IEC 62648

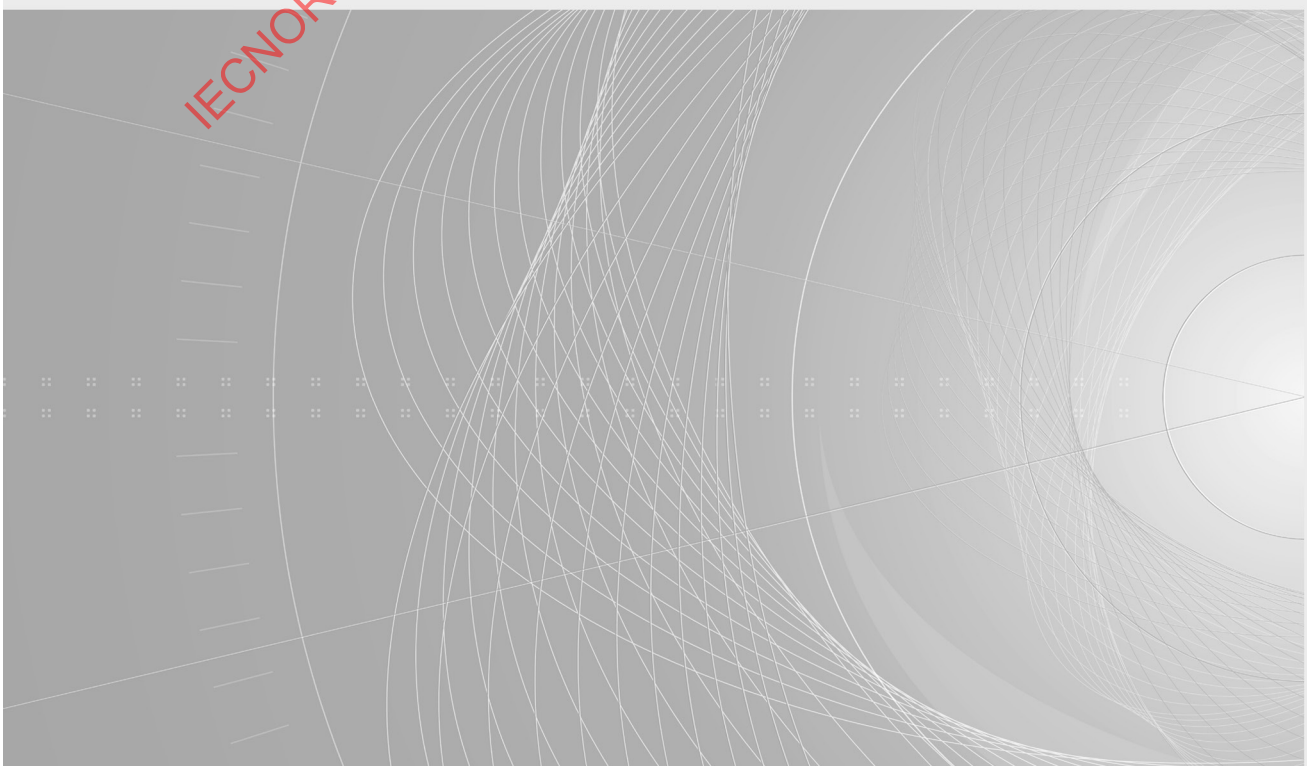
Edition 2.0 2022-09

INTERNATIONAL STANDARD

colour inside

HORIZONTAL PUBLICATION

Graphical symbols for use on equipment – Guidelines for the inclusion of graphical symbols in iec publications



IEC 62648:2022-09(en)

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC 62648

Edition 2.0 2022-09

INTERNATIONAL STANDARD

colour inside

HORIZONTAL PUBLICATION

Graphical symbols for use on equipment – Guidelines for the inclusion of graphical symbols in iec publications

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 01.080.40

ISBN 978-2-8322-5709-8

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

GRAPHICAL SYMBOLS FOR USE ON EQUIPMENT – GUIDELINES FOR THE INCLUSION OF GRAPHICAL SYMBOLS IN IEC PUBLICATIONS

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62648 has been prepared by subcommittee 3C: Graphical symbols for use on equipment, of IEC technical committee 3: Documentation, graphical symbols and representations of technical information. It is an International Standard.

