DNV·GL

Certificate No:
TAA00001K3

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Measurement Converter

with type designation(s)
Ant-8C-Marine, AW_marine

Issued to
Manner Sensortelemetrie GmbH
Spaichingen, Germany

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.

Type	Temperature	Humidity	Vibration	EMC	Enclosure
Ant-8C-Marine	A	B	B	A	B
AW_marine	A	B	B	A	B

Issued at **Hamburg** on **2018-05-24**
This Certificate is valid until **2023-05-23**.
DNV GL local station: **Augsburg**

for **DNV GL**

Approval Engineer: **Marco Rinkel**

Joannis Papanuskas
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.

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Product description

Torque Measuring Transducer based on Sensortelemetrie

Pick-up: Ant-8C-Marine
Receiver Unit: AW_marine

- The rotating torque measuring flange works with strain gage bridges which are connected like a Wheatstone bridge.
- The torque measuring flange measures static and dynamic torque on rotating and stationary shafts.
- The analog measuring signal is amplified and modulated to high frequency.
- The torque measuring signal and energy are transmitted contact-free.
- The measuring signal is transmitted inductively based on Sensortelemetrie
- In the evaluation unit the digitized torque signal is transformed into an analog current output signal of 4 to 20 mA.

Technical datas:
- HF frequency: 6.78 MHz
- HF power: 5 W
- Number of channels: 1
- Resolution: 16 Bit with 16 Bit CRC
- Data interface: USB type mini A
- Analog output current: 4 to +20 mA
- Amplifier adjustment (fine ±15%) at the evaluation unit
- Zero point adjustment (±20%) at the evaluation unit
- Zero point drift: ±0.02% / °C
- Bandwidth: 0 to 0.5 / 10/ 1 kHz (-3 dB)
- Linearity: <0.1%
- Input: Remote shunt calibration (active low, < 0,9V / pull up 2mA)
- Temperature range evaluation unit: -25 to +70°C
- Power supply: 18 - 32 V DC , (max. 1.2 A , 2 A internally fused)
- Protection class: IP65
- Sensitivity range: 0.05 to 12 mV / V, factory setting

Application/Limitation

Application/Limitation
The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNVGL, 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 Ships Pt.4 Ch.9 Control and Monitoring Systems.
Instructions for calibrations are to be observed.
Mechanical flanges are subject to separate approval.

Product certificate
If specified in the Rules, ref. Pt.4 Ch.9 Sec.1, the control and monitoring system in which the above listed hardware is used shall be delivered with a product certificate. For each such delivery the certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. The test shall be done according to an approved test program. 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 for evaluation and approval. Major changes in the software are to be approved before being installed.

Type Approval documentation

See ANNEX

Tests carried out

Applicable tests according to Class Guidelines DNVGL-CG-0339, November 2015.

Marking of product

Manner Sensortelemetrie	Manner Sensortelemetrie
Bauform: 8c Marine Type	AW-M 13-32V 5W 6,78MHz
Max. Leistung: 5Watt PCM	PCM_T32_4..20mA
Frequenz: 6,78MHz	SNr. Xxxxxx UssueA

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 typeapproved 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

ANNEX

Type Approval documentation

(hidden)