



SLOVENSKI STANDARD
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01-april-2022

Mopedi in motorna kolesa na električni pogon - Varnostne zahteve za prevodno (kabelsko) priključitev na zunanje električno napajanje (ISO/DIS 18246:2022)

Electrically propelled mopeds and motorcycles - Safety requirements for conductive connection to an external electric power supply (ISO/DIS 18246:2022)

Elektrisch angetriebene Mopeds und Motorräder - Sicherheitsanforderungen für die leitende Verbindung mit einer externen Energieversorgung (ISO/DIS 18246:2022)

Cyclomoteurs et motocycles à propulsion électrique - Exigences de sécurité relatives au couplage conducteur à une station extérieure d'alimentation d'énergie (ISO/DIS 18246:2022)

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Electrically propelled mopeds and motorcycles — Safety requirements for conductive connection to an external electric power supply

Cyclomoteurs et motocycles à propulsion électrique — Exigences de sécurité relatives au couplage conducteur à une station extérieure d'alimentation d'énergie

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 38, *Motorcycles and mopeds*.

If there is any lack of requirements especially for safety issues in this International Standard, the requirement in other relevant standards, such as ISO 17409, is adopted.

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ISO/DIS 18246:2022(E)**Introduction**

This document prescribes basic safety requirements for electrically propelled mopeds and motorcycles, which are called electric vehicles, for simplicity, while connected to an external electric power supply. The safety requirements for off-board appliances/equipment are not described in this document.¹⁾

This document does not standardize specific charging method in the body text. The requirements for the specific charging method are described as Annex.

Moped and motorcycle are defined in ISO 3833:1977, 3.4 and 3.5.

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1) See IEC 60335-2-29, IEC 61851-25, and IEC TS 61851-3 series. NOTE IEC TS 61851-3 series are under preparation. Stage at the time of publication: IEC 69/648/DTS, IEC 69/649/DTS, IEC 69/650/DTS, IEC 69/651/DTS, IEC 69/652/DTS and IEC 69/653/DTS:2019

Electrically propelled mopeds and motorcycles — Safety requirements for conductive connection to an external electric power supply

1 Scope

This document specifies safety requirements for conductive connection to of electrically propelled mopeds and motorcycles (hereinafter referred to as the "electric vehicles") to external electric circuits.

NOTE 1 External electric circuits include external electric power supplies and external electric loads.

It does not provide comprehensive safety information for manufacturing, maintenance and repair personnel.

It applies only to on-board charging systems between the plug or vehicle inlet and RESS circuits.

NOTE 2 The requirements when not connected to external electric circuits are specified in ISO 13063 all parts.

Requirements for bidirectional energy transfer DC to AC are under consideration and are not part of this edition.

NOTE 3 The safety requirements for DC EV supply equipment where protection relies on electrical separation, are specified in IEC 61851-25.

[NOTE 4 The safety requirements for DC EV supply equipment where protection relies on double or reinforced insulation, are specified in IEC TS 61851-3-1 and 3-2.]

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 20653, *Road vehicles — Degrees of protection (IP code) — Protection of electrical equipment against foreign objects, water and access*

IEC 60664-1, *Ed. 2.0:2007, Insulation coordination for equipment within low-voltage systems — Part 1: Principles, requirements and tests*

IEC 60950-1, *Ed. 2.0:2005, Information technology equipment — Safety — Part 1: General requirements*

IEC 61851-25, *Ed. 1.0, Electric vehicle conductive charging system — Part 25: DC EV supply equipment where protection relies on electrical separation*

IEC/TS 61851-3-1, *Ed. 1.0, ¹⁾ Electric Vehicles conductive power supply system — Part 3-1: General Requirements for EV supply equipment where protection relies on double or reinforced insulation – AC and DC conductive power supply systems*

IEC/TS 62196-4, *Ed. 1.0,²⁾ Plugs, socket-outlets, vehicle connectors and vehicle inlets — Conductive charging of electric vehicles — Part 4: Dimensional compatibility and interchangeability requirements for d.c. pin and contact-tube accessories for class II or class III applications*

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IEC 62196-6, Ed. 1.0,³⁾ *Plugs, socket-outlets, vehicle connectors and vehicle inlets — Conductive charging of electric vehicles — Part 6: Dimensional compatibility requirements for DC pin and contact-tube vehicle couplers for DC EV supply equipment where protection relies on electrical separation*

NOTE 1 Under preparation. Stage at the time of publication: IEC 69/648/DTS:2019.

NOTE 2 Under preparation. Stage at the time of publication: IEC 23H/382/DTS:2017.

NOTE 3 Under preparation. Stage at the time of publication: IEC 23H/464/CDV:2020.

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:

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

3.1 General

3.1.1 electric vehicle EV

vehicle with one or more electric drive(s) for vehicle propulsion

Note 1 to entry: In the context of this document, the term electric vehicle includes only moped or motorcycle.

[SOURCE: ISO DIS 13063-3:2019, 3.19, modified — Terminological entry "electrically propelled vehicle" is removed, and note is added.]

3.1.2 rechargeable energy storage system RESS

system that stores energy for delivery of electric energy and which is rechargeable

EXAMPLE Batteries, capacitors.

[SOURCE: ISO DIS 13063-3:2019, 3.29]

3.1.3 removable RESS

RESS that can be moved /removed from an EV by hand (portable RESS) or with the assistance of an installation/device (mobile RESS)

[SOURCE: EN 50604-1:2016 +A1:2021, 3.18]

3.1.4 indoor use

intended for operation under normal ambient conditions in a building

[SOURCE: IEC 61851-1:2017, 3.6.1]

3.1.5 outdoor use

capable of operating under specific range of outdoor conditions

[SOURCE: IEC 61851-1:2017, 3.6.2]

3.1.6**maximum working voltage**

highest value of AC voltage (r.m.s.) or of DC voltage that can occur in an electric system under any normal operating conditions according to the manufacturers' specifications, disregarding transients

[SOURCE: ISO DIS 13063-3:2019, 3.26]

3.1.7**voltage class A**

classification of an electric component or circuit as belonging to voltage class A, if its maximum working voltage is ≤ 30 V AC or ≤ 60 V DC, respectively

Note 1 to entry: The values 60 V DC and 30 V AC are selected taking into account humid weather conditions.

[SOURCE: ISO DIS 13063-3:2019, 3.33, modified — Note 1 to entry is added from ISO 13063:2012, Table 1.]

3.1.8**voltage class B**

classification of an electric component or circuit as belonging to voltage class B, if its maximum working voltage is > 30 and $\leq 1\,000$ V AC or > 60 and $\leq 1\,500$ V DC, respectively

Note 1 to entry: The values 60 V DC and 30 V AC are selected taking into account humid weather conditions.

[SOURCE: ISO DIS 13063-3:2019, 3.34, modified — Note 1 to entry is added from ISO 13063:2012, Table 1.]

3.1.9**electric chassis**

conductive parts of a vehicle that are electrically connected and whose potential is taken as reference

[SOURCE: ISO DIS 13063-3:2019, 3.15]

3.1.10**accessible part**

a part which can be touched by means of the standard test finger

[SOURCE: IEC 442-01-15]

3.1.11**degree of protection**

protection provided by an enclosure against access, foreign objects and/or water and verified by standardized test methods

[SOURCE: ISO 20653:2013, 3.2]

3.1.12**single fault condition**

condition in which one means for protection against electric shock is defective or one fault is present which could cause a hazard

Note 1 to entry: If a single fault condition results in one or more other fault conditions, all are considered as one single fault condition.

[SOURCE: IEC 61140:2016, 3.1.4]

ISO/DIS 18246:2022(E)**3.2 Charging****3.2.1****EV charging system**

complete system including the EV supply equipment and the EV functions that are required to supply electric energy to an EV for the purpose of charging

[SOURCE: IEC 61851-1:2017, 3.1.4]

3.2.2**on-board charging system**

on-board sections of EV charging system, which may have dedicated control functions used for the connection of the vehicle to an external electric circuit.

3.2.3**on-board charging equipment**

equipment or a combination of equipment in the on-board charging system

3.2.4**external electric power supply**

electric power source which is outboard of the vehicle for supplying electric energy to electric vehicle for electric propulsion

[SOURCE: ISO 17409:2015, 3.23]

3.2.5**EV supply equipment**

equipment or combined equipment providing dedicated functions for an electric power supply from a fixed installation to an EV for the purpose of charging for all dedicated charging modes and cases of connection

[SOURCE: ISO 17409:2015, 3.21]

3.2.6**charger**

power converter that performs the necessary functions for charging a battery

3.2.7**charger assembly**

power converter that performs the necessary functions for charging a battery, including cables

3.2.8**vehicle power supply circuit**

voltage class B electric circuit which includes all parts that are galvanically connected to the vehicle inlet (case B, case C) or the plug (case A) and that is operational when connected to an external electric power supply

Note 1 to entry: Case A, case B and case C are defined in IEC 61851-1.

[SOURCE: ISO 17409:2015, 3.47, modified — Note 1 to entry is added from ISO TR 8713-1:2018.]

3.2.9**primary circuit**

circuit in the charger intended to be galvanically connected to a supply network (mains)

3.2.10**secondary circuit**

circuit that has no direct connection to a primary circuit and derives its power from a transformer, converter or equivalent isolation device

[SOURCE: IEC 61851-23:2014, 3.112]

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3.2.11**RESS circuit**

electric circuit which includes all live parts that are galvanically connected to the secondary circuits of the charger and charging circuits of RESS, excluding propulsion circuits

3.2.12**DC output voltage limit parameter**

value sent by the EV to the DC EV supply equipment that indicates the allowable DC output voltage

[SOURCE: IEC 61851-25]

3.2.13**control pilot circuit**

circuit designed for the transmission of signals or communication between the EV and the EV supply equipment

[SOURCE: IEC 61851-1:2017, 3.3.2, modified — Note 1 to entry is deleted.]

3.3 Connection**3.3.1****AC connection**

connection at a vehicle inlet or plug, with an external AC power supply

3.3.2**DC connection**

connection at a vehicle inlet or plug, with an external DC power supply

3.3.3**charging cable assembly**

assembly consisting of flexible cable or cord fitted with a plug and/or a vehicle connector, that is used to establish the connection between the EV and the supply network or an EV charging station

Note 1 to entry: A cable assembly can be detachable or be a part of the EV or the EV charging station.

Note 2 to entry: A cable assembly can include one or more cables, with or without a fixed jacket, which can be in a flexible tube, conduit or wire way.

3.3.4**cord set**

assembly consisting of a flexible cable or cord fitted with a non-rewirable plug and a non-rewirable connector, intended for the connection of an electrical appliance to the electrical supply

[SOURCE: IEC 461-06-16]

3.3.5**socket-outlet**

accessory having socket-contacts designed to engage with the pins of a plug and having terminals for the connection of cables or codes

[SOURCE: IEC 61851-1:2017, 3.5.10]

3.3.6**plug**

accessory having pins designed to engage with the contacts of a socket-outlet

Note 1 to entry: It also incorporate means for the electrical connection and mechanical retention of flexible cables or codes.

[SOURCE: IEC 442-03-02, modified]