Certificate No:
TAA000030H

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Fire Detector

with type designation(s)
Resettable Line-Type Heat Detector d-LIST

Issued to
Listec GmbH
Isen, **Germany**

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.
Location classes:

Temperature	**B*/D**
Humidity	**B**
Vibration	**B**
EMC	**B**
Enclosure	**B*/C**

*** see Application/Limitation**

Issued at **Hamburg** on **2022-06-16**
This Certificate is valid until **2027-06-15**.
DNV local station: **Augsburg**

Approval Engineer: **Heinz Scheffler**

for **DNV**

Joannis Papanuskas
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

The line-type heat detector system d-LIST consists of the sensor control unit d-LISTcontroller d-LCON or sensor control unit SCU 835, the sensor element SEC 15, corresponding connection boxes CBO 15 and connection cable CC 15:

- Sensor control unit d-LCON / SCU 835
  - power supply 24 V DC
  - selectable alarm set-points for temperature rise and maximum temperatures
  - monitors up to 2 x 320m SEC15 with 2 x 100 addressable sensors
  - connection of 2 electronic sensor cable SEC 15
  - Measurement resolution of 0,0625 °C with a repeatability of ± 0.0625 K along the entire sensor cable length
  - cyclic function check of all sensors every 10 seconds
  - Interfaces: USB, RS232/RS485, Ethernet (LAN) - data protocol MODBUS (RTU) and/or MODBUS TCP/IP
  - 2 fault group alarm outputs (closed-circuit / change-over contact)
  - 2 temperature alarms outputs (closed-circuit / change-over contact)
  - 1 external reset input (potential free contacts or 5 V - 30V DC, max, 3mA)
  - 9 LED for Alarms, Warnings and Information on the d-LCON and 7 LED on the SCU 835
  - Expandable with relay board REL 835 with 16 alarm relays

- Electronic sensor cable SEC 15
  - up to 100 addressable sensors with selectable sensor spacing of 0,5 to 10 m
  - branching at any point in the cable via connection box CBO 15

- Halogen-free Connection Box CBO 15
  - Connection unit for up to two sensor cables SEC 15
  - May be combined with external sensors ESD
  - Based on configuration, it contains either a universal connection module UCM 15-SEC or UCM 15-ESD
  - UV- and weather-proof

- Halogen-free Prefabrication SECcon 15
  - Pre-assembled cable plugs and sockets, 3 pins
  - To connect sensor cable (or two) SEC 15 and connection cable CC 15

- Halogen-free Connection Cable CC 15
  - Fire alarm cable, type JE-H((St)H...Bd FE180 E30-E90
  - Cable diameter 5,5 mm
  - May be combined with sensor cable SEC 15 via connection boxes CBO 15 and/or prefabrication SECcon 15

Application/Limitation

Location class Temperature B: Sensor control unit d-LCON / SCU 835
Location class Enclosure B: Sensor control unit d-LCON / SCU 835

Please observed the Manuals and Installation Guides before Installation.

Approval Condition

As long as the System or components are covered by the Type Approval, no product certificate will be required according to Pt.4 Ch.9 - Control and monitoring systems.
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)
- Electrical diagram with interfaces
- Application software configuration
- Arrangement drawings showing location of the equipment of the Fire detection system and the connected wiring
- Functional description / Manuals

Clause for application 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 for evaluation and approval before implemented on board.

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.

Type Approval documentation
Test Report & Documents: List of Test Reports and Documents “DNV - Dokuübersicht-04 / 05.07.2022”

Tests carried out
Applicable tests according to class guideline DNV-CG-0339, August 2021
EN 54-22:2015+A1:2020; EN 60332-1-2/A11:2017

Marking of product
The products to be marked with:
- Model name
- Manufacturer name
- Serial / Cable 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