

TYPE APPROVAL CERTIFICATE

This is to certify:**That the RPM sensor**with type designation(s)
SPS-02/ESS series

Issued to

Kumoh Mach. & Elec. Co. Ltd.
Busan, Republic of Koreais found to comply with
DNV GL rules for classification – Ships and offshore units**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	A
Enclosure	B / IP67

This Certificate is valid until **2018-11-27**.Issued at **Høvik** on **2016-06-15**DNV GL local station: **Pusan**Approval Engineer: **Ståle Sneen**for **DNV GL**

Odd Magne Nesvåg
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.

Product description

SPS-02/ESS is a speed pick-up sensor series.

The sensing principle is frequency detection by magnetic induction.

The approved models are as follows:

Sensor housing type M12:

- SPS-02A: Cable with plug connection
- SPS-02B: Fixed cable connection
- ESS-4-E-12: Cable with plug connection
- ESS-5-E-12: Cable with plug connection
- ESS-6-E-12: Fixed cable connection

Sensor housing type M14:

- ESS-7-E-14: Cable with plug connection

Sensor housing type M16:

- ESS-30-E-16-0: Cable with plug connection

Technical data:

- Maximum frequency for operating: 20 kHz (Square Wave)
- Working distance: from 0.3...3.0 mm
- Operating voltage (input): 10...40 VDC
- Output signal: square wave (PNP)
- Maximal load: 300 mA with short circuit protection
- No load supply current: 6 mA
- Housing material: Stainless steel (SUS303F)
- Degree of protection: IP67

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, 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 GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Type Approval documentation

Tests carried out

Guidelines for the Performance of Type Approvals, Chapter 2, Edition 2003

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number

Job Id: **262.1-020941-1**
Certificate No: **TAA00000H9**

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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE