

Please read this manual carefully before installation and keep it for future reference.

# Installation & Owner's Manual



# **MRCOOL<sup>®</sup>**

**COMFORT MADE SIMPLE**

## **Hyper-Heat Single-Zone 24K-60K Ducted Air Handler & Condenser**

Due to updates and constantly improving performance, the information and instructions within this manual are subject to change without notice. Please visit [www.mrcool.com/documentation](http://www.mrcool.com/documentation) to ensure you have the latest version of this manual.

Version Date: 06/27/23

## Line Set Length Specifications

Unit: feet (meters)

| Air Handler Capacity (BTU/hr)                          | 24K              | 36K              | 48K              | 60K              |
|--|------------------|------------------|------------------|------------------|
| Max. refrigerant pipe length                           | 164.04 ft (50 m) | 213.25 ft (65 m) | 213.25 ft (65 m) | 213.25 ft (65 m) |
| Max. height difference between indoor and outdoor unit | 82.02 ft (25 m)  | 98.42 ft (30 m)  | 98.42 ft (30 m)  | 98.42 ft (30 m)  |

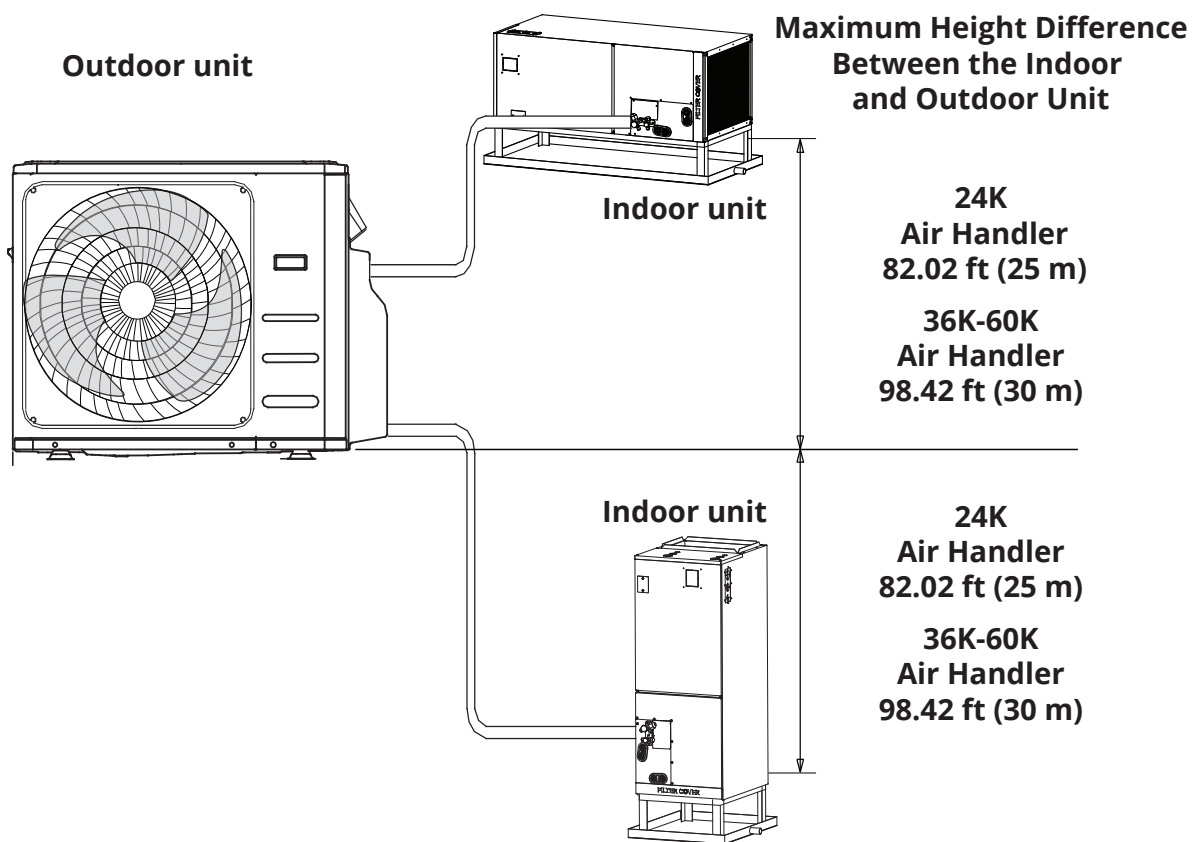


Fig. 6.1

### ⚠ IMPORTANT INSTALLATION INFORMATION!

#### Refrigerant Line Set Connection Options, Requirements, and Stipulations

24K/36K/48K/60K Capacity Units - These units are designed to be installed using either a traditional flare nut configuration of refrigerant piping or the optional MRCOOL® No-Vac® Quick Connect® Pre-Charged Line Set. If the optional No-Vac Quick Connect Line Set is used, you ***DO NOT*** have to retain the services of a professional HVAC installer. If the traditional flare nut configuration is selected, you ***ARE REQUIRED*** to retain the services of a professional HVAC installer. Stub pipes and copper nuts are included with these capacity units to complete this type of installation. If any other form of installation is attempted, or these stipulations are not followed, the ***WARRANTY WILL BE VOIDED.***

## Conventional Line Set Installation

### **! WARNING**

- All field piping must be completed by a licensed technician and must comply with the local and national regulations.
- When the unit is installed in a small room, measures must be taken in order to prevent the refrigerant concentration in the room from exceeding the safety limit should refrigerant leakage ever occur. If refrigerant should leak and its concentration exceeds the proper limit, it may create hazards due to a lack of oxygen.
- When installing the refrigeration system, ensure that air, dust, moisture, or any other foreign substances do not enter the refrigeration circuit. Contamination within the system could cause the operating capacity of the unit to become poor or create high pressure in the refrigeration cycle, which could cause an explosion and/or personal injury.
- If refrigerant leakage should occur during the installation, ventilate the room immediately. Refrigerant gas is both toxic and flammable. Ensure there is no refrigerant leakage after completing the installation.

### Note on Pipe Length and Elevation

Ensure that the length of the refrigerant piping, the number of bends, and the drop height between the outdoor and indoor units meet the requirements listed in the table below:

### The Maximum Length and Drop Height Based on Model Capacity

Units: feet (meters)

| Type of Model   | Capacity (Btu/h)  | Length of Piping | Maximum Drop Height |
|---|-------------------|------------------|---------------------|
| North America, Australia and the EU frequency conversion Split Type | 24K               | 164 ft (50 m)    | 82 ft (25 m)        |
|   | 36K<br>48K<br>60K | 213 ft (65 m)    | 98.4 ft (30 m)      |

### **! CAUTION**

#### Oil Traps

If oil flows back into the outdoor unit's compressor, this could cause liquid compression or deterioration of the oil return. Installing oil traps in the rising gas piping can prevent this. Please refer to Fig. 6.2 below as a guide.

- For 24,000 Btu/h units, an oil trap should be installed every 20 ft (6 m) of vertical suction line riser.
- For units 36,000 Btu/h or greater, an oil trap should be installed every 32.8 ft (10 m) of vertical suction line riser.

