

INTERNATIONAL STANDARD

IEC
61892-3

First edition
1999-02

Mobile and fixed offshore units – Electrical installations –

Part 3: Equipment

*Unités mobiles et fixes en mer –
Installations électriques –*

*Partie 3:
Matériel*

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Terminology, graphical and letter symbols

For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary (IEV)*.

For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams*.

* See web site address on title page.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MOBILE AND FIXED OFFSHORE UNITS –
ELECTRICAL INSTALLATIONS –

Part 3: Equipment

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61892-3 has been prepared by IEC technical committee 18: Electrical installations of ships and of mobile and fixed offshore units.

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

FDIS	Report on voting
18/859/FDIS	18/864/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.

Annex A is for information only.

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

IEC 61892 consists of the following parts, under the general title *Mobile and fixed offshore units – Electrical installations*

- Part 1: *General requirements and conditions*
- Part 2: *System design*
- Part 3: *Equipment*
- Part 4: *Cables*
- Part 5: *Mobile units*
- Part 6: *Installation*
- Part 7: *Hazardous areas*

INTRODUCTION

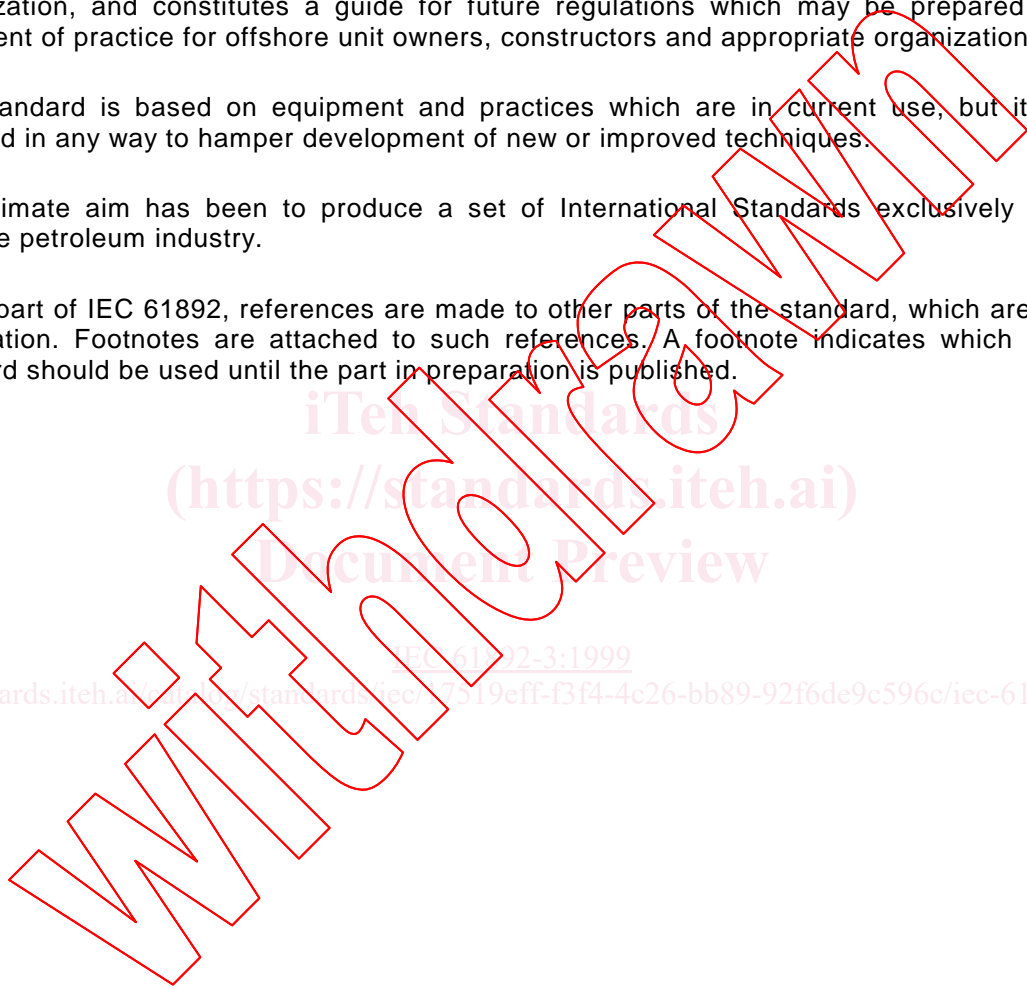
IEC 61892-3 forms part of a series of International Standards intended to ensure safety in the design, selection, installation, maintenance and use of electrical equipment for the generation, storage, distribution and utilization of electrical energy for all purposes in offshore units which are used for the purpose of exploration or exploitation of petroleum resources.

