SLOVENSKI STANDARD
oSIST prEN IEC 61851-23-3:2025

01-marec-2025

Sistem kabelskega napajanja električnih vozil - 23-3. del: Postaja za kabelsko napajanje električnega vozila z enosmernim tokom za megavatne napajalne sisteme

Electric vehicle conductive charging system - Part 23-3: DC electric vehicle supply equipment for Megawatt charging systems

Système de charge par conduction pour véhicules électriques - Partie 23-3: Système d'alimentation en courant continu pour véhicules électriques pour les systèmes de recharge mégawatt

Ta slovenski standard je istoveten z: **prEN IEC 61851-23-3:2025**

ICS:

43.120	Električna cestna vozila	Electric road vehicles

oSIST prEN IEC 61851-23-3:2025 **en,fr,de**

69/1025/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:	
IEC 61851-23-3 ED1	
DATE OF CIRCULATION:	CLOSING DATE FOR VOTING:
2025-01-17	**2025-04-11**
SUPERSEDES DOCUMENTS:	
69/912/CD, 69/1017/CC	

IEC TC 69 : ELECTRICAL POWER/ENERGY TRANSFER SYSTEMS FOR ELECTRICALLY PROPELLED ROAD VEHICLES AND INDUSTRIAL TRUCKS

SECRETARIAT:	SECRETARY:
Belgium	Mr Peter Van den Bossche
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL FUNCTION(S):
SC 23H	

ASPECTS CONCERNED:

Safety

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

Attention IEC-CENELEC parallel voting

The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.

The CENELEC members are invited to vote through the CENELEC online voting system.

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any relevant “In Some Countries” clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:

** Electric vehicle conductive charging system - Part 23-3: DC electric vehicle supply equipment for Megawatt charging systems **

PROPOSED STABILITY DATE: 2027

NOTE FROM TC/SC OFFICERS:

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231 ## FOREWORD

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262 International Standard IEC 61851-23-3 has been prepared by IEC technical committee 69:
263 Electric power/energy transfer systems for electrically propelled road vehicles and industrial
264 trucks.

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

XXX	Report on voting
69/XX/XXX	69/XX/RVD

Full information on the voting for the approval of this document 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 document is to be read in conjunction with IEC 61851-1:2017 and IEC 61851-23:2023.

The clauses of particular requirements in this document supplement or modify the corresponding clauses in IEC 61851-23:2023. Where the text of subsequent clauses indicates an "addition" to or a "replacement" of the relevant requirement, test specification or explanation of IEC 61851-23:2023, these changes are made to the relevant text of IEC 61851-23:2023, which then becomes part of this document. Where no change is necessary, the words "IEC 61851-23:2023, [clause] is applicable" are used, where [clause] indicated the relevant clause. The new clauses, which are not included in IEC 61851-23:2023, have a clause number starting from 201, for example 3.201, 201.1, etc. The new annexes of this document are numbered using triple-alphabet, for example Annex III, to avoid confusion with the annexes in IEC 61851-1:2017 and IEC 61851-23:2023.

In this document, the following print types are used:

– *test specifications: italic type*.

– notes: smaller roman type.

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.

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.

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

Responding to the global challenges of CO_2 reduction and energy safety, the automobile industry has started the development and commercialization of heavy duty electric vehicles (EV). These heavy duty EVs are equipped with significantly larger batteries than passenger cars or light commercial vehicles. The charging power provided by standards published before the publication of this standard, does not allow recharging of these batteries within the time needed for a commercial application of heavy duty EVs – especially considering long routes with limited time for intermediate charging. Consequently, this standard allows for superior charging power up to several megawatts and describes the related safety and interoperability requirements. Table 201 shows the comparison between IEC 61851-23 and this document.

Table 201 – Comparison between IEC 61851-23 and IEC 61851-23-3

Topic	IEC 61851-23	IEC 61851-23-3
Rated maximum voltage of the EV supply equipment at side B (EV side)	1 000 V	1 250 V
Rated continuous current of the EV supply equipment at side B (EV side)	maximum as defined in IEC 62196-3:2022	as defined in IEC TS 63379:202X
Basic signalling	CP and PP (Annex CC)	CE and ID
Digital communication	HomePlug GreenPHY (Annex CC) with ISO 15118-2, ISO 15118-20 or DIN 70121 as application layer	Ethernet 10BASE-T1S with ISO 15118-20 as application layer

Although the system described in this standard has been developed for heavy duty EVs, its application is not limited to these in principle.

The standard at hand for the EV supply equipment is accompanied by standards for the coupler interface and the vehicle side.

ELECTRIC VEHICLE CONDUCTIVE CHARGING SYSTEM –

Part 23-3: DC electric vehicle supply equipment for Megawatt charging systems

1 Scope

Replacement:

This part of the IEC 61851 series, together with [IEC 61851-1 Ed. 3] and [IEC 61851-23, Ed. 2.0], applies to the EV supply equipment to provide energy transfer between the supply network and electric vehicles (EVs), with a rated maximum voltage at side A (supply network side) up to 1 000 V AC or up to 1 500 V DC and a rated maximum voltage at side B (EV side) up to 1 250 V DC.

