

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Level Indicating System

with type designation(s)

BAL-2000 M-type, BAL-2000 E-type

Issued to

Marsen Co., Ltd.

Busan, Korea, Republic of

is found to comply with

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

Application :

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

Type	Temperature	Humidity	Vibration	EMC	Enclosure
BAL-2000 M-type	A/D *	B	A	B	A/C *
BAL-2000 E-type	A/D *	B	A	B	A/C/D *

* See page 2 for details

Issued at **Busan** on **2023-05-09**

This Certificate is valid until **2028-05-08**.

for **DNV**

DNV local unit: **Gimhae Station**

Approval Engineer: **Eun Sook Kim**

Hanwee Low
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

BAL-2000 ballast tank & draft level gauging system is designed to measure the level of ballast tanks, draft and fuel oil tanks of ships.

- M-type (BAL-2000-M): Electro-pneumatic type
- E-type (BAL-2000-E): Electric pressure type

M-type comprising the following units:

Model	Description	Temperature	Enclosure
LIP-200	Level indicator, dial type, 4-20 mA input	A	A
LID-200	Level indicator, digital type, 4-20 mA input	A	A
FRU-200	Flow regulator	A	A
GSU-200	Gauge saver	A	A
PIU-200	P/I converter, 4-20 mA output	A	A
---	Air supply unit	A	A
DCV-200	Dual check valve	D	C

E-type comprising the following units:

Model	Description	Temperature	Enclosure
LID-200	Level indicator, digital type, 4-20 mA input	A	A
---	Amplifier box	A	C
DMB-288+	I.S. barrier	A	A
PT-420	Pressure transmitter for level gauging	D	D (3 bar / 30 m)

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 classification of ships Pt.4 Ch.9 Control and monitoring systems.

Application/Limitation

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 Ex-certificate issued by a notified/recognized Certification Body.

For application in fuel oil tanks the installation requirements of Pt.4 Ch.6 Sec.4 [10.6] need to be adhered to.

Power supply filter and ferrite cores are required to satisfy the class EMC requirements. The following are to be provided in the standard installation:

- Power supply terminals to be equipped with EMI/EMC filter type (DIT) CA5-V33 or equivalent
- Power supply terminals to be clamped with ferrite core (Feelux) BNF-27 or equivalent
- Signal cables to be clamped with ferrite core (Feelux) BNF-0822 or equivalent

Type Approval documentation

Tests carried out

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

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number
- power supply ratings

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



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- 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