中国船级社
CHINA CLASSIFICATION SOCIETY

证书编号/Certificate No.
BG26PTB00012

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(Horten)

地址/Address

Bekkajordet 8A, 3189 Horten, Norway

产品名称/Product

综合测量、监控报警及控制系统
Integrated Gauging,Monitoring & Alarm and Controlling System

附加标志/Notations

无/Nil.

认可标准/Approval Standard

1. 中国船级社《钢质海船入级规范》第4篇第2, 3章
Chapter 2 and 3, Part Four of China Classification Society Rules for Classification of Sea-going Steel Ships
2. 中国船级社《钢质海船入级规范》第7篇第2, 3章
Chapter 2,3 Part Seven of China Classification Society Rules for Classification of Sea-going Steel Ships
3. 中国船级社《钢质海船入级规范》第3篇第9章
Chapter 9 ,Part There of China Classification Society Rules for Classification of Sea-going Steel Ships
4. 中国船级社《散装运输液化气体船舶构造与设备规范》第3篇第16章, 18章
Part 3 Chapter 16 and 18 of China Classification Society Rules for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk
5. 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16, 18章
Chapter 16,18 of IMO "International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk
6. 国际海事组织 MSC.1/Circ.1621通函《使用甲醇/乙醇作为燃料的船舶安全临时导则》
IMO MSC.1/Circ. 1621. Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel
7. 中国船级社《船舶应用甲醇/乙醇燃料指南》2022
China Classification Society Guildelines for ships using Methanol/Ethanol fuel 2022
8. 中国船级社《船舶网络安全指南》2025
China Classification Society Guidlines for Ship Cyber Security,2025
9. IACS UR E27(Rev.1)

证书有效期至/This Certificate is valid until **2031年01月07日/ Jan. 07,2031**

发证机构 中国船级社鹿特丹办事处
Issued by CCS Rotterdam Office

签发日期 2026年06月20日
Date Jun. 20,2026

用于/Intended for

船舶/Ships

产品明细/Product Description

综合测量、监控报警及控制系统/Integrated Gauging,Monitoring & Alarm and Controlling System(M0001)

名称/Name	属性（值）/Value	单位/Unit
型号/Type	K-Chief and K-Safe	
系统组成/System Component	Refer to additional pages	
软件版本号/Software Version	AIM Basis Software Release 8.3, 8.5, 8.6, 8.7, 8.8, 8.10 ,8.12 and 8.13.	
网络安全等级/Cyber Security Class	SL0	

批准的图纸/Approved Drawings

图纸批准号/ Drawings Approval No.: BG18A00015,NP24PPP03918,NP24PPP04305,NP25PPP01342,NP25PPP04544，NP26PPP02835

产品认可试验报告/ Approval Test Report

试验报告编号/ Test Report No.： 110-0165159
试验报告日期/ Test Report Date： 2026-04-17
试验单位/ Laboratory: Kongsberg Maritime AS(Horten)
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： DANAK-194874
试验报告日期/ Test Report Date： 1999-12-21
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-197538
试验报告日期/ Test Report Date： 2004-07-06
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-198195
试验报告日期/ Test Report Date： 2005-12-19
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-198195 Rev.1
试验报告日期/ Test Report Date： 2007-06-15
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

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: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-1910054
试验报告日期/ Test Report Date： 2008-02-06
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-1910264
试验报告日期/ Test Report Date： 2008-09-01
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-1910025
试验报告日期/ Test Report Date： 2008-01-22
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-1910121
试验报告日期/ Test Report Date： 2008-03-27
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-1910281
试验报告日期/ Test Report Date： 2008-10-14
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-1910740
试验报告日期/ Test Report Date： 2009-12-18
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-1910541
试验报告日期/ Test Report Date： 2009-06-11
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-1911658
试验报告日期/ Test Report Date： 2011-12-08
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-1912904
试验报告日期/ Test Report Date： 2013-03-15
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： DANAK-1914440
试验报告日期/ Test Report Date： 2014-12-05
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： Nemko-E14127.00
试验报告日期/ Test Report Date： 2014-05-21
试验单位/ Laboratory: Nemko
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： SP-3P08182
试验报告日期/ Test Report Date： 2015-02-02
试验单位/ Laboratory: SP
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： DANAK-1916085
试验报告日期/ Test Report Date： 2016-02-15
试验单位/ Laboratory: DANAK
试验单位地址/ Test Address: Denmark

试验报告编号/ Test Report No.： Nemko-E13144.03
试验报告日期/ Test Report Date： 2017-08-17
试验单位/ Laboratory: Nemko
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： Nemko-E15165.01
试验报告日期/ Test Report Date： 2017-04-28
试验单位/ Laboratory: Nemko
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： Nemko-E18040.01
试验报告日期/ Test Report Date： 2019-07-04
试验单位/ Laboratory: Nemko
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： Nemko-E19179.01
试验报告日期/ Test Report Date： 2020-03-25
试验单位/ Laboratory: Nemko

