

TYPE APPROVAL CERTIFICATE

Certificate no.:
TAA00002V8
Revision No:
2

This is to certify:
that the Gas Detector

with type designation(s)
MECCOS TrGL KM, MECCOS TrGL NH3, MECCOS TRGL O2, Splitter Box

issued to
Siegrist GmbH
Karlsruhe, Baden-Württemberg, Germany

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft
DNV rules for classification – Naval vessels

Application:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Location classes:

Temperature	C
Humidity	B
Vibration	B
EMC	A
Enclosure	B

Issued at **Hamburg** on **2026-09-23**

This Certificate is valid until **2030-09-17**.

DNV local unit: **Augsburg**

Approval Engineer: **Dariusz Lesniewski**



for **DNV**

This document has been digitally signed and will
therefore not have handwritten signature

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 USD 300 000.

Product description

Gas detection and alarm device: MECCOS TrGL KM, MECCOS TrGL NH3, MECCOS TRGL O2

Detectable gases:	CO ₂ , NH ₃ , O ₂ , ¹⁾ Refrigerants in Safety Group A1 / Group 1 Refrigerants
Measuring ranges:	0..0,1 to 0..25 Vol % (Refrigerants in Safety Group A1 / Group 1 Refrigerants) 0..25 to 0..30 Vol % (O ₂) 0..50 to 0..1000 Vpm (NH ₃)
Measuring accuracy:	+/- 10% of threshold value, respectively analogue output
Display:	5x LEDs (Alert, Prealert, Warning, Ready, Fail) 1x Buzzer, 1x Reset button
Outputs:	1x 4-20mA analogue (shielded cable required) 5x Relays (Alert, Prealert, Warning, Fail); Rating max. 48VDC, 20W
Power supply:	100-230V/AC 50/60Hz or 24V/DC (shielded cable required)
Degree of protection:	IP65
Splitter Box:	For connection of max. 2 MECCOS® TrGL (...and distribution of alarm messages)
Splitter box and single display unit with alarm forwarding	For connection of max. 1 MECCOS TrGL (...and distribution of alarm messages), 5x LEDs (Alert, Prealert, Warning, Ready, Fail). 1x Buzzer, 1x Reset button. 1x 4-20mA analogue (shielded cable required). 5x Relais (Alert, Prealert, Warning, Ready, Fail); Rating max. 48VDC,20W
Splitter box and 6 channel display unit with alarm forwarding	For connection of max. 6 MECCOS TrGL (.. and distribution of alarm messages), 30x LEDs (Alert, Prealert, Warning, Ready, Fail). 6x Buzzer, 1x Reset button. 6x 4-20mA analogue (shielded cable required). 30x Relais (Alert, Prealert, Warning, Ready, Fail); Rating max. 48VDC,20W

¹⁾Refrigerants in Safety Group A1 acc. to DIN EN 378, ASHRAE 34 (USA) or ISO 817 (Europa)
Group 1 Refrigerants acc. to DNV Rules – Ships, Part 4, Chapter 6, Section 6, 3.1 – Refrigerants (Table 1)

Application/Limitation

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Each gas detector to be delivered with the Calibration Certificate referring to the Function Test Listing no. 528190, DNV-CG-0339 for various refrigerants according to Safety Group A1

Type Approval documentation

Test Report: NEMKO No. FS-1306-238538-002, dated 2013-08-21

Test Report: NEMKO No. FS-1306-238538-004, dated 2013-09-16

Test Report: NEMKO No. FS-1311-248205-002, dated 2014-02-25

Test Report: NEMKO No. FS-2004-396848-002, dated 2020-07-16

Technical Report: TÜV No. 713038984, dated 2014-05-08

Technical Report: TÜV No. 713183357, dated 2020-03-06

User Manuals: MECCOS® TrGL (27.02.2014), TrGL NH3/O2 (23.05.2014)

Splitter box doc. Nr. 16698 (2013-10-14)

Construction Drawings, Hardware/-Software Description, Circuit Diagrams

Certificate extension 2026:

Test Report NEMKO REP148397TRFEMC-DNV, dated 30.01.2026

Test Report NEMKO REP148398TRFEMC-IEC, dated 30.01.2026

Test Report TÜV SÜD no. TR-713413517-00 /Rev. 0), dated 23.07.2026

Technical Report TÜV no TR-713389974-00 rev0, dated 23.03.2026

Function Test Report Siegrist GmbH, Report R513a, 15042026-1,-2,-3

Function Test Report Siegrist GmbH, Report R449a, 15042026-4,-5,-6

List no. 528190 of performance tests and results for various refrigerants according to Safety Group A1, date 2026-09-23

Calibration Certificate, date 2026-09-23

User Manuals:

MECCOS BA_TrGL_IR_D_V2026, no. 21851, dated 08-2025

Splitter box and single display unit with alarm forwarding, no. 21852, dated 01-2026

Splitter box and 6 channel display unit with alarm forwarding, no. 21854, dated 01-2026

Data sheet(s): InfraTec LIM-262-X043

Sensorix NH3 100 rev. 2020-09-08

LFO2-AL Long-Life Lead-Free Oxygen Sensor, Alphasense/AMETEK TS ver.1
PST-Hydrocarbon-Carbon-Dioxide-PST-DS-0003-Rev2.1
All relevant documents as in the reference document: 'Siegrist List of documents 52958-6', dated 18.08-2026
Type approval assessment report issued at Augsburg on 2025-08-18

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021

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