



Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	Kongsberg Maritime AS
Address	Skonnertvegen 1, Ranheim, 7053, Norway
Place of Production	Kongsberg Maritime AS Skonnertvegen 1, Ranheim, 7053, Norway
Type	Monitoring System
Description	<p>Kongsberg gauging systems K-Gauge is used for monitoring of level, pressure and temperature in tanks, configured in the system types as listed below:</p> <p>K-Gauge CLS Cargo Level System for monitoring of level, pressure and temperature on cargo tanks for oil, product and chemical cargo. It also includes monitoring of level in ballast and service tanks when operated from same system.</p> <p>K-Gauge HLA High Level and Overfill Alarm system independent from the CLS system on oil, product and chemical tanks.</p> <p>K-Gauge GAS Cargo Level System for monitoring of level, pressure and temperature on gas tankers. It also includes monitoring of tank and pressure related to gas as fuel.</p> <p>K-Gauge CTS Custody Transfer System for LNG tankers.</p>

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	<p>K-Gauge TOPS Radar based Tank Overfill Protection System for gas tankers.</p> <p>K-Gauge RSS Remote Sounding System for ballast and service tanks, including both electro and electro-pneumatic type.</p>
Trade Name	K-Gauge
Application	<p>Marine, Offshore and Industrial applications for use in environmental categories ENV1, ENV2, ENV3, ENV4 and ENV5, as defined in Lloyd's Register Type Approval System, Test Specification Number 1 – December 2021.</p> <p>Assignment of environmental categories as specified in the corresponding component type approval certificates. Detailed information can be found in section "Other Conditions".</p>
Specified Standard	IACS UR E10 Rev. 8 / 2021
Other Conditions	<p>For systems consisting of the listed components the final functional arrangement and application software are to comply with appropriate Lloyd's Register Rules and Regulations and shall be subject to project related Plan Approval Process, when installed on LR classed vessels. Documents and drawings for the actual application are to be provided according to relevant LR Rules and Regulations.</p> <p>The final application is subject to a Factory Acceptance Test (FAT) to the satisfaction of the attending LR Surveyor before being shipped to LR classed vessels.</p> <p>Software versions for above components as listed in document "SW revision history for K-Gauge", document no. 386311/P, issue P, dated 14 August 2023.</p> <p>The hardware components used in the K-Gauge concept - as specified above -</p>

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are based on either K-Chief 600 or K-Chief 700 technology and are covered by the following type approval certificates:

* The hardware for the microcomputer (RCU) and I/O modules is covered by Type Approval Certificate No. LR2372712TA (K-Chief 700), expiry date: 07.03.2028

* The hardware for DPU series and I/O modules is covered by Type Approval Certificate No. LR21457899TA (K-Chief 600), expiry date: 19.07.2024

* The special components for K-Gauge are covered by Type Approval Certificate No.:

- LR2002080TA-02, expiry date: 21.09.2024

- LR22242390TA-01, expiry date: 04.11.2027

- LR23144839TA, expiry date: 11.11.2027

Ingress Protection according to the Rules & Regulations to be provided upon installation on board.

Specific Conditions of Use as stated in applicable Ex-certificates and the conditions of the LR Rules & Regulations for the Classification of Ships, Part 6, Chapter 2 shall be observed when installed in hazardous areas.

The Ex-certification does not form part of this certificate.

Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.

If the specified standards are amended during the validity of this certificate, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

Previous Version: This certificate supersedes certificate number 18/20065 (E1) issued on



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18 September 2019 which is hereby cancelled.

The Design Appraisal Document HPC1662157-23/MK and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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