

MITSUBISHI ELECTRIC CITY MULTI

Air-Conditioners For Building Application

OUTDOOR UNIT

PUHY-TM

PUY-TM

FOR INSTALLER

INSTALLATION MANUAL

For safe and correct use, please read this installation manual thoroughly before installing the air-conditioner unit.

* Remote controller (PAR-F25MA) is available as an optional remote controller.

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1. Safety precautions

1.1. Before installation and electric work

- ▶ **Before installing the unit, make sure you read all the “Safety precautions”.**
- ▶ **The “Safety precautions” provide very important points regarding safety. Make sure you follow them.**

Symbols used in the text

Warning:

Describes precautions that should be observed to prevent danger of injury or death to the user.

Caution:

Describes precautions that should be observed to prevent damage to the unit.

Symbols used in the illustrations

-  : Indicates an action that must be avoided.
-  : Indicates that important instructions must be followed.
-  : Indicates a part which must be grounded.
-  : Indicates that caution should be taken with rotating parts. (This symbol is displayed on the main unit label.) <Color: Yellow>
-  : Indicates that the main switch must be turned off before servicing. (This symbol is displayed on the main unit label.) <Color: Blue>
-  : Beware of electric shock (This symbol is displayed on the main unit label.) <Color: Yellow>
-  : Beware of hot surface (This symbol is displayed on the main unit label.) <Color: Yellow>
-  **ELV** : Please pay attention to electric shock fully because this is not Safety Extra Low-Voltage (SELV) circuit. And at servicing, please shut down the power supply for both of Indoor Unit and Outdoor Unit.

Warning:

Carefully read the labels affixed to the main unit.

Warning:

- **Ask the dealer or an authorized technician to install the air conditioner.**
 - Improper installation by the user may result in water leakage, electric shock, or fire.
- **Install the air unit at a place that can withstand its weight.**
 - Inadequate strength may cause the unit to fall down, resulting in injuries.
- **Use the specified cables for wiring. Make the connections securely so that the outside force of the cable is not applied to the terminals.**
 - Inadequate connection and fastening may generate heat and cause a fire.
- **Prepare for typhoons and other strong winds and earthquakes and install the unit at the specified place.**
 - Improper installation may cause the unit to topple and result in injury.
- **Always use an air cleaner, humidifier, electric heater, and other accessories specified by Mitsubishi Electric.**
 - Ask an authorized technician to install the accessories. Improper installation by the user may result in water leakage, electric shock, or fire.
- **Never repair the unit. If the air conditioner must be repaired, consult the dealer.**
 - If the unit is repaired improperly, water leakage, electric shock, or fire may result.

- **Do not touch the heat exchanger fins.**
 - Improper handling may result in injury.
- **If refrigerant gas leaks during installation work, ventilate the room.**
 - If the refrigerant gas comes into contact with a flame, poisonous gases will be released.
- **Install the air conditioner according to this Installation Manual.**
 - If the unit is installed improperly, water leakage, electric shock, or fire may result.
- **Have all electric work done by a licensed electrician according to “Electric Facility Engineering Standard” and “Interior Wire Regulations” and the instructions given in this manual and always use a special circuit.**
 - If the power source capacity is inadequate or electric work is performed improperly, electric shock and fire may result.
- **Securely install the cover of control box and the panel.**
 - If the cover and panel are not installed properly, dust or water may enter the outdoor unit and fire or electric shock may result.
- **When installing and moving the air conditioner to another site, do not charge the it with a refrigerant different from the refrigerant (R22) specified on the unit.**
 - If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.
- **If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit even if the refrigerant should leak.**
 - Consult the dealer regarding the appropriate measures to prevent the safety limit from being exceeded. Should the refrigerant leak and cause the safety limit to be exceeded, hazards due to lack of oxygen in the room could result.
- **When moving and reinstalling the air conditioner, consult the dealer or an authorized technician.**
 - If the air conditioner is installed improperly, water leakage, electric shock, or fire may result.
- **After completing installation work, make sure that refrigerant gas is not leaking.**
 - If the refrigerant gas leaks and is exposed to a fan heater, stove, oven, or other heat source, it may generate noxious gases.
- **Do not reconstruct or change the settings of the protection devices.**
 - If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by Mitsubishi Electric are used, fire or explosion may result.

1.2. Before getting installed

Caution:

- **Do not install the unit where combustible gas may leak.**
 - If the gas leaks and accumulates around the unit, an explosion may result.
- **Do not use the air conditioner where food, pets, plants, precision instruments, or artwork are kept.**
 - The quality of the food, etc. may deteriorate.
- **Do not use the air conditioner in special environments.**
 - Oil, steam, sulfuric smoke, etc. can significantly reduce the performance of the air conditioner or damage its parts.
- **When installing the unit in a hospital, communication station, or similar place, provide sufficient protection against noise.**
 - The inverter equipment, private power generator, high-frequency medical equipment, or radio communication equipment may cause the air conditioner to operate erroneously, or fail to operate. On the other hand, the air conditioner may affect such equipment by creating noise that disturbs medical treatment or image broadcasting.
- **Do not install the unit on a structure that may cause leakage.**
 - When the room humidity exceeds 80% or when the drain pipe is clogged, condensation may drip from the indoor unit. Perform collective drainage work together with the outdoor unit, as required.

1.3. Before getting installed (moved) - electrical work

Caution:

- **Ground the unit.**
 - Do not connect the ground wire to gas or water pipes, lightning rods, or telephone ground lines. Improper grounding may result in electric shock.
- **Install the power cable so that tension is not applied to the cable.**
 - Tension may cause the cable to break and generate heat and cause a fire.
- **Install an leak circuit breaker, as required.**
 - If an leak circuit breaker is not installed, electric shock may result.
- **Use power line cables of sufficient current carrying capacity and rating.**
 - Cables that are too small may leak, generate heat, and cause a fire.
- **Use only a circuit breaker and fuse of the specified capacity.**
 - A fuse or circuit breaker of a larger capacity or a steel or copper wire may result in a general unit failure or fire.
- **Do not wash the air conditioner units.**
 - Washing them may cause an electric shock.
- **Be careful that the installation base is not damaged by long use.**
 - If the damage is left uncorrected, the unit may fall and cause personal injury or property damage.
- **Install the drain piping according to this Installation Manual to ensure proper drainage. Wrap thermal insulation around the pipes to prevent condensation.**
 - Improper drain piping may cause water leakage and damage to furniture and other possessions.
- **Be very careful about product transportation.**
 - Only one person should not carry the product if it weighs more than 20 kg.
 - Some products use PP bands for packaging. Do not use any PP bands for a means of transportation. It is dangerous.
 - Do not touch the heat exchanger fins. Doing so may cut your fingers.
 - When transporting the outdoor unit, suspend it at the specified positions on the unit base. Also support the outdoor unit at four points so that it cannot slip sideways.
- **Safely dispose of the packing materials.**
 - Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.
 - Tear apart and throw away plastic packaging bags so that children will not play with them. If children play with a plastic bag which was not torn apart, they face the risk of suffocation.

1.4. Before starting the test run

Caution:

- **Turn on the power at least 12 hours before starting operation.**
 - Starting operation immediately after turning on the main power switch can result in severe damage to internal parts. Keep the power switch turned on during the operational season.
- **Do not touch the switches with wet fingers.**
 - Touching a switch with wet fingers can cause electric shock.
- **Do not touch the refrigerant pipes during and immediately after operation.**
 - During and immediately after operation, the refrigerant pipes are may be hot and may be cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frost-bite if you touch the refrigerant pipes.
- **Do not operate the air conditioner with the panels and guards removed.**
 - Rotating, hot, or high-voltage parts can cause injuries.
- **Do not turn off the power immediately after stopping operation.**
 - Always wait at least five minutes before turning off the power. Otherwise, water leakage and trouble may occur.

2. Combination with indoor units

The indoor units connectable to this unit are shown below.

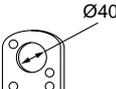
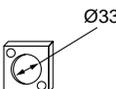
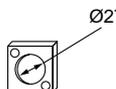
Outdoor unit model name	Total capacity of connected indoor unit models	Quantity of connectable indoor unit	Model name of connectable indoor unit	
PUHY-200 PUY-200	100 to 260	1 to 13	PLFY- 32 · 40 · 100 · 125 PLFY- 50 · 63 · 80 PLFY- 20 · 25 · 32 · 40 · 50 · 63 · 80 · 100 · 125 PEFY- 20 · 25 · 32 · 40 · 50 · 63 · 80 · 100 · 125	VGM NGM NLMD NM
PUHY-250 PUY-250	125 to 325	1 to 16	PKFY- 20 · 25 PKFY- 32 · 40 · 50 PCFY- 40 · 63 · 100 · 125	NAM NFM VGM

Note:

- The total capacity of connected indoor unit models represents the total sum of the figures expressed in the indoor model name.
- Combinations in which the total capacity of the connected indoor units exceeds the capacity of the outdoor unit will reduce the capacity of each indoor unit below the rated capacity during simultaneous operation. Therefore, if circumstances allows, combine indoor units within the capacity of the outdoor unit

3. Confirmation of parts attached

This outdoor unit is attached with the parts below. Please check the quantity for each item.

Name		① Wire mounting plate	② Conduit mounting plate	③ Conduit mounting plate	④ Conduit mounting plate
Shape					
Model name	PUHY-200 PUY-200	1	1	1	1
	PUHY-250 PUY-250	1	1	1	1
Name		⑤ Tapping screw M4 × 12	⑥ Connecting pipe	⑦ Packing	
Shape					
Model name	PUHY-200 PUY-200	6	1	1	
	PUHY-250 PUY-250	6	1	1	

*⑥ Connecting pipe is fixed with the unit.

4. Selection of installation site

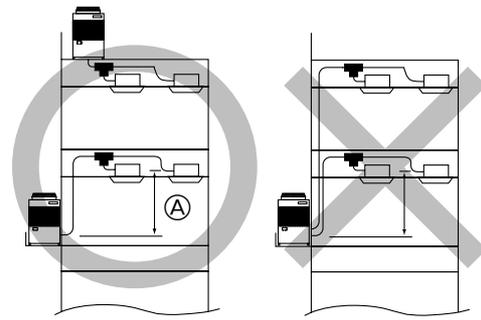
Select space for installing outdoor unit, which will meet the following conditions:

- no direct thermal radiation from other heat sources
- no possibility of annoying neighbors by noise from unit
- no exposition to strong wind
- with strength which bears weight of unit
- note that drain flows out of unit when heating
- with space for air passage and service work shown below

Because of the possibility of fire, do not install unit to the space where generation, inflow, stagnation, and leak of combustible gas is expected.

- Avoid unit installation in a place where acidic solution and spray (sulfur) are often used.
- When having cooling operation at an outside air temperature of below 10°C, in order to obtain steady operation of unit, select an installation site not exposed directly to rain and snow, or install air outlet and inlet ducts. (Refer to Page 12.) Install the outdoor unit at the same position on the same floor, or above, the indoor unit. (See the figure at the right.)
- Do not use unit in any special environment where oil, steam and sulfuric gas exist.

Installation restriction on outdoor unit when cooling operation is performed when the outdoor air temperature is 10°C or lower



(Same floor as indoor unit, or floor above)

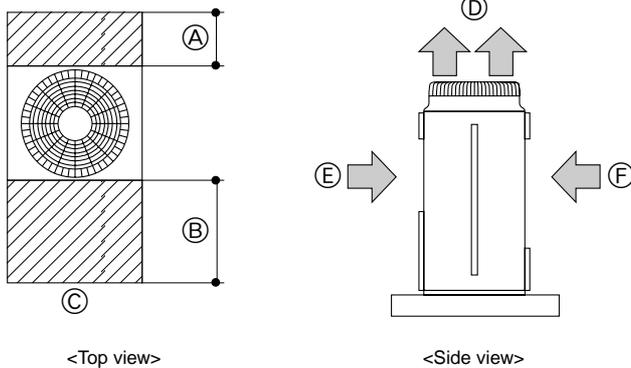
Ⓐ 4 m or less

5. Space required around unit

5.1. Individual installation

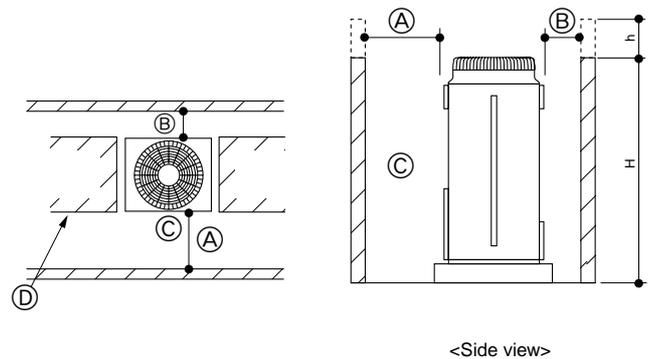
Basic space required

A space of at least 250 mm is necessary at the back for inlet air. Taking servicing, etc. from the rear into account, a space of about 450 mm should be provided, the same as at the front.



- Ⓐ 250 mm or more
- Ⓑ 450 mm or more
- Ⓒ Front (outside of machine room)
- Ⓓ Top discharge (open in principle)
- Ⓔ Front inlet (open in principle)
- Ⓕ Rear inlet (open in principle)

When inlet air enters from right and left sides of unit



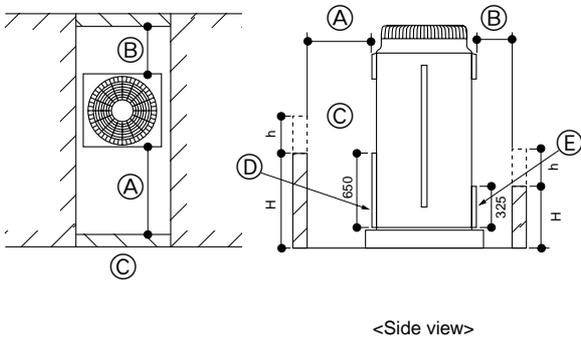
- Ⓐ L1 or more
- Ⓑ L2 or more
- Ⓒ Front
- Ⓓ No restrictions on wall height (left and right)

Note:

- Wall heights (H) of the front and the back sides shall be within overall height of unit.
- When the total height is exceeded, add the "h" dimension of the figure above to L1 and L2 in the table above.

Model	L1	L2
PUHY-200	450	250
PUHY-250		
PUY-200	450	250
PUY-250		

When unit is surrounded by walls



- Ⓐ L1 or more
- Ⓑ L2 or more
- Ⓒ Front
- Ⓓ Front panel
- Ⓔ Rear panel

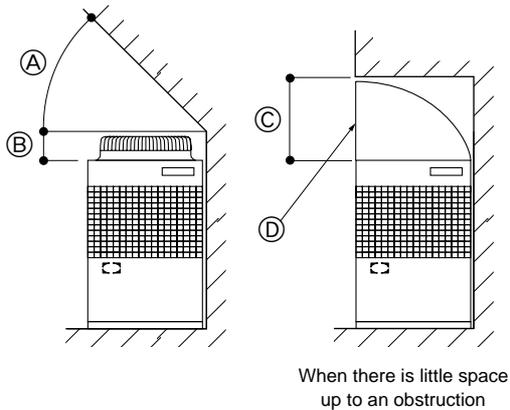
Note:

- Wall heights (H) of the front and the back sides shall be within overall height of unit.
- If the panel height is exceeded, add the “h” dimension of the figure above to L1 and L2 in the table above.

