

# 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

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Symboles littéraux à utiliser en électrotechnique -- Partie 2: Télécommunications et électronique SIST EN 60027-2:2008

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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

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EN 60027-2

NORME EUROPÉENNE EUROPÄISCHE NORM

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)

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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. 1-9112-4ddb-851a-c5c8a09eacb6/sist-en-60027-2-2008

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

### **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)
   iTeh STANDARD PREVIEW
- latest date by which the national standards conflicting with the EN have to be withdraw tandards.iteh.ai) (dow)
   2010-04-01

Annex ZA has been added by CENELECSIST EN 60027-2:2008

https://standards.iteh.ai/catalog/standards/sist/666ecd9f-9ff2-4ddb-85fac5c8a09eacb<del>6/sist-en-60027</del>-2-2008

### **Endorsement notice**

The text of the International Standard IEC 60027-2:2005 was approved by CENELEC as a European Standard without any modification.

\_\_\_\_\_

# 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	EN/HD	<u>Year</u>
IEC 60027-1	1992	Letter symbols to be used in electrical technology - Part 1: General	EN 60027-1 <sup>1)</sup>	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 iT	International Electrotechnical Vocabulary (IEV) - Part 101: Mathematics D PREVIE	- W	-
IEC 60050-131	2002	International Electrotechnical Vocabulary - Part 131: Circuit theory	-	-
IEC 60050-191	1990 https://st	International Electrotechnical Vocabulary and Electrotechnical Vocabulary (IEV) iteh aveatalog standards/six/666ecd91-912-4ddb Chapter 1912 Dependability and quality of service	0-85fa-	-
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	-	-

<sup>&</sup>lt;sup>1)</sup> EN 60027-1 is based on IEC 60027-1:1995 (Reprint) + A1:1997.

Publication IEC 60050-713	<u>Year</u> 1998	<u>Title</u> International Electrotechnical Vocabulary (IEV) -	<u>EN/HD</u> -	<u>Year</u> -
		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 <b>iT</b> (	International Electrotechnical Vocabulary (IEV) - Chapter 725: Space radiocommunications	W	-
IEC 60050-726	1982	International electrotechnical vocabulary (IEV) - Part 726: Transmission lines and waveguides	-	-
IEC 60050-731	https://st 1991	andards.iteh.ai/catalog/standards/sist/666ecd9f-9ff2-4dd International Electrotechnical Vocabulary (IEV) - Chapter 731: Optical fibre communication	o- <u>8</u> 5fa-	-
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	-	-

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<u>Publication</u>	<u>Year</u>	<u>Title</u>	EN/HD	<u>Year</u>
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	-	-

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# 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 technologydards.iteh.ai)

Part 2: <u>SIST EN 60027-2:2008</u>

https: Telecommunications and electronics

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International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale



CODE PRIX PRICE CODE



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# 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.
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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.

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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,

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amended. <u>SIST EN 60027-2:2008</u>

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### 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 (standards.iteh.ai)

IEC 60050-351:1998, International Electrotechnical Vocabulary – Part 351: Automatic control SIST EN 60027-2:2008

IEC 60050-702:1992, the international at Electrotechnical 600 ocabulary del-8 Part 702: Oscillations, signals and related devices c5c8a09eacb6/sist-en-60027-2-2008

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 radiocommunications

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 (Standards.iteh.al)

ISO 31-11:1992, Quantities and units – Part 11: Mathematical signs and symbols for use in the physical sciences and technology  $_{\rm SIST\ EN\ 60027\text{-}2:2008}$ 

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.

			n nal	r,	for	
	Remarks		The unit depends on the kind of quantity constituting the signal (electric current, voltage, pressure, etc.).	In a physical system, a signal power is always a physical power.	In practice, a base for the logarithm has to be specified.	
			The unit depends the kind of quantit constituting the signer constituting the signer contract, voltage, pressure, etc.).	In a physical syst a signal power is always a physical power.	In practice, at the logarithn be specified	
			The u the kii consti consti (electi voltagetc.).	In a ph a signa always power.	In pra the lo be sp	
s	ts	Symbol				
Units	Other units	Syr				dB
	Oth	Name				decibel
	Unit, coherent with the SI	Symbol		W		ď
	Unit, co with t	Name		watt		neper
			uantity itrary out and for al tage,	gnal". by s value I power	$S_{ref}$	
			The value of a signal is proportional to a physical quantity considered as representing information, with an arbitrary scale. In this document, S <sub>1</sub> and S <sub>2</sub> 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, 2-3.	"s" (lower case, upright) is lused 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).	are two grads of the same kind, $S_{\rm ref}$	power
	iTeh		The value of a signal is proportional to a physical or considered as representing information, with an art scale. In this document, 2,1 and 2,2 are used for in output signals respectively see IEC 60027-1:1992 suitable subscripts. In cases where the type of sign quantity is known, for example, electric current, volpressure, etc., use the appropriate symbol.  With respect to capital and lower-case letters, see IEC 60027-1:1992, 221.	subscrip eous po le instal nal to a	/IE /s/	$L_p = \frac{1}{2} \ln \frac{P}{P_{\rm ref}}  {\rm Np} = 10 \; {\rm lg} \frac{P}{P_{\rm ref}}  {\rm dB}$ where $P$ is a power and $P_{\rm ref}$ is a reference power
			The value of a signal is proportional to a pleonsidered as representing information, where it is called in this document, where IEC 60027 suitable subscripts. In cases where the type quantity is known, for example, electric curpressure, etc., use the appropriate symbol. With respect to capital and lower-case letter IEC 60027-1:1992, 24.	sed as stantantantantantantantantantantantantant	gnals of	dB is a re
h			is properties of the propertie	Pt) is in the square from the	ff2-4ddb- <b>§</b> 5fa-	$\log rac{P}{P_{ m ref}}$ and $P_{ m ref}$
			repress docume respec cripts. It own, for use th o capits	e, uprig y, the t ed for t iis squa a field 14-71,	υ	Np = 1
s			ered as ered as In this c signals e subsc ty is kno re, etc.	"s" (lower case, In signal theory, convention used of a signal. This if the signal is a (see IEV 101-14	$L = \log \left  \frac{S}{S_{\rm ref}} \right $ where $S$ and $S_{\rm ref}$ being a reference	$L_P = \frac{1}{2} \ln \frac{P}{P_{\rm ref}}$ Np = 10 lg $\frac{P}{P_{\rm ref}}$ dB where $P$ is a power and $P_{\rm ref}$ is a
Quantities			The vaconsid scale.  output suitable quantii pressu	"s" (lov In sign conver of a sign if the sign (see IE	$L = \log \left  -\frac{1}{2} \right $ where $S$	$L_P = \frac{1}{2}$ where
σr	Reserve symbol			$P_{ m sig}$	$L_{ m s}, L_{ m sig}$	
	loc			1	7	
	Chief symbol		s , S	$P_{\rm s}$	T	$L_p$
	Name of quantity		(uu)	er	=	ower er level
			signal (generic term)	signal power	signal level	absolute power level; power level
	Entry number in IEV 101-12-02 sig 702-04-01 (gi 351-12-16			<u></u>	<u>.</u> <u>.</u> <u>.</u>	
					702-07-04	
Item			101	102	103	103.1
					•	