



CERTIFICATE NUMBER  
EFFECTIVE DATE  
EXPIRY DATE  
ABS TECHNICAL OFFICE

19-LD1896003-PDA-DUP  
02-Oct-2019  
01-Oct-2024  
London Engineering Department

## CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

### **KONGSBERG MARITIME CHINA LTD.**

located at

NO. 6 BUILDING, 555 CHUANQIAO ROAD, , JINQIAO EXPORT AND  
PROCESSING ZONE, PUDONG DISTRICT, SHANGHAI, China,  
201206

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

**Product ACC, Electronic Ship Automation Equipment**

**Model C 20 (AC C20 & AC 600, K-Chief 500, K-Chief 600, BWU and BWMS-C20)**

American Bureau Of Shipping

Theodoros Chatzidakidas, Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

**KONGSBERG MARITIME CHINA LTD.**  
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**Tier: 5 - Unit Certification Required** TC

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**Product:** ACC, Electronic Ship Automation Equipment  
**Model:** C 20 (AC C20 & AC 600, K-Chief 500, K-Chief 600, BWU and BWMS-C20)  
**Intended Service:**

For use on ABS Classed Vessels and Offshore Facilities in accordance with the listed ABS Rules and International Standards.

**Description:**

AC C20 & AC 600 (propulsion control system), K-Thrust 600, K-Steering 600, K-Chief 500 and K-Chief 600 (alarm, monitoring and control system inclusive generator power management system) for AMS, ACC, ACCU and ABCU Classed Vessels and BWMS-C20 ( Bridge Navigational Watch Alarm System ) for NIBS and NBLES Classed Vessels.

It includes L2C (LAN to 2 CAN gateway), PB4 (Push Button 4), TMI (Torque Motor Interface), RFU MKII (Rudder feedback unit) and PB4, a push button panel including four switches with back-light and four LEDs. It is intended for use in K-Thrust 600, K-Steering 600 and AutoChief.

The purpose of the Common Thruster levers are both individual and common control of the thruster/propulsion/rudder units.

There are four main types of levers e.g. Azimuth, Single, Dual and Mini Wheel that each can be delivered with- or without integrated display. All levers have a main controller and a backup controller.

Additionally, they are equipped with electric shaft motors, buzzer, emergency stop- and backup activation buttons.

Additional information with detailed list of assemblies and sub-assemblies is provided on an additional information sheet.

**Rating:**

Supply voltage: 18 -32 V DC from a 230 VAC UPS; Operational temperature: -15 to +70 C degrees.  
Maximum relative humidity: 96% non-condensing; Ambient storage temperature: -25 to +70 C degrees in a dry area with approx. 70% humidity; DPU Degree of protection: IP 20 or IP 54 with extra encapsulation.  
DPUs are qualified for non-resilient mounting on machinery.

Pushbutton 4 (PB4): Supply voltage: 18-24 VDC, Power consumption: 1W, Operating temperature: -15°C to 70°C degrees., IP56 (Front)

L2C (LAN to 2 CAN gateway): Supply voltage:18 - 32 VDC, Power: 2.4 W Max, Operating temperature: -15°C to +70°C degrees., Ingress protection: IP22.

TMI (Torque Motor Interface): Supply voltage: 18-24 VDC, Power: Nom 10W, Max 40W, Operating temperature: -15 to + 70 C degrees Max, Ingress protection: IP20.

RFU MKII (Rudder feedback unit): Supply voltage: 4x 24VDC, Signal outputs: 4x 4-20mA, 4x on-off, Temperature range: -15°C to +70 C degrees. Ingress protection: IP55.

**Service Restriction:**

Unit Certification as detailed in 4-9-8/13.3 of the ABS Rules for Building and Classing Marine Vessels 2019 is required for this product if it is incorporated in a Category II or Category III system as detailed in 4-9-3/7.1 and 4-9-3/Table 1 of the ABS Rules for Building and Classing Marine Vessels 2019.

Unit Certification may be carried out during Factory Acceptance Test of the overall system.

**Comments:**

- Each configuration and external connection is to be specifically approved.  
- When incorporated in a system of Category I, II or III in accordance with 4-9-3/7.1 and 4-9-3/Table 1 of the ABS Rules for Building and Classing Marine Vessels 2019. The documentation detailed in 4-9-3/Table 2 of the ABS Rules for Building and Classing Marine Vessels 2019 is to be submitted to ABS or to be available for review by ABS as

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applicable.

- The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
- Unless specifically directed by the Administration, this approval is not to be construed as a substitute for Flag Administration's approval for SOLAS (Consolidated Edition 2014), as amended.

