For big relief from stress at pipe flanges!

Expansion Joints or Compensators are flexible rubber elements (combined with metal and/or textile reinforcements) useful for conveying fluids and absorbing movements between sections or pipeline. With a correct design they are able to absorb axial, lateral and angular movements offering both safety and insulation against noise and vibrations.

We offer the market the most comprehensive selection of rubber expansion joints, covering the widest range of applications and dimension. By adapting the latest rubber and fabric technology, Kanwal Industrial Corporation can provide the most effective solutions to suit the required needs for any pipe systems.

**Outstanding Advantages**

- Variety of polymers available
- Internationally approved design as per FSA and EJMA USA
- Positive sealing for leak free operation
- Eliminates stress or expansion & contraction
- Compensates for misalignment-primary, lateral, angular & torsional
- Absorbs vibration & shock
- Eliminates line noise
- Prevents pipe buckling & fracture
- Prevents electrolytic corrosion
- Stops water hammer
- Low deformation under pressure
- Greater recovery from movement
- Abrasion, water, heat, chemical, weather resistant
  - Resistant to fatigue
- Negligible loss of heat

**Wide Range** Standard Size Available

Ex-Stock

<table>
<thead>
<tr>
<th>Floating Flange</th>
<th>Single Arch</th>
<th>Double Arch</th>
</tr>
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<tbody>
<tr>
<td>U Type</td>
<td>Twin Sphere Connector</td>
<td>Triple Arch</td>
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<tr>
<td>Concentric</td>
<td>Eccentric</td>
<td>Rectangular</td>
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</table>
How A Rubber Expansion Joint works

The purpose of an Expansion Joint in general, regardless of design or materials of construction, is to provide a point of flexibility in a piping or duct system in order to absorb the growth of the piping due to thermal changes in the media and/or the environment, and to absorb the dynamic movements of machinery, buildings and structures that the piping is attached to or a part of.

The Rubber Expansion Joint, because of the non-metallic nature of its construction, offers the piping and ductwork designer advantages within the temperature and pressure ranges of these joints, which cannot be matched by all metal expansion joints.

Consisting of flanged ends and a flexible section, much the same as a flanged metal bellows, the rubber expansion joint can absorb within its free length more movements, particularly lateral, than any other joint of similar overall size and pressure rating.

The flexible section of a Rubber Expansion Joints is most often a single convolution, which, because of the inherent flexibility of the materials, can accept large lateral movements with low force, a phenomena which requires multiple convolutions in metal bellows. During axial and angular movements, the rubber convolution deflects much the same way that the metal convolution does. The limits of these motions are determined by the geometric shape and size of the convolution and the inherent pressure resisting capacity of the design.

The manner in which the pressure loads are resisted in a Rubber Expansion Joint is the major difference between Rubber and Metal Bellows. Circumferential (hoop) loads due to pressure are carried by the convolution itself in metallic bellows. In a Rubber Expansion Joint, the convolution is basically incapable of resisting pressure by itself, but is supported by the adjacent rubber tube with its internal fabric and/or fabric - metal reinforcing, or by the attachment flanges themselves.

All Easyflex Units have integrally molded flanges, sized and drilled to match standard flanges. All Rubber Expansion Joints require metallic split retaining rings behind the flanges to back up protect the rubber integral flange. Control rods must be used to protect expansion joints from excessive movement if piping system is not properly anchored and are normally recommended for most piping installations.

⇒ Due to policy of continual improvement, the specifications are subject to change without prior notice.
⇒ Measurements are subject to 5% tolerance.
⇒ To achieve good results do not overload fitting more than designed parameters as per drawing / catalogue.
⇒ Compliance – As per FSA Standards USA.
Easyflex™ Single Arch Expansion Joints

- Greater Movements.
- Higher Pressure Ratings.
- No gaskets required.
- Absorbs & Isolates Vibrations/Noise/Shock.
- Molded Design for better quality upto size 14" NB.
- Reduces System Noise.
- Absorbs Pipe Movement/Stress.
- Compensates for Misalignment/Offset.
- Available with tie rod assembly (Specially Recommended)
- Size from 25mm NB to 1800mm NB.

**Temperature Ratings**

| Standard | (-) 10° to 70°C |
| Special  | (-) 10° to 150°C |

* Expansion Joints for special applications in different Polymers and Pressure ratings available as per customer specifications.

### Movement Capability

<table>
<thead>
<tr>
<th>Nominal Bore (mm)</th>
<th>Length (mm)</th>
<th>Axial Corp. (mm)</th>
<th>Axial Elongation (mm)</th>
<th>Transverse Deflection (mm)</th>
<th>Angular Movement Bore (mm)</th>
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*Standard PN10 and PN16 REJ design chart for sizes 25NB to 350NB available on next page

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⇒ Compliance - As per FSA Standards USA.
## PN - 10

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<th>Length Nominal ft.</th>
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<th>ANSI 125/150# LBS</th>
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## PN - 16

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</table>

### Standard Pressure Rating from 400 NB.

- 400 NB - 600 NB - 7.5 kg/sq cm²
- 650 NB - 1600 NB - 6 kg/sq cm²
- 1600 NB - 1800 NB - 4.5 kg/sq cm²

⇒ Higher Pressure Ratings and Movement Capabilities Available.
⇒ Expansion Joints are available in a variety of polymers for different applications duty conditions.
⇒ For Sizes above 1800 NB and also for Higher Pressure Rating Bellows can be designed as per customer requirement.
⇒ Vacuum - 26 inches of HG.
⇒ Please refer to our engineering department for special duty conditions/polymers.
**Easyflex™**

**Construction Features**

- **Flanges** - Can be filed if required, to avoid accumulation of sediment and to provide a smooth bore. However, flexibility of joint is reduced by 50%.
- **Cover** - To protect body from atmospheric conditions or mechanical damages. NITRILE rubber is standard for weather, heat & oil resistance and long service life.
- **Arches** - Consists of layers of durable high tensile nylon/polyester cord for reinforcing the supporting member between tube and cover.
- **Corrosion** - Full faced integral with tube - are tough and non-compressible reset flow under bolting pressure, having O' rings upto 12" nominal bore which should be fully flattened when installed in pipeline No Gaskets are required.
- **Metal Reinforcements** - Non-migrating metal rings are embedded in the body for extra strength, higher safety factor, higher pressure and rigidity for vacuum service.
- **Tube** - Leakproof, Abrasion resistant. Seamless lining of Rubber (synthetic or natural) is selected to ensure that joint will not be affected by passing medium (e.g., air, water, oil, gas, acid or chemicals).
- **Control Rods (recommended)** - To prevent damage to expansion joints by excessive elongation or compression of piping systems not anchored properly.

*Other Polymers available on request.*

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⇒ Compliance - As per FSA Standards USA.
Easyflex™

Double Arch Spool Type Expansion Joints

- Greater Movement (Almost Double of Single Arch)
- Higher Pressure.
- No gaskets required.
- Absorbs & Isolates Vibrations/Noise/Shock.
- Molded Design for better quality upto size 10" NB.
- Reduces System Noise.
- Absorbs Pipe Movement/Stress.
- Compensates for Misalignment/Offset.

![Double Arch Spool Type Expansion Joints](image)

<table>
<thead>
<tr>
<th>Expansion Joint Size Nom. I.D. Inch / (mm)</th>
<th>Neutral LENGTH Inch / (mm)</th>
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⇒ Available pressure rating PN10 and PN16Due to policy of continual improvement, the specifications are subject to change without prior notice.
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Easyflex™ Floating Flange Expansion Joints

The Type "EFFF" Rubber Expansion Joint is a totally effective KANWAL solution for unwanted vibration in heating and air conditioning system. Available in the common HVAC, Plumbing and Fire fighting Pipeline sizes, it is ideal for motion compensation, vibration elimination, noise control and stress relief.

Manufactured to a fully molded spherical design the style "EFFF" has a high pressure rating with the added benefit of a non-clogging, long radius Arch. Available in Natural rubber and many different polymers like EPDM, Neoprene, Nitrile, Butyl having a wide range of flange drilling standards to your building services requirements.

Type "EFFF" is designed as per the latest International Standards of FSA and EJMA (USA) which are used all over the world. Further, the most beneficial advantage is that if replacement is required it can be replaced without disturbing the welded flange due to floating/rotating flange design.

