IEC 61892-6

Edition 2.0 2007-11

INTERNATIONAL STANDARD

Withdrawn

Mobile and fixed offshore units – Electrical installations – Part 6: Installation

IEC 61892-6:2007(E)

Documents
Document Sharing Hub

Full document details: IEC 61892-6 2007

THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2007 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

- Catalogue of IEC publications: www.iec.ch/searchpub
The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, withdrawn and replaced publications.
- IEC Just Published: www.iec.ch/online_news/justpub
Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.
- Electropedia: www.electropedia.org
The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.
- Customer Service Centre: www.iec.ch/webstore/custserv
If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:

Email: csc@iec.ch
Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00

Withdrawn

Documents
Document Sharing Hub

Full document details: IEC 61892-6 2007

IEC 61892-6

Edition 2.0 2007-11

INTERNATIONAL STANDARD

withdrawn

Mobile and fixed offshore units – Electrical installations – Part 6: Installation

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE W

ICS 29.260.99; 47.020.60

ISBN 2-8318-9392-5

Documents
Document Sharing Hub

Full document details: IEC 61892-6 2007

CONTENTS

FOREWORD 5
INTRODUCTION 7

1 Scope 8
2 Normative references 8
3 Terms and definitions 9
4 Equipment earthing and bonding 10
4.1 General 10
4.2 Earthing of exposed conductive parts 11
4.3 Equipotential bonding 12
4.4 Bonding connections 12
4.5 Connections to the unit structure 12
4.6 Protection against galvanic corrosion 13
4.7 Metal coverings of cables 13
4.8 Cable racks and cable tray 14
4.9 Ductings of heating, ventilation, air-condition (HVAC) and vessels 14
5 Cables and wiring 15
5.1 General 15
5.2 Installation 15
5.3 Cable-runs 16
5.4 Cable cleating and strapping 16
5.5 Joints and tappings 16
5.6 Cable ends 16
5.7 Cable termination 17
5.8 Cable ladders and trays 18
5.9 Cables and wiring for interconnection of equipment 18
6 Generators and motors 19
6.1 General 19
6.2 Installation 19
7 Transformers 19
7.1 General 19
7.2 Installation and location 19
7.3 Isolation of windings 20
8 Switchgear and controlgear assemblies 20
8.1 General 20
8.2 Location 20
8.3 Insulating mats 20
8.4 Passageways in front of switchgear and controlgear assemblies 21
8.5 Space at the rear and passageways 21
8.6 Positions of section and distribution boards 21
9 Semiconductor converters 21
10 Secondary cells and batteries 21
10.1 Location 21
10.2 Access 23
10.3 Electrical installation in secondary battery compartments 23
10.4 Protection against corrosion 23

Withdrawn

AVA Documents
Document Sharing Hub

Full document details: IEC 61892-6 2007

10.5 Fixing and supports ... 23
10.6 Protection of circuits from secondary batteries ... 23
10.7 Additional requirements for valve regulated lead acid (VRLA) type batteries ... 24
10.8 Protection against electric shock ... 24
10.9 Identification labels or marking ... 24
11 Luminaires ... 25
11.1 General ... 25
11.2 Degree of protection and safety requirements ... 25
11.3 Discharge lighting of voltage above 250 V ... 25
11.4 Emergency and escape lighting ... 25
11.5 Navigation aid system ... 25
12 Heating and cooking appliances ... 26
12.1 Guarding of combustible materials ... 26
12.2 Position of controlgear and switchgear ... 26
12.3 Mounting of space-heating appliances ... 26
13 Trace and surface heating ... 26
13.1 General ... 26
13.2 Trace heating cables ... 26
13.3 Marking ... 27
13.4 Protection ... 27
13.5 Requirements for installation in hazardous areas ... 27
13.6 Mechanical protection ... 27
13.7 Junction boxes ... 27
14 Control and instrumentation ... 27
14.1 General ... 27
14.2 Layout ... 27
14.3 Labelling ... 27
14.4 Labels ... 28
14.5 Display colours ... 28
14.6 Protection against fluid leakage ... 28
14.7 Protection from condensation ... 28
14.8 Protection during installation period ... 28
14.9 Sensors ... 28
14.9.1 Location of sensors ... 28
14.9.2 Temperature sensors ... 28
14.9.3 Pressure sensors ... 28
14.9.4 Enclosure ... 28
14.9.5 Testing and calibration ... 29
14.10 Measurements and indications ... 29
14.10.1 Instrument similarity ... 29
14.10.2 Direction of scale values ... 29
14.10.3 Scale division ... 29
14.10.4 Automatic control sequence ... 29
14.10.5 Centralized control ... 29
14.11 Controls ... 29
14.11.1 Direction of motion ... 29
14.11.2 Control levers ... 29
14.11.3 Identification ... 30

