BS 1363-2:2023



**BSI Standards Publication** 

# 13 A plugs, socket-outlets, adaptors and connection units

Part 2: 13 A switched and unswitched socket-outlets – Specification



Contents		Page
	Foreword	IV
1	Scope	1
2	Normative references	2
3	Terms and definitions	3
4	Conditions of use	7
5	General	7
6	General conditions for type testing	7
	Table 1 — Schedule of tests	9
	Figure 11 — GO gauge for socket-outlet	10
	Figure 12 — Contact test gauge	11
	Figure 14 — Non-contact test gauge	12
	Figure 16a) — Withdrawal pull gauges for effectiveness of contact: Gauge for earthing	
	socket contact	13
	Figure 16b) — Withdrawal pull gauges for effectiveness of contact: Gauge for line and neutral	
	current-carrying socket contacts	14
7	Classification and rating	14
	Table 2 — Rated current and maximum fuse rating in normal use, and load for flexing and	
	flexible cable grip tests related to size of flexible cable	16
8	Marking and labelling	16
9	Clearances, creepage distances and solid insulation	18
	Table 3 — Minimum clearances for basic insulation	19
	Table 4 — Minimum creepage distances (mm) for basic insulation	20
	Table 5 — Withstand voltages for insulation types	21
10	Accessibility of live parts	21
	Figure 1 — Test pin	22
	Figure 2a) — Apparatus for mechanical strength test on resilient covers	23
	Figure 2b) — Hardwood block for Figure 2a)	24
11	Provisions for earthing	25
	Table 6 — Torque values for screws and nuts	25
12	Terminals and terminations	26
13	(Not used)	30
14	Construction of socket-outlets	30
	Figure 3 — Disposition of socket contacts	30
	Figure 13 — Test apparatus and circuit for use with contact and non-contact gauges	31
	Figure 15 — Turning moment gauge	33
	Table 7 — Actuator test force	36
15	Resistance to ageing, resistance to humidity and protection provided by enclosures	39
	Table 8 — Tightening torque values for cable glands	41
16	Insulation resistance and electric strength	43
17	Temperature rise	44
	Table 9 — Permitted temperature rises	44
	Table 10 — Loading of socket-outlets for temperature rise test	46
18	Breaking capacity of socket-outlets	48
19	Normal operation of socket-outlets	48
20	Connection of flexible cables and cable anchorage	50
	Table 11 — Connection of flexible cables	51
	Figure 18 — Apparatus for flexing test	52
21	Mechanical strength	53

	Figure 19a) — BS 1362 Type solid link for test on fuse clips	53
	Figure 19b) — BS EN 60127-2 Type solid link for test on fuse clips	54
	Figure 21a) — Pendulum impact test: General view of apparatus	54
	Figure 21b) — Pendulum impact test: Constructional details of striking elements	55
	Figure 21c) — Pendulum impact test: Constructional details of mounting support for test samples	56
	Figure 20 — Tumbling barrel	58
	Figure 22 — Arrangements for mechanical strength test for portable socket-outlets	60
22	Screws, current carrying parts and connections	61
23	Resistance to heat	62
	Figure 23 — Apparatus for pressure test	63
24	Resistance to abnormal heat and fire	64
	Table 12 — Application of glow wire test	65
25	Resistance to excessive residual stresses and to rusting	65
26	Overload test	66
27	Cyclic loading test	67
Annex A	(normative) Requirements for incorporated electronic components	68
Annex B	(normative) Pollution degree	73
Annex C	(normative) Relation between rated impulse withstand voltage, rated voltage and	
	Overvoltage Category	74
	Table C.1 — Rated impulse withstand voltage for socket-outlets energized directly from the low	
	voltage mains	74
Annex D	(normative) Impulse voltage test	74
	Table D.1 — Test voltages for verifying clearances at sea level	75
Annex E	(normative) Measurement of clearances and creepage distances	75
	Table E.1 — Minimum values of width X	75
	Figure E.1 — Example 1	76
	Figure E.2 — Example 2	76
	Figure E.3 — Example 3	76
	Figure E.4 — Example 4	77
	Figure E.5 — Example 5	77
	Figure E.6 — Example 6	77
	Figure E.7 — Example 7	78
	Figure E.8 — Example 8	78
	Figure E.9 — Example 9	78
	Figure E.10 — Example 10	79
	Figure E.11 — Example 11	79
Annex F	(normative) Determination of the Comparative Tracking Index and Proof Tracking Index	79
Annex G	(normative) The construction and calibration of a calibrated link	80
	Figure 28 — Calibrated link	80
	Figure 29 — Calibration jig for calibrated link	83
Annex H	(normative) Test plug for temperature rise test	84
	Figure 30 — Test plug for temperature rise	85
Annex I	(informative) Recommendations for products that incorporate BS 1363-2 socket-outlets	86
	Table I.1 — List of clauses	86
Annex J	(informative) Annex identification migration from 2016 edition to 2023 edition	86
	Table J.1 — BS 1363 annex identification migration from 2016 to 2023	87

Bibliography

89

## Summary of pages

This document comprises a front cover, an inside front cover, pages I to VI, pages 1 to 89, an inside back cover and a back cover.

# Foreword

# **Publishing information**

This part of BS 1363 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 June 2023. It was prepared by Technical Committee PEL/23, *Electrical accessories*. A list of organizations represented on this committee can be obtained on request to the committee manager.

#### **Supersession**

This part of BS 1363 supersedes BS 1363-2:2016+A1:2018 which remains current and will be withdrawn on 30 June 2026.

## **Relationship with other publications**

BS 1363 is published in the following parts:

- Part 1: Rewirable and non-rewirable 13 A fused plugs Specification;
- Part 2: 13 A switched and unswitched socket-outlets Specification;
- Part 3: Adaptors Specification;
- Part 4: 13 A fused connection units: switched and unswitched Specification;
- Part 5: Fused conversion plugs Specification.

## Information about this document

This is a full revision of the document, and introduces the following principal changes:

- the Scope now covers operating frequencies from 50 Hz to 60 Hz;
- current carrying parts made of brass are required to have a minimum content of 58% copper;
- a new definition has been included for individually protected socket-outlet (IPS) and includes tests and requirements for IPS;
- new requirements have been added for switch actuating force test for double-pole switches;
- mounting box clearance requirements for flush mounted socket-outlets have been modified;
- Annex requirements for incorporated electronic components have been modified, specifically, USB circuits intended for charging portable devices with the addition of the abnormal condition.

The numbering of figures within this standard remains as in the previous version; however, future revisions will implement consecutive numbering throughout.

<u>Annex J</u> gives details of the annex renumbering from the 2016 editions of BS 1363, Part 1 to Part 5 to the 2023 editions.

This publication can be withdrawn, revised, partially superseded or superseded. Information regarding the status of this publication can be found in the Standards Catalogue on the BSI website at bsigroup.com/standards, or by contacting the Customer Services team.

Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

# **Presentational conventions**

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Requirements in this standard are drafted in accordance with the *Rules for the structure and drafting of UK standards:2022*, subclause **G.1.1**, which states, "Requirements should be expressed using wording such as: 'When tested as described in Annex A, the product shall …'". This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

#### **Contractual and legal considerations**

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

#### Compliance with a British Standard cannot confer immunity from legal obligations.

In particular, attention is drawn to the following specific regulations:

• The Plugs and Sockets etc. (Safety) Regulations 1994. SI No. 1768 [1].

#### 1 Scope

This part of BS 1363 specifies requirements for 13 A switched and unswitched shuttered socket-outlets for household, commercial and light industrial purposes, with particular reference to safety in normal use. The socket-outlets are suitable for the connection of appliances, sound vision equipment, luminaires, etc. in a.c. circuits only, operating at voltages not exceeding 250 V r.m.s. and frequencies from 50 Hz to 60 Hz using plugs in accordance with BS 1363-1:2023. Additional requirements are included for socket-outlets suitable for electric vehicle charging.

Requirements are specified for 13 A shuttered socket-outlets in single or multiple arrangements, with or without associated controlling switches, for flush mounting in suitable boxes, e.g. conforming to BS 4662:2006+A1:2009, or for surface or panel mounting or for portable use. Fixed socket-outlets are intended for use with cables conforming to BS 6004:2012+A1:2020 and cables to the relevant part of BS EN 50525, having copper conductors. Portable socket-outlets are intended for use with flexible cables conforming to the relevant part of BS EN 50525. Socket-outlets incorporating fuse links, Circuit Breakers for Equipment (CBE), switches and indicator lamps are included within the scope of this part of BS 1363. Socket-outlets incorporating electronic components as detailed in <u>Annex A</u> are included within the scope of this part of BS 1363.

This standard does not apply to socket-outlets incorporating screwless terminals for the connection of external conductors of the following types:

- a) insulation-piercing connecting devices; or
- b) twist-on connecting devices.

Socket-outlets conforming to this standard are shuttered and therefore do not require the use of additional means to shield the current carrying contacts when no plug is present in the socket-outlet.

Certain installations require the inclusion of intumescent and acoustic pads and this might have an effect on the conformance of the socket-outlet to the requirements of this standard. This might influence temperature rise and internal clearances. Verification of suitability of the socket-outlet needs to be obtained from the manufacturer.

NOTE 1 In order to maintain safety and interchangeability with plugs and socket-outlets it is necessary that these products conform to the requirements of <u>Clause 10</u> and <u>Clause 14</u> of this part of BS 1363, however their body outline need not be limited at a distance of 6.35 mm from the plug engagement surface.

*NOTE 2 Requirements for electromagnetic compatibility for socket-outlets that incorporate electronic devices are given in <u>Annex A</u>.* 

NOTE 3 A socket-outlet that does not incorporate electronic devices does not emit intolerable electromagnetic interference since significant electromagnetic disturbances are only generated during insertion and withdrawal which are not continuous.

*NOTE 4* A socket-outlet that does not incorporate electronic devices is mechanical by nature of construction. The product is therefore immune from electromagnetic interference.

*NOTE 5* Individually protected socket-outlets (IPS) are only intended to provide supplementary overcurrent protection downstream of the IPS. Individually protected socket-outlets are intended for use in circuits where fault protection is already assured upstream of the socket-outlet.

*NOTE* 6 *Individually protected socket-outlets (IPS) are rated at 13 A. The maximum load current is restricted by the fitted fuse/CBE for its particular application.* 

NOTE 7 Recommendations for products incorporating BS 1363-2 socket-outlets are given in Annex I.