<table>
<thead>
<tr>
<th>Size L.D mm</th>
<th>Standard F/F Length mm</th>
<th>Operating Condition</th>
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Temperature/Pressure Ratings

Maximum temperature: 115°C (Neoprene/EDPM)
Maximum Pressure: 16 BAR (G)
Vacuum Rating: full vacuum (26"Hg)

Working pressure depends on temperature and at higher temperature, the pressure ratings are reduced slightly.

Flange Drilling: BS Table D/E/F ANSI B16.5 Class 125/150 BS 4504/DIN 2501 or as per customer requirement

Elastomers
Neoprene - Provides excellent resistance to oxidation, ozone and sunlight ageing. Good resistance to oil.
EPDM - Good for hot and cold water service and chemicals.

Nitrile - Oil Resistant Properties.

Flanges
"EFFF" expansion joints are furnished with zinc plated steel flanges. They rotate easily on the bellow which allows for simple bolt alignment.

Control Units
Tie rods and gusset plates are normally recommended and can be supplied along with the bellows.

Warning: Control unit must be used unless piping is properly anchored. When Expansion joints are installed in pipelines or equipment carrying fluids and gases at elevated temperatures and pressure, precautions should be taken to ensure proper installation and regular inspection. Care is required to protect personnel in the event of leakage or splash.

Note: Maximum pressure rating is based on 40°C operating temperature.

Due to policy of continual improvement, the specifications are subject to change without prior notice.
Measurements are subject to 5% tolerance.
To achieve good results do not over load fitting
Compliance - As per FSA Standards USA.

Flanges drilling: Available ANSI B 16.5, DIN 2501, JIS B 2210, BS 4504, AS 2129, ISO 7005, etc. and other standard drilling for your specifications.

Structure

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<td>1</td>
<td>Body</td>
<td>CR, EPDM, IIR, NBR, CSM, VITON</td>
</tr>
<tr>
<td>2</td>
<td>Reinforce</td>
<td>Nylon Cord Fabric</td>
</tr>
<tr>
<td>3</td>
<td>Wire</td>
<td>Hard Steel Wire</td>
</tr>
<tr>
<td>4</td>
<td>Floating Flange</td>
<td>Mild Steel Zinc Plated RST 37-2</td>
</tr>
</tbody>
</table>

21
Easyflex®

Twin Sphere Connectors

Forged Steel
Floating Flanges
Powder Coated

Rubber Bellow
With Nylon
Reinforcement

SPECIFICATION

<table>
<thead>
<tr>
<th>Model</th>
<th>Size (inch)</th>
<th>Overall Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFTSC 20</td>
<td>¾”</td>
<td>150</td>
</tr>
<tr>
<td>EFTSC 25</td>
<td>1”</td>
<td>155</td>
</tr>
<tr>
<td>EFTSC 32</td>
<td>1¼”</td>
<td>155</td>
</tr>
<tr>
<td>EFTSC 40</td>
<td>1½”</td>
<td>165</td>
</tr>
<tr>
<td>EFTSC 50</td>
<td>2”</td>
<td>165</td>
</tr>
</tbody>
</table>

Features

⇒ Connects To Any Pipe Material GI, MS, Copper, Brass, SS or PVC
⇒ Minimizes Transmission Of Vibration And Noise
⇒ Guards Against Damage Due To Water Hammer And Pressure Surge
⇒ Prevents Contact Between Dissimilar Metals And Eliminates Electrolytic Corrosion
⇒ Absorbs Expansion, Contraction And Misalignment
⇒ Serves As Flexible Pipe Joint or Expansion Joint
⇒ Convenient To Align And Install, Saves Labor

Performance Data

Max. Pressure: 16 kg/cm²
Vacuum: 700mm Hg.
Temperature: -20 to 820°C
Burst Pressure: 50 kg/cm² App.
Working Fluids: Water, Air, Weak Acids & Alkalies

Flexible Joints for Special Applications Available on Order

Option Available / Ordering

⇒ Standard – Neoprene bellow with threaded Steel Flanges for connection to steel pipe.
⇒ Connection Options – Bronze Couplers for brazed Connection to copper pipe (suffix ‘BC’) Full Bronze Flanges with BSPT Male threads (suffix ‘BSM’), full Bronze Flanges with BSPT Female threads (suffix ‘BSF’).
⇒ SS 304 Couplers (suffix ‘SS’).
⇒ Any combination of the above can also be supplied.
⇒ Material Options – EPDM, SBR, Natural Rubber, Hypalon, Chloro-Butyl, Nitrile Rubber.
⇒ To Order – Please state type of pipe, actual pipe OD and type of Connection required.