This second edition cancels and replaces the first edition published in 2012 and Amendment 1:2015. This edition constitutes a technical revision.

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

a) new terms and definitions in IEC Guide 108 have been incorporated;
b) the designation "IEC 60417 SDB" has been introduced following the publication of IEC Supplement:2022, Annex SK;
c) Subclause 6.3 has been adapted in line with IEC Guide 108:2019, Clause 8.

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

Draft	Report on voting
3C/2497/CDV	3C/2525/RVC

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

It has the status of a horizontal publication in accordance with IEC Guide 108.

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/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

A graphical symbol is defined as a visually perceptible figure with a particular meaning used to transmit information independently of language. Graphical symbols are used on equipment for a wide range of purposes. The understanding of such symbols can be improved by consistent design. This is particularly important where families of symbols are used in one location or on similar equipment. Good design also helps to maintain the legibility of graphical symbols when they are reduced to small dimensions for application. Thus, there is a need for those involved in technical works to collaborate with experts in subcommittee 3C: Graphical symbols for use on equipment, of IEC technical committee 3: Documentation, graphical symbols and representations of technical information (SC 3C) responsible for developing and maintaining graphical symbols for use on equipment to be standardized in the horizontal publication IEC 60417.

This document is intended for IEC committees working on graphical symbols for use on equipment to be included in their product publications. It provides them with guidelines and requirements on how to create their own graphical symbols for use on equipment as well as on how to consult SC 3C so that these symbols are also included in advance or in parallel in IEC 60417.

This document provides commonly agreeable procedures in SC 3C and in other committees developing product publications, including graphical symbols for use on equipment in accordance with IEC Guide 108.

GRAPHICAL SYMBOLS FOR USE ON EQUIPMENT – GUIDELINES FOR THE INCLUSION OF GRAPHICAL SYMBOLS IN IEC PUBLICATIONS

1 Scope

This document provides guidelines to help ensure that the requirement in ISO/IEC Directives, Part 2:2021, 28.6.2 is met, such that graphical symbols for use on equipment in IEC product publications are consistent with the requirements of horizontal publications IEC 60417, and ISO 7000. This document is intended to be used by any IEC and ISO committees to develop graphical symbols for use on equipment for inclusion in their product publications.

This document is based on and develops upon IEC Guide 108:2019, Clause 8.

For the creation of new graphical symbols for use on equipment, IEC 80416-1 and ISO 80416-2 are applied. For the application of standardized graphical symbols for use on equipment, IEC 80416-3 and ISO 80416-4 are applied.

This horizontal publication is primarily intended for use by committees in the preparation of publications in accordance with the principles laid down in IEC Guide 108.

One of the responsibilities of a committee is, wherever applicable, to make use of horizontal publications in the preparation of its publications. The contents of this horizontal publication will not apply unless specifically referred to or included in the relevant publications.

2 Normative references

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.

IEC 60417, *Graphical symbols for use on equipment*, available at http://www.graphical-symbols.info/equipment

IEC 80416-1:2008, *Basic principles for graphical symbols for use on equipment – Part 1: Creation of graphical symbols for registration*

IEC 80416-3, *Basic principles for graphical symbols for use on equipment – Part 3: Guidelines for the application of graphical symbols*

IEC Guide 108:2019, *Guidelines for ensuring the coherence of IEC publications – Horizontal functions, horizontal publications and their application*

ISO/IEC Directives Part 1:2022, *Procedures for the technical work*

ISO/IEC Directives Part 2:2021, *Principles and rules for the structure and drafting of ISO and IEC documents*

ISO/IEC Directives, Supplement:2022, *Procedures specific to IEC*

ISO 3864-1, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings*

ISO 7000, *Graphical symbols for use on equipment,* available at http://www.graphical-symbols.info/equipment

ISO 7010, *Graphical symbols – Safety colours and safety signs – Registered safety signs,* available at https://www.iso.org/obp

ISO 80416-2, *Basic principles for graphical symbols for use on equipment – Part 2: Form and use of arrows*

