

Graphical symbols for diagrams —

Part 7: Switchgear, controlgear and protective devices

The European Standard EN 60617-7:1996 has the status of a
British Standard

ICS 01.080.30; 29.120.60

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National foreword

This British Standard has been prepared by Technical Committee GEL/3. It is the English language version of EN 60617-7:1996, *Graphical symbols for diagrams Part 7: Switchgear, controlgear and protective devices* published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 617-7:1996 published by the International Electrotechnical Commission (IEC).

This British Standard replaces BS 3939-7:1985 which is withdrawn.

NOTE The French language version of the alphabetic index has not been included.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 58 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

ICS 01.080.30

Descriptors: Electrical equipment, protective device, electric diagram, electrical symbol

English version

Graphical symbols for diagrams
Part 7: Switchgear, controlgear and protective devices
(IEC 617-7:1996)

Symboles graphiques pour schémas
Partie 7: Appareillage et dispositifs de
commande et de protection
(CEI 617-7:1996)

Graphische Symbole für Schaltpläne
Teil 7: Schaltzeichen für Schalt- und
Schutzeinrichtungen
(IEC 617-7:1996)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

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Foreword

The text of document 3A/385/FDIS, future edition 2 of IEC 617-7, 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 60617-7 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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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 11714-1¹⁾. The module size $M = 2,5 \text{ mm}$ 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 module. The module 2M has been chosen to provide enough space for a required terminal designation. The symbols have been drawn to a size convenient for comprehension, using the same grid consistently 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 617-7 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.

¹⁾ At present, at the stage of Draft International Standard (document 3/563/DIS).

Chapitre I: Règles Générales

- I.1 Il est permis d'ajouter à la plupart des symboles un petit cercle vide ou plein pour représenter le point de l'articulation. Voir par exemple le 07-02-02.
Dans quelques symboles, le cercle représentant le point d'articulation doit être figuré. Par exemple, voir 07-02-05.
- I.2 Pour d'autres méthodes de représentation d'interrupteurs en particulier les interrupteurs électroniques et complexes voir CEI 617-12, Section 17A et 29 et CEI 617-13, section 17.

Chapter I: General rules

- I.1 A small circle, open or filled in, representing the hinge point, may be added to most of the symbols. For example, see 07-02-02.
In some symbols the circle indicating the hinge point shall be shown. For example, see 07-02-05.
- I.2 For other methods of representing switches, especially complex, electronic switches, see IEC 617-12, section 17A and 29, and IEC 617-13, section 17.

Section 1 — Symboles distinctifs

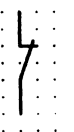
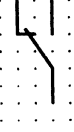
Section 1 — Qualifying symbols

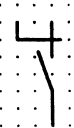
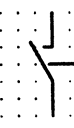
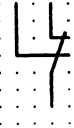
No.	Symbole Symbol	Légende	Description
07-01-01		Fonction contacteur	Contactor function
07-01-02		Fonction disjoncteur	Circuit breaker function
07-01-03		Fonction sectionneur	Disconnecter (isolator) function
07-01-04		Fonction interrupteur-sectionneur	Switch-disconnector (isolating-switch) function
07-01-05		Fonction déclenchement automatique provoqué par relais de mesure ou déclencheur incorporé	Automatic tripping function initiated by a built-in measuring relay or release
07-01-06		Fonction contact de position 1. Ce symbole distinctif peut être utilisé avec un contact simple afin d'indiquer un interrupteur de position lorsqu'il n'est pas nécessaire de préciser ce mode de commande. Dans les cas complexes où il est souhaitable de préciser ce mode de commande, on peut appliquer à la place, l'un des symboles 02-13-16 à 02-13-19. 2. Pour représenter un contact actionné mécaniquement dans les deux sens, ce symbole doit être placé des deux cotés du symbole de contact.	Position switch function 1. This qualifying symbol may be applied to simple contact symbols to indicate position switches if there is no need to show the means of operating the contact. In complicated cases, where it is desirable to show the means of operation, one of the symbols 02-13-16 through 02-13-19 may be used instead. 2. To depict a contact which is mechanically operated in both directions, this symbol shall be placed on both sides of the contact symbol.

No.	Symbole Symbol	Légende	Description
07-01-07		Fonction retour automatique, par exemple retour à ressort 1. Ce symbole peut être utilisé pour indiquer une fonction retour automatique. Par exemple, voir 07-06-01. 2. Ce symbole ne doit pas être utilisé conjointement avec les symboles distinctifs 07-01-01 ... 07-01-04. Dans de nombreux cas, le symbole 02-12-07 peut être utilisé.	Automatic return function, for example, spring return 1. This symbols may be used to indicate automatic return. For example. see 07-06-01. 2. This symbol shall not be used together with qualifying symbols 07-01-01, 07-01-02, 07-01-03 and 07-01-04. In many cases, symbol 02-12-07 may be used.
07-01-08		Fonction retour non-automatique (à position maintenue) 1. Ce symbole peut être utilisé pour indiquer une fonction retour non-automatique (à position maintenue). Lorsque cette convention est utilisée il convient de la signaler de manière appropriée. 2. Ce symbole ne doit pas être utilisé conjointement avec les symboles distinctifs 07-01-01, 07-01-02, 07-01-03 et 07-01-04. Dans de nombreux cas, le symbole 02-12-08 peut être utilisé.	Non-automatic return (stay put) function 1. This symbol may be used to indicate non-automatic return function. When this convention is invoked, its use should be appropriately referenced. 2. This symbol should not be used together with qualifying symbols 07-01-01, 07-01-02, 07-01-03 and 07-01-04. In many cases, symbol 02-12-08 may be used.
07-01-09		Manoeuvre positive d'un interrupteur 1. Ce symbole doit être utilisé pour indiquer que la manoeuvre positive de l'appareil mécanique de connexion est positive, c'est à dire que la manoeuvre donne l'assurance que tous les contacts sont dans la position correspondant à celle de l'organe de commande. 2. Si les contacts sont représentés avec une liaison, le symbole doit s'appliquer à tous les contacts reliés, sauf indication contraire (voir symbole 07-08-07).	Positive operation of a switch 1. This symbol shall be used to indicate that the positive operation of a mechanical device in the direction shown is ensured or is required. This means that the operation ensures that all contacts are in the position corresponding to the activating device. 2. If contacts are shown linked, the symbol shall apply to all the linked contacts unless otherwise indicated (see symbol 07-08-07).

Chapitre II: Contacts
Section 2 — Contacts à deux ou trois positions

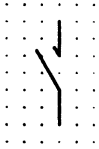
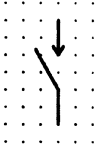
Chapter II: Contacts
Section 2 — Contacts with two or three positions

No.	Symbole	Symbol	Légende	Description
07-02-01	Forme 1 Form 1		Contact à fermeture (contact de travail) Ce symbole peut également être utilisé comme symbole général d'interrupteur.	Make contact This symbol may also be used as the general symbol for a switch.
07-02-02	Forme 2 Form 2			
07-02-03			Contact à ouverture (contact de repos)	Break contact
07-02-04			Contact à deux directions sans chevauchement	Change-over break before make contact
07-02-05			Contact à deux directions avec position médiane de coupure	Change-over contact with off-position in the centre

No.	Symbole	Symbol	Légende	Description
07-02-06	Forme 1 Form 1		Contact à deux directions avec chevauchement	Change-over make before break contact
07-02-07	Forme 2 Form 2			
07-02-08			Contact à deux fermetures	Contact with two makes
07-02-09			Contact à deux ouvertures	Contact with two breaks

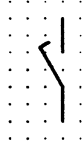
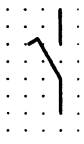
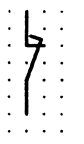
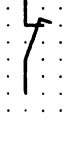
Section 3 — Contacts de passage à deux positions

Section 3 — Passing contacts with two positions

No.	Symbole	Symbol	Légende	Description
07-03-01			Contact de passage fermant momentanément à l'action de son organe de commande	Passing make contact closing momentarily when its operating device is actuated
07-03-02			Contact de passage fermant momentanément au relâchement de son organe de commande	Passing make contact closing momentarily when its operating device is released
07-03-03			Contact de passage fermant momentanément à l'action et au relâchement de son organe de commande	Passing make contact closing momentarily when its operating device is actuated or released

Section 4 — Contacts à fonctionnement décalé

Section 4 — Early and late operating contacts

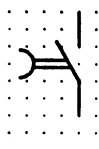
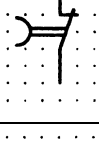
No.	Symbole Symbol	Légende	Description
07-04-01		Contact (d'un ensemble à plusieurs contacts) à fermeture anticipée par rapport aux autres contacts à fermeture de l'ensemble.	Make contact (of a multiple contact assembly) which is early to close relative to the other make contacts of the assembly
07-04-02		Contact (d'un ensemble à plusieurs contacts) à fermeture tardive par rapport aux autres contacts à fermeture de l'ensemble.	Make contact (of a multiple contact assembly) which is late to close relative to the other make contacts of the assembly
07-04-03		Contact (d'un ensemble à plusieurs contacts) à ouverture tardive par rapport aux autres contacts à ouverture de l'ensemble.	Break contact (of a multiple contact assembly) which is late to open relative to the other break contacts of the assembly
07-04-04		Contact (d'un ensemble à plusieurs contacts) à ouverture anticipée par rapport aux autres contacts à ouverture de l'ensemble.	Break contact (of a multiple contact assembly) which is early to open relative to the other break contacts of the assembly

