

## TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAA000004C**  
Revision No:  
**4**

**This is to certify:**

**That the**  
**Dynamic Positioning Control System**  
**Position Mooring Control System**  
**Independent Joystick Control System**

with type designation(s)  
**KONGSBERG K-Pos DP, K-Pos PM, K-Pos DPM, cJoy**

Issued to  
**KONGSBERG MARITIME AS**  
**Kongsberg, Norway**

is found to comply with  
**DNV GL 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 GL.**

**Location classes:**

<b>Temperature</b>	<b>B/A (Tested to -15°C)</b>
<b>Humidity</b>	<b>B</b>
<b>Vibration</b>	<b>A</b>
<b>EMC</b>	<b>B</b>
<b>Enclosure</b>	<b>Required protection according to the Rules to be provided upon installation on board</b>

Issued at **Høvik** on **2020-10-19**

for **DNV GL**

This Certificate is valid until **2022-10-18**.

DNV GL local station: **Sandefjord**

Approval Engineer: **Jens Erling Bråten**

.....  
**Jan Tore Grimsrud**  
**Head of Section**

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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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 300,000 USD.



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## Product description

The Type Approval is valid for the system type designation(s) as listed under the following groups:

### DYNAMIC POSITIONING CONTROL SYSTEMS

Software version: DP basis release 8.4, update 2 onwards  
K-Pos DP

### POSITION MOORING CONTROL SYSTEM

Software version: DP basis release 8.4, update 2 onwards  
K-Pos PM

### COMBINATION OF DYNAMIC POSITIONING AND POSITION MOORING

Software version: DP basis release 8.4, update 2 onwards  
K-Pos DPM

### INDEPENDENT JOYSTICK CONTROL SYSTEM

Software version: DP basis release 8.4, update 2 onwards  
cJoy

### ALTERNATIVE OPERATING STATION FOR DP AND/OR IJS

Software version: K-Master release 2.1, update 6 onwards  
Software version: DP basis release 8.4, update 2 onwards  
K-Master Work Station related to DP and/or IJS.

Additional Operating Stations/Terminals:

- cJoy DP-OT as part of K-Pos DP and K-Pos DPM.
- cWing as part of K-Pos (OS), cJoy OT (cJoy) and cJoy DP-OT.

### OPERATIONAL MODES AND SYSTEM FUNCTIONS

Software version: DP basis release 8.4, update 2 onwards

#### Modes:

Standby  
Joystick  
Auto Heading  
Auto Position  
Anchor Handling  
Position Mooring  
Auto Track (move up, low speed, high speed)  
Track Line  
Seismic Track  
Follow Target  
Dredge  
Modes related to Offshore Loading

#### Functions:

Thruster Allocation  
Power load monitoring and blackout prevention  
Integration with K-Power (Kongsberg integrated energy products) (from DP basis release 8.4)  
Alarm/Alert System  
Display System  
Chart Server Application  
Monitoring Functions  
Heavy Lift  
Pipelay  
DP Alert  
Drilling

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DP Online Consequence analysis  
DP Capability analysis  
Motion Prediction Analysis  
Econometer (from DP basis release 8.4)  
Position Mooring Consequence analysis

The available modes and system functions depend on the system type and configuration.

#### **HARDWARE:**

Main processing units:

- DPC Dynamic Positioning Controller with process unit(s).
- cC Compact Controller with process unit.

Operating Station/Terminal:

- K-Pos OS Operator Station for K-Pos DP/DPM/PM (including built-in versions).
  - K-Thrust OS Operator Station as part of Thruster Control (including built-in versions)
  - cJoy OT Operator Terminal for cJoy
  - cJoy DP-OT Remote DP Operator Terminal (Additional Operating Terminal)
  - cWing Remote Wing Terminal
  - K-Master Operating station for DP and/or Independent Joystick
- TCP Computer: NEO CE-HW-01 or MC330 i3 LAN or MP5810 Base Model
- Application server for DP: MC330 i3 LAN or MP5810 Base Model
- Main Display Server(s): MC330 i3 GPU incl. USB 3.1-4xGb Ethernet or MP5810 4-Display Model or MP5810 NAV RoLAN Model
- Network Units: Moxa EDS-316 or Moxa IKS-6728A-4GTXSFP-HV-HV-T \*)
- USB extender: Veinland USB Extender VL-66199-T/R
- Power Unit: Phoenix Contact Quint-PS/1AC/24DC/10
- Operator interface: Display 13.3" TCP, K-Master units (Heading Wheel, Joystick, Alarm Panel, Thruster Command Panel, I/O Controller), COP-05 Standalone Trackball
- Main display: Display 27" FHD ECDIS S MK4 or Display 27" FHD ECDIS KM05 MK4 or Display 27" FHD ECDIS G MK2 or Display 32" FHD ECDIS G MK1 or Display 55" UHD ECDIS G MK1
- Additional display (option): MD24 16:9 ECDIS Glass
- IJS PC/Display: Panel PC 7" 5:3 J1900

\*) Ethernet switch may be installed with modules and interfaces listed in type approval certificates TAA0000043 and TAA000006N

The full scope of hardware for K-Pos and cJoy is detailed in the K-Pos Hardware list, Doc. No. 448540/C. Note that this also includes hardware which is covered by separate Type Approvals. For details, refer to the Test Reports and Maintenance Manuals as listed under Type Approval documentation section. Important hardware requirements are given in Release Notes and Update Notes for DP Basis and K-Master Basis.

#### **Approval Conditions**

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- System block diagram
- Power supply arrangement (may be part of the System block diagram)

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- List of control and monitored points
- Test program for certification and for testing at sea trials
- Failure Mode and Effect Analysis (FMEA) for systems delivered to class notations, DPS(2), DPS(3), DPS(3-CB), DPS(3-CBT), DYNPOS(AUTR), DYNPOS(AUTRO), DYNPOS(AUTRO-CB), DYNPOS(AUTRO-CBT), DYNPOS(E), DYNPOS(ER) and POSMOOR(ATAR).
- Functional description of the Consequence Analysis facility. Required for systems which have applicable rule date of 2013-07-01 onwards, delivered to class notations DPS(2), DPS(3), DPS(3-CB), DPS(3-CBT), DYNPOS(AUTR), DYNPOS(AUTRO), DYNPOS(AUTRO-CB), DYNPOS(AUTRO-CBT), DYNPOS(E), DYNPOS(ER) and POSMOOR(ATAR).

The Type Approval covers hardware and software listed under Product description.

When the type approved software is revised (affecting all future deliveries) DNV GL is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have to be renewed to identify the new software version.

#### Product certificate

Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system according to an approved test program before the system is shipped to the yard. After the certification the clause for application software control will be put into force.

#### Clause for application software control

All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV GL for evaluation and approval. Major changes in the software are to be approved before being installed in the computer.

### **Application/Limitation**

Note for cWing (Remote Wing Terminal):

- Location class D for temperature and C for enclosure applies.

Note for printers:

- Location class B for EMC
- Tested for radiated/conducted emission only

### **Type Approval documentation**

- Type Approval Certificate: DNVGL TAA00002MD Rev.2, ThinkStation P330 Tiny
- Type Approval Certificate: DNVGL TAE00003WA, Enclosure for Electrical Equipment
- Type Approval Certificate: DNVGL TAA00002R1, Cisco 892FSP
- Type Approval Certificate: DNVGL TAA00002ME, Cisco 891-24X
- Type Approval Certificate: DNVGL TAA00002T9, Cisco Switch 2960-24TS-LL
- Type Approval Certificate: DNVGL TAA00002TB, Cisco Switch 2960-24TQ-LL
- Type Approval Certificate: DNVGL TAA00000M0 Rev.3, Veinland USB extender via CAT Type VL66199-T/R
- Type Approval Certificate: DNVGL TAA000021N Moxa Ethernet Switches
- Type Approval Certificate: DNVGL TAA000006K Rev.3 Moxa EtherDevice(TM) Switches
- Type Approval Certificate: DNVGL TAA000006T Rev.2, covering MOXA NPort 5232-T
- Type Approval Certificate: DNVGL TAA00000FC Rev.1 (DNVGL TA-Certificate for Computer NEO CE-HW-01)
- Type Approval Certificate: DNVGL TAE000014W, Quint-PS series
- Type Approval Certificate: DNVGL TAA00000H6, MP5810
- Type Approval Certificate: DNVGL TAA000006N Rev.2 (Type Approval Certificate for Ethernet Switches and Video Servers: EDS series, SPL series, SFP series, and VPort 351 series)
- Type Approval Certificate: DNVGL TAA00000BM Rev.4 (Trio-PS-26 Series)
- Type Approval Certificate: DNVGL TAA0000043 (MOXA IKS-6700A Series)

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- Mutual Recognition Type Approval Certificate: DNVGL MRA000002U (EU-RO-MR-TA-Certificate for Panel PC 7")
- Mutual Recognition Type Approval Certificate: DNVGL MRA000000H Rev.4 (EU-RO-MR-TA-Certificate for ISIC Monitors DuraMON 19 GLASS, DuraMON 24 GLASS, DuraMON 26 GLASS, DuraMON 27 GLASS, DuraMON 32 GLASS)
- Mutual Recognition Type Approval Certificate: DNVGL MRA000000R (EU-RO-MR-TA-Certificate for Computer NEO CE-HW-01)
- Mutual Recognition Type Approval Certificate: DNVGL MRA000000S Rev.2 (EU-RO-MR-TA-Certificate for Display MD24 16:9 MK3 and other ISIC Monitors)
- Mutual Recognition Type Approval Certificate: DNVGL MRA000001B (EU-RO-MR-TA-Certificate for DuraMON 55 GLASS)
- Mutual Recognition Type Approval Certificate: DNVGL MRA000002D (EU-RO-MR-TA-Certificate for Hatteland Technology AS Series E MMC Standard, Series E MMC Compact)
- Type Approval Assessment Report, renewal of TAA000004C Rev.3, DNV GL Sandefjord, dated 2020-10-13

Kongsberg Maritime TA-KPOS-2006: CDQM-0010 Rev.N2, including:

- Operator Manual: K-Pos DP, Kongsberg K-Pos DP Dynamic Positioning System. Doc. No. 436094/C (Rel.8.4.2)
- Operator Manual: K-Pos PM, Kongsberg K-Pos PM Position Mooring System. Doc. No. 436096/C (Rel.8.4.2)
- Operator Manual: K-Pos DPM, Kongsberg K-Pos DPM Dynamic Positioning and Position Mooring System. Doc. No. 436095/C (Rel.8.4.2)
- Operator Manual: Auto Track Mode, Kongsberg K-Pos. Doc. No. 436102/B (Rel.8.4.2)
- Operator Manual: Seismic Track Mode, Kongsberg K-Pos. Doc. No. 436104/A (Rel.8.4.0)
- Operator Manual: Follow Target Mode, Kongsberg K-Pos. Doc. No. 436103/D (Rel.8.4.2.3)
- Operator Manual: K-Pos Offshore Loading Application Operator Manual Doc. 436108/E (Rel.8.4.2.1)
- Operator Manual: Track Line Mode, Kongsberg K-Pos. Doc. No. 436106/A (Rel.8.4.0)
- Operator Manual: DP Analysis, Kongsberg K-Pos, (Rel.8.4.2) Doc. No. 436113/B
- Operator Manual: Backup DP System, Kongsberg K-Pos. Doc. No. 436111/B (Rel.8.4.1)
- Operator Manual: Alternative DP System, Kongsberg K-Pos. Doc. No. 436110/A (Rel.8.4.0)
- Operator Manual: Stand-alone Simulator, Kongsberg K-Pos. Doc. No. 436118/C (Rel.8.4.2)
- Operator Manual: Built-in Simulator, Kongsberg K-Pos. Doc. No. 436117/C (Rel.8.4.2)
- Operator Manual: cJoy DP-OT. Doc. No. 436098/B (Rel.8.4.1)
- Operator Manual: cJoy WT (cWing), Remote Wing Terminal. Doc. No. 436100/A (Rel.8.4.0)
- Operator Manual: cJoy OT, Joystick System. Doc. No. 436099/B (Rel.8.4.1)
- Operator Manual: cJoy, Seismic Track Mode. Doc. No. 436105/B (Rel.8.4.1)
- Operator Manual: K-Master Release 2.1.6 Doc. No. 427893/D
- Operator Manual: K-Thrust 720 Operator Manual Release 4.1 (intended for K-Master 2.1.2) Doc. No. 441551/A
- Hardware Module Description: Display 27" FHD ECDIS S MK4. Doc. No. 445067/B
- Hardware Module Description: Display 27" FHD ECDIS KM05 MK4. Doc. No. 445069/A
- Hardware Module Description: Display MD24 16:9 MK3 Doc. No. 421627/A
- Hardware Module Description: Display 27" FHD ECDIS G/GT MK2. Doc. No. 445079/A
- Hardware Module Description: Display 32" FHD ECDIS MK1. Doc. No. 404731/A
- Hardware Module Description: Display 55" UHD ECDIS MK1. Doc. No. 404720/A
- Hardware Module Description: K-Master Alarm Panel. Doc. No. 348019b
- Hardware Module Description: K-Master DP and IJS Joystick. Doc. No. 348031a
- Hardware Module Description: K-Master DP Joystick. Doc. No. 348032c
- Hardware Module Description: K-Master IJS Joystick. Doc. No. 358656a
- Hardware Module Description: Panel PC 7" 5:3 J1900. Doc. No. 405546/B
- Hardware Module Description: K-Master Heading Wheel. Doc. No. 348024a
- Hardware Module Description: K-Master I/O Controller. Doc. No. 348029C
- Hardware Module Description: Computer NEO CE-HW-01. Doc. No. 409277/B
- Hardware Module Description: K-Master Touch Control Panel 13.3" HD 13T21 KMD-DR1-CORx. Doc. No. 349793d

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- Hardware Module Description: Thruster Command Panel. Doc. No. 412460/B
- Hardware Module Description: USB Extender VL-66199-T/R. Doc. No. 391204a
- Hardware Module Description: RCU602. Doc. No. 408644/B
- Hardware Module Description: Moxa EtherDevice Switch EDS-316 Doc. No. 352676c
- Hardware Module Description: Moxa 5-Port Unmanaged Ethernet Switch EDS-205A Doc. No. 343879b
- Installation Manual: Patch panel 4/8 port, CAT 6a Doc. No. 441847c
- Hardware Module Description: Patch panel 19" 24 port, CAT 6a Doc. No. 441843a
- Hardware Module Description: Moxa IKS-6726A/6728A Series Doc. No. 439059a
- Hardware Module Description: Moxa Port Interface IM-6700A Series Doc. No. 439061b
- Hardware Module Description: Moxa SFP modules Doc. No. 440212a
- Hardware Module Description: Cisco 890 Series Integrated Service Routers (for K-IMS) Doc. No. 417159c
- Maintenance Manual: MC330 Computer [ThinkStation P330 Tiny] Doc. No. 450174b
- Maintenance Manual: K-Master Server Cabinet MK2 (using MC330) Doc. No. 462729/A
- Maintenance Manual: K-Master FWD Bridge Server Cabinet, Net A. Doc. No. 393278/C
- Maintenance Manual: K-Master FWD Bridge Server Cabinet, Net B. Doc. No. 396312/C
- Maintenance Manual: K-Master FWD Bridge Work Station MK2 Built-in. Doc. No. 423726/B+C
- Maintenance Manual: K-Master Pilot Chair. Doc. No. 387155c
- Maintenance Manual: K-Master Server Cabinet (600x1600x600). Doc. No. 359344i
- Maintenance Manual: K-Master Workstation MK2. Doc. No. 423725/A
- System Config Manual: KM, MC330 Doc. No. 459234/B
- Product Description Kongsberg K-Pos DP, Dynamic Positioning System. Doc. No. 301093b
- Product Description Kongsberg K-Pos DPM, Combined Dynamic Positioning and Position Mooring System. Doc. No. 301094b
- Product Description Kongsberg cJoy and cPos, Compact Joystick and DP Control Systems. Doc. No. 177332f
- Product Description Kongsberg K-Master Work Station Doc. No. 350434b
- Interface Manual: Kongsberg K-Pos. Doc. No. 300967f
- K-Pos Serial Lines, Interface Specification 300966d
- Test Report: Nemko E17254.00, EMC test KM18
- Test Report: Nemko Order No. 379788 (EMC; Canon LBP623Cdw)
- Test Report: Nemko Order No. 378649-3 (EMC; OKI ML1190 ECO)
- Test Report: Nemko Order No. 378649-1 (EMC; HP LaserJet Pro M254nw)
- Test Report: Nemko Order No. 378649-2 (EMC; OKI ML 280 ECO)
- Test Report: Nemko E19179.01, (EMC and environmental test for computer adapters EX-1330M, EX-1163HM, EX-1339HMVS)
- Test Report: Nemko E20096.02, IEC60945 and IACS E10 test report for USB-232-IND-HF and USB-422-IND-HF Computer adapters, KM Doc. No 464983/C.
- Test Report: TI3000-14-018241 Rev.- (cJoy OT MK3)
- Test Report: DNV Report No. 2005-3115 Rev.01. Compass safe distance
- Test Report: TI 310-04-0125 Rev.A (cWing and cJoy)
- Test Report: TI 3010-05-0121 Rev.- (Additional test cWing, cJoy, cPos)
- Test Report: NEMKO Order no. 32743 Rev.1, EN 60945 Corrosion Test (cWing)
- Test Report: NEMKO Order no. 41813 Rev 1.0 (Additional test cWing, cJoy, cPos)
- Test Report: TI 3010-05-0052 Rev.-, Test of KM-05 Operator Station – 650
- Test Report: DELTA DANAK-198637, Project no.: A504352-1 (IP22 KM-05)
- Test Report: DELTA DANAK-198575, Project no.: A504273-3 (KM-05 DL, MP7600, wire-isolators)
- Test Report: DELTA DANAK-198577, Project no.: A504327-2 (KM-05 DL, MP7600, rubber isolators)
- Test Report: DELTA DANAK-198195 Rev.1, Project no.: A503298-1, Rev.1 (COP-05)
- Test Report: DNV Report No. 2006-3293 Rev.01. Envir. Testing of Joystick Type KM-MOD
- Test Report: Joystick KC 06, Environmental, Thales Doc. Ident. 9501 029 033XX 001
- Test Report: NEMKO no. 69187 (IP22 test of COP-05 units: ALC, BU-NAV, Utility)
- Test Report: DNV Report No. 2006-3459 (IP22 test of COP-05 unit: Heading Wheel)
- Test Report: DNV Report No. 2006-3460 (IP22 test of COP-05 unit: Input Panel with Tracker Ball)
- Test Report: DELTA DANAK-1910979, Project no.: A506924-1 (COP-05 Input Panel)

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- Test Report: DELTA DANAK-198574, Project no.: A504273-2 (MP7600 on wire-isolators)
- Test Report: DELTA DANAK-198576, Project no.: A504327-1 (MP7600 on rubber isolators)
- Test Report: DELTA DANAK-198307 Rev.1, Project no.: A503711 (DPC-3 cabinet)
- Test Report: DELTA DANAK-198508, Project no.: A503547-1 (RIO)
- Test Report: TI 310-03-0319 Rev.A (FS120/NDU/NDU Mini) (Cabinet for cC-1)
- Test Report: DELTA DANAK-198632, Project no.: A503547-4 (CAN2DP)
- Test Report: NEMKO Order no. 140487 Rev 3 (cJoy / cWing)
- Test Report: NEMKO Order no. 265317 (EMC; Lexmark CS510de)
- Test Report: NEMKO Order no. 39760 Rev 1.0 (EMC; OKI ML280 ELITE)
- Test Report: DNV Report No. 2011-3416 Rev.01 (HD13T21 KMD-DR1-CORP)
- Test Report: K-Master FWD Bridge Fallback Modes and Effects. Doc. No. 391976b FTR
- Test Report: K-Pos HCS with K-Master Chair/Workstation. Doc. No. 391978b FTR
- Test Report: Nemko no. E11024.03 (K-Master Panel System)
- Test Report: Nemko no. E12059.00 (K-Master Bridge Chair)
- Test Report: TI 3000-14-015548 Rev.- (K-Master Pilot Chair). Doc. No. 391780a
- Test Report: TI 3000-14-016067 Rev.- (KMX Pedestall 300). Doc. No. 391796a
- Test Report: TI 3000-14-016343 Rev.- (KMX Medium-800 Console). Doc. No. 391795a
- Test Report: TI 3010-09-0221 Rev.- (Vibration test of K-Master Chair)
- Test Report: Nemko no. E15165.01 (RCU602 and RMC-ST). Doc. No. 383971/B
- Test Report: Nemko no. E16203.00 (Thruster Command Panel). Doc. No. E16203.00
- Test Report: KM, Presentation Testing, IEC 62288 (2014), DP Basis 8.3.0. Doc. No. 416661/A
- Test Report: KM, Presentation Testing, IEC 62288 (2014), K-Master 2.1.0. Doc. No. 416662/A
- Test Report: KM, BAM interface (SW, BAM interface support). Doc. No. 416664/A
- Test Report: KM, MOXA NPort 5232-T (related to IEC 61162-1). Doc. No. 416665/A
- Statement: Hatteland, 100984-1\_R18 for K-Master 13,3" and 8" TCP's Doc. No. 368641d
- Statement: KM, K-Master console test statement (KMX FWD Centre Console). Doc. No. 391778a
- Statement: KM, K-Master joystick test statement (K-Master 1 and 3 button joystick). Doc. No. 394658a
- Statement: KM, K-Master Pilot Chair test statement (K-Master Pilot Chairs). Doc. No. 391995b
- Statement: KM, K-Master Workstation, Vibration Test Statement. Doc. No. 368822b
- General Arrangement, DPC – 3 Cabinet, Doc. No. 302152b
- General Arrangement, DPC – 1/ 2 Cabinet, Doc. No. 302199b
- Functional Test Report, K-Pos Type Approval. Doc. No. 1012070b\_FTR
- Release Notes for DP Basis 8.4.0. Doc. No. 435576/A
- Patch Notes for DP Basis 8.4.0.1. Doc. No. 445877/A
- Update Notes for DP Basis 8.4.2. Doc. No. 451148/A
- Patch Notes for DP Basis 8.4.2.3. Doc. No. 466993/A
- Release Notes for K-Master Basis (2.1). Doc. No. 408744/A
- Update Notes for K-Master Basis (2.1.6). Doc. No. 460745/B
- K-Pos Hardware List 1001-N (Rev. C). Doc. No. 448540/C

