

TYPE APPROVAL CERTIFICATE

This is to certify:

That the **Control system for fire extinguishing**

with type designation(s)
NANO/MAR/PANEL, NANO/MAR/ETB

Issued to
N2KB B.V.
Schiedam, Netherlands

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application :

When the **NANO** system is used in installations intended to comply with **MSC.1/Circ.1270**, installation and performance as per requirements in **MSC.1/Circ.1270 Annex 1** is required

Location classes:

Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	B / IP 65

Issued at **Høvik** on **2022-12-22**

This Certificate is valid until **2027-12-21**.

DNV local unit: **Netherlands CMC**

Approval Engineer: **Frode Nygård**

for **DNV**

Frederik Tore Elter
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

NANO/MAR system is a stand-alone fire extinguishing release system.

The NANO/MAR system consists of the following two main components:

- NANO/MAR Control panel.
- NANO/MAR/ ETB 5-10 Extinguishers terminal Box

The purpose of the NANO/MAR system is to control, monitor and activate number of aerosol generators as a part of a fire extinguishing system. If applied for an engine room the system activates the extinguishing generators or solenoid activator, manually in the event of fire.

NANO/MAR system provides two alarm zones for fire detectors that can report fire alarm to the NANO control panel. NANO/MAR system has facilities monitoring the system itself and giving alarm if a fault within the system is detected.

Software release v1.3

Hardware release NKB310c

Communication Interface: Modbus RS485 to external monitoring systems.

Main and Emergency power supply input 12 to 24 VDC +/-30%.

Approval conditions

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- System block diagram
- Power supply arrangement (may be part of the System block diagram)

The Type Approval covers hardware and software listed under Product description.

When the type approved software is revised (affecting all future deliveries) DNV is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have to be renewed to identify the new software version.

The NANO/MAR System shall be installed, operated and configured in accordance with the instructions specified in *NANO Fire Detection & Extinguishing System - User Manual*.

Application/Limitation

The Type Approval covers control system only.

External cables and extinguishing generators are not covered by this certificate.

When the NANO/MAR system is used in installations intended to comply with the provisions of the FSS Code and IMO MSC/Circ.1270 installation and performance as per requirements in Annex 1 of MSC.1/Circ.1270 is required.

Type Approval documentation

Tests carried out

Applicable tests:

- according to class guideline – DNV-CG-0339, Edition August 2021.
- functional testing according to Performance Test Report NANO/MAR (DNV Witnessed)
- MSC.1/Circ.1270 (requirements with regard to control system testing only)

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
- 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