SVENSK STANDARD

SS-EN IEC 62840-1, utg 1:2025

Fastställd	Sida	Ansvarig kommitté
2025-12-17	1 (38)	SEK TK 69

Elfordon – System för batteribyte – Del 1: Allmänt och vägledning

Electric vehicle battery swap system – Part 1: General and guidance

Som svensk standard gäller europastandarden EN IEC 62840-1:2025. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 62840-1:2025.

Nationellt förord

Europastandarden EN IEC 62840-1:2025

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62840-1, First edition, 2025 - Electric vehicle battery swap system – Part 1: General and guidance**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SEK TS 62840-1, utg 1:2019 med eventuella tillägg, ändringar och rättelser gäller ej fr o m 2028-06-30.

ICS 43.120.00

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62840-1

June 2025

ICS 43.120

English Version

Electric vehicle battery swap system - Part 1: General and guidance (IEC 62840-1:2025)

Système d'échange de batterie de véhicule électrique - Partie 1: Généralités et recommandations (IEC 62840-1:2025)

Batteriewechselsysteme für Elektrofahrzeuge - Teil 1: Allgemeines und Leitfaden (IEC 62840-1:2025)

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 62840-1:2025 E

SEK Svensk Elstandard SS-EN IEC 62840-1, utg 1:2025

European foreword

The text of document 69/1035/FDIS, future edition 1 of IEC 62840-1, prepared by TC 69 "Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62840-1:2025.

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) 2026-06-30
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2028-06-30

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.

This document has been prepared under a standardization request addressed to CENELEC by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

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 62840-1:2025 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 60364 (series)	NOTE	Approved as HD 60364 (series)
IEC 61000 (series)	NOTE	Approved as EN IEC 61000 (series)
IEC 61851-1:2017	NOTE	Approved as EN IEC 61851-1:2019 (not modified)
IEC 61851-21-2	NOTE	Approved as EN IEC 61851-21-2
IEC 62840 (series)	NOTE	Approved as EN IEC 62840 (series)
IEC 62840-2	NOTE	Approved as EN IEC 62840-2
ISO 10218 (series)	NOTE	Approved as EN ISO 10218 (series)
ISO 17409:2020	NOTE	Approved as EN ISO 17409:2020 (not modified)

Annex ZA
(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.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60038	-	IEC standard voltages	EN 60038	-
IEC 61439-7	2022	Low-voltage switchgear and controlgear assemblies - Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicle charging stations	EN IEC 61439-7	2023
IEC 62368-1	-	Audio/video, information and communication technology equipment - Part 1: Safety requirements	EN IEC 62368-1	-

IEC 62840-1

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electric vehicle battery swap system – Part 1: General and guidance

Système d'échange de batterie de véhicule électrique – Partie 1: Généralités et recommandations

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRIC VEHICLE BATTERY SWAP SYSTEM –

Part 1: General and guidance

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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IEC 62840-1 has been prepared by IEC technical committee 69: Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks. It is an International Standard.

This first edition cancels and replaces the first edition of IEC TS 62840-1 published in 2016.

This edition includes the following significant technical changes with respect to IEC TS 62840-1:2016:

a) expanded scope to include handheld-swappable battery systems (HBS) and guidance on interoperability;
b) added definitions for "handheld-swappable battery system" (HBS) and expanded related terms such as "SBS/HBS coupler," "SBS/HBS charger," etc;
c) added classifications based on supply network characteristics, connection method, access and type of BSS;

d) added support for HBS, detailing the different compositions and workflows for type A (SBS) and type B (HBS) battery swap stations;

e) added requirements for functional interoperability, interface interoperability, data interoperability, operational interoperability, compatibility with legacy systems, and scalability;

f) added requirements for communication, protection against electric shock, specific requirements for accessories), cable assembly requirements, BSS constructional requirements, overload and short circuit protection, EMC, emergency switching or disconnect, marking and instructions;

g) expanded annex content, adding solutions for manual swapping stations for motorcycles with HBS and updating use cases.

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

Draft	Report on voting
69/1035/FDIS	69/1047/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 62840 series, published under the general title *Electric vehicle battery swap system*, 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

The purpose of the battery swap system is to provide energy partly or in total to electric road vehicles (EV) through fast replacement of their swappable battery system (SBS) or handheld-swappable battery system (HBS). The battery swap system aims to provide energy to electric road vehicles by quickly replacing their swappable battery system or handheld-swappable battery system. This can help alleviate range anxiety and make longer distance travel more convenient.

As there is a possibility to charge the batteries after their removal from the vehicle in various ways, the impact of this process on the critical infrastructure of the electrical grid is minimized.

Battery swap stations mainly include one or more of the following functions:

- swap of EV SBS or HBS;
- storage of EV SBS or HBS;
- charging and cooling of EV SBS or HBS;
- testing, maintenance and safety management of EV SBS or HBS.

This document serves as generic requirements for battery swap systems for EVs, e-motor vehicles.

This document is published in separate parts according to the following structure:

– IEC 62840-1: General and guidance;
– IEC 62840-2: Safety requirements;
– IEC TS 62840-3: Specific requirements for battery swap system operating with handheld-swappable battery systems[1].

[1] Under preparation. Stage at the time of publication: IEC TS/ACD 62840-3.2024.

ELECTRIC VEHICLE BATTERY SWAP SYSTEM –

Part 1: General and guidance

1 Scope

This part of IEC 62840 gives the general overview of battery swap systems, for the purposes of swapping batteries of electric road vehicles when the vehicle powertrain is turned off and when the battery swap system is connected to the supply network at standard supply voltages according to IEC 60038 with a rated voltage up to 1 000 V AC and up to 1 500 V DC.

This document is applicable to battery swap systems for EV equipped with one or more of the following:

– swappable battery systems (SBS);
– handheld-swappable battery systems (HBS).

This document provides guidance for interoperability.

This document applies to

- battery swap systems supplied from on-site storage systems (for example buffer batteries etc),
- manual, mechanically assisted and automatic systems,
- battery swap systems intended to supply SBS/HBS having communication allowing to identify the battery system characteristics, and
- battery swap systems intended to be installed at an altitude of up to 2 000 m.

This document is not applicable to

- aspects related to maintenance and service of the battery swap station (BSS),
- trolley buses, rail vehicles and vehicles designed primarily for use off-road,
- maintenance and service of EVs,
- safety requirements for mechanical equipment covered by the ISO 10218 series,
- locking compartments systems providing AC socket-outlets for the use of manufacturer specific voltage converter units and manufacturer specific battery systems,
- electrical devices and components, which are covered by their specific product standards,
- any fix-installed equipment of EV, which is covered by ISO, and
- EMC requirements for on-board equipment of EV while connected to the BSS.

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 60038, *IEC standard voltages*

IEC 61439-7:2022, *Low-voltage switchgear and controlgear assemblies – Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicle charging stations*

IEC 62368-1, *Audio/video, information and communication technology equipment – Part 1: Safety requirements*