

Installation Manual for Multi-Kits

Piping Connection Kit Models: MC-NP21SA1, MC-NP30SA1

NOTICE

After installation, it is recommended to give this manual to customer for future reference.

1. Applicable Outdoor Units

These multiple piping connecting kits can be applied to the R410A VRF heat pump systems.

Name	Piping Connection Kit for Heat Pump System	
Model	MC-NP21SA1	MC-NP30SA1
Application	For 2 Modules	For 3 Modules

2. Transportation

Transport this product as close to the installation site as is practical before unpacking. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete



Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance of its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.


Product Inspection Upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
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- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a wet cloth (quenching cloth) and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
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- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.

- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adapter. If you do, you may have condensate water dripping back which may cause leaks.
- Be sure the condensate hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions



To reduce the risk of serious injury or death, the following installation precautions must be followed:

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the condensate pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the condensate pipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the "Safety Precautions" use and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. The installation should meet requirements in ASHRAE Standards 15 and 34. If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.

- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Verify that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.






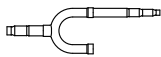
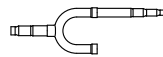
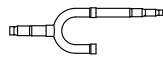







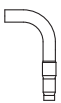
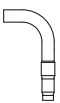













Do not place any material on this product

3. Before Installation

IMPORTANT! Verify that you have all the parts in the kit as listed in the table below.

NOTICE:

If any of these parts are missing, please contact your distributor. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

Model		MC-NP21SA1		MC-NP30SA1				
				Piping Connection Kit 1		Piping Connection Kit 2		
Name of Parts		Qty.		Qty.		Qty.		
Branch Pipe for Gas Line			1		1		1	
Branch Pipe for Liquid Line			1		1		1	
Accessory	Insulation for Gas Line		1 set		1 set		1 set	
	Insulation for Liquid Line		1 set		1 set		1 set	
	Reducer for Gas Line Connection (For Field Pipe Connection)		1		1		1	
			1		1		1	
			1		1		1	
	Reducer for Liquid Line Connection (For Field Pipe Connection)		1		1		1	
		-	None		1	-	None	
		Tape			2		2	

4. Installation Work

4.1 Piping Connection Size

The ends of the multi-kits are finished as shown in the following figures. Cut the end of the pipe to correspond to the pipe size.



Allow adequate space for elbow, angled, and irregular piping arrangements to compensate for expansion and contraction brought on by temperature change.

Unit: inch, ID: Inner Diameter, OD: Outer Diameter

Model	Branch Pipe for Gas Line	Branch Pipe for Liquid Line	Reducer for Gas Line	Reducer for Liquid Line
MC-NP21SA1				
MC-NP30SA1	<p>Piping Connection Kit 1</p>	<p>(To Piping Connection Kit 2)</p>		
	<p>Piping Connection Kit 2</p>			

4.2 Installation Position

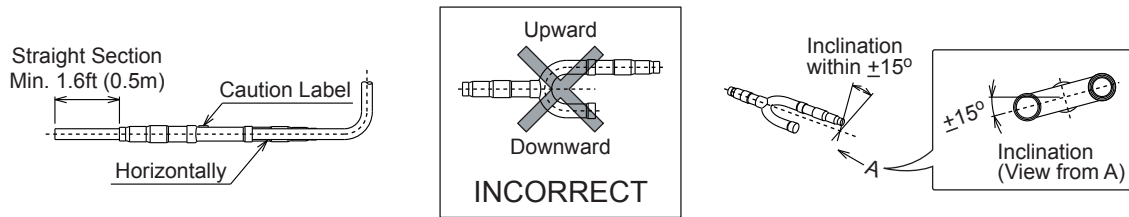
- Horizontal Installation

Locate the branch pipes to become the “Y” union pipe section with the affixed caution label.
(Inclination within $\pm 15^\circ$)

Make the straight section a minimum of 1.6ft (0.5m) after the vertical bend.

NOTICE:

Incorrect installation can result in the failure of the outdoor unit.



4.3 Piping Connection

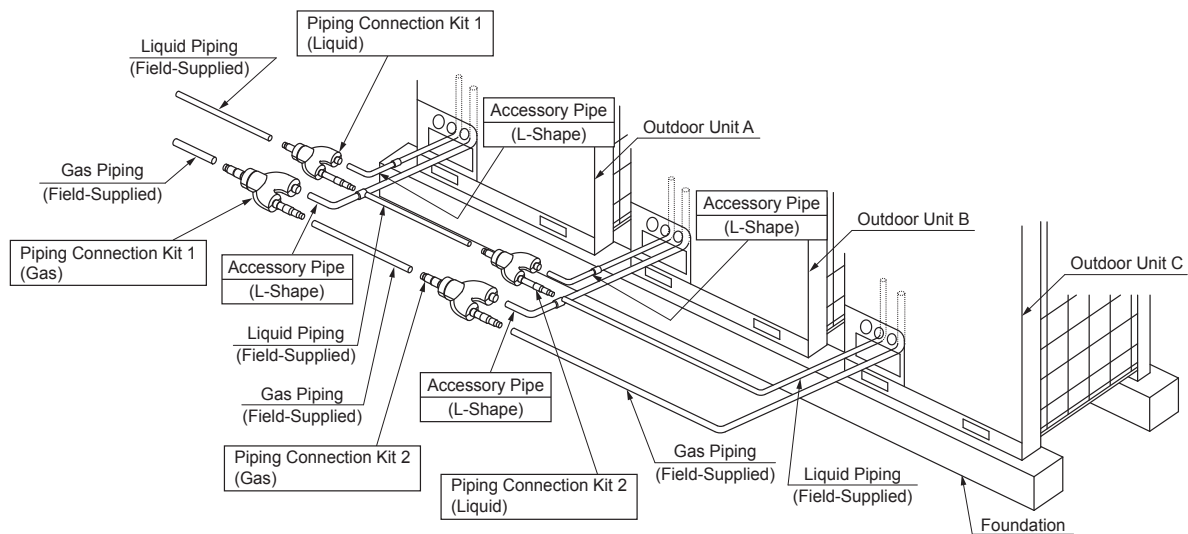
Perform piping connections work by referring to the figure below.

Refer to the installation and maintenance manual of each outdoor units for details of piping connections work and piping length.

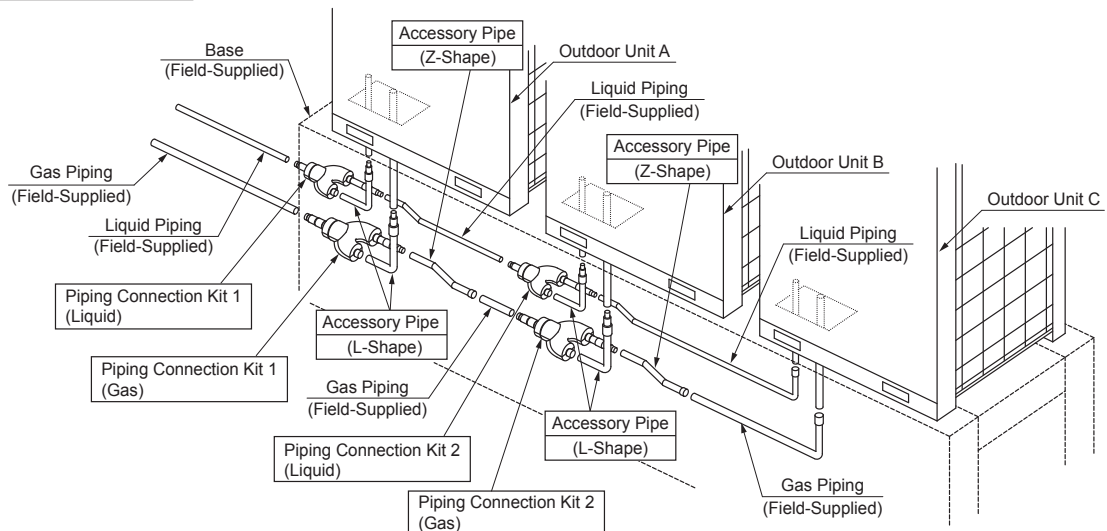
Example: Combination of three Outdoor Units

Use the field-supplied connecting pipe in accordance with the installation and maintenance manual for the outdoor units. If necessary, use a reducer (accessory).

Front Side Piping Connection

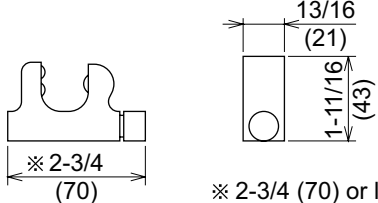


Downward Piping Connection

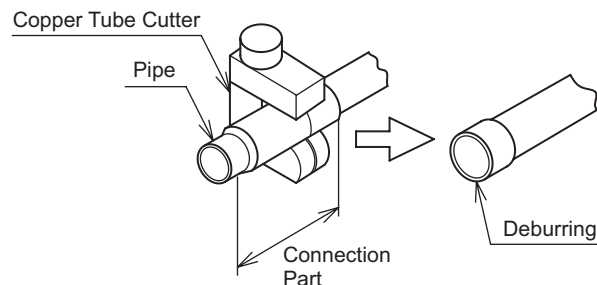


4.4 Piping Work

- When the branched pipe size is 7/8 inch (22.2mm) or less in inner diameter, a field-supplied mini-copper tube cutter is required.

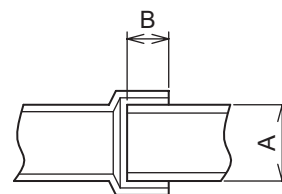
		inch (mm)	
Recommended Mini-Copper Tube Cutter		Available Cut Size	Rotating Radius
		$\phi 3/16 - 1-1/8$ ($\phi 5 - 28$)	1-15/16 (50)

- Use clean copper pipes without any moisture or foreign materials on inner surface of pipes. When connecting refrigerant pipe, cut the copper pipes with a copper tube cutter as shown below. Also deburr the cutting edge using deburring tool to ensure that no burr goes inside the pipe. Blow-out the pipes with nitrogen or compressed air to ensure that no dust remains inside the pipe. Do NOT use a saw, a grindstone or other tools which causes a large amount of powder residue when cutting.