NOTE 1 A rated maximum voltage of the EV supply equipment at side B of 1 500 V DC is under consideration.

This document specifies the EV supply equipment of Megawatt Charging System (MCS) equipped with a coupler according to IEC TS 63379. Systems different to system MCS using a coupler specified in IEC TS 63379 are under consideration.

Requirements for bidirectional power flow systems are under consideration.

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

Requirements for systems not providing protective separation between side A (supply network side) and side B (EV side) are under consideration.

The requirements for digital communication between the EV supply equipment and the EV for control of energy transfer are defined in ISO 15118-10[1] and ISO 15118-20.

The specific requirements for EV supply equipment with multiple side Bs (EV sides) are provided in Annex FF.

General information of communication and the energy transfer process is described in Annex GG.

General information on the touch current and touch impulse current is provided in Annex HH.

EV supply equipment in compliance with this document is not intended to provide energy transfer to a single EV using:

– multiple vehicle connectors of the same EV supply equipment; or
– multiple EV supply equipments.

Requirements for such use case are not specified in this document, but are under consideration.

NOTE 2 The safety requirements of vehicle during charging are specified in ISO 5474 series.

[1] Under preparation. Stage at the time of publication: ISO/DIS 15118-10:2024

NOTE 3 Requirements for an optional automated connection of system MCS are under preparation in IEC 61851-27.

Requirements for EVs mated to an EV supply equipment according to this document are specified in ISO 5474-3:2023, Annex B.

2 Normative references

IEC 61851-23:2023, Clause 2 is applicable, except as follows:

Addition:

IEC TS 63379:202X, *Vehicle connector, vehicle inlet and cable assembly for megawatt DC charging*

ISO 15118-10:202X, *Road vehicles – Vehicle-to-grid communication interface – Part 10: Physical layer and data link layer requirements for wired ethernet communication*

ISO 15118-20:2022, *Road vehicles – Vehicle-to-grid communication interface – Part 2: 2nd generation network layer and application layer requirements*

ISO 15118-20:2022/AMD1:202X, *Road vehicles – Vehicle-to-grid communication interface – Part 2: 2nd generation network layer and application layer requirements*

IEEE 802.3-2022*, IEEE Standard for Ethernet*

Open Alliance Inc., *Channel and components - Requirements for 10BASE-T1S link segments* [online], version x.x, 2024. Available at: https://opensig.org/ (TBD)[2]

3 Terms and definitions

IEC 61851-23:2023, Clause 3, is applicable except as follows:

3.3 Functions

3.3.1

Replacement:

charge enable conductor (identification: CE)
conductor incorporated in a cable assembly, which, together with the protective conductor, is part of the charge enable circuit

3.3.5

Replacement:

insertion detection function (identification: ID)
electrical or mechanical means to indicate the insertion state of the vehicle connector in the vehicle inlet of the EV and/or to indicate the insertion state of the EV plug in the EV socket-outlet of the EV supply equipment

[2] Document under development.

4 General requirements

IEC 61851-23:2023, Clause 4 is applicable, except as follows:

Addition:

Unless otherwise specified in this document:

– the requirements and tests for system C in IEC 61851-23:2023 apply for system MCS, and
– all references in IEC 61851-23:2023 to “Annex CC” are replaced by “Annex CC of IEC 61851-23-3:202X”.

EV supply equipment with a rated continuous current at side B ≥ 500 A:

– in the voltage range: 500 V DC ≤ voltage at side B ≤ 1 250 V, the EV supply equipment shall provide the rated continuous current at side B or rated continuous power at side B, and
– in the voltage range: 400 V DC ≤ voltage at side B < 500 V DC, the EV supply equipment shall be capable of continuously providing a current at side B ≥ 500 A.

EV supply equipment with a rated continuous current at side B < 500 A shall provide:

– the rated continuous current at side B or rated continuous power at side B in the voltage range: 400 V DC ≤ voltage at side B ≤ 1 250 V.

5 Classification

IEC 61851-23:2023, Clause 5 is applicable, except as follows:

Replacement:

5.101 Characteristics of EV supply equipment

5.101.3 System

The EV supply equipment shall be classified according to the system:

– System MCS (see Annex CC).

6 Charging modes and functions

IEC 61851-23:2023, Clause 6, is applicable, except as follows:

6.3 Functions provided in Mode 4

6.3.1 Mandatory functions in Mode 4

6.3.1.1 General

Replacement:

The EV supply equipment shall supply a DC current and voltage to the EV battery system according to an EVCC request.

The following functions shall be provided by EV supply equipment as given below:

– continuous continuity checking of the protective conductor according to 6.3.1.2;