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SLOVENSKI STANDARD
oSIST prEN IEC 62196-3:2024

01-junij-2024

Vtiči, vtičnice, konektorji in uvodnice na vozilih - Kabelsko napajanje električnih vozil - 3. del: Zahteve za dimenzijsko združljivost za spojke na vozilih s trni in cevastimi kontakti za enosmerni (DC) in izmenični/enosmerni (AC/DC) tok

Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers

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Stecker, Steckdosen und Fahrzeugsteckvorrichtungen - Konduktives Laden von Elektrofahrzeugen - Teil 3: Maßliche Kompatibilitätsanforderungen an Fahrzeugsteckvorrichtungen mit Stiften und Buchsen für Gleichstrom und kombiniert für Gleich- und Wechselstrom

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Fiches, socles de prise de courant, prises mobiles de vehicule et socles de connecteur de véhicule - Charge conductive des véhicules électriques - Partie 3: Exigences dimensionnelles de compatibilité pour les prises de courant de véhicule à broches et alvéoles pour courant continu et pour courants alternatif et continu

Ta slovenski standard je istoveten z: prEN IEC 62196-3:2024

ICS:

29.120.30	Vtiči, vtičnice, spojke	Plugs, socket-outlets, couplers
43.120	Električna cestna vozila	Electric road vehicles

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2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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23H/551/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:	
IEC 62196-3 ED3	
DATE OF CIRCULATION:	CLOSING DATE FOR VOTING:
2024-04-05	**2024-06-28**
SUPERSEDES DOCUMENTS:	
23H/535/CD, 23H/544A/CC	

IEC SC 23H : PLUGS, SOCKET-OUTLETS AND COUPLERS FOR INDUSTRIAL AND SIMILAR APPLICATIONS, AND FOR ELECTRIC VEHICLES

SECRETARIAT:	SECRETARY:
France	Mrs Anne Le Guennec
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 69	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ 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.	

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TITLE:

Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers

PROPOSED STABILITY DATE: 2030

NOTE FROM TC/SC OFFICERS:

Some drawings shall be improved at the next stage

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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PLUGS, SOCKET-OUTLETS, VEHICLE CONNECTORS AND VEHICLE INLETS – CONDUCTIVE CHARGING OF ELECTRIC VEHICLES –

Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers

FOREWORD

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IEC 62196-3 has been prepared by subcommittee 23H: Plugs, socket-outlets, and couplers for industrial and similar applications, and for electric vehicles, of IEC technical committee 23: Electrical accessories. It is an International Standard.

This third edition cancels and replaces the second edition published in 2022. This edition constitutes a technical revision.

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

a) The content of IEC TS 62196-3-1 has been integrated into this document as normative Annex CCC. As far as applicable, the clause numbers are identical with the main part. Added subclauses, tables and figures start with the number 100 to avoid confusion with the main part.
b) interchangeability requirements have been removed from the title of Part 3;
c) increased ratings for all configurations;
d) reference to new tests in IEC 62196-1 (Clauses 34, 35, 36 and 37).

oSIST prEN IEC 62196-3:2024

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

Draft	Report on voting
23H/500/FDIS	23H/504/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/standardsdev/publications.

A list of all the parts in the IEC 62196 series, published under the general title *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles*, can be found on the IEC website.

This document is to be read in conjunction with IEC 62196-1:2022. The clauses of the particular requirements in this document supplement or modify the corresponding clauses in IEC 62196-1:2022. Where the text indicates an "addition" to or a "replacement" of the relevant requirement, test specification or explanation of IEC 62196-1:2022, these changes are made to the relevant text of IEC 62196-1:2022, which then becomes part of this document. Where no change is necessary, the words "Clause X of IEC 62196-1:2022 is applicable" are used.

Subclauses, figures, tables, or notes which are additional to those in IEC 62196-1:2022 are numbered starting from 301.

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In this document, the following print types are used:

– requirements proper: in roman type;
– *test specifications: in italic type*;
– notes: in smaller roman type.

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

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INTRODUCTION

IEC 61851 (all parts) specifies requirements for electric vehicle (EV) conductive supply equipment.

IEC 62196 (all parts) specifies the requirements for plugs, socket-outlets, vehicle connectors, vehicle inlets and cable assemblies as described in IEC 61851 (all parts).

