Installation procedures Rubber expansion joints with " swiveling" flanges

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Important:

Please review this manual, to avoid errors
Before performing any maintenance on this product be sure that the system has been de-pressurized.

The improper installation or use of the expansion joint may result in personal injury, product failure, or causes a hazard for the environment.

In case of doubt please contact you supplier.
We cannot except no liability resulting from improper use or installation of this product.

Before you start the installation of the expansion joint, review the application to which the expansion joints is going to be applied!

Make sure that the pressure/vacuum, temperature, rubber quality and movements of the expansion joints meet the requirements of the system.

Carrie out the procedures mentioned on the drawings, documents and on the possible labels.

You will find the technical characteristics of the expansion joint in our catalogue

Inspect pipe and product

Check the flange facing of the counter flange for rouge/damaged areas, counter flanges must be flat, properly spaced and parallel to achieve proper seal.

The inner diameter of the counter flange should not be larger than the inner diameter of the rubber joint

Grind or file any sharp edges of the counter flange to prevent damaging the rubber joint

Measure length needed.

Measure the distance between the two flanges to be connected, measurements should be taken at ambient temperature. Make sure that the flanges are properly aligned, and that any misalignment does not exceed 1/8”

The length of the installation gap should be equal to the constructional length of the expansion joint.

Set Joint in place.

The expansion joint shall be mounted by authorized and qualified personnel only. Applicable rules and regulations for accident prevention shall be observed as required.

Care must be used when pushing the joint in its place between the mating flanges so as not to roll the leading edge of the joint out of its flange groove

Do not weld near any rubber expansion joint or weld the mating flanges with the expansion joint in place. There is the possibility of fire, spark or heat damage.

All pipe lines should be properly supported so that the expansion joints do not carry the pipe load.

The design conditions of the expansion joints must be respected.

Any field pre-positioning shall be performed in accordance with specification instructions which include both the direction and the magnitude of the movement.

Anchors, guides and pipe supports shall be installed in strict accordance with the piping system drawings.

Once the pipeline anchors or other fixed points are in place, the expansion joint shipping devices, if provided, shall be removed.

No movement of the expansion joint due to piping misalignment shall be imposed which has not been anticipated and designed into the movement capability of the expansion joint.

Expansion joint flanges must be in contact with a continues surface. Depressions or protrusions typical of victaulic or similar flanges must be covered with a steel cover flange first.

Rubber flanges will not retain loose elements in valve bodies that rely on contact with a steel flange. A steel cover flange must be inserted between the rubber expansion joint and the valve body.

Apply a thin film of graphite dispersed in glycerin or water to the surface of the rubber flange before installing. No other type of lubricant or seal should be used on the flange face. The graphite prevents the rubber from adhering to the metal flange so that the rubber pipe or joint can be removed without damage, should it ever be necessary.

It is preferable to install the bolts with washers; it is also preferable to install the bolts with the head next to the rubber arch. This eliminates the possibility of using overlong bolts with the bolt protruding the nut and cutting into the rubber arch. If this is for any reason impossible, ensure that the threaded bolds project as little as possible . (no more than 2 or 3 mm.

as far as possible, install expansion joint in such a way that they can be visually inspected at regular intervals for intact condition.

With high flow velocities involving possible resonance or turbulence caused by re-routing of the flow direction (downstream of pumps, valves, T-pieces, pipe bends) a guide sleeve must be installed. When installing, observe the flow direction!

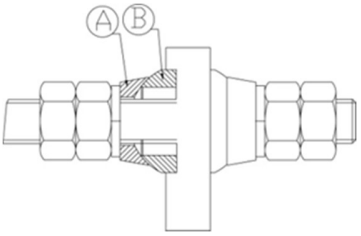
The rubber expansion joints are self-sealing, so special seals are not required. The sealing surfaces of the mating flange must be flat and clean.

note! that you have to use a gasket between the guide sleeve and the counter flange.

Never operate expansion joints above rated pressure or temperatures.

Do not lift the expansion joints by the bolt holes. They may be lifted by a padded sling. It is preferable not be roll joints on their flanges. Transport them to the position of installation and install them without contact with the floor wherever possible.

