TYPE APPROVAL CERTIFICATE

Certificate no.:
TAA00003DA
Revision No:
2

This is to certify:

that the Hardware Platform for the Remote Control System, Propulsion, Thruster and Steering

with type designation(s)
K-Thrust 720

issued to
Kongsberg Maritime AS
Kongsberg, **Norway**

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Location classes are listed in the certificate.

Issued at **Høvik** on **2026-10-06**

This Certificate is valid until **2031-04-03**.
DNV local unit: **Sandefjord**

Approval Engineer: **Sonali Marathe**

for **DNV**
This document has been digitally signed and will therefore not have handwritten signature

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

Product description

This Type Approval covers hardware components for the Kongsberg Maritime K-Thrust 720 systems, comprising the modules listed below.

K-Thrust 720 RCS system is a flexible and scalable thruster remote control system that can be tailored to suit a variety of different vessel requirements with regards to system segregation and redundancy. Each propulsion unit, steering gear or thruster has its own separate remote control sub system. A complete remote control system (RCS) for a propulsion plant consists of several parallel RCS'. Common functions for command transfer and control mode selection at each control position synchronise the parallel sub systems.

Location classes in the table below are denoted in the following sequence:

Temperature / Humidity / Vibration / EMC / Enclosure class

Where temperature is denoted as "*", then the module is tested to low temperature -15°C.
Where enclosure class is denoted as "**", required enclosure protection according to the rules to be provided upon installation onboard.

Products without a DNV Type Approval certificate are indicated by "#" in the "DNV reference" column, are subject to periodical assessment. Additional information regarding the products and/or manufacturers is provided in Document 110-0172125 and is to be used as a reference during the audit.

Products with a DNV Type Approval certificate will be audited under their respective certificates.

K-Thrust 720 Hardware:

Module type	Product Description	KM Item ID	Location Classes	Compass Safe Distance	DNV reference
Telegraph	Push Button Telegraph - PBT	8100278 8100318	C/B/B/B/**		TAA0000017
Lever	Azimuth Lever with display	405846	B*/B/A/B/A	1000 mm	TAA0000017
	Azimuth Lever	416533	B*/B/A/B/A	1000 mm	TAA0000017
	Single Lever with display	405842	B*/B/A/B/A	1300 mm	TAA0000017
	Single Lever	416531	B*/B/A/B/A	200 mm	TAA0000017
	Dual Lever with display	405844	B*/B/A/B/A	1300 mm	TAA0000017
	Dual Lever	416532	B*/B/A/B/A	200 mm	TAA0000017
	Lever display	416534	B*/B/A/B/A	1100 mm	TAA0000017
	Lever display - IP56	110-0122634	D/B/A/B/A	1100 mm	# DNV ID 41, 59, 79
	Lever telegraph unit – LTU11	364330	D/B/B/B/**	800 mm	TAA0000017
	Lever telegraph and speedset unit – LTU11ME	389505	B/B/A/B/**	600 mm	TAA0000017
Lever (G2 & G3)	Main propulsion, single, fwd	000114574	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion, single, aft	000122040	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion, double, fwd	000114575	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion, double, aft	000114576	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion, single, fwd, motorized	000122041	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion, single, aft, motorized	000122042	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion, double, fwd, motorized	000122043	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion, double, aft, motorized	000122044	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion, single pitch/RPM, ECR	RRM000353541	B/B/A/B/A	300 mm	# TAA00002DT

