Marine & Offshore

Certificate number: 03149/F1 BV
File number: ACM 135/0407/002
Product code: 2101I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

DURO DAKOVIC KOMPENZATORI d.o.o.

Slavonski Brod - CROATIA

for the type of product

METALLIC EXPANSION JOINTS / BELLOWS

Axial and Lateral expansion units Types SB and AR

Requirements:
- BUREAU VERITAS Rules for the Classification of Steel Ships
- BUREAU VERITAS Rules for the Classification of Offshore Units

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 31 May 2020

For Bureau Veritas Marine & Offshore,
At BV RIJEKA, on 24 Jan 2019,
Slaven Celic

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Axial and Lateral expansion units Types SB and AR

1.1 Rating

Type of expansion joint		Type of bellows	Drawing N° (SB)	ND (mm)	Working pressure (bar)	Working temperature (° C)
AR	Axial expansion joint - with pipe end - with flange	SB axial expansion bellows - with pipe end - with flange	8139, 8140, 8141, 8142, 8143, 8144	ND 65 to ND 2000	1	500
UD	United double expansion joint - with pipe end - with flange	SB axial expansion bellows - with pipe end - with flange	8145, 8146, 8147, 8148	ND 65 to ND 2000	1	500
AR, UD, HS,HD, GS, GD	Axial and axial-lateral expansion joint	SB axial expansion bellows SB axial/lateral expansion bellows - with pipe end - with flange	8491, 8492, 8494, 8496, 8499	ND 40 to ND 300	6, 10	200
AR, UD, HS,HD, GS, GD	Axial and axial-lateral expansion joint	SB axial/lateral expansion bellows - with flange	8493, 8495, 8497, 8498	ND 50 to ND 300	6, 10, 16	100
TD, TS, TM	Tied axial-lateral expansion joint	SB axial/lateral expansion unit - with flange	8500	ND 50 to ND 150	30	100
AR	Axial expansion unit - with flange	AR axial expansion unit - with flange	AR 25/65/25/Ns/1	ND 65	20	-5
AR	Axial expansion unit - with flange	AR axial expansion unit - with flange	AR/25/40/20/Ns/1	ND 40	20	-5

The values of temperature, pressures, axial and lateral displacements are not to exceed those specified by the manufacturer.

1.2 Materials and/or components

Bellows	316 S16 BS1449 (C4573) / 321 S12 BS1449 (C4572)
Welding ends	JUS CB5.221 (C1214) / JUS CB5.221 (C1212)
Flanges	SB 7661 (C0461) / SB 1377 (C0461) / SB 1378 (C0461)

When other choices of materials are used per manufacturer's recommendations, the BV agreement is to be obtained.

2. DOCUMENTS AND DRAWINGS

Drawings:

- N° SB 8139 to SB 8148 dated 11/1980: SB axial expansion unit with pipe end/with flange PN 1
- N° SB 8491, SB 8492, SB 8494, SB 8496 and SB 8499 dated 12/1981: SB axial/lateral expansion unit with pipe end/with flange PN 6, 10
- N° SB 8493, SB 8495, SB 8497 and SB 8498 SB dated 12/1981: axial/lateral expansion unit with flange PN 6, 10, 16
- N° SB 8500 dated 12/1981: Axial/lateral expansion unit SB with flange PN 40
- N° 14-02-16 dated 13/02/1985: Axial expansion unit AR 25/40/20/Ns/1
- N° 14-10-12 dated 13/02/1985: Axial expansion unit AR 25/65/25/Ns/1

No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.

3. TEST REPORTS

- Burst test report uploaded on 18/01/2019.
- Impulse test report N° DN 4-415-1/87 dated 21/12/1987.
- Vibration test report N° DN 4-415-2/87 dated 04/03/1988.

4. APPLICATION / LIMITATION

4.1 - The metallic expansion joints may be used for the following services on board depending on type:

- Exhaust (SB 8139 to 8148 - ND 65 to ND 2000)
- Fresh water, steam, lub-oil and crude-oil (SB 8491, SB 8492, SB 8494, SB 8496, SB 8499 - ND 40 to ND 300)
- Sea water (SB 8493, SB 8495, SB 8497, SB 8498 - ND 50 to ND 300)
- Compressed air (SB 8500 - ND 50 to ND 150)
- Refrigerating cooling system (AR 25/65/25/Ns/1 - ND 65 and AR 25/40/25/Ns/1- ND 40)

4.2 - Expansion joint is not accepted in high pressure fuel oil injection systems.

4.3 - Reduction factors are to be taken in consideration for maximum working pressure and tolerable movement caused by temperature influence according to manufacturer's instructions.

4.4 - The calculated maximum values of axial and lateral movements at design full cycles are not to be exceeded.

4.5 - In all cases, the associated pipelines are to be suitably aligned, supported and anchored. The joints are to be at any time accessible, well visible and protected against over extension and compression and against mechanical damage.

4.6 - Piping system drawings and calculation notes are to be submitted for review whenever expansion bellows are fitted on board BV-classed ships.

4.7 - The joints are to be installed according to manufacturer's instructions and Bureau Veritas Rules requirements.

4.8 - The use of stainless steel is to be restricted as per the BUREAU VERITAS Rules.

5. PRODUCTION SURVEY REQUIREMENTS

5.1 - The products are to be supplied by **DURO DAKOVIC KOMPENZATORI d.o.o.** in compliance with the type and the requirements described in this certificate.

5.2 - This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

5.3 - BV product certificate is required.

5.4 - Each metallic expansion joint is to be hydraulic pressure tested to twice the maximum working pressure under witnessing of a Society's Surveyor.

5.5 - For information, **DURO DAKOVIC KOMPENZATORI d.o.o.** has declared to Bureau Veritas the following production site:

DURO DAKOVIC KOMPENZATORI d.o.o.

Dr. Mile Budaka 1
HR-35000 Slavonski Brod
00385
CROATIA

6. MARKING OF PRODUCT

Each metallic expansion joint shall be marked clearly to avoid any wrong utilization with:

- Manufacturer's name or trade mark
- Type designation
- Date of manufacture
- Society's brand as relevant

7. OTHERS

It is **DURO DAKOVIC KOMPENZATORI d.o.o.**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

This certificate supersedes the Type Approval Certificate N° 03149/F0 BV issued by the Society.

***** END OF CERTIFICATE *****