

# **NORTEK GLOBAL HVAC, LLC**

## **Owner's Manual** **Installation Instructions**

Cold Climate Heat Pump Systems

Outdoor Units



Outdoor Models:      GXH09(2.6)KSK4DH  
                                 GXH12(3.5)KSK4DH  
                                 GXH18(5.2)KSK4DH

- Please read this owner's manual carefully before operation and retain for future reference.
- Specifications & illustrations subject to change without notice or incurring obligations.
- If you have lost the owner's manual, please visit [www.NortekHVAC.com](http://www.NortekHVAC.com) for electronic version.



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## User Notice

Children and persons with reduced mental, sensory or physical capabilities should not be allowed to operate or maintain this equipment.

If the power cord is damaged, it must be replaced by a new cord that meets the same standards as the original. It must be installed by a qualified professional. Failure to comply could result in damage to the equipment or cause a fire.

# Explanation of Symbols



## **DANGER**

Failure to comply will result in severe personal injury, property damage and/or death.



## **WARNING**

Failure to comply may result in severe personal injury, property damage and/or death.



## **CAUTION**

Failure to comply may result in personal injury and/or property damage.



## **NOTICE**

Indicates important but not hazard-related information, used to indicate risk of property damage.

## User Notice

Children and persons with reduced mental, sensory or physical capabilities should not be allowed to operate or maintain this equipment.

If the power cord is damaged, it must be replaced by a new cord that meets the same standards as the original. It must be installed by a qualified professional. Failure to comply could result in damage to the equipment or cause a fire.



#### **Operation and Maintenance**

- This appliance should not be used by children or persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge.
- Children shall not play with the appliance.
- Cleaning and user maintenance shall not be performed by children.
- Do not connect air conditioner to multi-purpose socket. Otherwise, it may cause fire hazard.
- Disconnect power supply when cleaning air conditioner. Otherwise, it may cause electric shock.
- If the supply cord is damaged, it must be replaced by qualified persons.
- Do not wash the air conditioner with water to avoid electric shock.
- Do not spray water on indoor unit. It may cause electric shock or malfunction.
- After removing the filter, do not touch fins to avoid injury.
- Do not dry filter over open flame or with hair dryer to avoid warping fire hazard.
- Maintenance must be performed by qualified professionals. Otherwise, it may cause personal injury or damage.
- Do not repair air conditioner by yourself. It may cause electric shock or damage. Please contact dealer when you need to repair air conditioner.

## Precautions



### WARNING

- Do not insert fingers or objects into air inlet or air outlet. It may cause personal injury or damage.
- Do not block air outlet or air inlet. It may cause malfunction.
- Do not spill water on the remote controller.
- When below situations occur, please turn off air conditioner and disconnect power immediately, and then contact the dealer or qualified professionals for service.
  - Power cord is overheating or damaged.
  - There's abnormal sound during operation.
  - Circuit breaker trips off frequently.
  - Air conditioner gives off burning smell.
  - Indoor unit is leaking.
- If the air conditioner malfunctions, it may cause electric shock or fire.
- When turning on or turning off the unit by emergency operation switch, please press this switch with an insulating object other than metal.
- Do not place objects on outdoor unit or use as step. It may cause damage or personal injury



### Attachment

- Installation must be performed by qualified professionals. Otherwise, it may cause personal injury or damage.
- Follow all the electric safety regulations when installing the unit.
- Use approved power supply circuit and circuit breaker according to local regulations.
- A circuit breaker must be used.
- An all-pole disconnect switch having a contact separation of at least 3mm (1/8 in) in all poles should be connected in fixed wiring.
- Include a circuit break with suitable capacity, please note the capacity table. Air switch should include magnet buckle and heating buckle function, to protect from circuit-short and overload.
- Air Conditioner should be properly grounded. Incorrect grounding may cause electric shock.
- Use only an approved power cord.
- Make sure the power supply matches the requirement listed on nameplate. Unstable power supply or incorrect wiring may cause malfunction. Please install proper power supply cables before using the air conditioner.
- Properly connect the live wire, neutral wire and grounding wire.
- Be sure to cut off the power supply before performing any work related to electricity.

