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Electrical installations in ships - Part 301: Equipment - Generators and motors

FOREWORD

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IEC 60092-301 has been prepared by IEC technical committee 18: Electrical installations of ships and of mobile and fixed offshore units. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 1980, Amendment 1:1994 and Amendment 2:1995. This edition constitutes a technical revision.

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

a) services conditions were added;
b) IEC 60034-1:2022, has been considered.

The text of this International Standard is based on the following documents:

Draft	Report on voting
18/1980/FDIS	18/1987/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

The IEC 60092 series forms a series of International Standards for electrical installations in sea-going ships, incorporating good practice and co-ordinating as far as possible existing rules.

These Standards form a code of practical interpretation and amplification of the requirements of the International Convention on Safety of Life at Sea, a guide for future regulations which may be prepared and a statement of practice for use by shipowners, shipbuilders and appropriate organizations.

1 Scope

This part of IEC 60092 is applicable to all rotating electrical machines rated at 750 W or more for use in ships. It also applies to excitation machines and includes relevant requirements for prime mover driving generators.

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 (all parts), *Rotating electrical machines*

IEC 60034-1:2022, *Rotating electrical machines - Part 1: Rating and performance*

IEC 60092-101:2018, *Electrical installations in ships - Part 101: Definitions and general requirements*

IEC 60092-201:2019, *Electrical installations in ships - Part 201: System design - General*

IEC 60092-501, *Electrical installations in ships - Part 501: Special features - Electric propulsion plant*

IEC 60092-503, *Electrical installations in ships - Part 503: Special features - AC supply systems with voltages in the range of above 1 kV up to and including 36 kV*

ISO 21940-11, *Mechanical vibration - Rotor balancing - Part 11: Procedures and tolerances for rotors with rigid behaviour*

ISO 8528-5:2022, *Reciprocating internal combustion engine driven alternating current generating set*

3.2
bipolar DC system
system having two poles normally operating at DC voltages of opposite polarity in relation to earth

[SOURCE: IEC 60050-601:1985, 601-04-03, modified – Replaced "link" with "system".]

4 Service conditions

4.1 Inclination

Electric machines shall be designed for use at all inclinations specified in IEC 60092-101.

Rotating electrical machines above 500 kW shall be placed with their shaft parallel to the longitudinal axis of the ship.

Machines in vertical mounting are permissible with special consideration of vibrations and inclinations.

4.2 Vibration

Electric machines shall withstand the vibrations at the place of installation in accordance with requirements to vibrations specified in IEC 60092-101.

4.3 Ambient temperatures

Electric machines shall be designed to operate under ambient temperatures in accordance with IEC 60092-101.

5 General requirements

5.1 General

All electric machines shall comply with all the relevant requirements of IEC 60034 (all parts).

In addition, the following applies:

– Electric machines with a rated voltage from 1 kV AC up to and including 36 kV AC shall comply with IEC 60092-503.
– Generator and propulsion motor for ships with electric propulsion system shall comply with IEC 60092-501.

5.2 Electrical supply

For three-phase AC machines intended to be directly connected to the general distribution systems, in addition to the requirements in IEC 60034-1, the characteristic of the supply shall be in accordance with IEC 60092-101.

NOTE See IEC 60034-1:2022, 7.2.

5.3 Entry of water

Where water cooling is used, the cooler shall be so arranged as to avoid entry of water into the electric machine, whether by leakage or condensation in the heat-exchanger.

A leakage detector shall be considered where there is a risk of water intrusion.