

TYPE APPROVAL CERTIFICATE

Certificate no.:
TAA00002TT
Revision No:
2

This is to certify:
that the Bridge Monitor

with type designation(s)
WE190, WE240, WE240HB, WE270, WE270HB, WE320, WA460

issued to
North Invent Norway AS
Haugesund, Norway

is found to comply with
MSC.191(79) Performance standards for presentation of navigation-related information on shipborne navigational displays
IMO Res. A.694(17) General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids

Application:
See page 2.

Issued at **Høvik** on **2025-09-18**

This Certificate is valid until **2030-09-17**.
DNV local unit: **Høvik Electrical Systems**
Approval Engineer: **Tommi Juhani Rifaat**



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 300,000 USD.

Product description

Wave monitor series with type designations WE190, WE240, WE240HB, WE270, WE270HB, WE320 and WA460 for use as navigation bridge displays and calibrated ECDIS displays. Installation with optional HMI panel.

Application/Limitation

- The Wave monitors are to be installed in accordance to manufacturers documentation
- The Wave monitors may fulfill requirements for physical displays without application in accordance with IEC62288 sections 4 and 7 for ECDIS, RADAR and other navigational displays on the ships bridge.
- The Wave monitors may be installed without HMI panel – this prescribing that the approved system the monitor is a part of fulfils requirements in IEC62288 7.2.1.1 independent of the monitor using the monitors SCOM serial interface. The functions to be implemented by other means than provided with the monitor are:
 - Manual brightness control
 - Readjustment for operation under daylight, from night
 - Reset to default value of brightness
 - Return of brightness to calibrated setting (For ECDIS)
- The Wave monitors may be installed with the HMI panel: The HMI panel will cover IEC62288 7.2.1.1 prescribed functions, Manual brightness control and Readjustment for operation under daylight, from night (where no day, dusk and night palette is required)
 - Readjustment for operation under daylight, from night
 - Reset to default value of brightness
 - Return of brightness to calibrated setting (For ECDIS)
- The Wave monitors may comply with requirements for ECDIS displays, if installed and configured in accordance to manufacturers documentation.
- Production of ECDIS calibrated units is to be performed in accordance manufacturers factory procedures, testing each unit for compliance to colour calibration requirements in IEC62288 Annex G / IHO S-52. The process is to be subject of annual retention survey.

Type Approval documentation

DNV No	Drw No	Rev	Title
120	NI/WE260/rev1.0/2025	1.0	Report: North Invent, IEC 62288-62388 WE270HB Flat Panel Display for use as Radar- and ECDIS-Monitor
119	WE270 100 628	0	Doc: North Invent, WE270 datasheet
118	31713	0	Report: Applica, 27" Monitor EN 60945 EMC Test Report 6GHz
117	30513	0	Report: Applica, WE320 EN 60945 EMC and Environmental Test Report
116	P18-0006	2	Report: Ektos, Wave II 24" and 27" IEC 60945 and IACS UR E.10 Test Report
113	WE240 000 204	2019.01.18-B1	Datasheet: WAVE 24" MONITOR
112	P18-0056 rev.1	1	Report: EKTOS, IEC 60945 and IACS e10 WE 185,190 & 240
110	WA460-01-MON.01-0001	00	Manual: Wave XL460 Monitor User's Manual
109	WA460-DS-	REV1.0-03.2014	Datasheet: WAVE XI 46" MONITOR
108	DELTA-L102798-4785	00	Report: DANAK, ECDIS WA460 Test report for homogeneity and contrast
106	WE320_rev_1.1	1.1	Report: North Invent, IEC 62288-62388 WE320 Flat Panel Display for use as Radar- and ECDIS-Monitor
105	30513	0	Report: Applica, IEC 60945 report WE320
104	WE240HB_rev_1.0	1.0	Report: North Invent, IEC 62288-62388 WE240HB Flat Panel Display for use as Radar- and ECDIS-Monitor
102		August 2020	Manual: User manual -Wave II Monitors
101			Statement: IEC60945 8.12 Corrosion Waiver Wave II v2
100	TAA000028U		Certificate: Wave II monitor series IEC 60945 Ed. 4 (2002-08)
86	WE320 000 121	2018.06.23-A1	Datasheet: WAVE 32" MONITOR
85	WE270 000 100	2018.05.24-A	Datasheet: WAVE 27" MONITOR

DNV No	Drw No	Rev	Title
84	WE240 000 105	2018.05.24-A1	Datasheet: WAVE 24" MONITOR
83	WE190 000 117	2018.07.17-A1	Datasheet: WAVE 19" MONITOR
81	WE320_rev_1.0		Report: North Invent, IEC 62288-62388 WE320 Flat Panel Display for use as Radar- and ECDIS-Monitor
80	WE270_rev_1.0		Report: North Invent, IEC 62288-62388 WE270 Flat Panel Display for use as Radar- and ECDIS-Monitor
79	WE240_rev_1.0		Report: North Invent, IEC 62288-62388 WE240 Flat Panel Display for use as Radar- and ECDIS-Monitor
78	WE190_rev_1.0		Report: North Invent, IEC 62288-62388 WE190 Flat Panel Display for use as Radar- and ECDIS-Monitor
48	DELTA-L102798-4832		Report: DELTA, WA460 ECDIS Test report for discrimination in chrominance
47	DELTA -L102798-4785	06/17/2006	Report: DELTA, WA460 Monitor Test report for homogeneity and contrast
44	DELTA-L102798-4780	2016-06-02	Report: DELTA, WA460 Test of flicker from a 46 inch monitor for use as ECDIS monitor
37			Report: North Invent, Wave viewing angle and active area
34		1.0	Manual: Wave XL460 Monitor - User Manual
30	4P02292		Report: SP, IEC 60945 Test Report WE460

Tests carried out

- Environmental testing: IEC 60945 (2002) incl. IEC 60945 Corr.1 (2008) for protected environment
- Presentation testing: IEC 62288 (2021) applicable sections for physical displays without application sections 4 and 7 for ECDIS, RADAR and other navigational displays on the ships bridge.

Marking of product

The Manufacturer and Type Designation to be applied to the equipment in a clearly visible location. In addition the equipment shall be marked with serial number, reference to Type Approval certificate, safe distance to magnetic compass, power consumption and/or supply voltage.

Periodical assessment

This certificate is only valid if required periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>