SLOVENSKI STANDARD
SIST EN 60617-13:1997

01-december-1997

Graphical symbols for diagrams - Part 13: Analogue elements (IEC 617-13:1993)

Graphical symbols for diagrams -- Part 13: Analogue elements

Schaltzeichen für Schaltungsunterlagen -- Teil 13: Analoge Elemente

Symboles graphiques pour schémas -- Partie 13: Opérateurs analogiques

Ta slovenski standard je istoveten z: **EN 60617-13:1993**

ICS:

01.080.40	Grafični simboli za uporabo v risbah, diagramih, načrtih v elektrotehniki in elektroniki ter v ustrezni tehnični proizvodni dokumentaciji	Graphical symbols for use on electrical and electronics engineering drawings, diagrams, charts and in relevant technical product documentation
29.020	Elektrotehnika na splošno	Electrical engineering in general

SIST EN 60617-13:1997 **en,fr**

EUROPEAN STANDARD EN 60617-13

NORME EUROPEENNE

EUROPÄISCHE NORM March 1993

UDC 621.3:003.62:621.3.037.33

Descriptors: Graphical symbols for diagrams, analogue quantities, analogue elements, mathematical operation

ENGLISH VERSION

Graphical symbols for diagrams
Part 13: Analogue elements
(IEC 617-13:1993)

Symboles graphiques pour schémas
Partie 13: Opérateurs analogiques
(CEI 617-13:1993)

Schaltzeichen für Schaltungsunterlagen
Teil 3: Analoge Elemente
(IEC 617-13:1993)

This European Standard was approved by CENELEC on 1992-03-24. 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, 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 60617-13:1993 E

FOREWORD

The text of document 3A(CO)210, as prepared by IEC sub-committee 3A: Graphical symbols for diagrams, of IEC technical committee 3: Documentation and graphical symbols, was submitted to the IEC-CENELEC parallel vote in June 1991.

The reference document was approved by CENELEC as EN 60617-13 on 24 March 1992.

The following dates were fixed:

- latest date of publication of an identical national standard	(dop)	1994-01-15
- latest date of withdrawal of conflicting national standards	(dow)	1994-01-15

Annexes designated "normative" are part of the body of the standard. In this standard, annex ZA is normative.

ENDORSEMENT NOTICE

The text of the International Standard IEC 617-13:1993 was approved by CENELEC as a European Standard without any modification.

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

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

IEC Publication	Date	Title	EN/HD	Date
27-1	1992	Letter symbols to be used in electrical technology - Part 1: General	-	-
617-2	1983	Graphical symbols for diagrams - Part 2: Symbol elements, qualifying symbols and other symbols having general application	-	-
617-3	1983	Part 3: Conductors and connecting devices	-	-
617-5	1983	Part 5: Semiconductors and electron tubes	-	-
617-10	1983	Part 10: Telecommunications: Transmission	-	-
617-12	1991	Part 12: Binary logic elements	-	-

NORME INTERNATIONALE
INTERNATIONAL STANDARD

CEI
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617-13

Deuxième édition
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Symboles graphiques pour schémas

Partie 13:
Opérateurs analogiques

Graphical symbols for diagrams

Part 13:
Analogue elements

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Международная Электротехническая Комиссия

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

GRAPHICAL SYMBOLS FOR DIAGRAMS

Part 13: Analogue elements

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 cooperation 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, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

3) They have the form of recommendations for international use 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.

International Standard IEC 617-3 has been prepared by IEC by sub-committee 3A: Graphical symbols for diagrams, of IEC technical committee 3: Documentation and graphical symbols.

This second edition of IEC 617-13 cancels and replaces the first edition, published in 1978.

The text of this standard is based on the following documents (apart from the firts edition of IEC 617-13):

DIS	Report on Voting
3A(CO)210	3A(CO)221

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

IEC 617 consists of the following parts, under the general title: Graphical symbols for diagrams.

- Part 1: 1985, General information, general index. Cross-reference tables
- Part 2: 1983, Symbol elements, qualifying symbols and other symbols having having general application
- Part 3: 1983, Conductors and connecting devices
- Part 4: 1983, Passive components
- Part 5: 1983, Semiconductors and electronic tubes
- Part 6: 1983, Production and conversion of electrical energy
- Part 7: 1983, Switchgear, controlgear and protective devices
- Part 8: 1983, Measuring instruments, lamps and signalling devices
- Part 9: 1983, Telecommunications: Switching and peripheral equipment
- Part 10: 1983, Telecommunications: Transmission
- Part 11: 1983, Architectural and topographical installation plans and diagrams
- Part 12: 1991, Binary logic elements
- Part 13: 1993, Analogue elements

Annexes A, B and C are for information only.

GRAPHICAL SYMBOLS FOR DIAGRAMS

Part 13: Analogue elements

Chapter I: General

1 Scope

This part of IEC 617 contains graphical symbols that have been developed to represent functions operating on and/or producing analogue quantities. They are intended also to represent physical devices or combinations of physical devices capable of carrying out these functions.

The symbols have been prepared with a view to electrical applications, but many can also be applied to non-electrical devices, for example pneumatic, hydraulic or mechanical.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 617. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 617 are encouraged to investigate the possibility of applying the most recent editions of the normative documents listed below. Members of IEC and ISO maintain registers of currently valid normative documents.

IEC 27-1: 1992, *Letter symbols to be used in electrical technology — Part 1: General*

IEC 617-2: 1983, *Graphical symbols for diagrams — Part 2: Symbol elements, qualifying symbols and other symbols having general application*

IEC 617-3: 1983, *Graphical symbols for diagrams — Part 3: Conductors and connecting devices*

IEC 617-5: 1983, *Graphical symbols for diagrams — Part 5: Semiconductors and electron tubes*

IEC 617-10: 1983, *Graphical symbols for diagrams — Part 10: Telecommunications: Transmission*

IEC 617-12: 1991, *Graphical symbols for diagrams — Part 12: Binary logic elements*

3 General notes

3.1 Construction and combination of outlines, labels and dependency notation should follow the applicable general rules of IEC 617-12 with the understanding that analogue connections carry a continuous range of signal levels rather than two logic states. Provided the direction of signal flow is

clear or properly indicated, inputs may be shown on the right and outputs may be shown on the left if it aids layout of the diagram or better conveys the structure of the device.

3.2 In some figures, lower-case letters that are not part of the symbols have been shown outside the outline just to identify the inputs and outputs as referenced in the description.

3.3 Weighting factors applied to the input signals are each indicated by a sign indicator in combination with a numerical value placed inside the outline of the symbol adjacent to the relevant input.

In this International Standard w_1, w_2, ..., w_n, which are understood to include the proper sign, are used to denote the values of the weighting factors. The symbols for sign indication are + and –. If the weighting factor is +1 or –1, such as where a simple non-inverting or inverting input is shown, the number 1 may be omitted.

3.4 In IEC 27, letter symbols for quantities are shown in italic (inclined) type. Upright lettering is allowed and normally used on diagrams. In this International Standard, upright letters are used for all lettering that is intended to be a final part of a symbol or a diagram.

3.5 In IEC 27, the letters *V* and *v* are recommended as reserve symbols for voltage; however, in the field of semiconductor devices and generally in the field of electronics, these symbols are so widely used that in graphical symbols prepared in accordance with this International Standard, *V* and *v* shall be considered equivalent to *U* and *u* including their use in qualifying symbols. In this International Standard, *V* and *v* and *U* and *u* are considered to be alternative chief symbols for voltage.

3.6 In symbols in this International Standard, the comma has been used for the decimal sign, as recommended in IEC 27-1.

3.7 In this International Standard, the "φ" has been used for phase (difference). The "Φ" is considered to be equivalent.

3.8 In many cases, examples are based on commercially available devices. Therefore, type numbers and terminal designations (for one unspecified package type) are shown for the assistance of the reader. Where the type number implies the product of a specific manufacturer, this is done to avoid uncertainties caused by functional variations that sometimes occur between devices that have the same generic portion of the type number but are made by different manufacturers.

3.9 Some symbols are shown in this International Standard with external connections or external networks. The function indicated by the symbol might be performed only when these external connections or external networks are present.

3.10 In cases where binary inputs or outputs are shown in this International Standard and the logic polarity indicator has not been used, positive logic convention is to be assumed.

3.11 Label grouping (see 54.6 of IEC 617-12) may be employed to group adjacent and associated connecting lines whose labels are partially alike.

Chapitre II : Symboles distinctifs associés aux accès et aux autres connexions

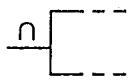
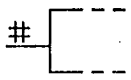
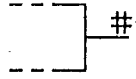
4 Symboles distinctifs indiquant le type de signal

Les symboles ∩ et # (symboles 02-17-08 et 02-17-09 de la CEI 617-2) doivent être utilisés s'il est nécessaire de distinguer entre eux des signaux analogiques et numériques. S' il y a possibilité de confusion sur la fonction ou le signal, on peut ajouter au symbole distinctif général adjacent les symboles 12-08-01, 12-08-05 et 12-08-06 de la CEI 617-12.

Chapter II : Qualifying symbols associated with inputs, outputs and other connections

4 Qualifying symbols indicating the type of signal

The symbols ∩ and # (symbols 02-17-08 and 02-17-09 of IEC 617-2) shall be used when it is necessary to distinguish between analogue and digital signals. They may also be added to a general qualifying symbol or placed adjacent to symbols 12-08-01, 12-08-05, and 12-08-06 of IEC 617-12 if confusion is likely regarding whether the function or signal is digital or analogue.

No.	Symbole Symbol	Légende	Description
13-04-01		Entrée analogique	Analogue input
13-04-02		Sortie analogique	Analogue output
13-04-03		Entrée numérique ou binaire	Digital input
13-04-04		Sortie numérique ou binaire	Digital output
13-04-05	Utiliser le symbole 12-10-01 de la CEI 617-12 Use symbol 12-10-01 of IEC 617-12	Connexion auxiliaire Accès d'alimentation du dispositif ou une connexion dont la connaissance n'est pas importante pour comprendre le fonctionnement de l'élément et du circuit (par exemple la connexion de la résistance ou du condensateur supplémentaire).	Subsidiary connection An input supplying power to the device or a connection the knowledge of whose level is not important to understand the function of the element and the circuit (e.g., a connection to an external supplementary resistor or capacitor).