

**01-maj-2023****Nadomešča:**  
**SIST EN 62196-3:2015**

---

**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 (d.c.) in izmenični/enosmerni (a.c./d.c.) tok (IEC 62196-3:2022)**

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 (IEC 62196-3:2022)

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 (IEC 62196-3:2022)

Fiches, socles de prise de courant, prises mobiles de véhicule et socles de connecteurs 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 (IEC 62196-3:2022)

**Ta slovenski standard je istoveten z: EN IEC 62196-3:2022**

---

**ICS:**

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

**SIST EN IEC 62196-3:2023** **en,fr,de**



EUROPEAN STANDARD

EN IEC 62196-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2022

ICS 29.120.30; 43.120

Supersedes EN 62196-3:2014

English Version

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  
(IEC 62196-3:2022)

Fiches, socles de prise de courant, prises mobiles de  
véhicule et socles de connecteurs 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  
(IEC 62196-3:2022)

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  
(IEC 62196-3:2022)

iTeh STANDARD PREVIEW

This European Standard was approved by CENELEC on 2022-11-23. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



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

**EN IEC 62196-3:2022 (E)****European foreword**

The text of document 23H/500/FDIS, future edition 2 of IEC 62196-3, prepared by SC 23H "Plugs, Socket-outlets and Couplers for industrial and similar applications, and for Electric Vehicles" of IEC/TC 23 "Electrical accessories" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62196-3:2022.

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) 2023-08-23
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-11-23

This document supersedes EN 62196-3:2014 and all of its amendments and corrigenda (if any).

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 given to CENELEC by the European Commission and the European Free Trade Association.

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.

(standards.iteh.ai)

**Endorsement notice**

SIST EN IEC 62196-3:2023

[https://standards.iteh.ai/catalog/standards/sist/b9c032ed-1280-41dc-91a3-](https://standards.iteh.ai/catalog/standards/sist/b9c032ed-1280-41dc-91a3-08dc585e70e7/sist-en-iec-62196-3-2023)

[08dc585e70e7/sist-en-iec-62196-3-2023](https://standards.iteh.ai/catalog/standards/sist/b9c032ed-1280-41dc-91a3-08dc585e70e7/sist-en-iec-62196-3-2023)

The text of the International Standard IEC 62196-3:2022 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 61851 (series)	NOTE	Harmonized as EN IEC 61851 (series)
ISO 2768-1	NOTE	Harmonized as EN 22768-1
ISO 17409:2020	NOTE	Harmonized 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.cenelec.eu](http://www.cenelec.eu).

*Annex ZA of EN IEC 62196-1:2022 applies, except as follows. Add the following references:*

<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
-	-	(standards.iteh.ai)	+ A11	2017
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 62196-3

Edition 2.0 2022-10

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**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**

**Fiches, socles de prise de courant, prises mobiles de véhicule et socles de connecteurs 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**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 29.120.30; 43.120

ISBN 978-2-8322-5930-6

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references .....	7
3 Terms and definitions .....	8
4 General .....	8
5 Ratings.....	8
6 Connection between the power supply and the electric vehicle.....	8
7 Classification of accessories.....	10
8 Marking .....	11
9 Dimensions .....	11
10 Protection against electric shock .....	12
11 Size and colour of protective earthing and neutral conductors .....	13
12 Provisions for earthing.....	13
13 Terminals .....	13
14 Interlocks.....	13
15 Resistance to ageing of rubber and thermoplastic material .....	14
16 General construction .....	14
17 Construction of EV socket-outlets – General.....	14
18 Construction of EV plugs and vehicle connectors.....	14
19 Construction of vehicle inlets.....	14
20 Degrees of protection .....	14
21 Insulation resistance and dielectric strength .....	15
22 Breaking capacity .....	15
23 Normal operation .....	15
24 Temperature rise .....	15
25 Flexible cables and their connection.....	15
26 Mechanical strength .....	16
27 Screws, current-carrying parts and connections.....	16
28 Creepage distances, clearances and distances through sealing compound.....	16
29 Resistance to heat and to fire .....	16
30 Corrosion and resistance to rusting .....	16
31 Conditional short-circuit current.....	17
32 Electromagnetic compatibility .....	17
33 Vehicle drive over.....	17
34 Thermal cycling .....	17
35 Humidity exposure.....	17
36 Misalignment .....	17
37 Contact endurance test.....	17
STANDARD SHEETS CONFIGURATION AA .....	18
STANDARD SHEETS CONFIGURATION BB .....	27
STANDARD SHEETS CONFIGURATION EE .....	31

STANDARD SHEETS CONFIGURATION FF .....	45
Annex A (informative) Legacy drawings from IEC 62196-3:2014 .....	60
Bibliography.....	66
Table 301 – Overview of the DC vehicle interface .....	9
Table 302 – Overview of the combined AC/DC vehicle interface .....	10
Table 303 – Interface overview .....	12
Table 304 – Functionality of the contacts for configuration EE .....	31
Table 305 – Functionality of the contacts for DC configuration FF.....	45

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN IEC 62196-3:2023](https://standards.iteh.ai/catalog/standards/sist/b9c032ed-1280-41dc-91a3-98da585c79e7/sist-en-iec-62196-3-2023)

<https://standards.iteh.ai/catalog/standards/sist/b9c032ed-1280-41dc-91a3-98da585c79e7/sist-en-iec-62196-3-2023>

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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

- 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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 second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision.

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

- a) interchangeability requirements have been removed from the title of Part 3;
- b) increased ratings for all configurations;
- c) reference to new tests in IEC 62196-1 (Clauses 34, 35, 36 and 37).

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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://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.

In this document, the following print types are used:

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

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](http://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.

## 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 3-1: Vehicle connector, vehicle inlet and cable assembly intended to be used with a thermal management system for DC charging.
- 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.

<https://standards.iteh.ai/catalog/standards/sist/b9c032ed-1280-41dc-91a3-98da585c79e7/sist-en-iec-62196-3-2023>

# 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:—<sup>1</sup>.

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, –35 °C applies: SE.

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

### 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*

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*

---

<sup>1</sup> Second edition under preparation. Stage at the time of publication: IEC PRVC 61851-23:2022.

### 3 Terms and definitions

Clause 3 of IEC 62196-1:2022 applies.

### 4 General

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

*Addition:*

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 62196-1:2022 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:*

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.

*Add the following new subclause:*

<https://standards.iteh.ai/catalog/standards/sist/b9c032ed-1280-41dc-91a3-3-2023>

#### 5.301 Rated current for auxiliary power supply contacts

For configuration BB, auxiliary power supply contacts are rated 30 V, 20 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 62196-1:2022 applies, except as follows:

#### 6.2 Basic interface

*Not applicable.*

#### 6.3 DC interface

*Replacement:*

*Replace the existing text of IEC 62196-1:2022, 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.

**Table 301 – Overview of the DC vehicle interface**

Position number <sup>a</sup>	Configuration				Symbol	Function
	AA		BB			
	$U_{max}$ V	$I_{max}$ A	$U_{max}$ V	$I_{max}$ A		
1	1 000	400	950	250	DC +	DC +
2	1 000	400	950	250	DC –	DC –
3	30	10	30	2	CP	Control Pilot 1
4	30	10	30	2	CP2	Control Pilot 2
5	30	10	-	-	CP3	Control Pilot 3
6	30	2	30	2	COM1	Communication 1 (+)
7	30	2	30	2	COM2	Communication 1 (–)
8	30	2	-	-	IM	Isolation Monitor
9	-	-	950	Rated for fault <sup>b</sup>	PE	Protective earth
10	30	2	-	-	PP or CS	Proximity detection or connection switch
11	30 <sup>c</sup>	10 <sup>c</sup>	30	20	AUX1	Auxiliary Power Supply 1 (+)
12	-	-	30	20	AUX2	Auxiliary Power Supply 1 (–)

<sup>a</sup> Position number does not refer to the location and/or identification of the contact in the accessory.

<sup>b</sup> "Rated for fault" means "rated for the highest fault current".

<sup>c</sup> For system 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" or Annex BB "DC EV supply equipment of System B", 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 62196-1:2022, 6.4 with the following:*

A combined interface extends the use of a basic interface for AC and DC charging.

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