

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Electric vehicle conductive charging system –
Part 1: General requirements**

**Système de charge conductive pour véhicules électriques –
Partie 1: Règles générales**



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

ICS 43.120

ISBN 978-2-88912-222-6

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ELECTRIC VEHICLE CONDUCTIVE CHARGING SYSTEM –**Part 1: General requirements**

FOREWORD

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International Standard IEC 61851-1 has been prepared by IEC technical committee 69: Electric road vehicles and electric industrial trucks.

This second edition cancels and replaces the first edition published in 2001. It constitutes a technical revision.

The main changes with respect to the first edition of this standard are the following:

- revision of connector definitions and current levels (Clause 8);
- modification definition of pilot wire to pilot function;
- division of Clause 9 to create Clauses 9 and 11;
- Clause 9: specific requirements for inlet, plug and socket-outlet;
- Clause 11: EVSE requirements: the basic generic requirements for charging stations;
- renumbering of annexes;

- deletion of previous Annex A and integration of charging cable requirements into new Clause 10;
- Annex B becomes Annex A and is normative for all systems using a PWM pilot function with a pilot wire;
- Annex C becomes Annex B;
- replacement of previous Annex D (coding tables for power indicator) with B.4 in Annex B using new values;
- new informative Annex C describing an alternative pilot function system.

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

FDIS	Report on voting
69/173/FDIS	69/179/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.

A list of all parts of the IEC 61851 series, 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,
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- replaced by a revised edition, or
- amended.

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ELECTRIC VEHICLE CONDUCTIVE CHARGING SYSTEM –

Part 1: General requirements

1 Scope

This part of IEC 61851 applies to on-board and off-board equipment for charging electric road vehicles at standard a.c. supply voltages (as per IEC 60038) up to 1 000 V and at d.c. voltages up to 1 500 V, and for providing electrical power for any additional services on the vehicle if required when connected to the supply network.

Electric road vehicles (EV) implies all road vehicles, including plug in hybrid road vehicles (PHEV), that derive all or part of their energy from on-board batteries.

The aspects covered include characteristics and operating conditions of the supply device and the connection to the vehicle; operators and third party electrical safety, and the characteristics to be complied with by the vehicle with respect to the a.c./d.c. EVSE, only when the EV is earthed.

NOTE 1 Class II vehicles are not defined, but the lack of information for this type of vehicle means that the requirements for the standard are under consideration.

NOTE 2 This standard also applies to EVSE with on-site storage capability.

Requirements for specific inlet, connector, plug and socket-outlets for EVs are contained in IEC 62196-1:2003. Standard sheets for the vehicle connector and inlet are also under consideration. They will be incorporated in a separate part of standard IEC 62196.

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

This standard is not applicable to trolley buses, rail vehicles, industrial trucks and vehicles designed primarily for use off-road.

2 Normative references

The following referenced documents are indispensable for the application 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 60038:2009, *IEC standard voltages*

IEC 60068-2-30:2005, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 + 12 h cycle)*

IEC 60068-2-75:1997, *Environmental testing – Part 2: Tests – Test Eh: Hammer tests*

IEC 60068-2-78:2001, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60276, *Definitions and nomenclature for carbon brushes, brush-holders, commutators and slip-rings*

IEC 60309-1:1999, *Plugs, socket-outlets and couplers for industrial purposes – Part 1: General requirements*

IEC 60309-2:1999, *Plugs, socket-outlets and couplers for industrial purposes – Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories*

IEC 60364-4-41:2005, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

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

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC/TR 60755:2008, *General requirements for residual current operated protective devices*

IEC 60884-1:2002, *Plugs and socket-outlets for household and similar purposes – Part 1: General requirements*

IEC 60884-2-5:1995, *Plugs and socket-outlets for household and similar purposes – Part 2 particular requirements for adaptors*

IEC 60947-3:2008, *Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*

IEC 60950-1:2005, *Information technology equipment – Safety – Part 1: General requirements*

IEC 60990:1999, *Methods of measurement of touch current and protective conductor current*

IEC 61000-6-1:2005, *Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments*

IEC 61000-6-3:2006, *Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments*

IEC 61008-1:2010, *Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) – General rules*

IEC 61009-1:2010, *Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) – General rules*

IEC 61180-1:1992, *High-voltage test techniques for low-voltage equipment – Part 1: definitions, test and procedure requirements*

IEC 62196-1:2003, *Plugs, socket-outlets, vehicle couplers and vehicle inlets – Conductive charging of electric vehicles – Part 1: Charging of electric vehicles up to 250 A a.c. and 400 A d.c.*

ISO 6469-2:2009, *Electrically propelled road vehicles – Safety specifications – Part 2: Vehicle operational safety means and protection against failures*

ISO 6469-3:2001, *Electric road vehicles – Safety specifications – Part 3: Protection of persons against electric hazards*

EN 50065-1:2001, *Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – Part 1: General requirements, frequency bands and electromagnetic disturbances*