DAIKIN

Refrigerant piping work
Flareless joint instruction manual

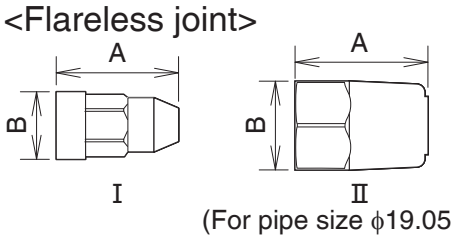
Preparation	· Perform any bending near the flareless joints before connecting them. · Prepare the marking gauge or plastic flare nut with marking gauge function (one of which is supplied with the product). * The plastic flare nut with marking gauge functionality shall hereinafter be referred to as the “plastic nut”.

⚠WARNING

· This product is compatible with R32 and R410A refrigerant.
· Be sure to observe the items listed on the right when working.

- Be sure to perform refrigerant piping work in accordance with this instruction manual.
- For safety considerations and details on product installation work related to flareless joint installation, be sure to read the installation manual included with the product.
- If the refrigerant piping is improperly installed, air may get mixed in, resulting in explosion, fire, or injury.
- Use a pipe cutter specially made for R32 or R410A.
- When polishing the surface of the piping to remove oxides, do not polish so much that the wall thickness of the piping becomes thinner than the minimum wall thickness required.
- Do not disassemble the flareless joints.
- When working in high places, work with a scaffold stable.
- Connect the flareless joints securely at 1 location at a time.
- Do not use flareless joints that have been deformed due to being dropped, etc.
- To prevent dust and dirt from entering the piping, and to prevent moisture from entering, protect the piping by pinching or taping.
- Do not reuse flareless joints that have previously been installed.
- Use the marking gauge or plastic nut.
  If pipes are not inserted deeply enough, refrigerant leakage may result.
- Do not reuse the plastic nut.
  If reused, the plastic may be worn away making it difficult to check for ovality of the piping and external or internal burrs.
- If, when the installation is complete, the length of the on-site piping is insufficient, there is a risk of the piping disconnecting resulting in refrigerant leakage.

<Flareless joint>



(For pipe size ϕ19.05 only)

Unit: inch (mm)

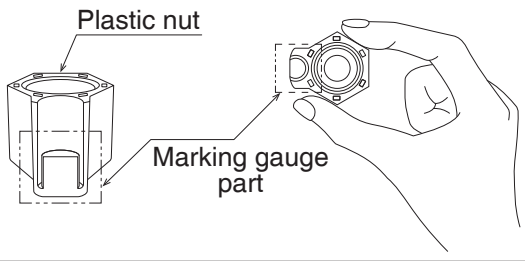
Shape	Piping Size (ϕ)		Flaress joint dimensions A	Flaress joint dimensions B
I	1/4	(6.35)	1-11/32 (33.9)	21/32 (17.0)
	3/8	(9.52)	1-1/2 (38.1)	7/8 (22.0)
	1/2	(12.70)	1-21/32 (42.0)	1-1/32 (26.0)
	5/8	(15.88)	1-13/16 (46.3)	1-5/32 (29.0)
II	3/4	(19.05)	2-3/32 (53.0)	1-13/32 (36.0)

1. Preparation of marking gauge

Prepare the marking gauge or plastic nut.

⚠CAUTION

Do not touch the marking gauge part when working with the plastic nut.
If force is applied to the marking gauge part, the plastic may become deformed, making it difficult to check for ovality of the piping and external or internal burrs.



2. Cutting of thermal insulation (piping)

· Being careful not to damage the piping, cut away the thermal insulation in the cylindrical direction. (See Fig. 1)

Unit: inch (mm)

Piping Size (ϕ)		Cut length
1/4	(6.35)	2-3/8 (60) or more
3/8	(9.52)	
1/2	(12.70)	
5/8	(15.88)	
3/4	(19.05)	2-3/4 (70) or more

⃠Prohibited

Do not cut in horizontally (lengthwise) using a cutting tool Horizontal (lengthwise) scratches may cause refrigerant leakage.

