3为1500（mm）或以下时	$L3 \geq 500$ （mm）
H3为1500（mm）或以上时	$L3 \geq 500 + (h3) \div 2$ （mm）
H4为500（mm）或以下时	$L4 \geq 200$ （mm）
H4为500（mm）或以上时	$L4 \geq 200 + (h4) \div 2$ （mm）
H5为500（mm）或以下时	$L5 \geq 200$ （mm）
H5为500（mm）或以上时	$L5 \geq 200 + (h5) \div 2$ （mm）

Fig.4

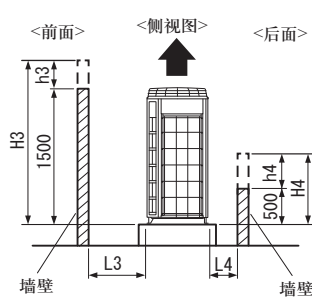


Fig.5

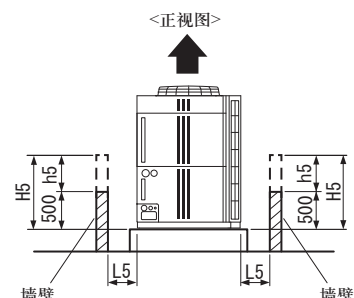


Fig.6

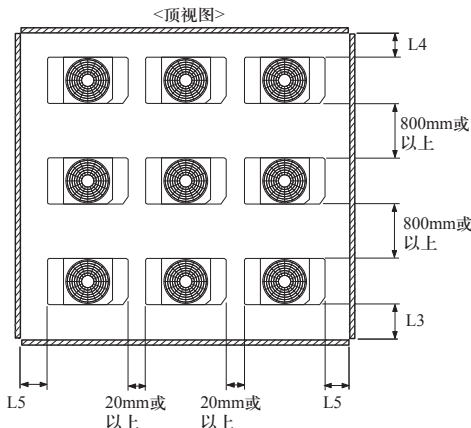
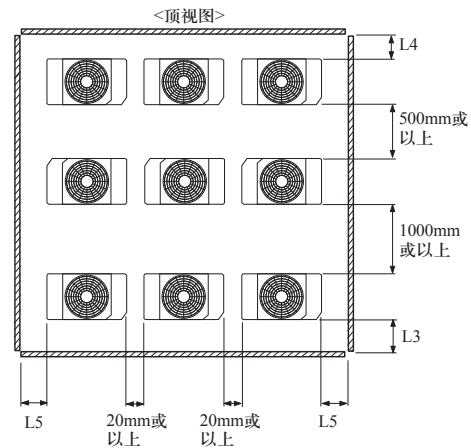


Fig.7



3.3.2. 靠近高度无限制的墙壁安装时

(1) 单机组安装和多重安装

- 对墙壁的高度没有限制。
- 室外机的左右两侧不得有墙壁（无高度限制）。室外机的前后两侧也不得有墙壁。
- 按照下图所示的条件设置L6以外的其它安装空间。
- 距离墙壁或产品等的距离大于2m时，通风阻力可以忽略不计。

室外机的后面面向墙壁一侧安装时

条件	需要的安装空间
$B \geq 400 \text{ (mm)}$ 时	$L6 \geq 200 \text{ (mm)}$
$20 \leq B < 400 \text{ (mm)}$ 时	$L6 \geq 200 + (400 - B) \times 3 \text{ (mm)}$

Fig.8 单机组安装

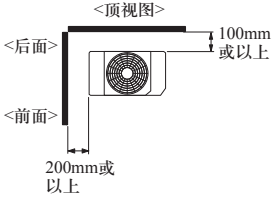
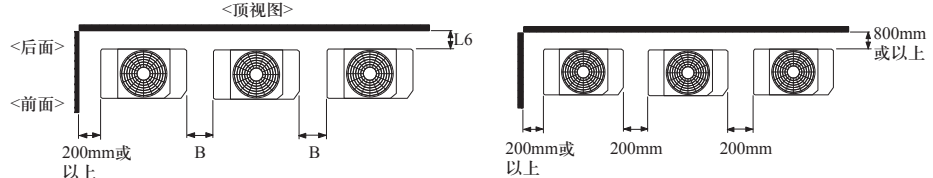


Fig.9 多重安装



例：
使B为200mm时
 $L6 \geq 200 + (400 - 200) \times 3 = 800\text{mm}$

室外机的前面面向墙壁一侧安装时

Fig.10

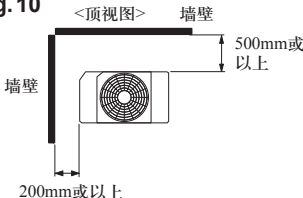
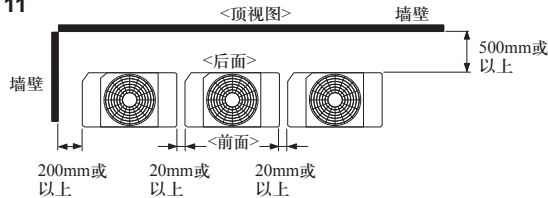


Fig.11



(2) 集合安装

- 室外机的左右两侧不得有墙壁（无高度限制）。室外机的前后两侧也不得有墙壁。
- 距离墙壁或产品等的距离大于2m时，通风阻力可以忽略不计。

Fig.12

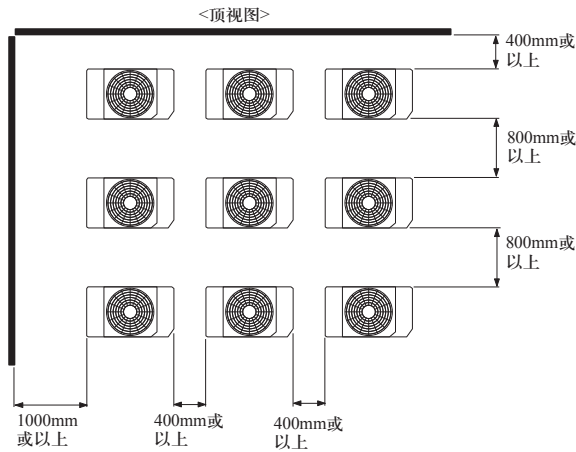
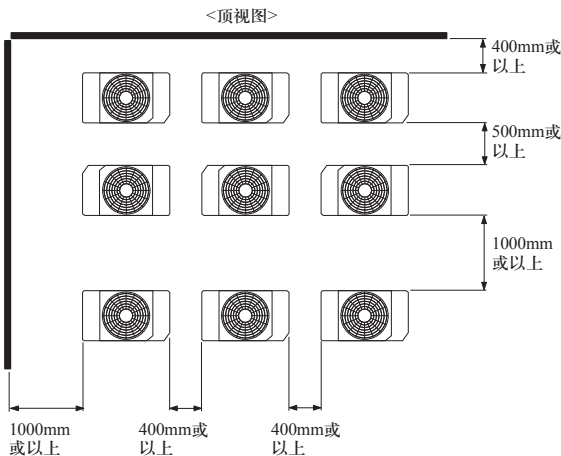


Fig.13



3.3.3. 产品上方有障碍物时

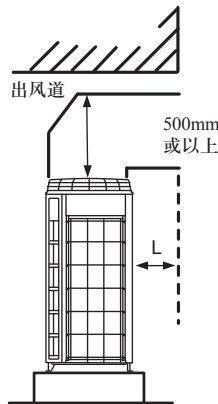
产品上方有障碍物时，请按图中所示保持最小安装高度并安装出风道。
安装出风道时，必须用按钮开关设置高静压模式。
(安装防护罩时方法类似)

设置高静压模式

请按照下表中的说明设置高静压模式。

条件	高静压模式设置 *1
$L \leq 150\text{mm}$ 且其它阻力未处于送风气流出口时（30Pa或以下）	设为模式1
$L > 150\text{mm}$ 或其它阻力处于送风气流出口时（80Pa或以下）	设为模式2

*1. 请参见“第7章 现场设置”中有关按钮开关设置的章节。



3.4. 运输室外机

吊装法 (Fig. A)

- 吊起室外机将其送到安装位置时，请按图中所示将绳索穿过前面和后面底部的4个开口，将机组吊起。
- 请使用2根长度至少为8m的绳索。如果使用长度较短的绳索，可能会损坏机组。
- 请使用能够完全承受机组重量的绳索。
- 请在机框与绳索可能接触的部位放置保护板或垫布以防止损坏。如果未使用保护板或垫布，可能会导致机框损坏或变形。
- 在机组吊装期间，务必保持机组水平，以防坠落。
- 吊装期间请注意不要受到冲撞。

用铲车运输 (Fig.B)

- 用铲车运输机组时，按下图所示使铲车臂穿过开口处。
前面：运输用木托盘的底部。
侧面：运输用托盘与机框之间的空间。
- 可以将运输用托盘从机框上拆下。
- 小心不要损坏。

用铲车运输 (手动铲车：手叉)

- 要用手动铲车运输机组时，请将铲车臂从侧面穿过运输用托盘与机框之间的开口处。

Fig.A

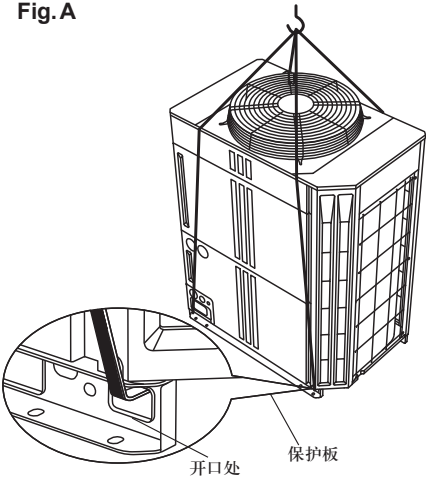
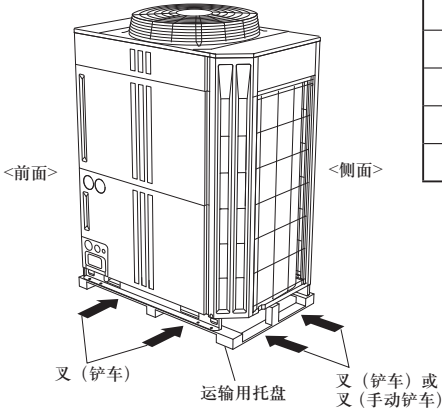


Fig.B



产品质量 (kg)	
AJ□A72LALH	220
AJ□A90LALH	220
AJ□108LALH	275
AJ□126LALH	296
AJ□144LALH	296

3.5. 安装机组

- 水平安装机组。(3度以内)。
- 在箭头指示的8处位置上安装4个或更多个锚栓 (Fig.A)。
- 以大于Table. A中A尺寸的间隔安装左右锚栓。
(在8处位置上安装锚栓时，这一点不适用。)
- 为了减少振动，请勿直接将室外机安装在地面上。
相反，请将机组安装在稳固的平台 (例如混凝土块) 上。(Fig.B)
- 基座应能支撑产品，产品的基脚宽度应大于46.5mm。
- 根据安装条件，机组在运行过程中的振动可能产生噪音和振动。
请安装防振材料 (例如防振垫)。
- 如果要安装基座，请考虑连接管的拆卸空间。
- 请使用锚栓、垫圈和螺母固定装置。

Fig.A

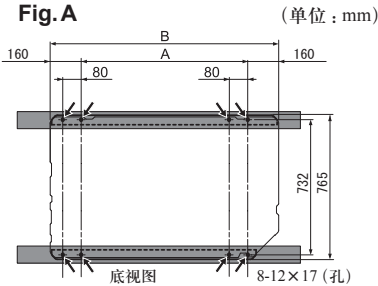
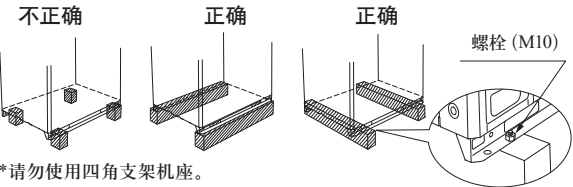


Table. A

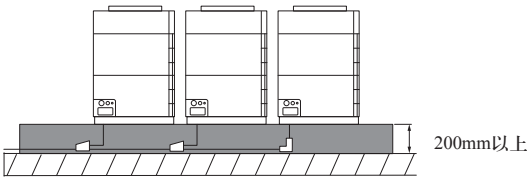
型号名称	A	B
AJ□A72LALH	610	930
AJ□A90LALH	610	930
AJ□108LALH	610	930
AJ□126LALH	920	1240
AJ□144LALH	920	1240

Fig.B



*请勿使用四角支架机座。

Fig.C



从室外机的底部安装管道时，室外机下方所需的空间≥200mm。

*请水平安装分流部件。

4. 系统布置

4.1. 系统布置

⚠ 注意

- 如果要连接多台室外机，请务必将制冷剂管道上最靠近室内机的室外机设置为主机组。
- 如果要连接多台室外机，请将具有最大标定系统容量的室外机安装在最靠近室内机的地方和制冷剂管道上，然后按照标定系统容量大小依次安装。
- 请务必遵守对制冷剂总量的限制。如果在充注时超过了制冷剂总量的限制，可能会导致设备故障。