Module type	Product Description	KM Item ID	Location Classes	Compass Safe Distance	DNV reference
	Main propulsion, single pitch/RPM, ECR, motorized	RRM000357317	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion, single pitch/RPM, fwd, motorized	RRM000480571	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion, single pitch/RPM, aft, motorized	RRM000480573	B/B/A/B/A	300 mm	# TAA00002DT
	Tunnel thruster, double	000104154	B/B/A/B/A	300 mm	# TAA00002DT
	Tunnel thruster, double, motorized	000104155	B/B/A/B/A	300 mm	# TAA00002DT
	Tunnel thruster, single	000104156	B/B/A/B/A	300 mm	# TAA00002DT
	Tunnel thruster, single, motorized	000104157	B/B/A/B/A	300 mm	# TAA00002DT
	Rudder Tiller (50- 0- 50)	000104162	B/B/A/B/A	300 mm	# TAA00002DT
	Rudder Tiller (70- 0- 70)	000112159	B/B/A/B/A	300 mm	# TAA00002DT
	Helmsman Lever (50- 0- 50)	000110624	B/B/A/B/A	300 mm	# TAA00002DT
	Rudder Tiller (45- 0- 45), with lever, no buttons	RRM000460995	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth CP, aft	000104146	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth CP, fwd	000104147	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth CP, motorized, aft	000104148	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth CP, motorized, fwd	000104149	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth CP, motorized, fwd, without scale numbering	000125251	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth FP, aft	000104150	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth FP, fwd	000104151	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth FP, motorized, aft	000104152	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth FP, motorized, fwd	000104153	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth FP, scale 0-10-0-10	RRM000377686	B/B/A/B/A	300 mm	# TAA00002DT
	Azimuth FP, motorized, scale 0-10-0-10	RRM000377687	B/B/A/B/A	300 mm	# TAA00002DT
	Main propulsion single, G3	RRM000385830	B/B/A/B/A	100 mm	# TAA00002DT
	Main propulsion double, G3	RRM000385831	B/B/A/B/A	100 mm	# TAA00002DT
	Tunnel thruster single, G3	RRM000385832	B/B/A/B/A	100 mm	# TAA00002DT
	Tunnel thruster double, G3	RRM000385833	B/B/A/B/A	100 mm	# TAA00002DT
	Azimuth, G3	RRM000385835	B/B/A/B/A	100 mm	# TAA00002DT
	Azimuth, limited +/-60 degrees	RRM000385836	B/B/A/B/A	100 mm	# TAA00002DT
Levers AQP	XD,AZM,CP,Dual out.M	110-0153617	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,FP1,Single out.M	110-0153622	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,FP3,Single out.DET5	110-0153625	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,CP,Dual out.	110-0153614	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,FP2,Dual out.M	110-0153624	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,FP1,Dual out.	110-0153619	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,FP1,mA	110-0153628	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8

Module type	Product Description	KM Item ID	Location Classes	Compass Safe Distance	DNV reference
	XD,AZM,FP1,Single out.	110-0153613	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,CP,Single out.M	110-0153616	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,FP1,Dual out.M	110-0153621	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,CP,mA, Single out.	110-0153627	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,CP,Single out.	110-0153618	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,FP2,Dual out.	110-0153615		Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,FP2,Single out.	110-0153620	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,FP2,Single out.M	110-0153623	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
	XD,AZM,FP2,mA	110-0153629	D/B/A/B/A	Standard: 550 mm Steering: 350 mm	TAA00003R8
Mini Wheel	Mini Wheel with display	412364	B*/B/A/B/A	1000 mm	TAA0000017
	Mini Wheel	417835	B*/B/A/B/A	1000 mm	TAA0000017
Operator Computer	PANEL COMPUTER 10.4"	RRM000603363 RRM000483816	D/B/A/B/A	1000 mm	TAA00001UU
	12 INCH PANEL COMPUTER	000124787	B*/B/A/B/A	650 mm	TAA00000EY
	8 inch panel computer	000123971	B*/B/A/B/A	700 mm	TAA00000EY
	MC340	477549 477550 477553 477554 110-0028204	D/B/A/B/A	1500 mm	TAA00002ZN
	MC360 Computer [ThinkStation P360 Tiny]	110-0016255 110-0016256 110-0016257 110-0016258 110-0016259 110-0016260 110-0024558	D/B/A/B/A	Standard: 750 mm Steering: 550 mm	TAA000038U
	MC380 Computer [ThinkStation P3 Tiny Gen2 & P3 Ultra SFF Gen2]	<u>P3 Tiny Gen 2:</u> 110-0134515 U5 Basic 110-0119632 U5 LAN 110-0148542 U5 Basic Extra 110-0119633 U7 LAN 110-0119634 U7 LAN Extra <u>P3 Ultra SFF Gen 2:</u> 110-0119637 U7 LAN Ultra	D/B/A/B/A	500 mm	TAA00003SE
Operator panels	K-Master Alarm Panel	346999	B*/B/A/B/**		TAA000004C
	K-Master I/O controller	344382	B*/B/A/B/**		TAA000004C
	K-Master Touch Control Panel	469945	B*/B/A/B/A,B	Standard:1100 mm	TAA000030Z

