

Operating instructions for INDUFLEX stainless expansion joints

Due to their moving parts and mechanisms, expansion fittings are susceptible to damage of all kinds and from inappropriate loadings when in use. To ensure their reliability, and in turn, that of the entire installation or pressurising system, the following notes and instructions must be read through carefully and completely, and followed and adhered to without fail. If they give rise to doubt or appear to be incomplete, Induflex should.

1. Installation instructions, entry into service:

- 1.1. Induflex expansion fittings may only be installed and put into service by trained, experienced personnel. Their reliability in use is conditional on expert installation.
- 1.2. Before starting work, remove the packaging completely and inspect the fitting for any possible damage in transit or storage including, in particular, corrosion resulting from surface damage. The hollows between the bellows, inside and out, must likewise be free of any foreign bodies or matter. Only fittings in perfect condition may be installed. In doubt, consult Induflex. The connecting pipes must be precisely aligned and securely installed to prevent the fitting from being buckled.
- 1.3. If the fitting is equipped with fixed flanges, the screw holes must be aligned with those in the connecting flanges.
- 1.4. Only 1 (one) fitting may be installed between 2 (two) fixed points. Any expansion in the section between these two points must be less than the maximum expansion capability of the fitting, as shown in the accompanying drawing.
- 1.5. Install the fitting as near as possible to a fixed point. In this case, only plain bearing will be needed on the other side of the fitting; otherwise, a plain bearing will be needed on both sides. The interval between the supporting points and the fitting is approximately twice the nominal diameter (ND). The use of a protective outer pipe with a type BK LRA fitting or an guide pipe with a type BK LRi fitting does not replace a plain bearing or fixed point.
- 1.6. The configurations and measurements of fixed points and plain bearings are to be determined by a structural engineer or static stress analyst on the basis of the maximum forces and moments which will occur. The plain bearings in the guide section must be sufficiently long to prevent seizing.
- 1.7. The length of the installation (LE) depends on the operating conditions. If prestressing is necessary, this length (LE) should be greater than the face-to-face length (L).
- 1.8. Fittings must not be subject to torsion. This must be borne in mind, in particular, when fittings are installed with fixed flanges and screw fastenings. As a fundamental principle, care must be taken when installing any type of expansion fitting to ensure that any stresses in the pipeline cannot induce any torsional effect on the expansion fitting.
- 1.9. If the fitting is used as a vibration absorber without prestressing, the installation length (LE) is the same as the face-to-face length (L).
- 1.10. Observe the direction of flow when installing expansion fitting with an inner guide pipe.
- 1.11. If Lifting gear is used for installation purposes, slings etc. must not be attached to the vulnerable parts of the fitting, e.g. the bellows.
- 1.12. Do not carry out any pressure or leak testing of the system until the fixed points and guide bearings have been correctly installed.
- 1.13. During installation, take care to ensure that the bellows of the fittings are not damaged (e.g. through welding spatter, thermal stresses, mechanical damage, dents, scratches, shocklike stresses, falling object, dirt, etc.) and that no foreign bodies get into the corrugations. The latter must be clean inside and out and remain in that condition to enable the fitting to function properly.
- 1.14. Prestressing equipment must not be removed until the installation of the fitting has been fully completed.
- 1.15. As far as possible, transit screws etc. should likewise be removed only on the completion of the installation.
- 1.16. Insulators may only be attached after prior consultation with Induflex and must be mounted to the bellows.
- 1.17. No electrical currents may be directed through the fitting, e.g. through welding operations, otherwise the metal bellows may be damaged beyond use.

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- 1.18. Fittings should be installed in such a way as to permit unrestricted visual inspections at regular intervals for freedom from damage. Any visible defects, e.g. dents, corrosion, discoloration or irregular deformations must be notified to Induflex and/or the fitting replaced without delay.
- 1.19. Pressure surges (hammering) in the system must be avoided. All the generally applicable safety precautions and accident prevention regulation in force must be observed without fail.

2. Operation:

- 2.1. Induflex stainless steel expansion fittings may only be used within the limits of the parameters for the layout given in the accompanying drawing, i.e.:
- 2.2. The highest operating pressure must not exceed the specified design pressure.
- 2.3. The maximum operating temperature must not exceed the specified design temperature.
- 2.4. The maximum expansion absorption capability must not exceed the specified axial or lateral expansion. A combination of these is only permissible subject to corresponding reduction factors and with the prior written approval of Induflex.
- 2.5. The specified number of loaded reversals must not be exceeded.
- 2.6. To ensure the reliable operation of the fitting and, in turn, the entire installation, all the data and instructions are to be observed and adhered to.

3. Maintenance:

As a rule, Induflex stainless steel expansion fittings require no particular maintenance. Nevertheless, thorough visual inspections should be carried out at regular intervals. If it is possible for the corrugations of the bellows to become contaminated, regular cleaning should be carried out to protect the material of the fitting (and the environment) with cleaning agents and implements approved for stainless steel. If corrosive substances come into contact with the bellows, either from outside or inside, they must be completely cleaned off, without delay, with adequate quantities of clean water. The bushes at the joints of stainless steel expansion fitting mounted in the open air must be smeared with viscous, water resistant, bearing grease at intervals appropriate to the ambient conditions. Ball joint expansion fittings should also be greased occasionally to prevent seizing. When making enquiries or ordering spare parts, please specify the type and serial number of the product (stamped into the rating plate) without fail.

4. Repairs:

If, in exceptional case, an expansion fitting needs to be repaired, any work in or modifications to the metal bellows and the connection parts of the fitting (e.g. welding, cutting or soldering operations) may only be carried out by Induflex personnel or companies authorized by Induflex to do so. As a rule, Induflex will be able to rectify the damage within a short period of time by fitting a new bellow which is a standard stock part. In this case, Induflex should be given detailed information as to the cause of the damage and the damage and the operating conditions on the site to that, if appropriate, Induflex can suggest measures for improvement. When making enquiries or ordering spare parts, please specify the type and serial number of the product (stamped into the rating plate) without fail.

5. Guarantee:

Induflex guarantees its products in accordance with the statutory regulations of the Federal Republic of Germany (specified in the delivery note and invoice). Damage attributable to natural wear, over-stressing or unsuitable treatment is excluded from the guarantee.

6. Environmental protection:

To protect the environment, the products, accessories and packaging should be disposed of through a recycling centre.