Model	L1	L2
PUHY-200	450	250
PUHY-250		
PUY-200		
PUY-250		

Example: When h is 100
The L1 dimension becomes 450+100=550 mm.

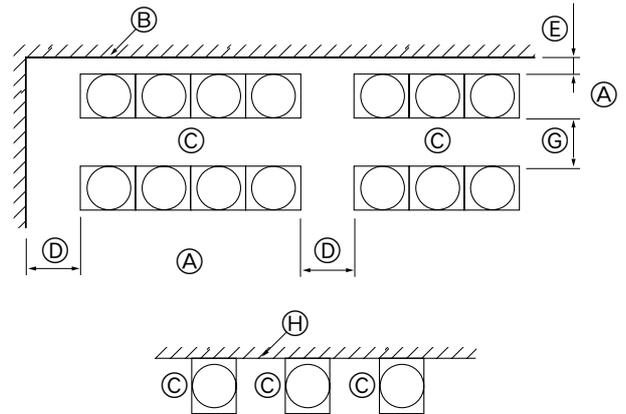
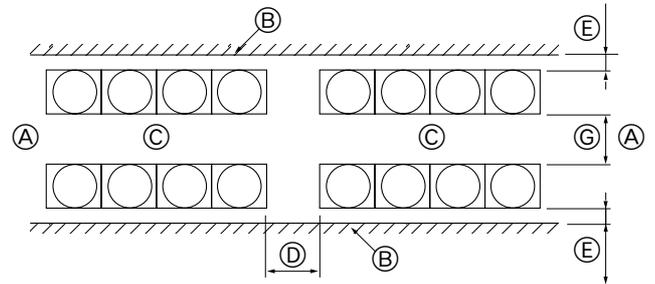
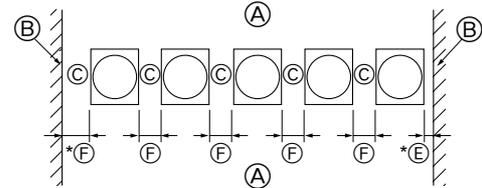
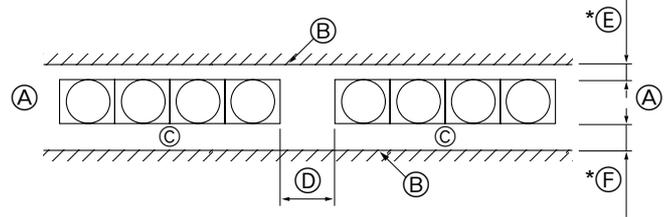
When there is an obstruction above the unit



- Ⓐ 45° or more
- Ⓑ 300 mm or more
- Ⓒ 1000 mm or more
- Ⓓ Air outlet guide (Procured at the site)

5.2. Collective installation and continuous installation

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



- Ⓐ (Must be open)
- Ⓑ Wall height (H)
- Ⓒ Front
- Ⓓ 1000 mm or more
- Ⓔ 250 mm or more
- Ⓕ 450 mm or more
- Ⓖ 900 mm or more
- Ⓗ No restrictions on wall height

Note:

- Open in the two directions
- In case wall height (H) exceeds overall height of unit, add “h” dimension (h=wall height <H> – overall height of unit) to * marked dimension.
- If there is a wall at both the front and the rear of the unit, install up to four units consecutively in the side direction and provide a space of 1000 mm or more as inlet space/passage space for each four units.

6. Lifting method and weight of product

- When carrying the unit suspended, pass the ropes under the unit and use the two suspension points each at the front and rear.
- Always lift the unit with ropes attached at four points so that impact is not applied to the unit.
- Attach the ropes to the unit at an angle of 40° or less.
- Use two ropes at least 7 m long.

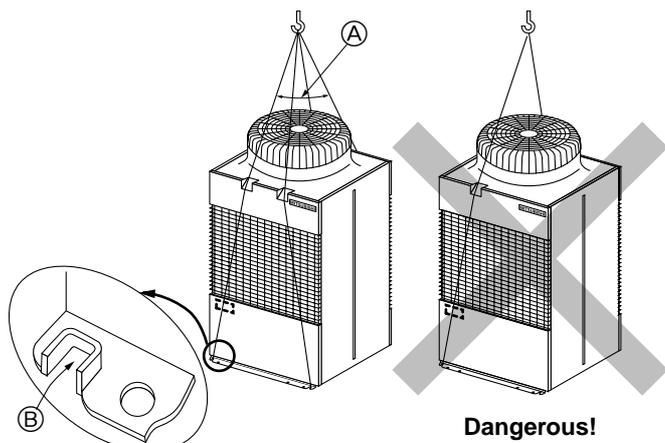
Weight of product:

PUHY-200	PUHY-250	PUY-200	PUY-250
225 kg	240 kg	220 kg	235 kg

⚠ Caution:

Be very careful to carry product.

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



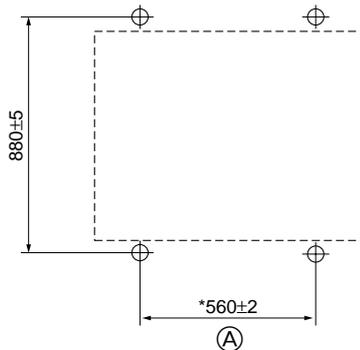
Ⓐ 40° or less

Ⓑ Rope suspension part

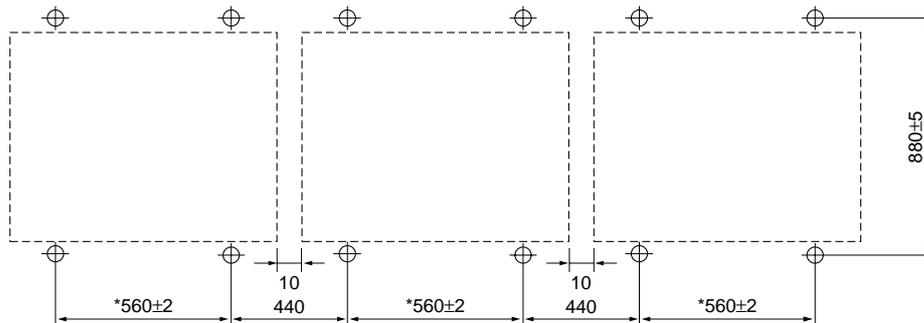
7. Installation of unit

7.1. Location of anchor bolt

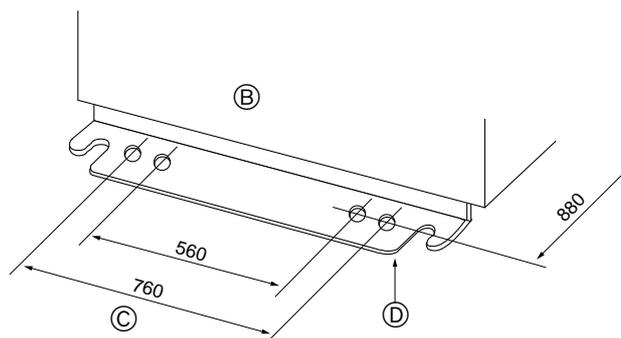
- Individual installation



- Example of collective installation



For collective installation, provide a 10 mm gap between units.



Ⓐ (Service side)

Ⓑ Unit

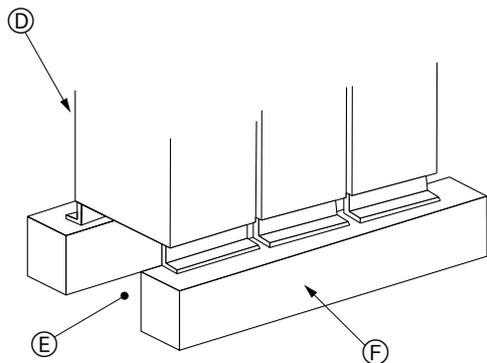
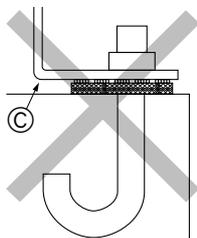
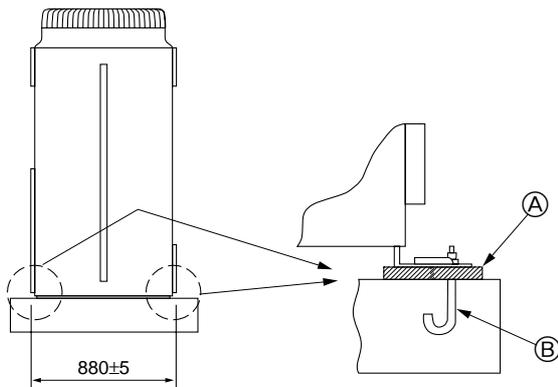
Ⓒ (Compatible with old models)

Ⓓ Installation foot

The dimension (560) indicated by the * can also handle 760 mm, taking interchange with old models into account. However, handle the depth dimension (800) at the site.

7.2. Installation

- Fix unit tightly with bolts as shown below so that unit will not fall down due to earthquake or gust.
- Use concrete or angle for foundation of unit.
- Vibration may be transmitted to the installation section and noise and vibration may be generated from the floor and walls, depending on the installation conditions. Therefore, provide ample vibrationproofing (cushion pads, cushion frame, etc.).



- (A) Be sure that the corners are firmly seated. If the corners are not firmly seated, the installation feet may be bent.
- (B) M10 anchor bolt procured at the site.
- (C) Corner is not seated.
- (D) Unit
(Provide ample vibrationproofing between the unit and the foundation by using cushion pads, cushion frame, etc.)
- (E) Piping and wiring space (Bottom piping, bottom wiring)
- (F) Concrete foundation

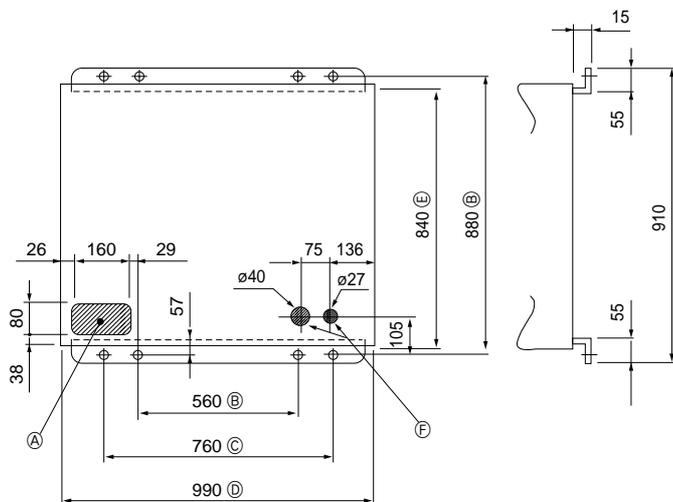
⚠ Warning:

- **Be sure to install unit in a place strong enough to withstand its weight.**
Any lack of strength may cause unit to fall down, resulting in a personal injury.
- **Have installation work in order to protect against a strong wind and earthquake.**
Any installation deficiency may cause unit to fall down, resulting in a personal injury.

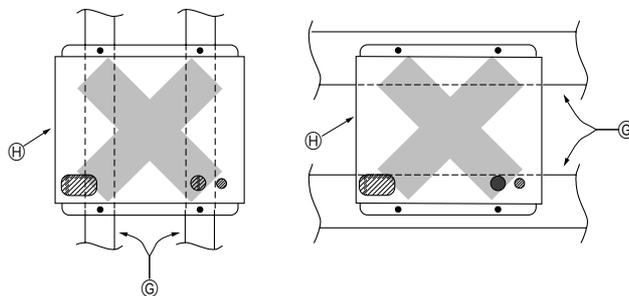
When building the foundation, give full attention to the floor strength, drain water disposal <during operation, drain water flows out of the unit>, and piping and wiring routes.

Down piping and down wiring precautions

When down piping and down wiring are performed, be sure that foundation and base work does not block the base through holes. When down piping is performed, make the foundation at least 100 mm high so that the piping can pass under the bottom of the unit.



The foundation and frame work shown below block the through holes and bottom piping and bottom wiring cannot be performed.

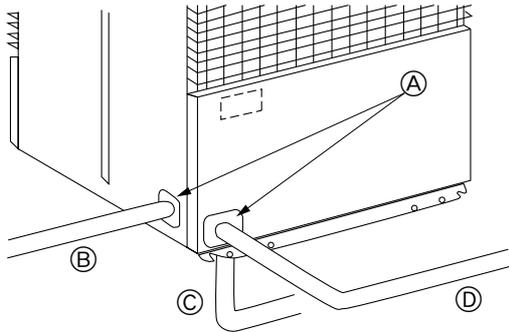


- (A) Bottom piping through hole
- (B) (bolt hole)
- (C) (bolt hole for old models)
- (D) (unit width)
- (E) (unit depth)
- (F) Bottom wiring through hole
- (G) Foundation
- (H) Unit base

7.3. Connecting direction for refrigerant piping

Three connecting directions are available for refrigerant piping of the outdoor unit: bottom piping and front piping and left piping. as shown below:

When performing rear piping, use the rear piping kit sold separately. However, when the units are installed collectively and consecutively, left side piping is not available in case that another unit is installed to the left.



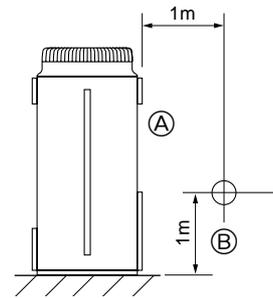
- (A) Knock-out hole
- (B) Left piping
- (C) Bottom piping
- (D) Front piping

Note:

In the case of bottom piping, build a 100 mm or higher foundation so that piping will go through the bottom of the unit.

7.4. Noise level

PUHY-200	PUHY-250
PUY-200	PUY-250
56 dB(A)	57 dB(A)



- (A) Front
- (B) Measuring point

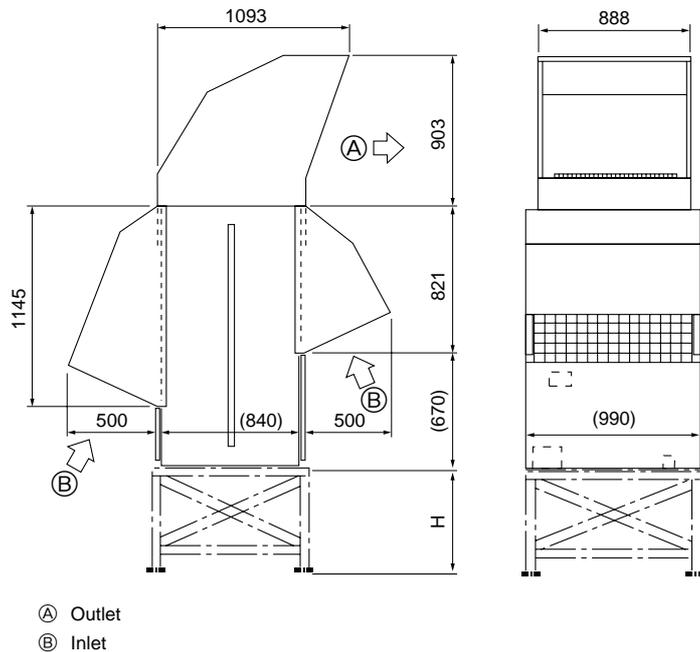
Measuring location: a room free from echoes and reverberations

8. Caution for snow and seasonal wind

In cold and/or snowy areas, sufficient countermeasures to wind and snow damages should be taken for operating unit in normal and good condition in winter time. Even in the other areas, full consideration is required for installation of unit in order to prevent abnormal operations caused by seasonal wind or snow. **When rain and snow directly fall on unit in the case of air-conditioning operations in 10 or less degrees centigrade outdoor air, mount inlet and outlet ducts on unit for assuring stable operations.**

8.1. Snow and seasonal wind

- Prevention of wind and snow damages in cold or snowy areas:
Refer to the figure of snow hood shown below:
- Snow hood

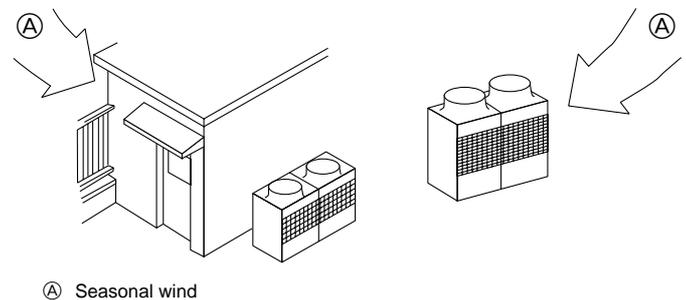


Note:

1. Height of frame base for snow damage prevention (H) shall be twice as high as expected snowfall. Width of frame base shall not exceed that of the unit. The frame base shall be made of angle steel, etc., and designed so that snow and wind slip through the structure. (If frame base is too wide, snow will be accumulated on it.)
2. Install unit so that seasonal wind will not directly lash against openings of inlet and outlet ducts.
3. Build frame base at customer referring to this figure.
Material : Galvanized steel plate 1.2T
Painting : Overall painting with polyester powder
Color : Munsell 5Y8/1 (same as that of unit)
4. When the unit is used in a cold region and the heating operation is continuously performed for a long time when the outside air temperature is below freezing, install a heater to the unit base or take other appropriate measures to prevent water from freezing on the base.

8.2. Countermeasure to seasonal wind

Referring to the figure shown below, take appropriate measures which will suit the actual situation of the place for installation.



9. Refrigerant piping installation

Connecting the piping is a terminal-branch type in which refrigerant piping from the outdoor unit is branched at the terminal and connected to each of the indoor units.

The method of connection consists of flare connections at the indoor units, flange connections for the piping of the outdoor unit and flare connections for the liquid piping. Note that the branched sections are brazed.

⚠ Warning:

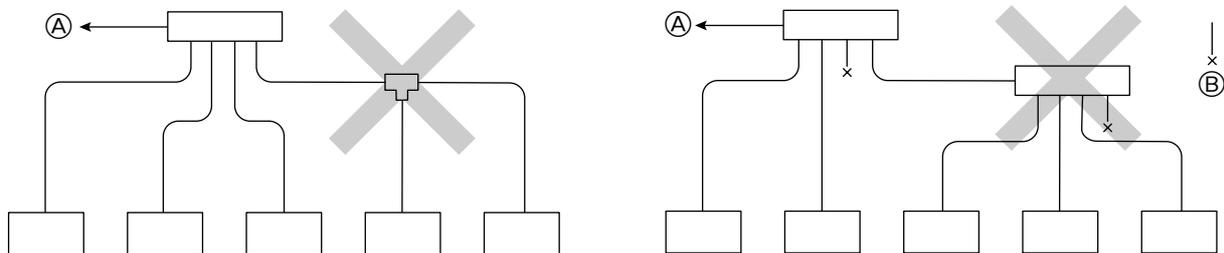
Always use extreme care to prevent the refrigerant gas (R22) from leaking while using fire or flame. If the refrigerant gas comes in contact with the flame from any source, such as a gas stove, it breaks down and generates a poisonous gas which can cause gas poisoning. Never weld in an unventilated room.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

9.1. Areas of caution

- ① Use the following materials for refrigeration piping.
 - Material: Seamless phosphorous deoxidized copper pipe, C1220T-OL or C1220T-O (Note: C1220T-OL is preferred.)
 - Size: Refer to Pages 14 to 16.
- ② Commercially available piping often contains dust and other materials. Always blow it clean with a dry inert gas.
- ③ Use care to prevent dust, water or other contaminants from entering the piping during installation.
- ④ Reduce the number of bending portions as much as possible, and make bending radius as big as possible.
- ⑤ Always use the branch piping set shown below, which are sold separately.

Line branching		Header branching		
Total of units downstream less than 160	Total of units downstream more than 161	4 branching	7 branching	10 branching
CMY-Y102S-F	CMY-Y102L-F	CMY-Y104-E	CMY-Y107-E	CMY-Y1010-E

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



- Ⓐ To Outdoor Unit
 Ⓑ Capped Piping

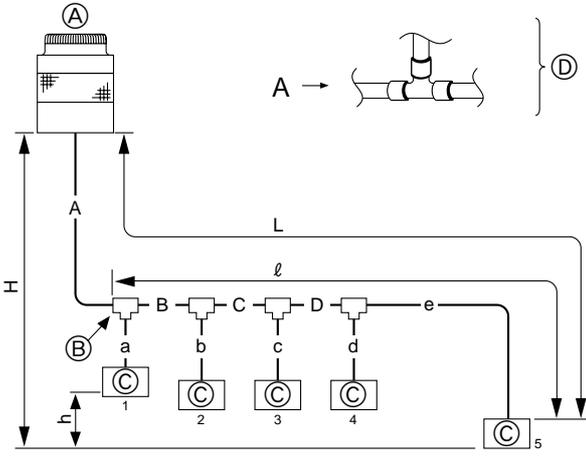
- ⑨ Always use good-quality materials for brazing.
- ⑩ The City Multi Series Y will stop due an abnormality due to excessive or insufficient coolant. At such a time, always properly charge the unit. When servicing, always check the notes concerning pipe length and amount of additional refrigerant at both locations, the refrigerant volume calculation table on the back of the service panel and the additional refrigerant section on the labels for the combined number of indoor units. (Refer to Pages 14 to 16.)
- ⑪ **Never perform a pump down. This will damage the compressor.**
- ⑫ Never use refrigerant to perform an air purge. Always evacuate using a vacuum pump.
- ⑬ Always insulate the piping properly. Insufficient insulation will result in a decline in heating/cooling performance, water drops from condensation and other such problems. (Refer to Pages 21 to 22.)
- ⑭ When connecting the refrigerant piping, make sure the ball valve of the outdoor unit is completely closed (the factory setting) and do not operate it until the refrigerant piping for the outdoor and indoor units has been connected, a refrigerant leakage test has been performed and the evacuation process has been completed.
- ⑮ Always use a non-oxidizing brazing material for brazing the parts. If a non-oxidizing brazing material is not used, it could cause clogging or damage to the compressor unit. (Details of the piping connections and valve operation can be found on Pages 17 to 18.)

⚠ Warning:

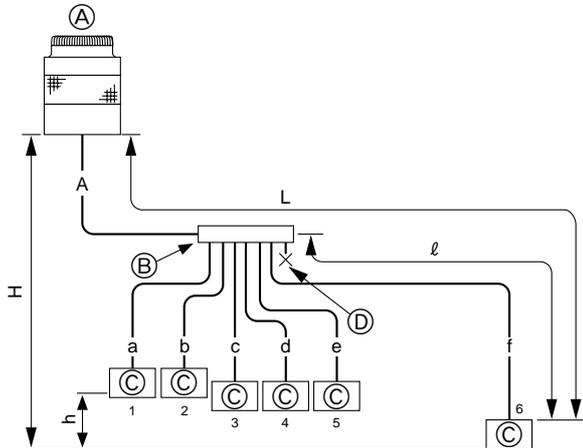
When installing and moving the air conditioner to another site, do not charge the it with a refrigerant different from the refrigerant (R22) specified on the unit.

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

9.2. Refrigerant piping system

<p>Line-Branch Method Connection Examples (Connecting to Five Indoor Units)</p>	 <p>Note: The model total for downstream units shown in the table below is the model total when viewed from Point A in the drawing above.</p> <p>① Outdoor Unit ② First Branch ③ Indoor unit ④ To downstream units</p>																																											
<table border="1"> <tr> <td rowspan="3">Permissible Length</td> <td>Total Piping Length</td> <td>A+B+C+D+a+b+c+d+e is 220 meters or less</td> </tr> <tr> <td>Farthest Piping Length (L)</td> <td>A+B+C+D+e is 100 meters or less</td> </tr> <tr> <td>Farthest Piping Length After First Branch (ℓ)</td> <td>B+C+D+e is 30 meters or less</td> </tr> </table>	Permissible Length	Total Piping Length	A+B+C+D+a+b+c+d+e is 220 meters or less	Farthest Piping Length (L)	A+B+C+D+e is 100 meters or less	Farthest Piping Length After First Branch (ℓ)	B+C+D+e is 30 meters or less																																					
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<p>■ Selecting the Refrigerant Branch Kit Use the table to the right to make the selection based on the model total of indoor units downstream from the branch section.</p>	<p>Select the branch kit, sold separately, from the table below. (Each kit contains a refrigerant and gas piping set.)</p> <table border="1"> <thead> <tr> <th>Downstream Unit Model Total</th> <th>Branch Kit Model</th> </tr> </thead> <tbody> <tr> <td>160 or less</td> <td>CMY-Y102S-F</td> </tr> <tr> <td>161 or more</td> <td>CMY-Y102L-F</td> </tr> </tbody> </table>	Downstream Unit Model Total	Branch Kit Model	160 or less	CMY-Y102S-F	161 or more	CMY-Y102L-F																																					
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<p>■ Select Each Section of Refrigerant Piping</p> <p>(1) Section From Outdoor Unit to First Branch (A) (2) Sections From Branch to Indoor Unit (a,b,c,d,e) (3) Section From Branch to Branch (B, C, D)</p> <p>Each Section of Piping</p> <p>Select the size from the table to the right.</p>	<p>(1) Refrigerant Piping Diameter In Section From Outdoor Unit to First Branch (Outdoor Unit Piping Diameter)</p> <table border="1"> <thead> <tr> <th>Model</th> <th colspan="2">Piping Diameter (mm)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">PUHY-200</td> <td>Liquid Line</td> <td>ø12.7</td> </tr> <tr> <td>Gas Line</td> <td>ø25.4</td> </tr> <tr> <td rowspan="2">PUY-200</td> <td>Liquid Line</td> <td>ø12.7</td> </tr> <tr> <td>Gas Line</td> <td>ø28.58</td> </tr> </tbody> </table> <p>(2) Refrigerant Piping Diameter In Section From Branch to Indoor Unit (Indoor Unit Piping Diameter)</p> <table border="1"> <thead> <tr> <th>Model number</th> <th colspan="2">Piping dia. (mm)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">20 · 25 · 32 · 40</td> <td>Liquid Line</td> <td>ø6.35</td> </tr> <tr> <td>Gas Line</td> <td>ø12.7</td> </tr> <tr> <td rowspan="2">50 · 63 · 80</td> <td>Liquid Line</td> <td>ø9.52</td> </tr> <tr> <td>Gas Line</td> <td>ø15.88</td> </tr> <tr> <td rowspan="2">100 · 125</td> <td>Liquid Line</td> <td>ø9.52</td> </tr> <tr> <td>Gas Line</td> <td>ø19.05</td> </tr> </tbody> </table> <p>(3) Refrigerant Piping Diameter In Section From Branch to Branch</p> <table border="1"> <thead> <tr> <th>Downstream Unit Model Total</th> <th>Liquid Line (mm)</th> <th>Gas Line (mm)</th> </tr> </thead> <tbody> <tr> <td>80 or less</td> <td>ø9.52</td> <td>ø15.88</td> </tr> <tr> <td>81 to 160</td> <td>ø12.7</td> <td>ø19.05</td> </tr> <tr> <td>161 or more</td> <td>ø12.7</td> <td>ø25.4</td> </tr> </tbody> </table>	Model	Piping Diameter (mm)		PUHY-200	Liquid Line	ø12.7	Gas Line	ø25.4	PUY-200	Liquid Line	ø12.7	Gas Line	ø28.58	Model number	Piping dia. (mm)		20 · 25 · 32 · 40	Liquid Line	ø6.35	Gas Line	ø12.7	50 · 63 · 80	Liquid Line	ø9.52	Gas Line	ø15.88	100 · 125	Liquid Line	ø9.52	Gas Line	ø19.05	Downstream Unit Model Total	Liquid Line (mm)	Gas Line (mm)	80 or less	ø9.52	ø15.88	81 to 160	ø12.7	ø19.05	161 or more	ø12.7	ø25.4
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<p>■ Additional Refrigerant Charge At the time of shipping, the outdoor unit PU(H)Y-200 is charged with 6.5 kilograms of refrigerant and the PU(H)Y-250 is charged with 8.5 kilograms. As this charge does not include the amount needed for extended piping, additional charging for each refrigerant line will be required on site. In order that future servicing may be properly provided, always keep a record of the size and length of each refrigerant line and the amount of additional charge by writing it in the space provided on the outdoor unit.</p> <p>■ Calculation of Additional Refrigerant Charge</p> <ul style="list-style-type: none"> Calculate the amount of additional charge based on the length of the piping extension and the size of the refrigerant line. Use the table to the right as guide to calculating the amount of additional charging and charge the system according. If the calculation results of the calculation result in a fraction of less than 0.1 kg, round up to the next 0.1 kg. For example, if the result of the calculation was 11.06 kilograms, round the result up to 11.1 kilograms. 	<p><Additional Charge></p> <table border="1"> <tr> <td>Additional refrigerant charge (kg)</td> <td>=</td> <td>Liquid pipe size Total length of ø12.7 × 0.12 (m) × 0.12 (kg/m)</td> <td>+</td> <td>Liquid pipe size Total length of ø9.52 × 0.06 (m) × 0.06 (kg/m)</td> <td>+</td> <td>Liquid pipe size Total length of ø6.35 × 0.024 (m) × 0.024 (kg/m)</td> <td>+ α</td> </tr> </table> <p><Example></p> <table border="1"> <tr> <td>Indoor 1 : 50</td> <td>A : ø12.7</td> <td>40 m</td> <td>a : ø9.52</td> <td>10 m</td> </tr> <tr> <td>2 : 100</td> <td>B : ø12.7</td> <td>10 m</td> <td>b : ø9.52</td> <td>10 m</td> </tr> <tr> <td>3 : 50</td> <td>C : ø12.7</td> <td>5 m</td> <td>c : ø9.52</td> <td>10 m</td> </tr> <tr> <td>4 : 32</td> <td>D : ø9.52</td> <td>5 m</td> <td>d : ø6.35</td> <td>5 m</td> </tr> <tr> <td>5 : 32</td> <td></td> <td></td> <td>e : ø6.35</td> <td>10 m</td> </tr> </table> <p>The total length of each liquid line is as follows ø12.7 : A + B + C = 40 + 10 + 5 = 55 m ø9.52 : D + a + b + c = 5 + 10 + 10 + 10 = 35 m ø6.35 : d + e = 5 + 10 = 15 m Therefore, <Calculation example> Additional refrigerant charge = 55 × 0.12 + 35 × 0.06 + 15 × 0.024 + 2 = 11.1 kg</p> <p>At the conditions below:</p> <p>Value of α</p> <table border="1"> <thead> <tr> <th>Total capacity of connecting indoor units to Model 80</th> <th>α</th> </tr> </thead> <tbody> <tr> <td>Models 81 to 160</td> <td>1.0 kg</td> </tr> <tr> <td>Models 161 to 325</td> <td>2.0 kg</td> </tr> </tbody> </table>	Additional refrigerant charge (kg)	=	Liquid pipe size Total length of ø12.7 × 0.12 (m) × 0.12 (kg/m)	+	Liquid pipe size Total length of ø9.52 × 0.06 (m) × 0.06 (kg/m)	+	Liquid pipe size Total length of ø6.35 × 0.024 (m) × 0.024 (kg/m)	+ α	Indoor 1 : 50	A : ø12.7	40 m	a : ø9.52	10 m	2 : 100	B : ø12.7	10 m	b : ø9.52	10 m	3 : 50	C : ø12.7	5 m	c : ø9.52	10 m	4 : 32	D : ø9.52	5 m	d : ø6.35	5 m	5 : 32			e : ø6.35	10 m	Total capacity of connecting indoor units to Model 80	α	Models 81 to 160	1.0 kg	Models 161 to 325	2.0 kg				
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Header Branch Method
Connection Examples
(When Connecting Six Indoor Units)