Compliance – All units are tested as per BS 5150 : 1974. Independent test certificates can be furnished on request.

⇒ Due to policy of continual improvement, the specifications are subject to change without prior notice.
⇒ Measurements are subject to ±5% tolerance.
⇒ To achieve good results do not over load
⇒ Compliance - As per FSA Standards USA.
Easyflex™ Twin Sphere Connectors With Union Threads

Features:
- Large pressure resistance (Bursting pressure, more than 50kg/cm²)
- Effective for large eccentricity thermal and bending angle.
- Superb absorption of vibration / pipe movement & stress.
- Superb resistance to water, heat, weather and chemicals.
- Low-cost installation & operation.
- Reduces system noise.
- Compensates Misalignment / Offset & Eliminates Electrolysis.

Typical Applications:
- Building equipment, piping systems for industrial plants and piping systems for private residences.
- Prevention of disasters due to earthquakes and subsidence of ground.
- Waterworks, sewerage, and sanitary lines (feed-water and drainage)
- FCUs, AHUs, Pumps, Chillers, Cooling Towers, Compressors, Blowers, Fans, Absorption Machines, Etc.

Dimensions & Allowable Movement

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Size (mm)</th>
<th>Length L (mm)</th>
<th>Axial Compression (mm)</th>
<th>Axial Elongation (mm)</th>
<th>Transverse Movement (mm)</th>
<th>Angular Movement Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFTSCU15</td>
<td>15</td>
<td>190</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>15°</td>
</tr>
<tr>
<td>EFTSCU20</td>
<td>20</td>
<td>190</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>15°</td>
</tr>
<tr>
<td>EFTSCU25</td>
<td>25</td>
<td>190</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>15°</td>
</tr>
<tr>
<td>EFTSCU32</td>
<td>32</td>
<td>200</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>15°</td>
</tr>
<tr>
<td>EFTSCU40</td>
<td>40</td>
<td>200</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>15°</td>
</tr>
<tr>
<td>EFTSCU50</td>
<td>50</td>
<td>200</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>15°</td>
</tr>
<tr>
<td>EFTSCU65</td>
<td>65</td>
<td>220</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>15°</td>
</tr>
</tbody>
</table>

Operating Conditions
Operating Pressure : 16 kg/cm²
Burst Pressure : 50 kg/cm²
Vacuum Rating : 400 mm Hg
Temperature : -10°C To 70°C
Fluids : Water, Hot water, sea water, weak Acid, Compressed Air.

Note : Please specify duty conditions to choose the correct polymer for your application. For higher Operating Conditions Please Contact Our Technical Dept.

Structure

<table>
<thead>
<tr>
<th>Item</th>
<th>Part</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Body</td>
<td>Natural/EPDM/Neoprene</td>
</tr>
<tr>
<td>2.</td>
<td>Body</td>
<td>Nylon Tyre Cord</td>
</tr>
<tr>
<td>3.</td>
<td>Union</td>
<td>IS / BS Standard</td>
</tr>
</tbody>
</table>

Standard, item employs IS / BS UNION. May be replaced with ANSI, DIN, or other standards.

Due to policy of continual improvement, the specifications are subject to change without prior notice.
Measurements are subject to 5% tolerance.
To achieve good results do not over load fitting more than designed parameters as per drawing / catalogue.
Compliance - As per FSA Standards USA.
Flexible connectors are used in ducting systems to reduce vibration transmission, shock and accommodate thermal movements with minimum stress to the ductwork. Since pressure requirements in ducts are very low compared to piping systems, they are manufactured in lighter construction to be more responsive to the reduced stiffness of sheet metal ducting. Designs are always airtight to prevent particle intake or leakage.

These products come in many configurations as no standard design can meet the varied scope, service or connection requirements. They can be round, square, rectangular, round on one end and square on the other and even "T" or "L" shaped. Concentric and Eccentric Reducers are common and custom made designs can be made to offset or compensate for older misaligned heavy ducting systems. The common characteristics are flexibility and long life. Motion requirements are met with single and multiple arches and by varying the face to face length.

**Materials**

Sometimes the duct joints are in all rubber with no reinforcement, but the most common construction is natural rubber or synthetic liner, plies of rubber impregnated tyre cord or fabric and a rubber cover. When pressure or vacuum conditions are extreme, wire of steel ring reinforcement is used as well.

Polymers available are Natural Rubber, EPDM, SBR, Neoprene, Butyl, Hypalon, Nitrile, Silicone and Viton. Reinforcement may be square woven fabric but more commonly Nylon, Polyester or Kevlar tyre cord.

**Connections**

Duct joints can be slip-ons retained by lightweight or heavy banding. Most of them are flanged and we can work to your requirements. We can supply the steel back up flanges in individual pieces in carbon steel, stainless steel, aluminum or any other material as per requirement. Carbon steel is normally painted, but can be hot dip galvanized or electroplated.

**Liners**

When temperatures are very high or the gases contain particle concentrations that tend to build up, carbon or stainless steel liners are often used. These liners pass through the duct connector and enter the adjacent ducting system to minimize damage and to increase the service / cycle life of the duct connector.

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Measurements are subject to 5% tolerance.

To achieve good results do not over load fitting

Compliance - As per FSA Standards USA.
KANWAL also offers a wide variety of round expansion joints designed for use on low pressure round ducting system with a maximum pressure to 10 psi.

Round Ducting Joints are often utilized in lightweight air handling system such as Precipitators/Scrubbers, Fans and Big Blowers to absorb vibration, thermal movement and misalignments.

This type of expansion joint is available in a variety of material configurations such as Neoprene, EPDM, Chlorobutyl, Hypalon® or Viton® elastomers with Nylon, Kevlar® or polyester tyre cord reinforcement.

Flanged style of ducting expansion joints are drilled to customers specifications. Round Duct Expansion Joints can also be manufactured with a slip-on connection where no mating flange exists. The joint is manufactured to the exact outside diameter of the duct, and simply slipped onto the pipe. Stainless steel/carbon steel bands hold the joint securely in place.

**Materials of construction**

**Elastomers**

Pure Gum Rubber, Neoprene, Hypalon® Chlorobutyl, Buna - N, EPDM, and Viton® and Silicone.

- Lightweight construction
- Maximum flexibility
- Absorbs vibrations
- Abrasion resistant

- As per customer requirement
- Multiple Arches
- Accommodates Greater Movement
- Flanged / Pipe end Designs

**Maximum movement capabilities in inches**

<table>
<thead>
<tr>
<th>Movement at shown Face-to-Face</th>
<th>6&quot; Face-to-Face</th>
<th>9&quot; Face-to-Face</th>
<th>12&quot; Face-to-Face</th>
<th>16&quot; Face-to-Face</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5&quot;</td>
<td>0.5&quot;</td>
<td>1&quot;</td>
<td>3&quot;</td>
<td>4&quot;</td>
</tr>
</tbody>
</table>

* Movement Capability depends on the number of arches.

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⇒ Compliance - As per FSA Standards USA.
Easyflex™ Control Unit Instructions

Why Control Units are Required:

⇒ Lack of proper pipe anchors - Initial surge of pump at an elbow may cause hyper-extension.
⇒ Lack of proper pipe supports - Easyflex expansion joints and vibration dampeners are not designed to support the weight of the piping system.
⇒ Lack of proper alignment guides - Control rods will prevent lateral movement beyond design specifications.
⇒ Wide fluctuations of temperature - The changing from hot to cold media may cause excessive expansion or contraction even when the pipe is properly anchored.
⇒ Testing at elevated pressures - The use of anchors and/or control rods is required to offset the thrust.

