BS EN ISO 16315:2016

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BSI Standards Publication

Small craft — Electric propulsion system

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee GME/33, Small craft.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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BRITISH STANDARD

ICS 47.080

Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

Date	Text affected
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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 16315

April 2016

ICS 47.080

English Version

Small craft - Electric propulsion system (ISO 16315:2016, Corrected version 2021-11)

Petits navires - Système de propulsion électrique (ISO 16315:2016, Version corrigée 2021-11)

Kleine Wasserfahrzeuge - Elektrische Antriebssysteme (ISO 16315:2016, korrigierte Fassung 2021-11)

This European Standard was approved by CEN on 20 February 2016.

This European Standard was corrected and reissued by the CEN-CENELEC Management Centre on 22 December 2021.

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European foreword

This document (EN ISO 16315:2016) has been prepared by Technical Committee ISO/TC 188 "Small craft"

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2016, and conflicting national standards shall be withdrawn at the latest by October 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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Endorsement notice

The text of ISO 16315:2016, Corrected version 2021-11 has been approved by CEN as EN ISO 16315:2016 without any modification.

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Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of Directive 2013/53/EU

This European Standard has been prepared under a mandate given to CEN by the European Commission to provide one means of conforming to Essential Requirements of the New Approach Directive 2013/53/EU.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one member state, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and EU Directives

Clauses/sub-clauses of this European Standard	Corresponding annexes/ paragraphs of Directive 2013/53/EU	Comments
	Annex 1, Clause 5.3 – Electrical System	
2, 4, 5, 8, 9, 10	Electrical systems shall be designed and installed so as to ensure proper operation of the watercraft under normal conditions of use	The normative references in Clause 2 of this standard are indispensable for its application
4.1, 4.13, 6, 8.5, 8.6	Electrical systems shall be designed and installed so as to minimise risk of fire and electric shock	
4, 7	All electrical circuits, except engine starting circuits supplied from batteries, shall remain safe when exposed to overload	
4, 9, 10	Electric propulsion circuits shall not interact with other circuits in such a way that either would fail to operate as intended	
4.1, 8.5, Annex B(a)	Ventilation shall be provided to prevent the accumulation of explosive gases which might be emitted from batteries	
8.1	Batteries shall be firmly secured and protected from ingress of water	

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4.14, 5, Annex A	**Annex I, Clause 2.5 – Owner's Manual**	Clause 4.14, Figure 1 gives enclosure hazard markings Clause 5 provides information on system alerts and alarms to be included in the owner's manual Annex A provides information necessary for safe use of the product drawing particular attention to set up, maintenance, regular operation, the prevention of risks and risk management

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 188, *Small craft*, together with CEN/BT/WG 69, *Small craft* and IEC/TC 18, *Electrical installations of ships and of mobile and fixed offshore units*.

This corrected version of ISO 16315:2016 incorporates the following corrections:

— the missing IEC logo on the cover page has been added.

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Introduction

Electrical propulsion systems are becoming more common in recreational craft and other small craft and propulsion system voltages of up to AC 1 000 V and DC 1 500 V are possible together with variable speed drives operating at frequencies which differ from 50/60 Hz or DC.

Electric propulsion systems for small craft are generally designed and constructed from a number of component parts many of which can be of proprietary origin and all of the electrical and control items are interconnected by cables and operated as a system.

There are a significant number of electrical propulsion system architectures for small craft and the main types are the following.

— DC sourced. The main power source is a propulsion battery which is either recharged from on-board DC generators, or on-board AC generators/an AC shore supply through battery chargers. The electric propulsion system(s) may be variable speed through a DC motor controller or AC through a Variable Frequency Drive (VFD) or be fixed speed with a variable pitch propeller or other mechanical means of providing thrust. The electric propulsion system may be electrically separate from other electrical systems on board (e.g. be fully insulated via the motor controller, or be an AC IT system via a VFD or motor starter). Or the electrical propulsion system may be integrated with the whole craft DC electrical system using converters DC/DC, DC/AC to provide for different services/consumers.

— AC sourced. The main power source is AC generator(s) generally configured as TT, TN-C or TN-S. The electric propulsion system(s) may be DC variable speed through a AC/DC converter and DC motor controller, or AC through a VFD, or be fixed speed with a variable pitch propeller or other mechanical means of providing thrust. The electric propulsion system may be DC fully insulated system or be an AC IT system via a galvanically isolated VFD or via an isolating transformer. A DC propulsion system(s) may be supported by propulsion battery.

— Also possible are hybrid systems similar to the types being introduced for road vehicles where the source is an internal combustion engine providing, for example, energy to a relatively lightweight energy storage system with power take-off via converters to propulsion motor(s) and other electrical consumers.

It is essential that the electric propulsion system designer/installer be competent with all aspects of the equipment included in the design of a particular system such that the component parts of the propulsion system are integrated in a coherent and safe manner.

Current electrical standards for small craft of less than 24 m LH are the following:

a) ISO 10133 which is limited to recommendation for the design, construction and installation of direct current systems that operate at a voltage of DC 50 V or less; and

b) ISO 13297 which is limited to single phase alternating current electrical systems less than AC 250 V.

Neither of these standards includes requirements for electrical propulsion systems.

c) IEC 60092-507 is applicable to small craft up to 50 m/500 GT and includes requirements for three-phase systems not exceeding AC 500 V and single-phase systems not exceeding AC 250 V and for DC systems and sub-systems not exceeding DC 50 V nominal, and includes a section on electric propulsion systems.

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