

Metallic Bellows, Moulded Rubber Bellows and Hose Assemblies

We offer supplies of a full range of Metallic Bellows (round or rectangular) from simple exhaust and axial units to complex double Gibbals and Hinged applications.



Moulded Rubber Bellows from metal flanged, tied or untied to full Hand Built Rubber Bellows; and Hose Assemblies with elastomer liners up to 16 bar g or with stainless steel liners and overbraid for higher pressures and chemical resistance.



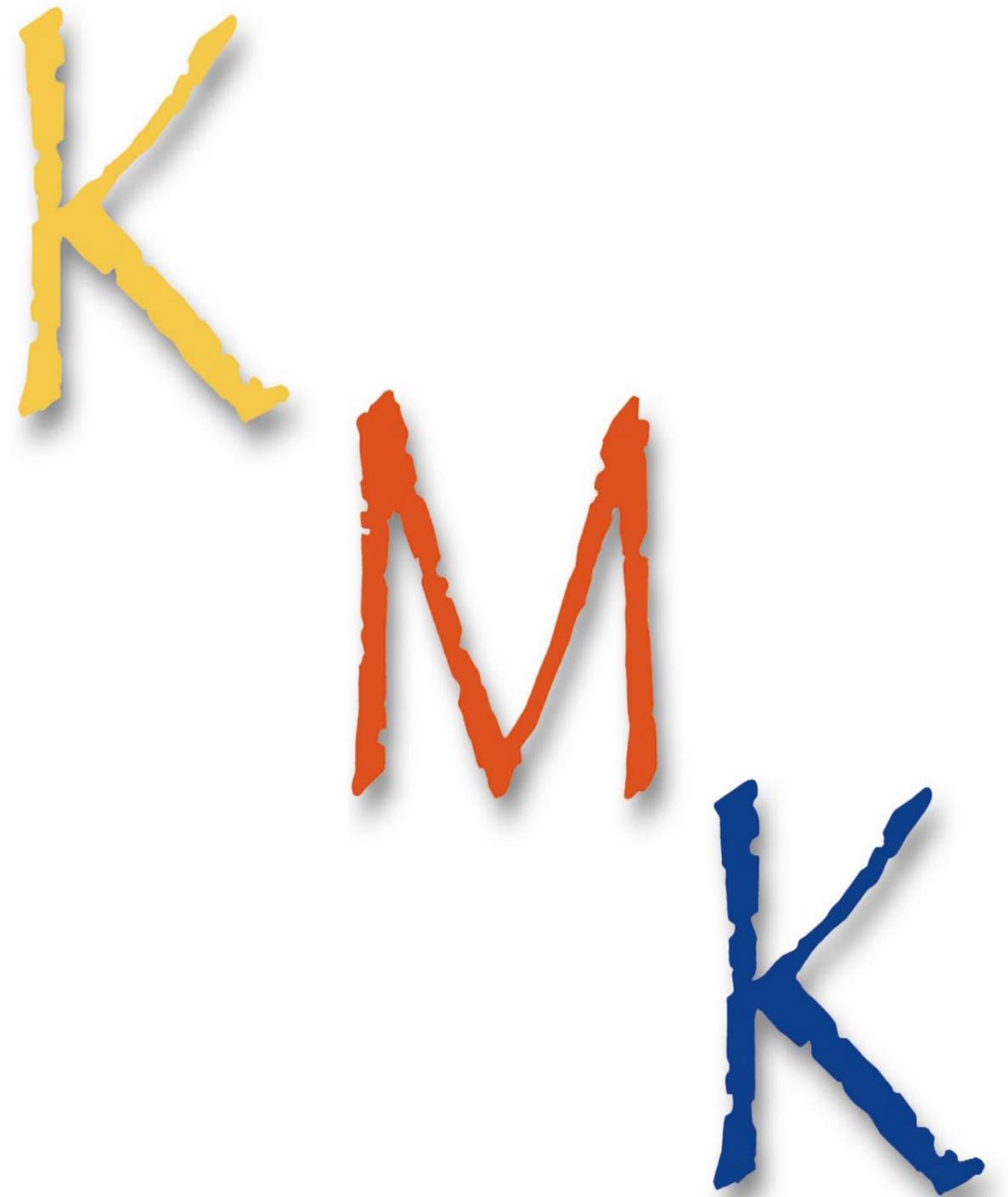
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KMK Compensators Ltd



KMK Compensators Ltd are manufacturers and installers of Fabric Expansion Joints and Bellows. We are also suppliers of Stainless Steel and Moulded Rubber Bellows and Flexible Hoses.



