

STN	Systémy akumulácie elektrickej energie (EES) Časť 1: Terminológia	STN EN IEC 62933-1 36 4400
------------	--	--

Electrical energy storage (EES) systems - Part 1: Vocabulary

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/24

Obsahuje: EN IEC 62933-1:2024, IEC 62933-1:2024

Oznámením tejto normy sa od 19.06.2027 ruší
STN EN IEC 62933-1 (36 4400) z februára 2019



EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN IEC 62933-1

June 2024

ICS 01.040.17

Supersedes EN IEC 62933-1:2018

English Version

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

Systèmes de stockage de l'énergie électrique (EES) - Partie
1 : Vocabulaire
(IEC 62933-1:2024)

Elektrische Energiespeichersysteme (EES-Systeme) - Teil
1: Terminologie
(IEC 62933-1:2024)

This European Standard was approved by CENELEC on 2024-06-19. 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

EN IEC 62933-1:2024 (E)**European foreword**

The text of document 120/358/FDIS, future edition 2 of IEC 62933-1, prepared by IEC/TC 120 "Electrical Energy Storage (EES) systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62933-1:2024.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2025-03-19 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2027-06-19 document have to be withdrawn

This document supersedes EN IEC 62933-1:2018 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.

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 62933-1:2024 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 60027 series	NOTE	Approved as EN 60027 series
IEC 61165:2006	NOTE	Approved as EN 61165:2006 (not modified)
IEC 61427-2:2015	NOTE	Approved as EN 61427-2:2015 (not modified)
IEC 61850-4:2011	NOTE	Approved as EN 61850-4:2011 (not modified)
IEC 61850-4:2011/A1:2020	NOTE	Approved as EN 61850-4:2011/A1:2020 (not modified)
IEC 61987-1:2006	NOTE	Approved as EN 61987-1:2007 (not modified)
IEC 62381:2012	NOTE	Approved as EN 62381:2012 (not modified)
IEC 62443-3-3:2013	NOTE	Approved as EN IEC 62443-3-3:2019 (not modified)
IEC 62477-1:2012	NOTE	Approved as EN 62477-1:2012 (not modified) +A11:2014
IEC 62668-1:2019	NOTE	Approved as EN IEC 62668-1:2019 (not modified)
IEC 62680 series	NOTE	Approved as EN IEC 62680 series
IEC 62928:2017	NOTE	Approved as EN IEC 62928:2018 (not modified)
IEC 62932-1:2020	NOTE	Approved as EN IEC 62932-1:2020 (not modified)
IEC 62934:2021	NOTE	Approved as EN IEC 62934:2021 (not modified)
ISO 14050:2020	NOTE	Approved as EN ISO 14050:2020 (not modified)



IEC 62933-1

Edition 2.0 2024-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Electrical energy storage (EES) systems –
Part 1: Vocabulary**

**Systèmes de stockage de l'énergie électrique (EES) –
Partie 1 : Vocabulaire**

**THIS PUBLICATION IS COPYRIGHT PROTECTED****Copyright © 2024 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.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat
3, rue de Varembe
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.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -**webstore.iec.ch/advsearchform**

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications, symboles graphiques et le glossaire. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 500 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 25 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.



IEC 62933-1

Edition 2.0 2024-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Electrical energy storage (EES) systems –
Part 1: Vocabulary**

**Systèmes de stockage de l'énergie électrique (EES) –
Partie 1 : Vocabulaire**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 01.040.17

ISBN 978-2-8322-8797-2

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms and definitions for EES systems classification.....	6
3.1 Fundamental concepts for EES systems classification	6
3.2 EES systems classification	7
3.3 EES systems long-duration application	9
3.4 EES systems short-duration application	10
3.5 EES systems hybrid and emergency application	12
4 Terms and definitions for EES systems specification	12
4.1 Fundamental concepts for EES systems specification	12
4.2 EES system duty cycles	15
4.3 EES system primary POC	17
4.4 EES system auxiliary POC	24
4.5 EES system service life	25
4.6 EES system energy efficiency	27
4.7 EES system step response performances	29
5 Terms and definitions for EES systems planning and installation	32
5.1 Fundamental concepts for EES systems planning and installation.....	32
5.2 EES system primary subsystem	33
5.3 EES system auxiliary subsystem.....	34
5.4 EES system control subsystem	35
6 Terms and definitions for EES systems operation	36
6.1 EES system operating state	36
6.2 EES system operating signals.....	37
6.3 EES system operating procedure	40
6.4 EES system operating mode	40
7 Terms and definitions for EES systems' environmental and safety issues	41
7.1 EES system environmental issues	41
7.2 EES system safety.....	42
Annex A (informative) Index.....	45
A.1 Terms index.....	45
A.2 Abbreviated terms index	45
Bibliography.....	51
Figure 1 – Illustrative example of EES system energy storage capacities relation	14
Figure 2 – Illustrative example of EES system charging-discharging cycle	16
Figure 3 – Illustrative example of EES system power capability chart.....	17
Figure 4 – Illustrative example of EES system response performances	30
Figure 5 – EES system architecture with one POC type	33
Figure 6 – EES system architecture with two POC types.....	34
Figure 7 – Illustrative example of EES system available energies relation.....	38
Table 1 – Illustrative example of EES system efficiency chart	27

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL ENERGY STORAGE (EES) SYSTEMS –**Part 1: Vocabulary****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 62933-1 has been prepared by IEC technical committee 120: Electrical Energy Storage (EES) systems. It is an International Standard.

This second edition cancels and replaces the first edition published in 2018. This edition constitutes a technical revision.

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

- a) addition (with revision) of the entries developed during the edition 1 stability period and, therefore, included only in other IEC 62933 parts;
- b) addition of the entries developed during the edition 1 stability period and published in this document for the first time;
- c) complete revision of the entries already present in edition 1.

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

Draft	Report on voting
120/358/FDIS	120/367/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.

IMPORTANT – The "colour inside" logo on the cover page of this document 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

The purpose of this terminology document is to provide terms and definitions for all the publications under the responsibility of TC 120, that standardize electrical energy storage systems (EES systems) including unit parameters, test methods, planning, installation, operation, safety and environmental issues. An EES system includes any type of grid-connected energy storages which can both store electrical energy and provide electrical energy (from electricity to electricity).

All TC 120 normative documents are subject to revision; this part of IEC 62933 will be revised together with other TC 120 publications in order to avoid mismatches.

From the technical point of view, an EES system can be a complex multi-stage system with several possible energy conversions. Each stage is made by well standardized components (e.g. transformers, power conversion systems) or innovative components (e.g. new types of batteries). Several IEC product standards give definitions necessary for the understanding of certain terms used for these components. The International Electrotechnical Vocabulary (IEV, <http://www.electropedia.org>), the IEC Glossary (<http://std.iec.ch/glossary>) and the ISO Online Browsing Platform (OBP, <http://www.iso.org/obp>) allow online access to this information. This document completes the need for precise terminology by giving definitions necessary at the system level.

Without a strong standardization of EES system terminology, focal terms can have a different meaning in EES systems related to different storage technologies. This aspect is critical also from the market point of view. It impacts economics and this can become a barrier for tender processes. The correct comparison among different options is fundamental, therefore basic terms and definitions impact economic decisions.

Terms and definitions have been harmonized with the IEV, the OBP, the IEC Glossary and relevant IEC documents as far as possible. Definitions not included in this terminology document can be found elsewhere in other IEC documents.

The use of abbreviated terms has been optimized: on the one hand to avoid tedious repetition and on the other hand to avoid confusion. A minimum set of abbreviated terms was identified and used in the definitions, the other terms are written out in full spelling when needed. The widely accepted abbreviated terms are:

EESS – EES system – Electrical energy storage system

EES – Electrical energy storage

POC – Point of connection

In order to facilitate document usage, Clause A.1 offers a term index and Clause A.2 offers an abbreviated term index.

ELECTRICAL ENERGY STORAGE (EES) SYSTEMS –

Part 1: Vocabulary

1 Scope

This part of IEC 62933 defines terms applicable to electrical energy storage (EES) systems including terms necessary for the definition of unit parameters, test methods, planning, installation, operation, environmental and safety issues.

This terminology document is applicable to grid-connected systems able to extract electrical energy from an electric power system, store energy internally, and provide electrical energy to an electric power system. The step for charging and discharging an EES system can comprise an energy conversion.

2 Normative references

There are no normative references in this document.

koniec náhľadu – text ďalej pokračuje v platenej verzii STN