试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： Nemko-E21088.03
试验报告日期/ Test Report Date： 2021-10-08
试验单位/ Laboratory: Nemko
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： REP006527C
试验报告日期/ Test Report Date： 2023-06-28
试验单位/ Laboratory: Nemko
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： Nemko-REP008558
试验报告日期/ Test Report Date： 2023-03-16
试验单位/ Laboratory: Nemko
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： 110-0066078
试验报告日期/ Test Report Date： 2024-05-22
试验单位/ Laboratory: Kongsberg Maritime AS
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： REP042855
试验报告日期/ Test Report Date： 2024-08-20
试验单位/ Laboratory: Nemko
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： Nemko-REP019643
试验报告日期/ Test Report Date： 2024-01-17
试验单位/ Laboratory: Nemko
试验单位地址/ Test Address: Norway

试验报告编号/ Test Report No.： I080351
试验报告日期/ Test Report Date： 2025-01-10
试验单位/ Laboratory: Kongsberg Maritime AS
试验单位地址/ Test Address: China

试验报告编号/ Test Report No.： i080597
试验报告日期/ Test Report Date： 2025-10-17
试验单位/ Laboratory: Kongsberg Maritime China Ltd
试验单位地址/ Test Address: Shanghai ,China

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.

备注/Remarks

1.本产品不支持直接与不可信网络连接，不支持无线访问，本系统硬件以及访问界面应设置在受控物理区域/This product does not supportdirect connection to untrusted networks and does not supportwireless access. all hardware devices and accessible interfacesin the CBS shall be installed in areas with physical accessrestrictions.

2.如实际产品交付时重大变化(含硬件及软件)应通知CCS，若变化明显影响本社相关要求时，可能需要进行型式试验，签发新的认可证书。/Major changes of the type approved system affecting futuredeliveries shall be informed to CCS. If the changes are consideredto affect functionality for which rule requirements apply, a newfunctional type test may be required, and the certificate may haveto be renewed to identify the new version.

3.工厂应确保产品的开发遵循安全开发生命周期中各阶段的网络安全要求，编制相应的程序和安全更新文件应持续有效，并符合本社《船舶网络安全指南》及 IACS UR E27 要求。/The manufacturer shall ensurethat the development of products meets the cyber securityrequirements at each stage of Secure Development Lifecycle, anddevelop corresponding procedures and security update documentsthat are continuously effective and comply with CCS "Guidelinesfor Ship Cyber Security" and IACS UR E27 requirements.

4. 工厂应确保产品的开发遵循安全开发生命周期中各阶段的网络安全要求，编制相应的程序和安全更新文件应持续有效，并符合本社《船舶网络安全指南》及IACS UR E27要求。/The manufacturer shall ensure that the development of products meets the cyber security requirements at each stage of Secure Development Lifecycle, and develop corresponding procedures and security update documents that are continuously effective and comply with CCS "Guidelines for Ship Cyber Security" and IACS UR E27 requirements

5. 结合具体项目申请本社检验时，以下文件应提交批准：CBS资产清单、网络系统拓扑图、配置核查报告/The following documentation of the specific base individual application is to be submitted for approval in each case:
- CBS asset inventory
- Topology diagrams
- Test report for configuration of security capabilities.

6.本证书由原型式认可证书（No. BG25PTB00019）变更并替代原证书。
This Certificate is modified from and supersedes the previous Type Approval Certificate No. BG25PTB00019.

7.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.

中国船级社卑尔根办事处
CCS Bergen Office

注：本证书含有附页，共4页
Note: The certificate is attached with additional 4 page(s)

1.Product Description

1.1 The function of the system

①K-Chief system performs the following functions:

-Alarm and Monitoring
-K-Gauge application and GLK SPU
-Power Management System
-Auxiliary generator controls
-Tank management
-Ballast/bunker monitoring and control
-Gas management
-Cargo monitoring and control
-Fully automated climate control
-Watch call system
-Operator fitness alarm system
-Methanol Fuel Supply System

②K-Safe system performs the following functions:

-Monitors and controls installations according to cause and effect charts
-Allows operator to safely monitor the situation and intervene with manual actions before pre-programmed actions will take place
-Supports multiple redundante configurations.
-Offers Safety Integrity Level (SIL) for an instrument safety functions defined in the standard IEC 61508

The K-Safe concept consists of number different safety modules (Safety Management & Control Systems, Emergency Shutdown System, Process Shutdown System and Fire & Gas Detection) which has been designed for various applications and types of installations. The modules can be supplied either as a stand alone or integrated systems and are based on the same hardware and software platforms.

1.2. Software for K-Chief and K-Safe

AIM Basis Software Release 8.3, 8.5, 8.6, 8.7, 8.8, 8.10 , 8.12 and 8.13

1.3. Hardware components which are specific for K-Chief and K-Safe systems are listed in this certificate. The approval for third party components is not included ,the delivery of those components should meet the requirements of CCS rules.

