

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Control system for fire extinguishing

with type designation(s)
FS12 Main Unit, FS12 Sub Unit

Issued to

JK E-solutions ApS
Ringkøbing, Denmark

is found to comply with
DNV GL rules for classification – Ships and offshore units

Application :

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

Location classes:

Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	C

This Certificate is valid until **2017-12-31**.

Issued at **Høvik** on **2016-03-29**

DNV GL local station: **Fredericia**

for **DNV GL**

Approval Engineer: **Frode Nygård**

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Odd Magne Nesvåg
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.

Job Id:
Certificate No: **TAA00000D3**

Product description

The type approval covers:

FS12 Main Unit Control and Monitoring System for Fixed Aerosol Fire Extinguishing System
- type designation JKE-0301-D14 and
FS12 Sub Unit Control and Monitoring System for Fixed Aerosol Fire Extinguishing systems
- type designation JKE-0302-E13.

The purpose of the FS12 system is to control and monitor a number of aerosol generators as a part of a fire extinguishing system. The FS12 system activates the aerosol generators in the event of fire. FS12 provides an input for smoke detectors and has facilities monitoring the system itself and giving alarm if a fault within the system is detected.

System software versions:

FS12 Main Unit: V1.02.01
FS12 Sub Unit: V1.02.03

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)
- Software version

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

Product certificate

As long as the units are covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 [1.2.3] will not be required. Correct configuration and set up for each delivery to be tested during commissioning after installation.

Clause for application software control

All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV GL for evaluation and approval.

Major changes in the software are to be approved before being installed in the computer.

A Certification of Application Functions may be required for the particular vessel.

Type Approval documentation

Tests carried out

Applicable tests according to DNV Standard for Certification No. 2.4, April 2006.

Performance test according to IMO MSC.1/Circ. 1270.

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Marking of product

The products to be marked with:

- manufacturer name
- model 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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE