

INTERNATIONAL STANDARD

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



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CONTENTS

FOREWORD	6
INTRODUCTION	8
1 Scope	9
2 Normative references	9
3 Terms and definitions	11
4 General	22
4.1 General requirements	22
4.2 Components	22
4.2.1 Ratings	22
4.2.2 Mechanical assembly	22
4.2.3 Current-carrying parts of incorporated components	22
4.2.4 Electrical connections	23
4.3 General notes on tests	23
5 Ratings	26
5.1 Preferred rated operating voltage ranges	26
5.2 Preferred rated currents	27
5.2.1 General	27
5.2.2 Rated current for signal or control purposes	27
5.2.3 Accessories not suitable for making and breaking an electrical circuit under load	27
5.2.4 Accessories suitable for, or not suitable for, making and breaking an electrical circuit under load	27
6 Connection between the power supply and the electric vehicle	28
6.1 Interfaces	28
6.2 Basic interface	28
6.3 DC interface	28
6.4 Combined interface	28
7 Classification of accessories	28
7.1 According to purpose	28
7.2 According to the method of connecting the conductors	28
7.3 According to serviceability	28
7.4 According to electrical operation	28
7.5 According to interface	28
7.6 According to locking facilities	29
7.7 According to interlock facilities	29
7.8 According to the presence of shutter(s)	29
8 Marking	29
9 Dimensions	32
10 Protection against electric shock	32
10.1 General	32
10.2 Accessories with shutters	33
10.3 Contact sequencing and order of contact insertion and withdrawal	36
10.4 Misassembly	37
11 Size and colour of protective earthing and neutral conductors	37
12 Provisions for earthing	38
13 Terminals	40

13.1	Common requirements	40
13.2	Screw terminals	42
13.3	Mechanical tests on terminals	44
14	Interlocks.....	47
14.1	Accessories with interlock.....	47
14.2	Accessories with integral switching device	55
14.3	Control circuit devices and switching elements	55
14.4	Pilot contacts and auxiliary circuits	55
15	Resistance to ageing of rubber and thermoplastic material	55
16	General construction	56
17	Construction of EV socket-outlets	59
18	Construction of EV plugs and vehicle connectors.....	60
19	Construction of vehicle inlets	61
20	Degrees of protection	61
21	Insulation resistance and dielectric strength	64
22	Breaking capacity	65
23	Normal operation.....	68
23.1	Mechanical, electrical, and thermal stresses and contaminants.....	68
23.2	Load endurance test	68
23.3	No-load endurance test.....	69
23.4	Lid springs	70
24	Temperature rise	70
25	Flexible cables and their connection	72
25.1	Strain relief	72
25.2	Requirements for EV plugs and vehicle connectors.....	73
25.2.1	Non-rewirable EV plugs and vehicle connectors	73
25.2.2	Rewirable EV plugs and vehicle connectors.....	73
25.3	EV plugs and vehicle connectors provided with a flexible cable.....	73
25.4	Cables	75
26	Mechanical strength	75
26.1	General.....	75
26.2	Ball impact.....	76
26.3	Drop test.....	78
26.4	Flexing test	79
26.5	Cable gland test.....	80
26.6	Shutters	81
26.7	Insulated end caps.....	81
26.7.1	General	81
26.7.2	Insulated end caps – Change of temperature test	82
26.7.3	Insulated end caps – Pull test.....	82
27	Screws, current-carrying parts and connections.....	82
28	Creepage distances, clearances and distances through sealing compound.....	85
29	Resistance to heat and to fire	86
30	Corrosion and resistance to rusting	87
31	Conditional short-circuit current	88
31.1	General.....	88

31.2	Ratings and test conditions	88
31.3	Test circuit	89
31.4	Calibration	93
31.5	Test procedure.....	93
31.6	Behaviour of the equipment under test.....	93
31.7	Acceptance conditions	93
32	Electromagnetic compatibility	93
32.1	Immunity	93
32.2	Emission.....	93
33	Vehicle drive over.....	93
34	Thermal cycling	94
34.1	General.....	94
34.2	Initial temperature rise test	94
34.3	Thermal cycling test.....	95
34.4	Final temperature rise test	95
35	Humidity exposure	95
35.1	General.....	95
35.2	Initial temperature rise test	95
35.3	Humidity test.....	95
35.4	Final temperature rise test	96
36	Misalignment	96
36.1	General.....	96
36.2	Samples	96
36.3	Misalignment test.....	97
37	Contact endurance test.....	99
37.1	Equipment	99
37.2	Test sequence	99
37.3	Compliance.....	101
Annex A (normative) Standard sheets for test gauges in 14.1.9		102
Annex B (informative) EV accessories directly connected to printed circuit boards (PCBs)		106
B.1	General.....	106
B.2	Terminals.....	106
B.2.1	General	106
B.2.2	Accessories intended to be directly connected to PCBs.....	106
B.3	Temperature rise	107
Bibliography.....		108
Figure 1 – Diagram showing the use of the accessories.....		12
Figure 2 – Lug terminals		16
Figure 3 – Mantle terminals		16
Figure 4 – Pillar terminals		17
Figure 5 – Saddle terminals		19
Figure 6 – Screw terminals		19
Figure 7 – Stud terminals.....		20
Figure 8 – Test piston		31
Figure 9 – Gauge "A" for checking shutters.....		34

Figure 10 – Gauge "B" for checking shutters.....	35
Figure 11 – Gauges for testing insertability of round unprepared conductors having the maximum specified cross-section.....	43
Figure 12 – Equipment test arrangement	45
Figure 13 – Apparatus for checking the withdrawal force	50
Figure 14 – Verification of the latching device.....	51
Figure 15 – Apparatus for checking the maximum force (F ₂) exerted by the retaining means.....	52
Figure 16 – Test gauge "vehicle inlet" and test arrangement in mated position for checking retaining means zone.....	54
Figure 17 – Example of an apparatus for checking the proper functioning of the latching device.....	54
Figure 18 – Nomenclature for a mounted vehicle inlet.....	62
Figure 19 – Circuit diagrams for breaking capacity and normal operation tests	67
Figure 20 – Example of points of measurement for DUT containing pin contacts.....	72
Figure 21 – Apparatus for testing the cable anchorage	74
Figure 22 – Ball impact test	76
Figure 23 – Arrangement for mechanical strength test for EV plugs and vehicle connectors.....	78
Figure 24 – Apparatus for flexing test.....	80
Figure 25 – Diagram of the test circuit for the verification of short-circuit current withstand of two-pole equipment on a single-phase AC or DC.....	90
Figure 26 – Diagram of the test circuit for the verification of short-circuit current withstand of three-pole equipment	91
Figure 27 – Diagram of the test circuit for the verification of short-circuit current withstand of four-pole equipment	92
Figure 28 – Overview of the mechanical load test	97
Figure 29 – Application of external mechanical load (mounted according to Figure 28).....	98
Figure 30 – Temperature rise criteria under external mechanical load.....	98
Figure 31 – Forced-air circulating oven	99
Figure 32 – Thermal cycling.....	100
Figure 33 – Pass/fail based on temperature rise criteria.....	101
Table 1 – Test sequence A	24
Table 2 – Parallel testing	26
Table 3 – Size for conductors	37
Table 4 – Short-time test currents.....	39
Table 5 – Values for flexing under mechanical load test.....	46
Table 6 – Value for terminal pull test.....	47
Table 7 – Interlock testing.....	48
Table 8 – Withdrawal force with respect to ratings	51
Table 9 – External force values for tests	55
Table 10 – Cable length used to determine pull force on retaining means	57
Table 11 – Test voltage for dielectric strength test.....	65
Table 12 – Breaking capacity	66
Table 13 – Normal operation.....	68

Table 14 – Test current and nominal cross-sectional areas of copper conductors for temperature rise test.....	71
Table 15 – Pull force and torque test values for cable anchorage.....	75
Table 16 – Summary of mechanical tests.....	76
Table 17 – Impact energy for ball impact test.....	77
Table 18 – Mechanical load flexing test	79
Table 19 – Torque test values for glands	81
Table 20 – Pulling force on insulated end caps	82
Table 21 – Tightening torque for verification of mechanical strength of screw-type terminals.....	83
Table B.1 – Standards for connecting methods	106

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

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IEC 62196-1 has been prepared by IEC 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 fifth edition cancels and replaces the fourth 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) addition of new tests for latching devices and retaining means;
- b) inclusion of type 4 accessories.

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

Draft	Report on voting
23H/579/FDIS	23H/586/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.

Subsequent parts of IEC 62196 deal with the requirements of particular types of accessories. The clauses of those particular requirements supplement or modify the corresponding clauses in this document.

In this document, the following print types are used:

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

A list of all 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.

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, or
- revised.

INTRODUCTION

The IEC 61851 series specifies requirements for electric vehicle (EV) conductive charging systems.

The IEC 62196 series specifies the requirements for plugs, socket-outlets, vehicle connectors, vehicle inlets and cable assemblies as described in the IEC 61851 series and in IEC 62752.

In some situations, a cable assembly is used to directly connect an electric vehicle to a standard socket-outlet connected to a supply network (mains or electrical grid). In other situations, the electric vehicle is connected to a supply network through EV supply equipment that incorporates control and communication circuits. The IEC 62196 series covers the mechanical, electrical and performance requirements for

- vehicle connectors and vehicle inlets for the direct connection between an electric vehicle and a standard socket-outlet, and
- EV plugs, EV socket-outlets, vehicle connectors and vehicle inlets for the connection between the EV supply equipment and the electric vehicle.

