

TYPE APPROVAL CERTIFICATE

Certificate No:
TAA00000AH
Revision No:
4

This is to certify:

That the Level Switches

with type designation(s)

Trimod Besta float operated liquid level switches and mounting accessories A, B, DA, DB, UxA, UxB, XUxA, XUxB, HA, HB, TDA, TDB, Z, X

Issued to

Bachofen AG
Uster, ZH, Switzerland

is found to comply with

DNV rules for classification – Ships, offshore units, and high speed and light craft

Application :

Products are approved by this certificate are accepted for installations on all vessels classed by DNV.

Location classes:

Temperature	B
Humidity	B
Vibration	B
EMC	Not relevant
Enclosure	see Product Description

Issued at **Hamburg** on **2022-01-14**

This Certificate is valid until **2027-01-13**.

for **DNV**

DNV local station: **Augsburg**

Approval Engineer: **Heinz Scheffler**

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Joannis Papanuskas
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Types A, B, DA, DB, UxA, UxB, XUxA, XUxB, HA, HB, TDA, TDB, Z and X and combinations thereof, including flange modules to ANSI, DIN, BS, JIS and Besta standard and float modules.

Operating temperature ratings:

- A, B: 0 to 330°C
- XA, XB: -30 to 330°C
- DA, DB: -30 to 120°C
- UxA, UxB: -30 to 80°C
- XUxA, XUxB: -30 to 80°C
- HA, HB: 0 to 400°C
- TDA, TDB: -196 to 270°C
- Z: -30 to 145°C

Small x is a placeholder for the length of the cable

Electrical ratings:

- A: 250VAC SA / 30VDC 5 A
- B: 3VDC 300 mA
- B (Ex-i application): max.30 VDC, max. 300 mA, max. 0.12 VA
- Z (Ex-d application): 250VAC 5 A / 250 VDC 0.25 A
- XA (Ex-d application): 250VAC SA / 250 VDC 0.25 A
- XB (Ex-i application): max.30 VDC, max. 300 mA, max. 0.12 VA

IP Rate

- Type A, B, HA HB: IP65
- Type DA, DB, TDA, TDB: IP66 / IP 67
- Type UxA, UxB, XUxA, XUxB: IP68
- Type Z, X: IP66 / IP 67

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV Rules for Ships Pt.4 Ch.9 Control and Monitoring Systems.

Application/Limitation

- Types Z, B and X are suitable for use in hazardous areas. Ratings for application in hazardous areas are to be obtained from applicable Ex Certificates.
- Ex-certification is not covered by this certificate. Application in hazardous area to be approved in each case according to the Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Excertificate issued by a notified/recognized Certification Body.
- The float stops are to be secured by split pins through the rod.
- Guiding brackets for the vertical float rod is to be provided. The brackets are subject to approval in each case.
- Gasket material is to be oil resistant.
- For use in liquefied gas carriers, Materials and Material Certificates shall comply with DNV Rules for Ships Pt.5 Ch.5 Sec.2.

Type Approval documentation

Test Reports: Report No. 84.13150, dated 30-08-1984; 20111126.A02.01, dated 26-07-2011; LRS-11-001, LRS-11-002, LRS-11-003, dated 20-07-2011; 20141107.A02.01/02/03, dated 30-07-2014; 20181115.A02.01, dated 23-08-2018.

Documents: Catalogue LTKEN 2017.08; Modification report TR-DNVGL-18.0001, dated 08-10-2018; Drawings 2909.1, 2909.2; SWM 041; Operating Instructions: LTB002X

Test Standard

Applicable tests according to class guideline DNV-CG-0339, August 2021

Marking of product

The products to be marked with:

- Model name
- Manufacturer name
- Serial number

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

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