Charging using off-board DC charging equipment can be achieved by the direct connection of an electric vehicle to DC EV supply equipment incorporating control and communication circuits.

To support the connection of DC power for such vehicles, this document provides the standard interface configurations of DC vehicle couplers and accessories to be used in conductive charging of electric vehicles, taking the most frequent charging situations into consideration.

IEC 62196 is divided into several parts as follows:

– Part 1: General requirements, comprising clauses of a general character.
– Part 2: Dimensional compatibility requirements for AC pin and contact-tube accessories.
– Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers.
– Part 4: Dimensional compatibility requirements for DC pin and contact-tube accessories for Class II or Class III applications.
– Part 6: Dimensional compatibility requirements for DC pin and contact-tube couplers for applications using a system of protective electrical separation.

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PLUGS, SOCKET-OUTLETS, VEHICLE CONNECTORS AND VEHICLE INLETS – CONDUCTIVE CHARGING OF ELECTRIC VEHICLES –

Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers

1 Scope

This part of IEC 62196 is applicable to vehicle couplers with pins and contact tubes of standardized configuration, herein also referred to as "accessories", intended for use in electric vehicle conductive charging systems which incorporate control means, with rated operating voltage and current in accordance with IEC 62196-1:2022.

This document applies to high power DC interfaces and combined AC/DC interfaces of vehicle couplers that are intended for use in conductive charging systems for circuits specified in IEC 61851-1:2017 and IEC 61851-23:—[1].

This document applies to accessories and cable assemblies that employ
– thermal sensing, or
– thermal transport and thermal sensing

with the system architecture described in CCC.4.100 of Annex CCC.

The DC vehicle connectors and inlets covered by this document are used only in charging mode 4, according to IEC 61851-1:2017, 6.2.4, and case C, as shown in IEC 61851-1:2017, Figure 3.

These vehicle couplers are intended to be used for circuits specified in IEC 61851-23:— which operate at different voltages, and which can include ELV and communication signals.

This document applies to the vehicle couplers to be used in an ambient temperature between –30 °C and +40 °C.

NOTE 1 In some countries, other requirements may apply.

NOTE 2 In the following country, −40 °C applies: SE.

These vehicle couplers are intended to be connected only to cables with copper or copper-alloy conductors.

These accessories are intended to be connected to cables according to the IEC 62893 series for DC cables.

2 Normative references

Clause 2 of IEC 62196-1:2022 applies, except as follows.

Additional normative references:

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

[1] Second edition under preparation. Stage at the time of publication: IEC PRVC 61851-23:2022.

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IEC 60811-501, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 501: Mechanical tests – Tests for determining the mechanical properties of insulating and sheathing compounds*

IEC 62196-1:2022, *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 1: General requirements*

IEC 62196-2:2022, *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles – Part 2: Dimensional compatibility requirements for AC pin and contact-tube accessories*

IEC 62893-4-1:—[2], *Charging cables for electric vehicles of rated voltages up to and including 0,6/1 kV – Part 4-1: Cables for DC charging according to mode 4 of IEC 61851-1 – DC charging without use of a thermal management system*

ISO 2719:2016, *Determination of flash point – Pensky-Martens closed cup method*

ISO 17409:2020, *Electrically propelled road vehicles – Conductive power transfer – Safety requirements*

ISO 25178-1:2016, *Geometrical product specifications (GPS) – Surface texture: Areal – Part 1: Indication of surface texture*

Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Eighth revised edition, United Nations, 2019

OECD Guidelines for the Testing of Chemicals, Section 3, Test No. 301: Ready Biodegradability, 17 Jul 1992

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3 Terms and definitions

Clause 3 of IEC 62196-1:2022 applies.

4 General

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Clause 4 of IEC 62196-1:2022 applies except as follows:

Addition:

Add the following after the 2nd paragraph of 4.1 of IEC 62196-1:20XX:

Accessories of the combined interface for AC/DC type intended for use with AC shall comply with the ratings and requirements of IEC 62196-2:2022.

