INTERNATIONAL STANDARD

ISO 16180

First edition
2013-03-01

Small craft — Navigation lights — Installation, placement and visibility

Petits navires — Feux de navigation — Installation, positionnement et visibilité

Reference number
ISO 16180:2013(E)

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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ISO 16180 was prepared by Technical Committee ISO/TC 188, *Small craft*.

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Small craft — Navigation lights — Installation, placement and visibility

1 Scope

This International Standard specifies requirements and gives guidelines for the placement, installation and visibility of navigation lights as described in COLREG for recreational craft of less than 24 m in length of hull, as described in ISO 8666. Annex A lists additional information to be included in the owner's manual.

NOTE Other national regulations may apply for craft on certain waters.

2 Normative references

The following referenced documents are indispensable for the application 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 8666, *Small craft — Principal data*

ISO 10133, *Small craft — Electrical systems — Extra-low-voltage d.c. installations*

ISO 10240, *Small craft — Owner's manual*

ISO 13297, *Small craft — Electrical systems — Alternating current installations*

The Convention on the International Regulations for Preventing Collisions at Sea, 1972, as amended (COLREG)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8666 and the following apply.

3.1
navigation light
coloured source of illumination on recreational craft used to signal a craft's position, heading, and status

Note 1 to entry: The International Maritime Organization (IMO) has clarified the use of "lantern," as in "combined lantern," and "light," as in "sidelight," as being the same. "Light" and "lantern," in this context, are the same and interchangeable with the term "navigation light", and refers to the whole assembly and all of its parts.

3.2
all-round light
unbroken light over an arc of the horizon of 360°

3.3
combination sidelight
single navigation light where sidelights are combined into one lantern showing green to starboard and red to port from straight ahead to 22,5° abaft the beam (90° + 22, 5° = 112,5°) on their respective sides carried on the fore and aft centre line

3.4
masthead light
white light placed over the fore and aft centreline showing an unbroken light over an arc of the horizon of 225°, fixed to show the light from straight ahead to 22,5° abaft the beam (90° + 22,5° = 112,5°) on either side of the craft

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3.5
sidelight
starboard sidelight showing green, and the port sidelight showing red, from straight ahead to 22,5° abaft the beam (90° + 22,5° = 112,5°) on their respective sides

3.6
stern light
white light placed as close as possible to the stern showing an unbroken light over an arc of the horizon of 135°, and fixed to show the light 67,5° from straight aft on each side of the craft

3.7
tricolour light
single navigation light where sidelights and a stern light are combined in a single lantern carried at or near the top of a mast where it can best be seen

Note 1 to entry: A tricolour light may only be displayed by a sailing craft of less than 20 m in length of hull that is underway under sail alone.

4 Placement, installation and visibility of navigation lights

4.1 General

COLREG requirements specify the type and placement of navigation lights. National governments may determine that a craft of any special construction which flies its flag, and which cannot comply with these requirements with respect to number, position, range or arc of visibility, shall comply with other provisions determined to be the closest possible compliance with this International Standard.

The construction and installation of lights shall be approved by the state whose flag the craft is entitled to fly.

4.2 Placement

4.2.1 Navigation lights shall comply with the positioning and technical requirements of COLREG with regard to the distances from which various lights are visible, where each light is to be placed on a craft, the arcs of visibility, and chromaticity.

4.2.2 Navigation lights shall be visible under normal operating trim conditions.

4.2.3 Navigation lights shall not be obscured by fixed structures or optional equipment under normal operating conditions.

NOTE In accordance with the COLREG, all-round lights may not be obscured by masts, topmasts, or structure's angular sectors of more than 6°, except anchor lights, which need not be placed at an impracticable height above the hull. This may require the fitting of more than one all-round light if there is an obstruction of greater than 6° of arc.

4.2.4 Navigation lights shall be mounted to prevent the lights from shining into the operators' eyes. This applies when the operator is in the normal operating position and shall prevent reflection of a craft's structure within the operator's field of vision.

4.2.5 Navigation lights shall be mounted to ensure that the light shows over the required arcs of visibility, and shall satisfy the required vertical separation and location requirements when the craft is in the fully loaded, ready-to-use condition as specified in ISO 8666, with special consideration given for normal operating trim angle when underway.

