

INTERNATIONAL STANDARD

**Mobile and fixed offshore units – Electrical installations –
Part 3: Equipment**

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IEC 61892-3:2007

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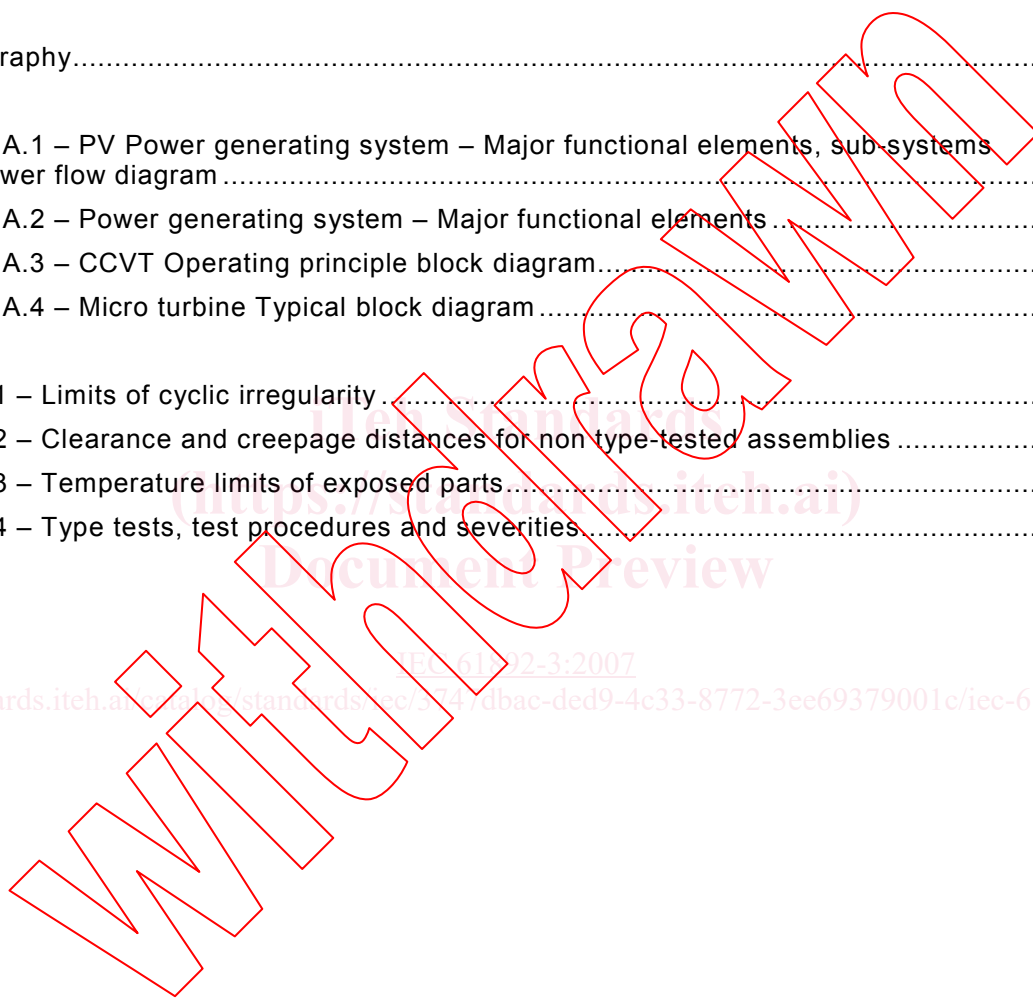
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CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references.....	8
3 Terms and definitions.....	10
4 General requirements.....	13
4.1 Degree of protection.....	13
4.2 Service conditions.....	13
4.3 Temperature rise.....	13
4.4 Nameplates and labels.....	13
5 Generators and motors.....	13
5.1 General.....	13
5.2 Voltage regulation of generators.....	14
5.3 Generators for special purposes.....	15
5.4 Parallel operation of general service generators – AC generators.....	15
5.5 Mechanical features (generators and motors).....	16
5.6 Lubrication (generators and motors).....	17
5.7 Prime movers.....	17
5.8 Cyclic irregularity.....	17
5.9 Lubrication (prime movers).....	18
5.10 Running speed.....	18
5.11 Testing.....	18
6 Transformers for power and lighting.....	18
6.1 General.....	18
6.2 Winding arrangement.....	18
6.3 Terminals.....	19
6.4 Cooling arrangement.....	19
6.5 Voltage regulation.....	19
6.6 Parallel operation.....	19
6.7 Tests.....	20
7 Switchgear and controlgear assemblies.....	20
7.1 Service conditions.....	20
7.2 Definitions.....	20
7.3 Low-voltage switchgear and controlgear assemblies.....	20
7.4 Switchgear and controlgear in the range above 1 kV up to and including 35 kV.....	25
7.5 Instruments for assemblies.....	26
8 Semiconductor convertors.....	28
8.1 General.....	28
8.2 Internal wiring.....	28
8.3 Cooling arrangements.....	28
8.4 Accessibility.....	28
8.5 Service conditions.....	29
8.6 Application.....	29
8.7 Diagrams.....	29

