SLOVENSKI STANDARD
SIST EN 60027-2:2008

01-januar-2008

Nadomešča:
SIST HD 60027-2:2004

Črkovni simboli za uporabo v elektrotehnologiji - 2. del: Telekomunikacije in elektronika (IEC 60027-2:2005)

Letter symbols to be used in electrical technology -- Part 2: Telecommunications and electronics

Formelzeichen für die Elektrotechnik - Teil 2: Telekommunikation und Elektronik

Symboles littéraux à utiliser en électrotechnique -- Partie 2: Télécommunications et électronique

Ta slovenski standard je istoveten z: **EN 60027-2:2007**

ICS:

01.075	Simboli za znake	Character symbols
31.020	Elektronske komponente na splošno	Electronic components in general
33.020	Telekomunikacije na splošno	Telecommunications in general

SIST EN 60027-2:2008 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60027-2

April 2007

ICS 01.060

Supersedes HD 60027-2:2003

English version

Letter symbols to be used in electrical technology - Part 2: Telecommunications and electronics

(IEC 60027-2:2005)

Symboles littéraux à utiliser en électrotechnique - Partie 2: Télécommunications et électronique (CEI 60027-2:2005)

Formelzeichen für die Elektrotechnik - Teil 2: Telekommunikation und Elektronik (IEC 60027-2:2005)

This European Standard was approved by CENELEC on 2007-04-01. 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, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the 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 60027-2:2007 E

Foreword

The text of the International Standard IEC 60027-2:2005, prepared by IEC TC 25, Quantities and units, and their letter symbols, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 60027-2 on 2007-04-01 without any modification.

This European Standard supersedes HD 60027-2:2003.

EN 60027-2:2007 includes the following significant technical changes with respect to HD 60027-2:2003:

– it contains a revision of some clauses of HD 245.2 S1:1983 that were not technically revised in HD 60027-2:2003;

– it contains a revision of Clause 8 which is now Clause 10;

– it contains some new clauses dealing with subjects that were not previously considered;

– former Clause 10 will be given in another part of EN 60027;

– former Clause 11 will be revised as EN 60027-6.

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)	2008-04-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2010-04-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60027-2:2005 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

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 60027-1	1992	Letter symbols to be used in electrical technology - Part 1: General	EN 60027-1[1)]	2006
IEC 60027-3	2002	Letter symbols to be used in electrical technology - Part 3: Logarithmic and related quantities, and their units	EN 60027-3	2007
IEC 60050-101	1998	International Electrotechnical Vocabulary (IEV) - Part 101: Mathematics	-	-
IEC 60050-131	2002	International Electrotechnical Vocabulary - Part 131: Circuit theory	-	-
IEC 60050-191	1990	International Electrotechnical Vocabulary (IEV) - Chapter 191: Dependability and quality of service	-	-
IEC 60050-351	1998	International Electrotechnical Vocabulary (IEV) - Part 351: Automatic control	-	-
IEC 60050-702	1992	International electrotechnical vocabulary (IEV) - Chapter 702: Oscillations, signals and related devices	-	-
IEC 60050-704	1993	International electrotechnical vocabulary (IEV) - Chapter 704: Transmission	-	-
IEC 60050-705	1995	International Electrotechnical Vocabulary (IEV) - Chapter 705: Radio wave propagation	-	-
IEC 60050-712	1992	International Electrotechnical Vocabulary (IEV) - Chapter 712: Antennas	-	-

[1)] EN 60027-1 is based on IEC 60027-1:1995 (Reprint) + A1:1997.

