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Electrically propelled mopeds and motorcycles — Safety specifications

Part 3: Electrical safety

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National foreword

This British Standard is the UK implementation of ISO 13063-3:2022. Together with BS ISO 13063-1:2022 and BS ISO 13063-2, it supersedes BS ISO 13063:2012, which will be withdrawn upon publication of the rest of the series.

The UK participation in its preparation was entrusted to Technical Committee AUE/14, Motor cycles and mopeds.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Electrically propelled mopeds and motorcycles — Safety specifications —

Part 3: Electrical safety

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Partie 3: Sécurité électrique

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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).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 38, *Motorcycles and mopeds*.

This first edition of ISO 13063-3, together with ISO 13063-1 and ISO 13063-2, cancels and replaces ISO 13063:2012, which has been technically revised.

The main changes are as follows:

— extension of protection against electric shock to all electric safety requirements;

— alignment of structure and requirements as possible with ISO 6469-3:2018;

— splitting the document into three documents which consist of the following parts, under the general title *Electrically propelled mopeds and motorcycles — Safety specifications:*

  — *Part 1: On-board rechargeable energy storage system (RESS)*;

  — *Part 2: Vehicle operational safety*;

  — *Part 3: Electrical safety*;

— addition of specific requirements for capacitive discharge;

— new test specification for the isolation resistance monitoring system;

— new requirements and test for touch current; and

— the requirements for conductive connection to an external electric power supply can be covered by ISO 18246.

A list of all parts in the ISO 13063 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Electrically propelled mopeds and motorcycles — Safety specifications —

Part 3: Electrical safety

1 Scope

This document specifies electric safety requirements for protection against electric shock and thermal incidents of electric propulsion systems and conductively connected auxiliary electric systems of-electrically propelled mopeds and motorcycles when used in normal conditions. It is applicable to a maximum working voltage of the on-board electrical circuit up to 1 000 V alternating current (a.c.) or 1 500 V direct current (d.c.). This document does not provide comprehensive safety information for manufacturing, maintenance and repair personnel.

NOTE Requirements for conductive connections of electrically propelled mopeds and motorcycles to an external electric power supply are described in ISO 18246.

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.

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

IEC 60227-1, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V — Part 1: General requirements*

IEC 60245-1, *Rubber insulated cables — Rated voltages up to and including 450/750 V — Part 1: General requirements*

IEC 60990:2016, *Methods of measurement of touch current and protective conductor current*

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
auxiliary electric system
vehicle system, other than the *propulsion system* (3.46), that operates on electric energy

[SOURCE: ISO 6469-3:2021, 3.1]

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3.2
balance of electric circuit
remaining section of an electric circuit when all electric power sources that are energized (e.g. *RESS* (3.23) and fuel cell stacks) are disconnected

[SOURCE: ISO 6469-3:2021, 3.2]

3.3
protective barrier
part providing protection against *direct contact* (3.9) from any usual direction of access

[SOURCE: IEC 60050-826:2004, 826-12-23, modified — Domain “<electrically>” was removed.]

3.4
basic insulation
insulation of *hazardous live parts* (3.35) which provides *basic protection* (3.5)

Note 1 to entry: This concept does not apply to insulation used exclusively for functional purposes.

Note 2 to entry: Where insulation is not provided by solid insulation only, it is complemented with *protective barriers* (3.3) or *protective enclosures* (3.15) to prevent access to *live parts* (3.19) in order to achieve basic protection.

[SOURCE: IEC 60050-581:2008, 581-21-24, modified — “Note 2 to entry was added.]

3.5
basic protection
protection against *electric shock* (3.13) under fault-free conditions.

[SOURCE: IEC 60050-195:2021, 195-06-01, modified — "normal" was replaced by "fault-free".]

3.6
conductive part
part which can carry electric current

[SOURCE: IEC 60050-195:2021, 195-01-06]

3.7
conductor
conductive part (3.6) intended to carry a specified electric current

[SOURCE: IEC 60050-195:2021, 195-01-07]

3.8
creepage distance
shortest distance along the surface of a solid insulating material between two *conductive parts* (3.6)

[SOURCE: IEC 60050-151:2001, 151-15-50]

3.9
direct contact
electric contact of persons or animals with *live parts* (3.19)

[SOURCE: IEC 60050-826:2004, 826-12-03]

3.10
double insulation
insulation comprising both *basic insulation* (3.4) and *supplementary insulation* (3.25)

[SOURCE: IEC 60050-195:2021, 195-06-08]

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3.11
electric chassis
conductive parts (3.6) of a vehicle that are electrically connected and whose potential is taken as reference

3.12
electric drive
combination of traction motor, power electronics and their associated controls for the conversion of electric to mechanical power and vice versa

[SOURCE: ISO 6469-3:2021, 3.13]

3.13
electric shock
physiological effect resulting from an electric current passing through a human body or animal body

[SOURCE: IEC 60050-826:2004, 826-12-01]

3.14
electrically propelled vehicle
vehicle with one or more *electric drive(s)* (3.12) for vehicle propulsion

[SOURCE: ISO 6469-3:2021, 3.15]

3.15
protective enclosure
electrical enclosure surrounding internal parts of equipment to prevent access to *hazardous live parts* (3.35) from any direction

[SOURCE: IEC 60050-195:2021, 195-06-14, modified — Domain “<electrically>” was removed.]

3.16
exposed conductive part
conductive part (3.6) of equipment which can be touched and which is not normally live, but which can become live when *basic insulation* (3.4) fails

Note 1 to entry: A conductive part of electrical equipment which can become live only through contact with an exposed conductive part which has become live is not considered to be an exposed conductive part itself.

[SOURCE: IEC 60050-442:1998, 442-01-21]

3.17
isolation resistance monitoring system
system that periodically or continuously monitors the *isolation resistance* (3.18) between *live parts* (3.19) and the *electric chassis* (3.11)

[SOURCE: ISO 6469-3:2021, 3.24]

3.18
isolation resistance
insulation resistance
resistance between *live parts* (3.19) of an electric circuit and the *electric chassis* (3.11) as well as other electric circuits which are insulated from this electric circuit

[SOURCE: ISO 6469-3:2021, 3.23]

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