TYPE APPROVAL CERTIFICATE
No. **ELE286720XG**

This is to certify that the product below is found to be in compliance with the applicable requirement of the RINA type approval system.

Description	**Oil mist detector for Diesel engine crankcase**
Type	**GRAVINER OMD Mk7 Oil Mist Detector**
Applicant	**Carrier Fire & Security BV** **KELVINSTRAAT 7** **NL-6003DH Weert** **NETHERLANDS**
Manufacturer	**Carrier CCS Manufacturing Polska SP. ZO.O.**
Place of manufacture	**UL. KOLEJOWA 24** **39-100 Ropczyce** **POLAND**
Reference standards	**RINA Rules for Classification of ships, Part C, Machinery systems and fire protection, Ch.3, Sect.6, table 1; IACS UR M67**

Issued in **HAMBURG** on **January 26, 2021**. *This Certificate is valid until* **January 25, 2026**

RINA Services S.p.A.
Giuseppe Russo

This certificate consists of this page and 1 enclosure

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GRAVINER OMD Mk7 Oil Mist Detector

GRAVINER OMD Mk7 Oil Mist Detection System consists of the following main components:

- **Control Unit Model 53836-K270, Programmable Unit 44782-K190 (Microchip details: PIC32MX575F256L-801/PT)** providing connection for maximum 10 detectors.

- **Detectors Model 53836-K269**, Detector using photodiode sensors, **CPU Board -44782-K191 (Microchip details: dsPIC33FJ64GP802T-I/MM)** Communication bi-directional over a half-duplex two wire CAN network, further connections include 24V power supply, 0V, and Backup Alarm. Detectors connected directly to controller via plug.

- **Display Unit Model 53836-K271** (Optional in the system, the system will work without display unit connection and if used shall be positioned in the ECR) can accommodate more than one control unit. Communication via modbus connection. The display is touch LCD giving facility to check the oil mist concentration, check the detectors status indication of alarm and fault, set alarm limit but not the slowdown set which is built in data at the commissioning.

- **Relays** 4-off relay providing the following external actions: Slowdown/shutdown relay, pre-alarm relay, fault relay and backup alarm relay.

Component / unit	Description / Application	Model No.
Mk7 Control Unit	The Mk7 control unit will be mounted on the engine and will monitor only that engine, IP 65, operating temp. 0 - 70° C	53836-K270 53836-K270-01 53836-K276 (non-membrane)
Display Unit (optional)	Positioned in the engine control room, IP 32, operating temp. 0 - 70°C	53836-K271
External connections to the detectors	Cable with plug and socked type connectors with IP 65	43682-K285 43682-K286 43682-K298
Mk7 Detectors	Up to 10 detectors can be connected directly to the control unit, IP 65, max. operating temp. 70° C	53836-K269 53836-K269-01

Relay connections: Slow down, pre-alarm, fault and back-up alarm.
Each relay output provides 3 connections:
Common - normally closed - normally open contacts

Communications: 2 MODBUS connections

Power supply: 24 VDC (18 - 32 VDC)

Software:
- Detector P66100-1xx
- Control Unit P66200-1xx respectively P66220-1xx
- Display Unit P66300-1xx

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GRAVINER OMD Mk7 Oil Mist Detector

Reference documents:

- Control Unit Board, Drawing No.: 44792-K190CD; 44782-K190CD sheet 1 - 8
- Display Driver Board, Drawing No.: 44782-K193CD sheet 1 - 2
- LED Mounting Block Assembly, Drawing No.: 53836-K272 30F5; 10F5 and 40F5
- Detector Head Assembly, Drawing No.: 53876-K272 50F5
- Detector CPU Board, Drawing No.: 44782-K191
- Membrane Board, Drawing No.: 44782-K196
- Display USB Board, Drawing No.: 44782-K194CD
- Assembly Drawing for Control Unit, Drawing No.: 53836-K270
- Base Tube Assembly, Drawing No.: 53836-K269 10F3
- LID Top assembly, Drawing No.: 53836-K272 20F5
- Detector LED Board, Drawing No.: 44782-K192CD sheet 1 - 2
- Oil Mist Detector Assembly, Drawing No.: 53836-K269 30F3 and 20F3
- Engineering Document: ED868; ED869; ED870; ED871; ED872; ED873; ED874; ED875; ED881
- Kidde Fire Protection, Installation, Operation and Maintenance Manual 59812-K007

Test reports:

- RINA Report No. 2011XU01 328
- Mariner Systems (UK) Ltd. Test File No. TL1550-A, Issue 01, Temperature Test Report
- Mariner Systems (UK) Ltd. Test File No. TL1550, Issue 02, EMC Test Report
- Mariner Systems (UK) Ltd. Test File No. TL1550, Issue 03, Environmental Test Report
- MS Testing (UK) Ltd. Test File No. TL15082-EMC, Issue 01, Electromagnetic Compatibility Test Report
- MS Testing (UK) Ltd. Test File No. TL15082-ENV, Issue 01, Environmental Compatibility Test Report
- MS Testing (UK) Ltd. Test File No. TL19128-EMV, Issue 01, Environmental Compatibility Test Report
- BSI Test Report No.: 2407/7753833; 20.09.2011
- TRac Certificate of Testing No.: TRA007124CC01C
- TRac Certificate of Testing No.: TRA007124CC02A
- TRac Certificate of Testing No.: TRA007124CC03A

The certificate cancels and supersedes RINA certificate No. ELE159616XG.

HAMBURG January 26, 2021

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