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**Grafični simboli za sheme - 6. del: Proizvodnja in pretvorba električne energije  
(IEC 60617-6:1996)**

Graphical symbols for diagrams -- Part 6: Production and conversion of electrical energy

Graphische Symbole für Schaltpläne -- Teil 6: Schaltzeichen für die Erzeugung und Umwandlung elektrischer Energie

Symboles graphiques pour schémas -- Partie 6: Production et conversion de l'énergie électrique

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01.080.40	Grafični simboli za uporabo v risbah, diagramih, načrtih v elektrotehnik 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

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60617-6**

June 1996

ICS 01.080.30

Descriptors: Electric conversion, production of electrical energy, electric diagram, electrical symbol

English version

**Graphical symbols for diagrams**  
**Part 6: Production and conversion of electrical energy**  
**(IEC 617-6:1996)**

Symboles graphiques pour schémas  
Partie 6: Production, transformation et  
conversion de l'énergie électrique  
(CEI 617-6:1996)

Graphische Symbole für Schaltpläne  
Teil 6: Schaltzeichen für die Erzeugung  
und Umwandlung elektrischer Energie  
(IEC 617-6:1996)

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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.

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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 3A/384/FDIS, future edition 2 of IEC 617-6, prepared by SC 3A, Graphical symbols for diagrams, of IEC TC 3, Documentation and graphical symbols, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60617-6 on 1996-03-05.

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) 1997-02-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 1997-02-01

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### Endorsement notice

The text of the International Standard IEC 617-6:1996 was approved by CENELEC as a European Standard without any modification.

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NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD

CEI  
IEC

617-6

Deuxième édition  
Second edition  
1996-05

Symboles graphiques pour schémas –

Partie 6:  
Production, transformation  
et conversion de l'énergie électrique

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Graphical symbols for diagrams –

Part 6: [SIST EN 60617-6:1997](https://standards.iteh.ai/catalog/standards/sist/53057763-6d9b-41a1-8807-5e64c4482a9/sist-en-60617-6-1997)  
Production and conversion  
of electrical energy

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International Electrotechnical Commission  
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For price, see current catalogue

## CONTENTS

	Page
FOREWORD .....	5
INTRODUCTION .....	7
<b>CHAPTER I: QUALIFYING SYMBOLS FOR WINDING INTERCONNECTIONS</b>	
Section 1      Separate windings .....	8
Section 2      Internally connected windings .....	9
<b>CHAPTER II: MACHINES</b>	
Section 3      Elements of machines .....	11
Section 4      Types of machines .....	12
Section 5      Examples of direct current machines .....	13
Section 6      Examples of alternating current commutator machines .....	14
Section 7      Examples of synchronous machines .....	15
Section 8      Examples of induction type (asynchronous) machines .....	17
<b>CHAPTER III: TRANSFORMERS AND REACTORS</b>	
Section 9      General symbols for transformers and reactors .....	20
Section 10     Examples of transformers with separate windings .....	23
Section 11     Examples of auto-transformers .....	31
Section 12     Examples of induction regulators .....	32
Section 13     Examples of measuring transformers and pulse transformers .....	33
<b>CHAPTER IV: POWER CONVERTERS</b>	
Section 14     Block symbols for power converters .....	37
<b>CHAPTER V: PRIMARY AND SECONDARY CELLS AND BATTERIES</b>	
Section 15     Primary and secondary cells .....	38
<b>CHAPTER VI: POWER GENERATORS</b>	
Section 16     General symbol for non-rotary power generators .....	39
Section 17     Heat sources .....	39
Section 18     Examples of power generators .....	40
Section 19     Closed-loop controllers .....	42
Annex A – Older symbols .....	43
Annex B – French alphabetic index .....	44
Annex C – English alphabetic index .....	46

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## GRAPHICAL SYMBOLS FOR DIAGRAMS –

## Part 6: Production and conversion of electrical energy

## 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.

SIST EN 60617-6:1997

International Standard IEC 617-6 has been prepared by sub-committee 3A: Graphical symbols for diagrams, of IEC technical committee 3: Documentation and graphical symbols.

This second edition cancels and replaces the first edition published in 1983 and constitutes a technical revision.

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

FDIS	Reports on voting
3A(CO)201 3A/384/FDIS	3A(CO)212 3A/422/RVD

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

Annexes A, B and C are for information only.

## INTRODUCTION

This part of IEC 617 forms an element of a series which deals with graphical symbols for diagrams.

The series consists of the following parts:

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

The scope and the normative references for this series are given in IEC 617-1.

Symbols have been designed in accordance with requirements given in the future ISO 11714-1\*. The module size  $M = 2,5$  mm has been used. For better readability smaller symbols in this standard have been enlarged to double size and are marked "200 %" in the symbol column. To save space larger symbols have been reduced to half size and are marked "50 %" in the symbol column. In accordance with the future ISO 11714-1, clause 7, symbol dimensions (for instance height) may be modified in order to make space for a greater number of terminals or for other layout requirements. In all cases, whether the size is enlarged or reduced, or dimensions modified, the thickness of the original line should be maintained without scaling.

The symbols in this standard are laid out in such a way that the distance between connecting lines is a multiple of a certain modulus. Modulus 2M has been chosen to provide enough space for the required terminal designation. The symbols have been drawn to a size convenient for comprehension, using consistently the same grid in the representation of all symbols.

All symbols are designed within a grid in a computer-aided draughting system. The grid which was used has been reproduced in the background of the symbols.

The older symbols which were included in appendix A of the first edition of IEC 617-6 for a transitional period, are no longer part of this second edition, as they will definitely be withdrawn from use.

The indexes in Annex B and C include an alphabetic list of symbol names and their corresponding number. The symbol names are based on the description of the symbols of this part. A general index including an alphabetic list of symbols of all parts is given in IEC 617-1.

\* At present, at the stage of Draft International Standard (document 3/563/DIS).



## SYMBLES GRAPHIQUES POUR SCHÉMAS

Sixième partie: Production, transformation et conversion  
de l'énergie électrique





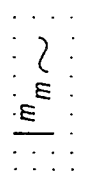
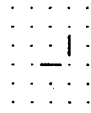
Part 6: Production and conversion  
of electrical energy

CHAPITRE I: SYMBOLES DISTINCTIFS POUR  
L'INTERCONNEXION DES ENROULEMENTS

CHAPTER I: QUALIFYING SYMBOLS FOR WINDING  
INTERCONNECTIONS

## SECTION 1 – ENROULEMENTS SÉPARÉS









## SECTION 1 – SEPARATE WINDINGS


No.	Symbole	Symbol	Légende	Description
06-01-01		Un enroulement	1. Il convient d'indiquer le nombre d'enroulements séparés: – soit par le nombre de traits dessinés, – soit par un nombre inscrit à côté du symbole.	One winding 1. The number of separate windings should be indicated: – either by the number of strokes drawn, – or by adding a figure to the symbol.
06-01-02		EXEMPLES: Trois enroulements séparés	EXEMPLES: Trois enroulements séparés	EXEMPLES: Three separate windings
06-01-03		Six enroulements séparés	Six enroulements séparés	Six separate windings
06-01-04		2. Le symbole 06-01-01 peut aussi être utilisé pour représenter des enroulements à phases séparées permettant, par des moyens extérieurs, différents modes de connexion.	2. Le symbole 06-01-01 peut aussi être utilisé pour représenter des enroulements à phases séparées permettant, par des moyens extérieurs, différents modes de connexion.	2. Symbol 06-01-01 may also be used to represent windings which can be externally connected in various ways.
06-01-05		EXEMPLES: Enroulement triphasé, à phases séparées Enroulement polyphasé, à m phases séparées	EXEMPLES: Enroulement triphasé, à phases séparées Enroulement polyphasé, à m phases séparées	EXEMPLES: Three-phase winding, phases not interconnected m-phase winding, phases not interconnected
06-01-06		Enroulement diphasé, quatre fils	Enroulement diphasé, quatre fils	Two-phase winding, four-wire

## SECTION 2 – ENROULEMENTS CONNECTÉS INTÉRIEUREMENT

## SECTION 2 – INTERNALLY CONNECTED WINDINGS

2.1 Le mode de connexion des enroulements de transformateurs peut également être indiqué par des codes. Voir la CEI 76: Transformateurs de puissance.  
 2.1 The method of connecting transformer windings may also be indicated by codes. See IEC Publication 76: Power Transformers.

No.	Symbole	Symbol	Légende	Description
06-02-01			Enroulement diphasé	Two-phase winding
06-02-02			Enroulement triphasé partiel, en V (60°)	Three-phase winding, V (60°)
06-02-03			Enroulement tétraphasé, avec neutre sorti	Four-phase winding with neutral brought out
06-02-04			Enroulement triphasé, en T	Three-phase winding, T
06-02-05			Enroulement triphasé, en triangle Ce symbole peut aussi être utilisé pour représenter des enroulements multiphasés connectés en polygone, en précisant par un chiffre le nombre de phases.	Three-phase winding, delta This symbol may be used to symbolize a multiphase polygon connection of windings by adding a figure to denote the number of phases.
06-02-06			Enroulement triphasé, en triangle ouvert	Three-phase winding, open delta
06-02-07			Enroulement triphasé, en étoile Ce symbole peut aussi être utilisé pour représenter des enroulements multiphasés connectés en étoile, en précisant par un chiffre le nombre de phases.	Three-phase winding, star This symbol may also be used to symbolize a multiphase star connection of windings by adding a figure to denote the number of phases.
06-02-08			Enroulement triphasé, en étoile, avec neutre sorti	Three-phase winding, star, with neutral brought out

No.	Symbole	Symbol	Légende	Description
06-02-09			Enroulement triphasé, en zigzag	Three-phase winding, zigzag or interconnected star
06-02-10			Enroulement hexaphasé, en double triangle	Six-phase winding, double delta
06-02-11			Enroulement hexaphasé, en polygone	Six-phase winding, polygon
06-02-12			Enroulement hexaphasé, en étoile	Six-phase winding, star
06-02-13			Enroulement hexaphasé, en double zigzag, avec neutre sorti	Six-phase winding, fork with neutral brought out

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CHAPITRE II: MACHINES  
SECTION 3 – ÉLÉMENTS DE MACHINES

CHAPTER II: MACHINES  
SECTION 3 – ELEMENTS OF MACHINES

No.	Symbole	Symbol	Légende	Description
06-03-01			Distinction entre divers types d'enroulements ayant différentes fonctions: Enroulement de compensation	Differentiation between windings having different functions: Commutating or compensating winding
06-03-02			Enroulement série	Series winding
06-03-03			Enroulement d'excitation en dérivation ou séparé	Shunt winding or separate winding
06-03-04			Balai (sur bague ou sur collecteur à lames) Les balais sont représentés seulement si cela est nécessaire. Comme exemple d'application, voir le symbole 06-05-03.	Brush (on slip-ring or commutator) Brushes are shown only if necessary. For an example of application, see symbol 06-05-03.

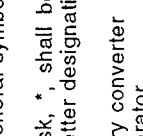
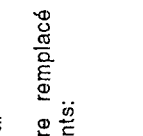
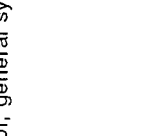

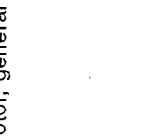

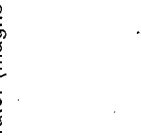

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## SECTION 4 – TYPES OF MACHINES

## SECTION 4 – TYPES DE MACHINES

No.	Symbole	Symbole	Légende	Description
06-04-01			<p>Machine, symbole général</p> <p>L'astérisque, *, doit être remplacé par un des symboles littéraux suivants:</p> <p>C Commutatrice  G Génératrice  GS Alternateur synchrone  M Moteur  MG Machine pouvant servir comme génératrice ou comme moteur  MS Moteur synchrone</p> <p>Les symboles 02-02-01 et 02-02-04 peuvent compléter le symbole comme indiqué dans les symboles des sections 5 à 8.</p> <p>Pour les générateurs de puissance non-rotatifs, voir section 16</p>	<p>Machine, general symbol</p> <p>The asterisk, *, shall be replaced by one of the following letter designations:</p> <p>C Rotary converter  G Generator  GS Synchronous generator  M Motor  MG Machine capable of use as a generator or motor  MS Synchronous motor</p> <p>The symbols 02-02-01 and 02-02-04 may be added, as shown in Sections 5 to 8</p> <p>For non-rotary power generators, see section 16</p>
06-04-02			<p>Moteur linéaire, symbole général</p>	<p>Linear motor, general symbol</p>
06-04-03			<p>Moteur pas à pas, symbole général</p>	<p>Stepping motor, general symbol</p>
06-04-04			<p>Générateur à commande manuelle (magnéto d'appel)</p>	<p>Hand-generator (magneto caller)</p>