Between the spherical bearings part A and part B, there must be a thin film of grease for smooth movements and to prevent corrosion.



The nuts for the spherical bearings are to be tighten by hand!

ANCHORS, PIPE GUIDES AND SUPPORTS

To stop the expansion joint from extending or compressing due to pressure thrust, main anchors must be located at some point on each side of the joint to withstand the forces of pressure thrust and keep the expansion joint at its proper length. Tie rods, hinges and/or gimbals may also be used to restrain pressure thrust force by attaching the ends of the expansion joint to each other. I n this case, these restraints prevent the bellows from absorbing any axial movement external to the expansion joint. Pressure-balanced expansion joints restrain pressure thrust and absorb axial movement external to the joint.

The forces exerted on a piping system due to the presence of expansion joints can be quite significant.

MAIN ANCHORS

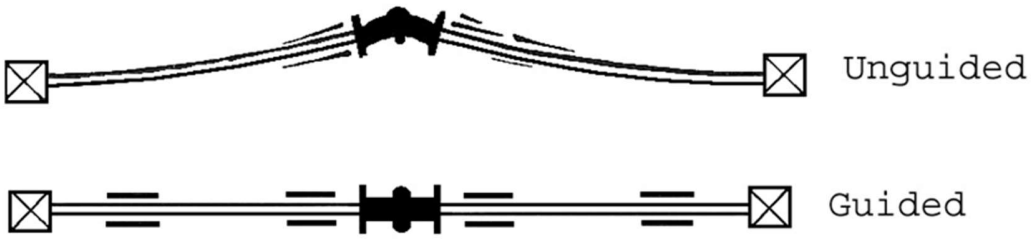
A main anchor must be designed to withstand the forces and moments imposed upon it by each of the pipe sections to which it is attached. In the case of a pipe section containing one or more unrestrained expansion joints, these will consist of the full bellows thrust due to pressure, media flow, the forces and/or moments required to deflect the expansion joint or joints their full rated movement, and the frictional forces caused by the pipe guides, directional anchors and supports. In certain applications it may be necessary to consider the weight of the pipe and its contents and any other forces and/or moments resulting from wind loading etc.

INTERMEDIATE ANCHORS

Intermediate anchors are not intended to withstand pressure thrust force. This force is absorbed by main anchors, by devices on the expansion joint such as tie rods, swing bars, hinges, gimbals, etc., or, as in the case of a pressure-balanced or double expansion joint, is balanced by an equal pressure force acting in the opposite direction. An intermediate anchor must withstand all of the non-pressure forces acting upon it by each of the pipe sections to which it is attached. In the case of a pipe section containing an expansion joint, these forces will consist of the force required to move the expansion joint and the frictional forces caused by the pipe guides.

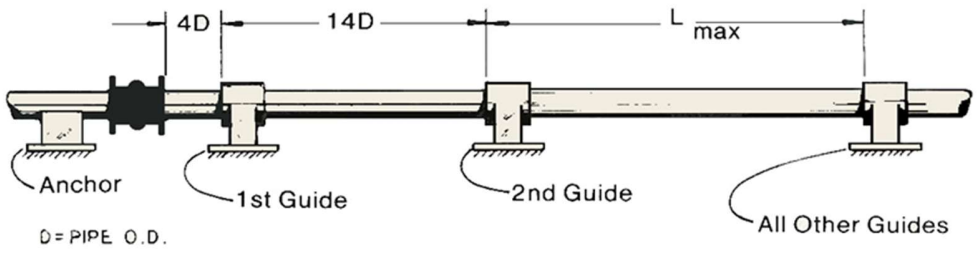
PIPE GUIDES AND SUPPORTS

Correct alignment of the pipe adjoining an expansion joint is of vital importance to its proper function. Although expansion joints are designed and built for a long and satisfactory life, maximum service will be obtained only when the pipeline has the recommended number of guides and is anchored and supported in accordance with good piping practice. Proper supporting of the pipeline is required not only to sup- port the pipe itself, but also to provide support at each end of the expansion joint. Pipe guides are necessary to insure proper alignment of movement to the expansion joint and to prevent buckling of the line. Buckling is caused by a combination of the expansion joint flexibility and the internal pressure loading on the pipe which causes it to act 1ike a column loaded by the pressure thrust of the expansion joint.



