



TYPE APPROVAL CERTIFICATE

Certificate no.:
TAA00001K3
Revision No:
1

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 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.

Location classes:

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 **2024-06-19**

for **DNV**

This Certificate is valid until **2029-06-18**.

DNV local unit: **Augsburg**

Approval Engineer: **Dariusz Lesniewski**

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

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 20A.

Technical data:

- 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 $\pm 15\%$) at the evaluation unit
- Zero point adjustment ($\pm 20\%$) at the evaluation unit
- Zero point drift: $\pm 0.02\%$ / °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

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, 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.

Type Approval documentation

Instructions for calibrations are to be observed.

Mechanical flanges are subject to separate approval.

Test Reports:

- 27077AA EMC Test Report Vektor Mast Moment System VMMS_kompr.pdf
- DRAFT_010030DA_EMV-Bericht_Tail-Rotor-System_2010-12-13.pdf
- DRAFT_010030DB_EMV-Bericht_Main-Rotor-System_2010-12-13.pdf
- Draft_B010030EA_Umwelttest-Bericht_Tail-Rotor.pdf
- Draft_B010030EB_Umwelttest-Bericht_Mai-Rotor.pdf
- EMV-Bericht.pdf
- Feuchte Wärme_Test_AW-MARINE.pdf
- Feuchte Wärme_Test_AW-MARINE_ANT-8C-MARINE.pdf
- Hochspannung_Test_AW-MARINE_ANT-8C-MARINE.pdf
- Isolationswiderstand_Test_AW-MARINE_ANT-8C-MARINE.pdf
- Kältetest_AW-MARINE_ANT-8C-MARINE.pdf
- Manner_Auswerteeinheit Marine_301489-1_051311 ohne Info.pdf
- Manner_Auswerteeinheit Marine_301489-1_051311.pdf
- Manner_Telemetrieauswerteeinh Marine_300330-2_6-78MHz.pdf
- Spannungsausfall_Test_AW-MARINE_ANT-8C-MARINE.pdf
- Spannungsschwankung_Test_AW-MARINE_ANT-8C-MARINE.pdf
- Trockene Wärme_Test_AW-MARINE_ANT-8C-MARINE.pdf
- e&c test lab Test Report no. 23PBI060216-00, 2023-11-11

Type approval assessment report issued at Augsburg on 2024-05-06

Tests carried out

Applicable tests according to Class Guidelines DNV-CG-0339, August 2021.

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 issue A

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