
**Ships and marine technology —
Positioning of magnetic compasses in
ships**

*Navires et technologie maritime — Emplacement des compas magnétiques
à bord des navires*

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ISO 694:2000

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 694 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 6, *Navigation*.

This first edition of ISO 694 cancels and replaces ISO Recommendation ISO/R 694:1968. In this International Standard only one method for the determination of safe distances is prescribed instead of the two methods in the Recommendation. Some values of minimum distances from the ship's iron have been changed.

Annex A forms a normative part of this International Standard.

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Introduction

The following elements produce magnetic fields which act on the magnetic compass and cause errors (deviations): the steel parts of the ship's construction, electric currents, electric and magnetic equipment of the ship which is installed in the vicinity of the magnetic compass, such as radar, echo sounder, etc.

To minimize these errors, the distances of the sources of magnetic disturbant fields from the magnetic compass should be as large as possible. This International Standard defines and prescribes the minimum distances to be respected.

Moreover, the method for determination of safe distances of electric and magnetic equipment from the magnetic compass is described.

In order to obtain satisfactory and durable compensation of compasses, this International Standard should be taken into consideration during the design stage of a ship.

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Ships and marine technology — Positioning of magnetic compasses in ships

1 Scope

This International Standard specifies the installation in ships of magnetic compasses and binnacles complying with the requirements of ISO 449, ISO 613, ISO 2269 and ISO 10316.

In addition, it covers magnetic control elements used in navigational aids.

It should be noted that this International Standard is established only for general purposes. It is not necessarily applicable to all sea-going ships.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 449:1997, *Ships and marine technology — Magnetic compasses, binnacles and azimuth reading devices — Class A*.

ISO 613:1999, *Ships and marine technology — Magnetic compasses, binnacles and azimuth reading devices — Class B*.

ISO 1069:1973, *Magnetic compasses and binnacles for sea navigation — Vocabulary*.

ISO 2269:1992, *Shipbuilding — Class A magnetic compasses, azimuth reading devices and binnacles — Tests and certification*.

ISO 10316:1990, *Shipbuilding — Class B magnetic compasses — Tests and certification*.

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 1069 and the following apply.

3.1

magnetic control sensor

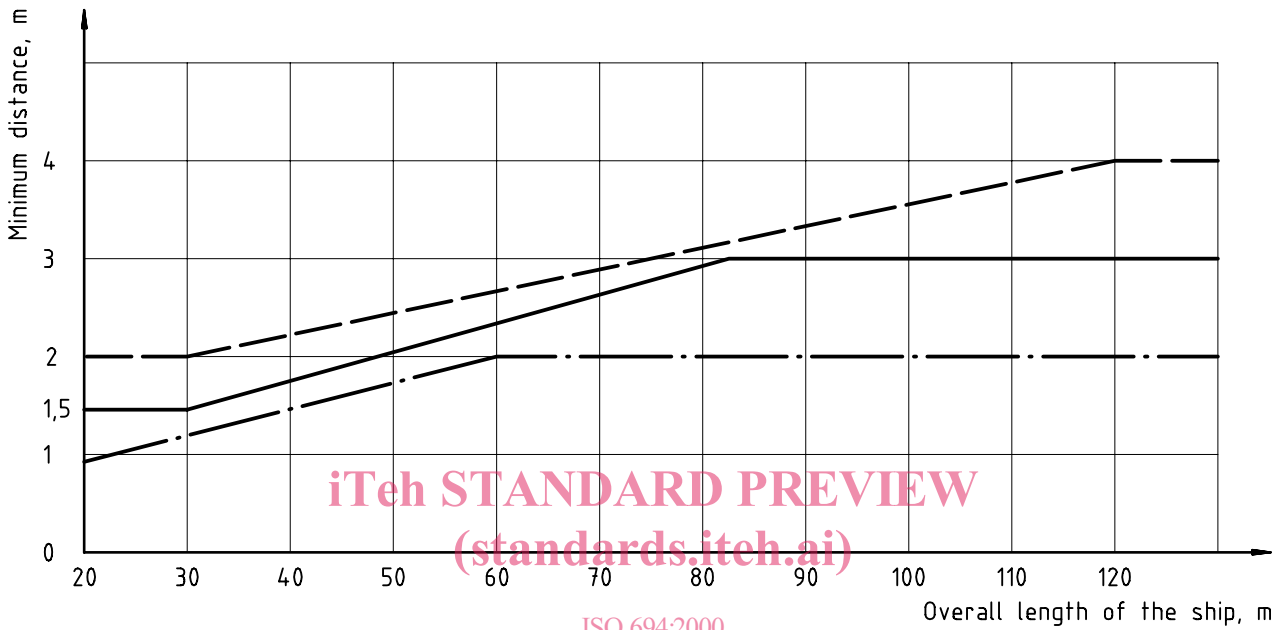
sensor using the geomagnetic field for feeding an automatic heading-control system, or controlling an off-course alarm unit, or feeding other devices

