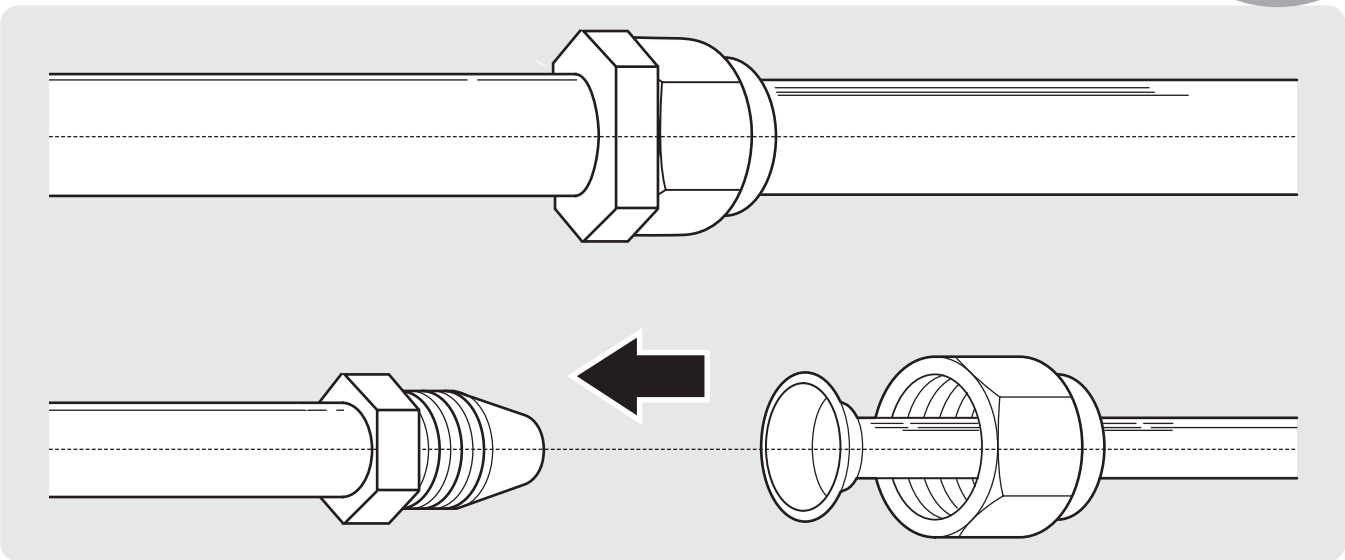

## NOTE ON PIPE LENGTH

The length of refrigerant piping will affect the performance and energy efficiency of the unit.

Nominal efficiency is tested on units with a pipe length of 16.5ft (5 meters).

Refer to the table below for specifications on the maximum length and drop height of piping.

**Maximum Length and Drop Height of Refrigerant Piping per Unit Model**

| Model | Capacity (BTU/h) | Max. Length (ft/m) | Max. Drop Height (ft/m) |
|---|---|---|---|
| R410A Inverter Split Air Conditioner | < 15,000 | 82ft (25) | 33ft (10) |
| | ≥ 15,000 and < 24,000 | 98.5ft (30) | 66ft (20) |
| | ≥ 24,000 and < 36,000 | 164ft (50) | 82ft (25) |
| | ≥ 36,000 and ≤ 60,000 | 213ft (65) | 98.5ft (30) |

## Connection Instructions – Refrigerant Piping

**Step 1: Cut pipes**

When preparing refrigerant pipes, take extra care to cut and flare them properly. This will ensure 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.** Make sure that the pipe is cut at a perfect 90° angle. Refer to **Fig. 6.1** for bad cut examples.

