



Type Approval Certificate

[Torque Measuring Device]

Initial Approval 13 December 2022
Manufacturer VAF Instruments B.V.
Vierlinghstraat 24, 3316 EL Dordrecht, The Netherlands

Product Description Optical torque measurement instrument
TYPE: T-Sense PB-660 and TIB-661 including control box 0815-1205
TT-Sense PB-663 and TIB-674 including control box 0815-1217
" See Appendix 1 "

Approval Condition " See Appendix 1 "

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows.
Pt. 6, Ch. 2, Art. 301 of the Rules for Classification of Steel Ships.

This Certificate is valid until 12 December 2027
Issued at Busan, Korea on 13 December 2022



This certificate is signed electronically in accordance with IMO FAL.5/Circ.39/Rev.2. Validation and authentication of the certificate can be confirmed from "<http://e-cert.krs.co.kr>" by using the tracking No(ME22036617969) and certificate No.(RTD03790-AC005).



KOREAN REGISTER

*General Manager of
Marine & Ocean Equipment Team*

- Note :**
1. This certificate will be valid subject to complying with the approval conditions described on the certificate and/or on the Rules of this Society.
 2. This certificate will be invalid from the expiry date aforementioned unless the extension or renewal has been granted to the applicant or the manufacturer.
 3. Any significant modifications or changes in design or construction to the above product without approval from this Society will render this certificate invalid.
 4. Should the specified rules, regulations or standards be amended during the validity of this certificate, the product is to be re-approved by this Society in accordance with the requirements as amended.

Product Description and/or Approval Condition

Date of Issue : 13 December 2022

A. Product Description

1. Product Specification

- 1) Product description :
T-Sense and TT-Sense torque measuring devices comprising a control box (stator) and rotor equipment as follows:
- 2) Specification :

Type	T-Sense	/	TT-Sense
Power supply	115 or 230 VAC, 50 or 60 Hz +/- 10%		
Control Box at stator part	Input	2.4 GHz fully protected encrypted signal	
	Outputs	RS 485 for MODBUS protocol, Optional 4-20 mA isolated current output, Optional Ethernet port for service purposes only	
	Dimensions	408 x 360 x 111 mm	/ 407 x 360 x 119 mm
Output	2.4 GHz fully protected encrypted signal		
Rotor Equip.	Dimensions	100 mm ~ 1000 mm	/ 200 mm ~ 1000 mm
	Measuring tolerance	< 0.5% FS	/ Thrust [kN] : < 1.0% FS Torque [kNm] : < 0.25% FS Power [kW] : < 0.25% FS

2. Approved Drawings and Documents

- 1) Drawings for T-Sense
 - 0815-1007 Rev. H, 0815-1010 Rev. F, 0815-1212 Rev. B, 0815-1014 Rev. C,
0815-1008 Rev. A, 0815-1016 Rev. O, 0815-1208 Rev. C, 0815-1206 Rev. E,
0815-1205 Rev. F, 0815-8002 Rev. F, 0815-8004 Rev. B,
- 2) Drawings for TT-Sense
 - 0815-1008 Rev. A, 0815-1012 Rev. H, 0815-1013 Rev. F, 0815-1014 Rev. O,
0815-1016 Rev. A, 0815-1028 Rev. O, 0815-1028 Rev. O, 0815-1029 Rev. O,
0815-1030 Rev. O, 0815-1031 Rev. O, 0815-1032 Rev. O, 0815-1033 Rev. O,
0815-1212 Rev. B, 0815-1217 Rev. A, 0815-2032 Rev. O, 0815-4012 Rev. O,
0815-4013 Rev. O, 0815-8005 Rev. O,

3. Test Reports, etc.

- 1) Performance
Test report issued by VAF, 17 Apr. 2019, Test report issued by VAF, 25 Jul. 2013,
Test report issued by VAF, 29 Oct. 2018
- 2) ENV
M18.005-P18.004 VAF Instruments B.V. dated 30 Nov. 2018,
M18.004-P18.003 dated 21 Nov. 2018, M19.001-P19.001 dated 5 Feb. 2018,
M10.002-2010.7123 dated 2 Dec. 2010, 2156301.0502-EMC dated 28 Feb. 2013,
- 3) EMC
18C00990RPT02, 2156301.0501-EMC 6 May. 2015,

B. Approval Condition

1. Application & Limitation

- 1) This approval is granted on the basis of the test reports and the approved documentation.
- 2) Degree of protection shall be complied with Rule Pt.6 Ch.1 Sec.2 201.2. (5).
- 3) The manufacturer should inform this Society of all kinds of revisions of the equipment.
If the changes are recognized to affect functionality of the approved equipment, type test to confirm the reliability of the revised equipment may be performed in the presence of our surveyor.
- 4) This Certificate covers the hardware only. The function of the software is to be verified by the individual product certification or onboard test.

Product Description and/or Approval Condition

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2. Individual Product Cert. and Drawing Approval Requirement

- 1) Individual Product Certification is required.

3. Marking

- 1) The product or packing is to be marked with the manufacturer's name and type designation on a suitable position.

4. Others

- 1) Test condition(IACS UR E10 Rev.8 basis)

Test	Condition	Remark
EMC	All locations excluding the bridge and deck zone	-
Temperature	5°C ~ +55°C	-
Vibration	Acceleration $\pm 0.7g$	-
Degree of protection	IP44	-

< End of Certificate >