This standard also incorporates and co-ordinates, as far as possible, existing rules and forms a code of interpretation, where applicable, of the requirements of the International Maritime Organization, and constitutes a guide for future regulations which may be prepared and a statement of practice for offshore unit owners, constructors and appropriate organizations.

This standard is based on equipment and practices which are in current use, but it is not intended in any way to hamper development of new or improved techniques.

The ultimate aim has been to produce a set of International Standards exclusively for the offshore petroleum industry.

In this part of IEC 61892, references are made to other parts of the standard, which are still in preparation. Footnotes are attached to such references. A footnote indicates which current standard should be used until the part in preparation is published.



ITEH Standards
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MOBILE AND FIXED OFFSHORE UNITS – ELECTRICAL INSTALLATIONS – Part 3: Equipment

1 Scope

This part of IEC 61892 contains provisions for electrical equipment in electrical installations of mobile and fixed units, including pipelines, pumping or "pigging" stations, compressor stations and exposed location single-buoy moorings, used in the offshore petroleum industry for drilling, production, processing and for storage purposes.

It applies to equipment in all installations, whether permanent, temporary, transportable or hand-held, to a.c. installations up to and including 15 000 V and d.c. installations up to and including 1 000 V.

This standard does not apply to the electrical installations in rooms used for medical purposes or in tankers.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61892. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 61892 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60034-1:1996, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60044-1:1996, *Instrument transformers – Part 1: Current transformers*

IEC 60050(441):1984, *International Electrotechnical Vocabulary (IEV) – Chapter 441: Switchgear, controlgear and fuses*

IEC 60056:1987, *High-voltage alternating-current circuit-breakers*

IEC 60065:1998, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60076-1:1993, *Power transformers – Part 1: General*

IEC 60076-2:1993, *Power transformers – Part 2: Temperature rise*

IEC 60076-3:1980, *Power transformers – Part 3: Insulation levels and dielectric tests*

IEC 60076-3-1:1987, *Power transformers – Part 3: Insulation levels and dielectric tests – Section 1: External clearances in air*

IEC 60076-5:1976, *Power transformers – Part 5: Ability to withstand short-circuit*

IEC 60092-101:1994, *Electrical installations in ships – Part 101: Definitions and general requirements*

- IEC 60092-201:1994, *Electrical installations in ships – Part 201: System design – General*
- IEC 60092-401:1980, *Electrical installations in ships – Part 401: Installation and test of completed installation*
- IEC 60092-504:1994, *Electrical installations in ships – Part 504: Special features – Control and instrumentation*
- IEC 60092-505:1984, *Electrical installations in ships – Part 505: Special features – Mobile offshore drilling units*
- IEC 60146-1-1:1991, *Semiconductor convertors – General requirements and line commutated convertors – Part 1-1: Specifications of basic requirements*
- IEC 60146-1-2:1991, *Semiconductor convertors – General requirements and line commutated convertors – Part 1-2: Application guide*
- IEC 60146-1-3:1991, *Semiconductor convertors – General requirements and line commutated convertors – Part 1-3: Transformers and reactors*
- IEC 60146-2:1974, *Semiconductor convertors – Part 2: Semiconductor self-commutated convertors*
- IEC 60146-3:1977, *Semiconductor convertors – Part 3: Semiconductor direct d.c. convertors (d.c. chopper convertors)*
- IEC 60265-1:1998, *High-voltage switches – Part 1: High-voltage switches for rated voltages above 1 kV and less than 52 kV*
- IEC 60282 (all parts), *High-voltage fuses*
- IEC 60298:1990, *AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV*
- IEC 60309 (all parts), *Plugs, socket-outlets and couplers for industrial purposes*
- IEC 60364-4-41:1992, *Electrical installations of buildings – Part 4: Protection for safety – Chapter 41: Protection against electric shock*
- IEC 60439-1:1992, *Low-voltage switchgear and controlgear assemblies – Part 1: Type-tested and partially type-tested assemblies*
- IEC 60466:1987, *AC insulation-enclosed switchgear and controlgear for rated voltage above 1 kV and up to and including 38 kV*
- IEC 60519 (all parts), *Safety in electroheat installations*
- IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
- IEC 60533:1977, *Electromagnetic compatibility of electrical and electronic installations in ships*
- IEC 60617 (all parts), *Graphical symbols for diagrams*
- IEC 60669 (all parts), *Switches for household and similar fixed-electrical installations*

