



BSI Standards Publication

# Electric vehicle battery swap system

Part 1: General and guidance

**National foreword**

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

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# TECHNICAL SPECIFICATION



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

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 43.120

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## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions .....	7
4 System overview .....	9
4.1 Battery swap system .....	9
4.2 Battery swap station.....	9
4.2.1 General description.....	10
4.2.2 Lane system .....	10
4.2.3 Battery handling system .....	11
4.2.4 Storage system .....	11
4.2.5 Charging system .....	11
4.2.6 Supervisory and control system.....	11
4.3 Supporting systems (optional) .....	12
4.3.1 General supporting systems .....	12
4.3.2 SBS logistic system .....	12
4.3.3 Battery maintenance system.....	12
4.4 Swappable battery system.....	12
4.5 Power supply system.....	12
4.6 Interfaces.....	12
4.7 Zones .....	13
4.7.1 General .....	13
4.7.2 Vehicle lane zone.....	13
4.7.3 Battery swap zone .....	13
4.7.4 Battery storage zone .....	14
4.7.5 Battery charging zone .....	14
5 Classification.....	15
5.1 General.....	15
5.2 Automation level .....	15
5.2.1 General .....	15
5.2.2 Full automatic .....	15
5.2.3 Semi-automatic .....	15
5.2.4 Manual mode .....	16
5.3 SBS swapping direction.....	16
5.4 EV categories .....	16
5.5 Environmental conditions .....	16
Annex A (informative) Use case .....	17
A.1 Use case for positioning vehicle .....	17
A.2 Use case for swapping battery pack.....	17
A.3 Use case for charging SBS.....	18
A.4 Use case for maintaining SBS .....	18
A.5 Use case for emergency charging vehicle .....	18
Annex B (informative) Battery swap station solutions .....	20
B.1 General.....	20

B.2	Commercial vehicles battery swap station .....	22
B.2.1	Automatic side-swapping station .....	22
B.2.2	Automatic top-swapping station .....	22
B.3	Passenger cars battery swap station.....	23
B.3.1	Semi-automatic rear-swapping station .....	23
B.3.2	Automatic bottom-swapping station .....	24
B.3.3	Automatic side-swapping station .....	25
Bibliography	.....	27
Figure 1	– EV battery swap system .....	10
Figure B.1	– Automatic side-swapping station layout .....	22
Figure B.2	– Automatic top-swapping station layout .....	23
Figure B.3	– Semi-automatic rear-swapping station layout .....	24
Figure B.4	– Automatic bottom-swapping station layout .....	25
Figure B.5	– Automatic side-swapping station layout .....	26
Table 1	– Accessibility of vehicle lane zone .....	13
Table 2	– Accessibility of battery swap zone.....	14
Table 3	– Accessibility of battery storage zone .....	14
Table 4	– Accessibility of battery charging zone .....	15
Table A.1	– Use case for positioning vehicle.....	17
Table A.2	– Use case for swapping battery pack.....	17
Table A.3	– Use case for charging SBS .....	18
Table A.4	– Use case for maintaining SBS .....	18
Table A.5	– Use case for emergency charging vehicle .....	19
Table B.1	– Key index of the system in different types of battery swap stations .....	21

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**ELECTRIC VEHICLE BATTERY SWAP SYSTEM –****Part 1: General and guidance**

## FOREWORD

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62840-1, which is a Technical Specification, has been prepared by IEC technical committee 69: Electric road vehicles and electric industrial trucks.

The text of this Technical Specification is based on the following documents:

Enquiry draft	Report on voting
69/368/DTS	69/399/RVC

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

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

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 publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

**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

The purpose of the battery swap system is to provide energy partly or in total to electric road vehicles (EVs) through fast replacement of their swappable battery system (SBS). While charging, the EV typically takes a relatively long time, the battery swap process takes only a few minutes to complete. Thus it will reduce range anxiety and will facilitate travel for longer distances.

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 swappable battery system (SBS);
- storage of EV SBS;
- charging and cooling of EV SBS;
- testing, maintenance and safety management of EV SBS.

This document serves as generic requirements for battery swap systems for EVs.

The IEC 62840 series includes two parts:

- IEC 62840-1: General and guidance;
- IEC 62840-2: Safety requirements.

# ELECTRIC VEHICLE BATTERY SWAP SYSTEM –

## Part 1: General and guidance

### 1 Scope

This part of IEC 62840, which is a Technical Specification, gives the general overview for battery swap systems, for the purposes of swapping batteries of electric road vehicles (EVs) 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 for battery swap systems for EV equipped with one or more swappable battery system (SBS).

NOTE Battery swap systems for light electric vehicles (LEVs) according to the IEC 185 31 Series are under consideration.

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.

### 2 Normative references

The following documents, in whole or in part are normatively referenced in this document and are indispensable for its application. 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*

### 3 Terms and definitions

#### 3.1

**electric vehicle**

**EV**

**electric road vehicle**

vehicle propelled by an electric motor drawing current from a rechargeable storage battery or from other portable energy storage devices (rechargeable, using energy from a source off the vehicle, such as residential or public electric service), which is manufactured primarily for use on public streets, roads or highways

[SOURCE: ISO 17409:2015, 3.19, modified — Some precisions have been added.]

#### 3.2

**battery swap system**

battery swap station and supporting systems

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<sup>1</sup> Under consideration.