

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Electrical Indicators**with type designation(s)
Sestrel Electronic Inclinator

Issued to

Zöllner Signal GmbH
Kiel, Schleswig-Holstein, Germany

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft
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
MSC.191(79) Performance standards for presentation of navigation-related information on
shipborne navigational displays
IMO Resolution MSC.363(92) Performance standards for Electronic Inclinator**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed**
by DNV GL.**Location classes:****Temperature B****Humidity B****Vibration A****EMC B****Enclosure Required protection according to the Rules to be provided upon installation on**
boardIssued at **Hamburg** on **2020-07-10**This Certificate is valid until **2025-07-09**.for **DNV GL**DNV GL local station: **Hamburg**Approval Engineer: **Jörg Rebel****Arne Schaarmann**
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.



Job Id: **262.1-029493-2**
Certificate No: **TAA00001ZS**
Revision No: **1**

Product description

The electronic inclinometer consists of the following components:

Component

1. Sestrel Inclinometer Control Unit
2. Sestrel Inclinometer Sensor Unit
3. Sestrel Inclinometer Junction box
4. Sestrel Inclinometer Slave Unit

with the software version nos. for

- Display 1.xx
- Sensor 1.xx
- Main 1.xx

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)

The Type Approval covers hardware listed under Product description.

As long as the units are covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 [1.2.3] will not be required. Correct configuration and set up for each delivery to be tested during commissioning after installation.

Software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV GL for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

Type Approval documentation

DNV GL No	Document No	Rev.	Description
2	6348	2015-06-03	Report: Environmental tests acc. to DNVGL-CG-0339 and IEC 60945, 8.2 to 8.4 and 8.7
3	D12961	2, 2015-07-01	Report: EMC tests acc. to IEC 60945, 9, 10 and 11.2
4	CML/Inspection/J1009/1	2015-06-27	Report: Display tests acc. to IEC 62288 and IEC 60945
5	DNV-GL 01_July_2015	2015-07-01	Report: Performance tests acc. to ISO 19697
14	01808979	2020-02-10	Manual: Sestrel Electronic Inclinometer
15	-	2018-08-23	Video: Tests acc. to ISO 19697, 6.8.1 e) and f)
16	E21544	Issue 2	Report: Eurofins ETC, EMC testing acc. to DNVGL-CG-0339, Sec.3 [14.8; 2..6 GHz]

Tests carried out

- Performance testing: ISO 19697 (2016)
- Environmental testing: DNVGL-CG-0339 (2019-12), IEC 60945 (2002) incl. Corrigendum 1 (2008)
- Serial interface testing: IEC 61162-1 (2016), IEC 61162-2 (1998)
- Presentation of navigational information: IEC 62288 (2014)

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Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number
- compass safe distance acc. to IEC 60945, 11.2

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

END OF CERTIFICATE