IEC 60865-1:1993, *Short-circuit currents – Calculation of effects – Part 1: Definitions and calculation methods*

IEC 60884 (all parts), *Plugs and socket-outlets for household and similar purposes*

IEC 60906 (all parts), *IEC system of plugs and socket-outlets for household and similar purposes*

IEC 61131 (all parts), *Programmable controllers*

IEC 61131-1:1992, *Programmable controllers – Part 1: General information*

IEC 61131-2:1992, *Programmable controllers – Part 2: Equipment requirements and tests*

IEC 61346-1:1996, *Industrial systems, installations and equipment, and industrial products – Structuring principles and reference designations – Part 1: Basic rules*

IEC 61363-1:1998, *Electrical installations of ships and mobile and fixed offshore units – Part 1: Procedures for calculating short-circuit currents in three-phase a.c.*

IEC 61892-6:1999, *Mobile and fixed offshore units – Electrical installations – Part 6: Installation*

IEC 61892-7:1997, *Mobile and fixed offshore units – Electrical installations – Part 7: Hazardous areas*

ISO 6592:1985, *Information processing – Guidelines for the documentation of computer-based application systems*

ISO 8528-5:1993, *Reciprocating internal combustion engine driven alternating current generating sets – Part 5: Generating sets*

3 Definitions

For the purpose of this part of IEC 61892, the following definitions apply.

3.1

computer-based system

system that consists of one or more programmable electronic devices with the connections, peripherals and software necessary to automatically carry out specified functions

NOTE – The following types of programmable devices could form part of a computer system: mainframe, mini-computer, micro-computer, programmable logic controller.

3.2

converter

a set of equipment, static or rotating, to convert one type of electric current to another type, different in nature, voltage and/or frequency

3.3

distribution board

switchgear or controlgear assembly for the control and distribution of electrical power to final subcircuits

3.4

double insulation

insulation comprising both basic insulation and supplementary insulation

3.5

electric surface heating

heat generated in the surface layer of a body to be heated by electrical means in order to raise or maintain its temperature

3.6

electric surface heating device

resistive or skin effect device designed to produce a defined output at a declared voltage and temperature, and terminated in a manner suitable for connection to the electricity supply

3.7

electric surface heating systems

system of electric surface heating devices together with any controls, thermal insulation and protective cladding designed to meet a specified electric surface heating requirement

3.8

electromagnetic compatibility (EMC)

ability of an equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment

3.9

emergency switchboard

switchgear and control gear assembly which is normally supplied by the main switchboard but which, in the event of failure of the main electrical power supply system, is directly supplied by the emergency source of electrical power or the transitional source of emergency power and is intended to distribute and control electrical energy to the emergency services for all electrical consumers essential to the safety of the crew, contractors, visitors and the unit under emergency conditions

3.10

expert system

intelligent knowledge-based system that is designed to solve a problem using information that has been compiled from some form of human expertise

3.11

extra-low voltage (safety voltage)

voltage which does not exceed 50 V a.c. r.m.s. between conductors, or between any conductor and earth, in a circuit isolated from the supply by means such as safety isolating transformers, or convertors with separate windings; a voltage which does not exceed 50 V d.c. between conductors, or between any conductor and earth, in a circuit which is isolated from higher voltage circuits.

