



SLOVENSKI STANDARD

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Sistem kabelskega napajanja električnih vozil - 23. del: Postaja za kabelsko napajanje električnega vozila z enosmernim tokom (IEC 61851-23:2014)

Electric vehicle conductive charging system - Part 23: D.C. electric vehicle charging station

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iTeh STANDARD PREVIEW

Système de charge conductive (pour véhicules électriques) - Partie 23: Borne de charge conductive en courant continu pour véhicules électriques

[SIST EN 61851-23:2014](https://standards.iteh.ai/catalog/standards/sist/ddee36bf-2b9d-4c66-896e-ca50a039d7a4/sist-en-61851-23-2014)

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43.120 Električna cestna vozila Electric road vehicles

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en

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EUROPEAN STANDARD

EN 61851-23

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2014

ICS 43.120

English Version

**Electric vehicle conductive charging system -
Part 23: DC electric vehicle charging station
(IEC 61851-23:2014)**

Système de charge conductive pour véhicules électriques -
Partie 23: Borne de charge en courant continu pour
véhicules électriques
(CEI 61851-23:2014)

Konduktive Ladesysteme für Elektrofahrzeuge - Teil 23:
Gleichstromladestationen für Elektrofahrzeuge
(IEC 61851-23:2014)

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[SIST EN 61851-23:2014](#)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 69/272/FDIS, future edition 1 of IEC 61851-23, prepared by IEC/TC 69 "Electric road vehicles and electric industrial trucks" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61851-23:2014.

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) 2015-01-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-04-15

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60364-7-722	NOTE	Harmonised as EN 60364-7-722 (not modified).
IEC 61851-21-2	NOTE	Harmonised as en 61851-21-2 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When 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 60364-5-54	2011	Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors	HD 60364-5-54	2011
IEC 60950-1 (mod)	2005	Information technology equipment - Safety - Part 1: General requirements	EN 60950-1	2006
+A1 (mod)	2009		+A1	2010
+A2 (mod)	2013		+A2	2013
IEC 61140		Protection against electric shock - Common aspects for installation and equipment	EN 61140	
IEC 61439-1	2011	Low-voltage switchgear and controlgear assemblies - Part 1: General rules	EN 61439-1	2011
IEC/TS 61479-1	2005	Effects of current on human beings and livestock - Part 1: General aspects	-	-
IEC 61557-8	-	Electrical safety in low voltage distribution systems up to 1 000 v a.c. And 1 500 v d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 8: insulation monitoring devices for it systems	EN 61557-8	-
IEC 61558-1	2005	Safety of power transformers, power supplies, reactors and similar products - Part 1: General requirements and tests	EN 61558-1	2005
IEC 61851-1	2010	Electric vehicle conductive charging system - Part 1: General requirements	EN 61851-1	2011
IEC 61851-24	2014	Electric vehicle conductive charging system - Part 24: Digital communication between a d.c. EV charging station and an electric vehicle for control of d.c. charging	EN 61851-24	2013
IEC 62052-11	-	Electricity metering equipment (AC) - General requirements, tests and test conditions - Part 11: Metering equipment	EN 62052-11	-
IEC 62053-21	-	Electricity metering equipment (a.c.) - Particular requirements - Part 21: Static meters for active energy (classes 1 and 2)	EN 62053-21	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62196-3	-	Plugs, socket-outlets, and vehicle couplers - conductive charging of electric vehicles - Part 3: Dimensional compatibility and interchangeability requirements for dedicated d.c. and combined a.c./d.c. pin and contact- tube vehicle couplers	EN 62196-3	-
ISO/IEC 15118-2	-	Road vehicles – Vehicle to grid communication interface - Part 2: Technical protocol description and open systems interconnections (OSI) layer requirements	-	-
ISO/IEC 15118-3	-	Road vehicles - Vehicle to grid communication- interface - Part 3 Physical layer requirements	-	-
IEC/TS 61479-1	2005	Effects of current on human beings and livestock - Part 1: General aspects	-	-
ISO 11898-1	-	Road vehicles - Controller area network (CAN) - Part 1: Data link layer and physical signalling	-	-
DIN SPEC 70121	-	Electromobility - Digital communication between a d.c. EV charging station and an electric vehicle for control of d.c. charging in the Combined Charging System	-	-