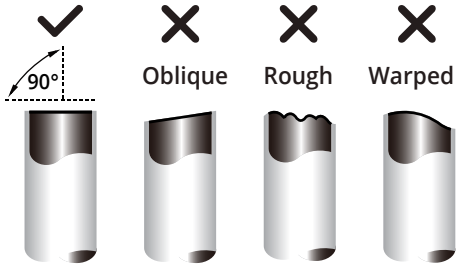


**Fig. 6.1**

## 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 air-tight seal of refrigerant piping connection. They must be completely removed.

**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 the pipe.

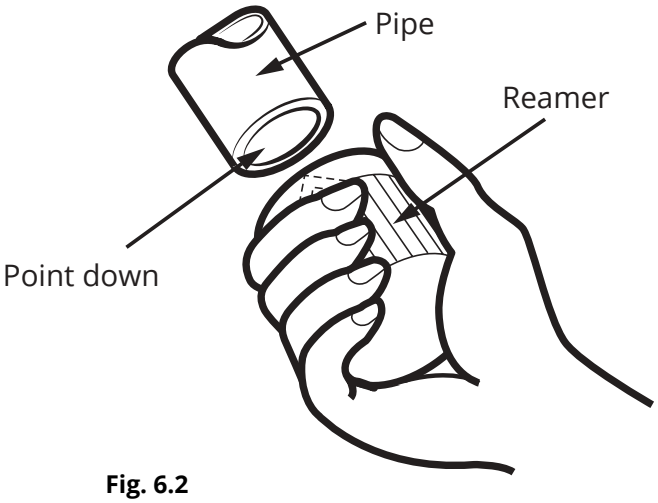


**Fig. 6.2**

**Step 3: Flare pipe ends**

Proper flaring is essential to achieve an airtight seal.

**1.** After removing burrs from 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 pipe. Make sure they are facing in the right direction, because you can't put them on or change their direction after flaring. See **Fig. 6.3.**

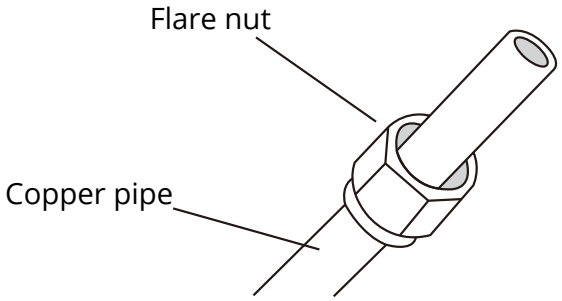


**Fig. 6.3**

**4.** Remove PVC tape from ends of pipe when ready to perform flaring work.

**5.** Clamp flare form on the end of the pipe. The end of the pipe must extend beyond the edge of the flare form in accordance with the dimensions shown in the table below.

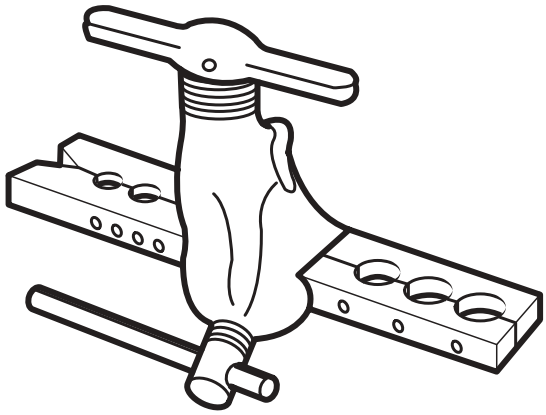

**Fig. 6.4**

**PIPING EXTENSION BEYOND FLARE FORM**

| Outer Diameter of Pipe (in/mm) | A (in/mm) Min. | Max. |
|---|---|---|
| Ø 0.25" (Ø 6.35) | 0.0275" (0.7) | 0.05" (1.3) |
| Ø 0.375" (Ø 9.52) | 0.04" (1.0) | 0.063" (1.6) |
| Ø 0.5" (Ø 12.7) | 0.04" (1.0) | 0.07" (1.8) |
| Ø 0.63" (Ø 16) | 0.078" (2.0) | 0.086" (2.2) |

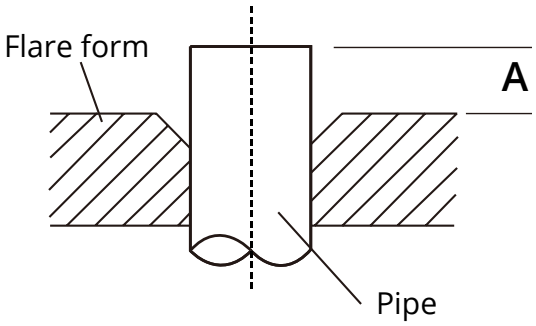


**Fig. 6.5**

### Step 3: Flare pipe ends continued

**6.** Place flaring tool onto the form.

**7.** Turn the handle of the flaring tool clockwise until the pipe is fully flared.

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

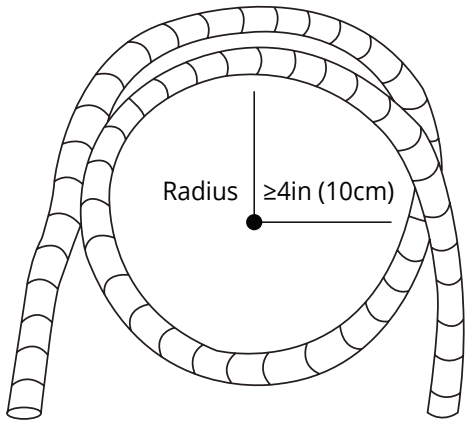


**Fig. 6.6**

### Step 4: Connect pipes

When connecting refrigerant pipes, be careful not to use excessive torque or to deform the piping in any way. You should first connect the low-pressure pipe, then the high-pressure pipe.

**MINIMUM BEND RADIUS**

When bending refrigerant piping, the minimum bending radius is 10cm. See **Fig 6.6**.

## TORQUE REQUIREMENTS

**1.** Excessive force can break the nut or damage the refrigerant piping. You must not exceed torque requirements shown in the table below.

**2.** You can find the Outer Pipe Diameter stamped (in inches) on the valve set of the condenser. Refer to this when finding and applying the torque values in the table below.

**3.** Note that there may be diferences in Torque Wrenches (i.e. automotive torque wrench versus a HVAC torque wrench) and that a socket style wrench cannot be used here.

| Outer Diameter of Pipe (in/mm) | Tightening Torque (N·m / lb·ft) | Add. Tightening Torque (N·m / lb·ft) |
|---|---|---|
| Ø0.25" (Ø 6.35mm) | 14.91 N·m (11 lb•ft) | 16 N·m (11.8lb•ft) |
| Ø0.375" (Ø 9.52mm) | 24.95 N·m (18.4 lb•ft) | 26 N·m (19.18lb•ft) |
| Ø0.5" (Ø12.7mm) | 34.98 N·m (25.8 lb•ft) | 36 N·m (26.55lb•ft) |
| Ø0.63" (Ø16mm) | 45 N·m (33.19 lb•ft) | 47.01N·m (34.67lb•ft) |

## Instructions for Connecting Piping to Indoor Unit

**1.** Align the center of the two pipes that you will connect. See **Fig. 6.7**.

**2.** Tighten the flare nut as tightly as possible by hand.

**3.** Using an adjustable wrench, grip the nut on the unit tubing.

**4.** While firmly gripping the nut on the unit tubing, use a torque wrench to tighten the flare nut according to the torque values in the **Torque Requirements** table. Loosen the flaring nut slightly, then tighten again.

