INSTALLATION and MAINTENANCE GUIDE of EXPANSION JOINT

Metal bellows are special items that are manufactured from thin layers of sheet metals. This makes them susceptible to damage during shipping, storage and installation. Following the manufacturer's instructions is essential to get the maximum performance out of an expansion joint. By following below instructions, you can get desired cycle life and designed pressure rating. Otherwise, pressure carrying capabilities and life of an expansion joint may be reduced significantly.

UNLOADING AND STORAGE

- Do not lift or move expansion joints by wrapping chains or belts around bellows. Also, make sure bellows do not stretch/compress/bend due to mechanical loads during lifting or moving.
- Visually inspect expansion joints to make sure that they were not damaged during shipping. If any damage is observed, please take photos and contact the manufacturer immediately.
- Expansion joints must be protected from weather conditions such as rain, moisture, snow. They should be stored in a clean and dry environment, preferably under a waterproof cover.
- Do not store expansion joints on top of each other.
- Do not store expansion joints in heavy traffic areas where they can be damaged by moving equipment such as forklifts.

INSTALLATION

- Make sure that installation personnel has proper training, experience and understanding of expansion joints.
- Visually inspect expansion joints to make sure that they were not damaged during storage. If any damage or rust is observed, please take photos and contact the manufacturer immediately.
- Shipping and pre-stressing bars will be identified with yellow stickers "Remove After Installation" (Figure 2). Do not remove these items until after the expansion joint is fully installed. In case of doubt, consult with the manufacturer.
- Expansion joints must not be used to compensate for piping misalignments unless they are designed to do so. If in doubt, consult with the manufacturer.
- Do not apply torsion on expansion joints.
- Make sure correct expansion joint is installed in the correct piping layout. Also, check expansion joint alignment within the piping system.
- Make sure that anchors and guides are placed in accordance with latest EJMA guidelines. Per EJMA guidelines, distance between expansion joint and first guide must not exceed "4 x nominal diameter" of the pipe. Distance between first and second guide must not exceed "14 x nominal diameter" of pipe.
- Main anchors must be strong enough to withstand forces coming from expansion joints and other pipe, environmental loads.
- Only one expansion joint must be installed between two main anchors.
- Bellows must be protected against weld splatter and debris if there is welding or grinding nearby.
- Take measures to prevent accidental arcing on bellows.
- Make sure expansion joints with inner sleeves (liner) are installed in the correct flow direction. Pay attention to the flow arrow attached/painted on expansion joint (Figure 1).
- Make sure that pins of hinged type expansion joints are correctly oriented in the system.
- Do not remove any hardware that does not have "Remove After Installation" sticker on them.
- Do not put equipment/tools or walk on bellows.
- During installation of flanged expansion joints, make sure the bolts or studs do not interfere with bellows.

AFTER INSTALLATION

- Visually inspect expansion joints to make sure that they were not damaged during installation. Make sure that expansion joint was not torqued or forced to absorb movements that it was not designed for. If in doubt, please take photos and contact the manufacturer immediately. Do not proceed with pressure test if in doubt.
- Make sure that bellows or expansion joints are free from foreign objects.
- All shipping bars or pre-stressing bars must be removed before pressure test.
- Make sure all guides and main anchors are installed correctly.

PRESSURE TEST

- Gradually increase the pressure during pressure test. Do not increase it fast. Observe the bellows carefully for any deformations during test.
- After reaching test pressure, inspect expansion joint for any leakage or instability/squirm or unexpected movement.
- If any instability or squirm is observed, stop the test immediately, take photos of the unit and contact the manufacturer.

MAINTENANCE

- A correctly installed and designed expansion joint does not require regular maintenance. However, a regular inspection of the expansion joint is recommended to look for any signs of rust, corrosion, deformations, leakage, damages during operation.
- Make sure no foreign object gets in-between bellows convolutions or no foreign object restricts the movement of an expansion joint.

CHECKLIST AFTER INSTALLATION OF EXPANSION JOINTS

- Anchors, guides and supports are installed in accordance with piping system drawings.
- Correct expansion joint is installed at the correct location.
- All shipping bars and pre-stressing bars are removed.
- All pre-set conditions (if any) are applied.
- Nuts on limit rods are set to allow desired design movements.
- No unanticipated movement of the piping system detected after pressure test.
- Hinge pins on angular joints are in the correct orientation and nuts on tie rods are fitted tightly.
- Expansion joint with liner positioned correctly in the direction of flow.
- No misalignment on expansion joint.
- There is enough space between bellows and other equipment/hardware/structure to do the desired movement.

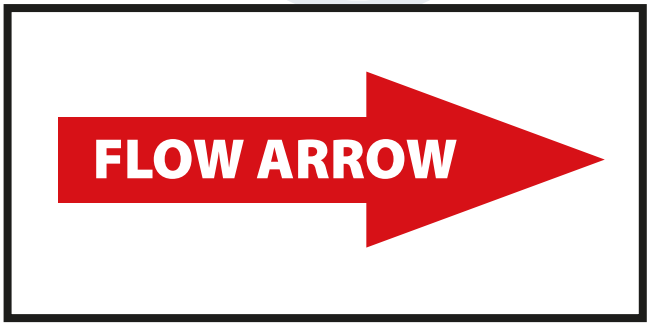

Figure 1
Flow arrow stickers are attached visibly when there is a liner

Figure 2
Parts that must be removed after assembly are clearly marked