Publication	Year	Title	EN/HD	Year
IEC 60050-713	1998	International Electrotechnical Vocabulary (IEV) - Part 713: Radiocommunications: transmitters, receivers, networks and operation	-	-
IEC 60050-715	1996	International Electrotechnical Vocabulary (IEV) - Chapter 715: Telecommunication networks, teletraffic and operation	-	-
IEC 60050-721	1991	International Electrotechnical Vocabulary (IEV) - Chapter 721: Telegraphy facsimile and data communication	-	-
IEC 60050-722	1992	International electrotechnical vocabulary (IEV) - Chapter 722: Telephony	-	-
IEC 60050-723	1997	International Electrotechnical Vocabulary (IEV) - Chapter 723: Broadcasting: Sound, television and data	-	-
IEC 60050-725	1994	International Electrotechnical Vocabulary (IEV) - Chapter 725: Space radiocommunications	-	-
IEC 60050-726	1982	International electrotechnical vocabulary (IEV) - Part 726: Transmission lines and waveguides	-	-
IEC 60050-731	1991	International Electrotechnical Vocabulary (IEV) - Chapter 731: Optical fibre communication	-	-
IEC 60122-1	2002	Quartz crystal units of assessed quality - Part 1: Generic specification	EN 60122-1	2002
IEC 60375	2003	Conventions concerning electric and magnetic circuits	EN 60375	2003
IEC 60747	Series	Semiconductor devices	-	-
IEC 60747-1	1983	Semiconductor devices - Part 1: General	-	-
IEC 60748	Series	Semiconductor devices - Integrated circuits	-	-
IEC 60748-1	2002	Semiconductor devices - Integrated circuits - Part 1:General	-	-
IEC 61703	2001	Mathematical expressions for reliability, availability, maintainability and maintenance support terms	EN 61703	2002
IEC/TR 61931	1998	Fibre optic - Terminology	-	-
ISO/IEC 2382-16	1996	Information technology - Vocabulary - Part 16: Information theory	-	-

Publication	Year	Title	EN/HD	Year
ISO 31-0	1992	Quantities and units - Part 0: General principles	-	-
ISO 31-11	1992	Quantities and units - Part 11: Mathematical signs and symbols for use in the physical sciences and technology	-	-

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60027-2

Troisième édition
Third edition
2005-08

Symboles littéraux à utiliser en électrotechnique –

Partie 2: Télécommunications et électronique

Letter symbols to be used in electrical technology –

Part 2: Telecommunications and electronics

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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For price, see current catalogue

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LETTER SYMBOLS TO BE USED IN ELECTRICAL TECHNOLOGY –

Part 2: Telecommunications and electronics

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 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 IEC National Committees.

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5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.

6) All users should ensure that they have the latest edition of this publication.

7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.

8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60027-2 has been prepared by IEC technical committee 25: Quantities and units, and their letter symbols.

This third edition cancels and replaces the second edition published in 2000. This third edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) it contains a revision of some clauses of the first edition that were not technically revised in the second edition;

b) it contains a revision of Clause 8 which is now Clause 10;

c) it contains some new clauses dealing with subjects that were not previously considered;

d) former Clause 10 will be given in another part of IEC 60027;

e) former Clause 11 will be revised as IEC 60027-6.

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

FDIS	Report on voting
25/298/FDIS	25/304/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.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IEC 60027 consists of the following parts, under the general title *Letter symbols to be used in electrical technology:*

Part 1: General

Part 2: Telecommunications and electronics

Part 3: Logarithmic and related quantities, and their units

Part 4: Symbols for quantities to be used for rotating electrical machines

Part 6: Control technology

Part 7: Physiological quantities and units

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under http://webstore.iec.ch in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

LETTER SYMBOLS TO BE USED IN ELECTRICAL TECHNOLOGY –

Part 2: Telecommunications and electronics

1 Scope

This part of IEC 60027 is applicable to telecommunications and electronics. It gives names and symbols for quantities and units.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60027-1:1992, *Letter symbols to be used in electrical technology – Part 1: General*

IEC 60027-3:2002, *Letter symbols to be used in electrical technology – Part 3: Logarithmic and related quantities*

IEC 60050-101:1998, *International Electrotechnical Vocabulary – Part 101: Mathematics*

IEC 60050-131:2002, *International Electrotechnical Vocabulary – Part 131 – Circuit theory*

IEC 60050-191:1990, *International Electrotechnical Vocabulary – Part 191: Dependability and quality of service*

IEC 60050-351:1998, *International Electrotechnical Vocabulary – Part 351: Automatic control*

IEC 60050-702:1992, *International Electrotechnical Vocabulary – Part 702: Oscillations, signals and related devices*

IEC 60050-704:1993, *International Electrotechnical Vocabulary – Part 704: Transmission*

IEC 60050-705:1995, *International Electrotechnical Vocabulary – Part 705: Radio wave propagation*

IEC 60050-712:1992, *International Electrotechnical Vocabulary – Part 712: Antennas*

