

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, Midtjylland, Denmark**

is found to comply with

DNV GL 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 GL.****Location classes:**

Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	B

Issued at **Høvik** on **2020-02-11**for **DNV GL**This Certificate is valid until **2024-12-31**.DNV GL local station: **Denmark CMC**Approval Engineer: **Frode Nygård**

**Marta Alonso Pontes
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: **262.1-011603-5**
Certificate No: **TAA00000D3**
Revision No: **3**

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-F17.
FS12 Power Input PCB Control and Monitoring System for Fixed Aerosol Fire Extinguishing systems
- type designation JKE-0305-C16.

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: V1.02.04
FS12 Sub Unit: V1.02.04

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.

As long as the units are covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 [1.4] will not be required. Correct configuration and set up for each delivery to be tested during commissioning after installation.

Software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV GL for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

Type Approval documentation

FS12 Certificate Renewal R3-2017-07-11
FS12 Installation and Service Manual R5, No. R5-2013-09-09
FS12 User Manual R3, No. R3-2013-09-09
FS12 Test Specification R3 No. R3-2011-10-10
Test programme No. A507525-JK e-solutions – Test programme.pdf
FS12 - Acceptance Test Report No. R3-2011-10-10 dated 2011-10-10
DELTA Test Report No. DANAK-1911662 Rev.A dated 17 November 2011.
DELTA Test Report No. DANAK-1916133 Supplementary tests, dated 11 february 2016
FORCE TECHNOLOGY Test Report No. 117-26209 Supplementary tests, dated 2017-07-10

DNV GL Fredericia renewal assessment report for TAA00000D3 Rev.2, dated 2019-11-21

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Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2016.
Performance test according to IMO MSC.1/Circ. 1270.

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 after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE