DNV·GL

Certificate No:
TAA00001VE

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Automatic Gas Detection System

with type designation(s)
VECSAFE Oxygen and Pressure Monitoring System

Issued to
Martek Marine Ltd.
Rotherham, South Yorkshire, United Kingdom

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.

This certificate covers hardware/components only.

Location classes:

Temperature	**D**
Humidity	**B**
Vibration	**A**
EMC	**B**
Enclosure	**Required protection according to relevant rules shall be provided upon installation on board**

Issued at **Høvik** on **2018-07-11**
This Certificate is valid until **2023-06-30**.
DNV GL local station: **Manchester**

for **DNV GL**

Approval Engineer: **Ståle Sneen**

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.

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Product description

VECSAFE monitors oxygen and pressure levels in the Vapour Emission Control System (VECS). Each vapour line is monitored during loading operations for any over and under pressurization or an oxygen level approaching 8% volume.

The system comprises of a deck mounted enclosure containing an explosion proof oxygen sensor and intrinsically safe pressure sensor and associated sample pipe work, selector switches and signal communications. A flow sensor will announce detected flow failure.

The control and alarm panel is normally mounted in the cargo control room (CCR) and provides an alphanumeric display of the oxygen level and pressure reading at each point. Local audio and visual alarms can be initiated from the control panel and repeater panels are optionally available for wheelhouse and engine control room annunciation.

Main components / technical data:

- MM2000® Control panel
  - Power Supply: 110/230 VAC 50/60 Hz @ 5 A
  - Power Consumption: 100 W (alarm condition)
  - Indicators: LED green = Power
    LED red = Alarm
    LED amber = Fault
    Display
  - Relay Outputs: 230 VAC @ 5 A, Voltage-free relay contacts
  - Relay 1 pre-set Common low alarm
  - Relay 2 pre-set Common high alarm
  - Relay 3 pre-set Common over-range alarms
  - Relay 17 pre-set Common fault alarm, SPCO relay
  - Relay 18 pre-set Mains fail, SPCO relay normally energized
  - 16 relays user selectable SPCO (zone selection for any sensor)
- MM1000® Oxygen sensor
- MM200® Pressure sensor
  - Power Supply: 10 to 30 VDC
  - Signal Output: 4…20 mA, 2-wire system

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 including power arrangement and location of suction points and central units
- Test Procedure

The Type Approval covers hardware 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.

Application/Limitation

The Type approval does not cover the external piping system.
Instruction manual covering each specific installation to be available 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.

Test results of the "Compass safe distance":

Compass; standard	Compass; steering / standby steering / emergency
0.7 m	0.5 m

Type Approval documentation

Tests carried out

Applicable tests according to DNV's Standard for Certification 2.4, April 2006.
The special purpose tests "Acoustic noise and signals" and the "Compass safe distance" were measured according to sections 11.1 and 11.2 of IEC 60945, 4th edition (2002).
Applicable tests according to EN 50104:2002.

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