A) 如果连接一台室外机

- 从室外机到最近的室内机：
 $a+f \leq 150\text{m}$, $a+p \leq 150\text{m}$ (实际管道长度)
- 从第一分枝管到最近的室内机：
 $f \leq 60\text{m}$, $p \leq 60\text{m}$ (实际管道长度)
- 室外机与室内机之间的高度差 (H1)
50m；对于下述室内机
40m；对于下述室外机
- 室内机与室内机之间的高度差
 $H2 \leq 15\text{m}$, $H3 \leq 15\text{m}$
- 管道总长度
 $a+f+h+j+l+n+p+q+s+u \leq 700\text{m}$
- 制冷剂总量 $\leq 31.5\text{kg}$

B) 如果连接两台室外机

- 从室外机到最近的室内机：
 $a+e+f \leq 150\text{m}$, $a+e+p \leq 150\text{m}$ (实际管道长度)
- 室外机与室内机之间的高度差 (H1)
50m；对于下述室内机
40m；对于下述室外机
- 从第一分枝管到最近的室内机
 $f \leq 60\text{m}$, $p \leq 60\text{m}$ (实际管道长度)
- 室内机与室内机之间的高度差 (H2, H3)
 $H2 \leq 15\text{m}$, $H3 \leq 15\text{m}$
- 室外机和室外机之间的高度差 (H4)
 $H4 \leq 0.5\text{m}$
- 从室外机到室外机分流部件
 $a \leq 3\text{m}$, $b \leq 3\text{m}$
- 管道总长度
 $a+b+e+f+h+j+l+n+p+q+s+u \leq 1000\text{m}$
- 制冷剂总量 $\leq 63\text{kg}$
- 室外机的容量
主机 $\geq$ 子机

C) 如果连接3台室外机

- 从室外机到最近的室内机：
 $a+e+f \leq 150\text{m}$, $a+e+p \leq 150\text{m}$ (实际管道长度)
- 从第一分枝管到最近的室内机：
 $f \leq 60\text{m}$, $p \leq 60\text{m}$ (实际管道长度)
- 室外机与室内机之间的高度差 (H1)
50m；对于下述室内机
40m；对于下述室外机
- 室内机与室内机之间的高度差 (H2, H3)
 $H2 \leq 15\text{m}$, $H3 \leq 15\text{m}$
- 室外机和室外机之间的高度差 (H4)
 $H4 \leq 0.5\text{m}$
- 从室外机到室外机分流部件
 $a \leq 3\text{m}$, $b \leq 3\text{m}$, $c \leq 3\text{m}$
- 从最近的室外机到第一室外机的分流部件之间
 $b+d \leq 12\text{m}$, $c+d \leq 12\text{m}$
- 管道总长度
 $a+b+c+d+e+f+h+j+l+n+p+q+s+u \leq 1000\text{m}$
- 制冷剂总量 $\leq 94.5\text{kg}$
- 室外机的容量
主机 $\geq$ 子机1 $\geq$ 子机2

- 注) • 如果制冷运行时室外温度预计为 -5°C 或以下，请勿将室外机安装低于室内机。
- 制冷剂总量参阅“8.3.2. 检查制冷剂总量，并计算追加制冷剂充注量”。

Fig. A

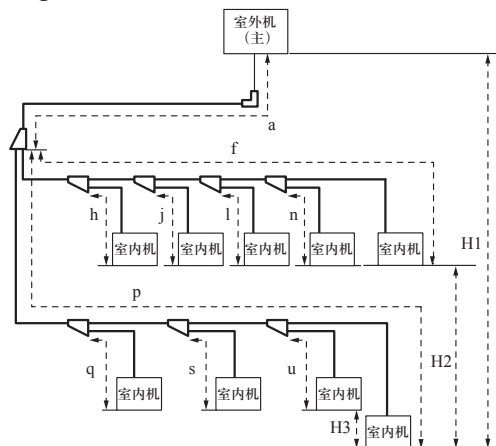


Fig. B

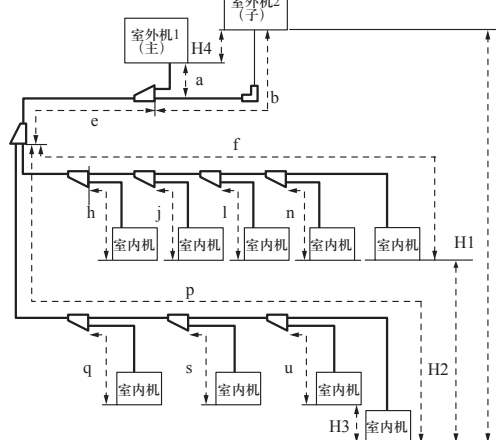
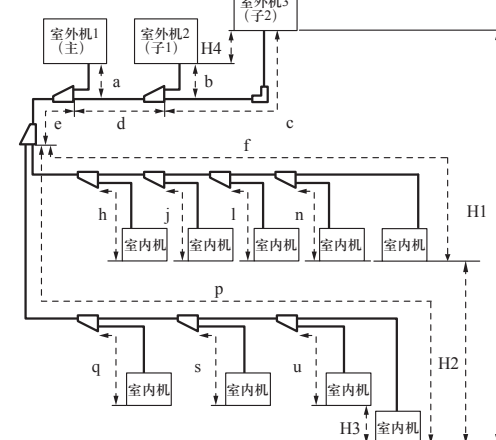


Fig. C



4.2. 管道选择

⚠ 注意

- 该机组为使用R410A制冷剂而专门设计。
- 用于R407C或R22的管道不可以用于该机组。
- 请勿使用现有的管道。
- 不正确的管道选择会降低性能。

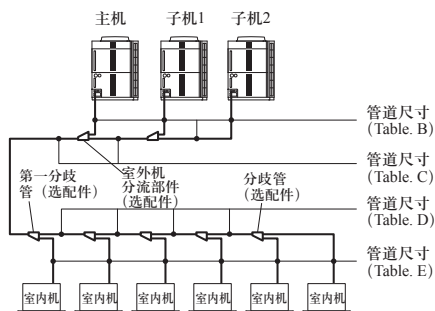


Table. A (针对每种直径的墙壁厚度和管道材料)

外径	mm	6.35	9.52	12.70	15.88	19.05	22.22	28.58	34.92	41.27
墙壁厚度*3	mm	0.8	0.8	0.8	1.0	1.2	1.0	1.0	1.2	1.43
材料	铜*1 JIS H3300 C1220T-O或相当品						铜*2 JIS H 3300 C1220T-H或相当品			

请根据当地规定选择管道尺寸。

Table. B (从室外机到室外机分流部件之间)

HP	室外机制冷容量 (kW)	外径 (mm)		分流部件*4
		液体管	气体管	
8	22.4	12.7	22.22	UTR-CP567X
10	28.0	12.7	22.22	
12	33.5	12.7	28.58	
14	40.0	12.7	28.58	
16	45.0	12.7	28.58	

*1. 允许张应力 ≥ 33 (N/mm²)

*2. 允许张应力 ≥ 61 (N/mm²)

*3. 管道耐受压力 4.2MPa

*4. 有关安装方法, 请参见“5.4. 多重连接”。

Table. C (从室外机分流部件到第一分歧管之间)

室外机制冷总容量 (kW)	外径 (mm)	
	液体管	气体管
22.4 至 28.0	12.70	22.22
28.1 至 45.0	12.70	28.58
45.1 至 56.0	15.88	28.58
56.1 至 80.0	15.88	34.92
80.1 至 96.0	19.05	34.92
96.1 或以上	19.05	41.27

如果分歧管 (根据Table. D) 之间的管道直径大于室外机分流部件与第一分歧管 (根据Table. C) 之间的管道直径, 请选择直径等于室外机分流部件与第一分歧管之间管道直径的管子。

(如果管道直径 $D > C$, 从Table. C中选择管道尺寸)

Table. D (分歧管之间)

室内机制冷总容量 (kW)	外径 (mm)		分歧管*5	分流接头*5
	液体管	气体管		
4.4 至 11.1	9.52	15.88	UTR-BP090X	UTR-H0906L UTR-H0908L
11.2 至 13.9	9.52	19.05		
14.0 至 28.0	12.70	22.22		
28.1 至 44.7	12.70	28.58	UTR-BP180X	UTR-H1806L UTR-H1808L
44.8 至 56.0	15.88	28.58		
56.1 至 80.0	15.88	34.92	UTR-BP567X	—
80.1 至 95.0	19.05	34.92		
95.1 或以上	19.05	41.27		

进行管道分流时, 请使用标准的分歧管。由于T形管无法让制冷剂均匀分歧, 所以请勿使用T形管。

*5. 有关安装方法, 请参见室内机管道连接、分歧管和分流接头安装说明书。

Table. E (从分歧管到室内机之间)

室内机制冷容量 (kW)	外径 (mm)	
	液体管	气体管
2.2, 2.8, 3.6, 4.0, 4.5	6.35	12.70
5.6, 7.1, 8.0, 9.0	9.52	15.88
11.2, 12.5, 14.0, 18.0		19.05
22.4, 25.0	12.70	22.22

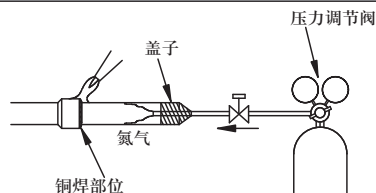
5. 管道安装

5.1. 铜焊

⚠ 注意

- 如果空气或其它类型的制冷剂进入制冷循环，制冷循环中的内部压力就会变得异常之高，使机组不能发挥其全部性能。
- 进行管子铜焊时要使用氮气。
氮气压力：0.02 MPa
(= 手背能感到的压力)

Fig.

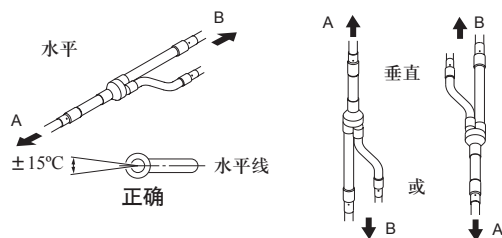


- 如果在管子铜焊时没有应用氮气，会产生氧化膜。这可能降低性能，或者损坏机组内的部件（如压缩机或阀）。
- 对管道进行铜焊时，请勿使用焊剂。如果焊剂是氯型的，就会引起管道腐蚀。而且，如果焊剂含有氟化物，就会因冷冻油变质而对制冷管道系统产生不良影响。
- 使用铜焊材料时，请使用不需要焊剂的磷铜。

5.2. 室内机管道连接

⚠ 注意

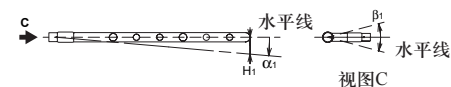
分歧管



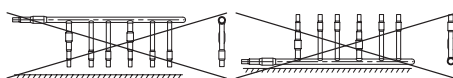
- A：室外机或制冷剂分流部件
B：室内机或制冷剂分流部件

分流接头

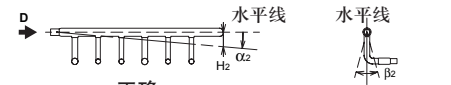
气体管
室外机端



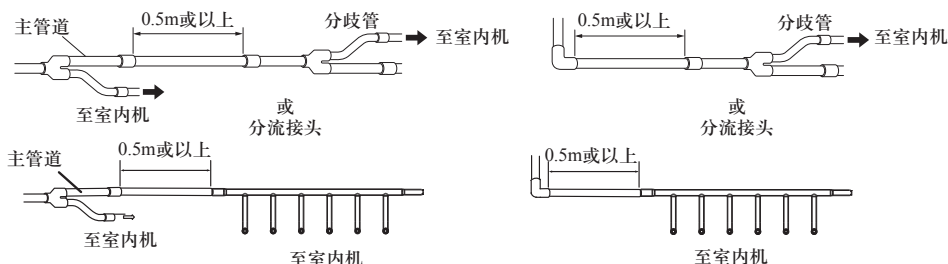
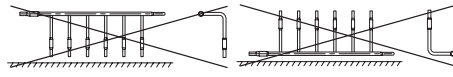
$H_1 = 0 \text{ mm} - 10 \text{ mm}$
 $(\alpha_1: 0^\circ - 1^\circ)$
 $\beta_1: -10^\circ - 10^\circ$



液体管
室外机端



$H_2 = 0 \text{ mm} - 10 \text{ mm}$
 $(\alpha_2: 0^\circ - 1^\circ)$
 $\beta_2: -10^\circ - 10^\circ$



- 请勿在分流接头后连接分歧管。
- 请在直部分与分流部件和分流接头之间保持0.5 m或以上的距离。
- 有关详细信息，请参见每个部件的安装说明书。

5.3. 管道连接方法

5.3.1. 敲开孔的开孔方法

⚠ 注意

- 打开敲开孔时，请小心不要使面板变形或损坏。
- 为防止打开敲开孔后切割电线，请去除边缘的毛刺。
- 另外，为防止生锈，建议在边缘涂防锈漆。

可以从前面或底部两个方向连接管道。
(提供敲开孔，可以从两个不同方向连接管道。)
请根据需要使用前面的敲开孔。

Fig.A 敲开位置

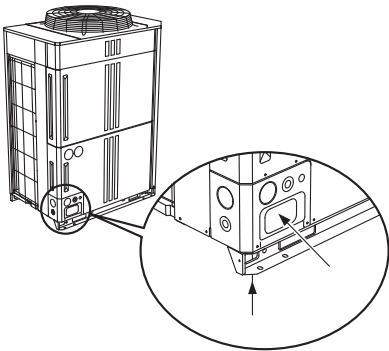


Fig.B 敲开位置详图（底部）

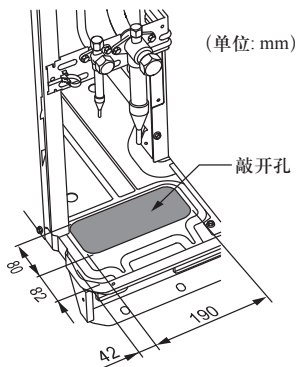
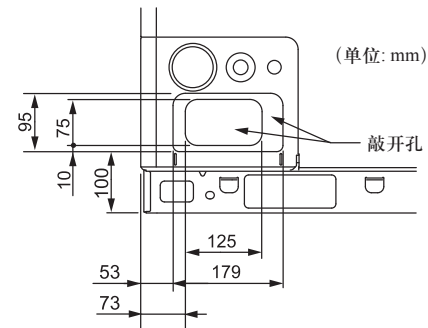


Fig.C 敲开位置详图（前面）



5.3.2. 夹管的拆卸方法

⚠ 警告

只有完全排空内部气体之后，才能拆卸夹管。
如果在管道内部残留气体的状态下用焊枪熔解焊接部位的焊接填充金属，可能会导致气体爆炸等重大事故。

连接管道前，请按照下列说明拆卸夹管：

- 1) 请确认液体端和气体端的3通阀是否关闭。
- 2) 请切断液体端和气体端夹管的顶端部分，抽出夹管内的气体。(Fig. B)
- 3) 完全抽出气体后，使用焊枪熔解焊接部位的焊接填充金属，拆下夹管。(Fig. C)

Fig.A

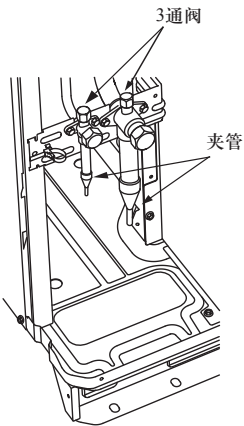


Fig.B

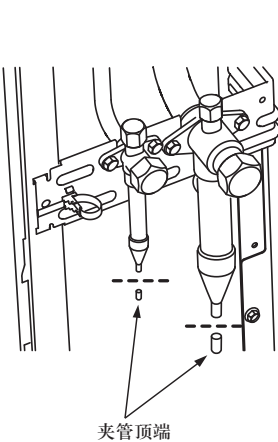
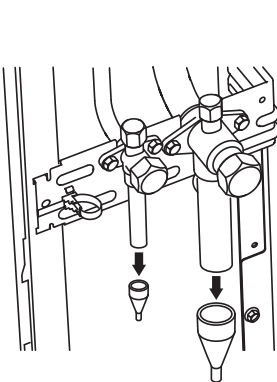


Fig.C



5.3.3. 管道连接

⚠ 注意 • 用油灰（现场供应）密封管道布线孔，使之没有间隙。 如果小昆虫或小动物进入室外机，可能引起电气盒内短路。 • 为了防止管道断裂，请勿对管道进行锐弯。 管道的弯曲半径为70mm或以上。 • 请勿在同一地方弯曲多次，以防断裂。 • 在连接了连接管之前，请勿在室内机上进行扩口连接。 • 拆卸夹管或焊接连接管时，请将3通阀完全冷却后再进行操作。 否则可能会导致3通阀损坏。

- 将连接管焊接到液体端和气体端的3通阀上。
请对连接管进行适当的加工，使其易于连接到主管道上。
- 请将液体端和气体端的连接管与主管道焊接在一起。
* 进行焊接时，请务必提供氮气。

Fig.A

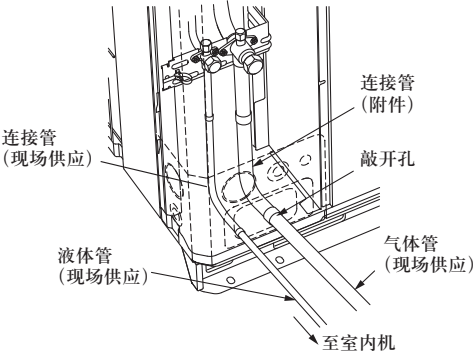
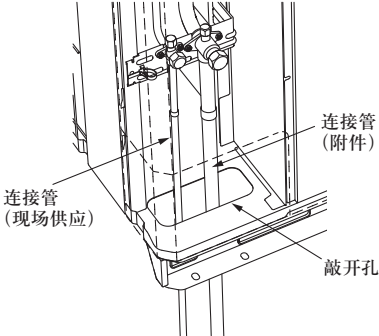
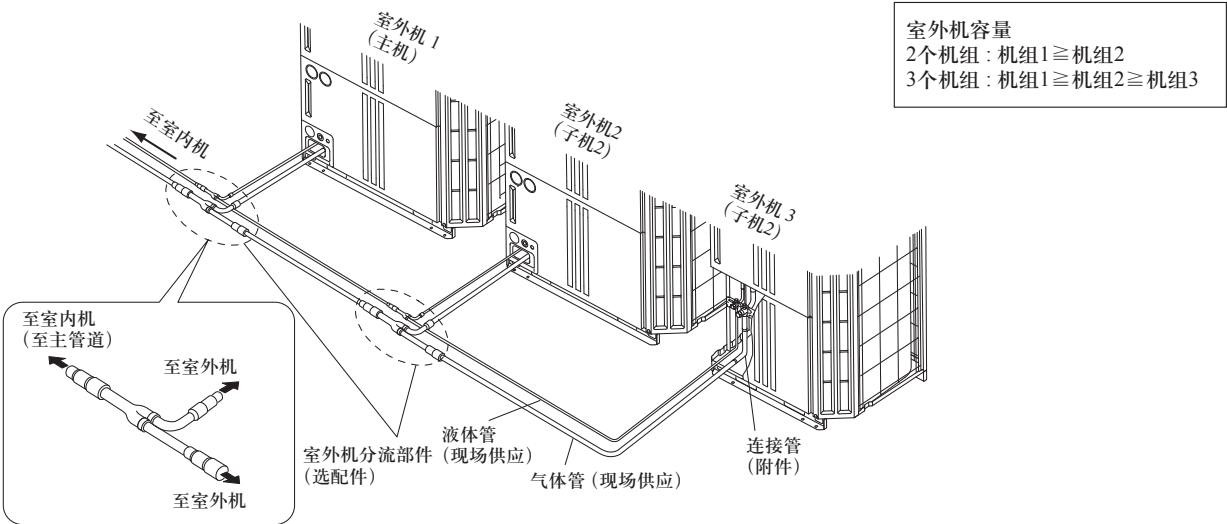


Fig.B



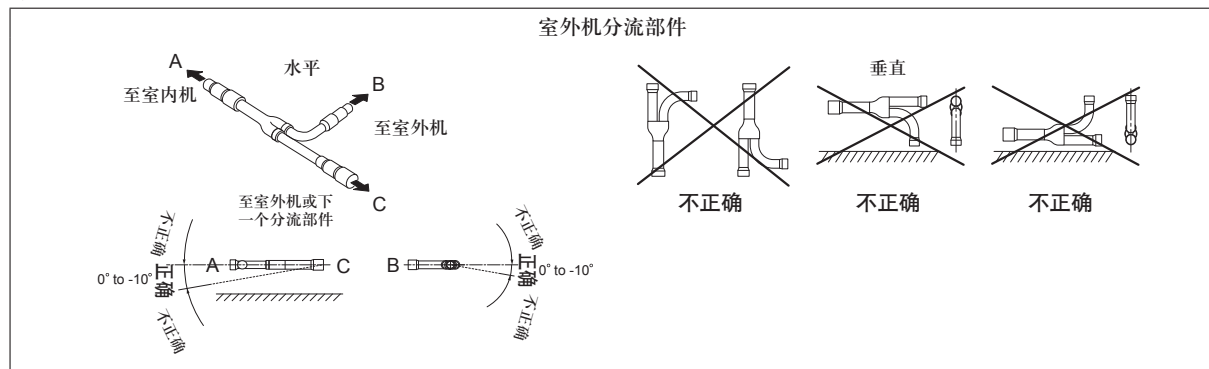
5.4. 多重连接

⚠ 注意 • 连接多台（最多3台）机组时，请务必将具有最大容量的机组尽量靠近室内机安装。 示例） AJ□126LALH（室外机1）+ AJ□126LALH（室外机2）+ AJ□A90LALH（室外机3） • 连接多台机组时，请将具有最大容量的机组设为主机组，其它设为子机组。 （请参见 7. 现场设置） • 连接多台机组时，请使用室外机分流部件（选配件）。
--



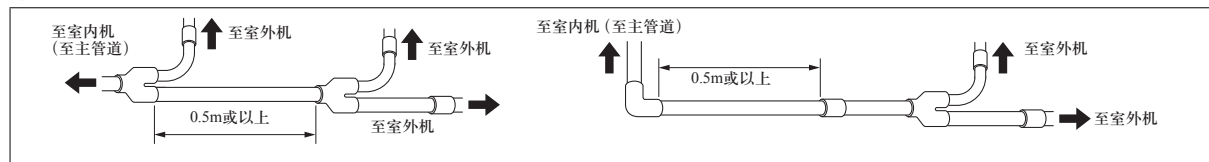
安装时的限制
务必遵守以下限制。

1) 安装角度



- 在 0° 至 -10° 水平范围内安装室外机分流部件，使制冷剂能均匀分歧。
- 不要垂直安装室外机分流部件。

2) 直管道的长度

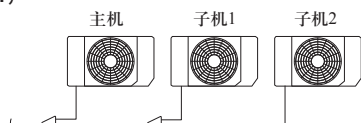


- 在直部分与室外机分流部件之间保持0.5m或以上的距离。

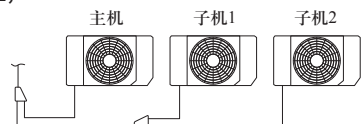
3) 有关详细信息,请参见室外机分流部件的安装说明书。

Fig. 多台机组安装示例

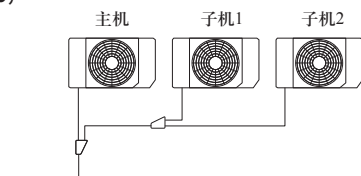
(示例1)



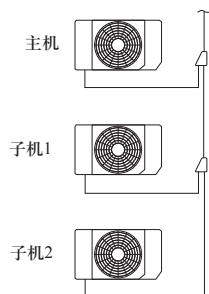
(示例2)



(示例3)



(示例4)

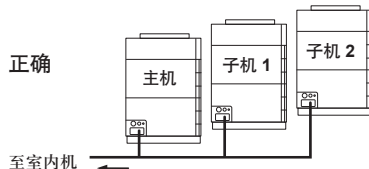
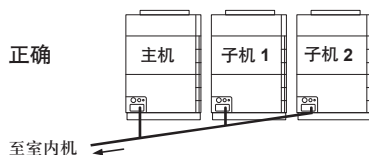
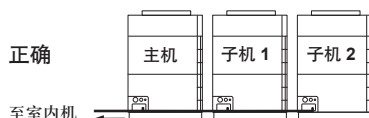


⚠ 注意

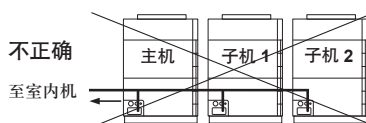
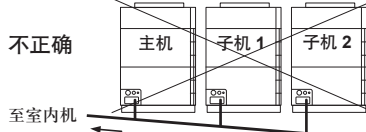
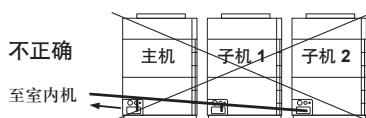
为了防止油在停止运行的机组内沉积，在室外机之间安装管道时，要使管道与室外机齐平或向上倾斜至室外机。

(1) 下面是多机组安装示例。

a) 可安装的模式

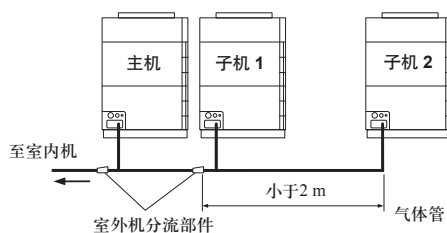


b) 不可安装的模式

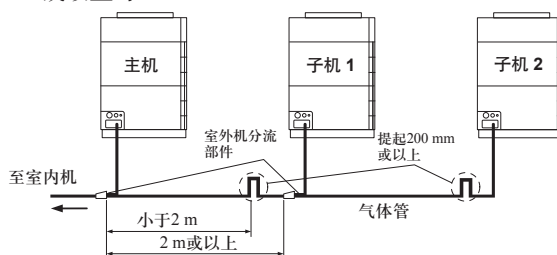


(2) 如果分流部件之间的长度和分流部件到室外机的长度超过2m,请在气体管上设置一处200mm或以上的提起。但是,即使长度超过2m,连接到主机组的管道也不需要设置提起。

a) 短于2m时



b) 2m或以上时



6. 电气接线

6.1. 电气接线的注意事项

⚠ 警告

- 必须由合格人员根据规格进行接线操作。
本产品的额定电源电压为3相4线50Hz，400V应使用342V至456V的电压。
- 连接电线之前，请确保电源是关闭的。
- 在每台室外机的电源上安装适当容量的断路器（接地泄漏断路器）。如果选择错误的断路器（接地泄漏断路器）或过渡配线，可能会导致触电、火灾等事故发生。
- 请勿将交流电源连接到信号线接线板。
不正确的接线可能损坏整个系统。
- 请依照相关的法规安装漏电断路器（接地泄漏断路器）。
- 将连接线牢固地连接在端子上。
不正确的安装可能会导致火灾。
- 务必使用线夹固定连接缆线的绝缘部分。损坏的绝缘材料可能造成短路。
- 切勿安装功率因数改进冷凝器。该冷凝器不仅不会改进功率因数，反而可能产生过热。
- 维修机组之前，请关闭电源开关。然后，在10分钟内请勿接触电气部件，因为可能有电击的危险。
- 请务必执行接地工作。不适当的接地工作可能导致电击。

⚠ 注意

- 主电源容量是用于空调机本身的，不包括其他装置的同时使用。
- 请正相连接电源线。如果负相连接电源线，机组会显示错误。如果开相连接，机组会无法正常工作。另外，请勿将N相（中相）的电缆连接（误接）到其他相。如果连线错误，可能会导致元件损坏。
- 请勿对室外机使用交叉电源接线。
- 如果电力不足，请与您的电力公司联系。
- 将断路器（接地泄漏断路器）安装在不会暴露于高温的地方。
如果断路器（接地泄漏断路器）周围的温度过高，断路器（接地泄漏断路器）切断的安培数可能会降低。
- 使用能够处理高频率的断路器（接地漏电路器）。由于室外机是受变频器控制的，因此使用高频率接地漏电断路器可以防止断路器本身发生故障。
- 如果配电盘安装在室外，请安装锁，使它不容易被接触到。
- 请勿将电源缆线和信号缆线束在一起。
- 请务必遵守信号线的长度限制。如果超过长度限制，可能会导致误动作。
- 操作控制PC板进行地址设置等操作时，人体所带的静电可能损坏控制PC板。
请注意下列几点。
提供室内机、室外机和选配设备的接地。
切断电源（断路器）。
接触室内机或室外机的金属部件（如未涂漆的控制箱部件）达10秒钟以上。放掉人体所带的静电。
切勿接触PC板上的元件终端或布线模式。

6.2. 敲开孔

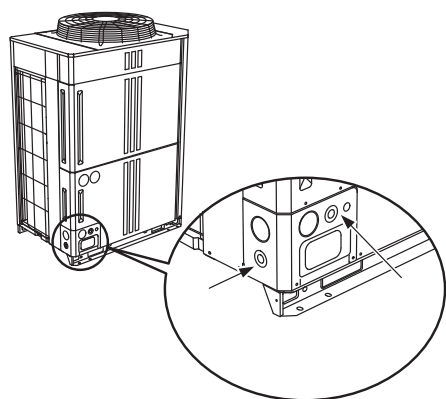
⚠ 注意

- 打开敲开孔时,请小心不要使面板变形或划伤。
- 打开敲开孔后,除去边缘毛刺,以防止切割电线。
建议在边缘涂防锈漆,以防止生锈。

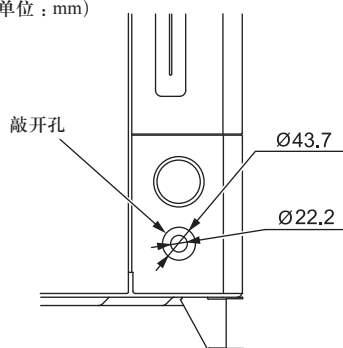
可以从前方或左侧连接电线。

(提供敲开孔,可以从两个不同方向接线。)

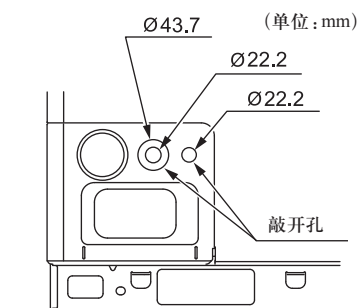
请根据需要,分别使用前方或左侧的敲开孔。



(单位 : mm)



(单位 : mm)



6.3. 选择电源线和断路器

⚠ 注意

- 电线尺寸和电路断路器的规定因地区而异，请按照当地相关法规进行选择。

有关各种安装条件下的接线和断路器规格，请参见表格。

(1) 连接1台室外机时电源线和断路器的选择

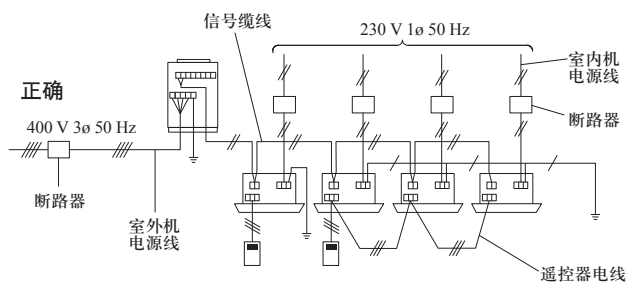
型号	断路器(延时保险丝或电路容量)		室外机电源线		
	容量(A)	漏电	电源线(mm ²)	接地线(mm ²)	临界接线长度(m)
AJ□A72LALH	30	100mA 0.1秒或以下	4	4	30
AJ□A90LALH	30		4	4	30
AJ□108LALH	50		10	6	42
AJ□126LALH	50		10	6	42
AJ□144LALH	50		10	6	42

1) 这些值为建议数据。

2) 规格：使用符合245 IEC57的电线。

3) 最大接线长度：设置长度使电压降在2%以内。接线长度较大时，请增加接线直径。

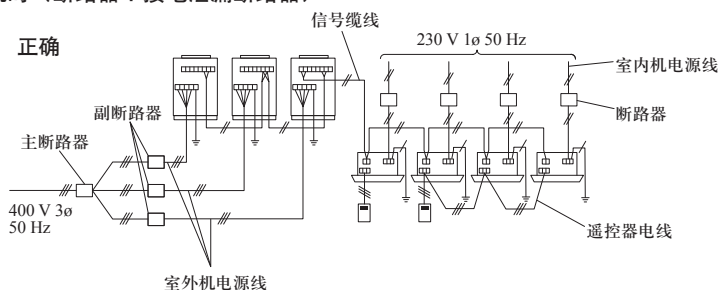
Fig. 连接室外机时（断路器：接地泄漏断路器）



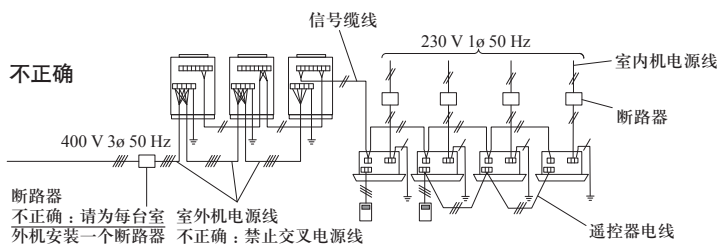
(2) 连接多台室外机时,主断路器及主电源线的选择

主断路器：主断路器 $\geq$ 总副断路器（副断路器的容量应参阅（1）项的表）

Fig. 连接3台室外机时（断路器：接地泄漏断路器）



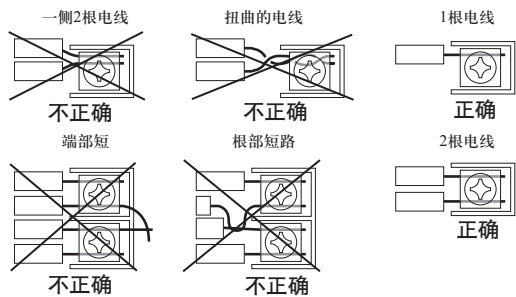
(3) 不正确的断路器连线示例



6.4. 信号线

⚠ 注意

- 连接缆线时请小心谨慎当剥去引线上的涂膜时，务必使用专用工具，例如剥线钳。如果没有必要的可用专用工具时，请使用切刀等小心地剥去涂膜，以免损坏导线。如果导线损坏，就可能造成开路和通讯故障。
- 在接线板上接线时，请注意以下几点。
 - 请勿在一侧连接2根电线。
 - 请勿扭曲电线。
 - 请勿交叉电线。
 - 请勿在电线的端部和根部短路。



6.4.1. 信号线规格

请选择符合下列规格的信号缆线。

用途	尺寸	电线类型	备注
信号缆线	0.33mm ²	22AWG LEVEL 4 (NEMA) 非极性双芯双绞实芯线，直径0.65mm	LONWORKS® 兼容缆线

6.4.2. 接线规则

(1) 信号线的总长度

总信号线长度：3600m以内

$$EF+EG+GH+HJ+HK+KL < 3600\text{m} \text{ (Fig.2)}$$

在下列情况下，需要使用信号放大器。

① 当信号线的总长度超过 500m时。

$$AB+BC+BD > 500\text{m} \text{ (Fig.1)}$$

② 机组* 总数超过64时。

③ 各机组*间的信号线长度为 $\geq 400\text{m}$

(2) 1个网段 (NS) 内的信号线长度

$$EF+EG+GH+HJ+HK \leq 500\text{m} \text{ (Fig.2)}$$

$$KL \leq 500\text{m} \text{ (Fig.2)}$$

(3) 1个制冷剂系统内的室外机间的信号线长度

$$MN \leq 18\text{m}$$

$$NP \leq 18\text{m}$$

注) 机组*指室内机、室外机、触摸面板遥控器和系统遥控器、信号放大器、单一体分转接器、网络转换器等。控制装置指LONWORKS®的触摸面板遥控器、系统遥控器和网络转换器。

请勿采用环路配线，否则可能会导致元件损坏及误动作。

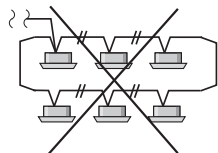


Fig.1

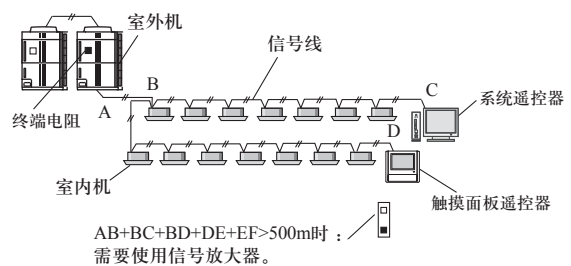
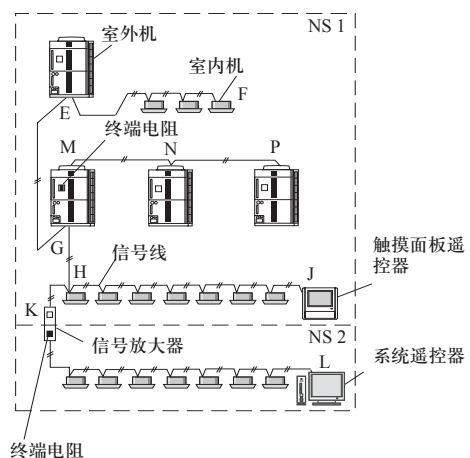
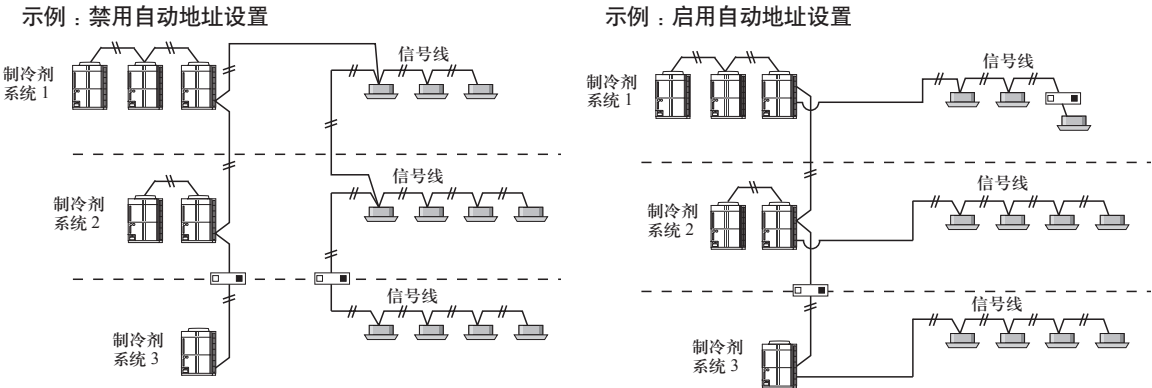


