Installation and Service Instructions
Rubber - Expansion Joint

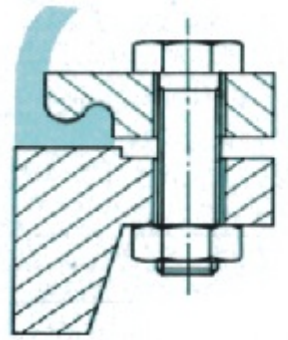
INNO-FLEX
Techn. Equipment

The following points must be observed during installation:

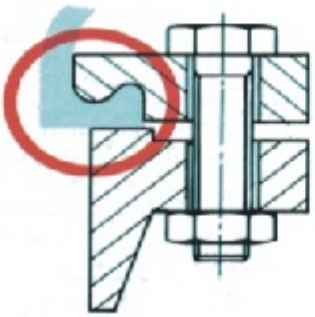
1. Do not work with sharp-edged tools (danger of damaging the rubber bellows).
2. During welding and cutting operations, the rubber parts must be protected with ceramic fibre material.
3. Tighten the screws on the flange crosswise in the normal manner. Additional sealing ring is not necessary.
4. After putting into service for the first time, re-tighten the flange screws.
5. The flange screws muts not protrude as fast as the rubber bellow.
6. All parts which come into contact with the rubber expansion joint must ve thoroughly feed from burrs.
7. Rubber parts must not be painted.
8. The test pressure must not exceed 1,5 times the operating pressure.
9. If required, all ruber expansion joints may be adapted for pipes under vacuum through insertion of corrosion resistant supporting rings.
10. The expansion joints must not be stressed simultaneously in the maximal axial and the maximal lateral or angular directions. The effect of temperature on the permissible movement, and on the permissible pressure can be taken from our catalogue.
11. During installation and subsequent operation, the expansion joint must under no circumstances be subjected to torsion (twisting).
12. If local conditions make it impossible to provide fixed points, it is essential to fit the expansion joint with length limiters. In this way the expansion joint is protected against excessive stretching. Length limiters can also be installed as an additional security measure at critical fixed points.
13. During servicing, regularly inspect the surface of the rubber bellows for cracks, damage and swelling. Test for freedom of movement by pushing into the guide bearings. Test the fixed points for rigidity.
14. Testing after changes in operating conditions (e.g. pressure, temperature, medium, flow direction, vibrations, frequency of load fluctuations) and when the existing equipment is extended. In such cases, consultation with us should take place, regarding testing the existing expansion joint for their suitability under the altered conditions.
15. The valid working pressure has to be limited with a suitable safety-feature.

caution: If there are temperatures above 80° C make use of the decreasing factors concerning "pressure".
(as you can see in the product catalogue, issue 2/2001, page 32-09 or at http://www.innoflex.at (installation instructions)

working temperature	85°C	90°C	95°C	100°C	105°C
decreasing factor	0,92	0,83	0,75	0,67	0,6



correct mounting



false mounting

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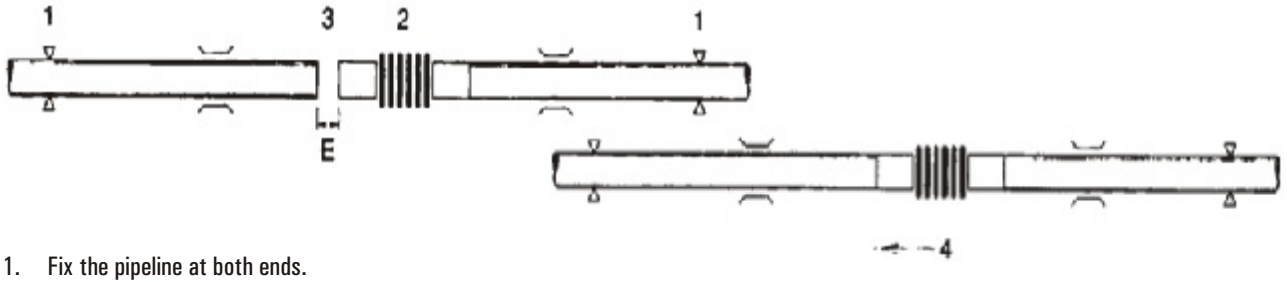
Examples of pre-tensioning:

installation length = $TL + H/2 - H \times t_u/t_d$

where $t_u = t_e - t_m$ and $t_d = t_{max} - t_{min}$

		Beispiel 1	Beispiel 2
TL	length of expansion joint as delivered	218 mm	218 mm
t_{max}	maximum possible temperature of the pipeline	+ 130°C	+40°C
t_{min}	minimum possible temperature of the pipeline	0°C	0°C
t_e	installation temperature	+20°C	+20°C
H	calculated total expansion of the pipeline	30 mm	30 mm
	installation length according to above formular	139 mm	130 mm

pre-tensioning in the direction:

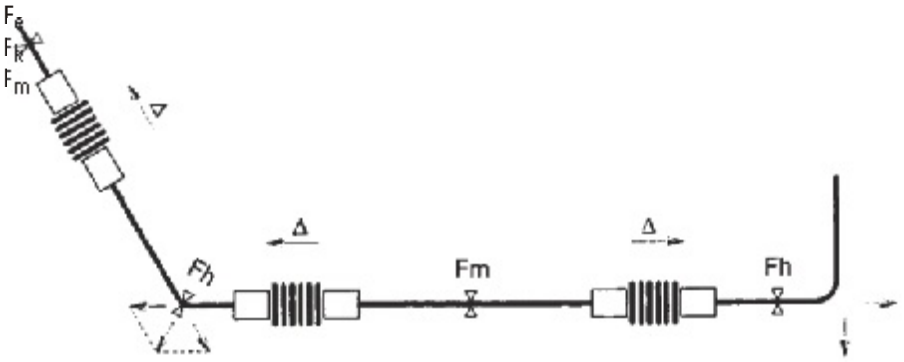


1. Fix the pipeline at both ends.
2. Mount the angular expansion joint in the initial position.
3. Cut out a length of pipe corresponding to the required pre-tensioning E, or mount the pipe line such that the seperation of the pipes from one another corresponds to the required pre-tensioning E.
4. Move the angular expansion joint into the pre-tensioned position E. Finally weld the pipes or combine them usin a flange.

Fixed points:

The section of pipe in which the expansion joint is installed must be bounded by fixed points. These must take up both the displacement forces of the expansion jointed the frictional resistance of the guide bearing. Fixed points and guides must be laid out so that the expansion joint does not bear the weight of the pipe.
there are the following types of fixed points:

a) end-fixed point F_e
b) knee/elbow fixed points F_k
c) intermediate fixed points F_m



Important: Make sure that the fixed points are really rigid. It must not be possible for the pipeline to move several millimeters before the system actually becomes rigid.

It is possible to combine expansion joints of different construction or functionality with the same pipeline system, as long as there is a sufficient number of rigid fixed points.

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