



Certificate No:
TAE00004H2

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Monitoring Relay

with type designation(s)
Insulation Resistance Monitor GM-A2 Series

Issued to

BMTECH
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.

Issued at **Busan** on **2022-07-04**

This Certificate is valid until **2027-07-03**.

DNV local station: **Gimhae Station**

for **DNV**

Approval Engineer: **Eun Jin Lee**

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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.



Form code: TA 251

Revision: 2021-03

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Product description

GM-A2 series monitors for ground faults stated in ungrounded single or three-phase AC system.

	A2H	A2HR	A2HRX
Nominal system voltage	0...690 V	0...690 V	0...690 V
Rated frequency	40-65 Hz	40-65 Hz	40-65 Hz
Rating of supply voltage	AC110/220/440	AC110/220/440	AC110/220/440
Supply voltage variation	90 to 254VAC / 380 to 480VAC	90 to 254VAC / 380 to 480 VAC	90 to 254VAC / 380 to 480 VAC
Measuring voltage (U _m)	< ±40 V	< ±40 V	< ±40 V
Measuring current	≤ 200 uA	≤ 200 uA	≤ 40 uA
Internal DC resistance	≥ 200 kΩ	≥ 200 kΩ	≥ 1000 kΩ
Measuring time(at Ce=<1uF)	≤ 3 sec	≤ 3 sec	≤ 3 sec
Permissible system leakage capacitance	≤ 50 uF	< 1000 uF	< 1000 uF
Alarm response value, 16 steps	10 kΩ – 10 MΩ	10 kΩ – 10 MΩ	10 kΩ – 10 MΩ
Alarm delay time	Response time + ab2.5s	Response time + ab2.5s	Response time + ab2.5s
Hysteresis(1kΩ-200kΩ)	-	< 25 %	< 25 %
Relative percentage error	< ±15%	< ±15%	< ±15%

Application/Limitation

Location classes :

Temperature A / Humidity B / Vibration A / EMC A / IP30

For installation inside switchgear and control gear assemblies, operating instructions of the manufacturer are to be observed.

Type Approval documentation

Tests carried out

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

Marking of product

Manufacturer name

Model name

Serial number

Power supply rating

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine Tests (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and 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