Fig.2

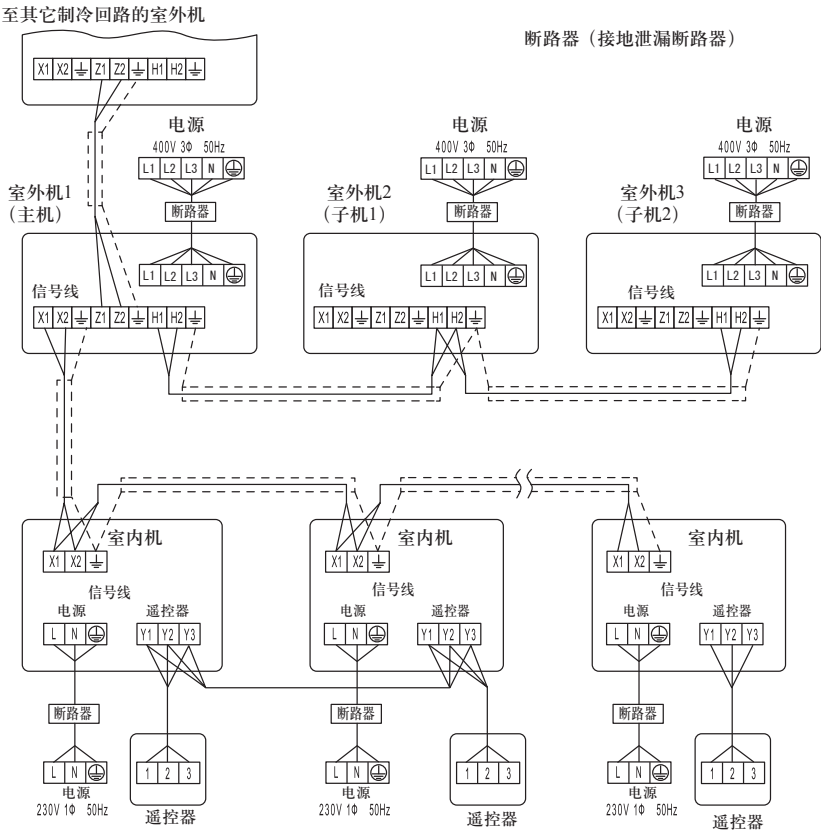


6.4.3. 室内机地址和信号放大器地址的设置

选择地址设置是自动或手动
可以自动或手动设置室内机的地址及信号放大器的地址。当自动设置室内机的地址时，请将室内机与同一制冷剂系统的室外机连接。

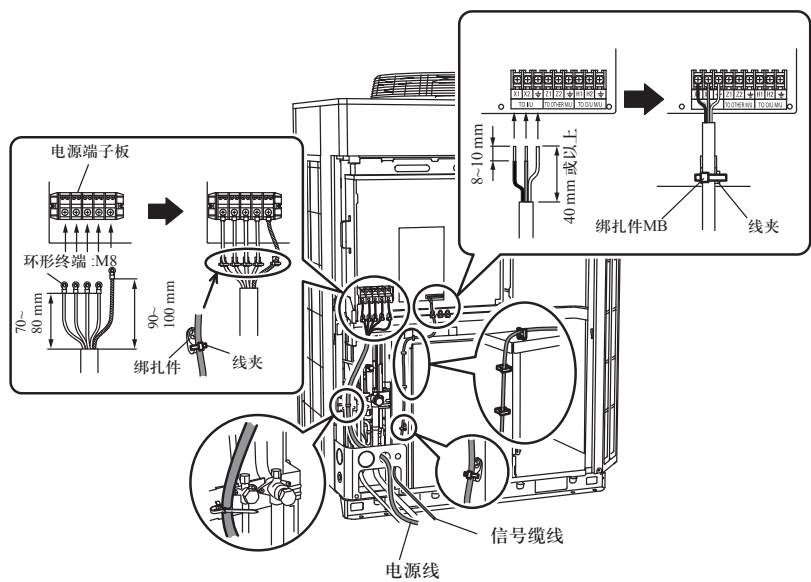


6.5. 接线方法



室外机和室内机的接线示例如图所示。
拆下电气盒盖，并按照端子铭牌将电线连接到端子上。
连接电线后，请使用电缆夹固定电线。
连接电线时，请避免张力过大。

如下图所示使用电缆夹固定。



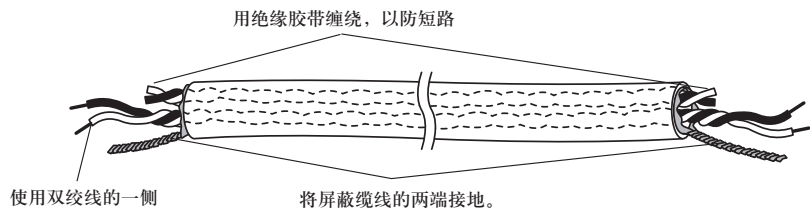
拧紧扭矩	
M3螺钉	0.5至0.6 N · m (5至6 kgf · cm)
M8螺钉	5.0至7.0 N · m (50至70 kgf · cm)

* 使用环形端子将电线连接到电源接线板。

信号线的屏蔽处理

将信号线的屏蔽线两端连接到机组的接地端子或端子附近的接地螺钉上。
注意不要过度拧紧螺钉，这样会导致电线断裂和端子损坏。

当使用由2套双绞线组成的信号线时，务必使用双绞线的一侧。



当一段网络的接线超过500m时，请务必连接信号放大器。
请参照信号放大器的使用说明书进行信号放大器的连接。

7. 现场设置

⚠ 注意

设置DIP开关前，请放掉人体所带的静电。
切勿接触安装在接线板上的部件的端子或布线模式。

7.1. 现场设置开关

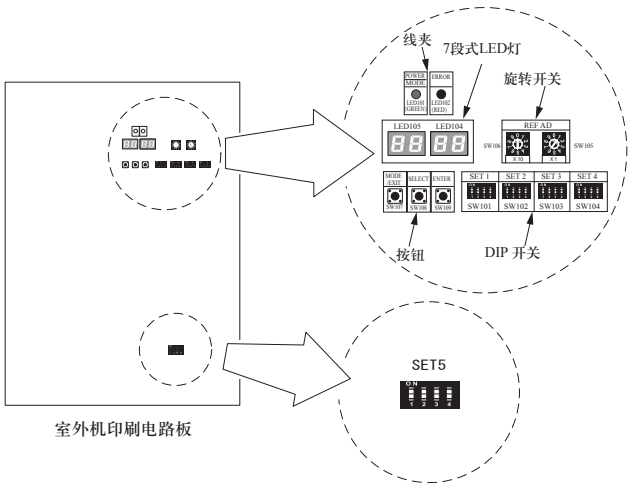
拆下室外机的前面板和电气盒盖，露出室外机的印刷电路板。
各种设置及LED显示器的印刷电路板开关如图所示。

7.2. DIP 开关设置

7.2.1. 设置列表

必须将DIP开关设置为SET3与SET5。请在打开电源前配置设置。SET1、SET2和SET4 DIP开关的设置
为出厂默认设置。请勿更改。

DIP 开关		功能
SET1	1-4	禁止
SET2	1-4	禁止
SET3	1	室外机 地址设置
	2	
	3	子机台数 设置
	4	
SET4	1-4	禁止
SET5	1-2	室外机的安装台数
	3	禁止
	4	终端电阻的设置



7.2.2. 本地配置的设置

(1) 室外机地址设置

将2台或3台室外机安装到一套制冷剂系统中时，请分别为每台室外机
设置地址。

为所有室外机设置地址。

SET3		室外机 地址	备注
1	2		
关 (OFF)	关 (OFF)	0	仅限主机 (出厂设置)
关 (OFF)	开 (ON)	1	子机1
开 (ON)	关 (OFF)	2	子机2
开 (ON)	开 (ON)	-	禁止

(2) 室外机的子机数量设置

设置连接到一套制冷剂系统的子机数量。

仅设置主机。

SET3		可连接的室外机 数量	备注
3	4		
关 (OFF)	关 (OFF)	0	仅限主机 (出厂设置)
关 (OFF)	开 (ON)	1	连接1台子机
开 (ON)	关 (OFF)	2	连接2台子机
开 (ON)	开 (ON)	-	禁止

切勿更改SET1和SET2的出厂默认设置。

SET1				室外机 型号 (HP)
1	2	3	4	
关 (OFF)	关 (OFF)	关 (OFF)	关 (OFF)	8HP型号
关 (OFF)	关 (OFF)	开 (ON)	关 (OFF)	10HP型号
关 (OFF)	开 (ON)	关 (OFF)	关 (OFF)	12HP型号
关 (OFF)	开 (ON)	开 (ON)	关 (OFF)	14HP型号
开 (ON)	关 (OFF)	关 (OFF)	关 (OFF)	16HP型号

SET2				型号类型
1	2	3	4	
关 (OFF)	关 (OFF)	关 (OFF)	关 (OFF)	空调/ 加热器固定型

(3) 室外机的安装台数

必须安装1个制冷剂系统内设置的室外机的台数。
设置为所有的室外机。

SET5		室外机台数	备注
1	2		
关 (OFF)	关 (OFF)	1	(出厂设置)
关 (OFF)	开 (ON)	2	-
开 (ON)	关 (OFF)	3	-
开 (ON)	开 (ON)	-	禁止

7.2.3. 终端电阻设置

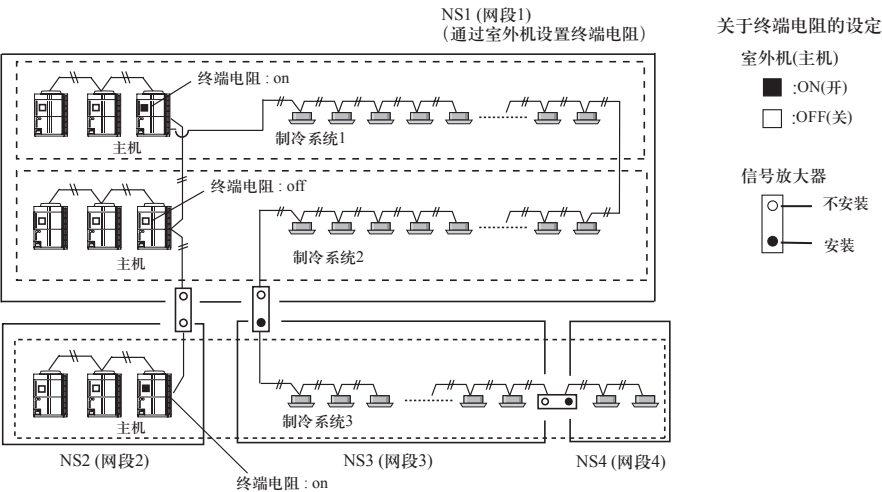
⚠ 注意
务必按规定安装终端电阻。 请对每个网段（NS）分别设置终端电阻。
如果在多台装置上安装终端电阻，整个信号系统可能损坏。 如果装置上没有设置终端电阻，则可能发生信号故障。

- 必须在一个网段中安装一个终端电阻。可以在室外机或信号放大器上安装终端电阻
- 安装信号放大器时，请参阅信号放大器随附的安装说明书。
- 安装多个终端电阻时，请注意下列项目。
 - ①1一个VRF系统中有多少个网段？
 - ②1在网段内的哪个位置安装终端电阻。（1个网段内的条件：室外机、室内机、信号放大器总计低于64台，或信号线的总计长度在500m以内）
 - ③1在1个制冷剂系统内连接了多少台室外机。

请根据①-③的条件，如下表所示，进行室外机的终端电阻设置（DIP开关（SET5））。

SET5	终端电阻	备注
4		
关 (OFF)	不设置	(出厂设置)
开 (ON)	设置	-

图：终端电阻设置示例



7.3. 旋转开关设置

旋转开关 (REF•AD) 是用于设置室外机的制冷剂回路地址。仅在1个制冷剂系统的主机上设置。
连接多个制冷剂系统时, 请按下表设置旋转开关 (REF AD)。

制冷剂回路地址	旋转开关设置	
	REF AD	
	×10	×1
0	0	0
1	0	1
2	0	2
3	0	3
4	0	4
5	0	5
•	•	•
•	•	•
•	•	•
•	•	•
97	9	7
98	9	8
99	9	9

设置	设置范围	开关类型	
制冷剂回路地址	0-99	设置示例 63	 
			REF AD × 10 REF AD × 1

旋转开关 (REF AD×1): 出厂设置 "0"
旋转开关 (REF AD×10): 出厂设置 "0"

