

# TYPE APPROVAL CERTIFICATE

**This is to certify:****That the Gas Detector**

with type designation(s)

**Flexsight™ LS2000 Line-of-Sight Infrared Gas Detector /Model HC800 (Autronica)**

Issued to

**Detector Electronics Corporation (Det-Tronics)  
MINNEAPOLIS, MN, United States**

is found to comply with

**Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Location classes:**

|                    |                        |
|--------------------|------------------------|
| <b>Temperature</b> | <b>D</b>               |
| <b>Humidity</b>    | <b>B</b>               |
| <b>Vibration</b>   | <b>A/B</b>             |
| <b>EMC</b>         | <b>B</b>               |
| <b>Enclosure</b>   | <b>C / IP66 / IP67</b> |

This Certificate is valid until **2019-09-07**.Issued at **Høvik** on **2015-09-08**DNV GL local station: **New York**Approval Engineer: **Andrzej Gdaniec**for **DNV GL**

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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.

## Product description

The Model LS2000 is a line of sight infrared gas detection system that provides continuous monitoring of combustible hydrocarbon gas concentrations in the range of 0 to 5 LFL-meters, over a distance of 5 to 120 meters. Standard system output includes an isolated 4-20 mA signal supporting HART communication protocol and an RS-485 output supporting MODBUS protocol.

The system consists of two stainless steel modules – a transmitter and a receiver, along with mounting and alignment bracket. The receiver provides the measurement signal outputs and is furnished with on board "status indication" LEDs and an internal magnetic calibration switch. The transmitter houses a xenon flash lamp and "status indication" LEDs. Both modules are powered from an external 24 VDC supply and are equipped with microprocessor controlled heated optics to increase resistance to moisture and ice.

## Application/Limitation

The Type Approval covers hardware listed under Type Designation/Product Description. In each case the hardware is used in application to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system. Reference to this certificate is to be made through the equipment list covering the application system in question.

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

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## Tests carried out

Applicable tests according to:

- DNV Standard for Certification No. 2.4 Edition April 2006.
- IEC 60079-0 Ed.6
- IEC 60079-29-4: Ed.1 – Explosive atmospheres- Part 29-4: Gas detectors- Performance requirements of open path detectors for flammable gases.

## 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



Job Id: **262.1-016845-1**  
Certificate No: **TAA000002M**