## Precautions

- Do not connect power before finishing installation.
- If the supply cord is damaged, it must be replaced by qualified persons.
- The temperature of refrigerant circuit will be high, please keep all cords and cables away from the copper tube.
- The appliance shall be installed in accordance with national wiring regulations.
- Installation must be performed in accordance with the requirement of NEC and CEC by authorized personnel only.
- The air conditioner is Class I electric appliance. It must be properly grounded by a professional, otherwise it may cause electric shock.
- The yellow-green wire in air conditioner must be used for grounding only.
- The grounding resistance should comply with national electric safety regulations.
- The appliance must be positioned so that the plug is accessible.
- All wires of indoor unit and outdoor unit should be connected by a professional.
- Use single wires for all connections. Wires should never be spliced together.
- For the air conditioner with plug, the outlet should be reachable after finishing installation.
- For the air conditioner without plug, a circuit break must be installed in the line.



## Precautions

- Once installed the air conditioner should not be moved and installed in a different location.
- Select a location which is out of reach for children and far away from animals or plants. If it is unavoidable, please put up a fence for safety purpose.
- The indoor unit should be installed close to the wall.

### Working Temperature Range

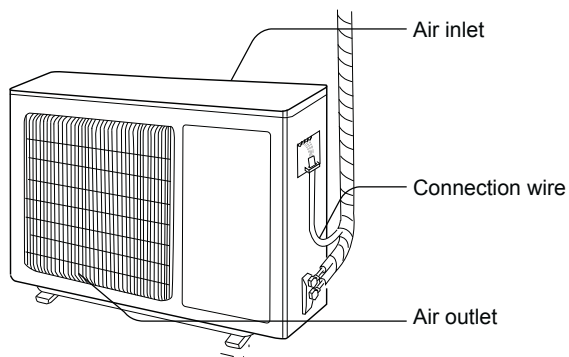
	Indoor Temp. DB/WB °C(°F)	Outdoor Temp. DB/WB °C(°F)
Maximum cooling	26.7/19.4(80/67)	54/24(129/75)
Maximum heating	26.7/- (80/-)	24/18(75/65)

### NOTICE:

- The operating temperature range (outdoor temperature) for cooling only unit is -18°C(-0.4°F) ~ 54°C(129°F); for heat pump unit is -30°C(-22°F) ~ 54°C(129°F).

# Parts

## Indoor Unit

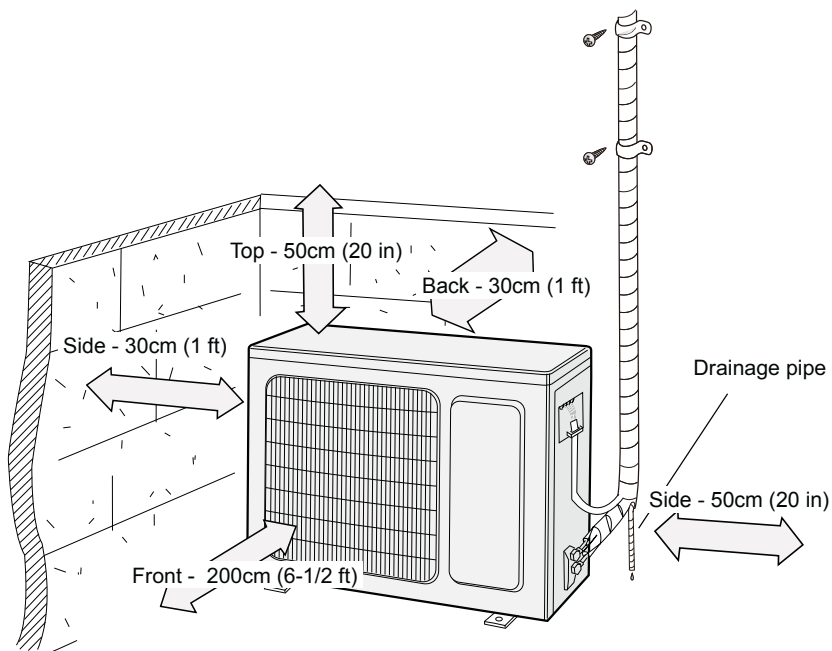


### ***NOTICE:***

Illustrations provided apply to different models and are for reference only. Actual equipment may look slightly different.

# Installation Clearances

Dimension below show minimum clearances from obstacles, walls, ceiling, floor, etc. allowed around indoor unit.



## Tools for Installation

- |                  |                    |                     |
|------------------|--------------------|---------------------|
| 1. Level         | 6. Torque wrench   | 11. Pressure Meter  |
| 2. Screwdriver   | 7. Open-end wrench | 12. Universal meter |
| 3. Impact drill  | 8. Pipe cutter     | 13. Alan wrench     |
| 4. Drill bit     | 9. Leak detector   | 14. Measuring tape  |
| 5. Pipe expander | 10. Vacuum pump    |                     |

### Note:

- Contact qualified professional for installation
- Proper power cord must be used.

## Installation Location Selection

### Basic requirement:

Installing the unit in the following places may cause malfunction.

1. Places with strong heat sources, vapors, flammable or explosive gasses, or volatile objects spread in the air.
2. Places with high-frequency devices (such as welding machine, medical equipment).
3. Coastal regions.
4. Place with oil or other fumes in the air.
5. Places with high sulfur gas concentration in the air.
6. Other places with special circumstances.
7. Do not use the unit in a laundry.

### Indoor Unit

1. Select a location where the noise and outflow air emitted by the outdoor unit will not disturb neighbor.
2. The location should be well ventilated and dry, in which the outdoor unit won't be exposed directly to sunlight or strong wind.
3. The location should be able to withstand the weight of outdoor unit.
4. Make sure that the installation follows the requirement of clearance dimension diagram.
5. Select a location which is out of reach for children and far away from animals or plants. If it is unavoidable, please add the fence for safety purpose.

# Electrical Requirements

## Safety Precautions

1. Follow all electric safety regulations when installing the unit.
2. Use approved power supply, circuit and circuit breaker as required by local regulations.
3. Make sure the power supply matches with the requirement listed on the name-plate. Unstable power supply or incorrect wiring will cause malfunction. Use approved power supply cable.
4. Properly connect the live wire, neutral wire and grounding wire.
5. Turn off the power supply before performing any work related to electricity and safety.
6. Complete all installation requirements before connecting power supply.
7. If the power cord is damaged, it must be replaced by qualified personnel.
8. The refrigerant piping will be hot. Be sure to keep all cables away from copper tubing.
9. The appliance shall be installed in accordance with national wiring regulations.

## Grounding Requirement

1. The air conditioner is a Class I electric appliance. It must be properly grounded with specialized grounding device by a professional, or it may cause electric shock.
2. The yellow-green wire in air conditioner can only be used as the grounding wire.
3. The grounding resistance should comply with national electric safety regulations.
4. The appliance must be positioned so that the plug is accessible.
5. An all-pole disconnection switch having a contact separation of at least 3mm (1/8 in) in all poles should be connected in fixed wiring. For models with a power plug, make sure the outlet is within reach after installation.

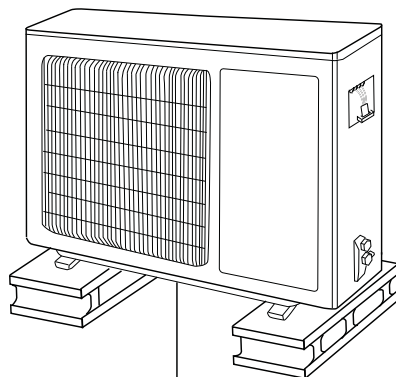
# Outdoor Unit Installation

## Step one: secure the support structure (select it based on installation needs)

1. Select installation location based on building construction and surroundings.
2. Secure the support of outdoor unit on the selected location with expansion screws.