7.4. 按钮开关设置

可以设置各种功能。根据需要进行设置。
将所有的室内机停止后, 再进行此设置。

可以设置的项目, 请参阅Table.A。

Table.A : 设置列表

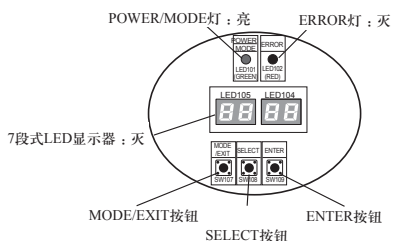
否	设置项目		7段式LED		出厂默认	内容
			前2位数字	后2位数字		
0	管道长度设置	标准管道 (40-65m)	0	0	0	可使用该项调整由连接管道长度引起的制冷循环损失。 根据连接管道的长度进行设置。 仅设置主机的该项。 *管道长度为管道线上室外机与室内机之间的最近距离。
		短管 (40m以内)		0	1	
		长管1 (65-90m)		0	2	
		长管2 (90-120m)		0	3	
		长管3 (120-151m)		0	4	
10	压缩机顺序启动切换	无切换	1	0	0	配置多个制冷剂系统后, 可使用该项延迟每个制冷剂系统的室外机启动时间。 当多个制冷剂系统同时启动时, 也可以限制启动电流。 仅设置主机的该项。
		切换1 (21秒)		0	1	
		切换2 (42秒)		0	2	
		切换3 (63秒)		0	3	
11	制冷容量切换	标准	1	1	0	必要时设置该项。
		节能模式		0	1	
		高功率模式1		0	2	
		高功率模式2		0	3	
12	制热容量切换	标准	1	2	0	必要时设置该项。
		节能模式		0	1	
		高功率模式1		0	2	
		高功率模式2		0	3	
13	(禁用设置)		1	3	0	(出厂默认)
20	紧急停止/强制停止开关	强制停止	2	0	0	当外部输入端子“CN134”收到停止信号时, 可使用该项停止同一制冷剂系统的室外/室内机。 • 强制停止: 使用遥控器恢复运行。 • 紧急停止: 解除紧急停止后, 可以使用遥控器等开始运转。 仅设置主机的该项。
		紧急停止		0	1	

21	优先模式设置	先按优先	2	1	0	0	O	可使用该项设置制冷循环运行模式下的优先项目。 • 先按优先：首先配置的运行模式将会给予优先权。 • 室外机外部输入优先：通过外部输入端子“CN132”配置的运行模式将会给予优先权。 • 管理室内机优先：使用有线遥控器配置的“管理室内机”运行模式将会给予优先权。 仅设置主机的该项。
		室外机外部输入优先			0	1		
		管理室内机优先			0	2		
22	下雪对应模式设置	正常操作	2	2	0	0	O	室外机被雪覆盖时，可使用该项定期运转室外机风扇，以防止设备被禁用。 仅设置主机的该项。
		下雪对应模式			0	1		
23	下雪对应运转间隔设置	标准（30分钟）	2	3	0	0	O	选择“下雪对应模式”时，可使用该项配置室外机风扇运转的间隔时间。 仅设置主机的该项。
		短时1（5分钟）			0	1		
		短时2（10分钟）			0	2		
		短时3（20分钟）			0	3		
24	高静压模式设置	标准	2	4	0	0	O	在下列条件下设置高静压模式。 高静压模式1： 安装风管时，该风管到主机的长度为150mm或以内，并且送风气流的出气口上没有其它障碍物（30Pa或以内）。 高静压模式2： 安装风管时，该风管到主机的长度为150mm或以上或者送风气流的出气口上有其它障碍物（80Pa或以内）。 请参见“3.3.3. 产品上方有障碍物时”，来进行高静压模式的设置。 设置主机和子机的该项。
		高静压模式1			0	1		
		高静压模式2			0	2		
25	(禁用设置)		2	5	0	0	O	(出厂默认)
26	(禁用设置)		2	6	0	0	O	(出厂默认)
27	(禁用设置)		2	7	0	0	O	(出厂默认)
28	(禁用设置)		2	8	0	0	O	(出厂默认)
29	(禁用设置)		2	9	0	0	O	(出厂默认)
30	节能等级	级别1（停止运行）	3	0	0	0	O	当外部输入端子“CN133”收到“节能峰值切断”信号时，可使用该项限制标定的系统容量或停止运行。 仅设置主机的该项。
		等级2（限制在40%）			0	1		
		等级3（限制在60%）			0	2		
		等级4（限制在80%）			0	3		
40	低噪音运行时的容量优先设置	低噪音优先	4	0	0	0	O	当选择“容量优先”时，如果低噪音运行下的制冷/制热容量不足，将会暂时取消低噪音运行模式。 （一旦取消不足的容量，机组将恢复低噪音运行模式） 仅设置主机的该项。
		容量优先			0	1		
41	低噪音运行设置	正常操作	4	1	0	0	O	选择“低噪音运行开启”时，运行噪音将被抑制。 仅设置主机的该项。
		低噪音运行	4	1	0	1		
42	低噪音运行等级设置	等级1（55dB）	4	2	0	0	O	机组在低噪音运行模式下运行时，可使用该项配置噪音等级。 仅设置主机的该项。
		等级2（50dB）	4	2	0	1		
70	(禁用设置)		7	0	0	0	O	(出厂默认)
90	(禁用设置)		9	0	0	0	O	(出厂默认)

(1) 打开室外机的电源进入待机模式。

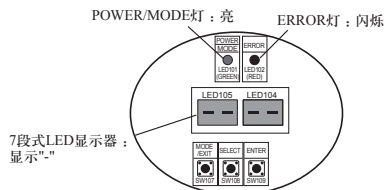
• 系统正常时

POWER/MODE灯亮起。（ERROR灯熄灭。）

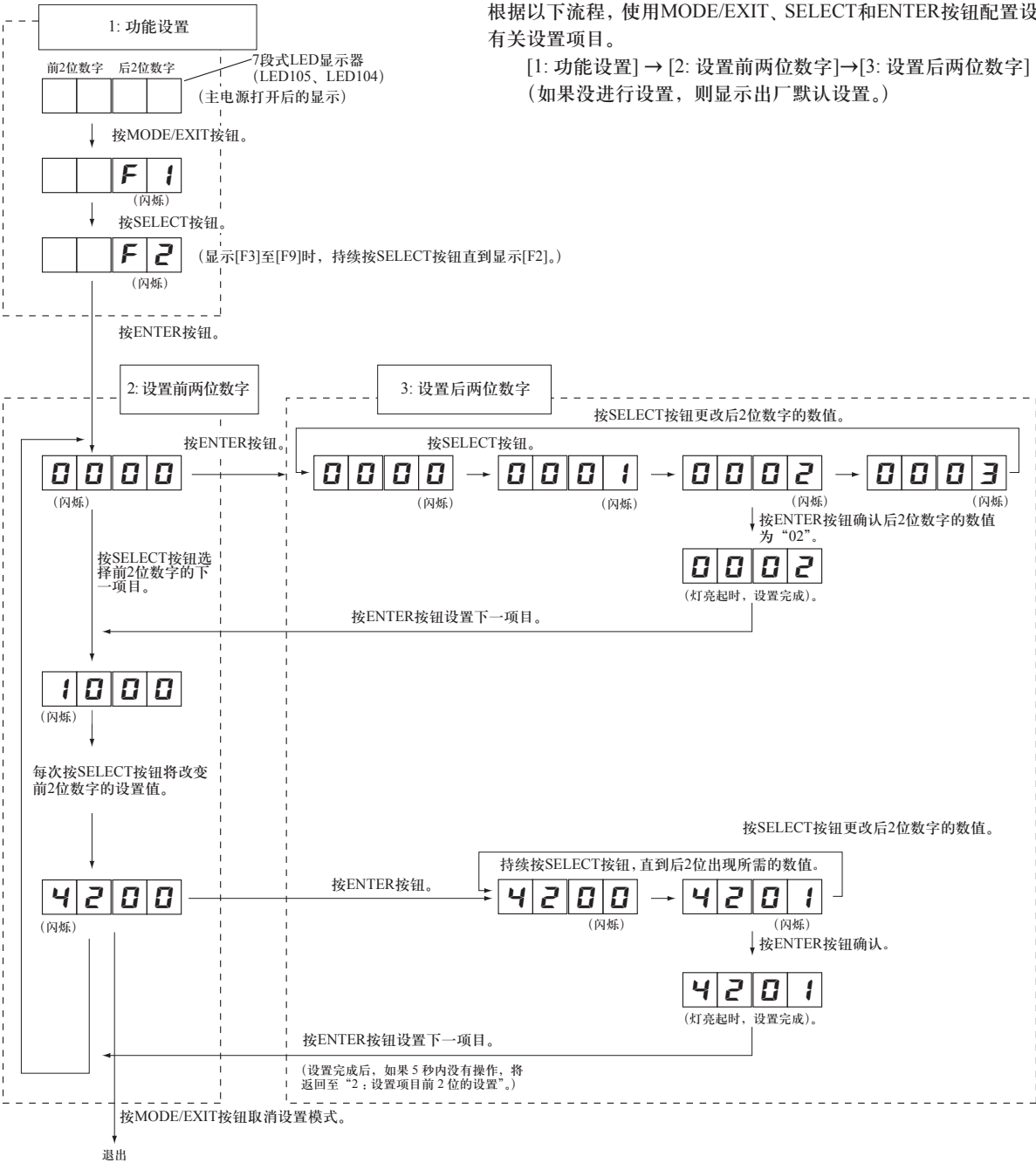


• 系统异常时

室外机地址（DIP开关SET3-1,2）或连接子机数量（DIP开关SET3-3, 4）设置有故障时，请检查设置。



(2) 设置方法



7.5. 信号放大器的地址设置

7.5.1. 信号放大器的地址设置

使用信号放大器时,必须设置信号放大器的地址。信号放大器的地址设置可以通过在网络上的1台室外机(主机)上操作,自动予以设置。关于连接示例,请参阅下项“Fig. 自动地址设置的配线连接示例”。(手动设置地址时,请参阅信号放大器的安装说明书。)

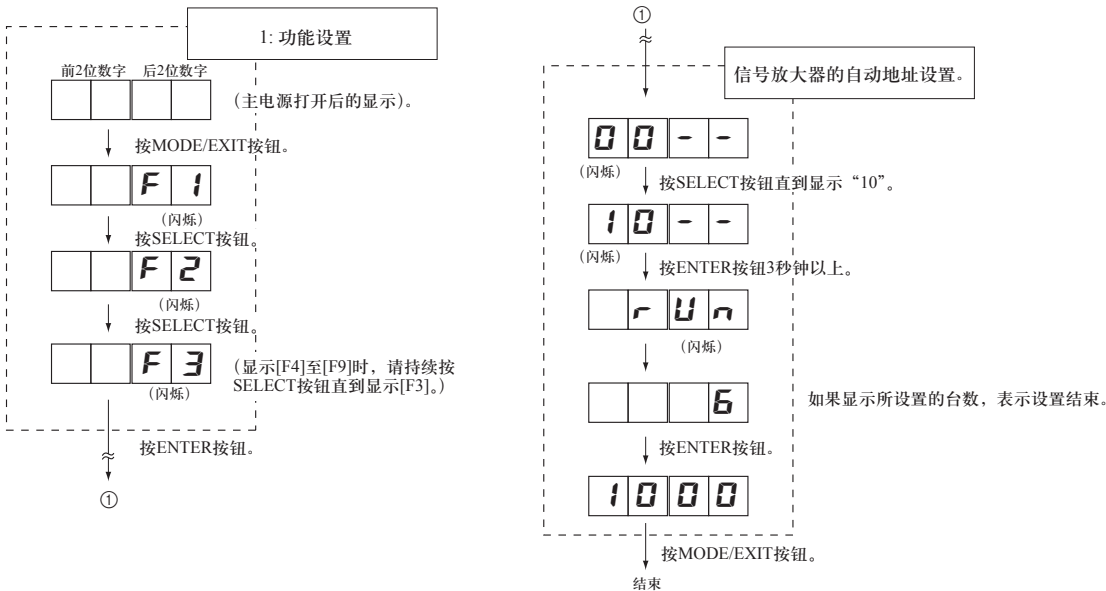
7.5.2. 信号放大器的自动地址设置

信号放大器的地址,请采用产品出厂时的设定。(参阅信号放大器的安装说明书)

系统正常时,7段式LED显示器上将没有显示。

显示ERROR时,请检查机组。

根据以下流程,使用室外机印刷电路板上的MODE/EXIT、SELECT和ENTER按钮来配置设置。



7.6. 室内机的地址设置

7.6.1. 室内机的地址设置。

室内机必须进行地址设置。

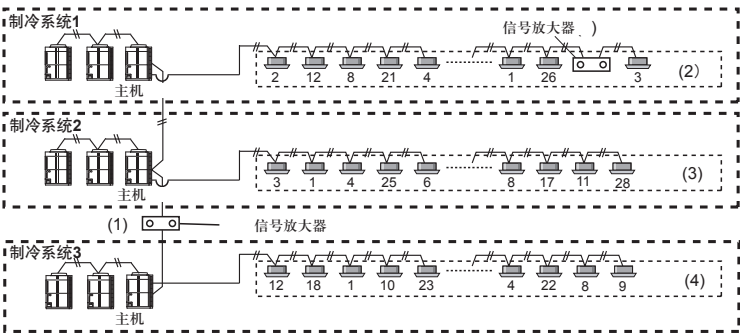
- 手动设置时 →
- 使用室内机内部的开关进行设置时,请参阅室内机的安装说明书予以设置。
- 自动设置时 →
- 使用遥控器进行设置时,请参阅遥控器的安装说明书予以设置。
 - 请确认配线连接如下图所示。在各个制冷剂系统的室外机主机上操作。

Fig. 自动地址设置的配线连接示例

(1) 信号放大器的连接示例

(2)(3)(4) 室内机的连接示例

(请按照下图,连接同一制冷剂系统中的室外机与室内机。)



注) • 自动地址功能最多可用于安装在同一制冷剂系统中的48台室内机。网络连接到其它制冷剂系统时,无法使用自动地址功能。
• 采用自动地址设置时,将不会按照所安装的顺序为室内机分配地址。(地址的确认步骤,请参阅室内机的安装说明书。)

