

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Mobile and fixed offshore units – Electrical installations –
Part 1: General requirements and conditions**

**Unités mobiles et fixes en mer – Installations électriques –
Partie 1: Exigences générales et conditions**

IEC 61892-1:2015

<https://standards.iteh.ai/standards/iec/af620c64-f9ea-4432-980c-1ff552d40521/iec-61892-1-2015>



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**Mobile and fixed offshore units – Electrical installations –
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MOBILE AND FIXED OFFSHORE UNITS –
ELECTRICAL INSTALLATIONS –****Part 1: General requirements and conditions**

FOREWORD

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International Standard IEC 61892-1 has been prepared by IEC technical committee 18: Electrical installations of ships and of mobile and fixed offshore units.

This third edition cancels and replaces the second edition published in 2010. This edition constitutes a technical revision.

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

- a) The general requirement to harmonic distortion has been changed from IEC 61000-2-4 Class 2 to Class 1.
- b) The voltage tolerance for a DC system has been changed from $\pm 10\%$ to $+10\%$, -15% .
- c) Annex C (informative) regarding specification of surface treatment and protective painting system has been added.

The text of this standard based on the following documents:

CDV	Report on voting
18/1385/CDV	18/1449/RVC

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 can be found, under the general title *Mobile and fixed offshore units – Electrical installations*, 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 website 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- withdrawn,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
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INTRODUCTION

The IEC 61892 series of International Standards is intended to enable 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 part of the IEC 61892 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, 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 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 1: General requirements and conditions

1 Scope

This part of IEC 61892 contains provisions for electrical installations 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 storage purposes.

This International Standard applies to all installations, whether permanent, temporary, transportable or hand-held, to AC installations up to and including 35 000 V and DC installations up to and including 1 500 V (AC and DC voltages are nominal values).

This standard does not apply either to fixed equipment for medical purposes or to the electrical installations of tankers.

NOTE For medical rooms, IEC 60364-7-710 provides more information.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 60034-1:2010, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60079 (all parts), *Explosive atmospheres*

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

IEC 61000-2-4:2002, *Electromagnetic compatibility (EMC) – Part 2-4: Environment – Compatibility levels in industrial plants for low-frequency conducted disturbances*

IEC 61140, *Protection against electric shock – Common aspects for installation and equipment*

IEC 61892-2:2012, *Mobile and fixed offshore units – Electrical installations – Part 2: System design*

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*

International Convention for the Safety of Life at Sea (SOLAS):1974, Consolidated edition 2009

IMO MODU Code, *Code for the construction and equipment of mobile offshore drilling units*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE The terms and definitions included in this part are those having general application in the IEC 61892 series. Terms and definitions applying to particular apparatus or equipment are included in the other parts of IEC 61892.

3.1

appropriate authority

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

3.2

equipment

single apparatus or set of devices or apparatuses, or the set of main devices of an installation, or all devices necessary to perform a specific task

EXAMPLE Power transformer, measuring equipment.

[SOURCE IEC 60050-151:2001, 151-11-25, modified — The words “the equipment of a substation” has been removed from the example.]

3.3

apparatus

device or assembly of devices which can be used as an independent unit for specific functions

[SOURCE IEC 60050-151:2001, 151-11-22, modified — The note has been deleted.]

3.4

rooms with a controlled atmosphere

rooms where the temperature and humidity can be controlled within specified limits

3.5

degree of protection of enclosure

IP

numerical classification according to IEC 60529 preceded by the symbol IP applied to the enclosure of electrical apparatus to provide:

- protection of persons against contact with, or approach to, live parts and against contact with moving parts (other than smooth rotating shafts and the like) inside the enclosure,
- protection of the electrical apparatus against ingress of solid foreign objects, and
- where indicated by the classification, protection of the electrical apparatus against harmful ingress of water

Note 1 to entry: Explanation of the numerals used for classification of degree of protection is given in Tables A.1 and A.2.

[SOURCE IEC 60050-426:2008, 426-04-02, modified — Note 1 to entry has been added.]

3.6

distribution board

assembly containing different types of switchgear and controlgear associated with one or more outgoing electric circuits fed from one or more incoming electric circuits, together with terminals for the neutral and protective conductors, if required

[SOURCE IEC 60050-826:2004, 826-16-08, modified — The words “if required” have been added.]

3.7

earth

ground, US, CA

general mass of the metal structure or hull of the unit

3.8

earthed

connected to the general mass of the metal structure or hull of the unit in such a manner as will ensure at all times an immediate discharge of electrical energy without danger

3.9

essential services

services essential for the navigation, steering or manoeuvring of the mobile unit, or for the safety of human life, or for special characteristics of the unit (for example special services)

3.10

frequency

3.10.1

cyclic frequency variation

periodic deviation in frequency during normal operation such as might be caused by regularly repeated loading

$$\frac{\pm(f_{\max} - f_{\min}) \times 100}{2 f_{\text{nominal}}} \%$$

3.10.2

frequency tolerance

maximum departure from nominal frequency during normal operation conditions excluding transient and cyclic frequency variations

Note 1 to entry: Frequency tolerance is a steady state tolerance and includes variations caused by loads and governor characteristics. It also includes variations due to environmental conditions.

3.10.3

frequency transient

sudden change in frequency which goes outside the frequency tolerance limits and returns to and remains inside these limits within a specified recovery time after initiation of the disturbance (time range: seconds)

3.11

live part

conductor or conductive part intended to be energized in normal operation, including a neutral conductor, but by convention not a PEN conductor or PEM conductor or PEL conductor

Note 1 to entry: This concept does not necessarily imply a risk of electric shock.

[SOURCE IEC 60050-195:1998, 195-02-19]

3.12

PEN conductor

conductor combining the functions of both a protective earthing conductor and a neutral conductor

[SOURCE IEC 60050-195:1998, 195-02-12]

3.13

PEM conductor

conductor combining the functions of both a protective earthing conductor and a mid-point conductor

[SOURCE IEC 60050-195:1998, 195-02-13]

3.14

PEL conductor

conductor combining the functions of both a protective earthing conductor and a line conductor

[SOURCE IEC 60050-195:1998, 195-02-14]

3.15

petroleum

complex mixture of hydrocarbons that occurs in the earth in liquid or gaseous forms

3.16

point <wiring>

any termination of the fixed wiring intended for the attachment of a luminaire or for connecting to the supply of a current-using appliance

3.17

voltages

3.17.1

voltage tolerance

maximum departure from nominal user voltage during normal operating conditions, excluding transient and cyclic voltage variations

Note 1 to entry: Voltage tolerance is a steady state tolerance and includes voltage drop in cables and voltage regulator characteristics. It also includes variations due to environmental conditions.

3.17.2

voltage unbalance tolerance

difference between the highest and lowest phase to phase voltage

3.17.3

cyclic voltage variation

periodic voltage deviation (max. to min. r.m.s. values) of the nominal voltage, such as might be caused by regularly repeated loading

$$\frac{\pm(U_{\max} - U_{\min}) \times 100}{2U_{\text{nominal}}} \%$$

3.17.4

voltage transient

sudden change in voltage (excluding spikes) which goes outside the nominal voltage tolerance limits and returns to and remains inside these limits within a specified recovery time after the initiation of the disturbance (time range: seconds)

3.18

recovery time

3.18.1

voltage transient recovery time

time elapsed from exceeding the normal voltage tolerance until the voltage recovers and remains within the normal tolerance limits

3.18.2 frequency transient recovery time

time elapsed from exceeding the normal frequency tolerance until the frequency recovers and remains within the frequency tolerance limits

3.19 waveform

3.19.1 total harmonic distortion

THD

ratio of the r.m.s. value of the sum of all the harmonic components up to a specified order (recommended notation “*H*”) to the r.m.s. value of the fundamental component

$$\text{THD} = \sqrt{\sum_{h=2}^{h=H} \frac{(Q_h)^2}{(Q_1)^2}}$$

where

Q represents either current or voltage;

*Q*₁ is the r.m.s. value of the fundamental component;

h is the harmonic order;

*Q*_{*h*} is the r.m.s. value of the harmonic component of order *h*;

H is 50 for the purpose of the compatibility levels in this standard

Note 1 to entry: THD takes account of harmonics only. For the case where interharmonics are to be included, reference is made to A.3.1 of IEC 61000-2-4:2002.

Note 2 to entry: This note applies to the French language only.

[SOURCE IEC 61000-2-4:2002, 3.2.7, modified — Note 1 to entry is modified.]

3.19.2 single harmonic content

ratio of the effective r.m.s. value of the harmonic to the r.m.s. value of the fundamental expressed in per cent

4 General requirements and conditions

4.1 General

This clause contains conditions and requirements which are common to all equipment and installations in the IEC 61892 series.

Electrical installations in units shall be such that:

- essential services will be maintained under various emergency conditions;
- the safety of crew, contractors, visitors and unit will be ensured;
- the requirements with respect to safety in this standard are considered;
- the requirements of the International Convention for the Safety of Life at Sea (SOLAS) are met as far as applicable;
- the requirements of the IMO MODU Code are met as far as applicable.

For floating and mobile units, all machinery and equipment shall operate satisfactorily under the static and dynamic inclination limits according to IEC 61892-5.

The appropriate authority may have additional requirements which have to be complied with.

NOTE Emergency conditions are normally defined in the safety assessment of the installation.

4.2 Acceptance of substitutes or alternatives

Where in the IEC 61892 series any special type of equipment, construction, or arrangement is specified, the use of any other equipment, construction or arrangement is admissible, provided it is not less effective and reliable.

4.3 Additions and alterations

An addition or alteration, temporary or permanent, shall not be made to an existing installation until it has been ascertained that the ratings and the condition of existing accessories, conductors, switchgear, etc. affected, are adequate for the new situation.

Special attention is drawn to those factors affecting the existing system design such as current-carrying capacity, short-circuit level, voltage drop, harmonics, stability and proper discrimination of the protective devices.

4.4 Environmental conditions

4.4.1 General

Electrical equipment shall operate satisfactorily under various environmental conditions.

Environmental conditions are characterised by a number of variables:

- one set including mainly climatic conditions, biological conditions, conditions dependent upon chemically and mechanically active substances and mechanical conditions;
- another set dependent mainly upon locations in unit, operational patterns and transient conditions.

NOTE For further information regarding environmental conditions in conjunction with some selected locations, operational patterns and transient conditions, which are considered to be generally representative, see IEC 60721-3-6.

4.4.2 Design parameters

4.4.2.1 General

Design parameters based on environmental conditions applicable to certain types of equipment may be determined according to location. Where no data is available, Table 1 and Table 2 give recommended values.

In certain areas, e.g. arctic areas, lower temperatures than those given in the tables have to be taken into consideration. In certain areas, also a higher temperature than given in the tables has to be taken into consideration.

4.4.2.2 Temperature

For a specific project, the project documentation may give specific information regarding ambient temperature. In absence of such information, the following may be used:

In other parts of the IEC 61892 series, where no "high air temperature" has been specified as a design parameter for equipment, a value of 45 °C shall apply.

Where equipment is designed to operate with temperatures higher or lower than those stated in Table 1, permissible temperature rises may be reduced or increased accordingly.