Withdrawn

AVA Documents
Document Sharing Hub

Full document details: IEC 61892-6 2007

14.12 Alarm system 30
15 Communication 30
16 Lightning protection 30
16.1 General 30
16.2 Protection against primary structural damage 30
16.3 Air terminals 31
16.4 Down conductors 31
16.5 Protection against secondary damage 31
17 Test of completed installation 32
17.1 General 32
17.2 Inspections and tests 32
17.3 Insulation-testing instruments 32
17.4 Insulation resistance 33
17.4.1 Wiring 33
17.4.2 Generators and motors 33
17.4.3 Switchboards, section boards and distribution boards 33
17.5 Generators 34
17.6 Switchgear 34
17.7 Lighting, heating and galley equipment 34
17.8 Communication systems 34
17.9 Emergency and safety systems 34
17.10 Earthing 34
17.11 Voltage drop 34
17.12 Requirements of International Convention and regulations 34
18 Documentation 35
18.1 General 35
18.2 Equipment 35
18.3 Testing 35
18.4 Maintenance 35

Annex A (informative) Performance test 36

Bibliography 38

Table 1 – Sizes of protective-earthing (PE) conductors and earthing connections 14
Table 2 – Enclosure-gland type 17
Table 3 – Location of batteries versus charging current 22
Table 4 – Test voltages 33

Withdrawn

Documents
Document Sharing Hub

Full document details: IEC 61892-6 2007

INTERNATIONAL ELECTROTECHNICAL COMMISSION

MOBILE AND FIXED OFFSHORE UNITS – ELECTRICAL INSTALLATIONS –

Part 6: Installation

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 provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
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 61892-6 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) clauses regarding installation of cables have been added;
b) the clause regarding secondary cells and batteries have been modified to give requirements also to installation of valve regulated (VRLA) type batteries;
c) an informative annex regarding testing of installation has been added.

Withdrawn

AVA Documents Document Sharing Hub

Full document details: IEC 61892-6 2007

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

FDIS	Report on voting
18/1065/FDIS	18/1071/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.

Withdrawn

Documents
Document Sharing Hub

Full document details: IEC 61892-6 2007

INTRODUCTION

IEC 61892 forms 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 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 laid down by 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 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.

Withdrawn

Documents
Document Sharing Hub

Full document details: IEC 61892-6 2007

MOBILE AND FIXED OFFSHORE UNITS – ELECTRICAL INSTALLATIONS –

Part 6: Installation

Withdrawn

1 Scope

This part of IEC 61892 contains provisions for electrical installation 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.

It applies to 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 does not apply to 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.

IEC 60079-14:2002, *Electrical apparatus for explosive gas atmospheres – Part 14: Electrical installations in hazardous areas (other than mines)*

IEC 60447:2004, *Basic and safety principles for man-machine interface – Actuating principles*

IEC 60502-1:2004, *Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1,2 kV) up to 30 kV (U_m = 36 kV) – Part 1: Cables for rated voltages of 1 kV (U_m=1,2 kV) up to 3 kV (U_m = 3,6 kV)*

IEC 60502-2:2005, *Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m=1.2 kV) up to 30 kV (U_m = 36 kV) – Part 2: Cables for rated voltages from 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV)*

IEC 60623:2001, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Vented nickel-cadmium prismatic rechargeable single cells*

IEC 60825 (all parts), *Safety of laser products*

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

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 61892-3, *Mobile and fixed offshore units – Electrical installations – Part 3: Equipment*

AVA Documents
Document Sharing Hub

Full document details: IEC 61892-6 2007

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

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

ISO 8468:1990, *Ship's bridge layout and associated equipment – Requirements and guidelines*

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
bonding
connection of non-current-carrying parts to ensure continuity of electrical connection, or to equalize the potential between parts

3.3
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

3.4
electric surface heating system
system of electric surface heating devices together with any controls, thermal insulation and protective cladding designed to meet a specified electric surface heating requirement

3.5
emergency switchboard
switchgear and controlgear assembly which is normally supplied by the main switchboard but, 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 for the safety of the crew and the unit under emergency conditions

3.6
equipotential bonding
electrical connection putting various exposed conductive parts and extraneous conductive parts at a substantially equal potential

3.7
exposed conductive part
conductive part which can readily be touched and which is not normally alive, but which may become alive under fault conditions

NOTE Typical exposed conductive parts are walls of enclosures, operating handles, etc.

3.8
extraneous conductive part
conductive part not forming a part of the electrical installation and liable to propagate a potential, including earth potential

Withdrawn

AVA Documents Document Sharing Hub

Full document details: IEC 61892-6 2007

3.9
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

3.10
primary structural damage
damage which can result from lightning strike to units which do not provide a path of low resistance to earth for the passage of lightning currents, for example units of non-metallic construction or those having substantial non-metallic members

3.11
safety voltage (extra low 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 a safety isolating transformer, or converter 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 use of equipment operating at less than 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 converter is operated at its rated supply voltage.

3.12
secondary damage
damage to units or to their electrical installations, which can result as an indirect consequence of a lightning strike to a unit or to its immediate vicinity. A path to earth of low resistance may not prevent secondary damage, which may occur as a result of high values of induced, or resistance drop voltages produced by the passage of lightning currents

3.13
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

3.14
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.

3.15
gastight sealed (secondary) cell
a secondary cell which remains closed and does not release either gas or liquid when operated within the limits and temperature specified by the manufacturer. The cell may be equipped with a safety device to prevent dangerously high internal pressure. The cell does not require addition to the electrolyte and is designed to operate during its life in its original sealed state

4 Equipment earthing and bonding

4.1 General

4.1.1 This clause contains mainly provisions for earthing of exposed conductive parts and bonding of extraneous conductive parts, various other bonding connections and a table for sizes of earth-continuity conductors and earthing connections.

Withdrawn

AVA Documents
Document Sharing Hub

4.1.2 All metallic parts of a unit, that are not normally current-carrying parts, shall be designated as either an exposed conductive part or an extraneous conductive part.

a) Exposed conductive parts shall be connected to earth under the specific conditions for each type of system earthing:

– for TT- and IT-systems, the exposed conductive parts shall be connected directly to earth;

– for TN-S systems, the exposed conductive parts shall be connected to the protective conductor, which is connected to earth at the neutral point of the distribution system.

NOTE 1 For the definition of TT-, IT- and TN-S-systems, see IEC 61892-2.

NOTE 2 Earth or an equipotential bonding system may be the steel structure or the hull of a unit.

b) Extraneous conductive parts shall be connected to an equipotential bonding system.

For units that have separate modules and/or concrete structures, equipotential bonding shall be installed between extraneous conductive parts.

It shall be ensured that there is no detrimental mutual influence between the different protective measures applied in the same installation or in part of an installation.

NOTE 1 For earthing requirements of system neutral points, see IEC 61892-2.

NOTE 2 For earthing and bonding requirements in hazardous areas, see IEC 61892-7.

4.1.3 Earth bars, when provided, shall be located in front of equipment and junction boxes to allow for easy access for usage, inspection and maintenance. All earthing bars and terminals shall be visible and possible to be checked also after termination of cables. Separate connections shall be used for each individual earth conductor.

4.2 Earthing of exposed conductive parts

4.2.1 Unless specifically included in the following exemptions, all exposed conductive parts shall be earthed.

Exemption:

– lamp caps;

– shades, reflectors and guards, supported on lampholders or luminaires constructed of, or shrouded in, non-conducting material;

– metal parts on, or screws in or through, non-conducting material, which are separated by such material from current-carrying parts, and from earthed non-current-carrying parts in such a way that in normal use they cannot become live or come into contact with earthed parts;

– portable appliances which have a double and/or reinforced insulation (see IEC 61892-1) provided that the appliances conform with recognized safety requirements;

– bearing housings which are insulated in order to prevent the circulation of current in the bearings;

– clips for fluorescent lighting tubes;

– equipment supplied at extra-low voltage (safety voltage);

– cable clips;

– equipment of "all-insulated" construction in which the insulation enclosing the equipment is durable and continuous;

– fixed equipment or parts of equipment which, although not shrouded in insulation material, are nevertheless protected in such a way that they cannot be touched and cannot come into contact with exposed metal;

– equipment located in special earth-free rooms.

Withdrawn

AVA Documents Document Sharing Hub

Full document details: IEC 61892-6 2007