NOTE 1 – Consideration should be given to the reduction of the limit of 50 V under certain conditions, such as wet surroundings, exposure to heavy seas or powerful water jets where direct contact with live parts is involved.

NOTE 2 – The voltage limit should not be exceeded, either at full load or no load, but it is assumed, for the purpose of this definition, that any transformer or convertor is operated at its rated supply voltage.

NOTE 3 – Information about protection by extra-low voltage is given in IEC 60364-4-41.

3.12**heating cable**

cable, with or without a shield or a metallic sheath, intended to give off heat for heating purposes

3.13**inverter**

converter for conversion from d.c. to a.c.

3.14**low-voltage switchgear and controlgear assemblies**

combination of one or more low-voltage switching devices together with associated control, measuring, signalling, protective, regulation equipment, etc., completely assembled under the responsibility of the manufacturer with all the internal electrical and mechanical inter-connections and structural parts

3.15**main switchboard**

switchgear and controlgear assembly which is directly supplied by the main source of electrical power and is intended to distribute and control electrical energy to the unit's services

3.16**non-type-tested low-voltage switchgear and controlgear assemblies (NTTA)**

low-voltage switchgear and controlgear assembly which does not belong to 3.17 or 3.28.

3.17**partially type-tested low-voltage switchgear and controlgear assemblies (PTTA)**

low-voltage switchgear and controlgear assembly, containing both type-tested and non-type-tested arrangements provided that the latter are derived (e.g. by calculation) from type-tested arrangements which have complied with the relevant tests

3.18**rectifier**

converter for conversion of a.c. to d.c.

3.19**reinforced insulation**

single insulation system applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation under the conditions specified in the relevant IEC standard.

NOTE – The term "insulation system" does not imply that the insulation must be one homogeneous piece. It may comprise several layers which cannot be tested singly as supplementary or basic insulation

3.20**resistive device**

electric surface heating device of either the trace heating unit type or the surface heating unit type

3.21**ripple-free**

conventionally defined for sinusoidal ripple voltage as a ripple content of not more than 10 % r.m.s.; the maximum peak value does not exceed 140 V for a nominal 120 V ripple-free d.c. system and 70 V for a nominal 60 V ripple-free d.c. system

3.22

(secondary) cell (*Syn.* (rechargeable) cell)

an assembly of electrodes and electrolyte which constitutes the basic unit of a secondary battery

3.23

section boards

switchgear and controlgear assembly for controlling and distributing the supply of electrical power to other section boards, distribution boards or final subcircuits

3.24

self-commutated convertor

convertor in which the commutating voltages are supplied by components within the convertor

NOTE – Included, for example, are converters in which the commutating voltages are built up within the semiconductor devices (as in transistors and in thyristors which can be turned off by the gate) or in which they are supplied outside the semiconductor devices by means of capacitors. Excluded are converters requiring special characteristics from the load to commute.

3.25

semiconductor device

device whose essential characteristics are due to the flow of charge carriers within a semiconductor

3.26

skin effect device

electric surface heating device of the skin effect heater type

3.27

software

program, procedures and associated documentation pertaining to the operation of a computer system and including both the application (user) program and the operating system (firmware) program

3.28

type-tested low-voltage switchgear and controlgear assembly (TTA)

low-voltage switchgear and controlgear assembly conforming to an established type or system without deviations likely to significantly influence the performance from the typical assembly verified to be in accordance with this standard

3.29

valve-regulated battery cell

a secondary cell which is closed under normal conditions but which has an arrangement which allows the escape of gas if the internal pressure exceeds a predetermined value. The cell cannot normally receive addition to the electrolyte

3.30

vented (secondary) battery cell (*Syn.* open (secondary) cell)

a secondary cell having a cover provided with an opening through which gaseous products may escape

NOTE – The opening may be fitted with a venting system.