

Plugs, socket-outlets and couplers for industrial purposes —

Part 1: General requirements

The European Standard EN 60309-1:1992 has the status of a
British Standard

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National foreword

This British Standard has been prepared under the direction of the Power Electrical Engineering Standards Policy Committee, PEL/- and is the English language version of EN 60309-1:1992 *Plugs, socket-outlets and couplers for industrial purposes — Part 1: General requirements*, published by the European Committee for Electrotechnical Standardization (CENELEC). It was derived by CENELEC from IEC 309-1:1988 published by the International Electrotechnical Commission (IEC), which has the same title as the European Standard, as corrected by the Corrigendum, March 1992.

The CENELEC common modifications have been implemented at the appropriate places in the text and are indicated by a side line in the margin. Parts of the original IEC text that have been modified by CENELEC have been quoted in National annex NA.

The following print types are used in this standard:

requirement proper:	in roman type
test specifications:	<i>in italic type</i>
explanatory matter:	in smaller roman type.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 52, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Descriptors: Low-voltage equipment, industrial use, plug and socket-outlet, appliance coupler, cable coupler, general requirement, rating, construction, test

English version

Plugs, socket-outlets and couplers for industrial purposes Part 1: General requirements

(IEC 309-1:1988)

Prises de courant pour usages industriels
Première partie: Règles générales
(CEI 309-1:1988)

Steckvorrichtungen für industrielle Zwecke
Teil 1: Allgemeine Festlegungen
(IEC 309-1:1988)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Foreword

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 309-1:1988 could be accepted without textual changes, has shown that some common modifications were necessary for the acceptance as European Standard.

The reference document, as corrected by the corrigendum issued as IEC 23H(SEC) 34, together with the common modifications prepared by the CENELEC Reporting Secretariat SR 23H, was submitted to the CENELEC members for formal vote.

The text of the draft was approved by CENELEC as EN 60309-1 on 23 September 1991.

This European Standard supersedes HD 196 S1:1978.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1993-02-01
- latest date of withdrawal of conflicting national standards (dow) 1998-02-01

For products which have complied with HD 196 S1:1978 before 1998-02-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2003-02-01.

Annexes designated “normative” are part of the body of the standard. In this standard, Annex ZA is normative.

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Introduction

This standard is divided into several parts:

Part 1: General requirements, comprising clauses of a general character.

Subsequent parts: Particular requirements dealing with particular types. The clauses of these particular requirements supplement or modify the corresponding clauses in Part 1. Where the text of subsequent parts indicates an “addition” to or a “replacement” of the relevant requirement, test specification or explanation of Part 1, these changes are made to the relevant text of Part 1, which then becomes part of the standard. Where no change is necessary, the words “This clause of Part 1 is applicable” are used.

1 Scope

This standard applies to plugs and socket-outlets, cable couplers and appliance couplers, with a rated operating voltage not exceeding 690 V d.c. or a.c. and 500 Hz a.c. and a rated current not exceeding 250 A, primarily intended for industrial use, either indoors or outdoors.

The list of preferred ratings is not intended to exclude other ratings, requirements for which are under consideration.

This standard applies to plugs and socket-outlets, cable couplers and appliance couplers, hereinafter referred to as accessories, for use when the ambient temperature does not normally exceed 40 °C.

The use of these accessories on building sites and for agricultural, commercial and domestic applications is not precluded.

Socket-outlets or appliance inlets incorporated in or fixed to electrical equipment are within the scope of this standard. This standard also applies to accessories intended to be used in extra-low voltage installations.

This standard does not apply to accessories primarily intended for domestic and similar general purposes.

In locations where special conditions prevail, for example on board ship or where explosions are liable to occur, additional requirements may be necessary.

2 Definitions

Where the terms voltage and current are used, they imply the d.c. or the a.c. r.m.s. values.

The following definitions apply for the purpose of this standard.

The application of accessories is shown in Figure 1.

2.1 Plug and socket-outlet

A means enabling the connection at will of a flexible cable to fixed wiring. It consists of two parts:

2.1.1

socket-outlet

the part intended to be installed with the fixed wiring or incorporated in equipment

A socket-outlet may also be incorporated in the output circuit of an isolating transformer.

2.1.2

plug

the part integral with or intended to be attached to the flexible cable connected to the equipment or to a connector

2.2 Cable coupler

A means enabling the connection at will of two flexible cables. It consists of two parts:

2.2.1

connector

the part integral with or intended to be attached to the flexible cable connected to the supply

In general, a connector has the same contact arrangement as a socket-outlet.

**2.2.2
plug**

the part integral with or intended to be attached to the flexible cable connected to the equipment or to a connector

The plug of a cable coupler is identical to the plug of a “plug and socket-outlet”.

2.3 Appliance coupler

A means enabling the connection at will of a flexible cable to the equipment. It consists of two parts:

**2.3.1
connector**

the part integral with, or intended to be attached to, the flexible cable connected to the supply

**2.3.2
appliance inlet**

the part incorporated in, or fixed to, the equipment or intended to be fixed to it

In general, the connector of an appliance coupler is identical to the connector of a cable coupler and an appliance inlet has the same contact arrangement as a plug.

**2.4
rewirable plug or connector**

an accessory so constructed that the flexible cable can be replaced

**2.5
non-rewirable plug or connector**

an accessory so constructed that the flexible cable cannot be separated from the accessory without making it permanently useless

**2.6
mechanical switching device**

a switching device designed to close and open one or more electric circuits by means of separable contacts

**2.7
switched socket-outlet**

a socket-outlet with an associated switching device to disconnect the supply from the socket-outlet contacts

**2.8
integral switching device**

a mechanical switching device constructed as a part of an accessory covered by this standard

**2.9
interlock**

a device, either electrical or mechanical, which prevents the contacts of a plug from becoming live before it is in proper engagement with a socket-outlet or connector, and which either prevents the plug from being withdrawn while its contacts are live or makes the contacts dead before separation

**2.10
retaining device**

a mechanical arrangement which holds a plug or connector in position when it is in proper engagement, and prevents its unintentional withdrawal

**2.11
rated current**

the current assigned to the accessory by the manufacturer

**2.12
insulation voltage**

the voltage assigned to the accessory by the manufacturer and to which dielectric tests, clearances and creepage distances are referred

2.13**rated operating voltage**

the nominal voltage of the supply for which the accessory is intended to be used

2.14**basic insulation**

the insulation necessary for the proper functioning of the accessory and for basic protection against electric shock

2.15**supplementary insulation (protective insulation)**

an independent insulation provided in addition to the basic insulation, in order to ensure protection against electric shock in the event of a failure of the basic insulation

2.16**double insulation**

insulation comprising both basic insulation and supplementary insulation

2.17**reinforced insulation**

an improved basic insulation with such mechanical and electrical qualities that it provides the same degree of protection against electric shock as double insulation

2.18 Terminal

A conductive part provided for the connection of a conductor to an accessory.

2.18.1**pillar terminal**

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. The clamping pressure may be applied directly by the shank of the screw or through an intermediate clamping member to which pressure is applied by the shank of the screw (see Figure 14a)

2.18.2**screw terminal**

a terminal in which the conductor is clamped under the head of the screw. The clamping pressure may be applied directly by the head of the screw or through an intermediate part, such as a washer, clamping plate or anti-spread device (see Figure 14b and Figure 14c)

2.18.3**stud terminal**

a terminal in which the conductor is clamped under a nut. The clamping pressure may be applied directly by a suitably shaped nut or through an intermediate part, such as a washer, clamping plate or anti-spread device (see Figure 14d)

2.18.4**saddle terminal**

a terminal in which the conductor is clamped under a saddle by means of two or more screws or nuts (see Figure 14e)

2.18.5**lug terminal**

a screw terminal or a stud terminal, designed for clamping a cable lug or bar by means of a screw or nut (see Figure 14f)

2.18.6**mantle terminal**

a terminal in which the conductor is clamped against the base of a slot in a threaded stud by means of a nut. 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 (see Figure 14g)

2.19**clamping unit**

the part of a terminal necessary for the clamping and the electrical connection of the conductor

3 General requirements

Accessories shall be so designed and constructed that in normal use their performance is reliable and without danger to the user or surroundings.

In general, compliance is checked by carrying out all the tests specified.

4 General notes on tests

4.1 Tests according to this standard are type tests. If a part of an accessory has previously passed tests for a given degree of severity, the relevant type tests shall not be repeated if the severity is not greater.

4.2 Unless otherwise specified, the samples are tested as delivered and under normal conditions of use, at an ambient temperature of $20 \pm 5^\circ\text{C}$; the tests are made at rated frequency.

4.3 Unless otherwise specified, the tests are carried out in the order of the clauses of this standard.

4.4 Three samples are subjected to all the tests. If, however, the tests of Clauses 20, 21 and 22 have to be made with both d.c. and a.c., the test with a.c. is made on three additional samples.

4.5 Accessories are deemed to comply with this standard if no sample fails in the complete series of appropriate tests. If one sample fails in a test, that test and those preceding which may have influenced the test result are repeated on another set of three samples, all of which shall then pass the repeated tests.

In general, it will only be necessary to repeat the test which caused the failure, unless the sample fails in one of the tests of Clauses 21 and 22, in which case the tests are repeated from that of Clause 20 onwards.

The applicant may submit, together with the first set of samples, the additional set which may be wanted should one sample fail. The testing station will then, without further request, test the additional samples and will reject only if a further failure occurs. If the additional set of samples is not submitted at the same time, the failure of one sample will entail a rejection.

4.6 When the tests are carried out with conductors, the latter shall be copper and comply with HD 21 S2, HD 383 S2 and HD 22.4 S2.

5 Standard ratings

5.1 Preferred rated operating voltage ranges and voltages are:

20 V to 25 V	380 V to 415 V
40 V to 50 V	440 V to 460 V
100 V to 130 V	480 V to 500 V
200 V to 250 V	600 V to 690 V
277 V	

5.2 Preferred rated currents are given in the following table:

Table I

Series I A	Series II A
16	20
32	30
63	60
125	100
250	200
NOTE Series I is preferred.	

6 Classification

6.1 Accessories are classified:

6.1.1 according to purpose: plugs, socket-outlets, connectors, appliance inlets;

6.1.2 according to degrees of protection: either in accordance with HD 365 S3 or according to degrees of protection against moisture:

- ordinary accessories;
- splashproof accessories;
- watertight accessories.

For new designs, degrees of protection according to HD 365 S3 shall be used.

IPX0/ordinary accessories have no special protection against moisture, and they need not have (hinged) lids.

6.1.3 according to earthing facilities:

- accessories without earthing contact;
- accessories with earthing contact;

6.1.4 according to the method of connecting the cable:

- rewirable plugs and connectors;
- non-rewirable plugs and connectors;

6.1.5 according to interlocking facilities:

- accessories without interlock, with or without integral switching device;
- accessories with mechanical interlock;
- accessories with electrical interlock.

7 Marking

7.1 Accessories shall be marked with:

- rated current(s) in amperes;
- rated operating voltage(s) or range(s) in volts;
- symbol for nature of supply, if the accessory is not intended for both a.c. and d.c., or is intended for a.c. with frequencies other than 50 Hz or 60 Hz, or if the rating is different for a.c. and d.c.;
- rated frequency if exceeding 60 Hz;
- either the name or trade mark of the manufacturer or of the responsible vendor;
- type reference, which may be a catalogue number;
- symbol for degree of protection as applicable;
- symbol indicating the position of the earthing contact or the means used for interchangeability, if any.

Optionally, the insulation voltage may be marked.

Compliance is checked by inspection.

7.2 When symbols are used, they shall be as follows:

A	amperes
V	volts
Hz	hertz
~	alternating current
— —	direct current
⊕ or ≡	earth
IPX0 or no symbol	ordinary construction
IPX4 or  (one drop in a triangle)	splashproof construction
IPX7 or  (two drops)	watertight construction
IPXX (relevant figures)	other constructions

For the marking of rated current(s) and rated operating voltage(s) or range(s), figures may be used alone. The figure for d.c. rated operating voltage, if any, shall then be placed before the figure for the a.c. rated operating voltage, and separated from it by a line or a dash.

Compliance is checked by inspection.

7.3 For socket-outlets and appliance inlets, the marking for rated current, nature of supply, if necessary, and either the name or trade mark of the manufacturer or the responsible vendor shall be on the main part, on the outside of the enclosure, or on the lid, if any, if the latter cannot be removed without the aid of a tool. Except for flush-type socket-outlets and appliance inlets, these markings shall be easily discernible when the accessory is mounted and wired as in normal use, if necessary after removal from the enclosure. The marking, if any, for the insulation voltage shall be on the main part; it shall not be visible when the accessory is mounted and wired as in normal use.

The marking for rated operating voltage, type reference, the symbol for degree of protection, if required, and the symbol indicating the position of the earthing contact or the means used for interchangeability, if any, shall be on a place which is visible after installation of the accessory, on the outside of enclosure or on the lid, if any, if the latter cannot be removed without the aid of a tool.

With the exception of the type reference, these markings shall be easily discernible when the accessory is mounted and wired as in normal use.

Compliance is checked by inspection.

The term “main part” of a socket-outlet or an appliance inlet means the part carrying the contacts.

The type reference may be marked on the main part.

The marking for rated current, nature of supply, rated operating voltage and (manufacturer’s name or trade mark or the responsible vendor’s name or trade mark) the name, trade mark of the manufacturer or of the responsible vendor, may be repeated on the lid, if any;

7.4 For plugs and connectors, the marking specified in Sub-clause 7.1, with the exception of the marking for insulation voltage, if any, shall be easily discernible when the accessory is wired ready for use.

The marking for insulation voltage, if any, shall be on the main part; it shall not be visible when the accessory is mounted and wired as in normal use.

The term “ready for use” does not imply that the plug or connector is in engagement with its complementary accessory.

The term “main part” of a plug or a connector means the part carrying the contacts.

Compliance is checked by inspection.

7.5 For rewirable accessories, the contacts shall be indicated by the symbols:

- for three-phase, the symbols L1, L2, L3, or 1, 2, 3 for the phases, N for neutral, if any, and the symbol  or  for earth;
- for two-pole, which may be used for both a.c. and d.c., one symbol for one of the live poles and the symbol  or  for earth, if any;
- for a period of time the marking R1, S2, T3 may be used instead of L1, L2, L3.

These symbols shall be placed close to the relevant terminals; they shall not be placed on screws, removable washers or other removable parts.

The terminals for pilot conductors are not required to be indicated.

The figures used with the letters may be written as an index. It is recommended that where practicable the symbol  should be used.

Compliance is checked by inspection.

7.6 Marking shall be indelible and easily legible.

Compliance is checked by inspection and by the following test:

After the humidity treatment of Clause 18, the marking is rubbed vigorously by hand for 15 s with a piece of cloth soaked in water and again for 15 s with a piece of cloth soaked with petroleum spirit.

Special attention is paid to the marking of the name or trade mark of the manufacturer or the responsible vendor and to that of the nature of supply, if any.

A special test for checking the indelibility of these markings is under consideration.

7.7 If, in addition to the marking prescribed, the rated operating voltage is indicated by means of a colour, the colour code shall be as shown in Table II. An indicating colour, if different from that of the enclosure, shall be used only if it can be easily distinguished.

Table II

Rated operating voltage V	Colour ^{ab}
20 to 25	Violet
40 to 50	White
100 to 130	Yellow
200 to 250	Blue
380 to 480	Red
500 to 690	Black
^a For frequencies over 60 Hz up to and including 500 Hz, the colour green may be used, if necessary, in combination with the colour for the rated operating voltage. ^b In countries where accessories of Series II current ratings are used, the colour orange is reserved for 125/250 V a.c. and the colour grey is reserved for 277 V a.c. accessories.	

8 Dimensions

8.1 Accessories shall comply with the appropriate standard sheets, if any.

8.2 It shall not be possible to engage plugs or connectors with socket-outlets or appliance inlets having different ratings, or having different contact combinations.

In addition, the design shall be such that improper connections shall not be possible between:

- the earth and/or pilot plug-contact and a live socket-contact, or a live plug-contact and the earth and/or pilot socket-contact;
- the phase plug-contacts and the neutral socket-contact, if any;
- a neutral plug-contact and a phase socket-contact.

Compliance is checked by inspection.

8.3 It shall not be possible to make single-pole connections between plugs and socket-outlets or connectors, or between appliance inlets and connectors or socket-outlets.

Plugs and appliance inlets shall not allow improper connections with socket-outlets complying with IEC Publication 83 or with connectors complying with EN 60320-1.

Socket-outlets and connectors shall not allow improper connections with plugs complying with IEC Publication 83 or with appliance inlets complying with EN 60320-1.

Improper connections include single-pole connections and other connections which do not comply with the requirements for protection against electric shock.

Compliance is checked by inspection.

9 Protection against electric shock

9.1 Accessories shall be so designed that live parts of socket-outlets and connectors, when they are wired as in normal use, and live parts of plugs and appliance inlets, when they are in partial or complete engagement with the complementary accessories, are not accessible.

In addition, it shall not be possible to make contact between a contact of a plug or appliance inlet and a contact of a socket-outlet or connector while any contact is accessible.

Compliance is checked by inspection and, if necessary, by a test on the sample wired as in normal use.

The standard test finger shown in Figure 2 is applied in every possible position, an electrical indicator, with a voltage not less than 40 V, being used to show contact with the relevant part.

Neutral contacts and pilot contacts of socket-outlets and connectors are deemed to be live parts.

9.2 Accessories with earthing contact shall be so designed that:

- when inserting the plug or connector, the earth connection is made before the phase connections and neutral, if any, are made;
- when withdrawing the plug or connector, the phase connections and neutral, if any, are broken before the earth connection is broken.

9.3 It shall not be possible to inadvertently assemble the part carrying plug contacts into the enclosure of a socket-outlet or connector.

Compliance is checked by manual test.

10 Provision for earthing

10.1 Accessories with earthing contact shall be provided with an earthing terminal. Metal-clad fixed accessories with an internal earthing terminal can, in addition, be provided with an external earthing terminal, which, except for flush type socket-outlets, shall be visible from the outside.

Earthing contacts shall be directly and reliably connected to the earthing terminals, except that the earthing terminal of socket-outlets incorporated in the output circuit of an isolating transformer shall not be connected.

Compliance is checked by inspection.

10.2 Accessible metal parts of accessories with earthing contact, which may become live in the event of an insulation fault, shall be reliably connected to the internal earthing terminal(s) by construction.

For the purpose of this requirement, screws for fixing bases, covers and the like are not deemed to be accessible parts which may become live in the event of an insulation fault.

If accessible metal parts are screened from live parts by metal parts which are connected to an earthing terminal or earthing contact, or if they are separated from live parts by double insulation or reinforced insulation, they are not, for the purpose of this requirement, regarded as likely to become live in the event of an insulation fault.

Compliance is checked by inspection and by the following test:

A current of 25 A derived from an a.c. source having a no-load voltage not exceeding 12 V is passed between the earthing terminal and each of the accessible metal parts in turn.

The voltage drop between the earthing terminal and the accessible metal part is measured, and the resistance calculated from the current and this voltage drop.

In no case shall the resistance exceed 0.05 Ω .

Care should be taken that the contact resistance between the tip of the measuring probe and the metal part under test does not influence the test results.

10.3 Earthing contacts shall be capable of carrying a current equal to that specified for the phase contacts without overheating.

Compliance is checked by the test of Clause 22.

10.4 Earthing contacts shall be so shrouded or guarded that they are protected against mechanical damage.

Compliance is checked by inspection.

This requirement precludes the use of side earthing contacts.

11 Terminals

11.1 Rewirable accessories shall be provided with terminals in which connection is made by means of screws, nuts or equally effective devices.

Compliance is checked by inspection.

Requirements for screwless terminals are under consideration.

11.2 Parts of terminals, other than screws, nuts, washers, stirrups, clamping plates and the like, shall be either of:

- copper;
- an alloy containing at least 58 % copper for parts that are worked cold or at least 50 % copper for other parts;
- or other metal not less resistant to corrosion than copper and having mechanical properties no less suitable.

Steel screws shall be adequately protected against corrosion.

Compliance is checked by inspection and by chemical analysis.

A relaxation of the requirement for parts of terminals is under consideration.

11.3 If the body of an earthing terminal is not part of the metal frame or housing of the accessory, the body shall be of material as prescribed in Sub-clause 11.2 for parts for terminals. If the body is part of the metal frame or housing, the clamping screw or nut shall be of such material.

If the body of the earthing terminal is part of a frame or housing of aluminium or aluminium alloy, precautions shall be taken to avoid the risk of corrosion resulting from contact between copper and aluminium or its alloys.

The requirement regarding the avoidance of the risk of corrosion does not preclude the use of adequately coated metal screws or nuts. More detailed requirements are under consideration.

Compliance is checked by inspection and by chemical analysis.

A test for determining the resistance to corrosion is under consideration.

11.4 Terminals shall allow the connection of conductors having nominal cross-sectional areas as shown in Table III.

For terminals other than lug terminals, compliance is checked by the following test and by the tests of Sub-clauses 11.7, 11.8 and 11.9.

Gauges as specified in Figure 13, having a measuring section for testing the insertibility of the maximum specified cross-sectional area of Table III shall be able to penetrate into the terminal aperture under their own weight to the designated depth of the terminal.

For pillar terminals in which the end of a conductor is not visible, the hole to accommodate the conductor shall have a depth such that the distance between the bottom of the hole and the last screw will be equal to at least half the diameter of the screw, and in any case not less than 1.5 mm.

Compliance is checked by inspection.

For terminals complying with Figure 14f, the lug shall accept conductors having nominal cross-sectional areas within the appropriate range specified in the Table III.

Terminals that cannot be checked by the gauges specified in Figure 13 are tested by suitably shaped gauges having the same cross-section as those given in Table III.

11.5 Terminals shall have appropriate mechanical strength.

Screws and nuts for clamping shall have an ISO thread or a thread comparable in pitch and mechanical strength.

Provisionally, SI, BA and UN threads are considered as being comparable in pitch and mechanical strength.

Compliance is checked by inspection, measurement and the test of Sub-clause 25.1. In addition to the requirements of Sub-clause 25.1, the terminals shall not have undergone changes after the test that adversely affect their future use.

11.6 Terminals shall be properly fixed to the accessory and shall not work loose when the clamping screws or nuts are tightened or loosened.

Screws and nuts for clamping the conductors shall not serve to fix any other component.

The clamping means for the conductor may be used to stop rotation or displacement of the plug or socket contacts.

Compliance is checked by inspection and, if necessary, by the test of Sub-clause 25.1.

These requirements do not preclude terminals that are floating or terminals so designed that rotation or displacement of the terminal is prevented by the clamping screw or nut, provided that their movement is appropriately limited and does not impair the correct operation of the accessory.

Terminals may be prevented from working loose by fixing with two screws, by fixing with one screw in a recess such that there is no appreciable play or by other suitable means.

Covering with sealing compound without other means of locking is not deemed to be sufficient. Self-hardening resins may, however, be used to lock terminals which are not subject to torsion in normal use.

11.7 Terminals shall be so designed that they clamp the conductor between metal surfaces with sufficient contact pressure and without damage to the conductor.

Compliance is checked by inspection and the type tests of the terminals of Sub-clauses 11.8 and 11.9, applied to three separate terminals.

Table III — Size of connectable conductors

Rating of the accessory		Internal connection ^a				External earthing connection if any	
Voltage V	Current A		Flexible cables for plugs and connectors Solid or stranded cables for appliance inlets ^b		Solid or stranded cables for socket-outlets ^b		
	Series I	Series II	mm ²		mm ²		mm ²
Not exceeding 50	16 32	20 30	4 to 10 4 to 10		4 to 10 4 to 10		
Exceeding 50	16 32 63 125 250	20 30 60 100 200	1 to 2.5 2.5 to 6 6 to 16 16 to 50 70 to 150		1.5 to 4 2.5 to 10 6 to 25 25 to 70 70 to 185 ^d		6 10 25 25 25
^a Terminals for pilot conductors, if any, shall allow the connection of conductors having the same nominal cross-sectional areas as the internal terminals of 16 A accessories having rated operating voltages exceeding 50 V. ^b Classification of conductors: according to IEC Publication 228, Clause 2, solid (Class 1); stranded (Class 2); flexible (Class 5). ^c The nominal cross-sectional areas of conductors are given in square millimeters (mm ²). ^d 150 mm ² for 200 A Series II devices.							