ISO 80416-4, *Basic principles for graphical symbols for use on equipment – Part 4: Guidelines for the adaptation of graphical symbols for use on screens and displays (icons)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC Guide 108, ISO/IEC Directives Part 1, ISO/IEC Directives Part 2, ISO/IEC Directives IEC Supplement, and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
equipment
associated assemblies intended to achieve a defined final objective

[SOURCE: IEC 80416-1:2008, 3.3]

3.2
graphical symbol
visually perceptible figure with a particular meaning used to transmit information independently of language

[SOURCE: IEC 80416-1:2008, 3.4]

3.3
graphical symbol for use on equipment
graphical symbol for use on associated assemblies intended to achieve a defined final objective

3.4
safety related graphical symbol
graphical symbol for use on equipment that conveys a message with a relation to personal and/or equipment safety and that is not qualified as a safety sign, e.g. because the related risk is comparatively low

Note 1 to entry: A safety related graphical symbol may, e.g., express a prohibition (Do not ... !) or a warning related to a specific hazard (Caution! ...); however it is not required to use the safety colours and shapes according to ISO 3864-1. A safety related graphical symbol may be standardized in IEC 60417 or ISO 7000.

3.5
safety sign
sign which gives a general safety message, obtained by a combination of colour and geometric shape and which, by the addition of a graphical symbol, gives a particular safety message

[SOURCE: ISO 17724:2003, 68]

3.6
safety symbol
graphical symbol used together with a safety colour and safety shape to form a safety sign

[SOURCE: ISO 17724:2003, 69]

3.7
danger
signal word used to indicate an imminently hazardous situation which, if not avoided, may result in death or serious injury

[SOURCE: ISO 17724:2003, 18]

3.8
warning
signal word used to indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury

[SOURCE: ISO 17724:2003, 84]

3.9
caution
signal word used to indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damage to the equipment

[SOURCE: ISO 17724:2003, 6, modified – The phrase "or damage to the equipment" has been added.]

3.10
signal word
word that calls attention to a potentially or imminently hazardous situation

[SOURCE: ISO 17724:2003, 73]

3.11
icon
graphical symbol presented on a screen or display

Note 1 to entry: Icons can be static and interactive and change as the result of user input, or dynamic and change as the result of equipment status.

[SOURCE: ISO 80416-4:2005, 3.3]

3.12
horizontal publication
document dealing with a subject relevant to a number of committees and of crucial importance to ensure the coherence amongst publications

[SOURCE: IEC Guide 108:2019, 3.1.3]

3.13
product publication
document covering a specific product or family of related products within the scope of a single product committee

[SOURCE: IEC Guide 108:2019, 3.1.4]

3.14
change request
CR
proposal to add, to change or to withdraw one or more graphical symbols for use on equipment in IEC 60417 SDB

Note 1 to entry: A CR shall be prepared by filling in the CR form given in the URL shown in Annex C.

Note 2 to entry: A CR should normally be linked to data describing graphical symbols by filling in the form given in Annex C.

[SOURCE: ISO/IEC Directives, IEC Supplement:2022, SK.3.1.10, modified – The words "data elements in an SDB" have been replaced by "graphical symbols for use on equipment in IEC 60417 SDB", Notes 1 and 2 to entry have been replaced by different Notes 1 and 2 to entry (see SK.4.1.3).]

3.15
SDB team
SDB team for IEC 60417
permanent group of experts appointed by and acting as delegates on behalf of their National Committees at the evaluation stage and validation stage

[SOURCE: ISO/IEC Directives, IEC Supplement:2022, SK.3.3.3, modified – In accordance with Note 1 to entry to SK.3.3.3, the name "SDB team for IEC 60417" has been added to the term. The term "National Bodies" has been replaced by "National Committees" and Note 1 to entry omitted.]

3.16
hard procedure
set of rules and guidelines to be followed in order for graphical symbols for use on equipment to be standardized in IEC 60417 or in ISO 7000 and to be referred to in IEC publications, i.e., provisions in relevant parts of ISO/IEC Directives and IEC Guide 108

3.17
soft procedure
set of rules and guidelines to be followed in order for graphical symbols for use on equipment to be designed, and for standardized graphical symbols for use on equipment to be applied and be adapted as icons, i.e., provisions in relevant parts of IEC 80416-1, ISO 80416-2, IEC 80416-3 and ISO 80416-4

4 Basic requirement for graphical symbols for use on equipment to be included in IEC publications

Graphical symbols for use on equipment included in IEC publications shall be in accordance with IEC 60417 and ISO 7000. To meet this requirement, the provisions given in Clause 5 of this document shall be followed.

