

EMRI



Rudder Angle Indication System

Rudder indication System



SAB10-230

Supply and Amplifier Box for Indicators.

Size 210 x 230 x 100 mm

Alternatives: 110V supplied



TPL511

45-0-45 Deg. 3 Face Rudder indicators for ceiling mounting. Easy to read scale, Size : Ø = 420 mm

Alternatives: 70-0-70 and built in Dimmer



RIB51X

50-0-50 Deg. Rudder indicator for panel mounting.

Easy to read scale, Size : 144x144 mm

Alternatives: Enclosures for built in.

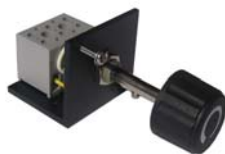


RIF511-RG-WP

50-0-50 Deg. Rudder indicator for Bulkhead mounting IP56

Easy to read scale, Size : 192x192 mm

Alternatives: built in Dimmer
RIF511-RG-WP-D



DIM14

Dimmer potentiometer for console mounting

Alternative: DIM42 (4 gang pot)



DIM14WP

Watertight dimmer potentiometer for console mounting including 3 m cable.



RFU32

Rudder Feedback Unit. Dual Pot. Including arm A=400mm, L=440mm and 2 uniball links. Max rudder angle 2 x 50 deg.

Alternative: RFU33 Single potentiometer and other arm length.
Available Arm lengths: A=420, 450, 500, 550, Max=600



RFB36

Rudder Feedback Unit. Dual Pot. Including 45 inch belt and pulley. Max rudder angle 2 x 85 deg.

Alternative: RFU33 Single potentiometer and other BELT lengths
Available Belt Lengths (inch): 42, 45, 51, 54, 60



ENCL-BX-BW

Bracket mounted watertight enclosure for EMRI 144 x 144mm instruments. IP56

Alternative: With Built in Dimmer
ENCL-BX-BW-D



ENCL-BX-WP

Console mountable Watertight enclosure for EMRI 144 x 144 mm instruments. IP56

RUDDER INDICATION SYSTEM. 35 & 45deg RUDDERS

Rudder Indication System Design.

The EMRI Rudder Indication System described in this document is for use with rudders with a maximum rudder angle of 2x45 deg.

The system consists of a number of rudder feedback units, supply & amplifiers boxes and indicators.

Some classification societies require two independent feedback units connected to two independent amplifier units driving individual indicators, to ensure that no individual failure will lead to a loss of indication on the bridge. Other classification companies can accept a simpler design.

Zero Adjustment of feedback units

Check that the linkage arm connections is a parallelogram and in accordance with the drawings in the Arm version (RFU) of feedback units datasheets. If the Feedback unit is a Belt- version (RFB), make sure the belt is tight and in accordance with the drawings in the Belt version of feedback units datasheets.

Since the potentiometers are factory calibrated, only a zeroing remains:
Energize the RFU/RFB-potentiometer by energizing the SAB10.

Bring the Rudder to exactly AMIDSHIPS.

Check that the potentiometer (potentiometers) have correct +/-12VDC supply.

Loosen the 3 screws holding potentiometer the fixing nails and then carefully turn the potentiometer until 0.0 Volts is measured at the potentiometer SIGNAL wiper terminal. (Terminal 2 or terminal 7.) Use terminal 4 or terminal 8 as signal reference to the digital voltmeter. The digital voltmeter (DVM) reading must follow the turning smoothly and continuously, and no backlash must be observed.

Correctly zeroed, the SIGNAL voltage should be less than 25mV. (5 mV is obtainable).

When the potentiometer has been zeroed, retighten the 3 fixing nail screws firmly.

NOTE:

For systems with link arm fine 0-adjustment can be done using the Left/Right Threaded pins of the UNIBALL LINKS.



Adjustment of SAB10-110 / SAB10-230 (Mod. 2)

The feedback input of SAB10 is factory calibrated to 0.2V/deg negative stbd. The SAB shall be checked and adjusted with feedback unit and all indicators connected.

With the rudder exactly amidships check that the signal measured at TP2 with reference to TP1 is 0mV. Zero can be fine adjusted if necessary on P3.

Move the rudder to a very exact large angle (f.ex. 30 or 40 deg). Check the signal at TP2 with reference to TP1 to be $30 \times 0.125V = 3.750V$ or $40 \times 0.125V = 5.000V$. Adjust on P4 if needed.

The CH1-6 outputs for indicators are factory calibrated to 0.25V/deg.

Normally no adjustments are needed.

With the rudder exactly amidships check zero indication on all indicators. If zero adjustment of an indicator is needed measure the output at the TP's as shown below and adjust the offset to bring the pointer to exactly zero. (25mV will move the pointer 0.1deg).

Check the rudder indication for every 5 deg. If gain adjustment of an indicator is needed measure the output at the TP's as shown below and adjust gain to correct indication.

	CH1	CH2	CH3	CH4	CH5	CH6
Signal	TP3	TP5	TP7	TP9	TP11	TP13
Reference	TP4	TP6	TP8	TP10	TP12	TP14
Zero adjust	P5	P7	P9	P11	P13	P15
Gain adjust	P6	P8	P10	P12	P14	P16

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

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

This is to certify:**That the Rudder angle indicator**

with type designation(s)
Rudder Angle Indication System

Issued to

Emri A/S
Herlev, Denmark

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2017/306**,
item No. MED/4.20. SOLAS 74 as amended, Regulations V/18, V/19 & X/3, 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)

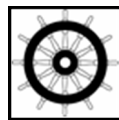
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2022-06-20**.

Issued at **Hamburg** on **2017-06-21**

DNV GL local station:
Copenhagen

Approval Engineer:
Jörg Rebel



Notified Body
No.: **0098**

for **DNV GL SE**

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Sven Dudzus
Head of Notified Body

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 GL 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 EMRI Rudder Indication System consists of the following rudder feedback units, supply & amplifiers boxes and indicators.

4 different types of Rudder Feedback Units are available:

RFU33A: Feedback Unit with link arm, single pot., drawing 4-7808-1
RFU32A: Feedback Unit with link arm, dual pot., drawing 4-7808-2
RFB33A: Feedback Unit with belt drive, single pot., drawing 4-7808-3
RFB32A: Feedback Unit with belt drive, dual pot., drawing 4-7808-4

2 different types of Supply & Amplifier Boxes are available:

SAB10-110: Rudder Indicator Supply & Amplifier Box, 110VAC.
SAB10-230: Rudder Indicator Supply & Amplifier Box, 230VAC.
Drawing: 4-7803

6 different types of Rudder Indicators are available:

RIB51X: 50-0-50 Rudder Indicator, 148x148, drawing 4-7331-1
RIB52X: 50-0-50 Rudder Indicator, 148x148, drawing 4-7331-2
RIF511-RG: 50-0-50 Rudder Indicator, 216x216, drawing 4-5146-1
RIF521-RG: 50-0-50 Rudder Indicator, 216x216, drawing 4-5146-3
TPL510: 45-0-45 Panorama Indicator, ø420, drawing 4-7805-1 (Rev. B)
TPL510-D: 45-0-45 Panorama Indicator w. dim., ø420, drawing 4-7805-2 (Rev. B)

Application/Limitation

None

Type Examination documentation

Test-reports: [DANAK-19/11899](#), [GL EMRI RAI 0312](#)

Tests carried out

Applicable tests according to ISO 20673 (2007), IEC 60945 (2002) incl. Corrigendum 1 (2008), IEC 62288 (2014) and IEC 61162 series.

Marking of product

According to Article 10 of the Council Directive (MED):

- The wheel mark shall be affixed visibly, legibly and indelibly to the product or to its data plate and, where relevant, embedded in its software. Where that is not possible or not warranted on account of the nature of the product, it shall be affixed to the packaging and to the accompanying documents.
- The wheel mark shall be affixed at the end of the production phase.
- The wheel mark shall be followed by the identification number of the notified body, where that body is involved in the production control phase, and by the year in which the mark is affixed.
- The identification number of the notified body shall be affixed by the body itself or, under its instructions, by the manufacturer or the manufacturer's authorised representative.

For specific products, manufacturers may use an appropriate and reliable form of electronic tag instead of, or in addition to, the wheel mark.

END OF CERTIFICATE

QS - CERTIFICATE OF ASSESSMENT - EC (MODULE D)

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

This is to certify:**That the Quality System for the products**

with type designation(s) as specified in the Appendix to this Certificate

Issued to

Emri A/S
Herlev, Denmark

is found to comply with the applicable requirements.

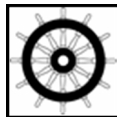
The quality system has been assessed with respect to the procedure of conformity assessment described in Annex II, Module D in the directive 2014/90/EU and regulation (EU) 2017/306.

This Certificate is valid until **2022-06-20**.

Issued at **Hamburg** on **2017-06-21**

DNV GL local station:
Copenhagen

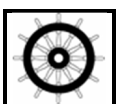
Approval Engineer:
Jörg Rebel



Notified Body
No.: **0098**

for **DNV GL SE**

Sven Dudzus
Head of Notified Body



0098/yyyy

0098: Notified Body number undertaking quality surveillance
yyyy: The year in which the mark is affixed

The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU. This certificate authorizes the manufacturer in conjunction with the valid EC Type Examination (Module B) Certificate(s) of the equipment listed before to affix the Mark of Conformity (wheelmark) to the product described herein. This certificate loses its validity if the manufacturer makes any changes to the approved quality system, which have not been notified to, and agreed with the notified body named on this certificate. This certificate remains valid unless suspended, withdrawn, recalled or cancelled. The Manufacturer has to apply for periodical audits to verify the maintenance and application of the quality system every 12 months.



Job Id: **344.1-006774-1**
Certificate No: **MEDD000012X**

APPENDIX

Item no. MED/4.20 Rudder angle indicator

Type designation	EC Type-Examination Certificate No.	Expiry date	Notified Body No.	USCG approval number
Rudder Angle Indication System ¹	MEDB00002EN	2022-06-20	0098	N/A

Places of production

1.Emri A/S, Marielundvej 37 A, Herlev, Denmark

Declaration of Conformity

We hereby declare that the following specified equipment complies with the Marine Equipment Directive 2014/90/EU.

Product Description:	Rudder Angle Indicator System
Product Type:	EMRI Rudder Indication System
Maker:	EMRI A/S 37A, Marielundvej DK-2730, Herlev, Denmark
Specified Standards:	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), ISO 20673 (2007), IEC 60945 (2002) incl. Corr.1 (2008), IEC 62288 Ed.2.0 (2014)
EC Type Examination Conformity Assessment Procedure	MEDB00002EN B
EC Cert.of Conformity Conformity Assessment Procedure	MEDD000012X D
Item No.	MED/4.20
EC Identification No.:	0098

Issued on: **2017-06-22**

Certified by:



Claus Nørtoft Thomsen
President of EMRI A/S

