DNV

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Dynamic Positioning 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 rules for classification – Ships, offshore units, and high speed and light craft
  DNV rules for classification – Ships Pt.6 Ch.5 Sec.21 Cyber security

Application :

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

This type approval covers security capabilities in accordance with DNV security profile 1 and IACS UR E27 Rev.1, subject to conditions stated in this certificate.

Location classes:

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

Issued at **Høvik** on **2024-07-04**

This Certificate is valid until **2026-07-03**.
DNV local unit: **Sandefjord**

Approval Engineer: **Qi Shen**

for **DNV**

This document has been digitally signed and will therefore not have handwritten signatures

Siri Tag
Head of Section

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 8.5, update 0 onwards
K-Pos DP

POSITION MOORING CONTROL SYSTEM
Software version: DP basis release 8.5, update 0 onwards
K-Pos PM

COMBINATION OF DYNAMIC POSITIONING AND POSITION MOORING
Software version: DP basis release 8.5, update 0 onwards
K-Pos DPM

INDEPENDENT JOYSTICK CONTROL SYSTEM
Software version: DP basis release 8.5, update 0 onwards
cJoy

ALTERNATIVE OPERATING STATION FOR DP AND/OR IJS
Software version: DP basis release 8.5, update 0 onwards

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 8.5, update 0 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
DP Online Consequence analysis
DP Capability analysis
Motion Prediction Analysis

Ecometer
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

The full scope of hardware for K-Pos and cJoy is specified in TA certificate TAA00003DB and detailed in asset inventory doc.no. 110-0062855. 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.

Approval Conditions

This type approval certificate confirms compliance with requirements as specified in the table below.

Product certificate
Each delivery of the type approved system is to be certified according to DNV Pt 4. Ch 9 Sec.1. Project-specific documentation shall be submitted for approval as per the table below and a certification test shall be performed at the manufacturer of the application system before the system is shipped to the yard.

Clause for application software control
All changes in software are to be recorded as long as the system is in use on board. Records of major changes are to be forwarded to DNV for evaluation and approval and shall be approved before implemented on board.

Major changes to the type approved system affecting future deliveries shall be informed to DNV. If the changes are considered 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 version. Minor changes are covered by this type approval.

This TA certificate covers:	For each delivery of the type approved system(s), the following documents shall be submitted:
Type approval of hardware components in accordance with: DNV-RU-SHIP Pt.4 Ch.9 Sec.5	– Reference to this Type Approval Certificate – Inventory/equipment list (F071/Z090), demonstrating consistency with asset inventory 110-0062855. – System topology (F030/I030), demonstrating system architecture and interfaces with other systems and equipment as per Topology diagram 110-0062856. – Power supply arrangement (I050), may be included in document I030.

Type approval of capabilities for control, monitoring, and alarm functions in accordance with: DNV-RU-SHIP Pt.4 Ch.9 DNV-RU-SHIP Pt.6 Ch.3 Sec.1 and Sec.2	– Functional description (I020). – List of control and monitored points (I110), including data transferred on communication links). – Test program for product certification (Z252). Type approved security capabilities are exempted from certification test. – Test program for testing at sea trials (Z253). Type approved security capabilities are exempted from certification test. – FMEA/Failure mode and effects analysis (Z071) 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)
Type approval of cyber security capabilities and system architecture in accordance with security profile 1 (SP1): DNV-RU-SHIP Pt.6 Ch.5 Sec.21	– Functional description of the Consequence Analysis facility (I020). 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) – Signed test report (F262) demonstrating configuration of security capabilities as per document 110-0066159.
Major changes in the delivered system compared with the type approved system requires submittal of additional documents as per applicable rules. For further description of document content, see DNV-CG-0550	

Application/Limitation

Note for cWing Mk3 Portable (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.

K-Pos may be integrated with other systems and equipment as per below:
- Kongsberg systems in the same security zone may connect directly to the K-Pos Process network A and B.
- Kongsberg systems in other security zones may connect to K-Pos Process network A and B via the K-Pos firewalls.
- Third party systems in the same or other security zones may connect to K-Pos via the K-Pos firewalls.
- Sensors and actuators may connect to K-Pos Fieldnet via the K-Pos firewalls, alternatively via hardwired signals or serial communication directly to the K-Pos controllers.

All the above connected systems and equipment shall be allocated to a security zone on board.

K-Pos may also be integrated with the below systems and equipment:
- Kongsberg Remote Services may connect to K-Pos firewall(s) as per type approval TAA00003F4.
- Kongsberg Information Management System (K-IMS) may connect to K-Pos firewall(s) as per type approval TAA00003F4 and TAA00003F5.
- Third party remote access or information management solutions may connect to K-Pos firewall(s).

All connected systems and equipment shall be described and illustrated in the System topology (F030/I030) and the integration is subject to testing on board in accordance with applicable requirements in DNV rules.

Type Approval documentation

Kongsberg Maritime type approval documents:
- HW platform type approval certificate TAA00003DB
- Operator Manual: K-Pos DP, Kongsberg K-Pos DP Dynamic Positioning System. Doc. No. 110-0066721/B (Rel.8.5)
- Operator Manual: K-Pos PM, Kongsberg K-Pos PM Position Mooring System. Doc. No. 110-0066743/B (Rel.8.5)
- Operator Manual: K-Pos DPM, Kongsberg K-Pos DPM Dynamic Positioning and Position Mooring System. Doc. No. 110-0066744/B (Rel.8.5)
- Operator Manual: Auto Track Mode, Kongsberg K-Pos. Doc. No. 110-0066727/A (Rel.8.5)
- Operator Manual: Seismic Track Mode, Kongsberg K-Pos. Doc. No. 110-0066729/A (Rel.8.5)
- Operator Manual: Follow Target Mode, Kongsberg K-Pos. Doc. No. 110-0066722/B (Rel.8.5)
- Operator Manual: K-Pos Offshore Loading Application Operator Manual Doc. 110-0066730/B (Rel.8.5)
- Operator Manual: K-Pos Drilling Application Operator Manual Doc. 110-0066731/A (Rel.8.5)
- Operator Manual: K-Pos Pipelaying Application Operator Manual Doc. 110-0066732/A (Rel.8.5)
- Operator Manual: K-Pos Autopilot Mode Operator Manual. 110-0066726/A (Rel.8.5)
- Operator Manual: Track Line Mode, Kongsberg K-Pos. Doc. No. 110-0066728/A (Rel.8.5)
- Operator Manual: DP Analysis, Kongsberg K-Pos, Doc. No. 110-0066738/A (Rel.8.5)
- Operator Manual: Backup DP System, Kongsberg K-Pos. Doc. No. 110-0066739/A (Rel.8.5)
- Operator Manual: Alternative DP System, Kongsberg K-Pos. Doc. No. 110-0066740/A (Rel.8.5)
- Operator Manual: K-Pos Heavy Lift Application Operator Manual Doc. 110-0066862/A (Rel.8.5)
- Operator Manual: Stand-alone Simulator, Kongsberg K-Pos. Doc. No. 110-0066794/A (Rel.8.5)
- Operator Manual: Built-in Simulator, Kongsberg K-Pos. Doc. No. 110-0066788/A (Rel.8.5)
- Operator Manual: cJoy DP-OT. Doc. No. 110-0066864/A (Rel.8.5)
- Operator Manual: cWing Mk3 Operator Manual. Doc. No. 110-0071432/A (Rel.8.5)
- Operator Manual: Independent Joystick System. Doc. No. 110-0066863/A (Rel.8.5)
- 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
- Interface Manual: Kongsberg K-Pos. Doc. No. 300967/H
- K-Pos Serial Lines, Interface Specification 300966/F
- 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
- Update Notes for DP basis 8.5.0. Doc. No. 110-0059786/B

Kongsberg Maritime Cyber security documents:
- Asset inventory. Doc. No. 110-0062855/D
- System topology. Doc. No. 110-0062856/D
- Description of security capabilities. Doc. No. 110-0062857/D
- Test procedure. Doc. No. 110-0062858/E
- Guideline for Secure Development Lifecycle processes. Doc. No. KM-GUI-0118/A
- KM Patch management. Doc. No. KM-GUI-6015/A
- Configuration management procedure. Doc. No. KM-PRO-0120/A
- Change management procedure. Doc. No. KM-PROC-0080/A
- Change management plan template. Doc. No. KM-TMPL-0218/A
- K-Pos DP Dynamic Positioning System Operator Manual Release 8.5. Doc.No. 110-0066721/B
- Cyber Security Configuration Procedure IACS SL1, Doc. No. 110-0066159/A

Software: Update Notes for DP Basis 8.5 (listed above)

Hardware: The full scope of hardware for K-Pos and cJoy is detailed in the K-Pos TAA00003DB.
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.

Places of manufacture
- Kongsberg Maritime AS, Kirkegårdsveien 45, 3616 Kongsberg, Norway
- Kongsberg Maritime AS, Bekkajordet 8A 3189 Horten, Norway
- Kongsberg Maritime Inc., New Orleans, USA
- Kongsberg Maritime China Ltd., No. 136 North Fute Road, Shanghai, Pilot Free Trade Zone, 200131,

China
- Kongsberg Maritime Korea Ltd., 1058-7, Dalsan-ri, Jungkwan-myeon, Gijang-gun, 619-961, 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 DNV-CG-0339, Environmental test specification for electrical, electronic and programmable equipment and systems, edition August 2021.
- Type test of security capabilities as per test procedure 110-0062858/E.

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
- Review documented evidence of adherence to Secure Development Lifecycle processes

Periodical assessment is to be performed at renewal of this certificate.