Note:
Branch piping cannot be used again after the header branch.

Ⓐ Outdoor Unit
Ⓑ First Branch
Ⓒ Indoor Unit
Ⓓ Cap

Permissible Length	Total Piping Length	A+a+b+c+d+e+f is 220 meters or less
	Farthest Piping Length (L)	A+f is 100 meters or less
	Farthest Piping Length After First Branch (ℓ)	f is 30 meters or less
Permissible High/Low Difference	High/Low Difference in Indoor/Outdoor Section (H)	50 meters or less (If the outdoor unit is lower, 40 meters or less)
	High/Low Difference in Indoor/Indoor Section (h)	15 meters or less

Selecting the Refrigerant Branch Kit
Use the table to the right to make the selection based on the number of indoor units to be connected.

Select the branch kit, sold separately, from the table below. (Each kit contains a refrigerant and gas piping set.)

4-Branching Header	7-Branching Header	10-Branching Header
CMY-Y104-E	CMY-Y107-E	CMY-Y1010-E

Select Each Section of Refrigerant Piping

(1) Section From Outdoor Unit to First Branch (A)
(2) Sections From Branch to Indoor Unit (a,b,c,d,e,f)

Each Section of Piping

Select the size from the table to the right.

(1) Refrigerant Piping Diameter In Section From Outdoor Unit to First Branch (Outdoor Unit Piping Diameter)

(2) Refrigerant Piping Diameter In Section From Branch to Indoor Unit (Indoor Unit Piping Diameter)

Model	Piping Diameter (mm)	
PUHY-200	Liquid Line	ø12.7
	Gas Line	ø25.4
PUHY-250	Liquid Line	ø12.7
	Gas Line	ø28.58

Model number	Piping dia. (mm)	
20 · 25 · 32 · 40	Liquid Line	ø6.35
	Gas Line	ø12.7
50 · 63 · 80	Liquid Line	ø9.52
	Gas Line	ø15.88
100 · 125	Liquid Line	ø9.52
	Gas Line	ø19.05

Additional Refrigerant Charge

At the time of shipping, the outdoor unit PU(H)Y-200 is charged with 6.5 kilograms of refrigerant and the PU(H)Y-250 is charged with 8.5 kilograms. As this charge does not include the amount needed for extended piping, additional charging for each refrigerant line will be required on site. In order that future servicing may be properly provided, always keep a record of the size and length of each refrigerant line and the amount of additional charge by writing it in the space provided on the outdoor unit.

Calculation of Additional Refrigerant Charge

- Calculate the amount of additional charge based on the length of the piping extension and the size of the refrigerant line.
- Use the table to the right as guide to calculating the amount of additional charging and charge the system according.
- If the calculation results of the calculation result in a fraction of less than 0.1 kg, round up to the next 0.1 kg.

<Additional Charge>

$$\begin{array}{|c|} \hline \text{Additional} \\ \text{refrigerant} \\ \text{charge} \\ \hline \text{(kg)} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Liquid pipe size} \\ \text{Total length of} \\ \hline \text{ø12.7} \times 0.12 \\ \hline \text{(m)} \times 0.12 \text{ (kg/m)} \\ \hline \end{array} + \begin{array}{|c|} \hline \text{Liquid pipe size} \\ \text{Total length of} \\ \hline \text{ø9.52} \times 0.06 \\ \hline \text{(m)} \times 0.06 \text{ (kg/m)} \\ \hline \end{array} + \begin{array}{|c|} \hline \text{Liquid pipe size} \\ \text{Total length of} \\ \hline \text{ø6.35} \times 0.024 \\ \hline \text{(m)} \times 0.024 \text{ (kg/m)} \\ \hline \end{array} + \alpha$$

<Example>

Indoor 1 : 50	A : ø12.7	40 m	a : ø9.52	20 m
2 : 63			b : ø9.52	10 m
3 : 40			c : ø6.35	5 m
4 : 32			d : ø6.35	20 m
5 : 32			e : ø6.35	20 m
6 : 32			f : ø6.35	30 m

At the conditions below:

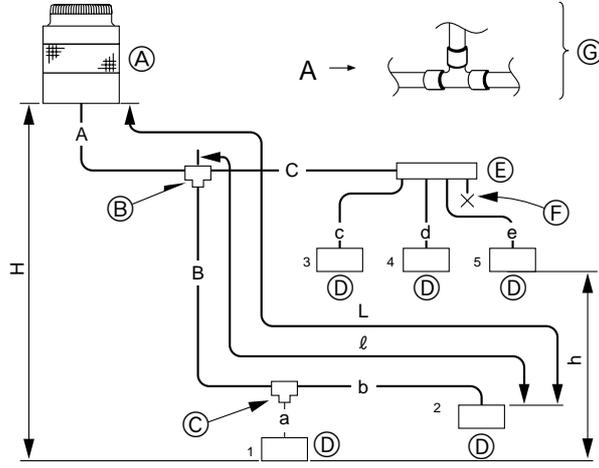
The total length of each liquid line is as follows
 ø12.7 : A = 40 m
 ø9.52 : a + b = 20 + 10 = 30 m
 ø6.35 : c + d + e + f = 5 + 20 + 20 + 30 = 75 m
 Therefore,

<Calculation example>
 Additional refrigerant charge = 40 × 0.12 + 30 × 0.06 + 75 × 0.024 + 2 = 10.4 kg

Value of α

Total capacity of connecting indoor units	α
to Model 80	1.0 kg
Models 81 to 160	1.5 kg
Models 161 to 325	2.0 kg

Multiple Line/Header Connection Example
(When Connecting Five Indoor Units)



Note:
 • Branch piping cannot be used again after the header branch.
 • The model total for downstream units shown in the table below is the model total when viewed from Point A in the drawing above.

- Ⓐ Outdoor Unit
- Ⓑ First Branch (Branch Joint)
- Ⓒ Branch Joint
- Ⓓ Indoor Unit
- Ⓔ Branch Header
- Ⓕ Cap
- Ⓖ To downstream units

Permissible Length	Total Piping Length	A+B+C+a+b+c+d+e is 220 meters or less
	Farthest Piping Length (L)	A+B+b is 100 meters or less
	Farthest Piping Length After First Branch (ℓ)	B+b is 30 meters or less
Permissible High/Low Difference	High/Low Difference in Indoor/Outdoor Section (H)	50 meters or less (If the outdoor unit is lower, 40 meters or less)
	High/Low Difference in Indoor/Indoor Section (h)	15 meters or less

■ Selecting the Refrigerant Branch Kit
 Use the table to the right to make the selection based on the model total of indoor units downstream from the branch section or on the number of indoor units to be connected on the header branch.

Select the branch kit, sold separately, from the table below. (Each kit contains a refrigerant and gas piping set.)

Line branching		Header branching		
Total of units downstream less than 160	Total of units downstream more than 161	4 branching header	7 branching header	10 branching header
CMY-Y102S-F	CMY-Y102L-F	CMY-Y104-E	CMY-Y107-E	CMY-Y1010-E

■ Select Each Section of Refrigerant Piping

(1) Section From Outdoor Unit to First Branch (A)
 (2) Sections From Branch to Indoor Unit (a,b,c,d,e)
 (3) Section From Branch to Branch (B, C)

Each Section of Piping

Select the size from the table to the right.

(1) Refrigerant Piping Diameter In Section From Outdoor Unit to First Branch (Outdoor Unit Piping Diameter)

Model	Piping Diameter (mm)	
PUHY-200	Liquid Line	ø12.7
	Gas Line	ø25.4
PUHY-250	Liquid Line	ø12.7
	Gas Line	ø28.58

(2) Refrigerant Piping Diameter In Section From Branch to Indoor Unit (Indoor Unit Piping Diameter)

Model number	Piping dia. (mm)	
20 · 25 · 32 · 40	Liquid Line	ø6.35
	Gas Line	ø12.7
50 · 63 · 80	Liquid Line	ø9.52
	Gas Line	ø15.88
100 · 125	Liquid Line	ø9.52
	Gas Line	ø19.05

(3) Refrigerant Piping Diameter In Section From Branch to Branch

Downstream Unit Model Total	Liquid Line (mm)	Gas Line (mm)
80 or less	ø9.52	ø15.88
81 to 160	ø12.7	ø19.05
161 or more	ø12.7	ø25.4

■ Additional Refrigerant Charge
 At the time of shipping, the outdoor unit PU(H)Y-200 is charged with 6.5 kilograms of refrigerant and the PU(H)Y-250 is charged with 8.5 kilograms. As this charge does not include the amount needed for extended piping, additional charging for each refrigerant line will be required on site. In order that future servicing may be properly provided, always keep a record of the size and length of each refrigerant line and the amount of additional charge by writing it in the space provided on the outdoor unit.

<Additional Charge>

Additional refrigerant charge (kg)	=	Liquid pipe size Total length of ø12.7 × 0.12 (m) × 0.12 (kg/m)	+	Liquid pipe size Total length of ø9.52 × 0.06 (m) × 0.06 (kg/m)	+	Liquid pipe size Total length of ø6.35 × 0.024 (m) × 0.024 (kg/m)	+ α
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<Example>

Indoor 1 : 50	A : ø12.7	30 m	a : ø9.52	10 m	} At the conditions below:
2 : 100	B : ø12.7	10 m	b : ø9.52	20 m	
3 : 40	C : ø12.7	15 m	c : ø6.35	10 m	
4 : 32			d : ø6.35	10 m	
5 : 32			e : ø6.35	10 m	

The total length of each liquid line is as follows

ø12.7 : A + B + C = 30 + 10 + 15 = 55 m

ø9.52 : a + b = 10 + 20 = 30 m

ø6.35 : c + d + e = 10 + 10 + 10 = 30 m

Therefore,

<Calculation example>

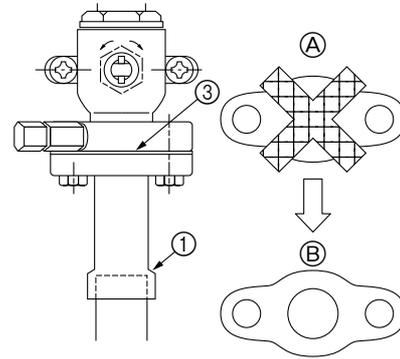
Additional refrigerant charge = 55 × 0.12 + 30 × 0.06 + 30 × 0.024 + 2 = 11.2 kg

Value of α

Total capacity of connecting indoor units	α
to Model 80	1.0 kg
Models 81 to 160	1.5 kg
Models 161 to 325	2.0 kg

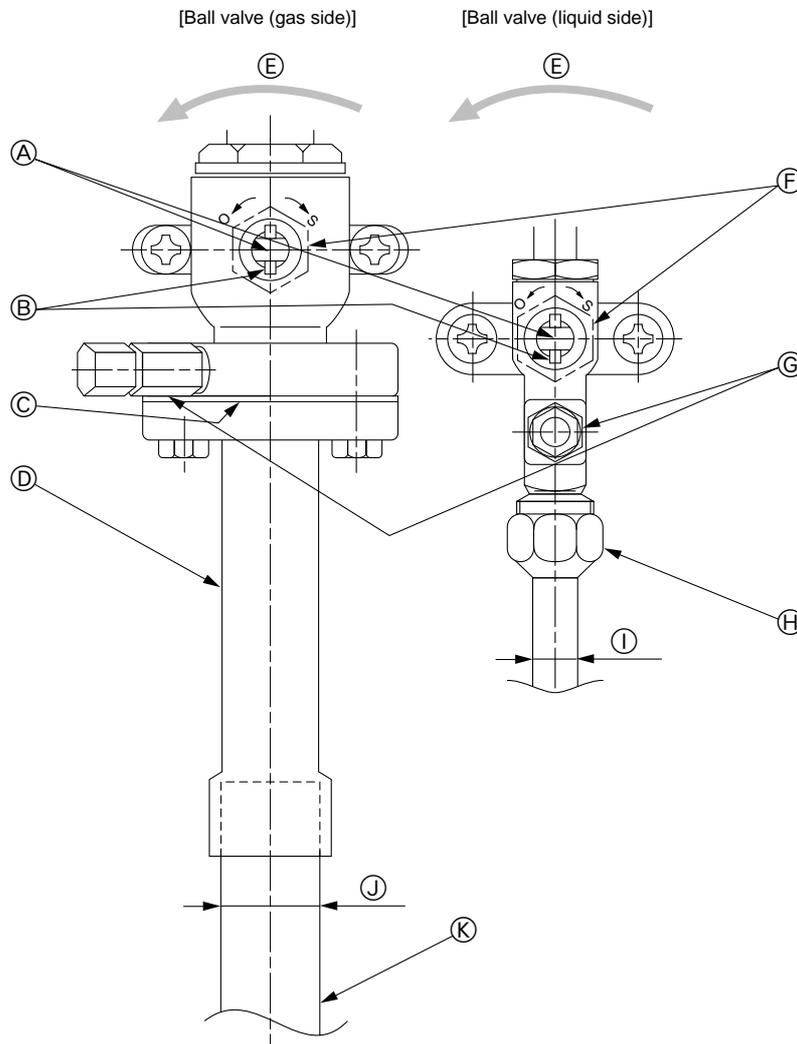
9.3. Caution for piping connection/valve operation

- Conduct piping connection and valve operation accurately by following the figure below.
- The gas side connecting pipe is being assembled for shipment. (See the figure at the right.)
 - ① For brazing to the connecting pipe with flange, remove the connecting pipe with flange from the ball valve, and braze it at the outside of the unit.
 - ② During the time when removing the connecting pipe with flange, remove the seal attached on the back side of this sheet and paste it onto the flange surface of the ball valve to prevent the entry of dust into the valve.
 - ③ The refrigerant circuit is closed with a round, close-packed packing at the shipment to prevent gas leak between flanges. As no operation can be done under this state, be sure replace the packing with the hollow packing attached at the piping connection.
 - ④ At the mounting of the hollow packing, wipe off dust attached on the flange sheet surface and the packing. Coat refrigerating machine oil onto both surfaces of the packing.



- Ⓐ Replace the close-packed packing
- Ⓑ Hollow packing

- After evacuation and refrigerant charge, ensure that the handle is fully open. If operating with the valve closed, abnormal pressure will be imparted to the high- or low-pressure side of the refrigerant circuit, giving damage to the compressor, four-way valve, etc.
- Determine the amount of additional refrigerant charge by using the formula, and charge refrigerant additionally through the service port after completing piping connection work.
- After completing work, tighten the service port and cap securely not to generate gas leak.



(This figure shows the valve in the fully open state.)

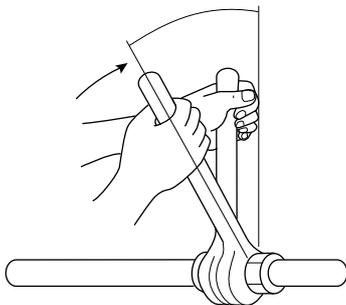
- Ⓐ Valve stem
[Fully closed at the factory, when connecting the piping, when evacuating, and when charging additional refrigerant. Open fully after the operations above are completed.]
- Ⓑ Stopper pin [Prevents the valve stem from turning 90° or more.]
- Ⓒ Packing (Accessory)
[Manufacturer: Nichiasu corporation]
[Type: T/#1991-NF]
- Ⓓ Connecting pipe (Accessory)
[Use packing and securely install this pipe to the valve flange so that gas leakage will not occur. (Tightening torque: 25 Nm (250 kg-cm)) Coat both surfaces of the packing with refrigerator oil.]
- Ⓔ Open (Operate slowly)
- Ⓕ Cap, copper packing
[Remove the cap and operate the valve stem. Always reinstall the cap after operation is completed. (Valve stem cap tightening torque: 25 Nm (250 kg-cm) or more)]
- Ⓖ Service port
[Use this port to evacuate the refrigerant piping and add an additional charge at the site.
Open and close the port using a double-ended wrench.
Always reinstall the cap after operation is completed. (Service port cap tightening torque: 14 Nm (140 kg-cm) or more)]
- Ⓗ Flare nut
[Tightening torque: 55 Nm (550 kg-cm)
Loosen and tighten this nut using a double-ended wrench.
Coat the flare contact surface with refrigerator oil.]
- Ⓛ ⌀12.7
- Ⓜ ⌀25.4 (PUHY-200, PUY-200)
⌀28.58 (PUHY-250, PUY-250)
- Ⓚ Field piping
[Braze to the connecting pipe. (When brazing, use unoxidized brazing.)]

Appropriate tightening torque by torque wrench

Copper pipe external dia. (mm)	Tightening torque (Nm)/(kg-cm)
⌀6.35	14 to 18 / 140 to 180
⌀9.52	35 to 42 / 350 to 420
⌀12.7	50 to 57.5 / 500 to 575
⌀15.88	75 to 80 / 750 to 800
⌀19.05	100 to 140 / 1000 to 1400

Tightening angle standard

Pipe diameter (mm)	Tightening angle (°)
⌀6.35, ⌀9.52	60 to 90
⌀12.7, ⌀15.88	30 to 60
⌀19.05	20 to 35



Note:

If a torque wrench is not available, use the following method as a standard
When you tighten the flare nut with a wrench, you will reach a point where the tightening torque will abruptly increase. Turn the flare nut beyond this point by the angle shown in the table above.

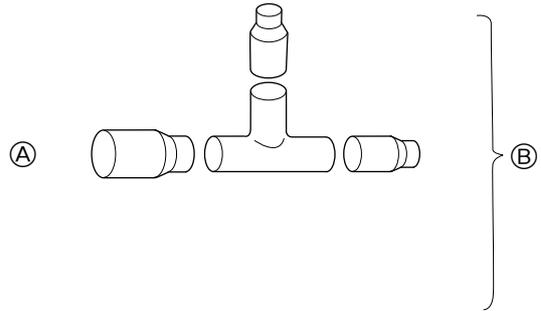
⚠ Caution:

- Always remove the connecting pipe from the ball valve and braze it outside the unit.
- Brazing the connecting pipe while it is installed will heat the ball valve and cause trouble or gas leakage. The piping, etc. inside the unit may also be burned.

9.4. How to install branch pipe

For detail, please observe the instruction manual attached to the optional refrigerant branch kit.

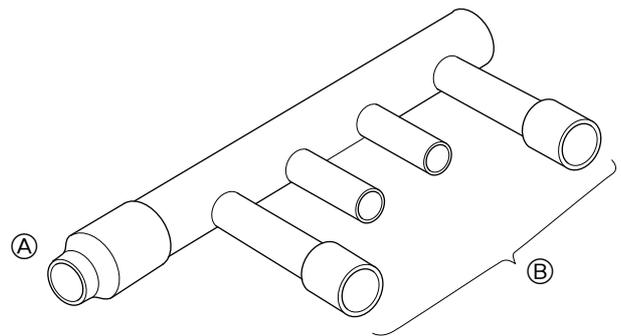
■ Joint



- Ⓐ To Outdoor Unit
- Ⓑ To Branch Piping or Indoor Unit

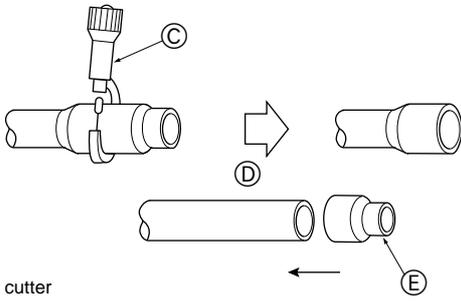
- There is no limitation on the joint mounting configuration.
- If the diameter of the refrigerant piping selected by the procedures described on pages 14 to 16 is different from the size of the joint, match the sizes using a deformed joint. The deformed joint is included with the kit.

■ Header



- Ⓐ To outdoor unit
- Ⓑ To indoor unit

- No restriction is applied to the mounting posture of the header.
- If the diameter of the refrigerant piping selected using the procedures described on pages 15 to 16 and the size of the joint is different, match the sizes using a deformed joint. The deformed joint is included with the kit.



- © Pipe cutter
- Ⓓ or
- Ⓔ Deformed joint

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

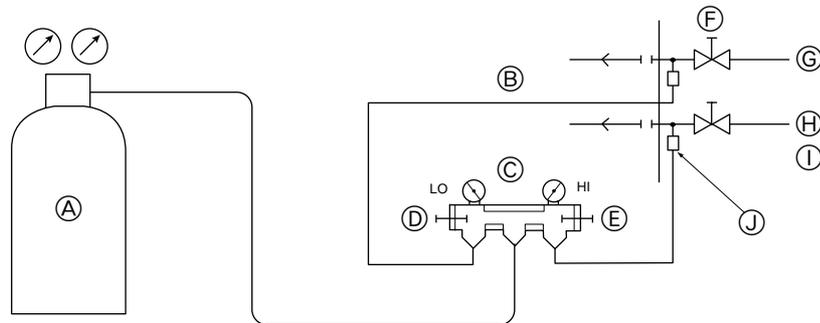
9.5. Airtight test and evacuation

① Airtight test

Airtight test should be made by pressurizing nitrogen gas to 2.94 MPa. For the test method, refer to the following figure. (Make a test with the ball valve closed. Be also sure to pressurize both liquid pipe and gas pipe.)

The test result can be judged good if the pressure has not been reduced after leaving for about one day after completion of nitrogen gas pressurization.

- Ⓐ Nitrogen gas
- Ⓑ To indoor unit
- Ⓒ System analyzer
- Ⓓ Lo Knob
- Ⓔ Hi Knob
- Ⓕ Ball valve
- Ⓖ Liquid pipe
- Ⓗ Gas pipe
- Ⓘ Outdoor unit
- ⓵ Service port

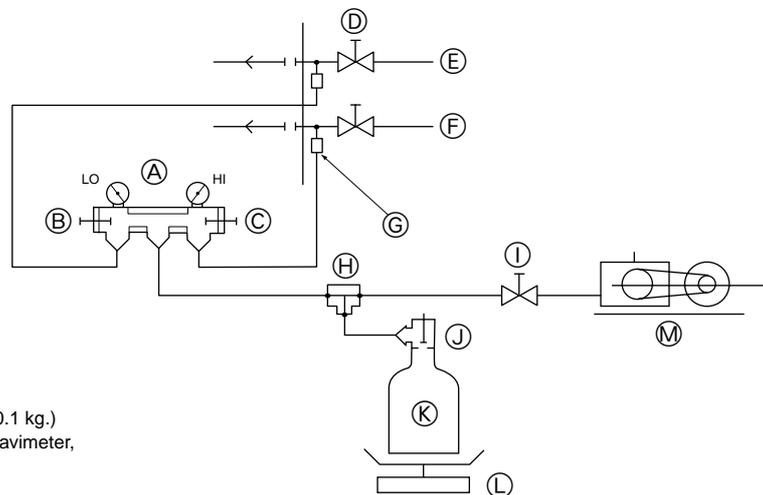


② Evacuation

Evacuation should be made from the service port provided on the outdoor unit's ball valve to the vacuum pump commonly used for both liquid pipe and gas pipe. (Make evacuation from both liquid pipe and gas pipe with the ball valve closed.)

* Never perform air purging using refrigerant.

- Ⓐ System analyzer
 - Ⓑ Lo Knob
 - Ⓒ Hi Knob
 - Ⓓ Ball valve
 - Ⓔ Liquid pipe
 - Ⓕ Gas pipe
 - Ⓖ Service port
 - Ⓗ Three-way joint
 - Ⓘ Valve
 - ⓵ Valve
 - Ⓚ Freon 22 cylinder
 - Ⓛ Scale
 - Ⓜ Vacuum pump
- Use a gravimeter. (One that can measure down to 0.1 kg.)
If you are unable to prepare such a high-precision gravimeter, you may use a charge cylinder.



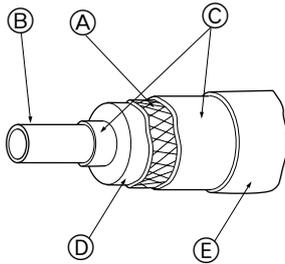
Note:
Always add an appropriate amount of refrigerant. (For the refrigerant additional charge, see pages 14 to 16.) Too much or too little refrigerant will cause trouble.

⚠ Warning:
When installing and moving the air conditioner to another site, do not charge it with a refrigerant different from the refrigerant (R22) specified on the unit.

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

9.6. Thermal insulation of refrigerant piping

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



- Ⓐ Steel wire
- Ⓑ Piping
- Ⓒ Asphaltic oily mastic or asphalt
- Ⓓ Heat insulation material A
- Ⓔ Outer covering B

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

Note:

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

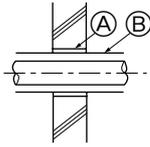
Bad example	<ul style="list-style-type: none"> Do not insulate gas or low pressure pipe and liquid or high pressure pipe together. <ul style="list-style-type: none"> Ⓐ Liquid pipe Ⓑ Gas pipe Ⓒ Electric wire Ⓓ Finishing tape Ⓔ Insulating material 	<ul style="list-style-type: none"> Be sure to fully insulate connecting portion. <p>Ⓐ These parts are not insulated.</p>
	Good example	<ul style="list-style-type: none"> Ⓐ Liquid pipe Ⓑ Gas pipe Ⓒ Finishing tape Ⓓ Insulating material

Note:

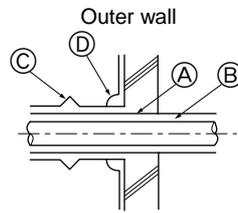
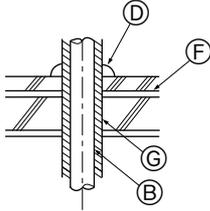
No heat insulation must be provided for electric wires.

Penetrations

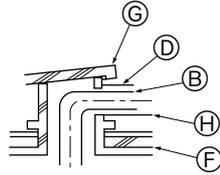
Inner wall (concealed)



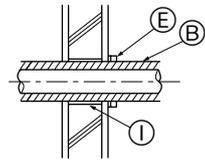
Floor (fireproofing)



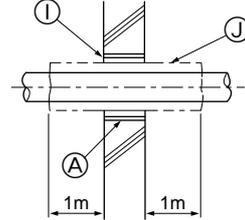
Roof pipe shaft



Outer wall (exposed)



Penetrating portion on fire limit and boundary wall

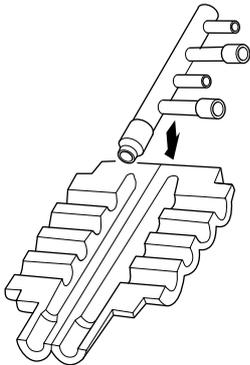


- (A) Sleeve
- (B) Heat insulating material
- (C) Lagging
- (D) Caulking material
- (E) Band
- (F) Waterproofing layer
- (G) Sleeve with edge

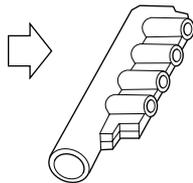
- (H) Lagging material
- (I) Mortar or other incombustible caulking
- (J) Incombustible heat insulation material

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

Branch piping section



Insulate the header using the insulation material attached to the branch pipe kit as shown in the figure.



10. Electrical work

10.1. Caution

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

⚠ Warning:

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

② Install the outdoor unit transmission line away from the power source wiring so that it is not affected by electric noise from the power source. (Do not run it through the same conduit.)

③ Be sure to provide designated grounding work to outdoor unit.

⚠ Caution:

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

④ Give some allowance to wiring for electrical part box of indoor and outdoor units, because the box is sometimes removed at the time of service work.

⑤ Never connect the main power source to terminal block of transmission line. If connected, electrical parts will be burnt out. (○ mark in the figure below)

⑥ Use 2-core shield cable for transmission line. If transmission lines of different systems are wired with the same multiplecore cable, the resultant poor transmitting and receiving will cause erroneous operations. (× mark in the figure below)

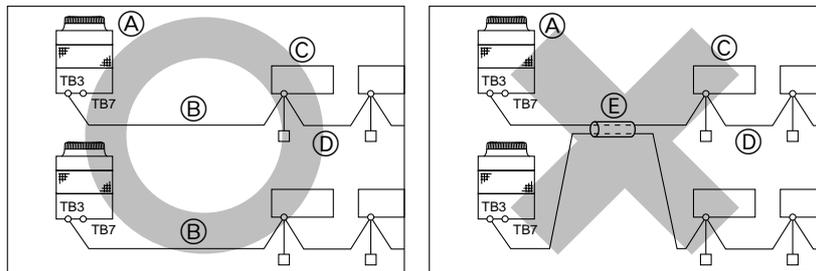
⑦ Only the transmission line specified should be connected to the terminal block for outdoor unit transmission.
(Transmission line to be connected with indoor unit : Terminal block TB3 for transmission line, Other : Terminal block TB7 for centralized control)
Erroneous connection does not allow the system to operate.

⑧ In case to connect with the upper class controller or to conduct group operation in different refrigerant systems, the control line for transmission is required between the outdoor units each other.

Connect this control line between the terminal blocks for centralized control. (2-wire line with no polarity)

When conducting group operation in different refrigerant systems without connecting to the upper class controller, replace the insertion of the short circuit connector from CN41 of one outdoor unit to CN40.

⑨ Group is set by operating the remote controller.



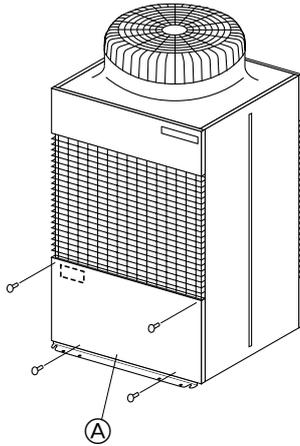
TB3: Transmission line terminal board, TB7: Central control line terminal board

- Ⓐ Outdoor unit
- Ⓑ 2-core cable
- Ⓒ Indoor unit
- Ⓓ Remote controller
- Ⓔ Multi-core cable

10.2. Control box and connecting position of wiring

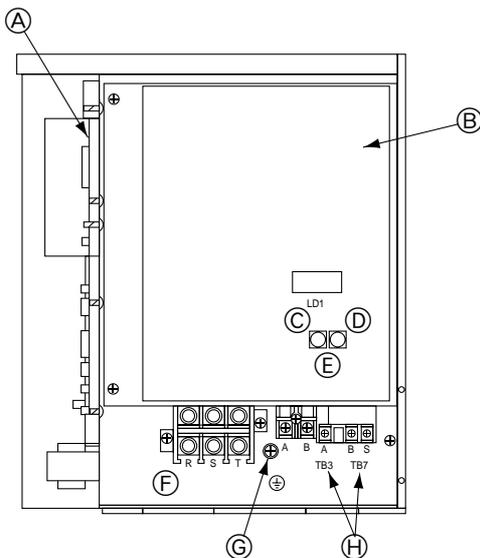
① Outdoor unit

1. Remove the service panel by taking out the screws at each of the service panel's four corners as shown in the figure below.



Ⓐ Service panel

2. The control box cover is divided into two sections. Two screws must be removed from each section to open the control box. However, when working in the field, it may be necessary to remove only one section of the control box cover. The power source line and transmission line are accessible by removing the lower cover. The connector and dip switch can be operated by removing just the upper cover. The illustration below provides a detail of the interior of the control box.

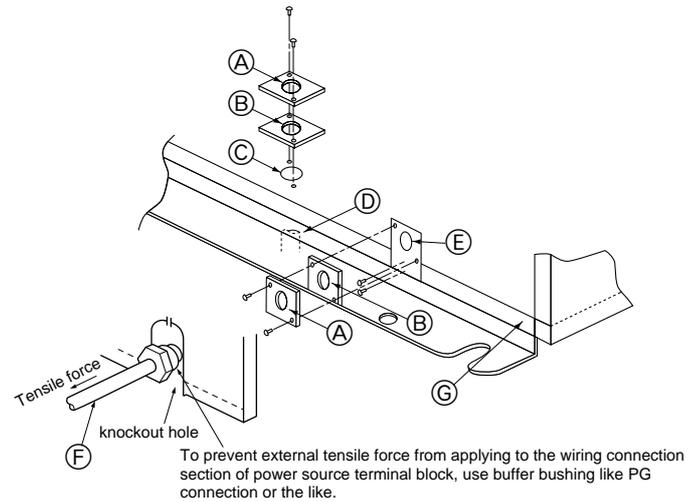


- Ⓐ Inverter board (INV board)
- Ⓑ Control board (MAIN board)
- Ⓒ Ten position
- Ⓓ One position
- Ⓔ Address switch
- Ⓕ Power source
- Ⓖ Earth screw
- Ⓗ Transmission line

3. Connect indoor and outdoor units through the terminal block for transmission lines (TB3). Outdoor units and connections to central control systems go through the terminal block for centralized control (TB7). When making an indoor/outdoor connection with shielded wiring, connect the shield ground to the earth screw (\oplus). When making a central control system connection with shielded wiring, use the terminal block for centralized control (TB7). When the CN41 power supply connector of an outdoor unit has been replaced with a CN40, the shield terminal (S) for centralized control (TB7) should also be connected to the earth screw (\oplus).

② How to use the conduit mounting plate

- (1) Conduit mounting plates ($\varnothing 27$, $\varnothing 33$, $\varnothing 40$) are being provided. Select conduit mounting plate based on the outside diameter of conduit to be used and mount it as shown in the figure.
- (2) Fix power source wiring to control box by using buffer bushing for tensile force (PG connection or the like)

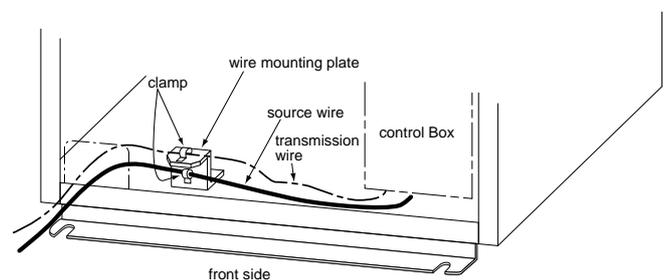


- Ⓐ $\varnothing 27$ mounting hole
- Ⓑ $\varnothing 30$ mounting hole
- Ⓒ $\varnothing 40$ knockout hole
- Ⓓ For the connecting of conduit at bottom
- Ⓔ $\varnothing 40$ mounting hole
- Ⓕ For the connecting of conduit at front
- Ⓖ The front of outdoor unit

③ How to use the wire mounting plate

When the power source and transmission lines are wired through the knock-out hole of the left wiring/front piping, it is necessary to attach the mounting plate onto the base of the front of the compressor with two screws.

In this case, the power source should be fastened with a lower clamp and the transmission line with an upper clamp as shown.



10.3. Wiring transmission cables

① Types of control cables

1. Wiring transmission cables

- Types of transmission cables
Shielding wire CVVS or CPEVS
- Cable diameter
More than 1.25 mm²
- Maximum wiring length Within 200 m

2. Remote control cables

Kind of remote control cable	2-core cable (unshielded)
Cable diameter	0.5 to 0.75 m ²
Remarks	When 10 m is exceeded, use cable with the same specifications as (1) Transmission line wiring.

② Wiring examples

Typical wiring examples are shown on pages **26** to **29**.

- Names, symbols, and number of connectable units

Name	Symbol	Number of connectable units
Outdoor unit controller	OC	
Indoor Unit Controller	IC	OC1: From 1 to 13 Units (PUHY-200, PUY-200), From 1 to 16 Units (PUHY-250, PUY-250)
Remote controller	RC	Max. 2 in 1 group

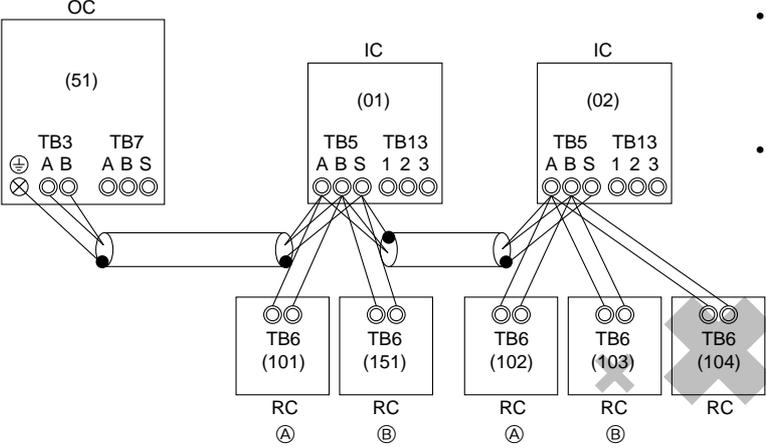
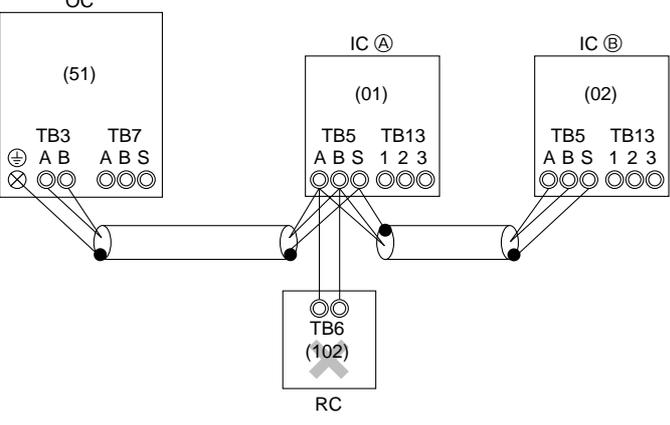
Note:

The IC and RC are limited to a maximum of 35 units.

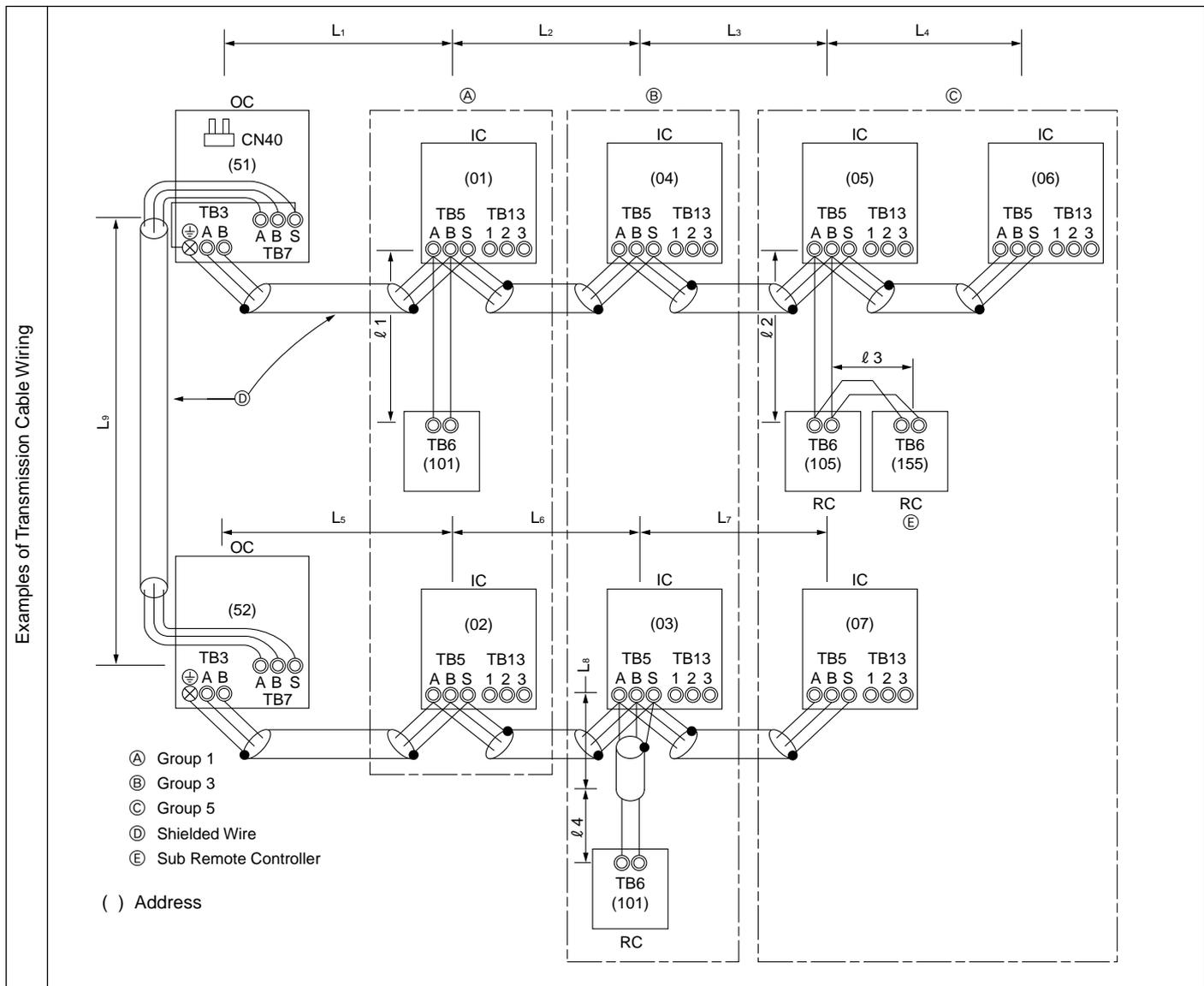
A. Example of a single-outdoor-unit system (Shielding wires and address setting are necessary.)

Example of Wiring Control Cables	Wiring Method and Address Setting																		
<p>1. Standard Operation</p> <ul style="list-style-type: none"> • One remote controller for each indoor unit. • Inside () Address: There is no need for setting the 100 position on the remote controller. 	<p>a. Use feed wiring to connect terminals A and B on transmission cable block (TB3) for the outdoor unit (OC) to terminals A and B on the transmission cable block (TB5) of each indoor unit (IC). Use non-polarized two wire. To ground the shielded wire, use cross-over wiring from the ground terminal E on the outdoor unit and terminal S on the indoor unit (TB5).</p> <p>b. Connect terminals A and B on the transmission cable block (TB5) for each indoor unit with the terminal block (TB6) for the remote controller (RC).</p> <p>c. Set the address setting switch as shown below. * To set the outdoor unit address to 100, the outdoor address setting switch must be set to 50.</p> <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Unit</th> <th>Range</th> <th>Setting Method</th> </tr> </thead> <tbody> <tr> <td>Indoor Unit</td> <td>01 to 50</td> <td>—</td> </tr> <tr> <td>Outdoor Unit</td> <td>51 to 100</td> <td>Use the most recent address of all the indoor units plus 50.</td> </tr> <tr> <td>Remote Controller</td> <td>101 to 150</td> <td>Indoor unit address plus 100.</td> </tr> </tbody> </table>	Unit	Range	Setting Method	Indoor Unit	01 to 50	—	Outdoor Unit	51 to 100	Use the most recent address of all the indoor units plus 50.	Remote Controller	101 to 150	Indoor unit address plus 100.						
Unit	Range	Setting Method																	
Indoor Unit	01 to 50	—																	
Outdoor Unit	51 to 100	Use the most recent address of all the indoor units plus 50.																	
Remote Controller	101 to 150	Indoor unit address plus 100.																	
<p>2. Operation Using Two Remote controllers</p> <ul style="list-style-type: none"> • Using two remote controllers for each indoor unit. <p style="text-align: right;"> (A) Main Remote Controller (B) Sub Remote Controller </p>	<p>a. Same as above</p> <p>b. Same as above</p> <p>c. Set the address switch as shown below. * To set the outdoor unit address to 100, the outdoor address setting switch must be set to 50.</p> <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Unit</th> <th>Range</th> <th>Setting Method</th> </tr> </thead> <tbody> <tr> <td>Indoor Unit</td> <td>01 to 50</td> <td>—</td> </tr> <tr> <td>Outdoor Unit</td> <td>51 to 100</td> <td>Use the most recent address of all the indoor units plus 50.</td> </tr> <tr> <td>Main Remote Controller</td> <td>101 to 150</td> <td>Indoor unit address plus 100.</td> </tr> <tr> <td>Sub Remote Controller</td> <td>151 to 200</td> <td>Indoor unit address plus 150.</td> </tr> </tbody> </table>	Unit	Range	Setting Method	Indoor Unit	01 to 50	—	Outdoor Unit	51 to 100	Use the most recent address of all the indoor units plus 50.	Main Remote Controller	101 to 150	Indoor unit address plus 100.	Sub Remote Controller	151 to 200	Indoor unit address plus 150.			
Unit	Range	Setting Method																	
Indoor Unit	01 to 50	—																	
Outdoor Unit	51 to 100	Use the most recent address of all the indoor units plus 50.																	
Main Remote Controller	101 to 150	Indoor unit address plus 100.																	
Sub Remote Controller	151 to 200	Indoor unit address plus 150.																	
<p>3. Group Operation</p> <ul style="list-style-type: none"> • Operating multiple indoor units using one remote controller. <p style="text-align: right;"> (A) Main (B) Sub </p>	<p>a. Same as above</p> <p>b. Connect terminals A and B on transmission cable terminal block (TB5) of the IC main unit with the most recent address within the same indoor unit (IC) group to terminal block (TB6) on the remote controller.</p> <p>c. Set the address setting switch as shown below. * To set the outdoor unit address to 100, the outdoor address setting switch must be set to 50.</p> <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Unit</th> <th>Range</th> <th>Setting Method</th> </tr> </thead> <tbody> <tr> <td>IC (Main)</td> <td>01 to 50</td> <td>Use the most recent address within the same group of indoor units.</td> </tr> <tr> <td>IC (Sub)</td> <td>01 to 50</td> <td>Use an address, other than that of the IC (Main) from among the units within the same group of indoor units. This must be in sequence with the IC (Main).</td> </tr> <tr> <td>Outdoor Unit</td> <td>51 to 100</td> <td>Use the most recent address of all the indoor units plus 50.</td> </tr> <tr> <td>Main Remote Controller</td> <td>101 to 150</td> <td>Set at an IC (Main) address within the same group plus 100.</td> </tr> <tr> <td>Sub Remote Controller</td> <td>151 to 200</td> <td>Set at an IC (Main) address within the same group plus 150.</td> </tr> </tbody> </table> <p>d. Use the indoor unit (IC) within the group with the most functions as the IC (Main) unit.</p>	Unit	Range	Setting Method	IC (Main)	01 to 50	Use the most recent address within the same group of indoor units.	IC (Sub)	01 to 50	Use an address, other than that of the IC (Main) from among the units within the same group of indoor units. This must be in sequence with the IC (Main).	Outdoor Unit	51 to 100	Use the most recent address of all the indoor units plus 50.	Main Remote Controller	101 to 150	Set at an IC (Main) address within the same group plus 100.	Sub Remote Controller	151 to 200	Set at an IC (Main) address within the same group plus 150.
Unit	Range	Setting Method																	
IC (Main)	01 to 50	Use the most recent address within the same group of indoor units.																	
IC (Sub)	01 to 50	Use an address, other than that of the IC (Main) from among the units within the same group of indoor units. This must be in sequence with the IC (Main).																	
Outdoor Unit	51 to 100	Use the most recent address of all the indoor units plus 50.																	
Main Remote Controller	101 to 150	Set at an IC (Main) address within the same group plus 100.																	
Sub Remote Controller	151 to 200	Set at an IC (Main) address within the same group plus 150.																	

Combinations of 1 through 3 above are possible.

Permissible Lengths	Prohibited Items
<p>Longest Transmission Cable Length (1.25 mm²) $L_1 + L_2, L_2 + L_3, L_3 + L_1 \leq 200$ meters Remote Controller Cable Length 1 If 0.5 to 0.75 mm² $l_1, l_2 \leq 10$ meters 2 If the length exceeds 10 meters, the exceeding section should be 1.25 mm² and that section should be a value within the total extension length of the transmission cable and maximum transmission cable length (L₃).</p>	 <ul style="list-style-type: none"> Use the indoor unit (IC) address plus 150 as the sub remote controller address. In this case, it is 152. Three or more remote controllers (RC) cannot be connected to one indoor unit. <p>(A) Main (B) Sub</p>
Same as above	Same as above
Same as above	 <ul style="list-style-type: none"> The remote controller address is the indoor unit main address plus 100. In this case, it is 101. <p>(A) Main (B) Sub</p>

B. Example of a group operation system with multiple outdoor units (Shielding wires and address setting are necessary.)

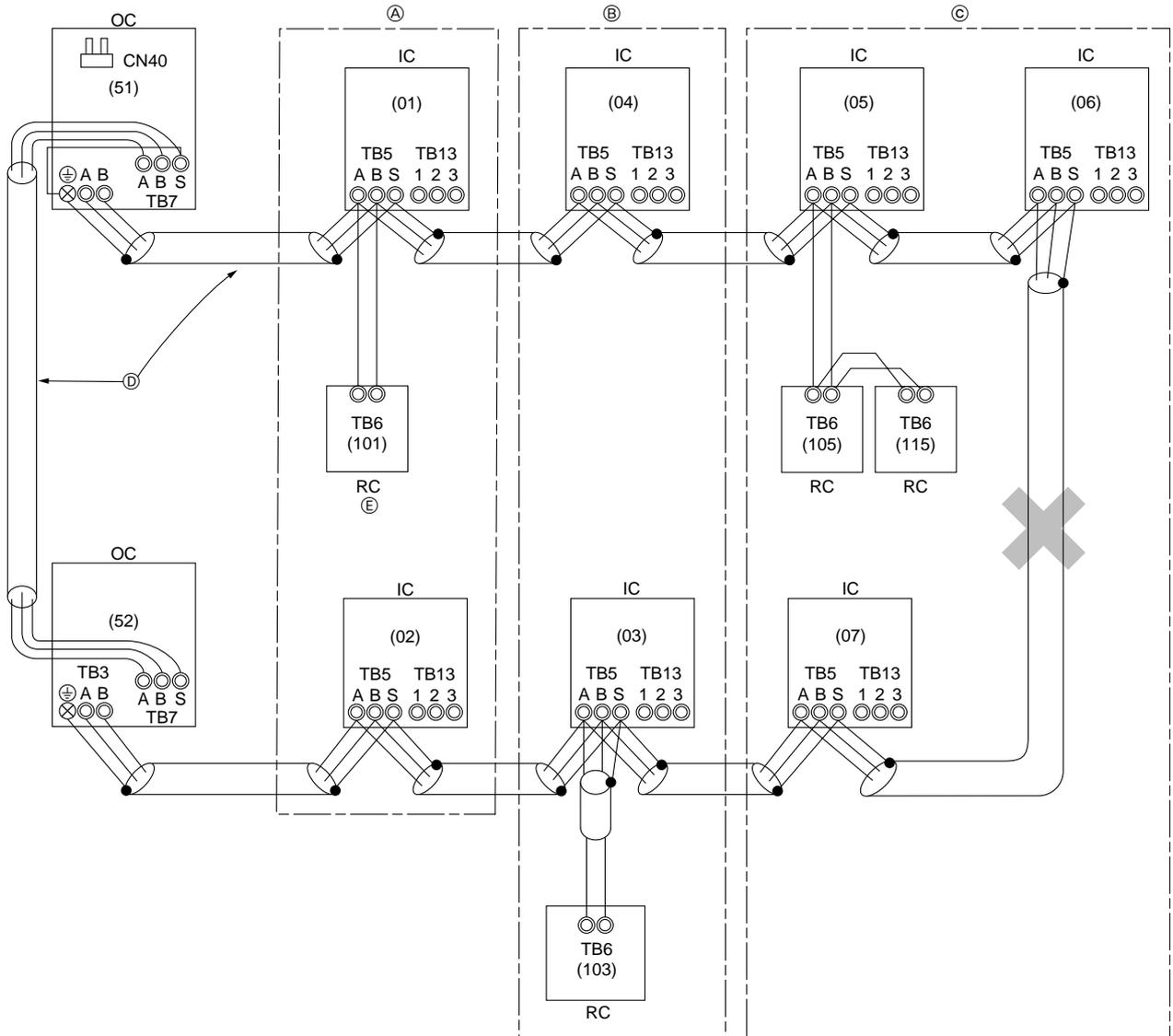


- Wiring Method and Address Settings
- Always use shielded wire when making connections between the outdoor unit (OC) and the indoor unit (IC), as well for all OC-OC, and IC-IC wiring intervals.
 - Use feed wiring to connect terminals A and B and the ground terminal on the transmission cable terminal block (TB3) of each outdoor unit (OC) to terminals A, B and terminal S on the transmission cable block of the indoor unit (IC).
 - Connect terminals A and B on the transmission cable terminal block of the indoor unit (IC) that has the most recent address within the same group to the terminal block (TB6) on the remote controller (RC).
 - Connect together terminals M1, M2 and terminal S on the terminal block for central control (TB7) for the outdoor unit (OC).
 - On one outdoor unit only, change the jumper connector on the control panel from CN41 to CN40.
 - Connect the terminal S on the terminal block for central control (TB7) for the outdoor unit (OC) for the unit into which the jumper connector was inserted into CN40 in Step above to the ground terminal (⊕) in the electrical component box.
 - Set the address setting switch as follows.
 - * To set the outdoor unit address to 100, the outdoor address setting switch must be set to 50.
- | Unit | Range | Setting Method |
|------------------------|------------|---|
| IC (Main) | 01 to 50 | Use the most recent address within the same group of indoor units. |
| IC (Sub) | 01 to 50 | Use an address, other than that of the IC (Main) from among the units within the same group of indoor units. This must be in sequence with the IC (Main). |
| Outdoor Unit | 51 to 100 | Use the most recent address of all the indoor units plus 50. |
| Main Remote Controller | 101 to 150 | Set at an IC (Main) address within the same group plus 100. |
| Sub Remote Controller | 151 to 200 | Set at an IC (Main) address within the same group plus 150. |
- The group setting operations among the multiple indoor units is done by the remote controller (RC) after the electrical power has been turned on.

Permissible Lengths

- Max length via outdoor units : $L_1+L_2+L_3+L_4+L_5+L_6+L_7+L_9$,
 $L_1+L_2+L_3+L_4+L_5+L_6+L_7+L_9 \leq 500$ meters (1.25 mm²)
- Max transmission cable length : $L_1+L_2+L_3+L_4+L_5+L_6+L_7$, $L_5+L_6+L_8$, $L_7+L_8 \leq 200$ meters (1.25 mm²)
- Remote controller wire length : $l_1, l_2, l_3, l_4 \leq 10$ meters (0.5 to 0.75 mm²)
 If the length exceeds 10 meters, use a 1.25 mm² shielded wire. The length of this section (L_s) should be included in the calculation of the maximum length and overall length.

Prohibited Items

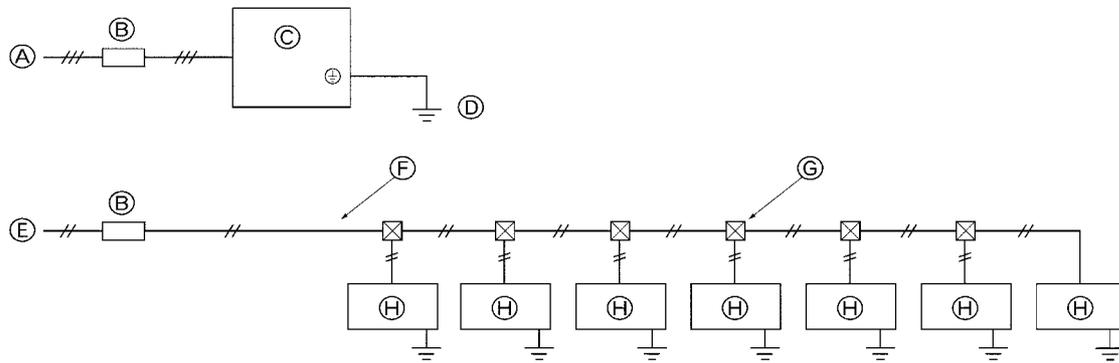


- Ⓐ Group 1
- Ⓑ Group 3
- Ⓒ Group 5
- Ⓓ Shielded Wire
- Ⓔ Remote Controller

- The terminal S on the terminal block (TB7) for the central control panel should be connected to the ground terminal (⊕) of the electric components box of the only outdoor unit installed with the CN40 into which the jumper connector was inserted.
- Never connect together the terminal blocks (TB5) for transmission wires for indoor units (IC) that have been connected to different outdoor units (OC).
- Set all addresses to ensure that they are not overlapped.