7.6.2. 室内机的自动地址设置步骤

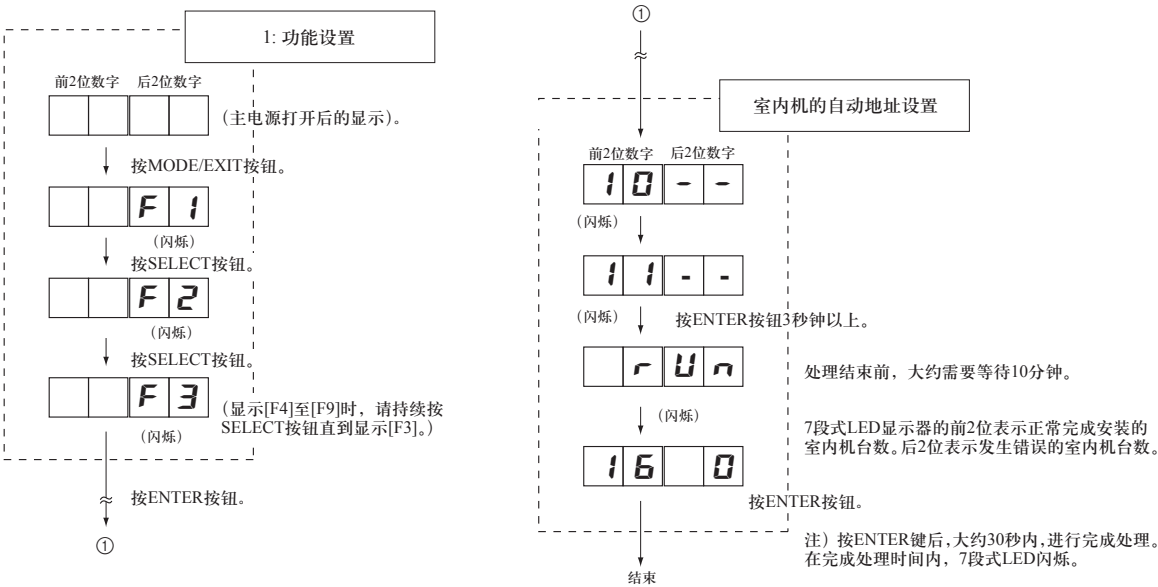
请确认室内机基板上的旋转开关“IU AD”设定为“00”。当设定为“00”以外的值时,该设备无法设置地址。(出厂时设定为“00”)。

打开室内机和室外机的电源。

系统正常时,7段式LED显示器上将没有显示。

显示ERROR时,请检查机组。

根据以下流程,使用室外机印刷电路板上的MODE/EXIT、SELECT和ENTER按钮来配置设置。



7.7. 信号线的电阻测量 (测量时关闭断路器)

⚠ 注意

如果信号线的端子间电阻异常, 请勿接通电源。否则可能会导致电路板损坏。

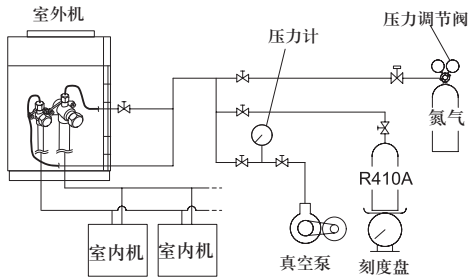
- 请测量信号线2个端子间的电阻。
- (1) 连接室外机与室内机以及信号放大器的信号线到安装了终端电阻的设备 (室内机、室外机以及信号放大器) 的距离不同时, 请测量其端子的电阻。根据所安装的设备及距信号放大器的距离不同, 终端电阻如表中值所示。另外, 这些值为近似值。
- (2) 连接同一制冷剂系统内的室外机之间的信号线信号线端子间电阻为 45 ~ 60Ω。另外, 这些值为近似值。

		到终端电阻的距离 (m)				
		0 ~100	~ 200	~ 300	~400	~500
近似电阻 (Ω)	0 ~ 50	某处出现短路, 或连接了2个或多个终端电阻				
	50					
	60					
	70					
	80					
	90					
	100					
	110					
	120					
	130					
	140					
	150					
	160					
	170					
	180					
	190 ~	错误接触, 或接线长度超过500m				
	1K ~ ∞	错误接触、开路或没有终端电阻				

8. 管道安装 II

Fig. 连接系统

A) 连接1台室外机时



B) 连接多台室外机时

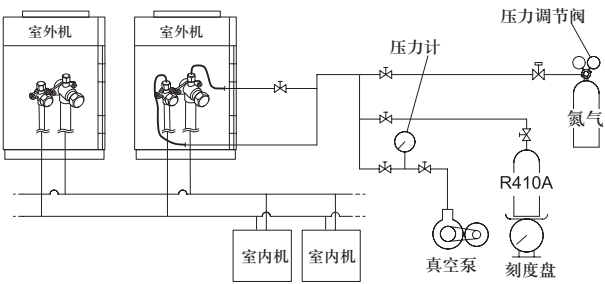


Fig. B

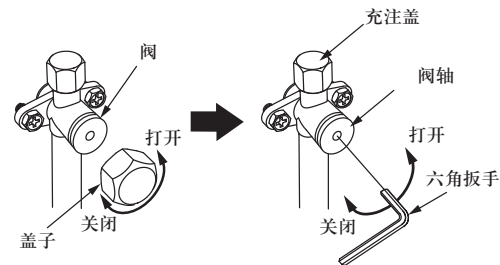


Table. A

管道	阀轴	盖子	充注盖
液体阀	9.0至12.0 N·m (90至120 kgf·cm)	20.0至24.0 N·m (200至240 kgf·cm)	12.5至16.0 N·m (125至160 kgf·cm)
气体阀	27.0至33.0 N·m (270至330 kgf·cm)	25.0至30.0 N·m (250至300 kgf·cm)	12.5至16.0 N·m (125至160 kgf·cm)

8.1. 密封测试

⚠ 注意

- 密封测试过程中请勿震动。
这可能使管道破裂，并造成严重伤害。
- 完成所有操作前，请勿接通电源。
- 在完成密封测试和充注制冷剂气体前，请勿阻挡墙壁和顶篷。

连接管道之后，请执行密封测试。

执行密封测试之前，请再次检查以确保三通阀的阀轴已关闭。(Fig. B)

通过液体管和气体管灌注氮气。

将氮气加压到4.2MPa，以执行密封测试。

检查所有扩口连接区域和焊接区域。

然后，检查压力是否没有下降。

加压后对压力进行比较，将压力保持24小时，然后检查压力是否没有下降。

* 室外温度变化5℃时，测试压力将变化0.05MPa。如果压力下降，管接头可能泄漏了。

如果发现泄漏，请立即修理，并重新执行密封测试。

* 焊接前请降低氮气的压力

完成密封测试后，请同时从两个阀释放氮气。

请缓慢地释放氮气。

8.2. 抽真空工作

⚠ 注意

- 完成所有操作前，请勿接通电源。
- 如果系统没有充分地抽真空，其性能就会下降。

抽真空步骤

- 1) 拆卸气体管和液体管的盖子,检查以确保阀是关闭的。
- 2) 拆卸充注盖。
- 3) 将真空泵和压力计连接到充注软管,并将充注软管连接到充注接口。
- 4) 启动真空泵并对室内机和连接管抽真空,直到压力计变为-76 cmHg。
气体管和液体管都要抽真空。
- 5) 压力计读数为-76 cmHg后,请继续对系统抽真空1小时。
- 6) 拆卸充注软管,并重新安装充注盖。

8.3. 追加充注

⚠ 注意

- 完成所有操作前，请勿接通电源。
- 系统进行抽真空后，请添加制冷剂。
- 请勿使用除R410A之外的其它制冷剂充注系统。
- 请务必遵守制冷剂总量的限制。如果制冷剂充填量超过制冷剂总量的限制，可能会导致故障。
- 请勿再次使用回收的制冷剂。
- 请使用电子刻度盘测量制冷剂的充注量。添加的制冷剂超过规定的量会造成故障。
- 使用液体管充注制冷剂。通过气体管添加制冷剂会造成故障。
- 添加制冷剂时，请用液体状态的制冷剂充注系统。如果制冷剂钢瓶上装有虹吸管，则不必竖立放置钢瓶。

8.3.1. 向系统充注制冷剂的程序

- 1) 从液体管上拆下充注盖。
- 2) 将充注软管连接到制冷剂钢瓶,并将它连接到充注接口。
- 3) 添加制冷剂时,根据下面显示的计算公式计算追加的制冷剂量。
- 4) 拆卸充注软管,并安装充注盖。
- 5) 拆卸机身盖(气体管、液体管和油管{如果安装了多台机组}),并打开阀。
- 6) 关闭机身盖。
- 7) 添加制冷剂后,请在机组上标出添加的充注量。

* 将机身盖和充注盖拧紧到表A中规定的扭矩值。
若要打开和关闭阀，对于液体管和油管，
请使用M4六角扳手。
对于气体管，请使用M10六角扳手。

8.3.2. 检查制冷剂总量,并计算追加制冷剂充注量

- 要添加的制冷剂充注量是基本制冷剂充注量和根据液体管长度计算出的值的总和。
- 结果计算到小数点后2位。

<计算>

- 1套系统中有3台室外机连接时 (AJ□144LALH, AJ□126LALH, AJ□108LALH)

(1) 1 室外机的追加充注量计算

$$A=3.30 \text{ (kg)} + 3.30 \text{ (kg)} + 1.20 \text{ (kg)} = 7.80 \text{ (kg)}$$

(2) 管道长度的追加充注量计算

如果液体管的管道长度如下：

φ 19.05 : 50m, φ 15.88 : 25m, φ 12.70 : 0m, φ 9.53 : 20m, φ 6.53 : 15m

$$\begin{aligned} \text{追加充注量 } B = & 50 \text{ (m)} \times 0.268 \text{ (kg/m)} + 25 \text{ (m)} \times 0.178 \text{ (kg/m)} + 0 \text{ (m)} \times 0.114 \text{ (kg/m)} \\ & + 20 \text{ (m)} \times 0.058 \text{ (kg/m)} + 15 \text{ (m)} \times 0.021 \text{ (kg/m)} = 19.325 \text{ kg} \end{aligned}$$

(3) 追加充注制冷剂的计算

$$C=A+B=7.80 \text{ (kg)} + 19.33 \text{ (kg)} = 27.13 \text{ (kg)}$$

(4) 出厂充注量计算

$$D=11.8 \text{ (kg)} + 11.8 \text{ (kg)} + 11.8 \text{ (kg)} = 35.4 \text{ (kg)}$$

(5) 检查制冷剂总量

1套系统中有3台室外机连接时，必须达到下列条件。

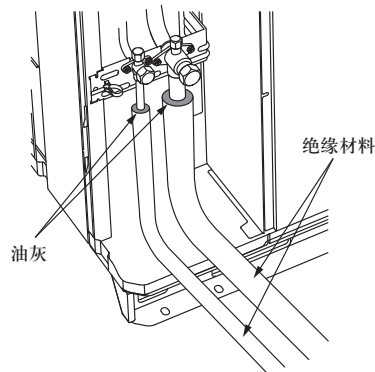
条件: $E=C+D \leq 94.5 \text{ (kg)}$

计算: $27.13 \text{ (kg)} + 35.4 \text{ (kg)} = 62.53 \text{ (kg)} < 94.5 \text{ (kg)}$

→满足上述条件则没有问题。

8. 4. 安装绝缘材料

- 执行“8.1 密封测试”后，请安装绝缘材料。
 - 在制冷剂管道上安装绝缘材料，以防止冷凝和滴水。
 - 请参见表以确定绝缘材料的厚度。
 - 如果将室外机安装在高于室内机的地方，凝结在室外机3通阀中的水就会流到室内机内。
- 因此，请在管道和绝缘材料之间的间隔内使用油灰，以防止水的进入。



绝缘材料的选择（针对使用热传导率等于或低于**0.040W/(m·k)**的绝缘材料）

		绝缘材料			
		最小厚度 (mm)			
相对湿度		≤ 70%	≤ 75%	≤ 80%	≤ 85%
管道直径 (mm)	6.35	8	10	13	17
	9.52	9	11	14	18
	12.70	10	12	15	19
	15.88	10	12	16	20
	19.05	10	13	16	21
	22.22	11	13	17	22
	28.58	11	14	18	23
	34.92	11	14	18	24
	41.27	12	15	19	25

* 当环境温度和相对湿度超过32℃时，请加厚制冷剂管的热绝缘材料。

9. 试运转

9.1. 试运转前检查项目

进行试运转前，请参考图并检查下列项目。

- ①1有气体泄漏吗？（管连接处{法兰连接和铜焊区域}）
- ②1系统充注了规定量的制冷剂了吗？
- ③1制冷剂回路地址正确吗？
- ④1在每台室外机的电源线上都安装了断路器吗？
- ⑤1连接到端子上的电线没有松动并且符合规格吗？
- ⑥1是否通过室外机的各开关，进行了适当的初始设置？
- ⑦1打开了室外机的3通阀吗？（气体管和液体管）
- ⑧1供应给曲轴箱加热器的电源至少有12小时了吗？



