IEC 62335

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Circuit breakers – Switched protective earth portable residual current devices for class I and battery powered vehicle applications

Disjoncteurs – Dispositifs différentiels mobiles avec sectionnement du conducteur de protection incorporé – Destinés aux matériels de classe I des véhicules électriques à batteries

IEC 62335:2008

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CONTENTS

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CIRCUIT BREAKERS – SWITCHED PROTECTIVE EARTH PORTABLE RESIDUAL CURRENT DEVICES FOR CLASS I AND BATTERY POWERED VEHICLE APPLICATIONS

FOREWORD

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International Standard IEC 62335 has been prepared by subcommittee 23E: Circuit-breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories.

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

FDIS	Report on voting
23E/650/FDIS	23E/652/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.

In this standard, the following print types are used:

– Requirements proper, in roman type;

– *Test specifications, in italic type;*

– NOTES, in smaller roman type.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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;
- withdrawn;
- replaced by a revised edition, or
- amended.

CIRCUIT BREAKERS – SWITCHED PROTECTIVE EARTH PORTABLE RESIDUAL CURRENT DEVICES FOR CLASS I AND BATTERY POWERED VEHICLE APPLICATIONS

1 Scope

This International Standard applies to portable devices intended for use with vehicles having class 1 insulation and battery powered vehicle applications having battery charging units. They have a switched protective earth (SPE) and hereafter are referred to as SPE-PRCDs.

The SPE-PRCD consists of a plug, a residual current device (RCD) and a portable socket outlet.

This standard applies to portable devices performing simultaneously the functions of detection of the residual current, of comparison of the value of this current with the residual operating value and of opening of the protected circuit when the residual current exceeds this value.

In addition to the RCD function, the SPE-PRCDs address incorrect supply connections resulting in a hazardous live PE and/or supply failure (for example: loss of supply PE or loss of supply N). These SPE-PRCDs are intended for application only on TN and TT systems.

These SPE-PRCDs will not operate if used on IT or other unearthed systems such as isolated winding generator or isolating transformer. These SPE-PRCDs, due to the PE effectively being an open supply conductor, will not function to close the contacts on an IT system.

NOTE 1 For applications where due to the supply system a SPE-PRCD cannot operate a PRCD (according to IEC 61540) may be used.

SPE-PRCDs are not required to incorporate overcurrent protection.

SPE-PRCDs are intended to be supplied from single-phase or two-phase circuits with rated currents not exceeding 16 A for rated voltages not exceeding 250 V a.c., or with rated current not exceeding 32 A for rated voltages not exceeding 130 V a.c. to earth.

SPE-PRCD have a rated residual operating current not exceeding 30 mA and are intended to provide additional protection against shock hazard in case of direct contact on the circuit downstream of the SPE-PRCD. This protection is additional to that provided by the fixed installations. They will not detect a direct contact of a person from line to neutral and do not substitute for safe installation requirements.

Plugs and socket-outlets will comply with the relevant standards. The use of an integral fuse is permitted, if necessary, for the relevant plug and socket-outlet system.

SPE-PRCD are not intended to be used as part of a fixed installation or permanently connected to equipment. They should be connected by a plug and the outlet should be a portable socket outlet.

If a SPE-PRCD of the incorrect type is used (example an LNSE instead of an LLSE) it should continue to protect.

SPE-PRCDs including batteries are not covered by this standard.

Additional requirements may be necessary for SPE-PRCDs used in locations having severe environmental conditions.

NOTE 2 The requirements for SPE-PRCDs are in line with the general requirements of IEC 61008-1 and IEC 61540. SPE-PRCDs are essentially intended to be operated by unskilled persons and designed not to require maintenance.

NOTE 3 The RCD part of the SPE-PRCD is not intended to provide isolation, which may be provided by the plug.

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.

CISPR 14 (all parts), *Electromagnetic compatibility – Requirements for household appliances,electric tools and similar apparatus*

IEC 60065, *Audio, video and similar electronic apparatus – Safety requirements*

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

IEC 60068-3-4, *Environmental testing – Part 2-34:Supporting documentation and guidance – Damp heat tests*

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 60245 (all parts), *Rubber insulated cables – Rated voltages up to and including 450/750V*

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

IEC 60364 (all parts), *Low-voltage electrical installations*

IEC 60384-14 (all parts), *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification – Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

IEC 60417-DB, *Graphical symbols for use on equipment*

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

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

IEC 60695-2-10, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

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

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

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1 A consolidated edition (3.1) exists including IEC 60884-1 (2002) and its Amendment 1 (2006).

IEC 60898 (all parts), *Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations*

IEC 61008-1:1996, *Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) – Part 1:General rules*[2]

IEC 61249-2 (all parts), *Materials for printed boards and other interconnecting structures*

IEC 61540:1997, *Electrical accessories – Portable residual current devices without integral overcurrent protection for household and similar use (PRCDs)*

IEC 61543:1995, *Residual current-operated protective devices (RCDs) for household and similar use – Electromagnetic compatibility*

3 Terms and definitions

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

NOTE 1 Where the terms "voltage" and "current" are used, they imply r.m.s. values, unless otherwise specified.

NOTE 2 Throughout this standard, the word "earthing" is used for "protective earthing".

NOTE 3 The term "accessory" is used as a general term covering plugs and socket-outlets. The term "portable accessory" covers plugs and portable socket-outlets. The use of the accessories is shown in Figure 1a of IEC 60884-1.

3.1 Definitions relating to plugs and socket-outlets

3.1.1
plug
accessory having pins designed to engage with the contacts of a socket-outlet, also incorporating means for the electrical connection and mechanical retention of flexible cables or cords

3.1.2
socket-outlet
accessory having socket-contacts designed to engage with the pins of a plug and having terminals for the connection of conductors

3.1.3
portable socket-outlet
socket-outlet intended to be connected to, or integral with, flexible cables or cords, and which can easily be moved from one place to another while connected to the supply

3.1.4
multiple socket-outlet
combination of two or more socket-outlets

3.1.5
rewirable plug
accessory so constructed that the flexible cable or cord can be replaced

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2 A consolidated edition (2.2) exists including IEC 61008-1 (1996) and its Amendments 1 (2002) and 2 (2006).

3.1.6
non-rewirable plug or a non-rewirable portable socket-outlet
accessory so constructed that it forms a complete unit with the flexible cable or cord after connection and assembly by the manufacturer of the accessory (see also 14.1 of IEC 60884-1)

3.1.7
moulded-on accessory
non-rewirable accessory, the manufacture of which is completed by insulating material moulded around pre-assembled component parts and the terminations of the flexible cable or cord

3.1.8
cord extension set
assembly consisting of a flexible cable or cord fitted with a non-rewirable plug and a non-rewirable portable socket-outlet

3.1.9
terminal
insulated or non-insulated connecting device serving for re-usable connection of the supply conductors

3.1.10
termination
insulated or non-insulated connecting device serving for non re-usable connection of the supply conductors

3.1.11
clamping unit of a terminal
unit consisting of the part(s) necessary for the mechanical clamping and the electrical connection of the conductor(s)

3.1.12
screw-type terminal
terminal for the connection and subsequent disconnection of a conductor or for the interconnection of two or more conductors capable of being dismantled, the connection being made, directly or indirectly, by means of screws or nuts of any kind

3.1.13
pillar terminal
screw-type terminal in which the conductor is inserted into a hole or cavity, where it is clamped under the shank of the screw or screws

NOTE The clamping pressure may be applied directly by the shank of the screw or through an intermediate member to which pressure is applied by the shank of the screw.

3.1.14
screw terminal
screw-type terminal in which the conductor is clamped under the head of the screw

NOTE The clamping pressure may be applied directly by the head of the screw or through an intermediate part, such as a washer, clamping plate or anti-spread device.

3.1.15
stud terminal
screw-type terminal in which the conductor is clamped under a nut

NOTE The clamping pressure may be applied directly by a suitably shaped nut or through an intermediate part, such as a washer, clamping plate or anti-spread device.