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Edition 1.0 2015-08

TECHNICAL SPECIFICATION

colour inside

Direct current (DC) plugs and socket-outlets for information and communication technology (ICT) equipment installed in data centres and telecom central offices
Part 1: Plug and socket-outlet system for 2,6 kW

IEC TS 62735-1:2015-08(en)

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DIRECT CURRENT (DC) PLUGS AND SOCKET-OUTLETS FOR INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) EQUIPMENT INSTALLED IN DATA CENTRES AND TELECOM CENTRAL OFFICES

Part 1: Plug and socket-outlet system for 2,6 kW

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Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62735-1, which is a Technical Specification, has been prepared by IEC technical committee 23: Electrical accessories.

In this standard, the following print types are used:

– compliance statements: in *italic* type

The text of this Technical Specification is based on the following documents:

Enquiry draft	Report on voting
23/692/DTS	23/708A/RVC

Full information on the voting for the approval of this Technical Specification 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 parts in the IEC 62735 series, published under the general title *Direct current (DC) plugs and socket-outlets for information and communication technology (ICT) equipment installed in data centres and telecom central offices*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International Standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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DIRECT CURRENT (DC) PLUGS AND SOCKET-OUTLETS FOR INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) EQUIPMENT INSTALLED IN DATA CENTRES AND TELECOM CENTRAL OFFICES

Part 1: Plug and socket-outlet system for 2,6 kW

1 Scope

This part of IEC 62735, which is a Technical Specification, applies to plugs and fixed socket-outlets for class I equipment with two active contacts plus an earthing contact, a rated power of 2,6 kW and a rated voltage range from 294 V to 400 V d.c. They are intended to power d.c. information and communication technology equipment only, products according to IEC 60950.

The accessories according to this part of IEC 62735 are intended to be used by ordinary persons in data centres only where the value of the d.c. voltage distribution system is defined as follows:

– 380 V with a tolerance of ±20 V for installations with no backup battery or with a voltage regulation system;
– 380 V with a voltage range of 294 V to 400 V for installations with a backup battery where voltage regulation is not guaranteed;
– the voltage value between each live conductor and earth does not exceed 200 V d.c. during normal operation;
– there are two abnormal voltage ranges (duration below 10 min):
  - 260 V up to 294 V, and
  - above 400 V to 410 V.

The maximum current of the plug and the socket-outlet is

– 6,5 A when the voltage between live contacts is 400 V d.c.,
– 8,8 A when the voltage between live contacts is 294 V d.c.

and can rise up to 10 A when the voltage between live contacts decreases to 260 V d.c. for 10 min maximum.

The voltage between live conductors can fall down to 260 V d.c. when the voltage discharge value of the battery reaches the disconnecting level. The consequence is that the current increases accordingly.

The accessories according to this part of IEC 62735 do not require maintenance.

Plugs and socket-outlets covered by this part of IEC 62735 are intended for use in circuits where

– basic protection,
– an overcurrent protection (of 8,8 A or less for each socket-outlet or multiple socket-outlet),
– the fault protection (indirect contact protection), and
– additional protection

are already assured.

This part of IEC 62735 does not cover requirements for flush mounting boxes: however, it covers only those requirements for surface-type mounting boxes which are necessary for the tests on the socket-outlet.

NOTE 1 General requirements for mounting boxes are given in IEC 60670.

This part of IEC 62735 also applies to

– plugs incorporated in cord sets,
– plugs and socket-outlets incorporated in cord extension sets for data centres to be fixed to a wall or a rack,
– the cord extension set and multiple socket-outlets for data centres intended to be fixed to a wall or a rack, and
– socket-outlets which are a component of an assembly,

unless otherwise stated in the standard for the relevant assembly.

This part of IEC 62735 does not apply to

– single or multiple portable socket-outlets not fixed to a wall or a rack;
– plugs, socket-outlets and couplers for industrial purposes;
– plugs, socket-outlets and vehicle couplers for electric vehicles according to the IEC 61851 and IEC 62196 series;
– plugs and socket-outlets for household;
– appliance couplers;
– plugs, fixed and portable socket-outlets for extra-low voltage (ELV);

NOTE 2 ELV values are specified in IEC 60364-4-41.

– fixed socket-outlets combined with fuses, automatic switches, etc.

Socket-outlets with pilot lights are allowed provided that pilot lights comply with the relevant standard, if any.

Plugs and socket-outlets complying with this part of IEC 62735 are only suitable for use at ambient temperatures not normally exceeding +40 °C, but their average over a period of 24 h does not exceed +35 °C, with a lower limit of the ambient air temperature of −5 °C.

Socket-outlets complying with this part of IEC 62735 are only suitable for incorporation or mounting in equipment in such a way and in such a place that it is unlikely that the surrounding temperature exceeds 35 °C.

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.

IEC 60050-151:2001, *International Electrotechnical Vocabulary – Part 151: Electrical and magnetic devices* (available at: www.electropedia.org)

IEC 60068-2-31, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

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 450/750 V*

IEC 60352-2, *Solderless connections – Part 2: Crimped connections – General requirements, test methods and practical guidance*

IEC 60423, *Conduit systems for cable management – Outside diameters of conduits for electrical installations and threads for conduits and fittings*

IEC 60512-12-1, *Connectors for electronic equipment – Tests and measurements – Part 12-1: Soldering tests – Test 12a: Solderability, wetting, solder bath method*

IEC 60512-12-2, *Connectors for electronic equipment – Tests and measurements – Part 12-2: Soldering tests – Test 12b: Solderability, wetting, soldering iron method*

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

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

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

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

ISO 1456, *Metallic coatings – Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-151 and the following apply.

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

NOTE 2 Throughout this part of IEC 62735, 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. Examples of the use of accessories are shown in Figure 1a.

3.1
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 cable

3.2
socket-outlet
accessory intended for frequent use by ordinary persons, having socket contacts designed to engage with the pins of a plug and having terminals, terminations or other means for the connection of cable and the like

Note 1 to entry: Throughout this part of IEC 62735, socket-outlets cover fixed socket-outlets, single and multiple socket-outlets for data centres to be fixed to a wall or a rack.

3.3
fixed socket-outlet
socket-outlet intended to be connected to fixed wiring

Note 1 to entry: An example is shown in Figure 1a.

3.4
single socket-outlet for data centres to be fixed to a wall or a rack
one socket-outlet for assemblies with or without cable

3.5
multiple socket-outlet for data centres to be fixed to a wall or a rack
combination of two or more socket-outlets for assemblies with or without cable

Note 1 to entry: An example is shown in Figure 1d.

3.6
socket-outlet for assemblies
socket-outlet intended to be built in, or fixed to assemblies

Note 1 to entry: Examples of assemblies are power strips, multiple socket-outlets to be fixed to a wall or a rack, power distribution units (PDUs), rectifier, d.c. power supply, and test equipment.

3.7
rewirable plug
plug so constructed that the flexible cable can be replaced

3.8
rewirable multiple socket-outlet for data centres intended to be fixed to a wall or a rack
multiple socket-outlet for data centres intended to be fixed to a wall or a rack so constructed that the flexible cable can be replaced

3.9
non-rewirable plug
plug so constructed that it forms a complete unit with the flexible cable after connection and assembly by the manufacturer of the accessory

Note 1 to entry: See also 14.1.

3.10
non-rewirable multiple socket-outlet for data centres intended to be fixed to a wall or a rack
multiple socket-outlet for data centres intended to be fixed to a wall or a rack so constructed that it forms a complete unit with the flexible cable after connection and assembly by the manufacturer of the accessory

Note 1 to entry: See also 14.1.

3.11
moulded-on plug
non-rewirable plug, the manufacture of which is completed by insulating material moulded around pre-assembled component parts and the terminations for the flexible cable or cord

[SOURCE: IEC 60050-442:1998, 442-01-14, modified – "accessory" has been replaced by “plug”.]

3.12
mounting box
box intended for mounting in or on a wall, floor or ceiling, etc., for flush or surface application, intended for use with fixed socket-outlet(s)

3.13
cord extension set for data centres intended to be fixed to a wall or a rack
assembly consisting of one flexible cable fitted with one plug and one single socket-outlet for equipment or multiple socket-outlet for data centres to be fixed to a wall or a rack

3.14
terminal
insulated or non-insulated connecting device intended for reusable electrical connection of the external conductors

3.15
termination
insulated or non-insulated connecting device intended for non-reusable electrical connection of the external conductors

3.16
clamping unit
part or parts of a terminal necessary for the mechanical clamping and the electrical connection of the conductor(s) for test purposes

3.17
screw-type terminal
terminal for the connection and subsequent disconnection of a conductor or 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

3.18
pillar terminal
screw-type terminal in which the conductor is inserted into a hole or cavity, where it is clamped under the end of the screw or screws

Note 1 to entry: The clamping pressure may be applied directly by the end of the screw or through an intermediate clamping member to which pressure is applied by the end of the screw.

Note 2 to entry: Examples of pillar terminals are shown in Figure 2.

3.19
screw terminal
screw-type terminal in which the conductor is clamped under the head of the screw

Note 1 to entry: The clamping pressure may be applied directly to the head of a screw or through an intermediate part, such as a washer, clamping plate or anti-spread device.

Note 2 to entry: Examples of screw terminals are shown in Figure 3.

3.20
stud terminal
screw-type terminal in which the conductor is clamped under a nut

Note 1 to entry: 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.

Note 2 to entry: Examples of stud terminals are shown in Figure 3.

3.21
saddle terminal
screw-type terminal in which the conductor is clamped under a saddle by means of two or more screws or nuts

Note 1 to entry: Examples of saddle terminals are shown in Figure 4.

3.22
mantle terminal
screw-type terminal in which the conductor is clamped against the base of a slot in a threaded stud by means of a nut

Note 1 to entry: The conductor is clamped against the base of the slot by a suitably shaped washer under the nut, by a central peg if the nut is a cap nut, or by an equally effective means for transmitting the pressure from the nut to the conductor within the slot.

Note 2 to entry: Examples of mantle terminals are shown in Figure 5.

3.23
screwless terminal
connecting device for the connection and subsequent disconnection of a rigid (solid or stranded) or flexible conductor or the interconnection of two or more conductors, capable of being dismantled, the connection being made, directly or indirectly, by means of springs, parts of angled, eccentric or conical form, etc., without special preparation of the conductor concerned, other than removal of insulation

3.24
thread-forming screw
screw having an uninterrupted thread, which by screwing in, forms a thread by displacing material

Note 1 to entry: An example of a thread-forming screw is shown in Figure 6.

3.25
thread-cutting screw
screw having an interrupted thread, which by screwing in, forms a thread by removing material

Note 1 to entry: An example of a thread-cutting screw is shown in Figure 7.

3.26
rated power
power assigned to the plug or socket-outlet

3.27
rated voltage range
voltage range assigned to the plug or socket-outlet

3.28
shutter
movable part incorporated into a socket-outlet arranged to shield at least the live socket-outlet contacts automatically when the plug is withdrawn

3.29
type test
test of one or more devices made to a certain design to show that the design meets certain specifications

3.30
routine test
test to which each individual device is subjected during and/or after manufacture to ascertain whether it complies with certain criteria

3.31
base
part of the socket-outlet supporting the socket-contacts