# INSTALLATION INSTRUCTION FOR METAL JOINTS

## READ THIS INSTALLATION INSTRUCTION BEFORE INSTALLING THE PRODUCT

If you have any doubts, please consult our data sheets at www.amnitec.co.uk
or speak to a member of our team at 01685 385641.

Amnitec expansion joints are supplied ready for installation.

Flanges and fittings can be adjusted to any required position.
Additional sealing may be needed. It is advisable to use extra sealing on the threaded sections of the fittings.

Remove the storage protection carefully, just before installation.
It is crucial to handle the bellows, flanges, weld-ends, and fittings with special care to avoid any damage.

Ensure that the joint interior and the piping system are free from damage, dirt, fat, grease, rust, welding rest materials or any other foreign materials. In case of the use of any cleaning products / agent, ensure that they are compatible with the bellow and / or expansion joint materials, as well as the piping (system).

Start installation of the expansion joint only once all work on the adjacent piping (flanges welding, anchors setting, etc.) has been completed and cooled down. Metal expansion joints can easily be damaged by welding sparks or heat, sharp objects, etc. Especially the thin walled corrugated bellow.

Avoid gradients, rotation or pipe misalignment that could exceed the permissible movements of the metal expansion joint in use.

Ensure and check alignment of the mating pipe work. Metal expansion joints are not designed to compensate for piping misalignment. Misalignment reduces rated movements, which can cause severe stress and reduce the service / life time.

Ensure and check the length and motions against the application.

It is important that the expansion joint be installed at the length specified by Amnitec. They should never be extended or compressed in order to make up for deficiencies in length, nor should they be offset to accommodate misaligned pipe work.

Make sure the metal expansion joint rating for temperature, pressure, vacuum and movements match the system requirements. Also check to make sure the material selected is (chemically) compatible with the process fluid or gas.

Check the risk of hammer blow. Ensure adequate drainage, insulation, preventing water pockets, inclination of the piping, etc.



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Avoid the installation of expansion joints in the immediate vicinity of pressure reducers, hot steam coolers and shut-down valves, butterfly valves, etc. and high frequency oscillations due to turbulence.

1) Before starting installation of the expansion joint ensure the counter flange / weld end / fitting is correct, e.g. proper sealing surfaces, pipe schedule, threading etc.

2) Pay attention to the correct neutral length. It must be avoided to pull out metal expansion joints to overlap installation gaps which are too large. This will cause overstressed metal bellows. This could lead to serious damage / leakage of the bellow and worse. During the tightening of the screws, bolts and nuts, the bellow will not seal properly.

For the allowable range of movement please see type specific data sheets. If possible, the length of the installation gap is designed to be equal to the recommended installation length, or slightly shorter. The low inherent resistance of our metal bellows allows a compression by hand and makes mounting into slight smaller gaps easy.

**Attention:** A shortening or lengthening of the joint of more than 3mm during installation will decrease the allowable range of movement during service, operation and therefore decrease the life-time, cycle-life.
Always use e.g. distance flanges or something equal.

3) We recommend installation of the metal expansion joint to enable maintenance engineers etc. to check production date, brand etc.

4) Bolts / screws should be mounted from the expansion joint side. If this is not possible, please check that the (sharp) ends of the bolts / screws do not reach the metal bellow surface in ALL operating conditions.

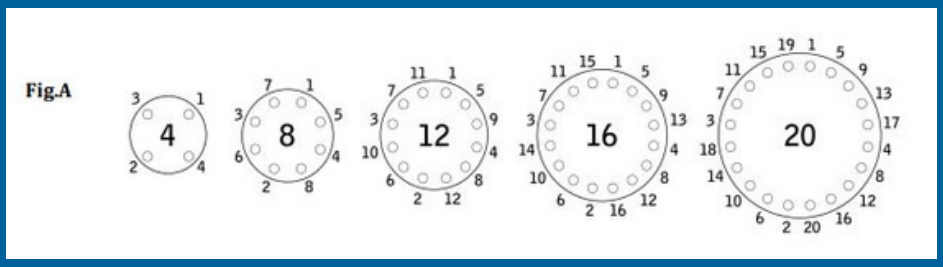
5) The screws / bolts have to be mounted and fastened / tightened in three uniform steps:

STEP 1: Tighten screws / bolts equally by hand, pay attention to parallel sealing surfaces

STEP 2: Fasten all screws / bolts crosswise with a 50Nm. torque. (as shown in **Fig.A.)**

STEP 3: Finish fastening crosswise (as shown in **Fig.A.)** and use the recommended flange to flange parameters

Do not use any sharp-edged tools which might damage the metal bellow.




6) The test pressure of a metal bellow commonly is 1.5 x PN. This valve depends on which component is weaker, see bellow and / or flange specifications.

7) The metal bellows of an expansion joint should not be painted, as this can damage the bellows and hinder visual inspection.

8) The metal bellow / expansion joint should not be subject to TORSION. Always avoid TORSION.

9) The metal bellow must always be protected against heat by all means, e.g. welding, heating, flame, sparks, cutting etc.

10) If necessary, flame protection covers should be used.

11) Metal expansion joints will always wear and must be included into routine inspection of the pipe system (we recommend visual inspection with regard to damages).

12) Outdoor installations can shorten the lifespan of metal joints; exploring alternatives is advisable.

13) Allow enough space to ease maintenance operations.

14) Consider the interaction between the system and the product. The correct selection and location of the joints, as well as guiding and anchoring of the piping are essential for the safe use of the joint.

15) A metal joint should work either as an anti-vibration device OR an expansion joint, NOT both functions at the same time; pipe anchoring and guiding requirements are different.

16) Amnitec metal joints are not always bi-directional, you should therefore pay extra attention to the flow direction, especially with joints with a liner. Commonly they are suitable to be installed either in horizontal and / or vertical pipelines.

17) Ensure that the threading on the fittings is compatible and suitable for use with the corresponding pipework.

18) Select a sealant that is appropriate and suitable for the intended application, such as hemp core or Teflon tape.

19) Check and ensure that the mating thread ends do NOT exceed the fitting threads.

To maximise their operational efficiency bellows are fabricated from thin wall (gauge) material and require VERY careful handling. Therefore, to ensure that the calculated lifetime and pressure capacity are maintained, proper care must be taken during installation. The procedures described in these pages are therefore strongly recommended.

If expansion joints are provided with outside / inside protection (whether temporary or permanent), it must not be removed until after installation.

The following instructions, sometimes overlapping, must be observed during installation. If there is any doubt, please use our data sheets, speak to a member of our team or visit www.amnitec.co.uk

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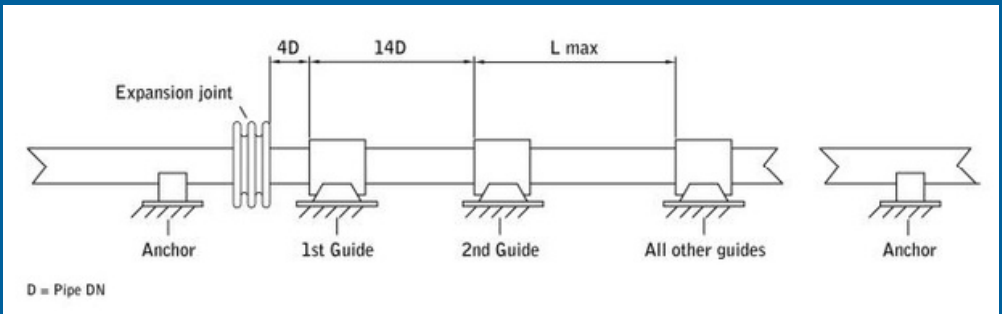
## RECOMMENDED ACTIONS AND AVOIDANCES

**DO**

- Inspect bellows and steel components for any physical damage. Dents or scratches etc. on the bellows may reduce both lifetime and pressure capacity.
- Only use the lugs for lifting the expansion joint. Never use the bellow itself.
- Always check the length of the expansion joint against the application via our drawing and / or specification / documentation.
- Always check the need of tie-rods.
- Adjust or align the piping system to fit the necessary length of the expansion joint. Overextending an expansion joint can diminish its lifespan and pressure capability.
- Check that there is no misalignment of the expansion joint other than that specified in the design phase.
- Install the expansion joint with the flow indicator, pointing in the direction of flow.
- Ensure that, when internal sleeves/lining is fitted, they are fitted in the direction of the flow and not in the opposite direction.
- Remove all shipping devices after installation and prior to the pressure test.
- Should Amnitec grant approval for insulating the expansion joint, it is crucial to apply the insulation over a slim protective cover to safeguard the bellows convolutions. Direct insulation of the bellows convolutions is strictly prohibited. Additionally, when insulating the bellows, it is imperative to ensure ample free space is provided for the unimpeded movement of the expansion joint.
- Check for and remove any material adhering to the inside or outside of the bellows convolutions.
- Ensure that, if only the bellows is required, it is extended to the correct length before installation.
- Before installing ensure you have the CORRECT guiding, spacing and anchoring of the piping. Refer to the recommendations of the EJMA or EN 13480.
- When installing the expansion joint, ensure that the pipe line is straight and in-line. Possible fixed points must be placed so as to allow correct expansion to the piping system in accordance with the type of expansion joint chosen. Between any two fixed points/guides, ONLY ONE axial expansion joint must be installed.





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**DON'T**

- Use an expansion joint to take up any misalignment other than that specified in the design phase.
- Remove any protection, shipping devices etc. prior to installation.
- Expose bellows to weld splatter or wheel swarf. If necessary, protect the bellows with "non chloride" wet protection blankets. Never use any plastic blankets or foils.
- Open or remove anything from the package before installation.
- Drop or bump the bellows.
- Use the tie-rods, hinges, etc. as lifting lugs.
- Attach chains or other lifting devices directly to the bellows.
- Use detergents that contain chlorides.
- Use steel wool or any other mechanical and abrasive methods for cleaning the bellows.
- Insulate the expansion joint without prior consultation with Amnitec.
- Forcibly rotate one end of a fixed flange or weld end of an expansion joint for bolt alignment etc. Bellows are **UNABLE** to take up any **TORSIONA**L movement.
- Pressure test to more than that pressure which is specified by the certificate requirements. If there is any doubt, consult Amnitec.
  Always ensure that adequate support is provided to take the extra weight of the testing media contained within the expansion joint during testing.
- Use shipping bars to retain pressure thrust in pressure test or in operation.

IF THE INSTRUCTIONS ARE NOT STRICTLY FOLLOWED, WE WILL DECLINE FROM ANY RESPONSIBILITY AND/OR GUARANTEE ETC.

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