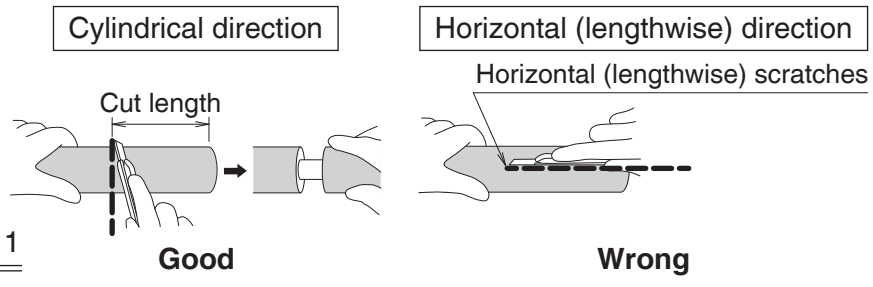


Fig. 1

3. Cutting of piping

(1) Ensure that the on-site piping is long enough to reach the edge of the connecting part. (See Fig. 2-1)
If, when the installation is complete, the length of the on-site piping is insufficient, there is a risk of the piping disconnecting resulting in refrigerant leakage.
(2) Use a pipe cutter to cut at a right angle to the piping. (See Fig. 2-2)

⚠CAUTION

Cut gradually and slowly to prevent deformation of the piping.

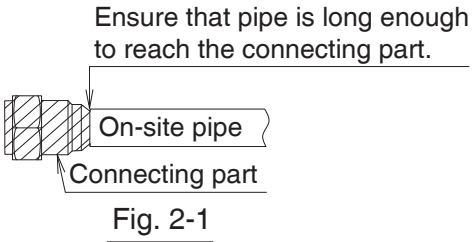


Fig. 2-1

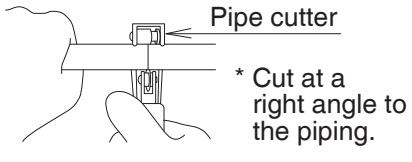


Fig. 2-2

4. Checking of piping

(1) Cut away the section of the flareless joint for insertion if it has any scratches or bends, or if it is not completely round or shows signs of thermal damage. (See Fig. 3)
(2) Straighten the section of piping for insertion.
(3) If any foreign matter is adhered to the inner or outer surfaces, remove it.

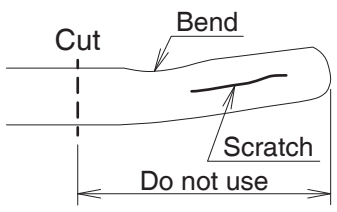


Fig. 3

⚠CAUTION

· If the piping can be easily inserted into the marking gauge, it is within acceptable limits in regard to straightness and roundness.
· If you are using existing piping, polish the piping surface in the cylindrical direction with a fine sandpaper of 1000 grit or more to remove oxides.

5. Chamfering of piping

(1) External chamfering: As a guide, chamfer away about half the wall thickness.
(2) Internal chamfering: Continue chamfering until there are no burrs.
(See Fig. 4)

⚠CAUTION

· If the outer surface is not chamfered, the sealing material inside the flareless joint may be damaged, and refrigerant may leak.
· If the inner surface is not chamfered, it may cause the piping to be inserted incorrectly or the flow rate may not be able to be secured.
· When chamfering the piping, be careful not to let chips get inside the piping.

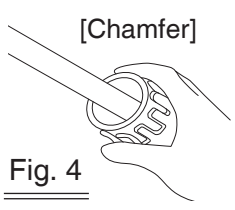
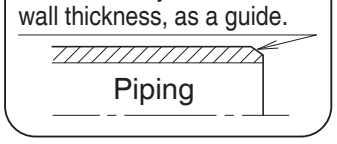
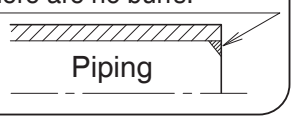


Fig. 4

[Exterior chamfer]
Chamfer away about half the wall thickness, as a guide.



