



中国船级社
CHINA CLASSIFICATION SOCIETY

证书编号/Certificate No.
BG23PTB00013_02

型式认可证书
CERTIFICATE OF TYPE APPROVAL

兹证明本证书所述制造厂具备按照下列标准的要求生产本证书所列产品的能力和条件。

This is to certify that the manufacturer stated in the certificate meets the requirements of the standards listed below and is available with the ability and conditions to produce the products described in the certificate.

制造厂/Manufacturer

Kongsberg Maritime AS(Trondheim)

地址/Address

Skonnertvegen 1, N-7053 Ranheim, Norway

产品名称/Product

压力、温度、液位测量报警系统
Pressure, Temperature, Level Measuring Alarm System

认可标准/Approval Standard

- 中国船级社《散装运输液化气体船舶构造和设备规范》（2023）第10, 13章及其变更通告
Chapter 10,13 of CCS Rules for Construction and Equipment of Ships Carrying Liquefied Gases in Bulk 2023 and its Change Notices
- 国际海事组织《国际散装运输液化气体船舶构造和设备规则》第10, 13章
Chapter 10,13 of IMO "International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk"

用于/Intended for

船舶/Ships



证书有效期至/ This Certificate is valid until 2028年11月13日/ Nov. 13,2028

发证机构/ Issued by 中国船级社卑尔根办事处
CCS Bergen Office

签发日期/ Date 2024年04月02日
Apr. 02,2024

本证书根据中国船级社规范和相关规定签发。所有证书页为一个整体，必须同时使用。纸质证书每页均须由本社盖章方为有效，电子证书含数字签名方为有效，本证书复印件无效。任何单位和个人均不应摘录或节选本证书的部分内容。有关方对所持证书的真实性有疑问时，可以向本社检验机构咨询。This Certificate is issued pursuant to the Rules of the Society and related regulation. All pages of the certificate are taken as a whole and are used simultaneously. No paper certificate page is valid without bearing the stamp of the Society, no electronic certificates is valid without the digital signature, and no copied form of the certificate is regarded as valid. Any part of the certificate is not to be extracted or abridged by any unit or individual in any form. Related parties who are doubted about the authenticity of the certificate may inquire of the Society or its offices.



Form No: T01.

联系方式/Contact Us, 见本社官方网站/See official web site of the Society (<http://www.ccs.org.cn>)

UTN:P024-59344830

产品明细/Product Description

压力、温度、液位测量报警系统/Pressure, Temperature, Level Measuring Alarm System (M0001)

名称/Name	属性(值)/Value	单位/Unit
型号/Type	K-Gauge GAS 600, K-Gauge GAS 700, K-Gauge CTS, K-Gauge TOPS	
探测范围/Range of Detection	Refer to "Remarks" for details	
外壳防护等级/Degree of Protection of Enclosure	Refer to "Remarks" for details	

批准的图纸/Approved Drawings

图纸批准号/ Drawings Approval No. : BG20PPP20001;NP21PPP01091

产品认可试验报告/ Approval Test Report

试验报告编号/ Test Report No. : DANAK-198696
 试验报告日期/ Test Report Date : 2007-03-15
 试验单位/ Laboratory: DELTA
 试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No. : E09680.00
 试验报告日期/ Test Report Date : 2009-06-24
 试验单位/ Laboratory: Nemko AS
 试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No. : 209536
 试验报告日期/ Test Report Date : 2012-08-21
 试验单位/ Laboratory: Nemko AS
 试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No. : DANAK-1911523 Revision 1
 试验报告日期/ Test Report Date : 2012-10-26
 试验单位/ Laboratory: DELTA
 试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No. : E13227.00
 试验报告日期/ Test Report Date : 2013-10-02
 试验单位/ Laboratory: Nemko AS
 试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No. : P-TA-GAS/XE Rev. B
 试验报告日期/ Test Report Date : 2014-01-23
 试验单位/ Laboratory: Kongsberg Maritime AS
 试验单位地址/ Test Address: Trondheim,Norway

试验报告编号/ Test Report No. : E15165.00
 试验报告日期/ Test Report Date : 2015-09-18
 试验单位/ Laboratory: Nemko AS
 试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No. : E16236.00
 试验报告日期/ Test Report Date : 2016-11-14
 试验单位/ Laboratory: Nemko AS
 试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No. : E17118.00
 试验报告日期/ Test Report Date : 2017-09-22
 试验单位/ Laboratory: Nemko AS
 试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No. : E18081.00
 试验报告日期/ Test Report Date : 2018-04-23
 试验单位/ Laboratory: Nemko AS
 试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No. : Sira 14ATEX2056X
试验报告日期/ Test Report Date : 2020-10-23
试验单位/ Laboratory: Sira Certification Service
试验单位地址/ Test Address: U.K.