Components		Part No.
Operator Control Panels	COP-05 BU-AUT Panel	603529
	COP05 ALC Stand Alone	391890
	Tracker Ball Panel(TBP)	388930
	Panel ALC	603526
	Panel Input Mk3 COP 05	110-0049940
Earth Failure Indicator	EFI-16	321492
	EFI-16-2	110-0019139
Media Converter	RMC-ST	321520
Controller	RCU 502i	421768
	RCU 601	477601
	RCU 602	383962

Components		Part No.
IO Units	RMP420	306712
	RMP420S	319824
	RDIOR420	306713
	RDIO420S	316564
	RMP422i	408442
	RMP422Si	408406
	RMP201-8	324400
	RSER200-4	603444
	RHUB200-5	603442
Distributed Processing Units (DPU)	Remote Analog input Module - RAi-16xe	329714
	Remote Digital output Module - RDo-16xe	329699
	Remote Digital input Module - RDi-32xe	333523
	Remote Digital input Module - RDi-32Axe	333824
	Remote Analog output Module - RAo-08xe	333505
	Remote Digital I/O Module - RIO-C2xe	333346
	PSS Module	8100184
LAN to CAN Module	L2C	404654
Signal Processing Unit	GLK-300	GLK-300
Network component	RTL8153B-USB3.0/3.1/3.2 to 4x Gb Ethernet	446030
Extension Alarm and Watch Call Units	WCC 600	373860
Alarm Buzzer	ALB USB Panel	110-0051818

Components(The third party equipment)		Part No.
Network devices	Cisco Catalyst1000 Series	469125 110-0001617
	Moxa IKS-6700Series	110-0037724 382427
	Fortinet FGR-60F	110-0020955
	Fortinet FS-124F	110-0096228
	Moxa EDR-8010-2GSFP	110-0061800
	Moxa EDS-408A Seires	467615 450144 464916 110-0121107
	Moxa EDS-518E Seires	467617 467618
Display	Display 10" 16:10 XT MK1	469944
	Power adapter 10"/15"XT display	480653
	Display 15" FHD XT MK1	469945
	Display 22" FHD X MK1	469948
	Display 22" FHD XT MK1	472397
	Display MD24 16:9 MK3	421502

Components(The thrid party equipment)		Part No.
Display	Display 24" 16:9 Ex ET677	393213
	Display 24" FHD XE MK1	469971
	Display 24" FHD XTE MK1	472398
	Display 24" 16:9 Touch MD24	406103
	Display 24" 16:10 WUXGA E24i G4	476791
	Display 27" 16:9 FHD E27-G5	110-0042172
	Display 27" Full HD ECDIS KM05 MK4	444594
	Display 27" FHD XE MK2	110-0002528
	Display 27" FHD XTE MK2	110-0002529
	Display 32" UHD XE MK1	469973
	Display 32" UHD XTE MK1	472400
	Display 43" UHD XTE MK1	472401
	Display 55" UHD ECDIS GT MK1	425646
	Display 55" UHD XTE MK1	472402
Remote Operator Station (ROS) –Computer	MC340 i3 GPU(Based on Windows10)	110-0028204
	MC340 i7 GPU(Based on Windows10)	477554
	MC360 i3 LAN(Based on Windows10)	110-0016256
	MC360 i5 GPU(Based on Windows10)	110-0016258
	MC360 i7 LAN(Based on Windows10)	110-0016259
	MC380 u5 Basic(Based on Windows11)	110-0134515
	MC380 u5 LAN(Based on Windows11)	110-0119632
	MC380 u5 BasicExtra(Based on Windows11)	110-0148542
	MC380 u7 LAN(Based on Windows11)	110-0119633
	MC380 u7 LANExtra(Based on Windows11)	110-0119634
	MC380 Ultra u7 (Based on Windows11)	110-0119637
PMS IO	LSP 7.x (PPU 300)	110-0123841 110-0123817 110-0123850
	LBD	464830
Touch Control Panel	Panel PC 10" 16:10 MPS	493284
UPS	Standby power, 230V/24V	349827 349882 350225 350239 350247 364235 364237 450935
Stahl IS IO	Stahl IS IO modules	-
B&R Module	B&R X20 IO Module system	000108227 000110698
	B&R X20 BUS Module system	000108227
	B&R X20 Comm. Module system	000110698

2. For each designated vessel, the drawing of K-Chief and K-Safe should be submitted for approval to the CCS Plan Approval Center.

3.The hardware was tested and found in compliance with the requirements of IACS UR E10:2024(rev 10).

4.Manufacturing places include as below
(1) Kongsberg Maritime AS, Bekkajordet 8A, 3189 Horten, Norway
(2) Kongsberg Maritime Korea Ltd, 9-7, Sandan 3-ro, Jeonggwan-eup, Gijang-gun, Busan, 46027, Korea
(3) Kongsberg Maritime AS (Kongsberg) Kirkegardsveien 45, NO-3601 Kongsberg, Norway
(4) Kongsberg Maritime China Ltd., No. 136 North FuTe Road, China (Shanghai), Pilot Free Trade Zone, 200131 Shanghai, China
(5) Kongsberg Maritime AS(Trondheim), Skonnertvegen 1, N-7053 Ranheim, Norway
Blank bellowing.