INTERNATIONAL STANDARD

ISO 20673

Second edition
2022-02

Ships and marine technology — Electric rudder angle indicators

Navires et technologie maritime — Indicateurs de direction des gouvernails électriques

Reference number
ISO 20673:2022(E)

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Published in Switzerland

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 6, *Navigation and ship operations*.

This second edition cancels and replaces the first edition (ISO 20673:2007), which has been technically revised.

The main changes are as follows:

— in Clause 2, deleted IEC 61162-1 and IEC 61162-2;

— in 4.1 and 6.1, added a provision on displays for presentation and a reference to IEC 62288;

— in new 4.4 and 6.6, added a provision on alerts and a reference to IEC 62923-1 and IEC 62923-2;

— in Clause 7, updated interface requirements;

— in the Bibliography, added IEC 61162-1, IEC 61162-2, IEC 61162-450, IEC 62288, IEC 62923-1, IEC 62923-2, IMO Resolution MSC.191(79), IMO Resolution MSC.302(87) and IMO Resolution MSC.466(101).

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Ships and marine technology — Electric rudder angle indicators

1 Scope

This document specifies the construction, performance requirements, methods of testing and required test results for electric rudder angle indicators required to comply with Clause 2.5.4, Regulation 19, chapter V, SOLAS 1974 (as amended, 2000).

This document is associated with IMO Resolution A.694 (17) and IEC 60945.

Where a requirement in this document is different from IEC 60945, the requirement in this document takes precedence.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60945, *Marine navigation and radiocommunication equipment and systems — General requirements — Methods of testing and required test results*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
rudder angle indicator
remote device that indicates ship's rudder angle and direction

Note 1 to entry: An indicator system consists of a transmitter and a receiver (indicator).

3.2
analogue-type indicator
indicator that shows the rudder angle in a continuous way, such as by means of an arrow pointer and a graduated scale

3.3
digital-type indicator
indicator that shows the rudder angle in a discrete, alphanumeric way

3.4
calibration accuracy
difference between the angle of the receiver (indicator) shaft and the angle of the transmitter shaft

3.5
damping efficiency
time elapsed for the indicated angle to match the angle of the transmitter shaft

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3.6
full scale
range from 0° to the greatest angle of port (or starboard) direction

4 Construction of the indicator system

4.1 General

The construction shall comply with the following requirements.

a) The indicator system enclosures shall be robust and constructed to facilitate adjustment and maintenance.

b) The indicator system shall be provided with an earthing terminal or shall be constructed to be capable of being connected to an electrical earth.

c) The indicator system shall include an analogue-type indicator. A digital-type indicator may additionally be used, if fitted. If a display is used for presentation, the equipment shall comply with MSC.191(79), as amended by MSC.466(101), and IEC 62288.

4.2 Transmitter

The transmitters shall comply with the following requirements.

a) The transmitter shall be driven by lever or belt, or other suitable means from the rudder head.

b) The transmitter shall be capable of being adjusted.

c) Where the transmitter drive includes pivot connections, they shall be designed so as not to be loosened by vibration.

4.3 **Receiver** (indicator)

The indicator shall comply with the following requirements.

a) The indicator shall be connected to the transmitters and shall indicate rudder angle and direction.

b) The maximum angle indicated by the indicator shall be the same for both port and starboard directions and shall not be less than 40°. Scale graduations shall be no less than 1°. The graduation marks for every 5° shall be longer than those for each degree. In the case of wide-angle indicators, with angles of 70° or greater, the graduations may be 2°. In the case of a 2° scale, the graduation line shall be made longer than other scales for every 10° scale.

c) The pointer of the indicator shall be capable of being adjusted to zero.

d) The letters and graduations for angles to port on the dial shall be clearly distinguishable from those for angles to starboard.

e) All illumination and lighting of the indicator shall be adjustable down to zero, except the control of the dimmers which shall remain readable.

f) The illumination and lighting of the indicators shall be arranged so as not to obstruct an operator's vision at night, and to make the scale, pointer and letters as equally visible as possible even in dim light or the dark.

4.4 Alert

If the equipment is capable of raising an alert, it shall comply with MSC.302(87), IEC 62923-1 and IEC 62923-2.

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