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## Small craft — Carbon monoxide (CO) detection systems and alarms

*Petits navires — Systèmes de détection et d'alarme du monoxyde de carbone (CO)*



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Published in Switzerland

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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.

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](http://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](http://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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 188, *Small craft*.

This second edition cancels and replaces the first edition (ISO 12133:2011), which has been technically revised.

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

- in [Clause 2](#) and throughout the text, dates to normative references have been added;
- in [Clause 3](#), definitions have been updated;
- in [5.1.5](#), a low battery alarm requirement has been added;
- [5.2.3](#), design operating temperature range, has been added;
- requirements have been clarified in [5.3.2](#);
- [5.3.3](#) has been updated to require CO detectors without self-contained batteries to be connected to the continuously energized side of the battery switch;
- in [6.3](#), marking requirements have been added;
- in [Figure 1](#) (beta curve chart) the 30 ppm line reference has been updated;
- in [Figure 1](#), the Key has been updated;
- in [Annex A](#), the other factors during boat operation that can affect carbon monoxide concentration have been clarified;
- EN 50291 has been moved to the Bibliography.

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](http://www.iso.org/members.html).

# Small craft — Carbon monoxide (CO) detection systems and alarms

## 1 Scope

This document specifies requirements for the design, construction and installation of carbon monoxide detection and alarm systems in small craft.

[Annex A](#) provides essential educational material about carbon monoxide relative to small craft, and recreational boating recommendations.

## 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 13297:2020, *Small craft — Electrical systems — Alternating and direct current installations*

IEC 60529:2013/Corr1:2019, *Degrees of protection provided by enclosures (IP Code)*

## 3 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

#### **carbon monoxide**

#### **CO**

gas formed by the combination of one atom of carbon and one atom of oxygen

Note 1 to entry: In its chemical formula, C stands for carbon and O for oxygen. For the purposes of this document, the CO level is always expressed in terms of mass fraction of CO in air.

### 3.2

#### **carboxyhaemoglobin**

#### **COHb**

compound formed when *carbon monoxide* (3.1) combines with haemoglobin

### 3.3

#### **% COHb**

degree to which the oxygen carrying capacity of blood is impeded by the union of *carbon monoxide* (3.1) to the haemoglobin in blood, expressed as a percentage

### 3.4

#### **enclosed accommodation compartment**

contiguous space, surrounded by permanent structure, that contains all of the following:

- a) designated sleeping accommodations,