

Basic and safety principles for man-machine interface, marking and identification — Actuating principles

The European Standard EN 60447:2004 has the status of a
British Standard

ICS 29.020

National foreword

This British Standard is the official English language version of EN 60447:2004. It is identical with IEC 60447:2004. It supersedes BS EN 60447:1994 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/16, Terminal marking and other identifications, which has the responsibility to:

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 23 and a back cover.

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English version

**Basic and safety principles for man-machine interface,
marking and identification –
Actuating principles
(IEC 60447:2004)**

Principes fondamentaux et de sécurité
pour l'interface homme-machine,
le marquage et l'identification –
Principes de manoeuvre
(CEI 60447:2004)

Grund- und Sicherheitsregeln
für die Mensch-Maschine-Schnittstelle,
Kennzeichnung –
Bedienungsgrundsätze
(IEC 60447:2004)

This European Standard was approved by CENELEC on 2004-03-01. 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

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Foreword

The text of document 16/419/FDIS, future edition 3 of IEC 60447, prepared by IEC TC 16, Basic and safety principles for man-machine interface, marking and identification, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60447 on 2004-03-01.

This European Standard supersedes EN 60447:1993.

This European Standard includes the following significant changes with respect to EN 60447:1993:

- requirements concerning rotating actuators have been added;
- requirements concerning work with display screen equipment have been added.

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) 2004-12-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2007-03-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60447:2004 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

ISO 9241-15	NOTE	Harmonized as EN ISO 9241-15:1997 (not modified).
ISO 9241-17	NOTE	Harmonized as EN ISO 9241-17:1998 (not modified).
ISO 11064-1	NOTE	Harmonized as EN ISO 11064-1:2000 (not modified).
ISO 11064-2	NOTE	Harmonized as EN ISO 11064-2:2000 (not modified).
ISO 11064-3	NOTE	Harmonized as EN ISO 11064-3:1999 (not modified).

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INTRODUCTION

This basic safety publication is intended for use by technical committees in the preparation of standards; it is not intended to be used on its own except in the absence of such standards.

Where no safety consideration is involved, the relevant technical committee may permit specific exclusions within the framework of this basic safety publication, and according to the rules given in IEC Guide 104 and ISO/IEC Guide 51.

Different kinds of actuators enable electrical equipment and processes to be operated and maintained under normal and fault conditions.

In modern equipment, the moving of an actuator in a certain direction is only one method of actuation. In addition, actuators or data input devices arranged in the form of function or alphanumeric keyboards, or other kinds of actuator (e.g. light pen, touch sensitive screen, mouse), are in general use for computerized equipment.

Actuators as a part of the man-machine interface may have a different importance in the dialogue between the operator and the equipment or machine.

Standardization is especially important where safety is concerned (e.g. where an incorrect actuation may cause damage, or where a frequent or rapid actuation is necessary, such as in the operation of cranes or transport vehicles), and is particularly necessary in the case of equipment likely to be operated by unskilled persons.

Ergonomic aspects should also be taken into account.

BASIC AND SAFETY PRINCIPLES FOR MAN-MACHINE INTERFACE, MARKING AND IDENTIFICATION – ACTUATING PRINCIPLES

1 Scope

This International Standard establishes general actuating principles for manually operated actuators forming part of the man-machine interface associated with electrical equipment, in order to:

- increase the safety (e.g. of persons, property, environment) through the safe operation of the equipment;
- facilitate the proper and timely operation of the actuators.

These principles apply, not only for the operation of electrical equipment, machines, or complete plant under normal conditions, but also under fault or emergency conditions.

This standard is for general application, from simple cases such as single actuators (e.g. push-buttons) to multiple actuators, forming part of a large assembly of electrical and non-electrical equipment, or part of a central process control station.

This standard establishes correlations between the function of an actuator and its direction of actuating or location in relation to other actuators.

In the absence of particular rules, this standard may also be applied to actuators operated by a part of the human body other than the hand (e.g. to foot-operated devices).

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 60050(721), *International Electrotechnical Vocabulary (IEV) – Chapter 721: Telegraphy, facsimile and data communication*

IEC 60073, *Basic and safety principles for man-machine interface, marking and identification – Coding principles for indicators and actuators*

IEC Guide 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

actuator

part of the actuating system which receives a human actuating action

NOTE 1 The actuator may take the form of a handle, knob, push-button, push-push button, push-pull button, roller, plunger, mouse, light pen, keyboard, touch sensitive screen.

NOTE 2 The definition of an actuator is based on IEC 441-15-22 and, for the purposes of this standard, is narrowed to human actuation.

3.1.1

monofunction actuator

one or a set of actuators correlated to one final effect (e.g. by direction of movement, or by disposition of actuators)

3.1.2

multifunction actuator

one or a set of actuators alternately correlated to different final effects (e.g. by direction of movement, or by disposition of actuators)

3.2

keyboard

arrangement of keys (typing or function keys) laid out in a specified manner

3.2.1

numeric keyboard

arrangement of keys representing numerals

3.2.2

alphanumeric keyboard

arrangement of keys representing a set of characters, e.g.:

- letters of the latin alphabet (A to Z);
- digits (0 to 9);
- non-printing graphic space;
- punctuation signs and other graphics, as required

3.2.3

function keyboard

arrangement of keys representing certain equipments, machines, functions or commands

3.3

man-machine interface (MMI)

parts of the equipment intended to provide a direct means of communication between the operator and the equipment, and which enable the operator to control and monitor the operation of the equipment

NOTE Such parts may include manually operated actuators, indicators and screens.