



Type Approval Certificate

[Tank Monitoring and Control System]

Initial Approval 20 November 2007
Manufacturer Kongsberg Maritime AS, Trondheim
Skonnertvegen 1, NO-7053 Ranheim, Norway
Product Description Type : K-Gauge

" 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. 6, Ch. 2, Art. 301 & Pt. 7, Ch. 1, Art. 1002 of the Rules for Classification, Steel Ships

This Certificate is valid until 19 November 2027

Issued at Busan, Korea on 25 April 2023



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.(ME23017660268) and certificate No.(CPH04968-AC004).



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 : 25 April 2023

A. Product Description

1. Product Specification

1) System Description (Type : K-Gauge)

K-Gauge Kongsberg gauging systems for level, pressure and temperature, typically configured in system types as listed below

K-Gauge CLS 600/700

Cargo Level System for monitoring of level, pressure and temperature on cargo tanks for oil, product and chemical cargo. Also included monitoring of level in ballast and service tanks when operated from same system. Based on either K-Chief 600 or K-Chief 700 and SW components

K-Gauge HLA 600/700

High Level and Overfill system independent from the CLS system on oil, product and chemical tanks. Based on either K-Chief 600 or K-Chief 700 and SW components

K-Gauge GAS 600/700

Cargo Level System for monitoring of level, pressure and temperature on gas tankers. Also included monitoring of tank and pressure related to gas as fuel. Based on either K-Chief 600 or K-Chief 700 and SW components

K-Gauge CTS 600/700

Custody Transfer System for LNG tankers. Based on either K-Chief 600 or K-Chief 700 and SW components

K-Gauge TOPS 600/700

Radar based Tank Overfill Protection System for gas tankers. Based on either K-Chief 600 or K-Chief 700 and SW components.

K-Gauge RSS

Remote Sounding System for ballast and service tanks, including both electro and electro-pneumatic type. Based on either K-Chief 600 or K-Chief 700 and SW components.

2) Hardware Components

The hardware components used in the K-Gauge system can be composed of the components in the following Type Approval Certificates only. The system drawings including actual combinations of these components are to be submitted for individual drawing approval.

- The hardware for the microcomputer (RCU) and I/O modules : CPH03795-AC008 (K-Chief 700)
- The hardware for DPU series : CPH27937-AC002 (K-Chief 600)
- The special components for K-Gauge : CPH04968-AC005

3) Software Version

- SW revision history for K-Gauge Issue No. N (2018.10.08)
- SW revision history for K-Gauge Issue No. O (2020.08.17)

2. Approved Drawings and Documents

1) Ex-proof Certificate

- GLA-310/5 : Sira 14ATEX2056X (Issue.0, 2014.12)
- GLK-300 : Presafe 14 ATEX 5412 X (Issue.2, 2017.08)
- DZ-110/U : Presafe 14 ATEX 4368 (Issue.3, 2017.08)
- DZ-120 : Presafe 16 ATEX 7965 (Issue.1, 2017.08)
- GC-300, GC-306 : Sira 14ATEX2054X (Issue.1, 2017.08)

2) Manual

- K-Gauge CLS 600 Operator Manual No. 385541C
- K-Gauge GAS 600 Operator Manual No. 387761B
- K-Gauge CLS 700 Operator Manual No. 458335A
- K-Gauge GAS 700 Operator Manual No. 458319A
- K-Gauge HLA High Level Alarm System (600), Operator Manual No. 448723A
- K-Gauge HLA 700 High Level and Overfill Alarm System, Operator Manual No. 422699A

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3. Test Reports, etc.

- 1) Environmental / EMC / IP Test Report
 - Report No. 209536 Issued 2012.08 by Nemko
 - Report No. 298130 Issued 2015.12 by Nemko
 - Report No. E09680.00 Issued 2009.06 by Nemko
 - Report No. E13227.00 Issued 2013.10 by Nemko
 - Report No. E15308.02 Issued 2016.07 by Nemko
 - Report No. E17118.00 Issued 2017.09 by Nemko
 - Report No. E21214.00 Issued 2021.11 by Nemko

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 is to inform this Society of all kinds of revisions of the equipment including software. If the changes are recognized to affect the 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) Explosion-proof certification by a notified/recognized Certification Body is not covered by this certificate. Ratings and Special Condition for Safe Use in hazardous areas are to be obtained from the relevant valid Ex-Certificate.
- 4) PC and monitor are to be separately type-approved by this Society.

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.

4. Others

N/A