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Introduction

Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international and European standards, comments will be reviewed by the relevant UK national committee before submitting the consensus UK vote and comments. If the draft standard is approved, it is usual for the resulting published standard to be adopted as a British Standard.

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BS 546:2025

Two-pole and earthing-pin plugs, socket-outlets and adaptors – Specification

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on XX Month 2025. 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This British Standard supersedes BS 546:1950, which is withdrawn.

Relationship with other publications

This document is based on the technical requirements given in the BS 1363 series and adapted for BS 546 products.

Information about this document

This is a full revision of the document, and introduces the following principal changes to align with current technical requirements of BS 1363 plugs, socket outlets and adaptors:

- converting units from imperial to SI;
- including requirements for non-rewireable plugs.

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It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this document 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 document 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 document.

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

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

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

- Plugs and Sockets etc. (Safety) Regulations 1994 [1].

1 Scope

This British Standard specifies requirements for two-pole and earthing-pin plugs, plugs (fused and unfused, rewirable and non-rewirable), socket-outlets and adaptors, having ratings of 2 A, 5 A, 15 A and 30 A for household, commercial and light industrial purposes, with particular reference to safety in normal use. This British Standard covers plugs, socket-outlets and adaptors in AC circuits only, operating at voltages not exceeding 250 V root mean square (RMS) and frequencies from 50 Hz to 60 Hz.

NOTE 1 These are suitable for the connection of portable appliances, sound vision equipment and luminaries.

This British Standard does not cover:

- a) plugs incorporating switches, indicator lamps and electronic components; and
- b) socket-outlets and adaptors incorporating electronic components.

NOTE 2 For application in the UK, attention is drawn to the Plugs and Sockets etc. (Safety) Regulations 1994 [1] and to BS 7671 which provide the regulatory framework for the use of these products.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions, or limits the application, of this document¹⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 646, *Specification for Cartridge fuse-links (rated up to 5 amperes) for a.c. and d.c. service*

BS 4662, *Boxes for flush mounting of electrical accessories – Requirements, test methods and dimensions*

BS 6004:2012+A1:2020, *Electric cables – PVC insulated and PVC sheathed cables for voltages up to and including 300/500 V, for electric power and lighting*

BS EN 10270-1:2024, *Steel wire for mechanical springs – Part 1: Patented cold drawn unalloyed spring steel wire*

BS EN 50075, *Specification for flat non-wirable two-pole plugs 2.5 A 250 V, with cord, for the connection of class II-equipment for household and similar purposes*

BS EN 50525-2-11, *Electric cables – Low voltage energy cables of rated voltages up to and including 450/750V (U0/U) – Part 2-11: Cables for general applications – Flexible cables with thermoplastic PVC insulation*

BS EN 50525-2-12, *Electric cables – low voltage energy cables of rated voltages up to and including 450/750 V (U0/U) – Part 2-12: Cables for general applications – Cables with thermoplastic PVC insulation for extensible leads*

BS EN 50525-2-21, *Electric cables – Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U) – Part 2-21: Cables for general applications – Flexible cables with crosslinked elastomeric insulation*

BS EN 50525-2-71, *Electric cables – Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U) – Part 2-71: Cables for general applications – Flat tinsel cables (cords) with thermoplastic PVC insulation*

BS EN 60695-10-2, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method*

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

BS EN 61032:1998, *Protection of persons and equipment by enclosures – Probes for verification*

BS EN 61180:2016, *High-voltage test techniques for low-voltage equipment – Definitions, test and procedure requirements, test equipment*

BS EN IEC 60112:2020, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

BS EN IEC 60664-1, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*²⁾

BS EN IEC 60695-2-11:2021, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end products (GWEPT)*

3 Terms and definitions

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

NOTE Where the terms voltage and current are used, they imply RMS values, unless otherwise stated.

3.1 accessible external surface <of a plug>

surface that can be touched by test probe B of BS EN 61032:1998 when the plug is in full engagement with a corresponding socket-outlet

3.2 accessible external surface <of a socket-outlet>

surface that can be touched by test probe B specified in BS EN 61032:1998 when the socket-outlet is installed as in normal use, without any plugs being engaged

3.3 accessible external surface <of an adaptor>

surface that can be touched by test probe B specified in BS EN 61032:1998 when the adaptor is in full engagement with the corresponding socket-outlet without any plugs being in engagement with the adaptor

3.4 actuating member

part which is pulled, pushed or turned by the user to operate the switch mechanism of a switched adaptor

3.5 adaptor

portable accessory having plug pins, intended to engage with the contacts of a BS 546 socket-outlet, and having socket-outlet contacts to accommodate one or more plugs of BS 546 type

3.6 adaptor socket-outlet

set of contacts for forming part of an adaptor and designed to engage with the pins of a corresponding plug

3.7 basic insulation

insulation applied to live parts to provide basic protection against electric shock

NOTE Basic insulation does not necessarily include insulation used exclusively for functional purposes.

3.8 class I

method of protection against electric shock which does not rely on basic insulation only, but which includes means for the connection of exposed conductive parts to a protective conductor in the fixed wiring of the installation

3.9 clearance

shortest distance in air between two conductive parts

²⁾ This document also gives an informative reference to BS EN 60664-1:2020.

3.10 creepage distance

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

3.11 engagement surface <of the plug portion of an adaptor>

surface which is not able to be touched by test probe B specified in BS EN 61032:1998 when the adaptor is in full engagement with a corresponding socket-outlet without any plugs being in engagement with the adaptor

3.12 engagement surface <of a plug>

surface which is not able to be touched by test probe B specified in BS EN 61032:1998 when the plug is in full engagement with a corresponding socket-outlet

3.13 engagement surface <of a socket-outlet (or the socket-outlet portion of an adaptor)>

surface, ignoring any raised marking, which is the area corresponding to the radius of engagement of a BS 546 plug matching the socket-outlet portion of the adaptor

NOTE See Table 18, 13.2, 14.1, 15.1 and 15.2.

3.14 fine wire thermocouple

thermocouple having wires not exceeding 0.3 mm in diameter

3.15 fixed socket-outlet

socket-outlet which, with its associated enclosure, is intended for use mounted in or on a fixed surface

3.16 flush mounted socket-outlet

socket-outlet which is intended to be mounted in a box which is recessed into a wall or other flat surface

NOTE The socket-outlet plate and the socket-outlet base are regarded as forming a complete unit, and the socket-outlet plate is mounted with its back either flush with a wall or other flat surface structure, or flush with the front of a socket-outlet box or enclosure.

3.17 functional insulation

insulation between conductive parts which is necessary only for the proper functioning of the equipment

3.18 fuse carrier

moveable or removable part designed to carry, retain, cover and/or remove the fuse link

3.19 fused adaptor

adaptor having a replaceable cartridge fuse link interposed between the line pin and one or more line socket contacts

3.20 fused plug

plug having provisions for a replaceable cartridge fuse link

3.21 indicator lamp

lamp or similar device which illuminates to indicate that the socket-outlet or adaptor is energized

3.22 insignificant mass

insufficient combustible mass to constitute a fire hazard

NOTE Parts of insignificant mass are usually less than 2 g.

3.23 live parts

current carrying parts and those metal parts in contact with them during normal use

NOTE Metal parts of the earthing circuit are not considered to be current carrying parts.

3.24 moulded-on <plug>

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

3.25 lug terminal

screw terminal or a stud terminal, designed for clamping a cable lug or bar by means of a screw or nut

[SOURCE: BS 5733:2010+A1:2014, 3.28]

3.26 mantle terminal

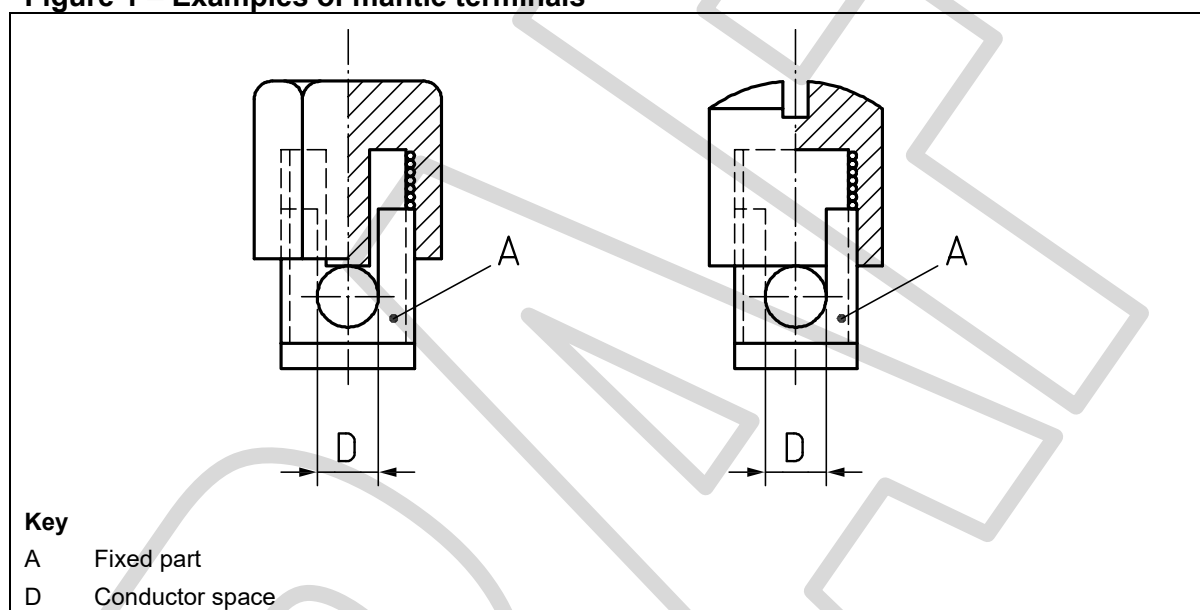
terminal with screw clamping in which the conductor is clamped against the base of a slot, in a threaded stud, by means of a nut

NOTE 1 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 equally effective means for transmitting the pressure from the nut to the conductor within the slot.