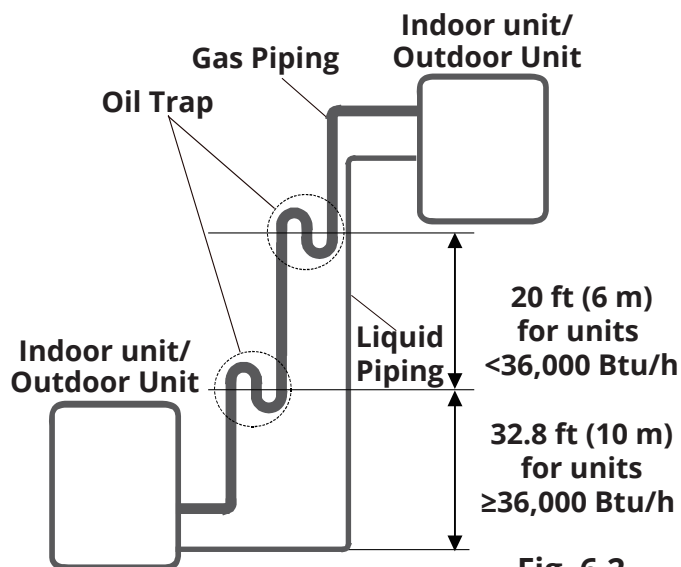


Fig. 6.2

## ! CAUTION

- ⚠ **DO NOT** install the connecting piping until the installation of the indoor and outdoor units have been completed.
- Insulate both the gas and liquid piping in order to prevent water leakage.

| Name                     | State       | Capacity (Btu/h) | Piping Diameter    | Note  |
|--------------------------|-------------|------------------|--------------------|---|
| Connecting Pipe Assembly | Liquid side | 24K/36K/48K/60K  | Φ 3/8 in (9.52 mm) | *When installing the 60K, the gas side of the AHU is 3/4 in (19 mm), a 3/4 in (19 mm) to 7/8 in (22 mm) stub pipe is included in the AHU accessories. |
|                          | Gas side    | 24K/36K/48K      | Φ 3/4 in (19 mm)   |   |
|                          |             | 60K              | Φ 7/8 in (22 mm)*  |   |

## Connecting Refrigerant Piping

### Step 1: Cut Pipes

When preparing refrigerant pipes, take extra care to cut and flare them properly. This will ensure an airtight seal, efficient operation, and, minimize the need for future maintenance.

1. Measure the distance between the indoor and outdoor units.
2. Using a pipe cutter, cut the pipe a little longer than the measured distance.
3. Ensure the pipe is cut at a perfect 90° angle. Please refer to **Fig. 6.3** below for cut examples.

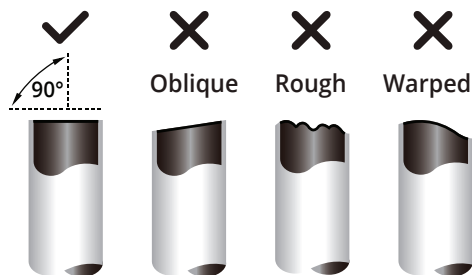


Fig. 6.3

## ! CAUTION

- ⚠ **DO NOT** deform pipe while cutting. Be extra careful not to damage, dent, or deform the pipe while cutting. This will drastically reduce the heating efficiency of the unit.

### Step 2: Remove Burrs

Burrs can affect the airtight seal of the refrigerant piping connection. They must be completely removed by following these steps:

1. Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
2. Using a reamer or deburring tool, remove all burrs from the cut section of pipe. Refer to **Fig. 6.4** above.

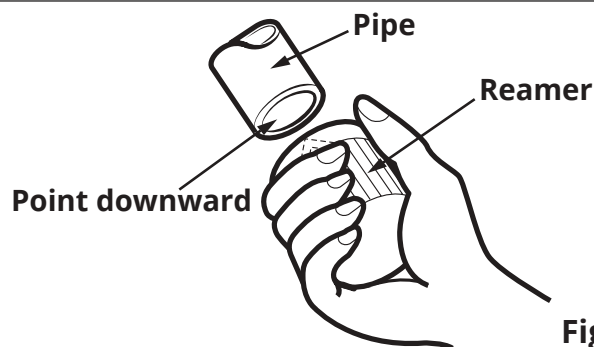
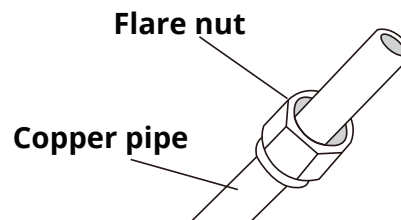


Fig. 6.4

### Step 3: Flare Pipe Ends

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from the cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
2. Sheath the pipe with insulating material.
3. Place flare nuts on both ends of the pipe. Ensure they are facing the correct direction because once the pipe is flared you will be unable to change their direction.



