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Part 2-5: Particular requirements for adaptors

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

Public



23B/1506/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER: IEC 60884-2-5 ED3	
DATE OF CIRCULATION: 2024-04-19	CLOSING DATE FOR COMMENTS: 2024-07-12
SUPERSEDES DOCUMENTS: 23B/1504/RR	

IEC SC 23B : PLUGS, SOCKET-OUTLETS AND SWITCHES	
SECRETARIAT: Italy	SECRETARY: Mr Cristiano Masini
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY	

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Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:

Plugs and socket-outlets for household and similar purposes - Part 2-5: Particular requirements for adaptors

NOTE FROM TC/SC OFFICERS:

This document represents a new edition of IEC 60884-2-5. Document 23B/1507/INF is published in parallel to this one and show in track changes mode the modification from the published version of the standard

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PLUGS AND SOCKET-OUTLETS FOR HOUSEHOLD AND SIMILAR PURPOSES –

Part 2-5: Particular requirements for adaptors

1 Scope

Replacement:

This part of IEC 60884 applies to adaptors for AC only, with or without earthing contact, with a rated voltage greater than 50 V but not exceeding 440 V and a rated current not exceeding 32 A, intended for household and similar purposes, either indoors or outdoors.

Compatible plugs and socket-outlets, when combined, form a plug and socket-outlet system. Standardized systems used around the world are reported in IEC/TR 60083.

This document also applies to travel adaptors (see Annex AA). For travel adaptors the scope is limited to a voltage rating greater than 50 V but not exceeding 250 V and to a current rating not exceeding 20 A.

Travel adaptors allowing the simultaneous connection of two or more plugs are not covered by this document.

NOTE 1 In the following countries the use of non-shuttered adaptors is not allowed: BE, CN, DK, ES, FR, IT, NO, MY, PT, SE, SG, UK, ZA.

NOTE 2 In the following countries adaptors having IP classes below IPX4 shall be provided with shutters: FI.

NOTE 3 In the following countries fused adaptors are not allowed: ZA.

NOTE 4 In the following countries rewirable external flexible cables connected to adaptors are not allowed: ZA.

NOTE 5 In the following countries, travel adaptors shall not be used for charging electrical vehicles: CH, NL, SE.

This document gives additional requirements for adaptors incorporating USB power supply, see Annex CC (normative).

This document gives additional requirements for adaptors incorporating electronic components to perform additional functions, see Annex DD (normative).

This document does not apply to adaptors incorporating connectors according to IEC 60320 (all parts).

Adaptors complying with this document are 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.

2 Normative references

This clause of Part 1 is applicable except as follows:

Addition:

IEC 60127-2, *Miniature fuses – Part 2: Cartridge fuse-links*

IEC 60127-3, *Miniature fuses – Part 3: Sub-miniature fuse-links*

IEC 60269-3, *Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household or similar applications) – Examples of standardized systems of fuses A to F*

IEC 60884-1:2022, *Plugs and socket-outlets for household and similar purposes – Part 1: General requirements*

IEC 60884-3-1:2021, *Plugs and socket-outlets for household and similar purposes - Part 3-1: Particular requirements for socket-outlets incorporating USB power supply*

IEC 60884-3-2:202X, *Plugs and socket-outlets for household and similar purposes - Particular requirements for accessories incorporating electronic components to perform additional functions*

3 Terms and definitions

This clause of Part 1 is applicable except as follows:

Replacement of NOTE 3:

NOTE 3 The term "accessory" is used as a general term covering plugs, socket-outlets and adaptors; the term "portable accessory" covers plugs, portable socket-outlets and adaptors.

Addition:

NOTE 101 The term "adaptor" is used as a general term covering all types of adaptors except where reference is made to one particular type.

Addition:

3.101

adaptor

portable accessory constructed as an integral unit incorporating one plug part and one or more socket-outlet parts, with or without integrated additional functions, allowing the connection of one or more plugs to a socket-outlet, both the socket-outlet and the plugs belonging to the same national system

Note 1 to entry: Examples of national systems are listed in IEC TR 60083.

3.102

fused adaptor

adaptor incorporating a replaceable fuse link in one or more current-carrying poles

Note 1 to entry: Fuses of fused adaptors are not intended to protect appliances or parts of them against overload.

3.103

polarized adaptor

adaptor constructed so that, when inserted in a socket-outlet installed in a polarized wiring installation, the correct relationship between the neutral and the line pole or poles is maintained

3.104

single-way adaptor

adaptor with one socket-outlet part allowing the connection of one plug

3.105

multi-way adaptor

adaptor with more than one socket-outlet part allowing the simultaneous connection of two or more plugs

3.106

travel adaptor

portable accessory, intended for temporary use, allowing the connection of one or more plug type(s) of different national systems to a socket-outlet that is not designed to accept such plugs

Note 1 to entry: A travel adaptor is not necessarily an integral unit and it can include integrated additional functions.

Note 2 to entry: Examples of national systems are listed in IEC TR 60083.

3.107

travel adaptor with movable pins

travel adaptor where plug pins may slide in and out, rotate or fold in any direction, so that they are not permanently fixed but have means to be locked in position for normal use

3.108

intermediate adaptor

adaptor allowing the connection of one or more plugs to a socket-outlet via a control device such as a dimmer, photo-electric switch, etc., which is connected to the adaptor by an external flexible cable

3.109**rewirable intermediate adaptor**

intermediate adaptor constructed in such a way that the external flexible cable can be replaced

3.110**non-rewirable intermediate adaptor**

intermediate adaptor constructed in such a way that it forms a complete unit with the external flexible cable after connection and assembly by the manufacturer of the adaptor

Note 1 to entry: See also 14.1.

3.111**adaptor with cable outlet**

adaptor which may be rewirable or non-rewirable, and constructed in such a way that it allows the connection of an external flexible cable through a cable outlet

3.112**rated power**

power value assigned to the accessory by the manufacturer

4 General requirements

This clause of Part 1 is applicable except as follows.

Addition:

When a requirement of Part 1 applies to plugs and/or to portable socket-outlets, in Part 2-5 it applies to plug parts and/or to socket-outlet parts of adaptors respectively.

All requirements in Part 1 related to fixed socket-outlets are not applicable to adaptors.

5 General remarks on tests

This clause of Part 1 is applicable except as follows:

5.1 General

Addition:

For the purposes of the tests, unless otherwise specified, the word “adaptors” covers all adaptors including fused adaptors, polarized adaptors, single-way adaptors, multi-way adaptors, intermediate adaptors, adaptors with cable outlet and travel adaptors.

SECRETARIAT NOTE 1. Table 1 shall be modified at the end of the revision.

6 Ratings

This clause of Part 1 is applicable except as follows:

Addition:

6.101 Rated voltage

The rated voltage of the adaptor shall not be lower than the nominal voltage of the supply system to which it can be connected via a socket-outlet.

NOTE Nominal voltages are defined in IEC 60038.

Compliance is checked by inspection of the marking.

6.102 Rated current

The rated current of the adaptor shall be the lowest value of the following:

- the rated current of the plug part; or
- the arithmetic sum of the highest rated currents of all plugs which can be simultaneously inserted into the adaptor; or

– the rated current of the incorporated overcurrent protective device, if any.

Compliance is checked by inspection of the marking.

6.103 Rated power

When assigned, the rated power of the adaptor shall be calculated by multiplying the rated current (as determined in 6.102) and the nominal voltage of the supply system at a power factor equal to 1.

NOTE Nominal voltages are defined in IEC 60038.

Compliance is checked by inspection of the marking, if any.

7 Classification

This clause of Part 1 is applicable.

8 Marking

This clause of Part 1 is applicable except as follows:

8.1 General

Replacement of the first dashed item:

– rated current in amperes or rated power in watts, or both;

Addition at the end of the subclause:

The marking for the rated power, if any, shall be completed by the word MAX.

NOTE 101 These markings can be shown as in the examples: MAX 2 000 W or 2 000 W MAX.

The maximum admissible power and/or current marking shall not be hidden by any inserted plug.

Fused adaptors shall be marked to indicate the presence of a fuse within the adaptor and this marking may be in the form of a symbol.

Fused adaptors shall be marked with the rated current and type of fuse on the fuse-holder or in the proximity of the fuse.

Where it is possible to insert an adaptor into another adaptor, then an instruction, which may be a symbol or a sentence, warning against inserting an adaptor into another adaptor shall be provided by the manufacturer::

– on the adaptor, or

– on the smallest package unit, or

– on the instruction sheet accompanying the adaptor.

NOTE 102 A standardized symbol and/or sentence can be defined by the National Committees.

NOTE 103 In the following country, it is not permitted to have adaptors plugged into one another as it strains the socket-outlet and poses a safety risk to the consumer: ZA.

8.2 Symbols

Addition before NOTE 1:

Watts W

Fuse 
(see IEC 60417-5016:2002-10)

8.4 Particular requirements for portable accessories

Replacement:

8.4 Particular requirements for adaptors

Commented [BA1]: It is considered necessary this marking is always visible, even when all socket-outlet parts are paired with plugs.

179 For adaptors the marking specified in 8.1 shall be easily discernible on the external surface
180 with the exception of rewirable intermediate adaptors and of rewirable adaptors with cable outlet
181 for which the marking specified in 8.1, other than the type reference, shall be easily discernible
182 when the accessory is wired and assembled. NOTE The type reference of rewirable intermediate
183 adaptors and of rewirable adaptors with cable outlet can be marked on the inside of the enclosure or
184 cover.

185 9 Checking of dimensions

186 This clause of Part 1 is applicable except as follows.

187 9.1 General

188 *Replacement of the 4th paragraph:*

189 *Socket-outlet parts of adaptors are first subjected to 10 insertions and 10 withdrawals of a plug*
190 *complying with the corresponding standard sheet having the maximum dimensions for the pins.*
191 *Then the dimensions of the socket-outlet parts and of the plug parts are checked by*
192 *measurement and/or by means of gauges.*

193 10 Protection against electric shock

194 This clause of Part 1 is applicable except as follows:

195 10.2 Accessibility of live parts during normal use

196 *Replacement of the first and the second paragraphs and the NOTE:*

197 Adaptors shall be so designed and constructed that live parts are not accessible, even after
198 removal of parts which can be removed without the use of a tool, when the plug parts of
199 the adaptors are in partial or complete engagement with a socket-outlet of the same system
200 and when the associated plug of the same system is in partial or complete engagement with
201 the socket-outlet part of the adaptor.

202 NOTE In the following countries this requirement does not apply when the plug part of the adaptor is partially
203 engaged: CA, DK, JP, US.

204 *Replacement of the fifth paragraph:*

205 *For adaptors, the test finger, test probe B of IEC 61032, is applied in every possible position*
206 *when the adaptor is in partial or complete engagement with a socket-outlet of the same system,*
207 *an electrical indicator with a voltage between 40 V and 50 V being used to show contact with the relevant*
208 *parts.*

209 10.4 Single-pole insertion

210 *Replacement of the first paragraph:*

211 It shall not be possible to make contact between a pin of a plug and a live socket contact of
212 an adaptor or between a pin of an adaptor and a live socket contact of a socket-outlet, of the
213 same system, whilst any other current-carrying pin is accessible.

214 *Addition:*

215 10.101 Removal of fuse

216 Removal of the fuse and/or fuse carrier shall not result in live parts becoming accessible when
217 the adaptor is in full engagement with a socket-outlet.

218 *Compliance is checked by inspection and, in case of doubt, by applying test probe 13 according*
219 *to IEC 61032 with a force not exceeding 5 N when the fuse and/or fuse carrier are not in position*
220 *as in normal use and with the adaptor in full engagement with a socket-outlet. The test probe*
221 *shall not touch live parts.*

222 11 Provision for earthing

223 This clause of Part 1 is applicable.

Commented [BA2]: It is necessary to verify the safety also during the insertion of a plug in any socket-outlet part of the adaptor.

12 Terminals and terminations

This clause of Part 1 is applicable except as follows:

12.1 General

Replacement of the second paragraph:

Adaptors with a cable outlet and rewirable intermediate adaptors shall be provided with terminals with screw clamping.

13 Construction of fixed socket-outlets

This clause of Part 1 is not applicable.

14 Construction of plugs and portable socket-outlets

This clause of Part 1 is applicable except as follows:

Replacement of the title:

14 Construction of adaptors

14.1 Non-rewirable portable accessories

Replacement of the title:

14.1 Requirement on opening the adaptors

Replacement:

Adaptors shall be constructed in such a way that they cannot be opened by hand or by using a general purpose tool, for example a screwdriver used as such, without making it permanently useless.

Exception is made for adaptors with a cable outlet and rewirable intermediate adaptors, where they shall be constructed in such a way that they can be opened using a general purpose tool, for example a screwdriver used as such.

Compliance is checked by inspection.

NOTE 1 An adaptor is considered permanently useless, when, while re-assembling the adaptor, parts or materials other than the original are used.

NOTE 2 In the following country multiway adaptors shall be so designed and constructed that it is not possible to create additional outputs when plugging two or more multiway adaptors into each other: BE.

NOTE 3 In the following country rewirable adaptors are not allowed: ZA.

14.2 Mechanical strength of pins of portable accessories

Replacement of the first paragraph:

Pins of adaptors shall have adequate mechanical strength.

14.3 Fixing of pins and contacts of portable accessories

Replacement of the first, the second and the third paragraphs:

Pins and contacts of adaptors shall be:

- locked against rotation, except where rotation is not likely to impair safety or function;
- not removable without dismantling the adaptor;
- adequately fixed in the body of the adaptor when the adaptor is wired and assembled as for normal use.

Earthing contacts, phase contacts and neutral contacts of adaptors shall, when in use, be locked against rotation and removable only with the aid of a tool, after dismantling the adaptor.

It shall not be possible to arrange the pins or contacts of adaptors in an incorrect position.

14.10 Cord anchorage

Replacement of the first line of the first paragraph:

For adaptors with a cable outlet and rewirable intermediate adaptors:

14.22 Plug which is an integral part of plug-in equipment

Replacement of the title:

14.22 Mechanical strain requirements

Replacement:

14.22.1 Adaptors shall not impose undue strain on fixed socket-outlets.

Compliance is checked by the following test.

The adaptor is inserted into a fixed socket-outlet complying with Part 1.

Each socket-outlet part is first fitted with a relevant plug completed with 1 m of 0,75 mm² circular flexible cable of 60227 IEC 53 type.

The number of conductors shall be the same as that of the poles of the relevant plug.

The socket-outlet is pivoted about a horizontal axis through the axis of the live socket contacts at a distance of 8 mm behind the engagement face of the socket-outlet and parallel to this engagement face.

The additional torque which has to be applied to the socket-outlet in order to maintain the engagement face in the vertical plane shall not exceed 0,25 Nm.

During the test, care shall be taken that the flexible cable(s) hang(s) freely.

NOTE In the following countries a torque value of 0,5 Nm is allowed: CH, SE.

Subclauses 14.22.2 and 14.22.3 are not applicable to adaptors.

Addition:

14.22.101 Adaptors shall withstand the lateral strain imposed by equipment likely to be introduced into them.

Compliance is checked by the following test using the device shown in Figure 16.

The specimen is mounted on a vertical surface with, initially, the plane through the live socket contacts horizontal. The face to be tested shall be in a vertical position and parallel to the vertical mounting surface.

The device is then fully-engaged, and a force of 5 N is applied in a vertically downward direction.

The device is removed after 1 min and the adaptor is turned 90° on the mounting surface. The test is made four times, the adaptor being turned 90° after each engagement. During the test the device shall not come out. The test is repeated for each socket-outlet part of the adaptor.

After the test, the adaptor shall show no damage within the context of this document, in particular it shall comply with the requirements of Clause 22.

14.23 Gripping

Replacement:

Adaptors shall be shaped in such a way and/or made of such a material that they can be easily withdrawn by hand from the relevant socket-outlet.

In addition, the gripping surfaces shall be designed in such a way that the adaptor can be withdrawn without having to pull the flexible cable, if any.

305 *Compliance is checked by inspection and in case of doubt by test.*

306 NOTE Examples of possible tests are given in Annex B and by replacing the word "plug" by "adaptor".

307 **14.24 Membranes in inlet openings of portable accessories**

308 This subclause of Part 1 is not applicable.

309 *Addition:*

310 **14.101 Earthing pins and contacts**

311 The plug part of adaptors shall be provided with earthing pins or contacts if any one of the
312 socket-outlet parts is provided with an earthing pin or contact.

313 An adaptor allowing the connection between a socket-outlet with earthing contact and a plug
314 without earthing contact for class zero equipment is not permitted.

315 *Compliance is checked by inspection and by the test of 11.5.*

316 **14.102 Adaptors for use in polarized socket-outlets**

317 Adaptors for use in polarized socket-outlets shall be designed in such a way that the internal
318 connection shall ensure that plug pins, socket-contacts and terminals, if any, maintain the same
319 polarity at the input and output parts of the adaptor.

320 *Compliance is checked by inspection and if necessary by an electrical continuity test.*

321 **14.103 External flexible cables intended for control**

322 If the insulation of an external flexible cable intended for control is not equivalent at least to
323 that of cables according to the relevant IEC standard, and it does not comply with the electric
324 strength test carried out between the cable and a metallic sheet wrapped around the insulation
325 according to the specifications of 17.2, the cable shall be considered as a bare conductor.

326 **14.104 Fuse-link in adaptors**

327 Provision shall be made within the body of a fused adaptor for suitable fuse-link complying with
328 IEC 60269-3, IEC 60127-2 or IEC 60127-3 as far as they reasonably apply.

329 The fuse-link shall be connected between an adaptor plug pin and the corresponding socket
330 contact(s).

331 In polarized systems the fuse-link shall be mounted between the line plug pin and the
332 corresponding line socket contact(s).

333 Fuse-links shall not be fitted in the earthing circuit.

334 The design of the adaptor shall be such that the fuse-link cannot be left in inadequate contact
335 when the adaptor is assembled.

336 *Compliance is checked by inspection.*

337 **14.105 Adaptors with a plug part rated 2,5 A**

338 Adaptors having a plug part standardized with a rated current of 2,5 A shall be provided with
339 an overcurrent protective device rated 2,5 A or less.

340 NOTE Examples of a plug part standardized with a rated current of 2,5 A are provided in EN 50075.

341 *Compliance is checked by inspection.*

342 **14.106 Adaptors shaped or decorated like a toy**

343 Adaptors shall not have an enclosure that is shaped or decorated like a toy.

344 NOTE Examples of such enclosures are those representing animals, characters, persons or scale models.

345 *Compliance is checked by inspection.*

14.107 Rated current of plug part and socket-outlet part

Adaptors shall not have any socket-outlet part which permits the insertion of a plug with a higher current rating than the rated current of the plug part of the adaptor, unless the adaptor is provided with an overcurrent protective device rated less than or equal to the rated current of the plug part.

NOTE In the following country different rules may apply: IT.

Compliance is checked by inspection.

15 Interlocked socket-outlets

This clause of Part 1 is applicable except as follows:

Replacement of the title:

15 Interlocked socket-outlet parts of adaptors

Replacement of the first paragraph:

Socket-outlet parts of adaptors interlocked with a switch shall be constructed in such a way that a plug cannot be inserted or completely withdrawn from the adaptor while the socket-contacts are live, and the socket-contacts of the adaptor cannot be made live until a plug is almost completely in engagement.

16 Resistance to ageing, protection provided by enclosures, and resistance to humidity

This clause of Part 1 is applicable except as follows:

16.1 Resistance to ageing

Replacement of the seventh paragraph:

For adaptors, the plug of the same national system shall be inserted into each socket-outlet part during the test. A plug available in the market can be suitably modified if necessary to allow the closure of the lid, if any.

Within a national system, the plug which is deemed to give the most severe condition shall be used for the test where more than one plug type can be inserted in the socket-outlet part.

NOTE 101 The national systems are listed in IEC TR 60083.

Replacement of the last three paragraphs:

For adaptors, after having withdrawn the test plug from the socket-outlet part, the contact pressure of the contact assembly is checked as specified in 22.3 with the single-pin gauge. The gauge shall not fall from the contact assembly within 30 s.

17 Insulation resistance and electric strength

This clause of Part 1 is applicable except as follows:

17.2.2 Replacement:

For adaptors the insulation resistance is measured consecutively:

- a) between all poles connected together and a metal foil in contact with the outer surface of accessible external parts of insulating material including external assembly screws, the measurements being made with plug(s) in engagement;
- b) between each pole in turn, and all others, these being connected together to a metal foil in contact with the outer surface of accessible external parts of insulating material including external assembly screws with plug(s) in engagement;
- c) for adaptors with cable outlet and rewirable intermediate adaptors, between any metal part of any cable anchorage, including clamping screws, and the earthing pin or terminal, if any;