**Notes/Drawing/Documentation:**

Drawing No. 320663, FMEA K-Chief 500, Revision: D, Pages: -  
Drawing No. 344794, FMEA for K-Chief 600, Revision: C, Pages: -  
Drawing No. 386083, SW Revision History for C600, Revision: E, Pages: -  
Drawing No. 390547, FMEA AutoChief 600, Revision: A, Pages: -  
Drawing No. 394622, FMECA K-Steering 600, Revision: D, Pages: -  
Drawing No. 404047, FMECA K-Thrust 600, Revision: B, Pages: -  
Drawing No. 412948A, Common Thruster lever, Revision: A, Pages: -  
Drawing No. E16203.00, NEMKO Test Report for K-Thrust Modules, 29 March 2017, NEMKO Group, Revision: -, Pages: -  
Drawing No.2012-10-25 - updated and added items RAi-10tcxe, GPM C3GPxe, GCM C4xe, MSI-12, MSI-CL, NQB-101.  
Drawing No.2013-02 Revised to include AC 600 module and AC600 Lever Telegraph Unit (LTU11).  
Drawing No. DELTA Test Reports: DANAK-1911256, A507423, 1911279, 1912904, 1913963, 1914404, 1914440, DELTA Test Report 2014;  
Drawing No. NEMKO Test Reports E12103.01, E14127.00; Applica Test Report 2018; NEMKO Group, SP Technical Research Institute of Sweden Test Report 3P08182  
Drawing No.381827 Rev B Datasheet WCC 600 Watch Call Panels  
Drawing No.354760 Rev C Functional Description Standard K-Chief 600 Alarm & Monitoring system  
Drawing No.367938 Rev D AutoChief 600 LTU11 and LTU11-ME Lever Telegraph Unit Datasheet  
Drawing No.389143 Rev A KM 7" Marine Touch Panel PC Hardware Module Description  
Drawing No.389994B Touchpad Panel Datasheet  
Drawing No.390759A Touchpad Panel Product Description  
Drawing No.389995C Tracker Ball Panel Datasheet  
Drawing No.390760A Tracker Ball Panel Product Description  
Drawing No.398092A Datasheet RPM Pickup CAN  
Drawing No.358700 Rev D Software Quality Plan C600  
Drawing No.386083 Rev C Software Revision History for C600  
Drawing No. 19/15712, Test for Marine Type Approval of TMI, 20 October 2015, DELTA, Revision: -, Pages: 1  
Drawing No. 19/15815, Test for Marine Type Approval of RFU mk2, 5 November 2015, DELTA, Revision: -, Pages: 1  
Drawing No. 19/16085, Test for Marine Type Approval of L2C, 21 January 2016, DELTA, Revision: -, Pages: 1  
Drawing No. 398682, TMI module Torque Motor Interface, Revision: B, Pages: 1  
Drawing No. 404663, L2C LAN to CAN converter, Revision: A, Pages: 1  
Drawing No. 406806, Rudder Feedback Unit mk2, Revision: -, Pages: 1  
Drawing No. 409453/A, L2C LAN to CAN Gateway, Revision: -, Pages: 1  
Drawing No. 409590A, Torque Motor Interface, Revision: -, Pages: 1  
Drawing No. 409612, Rudder Feedback Unit mk2, Revision: A, Pages: 1  
Drawing No. NA1224 PB4 Standard Module drawing , Revision: B, Pages: 1  
Drawing No. 1915862 - Kongsberg Maritime AS - PB4, DELTA TEST REPORT, Revision: 0, Pages: 1  
Drawing No. 405886A\_PB4, PUSH BUTTON 4, Revision: 0, Pages: 1  
Drawing No. 406171A - PB4, PRODUCT DESCRIPTION PB4 PUSH BUTTON 4, Revision: 0, Pages: 1  
Drawing No. OS2207220, Certificate of Manufacturing Assessment, Revision: -, Pages: 1  
Drawing No. 394651D FDD K-Steering 600

**Terms of Validity:**

NA.

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## **STANDARDS**

### **ABS Rules:**

- Marine Vessels Rules (2019): 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-9-2/7, 4-9-2/9.1, 4-9-2/9.5, 4-9-2/13, 4-9-3/9, 4-9-3/11.9, 4-9-8/7, 13.1, 4-9-8/Table 1
- Steel Vessels for Service on Rivers and Intracoastal Waterways Rules (2019): 1-1-4/7.7, 1-1-A2, 1-1-A3
- Steel Barge Rules (2019): 1-1-4/7.9, 1-1-A3, 1-1-A4
- High Speed Crafts Rules (2019): 1-1-4/11.9, 1-1-A2, 1-1-A3, 4-7-1/5, 4-7-1/9.7, 4-7-1/9.9, 4-7-9 Table 9
- Facilities on Offshore Installations Rules (2019): 1-1-4/9.7, 1-1-A2, 1-1-A3
- Mobile Offshore Units Rules (2019): 1-1-4/9.7, 1-1-A2, 1-1-A3

### **National:**

NA

### **International:**

IACS UR E10 Rev 5:2006,  
IACS UR E22 Rev 2:2016 (CAT II and III)

### **BWMS-C20 Unit:**

IEC 60945 Ed 4:2002  
SOLAS Reg. V/17  
IMO MSC 128(75)  
IACS UI SC 194:Sep 2005

Pushbutton 4 (PB4), L2C (LAN to 2 CAN gateway), Torque Motor Interface (TMI) and RFU MKII (Rudder feedback unit):

IACS E10: Rev. 6, Oct 2014,  
IEC 60945 Ed 4:2002 corrigendum 1, 2008,  
IEC 60533 Ed 3:2015

### **Government:**

NA

### **EUMED:**

NA

TC

### **OTHERS:**

NA