[Interior chamfer]
Continue chamfering until there are no burrs.



6. Insertion markings setting up

⚠WARNING

Be sure to perform marking work to control the insertion allowance for piping. Insufficient piping insertion may cause refrigerant leakage.

(1) Insert the pipe fully into the marking gauge or plastic nut to check pipe ovality and that the pipe is clear of external and internal burrs.
(2) Using the confirmation window, make sure that the piping is inserted all the way into the marking gauge.
(3) Make a mark through marking hole with an oil-based pen, etc. (2 locations)
(See Fig. 5-1, 5-2)
(4) Markings made with oil-based pen may be difficult to see in dark surroundings (such as in the ceiling). Add markers using vinyl tape, etc. as much as possible to improve visibility. (See Fig. 5-3)

⚠CAUTION

Do not force the pipe into the marking gauge or plastic nut.
If the piping cannot be inserted into the marking gauge or plastic nut smoothly, correct the problem and chamfer the piping again.
Forcibly inserting the piping may damage/scratch the marking gauge or plastic nut causing debris to adhere to the inside of the piping.

[When using the marking gauge]

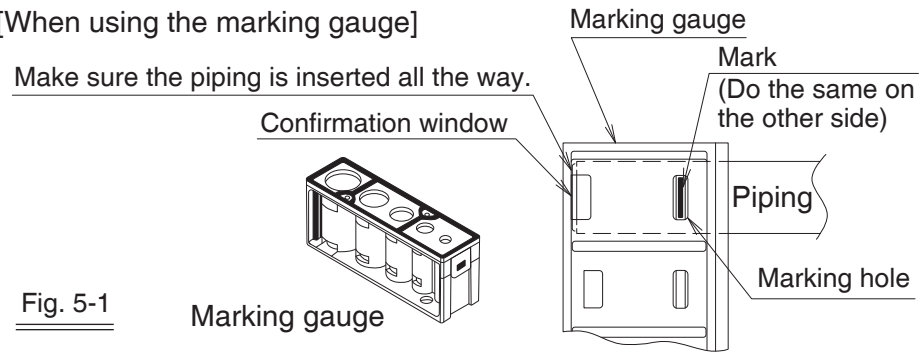


Fig. 5-1

[When using the plastic nut]

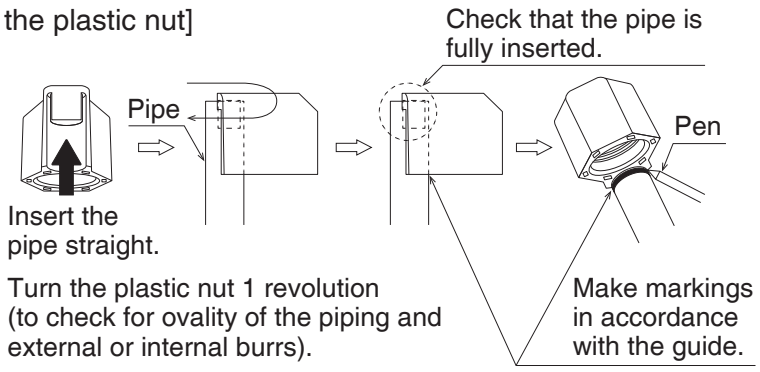


Fig. 5-2

⚠ CAUTION

Keep the pipe straight when inserting it into or removing it from the plastic nut. If the pipe is inserted or removed at an angle, the marking gauge part may get damaged. In the event that it is damaged, do not use it.