4. Remove the PVC tape from the ends of the pipe right before performing flaring work.
5. Clamp the flare form on the end of the pipe to be flared. The end of the pipe must extend beyond the flare form. Please refer to **Fig. 6.5** below.

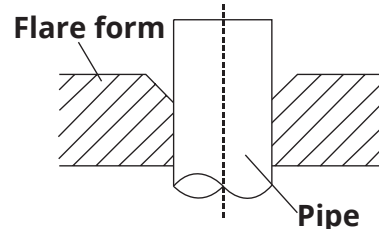


Fig. 6.5

# Refrigerant Piping Connections

- Place flaring tool onto the form.
- Turn the handle of the flaring tool clockwise until the pipe is fully flared. Flare the pipe in accordance with the dimensions in the table and **Fig. 6.6** below.

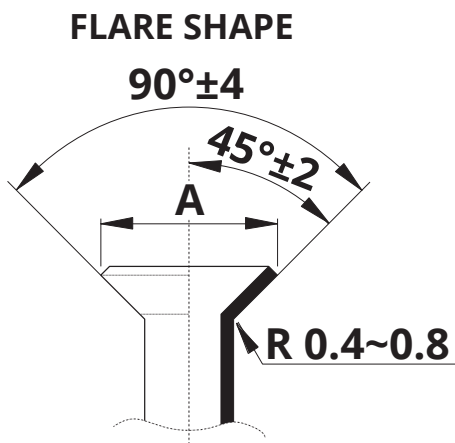


Fig. 6.6

## PIPING EXTENSION BEYOND FLARE FORM

| Pipe gauge | Tightening Torque<br>lb-ft (Nm) | Flare dimension (A)<br>Inch (millimeter) |                      |
|------------|---------------------------------|--|----------------------|
|            |                                 | Min.                                     | Max.                 |
| Ø 3/8 in   | 23.6-28.8 lb-ft<br>(32-39 Nm)   | 0.52 in<br>(13.2 mm)                     | 0.53 in<br>(13.5 mm) |
| Ø 3/4 in   | 49.4-74.5 lb-ft<br>(67-101 Nm)  | 0.91 in<br>(23.2 mm)                     | 0.93 in<br>(23.7 mm) |
| Ø 7/8 in   | 62.7-81.1 lb-ft<br>(85-110 Nm)  | 1.04 in<br>(26.4 mm)                     | 1.06 in<br>(26.9 mm) |

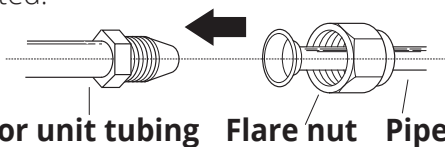
- Remove the flaring tool and flare form, then inspect the end of the pipe for cracks and even flaring.

### Step 4: Connect Pipes

In this step you will connect the copper refrigerant pipes to the indoor unit first, and then to the outdoor unit. The low pressure pipe should be connected first and then the high pressure pipe can be connected.

**NOTE: If you are installing a 60K capacity air handler, please refer to the instructions on the next page as it requires additional steps.**

- When connecting the flare nuts, apply a thin coat of refrigerant oil to the flared ends of the pipes.
- Align the center of the two pipes that are to be connected.



- Tighten the flare nut by hand as tightly as possible.
- Using a spanner, grip the nut on the unit tubing.

- While firmly gripping the nut on the unit tubing with the spanner, use an HVAC torque wrench to tighten the flare nut (**Fig 6.7** below). Continue to tighten the flare nut with the torque wrench until specified torque rating listed in the table to the left is reached.

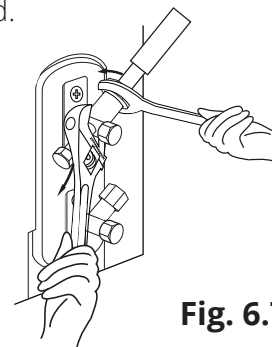


Fig. 6.7

### NOTE ON TIGHTENING TORQUE

When torquing the flare nut be sure to use the correct torque rating according to the table. **DO NOT** overtighten the flare nut as this could damage it and under tightening it could also cause it to leak.

- Then, carefully route and bend the piping to the exterior through the wall hole so it can be connected to the outdoor unit. For more detailed information about bending the piping and the minimum pipe radius please refer to the note and **Fig. 6.8** below.

### NOTE ON MINIMUM BEND RADIUS

Carefully bend the refrigerant piping in the middle according to the illustration below. **DO NOT** bend the piping at an angle greater than 90° or more than 3 times as it could become damaged and/or break.

**Bend the pipe using your thumbs**



**Minimum Bend Radius: 3.9 in (10 cm)**

Fig. 6.8

- Then, connect the refrigerant piping to the outdoor unit by repeating steps 1-5.
- Evacuate air and moisture from the refrigerant lines. Please refer to the **Air Evacuation & Adding Refrigerant** section of this manual for more detailed instructions for completing this step.
- Open the stop valves of the outdoor unit to start the flow of the refrigerant between the indoor and outdoor unit.

# Refrigerant Piping Connections

## ! CAUTION

Once the refrigerant piping is connected and the installation of the indoor and outdoor units has been completed, perform leak tests to ensure the system is not leaking. Should you detect a refrigerant leak, ventilate the area immediately and evacuate the system (refer to the Air Evacuation section of this manual).

9. Once the unit is installed, and you have confirmed the system does not leak, insulate and wrap all the piping, including the valve bodies with thermal insulation material to prevent condensation. Ensure the valve is sealed. Please refer to **Fig. 6.9**.

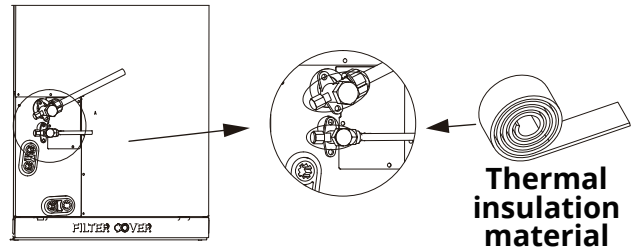


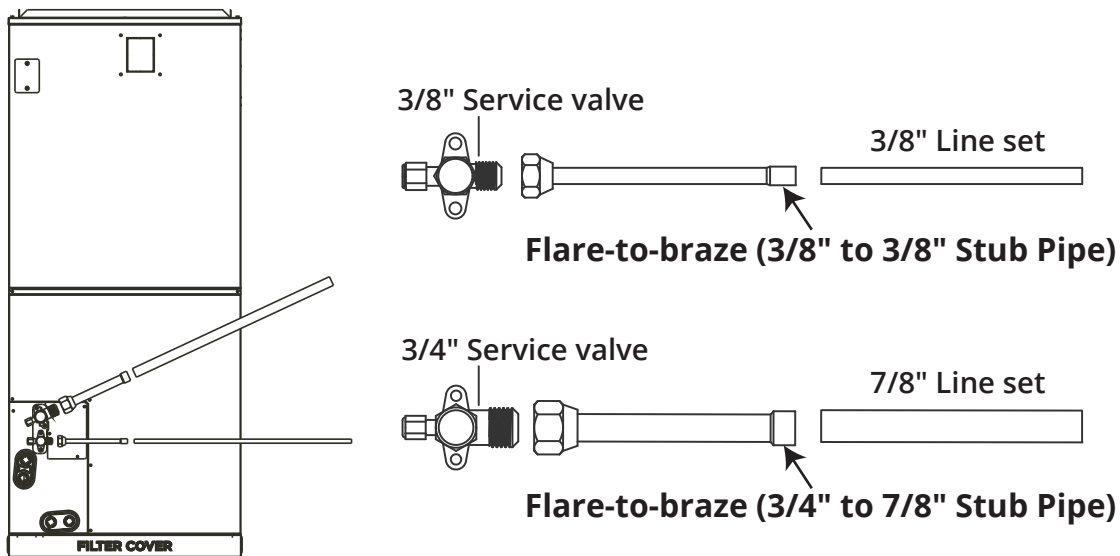
Fig. 6.9

## ! CAUTION

Ensure insulation is properly wrapped around the piping. Direct contact with bare piping may result in burns or frostbite.

### 60K Indoor Air Handler Piping Connection Instructions

When connecting refrigerant piping to a 60K capacity air handler additional steps are required. Complete the piping connections to the indoor unit as shown below. Only use flare-to-braze 3/4" to 7/8" & 3/8" to 3/8" connect the 7/8" line set. If you attempt to connect the line set in any other manner than the one shown below, it will cause the performance of the unit to decrease.



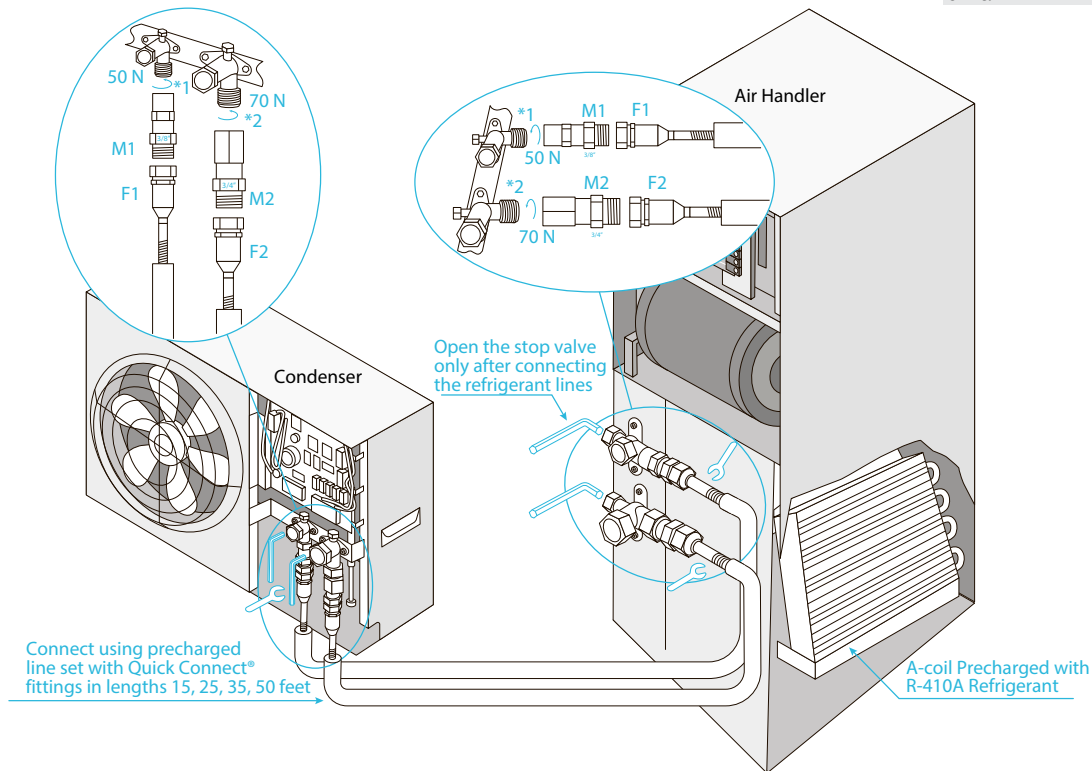
# No-Vac® Quick Connect® Line Set\* Installation

**INSTRUCTIONS FOR USE WITH NO-VAC™ QUICK CONNECT® LINE SET\* SOLD SEPARATELY**  
**KINK RESISTANT, PRECHARGED, SIMPLE SECURE QUICK CONNECT, 100% CONNECTION GUARANTEE**

**Please read and follow the instructions and diagram below\* :**  
**Connections must be made exactly as specified to avoid system leaks and /or damage**