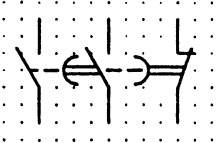
Section 5 — Contacts avec opération retardée

5.1 Voir les symboles 02-12-05 et 02-12-06. La fermeture et l'ouverture est retardée par rapport à l'opération d'activation ou à la disparition d'activation. Le mouvement est retardé dans la direction vers le centre de l'arc ("effet de parachute"). Dans le symbole de contact il est permis de figurer le symbole de retard du côté qui convient le mieux à l'application et à la mise en place des désignations de matériel.

Section 5 — Contacts with delayed operation

5.1 See symbols 02-12-05 and 02-12-06. Closing and opening of the contact is delayed with respect to the activation or deactivation operation. The movement is delayed in the direction towards the centre of the arc ("parachute effect"). The symbol for delayed action may be drawn on that side of the contact symbol which is most suitable for the application and for the placing of item designations.

No.	Symbole	Symbol	Légende	Description
07-05-01			Contact à fermeture, retardé lorsque le dispositif contenant le contact est activé	Make contact, delayed when the device containing the contact is being activated
07-05-02			Contact à fermeture, retardé lorsque le dispositif contenant le contact n'est plus activé	Make contact, delayed when the device containing the contact is being de-activated
07-05-03			Contact à ouverture, retardé lorsque le dispositif contenant le contact est activé	Break contact, delayed when the device containing the contact is being activated
07-05-04			Contact à ouverture, retardé lorsque le dispositif contenant le contact n'est plus activé	Break contact, delayed when the device containing the contact is being de-activated
07-05-05			Contact à fermeture, retardé à la fois lorsque le dispositif contenant le contact est activé et lorsqu'il n'est plus activé	Make contact, delayed both when the device containing the contact is being activated and when it is being de-activated

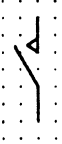
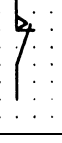
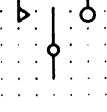
No.	Symbole Symbol	Légende	Description
07-05-06		EXEMPLE: Ensemble d'un groupe de contacts comprenant un contact à fermeture non-retardé, un contact à fermeture retardé lorsque le dispositif contenant les contacts est activé et un contact à ouverture retardée lorsque le dispositif n'est plus activé	EXAMPLE: Contact assembly with one make contact not delayed, one make contact delayed when the device containing the contact is being activated and one break contact delayed when the device containing the contact is being de-activated

Section 6 — Contacts à retour automatique et à position maintenue

Section 6 — Automatic return and non-automatic return contacts

6.1 Les règles des symboles 07-01-07 et 07-01-08 sont applicables.

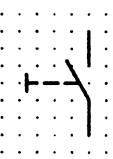
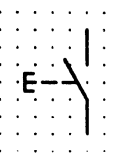
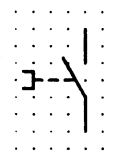
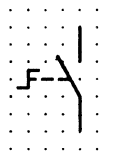
6.1 The rules with symbols 07-01-07 and 07-01-08 apply.

No.	Symbole Symbol	Légende	Description
07-06-01		Contact à fermeture, à retour automatique	Make contact with automatic return
07-06-02		Contact à fermeture, sans retour automatique Contact à fermeture, à position maintenue	Make contact with automatic return Stay put make contact
07-06-03		Contact à ouverture, à retour automatique	Break contact with automatic return
07-06-04		Contact à deux directions avec position médiane de coupure, à retour automatique d'une position figurée à gauche et sans retour automatique dans la position opposée	Two-way contact with off-position in the centre and automatic return from one position (shown to the left), and without automatic return in the opposite position

Chapitre III: Auxiliaires de commande, appareils mécaniques de connexion et démarreurs

- III.1 Les appareils à action “pousser” ou “tirer” sont le plus souvent à retour automatique. Il n’est donc pas nécessaire de compléter leur symbole par celui de retour automatique (02-12-07). En revanche, le symbole de crantage (02-12-08) doit être figuré dans les cas où un dispositif de non-retour existe.
- III.2 Les appareils commandés par rotation ne sont pas, le plus souvent, à retour automatique. Il n’est donc pas nécessaire de compléter leur symbole par celui de crantage (02-12-08). En revanche, il convient que le symbole de retour automatique (02-12-07) soit figuré dans les cas où un retour automatique existe.