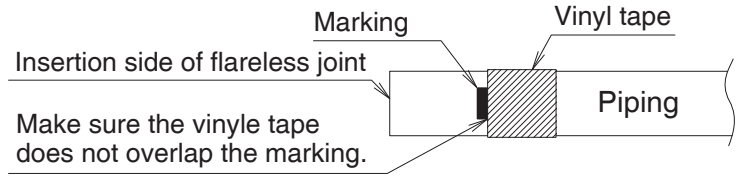


Fig. 5-3

About installation work

When attaching flareless joints to the indoor unit, work in the order of **7** → **8** below.
When attaching flareless joints to the outdoor unit, work in the order of **8** → **7** below.

7. Insertion of piping

(1) Make sure that there is no dust or dirt inside the flareless joint.
(2) Insert the pipe straight and firmly all the way into the flareless joint.
Anti-release tabs will engage. (See Fig. 6)
*There are tabs inside the flareless joint, creating some resistance. Insertion resistance is much greater for piping sizes of ϕ1/2 and above as compared to sizes ϕ1/4 and ϕ3/8.
*While the black line on the surface of the flareless joint provides a guideline for pipe insertion depth, do not use this guideline alone to determine the insertion depth when inserting the piping.
(3) Make sure the marking is at the base of the flareless joint end.

⃠ Prohibited

Do not insert the piping at an angle or use a tool to hit it and drive it into the flareless joint. The action described above might damage the piping or sealing material causing refrigerant leaks.

⚠ CAUTION

- If the piping cannot be inserted into the flareless joint, the marking gauge or plastic nut you used may be damaged. Please replace the marking gauge or plastic nut.
- Insert straight until the marking reaches or disappears under the end of the flareless joint.
- After piping has been inserted, it cannot be removed due to the anti-release mechanism. Forcibly pulling out the piping will result in damage. To remove, cut out the piping and use a new flareless joint.

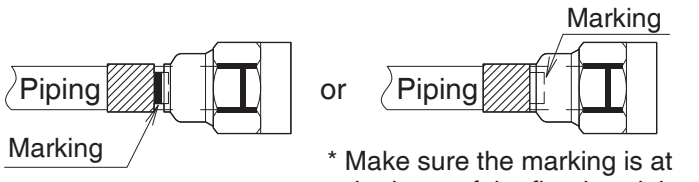


Fig. 6

* Make sure the marking is at the base of the flareless joint.

8. Hand-tightening of flareless joint connections

(1) Make sure that there is no dust or dirt inside the flareless joint, or inside the connector portion.
(2) Turn the flareless joint by hand and tighten it until it will not turn any more. (See Fig. 7 and Fig. 8)

⚠ CAUTION

There is lubricant (white) on the threads of the flareless joint. Make sure that no lubricant gets on the connector portion (other than the screw part).

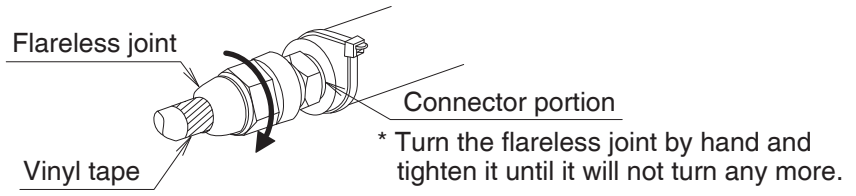


Fig. 7 Indoor unit connection example

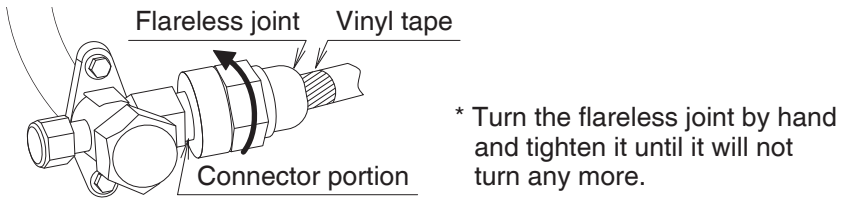


Fig. 8 Outdoor unit connection example

9. Checking the position of the insertion depth marking

Check again that the marking is at the base of the flareless joint. (See Fig. 9)
*Make sure that the width of the bare pipe is smaller than width A shown in Fig. 9.
If the width is larger than A, the tabs may not be engaged and the pipe may not be inserted sufficiently.
In this case, insert the pipe straight and firmly all the way in again.

