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Installation Instructions Expansion Joints – Moulded Rubber Bellows

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.

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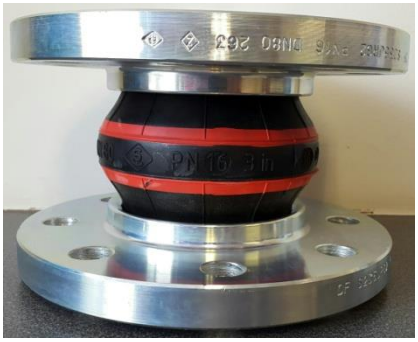


Storage

Rubber bellows should be stored in a cool, dark, clean area and be protected from damage caused by other items of plant and equipment.

Inspection

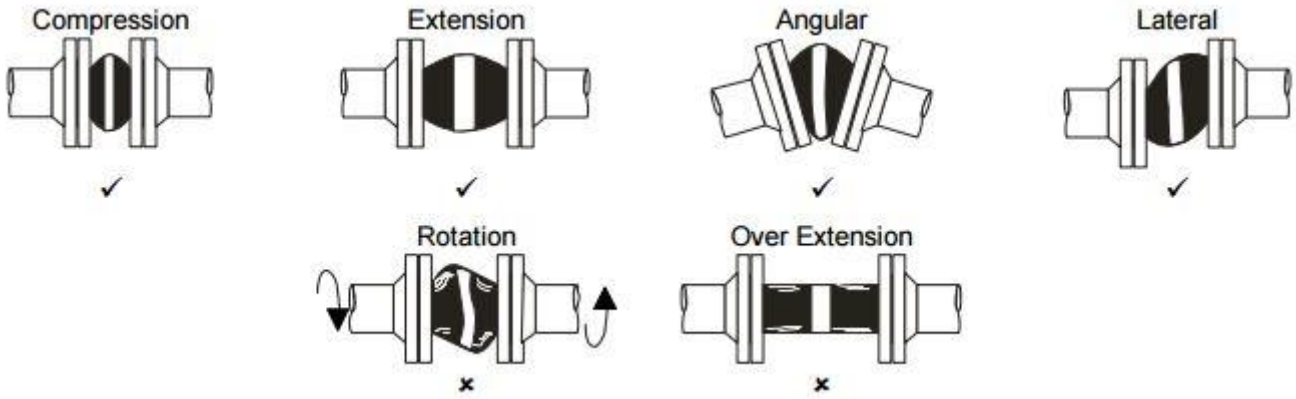
Rubber bellows should be inspected for internal and external damage prior to installation. The rubber bellows sealing surface should be clean and free from any debris that would prevent a seal or cause damage to the bellows in service.

Selection

The Quick-Steel range of rubber bellows are supplied at varying lengths. The movements stated in the datasheet can only be achieved when the given installation lengths are adhered too.
Check that the correct rubber bellows have been selected for the operating conditions that exist. Temperature, pressure and movement should all be confirmed, as the wrong selection may result in failure of the system.
Also check whether vacuum conditions exist and if so whether a vacuum support ring is required and has been fitted.

Installation

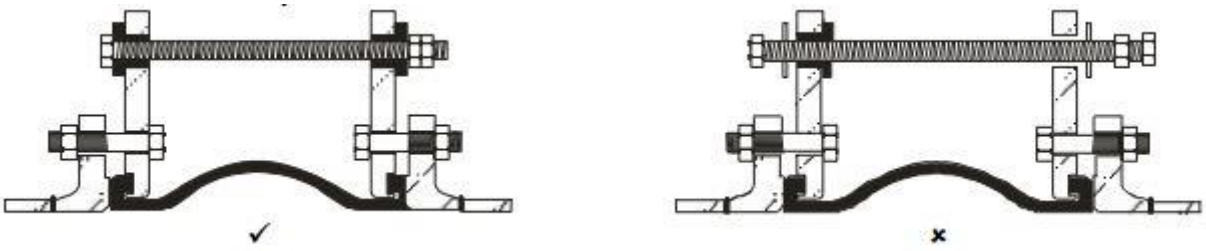
Rubber bellows should be installed at their neutral (supplied) length. Confirm that the gap left between the mating flanges in the pipework corresponds exactly with the neutral (supplied) length of the rubber bellows.
Pipework should be true and straight. Any adjustments should be made to the pipework before the rubber bellows are fitted. See appropriate Quick-Steel data sheets for the installation length of the rubber bellows being installed.



Only the correct mating flanges should be used. They should be the same size and drilling and have a similar sealing face as that of the rubber bellows. They must be clean and free from any debris, sharp edges etc. to prevent damage occurring to the sealing face of the bellows. For mating flanges with a different sealing face diameter a composite gasket should be used to prevent any sharp edges cutting into the rubber sealing face.

Flange bolts must not be over tightened, bolts should be tightened gradually and evenly and in a crosswise manner. Bolts should be positioned so that the bolt head is nearest the bellows to prevent the bolt damaging the bellow in service. Tightness of bolts should be checked approximately seven days after installation.

When tied rubber bellows are being used they must be installed at their neutral (supplied) length. Recheck installation length and movement capabilities of the bellows being installed. Ensure that the steel washers and the rubber top hat washers have been correctly fitted. Tie bar assemblies should be uniformly tightened and bolts rechecked after approximately seven days.

