

Installation Instructions Bellows Expansion Joints

Piping:

Because the bellows expansion joint is required to absorb thermal and / or mechanical movements, the bellows element must be constructed of a relatively thin gauge material. This requires special installation precautions.

Piping should be lined up accurately before installing the expansion joint. Angular, lateral, and axial misalignment, and / or torque, will cause shearing stresses. The system must be piped to eliminate misalignment at the joint.

Don't rotate or torque the expansion joint to match bolt holes in the mating flanges. Bolt holes should be lined up accurately and flange bolts should not be used to correct alignment problems.

Be sure the face to face opening between the mating pipe flanges is the proper dimension for the expansion joint and that the faces of the flanges are parallel. Piping centerlines must be aligned.

Don't let the expansion joint support any weight except its own. The system piping must be properly supported and hung. Since the expansion joint is flexible, any extra weight will stress it.

**** IMPORTANT: When installing weld end expansion joints, be sure the opening in the pipeline is the proper dimension for the expansion joint and that the piping is straight and true. When welding the expansion joint, or even when welding nearby, cover the expansion joint with a chloride free, heat resistant protector to prevent arc strikes, weld spatter, etc. from damaging the expansion joint, especially the stainless steel bellows.**

General:

Don't use any cleaning agents which contain chlorides. They can cause stress corrosion which will appear only after the bellows is put in service.

Don't use wire brushes, steel wool or other abrasives to clean the bellows. Some types of insulation leach chlorides when wet. Keep them away from the bellows.

If you're doing any welding near or above the expansion joints, cover them with a chloride free, heat resistant protector to prevent arc strikes, weld spatter, etc. from damaging the bellows.

Notes:

Before system pressurization, be sure all hangers, guides, and anchors are installed and functioning.

Don't hydro-test the system at pressures greater than the rated test pressure of the components or the anchor load design.

Guiding:

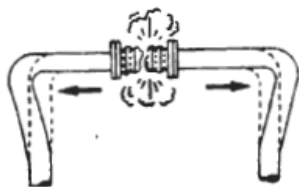
Piping systems which contain expansion joints tend to buckle under the compressive forces in the system. Due to the flexibility of the expansion joint and internal pressure thrust loading, the pipe acts as a column that must be properly guided to prevent buckling.

The piping must be properly guided with at least two concentric pipe guides on each side of the expansion joint so neither the expansion joint nor the piping can squirm out of the piping centerline. Pipe hangers and supports are not guides. Guides are not for supporting piping.

Pipe guide location: (150 PSI System Working Pressure)

Nominal Pipe size	From Joint to 1st Guide	From 1st to 2nd Guide	Between all Other Guides
3"	1.00 ft	4 ft	22 ft
4"	1.25 ft	5 ft	30 ft
5"	1.50 ft	8 ft	35 ft
6"	2.00 ft	10 ft	40 ft
8"	2.75 ft	10 ft	50 ft
10"	3.50 ft	12 ft	62 ft
12"	4.00 ft	14 ft	68 ft

Effect of internal pressure thrust load without proper anchors



Effect of thermal expansion of piping without guides



Proper installation with alignment of anchors & guides



Anchoring:

Pipeline and/or expansion joint failures can be caused by under-designed and / or inadequate anchors on the piping system.

Main anchors must be able to withstand the bellows generated pressure thrust load, the deflection forces, and the guiding frictional forces. Anchors are required at each pipeline direction change, blind end, valve, major branch connection, or change in pipe diameter.

Pressure Thrust Load is the outward force of the bellows, when pressurized, on the piping system and anchors. These forces can be considerably more than the system operating pressure, and the anchors should be designed with an ample safety factor in addition to these forces.