DNV·GL

Certificate No:
TAP00000ZK

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Metallic Expansion Joints

with type designation(s)
K-0060832, K-0053310

Issued to
BOA Balg- und Kompensatoren Technologie GmbH
Stutensee, Germany

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems

Application :

Product approved by this certificate is accepted for installation on all vessels classed by DNV GL.

Temperature range:	**up to 750°C**
Max. working press.:	**3.6 bar**
Sizes:	**DN200**

Issued at **Hamburg** on **2018-04-20**

This Certificate is valid until **2023-04-19**.

DNV GL local station: **Augsburg**

Approval Engineer: **Hagen Markus**

for **DNV GL**

Olaf Drews
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

The metallic expansion joint of type K-0060832, K-0053310 consist of an Omega shaped bellow with guidance tube. and filled welded flanges.
The bellows design is based on EJMA, Edition 9.

Materials

Component	DIN EN	Temperature range	Material certificates
Bellow	1.4833	0 °C up to 750°C	Test report (TR)[1]
Reinforcement ring (collar)	1.4828		
Flanges	1.4828		
Guidance tube	1.4828		

Notes
[1] A document signed by the manufacturer stating:
- that the object complies with the rules
- that tests are carried out on samples from the current production. Refer to Pt.1, Ch.3, Sec.5

Design documents

Expansion bellow design[1]	Drawing number
Axial Expansion	K-0053310, Rev.0
Axial Expansion	K-0060832, Rev.0

Notes
[1] EJMA calculation of bellows based on fatigue life testing with 10.000 cycles with axial and lateral load. Standard safety factor 1.5.

Range of Application / Limitation

The metallic expansion joints of type K-0060832 and K-0053310,DN200 are type approved for installation in exhaust gas systems of combustion engines downstream (after) turbocharger.

This type approval does not cover design evaluation with respect to installation of the expansion joints directly on diesel engines, e.g. cylinder exhaust gas outlet.

Size range	DN200
Max. service pressure	3.6bar
Movements	Axial: - 4mm
	Lateral: - 1.5mm
Temperature range	0°C up to + 750°C

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Bellow design depending on service conditions

This type approval is based on EJMA bellow design calculations with specific service parameters and life cycle expectations and design drawings as specified in this type approval certificate.

Bellow design modification within the type tested movement and temperature range are covered by this type approval certificate.
Applications not in compliance with the type tested conditions are subject to case by case approval.

Installation on board ship
The exhaust gas pipeline, in which an expansion bellow is to be fitted, is to be adequately adjusted, aligned and clamped. Refer to instruction of manufacturer BOA.

Type Approval documentation

Marking of product
For traceability to this type approval, the flange is to be provided with a name plate or hard stamping as follows:

Scope	**Example**
Manufacturer name	BOA-BKT GmbH
Type	K-0060832
Size	DN200
M.A.W.P.	3,6bar
Serialnumber	999999 / 01

Periodical assessment
For retention of the type approval certificate periodical assessments shall be carried out at production places.
The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:
- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking

Periodical assessment is to be performed after 2 years and after 3.5 years.

A renewal assessment will be performed at renewal of the certificate.

End of certificate