



PRE-RELEASE VERSION (FDIS)

Electrical installations in ships – Part 101: Definitions and general requirements

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 01.040.47; 47.020.60

Warning! Make sure that you obtained this publication from an authorized distributor.



FINAL DRAFT INTERNATIONAL STANDARD (FDIS)

PROJECT NUMBER: IEC 60092-101 ED5	
DATE OF CIRCULATION: 2018-07-06	CLOSING DATE FOR VOTING: 2018-08-17
SUPERSEDES DOCUMENTS: 18/1473/CDV,18/1525A/RVC	

IEC TC 18 : ELECTRICAL INSTALLATIONS OF SHIPS AND OF MOBILE AND FIXED OFFSHORE UNITS	
SECRETARIAT: Norway	SECRETARY: Mr Arild Røed
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 1,TC 2,TC 8,SC 8A,SC 8B,TC 14,TC 17,SC 18A,TC 20,TC 21,TC 31,SC 31J,TC 44,TC 64,TC 65,SC 65A,SC 65B,SC 65C,SC 65E,TC 73,TC 77,SC 77A,SC 77B,SC 77C,TC 80,TC 120,TC 121,SC 121A,SC 121B	HORIZONTAL STANDARD: <input type="checkbox"/>
FUNCTIONS CONCERNED: <input checked="" type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input checked="" type="checkbox"/> SAFETY	
<input type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING	<input checked="" type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING

This document is a draft distributed for approval. It may not be referred to as an International Standard until published as such.

In addition to their evaluation as being acceptable for industrial, technological, commercial and user purposes, Final Draft International Standards may on occasion have to be considered in the light of their potential to become standards to which reference may be made in national regulations.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:
Electrical installations in ships - Part 101: Definitions and general requirements

PROPOSED STABILITY DATE: 2020

NOTE FROM TC/SC OFFICERS:

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	7
4 General requirements and conditions	13
4.1 General.....	13
4.2 Applicability of the IEC 60092 series to AC and DC	13
4.3 Acceptance of substitutes or alternatives	13
4.4 Provisions for maximum load	13
4.5 Additions and alterations.....	13
4.6 Environmental conditions	13
4.6.1 General	13
4.6.2 Mandatory condition limits	14
4.6.3 Design parameters	14
4.7 Materials.....	15
4.8 Power supply system characteristics.....	16
4.8.1 General	16
4.8.2 AC distribution systems	16
4.8.3 DC distribution systems	17
4.9 Electrical equipment for hazardous areas.....	17
4.10 Precautions necessary when electrical fittings, cables, etc., are attached to structures of conductive materials with different galvanic potential.....	18
4.11 Clearance and creepage distances	18
4.12 Insulation.....	18
4.13 Maintenance and inspection.....	18
4.14 Degrees of protection of enclosures.....	18
4.15 Cable entries	18
4.16 Precautions against vibration and mechanical shock.....	18
4.17 Position in ship	19
4.18 Mechanical protection	19
4.19 Protection from water, steam and oil.....	19
4.20 Protection against electrical shock.....	19
4.21 Axes of rotation.....	19
4.22 Magnetic compasses	20
4.23 Environmental impact.....	20
Annex A (informative) Guidance on environmental conditions	21
Bibliography.....	31
Figure A.1 – Model shock response spectra (first-order maximum shock response spectra)	30
Table 1 – Condition limits.....	14
Table 2 – Design parameters – Angular deviation and motion	15
Table 3 – Design parameters – Vibration	15

Table A.1 – Survey of environmental conditions related to locations	22
Table A.2 – Environmental condition guidance – Climatic conditions.....	23
Table A.3 – Environmental conditions guidance – Biological conditions	27
Table A.4 – Environmental conditions guidance – Conditions dependent on chemically and mechanically active substances	28
Table A.5 – Environmental condition guidance – Mechanical conditions.....	29

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL INSTALLATIONS IN SHIPS –

Part 101: Definitions and general requirements

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60092-101 has been prepared by IEC technical committee 18: Electrical installations of ships and of mobile and fixed offshore units.

This fifth edition cancels and replaces the fourth edition published in 1994 and Amendment 1:1995. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the applicability of the standard has been changed to 1 000 V AC and 1 500 V DC;
- b) the table for design temperature has been simplified;
- c) the clause regarding power supply system characteristics has been rewritten;
- d) information regarding pollution degree has been added in the clause regarding clearance and creepage distances;
- e) a clause regarding environmental impact has been added;

- f) the clause regarding classification test for materials has been deleted;
- g) the annex regarding flame-retardant test for cables has been deleted;
- h) the annex regarding test on bunched wires or cables under fire conditions has been deleted.

The text of this standard is based on the following documents:

FDIS	Report on voting
18/XXX/FDIS	18/XXX/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60092 series, published under the general title *Electrical installations in ships*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

The IEC 60092 series includes international standards for electrical installations in sea-going ships, incorporating good practice and coordinating, as far as possible, existing rules. These standards form a code of practical interpretation and amplification of the requirements of the International Convention for the Safety of Life at Sea, a guide for future regulations which may be prepared and a statement of practice for use by ship-owners, shipbuilders and appropriate organizations.

ELECTRICAL INSTALLATIONS IN SHIPS –

Part 101: Definitions and general requirements

1 Scope

This part of IEC 60092 is applicable to electrical installations for use in ships.

The definitions and general requirements given in this part are applicable, unless otherwise indicated, to other parts of the IEC 60092 series.

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.

IEC 60034-30-1, *Rotating electrical machines – Part 30-1: Efficiency classes of line operated AC motors (IE code)*

IEC 60079 (all parts), *Explosive atmosphere*

IEC 60092-201, *Electrical installations in ships – Part 201: System design – General*

IEC 60092-305, *Electrical installations in ships – Part 305: Equipment – Accumulator (storage) batteries*

IEC 60092-504, *Electrical installations in ships – Part 504: Automation, control and instrumentation*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60533, *Electrical and electronic installations in ships – Electromagnetic compatibility (EMC) – Ships with a metallic hull*

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60695-11-5, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

IEC 61439-1:2011, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*