



CERTIFICATE NUMBER	20-LD1964534-PDA
EFFECTIVE DATE	01-Apr-2020
EXPIRY DATE	31-Mar-2025
ABS TECHNICAL OFFICE	London Engineering Department

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

VAF INSTRUMENTS

located at

VIERLINGHSTRAAT 24, 3316 EL DORDRECHT, Netherlands

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product Transmitter, Shaft Torque

Model T-Sense, TT-Sense

This Product Design Assessment (PDA) Certificate remains valid until 31/Mar/2025 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

VAF INSTRUMENTS

VIERLINGHSTRAAT 24

3316 EL DORDRECHT

Netherlands

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Web: www.vaf.nl

Tier: 3 - Type Approved, unit certification not required

Product: Transmitter, Shaft Torque

Model: T-Sense, TT-Sense

Intended Service:

For use on ABS classed vessels and offshore facilities in accordance with the listed ABS Rules and International Standards.

Description:

The T-Sense optical torque sensor is intended for the measurement of torque and shaft power. The output can be used for the measurement of torque and shaft power. This system is used only for monitoring. It consists of three main components: the optical sensor on the shaft (rotor), the stator pedestal with coil and antenna and the electronic control box holding the data receiver, power supply and the data output. When a shaft is subject to torque this will result in a small strain at the shaft surface. A LED and an extremely accurate optical cell can detect these small movements of the surface. The measured values are transferred continuously from the rotating shaft to the stator part through a 2,4 GHz wireless data connection. Power transmission from the stator to the rotating shaft is performed by means of induction.

The TT-Sense optical thrust & torque sensor is intended for the measurement of torque, shaft power and propeller thrust. This system is used only for monitoring. It consists the optical sensors on the shaft (rotor), the stator pedestal with coil and antenna and the electronic control box holding the data receiver, power supply and the data output clamped onto the shaft by means of three rings. When a shaft is subject to thrust and torque this results in a small strain at the shaft surface. LEDs and extremely accurate optical sensors can detect these small displacements, in both axial and radial directions. The measured values are transferred continuously from the rotating shaft to the stator part through wireless data connection. Power transmission from the stator to the rotating shaft is performed by means of induction. The stator part consists of a power transmission coil, a data signal receiver and a control box equipped with digital or analogue output connections. These outputs can be linked directly to the vessels data network, monitoring- or control system.

Rating:

Stator

Supply: 115 / 230 VAC \pm 10%

Input: Wireless 2.4 GHz fully protected encrypted signal

Outputs: RS 485 for MODBUS protocol, Ethernet

Rotor

Input: Wireless 2.4 GHz fully protected encrypted signal

Power supply: 40 Watt through inductive coupling

Output: 2.4 GHz fully protected encrypted signal

Operating temperature: -10°C to 60°C

Protection degree stator control box IP65

Service Restriction:

1. Unit certification is not required for the product when it is used for display and monitoring function for informational/administrative tasks as per 2020 ABS Marine Vessels Rules 4-9-3/Table 1 Computer-Based Systems Category I.
2. Unit certification is required by the user to customize this product where this product is used for Category II or III services in accordance with 4-9-3/Table 1 and Table 2 of 2020 Marine Vessels Rules.
3. The Unit Certification may be carried out during Factory Acceptance Test of the overall system by the end user. When this product is used for Computer-Based Systems Category I, II or III services as per 4-9-3/Table 1 of the Marine Vessels Rules, specific details are to be submitted for each specific application in accordance with 2020 Marine Vessels Rules 4-9-3/Table 2.T
4. This certificate covers hardware only.
5. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the

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specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:

The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product. The systems do not generate alarms or are involved in other systems of a ship. They are used only for monitoring function for information only.

Notes/Drawing/Documentation:

Drawing No. M18.005-P18.004, Climate test report, Sebert Trillingstechniek B.V , The Netherlands, Date: 30.11.2018, Pages: 14
Drawing No. 18C00990RPT02, EMC test, Dare Service B.V, The Netherlands, Date: 08.04.2019, Pages: 76
Drawing No. Functional test -tt-sense, VAF Instruments, The Netherlands, Date: 17.04.2019, Pages: 14
Drawing No. 2156301.0502, EMC test report- T-sense, Draka Certifications B.V, The Netherlands, Date: 06.05.2015, Pages: 35
Drawing No. 2156301.0502-EMC, Environment test report- T-sense, Draka Certifications B.V, The Netherlands, Date: 28.02.2013, Pages: 28
Drawing No. Final test report- T-sense, VAF Instruments, The Netherlands, Date: 25.07.2013, Pages: 09
Drawing No. IP 44 test, Rotor enclosure VAF Instruments, The Netherlands, Date: 24.05.2015, Pages: 03
Drawing No. PB-660, PB-660-GB-0119 T-sense Product Bulletin, Pages: 12
Drawing No. PB-663, PB663-GB-0119 TT-sense Product Bulletin, Pages: 12
Drawing No. TIB-661, TIB-661-GB-0319 T-sense Technical Manual, Pages: 46
Drawing No. TIB-674, TIB-674-GB-0819 TT-sense Technical Manual, Pages: 49
Drawing No. Test programma, TT-sense REV.C, Date: 27.09.2018,Pages: 05
Drawing No. M19.001-P19.001, Vibration test report, Sebert Trillingstechniek B.V, The Netherlands, Date: 05.02.2019, Pages: 14
Drawing No. Statement from Sebert trillingstechniek, Date: 16.03.2020,Pages: 01

Terms of Validity:

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STANDARDS

ABS Rules:

- Marine Vessels Rules (2020): 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-8-3/1.7, 4-8-3/1.9, 4-8-3/1.11, 4-9-3/11.9, 4-9-9/7, and 4-9-9/Table 1 and 4-9-9/Table 2;
- Facilities on Offshore Installations (2019): 1-1-4/9.7, 1-1-A2, 1-1-A3, 3-7/3.5
- Mobile Offshore Units (2020): 1-1-4/9.7, 1-1-A3, 1-1-A4, 6-1-1/9, 6-1-1/13; 4-3-1/9, 4-3-1/11, 4-3-1/15;
- Steel Vessels for Service on Rivers and Intra-coastal Waterways (2020): 1-1-4/7.7, 1-1-A3, 1-1-A4;
- High Speed Crafts (2020): 1-1-4/11.9, 1-1-A2, 1-1-A3, 4-7-9/7, 4-7-9 Table 9 and 4-7-9 Table 10;
- Steel Barge Rules (2020): 1-1-4/7.9, 1-1-A3, 1-1-A4;

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National:
NA

International:
IACS E10 rev7:2018

Government:
NA

EUMED:
NA

OTHERS:
NA