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Electrically propelled mopeds and motorcycles — Safety specifications —

Part 2: Vehicle operational safety

Cyclomoteurs et motocycles à propulsion électrique — Spécifications de sécurité —

Partie 2: Sécurité fonctionnelle du véhicule

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Contents

Page

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

The main changes are as follows:

— 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;*

— improvement of the operational safety requirements for the driving-enabled mode;

— addition of the requirement for vehicles with a permanently connected recharge cable according to case A of IEC 61851-1;

— alignment with ISO 6469-2.

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

Electrically propelled mopeds and motorcycles — Safety specifications —

Part 2: Vehicle operational safety

1 Scope

This document specifies requirements for operational safety means and protection against failures related to hazards specific to any kind of electrically propelled mopeds and motorcycles when used in normal conditions.

It is applicable only if the maximum working voltage of the on-board electrical circuit does not exceed 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.

This document does not consider specific aspects of driving automation features.

NOTE For definition of the term "driving automation features", see SAE J3016.

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 11451 (all parts), *Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy*

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
driving-enabled mode
operating mode in which the vehicle can be moved by its own *propulsion system* (3.13) by one action

Note 1 to entry: Examples for this action are: rev up the throttle grip, activation of an equivalent control, release of the brake system.

[SOURCE: ISO 6469-2:2022, 3.5, modified — Note 1 to entry modified.]

3.2
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]

3.3
electrically propelled vehicle
EV
vehicle with one or more *electric drive(s)* (3.2) for vehicle propulsion

[SOURCE: ISO 6469-2:2022, 3.6]

3.4
fuel cell stack
assembly of two or more fuel cells that are electrically connected

[SOURCE: ISO 6469-3:2021, 3.20]

3.5
fuel cell system
system, typically containing the following subsystems: *fuel cell stack* (3.4), air processing, fuel processing, thermal management, water management, and their control

[SOURCE: ISO 6469-2:2022, 3.10]

3.6
fuel cell vehicle
FCV
electrically propelled vehicle (3.3) with a *fuel cell system* (3.5) as the power source for vehicle propulsion

Note 1 to entry: An FCV may also have a *rechargeable energy storage system (RESS)* (3.7) or another power source for vehicle propulsion.

[SOURCE: ISO 6469-2:2022, 3.11]

3.7
rechargeable energy storage system
RESS
rechargeable system that stores energy for the delivery of electric energy

EXAMPLE Batteries, capacitors.

[SOURCE: ISO 6469-2:2022, 3.13, modified — "for the electric drive" was deleted.]

3.8
auxiliary electric system
vehicle system, other than for vehicle propulsion, that operates on electric energy

[SOURCE: ISO 6469-2:2022, 3.1]

3.9
case A
connection of an *electrically propelled vehicle (EV)* (3.3) to the supply network with a plug and cable permanently attached to the EV

[SOURCE: ISO 6469-2:2022, 3.2]

3.10
case B
connection of an *electrically propelled vehicle (EV)* (3.3) to the AC supply network with a cable assembly detachable at both ends

[SOURCE: ISO 6469-2:2022, 3.3]

3.11
case C
connection of an *electrically propelled vehicle (EV)* (3.3) to the AC supply network utilizing a cable and *vehicle connector* (3.17) permanently attached to the EV charging station

[SOURCE: ISO 6469-2:2022, 3.4]

3.12
maximum working voltage
highest value of AC voltage RMS or of DC voltage that can occur under any normal operating conditions according to the manufacturer's specifications, disregarding transients and ripples

[SOURCE: ISO 6469-3:2021, 3.26]

3.13
propulsion system
combination of power source and powertrain for vehicle propulsion

[SOURCE: ISO 6469-2:2022, 3.12]

3.14
vehicle inlet
part of a *vehicle coupler* (3.15) incorporated in, or fixed to, an *electrically propelled vehicle (EV)* (3.3)

[SOURCE: ISO 6469-2:2022, 3.17]

3.15
vehicle coupler
means of enabling the manual connection of a flexible cable to an *electrically propelled vehicle (EV)* (3.3) for the purpose of supplying electric energy to an EV

Note 1 to entry: It consists of two parts: a *vehicle connector* (3.17) and a *vehicle inlet* (3.14).

3.16
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 60050-442:1998, 442-03-02]

3.17
vehicle connector
part of a *vehicle coupler* (3.15) integral with, or intended to be attached to, one flexible cable

[SOURCE: ISO 6469-2:2022, 3.16]

3.18
vehicle power supply circuit
voltage class B (3.19) electric circuit which includes all parts that are galvanically connected to the *vehicle inlet* (3.14) [*case B* (3.10), *case C* (3.11)] or the plug [*case A* (3.9)] and that is operational when connected to an external electric power supply

[SOURCE: ISO 6469-2:2022, 3.18]

3.19
voltage class B
classification of an electric component or circuit with a *maximum working voltage* (3.12) of (>30 and ≤1 000) V a.c. (rms), or (>60 and ≤1 500) V d.c., respectively

[SOURCE: ISO 21498-1:2021, 3.18]

3.20
single-point failure
system failure caused by the failure of only one of its constituent items

[SOURCE: ISO 6469-2:2022, 3.14]

3.21
state of charge
SOC
available capacity of a *rechargeable energy storage system (RESS)* (3.7) or RESS subsystem expressed as a percentage of rated capacity

[SOURCE: ISO 6469-1:2019, 3.26]

4 Abbreviated terms

EV electrically propelled vehicle

SOC state of charge

RESS reachable energy storage system

FCV fuel cell vehicle

5 Environmental and operational conditions

The requirements given in this document shall be met across the range of environmental and operational conditions for which the electrically propelled vehicle is designed to operate, as specified by the vehicle manufacturer.

NOTE See the ISO 16750 series, ISO 21498-1 and the ISO 19453 series for guidance.

6 Operational safety

6.1 General

Measures shall be implemented to manage credible single-point failures specific to electrically propelled vehicles.

Examples for measures that address single-point failures are:

— normally open switches;

— normally closed fuel valves.

6.2 Driving-enabled/disable mode

Movement of the vehicle by its propulsion system shall be possible only in the driving-enabled mode.

To switch the propulsion system from shut-off condition to driving-enabled mode, at least two deliberate and distinctive actions shall be necessary.

Only one action is required to go from driving-enabled mode to driving disable mode.

A main switch function and its actuation are required to activate and to deactivate the propulsion system. It shall be designed according to 6.1.

The vehicle shall indicate to the rider that the propulsion system is in driving-enabled mode.

For reactivation of the propulsion system after its automatic or manual shut-off, the requirements for activating the driving-enabled mode shall apply.

If FCVs are deactivated by a main switch function, the fuel-cell system may remain active to perform certain functions as required by the system.

If the vehicle is not in the driving-enabled mode, the power sources of the propulsion system (e.g. fuel cell system, RESS) may be active.

6.3 Driving partially

6.3.1 Indication of reduced propulsion power

If the electric propulsion system is equipped with a means to automatically reduce the vehicle propulsion power, it is recommended to indicate significant reductions to the rider.

NOTE Such means could limit the effects of a fault in the propulsion system or of an excessive power demand by the rider.

6.3.2 Low energy content of RESS

If a low state of charge (SOC) in the RESS has a relevant impact on vehicle driving performance, a low energy content of the RESS shall be indicated to the rider, (e.g. a visual or audible signal). At the indicated low SOC specified by the vehicle manufacturer, the vehicle shall meet the following requirements:

a) the vehicle shall be capable of being driven out of the traffic area using its own propulsion system;

b) a minimum energy reserve shall still be available for the lighting system when there is no independent energy storage for the auxiliary electric systems. Please note that national and/or International Standards or regulations can specify requirements for these situations.

6.3.3 Driving backwards

If driving backwards is achieved by reversing the rotational direction of the electric motor, the following requirements shall be met to prevent unintentional switching into reverse when the vehicle is in motion:

To switch between the forward and backward (reverse) directions, either:

— two separate actions by the rider shall be required; or

— if only one rider action is required, a safety device shall allow the transition only when the vehicle is stationary or moving slowly, as specified by the manufacturer.

The vehicle shall indicate the selected drive direction to the rider.

6.4 Parking

When the rider is leaving the vehicle, it shall be indicated whether the electric propulsion system is still in the driving-enabled mode.