



## Installation Instructions Expansion Joints – Axial Expansion Joints

### General safety recommendations

Prior to installation and start-up, installation and start-up instructions must be read and observed. Installation, start-up and maintenance work shall only be performed by **qualified and authorised staff**.

### Maintenance

Expansion joints are maintenance free. Prior to disassembly and maintenance, the system must be depressurised, cooled down, emptied. Otherwise there is a risk of an accident!

### Transport, packaging and storage

- The consignment must be checked for completeness upon receipt.
- Any transport damage must be reported to the carrier and the manufacturer.
- At an intermediate storage we recommend to use the original packaging.

Admissible ambient conditions for storage and transport are ambient temperature - 4°C to +70 °C

Expansion joints must be protected against wetness, humidity, dirt, shocks and damage.

### Warranty

A warranty claim requires professional installation and start-up in accordance with installation and start-up instructions. The necessary installation, start-up and maintenance work must be performed by qualified and authorised staff.

### Operating pressure

- The permissible operating pressure results in the nominal pressure considering the reduction factors.
- At higher temperatures, the expansion capacity has to be reduced according to the reduction factors.

### Start-up and check

Before starting-up check if

- The pipeline is installed with sufficient inclination to avoid water pockets
- There is sufficient drainage
- Pipe anchors and pipe supports/ guides are firmly installed prior to filling and pressure testing the system
- The expansion joint is not stressed by torsion, especially not expansion joints with socket attachment
- The flow direction has been observed for expansion joints with inner sleeves
- The steel bellows is free of dirt, welding, plaster or mortar splatters or any other soiling; clean if necessary
- The general due diligence requirements to avoid corrosion damage are observed, such as water treatment, or prevention of galvanic corrosion in copper and galvanized pipes.

### Insulation

Expansion joints may be insulated exactly as the pipeline.

- If no coating is provided, protect the bellows to avoid insulation material dropping into the convolutions.
- If the expansion joint is to be placed under plaster, a protective cover is essential. This ensures the bellows function, protects against soiling and avoids contact with structure materials.

### Improper operation

- The limits given in the technical data of the standard range must not be exceeded.
- Swinging suspensions adjacent to expansion joints are not permitted.
- Do not clean the newly installed pipeline by blowing it with steam to avoid water hammers and unacceptable vibration stimulating of the bellows.

### System start-up

- During pressure testing and operation, the allowable test or operating pressure for the expansion joint mustn't be exceeded.
- Excessive pressure peaks as a consequence of valves closing too abruptly, water hammers etc. are not permitted.
- Avoid contact with aggressive media.
- The start-up of steam lines must be performed such that the condensate has time to drain off.



## Installation Instructions Axial Expansion Joints

### Axial Expansion Joints

Axial expansion joints are intended to compensate for axial expansion movements in straight pipeline sections. In addition, they are used:

- As flexible seals at the end of jacketed pipes in district heating systems
- To compensate for thermal expansion and vibrations in exhaust gas lines of boilers and engines
- As disassembly joints for pumps, valves and plate heat exchangers
- As gas-tight wall penetration of pipelines in reactor construction and shipbuilding
- To take up occurring differential expansion in vessel and apparatus construction



Prerequisite for the application of axial expansions is the presence of appropriate anchor points and axial guide bearings. The technical data given on the rating plate are decisive for use.

On site the general due diligence requirements to avoid corrosion damage must be observed, such as water treatment, or prevention of galvanic corrosion in copper and galvanized pipes.

### Installation advice

#### Assembly

- Anchor points and pipe guides must be firmly installed before filling and pressure testing the system.
- Expansion joints must be installed without being subject to torsion.
- The steel bellows must be protected against damage and dirt (e.g. welding, plaster or mortar splatter).
- Steam pipelines should be installed in such a way that water hammers are avoided. This can be achieved by adequate drainage, insulation, by preventing water pockets and by sufficient inclination of the line.
- Observe the flow direction while installing expansion joints with inner sleeves.
- Avoid the installation of expansion joints in the immediate vicinity of pressure reducers, hot steam coolers and shut-down valves, if high frequency oscillations are expected due to turbulence. Otherwise special measures must be installed (e.g. thick-walled sleeves, perforated disks, calming sections etc.).
- If high frequency vibrations or turbulence or high flow speed are expected, we recommend the installation of expansion joints with inner sleeve.
- Inner sleeves are also recommended for expansion joints with  $DN \geq 150$ , if the flow speed of air, gas or steam media exceeds 8 m/s, or 3 m/s in case of liquid media.