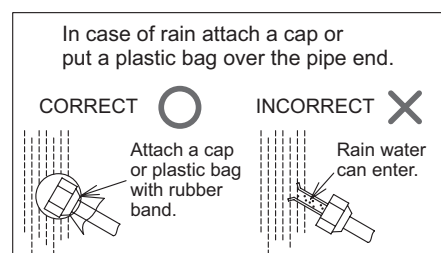
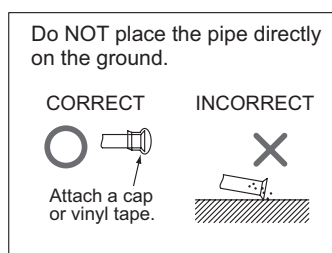
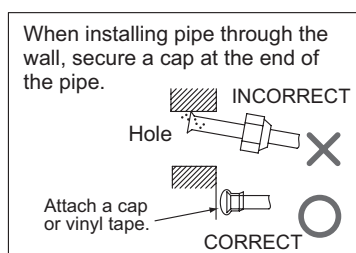


- When cutting the pipe, allow for an adequate depth for brazing as shown in the following table.

inch (mm)	
Diameter (A)	Min. Insertion Depth (B)
$3/16 \leq A < 5/16$ ($5 \leq A < 8$)	1/4 (6)
$5/16 \leq A < 1/2$ ($8 \leq A < 12$)	9/32 (7)
$1/2 \leq A < 5/8$ ($12 \leq A < 16$)	5/16 (8)
$5/8 \leq A < 1$ ($16 \leq A < 25$)	3/8 (10)
$1 \leq A < 1-3/8$ ($25 \leq A < 35$)	1/2 (12)
$1-3/8 \leq A < 1-3/4$ ($35 \leq A < 45$)	9/16 (14)



• Caution for Refrigerant Piping



4. Do not open these stop valves until all the refrigerant piping are connected, pressure tested, and vacuumed.
5. Blow-out the inside of the pipes with nitrogen gas before brazing. Bleed nitrogen gas through piping during brazing. Pressure not to exceed 2.9psi (0.02MPa).

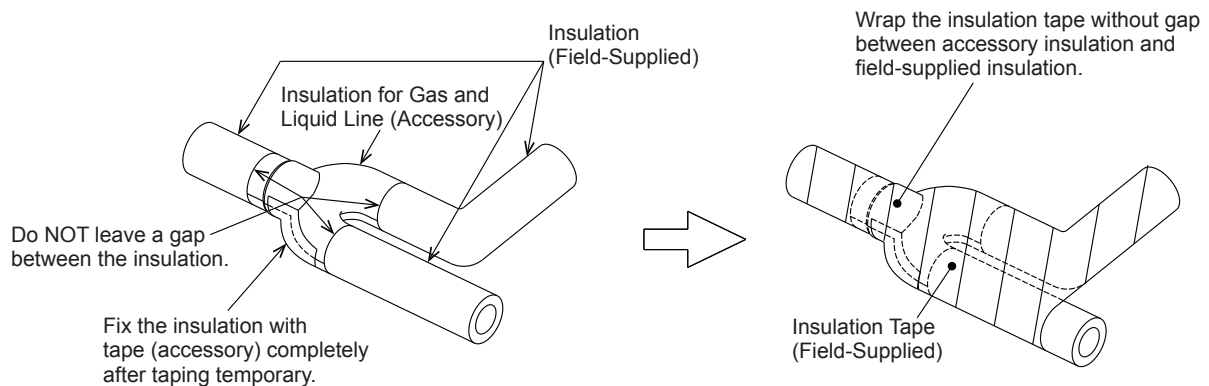
⚠ DANGER

Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, and catch on fire, toxic gas will be generated. Fluorocarbon, which is heavier than air, will form on the floor surface and could cause suffocation.

6. The airtight test pressure for this product is 601psi (4.15MPa).
7. Install the field-supplied insulation with these multi-kits to each branch (liquid side and gas or vapor side), with tape. Also, apply the field-supplied insulation for these units.

NOTICE

When polyethylene foam is applied, a thickness of 3/8 inch (10mm) for liquid piping and 9/16 to 13/16 inch (15 to 20mm) for gas piping is recommended. (Use a grade of insulation with heat resistance of 212°F (100°C) for gas piping.)



⚠ CAUTION

- Perform insulation work only when the surface temperature of the pipe material has cooled to room temperature. Anything done immediately after brazing can cause the insulation to melt.
- During piping work, always cover over or plug the open end to keep the inside free of dust and moisture.

After installation, it is recommended that the customer retain this manual for future reference.