The IEC 62196 series consists of the following parts:

- IEC 62196-1: General requirements, comprising clauses of a general character;
- IEC 62196-2: Dimensional compatibility requirements for AC pin and contact-tube accessories;
- IEC 62196-3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers;
- IEC TS 62196-4: Dimensional compatibility and interchangeability requirements for DC pin and contact-tube accessories for class II or class III applications;
- IEC 62196-6: Dimensional compatibility requirements for DC pin and contact-tube vehicle couplers intended to be used for DC EV supply equipment where protection relies on electrical separation.
- IEC TS 62196-7¹: Vehicle adapter.

¹ Under preparation. Stage at the time of publication: IEC TS/ADTS 62196-7:2025.

1 Scope

This part of IEC 62196 is applicable to EV plugs, EV socket-outlets, vehicle connectors, vehicle inlets, herein referred to as "accessories", and to cable assemblies for electric vehicles (EV) intended for use in conductive charging systems which incorporate control means, with a rated operating voltage not exceeding

- 690 V AC 50 Hz to 60 Hz, at a rated current not exceeding 250 A, and
- 1 500 V DC at a rated current not exceeding 800 A.

These accessories and cable assemblies are intended to be installed by instructed persons (IEV 195-04-02) or skilled persons (IEV 195-04-01) only.

These accessories and cable assemblies are intended to be used for circuits specified in the IEC 61851 series, which operate at different voltages and frequencies, and which can include extra-low voltage circuits, such as control and communication circuits.

These accessories and cable assemblies are anticipated to be used at an ambient temperature between -30 °C and $+40\text{ °C}$.

NOTE 1 In some countries, other requirements can apply.

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

NOTE 3 The manufacturer can enlarge the temperature range on the condition that the specified range information is provided.

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

The accessories covered by this document are intended for use in electric vehicle supply equipment in accordance with IEC 61851 (all parts).

This document does not apply to standard plugs and standard socket-outlets used for mode 1 and mode 2 according to IEC 61851-1:2017, 6.2.

NOTE 4 In the following countries, mode 1 is not allowed: UK, US, CA, SG.

2 Normative references

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.

IEC 60068-2-14, *Environmental testing - Part 2-14: Tests - Test N: Change of temperature*

IEC 60068-2-20, *Environmental testing - Part 2-20: Tests - Test Ta and Tb: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60068-2-30, *Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60228:2023, *Conductors of insulated cables*

IEC 60245-4, *Rubber insulated cables - Rated voltages up to and including 450/750 V - Part 4: Cords and flexible cables*

IEC 60269-1, *Low-voltage fuses - Part 1: General requirements*

IEC 60269-2, *Low-voltage fuses - Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - Examples of standardized systems of fuses A to K*

IEC 60309-4:2021, *Plugs, fixed or portable socket-outlets and appliance inlets for industrial purposes - Part 4: Switched socket-outlets with or without interlock*

IEC 60352-5, *Solderless connections - Part 5: Press-in connections - General requirements, test methods and practical guidance*

IEC 60417, *Graphical symbols for use on equipment*, available at <http://www.graphical-symbols.info/equipment>

IEC 60529:1989, *Degrees of protection provided by enclosures (IP code)*

IEC 60529:1989/AMD1:1999

IEC 60529:1989/AMD2:2013

IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests*

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems - Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60695-2-11, *Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end products (GWEPT)*

IEC 60695-10-2, *Fire hazard testing - Part 10-2: Abnormal heat - Ball pressure test method*

IEC 60947-3, *Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*

IEC 60947-5-1, *Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices*

IEC 61032:1997, *Protection of persons and equipment by enclosures - Probes for verification*

IEC 61058-1:2016, *Switches for appliances - Part 1: General requirements*

IEC 61851-1:2017, *Electric vehicle conductive charging system - Part 1: General requirements*

IEC 61851-23:2023, *Electric vehicle conductive charging system - Part 23: DC electric vehicle supply equipment*

IEC 62196-2:2025, *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:—, *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*²

IEC 62752, *In-cable control and protection device (IC-CPD) for mode 2 charging of electric road vehicles*

ISO 12103-1, *Road vehicles - Test contaminants for filter evaluation - Part 1: Arizona test dust*

ISO 4521:2008, *Metallic and other inorganic coatings - Electrodeposited silver and silver alloy coatings for engineering purposes - Specification and test methods*

ISO 5474 (all parts), *Electrically propelled road vehicles - Functional and safety requirements for power transfer between vehicle and external electric circuit*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

NOTE The application of accessories is shown in Figure 1.

² Under preparation. Stage at the time of publication: IEC/AFDIS 62196-3:2025.