



Belman



District Heating Expansion Joints

INSTALLATION INSTRUCTION



USEFUL INFORMATION

THERMAL EXPANSIONS OF DISTRICT HEATING PIPELINES

Thermal expansion

Temperature expansion of the pipe system depends on the initial and final temperature values and the material's thermal expansion factor. General formula for calculation of thermal expansions is:

$$dl = \alpha L_o dt$$

where:

- dl Pipeline expansion
- L_o Length of the pipeline
- dt Temperature difference
- α Thermal expansion factor

CALCULATION OF DEFORMATIONS

In general, the formula for calculation of deformations is:

$$\Delta L = \Delta l_t - \Delta l_{fr} - \Delta l_{(dm)} + \Delta l_p$$

where:

- Δl_t – Thermal deformation
- Δl_{fr} – Deformation due to the friction forces
- Δl_p – Deformation due to the inner pressure
- Δl_{dm} – Damper reaction (ground, foam pads, axial joint stiffness, spring rate of U-, L-, Z-shape and other compensating devices).

Installation of guides

Just one expansion joint is required between two anchors or physically fixed pipe section areas. Guides are required when expansion joints are utilized in trench/trenchless systems and tunnels. The first guides are usually installed on both sides at the distance of 2÷4 DN. The second two are installed on both sides at the distance of 14÷16 DN from the expansion joint. The number and the necessity for the installation of the second and further pairs of supporting guides is determined by results of the strength analysis of the pipe system

during the design phase.

There is no need for the first pair of guides on the distance of 2÷4 DN, when applying AXTDH expansion joints in trenches, tunnels/chambers as well as ground surfaces and inside buildings, as this type is designed to compensate for such stresses. Nevertheless, the installation of the guide supports on the distance of 14÷16 DN from the expansion joint is required.

If the expansion joints are installed near the anchor the distance to the anchors should be within 2÷4 DN. In such a case, the guides should be installed only from one side of the joint as the anchor functions as a guide from the other side. Typical support guides for district heating systems would be, saddle and frame types, preventing lateral and angular movements, but allowing it to slide in axial direction. The length of the first guide should not be less than two diameters. The gap between the pipe and the guide should be no more than 1,6 mm for pipes with $DN \leq 100$ and 2,0 mm for pipes with $DN \geq 125$ mm.



INSTALLATION INSTRUCTIONS

There are different categories of district heating expansion joints: District heating expansion joints and one-step expansion joints. They have different designs for different purposes. There are differences also in their installation. For this reason we have provided below instructions and some useful advice for the installation of expansion joints and design support. Please pay attention to the general instructions concerning storage, transportation and installation of Belman expansion joints.

District heating expansion joints




1. The pipeline should be examined to ensure that it is ready for the expansion joint installation, also the connection ends should be checked to ensure the pipeline is suited to the expansion joint installation length.
2. Check the expansion joint for possible damages.
3. Check that the direction of expansion joint installation is correct. The arrow direction on the expansion joint should coincide with the direction of the flow.
4. The expansion joint should be installed while the pipeline is cold. The expansion joint is supplied by default in a pre-stressed state unless specifically agreed in advance with the customer. If the expansion joint has to be installed on a heated pipeline it must be specified to us at time of order placement.
5. For the installation of expansion joints at ground level pipeline anchors should be fixed. Please, follow our general instructions concerning installation. No additional measures are required for the underground installation of pipeline systems. In both cases the connection ends of the expansion joints are welded to the respective ends of the pipeline.
6. In the case of pre-stressed installation of the expansion joint the pre-stressing device unfastens itself automatically when the system is in operation, then the expansion joint works in a stable condition.
7. Protect the expansion joint from welding splatter during installation.
8. Avoid applying torsion to the expansion joints, despite their torsion resistance.
9. If the expansion joint is installed on a pre-isolated pipeline it can be isolated with foam just after installation.
10. Avoid pressure testing at more than 1,5 times the design pressure.

The installation could be performed with manual or automatic welding.

Our experience, your benefit



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For more information about our sales and production entities as well as our cooperative partners please refer to our website or contact us.

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