

EC-TYPE EXAMINATION CERTIFICATE

Application of: Council Directive 96/98/EC of 20 December 1996 on Marine Equipment as amended by directive 2014/93/EU, issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Directorate. This Certificate is issued by DNV GL AS under the authority of the Government of the Kingdom of Norway.

This is to certify:**That the Speed and distance measuring equipment (SDME)**with type designation(s)
DS-60

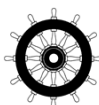
Issued to

Furuno Electric Co., Ltd.
Nishinomiya Hyogo Pref, Japan

is found to comply with the requirements in the following Regulations/Standards:

Annex A.1, item No. A.1/4.7 and Annex B, Module B in the Directive. SOLAS 74 as amended, Regulation V/18, V/19 & X/3, IMO Resolution A.694(17) & A.824(19), IMO Resolution MSC. 96 (72) & 191 (79) and 2000 HSC Code 13

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

Høvik, 2015-10-15
for **DNV GL AS**This Certificate is valid until
2020-10-15Notified Body No.: **0575**-----
Vidar Dolonen
Head of DepartmentDNV GL local office:
Kobe-----
Olaf Gundersrud
Surveyor

Product description

The DS-60 SDME consists of the following main units:

Component	Location
Display	Protected
Transceiver	Protected
Transducer	Exposed
Distributor	Protected

For details, see Appendix.

For latest revision of the Appendix, see <http://exchange.dnv.com/tari>

Application/Limitation

The DS-60 is applicable for provision of speed and distance measurements over the ground (SOG) and through the water (STW).

The DS-60 equipment shall be installed in compliance with the installation instructions of Pub. No. IME-72640-E or impending versions.

Note: The DS-60 interface protocol is examined and found to comply with the standards for interconnection with a Bridge Alarm Management System; IMO resolution MSC.302(87) "Bridge Alarm Management" and IEC 61924-2 "Modular structure for INS", Annex K and Annex M.

Type Examination documentation

- See Appendix.

Tests carried out

- IEC61023(2007)
- IEC61162-1(2010)
- IEC62288(2014)
- IEC60945(2002) incl. corr.1 2008

Marking of product

The designation of Manufacturer and Type shall be fixed in a clearly visible location. In addition the equipment shall be marked with serial number, safe distance to magnetic compass, power consumption and/or supply voltage.

Mark of Conformity

The manufacturer is allowed to affix the Mark of Conformity according to Article 11 in the Council Directive 96/98/EC on Marine Equipment and shall issue a Declaration of Conformity, only when the module D or E or F of Annex B in the same directive is fully complied with.

USCG Approval

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 United States of America and the EEA/EFTA states on the mutual recognition of Certificates of Conformity for Marine Equipment" signed 17 October 2005.

APPENDIX REV. NO. 0 (PAGE 1 OF 2)

Job Id: **344.1-004925-1**
 Certificate No: **MEDB000008R**

Product description:

The DS-60 SDME comprises combinations of the following units:

Unit	Model Name	Remark
Display unit	DS-600	
Distributor unit	DS-610	
Transceiver unit	DS-620	
Transducer	DS-630 or	¹⁾ with watertight connection
	DS-630A or	
	DS-631 ¹⁾ or	
	DS-631A ¹⁾	
Transducer tank	DS-660 or	for DS-630/631
	DS-660A	for DS-630A/631A
Gate valve	DS-661	for DS-630

Optional units	Model name	Remark
Remote display	RD-20	
Remote display	RD-50	
Rate-of-turn gyro	DS-670	
Remote controller	RD-501	
Dimmer controller	RD-502	
Junction box	DS-640/645A/645B	w/installation materials (CP66-01721)
Waterproof box	DS-605-R/605-L	w/installation materials (CP66-01731)
Analogue Indicator	FL-200S-1	-10 to 30 kn, flush mount
	FL-200S-2	-10 to 40 kn, flush mount
	SL-200-1	-10 to 30 kn, bulkhead mount
	SL-200-2	-10 to 40 kn, bulkhead mount
	FL-200S-1W	-10 to 30 kn, flush mount
	FL-200S-3	-10 to 20 kn, flush mount

Type Examination documentation

DNV No.	Document No.	Document Title
22	FLI 12-14-128	IEC 62288 ed.2.0 test report DS-60
21	FLI 12-13-009	IEC 61162-1 test report DS-60
20	FLI 12-10-028	IEC60945 and IEC61023 test report DS-60
19	FLI 12-09-070	IEC60945 Vibration test report DS-60
18	FLI 12-09-068	IEC60945 RD-50
17	FLI 12-09-053	IEC60945 RD-20
16	FLI 12-09-046	EMC test report - DS-60
15	FLI 12-09-045	IEC60945 and IEC61023 DS-60
14	K66-17-166-2	DNVGL type approval testing report - doppler sonar
13	BSH/46162/0121509/09	IEC 61162-1 (2007) RD-50 display

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Job Id: **344.1-004925-1**
Certificate No: **MEDB000008R**

Type Examination documentation cont.

12	BSH/46162/0121508/09-1	IEC 61162-1 (2007) RD-20 display
11	BSH/46162/0121508/09	IEC 62288 (2008) RD-20 display
10	BSH/4612/4071804/11-3	IEC 61023 (2007) analogue indicator
9	BSH/4612/4071804/11-2	IEC 62288 (2008) analogue indicator
8	BSH/4612/4071804/11-1	IEC 61162-1 (2007) DS-60
7	BSH/4612/4071589/10	IEC 61023 (2007) DS-60
6	BSH/4612/4071196/09-1	IEC 61023(2007) and IEC61162-1 (2007)
5	BSH/4612/4071196/09	IEC 62288 (2008)
4	OME-72640-C	Operator's manual
3	IME-72640-E	Installation manual

Place and date
HØVIK, 2015-10-15

Olaf Gundersrud

End of Certificate