Pre-Installation Check List:

⇒ Compare the requirements of the system to ensure the proper number of control rods have been specified. (Minimum of two (2) required.)
⇒ Check Control Units to be sure all parts are included. The unit consists of minimum four (4) gusset plates, two (2) tie rods with six (6) nuts and six (6) metal / rubber washers. For bigger sizes and higher pressures the quantities might increase. Contact our Engg. Dept. or refer drawing.

Installation:

⇒ Bolt the control unit plates to the outer side of the Companion flanges at the same time while the bolt is being installed through the split retaining ring / rubber flange / companion flange and the control unit gusset plates. They are to be equally spaced around the circumference of the flange.
⇒ Install the tie rod through the top hole in each gusset plate after placing rubber/metal washer on either side of the gusset plate. (See illustration above.)
⇒ Tighten the first two nuts ("A" location) in the direction of flow tightly. Check the recommended movement for the particular size from our catalogue and keep the second set of nuts ("B" location) loose accordingly. The second check nut should be tightened keeping space/gap for movement capability.

Note:
If excessive compression exists, optional compression sleeves should be specified. The compression sleeves will limit the compression to the maximum allowable movement.

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⇒ Compliance - As per FSA Standards USA.
Typical Piping Layout Utilizing Expansion Joint When Equipment and Piping are Properly Anchored

Typical Piping Layout showing the use of Control Units with the Expansion Joint when proper System Anchoring is Limited

Use of an Inertia Base for Pump and Piping

Superior Installation With Pump Base Independently Supported by Anchors

Typical Piping Layout Utilizing Expansion Joints and proper use of Anchors in Branch Locations

Typical Pump Installation With Expansion Joints Utilizing Vibration Mounts

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Compliance - As per FSA Standards USA.
Site Pre Installation Check & Instructions:

- Is type of Bellow/Joint correct for application.
- Check maximum service temperature does not exceed maximum temperature specified in catalogue.
- Are anchors suitable for the thrust generated.
- Does pipework have adequate guiding and support.
- Cold test pressure must not exceed 1.5 times the working pressure.
- Area of movement of the joint must be free from obstruction.
- Do not paint the rubber bellows/expansion joints (the outer cover is fully waterproof.)

Fitting Instructions:

The necessary steps for installing all expansion joints should be pre-planned. The installers should be made aware of these steps as well as the special instructions furnished with the expansion joint by the manufacturer, which will provide information necessary for proper handling and installation of expansion joints. The most critical phases of the expansion joint installation are as follows:

- The installed length of the bellow in between the companion flanges should be equivalent to the over all length as per the Invoice.
- No movement of the expansion joint (compression, extension, lateral offset, rotation) due to piping misalignment, for example, shall be imposed which has not been anticipated and designed into the movement capability of the expansion joint. Imposing such movements can result in systems malfunction or damage to the bellows or other components in the system. Specifically cycle life can be substantially reduced where forces imposed by attached equipment may exceed their designated limits, internal sleeve clearances may be adversely affected, and the pressure capacity and stability of the bellow may be reduced.
- Anchors, guides, and pipe supports shall be installed in strict accordance with the piping systems drawings. Any field variances from planned installation may affect proper functioning of the expansion joint and must be brought to the attention of competent design authority for resolution.
- Mating flanges must be smooth and must extend to the bore of the bellow/joint e.g. 100mm NB must be 100mm internal bore. There must be no grooves, protrusions or sharp edges applied to the rubber bellows/joint face.
- Flange bolts should be located with their heads on the expansion joint side of the flange. If this location is not possible 10mm clearance must be made between the bolt and bellow/joint body.
- Tighten bolts crosswise (not in rotation).
- Protection for the body must be provided when welding in the vicinity of the rubber bellow/joint.

Post Installation inspection:

A careful inspection of the entire piping system shall be made with particular emphasis on the following:

- Are anchors, guides and supports installed in accordance with the system drawings.
- Is the expansion joint in the proper location and is the installed length correct and have the control units been installed properly (Please refer to our catalogue).
- Are all guides, pipe supports and the expansion joints free to permit pipe movement.
- Are any expansion joints misaligned? Measuring the joint overall length and checking clearances at critical points on the expansion joint and at other points in the system can determine this.

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Measurements are subject to 5% tolerance.

To achieve good results do not overload fitting more than designed parameters as per drawing / catalogue.

Compliance - As per FSA Standards USA.