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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Powertrack systems – Part 1: General requirements

Systèmes de conducteurs préfabriqués – Partie 1: Exigences générales

IEC 61534-1:2011

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61534-1 has been prepared by subcommittee 23A: Cable management systems, of IEC technical committee 23: Electrical accessories.

This second edition cancels and replaces the first edition published in 2003 and constitutes a technical revision. The main changes from the previous edition are as follows:

- updated normative references (Clause 2);
- changes to the number of samples to be tested (Subclause 5.3);
- inclusion of a short circuit test (New Clause 18);
- changes to external influences (Clause 21).

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

FDIS	Report on voting
23A/630/FDIS	23A/631/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 the parts in the IEC 61534 series, under the general title *Powertrack systems*, can be found on the IEC website.

The following difference exists in the countries indicated below:

– Table 4, first column, first line: the 10 A rated terminal should be capable of clamping 1 mm^2 as a minimum (UK);

– Australia has specific wiring rules covering socket-outlets to be switched. In Australia, AS/NZS 3000 contains requirements for switching devices to be used in Australian and New Zealand electrical installations;

– 9.5: in Australia, fuses and fuse-links are not to be used.

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,
- withdrawn,
- replaced by a revised edition, or
- amended.

The contents of the corrigendum of June 2013 apply to the French version only.

INTRODUCTION

Particular requirements for specific types of powertrack systems will be specified in the relevant parts 2 of IEC 61534.

For a specific type of powertrack system the requirements of Part 1 of the standard are to be considered, together with the particular requirements of the appropriate Part 2, which will supplement or modify some of the corresponding clauses in Part 1 to provide the complete requirements for that type of system.

Part 1 shall apply unless supplemented or modified by an appropriate Part 2.

POWERTRACK SYSTEMS –

Part 1: General requirements

1 Scope

1.1 This part of IEC 61534 specifies general requirements and tests for powertrack (PT) systems with a rated voltage not exceeding 277 V a.c. single phase, or 480 V a.c. two or three phase 50 Hz/60 Hz with a rated current not exceeding 63 A. These systems are used for distributing electricity in household, commercial and industrial premises.

1.2 Powertrack systems, according to this standard, are intended for use under the following conditions:

– an ambient temperature in the range –5 °C to + 40 °C, the average value over a 24 h period not exceeding 35 °C;

– a situation not subject to a source of heat likely to raise temperatures above the limits specified above;

– an altitude not exceeding 2000 m above sea level;

– an atmosphere not subject to excessive pollution by smoke, chemical fumes, prolonged periods of high humidity or other abnormal conditions.

In locations where special conditions prevail, as in ships, vehicles and the like and in hazardous locations, for instance, where explosions are liable to occur, special constructions may be necessary.

This standard does not apply to

– cable trunking systems and cable ducting systems covered by IEC 61084 [8] [1];

– busbar trunking systems covered by IEC 60439-2 [5];

– electrical supply track systems for luminaires covered by IEC 60570 [6].

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 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60068-2-52, *Environmental testing – Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium, chloride solution)*

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

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1 Figures in square brackets refer to the bibliography.

IEC 60112:2003, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60127-1:2006, *Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links*

IEC 60269-1:2006, *Low-voltage fuses – Part 1: General requirements*

IEC 60417, *Graphical symbols for use on equipment*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP code)* [2]

IEC 60695-2-11:2000, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods-Glow-wire flammability test methods for end-products*

IEC 60695-11-2:2003, *Fire hazard testing – Part 11-2: Test flames – 1 kW nominal pre-mixed flame – Apparatus, confirmatory test arrangement and guidance*

IEC 60695-10-2:2003, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test*

IEC 60884-1:2002, *Plugs and socket outlets for household and similar purposes – Part 1: General requirements*
Amendment 1 (2006)[3]

IEC 60998-1:2002, *Connecting devices for low-voltage circuits for household and similar purposes – Part 1: General requirements*

IEC 60998-2-3:2002, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-3: Particular requirements for connecting devices as separate entities with insulation piercing clamping units*

IEC 60999-1:1999, *Connecting devices – Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm² up to 35 mm² (included)*

IEC 60999-2:2003, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 2: Particular requirements for clamping units for conductors above 35 mm² up to 300 mm² (included)*

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61210:2010, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

ISO 1456:2009, *Metallic and other inorganic coatings – Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

ISO 2081:2008, *Metallic and other inorganic coatings – Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 2093:1986, *Electroplated coatings of tin – Specification and test methods*

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2 There exists a consolidated edition 2.1 (2001) that includes IEC 60529 (1989) and its Amendment 1 (1999).

3 There exists a consolidated edition 3.1 (2006) that includes IEC 60884-1 (2002) and its Amendment 1 (2006).

3 Terms and definitions

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

3.1
powertrack system
PT system
assembly of system components including a powertrack by which accessories may be connected to an electrical supply at one or more points (pre-determined or otherwise) along the powertrack

3.2
system component
part specifically designed for the PT system which may or may not incorporate an accessory

3.3
powertrack
system component which is a generally linear assembly of spaced and supported busbars providing electrical connection of accessories

NOTE A powertrack may also provide mechanical support for accessories.

3.4
busbar
main current carrying conductor(s) to which for example one or more tap-off units, accessories or electrical system components may be connected

3.5
accessory
electrical device complying with its own standard and associated with or incorporated in the PT system

3.6
rewireable accessory
accessory so constructed that a cable can be fitted or replaced using a tool

3.7
non-rewirable system component
system component so constructed that it forms a complete unit with the cable after connection and assembly by the manufacturer of the system component

3.8
connector
device which provides the electrical connection and possibly the mechanical connection of powertracks

3.9
supply connector
device enabling the supply wiring to be connected to the powertrack

3.10
live parts
conductor or conductive part intended to be energized in normal operation, including a neutral conductor, but by convention not a PEN conductor

[IEC 60050-195:1998, 195-02-19, modified] [2]

3.11
rated voltage, rated current
value assigned to a PT system by the manufacturer and to which operation and performance characteristics are referred

3.12
clamping unit
part(s) of a terminal necessary for the mechanical clamping and the electrical connection of the conductor(s) including the parts which are necessary to ensure the correct contact pressure

3.13
termination
part of a PT system to which a conductor(s) is attached providing a non-reusable connection

3.14
terminal
part of the PT system composed of one or more clamping unit(s) to which a conductor(s) is attached providing a reusable connection

3.15
insulation piercing connecting device
IPCD
connecting device for the connection and possible disconnection of one conductor or the interconnection of two or more conductors, the connection being made by piercing, boring through, cutting through, removing, displacing or making ineffective in some other manner the insulation of the conductor(s) without previous stripping

NOTE The removal of the sheath of the cable, if necessary, is not considered as a previous stripping.

3.16
flat quick-connect termination
electrical connection consisting of a male tab and a female connector which can be inserted and withdrawn with or without the use of a tool

3.17
plug
accessory intended for connection to a flexible cable intended for frequent manual engagement with a socket outlet

3.18
socket-outlet
accessory having a set of contacts designed to engage with the pins of a corresponding plug and which may have terminals or terminations for the connection of conductors

3.19
fuse-link
part of the fuse including the fuse-element(s) and intended to be replaced after the fuse has operated

3.20
type test
test of one or more PT systems made to a certain design to show that design meets certain specifications

[IEC 60050-151:2001, 151-16-16, modified] [1]

3.21
routine test
test to which each PT system is subjected during or after manufacture to ascertain whether it complies with the relevant requirements of this standard

[IEC 60050-151:2001, 151-16-17, modified]

NOTE The routine test is specified in Annex G.

3.22
dummy track
device for maintaining visual appearance and mechanical integrity which may be with or without current carrying parts

3.23
tap-off unit
system component intended for infrequent manual engagement with the busbars directly or indirectly via a tap-off outlet

3.24
tap-off outlet
aperture into which the tap-off unit engages

3.25
clearance
shortest distance in air between two conductive parts

3.26
creepage distance
shortest distance along the surface of the insulating material between two conductive parts

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

3.27
overvoltage
voltage having a peak value exceeding the corresponding peak value of maximum steady-state voltage at normal operating conditions

3.28
transient overvoltage
short duration overvoltage of a few milliseconds or less, oscillatory or non-oscillatory, usually highly damped

[IEC 60050-604:1987, 604-03-13]

3.29
overvoltage category
numeral defining a transient overvoltage condition

3.30
rated impulse withstand voltage
highest peak value of impulse voltage of prescribed form and polarity assigned by the manufacturer and which does not cause breakdown of insulation under specified conditions

3.31
rated insulation voltage
r.m.s. withstand voltage value assigned by the manufacturer to the PT system or to a part of it, characterising the specified (long term) withstand capability of its insulation

3.32
basic protection
protection against electric shock under fault-free conditions

[IEC 60050-195:1998, 195-06-01]

3.33
fault protection
protection against electric shock under single fault conditions (for example, failure of basic insulation)

[IEC 60050-195:1998, 195-06-02, modified]

3.34
functional insulation
insulation between live parts which is necessary only for the proper functioning of the PT system

[IEC 60050-195:1998, 195-02-41, modified]

3.35
basic insulation
insulation of live parts which provides basic protection against electric shock

[IEC 60050-195:1998, 195-06-06, modified]

3.36
supplementary insulation
independent insulation as applied as fault protection in addition to basic insulation in order to provide protection against electric shock in the event of a failure of basic insulation (fault protection)

[IEC 60050-195:1998, 195-06-07, modified]

3.37
double insulation
insulation comprising both basic insulation and supplementary insulation

[IEC 60050-195:1998, 195-06-08]

3.38
reinforced insulation
insulation of live parts which provides a degree of protection against electric shock equivalent to double insulation

[IEC 60050-195:1998, 195-06-09]

3.39
solid insulation
insulation material, not gaseous or liquid, interposed between two conductive parts

3.40
pollution
contamination by foreign matter, solid, liquid, or gaseous that can result in a reduction of electric surface resistivity

3.41
pollution degree
numeral characterising the expected pollution of the micro-environment