Software: Update Notes for DP Basis 8.4.2 (listed above)  
Update Notes for K-Master Basis 2.1.6 (listed above)

Hardware: The full scope of hardware for K-Pos and cJoy is detailed in the K-Pos Hardware list (see above). Note that this also includes hardware which is covered by separate Type Approvals. For details, refer to the Test Reports and Maintenance Manuals as listed under Type Approval documentation section above. Important hardware requirements are given in Release Notes and Update Notes for DP Basis and K-Master Basis.

## Places of manufacture

- Kongsberg Maritime AS, Kongsberg, Norway
- Kongsberg Maritime AS, Horten, Norway
- Kongsberg Maritime AS, Sandefjord, Norway
- Kongsberg Maritime Inc., New Orleans, USA
- Kongsberg Maritime China Waigaoqiao Ltd., 2F/3F, No. 136 North Fute Road, China (Shanghai) Pilot Free Trade Zone, Shanghai, China



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- Kongsberg Maritime Korea Ltd., Busan, Korea
- Kongsberg Maritime Pte. Ltd., Singapore, Singapore

## Tests carried out

Applicable tests according to:

- Standard for Certification 2.4 (April 2006)
- Class Guideline DNVGL-CG-0339, Environmental test specification for electrical, electronic and programmable equipment and systems, edition November 2016.
- Class Guideline DNVGL-CG-0339, Environmental test specification for electrical, electronic and programmable equipment and systems, edition December 2019.

With the exception of the products mentioned below (\*), EMC in the range 2 GHz to 6 GHz according to DNVGL-CG-0339, December 2019 has not been documented. EMC up to 6 GHz must additionally be documented for installation on ships contracted for construction on or after 2022-01-01.

(\*) The following units have been tested up to 6GHz as relevant (printers are tested for radiated/conducted emission only, see "Application/Limitation"):

- Computer adaptors (intended for MC330)
- Printer Canon LBP623Cdw
- Printer OKI ML 1190 ECO
- Printer HP LaserJet Pro M254nw
- Printer OKI ML 280 ECO

## Periodical assessment

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 at renewal of this certificate.