Location - You will find our works and offices well situated in Bradford, West Yorkshire, to effectively and efficiently service all UK Industry.



Experience - In all areas of our business, Manufacturing and Production, Sales, Technical and On Site Services, our combined experience adds up to more than 200 years! Therefore our customers are assured quality and reliability of service.



Quality - Apart from our standard range we can offer bespoke items individually designed to meet customers requirements, manufactured and inspected in accordance with quality procedures as defined by ISO. 9001 (Certificate No. 12979).

Our policy is of strict material control and source raw materials only from approved suppliers who themselves comply with the relevant quality standards.



KMK Fabric Expansion Joints

There are distinct advantages to using fabric expansion joints as they can accommodate relatively large amounts of movement and some misalignment of flanges. They are also lightweight, easy to install and with the addition of insulation bolsters have good acoustic properties.



KMK Expansion Joints

KMK Expansion Joints can be supplied fully assembled with the supporting steel flange arrangements, ready to slot into ductwork. For existing applications we can supply factory jointed or open for on site joining where access is limited.



KMK Compensators can also supply in compensator strip form, complete with jointing kits, made to any required length and width (up to 1 metre wide max.) which is particularly ideal for emergency repairs when required.



Materials

We have a full range of high performance textiles available for selection and from these we can choose the best or most economical construction for the expansion joint required.

These materials include:

- High Strength Fabric (including fabric woven with chrome steel or nickel alloy wire reinforcements)
- Insulation Felts
- Metal Foils
- Cast/Sintered PTFE reinforced Fabrics
- Elastomer and Fluoro-Elastomer Films
- Elastomer and Fluoro-Elastomer Coated Fabrics
- Fine Chrome Steel or Nickel Alloy Woven Mesh



Operating conditions can be accommodated by the right design choice. Ranging internally from -60°C to 1200°C, from ambient air to highly corrosive gasses. We can supply suitable expansion joints from simple single ply flexibles to the multi-layered construction expertly tailored to fit virtually any application. And with an additional insulation bolster we can further enhance its service life expectancy.



Site Installation Services

Our experienced teams of fitters (all qualified to the National Safety Passport Scheme) are always available to respond to customers requirements for on site installation services. And will carry out all such work in a safe and efficient manner.

We can also provide a site supervisory service to supervise our customers own personnel in the correct manner of installation.



Design



Our expansion joints are designed and manufactured to suit our customers individual requirements and applications. Technical assistance is always available to help establish the best solution to expansion joint problems. We can supply full metal packages, including support steel work and flanges, backing flats and flow plates, designed for economy and efficiency.



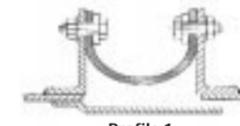
The design of the supporting metalwork and flange configuration is important and the choice is influenced by the prevailing conditions: positive or negative pressure; large or small amounts of movement, axially and/or laterally; velocity.

Compensator Profiles

Whilst KMK have the capability to produce custom-built designs as requested, the vast majority of applications can be met from the five standard profiles detailed here.

Profile 1

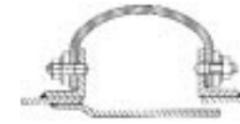
This design is suitable only for applications operating under vacuum. For any given distance between the flanges, the depth of the profile increases as flange separation reduces due to expansion. To prevent the compensator protruding into the gas stream or fouling any flow plate, the flange depth must be increased as a function of the original gap and the amount of expansion. The minimum recommended flange depth for Profile 1 is 100mm. Installation of Profile 1 is relatively simple, as access is required only on the outside and loose nuts and bolts can be used for fastening.



Profile 1

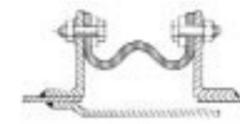
Profile 2

Profile 2 is intended only for applications operating under pressure. There is a similar relationship between profile height, flange gap and expansion as with Profile 1. Since there is often little to foul the outside of the compensator, protrusion does not normally create problems.



Profile 2

Because of the design of Profile 2, loose bolts are not recommended, as access from inside is sometimes difficult. It is recommended that studs or welded bolts be used for fastening. This method also allows the compensator to be hung in position prior to fixing. We do not recommend the use of nuts welded to the flanges since difficulties in bolt location can be experienced. The recommended minimum flange depth for Profile 2 is 50mm.



