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	Bekkajordet 8a, Horten, 3194, Norway
Type	Control Systems
Description	Electronic Ship Automation Equipment and Propulsion-, Thruster- and Steering Control System
Trade Name	K-Chief 500 & 600; AutoChief C20 & C600; K-Thrust 600; K-Steering 600; Lever K-Thrust; Command Panel; WCC 600; K-Chief
Application	Marine applications in environmental categories ENV1, ENV2*, ENV3(*), ENV4** and ENV5*** as defined in LR Test Specification No. 1 (2021).
Specified Standard	Manufacturers Specification.
Additional Tests	refer to Appendix.
Other Conditions	The software development and quality assurance processes of Kongsberg are covered by the Software Conformity Assessment (SCA) Certificate. For programmable electronic systems implementing emergency stop or safety critical functions the requirements of Control Engineering Systems needs to be satisfied.

Martin Lange

Lead Specialist to Lloyd's Register EMEA
A member of the Lloyd's Register group

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TA01 1.0.0

Type Approval Certificate

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.

The Design Appraisal Document HTS/ETS 42006-22 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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Appendix

TYPE

Module	Description
SCU **	Segment Controller Unit
PSS **	Process Segment Star Controller
RAi-16xe **	Remote Analog Input 16Ch
RAo-8xe **	Remote Analog Output 16Ch
RDi-32xe **	Remote Digital Input 32Ch
RDo-16xe **	Remote digital Output 16Ch
C2xe **	Distributed Processing Unit
C3xe **	Distributed Processing Unit
C4xe **	Distributed Processing Unit
MSI-12 **	Distributed Processing Unit
MSI-CL **	Distributed Processing Unit
NQB101 **	Torque and Power Monitoring System for rotating shafts
RAi-10tcxe **	Remote Analog TC Input 10Ch
TBP (*)	Tracker Ball Panel
TPP (*)	Touch Pad Panel
Speed set dial unit ** (for AutoChief 600)	
PB4 (*)	NFU Control of Rudder or CPP or Pump start/stop
L2C (*)	LAN to CAN converter
Thruster Command Panel (*)	
Lever K-Thrust Display (*)	Azimuth with/without Display
	Single with/without Display
	Dual with/without Display
	Mini Wheel with/without Display
CP12 (*)	Control Panel PC 12" with touch Display
WCC 600 (*)	Watch Call Panel
ABE11/KBE11 **	Button extension strip
MEI **	Main Engine Interface Unit
ESU **	Engine Safety Unit
ESU-12 **	Engine Safety Unit
LTU11 / LTU11ME (*)	Lever Telegraph Unit
LTU (*)	Lever Telegraph Unit
DGU **	Digital Governor Unit
RPMU **	RPM Unit
RPME **	RPM Unit
PTB **	Push Button Telegraph
MPP **	Multi Purpose Panel
MPD **	Multi Purpose Display

Module	Description
ESS (*)	Electric Shaft System
INP (*)	Input Panel
CRP (*)	Control Room Panel
ALC (*)	Alarm and Command Panel
PSO /-P /-S (*)	Power Switch Over Unit
DSU 38 *	Digital Servo Unit
ELACT 3812 (*) **	Actuator
ELACT 0516 (*) **	Actuator
BWU21 ***	Bridge Wing Unit

Module	Description
” MTP (*)	7” Marine Touch Panel PC (Intel Atom N2800, Dual Core 1.86GHz)
8” AIPC *	8” Panel PC (Intel Atom N450 1.6GHz CPU)
8” TCP *	8” Control Panel with multi touch functionality
13.3” AIPC *	13.3” Panel PC with multi touch functionality (Intel Atom N450 1.6GHz CPU)
13.3” TCP *	13.3” Control Panel with multi touch function
13.3” IPC *	13.3” Panel PC with multi touch function (Intel Dual Core 2.26GHz CPU)
Operating System: Windows Embedded 7P, Windows XP *Firmware Version: 121129R0V01* *Touch Firmware: 1.100*	

ADDITIONAL TESTS   Ingress Protection rating (IP)

MDS-8, BWU21	IP66
NBQ101, PB4 (with internal buzzer), CP12 (front)	IP56
WCC600, Speed Set Dial Unit, Thruster Command Panel, ABE/KBE11, CP12 with ABE/KBE11, DSU 38, ELACT 3812, ELACT 0516	IP44
MSI-12, MSI CL, RAi-10tcxe, C3xe, C4xe, ESU-12, 7” MTP, TBP, L2C	IP2X
LTU11 (ME), TPP, Lever K-Thrust, Lever K-Thrust Display	IP22
8” TCP/IAPC and 13.3” TCP/IAPC/IPC	IP20(back) IP66(front)

Low Temperature Test

SCU, RAi-16xe, RAo-8xe, RDi-32Axe, RDi-32xe RDo-16xe, C2xe, NQB101, MSI-12, MSI CL, RAi-10tcxe, C3xe, C4xe, ESU-12, WCC600, LTU11 /ME, TBP, 8” TCP/IAPC and 13.3” TCP/IAPC/IPC, 7” MTP, Speed Set Dial Unit, Lever K-Thrust, Lever, K-Thrust Display, CP12, ABE/KBE11, ESU, LTU, ESS, PSO-S	-15°C
TPP, L2C, Thruster Command Panel, DGU, RPMU, RPME, MEI, MPD, BWU21	-25°C

Compass Safe Distance

	Standard	Steering
LTU11	80cm	-
C2xe, LTU11 ME	60cm	-
TBP	50cm	-
ESU	45cm	
TPP	40cm	-
RAo-8xe, MPD	30cm	-
SCU, RDi-32Axe	25cm	-
ESU-12, MSI-12, NQB101	20cm	-
RAi-16xe, RDi-32xe, RDo-16xe, C3xe, C4xe, MSI CL, L2C, PBT, MPP, DGU, RPMU, RPME, PSO-P, PSO-S	10cm	-
RAi-10tcxe, ABE/KBE11	5cm	-
BWU21	60cm	40cm
7" MTP	55cm	40cm
8" AIPC / TCP	45cm	25cm
13.3" AIPC/TCP	45cm	30cm
13.3" IPC	65cm	42cm
WCC600	45cm	27cm
MDS-8	35cm	20cm
Speed Set Dial Unit (Autochief 600)	80cm	50cm
PB4	20cm	10cm
CP12	75cm	50cm
Lever K-Thrust Single or Dual with Display	20cm	10cm
without Display	130cm	90cm
Mini Wheel K-Thrust with Display	100cm	60cm
without Display	100cm	60cm
Lever K-Thrust Azimuth with Display	100cm	60cm
without Display	100cm	60cm
Lever K-Thrust Display	110cm	80cm
Thruster Command Panel	120cm	70cm

Software Versions: WCC600   AutoChief 600 / K-Chief 600

Application: V1.00.01   *Release : V12.16*

BSP: V2.24   *OS software: V1.16.xx*

                                        DPU software: V8.16.xx

<u>Specific for K-Chief:</u>

The K-Chief Hardware components which are common for the C600 platform are listed in the current Type Approval Certificate.

Hardware components which are specific for the K-Chief are listed in Type Approval Certificate no. **18-20018-02** for K-Chief, K-Safe and K-Chief 700.

PLACES OF PRODUCTION

Kongsberg Maritime Korea Ltd.	W. Gessmann GmbH	Kongsberg Maritime China Ltd.
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