NOTE 2 Examples of mantle terminals are shown in Figure 1.

[SOURCE: BS 5733:2010+A1:2014, 3.29]

Figure 1 – Examples of mantle terminals



3.27 multiple socket-outlet

combination of two or more socket-outlets

3.28 multiway adaptor

adaptor having more than one set of socket contacts

NOTE The socket contacts might or might not be of the same type or rating as the plug pin portion.

3.29 non-rewirable portable socket-outlet

portable socket-outlet so constructed that it forms a complete unit with a flexible cable which cannot be replaced after assembly by the manufacturer of the portable socket-outlet

NOTE See also 14.14.

3.30 non-rewirable plug

plug so constructed that it forms a complete unit with a flexible cable which cannot be replaced after assembly by the manufacturer of the plug

NOTE See also 13.5.

3.31 pillar terminal

terminal with screw clamping 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 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 Examples of pillar terminals are shown in Figure 2 and connecting capacity given in Table 1.

[SOURCE: BS 5733:2010+A1:2014, 3.25]

Figure 2 – Examples of pillar terminals

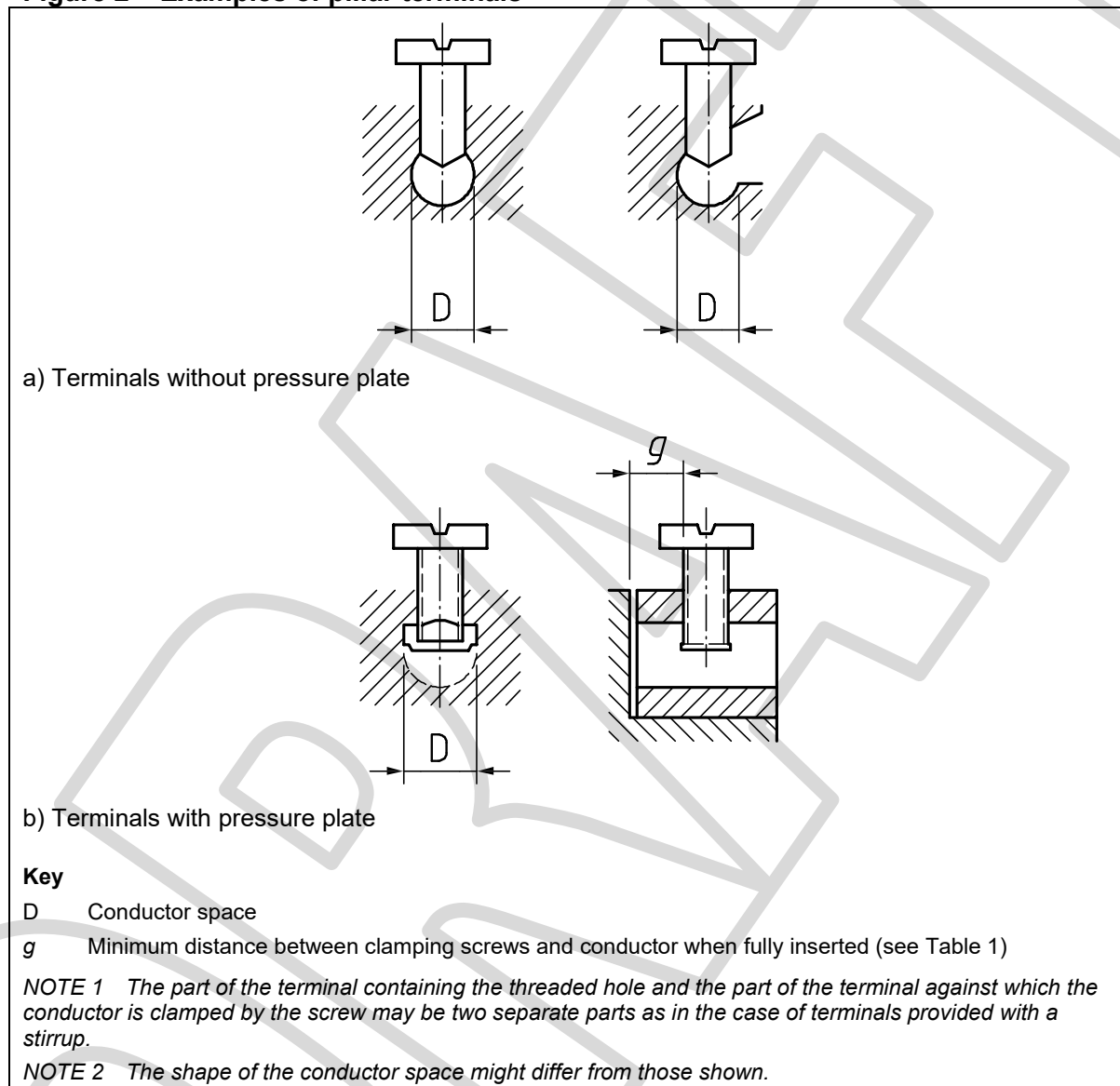


Table 1 – Pillar terminals connecting capacity

Connecting capacity of terminal mm ²	Minimum distance <i>g</i> between clamping screws and conductor when fully inserted	
	One screw mm	Two screws mm
0.5 to 1.5	1.5	1.5
1.0 to 4.0	1.8	1.5
4.0 to 6.0	2.0	1.5
6.0 to 10.0	2.5	2.0
10.0 to 16.0	3.0	2.0

3.32 plug

portable fused device having projecting pins designed to engage with the contacts of a corresponding socket-outlet, incorporating means for the electrical connection and the mechanical retention of a suitable flexible cable

3.33 portable socket-outlet

socket-outlet intended to be connected to, or integral with, a flexible cable, and able to be moved from one place to another while connected to the supply

3.34 rated voltage

voltage assigned by manufacturer for a specified operating condition

3.35 reinforced insulation

single insulation system applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation under the conditions specified in the relevant standard

3.36 resilient material

material having the inherent capability of regaining or substantially regaining its original form when deforming loads are removed

3.37 rewirable plug

plug so constructed as to enable the fitting or replacing of a flexible cable using general purpose tools

3.38 rough use plug

plug designed to withstand severe mechanical handling

NOTE Rough use plugs are identified by additional marking in accordance with **8.1b**). They are not intended for gross misuse.

3.39 rewirable portable socket-outlet

portable socket-outlet so constructed as to enable the fitting or replacing of a flexible cable using general purpose tools

3.40 screw type terminal

terminal in which the connection is made directly by means of screws or nuts of any kind or indirectly through an intermediate metal part such as a washer, clamping plate or anti spread device on which the screw bears directly

NOTE The following are examples of screw type terminals.

- a) A pillar terminal is a terminal in which the conductor is inserted into a hole or cavity, where it is clamped under the shank of the screw or screws.
- b) A screw terminal is a terminal in which the conductor is clamped under the head of the screw.
- c) A stud terminal is a terminal in which the conductor is clamped under a nut.

3.41 shutter

movable device arranged to shield the current carrying socket-outlet contacts automatically when a corresponding plug is removed

3.42 small parts

parts where each surface lies completely within a circle of 15 mm diameter or where some of the surface lies outside the 15 mm diameter circle but in such a way that it is not possible to place a circle of 8 mm diameter on any of this remaining surface

NOTE More information concerning small parts can be found in BS EN IEC 60695-2-11:2021, 4.4.

3.43 socket-outlet

accessory having a set of three socket contacts designed to engage with the pins of a corresponding plug and having means for the electrical connection of appropriate flexible cables and including its dedicated enclosure if any

3.44 socket-outlet base

part of the socket-outlet which carries the contacts

NOTE It may be integral with the socket-outlet plate.

3.45 socket-outlet box

box suitable for mounting one or more socket-outlets

3.46 socket-outlet plate

external plate which covers the base and contact assembly of a socket-outlet and through which the pins of the plug are inserted

3.47 stud terminal

terminal with screw clamping in which the conductor is clamped under a nut

NOTE 1 The clamping pressure may be applied directly by a suitably shaped nut or through an intermediate part, such as a washer, a clamping plate or an anti-spread device.

NOTE 2 Examples of stud terminals are shown in Figure 3.

[SOURCE: BS 5733:2010+A1:2014, 3.26]

3.48 supplementary insulation

independent insulation applied in addition to basic insulation to provide protection against electric shock in the event of failure of basic insulation

3.49 terminal

means which facilitates an electrical connection between the appropriate flexible cable and the conducting parts of the adaptor without the use of special purpose tools

3.50 termination

means which facilitates an electrical connection between the appropriate flexible cable and the conducting part of the adaptor using special purpose tools

NOTE Special purpose tools could include soldering, welding and crimping.

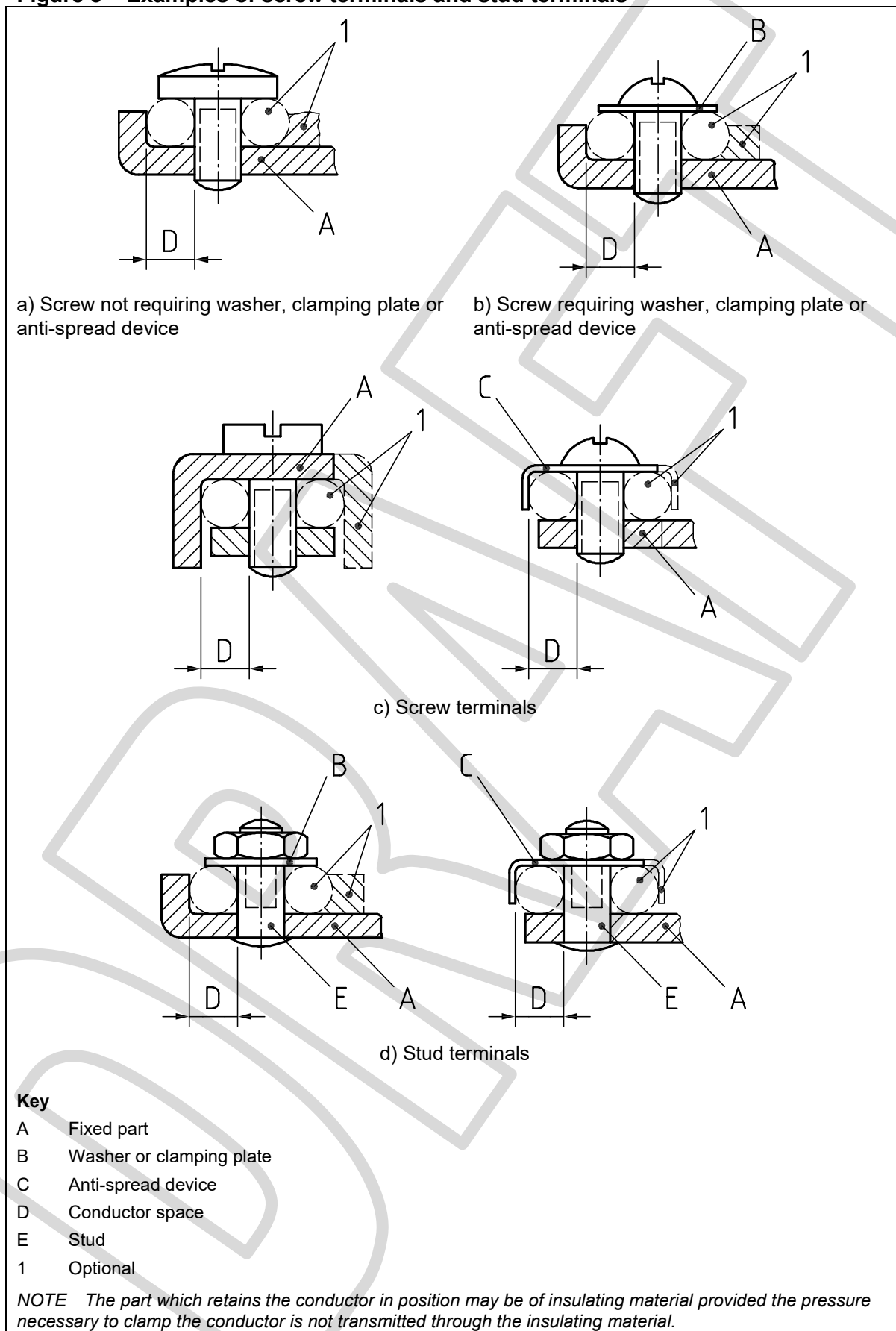
3.51 type test

test or series of tests made on a type test sample, for the purpose of checking conformity of the design of a given product with the requirements of the relevant standard

3.52 type test sample

one or more similar units or specimens submitted by the manufacturer or responsible vendor for the purpose of a type test

Figure 3 – Examples of screw terminals and stud terminals



4 Conditions of use

Plugs, socket-outlets and adaptors shall be suitable for use under the following conditions:

- a) an ambient temperature in the range $-5\text{ }^{\circ}\text{C}$ to $+40\text{ }^{\circ}\text{C}$, the average value over 24 h not exceeding $25\text{ }^{\circ}\text{C}$;

NOTE Under normal conditions of use, the available cooling air is subject to natural atmospheric variations of temperature and hence the peak temperature occurs only occasionally during the hot season, and on those days when it does occur it does not persist for lengthy periods.

- b) a situation not subject to exposure to direct radiation from the sun or other source of heat likely to raise temperatures above the limits specified in a);
- c) an altitude not exceeding 2 000 m above sea level; and
- d) an atmosphere not subject to abnormal pollution by smoke, chemical fumes, rain spray prolonged periods of high humidity or other abnormal conditions. This is the equivalent to pollution degree 2 (see Annex A), and Overvoltage Category III (see Annex B).

5 General

Plugs, socket-outlets and adaptors shall be designed and constructed such that in normal use their performance is reliable and minimizes the risk of danger to the user or to the surroundings.

6 General conditions for type testing

6.1 Principle

All tests shall be type tests.

6.2 Environmental conditions

Unless otherwise specified, the plugs, socket-outlets and adaptors shall be tested as delivered by the manufacturer or responsible vendor and under normal conditions of use, at an ambient temperature of $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ after being conditioned at normal laboratory temperature and humidity levels for at least four days.

6.3 Test samples

The plugs, socket-outlets and adaptors used for the tests shall be representative of normal production items in respect of all details which might affect the test results.

Non-rewirable plugs and socket-outlets shall be supplied with an appropriate flexible cable which is at least 1 m long.

6.4 Conformity criteria

Plugs, socket-outlets and adaptors shall be deemed to conform to this British Standard if no sample fails in the complete series of tests given in Table 2 to Table 4.

If one sample fails in a complete series of tests given in Table 2 to Table 4, then products of that type shall be deemed to have failed to conform to this British Standard, unless the product is shown to be not representative of normal production or design, in which case a further type test sample shall be submitted to the test or tests in that particular group. If there is no failure in this retest, then products of that type shall be deemed to conform to this British Standard.

If more than one sample fails in the complete series of tests given in Table 2 to Table 4, the products of that type shall be deemed not to conform to this British Standard.

NOTE For type testing, all tests have been included in the test schedule and should be performed in the specified order. References to carrying out specific tests in various clauses are not intended to indicate a sequence of testing different from that in the schedule and should not be conducted as separate additional tests.

Table 2 – Schedule of tests for plugs

Sequence	Samples	Tests	Clause number
1	3	Inspection, measurement, gauging and manipulation	6, 7, 8, 12, 10.1, 10.3, 10.5, 13.1, 13.2, 13.3, 13.4, 13.8.1, 13.8.2, 13.12, 13.13, 13.14, 13.15, 21.2, 21.3, 21.4, 21.6, 9 (except Annex C), 26
2	3	General	6, 10.4, 21.2, 13.11, 13.16.2.2, 13.16.2.3
3	3	General	6, 16.2, 13.7, 21.5, 13.16.2.4
4	3	General	6, 16.2, 17.2.1, 23, 13.6, 11.2, 13.9, 13.5, 13.10
5	3 ^{A)}	Pin strength	6, 13.8.3.2
6	9	Additional tests for plugs with nickel plated brass pins, non-solid pins	6, 13.8.4
7	3	Materials	6, 27
8	3	Materials	6, 28, 9.3 (Annex C only)
9	3	Materials	6, 29

NOTE The order of tests given in sequence 1 is preferred but not mandatory except where required within the text of the appropriate clause.

^{A)} An additional three samples are required for plugs with non-solid pins.

Table 3 – Schedule of tests for socket-outlets

Sequence	Samples	Test	Clause no.
1	3	Inspection, measurement, gauging and manipulation	6, 7, 8, 10.1, 10.2, 12, 10.3, 10.6, 11.1, 14.1, 14.2, 14.7, 14.8, 14.10, 14.11, 14.12, 14.13, 14.14, 22.2, 22.3, 22.4, 22.6, 9 (except Annex C), 26
2	3	Inspection, measurement, gauging and manipulation	6, 10.4, 26.3 (11.2, 11.3 only), 22.1, 16.2, 14.3, 14.4
3	3	General	6, 19, 14.9.1, 18.2, 22.5
4	3	General	6, 16.1, 17, 20.2.2, 11.2, 14.4, 14.5, 14.6
5	3	General	6, 16.2, 20.2.3, 24
6	3	General	6, 27
7	3	Materials	6, 28, 9.3 (Annex C only)
8	3	Materials	6, 29
9 ^{A)}	3	Positive break	6, 14.9.2

NOTE The order of tests given in sequence 1 above is preferred but not mandatory except where required within the text of the appropriate clause.

^{A)} An additional new set of three samples prepared with the contacts closed might be required.

Table 4 – Schedule of tests for adaptors

Sequence	Samples	Tests	Clause number
1	3	Inspection, measurement, gauging and manipulation	6, 7, 8, 10.1, 10.2, 10.3, 10.6, 11.1, 15.1.1, 15.1.2, 15.1.3, 15.1.4.1, 15.1.4.2, 15.1.7.1, 15.1.7.2, 15.1.10, 15.1.11, 15.2.1, 15.2.2, 15.2.3, 15.2.7, 15.2.8, 15.2.10, 9 (except Annex C), 26
2	3	General	6, 10.4, 15.1.9, 15.1.12.2.2, 15.1.12.2.3, 15.1.12.2.2
3	3	General	6, 25.2.2, 19, 25.2.3, 18.3
4	3	General	6, 16.2, 15.1.12.2.4
5	3	General	6, 16.1, 25.2.4, 15.1.6, 11.2, 15.1.5, 15.1.8
6	3	General	6, 16.1, 17, 15.2.5, 20, 15.2.4
7	3 ^{A)}	General	6, 15.1.7.3
8	9	Additional tests for adaptors with non-solid pins	6, 15.1.7.4
9	3	Materials	6, 27
10	3	Materials	6, 28, 9.3 (Annex C only)
11	3	Materials	6, 29

NOTE The order of tests given in sequence 1 is preferred but not obligatory except where required within the text of the appropriate clause.

^{A)} An additional three samples are required for plugs with non-solid pins.

6.5 Inspection and testing

All inspections and tests of any one classification (see Clause 7) shall be performed as specified in Table 2 to Table 4, including the number of samples and in the order given.

6.6 Gauge tolerances

The measured values of the gauges shall not exceed ± 0.005 mm.

7 Classification and rating

7.1 Classifications

Plugs, socket-outlets and adaptors shall be classified in accordance with Table 5 and Table 6.

Table 5 – Classifications

	Plugs	Socket-outlets	Adaptors
Unfused	✓	✓	✓
Fused (GB 2 and GB 3 styles only)	✓	—	✓
Switched or unswitched	unswitched only	✓	unswitched only
Rewireable or non-rewireable	✓	✓	—
Normal or rough use	✓	—	—
Multiway	—	—	✓
Single or multiple	—	✓	—
Fixed flush mounting	—	✓	—
Fixed surface mounting	—	✓	—
Panel mounting	—	✓	—
With indicator lamp	—	✓	✓
Without indicator lamp	—	✓	✓

Table 6 – Plug, socket-outlet and adaptor system types

System type	Rated current (A)
GB 2	2
GB 3	5
GB 4	15
GB 5	30
<i>NOTE System type derived from IEC TR 60083.</i>	

7.2 Rating

The rated voltage of plugs, socket-outlets and adaptors shall be 250 V.

The rated current of plugs and single socket-outlets shall be 2 A, 5 A, 10 A, 15 A or 30 A.

NOTE 10 A rating only applies to non-rewireable plugs of GB 4 style fitted with 0.75 mm² flexible cable.

The rated current of multiple fixed socket-outlets shall be the sum of the incorporated outlets.

The rated current of multiple portable socket-outlets shall be equal to the sum of the rated currents of each incorporated socket-outlet but not greater than the rated current given in Table 7 for the size of cable fitted.

The rated current of adaptors shall be one of the following:

- equal to the sum of the rated currents of the adaptor socket-outlet portions, if this sum is lower than the nominal current of the plug portion; or
- the current corresponding to the plug portion system type in accordance with Table 6, if the sum of the rated currents of the adaptor socket-outlet portions is higher than that of the plug portion.

Table 7 – Rated current and maximum fuse rating in normal use, and load for flexing and cable grip tests related to system type and size of flexible cable

System type	Flex cable nominal cross sectional area mm ²	Rated current A	Test current ±0.4 A	Fuse rating A	Load for flexing test	Cable grip tests	
					+2%, -0%	Load +2%, -0%	Torque ^{A)}
					kg	kg	nm
GB 2	0.5	2	2.5	2	1	3	0.15
GB 3	0.5	5	6	5	1	3	0.15
GB 3	0.75	5	6	5	1	3	0.25
GB 4	0.75	10	11	—	1	3	0.25
GB 4	1	15	18	—	2	3	0.25
GB 4	1.25	15	18	—	2	6	0.30
GB 4	1.5	15	18	—	2	6	0.35
GB 5	2.5	30	33	—	3	10	0.425
GB 5	4.0	30	33	—	3	10	0.425
GB 5	6.0	30	33	—	3	10	0.425

^{A)} The recording of a measured value of torque in accordance with this table is deemed to conform to this British Standard on condition that the uncertainty of measurement at not less than 95% confidence level does not exceed ±10%.

8 Marking and labelling

8.1 Marking

8.1.1 Requirements

Plugs, socket-outlets and adaptors shall be legibly and durably marked with the following information, which shall not be placed on screws, removable washers or other easily removable parts, or upon parts intended for separate sale:

- either the name, trademark or identification mark of the manufacturer or responsible vendor;
NOTE This may be duplicated on a removable fuse carrier.
- the number of this British Standard, i.e. BS 546³⁾, or BS 546/A for rough use plugs;
- on rewirable plugs and socket-outlets, the terminals intended for the connection of the various conductors shall be identified by the symbols given in **8.4**;
- for fused plugs and fused adaptors, the words “FUSE” or “FUSED” on the external accessible surface;
- non-rewirable fused plugs shall be marked on the engagement surface with the rated current of the fuse link fitted, which shall not exceed the value given in Table 6 for the appropriate size of flexible cable;

³⁾ Marking BS 546 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with second or third party certification of conformity. Further testing and conformity certification remains at the discretion of the manufacturer and is not a requirement of this standard.

- f) all plugs, socket-outlets and adaptors shall be marked with:
 - 1) rated current;
 - 2) rated voltage, which shall be 250 V; and
 - 3) nature of supply;
- g) for fused plugs, the words “USE CORRECT FUSE-LINKS”, or words to this effect; and
- h) for adaptors, the words “TOTAL LOADING MUST NOT EXCEED *..... AMPERES”, or words to this effect.

8.1.2 Test method

Conformity shall be checked by inspection and by rubbing the marking for approximately 15 s with a cloth soaked in water, and again for approximately 15 s with a cloth soaked in an aliphatic solvent hexane with a content of aromatics of maximum 0.1% by volume, a kauri-butanol value of 29, initial boiling point of approximately 69 °C, and relative density of approximately 0.68. The marking shall remain legible. Markings produced by an engraving or moulding process shall be deemed to conform without test.

8.2 Labelling

8.2.1 Requirements

Except where a plug fitted with a flexible cable is supplied direct to a manufacturer for incorporation in other equipment, the free end of such an assembly shall have a label attached which shall include the following:

- a) the statement: “The flexible cable of this plug must be connected to an item of equipment before being plugged into a socket-outlet”;
- b) the maximum rating, in A, of the equipment to which it might be fitted (as given in Table 7);
- c) the colour code of the cores of the flexible cable as follows:

“IMPORTANT. Wires in the mains lead are coloured in accordance with the following code:

Green-and-yellow	Earth (if any)
Blue	Neutral
Brown	Line”

- d) if the plug is fitted with a 2-core flexible cable, the following statement:

“This lead must not be used with equipment requiring the protection of an earth continuity conductor”.

8.2.2 Test method

Conformity shall be checked by inspection.

8.3 Instructions

8.3.1 Requirements

Rewirable plugs shall be provided with instructions for the safe connection of the appropriate flexible cables including clear instructions for the removal of insulation from the conductors.

8.3.2 Test method

Conformity shall be checked by inspection.

8.4 Symbols

Symbols shall be as follows.

amperes	A
volts	V
alternating current	~
line	L
neutral	N
earth	 (preferred) or 

NOTE 1 The letter "E" may be used in addition to either of these symbols for earth.

NOTE 2 For the marking of the rated current and rated voltage of the plug, socket-outlet or adaptor, figures may be used alone. The figures for the current rating being placed before or above that of the rated voltage and separated by a line.

If a symbol for nature of supply is used, it shall be placed next to the marking for rated current and rated voltage, for example:

15 A 250 V ~ or 15/250 ~ or $\frac{15}{250}$ ~

or 15 A 250 V AC or 15/250 AC or $\frac{15}{250}$ AC

9 Clearances, creepage distances and solid insulation

9.1 General

Plugs, socket-outlets and adaptors shall be constructed so that the clearances, creepage distances and solid insulation are sufficient to withstand the electrical stresses, taking into account the environmental influences that might occur. Clearances, creepage distances and solid insulation shall conform to the relevant requirements of **9.1**, **9.2**, **9.3** and **9.4**.

The distance between lead wires in the pinch of a neon lamp with external resistor shall be a minimum of 1 mm.

Plugs, socket-outlets and adaptors conforming to the requirements for basic insulation shall be deemed to meet the requirements of this clause. If the manufacturer declares an insulation level exceeding basic insulation then the plug, socket-outlet or adaptor shall be tested accordingly.

NOTE 1 The requirements and tests are based on BS EN IEC 60664-1.

NOTE 2 Product insulation consists of basic insulation and protective earthing as required by BS EN 61140 for Class I equipment. Mechanical strength equivalent to that which would be provided by reinforced insulation as listed in BS EN 61140 is achieved through specific mechanical and material tests.

9.2 Clearances

9.2.1 General

COMMENTARY ON 9.2.1

Plugs, socket-outlets and adaptors energized directly from the low voltage supply fall into Overvoltage Category III.

The clearances shall withstand the rated impulse voltage declared by the manufacturer taking into account the rated voltage and the Overvoltage Category in accordance with Annex B and the pollution degree declared by the manufacturer in accordance with Annex A.

NOTE 1 For the measurements, all parts which can be removed without the use of a tool are removed and moveable parts which can be assembled in different orientations are placed in the most unfavourable position.

NOTE 2 Moveable parts are, for example, hexagonal nuts, the position of which cannot be controlled throughout an assembly.

9.2.2 Clearances for basic insulation

9.2.2.1 Requirements

The clearances for basic insulation shall be not less than the values given in Table 8.

Smaller clearances, other than those values marked in Table 8 with footnote “B”, shall be permitted if the plug meets the impulse withstand voltage test specified in Annex D at the impulse voltage specified in Table D.1. This exception shall apply only if the parts are rigid or located by mouldings or if the construction is such that it is unlikely that distances will be reduced by distortion or by movement of the parts during mounting, connection and normal use.

9.2.2.2 Test method

Conformity shall be checked by inspection and, if necessary, by measurement, or by testing in accordance with Annex D.

If clearance distances are to be measured, this shall be carried out in accordance with Annex E.

Table 8 – Minimum clearances for basic insulation

Rated impulse withstand voltage	Minimum clearances in air up to 2 000 m above sea level
kV ^{A)}	mm
0.33	0.2 ^{B)}
0.50	0.2 ^{B)}
0.80	0.2 ^{B)}
1.5	0.5
2.5	1.5
4.0	3.0
6.0	5.5

^{A)} See Annex C. This voltage is:

- for functional insulation, the minimum impulse voltage expected to occur across the clearance;
- for basic insulation directly exposed to or significantly influenced by transient overvoltage from the low voltage mains, the rated impulse withstand voltage of the plug, socket-outlet or adaptor;
- for other basic insulation, the highest impulse voltage that can occur in the circuit.

^{B)} Minimum clearances values are based on BS EN IEC 60664-1.

9.2.3 Clearances for functional insulation

9.2.3.1 Requirements

The clearances for functional insulation shall be not less than the values specified for basic insulation in **9.2.2**.

9.2.3.2 Test method

Conformity shall be checked by inspection and, if necessary, by measurement, or by testing in accordance with Annex D.

If clearance distances are to be measured, this shall be carried out in accordance with Annex E.

9.2.4 Clearances for supplementary insulation

9.2.4.1 Requirements

The clearances for supplementary insulation shall be not less than the values specified for basic insulation in **9.2.2**.

9.2.4.2 Test method

Conformity shall be checked by inspection and, if necessary, by measurement, or by testing in accordance with Annex D.

If clearance distances are to be measured, this shall be carried out in accordance with Annex E.

9.2.5 Clearances for reinforced insulation

9.2.5.1 Requirements

The clearances for reinforced insulation shall be not less than the values specified for basic insulation in **9.2.2** but using the next higher step for rated impulse withstand voltage given in Table 8.

This requirement shall not be applied to the sleeves of the plug pins.

9.2.5.2 Test method

Conformity shall be checked by inspection and by measurement, or by testing in accordance with Annex D.

9.2.6 Contact gap

9.2.6.1 Requirements

The minimum contact gap shall be 1.2 mm when the switch is in the open position.

9.2.6.2 Test method

Conformity shall be checked by measurement.

9.3 Creepage distances

9.3.1 General

The creepage distance shall be dimensioned for the voltage, which is expected to occur in normal use taking into account the pollution degree, and the material group as declared by the manufacturer.

NOTE 1 For the measurements, all parts which can be removed without the use of a tool are removed and moveable parts which can be assembled in different orientations are placed in the most unfavourable position.

NOTE 2 Moveable parts are, for example, hexagonal nuts, the position of which cannot be controlled throughout an assembly.

NOTE 3 A creepage distance cannot be less than the associated clearance.

Creepage distances shall be measured in accordance with Annex E.

The relationship between material group and between comparative tracking index (CTI) values and proof tracking index (PTI) values is as follows.

Material group I	$600 \leq \text{CTI/PTI}$
Material group II	$400 \leq \text{CTI/PTI} < 600$
Material group IIIa	$175 \leq \text{CTI/PTI} < 400$
Material group IIIb	$100 \leq \text{CTI/PTI} < 175$

The CTI or PTI values shall be determined in accordance with Annex C.

NOTE 4 For glass, ceramics and other inorganic materials which do not track, creepage distances need not be greater than their associated clearance.

9.3.2 Creepage distances for basic insulation

9.3.2.1 Requirement

The creepage distances for basic insulation shall be not less than the values specified in Table 9.

Table 9 – Minimum creepage distances (mm) for basic insulation

Rated voltage ^{A)} V (RMS)	Pollution degree 2 ^{B)}			Pollution degree 3 ^{B)}		
Up to and including	Material group			Material group		
—	I	II	IIIa/IIIb	I	II	IIIa
250	1.3	1.8	2.5	3.2	3.6	4.0

^{A)} This voltage is the voltage rationalized through BS EN IEC 60664 1:2020, Table F.3a and Table F.3b, based on the nominal voltage of the supply system.

^{B)} Details of pollution degrees are given in Annex B.

9.3.2.2 Test method

Conformity shall be checked by measurement.

9.3.3 Creepage distances for functional insulation

9.3.3.1 Requirement

The creepage distance for functional insulation shall be not less than the values specified for basic insulation in 9.3.2.

9.3.3.2 Test method

Conformity shall be checked by measurement.

9.3.4 Creepage distances for supplementary insulation

9.3.4.1 Requirement

The creepage distances for supplementary insulation shall be not less than the values specified for basic insulation in 9.3.2.

9.3.4.2 Test method

Conformity shall be checked by measurement.

9.3.5 Creepage distances for reinforced insulation

9.3.5.1 Requirement

The creepage distances for reinforced insulation shall be not less than those derived from twice the distance specified for basic insulation in Table 9.

This requirement shall not be applied to the sleeves of the plug pins.

9.3.5.2 Test method

Conformity shall be checked by measurement.

9.4 Solid insulation

9.4.1 Requirement

Solid insulation for basic, functional, supplementary and reinforced insulation shall be capable of withstanding electrical stresses which occur in normal use.

NOTE No minimum thickness is specified for solid insulation.

9.4.2 Test method

Conformity shall be checked by tests in accordance with **17.2.3** using the values specified in Table 10.

Table 10 – Withstand voltages for insulation types

Insulation	Test voltage V (RMS)
Functional insulation	1 500
Basic insulation	1 500
Supplementary insulation	1 500
Reinforced insulation	3 000

10 Accessibility of live parts

10.1 General

10.1.1 Requirements

Live parts of plugs shall not be accessible when wired as in normal use and in full engagement with a corresponding socket-outlet. Live parts of socket-outlets shall not be accessible when wired and mounted as in normal use. Live parts of adaptors shall not be accessible when in full engagement with a corresponding socket-outlet. Removal of detachable fuse carriers shall not result in live parts becoming accessible when a fused plug or fused adaptor is in full engagement with the socket-outlet.

10.1.2 Test method

Conformity shall be checked by the application of test probe 12 in BS EN 61032:1998,

Figure 8, applied with a force of 5_{-1}^0 N with non-rewirable plugs fitted with their appropriate flexible cables, rewirable plugs fitted with a 2-core flexible cable of smallest cross-section specified in Table 7 for the plug rating. Detachable fuse carriers shall be removed before this test is undertaken.

10.2 Socket-outlets and adaptors

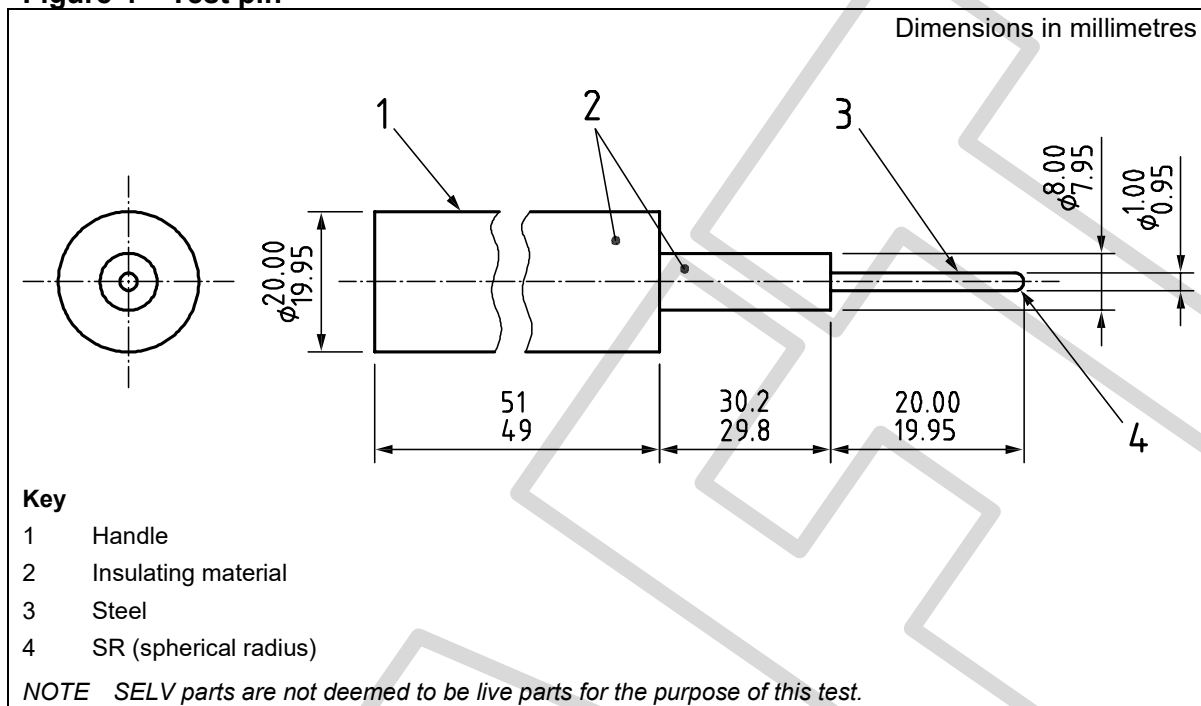
10.2.1 Requirements

Socket-outlets shall be so designed that when they are wired and mounted as in normal use live parts are not accessible. Adaptors shall be so designed that when in full engagement with a corresponding socket-outlet live parts are not accessible.

10.2.2 Test method

Conformity shall be checked by the application of the test pin in accordance with Figure 4 perpendicular to the accessible external surface with a force of 5_{-1}^0 N. It shall not be possible to touch live parts.

Figure 4 – Test pin



10.3 Plugs and the plug portion of adaptors

10.3.1 Requirements

Plugs and the plug portion of adaptors shall be designed and constructed so as to protect the user against accidental contact with live parts during insertion or withdrawal from corresponding socket-outlets. Socket-outlets and the socket-outlets of an adaptor shall be designed and constructed so as to protect the user against accidental contact with live parts during insertion or withdrawal of plugs.

10.3.2 Test method

Conformity shall be verified by satisfying the dimensional and gauging requirements in **13.2** and **15.1.2**.

10.4 Resilient covers

10.4.1 Requirements

Resilient covers shall be so designed and constructed that when assembled and wired as in normal use, there is no risk that, as a result of undue pressure, live parts could penetrate the cover or become so disposed as to reduce creepage distances and clearances below those given in **Clause 9**.

10.4.2 Test method

Conformity shall be checked in accordance with the following test.

NOTE An example of a suitable apparatus is shown in **Figure 5**.

Figure 5 – Apparatus for mechanical strength test on resilient covers

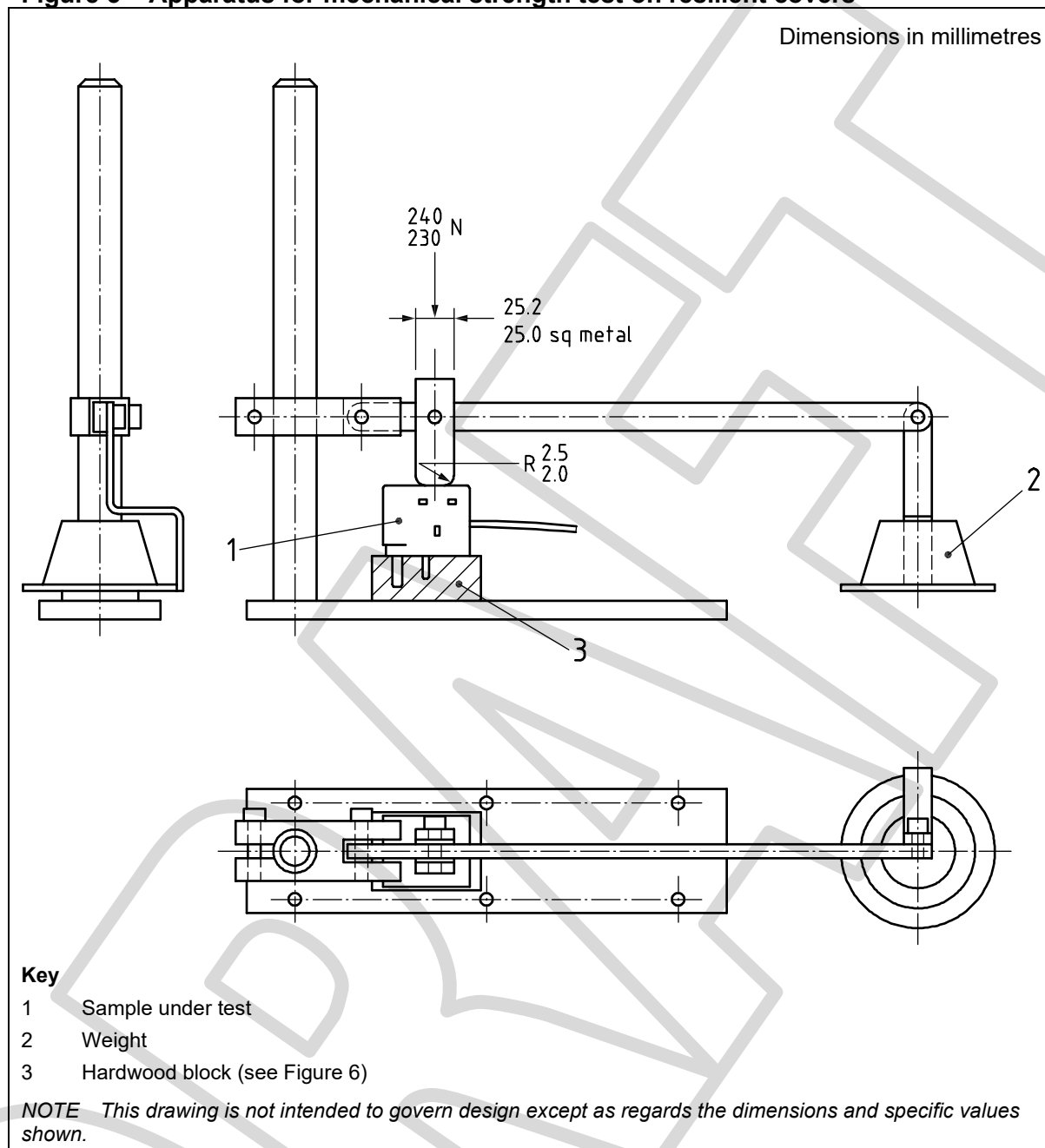


Figure 6 – Hardwood block for Figure 5

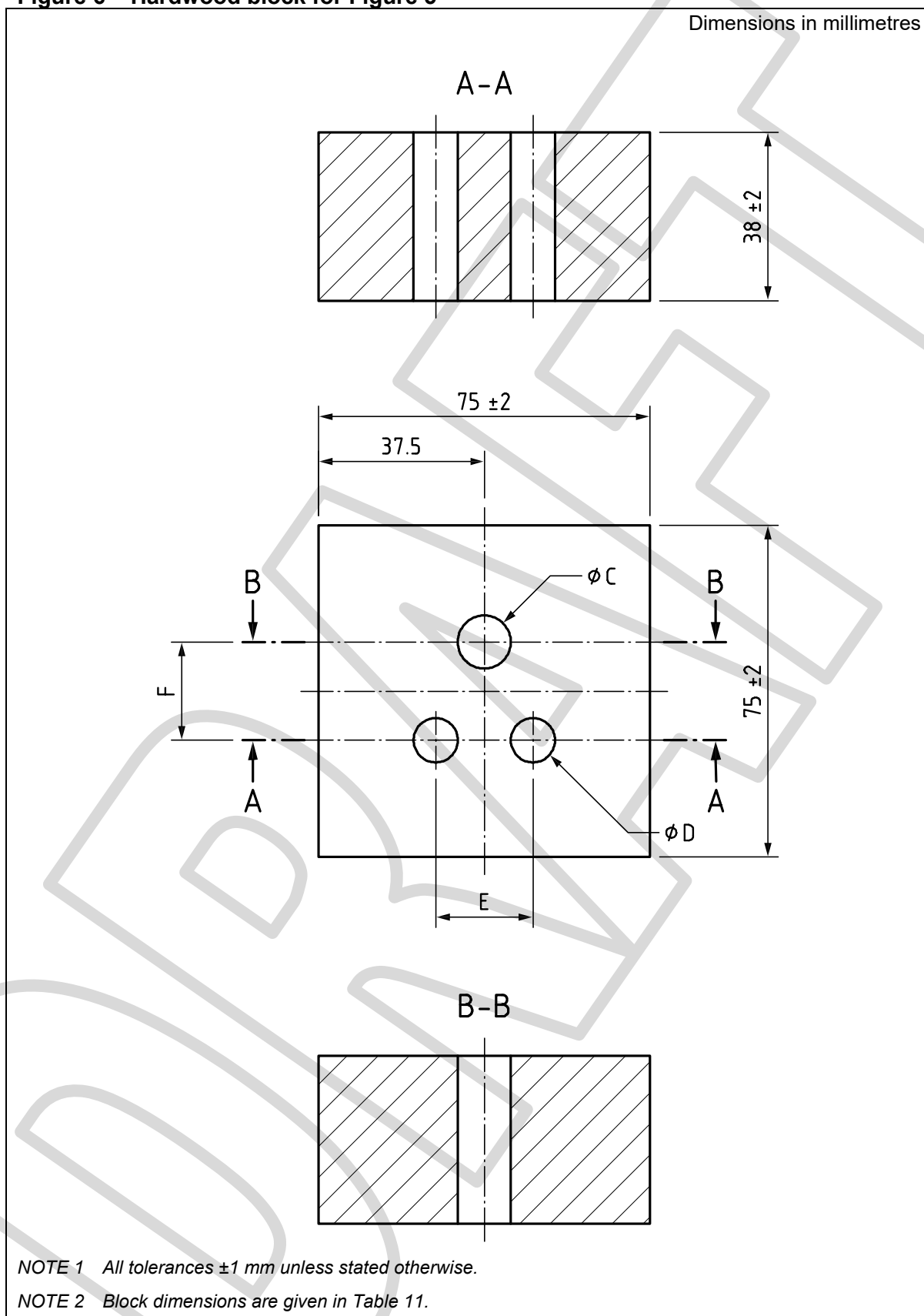


Table 11 – Block dimensions for Figure 6

	L to N pin horizontal distance	E to L-N pin vertical distance	E pin diameter	L and N pin diameter
Drawing reference >>	E	F	C	D
GB 2 block dimensions	14.5	12.5	7.7	5.4
GB 3 block dimensions	19.1	20.1	10.6	7.7
GB 4 block dimensions	25.4	25.6	13.1	10.6
GB 5 block dimensions	36.5	35.2	14.3	11.9

The design of the apparatus shall be such that a steady force of 240_{-10}^0 N can be applied to those places where the possibility of a failure exists, the force being applied through a metal test pressure block as shown in Figure 5.

Each sample shall be subjected to the force at each chosen place in turn. During each application of force, a test voltage of $2\,000\text{ V} \pm 60\text{ V}$, 50 Hz of substantially sinusoidal waveform shall be applied for 60_{+5}^0 s between all live parts bonded together and the metal test pressure block.

During the test no flashover or breakdown shall occur.

After the test, it shall not be possible to touch live parts with test probe 11 in BS EN 61032:1998, Figure 7, when applied with a force of 30_{-2}^0 N.

10.5 Plugs fitted with flexible cable

10.5.1 Requirements

Except when supplied to equipment manufacturers for incorporation into their equipment, plugs fitted with a flexible cable shall have the free end encapsulated in insulating material.

10.5.2 Test method

Conformity shall be checked by inspection.

10.6 Socket-outlet and adaptor earth pin apertures

10.6.1 Requirements

It shall not be possible to introduce a conducting device through the earthing socket aperture(s) of a socket-outlet or adaptor in such a manner that there is a risk of making contact with live parts, or a live conductor with or without insulation.

10.6.2 Test method

Conformity shall be checked by introducing a rigid metal pin, $1_{-0.05}^0$ mm diameter $\times$ 60 mm $\pm$ 1 mm long, through any earthing socket aperture or apertures of a socket-outlet or a socket-outlet of an adaptor mounted as in normal use, applying a force of 5_{-1}^0 N, and with the conductors, if any, in the most unfavourable position.

11 Provision for earthing

11.1 Socket-outlet and adaptor contacts

11.1.1 Requirements

Socket-outlets and adaptors shall be so constructed that, when inserting a plug with an earthing pin into a corresponding socket-outlet the earth connection is made before the current carrying pins of the plug become live. When withdrawing a plug, the current carrying parts shall separate before the earth contact is broken.

11.1.2 Test method

Conformity shall be checked by inspection and electrical test.

11.2 Accessible metal parts

11.2.1 Requirements

All accessible metal parts shall be in effective electrical contact with the earthing socket-contact and earthing plug pin, except that metal parts on or screws in or through, non-conducting material, and separated by such material from current carrying parts in such a way that in normal use they cannot become live, need not be in effective electrical contact with the earthing socket contact and earthing plug pin.

11.2.2 Test method

Conformity shall be checked by inspection, and the following:

- a) for metal parts insulated from live parts, by the test specified in **17.2.3**; and
- b) for metal parts connected to an earthing terminal or earthing plug pin, by the following test.

Metal parts having an accessible surface coating of lacquer or enamel shall be tested as accessible metal parts.

A current of 25 A ± 0.75 A, derived from an AC source having a no-load voltage not exceeding 12 V, shall be passed for 60⁺⁵₀ s as follows:

- 1) for plugs, between the earthing pin of the plug, and between the remote end of the protective conductor of a three-core flexible cable (cut to a length of 150 mm ± 5 mm measured from the nearest edge of the earthing pin) and the remote end of the earthing plug pin and any accessible metal part intended to be earthed, in accordance with the following:
 - i) for non-rewirable plugs, the manufacturer's connection is tested as supplied, with the flexible cable cut to a length of 150 mm ± 5 mm measured from the nearest edge of the earthing pin, precoiled flexible cables being extended before measurement;
 - ii) for rewirable plugs, flexible cable conforming to BS EN 50525-2-11 having smallest size of cable for the plug system type in accordance with Table 7 shall be used. Terminal screws and nuts shall be tightened with a torque equal to two thirds of the appropriate value given in Table 13;
- 2) for socket-outlets, between the earthing terminal and any accessible metal part intending to be earthed and an earthing plug pin inserted into the earthing socket contact;
- 3) for all adaptors, between the earthing pin of the adaptor, and the following:
 - i) the terminal of an earthing pin of an appropriate plug inserted into each adaptor earthing socket contact; and
 - ii) any accessible metal part intended to be earthed.

The resistance between the earthing plug pin or earthing terminal and any other nominated part shall not exceed 0.05 Ω .

11.3 [heading to come]

If means are provided for electrically bonding the mounting box to the earthing circuit of the socket-outlet by means of the fixing screws, the connection between the screw and earthing terminal shall be of low resistance.

Conformity shall be checked by the test described in **11.2.2b)** applied between the socket-outlet earthing terminals and any fixing screw in electrical contact with the earthing circuit. For the purpose of this test the socket-outlet shall be attached to its appropriate mounting box, the fixing screws being tightened to a value of two thirds those given in Table 7.

11.4 [heading to come]

Where fixed socket-outlets have more than one earth terminal for connecting to the earth socket contact(s), these terminals shall be reliably connected together.

Conformity shall be checked by inspection and by the test described in **11.2.2b)** applied between each terminal.

12 Terminals and terminations of plugs, socket-outlets and adaptors

12.1 Terminals for rewirable accessories

Rewirable accessories shall be provided with screw-type terminals.

NOTE 1 The number of conductors to be clamped is dependent upon the application of the accessory.

The means for clamping the conductors in the terminals shall not serve to fix any other component.

NOTE 2 They may hold the terminals in place or prevent them from turning.

Conformity shall be checked by inspection and in accordance with the tests in **12.2**, as applicable.

12.2 Screw-type terminals

12.2.1 Requirement 1

Terminals shall be designed such that it is possible to properly connect copper conductors having nominal cross-sectional areas in accordance with Table 12.

Terminals shall be designed such that the conductor can be connected without special preparation.

NOTE The term “special preparation” covers soldering of the wires of the conductor, use of cable lugs, formation of eyelets, etc., but not the reshaping of the conductor before its introduction into the terminal or the twisting of a flexible conductor to consolidate the end.

Table 12 – Conductors to be accommodated by terminals

Ranges of rated currents	Rigid conductors (solid or stranded) nominal cross-sectional area ^{A)} (inclusive)	Flexible conductors (cords or cables) nominal cross-sectional area ^{A)} (inclusive)
A	mm ²	mm ²
Up to 6	1 to 1.5	0.5 to 0.75
Above 6 up to and including 10	1 to 1.5	0.5 to 1.0
Above 10 up to and including 16	1 to 2.5	0.5 to 1.5
Above 16 up to and including 25	1.5 to 4.0	1.5 to 2.5
Above 25 up to and including 32	4.0 to 6.0	2.5 to 4.0
Above 32 up to and including 45	6.0 to 10.0	4.0 to 6.0
Above 45 up to and including 63	10.0 to 16.0	6.0 to 10.0

^{A)} For screwless terminals, where the maximum conductor size is marked on the accessory in relation to the rated current, the marked maximum conductor size applies. This shall be not greater than the values given in the table.

12.2.2 Test method 1

Conformity shall be checked by inspection, by measurement and by fitting conductors of the smallest and then the largest nominal cross-sectional areas specified.

12.2.3 Requirement 2

Terminals with screws or nuts for clamping conductors shall have an ISO metric thread or a thread comparable in pitch and mechanical strength.

Threaded parts of terminals shall not be of metal which is soft or liable to creep, such as zinc or aluminium.

NOTE SI, BA and UN threads are comparable in pitch and mechanical strength to ISO metric thread.

12.2.4 Test method 2

Conformity shall be checked by inspection.

12.2.5 Requirement 3

Terminals shall be resistant to corrosion.

12.2.6 Test method 3

Conformity shall be checked by inspection and in accordance with **26.3**.

12.2.7 Requirement 4

Terminals shall be so designed that they clamp the conductor(s) without undue damage to the conductor(s).

When terminals intended for the connection of rigid (solid or stranded) conductors are tested in accordance with **12.2.8**, the solid conductor or any strand of a stranded conductor shall not come out of, or break at, the terminal.

12.2.8 Test method 4

Conformity shall be checked by inspection and in accordance with the following test.

The terminal shall be fitted with a rigid (solid or stranded) conductor(s), in accordance with Table 12, first with the smallest and then with the largest cross-sectional area, the clamping screws or nuts being tightened with the torque in accordance with Table 13.

Each conductor in turn shall be subjected separately to two circular motions in accordance with Figure 7 using the appropriate value of *H* given in Table 14.

Table 13 – Torque values for test of screws and nuts

Nominal outside diameter of thread mm	Torque N·m				
	1 ^{A)}	2 ^{B)}	3 ^{C)}	4 ^{D)}	5 ^{E)}
Up to and including 2.8	0.2	—	0.4	—	0.4
Over 2.8 up to and including 3.0	0.25	—	0.4	—	0.4
Over 3.0 up to and including 3.2	0.3	—	0.6	—	0.6
Over 3.2 up to and including 3.6	0.4	—	0.8	—	0.8
Over 3.6 up to and including 4.1	0.7	1.2	1.2	1.2	1.2
Over 4.1 up to and including 4.7	0.8	1.2	1.8	1.8	1.8
Over 4.7 up to and including 5.3	0.8	1.4	2.0	2.0	2.0
Over 5.3 up to and including 6.0	—	1.8	2.5	3.0	3.0

A) Applicable to screws without heads if the screw when tightened does not protrude from the hole, and to other screws which cannot be tightened by means of a screwdriver with a blade wider than the diameter of the screw.

B) Applicable to nuts of mantle terminals which are tightened by means of a screwdriver.

C) Applicable to other screws or threaded fixing devices which are tightened by means of a screwdriver.

D) Applicable to nuts of mantle terminals in which the nut is tightened by means other than a screwdriver.

E) Applicable to screws or nuts, other than nuts of mantle terminals, which are tightened by means other than a screwdriver.

Figure 7 – Arrangement for checking damage to conductors

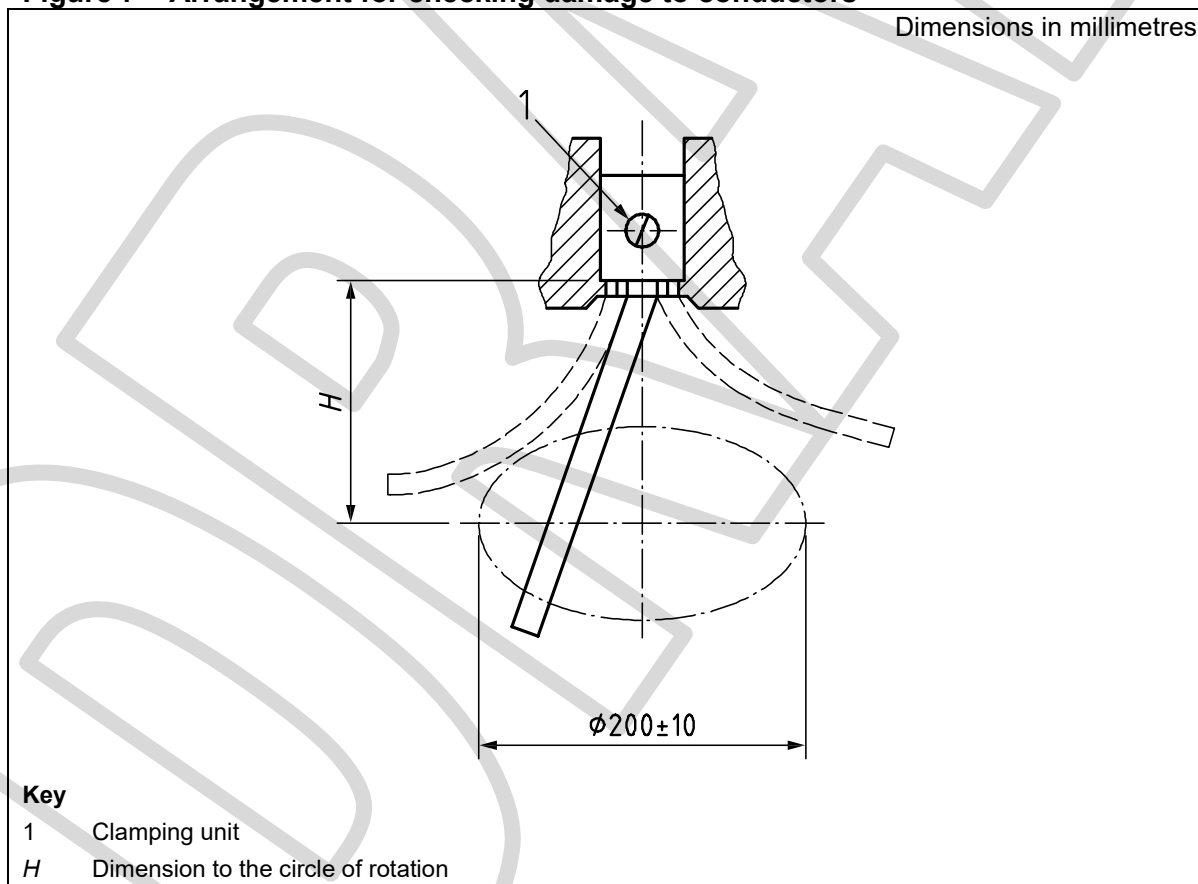


Table 14 – Dimension *H*

Cross-sectional area mm ²	<i>H</i> mm
≤4	250 ±10
5 to 16	500 ±10

The conductor shall be moved in one direction at a constant speed of approximately one turn per 5 s.

During the circular motion, the conductor shall be subjected to a pull having a value shown in Table 15.

Table 15 – Pull for terminal clamping test

Nominal conductor size mm ²	Pull $\begin{smallmatrix} 0 \\ -5 \end{smallmatrix} \%$ N
0.75	20
1	30
1.25	35
1.5	40
2.5	50
4	50
6	60

12.2.9 Requirement 5

Terminals shall be so designed that they clamp the conductor securely and between metal surfaces.

When terminals intended for the connection of rigid (solid or stranded) conductors are tested in accordance with **12.2.10**, the conductor shall not move noticeably in the terminal.

12.2.10 Test method 5

Conformity shall be checked by inspection and in accordance with the following test. The test shall be first carried out with conductors of the smallest cross-sectional area and then with conductors of the largest cross-sectional area.

The terminals shall be fitted with rigid (solid or stranded) conductors in accordance with Table 12, the terminal screws being tightened with a torque equal to two-thirds of the torque shown in the appropriate column of Table 13.

If the screw has a hexagonal head with a slot, the torque applied shall be equal to two-thirds of the torque shown in column 3 of Table 13.

Each conductor shall then be subjected to a pull as given in Table 15, applied in one smooth motion, for 60 s ±5 s in the direction of the axis of the conductor space.

If the clamp is provided for two or three conductors, the appropriate pull shall be applied consecutively to each conductor.

12.2.11 Requirement 6

Terminals shall be so designed or placed that with the conductor properly inserted neither a rigid solid conductor nor a wire of a stranded conductor nor a strand of flexible conductor can slip out while the clamping screws or nuts are tightened.

NOTE This requirement does not apply to lug terminals.

When tested in accordance with **12.2.12**, no conductor shall have escaped from the retaining device of the clamping part.

12.2.12 Test method 6

Conformity shall be checked by inspection and in accordance with the following test. The terminals shall be fitted with rigid (solid or stranded) conductors or flexible conductors having the largest cross-sectional area appropriate to the current rating of the accessory as specified in Table 12 and appropriate to the intended purpose of the terminal.

Terminals intended for the connection of rigid conductors shall be tested with solid conductors and with stranded conductors.

Terminals intended for the looping-in of two or three conductors shall be tested and shall be fitted with the maximum permissible number of conductors.

Before insertion into the clamping part of the terminal, conductors shall be straightened.

NOTE Stranded or flexible conductors may, in addition, be twisted to restore them approximately to their original shape.

The conductor or conductors shall be installed in the clamping part of the terminal in a manner appropriate to the terminal design. The clamping screw shall then be tightened with a torque equal to two-thirds of the torque shown in the appropriate column of Table 13.

12.2.13 Requirement 7

Terminals shall be so fixed or located within the accessory that, when the clamping screws or nuts are tightened or loosened, the terminals shall not work loose from their fixings to the accessory.

NOTE 1 This does not mean that terminals should be so designed that their rotation or displacement is prevented, but any movement should be sufficiently limited so as to prevent non-conformity with this British Standard.

NOTE 2 The use of sealing compound or resin is sufficient for preventing a terminal from working loose, provided that:

- a) the sealing compounds or resin is not subject to stress during normal use; and
- b) the effectiveness of the sealing compound or resin is not impaired by temperatures attained by the terminal under the most unfavourable conditions specified in this standard.

When tested in accordance with **12.2.14**, terminals shall not work loose and there shall be no damage, such as breakage of the screws or damage to the head, slots, threads, washers or stirrups that impairs the further use of the terminals.

12.2.14 Test method 7

Conformity shall be checked by inspection and the following test.

A solid rigid copper conductor of the largest cross-sectional area specified in Table 12 shall be placed in the terminal. The screws or nuts under test shall be tightened and loosened five times, by means of a suitable screwdriver or spanner, applying the appropriate torque shown in Table 13. A new conductor end shall be used each time the screw or nut is loosened.

Screws, or nuts of mantle terminals, which are tightened by means of a screwdriver, shall be tightened using the appropriate torque value shown in columns 1, 2 or 3 of Table 13.

Nuts of mantle terminals, tightened by means other than a screwdriver, shall be tightened using the appropriate torque value shown in column 4 of Table 13.

Other screws, or nuts, tightened by means other than a screwdriver, shall be tightened using the appropriate torque value shown in column 5 of Table 13.

Where a screw has a hexagonal head and a slot for tightening by means of a screwdriver and the torque values shown in columns 3 and 5 of Table 13 are the same, one test shall be

made using a screwdriver applying the appropriate torque value shown in column 3 of Table 13.

If the values shown in columns 3 and 5 of Table 13 are different, two tests shall be made as follows:

- a) first applying the appropriate torque value, shown in column 5 of Table 13, to the hexagonal head;
- b) then applying the appropriate torque value, shown in column 3 of Table 13, by means of a screwdriver.

The shape of the blade of the test screwdriver shall suit the head of the screw to be tested.

Screws and nuts shall be tightened in one smooth motion.

12.2.15 Additional requirements for earthing terminals

12.2.15.1 Requirement 1

Clamping screws or nuts of earthing terminals with screw clamping shall be designed to resist accidental loosening and it shall not be possible to loosen them without the aid of a tool.

NOTE In general, the designs of terminals shown in Figure 1, Figure 2 and Figure 3 provide sufficient resilience to conform to this requirement; for other designs, special provisions, such as the use of an adequately resilient part which is not likely to be removed inadvertently, might be necessary.

12.2.15.2 Test method 1

Conformity shall be checked by inspection and, if necessary, by manual test.

12.2.15.3 Requirement 2

Earthing terminals shall be of the materials specified in **26.3** so that there is minimal risk of corrosion resulting from contact between these parts and the copper of the earthing conductor, or any other metal that is in contact with these parts.

If the body of the earthing terminal is a part of a frame or box of aluminium alloy, precautions shall be taken to avoid the risk of corrosion resulting from contact between copper and aluminium or its alloys. The screw or nut shall be of brass or other metal no less resistant to corrosion.

NOTE Screws or nuts of plated steel withstanding the test in 29.2 are of metal no less resistant to corrosion than brass.

12.2.15.4 Test method 2

Conformity shall be checked by inspection.

12.2.16 Additional requirements for pillar and mantle terminals

12.2.16.1 Requirement

For pillar terminals, the distance between the clamping screw and the end of the conductor, when fully inserted, shall be at least that specified in Figure 2.

NOTE The minimum distance between the clamping screw and the end of the conductor applies only to pillar terminals in which the conductor cannot pass right through.

For mantle terminals, the distance between the fixed part and the end of the conductor, when fully inserted, shall be at least that specified in Figure 1.

12.2.16.2 Test method

Conformity shall be checked by measurement, after a solid conductor of the largest cross-sectional area specified in Table 12 has been fully inserted and fully clamped.