10.4. Wiring of main power supply and equipment capacity

Schematic Drawing of Wiring (Example)



- Ⓐ Power Supply (3-Phase, 3-Wire) 220 Volt
- Ⓑ Switch (Breakers for Wiring and Current Leakage)
- Ⓒ Outdoor Unit
- Ⓓ Ground

- Ⓔ Power Supply (Single-Phase) 220 Volt
- Ⓕ 1.6 mm or more
- Ⓖ Pull Box
- Ⓗ Indoor Unit

Thickness of Wire for Main Power Supply and On/Off Capacities

Model		Minimum Wire Thickness (mm ²)			Switch (A)		Breaker for Wiring (NFB)	Breaker for Current Leakage
		Main Cable	Branch	Ground	Capacity	Fuse		
Outdoor Unit	PUHY-200 PUY-200	8.0	–	3.5	60	50	50 A	50 A 100 mA 0.1 s. or less
	PUHY-250 PUY-250	14.0	–	3.5	60	50	50 A	50 A 100 mA 0.1 s. or less

Model		Wire Thickness (mm)			Switch (A)		Breaker for Wiring	Breaker for Current Leakage
		Main Cable	Branch	Ground	Capacity	Fuse		
Indoor Unit	All Models	1.6	1.6	1.6	15	15	20 A	20 A 30 mA 0.1 s. or less

1. Use a separate power supply for the outdoor unit and indoor unit.
2. Bear in mind ambient conditions (ambient temperature, direct sunlight, rain water, etc.) when proceeding with the wiring and connections.
3. The wire size is the minimum value for metal conduit wiring. The power cord size should be 1 rank thicker consideration of voltage drops. Make sure the power-supply voltage does not drop more than 10%.
4. Specific wiring requirements should adhere to the wiring regulations of the region.
5. Power supply cords of parts of appliances for outdoor use shall not be lighter than polychloroprene sheathed flexible cord (design 245 IEC57). For example, use wiring such as YZW.

⚠ Warning:

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

⚠ Caution:

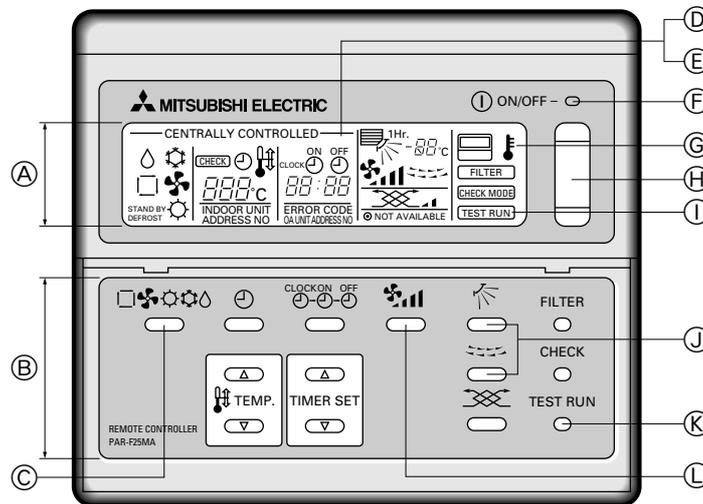
- Some installation site may require attachment of an earth leakage breaker. If no earth leakage breaker is installed, it may cause an electric shock.
- Do not use anything other than breaker and fuse with correct capacity. Using fuse and wire or copper wire with too large capacity may cause a malfunction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

11. Test run

11.1. Checking before getting test run

1	Check to see whether there are refrigerant leakage, and slack of power or transmission cable.
2	<p>Confirm that 500 V megger shows 1.0 MΩ or more between power supply terminal block and ground. Do not operate in the case of 1.0 MΩ or less.</p> <p>NOTE: Never carry out megohm check over terminal block for transmission. Otherwise the control board would be broken.</p> <p>Immediately after mounting the unit or after leaving it turned off for an extended length of time, the resistance of the insulation between the power supply terminal block and the ground may decrease to approx. 1 MΩ as a result of refrigerant accumulating in the internal compressor.</p> <p>If the insulation resistance is more than 1 MΩ, turning on the main power supply and energizing the crankcase heater for more than 12 hours will cause the refrigerant to evaporate, increasing the insulation resistance.</p>
3	<p>Check to see whether both gas and liquid valves are fully open.</p> <p>NOTE: Be sure to tighten caps.</p>
4	<p>Check the phase sequence and the voltage between phases.</p> <p>NOTE: If the phase sequence is reversed, an error (4103) may occur when a test run is made, causing the unit to stop.</p>
5	Turn on universal power supply at least 12 hours before getting test run in order to carry current to crank case heater. If current-carrying hours are too short, it may result in a malfunction of compressor.

11.2. Test run method



- A Display panel
- B Control panel
- C Cooling/Heating select button ③, ④
- D Check code indicator (see note 1)
- E Test run remaining time indicator (see note 3)
- F ON/OFF LED (Lights up in operation)
- G Indoor unit liquid pipe temperature indicator (See note 4)
- H ON/OFF button ⑧
- I Test run indicator
- J Wind adjust button ⑥
- K Test run button ②
- L Air blow adjust button ⑤

Operation procedure	
①	Turn on universal power supply at least 12 hours before getting started → displaying "HO" on display panel for about two minutes. The universal power supply must be left on for at least 12 hours (with the crank case heater turned on).
②	Press [TEST RUN] button twice → displaying "TEST RUN" on display panel.
③	Press [Cooling/Heating] select button → make sure that air is blowing out.
④	Press [Cooling/Heating] select button to change from cooling to heating operation, and vice versa → make sure that warm or cold air is blowing out.
⑤	Press [Wind] adjust button → make sure that air blow is changed.
⑥	Press [Up/Down Wind] or [Louver] button to change wind → Make sure that horizontal or downward blow is adjustable.
⑦	→ Make sure that indoor unit fans operate normally.
⑧	Make sure that interlocking devices such as ventilator operate normally if any.
⑨	Press [ON/OFF] button to cancel test run → Stop operation.
NOTE 1: If check code is displayed on remote controller or remote controller does not operate normally, see page 32 or further.	
NOTE 2: Test run automatically stops operating after two hours by activation of timer set to two hours.	
NOTE 3: During test run, test run remaining time is displayed on time display section.	
NOTE 4: During test run, temperature of liquid pipe in indoor unit is displayed on remote controller room temp. display section.	
NOTE 5: When pressing [Wind] adjust button, depending on the model, "This function is not available" may be displayed on remote controller. However, it is not a malfunction.	

11.3. How to cope with test run abnormality

① A 4-digit check code is displayed on remote controller display panel if unit is stopped due to a trouble. Check to see causes of that trouble.

1. Indoor unit

Check code	Abnormality	Check code	Abnormality
2500	Water leakage abnormality	6603	Transmission error (Transmission route BUSY)
2502	Drain pump error	6606	Transmission and reception error (Communication trouble with transmission processor)
2503	Drain sensor error, Float switch on		
5101	Air inlet sensor error		
5102	Piping sensor error		
5103	Piping sensor error in the gas side	6607	Transmission and reception error (No ACK error)
6600	Duplicated unit address setting	6608	Transmission and reception error (No responsive frame error)
6602	Transmission error (Transmission processor hardware error)	7101	Capacity code error
		7111	Remote controller sensor error

2. Outdoor unit

Check code	Abnormality	Check code	Abnormality
0403	Serial transmission malfunction	5105	Piping temperature sensor error (TH5)
1102	Discharge temperature abnormality	5106	Outdoor temperature sensor error (TH6)
1111	Low pressure saturated temperature abnormality (Detected by saturated temperature sensor)	5107	Subcool coil liquid outlet temperature sensor error (TH7)
1112	Low pressure saturated temperature abnormality (Detected by liquid level detecting temperature sensor)	5108	Subcool coil bypass outlet temperature sensor error (TH8)
		5110	Inverter cooling plate temperature sensor error (THHS)
1113	Low pressure saturated temperature abnormality (Detected by liquid level detecting temperature sensor)	5201	High-pressure sensor (HPS) error
1302	High pressure abnormality	5301	IDC sensor circuit error
1500	Excessive refrigerant replenishment	6600	Duplicated unit address setting
1505	Low pressure abnormality	6602	Transmission error (Transmission processor hardware error)
4103	Reverse phase	6603	Transmission error (Transmission route BUSY)
4115	Power supply simultaneous signal abnormality	6606	Transmission and reception error (Communication trouble with transmission processor)
4200	VDC/IDC detection circuit error		
4210	Overcurrent interruption	6607	Transmission and reception error (No ACK error)
4220	Inverter bus line voltage low	6608	Transmission and reception error (No responsive frame error)
4230	Overheat protection of radiator panel		
4240	Overcurrent protection	7100	Total capacity error
4260	Cooling fan abnormality	7101	Capacity code error
5101	Discharge temperature sensor error (TH1)	7102	Connecting unit number error
5102	Low pressure saturated temperature error (TH2)	7105	Address set error
5103	Liquid surface detecting temperature sensor error (TH3)	7109	Incorrect connection
5104	Liquid surface detecting temperature sensor error (TH4)	7130	Incorrect setup

3. Remote controller

Check code	Abnormality	Check code	Abnormality
6101	Unreadable response receiving error	6607	Transmission and reception error (No ACK error)
6600	Duplicated unit address setting	6608	Transmission and reception error (No responsive frame error)
6602	Transmission error (Transmission processor hardware error)		
6603	Transmission error (Transmission route BUSY)		
6606	Transmission and reception error (Communication trouble with transmission processor)		

② **Diagnostic switch (SW1) and the service LED on multi-controller board of indoor unit can be used to judge a malfunction of outdoor unit.**
 <Operation of self-diagnosis switch (SW1) and the service LED display>

Self-diagnosing item	SW1 setting	Display at LED lighting (blinking) Remarks									
		Flag 1	Flag 2	Flag 3	Flag 4	Flag 5	Flag 6	Flag 7	Flag 8		
①	Relay output display 1 (Lighting)		During compressor run	Crank case heater	21S4 *	SV1	SV2			Always lighting	Flag 8 always lights at microcomputer power ON * only for PUHY
	Check display 1 (Blinking)		0000 to 9999 (Alternate display of address and error code)								
	Relay output display 2								SSR		
②	Check indoor unit		No.1 unit	No.2 unit	No.3 unit	No.4 unit	No.5 unit	No.6 unit	No.7 unit	No.8 unit	Lights at emergency stop in IC Turns off by resetting
	Check indoor unit		No.9 unit	No.10 unit	No.11 unit	No.12 unit	No.13 unit	No.14 unit	No.15 unit	No.16 unit	
	Indoor unit mode		No.1 unit	No.2 unit	No.3 unit	No.4 unit	No.5 unit	No.6 unit	No.7 unit	No.8 unit	Lights at cooling Blinks at heating Turns off at stop/fan
	Indoor unit mode		No.9 unit	No.10 unit	No.11 unit	No.12 unit	No.13 unit	No.14 unit	No.15 unit	No.16 unit	
	Indoor unit thermostat		No.1 unit	No.2 unit	No.3 unit	No.4 unit	No.5 unit	No.6 unit	No.7 unit	No.8 unit	Lights at thermostat on Turns off at thermostat off
	Indoor unit thermostat		No.9 unit	No.10 unit	No.11 unit	No.12 unit	No.13 unit	No.14 unit	No.15 unit	No.16 unit	
	Indoor unit address		Displays in order the addresses (1 through 50) of all indoor units connected to the outdoor unit.								

- ① Outdoor unit ② Indoor unit
 (A) ON (B) OFF (C) At factory shipment

Displaying the service LED

Service LED (LD1) 8888

- Error code display
Alternate display of error generating address and error code
Example At outdoor unit address 51, abnormal discharge temperature (Code 1102)
- Flag display
Example SV1 ON under compressor operation

051

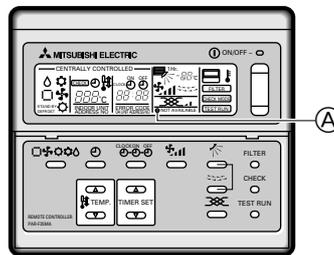
 → 1102

1 1 1

↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑
 (A) (B) (C) (D) (E) (F) (G) (H)

- (A) Flag 1 (E) Flag 5
- (B) Flag 2 (F) Flag 6
- (C) Flag 3 (G) Flag 7
- (D) Flag 4 (H) Flag 8

11.4. Coping with remote controller abnormality



(A) Display: Appears when current is carried

	Phenomenon	Cause	How to cope with abnormality
1	Unit does not operate and display stays off even after pressing remote controller ON switch. (Current-carrying indicator does not light up)	(1) Outdoor unit power was not turned on. (2) Transmission or remote controller cable was shorted or connection failure. (3) Power cable contact failure (4) Remote controller was erroneously connected to unit remote controller terminal block. (5) Too many remote controllers or indoor units were connected.	(a) Check voltage between remote controller terminals. (i) Remote controller fails when voltage is 17 to 30 V. (ii) If there is no voltage <ul style="list-style-type: none"> • Check the number of remote controllers and indoor units connected • Remove wire from transmission cable terminal block (TB3) on outdoor unit, and check voltage between terminals. <ul style="list-style-type: none"> • If voltage is 17 to 30 V, check (2) and (4) at left. • If there is no voltage, check (1) and (3) at left.
2	"HO" indicator does not disappear. Unit does not operate even if the switch is pressed.	(1) No transmission cable was connected to transmission cable terminal block on the indoor unit. (2) Outdoor unit address was erroneously set (3) Indoor unit address was erroneously set.	<ul style="list-style-type: none"> • Check all items at left.
3	Display comes on once but disappears immediately after a press of the switch.	(1) Indoor unit power was not turned on.	<ul style="list-style-type: none"> • Check item at left.

11.5. The following phenomena do not represent abnormality (emergency)

* The PUY cannot perform the heating operation.

Phenomenon	Display of remote controller	Cause
Indoor unit does not perform cooling (heating) operation.	"Cooling (heating)" flashes	When another indoor unit is performing the heating (cooling) operation, the cooling (heating) operation is not performed.
The auto vane runs freely.	Normal display	Because of the control operation of auto vane, it may change over to horizontal blow automatically from the downward blow in cooling in case the downward blow operation has been continued for 1 hour. At defrosting in heating, hot adjusting and thermostat OFF, it automatically changes over to horizontal blow.
Fan setting changes during heating.	Normal display	Ultra-low speed operation is commenced at thermostat OFF. Light air automatically changes over to set value by time or piping temperature at thermostat ON.
Fan stops during heating operation.	Defrost display	The fan is to stop during defrosting.
Fan does not stop while operation has been stopped.	No lighting	Fan is to run for 1 minute after stopping to exhaust residual heat (only in heating).
No setting of fan while start SW has been turned on.	Heat ready	Ultra low-speed operation for 5 minutes after SW ON or until piping temperature becomes 35°C, low speed operation for 2 minutes thereafter, and then set notch is commenced. (Hot adjust control)
Outdoor unit does not operate by turning switch on.	Normal display	When the outdoor unit is being cooled and the refrigerant is resting, warming up operation is performed for at least 35 minutes to warm the compressor. During this time, only the fan operates.
Indoor unit remote controller shows "HO" indicator for about two minutes when turning ON universal power supply.	"HO" flashes	System is being driven. Operate remote controller again after "HO" disappear.
Drain pump does not stop while unit has been stopped.	Light out	After a stop of cooling operation, unit continues to operate drain pump for three minutes and then stops it.
Drain pump continues to operate while unit has been stopped.		Unit continues to operate drain pump if drainage is generated, even during a stop.

This product is designed and intended for use in the residential,
commercial and light-industrial environment.

Please be sure to put the contact address/telephone number on
this manual before handing it to the customer.

 **mitsubishi electric corporation**

HEAD OFFICE MITSUBISHI DENKI BLDG MARUNOUCHI TOKYO 100-8310 TELEX J24532 CABLE MELCO TOKYO