8.8	Convertor transformers.....	29
9	Secondary cells and batteries.....	30
9.1	General.....	30
9.2	Types of batteries.....	30
9.3	Charging facilities.....	30
9.4	Ventilation of secondary battery compartments	30
10	Luminaires	31
10.1	General.....	31
10.2	Construction.....	31
10.3	Temperature and temperature rise	31
10.4	Exposure to mechanical damage.....	31
10.5	Discharge lamp luminaires operating at voltages below 250 V.....	31
10.6	Discharge lamp luminaires operating at voltages above 250 V.....	32
10.7	Searchlights and arc lamps	32
10.8	Portable luminaires	32
11	Heating and cooking appliances	33
11.1	General.....	33
11.2	General requirements.....	33
11.3	Special requirements for galley appliances.....	35
11.4	Special requirements for space-heating appliances.....	35
12	Trace and surface heating.....	35
12.1	General.....	35
12.2	Construction.....	36
13	Communication.....	36
13.1	General.....	36
13.2	Safety requirements.....	36
13.3	External communication systems.....	36
13.4	Internal communication.....	36
13.5	Safety and maintenance.....	37
14	Underwater systems and appliances.....	37
14.1	General.....	37
14.2	Fixed diving systems.....	38
14.3	Temporary diving systems.....	38
15	Control and instrumentation.....	38
15.1	General.....	38
15.2	General requirements.....	38
15.3	Environmental and supply conditions and testing.....	38
15.4	Adjustments	46
15.5	Accessibility	46
15.6	Replacement.....	46
15.7	Non-interchangeability.....	46
15.8	Cooling air.....	47
15.9	Mechanical load on connectors.....	47
15.10	Mechanical features of cabinets	47
15.11	Shock and vibration absorbers	47
15.12	Internal wiring.....	47
15.13	Cable connections.....	47
15.14	Rodent protection	47

15.15	Sensors	47
15.16	Computer-based systems	48
16	Accessories	51
16.1	General	51
16.2	Enclosures	51
16.3	Switches	51
16.4	Socket outlets and plugs	51
Annex A (informative) Alternative method of power generation		53
Bibliography.....		59
Figure A.1 – PV Power generating system – Major functional elements, sub-systems and power flow diagram		54
Figure A.2 – Power generating system – Major functional elements		55
Figure A.3 – CCVT Operating principle block diagram.....		57
Figure A.4 – Micro turbine Typical block diagram		58
Table 1 – Limits of cyclic irregularity		18
Table 2 – Clearance and creepage distances for non type-tested assemblies		22
Table 3 – Temperature limits of exposed parts.....		34
Table 4 – Type tests, test procedures and severities.....		40



INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

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

This second edition cancels and replaces the first edition published in 1999. This edition constitutes a technical revision.

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

- a) the requirement to d.c. generators has been deleted;
- b) detailed requirements to testing of machines have been deleted. Reference is made to the IEC 60034 series;
- c) requirement to switchgear and controlgear has been rewritten, based on updated IEC 60439 and the IEC 62271 series;
- d) requirement to Control and instrumentation has been rewritten, based on updated IEC 60092-504.

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

FDIS	Report on voting
18/1064/FDIS	18/1070/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 of the IEC 61892 series, under the general title *Mobile and fixed offshore units – Electrical installations*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

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INTRODUCTION

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

This part of IEC 61892 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 Organisation, a guide for future regulations which may be prepared and a statement of practice for offshore unit owners, constructors and appropriate organisations.

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

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

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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 mobile and fixed offshore units including pipeline, pumping or 'pigging' stations, compressor stations and exposed location single buoy moorings, used in the offshore petroleum industry for drilling, processing and for storage purposes.

This standard applies to equipment in all installations, whether permanent, temporary, transportable or hand-held, to a.c. installations up to and including 35 000 V and d.c. installations up to and including 750 V (a.c. and d.c. voltages are nominal values).

This standard gives requirements to equipment, which is additional to the requirement given in the product standard for the relevant equipment.

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

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.

CISPR 16 (all parts), *Specification for radio disturbance and immunity measuring apparatus and methods*

IEC 60034 (all parts), *Rotating electrical machines*

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

IEC 60044-2:1997, *Instrument transformers – Part 2: Inductive voltage transformers*

IEC 60065:2001, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60068 (all parts) *Environmental testing*

IEC 60076 (all parts), *Power transformers*

IEC 60076-1:2000, *Power transformers – Part 1: General*

IEC 60076-5:2006, *Power transformers – Part 5: Ability to withstand short circuit*

IEC 60076-11:2004, *Power transformers – Part 11: Dry-type transformers*

IEC 60092 (all parts), *Electrical installations in ships*

IEC 60146-1-1:1991, *Semiconductor converters – General requirements and line commutated convertors – Part 1-1: Specifications of basic requirements*

IEC 60146-1-2:1991, *Semiconductor converters – General requirements and line commutated convertors – Part 1-2: Application guide*

IEC 60146-1-3:1991, *Semiconductor converters – General requirements and line commutated convertors – Part 1-3: Transformers and reactors*

IEC 60146-2:1999, *Semiconductor converters – Part 2: Self-commutated semiconductor convertors including direct d.c. convertors*

IEC 60282 (all parts), *High-voltage fuses*

IEC 60309 (all parts), *Plugs, socket-outlets and couplers for industrial purposes*

IEC 60331 (all parts), *Tests for electric cables under fire conditions – Circuit integrity*

IEC 60332-1-2:2004, *Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW premixed flame*

IEC 60439 (all parts), *Low-voltage switchgear and controlgear assemblies*

IEC 60439-1:2004, *Low-voltage switchgear and controlgear assemblies – Part 1: Type-tested and partially type-tested assemblies*

IEC 60529:2001, *Degrees of protection provided by enclosures (IP Code)*

IEC 60533:1999, *Electromagnetic compatibility – Electrical and electronic installations in ships*

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 60896-11:2002, *Stationary lead-acid batteries – Part 11: Vented types – General requirements and methods of tests*

IEC 60896-21:2004, *Stationary lead-acid batteries – Part 21: Valve regulated types – Methods of test*

IEC 60896-22:2004, *Stationary lead-acid batteries – Part 22: Valve regulated types – Requirements*

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

IEC 60945:2002, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

<https://www.standards.com> IEC 60947-3:1999, *Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*

IEC 61000-4-2:1995, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test¹*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-4:2004, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2005, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-6:2003, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields²*

IEC 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*

IEC 61097 (all parts), *Global maritime distress and safety system (GMDSS)*

IEC 61131 (all parts), *Programmable controllers*

¹ A consolidated edition (1.2), published in 2001, exists including IEC 61000-4-2 (1995), its Amendment 1 (1998) and its Amendment 2 (2000).

² A consolidated edition (2.2), published in 2006, exists including IEC 61000-4-2 (2003), its Amendment 1 (2004) and its Amendment 2 (2005).

IEC 61800 (all parts), *Adjustable speed electrical power drive systems*

IEC 61892-1, *Mobile and fixed offshore units – Electrical installations – Part 1: General requirements and conditions*

IEC 61892-2, *Mobile and fixed offshore units – Electrical installations – Part 2: System design*

IEC 61892-4, *Mobile and fixed offshore units – Electrical installations – Part 4: Cables*

IEC 61892-5, *Mobile and fixed offshore units – Electrical installations – Part 5: Mobile units*

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

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

IEC 62040 (all parts), *Uninterruptible power systems (UPS)*

IEC 62271 (all parts), *High-voltage switchgear and controlgear*

IEC 62271-100:2001, *High-voltage switchgear and controlgear – Part 100: High-voltage alternating-current circuit-breakers*

IEC 62271-102:2005, *High-voltage switchgear and controlgear – Part 102: Alternating-current disconnectors and earthing switches*

IEC 62271-200:2003, *High-voltage switchgear and controlgear – Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV*

IEC 62271-201, *High-voltage switchgear and controlgear – Part 201: AC insulation-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV*

ISO 6592:2000, *Information technology – Guidelines for the documentation of computer-based application systems*

IMO *Code of Safety for Diving Systems*

3 Terms and definitions

For the purposes of this document the terms and definitions given in IEC 61892-1 through IEC 61892-7 and the following apply:

3.1

appropriate authority

governmental body and/or classification society with whose rules a unit is required to comply

3.2

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.

3.3

convertor

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

3.4

distribution board

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

3.5

double insulation

insulation comprising both basic insulation and supplementary insulation

3.6**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

3.7**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

3.8**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

3.9**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

3.10**emergency switchboard**

switchgear and controlgear 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

3.11**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

3.12**extra-low voltage ELV**

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.

3.13**heating cable**

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

3.14**invertor**

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

3.15**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

3.16**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

3.17**non-type-tested low-voltage switchgear and controlgear assemblies NTTA**

low-voltage switchgear and controlgear assembly which does not belong to 3.18 or 3.27

3.18**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

3.19**rectifier**

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

3.20**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

3.21**resistive device**

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

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**semiconductor device**

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

3.25**skin effect device**

electric surface heating device of the skin effect heater type

3.26**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

3.27**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