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INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Electric vehicle conductive charging system –
Part 23: DC electric vehicle charging station**

**Système de charge conductive pour véhicules électriques –
Partie 23: Borne de charge en courant continu pour véhicules électriques**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRIC VEHICLE CONDUCTIVE CHARGING SYSTEM –**Part 23: DC electric vehicle charging station**

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 61851-23 has been prepared by IEC technical committee 69: Electric road vehicles and electric industrial trucks.

The text of this standard is based on the following documents:

FDIS	Report on voting
69/272/FDIS	69/279/RVD

Full information on the voting for the approval of this standard 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.

This standard is to be read in conjunction with IEC 61851-1:2010. It was established on the basis of the second edition (2010) of that standard.

The clauses of particular requirements in this standard supplement or modify the corresponding clauses in IEC 61851-1:2010. Where the text of subsequent clauses indicates an "*addition*" to or a "*replacement*" of the relevant requirement, test specification or explanation of Part 1, these changes are made to the relevant text of Part 1, which then becomes part of this standard. Where no change is necessary, the words "This clause of Part 1 is applicable" are used. Additional clauses, tables and figures which are not included in Part 1, have a number starting from 101. Additional annexes are lettered AA, BB etc.

A list of all parts in the IEC 61851 series, published under the general title *Electric vehicle conductive charging system*, can be found on the IEC website.

In this standard, the following print types are used:

- *test specifications and instructions regarding application of Part 1: italic type.*
- notes: smaller roman type.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

The introduction and commercialisation of electric vehicles has been accelerated in the global market, responding to the global concerns on CO₂ reduction and energy security. Concurrently, the development of charging infrastructure for electric vehicles has also been expanding. As a complement to the a.c. charging system, d.c. charging is recognized as an effective solution to extend the available range of electric vehicles. The international standardization of charging infrastructure is indispensable for the diffusion of electric vehicles, and this standard is developed for the manufacturers' convenience by providing general and basic requirements for d.c. EV charging stations for conductive connection to the vehicle.

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ELECTRIC VEHICLE CONDUCTIVE CHARGING SYSTEM –

Part 23: DC electric vehicle charging station

1 Scope

This part of IEC 61851, together with IEC 61851-1:2010, gives the requirements for d.c. electric vehicle (EV) charging stations, herein also referred to as "DC charger", for conductive connection to the vehicle, with an a.c. or d.c. input voltage up to 1 000 V a.c. and up to 1 500 V d.c. according to IEC 60038.

NOTE 1 This standard includes information on EV for conductive connection, but limited to the necessary content for describing the power and signaling interface.

This part covers d.c. output voltages up to 1 500 V.

Requirements for bi-directional power flow are under consideration.

NOTE 2 Typical diagrams and variation of d.c. charging systems are shown in Annex DD.

This standard does not cover all safety aspects related to maintenance.

This part specifies the d.c. charging systems A, B and C as defined in Annexes AA, BB and CC.

NOTE 3 Typical configuration of d.c. EV charging system is shown in Annex EE.

EMC requirements for d.c. EV charging stations are defined in IEC 61851-21-2.

This standard provides the general requirements for the control communication between a d.c. EV charging station and an EV. The requirements for digital communication between d.c. EV charging station and electric vehicle for control of d.c. charging are defined in IEC 61851-24.

2 Normative references

This clause of Part 1 is applicable except as follows:

Addition:

IEC 60364-5-54:2011, *Low-voltage electrical installations – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements and protective conductors*

IEC/TS 60479-1:2005, *Effects of current on human beings and livestock - Part 1: General aspects*

IEC 60950-1:2005, *Information technology equipment - Safety - Part 1: General requirements*
Amendment 1:2009
Amendment 2:2013

IEC 61140, *Protection against electric shock – Common aspects for installation and equipment*

IEC 61439-1:2011, *Low voltage switchgear and controlgear assemblies – Part 1: General rules*

IEC 61557-8, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 8: Insulation monitoring devices for IT systems*

IEC 61558-1:2005, *Safety of power transformers, power supplies, reactors and similar products – Part 1: General requirements and tests*

IEC 61851-1:2010, *Electric vehicle conductive charging system – Part 1: General requirements*

IEC 61851-24:2014, *Electric vehicle conductive charging system – Part 24: Digital communication between a d.c. EV charging station and an electric vehicle for control of d.c. charging*

IEC 62052-11, *Electricity metering equipment (AC) – General requirements, tests and test conditions – Part 11: Metering equipment*

IEC 62053-21, *Electricity metering equipment (a.c.) – Particular requirements – Part 21: Static meters for active energy (classes 1 and 2)*

IEC 62196-3:—¹, *Plugs, socket-outlets, and vehicle couplers – Conductive charging of electric vehicles – Part 3: Dimensional compatibility and interchangeability requirements for d.c. and a.c./d.c. pin and tube-type contact vehicle couplers*

ISO/IEC 15118-2:—¹, *Road Vehicles – Vehicle to grid communication interface – Part 2: Technical protocol description and Open Systems Interconnections (OSI) layer requirements*

ISO/IEC 15118-3:—¹, *Road Vehicles – Vehicle to grid communication interface – Part 3: Physical layer and data link layer requirements*

ISO 11898-1, *Road vehicles – Controller area network (CAN) – Part 1: Data link layer and physical signalling*

DIN SPEC 70121, *Electromobility – Digital communication between a d.c. EV charging station and an electric vehicle for control of d.c. charging in the Combined Charging System*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61851-1 and IEC 61668-1, as well as the following apply.

NOTE The definitions included in this part are those having general application herein. Definitions applying to isolating transformers, safety isolating transformers, switch mode power supplies, and their construction are included in IEC 61558-1.

3.101

d.c. EV charging system

system composed of a DC charger, cable assembly and the equipment on EV that is required to fulfil the charging function including digital communication for charging control

3.102**isolated d.c. EV charging station**

d.c. EV charging station with d.c. circuit on output side which is electrically separated by at least basic insulation from a.c. circuit on power system side

3.103**non-isolated d.c. EV charging station**

d.c. EV charging station with d.c. circuit on output side which is not electrically separated by at least basic insulation from the supply system

3.104**regulated d.c. EV charging station**

d.c. EV charging station that supplies vehicle battery with a charging current or charging voltage in accordance with the request from vehicle

3.105**non-regulated d.c. EV charging station**

under consideration

3.106**d.c. charging control function****DCCCF**

function embedded in a d.c. EV charging station which controls d.c. power output following VCCF direction

Note 1 to entry: This note applies to the French language only.

3.107**vehicle charging control function****VCCF**

function in a vehicle which controls the charging parameters of off-board d.c. EV charging station

Note 1 to entry: This note applies to the French language only.

3.108**CCC****controlled current charging**

energy transfer method that the d.c. EV charging station regulates charging current according to the current value requested by the vehicle

Note 1 to entry: This note applies to the French language only.

3.109**CVC****controlled voltage charging**

energy transfer method that the d.c. EV charging station regulates charging voltage according to the voltage value requested by the vehicle

Note 1 to entry: This note applies to the French language only.

3.110**control circuit**

circuit for signal and digital communication with vehicle, and for the management of charging control process

3.111**primary circuit**

a circuit that is directly connected to the a.c. mains supply, and includes the primary windings of transformers, other loading devices and the means of connection to the a.c. mains supply