### Note:

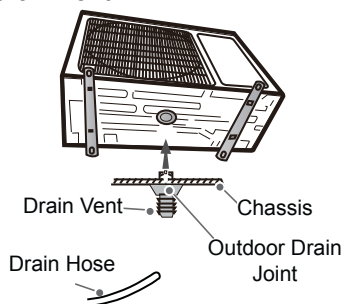
- Take sufficient protective measures when installing the outdoor unit.
- Make sure the support can withstand at least four times of the unit weight.
- The outdoor unit should be installed at least 3cm (1-1/4 in) above the floor in order to install drain.
- For unit with cooling capacity of 2300W~5000W, 6 expansion screws are needed; for unit with cooling capacity of 6000W~8000W, 8 expansion screws are needed; for unit with cooling capacity of 10000W~16000W, 10 expansion screws are needed.



At least 3cm (1-1/4")  
above the floor

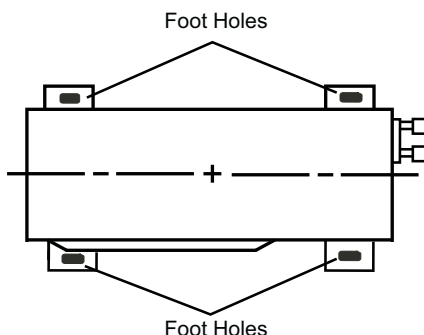
## Step two: install drain joint (Only for cooling and heating unit)

1. Connect the outdoor drain joint into the hole on the chassis, as shown in the picture below.
2. Connect the drain hose into the drain vent.



## Step three: secure outdoor unit

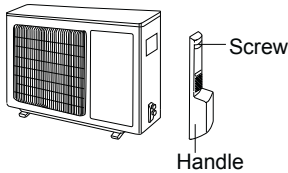
1. Place the outdoor unit on the support.
2. Fasten the foot holes of outdoor unit with bolts.



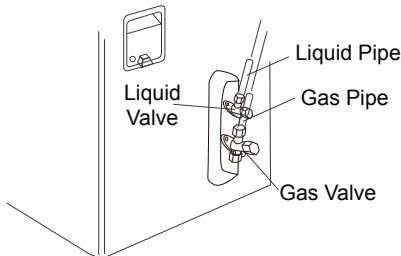
# Outdoor Unit Installation

## Step four: connect indoor and outdoor pipes

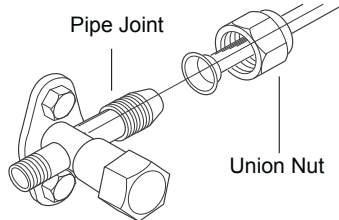
1. Remove the handle from the right side by removing the screw.



2. Remove the screw cap of the valve and align the pipe joint with the pipe bellmouth.



3. Tighten the union nut by hand.

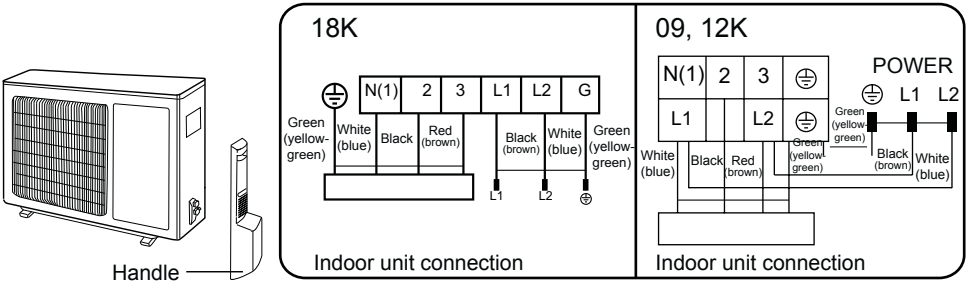


4. Tighten the union nut with torque wrench by referring to the sheet below.

Hex Nut Diameter	Tightening Torque (N-m)
Ø6mm (1/4 in)	15~20
Ø9.52mm (3/8 in)	30~40
Ø 12mm (1/2 in)	45~55
Ø16mm (5/8 in)	60~65
Ø19mm (3/4 in)	70~75

## Step five: connect outdoor electric wire

1. Remove the wire clip; connect the power wire and signal control wire (heating only unit) to the wiring terminal according to the color; attach them with screws.



