Electrical energy storage (EES) systems - Part 4-3: Protection requirements of battery-based energy storage systems (BESS) according to environmental conditions

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 62933-4-3:2025 sisaldab Euroopa standardi EN IEC 62933-4-3:2025 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 62933-4-3:2025 consists of the English text of the European standard EN IEC 62933-4-3:2025.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 28.11.2025.	Date of Availability of the European standard is 28.11.2025.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 13.020.30, 27.010

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62933-4-3

November 2025

ICS 13.020.30; 27.010

English Version

Electrical energy storage (EES) systems - Part 4-3: Protection requirements of battery-based energy storage systems (BESS) according to environmental conditions (IEC 62933-4-3:2025)

Systèmes de stockage de l'énergie électrique (EES) - Partie 4-3: Exigences de protection des systèmes de stockage de l'énergie sur batterie (BESS) en fonction des conditions environnementales (IEC 62933-4-3:2025)

Elektrische Energiespeichersysteme (EES) - Teil 4-3: Die Schutzanforderungen von BESS entsprechend den Umweltbedingungen und Standorttypen (IEC 62933-4-3:2025)

This European Standard was approved by CENELEC on 2025-11-24. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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

Ref. No. EN IEC 62933-4-3:2025 E

European foreword

The text of document 120/419/FDIS, future edition 1 of IEC 62933-4-3, prepared by TC 120 "Electrical Energy Storage (EES) systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62933-4-3:2025.

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) 2026-11-30
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2028-11-30

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.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62933-4-3:2025 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 standard indicated:

IEC 62477-1:2022	NOTE	Approved as EN IEC 62477-1:2023 (not modified)
IEC 62606:2013	NOTE	Approved as EN 62606:2013
ISO 9999:2022	NOTE	Approved as EN ISO 9999:2022 (not modified)
ISO 13702:2024	NOTE	Approved as EN ISO 13702:2024 (not modified)
ISO 14001:2015	NOTE	Approved as EN ISO 14001:2015 (not modified)

IEC 62933-4-3

Edition 1.0 2025-10

INTERNATIONAL STANDARD

Electrical energy storage(EES) systems -
Part 4-3: Protection requirements of battery-based energy storage systems (BESS) according to environmental conditions

ICS 13.020.30; 27.010

ISBN 978-2-8327-0623-7

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
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 corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

Electrical energy storage (EES) systems - Part 4-3: Protection requirements of battery-based energy storage systems (BESS) according to environmental conditions

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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62933-4-3 has been prepared by IEC technical committee TC120: Electrical Energy Storage (EES) systems. It is an International Standard.

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

Draft	Report on voting
120/419/FDIS	120/433/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/publications.

A list of all parts in the IEC 62933 series, published under the general title *Electrical energy storage (EES) systems*, 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

According to reports over the world, BESS have been influenced by environmental and climatic conditions of the areas where they are installed. The BESS can be particularly affected by temperature, humidity, and vibration and natural disasters. In order to minimize the impacts, this document is expected to be of great help in stable installation and operation by presenting the causes, risk factors and the appropriate measures for each environmental condition when installing the BESS.

1 Scope

This part of IEC 62933 applies to the effects of the environmental conditions on battery-based energy storage systems (BESS). This document addresses these effects and identifies causes, chains of events and final effects on the BESS. Based on those effects, preventative or mitigating measures are described. Typical environmental effects on the BESS include, but are not limited to, the effects of lightning, seismic activities, water, air, flora, fauna, and humans. The described measures focus on the entire BESS including all power and communication connections and their point of connections (POCs).

The scope of this document is limited to BESS specific requirements and operating conditions. Specific design or safety requirements of individual BESS subsystems are excluded from this document.

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.

IEC 62933-1:2024, *Electrical energy storage (EES) systems - Part 1: Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62933-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
environmental factor
physical, social and attitudinal environment in which people live and conduct their lives

[SOURCE: ISO 9999:2022, 3.7]

3.2
risk analysis
systematic use of available information to identify hazards and to estimate the risk

[SOURCE: ISO/IEC Guide 51:2014, 3.10]

3.3
seismic action
action caused by earthquake ground motions

[SOURCE: ISO 2394:2015, 2.3.15]

3.4
human factors
environmental, organisational, and job factors that influence behaviour of work in a way that can affect health and safety outcomes including the performance of critical safety systems