EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB000085H

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED). This Certificate is issued by DNV SE based on the notification of the Federal Maritime and Hydrographic Agency of Germany.

This is to certify:

That the Rate-of-turn indicator (ROTI)

with type designation(s)
MFG-III Marine Optic Gyro Compass

Issued to
CSSC Marine Technology Co.,Ltd.
Shanghai, **China**

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2022/1157,**
item No. MED/4.9. SOLAS 74 as amended, Regulations V/18, V/19 & X/3, IMO Res. A.526(13), IMO Res. A.694(17), IMO Res. MSC.36(63), IMO Res. MSC.97(73), IMO Res. MSC.191(79), IMO Res. MSC.302(87)

Manufacturers authorised representative
SEACOTEC GmbH & Co. KG
Hamburg, Germany

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2027-08-25**.

Issued at **Hamburg** on **2022-08-26**

DNV local station:
Shanghai

Approval Engineer:
Jörg Rebel

Notified Body
No.: **0098**

for **DNV SE**

Christine Mydlak-Roeder
Head of Notified Body

A U.S. Coast Guard approval number will be assigned to the equipment when the production module has been completed and will appear on the production module certificate (module D, E or F), as allowed by the "Agreement between the European Community and the United States of America on Mutual Recognition of Certificates of Conformity for Marine Equipment", signed February 27th, 2004, and amended by Decision No 1/2018 dated February 18th, 2019.

The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV SE of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

Product description

The fiber-optical gyro compass MFG-III with rate-of-turn indicator function consists of the following equipment:

Type	Description	Software Revision
MFG-III G1-I	Main Compass	V1.x (x ≥ 1)
G2-I	Power Box	N/A
G3-I	Operation Display Unit	V1.x (x ≥ 2)
G4-I	Interface Box	V2.x (x ≥ 3)

Interfaces:
Input: 1 x GPS, 1 x SDME* (opt.), 1 x Magnetic compass
Output: 2 x Rate-of-turn, 8 x Repeater compass, 6 x Heading
Alert interface: 1 x CAM, 1 x backup CAM

Power supply: 220 V AC (±10%, Frequency: 47 – 63 Hz)
24 V DC (-25% – 30%) as backup

* SDME = Speed and distance measuring equipment

The following additional equipment may be connected:

SHL-D	Steering repeater compass bulkhead mounted
SHL-E	Steering repeater compass flush mounted
19-V	Bearing repeater
20-I	Pelorus stand
SHL-A	Digital repeater, with brackets
SHL-B	Digital repeater, bulkhead mounted
SHL-C	Digital repeater, flush mounted
G5	Change over box, for two gyros or gyro/magnetc
ROT-A	Rate of turn indicator 192x192
ROT-2	Remote operator unit for ROT-A

Application/Limitation

The fiber-optical gyro compass MFG-III fulfils also the carriage requirements of 2000 HSC Code, 13.
The gyro compass system is to be installed according to manufacturer's instructions.

Type Examination documentation

DNV No.	Document ID	Rev.	Description
10	-	2022-08-17	Manual: MFG-III - Installation and operation
9	056HH2.70-00TR-01	2022-08-17	Report: CSSC Marine Tech., Tests acc. to ISO 8728, ISO 16328 and ISO 20672 for MFG-III
8	056HH2.70-00TP-01	2022-08-17	Report: CSSC Marine Tech., Tests acc. to ISO 8728, ISO 16328, ISO 20672, IEC 61162-1/-2, IEC 62288 Ed.2 and IEC 62923-1/-2 for MFG-III
7	A20-018-ZC	2021-02-23	Report: SiTiiAS, Environmental tests acc. to ISO 8728 and EMC tests acc. to IEC60945 for MFG-III
6	A19-019-WT	2019-11-21	Report: SiTiiAS, Temperature and vibration tests acc. to ISO 8728 for Changeover Box G5
5	A19-017-WT	2019-10-30	Report: SiTiiAS, Performance tests acc. to ISO 20672 for ROT-A
4	A18-011-ZC	2018-08-27	Report: SiTiiAS, Tests acc. to ISO 8728/ISO 16328, Clause 6 for MFG-I

DNV No.	Document ID	Rev.	Description
3	A16-020-ZC	2016-09-07	Report: SiTiiAS, Tests acc. to ISO 8728 and IEC 60945 for DH-V (including various repeaters)
2	UL106820180720002A1	2018-08-24	Report: Unilab, Tests acc. to IEC 62288 and ISO 60945, 10.3 and 10.9

Tests carried out

- Environmental and EMC testing: IEC 60945 (2002) incl. Corrigendum 1 (2008)
- Interface testing: IEC 61162-1 (2016) and IEC 61162-2 (1998)
- Presentation testing: IEC 62288 (2014)
- Bridge alert management testing: IEC 62923-1 (2018) and IEC 62923-2 (2018)
- Performance testing: ISO 20672 (2007)

Marking of product

According to IEC 60945, Sect.4.9:

The product to be marked with following information, where practicable:

- Identification of the manufacturer,
- Equipment type number or model identification under which it was type tested,
- Serial number of the unit,
- Compass safe distance.

Alternatively, the marking may be presented on a display at equipment start-up, and in case of fixed equipment compass safe distance may be given in the equipment manual.

END OF CERTIFICATE