

CEI EN IEC 60445**2022-07**

La seguente Norma è identica a: EN IEC 60445:2021-09.

*Titolo***Principi fondamentali e di sicurezza per l'interfaccia uomo-macchina, la marcatura e l'identificazione - Identificazione dei morsetti delle apparecchiature, delle estremità dei conduttori e dei conduttori***Title***Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals, conductor terminations and conductors***Sommario*

Questa Norma è relativa all'identificazione e alla marcatura dei morsetti di apparecchiature elettriche quali resistori, fusibili, relè, contattori, trasformatori, macchine elettriche rotanti e, ove applicabile, a combinazioni di tali apparecchiature (ad esempio, assiemmi) e all'identificazione delle estremità di alcuni conduttori designati.

La Norma fornisce inoltre regole generali per l'utilizzo di determinati colori o notazioni alfanumeriche al fine di identificare i conduttori con l'obiettivo di evitare ambiguità e garantire un funzionamento sicuro.

Questi colori o le notazioni alfanumeriche dei conduttori sono applicati nei cavi, conduttori, sbarre, apparecchiature ed impianti elettrici.

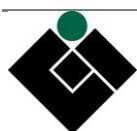
Le modifiche più significative di questa edizione rispetto alla precedente riguardano:

- lo spostamento del testo dell'introduzione nel campo di applicazione (in accordo alla Guida IEC 104);
- la definizione dei codici dei colori per l'identificazione dei conduttori dei sistemi in c.c.;
- la definizione del codice del colore per l'identificazione del conduttore di terra funzionale;
- l'aggiornamento della Tabella A.1 con i codici dei colori per i conduttori dei sistemi in c.c.;
- l'allineamento della terminologia alla IEC 60050-195.

La Norma in oggetto sostituisce completamente l'edizione precedente, Norma CEI EN 60445 (16055E:2018-03; 16503:2018-10) che rimane applicabile fino al 20-08-2024.

Questa Norma viene pubblicata dal CEI nella sola lingua inglese in quanto particolarmente mirata a settori specialistici.

La presente Norma recepisce il testo originale inglese della Pubblicazione IEC.



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EUROPÄISCHE NORM

September 2021

ICS 01.080.20; 13.110; 29.020

Supersedes EN 60445:2017 and all of its amendments
and corrigenda (if any)

English Version

**Basic and safety principles for man-machine interface, marking
and identification - Identification of equipment terminals,
conductor terminations and conductors
(IEC 60445:2021)**

Principes fondamentaux et de sécurité pour les interfaces
hommes-machines, le marquage et l'identification -
Identification des bornes de matériels, des extrémités de
conducteurs et des conducteurs
(IEC 60445:2021)

Grund- und Sicherheitsregeln für die Mensch-Maschine-
Schnittstelle - Kennzeichnung von Anschlüssen elektrischer
Betriebsmittel, angeschlossenen Leiterenden und Leitern
(IEC 60445:2021)

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 60445:2021 (E)

European foreword

The text of document 3/1491/FDIS, future edition 7 of IEC 60445, prepared by IEC/TC 3 “Documentation, graphical symbols and representations of technical information” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60445:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2022-05-20 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2024-08-20 document have to be withdrawn

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The text of the International Standard IEC 60445:2021 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:

IEC 60079-11 NOTE Harmonized as EN 60079-11

IEC 60757 NOTE Harmonized as HD 457 S1

IEC 61666:2010 NOTE Harmonized as EN 61666:2010 (not modified)

IEC 62491 NOTE Harmonized as EN 62491

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60417	-	Graphical symbols for use on equipment	-	-
IEC 60617	-	Graphical symbols for diagrams	-	-



IEC 60445

Edition 7.0 2021-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors

Principes fondamentaux et de sécurité pour les interfaces homme-machine, le marquage et l'identification – Identification des bornes de matériels, des extrémités de conducteurs et des conducteurs



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IEC 60445

Edition 7.0 2021-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors

Principes fondamentaux et de sécurité pour les interfaces homme-machine, le marquage et l'identification – Identification des bornes de matériels, des extrémités de conducteurs et des conducteurs

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**BASIC AND SAFETY PRINCIPLES FOR MAN-MACHINE
INTERFACE, MARKING AND IDENTIFICATION –
IDENTIFICATION OF EQUIPMENT TERMINALS,
CONDUCTOR TERMINATIONS AND CONDUCTORS**

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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IEC 60445 has been prepared by IEC technical committee 3: Documentation, graphical symbols and representations of technical information. It is an International Standard.

It has the status of a basic safety publication in accordance with IEC Guide 104.

This seventh edition cancels and replaces the sixth edition published in 2017. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the definitions have been aligned with IEC 60050-195:2021 and IEC 60050-826:—¹;

¹ Third edition under preparation. Stage at time of publication: IEC FDIS 60050-826:2021.

- b) the provisions for colour to be used for identification of certain designated conductors are made requirements and not only recommendations;
- c) introduction of a new subclause on marking of protective terminals for multiple power supply inputs on equipment.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
3/1491/FDIS	3/1517/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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BASIC AND SAFETY PRINCIPLES FOR MAN-MACHINE INTERFACE, MARKING AND IDENTIFICATION – IDENTIFICATION OF EQUIPMENT TERMINALS, CONDUCTOR TERMINATIONS AND CONDUCTORS

1 Scope

This document applies to the identification and marking of terminals of electrical equipment such as resistors, fuses, relays, contactors, transformers, rotating machines and, wherever applicable, to combinations of such equipment (e.g. assemblies), and it also applies to the identification of terminations of certain designated conductors. It also provides general rules for the use of certain colours or alphanumeric notations to identify conductors with the aim of avoiding ambiguity and ensuring safe operation. These conductor colours and alphanumeric notations are intended to be applied on cores, busbars, and electrical equipment, and in cables or installations.

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