# Outdoor Unit Installation

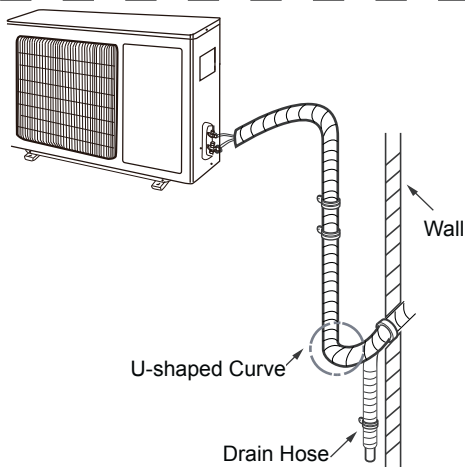
- Secure the power connection wire and signal control wire with the wire clip (for cooling and heating unit only).

## Note:

- After tightening the screw, pull on the power cord lightly to check if it is secure.
- Power cord should be a single wire. Splices are not allowed.

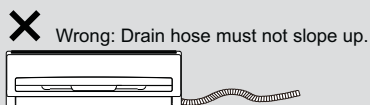
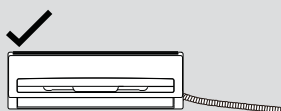
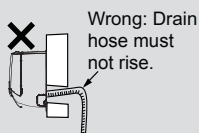
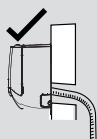
## Step six: Arrange the pipes

- The pipes should be placed neatly, or hidden, along the wall, with as few bends as possible. Min. radius of pipe bends should be 10 cm (4 in).
- If the outdoor unit is higher than the wall hole, you must make a U-shaped curve in the pipe before pipe goes into the room, to prevent rain from getting inside.

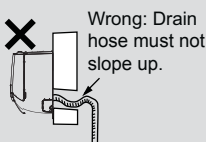
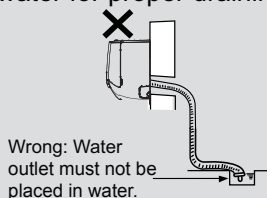


## Note:

- The wall hole should be lower than the drain pipe connection on the indoor unit.
- Slope the drain hose slightly downwards with no trapping.



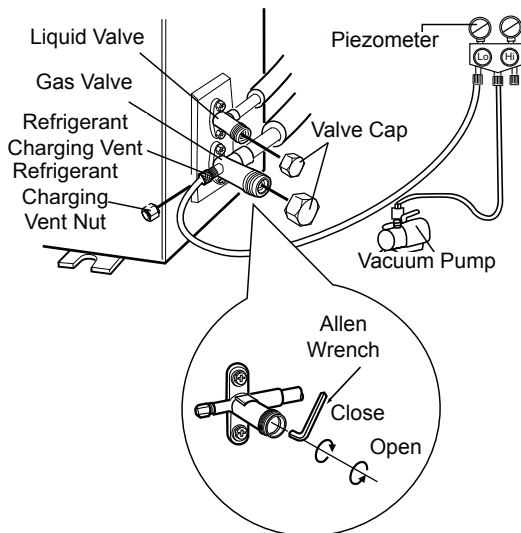
- The water hole must not be placed in water for proper draining.





