
**Graphical symbols for diagrams —
Part 2:
Symbols having general application**

Symboles graphiques pour schémas —

Partie 2: Symboles d'application générale

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 14617 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14617-2 was prepared by Technical Committee ISO/TC 10, *Technical product documentation*, Subcommittee SC 10, *Process plant documentation and tpd-symbols*.

ISO 14617 consists of the following parts, under the general title *Graphical symbols for diagrams*:

- Part 1: General information and indexes
- Part 2: Symbols having general application
- Part 3: Connections and related devices
- Part 4: Actuators and related devices
- Part 5: Measurement and control devices
- Part 6: Measurement and control functions
- Part 7: Basic mechanical components
- Part 8: Valves and dampers
- Part 9: Pumps, compressors and fans
- Part 10: Fluid power converters
- Part 11: Devices for heat transfer and heat engines
- Part 12: Devices for separating, purification and mixing
- Part 15: Installation diagrams and network maps

Other parts are under preparation.

Introduction

The purpose of ISO 14617 in its final form is the creation of a library of harmonized graphical symbols for diagrams used in technical applications. This work has been, and will be, performed in close cooperation between ISO and IEC. The ultimate result is intended to be published as a standard common to ISO and IEC, which their technical committees responsible for specific application fields can use in preparing International Standards and manuals.

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Graphical symbols for diagrams —

Part 2: Symbols having general application

1 Scope

This part of ISO 14617 specifies graphical symbols of a general character, mainly for use in building-up complete symbols representing specific products and functions in diagrams.

For the fundamental rules of creation and application of graphical symbols in diagrams, see ISO 81714-1.

For an overview of ISO 14617, information on the creation and use of registration numbers for identifying graphical symbols used in diagrams, rules for the presentation and application of these symbols, and examples of their use and application, see ISO 14617-1.

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2 Normative references (standards.iteh.ai)

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 14617. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 14617 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 31-11:1992, *Quantities and units — Part 11: Mathematical signs and symbols for use in the physical sciences and technology*

ISO 14617-1:2002, *Graphical symbols for diagrams — Part 1: General information, general indexes*

ISO 14617-3:2002, *Graphical symbols for diagrams — Part 3: Connections and related devices*

ISO 14617-6:2002, *Graphical symbols for diagrams — Part 6: Measurement and control functions*

ISO 81714-1:1999, *Design of graphical symbols for use in the technical documentation of products — Part 1: Basic rules*

IEC 60617-2:1996, *Graphical symbols for diagrams — Part 2: Symbol elements, qualifying symbols and other symbols having general application*

IEC 60617-13:1993, *Graphical symbols for diagrams — Part 13: Analogue elements*

3 Terms and definitions

For the purposes of this part of ISO 14617, the following terms and definitions apply.

NOTE The list has been restricted to terms whose meaning is not obvious and which have not been defined elsewhere in an International Standard, or which have been defined in various ways in different standards. In preparing these definitions, ISO and IEC standards on terminology have been consulted; see the references in parentheses. However, most of the definitions in those standards were prepared by different technical committees within a restricted scope. This means that many terms so defined have to be given more general or neutral definitions when applied in the context of graphical symbols.

3.1 complex device

device consisting of several functionally interrelated components or elements, the description of which needs a diagram

EXAMPLE An automatic star-delta starter; an automatic actuator consisting of a motor, a blocking device, a gear-box, a position switch.

3.2 functional unit

constructional assembly containing functionally interrelated components or devices

[IEC 60050-441]

3.3 input/output label

graphical symbol, letter(s) or number indicating the function of an input/output of a component or device

[IEC 60617-12]

3.4 conversion

change of one form of energy, information or material into another

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[IEC 60050-551, IEC 60050-601]

3.5 hysteresis

property of a device whereby it gives different output values in relation to its input values, depending on the directional sequence in which the input values have been applied

[IEC 60050-351]

3.6 stabilizing

function where the influence of other quantities is eliminated or reduced so that the level of an output quantity can be regarded as constant

[IEC 60050-351]

3.7 enabling

making it possible for a function to be performed

[IEC 60617-12]

3.8**compensation**

effect to counteract sources of error due to variations in operating conditions

3.9**postponed output function**

function where the change of state of an output is postponed until the input signal initiating the change returns to its original state

[IEC 60617-12]

3.10**high/low limitation**

function limiting a quantity to be higher/lower than a predetermined value

[IEC 60050-151]

3.11**dead band threshold**

finite range of values within which variation of the input variable does not produce any noticeable change in the output variable

[IEC 60050-351]

3.12**high/low selection**

function by which the highest/lowest value is selected

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3.13**automatic**, adj.

(control, operation) self-acting (not needing human intervention)

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[IEC 60050-151]

3.14**complex function**

function whose characteristic cannot easily be described only by a mathematical expression but needs a description by supplementary text, a graph, a table, etc.

