

# TECHNICAL SPECIFICATION

**Direct current (DC) plugs and socket-outlets for information and communication technology (ICT) equipment installed in data centres and telecom central offices –**

**Part 2: Plug and socket-outlet system for 5,2 kW**



## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2016 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

#### IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

#### IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [csc@iec.ch](mailto:csc@iec.ch).

# TECHNICAL SPECIFICATION

**Direct current (DC) plugs and socket-outlets for information and communication technology (ICT) equipment installed in data centres and telecom central offices –**

**Part 2: Plug and socket-outlet system for 5,2 kW**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 29.120.01; 29.120.30

ISBN 978-2-8322-3708-3

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 General requirements .....	7
5 General notes on tests .....	7
6 Ratings.....	7
7 Classification.....	7
8 Marking .....	7
9 Checking of dimensions.....	8
10 Protection against electric shock .....	8
11 Provision for earthing .....	8
12 Terminals and terminations.....	8
13 Construction of socket-outlets.....	11
14 Construction of plugs.....	11
15 Interlocked plug and socket-outlet systems.....	12
16 Resistance to ageing, protection provided by enclosures, and resistance to humidity.....	12
17 Insulation resistance and electric strength.....	12
18 Operation of earthing contacts .....	13
19 Temperature rise .....	13
20 Breaking capacity .....	14
21 Normal operation .....	14
22 Force necessary to withdraw the plug .....	14
23 Flexible cables and their connection .....	15
24 Mechanical strength .....	16
25 Resistance to heat.....	16
26 Screws, current-carrying parts and connections.....	16
27 Creepage distances, clearances and distances through sealing compound.....	16
28 Resistance of insulating material to abnormal heat and to fire .....	16
29 Resistance to rusting .....	16
Annexes .....	16
Annex AA (normative) Standard sheets and gauges.....	17
Bibliography.....	21
Figure AA.1 – Standard sheet 4: 5,2 kW / 294 V to 400 V d.c. socket-outlet for class I equipment.....	18
Figure AA.2 – Standard sheet 5: 5,2 kW / 294 V to 400 V d.c. plug for class I equipment.....	19
Figure AA.3 – Standard sheet 6: positioning of the “+” and “–” pins/socket-contacts .....	20
Table 1 – Relationship between rated power and connectable nominal cross-sectional areas or American Wire Gauge (AWG) size of copper conductors .....	9

Table 2 – Values for pull test for screw-type terminals .....	9
Table 3 – Composition of conductors for plugs.....	9
Table 5 – Relationship between rated power and connectable cross-sectional areas or AWG size of copper conductors for screwless terminals .....	10
Table 6 – Value for pull test for screwless-type terminals.....	10
Table 7 – Values for flexing under mechanical load test for copper conductors .....	10
Table 8 – Test current for the verification of electrical and thermal stresses in normal use for screwless terminals.....	10
Table 9 – Nominal cross-sectional areas or AWG size of rigid copper conductors for deflection test of screwless terminals.....	11
Table 10 – Deflection test forces.....	11
Table 14 – External cable dimension limits for surface-type socket-outlets .....	11
Table 15 – Nominal cross-sectional areas of copper conductors and test currents for the temperature rise test.....	13
Table 16 – Maximum and minimum withdrawal force for plugs and socket-outlets.....	15
Table 17 – External dimensions of flexible cables to be accommodated by cord anchorage.....	15
Table 18 – Torque test values for cord anchorage.....	15
Table 19 – Maximum dimensions of flexible cables to be accommodated in rewirable accessories .....	16

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DIRECT CURRENT (DC) PLUGS AND SOCKET-OUTLETS FOR  
INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) EQUIPMENT  
INSTALLED IN DATA CENTRES AND TELECOM CENTRAL OFFICES –****Part 2: Plug and socket-outlet system for 5,2 kW**

## 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

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

IEC TS 62735-2, which is a technical specification, has been prepared by IEC technical committee 23: Electrical accessories.

This technical specification is to be used in conjunction with IEC 62735-1:2015.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
23/743/DTS	23/745A/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 document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This Part 2 supplements or modifies the corresponding clauses in IEC 62735-1 so as to convert that publication into the IEC technical specification: *Direct current (DC) plugs and socket-outlets for information and communication technology (ICT) equipment installed in data centres and telecom central offices*.

Where this Part 2 states "addition", "modification" or "replacement", the relevant requirement, test specification or explanatory matter in Part 1 should be adapted accordingly.

Where no change is necessary, this Part 2 indicates that the relevant clause or subclause applies.

In this publication:

- 1) The following print types are used:
  - Requirements proper: in roman type.
  - *Test specifications: in italic type.*
- 2) Subclauses, notes, tables or figures which are additional to those in Part 1 are numbered starting from 101 and additional list items are numbered from aa). Additional annexes are lettered AA, BB, etc.

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.

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

## **Part 2: Plug and socket-outlet system for 5,2 kW**

### **1 Scope**

This clause of Part 1 is applicable except as follows:

*Replacement:*

*Replace the first paragraph with the following:*

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 5,2 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.

The 2,6 kW system complying with Part 1 is safely compatible with the system complying with this part as it is possible to insert the 2,6 kW plug in the 5,2 kW socket-outlet but it is not possible to insert the 5,2 kW plug into the 2,6 kW socket-outlet.

*Replace the third paragraph with the following:*

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

- 13 A when the voltage between live contacts is 400 V d.c.
- 17,6 A when the voltage between live contacts is 294 V d.c.

and can rise up to 20 A when the voltage between live contacts decreases to 260 V d.c. for 10 min maximum.

*Replace, in the 6<sup>th</sup> paragraph, the second dash with:*

- an overcurrent protection (of 17,6 A or less for each socket-outlet or multiple socket-outlet),

### **2 Normative references**

This clause of Part 1 is applicable.

### **3 Terms and definitions**

This clause of Part 1 is applicable except as follows:

*Addition:*

*Add the following definitions:*