## Vacuum Pumping

1. Remove the valve caps on the liquid valve and gas valve and the nut of refrigerant charging vent.
2. Connect the charging hose refrigerant charging of manifold gauge to the refrigerant charging vent of gas nut of refrigerant valve and then connect the other charging hose to the vacuum pump.
3. Open the manifold gauge completely and operate for 10-15 min to check if the pressure of manifold gauge remains at  $-0.1\text{MPa}$ .
4. Close the vacuum pump and maintain this status for 1-2 min to check if the pressure of manifold gauge remains at  $-0.1\text{MPa}$ . If the pressure decreases, there may be leakage.
5. Remove the manifold gauge, open the valve core of liquid valve and gas valve completely with hexagon wrench.
6. Tighten the screw caps of valves and refrigerant charging vent.
7. Reinstall the handle.



## Leak Detection

1. With leakage detector:  
Check if there is leakage with leakage detector.
2. With soapy water:  
If leakage detector is not available, please use soapy water for leakage detection. Apply soapy water at the suspected leak location and keep it there for more than 3min. If you see air bubbles, there is a leak.

# After Installation Checklist

- Check according to the following requirement after completing installation.

Items to check	Possible result
Has the unit been installed securely ?	The unit may fall, shake or emit noise.
Have you done the refrigerant leakage test?	It may cause insufficient cooling (heating) capacity.
Is heat insulation of pipeline sufficient?	It may cause condensation and water dripping.
Will water easily drain?	It may cause condensation and water dripping.
Does the voltage match voltage marked on the nameplate?	It may cause malfunction or damage.
Is electric wiring and pipeline installed correctly?	It may cause malfunction or damage.
Is the unit grounded securely?	It may cause short circuit.
Does the power cord match the specification?	It may cause malfunction or damage
Is there any obstruction in the air inlet and outlet?	It may cause insufficient cooling (heating) capacity.
Is the dust and debris from installation removed?	It may cause malfunction or damage
Are the gas valve and liquid valve of connection pipe open completely?	It may cause insufficient cooling (heating) capacity.
Is the inlet and outlet of piping hole covered?	It may cause insufficient cooling (heating) capacity or drafts.

## Test Operation

1. Before testing operation
  - The client approves the installation.
  - Explain operation and other important notes to client.
2. Testing method
  - Turn on the power, press ON/OFF button on the remote controller to start operation.
  - Press MODE button to select AUTO, COOL, DRY, FAN and HEAT to check whether the operation is normal or not.
  - If the ambient temperature is lower than 16°C (61°F), the air conditioner can't start cooling

# Connection Pipe Configuration

1. Standard length of connection pipe
  - 5m (16 ft), 7.5m (25 ft), 8m (26 ft).
2. Min. length of connection pipe is 3m (10 ft).
3. Maximum length of connection pipe and maximum height difference.

Cooling Capacity	Max length of connection pipe	Max height difference
5000Btu/h (1465W)	15M (50 ft)	5M (16 ft)
7000Btu/h (2051W)	15M (50 ft)	5M (16 ft)
9000Btu/h (2637W)	15M (50 ft)	5M (16 ft)
12000Btu/h (3516W)	20M (65 ft)	10M (33 ft)
18000Btu/h (5274W)	20M (65 ft)	10M (33 ft)

Cooling Capacity	Max length of connection pipe	Max height difference
24000Btu/h (7032W)	25M (65 ft)	10M (33 ft)
28000Btu/h (8204W)	30M (100 ft)	10M (33 ft)
36000Btu/h (10548W)	30M (100 ft)	20M (65 ft)
42000Btu/h (12306W)	30M (100 ft)	20M (65 ft)
48000Btu/h (14064W)	30M (100 ft)	20M (65 ft)

4. The additional refrigerant oil and refrigerant charging required after extending connection pipe
  - After the length of connection pipe is extended for 10m (33 ft) at the basis of standard length, you should add 5ml (3/16 oz) of refrigerant oil for each additional 5m (16 ft) of connection pipe.
  - The calculation method of additional refrigerant amount (on the basis of liquid pipe):
    - Additional refrigerant amount = additional length of liquid pipe × additional refrigerant charging amount per foot.
  - Basing on the length of standard pipe, add refrigerant according to the requirement as shown in the table. The additional refrigerant charging amount per foot is different according to the diameter of liquid pipe. See the following table.