Module type	Product Description	KM Item ID	Location Classes	Compass Safe Distance	DNV reference
	- 15" FHD XT MK1 ISIC Id 09315-001			Steering: 700 mm	
	Direct Wiring Panel	345857	B*/B/A/B/**	50 mm	# DNV No. 18, 20, 22, 79
	Direct Wiring IO Controller	345847	B*/B/A/B/**	100 mm	# DNV No. 18, 20, 22, 79
	Thruster Command Panel	406412	D/B/A/B/A	1200 mm	TAA000004C
	Thruster Command Panel - IP56	110-0122573	D/B/A/B/A	Standard: 1200 mm Steering: 700 mm	# DNV No. 41, 58, 79
	Multi Purpose Panel - MPP	8100290	C/B/B/B/**		TAA0000017
	Push Button 4 (PB4)	400992 RRM000477379	D/B/B/B/B	200 mm	TAA0000017
	Push Button 4 (PB4) Momentary	110-0033305	D/B/B/B/B	200 mm	# DNV No. 27, 79 + TAA0000017
	Push Button 6 - PB6 USB	110-0060620	B*/B/A/B/A	Standard: 400 mm Steering: 300 mm	TAA0000017
	COP05 ALC Stand Alone	391890	B*/B/A/B/A	Standard: 400 mm Steering: 250 mm	TAA00003E3
Controller	RCU601	477601	B/B/A/B/A	300 mm	TAA00003BA
	RCU602	383962	B*/B/A/B/A	300 mm	TAA00000W5
	RCU502i	421768	B*/B/A/B/A	300 mm	TAA00000W5
	RCU801	110-0060198	B*/B/A/B/A	Standard: 200 mm	# DNV ID 33, 48, 66, 79
CAN Distribution	CAN Switch - CS100	396502	B*/B/A/B/A	1000 mm	# DNV No. 19, 22, 23, 79
	CAN Switch Connector Module – CC100A	396504	B*/B/A/B/A	1000 mm	# DNV No. 19, 22, 24, 79
	CAN Switch Connector Module – CC100B	396633	B*/B/A/B/A	1000 mm	# DNV No. 19, 22, 24, 79
	LAN to CAN Gateway – L2C	404654	D/B/B/B/**	100 mm	# DNV No. 22, 25, 26, 79
IO unit	Remote Serial line interface module - RSER200-4	603444	B*/B/A/B/**	50 mm	TAA00000W5
	RBUS Hub Module - RHUB200-5	603442	B*/B/A/B/**	50 mm	TAA00000W5
	Remote Multi Purpose IO Module - RMP201-8	324400	B*/B/A/B/**	50 mm	TAA00000W5
	Remote Multi Purpose module series 420 - RMP420	306712	B*/B/A/B/**	50 mm	TAA00000W5
	Remote Digital I/O Relay series 420 - RDIOR420	306713	B*/B/A/B/**	50 mm	TAA00000W5
	Remote Multi Purpose IO Module - RMP830-32	110-0025568	B*/B/A/B/A	Standard: 200 mm Steering: 100 mm	# DNV ID 34, 54, 66, 79
	Remote Digital I/O Relay Module - RDIO830-64	110-0050940	B*/B/A/B/A	Standard: 300 mm Steering: 200 mm	# DNV ID 32, 51, 79
Terminal Carrier (Terminal Boards)	Dual CANopen interface TC-RCUMP830AC-32/4R	494168	B*/B/A/B/A	Standard: 300 mm Steering: 200 mm	# DNV No. 66, 73, 79
	Dual CANopen interface TC-RMP830ES-32/4R	110-0074678	B*/B/A/B/A	Standard: 500 mm Steering: 400 mm	# DNV No. 52, 63, 79
	Dual CANopen interface	494163	B*/B/A/B/A	Standard: 200 mm	# DNV No. 34,