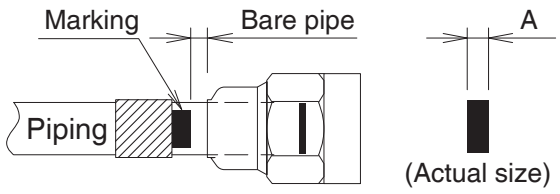


Fig. 9

10. Marking

- Mark the flareless joint and the connector portion. (See Fig. 10)

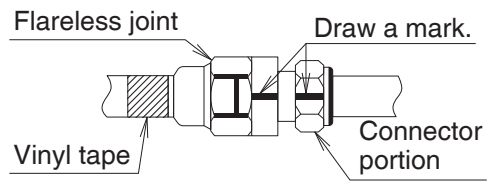


Fig. 10

11. Tightening of the nuts

- Secure the flareless joint and the connector portion using adjustable spanners, then, using the marking or the characters printed on the flareless joint as a guide, rotate the flareless joint 1 time to tighten it. (See Fig. 11 and 12)
Be sure to use 2 adjustable for this purpose.

⚠ CAUTION

- Do not tighten excessively as this may damage the flareless joint and cause cracking over time.
- After tightening, the position of the marking on the piping inserted in step **7** (Fig. 6) will change.
- If you do not use 2 adjustable spanners, refrigerant leakage may result.

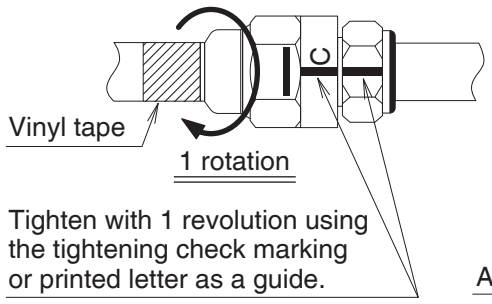


Fig. 11

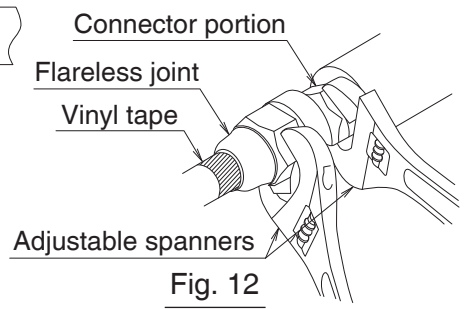


Fig. 12

12. Airtightness testing and refrigerant leakage inspection

- Perform an airtightness test and refrigerant leakage inspection of the piping connections.
- For warnings and precautions, be sure to check the installation manual attached to the product unit.
- After completing the inspection, perform thermal insulation work.
- For airtightness test, refrigerant leak inspection, insulation work, refer to the installation manual attached to the product unit.

13. Precautions after installation

After connecting the flareless joints, do not twist the flareless joints or the piping.

- If connecting bent sections of piping bend the piping in advance, and then attach flareless joints and connect the piping sections. After tightening, do not bend the piping. (See Fig. 13)
- Do not apply force horizontally or vertically to the piping to which the flareless joint is connected. (See Fig. 14)
Do not reuse flareless joints that have previously been installed.

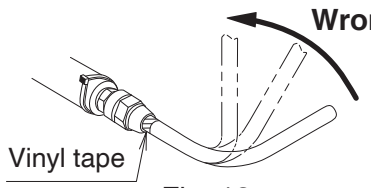


Fig. 13

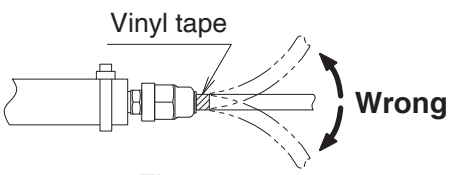


Fig. 14