

INSTALLATION INSTRUCTION FOR METAL JOINTS

READ THIS INSTALLATION INSTRUCTION BEFORE INSTALLING THE PRODUCT



If there is any doubt, don't hesitate to check our data sheets or consult us.
www.amniflex.nl

Amniflex expansion joints are commonly supplied ready for installation. The standard flanges/fittings can be turned into any desired position. Additional sealings are not in our scope, but may be necessary. For fittings we recommend additional sealing for the threaded parts.

Remove the storage protection carefully if any, just before installation. Special care should be taken in order not to damage the bellow and/or flanges/weld-ends and/or fittings.

Ensure that the joint interior and the piping system are free from damages, dirt, fat, grease, and rust, welding rest materials or any other foreign materials. In case of the use of any cleaning products/agent, convince yourself and make sure 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 normally not designed to compensate for piping misalignment. Misalignment reduces rated movements, will cause severe stress and reduces service/life time.

Ensure and check the proper length and motions against the application!

It is important that the expansion joint be installed at the length specified by Amniflex. 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.

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

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- 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 might 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 3 mm during installation will absolutely decrease the allowable range of movement during service, operation and therefore decrease life-time, cycle life.

Always use e.g. distance flanges or something equal.

- 3) We recommend installation of the metal expansion joint in such a way 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 may not reach the metal bellow surface in ALL operating conditions.
- 5) The screws/bolts have to be mounted and fastened/tightened in 3 uniform steps:

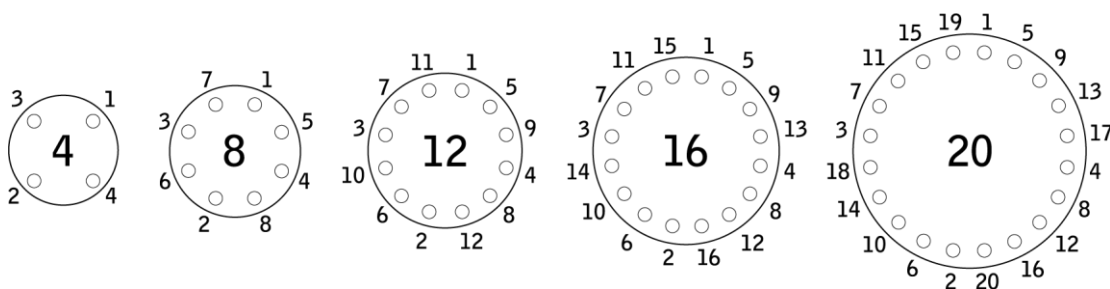
1st step: Tighten screws/bolts equally by hand, pay attention to parallel sealing surfaces.

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

3rd step: 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.

Fig.A



- 6) The test pressure of a metal bellow commonly is 1.5 x PN. This value depends on which component is weaker, see bellow and/or flange spec's.
- 7) The metal bellow of the expansion joint better not to be painted this may cause damage to the bellow and may result in impossible visual inspection.
- 8) The metal bellow/expansion joint MAY NEVER 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. etc.

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- 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 installation may reduce metal joints life span, consider alternatives.
- 13) Allow enough space to ease maintenance operations.
- 14) Consider the interaction between the system and the product. Proper selection and location of the joints, as well as proper guiding and anchoring of the piping are essential for the safe and proper use of the joint.
- 15) A metal joint should work either as an anti-vibration device or as expansion joint, but not both functions at the same time; pipe anchoring and guiding requirements are different.
- 16) Amniflex metal joints are not always bi-directional and 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. If in doubt, don't hesitate to check our data sheets or consult us, www.Amniflex.nl
- 17) Ensure that the threading of the fittings is similar and/or proper/suited for use in combination with the mating pipe work.
- 18) Use a proper sealant(s) according and/or suitable for the applicable duty, such as hemp core, Teflon tape etc.
- 19) Check and ensure that the mating thread ends do NOT EXCEED the fitting threads.

To maximize 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, don't hesitate to check our data sheets or consult us, www.amniflex.com

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Do's and do not's

Do-inspect bellows and steel components for any physical damage. Dents or scratches etc. on the bellows may reduce both lifetime and pressure capacity.

Do-only use the lugs for lifting the expansion joint. Never ever use the bellow itself.

Do-check the length of the expansion joint always against the application via our drawing and/or specification/documentation.

Do-always check the need of tie-rods.

Do-correct or line up the piping system to accommodate the required length of the expansion joint.

Stretching an expansion joint may reduce its lifetime and pressure capacity.

Do-check that there is no misalignment of the expansion joint other than that specified in the design phase.

Do-install the expansion joint with the flow indicator, if any, pointing in the direction of flow.

Do-ensure that, when internal sleeves/lining is fitted, they are fitted in the direction of the flow and not in the opposite direction.

Do-remove all shipping devices after installation and prior to the pressure test.

Do-if acceptance has already been given by Amniflex that the expansion joint may be insulated, always ensure that insulation is applied over a thin cover to protect the bellows convolutions. Bellows convolutions must never be covered directly with insulation. Furthermore, if the bellows is insulated, sufficient free space must be made available for the expansion joint to move freely.

Do-check for and remove any material adhering to the inside or outside of the bellows convolutions.

Do-ensure that, if only the bellows is required, it is extended to the correct length before installation.

Do-ensure and check, before installing PROPER and CORRECT guiding, spacing and anchoring of the piping. Refer to the recommendations of the EJMA or EN 13480.

Do-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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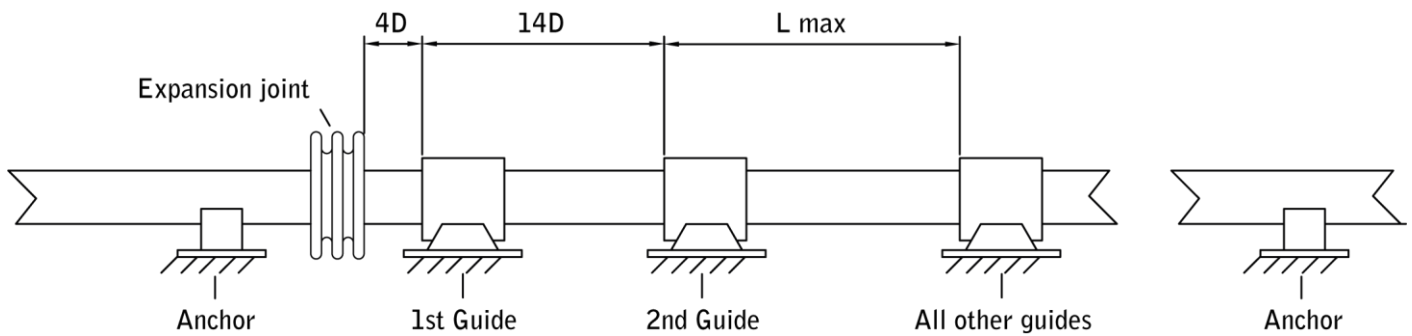
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D = Pipe DN

Do NOT- use an expansion joint to take up any misalignment other than that specified in the design phase.

Do NOT-remove any protection, shipping devices etc. prior to installation.

Do NOT-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.

Do NOT-open or remove anything from the package before installation.

Do NOT-drop or bump the bellows.

Do NOT-use the tie-rods, hinges, etc. as lifting lugs.

Do NOT-attach chains or other lifting devices directly to the bellows.

Do NOT-use detergents that contain chlorides.

Do NOT-use steel wool or any other mechanical and abrasive methods for cleaning the bellows.

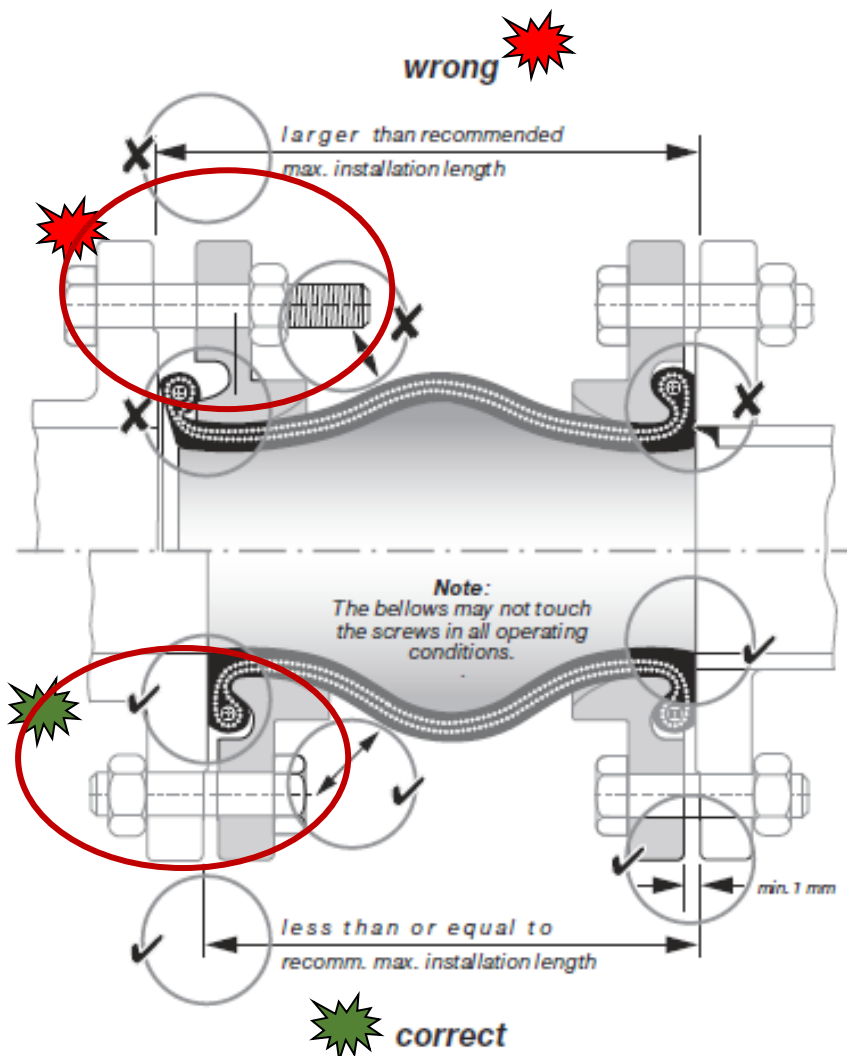
Do NOT-insulate the expansion joint without prior consultation with Amnitec.

Do NOT-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 **TORSIONAL** movement.

Do NOT-pressure test to more than that pressure which is specified by the certificate requirements. If there is any doubt, consult Amniflex. Always ensure that adequate support is provided to take the extra weight of the testing media contained within the expansion joint during testing.

Do NOT-use shipping bars to retain pressure thrust in pressure test or in operation.

Although this image is a rubber bellow the way the bolt & nut has been placed are also applicable on metal bellows.



If above is not possible please take care of the fact the (sharp) ends of the bolt never reach the metal bellow surface in ALL operation conditions.

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

When using wrenches(spanners) ensure that tightening is only done on the outside of the flange and **never on the inside** of the flange. Otherwise you will damage the bellow element !

For further important information see:

- Guide to the use of Amniflex Metal bellows and expansion joints.

If there is any doubt consult Amniflex BV

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

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