BS EN IEC 61936-1:2021

BSI Standards Publication

Power installations exceeding 1 kV AC and 1,5 kV DC

Part 1: AC

bsi.

National foreword

This British Standard is the UK implementation of EN IEC 61936-1:2021. It is identical to IEC 61936-1:2021. It supersedes BS EN 61936-1:2010+A1:2014, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PEL/99, Erection and operation of power installations.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2021

ISBN 978 0 539 03692 3

ICS 29.020; 29.080.01

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2021.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61936-1

August 2021

ICS 29.020; 29.080.01

Supersedes EN 61936-1:2010 and all of its amendments and corrigenda (if any)

English Version

Power installations exceeding 1 kV AC and 1,5 kV DC - Part 1: AC
(IEC 61936-1:2021)

Installations électriques de puissance de tension supérieure à 1 kV en courant alternatif et 1,5 kV en courant continu - Partie 1: Courant alternatif
(IEC 61936-1:2021)

Starkstromanlagen mit Nennwechselspannungen über 1 kV AC und 1,5 kV DC - Teil 1: Wechselstrom
(IEC 61936-1:2021)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 99/311/FDIS, future edition 3 of IEC 61936-1, prepared by IEC/TC 99 “Insulation co-ordination and system engineering of high voltage electrical power installations above 1,0 kV AC and 1,5 kV DC” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61936-1:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022–05–11
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024–08–11

This document supersedes EN 61936-1:2010 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of the International Standard IEC 61936-1:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60034-3	NOTE	Harmonized as EN IEC 60034-3
IEC 60038	NOTE	Harmonized as EN 60038
IEC 60068 (series)	NOTE	Harmonized as EN 60068 (series)
IEC 60076-13	NOTE	Harmonized as EN 60076-13
IEC 60092 (series)	NOTE	Harmonized as EN 60092 (series)
IEC 60282-1	NOTE	Harmonized as EN IEC 60282-1
IEC 60364-4-41	NOTE	Harmonized as HD 60364-4-41
IEC 60364-7-729	NOTE	Harmonized as HD 60364-7-729
IEC 60376	NOTE	Harmonized as EN IEC 60376
IEC 60480	NOTE	Harmonized as EN IEC 60480
IEC 60664-1	NOTE	Harmonized as EN IEC 60664-1
IEC 60721 (series)	NOTE	Harmonized as EN 60721 (series)
IEC 60721-2-2	NOTE	Harmonized as EN 60721-2-2

IEC 60721-2-3	NOTE	Harmonized as EN 60721-2-3
IEC 60721-2-4	NOTE	Harmonized as EN IEC 60721-2-4
IEC 60721-2-7	NOTE	Harmonized as EN IEC 60721-2-7
IEC 60721-3-1	NOTE	Harmonized as EN IEC 60721-3-1
IEC 60721-3-2	NOTE	Harmonized as EN IEC 60721-3-2
IEC 60832 (series)	NOTE	Harmonized as EN 60832 (series)
IEC 60855-1	NOTE	Harmonized as EN 60855-1
IEC 60865-1	NOTE	Harmonized as EN 60865-1
IEC 60909 (series)	NOTE	Harmonized as EN 60909 (series)
IEC 61000 (series)	NOTE	Harmonized as EN IEC 61000 (series)
IEC 61039	NOTE	Harmonized as EN 61039
IEC 61082-1	NOTE	Harmonized as EN 61082-1
IEC 61243 (series)	NOTE	Harmonized as EN 61243 (series)
IEC 61355-1	NOTE	Harmonized as EN 61355-1
IEC 61869 (series)	NOTE	Harmonized as EN IEC 61869 (series)
IEC 62271-4	NOTE	Harmonized as EN 62271-4
IEC 62271-100	NOTE	Harmonized as EN 62271-100
IEC 62271-102	NOTE	Harmonized as EN IEC 62271-102
IEC 62271-103	NOTE	Harmonized as EN 62271-103
IEC 62271-104	NOTE	Harmonized as EN IEC 62271-104
IEC 62271-105	NOTE	Harmonized as EN 62271-105
IEC 62271-206	NOTE	Harmonized as EN 62271-206
IEC 62305 (series)	NOTE	Harmonized as EN 62305 (series)
IEC 81346 (series)	NOTE	Harmonized as EN IEC 81346 (series)
ISO 26800	NOTE	Harmonized as EN ISO 26800

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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POWER INSTALLATIONS EXCEEDING 1 kV AC AND 1,5 kV DC –

Part 1: AC

FOREWORD

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International Standard IEC 61936-1 has been prepared by IEC technical committee 99: Insulation co-ordination and system engineering of high voltage electrical power installations above 1,0 kV AC and 1,5 kV DC.

This third edition cancels and replaces the second edition published in 2010 and Amendment 1:2014. This edition constitutes a technical revision.

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

a) introduction has been rewritten to reflect the status when this document is produced;
b) the scope has been improved to clarify the application of this document;
c) missing and obsolete terms and definitions have been updated including improvement of existing terms;
d) Table 1 has been updated where agreements between supplier and user are needed;
e) requirements of electromagnetic compatibility have been clarified;

f) insulation coordination clause (Clause 5) has improved wording for better clarity and the technical content has an updated coordination to the latest versions of the insulation coordination standards;

g) wording regarding electrical equipment has been improved and made clearer;

h) subclause for fuses has been improved and reworded;

i) requirements have been added for labelling when multiple sources are required to be disconnected;

j) missing requirements for GIS have been reintroduced;

k) subclause regarding ventilation (HVAC) has been improved;

l) figures in Clause 7 have been updated and moved to the corresponding subclause;

m) requirements for transformer installations have been improved including adjustment of editorial typing-errors;

n) clause on protection, automation and auxiliary systems has been restructured and improved;

o) protection against lightning strokes has been extended;

p) clarification of content due to the distinction between erection (and providing electrical safety for the intended use of the electrical power installation) and subsequent activities such as maintenance and repair with safe working procedures;

q) where no provincial, national or regional regulations are available for safe working procedures, an informative guideline is provided in Annex F. This replaces the former parts of Figure 3 in Clause 7.

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

FDIS	Report on voting
99/311/FDIS	99/316/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/standardsdev/publications.

A list of all parts in the IEC 61936 series, published under the general title *Power installations exceeding 1 kV AC and 1,5 kV DC*, can be found on the IEC website.

A document on principles to be observed in the preparation of safety publications regarding high voltage installations is currently under development (IEC TS 61936-0).

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,
- replaced by a revised edition, or
- amended.

The reader's attention is drawn to the fact that Annex G lists all of the "in-some-country" clauses on differing practices of a less permanent nature relating to the subject of this document.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 61936 contains the minimum requirements for the design, erection, and verification of high voltage power installations greater than 1 kV AC. The rules are intended to provide for the safety of persons, livestock and property against dangers and damage which may arise in the reasonable use of such electrical installations and to provide for the proper functioning of those installations.

There are many provincial, national and regional laws, standards and internal rules dealing with the matter coming within the scope of this document regarding high voltage power installations. These practices have been taken as a basis for this work.

This third edition of IEC 61936-1, first published in 2001, follows worldwide feedback to improve clarity. It continues the effort to towards the alignment all over the world of practices concerning the design and erection of high voltage power installations.

Particular requirements for transmission and distribution installations, as well as particular requirements for power generation and industrial installations, are included in this document.

While national standards and regulations take precedence, jurisdictions may elect to adopt the requirements of this document.

POWER INSTALLATIONS EXCEEDING 1 kV AC AND 1,5 kV DC –

Part 1: AC

1 Scope

This part of IEC 61936 provides requirements for the design and the erection of electrical power installations in systems with nominal voltages exceeding 1 kV AC and nominal frequency up to and including 60 Hz, so as to provide safety and proper functioning for the use intended.

For the purpose of interpreting this document, an electrical power installation is considered to be one of the following:

a) substation, including substation for railway power supply;

b) electrical power installations on mast, pole and tower, switchgear and/or transformers located outside a closed electrical operating area;

c) one (or more) power station(s) located on a single site, the electrical power installation includes generators and transformers with all associated switchgear and all electrical auxiliary systems. Connections between generating stations located on different sites are excluded;

d) the electrical system of a factory, industrial plant or other industrial, agricultural, commercial or public premises;

e) electrical power installations on offshore facilities for the purpose of generation, transmission, distribution and/or storage of electricity;

f) transition towers/poles (between overhead lines and underground lines).

The electrical power installation includes, among others, the following equipment:

– rotating electrical machines;
– switchgear;
– transformers and reactors;
– converters;
– cables;
– wiring systems;
– batteries;
– capacitors;
– earthing systems;
– buildings and fences which are part of a closed electrical operating area;
– associated protection, control and auxiliary systems;
– large air core reactor.

NOTE 1 In general, equipment standards take precedence over the requirements of this document.

This document does not apply to the design and erection of any of the following:

– overhead and underground lines between separate electrical power installations;
– electrified railway tracks and rolling stock;
– mining equipment and installations;