4.2.6 All craft for which navigation lights are provided shall incorporate a provision for displaying an anchor light. When in use, one operation, such as one switch or one position of a multiple position switch, shall display the complete navigation light configuration as required for the craft while underway. Another switch or switch position shall display the anchor light only.

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4.2.7 Navigation lights shall be mounted so as to minimize damage caused by contact with other objects under normal operating conditions.

4.3 Installation

4.3.1 Navigation lights shall be installed in accordance with the manufacturers' instructions.

4.3.2 Electric navigation lights shall be installed in accordance with ISO 10133 or ISO 13297, or an equivalent electrical safety standard. Conductors used for navigation light wiring shall be sized for no more than 3 % voltage drop.

NOTE ISO 10133 and ISO 13297 also specify instructions to be included with the owner's manual (ISO 10240) which should also be implemented for navigation lights.

4.3.3 If a metallic frame or enclosure in a direct current (dc) system has a current carrying connection, it shall be mounted on an electrically nonconductive surface and polarity of the electrical leads shall be observed.

4.4 Configuration — Minimum visibility and positioning requirements

4.4.1 General

The arrangements shown in the figures and the configurations recommended shall be followed as closely as the configuration of a particular craft will permit, but within the specifications of COLREG. If deviations from the recommendations are necessary, the locations selected shall be checked for compliance with COLREG.

NOTE Under certain operating conditions, light configurations in addition to those recommended might be required by COLREG, e.g. towing lights. Configurations for these conditions are not indicated in this International Standard.

4.4.2 Power driven craft (including sailing craft under power and sail) — Underway

4.4.2.1 General

Craft may choose to exhibit a second masthead light but are not obliged to do so. If two masthead lights are carried the aft one shall be at least 4,5 m vertically higher than the forward one and the horizontal distance between them shall not be less than one half of the length of the craft. The forward light shall be placed not more than one quarter of the length of the craft from the stem.

NOTE A craft under sail and power, or a sailing craft under power alone, for purposes of light configurations, is considered a power driven craft when underway.

Craft less than 7 m in length of hull and whose maximum speed does not exceed 7 knots may in lieu of the following subclauses exhibit an all-round white light. If sidelights are also carried then the all-round white light shall be 1 m higher than the sidelights.

4.4.2.2 Craft < 12 m in length of hull

4.4.2.2.1 The following configurations apply [see Figure 1 a)]:

a) separate sidelights, visible for at least one nautical mile; and

b) a masthead light as far forward as practicable, visible for at least two nautical miles, 1 m minimum above the sidelights; and

c) a stern light, visible for at least two nautical miles;

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OR

d) a combination sidelight, visible for at least one nautical mile, over the fore and aft centreline, and

e) a masthead light as far forward as practicable, visible for at least two nautical miles, 1 m minimum above the combination sidelight; and

f) a stern light, visible for at least two nautical miles;

OR

g) a combination sidelight, visible for at least one nautical mile, over the fore and aft centreline; and

h) a white, all-round light over the fore and aft centreline, visible for at least two nautical miles, 1 m minimum above the combination sidelight;

OR

i) separate sidelights, visible for at least one nautical mile; and

j) a white, all-round light over the fore and aft centreline, visible for at least two nautical miles, 1 m minimum above the combination sidelight.

4.4.2.2.2 The masthead light or all-round light for a power driven craft that is less than 12 m in length of hull may be displaced from the fore and aft centreline if centreline fitting is not practical, provided that the sidelights are combined into one lantern and are carried either on the fore and aft centreline of the craft or are located as close as possible to the same fore and aft line as the masthead light or all-round light.

4.4.2.2.3 Lights designed for a craft 12 m to less than 20 m in length of hull may be used on a craft under 12 m in length of hull.

4.4.2.3 Craft ≥ 12 m to < 20 m in length of hull

The following configurations apply [see Figure 1 b)]:

a) separate sidelights visible for at least two nautical miles, not higher than three quarters of the height that the masthead light is above the gunwale; and

b) a masthead light as far forward as practicable, visible for at least three nautical miles, placed over the fore and aft centreline of the craft at a minimum height of 2,5 m above the gunwale; and

c) a stern light visible for at least two nautical miles;

OR

d) a combination sidelight visible for at least two nautical miles, over the fore and aft centreline, not less than 1 m below the masthead light; and

e) a masthead light as far forward as practicable, visible for at least three nautical miles, placed over the fore and aft centreline of the craft, 2,5 m minimum above the gunwale; and

f) a stern light visible for at least two nautical miles.

