TYPE APPROVAL CERTIFICATE

Certificate No:
TAA000010H
Revision No:
3

This is to certify:

That the Monitoring System

with type designation(s)
Oil Mist Detection System Mk7 consisting of:
Control Unit, Remote Display Unit, Detector, Control Unit Detector Cable

Issued to
Carrier Fire & Security Limited
Milton Keynes, United Kingdom

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:

Type	Temperature	Humidity	Vibration	EMC	Enclosure
Control Unit	B	B	B	A	B
Remote Display Unit	B	B	A	A	A
Detector	B	B	B	A	B
Control Unit Detector Cable	B	B	B	A	B

Issued at **Høvik** on **2022-02-23**

This Certificate is valid until **2026-12-31**.
DNV local station: **Southampton**

Approval Engineer: **Frode Nygård**

for **DNV**
Digitally Signed By: Sneen, Ståle
Location: DNV Høvik, Norway
on behalf of

Trond Sjåvåg
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
Oil Mist Detection System Mk7

Unit	Part number	Software
Control Unit w/ printed circuit board	53836-K270 (with membrane) 53836-K276 (without membrane) 44782-K190 rev9 (K196 rev1)	66200 / 9
Control Unit – Caterpillar w/ printed circuit board	53836-K270-01 (with membrane) 44782-K190-01 rev1 (K196 rev1)	66220 / 3
Remote Display Unit w/ printed circuit board	53836-K271 44782-K193 rev10 (K194 rev2)	66300 / 3
Detector w/ printed circuit board	53836-K269 (with base) 53836-K272 (replacement head) 53836-269-01 (short sample pipe) 44782-K191 rev5 (K192 rev4)	66100 / 1
Control Unit Detector Cable	43682-K286-xx (Straight) 43682-K285-xx (Right Angle) 43682-K298-xx (Right Angle)	N.A.

The control unit has individual digital output signals for:
- Fault
- Pre-Alarm: 0.5mg/l to 1.2 mg/l (53836-K270), 0.5mg/l to 2.3mg/l (53836-K270-01)
- Slow-Down/Shut-Down: 1.3mg/l to 2.4mg/l
- Back-up alarm: 3.0mg/l

Software update notification
When the type approved software is revised (affecting all future deliveries) DNV 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

Place of manufacture
Carrier Manufacturing Poland Sp. z o.o.
ul. Kolejowa 24
39-100 Ropczyce, Poland

Application/Limitation
Each engine is to be provided with its own independent control unit and dedicated alarms.

One Mk7 Remote Display Unit is capable to serve up to 10 engines. Verification that alarms and slowdown/shutdown are clearly identifiable for each engine in central IAS (Integrated Alarm System) shall be done during commissioning.

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)

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 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 for evaluation and approval before implemented on board.

Type approval documentation

Document title	Document no.	Rev.
OMD Mk7 Membrane Board	44782-K196CD	1
OMD Mk7 Display USB Board	44782-K194CD	2
OMD Mk7 Control Unit Board	44782-K190CD	7
OMD Mk7 Display Driver Board	44782-K193CD	9
OMD Mk7 Detector LED Board	44782-K192CD	3
OMD Mk7 Assembly Drawings (page 1-3)	53836-K269	7
OMD MK7 Assembly Drawing Control Unit	53836-K270	8
OMD Mk7 Assembly Drawings (page 1-5)	53836-K272	8
OMD Mk7 Specification	ED868	3
OMD Mk7 Control Board Hardware Specification	ED869	2
OMD Mk7 Control Unit Mechanical Specification	ED870	1
OMD Mk7 Display Unit Hardware Specification	ED871	2
OMD Mk7 Display Unit Mechanical Specification	ED872	1
OMD Mk7 Detector Hardware Specification	ED873	3
OMD Mk7 Detector Software Specification	ED874	1
OMD Mk7 Control Unit Software Specification	ED875	2
OMD Mk7 Class Society Test Procedure	ED881	2
OMD Mk7 Class Society Test Result	ED883	2
OMD Mk7 Detector CPU Board	44782-K191	5
OMD Mk7 Interim Passport 2		
OMD Mk7 Halt Testing Engineering Report		
Graviner Mk7 OMD Inst. Op. and maintenance manual	59812-K007	15
TRAC Certificate of Testing Display IP32	TRA007124CC03A	
TRAC Certificate of Testing Detector IP65	TRA007124CC01C	
TRAC Certificate of Testing Control Unit IP65	TRA007124CC02A	
Environmental Test Report Oil Mist Detector System OMD MK7	TL1550	2
Detector temperature testing Engineering Report OMD Mk7		
Elastollan® 1185 A FHF General product information (BASF)		
Comments OMD Mk7		
Flame Retardant ABS, POLYLAC PA-765A		
BSI Test Report	2407/7753833	

Renewal 2014:
Product change description: “DNV Document status 01-04-14”

Renewal 2017:

Test Report Environmental Compatibility MK7 OMD System	TL15082-ENV	14th October 2015
Test Report Electromagnetic Compatibility MK7 OMD System	TL15082-EMC	14th October 2015
OMD Mk7 ClassNK Test Results	ED912	3

Extension 2021:
The TA is extended to include part number 53836-K270-01 and 43682-K298-xx.

Renewal 2022:

Test Report Electromagnetic Compatibility MK7 OMD System	TL20118	21th January 2021

Type approval renewal assessment report Production plant for DNV, Ropczyce on 2021-11-23
Type approval renewal assessment report for DNV, Sunderland, UK on 2021-12-23

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.
For the bridge mounted components the ‘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).
Functionality tests according to IACS UR M67, Rev. 2.

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