#### Pipe guides, pipe supports

- Provide inclination for drainage
- Align the pipeline, distance between pipe guides

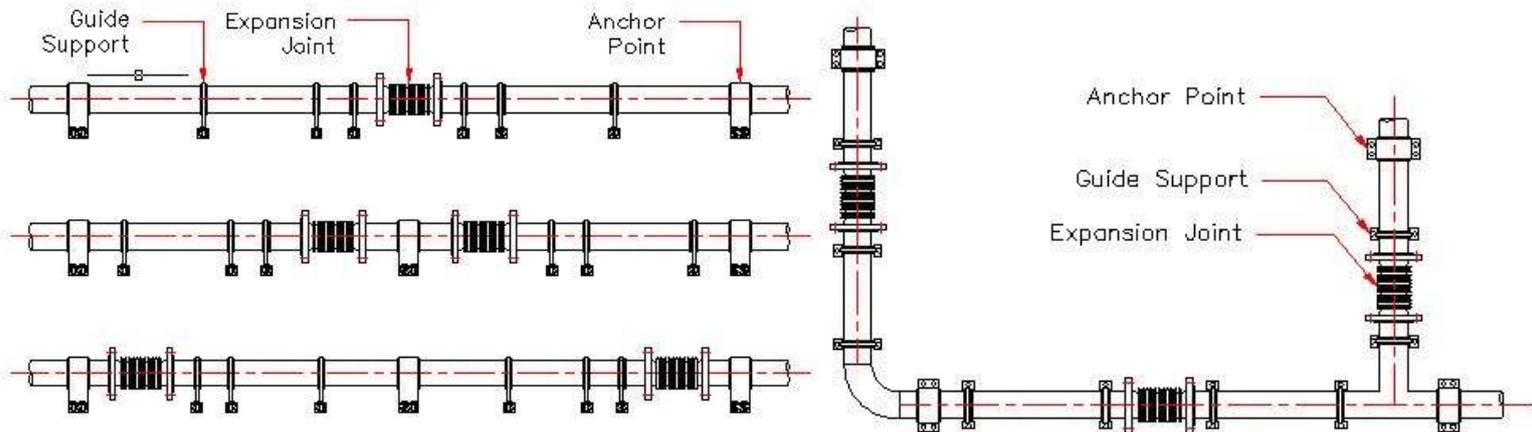
**NOTE** - Sliding or roller supports are the safest measures to avoid buckling and lifting of the pipeline.

**CAUTION** - Swing suspensions are not permitted adjacent to expansion joints!



## Anchor points

- Install main anchors at locations where the pipeline changes direction.
- Limit by anchors each pipe section to be compensated for.
- Only **one** expansion joint is allowed between **two** anchors.
- Main anchors must be installed at locations where the pipeline changes direction. They must take up the pressure thrusts of the expansion joints as well as the frictional forces of the pipe supports/ guides.
- Intermediate anchors must be installed if the movement capacity of one axial expansion joint is not sufficient to compensate for the entire expansion of a long pipeline. In that case, several axial expansion joints are required.
- In vacuum mode, the anchor points must be capable to take up tensile and pressure forces.



## Pre-restraint

All common expansion joints must be installed pre-restrained by 50% of their movement capacity (for heating systems: overall length of expansion joint plus 50%, whereas for cooling systems: overall length of expansion joint minus 50% of the movement). If an expansion joint is not installed at the lowest operating temperature of a heating system or at the highest operating temperature of a cooling system (e.g. repair of a still-warm pipe), an individual pre restraint mode must be chosen

## Installation of an expansion joint with flanges

- Align pipe axes and flange bolt holes.
- ensure flanges are parallel
- ensure gaskets are centred
- tighten bolts crosswise.
- Make sure the expansion joint is not exposed to torsion during installation.
- After installation, check if the bellows convolutions are free of dirt.



**Quick-Steel Ltd.**

11 Dalton Way, Midpoint 18, Middlewich, Cheshire, CW10 0HU

Telephone : 01606 862225 Fax : 01606 593539

Email : [sales@quicksteelltd.co.uk](mailto:sales@quicksteelltd.co.uk)

Website : [www.quicksteelltd.co.uk](http://www.quicksteelltd.co.uk)