4.4.2.4 Craft ≥ 20 m in length of hull

The following applies (see Figure 1):

a) separate sidelights visible for at least two nautical miles placed at or near the side of the craft not in front of the forward masthead light. Inboard matt black side screens shall be fitted to reach the practical cut-off between 1° and 3° outside the prescribed sector requirements;

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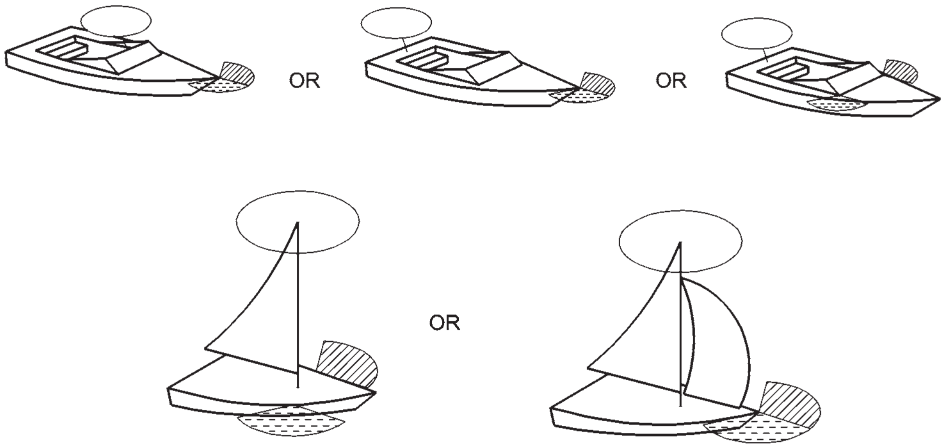
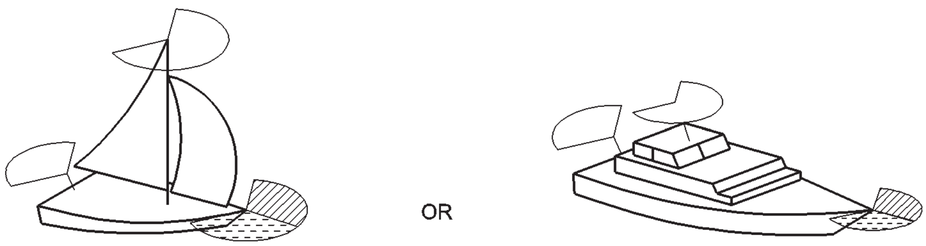
b) a masthead light visible for at least five nautical miles carried forward of amidships at a height above the hull of not less than 6 m, and, if the breadth of the craft exceeds 6 m, then at a height above the hull not less than such breadth, although this need not be placed at a height above the hull greater than 12 m; and

c) a stern light visible for at least two nautical miles.



a) Power driven craft less than 12 m in length of hull



b) Power driven craft less than 20 m in length of hull

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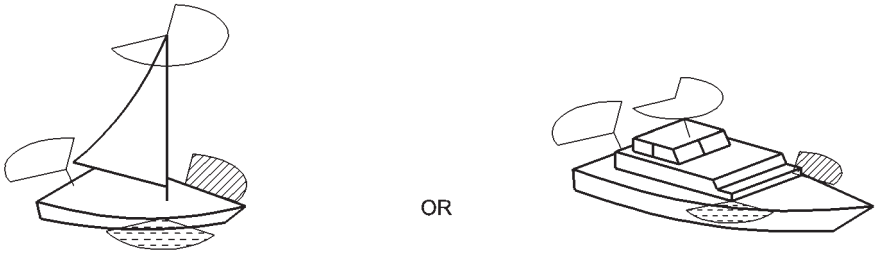

c) Power driven craft less than 24 m in length of hull

Key


Green


Red


White

Figure 1 — Power driven craft underway (including sailboats under power and sail)

4.4.3 Sailing craft — Underway under sail alone

4.4.3.1 General

A sailing craft under sail alone may exhibit where they can best be seen, two all-around lights in a vertical line, the upper being red and the lower green, in addition to the prescribed sidelights and stern light but not with a tricolour light.