# Connection Pipe Configuration

Additional refrigerant charging amount for R410A.

Diameter of connection pipe mm (in)		Outdoor unit throttle g/m (oz/ft)	
Liquid Pipe	Gas Pipe	Cooling Only	Cooling & Heating
Ø 6 (1/4)	Ø 9.52 or 12 (3/8 or 1/2)	15 (1/6)	20 (1/5)
Ø 6 or 9.52 (1/4 or 3/8)	Ø 16 or 19 (5/8 or 3/4)	15 (1/6)	50 (1/2)
Ø 12 (1/2)	Ø 19 or 22.2 (3/4 or 7/8)	30 (1/3)	120 (1-1/3)
Ø 16 (5/8)	Ø 25.4 or 31.8 (1 or 1-1/4)	60(2/3)	120 (1-1/3)
Ø 19 (3/4)	-	250 (2-2/3)	250 (2-2/3)
Ø 22.2 (7/8)	-	350 (3-3/4)	350 (3-3/4)

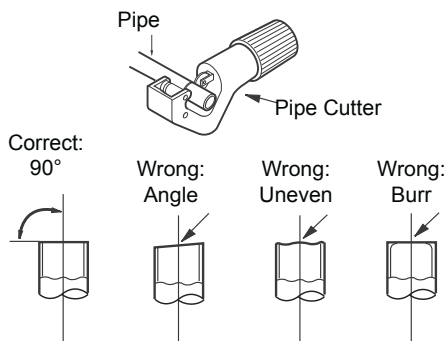
# Pipe Expansion Method

## Note:

Improper pipe expanding is the main cause of refrigerant leakage. Please expand the pipe according to the following steps:

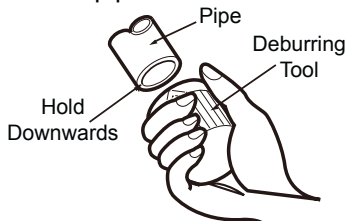
### A. Cut the pipe

- Confirm the distance between the indoor and outdoor units.
- Cut the required length with pipe cutter.



### B. Remove the burrs

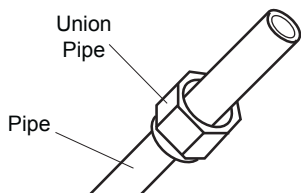
- Remove the burrs with deburring tool and prevent the burrs from getting into the pipe.



### C. Put on suitable insulating pipe

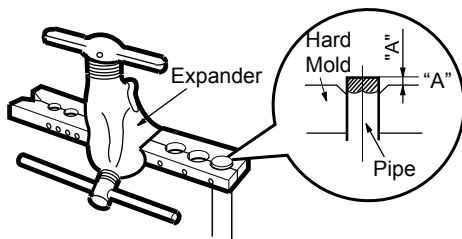
### D. Put on the union nut

- Remove the union nut on the indoor connection pipe and outdoor valve; install the union nut on the pipe.



### E. Expand the port

- Expand the port with expander.



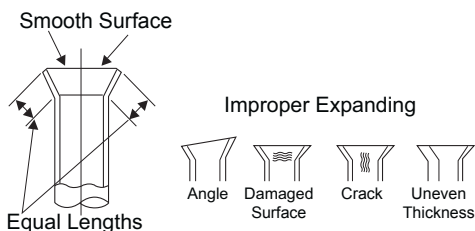
## Note:

- "A" is different according to the diameter, please refer to the table below:

Outer diameter mm (in)	A mm (in)	
	Max	Min
Ø6~6.35 (1/4)	1.3 (1/16)	0.7 (1/32)
Ø9.52 (3/8)	1.6 (1/16)	1.0 (1/16)
Ø12~12.7 (1/2)	1.8 (1/16)	1.0 (1/16)
Ø15.8~16 (5/8)	2.4 (3/32)	2.2 (3/32)

### F. Inspection

- Check the quality of expanding port. If there is any blemish, expand the port again according to the steps above.







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