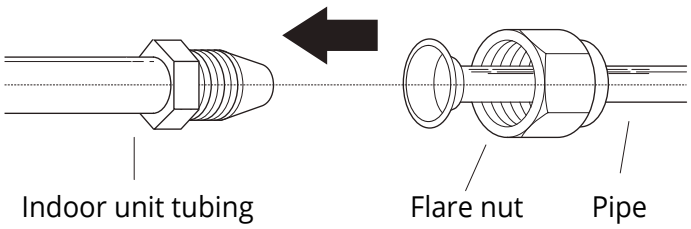


**Fig. 6.7**

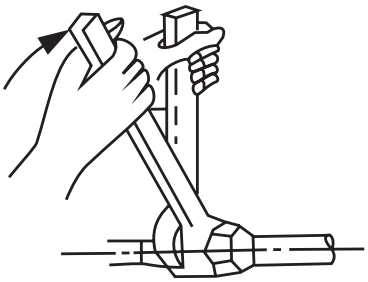

**Fig. 6.8**

## Instructions for Connecting Piping to Outdoor Unit

**1.** Unscrew the cover from the packed valve on the side of the outdoor unit. (See **Fig. 6.9**)

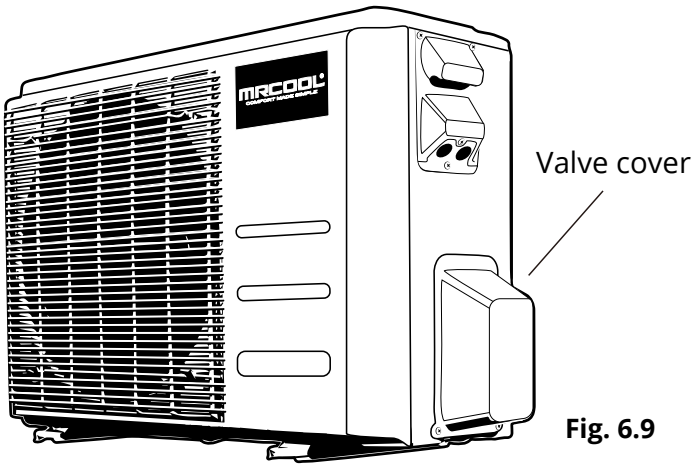


**Fig. 6.9**

**2.** Remove protective caps from ends of valves.

**3.** Align flared pipe end with each valve, and tighten the flare nut as tightly as possible by hand.

**4.** Using an adjustable wrench, grip the body of the valve. Do not grip the nut that seals the service valve. (See **Fig. 6.10**)

### USE ADJUSTABLE WRENCH TO GRIP MAIN BODY OF VALVE

Torque from tightening the flare nut can snap off other parts of valve. See **Fig. 6.10**.

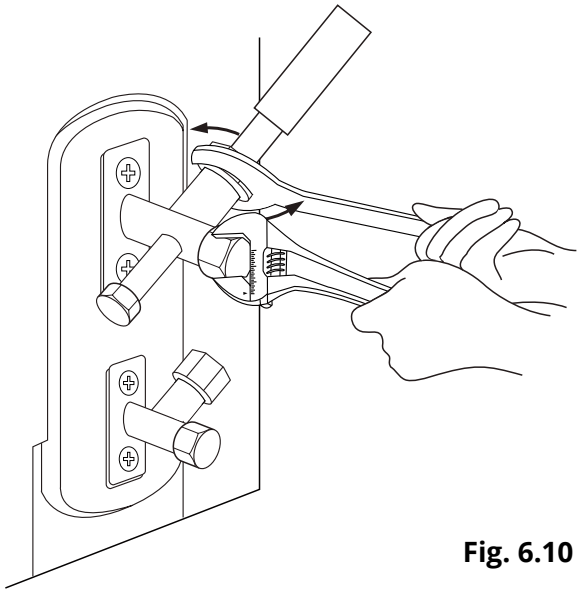

**Fig. 6.10**

**5.** While firmly gripping the body of the valve,use a torque wrench to tighten the flare nut according to the correct torque values.

**6.** Loosen the flaring nut slightly, then tighten again.

**7.** Repeat Steps 3 to 6 for the remaining pipe.