Sailing craft under 7 m in length of hull may exhibit lights as prescribed for craft under 12 m in length of hull or shall have ready an electric torch or lantern showing a white light which shall be exhibited in time to prevent collision.

4.4.3.2 Sailing craft < 12 m in length of hull

The following configurations apply [see Figure 2 a) and 2 b)]:

a) separate sidelights visible for at least one nautical mile; and

b) a stern light visible for at least two nautical miles;

OR

c) a combination sidelight visible for at least one nautical mile, on the fore and aft centreline; and

d) a stern light visible for at least two nautical miles;

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OR

e) a tricolour light, the port and starboard sectors visible for at least one nautical mile, the stern sector visible for at least two nautical miles.

The tricolour light indicates a sailing craft that is under sail alone, and shall not be displayed when the craft is under power, or when under sail and power. Under these conditions, the configurations applicable to a power craft apply. Provision shall be made to display the two configurations separately, not simultaneously.

4.4.3.3 Sailing craft ≥ 12 m to < 20 m in length of hull

The following configurations apply [see Figure 2 a) and 2 b)]:

a) separate sidelights visible for at least two nautical miles; and

b) a stern light visible for at least two nautical miles;

OR

c) a combination sidelight visible for at least two nautical miles, placed over the fore and aft centreline; and;

d) a stern light visible for at least two nautical miles;

OR

e) a tri-colour light, all sectors visible for at least two nautical miles.

The tricolour light indicates a sailing craft that is under sail alone, and shall not be displayed when the craft is under power, or when under sail and power. Under these conditions, the configurations applicable to a power craft apply. Provision shall be made to display the two configurations separately, not simultaneously.

4.4.3.4 Sailing craft ≥ 20 m in length of hull

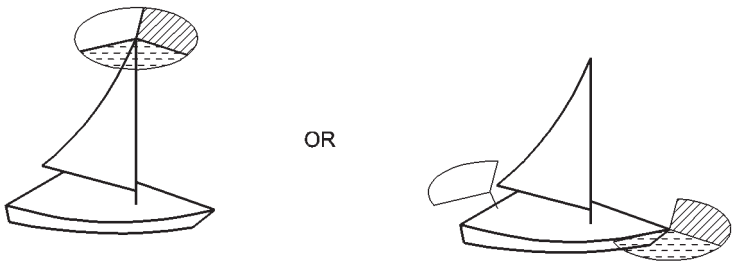
The following configuration applies [see Figure 2 b)]:

a) separate side lights visible for at least two nautical miles; and

b) stern light visible for at least two nautical miles.

4.4.4 Craft at anchor

Where it can best be seen, an all-round white light visible for at least two nautical miles.



a) Sailing craft less than 20 m in length of hull, under sail alone

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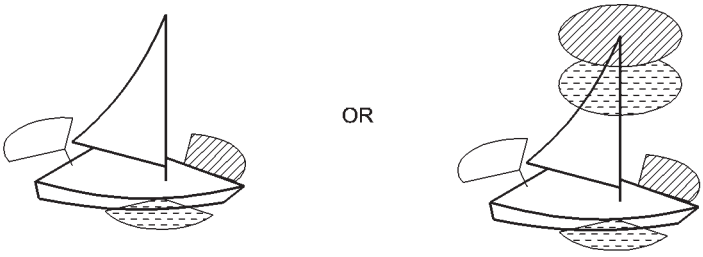

b) Sailing craft less than 24 m in length of hull, under sail alone

Key

Green

Red

White

Figure 2 — Sailing craft under sail alone

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Annex A
(normative)

Information and instructions to be included with owner's manual

A.1 The owner's manual shall be in accordance with ISO 10240 and shall include the following information:

a) diagram(s) identifying the electrical circuits of the craft with the location of navigation lights in the craft and identification of conductors by colour or other means;

b) location and description of functions of electrical controls, dials, switches, fuses and also circuit-breakers installed on the panel-board for the operation of the navigation lights;

c) details of replacement light sources:

d) access to navigation light fixtures.

A.2 The following advisory instructions shall be provided for the owner.

Never:

a) work on the electrical installation while the system is energized;

b) modify the craft's electrical system or relevant drawings. Installation, alterations and maintenance should be performed by a competent marine electrical technician;

c) alter or modify the rated current amperage of overcurrent protective devices;

d) install or replace electrical appliances or devices with components which exceed the rated current amperage of the circuit.

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