[IEC 60617-12]

3.15**bias**

function giving an output corresponding to that portion of an input signal exceeding a predetermined threshold value

[IEC 60050-393]

3.16**reverse function****reverse action**

mathematical function $Y = 1 - X$, i.e. when X is 0 %, then Y is 100 %, when X is 100 %, then Y is 0 %

[IEC 60050-351]

3.17

characteristic quantity

⟨measuring device⟩ quantity whose name characterizes the device and its function

EXAMPLE The characteristic quantity for a safety valve is “pressure”; for an overcurrent relay, “current”.

[IEC 60050-446]

3.18

pilot switch

monitoring device actuated in response to specified conditions of a non-electric characteristic quantity

EXAMPLE Pressure, temperature, speed, flow rate or liquid level.

[IEC 60050-441]

3.19

logic negation

condition mainly used with binary logic elements where the logic state 1 (TRUE) is converted to a logic state 0 (FALSE) or vice versa

[IEC 60617-12, IEC 61082-2]

3.20

logic inversion

condition mainly used with binary logic elements where a higher physical level is converted to a lower physical level or vice versa

[IEC 60617-12, IEC 61082-2]

3.21

feedback controller

device in which the control action is made to depend on the measurement of the controlled variable

[IEC 60050-351]

3.22

variability

ability of changing a property

cf. adjustability (3.23) and inherent variability (3.25)

3.23

adjustability

ability to adjust the setting of a component or device

[IEC 60050-371]

cf. variability (3.22)

3.24

pre-set adjustability

ability to adjust the setting of a component or device before normal service

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3.25**inherent variability**

variability depending on the inherent characteristic of a component or device

[IEC 60050-351]

cf. variability (3.22) and adjustability (3.23)

3.26**reference direction**

direction arbitrarily fixed from one point A to another point B

NOTE A flow is considered as positive when its actual direction is from point A to point B. A pressure or voltage is considered as positive when the pressure or potential is higher in point A than in point B.

[IEC 60375]

3.27**correlation indication**

graphical symbol indicating correlated directions, polarities, etc.

3.28**stepping**

function providing displacement or rotation in steps

3.29**bidirectional**

having the property to move, transmit, etc. in two alternative, opposite directions

[IEC 60050-521]

3.30**envelope****tank**

gas- or watertight enclosure for ensuring the function of the component of which the envelope or tank is a part

[IEC 60050-531]

NOTE An envelope or tank is a part of a component. The term should not be confused with the outline (periphery) of a graphical symbol.


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4 Components, devices, functional units, equipment, plants and functions

4.1 Symbol of a basic nature

4.1.1	101		Complex device, functional unit, equipment, plant, function See R101 (4.2.1).
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4.2 Application rules for the symbol in 4.1

4.2.1	R101	<p>The symbol shall be used</p> <ul style="list-style-type: none"> — when it is not possible or practical to construct a graphical symbol by combining symbols for the constituent parts of a component or device or when a specific symbol for a component or device does not exist, — for functions. <p>The asterisk shall be replaced with information as stated in a) to g) below or shall be omitted if the symbol can be understood without such information, such as by means of input and output labels, see symbol 106 (4.3.1.1). For an example, see X112 (4.5.12).</p> <ol style="list-style-type: none"> a) Graphical symbol(s) representing the most significant constituent(s). For an example, see X101 (4.5.1). b) Mathematical signs or formulae or both letter symbols for quantities, chemical formulae, graphs and symbols from International Standards. Mathematical signs shall be in accordance with ISO 31-11. For examples, see X102 (4.5.2) to X105 (4.5.5). c) An abbreviation, preferably mnemonic based on the English language. For an example, see X106 (4.5.6). If the mnemonic is not standardized and its interpretation is not self-evident to a reader of the diagram, the mnemonic used shall be explained on the diagram or in a supporting document. d) Graphical symbols providing supplementary information related to the inputs and outputs in accordance with symbol 106 (4.3.1.1). For an example, see X112 (4.5.12). e) Graphical symbols providing supplementary information related to the assembly as a whole, located inside or outside the solid outline. For examples, see X108 (4.5.8) to X111 (4.5.11). f) If it is impossible to describe the meaning of the graphical symbol by the methods given in a) to e), a short, descriptive text may be added. This text should be written in English, independent of the language or language being used in the diagram. However, for use limited to a defined language region, a different language may be used instead of English. The text may be located inside or outside the box. For an example, see X107 (4.5.7). g) Combinations of methods a) to f). For examples, see X113 (4.5.13) and X114 (4.5.14). <p>Notations according to a) to c) shall be located at the top of the outline and centred horizontally.</p> <p>NOTE The rules above are in accordance with ISO 81714-1.</p> <p>The square-shaped form of the symbol is the basic form. For some items another form is used in ISO 14617.</p>
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