Profile 3

Profile 3

Profile 3 is used for pressure applications where it is undesirable to have any part of the compensator protruding beyond the flanges. Fitting can be done from the outside using loose bolts.

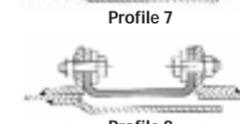


Profile 7

The recommended minimum flange depth for Profile 3 is normally 100mm, but smaller flanges may be acceptable under certain circumstances.

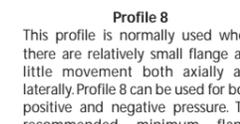
Profile 7

Suitable for both positive and negative pressure, Profile 7 is the most versatile of the profiles. It is extremely simple to install using loose bolts.



Profile 8

The recommended minimum flange depth is 100mm for vacuum and 50mm for pressure applications.



Profile 8

The recommended minimum flange width for bolting the compensator is 40mm for both vacuum and pressure applications.

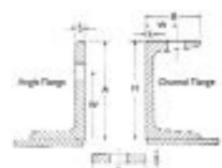
This profile is normally used where there are relatively small flange and little movement both axially and laterally. Profile 8 can be used for both positive and negative pressure. The recommended minimum flange depth is 75mm.

Flanges

Standard mild steel angles or channels should be used and for adequate rigidity and maximum flange thickness of 6mm is recommended.

Recommended Minimum Flange Dimensions (mm)

Profile	Angle Flange			Clamping Bar			Channel Flange			
	A	S	W	B	S	H	B	S	W	
1	100	6	75	40	6					
2	50	6	25	40	6					
3	100	6	75	20	6					
7 (Pos)				40	6	50	40	6	22	
7 (Vac)				40	6	100	50	6	28	
8	75	6	50	20	6					



Clamping

The clamping bars used to secure the compensator should be between 6 and 10mm thick. Both pitches should be between 100 and 150mm for M12 minimum diameter bolts.

Flange Gap

The optimum distance between flanges can be fixed conveniently at between 100 and 150mm. Depending on the movement involved, the minimum gap to be considered is 50mm, with a maximum of 800mm. It is not expected that large gaps will be designed in original equipment, but they can be found where a fabric compensator is replacing a metal bellows. Even here, it is recommended that consideration should be given to reducing the gap to the suggested dimensions.

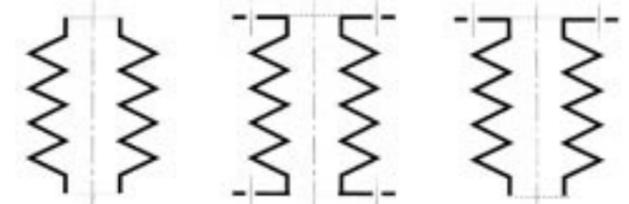
Flow Plates

These should always be included in the flange design. Their main function is to protect the compensator from abrasive particulates in the gas stream and to help prevent the deposition of solid matter in the bottom of the compensator. Build-up of such deposits may restrict the movement of the compensator or damage the compensator itself.

Flow plates are also useful in maintaining laminar gas flow and preventing turbulence at the compensator which, if excessive, could eventually lead to its mechanical failure. They are strongly recommended where the flow rate exceeds 5 m/s.

Fabric Bellows

Fabric Bellows are extremely flexible and can be made from a variety of specially woven fabrics impregnated with selected elastomers. We have three basic types of fabric bellows:- Formed, Stitched and Shaped. In the following profiles:



Profile 1

Profile 2

Profile 3



There are many applications in industry which require the use of KMK Bellows. Some of these can be listed as follows:

- Conducting air or other gases
- Protecting screws and rams
- Vibration and noise elimination in ducting
- Accommodating axial and lateral movement



Formed - This type of bellows is produced using metal forming tools which result in a seamless, gas tight bellows ideal for conducting air or other gases.



Sewn - Where there are requirements for very small inside dimensions or large convolutions then sewing is the ideal manufacturing method.

Shaped - For very large bellows, where forming or sewing are not practicable, these can be shaped by hand using an appropriate wire reinforced material.



Each type can incorporate additional design features:

- Extension Control Tapes
- Pressure Support Rings
- Breather Vents
- Centralising Discs



Split Bellows can be produced when an application cannot be dismantled, to wrap around and be fixed by means of a zip, Velcro or press studs.