Module type	Product Description	KM Item ID	Location Classes	Compass Safe Distance	DNV reference
	TC-RMP830-32			Steering: 100 mm	53, 79
	Dual CANopen interface TC-RDIO830-64/2S	494164	B*/B/A/B/A	Standard: 300 mm Steering: 200 mm	# DNV ID 32, 49, 79
	Dual CANopen interface TC-RDIO830-64/16R	494165	B*/B/A/B/A	Standard: 300 mm Steering: 200 mm	# DNV ID 32, 50, 79
IO Units (C600)	Main Engine Interface unit - MEI	8100276	B*/B/B/B/**		TAA0000017
	Remote input/output - C2xe	333346	B*/B/B/B/**	600 mm	TAA0000018
Other	Earth fail indicator, EFI-16-2	110-0019139	B/B/A/B/A	200 mm	TAA00000W5
Network devices	Moxa EDS-405A Series	455729	D/B/A/B/**	Standard: 500 mm Steering: 600 mm	TAA000006K
	Moxa EDS-408A Series EDS-408A-MM-SC EDS-408A-3M-SC	467615 450144 464916	D/B/A/B/**	600 mm	TAA000006N
	Moxa IKS-6728A series	382427	D/B/A/B/**	500 mm	TAA0000043
	Cisco C1000-24T-4X-L	110-0001617	D/B/A/B/A	2400 mm	TAA000035N
	Cisco C1000-24FP-4G-L	110-0009583 469123	D/B/A/B/A	2400 mm	TAA000035N
	Cisco C1000-24T-4G-L	469125	D/B/A/B/A	2400 mm	TAA000035N
	Cisco C1000-24P-4G-L	492517	D/B/A/B/A	2400 mm	TAA000035N
	Fortinet FGR-60F	110-0020955	D/B/A/B/A	450 mm	TAA000035M
	Fortinet HN FS-124F (1GB switch)	110-0096228	D/B/A/B/A	Standard: 700 mm Steering: 500 mm	TAA00003VA
	Moxa EDR-8010 series EDR-8010-2GSFP EDR-8010-VPN-2GSFP	110-0061800 110-0061801	D/B/A/B/**	Standard: 400 mm Steering: 300 mm	TAA00003B9
	Moxa EDR-9010 series EDR-G9010-VPN-2MGSF	110-0113920	D/B/A/B/A	Standard: 450 mm Steering: 350 mm	TAA000031W

Place of manufacture

Manufacturer listed herein apply solely to products without a DNV Type Approval. Please refer “Product description” section for details.

Kongsberg Maritime AS
Kirkegårdsveien 45/4, Carpus, 3616 Kongsberg, Norway

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Refer K-Thrust 720 certificate TAA000025R for further details.

Type Approval documentation

DNV No.	Document ID	Rev.	Description
18	334102	F	Direct Wiring Panel and IO Controller Hardware Module Description
19	E15157	02	Test Report CAN Distribution Unit (CDU) CS100/CC100A/CC100B/CR100
20	354809/DANAK-1910900	A	Test for Marine Type Approval of STG Panel and STG Panel Controller
22	487708	3	Nemko test report 1-6 GHz
23	396509	B	CS100 Hardware Module Description
24	396515	B	CC100A / CC100B Hardware Module Description
25	409453	C	L2C LAN to CAN Gateway (datasheet)
26	DANAK-19/16085	A	Test for Marine Type Approval of L2C
27	REP026850	A	Test report NEMKO PB4 (KM Item No: 110-0033305)
32	REP024007	C	Nemko report ENV & EMC - RDIO830-64, TC-RDIO830-64/2S, TC-RDIO830-64/16R
33	REP024012	C	Nemko report ENV & EMC - RCU801, TC-RCU801
34	REP006706	B	Nemko report - RMP830-32 and TC-RMP830-32
41	REP118887	A	Test Report Lever K-Thrust Display IP56, Thruster Command Panel IP56 (IP, Corrosion Test, Cold and Dry heat)
48	110-0141322	A	Datasheet RCU801
49	110-0143627	A	Datasheet TC-RDIO830-64/2S
50	110-0143634	B	Datasheet TC-RDIO830-64/16R
51	110-0147492	A	Datasheet RDIO830-64
52	REP090983	A	Nemko report ENV & EMC - TC-RMP830ES-32/4R
53	110-0141318	A	Datasheet TC-RMP830-32 (494163)
54	110-0141321	A	Datasheet RMP830-32
58	110-0144834	A	Hardware Module Description - Thruster Command Panel IP56
59	110-0145394	A	Hardware Module Description - Thrust Lever Display IP56
61	REP090983	A	Nemko report TC-RMP830ES-32/4R (with RMP830-32)
63	110-0141314	B	Datasheet TC-RMP830ES-32/4R
66	REP024011	C	Nemko report RCU801, RMP830-32, TC-RCUMP830AC-32/4R
73	110-0141313	B	Datasheet TC-RCUMP830AC-32/4R
79	REP173172	B	Nemko Report Radiated emission IACS E10 Rev.10

Document 110-0172125 Rev.B - Manoeuvring Control TA Additional HW assets dated 2026-09-30

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.
For the bridge mounted components the ‘Compass safe distance’ was measured according to section 11.2 of IEC 60945 4th edition (2002).

Marking of product

The products to be marked with:
- manufacturer name
- model name
- serial number
- power supply ratings

Periodical assessment

For details regarding assessment, please refer “Product description” section.

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer’s product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE