DNV·GL

Certificate No:
TAA00002J5

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Engine Control and Alarm System

with type designation(s)
MEC24-A, MEC24-S, MEC24-H, MEC24-B

Issued to
Lindenberg-Anlagen GmbH
Overath, Nordrhein-Westfalen, Germany

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.

Temperature	**B**
Humidity	**B**
Vibration	**B**
EMC	**B**
Enclosure	***) Required protection according to DNV GL Rules shall be provided upon installation on board**

Issued at **Hamburg** on **2019-11-13**
This Certificate is valid until **2020-07-09**.
DNV GL local station: **Essen**

Approval Engineer: **Jens Dietrich**

for **DNV GL**

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.

© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

Place of system assembly:
Lindenberg Anlagen GmbH, Hoffnungsthaler Str. 41, D-51491 Overath.

Product description

Genset engine control system consisting of following components:

MEC24-A Alarm System and Start-/Stop Unit:
6 analog inputs 4..20mA
6 analog inputs PT100/PT1000
1 RPM input, galvanic isolated
2 add. binary inputs
6 binary inputs for control
2 voltage input for fuse trip and charging alternator
2 voltage input for speed-up/down
8 binary relay outputs 6A
2 binary transistor outputs (with wire break monitoring)
1 voltage output 1..5V/1..10V
2 status-LEDs
Interfaces: 2 CAN bus, RS232 diagnostic, serial for I/O extensions
Degree of protection: IP20
Power supply: 24VDC
Functions: Alarming, Start-/Stop Control, logging SW-Version 3.12.xxx.

MEC24-S: Safety System
2 emergency stop inputs, direct acting, with wire break monitoring
5 binary inputs for automatic shut down with wire break monitoring
5 binary inputs for control (reset, override...)
1 RPM input, galvanic isolated
4 binary relay outputs, 6A
2 transistor outputs 8A, with wire break monitoring
1 transistor output 8A, short-circuit-proof with wire break monitoring
1 current output 4..20mA
2 status-LEDs
8 alarm-LED for override, emergency stop, overspeed and 5 other safety stop criteria
Interfaces: 1 CAN Bus for communication with MEC24-A and MEC24-H, serial output.
Degree of protection: IP20
Power Supply 24VDC.
Functions: Manual emergency stops and automatic shut-down.
SW-Version 1.19.xx

Operator Panels MEC24-H (local), MEC24-B (bridge)
-5.7" colour display with automatic dimmed illumination
-indication of most important analog engine parameters on each page
-engine status indication
-alarm pages for acknowledged and unacknowledged alarms
-membrane keys for engine start/stop, buzzer stop, acknowledgement, reset and page selection
-buzzer
-CAN interfaces for communication with MEC24-A and MEC24-S.
Degree of protection: IP20; front side: IP44.
Power Supply 24VDC
SW-Version: 1.30.xxx.x.

Software update notification
When the type approved software is revised (affecting all future deliveries) DNV GL is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have

to be renewed to identify the new software version.

Application/Limitation

-This certificate is only valid for system applications made and delivered by production facilities listed under Place of Assembly above for engines holding a valid DNV GL Type Approval certificate
-The system is suitable for auxiliary engines, emergency engines and multi engine propulsion systems.
-The Type Approval covers hardware and basic software listed under Product description.
-The installation Instructions in the Operation Manual have to be observed.
-If MEC24-B panel is part of the delivery project related functional description is to be submitted.
-Load sharing function is not covered by this Type Approval certificate.

The following documentation of the actual application is to be submitted for approval in each case:
- Reference to this Type Approval Certificate
- Specifications for Engine and/or reference to engine Type Approval Certificate
- Electric circuit diagrams showing power supply arrangement
- List of controlled and monitored points showing alarms and safety functions
- Software version for particular delivery

As long as the units are covered by this Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 will not be required. Correct configuration, start-/stop and saftey functions for each delivery is to be tested during genset test-run at Lindenberg's test bed. The SW version and LIAG configuration need to be recorded during this test prior to delivery.

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.

Tests carried out

Applicable tests according to DNV GL Class Guideline CG-0339, November 2016.
Performance test, dated 2013-05-16.

Marking of product

Manufacturer, Type designation, 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

A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE