



BSI Standards Publication

Safety requirements for secondary batteries and battery installations

Part 5: Safe operation of stationary lithium ion batteries

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National foreword

This British Standard is the UK implementation of EN IEC 62485-5:2021. It is identical to IEC 62485-5:2020, incorporating corrigendum June 2022.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by IEC corrigendum June 2022 is indicated in the text by AC1 AC1.

The UK participation in its preparation was entrusted to Technical Committee PEL/21, Secondary cells and batteries.

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

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Amendments/corrigenda issued since publication

Date	Text affected
30 September 2022	Implementation of IEC corrigendum June 2022

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EUROPÄISCHE NORM

January 2021

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English Version

Safety requirements for secondary batteries and battery
installations - Part 5: Safe operation of stationary lithium ion
batteries
(IEC 62485-5:2020)

Exigences de sécurité pour les batteries d'accumulateurs et
les installations de batteries - Partie 5: Fonctionnement en
toute sécurité des batteries ions-lithium stationnaires
(IEC 62485-5:2020)

Sicherheitsanforderungen an sekundäre Batterien und
Batterieanlagen - Teil 5: Sicherer Betrieb von stationären
Lithium-Ionen-Batterien
(IEC 62485-5:2020)

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European foreword

The text of document 21/1069/FDIS, future edition 1 of IEC 62485-5, prepared by IEC/TC 21 "Secondary cells and batteries" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62485-5:2021.

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) 2021-09-30
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-12-30

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The text of the International Standard IEC 62485-5:2020 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 60065	NOTE	Harmonized as EN 60065
IEC 60079-10-1	NOTE	Harmonized as EN 60079-10-1
IEC 60364-1	NOTE	Harmonized as HD 60364-1
IEC 60364-4-42	NOTE	Harmonized as HD 60364-4-42
IEC 60364-5-54	NOTE	Harmonized as HD 60364-5-54
IEC 60364-7-706	NOTE	Harmonized as HD 60364-7-706
IEC 60695-11-20	NOTE	Harmonized as EN 60695-11-20
IEC 60695-11-10	NOTE	Harmonized as EN 60695-11-10
IEC 60900	NOTE	Harmonized as EN IEC 60900
IEC 60950-1	NOTE	Harmonized as EN 60950-1
IEC 60990	NOTE	Harmonized as EN 60990
IEC 61000-4-2	NOTE	Harmonized as EN 61000-4-2
IEC 61000-6-5	NOTE	Harmonized as EN 61000-6-5
ISO 9773	NOTE	Harmonized as EN ISO 9773

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(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-482	-	International Electrotechnical Vocabulary - Part 482: Primary and secondary cells and batteries	-	-
IEC 60364-4-41 (mod)	2005	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41	2017
+A1	2017		+ A11	2017
-	-		+ A12	2019
IEC 60364-4-43	-	IEC 60364-4-43 Ed. 4: Low-voltage electrical installations - Part 4-43: Protection for safety - Protection against overcurrent	-	-
IEC 60364-5-53	-	Low-voltage electrical installations - Part 5-53: Selection and erection of electrical equipment - Protection, isolation, switching, control and monitoring	-	-
IEC 60364-5-54	-	Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors	HD 60364-5-54	-
IEC 60417	-	Graphical symbols for use on equipment. Index, survey and compilation of the single sheets.	-	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	-	-
IEC 60664-1	2020	Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests	EN IEC 60664-1	2020
IEC 60755	-	General safety requirements for residual current operated protective devices	-	-

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IEC 61000-1-2	-	Electromagnetic compatibility (EMC) - Part 1-2: General - Methodology for the achievement of functional safety of electrical and electronic systems including equipment with regard to electromagnetic phenomena	EN 61000-1-2	-
IEC 61000-6-1	-	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments	EN IEC 61000-6-1	-
IEC 61000-6-2	-	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments	EN IEC 61000-6-2	-
IEC 61000-6-3	-	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential environments	EN IEC 61000-6-3 ¹	-
IEC 61000-6-4	-	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments	EN IEC 61000-6-4	-
IEC 61000-6-7	-	Electromagnetic compatibility (EMC) - Part 6-7: Generic standards - Immunity requirements for equipment intended to perform functions in a safety-related system (functional safety) in industrial locations	EN 61000-6-7	-
IEC 61140	-	Protection against electric shock - Common aspects for installation and equipment	EN 61140	-
IEC/TR 61340-1	-	Electrostatics - Part 1: Electrostatic phenomena - Principles and measurements	-	-
IEC 61340-5-1	-	Electrostatics - Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements	EN 61340-5-1	-
IEC 61660-1	-	Short-circuit currents in d.c. auxiliary installations in power plants and substations - Part 1: Calculation of short-circuit currents	EN 61660-1	-
IEC 61660-2	-	Short-circuit currents in d.c. auxiliary installations in power plants and substations - Part 2: Calculation of effects	EN 61660-2	-
IEC 62133-2	-	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary lithium cells, and for batteries made from them, for use in portable applications - Part 2: Lithium systems	EN 62133-2	-

¹ To be published. Stage at the time of publication: prEN IEC 61000-6-3:2019.

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IEC 62485-1	-	Safety requirements for secondary batteries and battery installations - Part 1: General safety information	EN IEC 62485-1	-
IEC 62619	2017	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries, for use in industrial applications	EN 62619	2017
IEC 62620	2014	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium cells and batteries for use in industrial applications	EN 62620	2015
ISO/IEC Guide 51	-	Safety aspects - Guidelines for their inclusion in standards	-	-
ISO 3864	series	Graphical symbols - Safety colours and safety signs	-	-
ISO 7010	-	Graphical symbols - Safety colours and safety signs - Registered safety signs	-	-



INTERNATIONAL STANDARD

NORME INTERNATIONALE



Safety requirements for secondary batteries and battery installations – Part 5: Safe operation of stationary lithium ion batteries

Exigences de sécurité pour les batteries d'accumulateurs et les installations de batteries – Partie 5: Fonctionnement en toute sécurité des batteries ions-lithium stationnaires

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY REQUIREMENTS FOR SECONDARY BATTERIES AND BATTERY INSTALLATIONS –

Part 5: Safe operation of stationary lithium ion batteries

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.
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International Standard IEC 62485-5 has been prepared by IEC technical committee 21: Secondary cells and batteries.

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

FDIS	Report on voting
21/1069/FDIS	21/1076/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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A list of all parts in the IEC 62485 series, published under the general title *Safety requirements for secondary batteries and battery installations*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://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.

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INTRODUCTION

The described safety requirements comprise the protective measures to protect from hazards generated by electricity and chemical substances when using secondary batteries. In addition measures are described to maintain the functional safety of batteries and battery installations.

For electrical safety (protection against electric shock) under Clause 4, this document refers to IEC 60364-4-41. The pilot function of this document is fully observed by indication of cross-reference numbers of the relevant clauses, but interpretation is given where adoption to direct current (DC) circuits is required.

This document comes into force with the date of publication and applies to all new batteries and battery installations. Previous installations are intended to conform to the existing national standards at the time of installation. In the case of the redesign of old installations, this document applies.

Lithium ion cells/batteries used in stationary industrial applications are intended to fulfil safety requirements in accordance with IEC 62619.

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SAFETY REQUIREMENTS FOR SECONDARY BATTERIES AND BATTERY INSTALLATIONS –

Part 5: Safe operation of stationary lithium ion batteries

1 Scope

This part of IEC 62485 applies to the installation of one or more stationary secondary batteries having a maximum aggregate DC voltage of 1 500 V to any DC part of the power network, and describes the principal measures for protections during normal operation or under expected fault conditions against hazards generated from:

- electricity,
- short-circuits,
- electrolyte,
- gas emission,
- fire,
- explosion.

This document provides requirements on safety aspects associated with the installation, use, inspection, and maintenance and disposal of lithium ion batteries used in stationary applications.

This document covers stationary batteries for industrial applications that are installed in separate closed buildings or housings as well as stationary batteries that are installed in public buildings, offices and private residences. AC1 *Text deleted.* AC1

Batteries containing lithium metal are not covered by this document.

Examples of the main applications are:

- telecommunications,
- power station operation,
- central emergency lighting and alarm systems,
- uninterruptible power supplies (UPS),
- stationary engine starting,
- photovoltaic systems.

In general, the safety requirements for secondary batteries and battery installations – General safety information and definitions are specified for lead-acid, nickel-cadmium and nickel-metal hybrid batteries in accordance with IEC 62485-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.