

INTERNATIONAL
STANDARD

ISO
25862

Second edition
2019-07

**Ships and marine technology —
Marine magnetic compasses, binnacles
and azimuth reading devices**

*Navires et structures maritimes — Compas magnétiques marins,
habitacles et alidades*



Reference number
ISO 25862:2019(E)

© ISO 2019



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Magnetic compasses	2
4.1 General	2
4.1.1 Class A magnetic compass	2
4.1.2 Class B magnetic compass	2
4.2 Construction and materials	3
4.2.1 Magnetic material	3
4.2.2 Lubber mark	3
4.2.3 Position of the card (class A only)	3
4.2.4 Angle of gimbal axes and intersection of vertical planes passing through them	3
4.2.5 Thickness of the top glass cover (class A only)	3
4.2.6 Constructional condition within the temperature range	3
4.2.7 Horizontal position	4
4.3 Mounting	4
4.3.1 Tilt of supporting device	4
4.3.2 Freedom of the compass card with no supporting gimbal	4
4.4 Directional system	4
4.4.1 Moment of inertia	4
4.4.2 Suspension (class A only)	4
4.4.3 Magnetic moment	4
4.4.4 Settling time	5
4.4.5 Tilt of the directional system with regard to the vertical field (class A only)	5
4.4.6 Supporting force (class A only)	6
4.5 Compass card	6
4.5.1 Graduation	6
4.5.2 Diameter of the card	6
4.5.3 Readability	6
4.5.4 Bearing compasses	7
4.6 Accuracy	7
4.6.1 Directional error	7
4.6.2 Error of lubber marks	7
4.6.3 Error due to friction	7
4.6.4 Swirl error	8
4.6.5 Induction error (class A only)	8
4.6.6 Mounting error of azimuth reading device	8
4.6.7 Error due to eccentricity of the verge ring (class A only)	8
4.7 Environmental conditions tests of magnetic compasses (class A only)	8
5 Binnacles	9
5.1 General	9
5.2 Binnacle type A1	9
5.2.1 General	9
5.2.2 Construction and materials	9
5.2.3 Provision for correction of deviation (if combined with class B compasses)	9
5.2.4 Accuracy of fore and aft marks	11
5.2.5 Illumination	11
5.2.6 Environmental conditions requirements (class A only)	11
5.3 Binnacle type A2	11
5.3.1 General	11
5.3.2 Construction and materials	11
5.3.3 Provision for correction of deviation	11

5.3.4	Accuracy of fore and aft marks	12
5.3.5	Illumination.....	13
5.3.6	Environmental conditions requirements (class A only).....	13
6	Azimuth reading devices	13
6.1	General.....	13
6.2	Azimuth sight.....	13
6.3	Azimuth reading devices with vanes	13
6.4	Level.....	13
7	Marking	13
8	Designation	14
Annex A (normative) Testing and certification of marine magnetic compasses, binnacles and azimuth reading devices — General requirements		15
Annex B (normative) Testing and certification of marine magnetic compasses		17
Annex C (normative) Testing and certification of azimuth reading devices		27
Annex D (normative) Type-testing and certification of binnacles		32
Annex E (normative) Positioning of magnetic compasses in ships		40
Annex F (normative) Determination of safe distances		45
Annex G (normative) Adjustment of magnetic compass deviation		46
Annex H (normative) Requirements of magnetic compass for lifeboats/rescue boats		48
Bibliography		49

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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 25862:2009), which has been technically revised.

The main changes compared to the previous edition are as follows:

- [Clause 1](#): an overview of the annexes was added.
- [Clause 2](#): moved IMO Resolution A. 382 (X) to the Bibliography.
- [Clause 3](#): [3.4](#) and [3.5](#) were added.
- [Clause 4](#): [4.1](#) was added. The temperature range of Class B magnetic compasses was changed to “-30 °C to +60 °C” ([4.2.6](#)). The magnetic moment of Class B magnetic compasses was added to [Figure 1](#). [Table 2](#) was updated (Equal interval of the graduation of Class B magnetic compasses was changed to “1°, 2°, 2,5° or 5°”. Card numbered of Class B magnetic compasses was changed to “Every 30° or every 10°”) and [4.7](#) was updated.
- [Clause 5](#): [5.1](#), [5.2.1](#), and [5.3.1](#) were added. [5.2.6](#) and [5.3.6](#) were updated.
- [Clause 6](#): [6.1](#) was added.
- [Annex D](#): [D.2.4.1](#) and [D.2.6.1](#) were added.
- [Annex H](#): [H.2.1](#) was added.
- Bibliography: IMO Resolution A. 382 (X) and EN 166 were added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Ships and marine technology — Marine magnetic compasses, binnacles and azimuth reading devices

1 Scope

This document specifies requirements for the construction and performance of marine magnetic compasses for navigation and steering purposes, binnacles and azimuth reading devices.

Two types of binnacle are specified; the appropriate type for a given vessel is determined by the design of the ship (see [Clause 5](#)).

This document applies to liquid-filled magnetic compasses:

- intended for use in ship's navigation and steering in sea navigation;
- having a direct reading system; and
- which can be of the reflecting, projecting or transmitting types.

In the context of this document, a magnetic compass is an instrument consisting of a directional system supported by a single pivot inside a bowl that is completely filled with liquid and supported by gimbals inside or outside the bowl. However, this document also addresses compasses without gimbals; the requirements relating to gimbals do not apply to such compasses.

This document applies to magnetic compasses carried on board:

- a) all ships required to carry a standard compass as per SOLAS Chapter V, the Class A magnetic compass;
- b) lifeboats and rescue boats as per the IMO Lifesaving Appliances (LSA) Code, fitted with the Class B magnetic compass; and
- c) all ships to which a) and b) above do not apply, but which are fitted with a Class A or B magnetic compass.

This document does not apply to:

- a) dry card compasses;
- b) types of compass designed on principles different from those stated above or not complying with the descriptions given; or
- c) hand bearing compasses.

The requirements for the testing and certification of marine magnetic compasses, azimuth reading devices and binnacles are given in [Annexes A, B, C, and D](#). The requirements for the positioning in ships, the determination of safe distances and the deviation adjustment of compasses are given in [Annexes E, F and G](#), respectively. The special requirements of the magnetic compass for lifeboats/rescue boats are given in [Annex H](#).

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.

ISO 1069, *Magnetic compasses and binnacles for sea navigation — Vocabulary*