3.2 safe distance

distance measured between the nearest point of the item concerned and the centre of the compass, as determined in annex A

3.3 minimum distance

distance measured between the nearest point of magnetic material which is part of the ship's structure and the centre of the compass, shown in Figure 1



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Key

Type of magnetic material	Ships in which a standard compass is prescribed	Fishing vessels and ships designed for restricted service
Uninterrupted fixed magnetic material (except horizontal deck)	—————	— · — · — · —
End parts of fixed magnetic material, such as top edges of walls, partitions and bulkheads, extremities of frames, girders, stanchions, beams, pillars and similar steel parts. Magnetic material subject to movement at sea such as davits, ventilators, steel doors, etc. Large masses of magnetic material with variable fields such as funnels ^a .	— · — · — · —	— · — · — · —

^a "Funnel" is understood to mean that part of the funnel uptake or exhaust pipe which is liable to heating. The funnel casing may be regarded as fixed magnetic material.

NOTE For the minimum distance from steering and other compasses, see clause 5.

Figure 1 — Minimum distance from the standard magnetic compass

4 General

4.1 Compass positions

The specifications governing the minimum distances of a compass from magnetic material take into consideration the accuracy required of that compass for normal navigation.

The magnetic compass shall be positioned in the centre of the ship. Only in exceptional cases is a deviation from this requirement acceptable.

4.2 Safe distances

Safe distances from the magnetic compass are prescribed for magnetic and electrical equipment. They are defined as the minimum distances considered necessary for any of these items in order to eliminate or greatly reduce the magnetic fields acting on the magnetic compass and causing it to deviate.

4.3 Accuracy of magnetic compasses

The reliability and accuracy of magnetic compasses are dependent to a great extent on their position in the ship and on the proximity of magnetic and electrical equipment in relation to that position. Varying degrees of reliability and accuracy are, however, permitted, dependent on the function the compass has to perform and the overall length of the ship in which it is installed.

4.4 Functions of magnetic compasses

4.4.1 Magnetic compasses are classified according to the functions they are intended to perform in ships. In the following description of the function of the standard magnetic compass, no account has been taken of the possible fitting of one or more gyro-compasses in the ship. The fitting of a gyro-compass shall not be taken as a reason for reducing in any way the accuracy to be expected from the ship's standard magnetic compass, which is the primary means of navigating a ship.

4.4.2 The standard magnetic compass shall be sited in the vicinity of the position from which the ship is ordinarily navigated and the view of the horizon from this position shall be as uninterrupted as possible, for the purpose of taking bearings. In the sector from right ahead to 115° on either side, the view of the horizon may be interrupted only by masts, derrick posts, cranes and similar obstructions.

4.4.3 If the standard compass sited on the wheelhouse top is of the projector or reflector type, thus providing the heading information clearly readable by the helmsman at the main steering position, it also acts as the steering compass.

4.4.4 An example of a stand-by steering compass is a steering compass fitted in a ship's wheelhouse where the reflected or projected image of the standard compass is available and principally used for steering.

An emergency compass is one fitted for the purpose of conning or steering the ship after damage or breakdown of all other means of doing so.

4.4.5 Magnetic control sensors are not used for any of the purposes defined in 4.4.2, 4.4.3 and 4.4.4.

5 Minimum distance requirements concerning the ship's structure

5.1 The standard compass shall be so positioned that it complies with the minimum distance requirements for magnetic material which may be regarded as part of the ship's structure, as indicated in Figure 1. Any magnetic material in the vicinity of the compass but outside the minimum distances (see Figure 1) should be disposed symmetrically relative to the compass.