PIPE GUIDE APPLICATION

When locating pipe guides for applications involving axial movement only, it is generally recommended that the expansion joint be located near an anchor, and that the first guide be located a maximum of 4 pipe diameters away from the expansion joint. This arrangement will provide proper movement guiding as well as proper support for each end of the expansion joint. The distance between the first and second guide should not exceed 14 pipe diameters.



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Dimension inspection procedure according to FSA

Nominal pipe size Expansion joints ID	Tolerance for rubber pipe & expansion joints							
	Exp. joints I.D.[1] mm	Non-critical Flange O.D.[1] mm	Bolt Line[3] mm	Face –to-Face length "F" All dimensions to be an Average reading. Applies to open or filled Arch				Number of Measurements To be averaged
				0-150	175 - 300	350 -450	500 -up	
0 to 250	±5	±6	±5	±5	±5	±5	±5 - ±6	4
300 to 550	±6	±10	±5	±5	±5	±5	±5 - ±6	4
600 to 1150	±10	±10-12	±5	±5	±5	±5 - ±6	±6	4
1200 to 1750	±10-12	±10-12	±10	±6	±10	±10	±10	6
1800 and up	±10 -12	±12-25	±12	±6	±10	±10	±10	6

1. All diameters to be measured with a "Pi" tape.
2. All linear dimensions to be measured with a steel rule and averaged.
3. Bolt line= actual I.D. plus 2 times the space between the bolt holes and the I.D. plus 1 time the bolt holes.

FLANGE THICKNESS (non –critical)			
Nominal pipe size	Nominal Flange thickness mm	Measurements	Tolerance mm
0 to 250	14	4	4
300 to 550	16 and 22	4	5
600 to 1150	25	4	6
1200 to 1750	28 and 32	5	8
1800 and up	28 and 35	6	9

Measurements taken at the bolt hole

Use the right torque for the bolts

1e Step
Put all the bolts into the flanges and tighten bolts equally by hand, make sure that the packing sealing is parallel with the counter sealing.

2e Step
Fasten crosswise with a torque of appr. 50 Nm.

3e Step
Fasten crosswise

Up to DN 80	Max. 80 Nm
Up to DN 300	Max. 100 Nm
Up to 500 mm.	Max. 130 Nm

When some leakage occurs during the pressure test, you must draw the bolts tighter.

Installation instruction:

Tools

Rubber-hammer, moment-spanner and a taper-pin
The tools must be free of grease, otherwise the rubber could be damaged
Do not use sharp edge tools.

Use bolts class 8.8

Attention

The given moment on the bolts are not to be essential exceeded

Storage

The rubber expansion joints have to be stored without any tension or deformation

Rubber joints with steel flanges have to be stored, standing on the flanges, otherwise they could get deformed by the weight of the steel flanges.

Storage room

The storage room should be cool, dry and free of dust, also the room have to be regularly ventilated.

Oxygen and Ozone

The rubber joints have to be protected against air-draft, if necessary cover up, also no Ozone creating machines such as electrical engines are allowed in the same room as the rubber expansion joints.

Goods stored together

Do not store solvent, gasoline's, or chemicals in the same room as the rubber expansion joints

Maintenance

Before the system is operational for the first time, the bolts have to be checked again for the correct moment.

The rubber parts are not to be painted and must be kept clean (to be cleaned with water and soap) and free of oils and grease .

One week after the startup of the system, the bolts have to be checked with an moment-spanner for the correct torque.

The same after 1,4 and 12 months, after that every year.

Checking the joints

- Visual damaged in the rubber and on the connections
- Deformation on the outside of the rubber joints between the bolts and nuts (If the flanges have not been moving).
- Changes on the rubber joints such as blisters, crispness, cracks, or hairline cracks.
- Checking the flanges for not allowed movements or shifting.