IEC 60050-713:1998, *International Electrotechnical Vocabulary – Part 713: Radiocommunications: transmitters, receivers, networks and operation*

IEC 60050-715:1996, *Telecommunication networks, teletraffic and operation*

IEC 60050-721:1991, *International Electrotechnical Vocabulary – Part 721: Telegraphy, facsimile and data communication*

IEC 60050-722:1992, *International Electrotechnical Vocabulary – Part 722: Telephony*

IEC 60050-723:1997, *International Electrotechnical Vocabulary – Part 723: Broadcasting: sound, television, data*

IEC 60050-725:1994, *International Electrotechnical Vocabulary – Part 725: Space radio-communications*

IEC 60050-726:1982, *International Electrotechnical Vocabulary – Part 726: Transmission lines and waveguides*

IEC 60050-731:1991, *International Electrotechnical Vocabulary – Part 731: Optical fibre communication*

IEC 60122-1:2002, *Quartz crystal units of assessed quality – Part 1: Generic specification*

IEC 60375:2003, *Conventions concerning electric and magnetic circuits*

IEC 60747(all parts), *Semiconductor devices – Discrete devices*

IEC 60747-1:1983, *Semiconductor devices – Discrete devices – Part 1: General*

IEC 60748 (all parts), *Semiconductor devices – Integrated circuits*

IEC 60748-1:2002, *Semiconductor devices – Integrated circuits – Part 1: General*

IEC 61703:2001, *Mathematical expressions for reliability, availability, maintainability and maintenance support terms*

IEC 61931:1998, *Fibre optic – Terminology*

ISO/IEC 2382-16:1996, *Information technology – Vocabulary – Part 16: Information theory*

ISO 31-0:1992, *Reference materials – Contents of certificates and labels*

ISO 31-11:1992, *Quantities and units – Part 11: Mathematical signs and symbols for use in the physical sciences and technology*

NOTE 1 In this part of IEC 60027, complex quantities are denoted by underlining their symbols. However, this does not constitute a compulsory rule in applications (see 1.6 in IEC 60027-1).

NOTE 2 The heading in the tables "Unit, coherent with the SI" covers SI units and other units coherent with the SI, such as bar and neper.

3 General concepts

3.1 General

For logarithmic quantities defined as a logarithm of the ratio of two power or field quantities, respectively, the neper, Np, is coherent with the SI and is a special name for the unit one. In practice, however, the submultiple decibel, dB, of the bel, B, is generally used. The bel is not explicitly mentioned in the table. See IEC 60027-3.

Item number	Quantities					Units				
	Entry number in IEV	Name of quantity	Chief symbol	Reserve symbol	Remarks	Unit, coherent with the SI		Other units		Remarks
						Name	Symbol	Name	Symbol	
101	101-12-02 702-04-01 351-12-16	signal (generic term)	S , s		The value of a signal is proportional to a physical quantity considered as representing information, with an arbitrary scale. In this document, S_1 and S_2 are used for input and output signals respectively (see IEC 60027-1:1992 for suitable subscripts. In cases where the type of signal quantity is known, for example, electric current, voltage, pressure, etc., use the appropriate symbol. With respect to capital and lower-case letters, see IEC 60027-1:1992, 2.1.					The unit depends on the kind of quantity constituting the signal (electric current, voltage, pressure, etc.).
102		signal power	P_s	P_{sig}	"s" (lower case, upright) is used as subscript for "signal". In signal theory, the term "instantaneous power" is by convention used for the square of the instantaneous value of a signal. This square is proportional to a physical power if the signal is a field quantity (see IEV 101-14-71, Note 1).	watt	W			In a physical system, a signal power is always a physical power.
103		signal level	L	L_s, L_{sig}	$L = \log \left\| \frac{S}{S_{ref}} \right\|$ where S and S_{ref} are two signals of the same kind, S_{ref} being a reference					In practice, a base for the logarithm has to be specified.
103.1	702-07-04	absolute power level; power level	L_P		$L_P = \frac{1}{2} \ln \frac{P}{P_{ref}}$ Np $= 10 \lg \frac{P}{P_{ref}}$ dB where P is a power and P_{ref} is a reference power	neper	Np	decibel	dB	