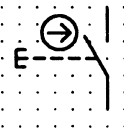
Section 7 — Commutateurs unipolaires

No.	Symbole	Symbol	Légende	Description
07-07-01			Contact à fermeture à commande manuelle, symbole général	Manually operated switch, general symbol
07-07-02			Interrupteur à bouton-poussoir à fermeture et à retour automatique	Push-button switch make contact and automatic return
07-07-03			Interrupteur à tirette, comportant un contact à fermeture et à retour automatique	Pull-switch with make contact and automatic return
07-07-04			Interrupteur à bouton rotatif, comportant un contact à fermeture sans retour automatique	Turn-switch with make contact without automatic return

Chapter III: Switches, switchgear and starters

- III.1 Devices with “push” or “pull” operation most often have automatic return. It is therefore not necessary to show the automatic return symbol (02-12-07). On the other hand, a detent symbol (02-12-08) shall be shown in those cases where non-return exists.
- III.2 Devices operated by turning do not usually have automatic return. It is therefore not necessary for the detent symbol (02-12-08) to be shown. On the other hand, the automatic return symbol (02-12-07) should be shown in those cases where an automatic return exists.

Section 7 — Single-pole switches

No.	Symbole Symbol	Légende	Description
07-07-05		Interrupteur à bouton-poussoir, comportant un contact à fermeture à manoeuvre positive de fermeture (par exemple: alarme)	Push-button switch with positive operation of the make contact (for example: alarm)
07-07-06		Interrupteur d'arrêt d'urgence (actionné par bouton type "coup de poing"), comportant un contact à ouverture, et à position maintenue, à manoeuvre positive d'ouverture	Emergency stop switch ("mushroom-head" activated) with positive opening operation of the break contact and maintain position

Section 8 — Interrupteurs de position

Si, dans un ensemble de contacts, l'un ou plusieurs d'entre eux sont construits pour avoir une manoeuvre positive, la positivité peut concerner:

- soit l'ouverture de contact(s) à ouverture (par exemple 07-08-04: Interrupteur de position et 07-07-06: Interrupteur d'arrêt d'urgence), ou la fermeture d'un contact à fermeture (par exemple 07-07-05: Alarme), et
- soit tous les contacts, soit seulement des contacts particuliers (voir par exemple 07-13-14) mais
- pas à la fois l'ouverture *et* la fermeture d'un même contact.

Section 8 — Position switches

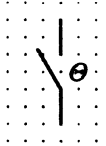
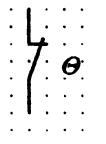
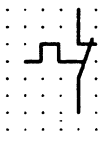
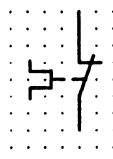
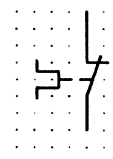
Where in a set of contacts one or some of the them are constructed to have positive opening operation this positivity may concern:

- either the opening of break contact(s) (for example 07-08-04: Position switch and 07-07-06: Emergency stop switch) or the closing of a make contact (for example 07-07-05: Alarm) and
- either all the contacts or only particular contacts (see for example 07-013-14) but
- not both the opening *and* the closing of the same contact.

No.	Symbole Symbol	Légende Description	Description
07-08-01		Interrupteur de position, contact à fermeture	Position switch, make contact
07-08-02		Interrupteur de position, contact à ouverture	Position switch, break contact
07-08-03		Interrupteur de position à deux circuits distincts actionné mécaniquement dans les deux sens	Position switch, mechanically operated in both directions with two separate circuits
07-08-04		Interrupteur de position comportant un contact à ouverture à manoeuvre positive d'ouverture	Position switch with positive opening operation of the break contact

Section 9 — Interrupteurs fonctionnant sous l'effet de la température

Section 9 — Temperature sensitive switches

No.	Symbole Symbol	Légende Description	Description
07-09-01		Interrupteur fonctionnant sous l'effet de la température, contact à fermeture θ peut être remplacé par les valeurs de température de fonctionnement	Temperature sensitive switch, make contact θ may be replaced by the operating temperature conditions
07-09-02		Interrupteur fonctionnant sous l'effet de la température, contact à ouverture La note du symbole 07-09-01 est applicable	Temperature sensitive switch, break contact The note with symbol 07-09-01 applies
07-09-03		Interrupteur agissant par effet thermique direct (par exemple, bilame) contact à ouverture Il est important d'établir une distinction entre le contact ainsi représenté et le contact d'un relais thermique, pouvant être ainsi figuré en représentation développée:	Self-operating thermal switch (for example, bimetal) break contact It is important to distinguish between a contact as shown and a contact of a thermal relay, which in detached representation may be shown as follows:
			
07-09-04		Tube à gaz avec bilame Starter pour lampe fluorescente	Gas discharge tube with thermal element Starter for fluorescent lamp