Annex A provides hard and soft procedures to be followed, Annex B provides requirements and examples of the applications of graphical symbols for use on equipment, and Annex C provides a URL for forms, together with visual images, to propose change requests to IEC 60417 SDB.

5 Principal guidelines

5.1 General

The method of referring to graphical symbols for use on equipment in IEC publications shall be in accordance with IEC 80416-3. Regarding the designation systems of graphical symbols for use on equipment, IEC 80416-1:2008, Annex C, shall apply.

5.2 Coherency of graphical symbols for use on equipment

All graphical symbols for use on equipment within product publications shall be coherent without contradictions. For this purpose, the IEC and ISO corpus of graphical symbols for use on equipment has been standardized and maintained in the horizontal publication IEC 60417, and ISO 7000. Therefore, all committees shall consult IEC 60417 and ISO 7000 in advance of drafting any graphical symbols for use on equipment for their own purpose to be included in product publications.

6 Responsibilities of product committees using horizontal publication IEC 60417

6.1 General

Product committees shall determine whether the horizontal publication IEC 60417 is relevant to their work, and establish and maintain liaison with IEC 60417 SDB owner committee (SC 3C) for preparing and maintaining IEC 60417 SDB.

Product committees shall indicate their interest in change requests for IEC 60417 SDB to IEC 60417 SDB owner committee (SC 3C) and are encouraged to contribute to the development of the new CR.

6.2 Application of horizontal publication IEC 60417

Product committees, when preparing, amending, or revising publications, shall make use of graphical symbols for use on equipment in IEC 60417 SDB in line with their intended use. They may select from such graphical symbols for use on equipment in IEC 60417 SDB specific to their area, but shall not modify them except as specified in 6.3 or in agreement with the provisions given in IEC 80416-3.

Where a product committee incorporates in its product publication, an amended version of a graphical symbol in IEC 60417 SDB in accordance with 6.3, a note in the foreword shall indicate the changes which have been made.

If it is not practicable for a product committee to immediately align an existing publication with the graphical symbols for use on equipment, alignment shall be carried out when the product publication is next amended or revised.

6.3 New change requests to SDB owner committee for IEC 60417 (SC 3C)

A product committee may have a need for a graphical symbol for use on equipment that is not adequately covered in IEC 60417 SDB. In this case, the product committee shall submit change requests to SDB owner committee for IEC 60417 (SC 3C), including a suggested date for release of graphical symbols.

The proposals will be considered by SDB owner committee for IEC 60417 (SC 3C), as detailed in ISO/IEC Guide 108:2019, 7.2.

The product committee in cooperation with SDB owner committee for IEC 60417 (SC 3C) may develop product publications including the graphical symbols for use on equipment in the following cases:

– SDB owner committee for IEC 60417 (SC 3C) does not accept the proposal for change request; or
– SDB owner committee for IEC 60417 (SC 3C) accepts the work but is unable to offer a graphical symbol by a date acceptable to the product committee; or
– a product committee does not consider that the graphical symbol for use on equipment provided by IEC 60417 SDB is suitable for incorporation in its publication and informs SDB owner committee for IEC 60417 (SC 3C) of the reasons.

In these cases, all relevant documents generated shall be provided to SDB owner committee for IEC 60417 (SC 3C).

Annex A
(normative)

Hard and soft procedures

A.1 General

As far as graphical symbols for use on equipment are concerned, every IEC (and ISO) document drafted in accordance with the ISO/IEC Directives, Part 2:2021, shall follow the requirement in the first paragraph of ISO/IEC Directives, Part 2:2021, 28.6.2. Namely, "Graphical symbols for use on equipment shall be in accordance with IEC 60417 and ISO 7000".

The following two types of procedures shall be followed to meet the above-mentioned requirement:

a) Hard procedures according to ISO/IEC Directives, Part 2:2021, 28.6.2, ISO/IEC Directives, IEC Supplement:2022, Annex SK and IEC Guide 108; and

b) Soft procedures according to IEC 80416-1 and ISO 80416-2.

A.2 Hard procedures

Hard procedures are the relevant rules and guidelines which shall be followed for graphical symbols for use on equipment to be included in IEC documents and IEC publications. Questions and associated answers in Table A.1 provide a step-by-step approach.

Table A.1 – Step-by-step approach to the hard procedures

Step	Questions	Answers	
1	Do you plan for graphical symbols for use on equipment to be included in IEC documents?	Yes. Continue to step 2.	No. [termination]
2	Are they found in IEC 60417 or ISO 7000?	No. Continue to step 3.	Yes. Use them in accordance with – IEC 80416-3, in the case of normal use (including: negate, fill, rotate); – ISO 80416-4, in the case of icons; – IEC 80416-1:2008, 7.9, in the case of negation. See also Table B.3. [termination]
3	Have you coordinated with IEC TC 3/SC 3C (IEC 60417 SDB owner committee) or with ISO TC 145/SC 3 (maintaining ISO 7000)?	No. Follow the soft procedures in Clause A.3.	Yes. Relevant Committees and SDB team / Maintenance Teams take necessary action. [termination]

For execution of the hard procedures, IEC 60417 SDB owner committee (IEC TC 3/SC 3C) responsible for maintenance of IEC 60417 SDB and ISO TC 145/SC 3 responsible for maintenance of ISO 7000 are involved. In the case of IEC 60417 SDB, VT 60417, and if required maintenance team 60417, together with relevant committees are major players.

A.3 Soft procedures

A.3.1 General

Soft procedures are the relevant rules and guidelines which shall be followed for

– new graphical symbols for use on equipment to be designed, and
– existing graphical symbols for use on equipment in IEC 60417 SDB or ISO 7000 to be applied and adapted as icons.

A.3.2 Soft procedures for designing new graphical symbols

In order to design new graphical symbols for use on equipment to be coordinated with the committees responsible for maintenance of IEC 60417 SDB or ISO 7000, IEC 80416-1 and ISO 80416-2 shall be followed.

Requirements in ISO 7010 on the use of the equilateral triangle as a surrounding shape shall be adhered to. See also examples in Annex B.

A graphical symbol element of the equilateral triangle as a surrounding shape shall only be allowed for safety related graphical symbols. Whether or not such graphical symbols fall within the definition of a safety related graphical symbol shall be decided by the IEC 60417 SDB manager and maintenance team 60417 with the help of relevant committees, if necessary, in collaboration with the committee developing such graphical symbols.

A combination of a circle and a slanted bar in any colour shall not be a constituting part of graphical symbols for use on equipment according to IEC 80416-1:2008, 7.9.4.

A unique title and description for each newly designed graphical symbol shall be prepared in accordance with IEC 80416-1 using the form given in Annex C. The title shall simply be a name to allow the symbol to be mentioned and discussed and shall be a noun or a noun phrase. The description shall define a meaning of the newly designed graphical symbol for use on equipment. The description of the symbol shall be prepared in accordance with IEC 80416-1:2008, Annex A.

A.3.3 Soft procedures for using existing graphical symbols

For the application of existing graphical symbols for use on equipment such as when they are being included in and/or being referenced in IEC publications, IEC 80416-3 shall be followed.

For the adaptation of existing graphical symbols for use on equipment such as for use on screens and displays (icons), ISO 80416-4 shall be followed.

Annex B
(normative)

Requirements and examples of applications of graphical symbols for use on equipment

B.1 General

Annex B provides requirements and examples for the inclusion of graphical symbols in IEC publications by way of examples and illustrates the difference between graphical symbols for use on equipment, safety symbols and safety signs. Safety signs deliver safety messages, such as "danger", "warning" and "caution".

Some safety signs are composed of graphical symbols for use on equipment together with the safety shape and safety colour; such graphical symbols for use on equipment are called safety symbols.

In the creation and inclusion of new graphical symbols for use on equipment, they shall fall within the scope of IEC 60417 and ISO 7000.