5 Ratings

Clause 5 of IEC 62196-1:202X applies, except as follows:

Addition:

5.2.2 Rated current for signal or control purposes

Add the following text at the end of Subclause 5.2.2:

---

2 Under preparation. Stage at the time of publication: IEC FDIS 62893-4-1:2020.

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For configuration AA, control pilot contacts are rated 30 V, 10 A. The auxiliary power supply may consist of a safety extra-low voltage system circuit.

5.2.4 Accessories suitable or, not suitable for, making and breaking an electrical circuit under load

Clause 5.2.4 is not applicable.

Add the following new subclause:

5.301 Rated current for auxiliary power supply contacts

For configuration BB, auxiliary power supply contacts are rated 30 V, 10 A. The auxiliary power supply may consist of a safety extra-low voltage system circuit.

6 Connection between the power supply and the electric vehicle

Clause 6 of IEC 62196-1:202X applies, except as follows:

6.2 Basic interface

Not applicable.

6.3 DC interface

Replacement:

Replace the existing text of IEC 62196-1:202X, 6.3 with the following:

The DC interface may contain up to 12 power or signal contacts, with only one physical configuration of contact positions. The electrical ratings and contact functions are described in Table 301.

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Table 301 – Overview of the DC vehicle interface

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Position number [a]	Configuration							
	AA		BB		GG			
	U_{max} V	I_{max} A	U_{max} V	I_{max} A	U_{max}	I_{max}	Symbol	Function
1	1 000	400	950	250	1 500	600	DC +	DC +
2	1 000	400	950	250	1 500	600	DC −	DC −
3	30	10	30	2	30	2	CP	Control Pilot 1
4	30	10	30	2	30	2	CP2	Control Pilot 2
5	30	10	-	-	-	-	CP3	Control Pilot 3
6	30	2	30	2	30	2	COM1	Communication 1 (+)
7	30	2	30	2	30	2	COM2	Communication 1 (−)
8	30	2	-	-	-	-	IM	Isolation Monitor
9	-	-	-	-	-	b	PE	Protective earth
10	30	2	-	-	-	-	PP or CS	Proximity detection or connection switch
11	30[c]	10[c]	30	20	-	-	AUX1	Auxiliary Power Supply 1 (+)

12	-	-	30	20	-	-	AUX2	Auxiliary Power Supply 1 (−)

[a] Position number does not refer to the location and/or identification of the contact in the accessory.

[b] Conductor size dependent upon system requirements

[c] For configuration AA, position 11 is optional.

DC vehicle interfaces shall be used in a system according to IEC 61851-23:—, Annex AA "DC EV supply equipment of System A," Annex BB "DC EV supply equipment of System B," or Annex DD “DC EV Supply Equipment of System G” (under development) respectively. See the corresponding standard sheets for additional interface details.

For use with non-isolated DC EV supply equipment, the interface shall be provided with a contact for protective earthing conductors.

For use with isolated DC EV supply equipment, the interface may be provided with a contact for protective earthing conductors.

6.4 Combined interface

Replacement:

Replace the existing text of IEC 62196-1:202X, 6.4 with the following:

A combined interface includes both an AC interface and a DC interface.

The combined interface permits AC or DC energy through separate power contacts. The electrical ratings and their function are described in Table 302.

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Table 302 – Overview of the combined AC/DC vehicle interface

Position number [a]	Configuration EE				Configuration FF			
	U_{max} V	I_{max} A	Symbol	Function	U_{max} V	I_{max} A	Symbol	Function
1	250 [b]	32 [b]	L1	L1	480 [c]	63 [c,e]	L1	L1
2	250 [b]	32 [b]	L2	L2/N	480 [c]	63 [c]	L2	L2
3	–	–	–	–	480 [c]	63 [c]	L3	L3
4	–	–	–	–	480 [c]	63 [c,e]	N	Neutral
5	–	–[f]	PE	Protective earth	–	–[f]	PE	Protective earth
6	30 [d]	2 [d]	CP	Control pilot	30 [d]	2 [d]	CP	Control pilot
7	30 [d]	2 [d]	PP or CS	Proximity detection or connection switch	30 [d]	2 [d]	PP or CS	Proximity detection or connection switch
8	1 000	400[g,h]	DC+	DC+	1 000	400 [g,h]	DC+	DC+
9	1 000	400 [g,h]	DC−	DC−	1 000	400 [g,h]	DC−	DC−