SLOVENSKI STANDARD
SIST EN 60309-1:2000

01-april-2000

Nadomešča:
SIST EN 60309-1:1999

Vtiči, vtičnice in spojke za industrijske namene - 1. del: Splošne zahteve (IEC 60309-1:1999)

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

Stecker, Steckdosen und Kupplungen für industrielle Anwendungen -- Teil 1: Allgemeine Anforderungen

Prises de courant pour usages industriels -- Partie 1: Règles générales

Ta slovenski standard je istoveten z: **EN 60309-1:1999**

ICS:

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

SIST EN 60309-1:2000 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60309-1

April 1999

ICS 29.120.30

Supersedes EN 60309-1:1997

English version

Plugs, socket-outlets and couplers for industrial purposes
Part 1: General requirements
(IEC 60309-1:1999)

Prises de courant pour usages industriels
Partie 1: Règles générales
(CEI 60309-1:1999)

Stecker, Steckdosen und Kupplungen für industrielle Anwendung
Teil 1: Allgemeine Festlegungen
(IEC 60309-1:1999)

This European Standard was approved by CENELEC on 1999-04-01. 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.

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

Ref. No. EN 60309-1:1999 E

Foreword

The text of document 23H/88/FDIS, future edition 4 of IEC 60309-1, 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 60309-1 on 1999-04-01.

This European Standard supersedes EN 60309-1:1997.

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) 2000-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2002-04-01

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

Endorsement notice

The text of the International Standard IEC 60309-1:1999 was approved by CENELEC as a European Standard without any modification.

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.

Publication	Year	Title	EN/HD	Year
IEC 60050(441)	1984	International Electrotechnical Vocabulary (IEV) Chapter 441: Switchgear, controlgear and fuses	-	-
IEC 60083	1997	Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC	-	-
IEC 60112	1979	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	HD 214 S2	1980
IEC 60227 (mod)	series	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V	HD 21	series
IEC 60228 + IEC 60228A (mod)	1978 1982	Conductors of insulated cables First supplement: Guide to the dimensional limits of circular conductors	HD 383 S2 + A1 + A2	1986 1989 1993
IEC 60245-4 (mod)	1994	Rubber insulated cables of rated voltages up to and including 450/750 V Part 4: Cords and flexible cables	HD 22.4 S3 + A1	1995 1999
IEC 60269-1	1986	Low-voltage fuses Part 1: General requirements	EN 60269-1[1)]	1989
IEC 60269-2	1986	Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application)	EN 60269-2	1995
IEC 60320 (mod)	series	Appliance couplers for household and similar general purposes	EN 60320	series
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993

1) EN 60269-1 is superseded by EN 60269-1:1998, which is based on IEC 60269-1:1998.

Publication	Year	Title	EN/HD	Year
IEC 60664-1 (mod)	1992	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	HD 625.1 S1 + corr. November	1996 1996
IEC 60695-2-1	1994	Fire hazard testing Part 2: Test methods - Section 1	EN 60695-2-1	1996
IEC 60947-3 + corr.December (mod)	1990 1991	Low-voltage switchgear and controlgear Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units	EN 60947-3[2)] + corr. June	1992 1997

2) EN 60947-3 is superseded by EN 60947-3:1999, which is based on IEC 60947-3:1999.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60309-1

Quatrième édition
Fourth edition
1999-02

Prises de courant pour usages industriels –

Partie 1:
Règles générales

Plugs, socket-outlets and couplers for industrial purposes –

Part 1:
General requirements

International Electrotechnical Commission 3, rue de Varembé Geneva, Switzerland
Telefax: +41 22 919 0300 e-mail: inmail@iec.ch IEC web site http://www.iec.ch

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE XC

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

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

PLUGS, SOCKET-OUTLETS AND COUPLERS FOR INDUSTRIAL PURPOSES –

Part 1: General requirements

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 60309-1 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 and constitutes a technical revision.

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

FDIS	Report on voting
23H/88/FDIS	23H/91/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.

Annex A forms an integral part of this standard.

INTRODUCTION

International Standard IEC 60309 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.

PLUGS, SOCKET-OUTLETS AND COUPLERS FOR INDUSTRIAL PURPOSES –

Part 1: General requirements

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 is normally within the range of –25 °C to +40 °C. These accessories are intended to be connected to cables of copper or copper alloy only.

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.

For the purpose of this part of IEC 60309, the following definitions apply.

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 directly to one 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 one flexible cable connected to the supply

NOTE – 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 one flexible cable connected to the equipment or to a connector

NOTE – 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, one flexible cable connected to the supply

NOTE – In general, the connector of an appliance coupler is identical to the connector of a cable coupler.

2.3.2
appliance inlet
the part incorporated in, or fixed to, the equipment or intended to be fixed to it

NOTE – In general, 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 figures 14b and 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

2.20
***c*onditional short-circuit current**
the prospective current that an accessory, protected by a specified short-circuit protective device, can satisfactorily withstand for the total operating time of that device under specified conditions of use and behaviour

NOTE – This definition differs from IEV 441-17-20 by broadening the concept of current-limiting device into a short-circuit protective device, the function of which is not only to limit the current.

2.21
cap
a part separated or attached, which may be used to provide the degree of protection of a plug or appliance inlet when it is not engaged with a socket-outlet or connector

2.22
lid
a means to ensure the degree of protection on a socket-outlet or a connector

3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60309. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60309 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050-441:1984, *International Electrotechnical Vocabulary (IEV) – Chapter 441: Switchgear, controlgear and fuses*

IEC 60083:1997, *Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC*

IEC 60112:1979, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

IEC 60227, (all parts) *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60228:1978, *Conductors of insulated cables*

IEC 60245-4:1994, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 4: Cords and flexible cables*

IEC 60269-1:1986, *Low-voltage fuses – Part 1: General requirements*

IEC 60269-2:1986, *Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) – Sections I to III*

IEC 60320, (all parts) *Appliance couplers for household and similar general purposes*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP code)*

IEC 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60695-2-1:1994, *Fire hazard testing – Part 2: Test methods*

IEC 60947-3:1990, *Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*