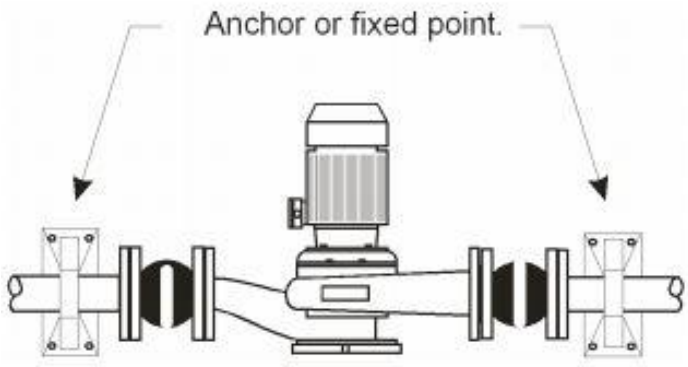


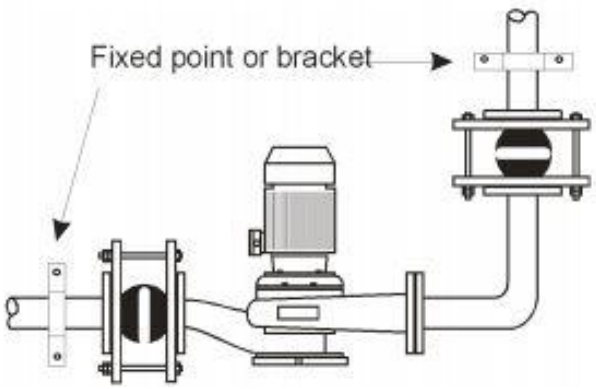
Pressure Test

If a hydraulic pressure test is to be carried out on a system containing rubber bellows, ensure that the anchors are correctly fitting before the test is carried out. Also ensure that the test pressure (usually 1.5 x working) does not exceed the maximum test pressure of the rubber bellows.

Anchoring

Rubber bellows must be anchored to ensure their correct performance. Tied rubber bellows should be selected for the sizes above 80mm and where pressures exceed 3bar.

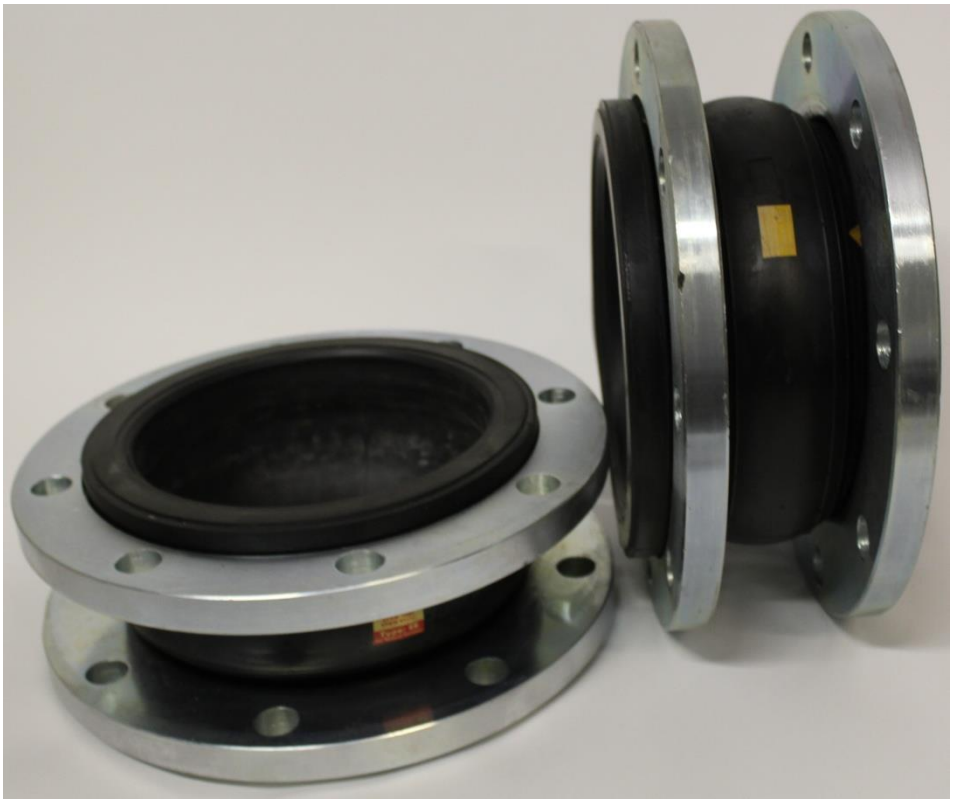




Rubber bellows will exert a pressure thrust in service and must be anchored to protect adjacent pipework and equipment. Rubber bellows will extend under pressure and must be anchored to prevent this happening.

Maintenance

When properly installed and used at their correct operating temperature and pressure, rubber bellows will give many years of trouble free service. However rubber bellows should be inspected periodically for signs of deterioration. If insulation is to be used, this should be removable to allow inspection to be carried out. Flange bolts should be checked and retightened if required. Rubber bellows should not be painted as this may reduce service life. If fine hair cracks become evident in bellows membrane this is a sign that the bellows is nearing the end of its service life and should be replaced at the next convenient opportunity. A rubber bellows is an important part of any heating or chilled water system and consideration should be given to keeping a quantity of spares that would prevent a long term shutdown of the system.



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