

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Metallic Expansion Joints**

with type designation(s)
UM1FE.0250.1-164, 165 and 166

Issued to

EagleBurgmann KE A/S
Ringkøbing Midtjylland, Denmark

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018

Application :

Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.

Temperature range: 0°C to 250°C

Max. working press.: 4 bar

Sizes: DN 250

Issued at **Høvik** on **2018-02-14**

This Certificate is valid until **2023-02-13**.

DNV GL local station: **Fredericia**

for **DNV GL**

Approval Engineer: **Zeinab Sharifi**

.....
Marianne Spæren Marveng
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

Single metallic expansion bellows designed according to EJMA 9th edition- with 4 convolutions, 3 plies and internal sleeve. The ends are connected to standard pipes/flanges.

Detail dimensional data and allowable movements (axial, lateral and angular) are according to reviewed documentation listed in this certificate.

Operating medium: Charge air/exhaust gas

Corrosions allowance: 0 mm

Material for main pressurized parts (bellow, pipe and flange): 1.4541 (AISI 321)/ 1.4307 (304L), EN 10028-7.

Application/Limitation

All expansion bellows covered by this certificate are approved for 3300 fatigue cycles.

Each expansion bellow shall be subjected to minimum hydrostatic test pressure equal to 1.5 times internal design pressure. Bellows installed in piping classes I, II and III, shall be delivered with a product certificate issued by society (ref. to DNV GL ship Rules Pt.4 Ch.6 Sec.1 Table 4). In this case hydrostatic test shall be witnessed by a DNV GL surveyor.

Bellows installed in non-class piping systems may be delivered with manufacturer's certificate; in this case production test is not to be witnessed by DNV GL surveyor.

Bellows are considered to be in the as-formed condition (with cold work).

Welding shall fulfill requirements in DNV GL Rules Pt.2 Ch.4. All welding for piping components for piping classes I and II shall be carried out in an approved welding work shop by DNV GL.

Material of bellow shall have material certificates in accordance with DNV GL rules for classification of ships Pt.4 Ch.6 Sec.2 Table 3. All materials delivered with VL or works certificate shall be made at work approved by DNV GL manufacturers (AOM).

This type approval covers the design of the product with respect to internal pressure. External loading/pipe loads have not been considered. The installation/location shall fulfil below conditions:

- 1- The installation/location of expansion joints is to be approved in each case. Piping system drawings shall be approved by DNV GL whenever expansion joints are to be installed in a ship classed by the society. The piping system design drawing(s) shall specify the location of all anchors, guides, supports, fixed points and type and location of all expansion joints.
- 2- The pipeline in which an expansion bellow shall be fitted, shall be adequately adjusted, aligned and clamped. When found necessary, protection against mechanical damage of the expansion bellows may be required. The pipeline which expansion bellows are to be fitted shall not be subject to ship deformation loads.

Type Approval documentation

Job Id: **262.1-027586-1**
Certificate No: **TAP0000188**

Marking of product

For traceability to this type approval, the hose assemblies are to be marked with:

- Manufacturer's name or trade mark.
- Type designation.
- Size

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.