1. Take out matching male connectors **M1** and **M2**.
2. **Remove** protective cap with the copper gasket at each stop valve on the **CONDENSER** and ensure the threads are clean and complete.
3. **Tighten** the **M1** connector to the **cutoff valve \*1** with a tightening force of **37 ft/lb (50 Nm)**. **Tighten** the **M2** connector to the **cutoff valve \*2** with a tightening force of **52 ft/lb (70 Nm)**.
4. **Repeat** step 3 for **AIR HANDLER** at the other end of the **LINE SET**.
5. Unroll and route the **LINE SET** between the **AIR HANDLER** and the **CONDENSER**. Bend the line set piping by hand to route the line set to suit your application. Use care when bending the line set. Please refer to the **Bending the Line Set** section of **Pg. 13** for more detailed instructions on how to properly and safely bend the line set refrigerant piping, as well as the correct bend radius.
6. **Remove** the protective caps of the valves at both ends of the **LINE SET**. Verify that all threads are clean and complete.
7. **Tighten** the **LINE SET F1** valve to the **M1 Connector** (attached in step 3) with a force of **33 ft/lb (45 Nm)**. **Tighten** the **LINE SET F2** valve to the **M2 Connector** (attached in step 3) with a tightening force of **33 ft/lb (45 Nm)**.
8. **Repeat** this process for the **AIR HANDLER** at the other end of the **LINE SET**.
9. At the **OUTDOOR UNIT** remove the **protective cap** at the **cutoff valve switch** and **open** the **stop/cutoff valve** with a hex wrench to release refrigerant into the system. **If** there is any fizz, grease or other **leakage**, then **close** the valve **immediately** and **check** that **steps 3 and 7** were done properly. **Otherwise**, using a sponge or spray bottle, apply a soapy water solution to the connection points to check for micro leaks. **If any bubbles form** it indicates there is a leak. If this does occur, **close** the valve **immediately** and **check** that **steps 3 and 7** were done properly and re-tighten the valves and line set if necessary.
10. **After** the correct connection, **re-tighten** the cutoff valve's **protection cap** and **cover** the **M1, M2** and **F1, F2** connections with the gray **insulating sleeve** to help **prevent condensation**.

## Complete unit replacement using the No-Vac® Quick Connect® lines



### ⚠ IMPORTANT

When running the Line Set through the knockout hole of the condenser, it may be necessary to slightly trim the line set insulation so it feeds through the hole freely. Otherwise, it may be difficult to connect it to the condenser. Once the installation is complete, pack the hole with neoprene to prevent small animals and insects from entering the condenser.



### NOTE ON WRENCHES

The wrench sizes needed for tightening the No-Vac® Quick Connect® Line Set are listed below. However, based on the availability of the wrench sizes needed, it is recommended to use two large crescent (adjustable-type) wrenches. Using one to hold the valve while using the other wrench to tighten the line set connector.

| Piping Size<br>(Stamped on piping)              | Wrench Size Required |        |
|---|----------------------|--------|
|   | Standard             | Metric |
| 3/8"  | 1"                   | 25 mm  |
| 3/4"  | 1-3/8"               | 35 mm  |
| Or 2x large crescent (adjustable-type) wrenches |                      |        |

### Allen/Hex Wrench Sizes Needed To Open Stop/Cutoff Valves

| Piping/Valve Size<br>(Stamped on piping) | Allen Wrench Size |
|--|-------------------|
| 3/8"                                     | 5 mm              |
| 3/4"                                     | 8 mm              |

### ⚠ IMPORTANT

The stop/cutoff valves on the unit must be opened **AFTER** connecting the lines and **BEFORE** turning on the unit. **Otherwise**, operation can cause leakage and/or damage to the unit.

*Failure to follow the instructions provided could result in severe harm to you, this product, or other property. The manufacturer, distributor, and seller are not responsible for any harm resulting from the failure to follow instructions and the failure to follow these instructions will void any and all warranties express or implied.*

\*Pat. <https://mrcool.com/mrcool-patents/>

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