检查以确保上述各项都没有问题后，请参见“9.2 试运转方法”进行机组试运转。

如果有问题，请立即调整，并重新检查。

9.2. 试运转方法

请务必在室外机停止运转的状态下，进行试运转设置的操作。

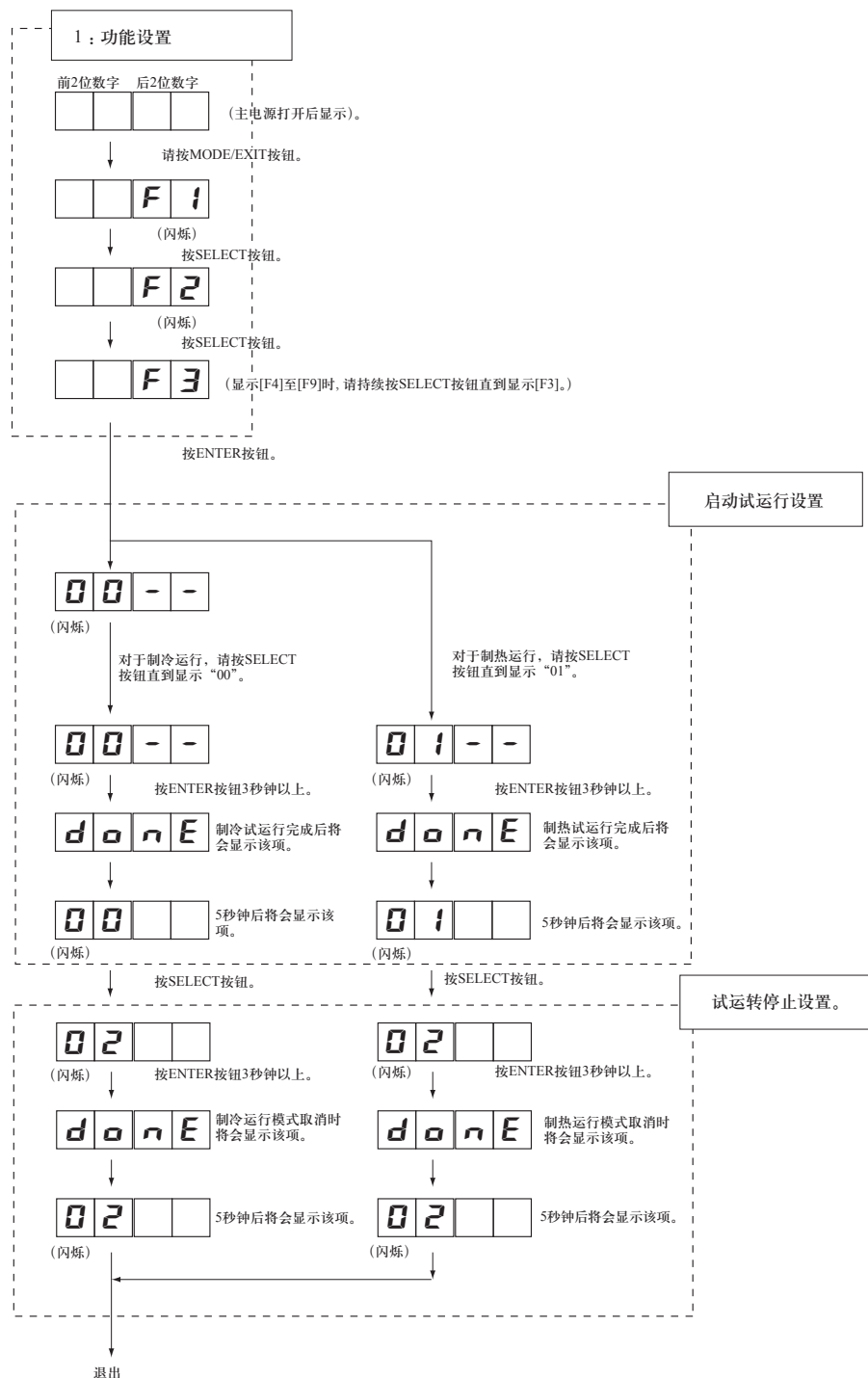
- 根据室内机与室外机之间的通讯状态，试运转设置完成后，系统开始运转可能要花几分钟的时间。
- 试运转设置完成后，所有室外机和所连接的室内机都将开始运转。试运转期间（持续运转）室温控制器不启动。

为每个制冷剂系统执行试运转。

可以使用室外机印刷电路板上的按钮开关设置“制冷试运转”或“制热试运转”。

试运转设置方法

根据以下流程，使用室内机印刷电路板上的MODE/EXIT、SELECT和ENTER按钮来配置设置。



试运行完成后, 关闭电源。安装电气盒盖和室外机的前面板。

注意

- 请检查连接到同一制冷剂系统的室内机和室外机运转是否正常。
- 如果室内机或室外机不运转, 或其它制冷剂系统的室内机和室外机运转, 连接子机数的室内机/室外机地址或DIP开关配置不正确。
- 如果DIP开关设置不正确, 系统将无法正常运转。
请立即停止系统, 重新检查DIP开关设置。

9.3. 检验表

	检查描述	检查方法	标准
1	高压值和低压值正常。	使用压力计检查。	制冷：低压约0.8MPa 制热：高压约3.0MPa
2	通过排水软管顺利将排水排出。	通过灌水检查。	—
3	室内机和室外机风扇正在运转。	进行目视检查。	—
4	压缩机在室内机运转后运转。	检查运转声音。	—
5	进风和出风温差正常。	测量进风和出风温度。	温差为10度
6	没有显示故障	检查7段式LED显示器	故障闪烁或无故障代码显示

10. LED 显示器

可以通过LED指示灯的点亮和闪烁情况确定运转情况。

根据下表检查情况。

10.1. 正常运转模式

模式	代码	说明
运转	C L	制冷
	H t	制热
	o r	油回收运转中
	d F	除霜运转中
	P C	节能运转中
	L n	低噪音运转中
	S n	下雪模式设置中

10.2. 故障显示模式

模式	代码	说明	模式	代码	说明
通讯故障	E 1 2. 1	有线遥控器通讯故障	室外机执行机构故障	E 9 2. 1	压缩机2故障
	E 1 2. 2	有线遥控器信号故障		E 9 2. 2	压缩机2过电流故障
	E 1 3. 1	室外机间通讯故障		E 9 3. 1	变频压缩机启动故障
	E 1 4. 1	室外机网络通讯1故障		E 9 4. 1	跳闸检测
	E 1 4. 2	室外机网络通讯2故障		E 9 5. 5	压缩机马达同步丧失
	E 1 4. 3	室内机网络通讯故障		E 9 7. 1	室外机风扇马达锁定故障
	E 1 4. 4	周边设备网络通讯故障		E 9 7. 4	室外机风扇马达电压不足
	E 1 5. 1	初始设置扫描故障		E 9 7. 5	室外机风扇马达
	E 1 5. 2	室内机数量过多（超过400台）		E 9 9. 1	4通阀故障
	E 1 5. 3	室外机数量过多（超过100台）		E 9 U. 1	室外机故障
	E 1 5. 4	数据获取故障		E 9 U. 2	子机故障
	E 1 5. 5	设置范围故障	制冷剂系统异常	E A 1. 1	排气温度1异常
	E 1 6. 1	信号PCB连接故障		E A 2. 1	排气温度2异常
	E 1 6. 2	转接器/转换器连接故障		E A 3. 1	压缩机1温度异常
	E 1 6. 3	局域网通讯故障		E A 3. 2	压缩机2温度异常
功能设置故障	E 2 1. 1	初始设置故障		E A 4. 1	高压异常
	E 2 6. 1	重复地址故障		E A 4. 2	高压保护1
	E 2 6. 2	制冷剂回路地址设置故障		E A 4. 3	高压保护2
	E 2 6. 3	节点地址设置故障		E A 5. 1	低压异常
	E 2 7. 1	主机、子机设置故障		E A A. 2	抽真空故障
	E 2 8. 1	自动地址设置故障		E A C. 4	散热器温度异常
	E 2 8. 2	节点设置故障	周边设备PCB/元件故障	E C 1. 1	主PCB故障
	E 2 8. 3	手动存储2故障		E C 2. 1	信号PCB故障
室内机PCB/开关故障	E 2 8. 4	信号放大器自动地址故障		E C 3. 1	PCB1故障
	E 3 1. 3	室内机电源频率异常		E C 4. 1	PCB2故障
	E 3 2. 1	室内机PCB机型信息故障		E C 5. 1	PCB3故障
	E 3 2. 3	室内机EEPROM访问故障		E C 6. 1	PCB4故障
	E 3 5. 1	手动·自动开关故障		E C 7. 1	PCB5故障
	E 3 7. 1	室内机信号PCB并行通讯故障		E C 8. 1	输入设备故障
	E 3 8. 1	网络转换器PCB故障1		E C 9. 1	显示设备故障
	E 3 8. 2	网络转换器PCB故障2		E C A. 1	EEPROM故障
	E 3 8. 3	网络转换器PCB故障3		E C C. 1	传感器故障

室内机传感器故障	E	4	1.	1	室温传感器故障	周边设备PCB/元件故障	E	C	J.	1	其它部分故障
	E	4	2.	1	室内机制热 如：进口温度传感器故障		E	F	1.	1	数据库访问故障
	E	4	2.	2	室内机制热 如：中温传感器故障		E	F	1.	2	数据库连接故障
	E	4	2.	3	室内机制热 如：出口温度传感器故障		E	F	1.	3	软件重启故障
室内机执行机构故障	E	5	1.	2	室内机风扇马达故障	系统工具故障	E	F	1.	4	程序运行时间故障
	E	5	3.	1	排水泵故障		E	F	1.	5	特殊操作故障
	E	5	U.	1	室内机故障		E	F	2.	1	通讯转接器连接故障
	E	6	1.	5	室外机反相、漏相接线故障		E	F	2.	2	通讯故障（无数据）
室外机PCB/电气元件/开关故障	E	6	2.	2	室外机PCB微机通讯故障		E	F	2.	3	外部输入功率计故障
	E	6	2.	3	室外机EEPROM访问故障		E	F	3.	1	进程间通讯故障
	E	6	2.	6	变频器通讯故障		E	F	3.	2	带暗码插头故障（包括WIBU暗码故障）
	E	6	3.	1	变频器故障		E	F	3.	3	服务器/客户机通讯故障
	E	6	7.	2	变频器PCB短时中断检测		E	F	4.	1	硬盘驱动能力故障
	E	6	8.	1	电磁继电器故障		E	F	4.	2	系统要求故障
	E	6	8.	2	冲击电流限制电阻温度上升保护		E	F	4.	3	时间故障
	E	6	9.	1	室外机信号PCB并行通讯故障						
	E	7	1.	1	排气温度传感器1故障						
	E	7	1.	2	排气温度传感器2故障						
室外机传感器故障	E	7	2.	1	压缩机温度传感器1故障						
	E	7	2.	2	压缩机温度传感器2故障						
	E	7	3.	3	室外机制热 如：液体温度传感器故障						
	E	7	4.	1	室外温度传感器故障						
	E	7	5.	1	吸入气体温度传感器故障						
	E	7	7.	1	散热器温度传感器故障						
	E	8	2.	1	过冷制热 如：气体进口温度传感器故障						
	E	8	2.	2	过冷制热 如：气体出口温度传感器故障						
	E	8	3.	1	液体管温度传感器1故障						
	E	8	3.	2	液体管温度传感器2故障						
	E	8	4.	1	电流传感器故障						
	E	8	6.	1	排气压力传感器故障						
	E	8	6.	3	进气压力传感器故障						
	E	8	6.	4	高压开关1故障						
	E	8	6.	5	高压开关2故障						

LED lamp :

A: **A**, C: **C**, E: **E**, F: **F**, H: **H**, J: **J**, L: **L**, 1: **1**, 2: **2**, 3: **3**, 4: **4**, 5: **5**
6: **6**, 7: **7**, d: **d**, n: **n**, o: **o**, r: **r**, t: **t**, S: **S**, P: **P**, U: **U**, 8: **8**, 9: **9**

11. 信息

标签的主要内容

项目	详细信息
1. 型号名称	型号名称
2. 出厂编号	出厂编号
3. 电气特性	相、额定电压、频率
4. 重量	产品重量
5. 容量	制冷/制热环境下的制冷/制热容量（参见项目15）
6. 电流	制冷/制热环境下制冷/制热运转期间的电流（参见项目15）
7. 输入功率	制冷/制热环境下制冷/制热运转期间的输入（参见项目15）
8. 最大电流	最大电流（温度环境为最大制冷环境[参见项目16]）
9. 空气循环	空气循环
10. 噪音水平	噪音水平
11. 制冷剂	制冷剂类型和初始充注量
12. 最大压力（HP/LP）	指高压侧/低压侧的压力
13. 保护	防尘防水保护等级
14. 工作温度	工作温度
15. 制冷/制热环境	标准制冷/制热环境下的干球温度和湿球温度
16. 最大制冷环境	最大电流及输入时的干球温度和湿球温度
17. 制造年份	制造年份
18. 原产地	原产国家
19. 制造商	制造商 富士通将军有限公司 地址：日本川崎市高津区末长1116番地 213-8502