试验报告编号/ Test Report No. : Sira 14ATEX2054X
试验报告日期/ Test Report Date : 2020-10-23
试验单位/ Laboratory: Sira Certification Service
试验单位地址/ Test Address: U.K.

试验报告编号/ Test Report No. : 14 ATEX 5412X
试验报告日期/ Test Report Date : 2020-11-18
试验单位/ Laboratory: DNV GL Nemko Presafe AS
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No. : E21214.00
试验报告日期/ Test Report Date : 2021-11-01
试验单位/ Laboratory: Nemko
试验单位地址/ Test Address: Oslo Norway

认可后的产品检验方式/ Method of Product Inspection after Approval

按规范认可后应进行产品检验的产品/The product should be inspected in term of the rules:
认可后的产品检验应由本社验船师根据本社规范规定按批准的产品检验计划进行检验, 经检验合格后由本社颁发船用产品证书。

After approval, product inspection should be carried out by the Surveyor of the Society in accordance with the approved product inspection scheme, and the Marine Product Certificate will be issued by the Society upon satisfactory inspection.

认可保持条件/ Maintenance Requirements of Approval

1. 型式认可后, 如果产品及其重要零部件的设计、所用材料或制造方法有所改变, 且影响到产品的主要特性、特征; 或产品的性能指标有所更改, 且超过认可的范围, 则有关图纸和文件应经检验机构审批。并在检验机构认为必要时, 经本社检验人员见证有关试验和进行检查, 其结果应能证实仍符合认可条件。

After type approval, if there are changes to the design, materials used or manufacturing method of the product and important components and such changes affect major characteristics and properties of the product, or property indexes of the product are changed and exceed the scope of approval, related drawings and documents are to be examined and approved by the concerned survey office. Where deemed necessary by the survey office, the surveyor to the Society will go to witness relevant tests and conduct inspection and the results should be able to demonstrate compliance with the approval conditions.

2. 工厂的质量管理体系应保持有效运行, 并且与认可时一致。如果质量管理体系发生改变, 应经原体系认证机构审核并报本社批准。

The quality management system of the factory shall be ensure effective operation, and shall be the same as the situation of approval. If there are any changes to the quality management system, auditing of the original certification organization for quality management system and the society's approval shall be obtained.

3. 认可证书有效期内, 如果出现可能导致本社取消认可的情况, 工厂应及时采取有效的纠正措施。

Within the validity of the approval certificate, if cases occur that may cause the Society to withdraw the approval, the manufacturer should take corrective actions in a prompt and effective manner.

4. 在认可证书有效期内, 本社检验人员可在未经事先通知的情况下对工厂的产品制造过程进行审核, 以验证产品的生产是否符合业经本社批准的图纸和文件。工厂应予以配合。

Within the validity of the approval certificate, the surveyor to the Society may pay unannounced audit to the manufacturing process of the product in order to confirm whether it is in compliance with the drawings and documents approved by the Society. The factory should provide an active cooperation and necessary for the surveyor.

5. 如果属于获得型式认可B 模式证书, 且无需颁发船用产品证书/等效证明文件的情况, 证书获得者应接受本社每年一次的定期审核, 定期审核日为认可证书期满之日对应的每一周年日, 检查工作应在周年日的前后三个月内进行。

If belong to the situation of the product has type approval mode B certificate, and marine product certificate/equivalent document is not necessary, those who have obtained the certificate should be subject to periodical audit every year. The date of periodical audit shall be each anniversary date which corresponds to the date of expiry of the relevant certificate and the periodical audit shall be done within a time span of three months before and after the annual surveillance date.

备注/Remarks

1. K-Gauge GAS/TOP/CTS System consists of:

1) GLA-310/5 Radar Tank Gauge (RTG)

Meas. range: 0~55m

Frequency: X-band(10GHz)

Material: AISI 316L and PTFE/PEEK

Degree of protection: IP66/67

Ex-Proof Grade: II 1 G Ex ia IIC T4 Ga Ta = -45°C to +85°C Ta = -45°C to +80°C (when fitted with the GLH-320) (Ex-Certificate No.: Sira 14ATEX 2056X, Issuing Body: Sira Certification Service, Standards for Ex-Proof : 2014/34/EU, EN 60079-0:2012, EN 60079-11:2012)

2) GC-306 Cargo Temperature Unit (CTU)

Output signal: HART

Meas. range: -200°C~50°C

Number of sensors: Max.6 temperature sensors

Material: Polystyrene plastic

Ambient temperature: -45°C~85°C

Degree of protection: IP20

Ex-Proof Grade: II 1 G Ex ia IIC T4 Ga Ta = -45°C to +85°C (Ex-Certificate No.: Sira 14ATEX 2054X, Issuing Body: Sira Certification Service, Standards for Ex-Proof : 2014/34/EU, EN 60079-0:2012, EN60079-11:2012, EN 60079-26:2006)

3) GLK-300 Signal Processing Unit (SPU)

Power supply: 24 VDC (18~32V)

Power consumption: 8 W typical

Communication: Dual Ethernet

Input/Output: 1 radar input, 1 HART input

Ex-Proof Grade: II (1) G [Ex ia Ga] IIB/IIC Ta: -15°C to +70°C (Ex-Certificate No.: Presafe 14ATEX5412X, Issuing Body: DNV GL Nemko Presafe AS, Standards for Ex-Proof : 2014/34/EU, EN 60079-0:2012/A11:2013, EN 60079-11)

4) RMP420 Remote Multipurpose I/O

Power Supply: 24 VDC

Power consumption: 10 W Typical (dissipated)

I/O: 32 Channels, Multipurpose, AI/AO/DI/DO

5) RDIOR420 Remote Digital I/O and Relay

Power Supply: 24 VDC

Power consumption: 8 W Typical (dissipated)

I/O: total 32 Channels (16 DI/DO, 16 relay)

6)RCU502i Remote Controller Unit

Power Supply: 24 VDC

Power consumption: Max.20 W

Degree of protection: IP20

I/O: 4 x opto-isolated inputs, 4 x opto-isolated outputs Max. 30mA / 1 x opto-isolated watchdog (for external interface) Max. 30mA

Ex-Proof Grade: II 3 G Ex ec IIC T4 Gc -20°C ≤ Ta ≤ +55°C (Ex-Certificate No.: Presafe 18 ATEX 12094X, Issuing Body: DNV GL Presafe AS, Standards for Ex-Proof : 2014/34/EU, EN 60079-0:2012/A11:2013, EN 60079-7:2015)

7)RCU602 Remote Controller Unit

Power Supply: 24 VDC

Power consumption: Max.20 W

Degree of protection: IP20

I/O: 4 x opto-isolated inputs, 4 x opto-isolated outputs Max. 30mA / 1 x opto-isolated watchdog (for external interface) Max. 30mA

8). K-Gauge TOP Tank Overfill Protection System (optional)

9). GLA-310/5-FUEL Radar Tank Gauge For LNG Fuel Tank (optional)

10). GLA-310/5-NH3 Radar Tank Gauge For Liquefied Ammonia (NH3) (optional)

11). GLA-310/5 DUAL Radar Tank Gauge For Gas Carriers (optional)

12).GLA-310/5-LH2 Radar Tank Gauge for Liquified Hydrogen (optional)

13).K-Gauge GL-300 based multifunction system with dual radar (optional)

2. Software version information

K-Gauge GAS 600: 359018.12

K-Gauge GAS 700, K-Gauge CTS, K-Gauge TOPS:AIM Basis software release 8.5, 8.6, 8.7, 8.8 and 8.10.

3. Listing of the K-Gauge GAS 600 system components:

- Main cabinet
- Radar Tank Gauge (RTG)
- Cargo temperature unit (CTU)
- Signal processing unit
- Tank pressure transmitters
- Cargo temperature sensors
- Operation stations and panels
- Zener barriers
- Distributed Processing Units (DPU)
- Segment Controller Units (SCU)

4. Listing of the K-Gauge GAS 700, K-Gauge CTS and K-Gauge TOPS system components:

- Main cabinet
- Radar Tank Gauge (RTG)
- Cargo temperature unit (CTU)
- Signal processing unit
- Tank pressure transmitters
- Cargo temperature sensors
- Operation stations and panels
- Zener barriers
- Remote controller unit RCU502i, RCU602
- Remote I/O unit RMP420, RDIOR420
- Other units RSER200-4, RHUB200-5

5. The system mentioned in this certificate can be produced by following company:

Chinese Name: 康士伯企业管理(上海)有限公司

Chinese Address: 中国(上海)自由贸易试验区富特北路136号, 邮编: 200131

English Name: Kongsberg Maritime China Ltd.

English Address: No. 136 North Fute Road, China (Shanghai) Pilot Free Trade Zone, 200131, China

6. For each designed vessel, the drawings of the K-Gauge Cargo monitoring system should be submitted for approval to the Society Plan Approval Center.

7. The Ex-Proof parameters of the approved products originate from Ex-Certificate received from manufacturer, not approved by CCS. This Type Approval Certification will be invalid if the approved products do not hold valid Ex-Certificate.

8. 本社已审核了产品厂无石棉声明, 但本社的审核不免除产品厂按照合同关系向订货方保证产品无石棉的责任。The declaration of asbestos-free submitted by manufacturer has been reviewed by the Society. However, liability of the manufacturer to guarantee the products are asbestos-free to purchaser under contract will not be exempted.

9. 本证书由原型式认可证书 (No. BG20PTB00001_02) 换新并替代原证书。

This certificate is renewed from and supersedes the previous Type Approval Certificate No. BG20PTB00001_02.

中国船级社卑尔根办事处
CCS Bergen Office