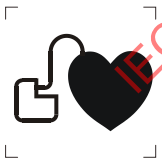
B.2 Examples

B.2.1 Examples of graphical symbols for use on equipment and safety signs

The graphical symbols for use on equipment shown in the left-hand column of Table B.1 have been standardized in IEC 60417 SDB or ISO 7000 and comply with IEC 80416-1. The safety signs in the right-hand column have been standardized in ISO 7010 and comply with ISO 3864-1 using graphical symbols for use on equipment as safety symbols.

Table B.1 shows examples of the relationships between IEC 60417-5937 and ISO 7010-P007; IEC 60417-5582 and ISO 7010-P026; IEC 60417-5036 and ISO 7010-W012; IEC 60417-5140 and ISO 7010-W005; and IEC 60417-5019 and ISO 7010-M005.

Table B.1 – Examples of graphical symbols for use on equipment as safety symbols to form safety signs

Graphical symbol for use on equipment	Safety sign
 IEC 60417-5937 (2006-08), modified: Cardiac pacemaker; implantable cardioverter defibrillator On medical equipment. To indicate a reference to an active implantable cardiovascular device, for example, cardiac pacemaker or implantable cardioverter defibrillator (ICD). In case of application as a safety sign, the rules according to ISO 3864-1 shall be adhered to. [SOURCE: IEC 60417-5937, modified - The preamble "Notes" is deleted and the remaining text is placed as an additional part of the description.]	 ISO 7010-P007 (2011-05) No access for people with active implanted cardiac devices. To prohibit people with active implanted cardiac devices from entering a designated area.

Graphical symbol for use on equipment	Safety sign
 IEC 60417-5582 (2002-10): Suitable for use in a bath or shower To identify electrical appliances, for example wet shavers, which are suitable for use in a bath or shower. NOTE See also the symbol IEC 60417-5574.	 ISO 7010-P026 (2011-05) Do not use this device in a bathtub, shower or water-filled reservoir. To prohibit the use of unsuitable electrical equipment in or near water.
 IEC 60417-5036 (2002-10), modified: Dangerous voltage To indicate hazards arising from dangerous voltages. In case of application in a warning sign the rules according to ISO 3864 shall be adhered to. [SOURCE: IEC 60417-5036, modified - The preamble "Notes" is deleted and the remaining text is placed as an additional part of the description.]	 ISO 7010-W012 (2011-05) Warning; Electricity To warn of electricity.
 IEC 60417-5140 (2003-04), modified: Non-ionizing electromagnetic radiation To indicate generally elevated, potentially hazardous, levels of non-ionizing radiation, or to indicate equipment or systems e.g. in the medical electrical area that include RF transmitters or that intentionally apply RF electromagnetic energy for diagnosis or treatment. In case of application in a warning sign the rules according to ISO 3864 shall be adhered to. [SOURCE: IEC 60417-5140, modified - The preamble "Notes" is deleted and the remaining text is placed as an additional part of the description.]	 ISO 7010-W005 (2011-05) Warning; Non-ionizing radiation To warn of non-ionizing radiation.
 IEC 60417-5019 (2006-08): Protective earth; protective ground To identify any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.	 ISO 7010-M005 (2011-05) Connect an earth terminal to the ground To signify that an earth terminal must be connected.

Safety signs shall be used only for instructions which are related to the safety and health of people.

Graphical symbols for use on equipment are standardized in IEC 60417 SDB and safety signs are standardized in ISO 7000 for references to and inclusion in IEC publications, if required, in accordance with IEC 80416-3. All safety signs are standardized in ISO 7010.

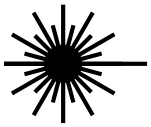
B.2.2 Examples of safety related graphical symbols for use on equipment and safety signs

Some graphical symbols for use on equipment standardized in IEC 60417 SDB relating to safety aspects (safety related graphical symbols) have been used as safety symbols to compose safety signs, which are standardized in ISO 7010 with a special shape and colour.

An example of a safety related graphical symbol for use on equipment to convey the message of "Caution" standardized in IEC 60417 SDB is shown in the left-hand column of Table B.2. The similar shaped graphical symbol in the right-hand column of Table B.2 has been standardized in ISO 7010 to convey the message of "Warning".

All safety related graphical symbols for use on equipment shall be standardized in IEC 60417 SDB (or ISO 7000) for references to and inclusion in IEC publications, if required, in accordance with IEC 80416-3. All safety signs are to be standardized in ISO 7010.

Table B.2 – Examples of safety related graphical symbols for use on equipment and safety signs

Safety related graphical symbol for use on equipment	Safety sign
 IEC 60417-5041 (2002-10): Caution, hot surface To indicate that the marked item can be hot and should not be touched without taking care. NOTE 1 The inner symbol is standardized in ISO 7000-0535 "Transfer of heat, general". NOTE 2 Warning signs are standardized in ISO 3864.	 ISO 7010-W017 (2011-05): Warning; Hot surface To warn of a hot surface.
 IEC 60417-5152 (2002-10), modified: Radiation of laser apparatus To identify the radiation of laser products. In case of application in a warning sign the rules according to ISO 3864 shall be adhered to. [SOURCE: IEC 60417-5152, modified - The preamble "Notes" is deleted and the remaining text is placed as an additional part of the description.]	 ISO 7010-W004 (2011-05): Warning; Laser beam To warn of a laser beam.

B.2.3 Requirements and examples of negation of graphical symbols for use on equipment

Some graphical symbols for use on equipment standardized in IEC 60417 SDB and ISO 7000 may be negated in accordance with IEC 80416-1:2008, 7.9. The standardization of the negated graphical symbol in IEC 60417 SDB is only necessary if the negated version represents a specific meaning such as to indicate:

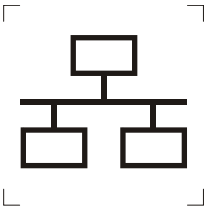
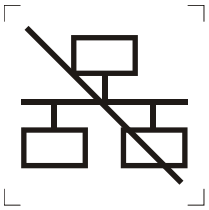
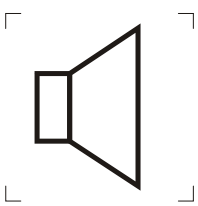
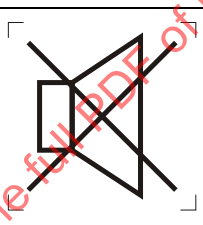
a) the non-availability of a function due to cancellation by the user or for operational reasons, or;

b) required behaviour (such as "do not").

Some examples are shown in Table B.3. Other examples are found in IEC 80416-1:2008, Figure 5.

A circle combined with a diagonal bar, in any colour, including black and white, shall not be used for the negation of graphical symbols for use on equipment standardized in IEC 60417 SDB or ISO 7000. See also IEC 80416-1:2008, 7.9.4.

Table B.3 – Examples of negation of the meaning of graphical symbols for use on equipment

Graphical symbol for use on equipment	Negated graphical symbol
 IEC 60417-5988 (2006-09): Computer network To identify the computer network itself or to indicate the connecting terminals of the computer network.	 IEC 60417-5988, modified – The graphical symbol element of negation has been added: Computer network not available To identify that the computer network itself or the connecting terminals of the computer networks are not available or accessible.
 IEC 60417-5080 (2002-10): Loudspeaker To identify the socket, terminals or switch for a loudspeaker.	 IEC 60417-5436 (2002-10): Sound muting To identify the control for suppressing the sound.
 IEC 60417-5641 (2002-10), modified: Suitable for covering To indicate an electrical appliance, for instance a towel rail, that by design is suitable for draping with clothing or other material. In case of application as a safety sign, the rules according to ISO 3864 shall be adhered to. [SOURCE: IEC 60417-5641, modified - The preamble "Notes" is deleted and the remaining text is placed as an additional part of the description.]	 IEC 60417-6096 (2012-01): Do not cover To indicate – in order to avoid overheating – that the electrical appliance, for instance a room heater or an AC power adapter, should not be draped with clothing or other material.
 IEC 60417-5019 (2006-08): Protective earth; protective ground To identify any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.	 IEC 60417-6032 (2010-02): Do not connect to protective earth; do not connect to protective ground To indicate that conductive parts shall not be connected to protective earth (ground), e.g. on electrical equipment with conductive parts inside an insulating enclosure. NOTE The use of this symbol is described in IEC 60364-4-41.