



SLOVENSKI STANDARD

SIST EN 60309-2:2000

01-april-2000

Nadomešča:
SIST EN 60309-2:1999

Vtiči, vtičnice in spojke za industrijske namene - 2. del: Zahteve za dimenzijsko izmenljivost pribora s trni in pušami (IEC 60309-2:1999)

Plugs, socket-outlets and couplers for industrial purposes -- Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories

Stecker, Steckdosen und Kupplungen für industrielle Anwendungen -- Teil 2: Anforderungen und Hauptmaße für die Austauschbarkeit von Stift- und Buchsensteckvorrichtungen

Prises de courant pour usages industriels -- Partie 2: Règles d'interchangeabilité dimensionnelle pour les appareils à broches et alvéoles

Ta slovenski standard je istoveten z: EN 60309-2:1999

ICS:

29.120.30 Vtiči, vtičnice, spojke Plugs, socket-outlets, couplers

SIST EN 60309-2:2000 en

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English version

**Plugs, socket-outlets and couplers for industrial purposes
Part 2: Dimensional interchangeability requirements for pin and
contact-tube accessories
(IEC 60309-2:1999)**

Prises de courant pour usages
industriels
Partie 2: Règles d'interchangeabilité
dimensionnelle pour les appareils à
broches et alvéoles
(CEI 60309-2:1999)

Stecker, Steckdosen und
Kupplungen Teil 2: Anforderungen
und Hauptmaße für die
Austauschbarkeit von Stift- und
Buchsensteckvorrichtungen
(IEC 60309-2:1999)

This European Standard was approved by CENELEC on 1999-05-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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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 text of document 23H/89/FDIS, future edition 4 of IEC 60309-2, prepared by SC 23H, Industrial plugs and socket outlets, of IEC TC 23, Electrical accessories, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60309-2 on 1999-05-01.

This European Standard supersedes EN 60309-2:1998.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2000-02-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2002-05-01

This Part 2 is to be used in conjunction with EN 60309-1:1999.

Annexes designated "normative" are part of the body of the standard.
In this standard, annexes ZA and ZB are normative.
Annexes ZA and ZB have been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60309-2:1999 was approved by CENELEC as a European Standard without any modification.

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Addition:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60617-2	1996	Graphical symbols for diagrams Part 2: Symbol elements, qualifying symbols and other symbols having general application	EN 60617-2	1996

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Annex ZB (normative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions. If it affects harmonization, it forms part of the European Standard or Harmonization Document.

For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.

<u>Clause</u>	<u>Special national condition</u>
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6.1.2	Italy
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Addition:

For interlocked socket-outlets or switched socket-outlets degrees of protection from IP44 up to IP67 according to IEC 60529 are allowed.

For accessories with degrees of protection more than IPX4, standard sheet 2-I (continuation 2) or standard sheet 2-III (continuation 2) shall be used.

7.2	Delete the paragraph of IEC 60309-2.
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**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC**

60309-2

Quatrième édition
Fourth edition
1999-04

**Prises de courant pour usages industriels –
Partie 2:
Règles d'interchangeabilité dimensionnelle
pour les appareils à broches et alvéoles**

**Plugs, socket-outlets and couplers
for industrial purposes –**

**Part 2:
Dimensional interchangeability requirements
for pin and contact-tube accessories**

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

X

Pour prix, voir catalogue en vigueur
For price, see current catalogue

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PLUGS, SOCKET-OUTLETS AND COUPLERS FOR INDUSTRIAL PURPOSES –**Part 2: Dimensional interchangeability requirements for
pin and contact-tube accessories**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60309-2 has been prepared by subcommittee 23H: Industrial plugs and socket-outlets, of IEC technical committee 23: Electrical accessories.

This fourth edition cancels and replaces the third edition published in 1997.

This part 2 shall be used in conjunction with part 1.

The text of this standard is based on the following documents:

FDIS	Report on voting
23H/89/FDIS	23H/92/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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.

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PLUGS, SOCKET-OUTLETS AND COUPLERS FOR INDUSTRIAL PURPOSES –

Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories

1 Scope

Replacement:

This standard applies to plugs and socket-outlets, cable couplers and appliance couplers with a rated operating voltage not exceeding 690 V, 500 Hz and a rated current not exceeding 125 A, primarily intended for industrial use, either indoors or outdoors.

NOTE – All references for accessories with a rated current of more than 125 A in part 1 are not applicable to this part 2.

This standard applies to plugs and socket-outlets, cable couplers and appliance couplers with pins and contact tubes of standardized configurations.

This standard applies to plugs and socket-outlets, cable couplers and appliance couplers, hereinafter referred to as accessories, for use when the ambient temperature is normally within the range $-25\text{ }^{\circ}\text{C}$ to $40\text{ }^{\circ}\text{C}$.

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.

NOTE – 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

This clause of part 1 is applicable except as follows:

Additional subclause:

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2.101

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phase inverter

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a plug or an appliance inlet with operating means to interchange the position of two phase pins without disconnecting them from the conductors

3 Normative references

This clause of part 1 is applicable except as follows:

Addition:

IEC 60617-2:1996, *Graphical symbols for diagrams – Part 2: Symbol elements, qualifying symbols and other symbols having general application*

4 General

This clause of part 1 is applicable except as follows:

Additional subclause:

4.101 If gauges are used, they shall be of hardened steel, all corners shall be slightly rounded-off with a maximum radius of 0,1 mm, and the surface finish for all measurement surfaces shall be $\sqrt[NS]{\quad}$ min., if not otherwise specified.

In this standard:

$2P + \frac{1}{2}$ covers both $2P + \frac{1}{2}$ and $1P + N + \frac{1}{2}$ and

$3P + \frac{1}{2}$ covers both $3P + \frac{1}{2}$ and $2P + N + \frac{1}{2}$

unless specifically excluded (see table 104).

5 Standard ratings

This clause of part 1 is applicable except as follows:

5.2 Replacement:

Standard rated currents are given in table 101.

Table 101

Series I	Series II
A	A
16	20
32	30
63	60
125	100

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6 Classification

This clause of part 1 is applicable except as follows:

6.1.2 Replacement:

According to degrees of protection:

- either in accordance with IEC 60529: IP44, IP67
- or according to degree of protection against moisture:
 - splash-proof accessories;
 - watertight accessories.

For new designs, degrees of protection according to IEC 60529 shall be used.

7 Marking

This clause of part 1 is applicable except as follows:

7.1 Modification:

Delete the note

Addition:

The symbol indicating the position of the earthing contact or of the minor key or keyway shall be placed before or above the figure for the rated operating voltage, and separated from it by a line.

These markings shall be placed after that for rated current, separated from it by a dash if an oblique line separates the symbol indicating the position of the earthing contact or of the minor key or keyway from the figure for the rated operating voltage.

If a symbol for nature of supply is used, it shall be placed next to or below the marking for rated operating voltage.

For three-phase accessories it is not necessary to mark the voltage phase to neutral, if any.

The marking for rated current(s), position of the earthing contact or the minor key, keyway, rated operating voltage(s) and nature of supply accordingly may be as follows:

For series I:

16 A - 9 h/400 V~, or 16 - 9 h/400~, or 16 - $\frac{9 \text{ h}}{400 \sim}$, or

16 A - 9 h/380-415 V~, or 16 - 9 h/380-415~, or 16 - $\frac{9 \text{ h}}{380 - 415 \sim}$

32 A - 6 h/230/400 V~, or 32 - 6 h/230/400~, or 32 - $\frac{6 \text{ h}}{230 / 400 \sim}$, or

32 A - $\frac{6 \text{ h} / 220 / 380 \text{ V} \sim}{240 / 415 \text{ V} \sim}$, or 32 - $\frac{6 \text{ h} / 220 / 380 \sim}{240 / 415 \text{ V} \sim}$, or 32 - $\frac{6 \text{ h}}{220 / 380 \sim}$
 $\frac{6 \text{ h}}{240 / 415 \sim}$

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For series II

20 A - 7 h/480 V a.c. or 20 A - 7 h/480~, or 20 A - $\frac{7 \text{ h}}{480 \sim}$

30 A - 7 h/480 V, 3 Phase, or 30 A - 7 h/480, 3Φ, or 30 A - $\frac{7 \text{ h}}{480 \text{ V, } 3\Phi}$

60 A - 7 h/277/480 V, 3 Phase Y, or 60 A - 7 h/277/480, 3ΦY, or 60 A - $\frac{7 \text{ h}}{277/480 \text{ V, } 3\Phi \text{ Y}}$

It is allowed to put the symbols for a.c. (~) and d.c. (— or —) after the values (IEC 60617-2).

The drawings of standard sheets 2-I, 2-II, 2-III and 2-IV show accessories with the symbol 6 h and those of standard sheets 2-VIII and 2-IX accessories with the symbol 12 h.

For accessories having rated operating voltages exceeding 50 V, the symbol indicating the position of the earthing contact shall be a numeral followed by the letter h.

The numeral is derived from the position of the earth contact tube, when compared with the face of a clock, the socket-outlet or connector being viewed from the front with the keyway at the sixth hour.

For accessories having rated operating voltages not exceeding 50 V, the symbol indicating the position of the minor key shall be a numeral followed by the letter h.

The numeral is derived from the position of the minor key, when compared with the face of a clock, the socket-outlet or connector being viewed from the front with the major key at the sixth hour.

For plugs and appliance inlets, the symbol indicating the position of the earthing contact or the minor keyway shall be the same as that for the corresponding socket-outlet or connector.

Contact tubes of socket-outlets and connectors shall be positioned in the clockwise order when viewed from the front as shown in the standard sheets (see also 7.5).

Pins of plugs and appliance inlets shall be positioned in the opposite order viewed from the front.

7.2 Modification:

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Delete the following:

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IPXX (relevant figures)..... degree of protection according to IEC 60529

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Add the following:

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Where IP Code is used only the following are permitted:

- IP44..... degree of protection according to IEC 60529
- IP67..... degree of protection according to IEC 60529

7.4 Replacement

For plugs and connectors, the marking specified in 7.1 shall be easily discernible when the accessory is wired ready for use.

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

NOTE 1 – The term "ready for use" does not imply that the plug or connector is engaged with its complementary accessory.

NOTE 2 – The term "main part" of a plug or a connector means the part carrying the contacts.

Compliance is checked by inspection.

7.5 Replacement

For rewirable accessories, the contacts shall be indicated by the following symbols.

- for accessories with three contacts (phase + neutral + earth, or, phase + phase + earth):

L / +, unmarked, Ⓛ or Ⓟ

except for Series II clock position 4 h and 5 h which are marked:

N, unmarked, Ⓝ or Ⓟ

- for accessories with four contacts (three phase + earth):

L1, L2, L3, Ⓛ or Ⓟ or alternatively 1, 2, 3, Ⓛ or Ⓟ

except for Series II clock position 12 h (phase + centre tap + phase + earth) which is marked:

L1, N, L2, Ⓛ or Ⓟ

- for accessories with five contacts (three phase + neutral + earth):

L1, L2, L3, N, Ⓛ or Ⓟ or alternatively 1, 2, 3, N Ⓛ or Ⓟ

- 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.

For phase inverters these symbols shall conform in one position with the requirements of 7.1. In the other position of the inverting means, the phase marking need not conform.

NOTE – 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 Ⓛ be used.

Compliance is checked by inspection.

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