Type Approval Certificate

[Oil Mist Detection System]

Initial Approval 7th March, 2012

Manufacturer Carrier Manufacturing Polska Sp. z o.o.
Ul. Kolejowa 25, 39-100 Ropczyce, Poland

Product Description Type : Graviner OMD Mk7

- Intended for : Diesel Engine Crankcase
- Power Supply : DC 24V

* Applicant : Carrier Fire & Security UK Limited.
8 Newmarket Court, Chippenham Drive, Kingston,
Milton Keynes, UK.

" See Appendix 1 "

Approval Condition " See Appendix 1 "

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows.

Pt. 5, Ch. 2, Art. 203 & Pt. 6, Ch. 2, Art. 301 of the Rules for Classification, Steel Ships and IACS UR M67 Rev.2

This Certificate is valid until 6th March, 2027

Issued at Busan, Korea on 10th November, 2021

This certificate is signed electronically in accordance with IMO FAL.5/Circ.39/Rev.2. Validation and authentication of the certificate can be confirmed from "http://e-cert.krs.co.kr" by using the tracking No(ME21028796099) and certificate No.(HMB36074-OD002).

KOREAN REGISTER

General Manager of
Marine & Ocean Equipment Team

Note : 1. This certificate will be valid subject to complying with the approval conditions described on the certificate and/or on the Rules of this Society.
2. This certificate will be invalid from the expiry date aforementioned unless the extension or renewal has been granted to the applicant or the manufacturer.
3. Any significant modifications or changes in design or construction to the above product without approval from this Society will render this certificate invalid.
4. Should the specified rules, regulations or standards be amended during the validity of this certificate, the product is to be re-approved by this Society in accordance with the requirements as amended.

Product Description and/or Approval Condition

Date of Issue : 10th November, 2021

A. Product Description

1. Product Specification

System comprising;

1) Control Unit(Type : 53836-K270), CPU Board(Type : 44782-K190)
- Max. No. of Detectors : 10
- Alarm Ranges : Pre Alarm(0.5 mg/l to 1.2 mg/l)
  Alarm(1.3 mg/l to 2.4 mg/l)
  Back-up(3 mg/l)
- Output relays at 30 V DC 1 A : Back-up, Pre-alarm, Fault, Slowdown/Shutdown
- Communication : CANBUS(with detectors) & MODBUS connections
- Enclosure Rating : IP65
- Software : P66200 Rev.109

2) Oil Mist Detector(Type : 53836-K269), CPU Board(Type : 44782-K191)
- Indicators : Green(Detector On), Red(Alarm), Amber(Detector fault)
- Detector Cable : 90°Connector(Type : 43682-K285),
  Straight Connector(Type : 43682-K286)
- Enclosure Rating : IP65
- Software : P66100 Rev.101

3) Remote Display Unit (Type : 53836-K271)
- Max. No. of Detectors : 100
- Max. No. of Engines : 10
- Enclosure Rating : IP32
- Software : P66300 Rev.103

2. Approved Drawings and Documents

1) Doc. No. 53836-K271 Rev.10 (2016-03-18), OMD Mk7 Spec. No. ED868 Rev.2
2) Drawing No. 44782-K190CD, 44782-K191, 44782-K192CD ~ 44782-K196CD,
   53836-K269 Rev.7, 53836-K270 Rev.8, 53836-K272 Rev.8

3. Test Reports, etc.

1) Test Reports
- URM67 Test Report No. ED881/ED883/ED912 issued by KIDDE Fire Protection
- EMC Test Report No. TL1550, TL15082/15083 Issue 2 issued by Mariner Systems Ltd.
- Environmental Test Report No. TL1550 Issue 2 issued by Mariner Systems Ltd.
- IP Test Report No. TRA007124CC02A, TRA007124CC01C, TRA007124CC03A issued by TRAC
- Engineering Report - OMD Mk7 Halt testing, Detector temperature testing
- Test Report No. TL19128 Issue 3, TL20118 Issue 1 issued by MS Testing

2) Control unit board Spec. No. ED869 Rev.1 & Mechanical Spec. No. ED870 Rev.1
3) Display unit hardware Spec. No. ED871 Rev.1 & Mechanical Spec. No. ED872 Rev.1
4) Detector hardware Spec. No. ED873 Rev.2 & Software Spec. No. ED874 Rev.1
5) Mk7 Control unit Software Spec. No. ED875 Rev.1
6) Technical Manual No. 59812-K007 Rev.17

B. Approval Condition

1. Application & Limitation

1) This approval is granted on the basis of the test reports and the approved documentation.
2) The manufacturer should inform this Society of all kinds of revisions of the equipment including software. If the changes are recognized to affect functionality of the approved equipment, type test to confirm the reliability of the revised equipment may be performed in the presence of our surveyor.
3) Degree of protection shall be complied with Rule Pt.6 Ch.1 Sec.2 201.2.(5).
4) The product shall not be installed in the bridge or on open decks.

2. Individual Product Cert. and Drawing Approval Requirement

1) In case where this system is installed on board, the system drawings for individual vessel are to be approved by this society.
2) Individual product certification is required.

3. Marking

1) The product or packing is to be marked with the manufacturer's name and type designation on a suitable position.

Product Description and/or Approval Condition

Date of Issue : 10th November, 2021

4. Others

1) Test condition (IACS UR E10 Rev.8 basis)

Test	Condition	Remark
EMC	All locations excluding the bridge and deck zone	-
Temperature	0℃ ~ +70℃ -25℃ ~ +70℃	The others Remote display unit
Vibration	Acceleration ±0.7g Acceleration ±4g	The others Oil mist detector
Ingress protection	IP65 IP32	The others Remote display unit

< End of Certificate >