International Standard

ISO 14617-1

Third edition
2025-03

# Graphical symbols for diagrams —

# Part 1: General rules

*Symboles graphiques pour schémas —*
*Partie 1: Informations générales et index*



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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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# Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 10, *Technical product documentation*, Subcommittee SC 10, *Process plant documentation.*

This third edition cancels and replaces the second edition (ISO 14617-1:2005), which has been technically revised.

The main changes are as follows:

— Clause 3 terms and definitions were changed;

— ”GSD” was added in front of registration numbers;

— symbols using letter codes are not included in the revised ISO 14617 series because the definition of letter codes moved to ISO 15519-2;

— structuring of the presentation of graphical symbols has been changed in order to improve the user’s access to navigate and find symbols;

— annexes have been reconstructed.

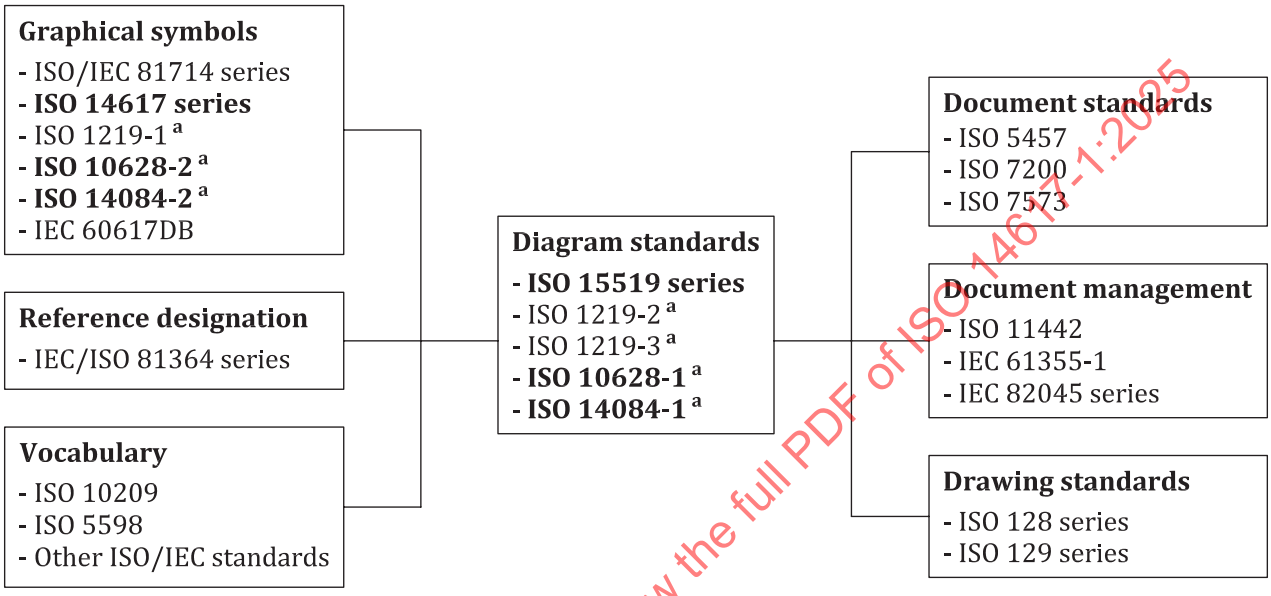
Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

# Introduction

## 0.1 General

ISO/TC 10 prepares standards for diagrams including graphical symbols, which together with International Standards prepared by other ISO committees and the IEC constitute the basis for the preparation of diagrams.

The interrelations between these International Standards are illustrated in Figure 1. Standards in bold are ISO/TC 10 standards.




**Key**

a Collective application standards.

**Figure 1 — Interrelations between ISO and IEC standards for diagrams**

## 0.2 Collective application standards

Technical committees, requiring a field specific standard, can, in co-operation with ISO/TC 10, develop their own collective application standard for the preparation of diagrams and graphical symbols as per the requirements given in ISO 15519-1 or ISO 14617, or both. Collective application standards are not to be contradictory with respect to the source standard(s).

# Graphical symbols for diagrams —

# Part 1:
# General rules

## 1 Scope

This document specifies general rules for and gives guidance on the preparation and presentation of graphical symbols for diagrams, which are related to physical industrial components, products and processing.

## 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.

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

## 3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

**3.1**
**graphical symbol**
visually perceptible figure with a particular meaning used to transmit information independently of language

Note 1 to entry: The graphical symbol can represent objects of interest, such as products, functions or requirements for manufacturing, quality control, etc.

Note 2 to entry: A graphical symbol is not to be confused with the simplified representation of products which are normally drawn to scale and which can look like a graphical symbol.

Note 3 to entry: The graphical symbol means the same as the technical product documentation symbol (TPD-symbol).

[SOURCE: ISO 81714-1:2010, 3.1, modified — Note 3 to entry has been added.]

**3.2**
**basic symbol**
symbol which can be used direct in diagrams or combined with *supplementary symbols* (3.3) to form *symbol examples* (3.5)

**3.3**
**supplementary symbol**
symbol which can be combined with a *basic symbol* (3.2) to form a *symbol example* (3.5)

**3.4**
**application rule**
information on how to design composite symbols and how to apply the *graphical symbols* (3.1) in a diagram

Note 1 to entry: The *symbol examples* (3.5) are regarded as guidelines.

Note 2 to entry: Application rules for symbols are specified in Annex A of ISO 14617-2:2025.

**3.5**
**symbol example**
example of how to combine *basis symbols* (3.2) and *supplementary symbols* (3.3) using the *application rules* (3.4)

Note 1 to entry: Each symbol example is accompanied by information on which *basic* (3.2) and *supplementary symbols* (3.3) have been used to compose itself.

Note 2 to entry: The symbol examples are regarded as guidelines.

Note 3 to entry: Symbol example was denoted as application example in the previous edition of the ISO 14617 series.

**3.6**
**registration number**
unique number assigned each *graphical symbol* (3.1)

Note 1 to entry: In principle, this number is arbitrarily chosen. No information can be derived from it.

Note 2 to entry: The registration number remains unchanged throughout the lifetime of the corresponding graphical symbol, including in future revisions of this document. If a graphical symbol is slightly changed in the future, the registration number shall be supplemented with one or more characters. If the graphical symbol is substantially changed, it shall instead be given a new registration number.

Note 3 to entry: Three types of registration number are used, where "n" is a digit:

— basic and supplementary symbols: GSD nnnn;

— application rules: Rnnnn;

— symbol examples: GSD Xnnnn.

The supplemented registration number according to a small change of symbol is nnnn-m, where “m” is the number of changing times. Detail explanations of registration number are shown in Annex A.

Note 4 to entry: Annex C specifies common registration number rules for ISO 14617-2 and derived collective application standards.

Note 5 to entry: ”GSD” was added in front of registration numbers defined in the previous edition of the ISO 14617 series. The reason is to distinguish the graphical symbols in the ISO 14617 series from those defined by other standards on the ISO Online browsing platform. “GSD” stands for graphical symbols for diagrams.



# 4 Graphical symbols

## 4.1 General

Graphical symbols for diagrams shall be designed according to the rules given in ISO 81714-1. For CAx application, IEC 81714-2 should be applied.

The application of graphical symbols in diagrams for the process industry is described in the ISO 15519 series.

## 4.2 Graphical symbols of same shape but different meaning

Graphical symbols with the same shape but different meanings have different registration numbers. This implies that it is possible to distinguish between same-shape graphical symbols in a computer-aided design (CAD) system, specified that each symbol has been recalled from a CAD library using the appropriate registration number.

For a person reading a diagram, the intended meaning can normally be recognized by the context of the diagram. When this is not possible, graphical symbols having the same shape shall be specified with supplementary information. For examples, see the symbols for connections in ISO 14617-2 and the rules for adding symbols giving supplementary information such as application rule R402 in ISO 14617-2:2025, Annex A.

## 4.3 Dimensions and lines

The symbols in ISO 14617-2 are shown in a grid system with module M = 2,5 mm. The proportions of graphical symbols may be modified according to the requirements of ISO 81714-1.

NOTE The grid system in ISO 14617-2 can be omitted for practical use.

The normal line width of a graphical symbol is 0,1M (= 0,25 mm) in accordance with ISO 81714-1. When the size of a symbol is changed, the line width shall be unchanged.

## 4.4 Modification of proportions

The proportions of a symbol may be modified, if necessary. The extent of modification of the symbol shape shall not make it impossible to recognize the symbol. The most common modifications of proportions of graphical symbols are:

— enlargement, by scaling, in order to give space for insertion of text;

— reduction, by scaling, in order to emphasise a certain aspect (e.g. a lubrication oil pump for a main pump);

— prolongation in order to give space for longer inserted text than possible in the original symbol.

When symbols containing digits or letters, or both, are subjected to scaling, then the digits and/or letters should be replaced by digits and/or letters of a size corresponding to those in the document, or a new symbol with scaled graphics should be developed.

## 4.5 Orientation of graphical symbols

A graphical symbol can be subject to turning or mirroring or combination of turning and mirroring if necessary, in order to fit into the actual layout of the diagram.

Rules for turning and mirroring are given in ISO 81714-1.

Exceptions for turning are symbols representing components or devices where gravity is a functionality (e.g. an open tank, a cyclone separator). Such symbols shall not be turned.

Attention is drawn to turning and mirroring of symbols containing digits or letters, or both. If the symbol is turned to a position where it is not readable from the bottom line or the right-hand line, then a new symbol should be created to the actual orientation.

## 4.6 Different forms of graphical symbols

In some cases, different forms of a graphical symbol can occur. These different forms are given separate registration numbers. The primary reason for having two or more forms for the same symbolisation is that they convey differing amounts of information.

Symbols having different forms and differing amounts of information (e.g. those for use in overview diagrams and those for use in circuit diagrams) are marked Form 1, Form 2, etc. This marking is also used in some cases where the different forms contain the same amount of information, but where more than one form is justified because of different application methods in the rules for preparing diagrams.

### 4.7 Creation of new symbol examples

This document includes the most commonly used graphical symbols for diagrams. When a needed symbol cannot be found in the standard, the needed graphical symbol example should be created on the basis of basic and supplementary graphical symbols as illustrated in Annex B.

### 4.8 Letter codes, abbreviations, etc.

#### 4.8.1 Overview

Letter codes, chemical formulae, abbreviations, etc. are often used to add information to the graphical symbol. The following elements can be used to increase the information extent of a graphical symbol:

— letter codes for instrumentation and control;

— abbreviations;

— chemical formulae;

— unit designation.

If the used abbreviation is not self-explanatory, the abbreviation shall be defined in a referred document.

NOTE 1 Letter codes defined in ISO 14617-6 have been moved to ISO 15519-2. See Annex C.

NOTE 2 Rules for lettering and position of text in graphical symbols are given in IEC 81714-2.

#### 4.8.2 Chemical formulae

If the used chemical formulae are not evident, the chemical formulae shall be explained in a referred document.

#### 4.8.3 Unit designations

Unit designations (e.g. Pa for pressure) should be taken from ISO 80000-1.

## 5 Representation of graphical symbols

### 5.1 Structuring of representation

Graphical symbols are divided in logical functional groups, primarily according to their application, see Table 1.

**Table 1 — Subject groups for graphical symbols**

| Clause in ISO 14617-2:2025 | Subject group |
|---|---|
| 4 | General application symbols |
| 5 | Connections and related devices (fluids) |
| 6 | Fluid flow control |
| 7 | Actuators |
| 8 | Fluid transport |
| 9 | Fluid energy transfer |
| 10 | Fluid separation and mixing |
| 11 | Fluid processing |
| 12 | Fluid power converters |

**Table 1** *(continued)*

| Clause in ISO 14617-2:2025 | Subject group |
|---|---|
| 13 | Storage |
| 14 | Material transport and flow control |
| 15 | Material separation and mixing |
| 16 | Material processing |
| 17 | Energy conversion, boilers, turbines, motors, etc. |
| 18 | Mechanical transmission |
| 19 | Measurement and control devices |
| 20 | Measurement and control functions |
| 21 | Vacuum technology |

## 5.2 Representation of graphical symbols in ISO 14617-2

Graphical symbols and their allocated information are represented as illustrated in Table 2.

**Table 2 — Explanation of column and row headings**

| Entry No. | Reg. No. | Symbol graphics | Symbol names and references |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| | | | 5 |
| | | | 6a, 6b |

**Key**

1 Entry number in ISO 14617-2.

2 Symbol registration number.

3 Graphics.

4 Symbol name, symbol title.

5 Supplementary or standards that have defined the symbol name or title or functional description.

6a For basic and supplementary symbols. References to application rules given in ISO 14617-2:2025, Annex A, which are as shown as “Rnnnn”.

6b For symbol examples. Registration numbers of basic and supplementary symbols that the symbol examples are combined of, which are as shown as “GSD Xnnnn”. In addition, application rules can be added.

NOTE Symbols that have different forms are marked Form 1, Form 2, etc., as supplementary (see 4.6).

# Annex A
(informative)

# Registration numbers for graphical symbols

## A.1 General

This annex specifies a registration number matrix for graphical symbols for ISO 14617-2.

## A.2 Types of registration numbers

The following types of registration number are used in ISO 14617-2 and allocated collective application standards. Here, "n" is a digit:

— GSD nnnn Registration number for basic and supplementary symbols in ISO 14617-2

— Rnnnn Application rule of the symbol

— GSD Xnnnn Registration number for basic and supplementary symbol examples in ISO 14617-2

## A.3 Registration number matrix

Table A.1 specifies a registration number matrix showing where the symbols come from.

**Table A.1 — Registration number matrix**

| Type of symbols | Previous ISO 14617 series | ISO 10628-2: 2012 | ISO 14084-2: 2015 | IEC or other standards | ISO 3753: 1977[a)] |
|---|---|---|---|---|---|
| Basic and supplementary symbols | GSD 1 to GSD 899, GSD 1000 to GSD 3999 | GSD 4000 to GSD 4099 | GSD 4100 to GSD 4199 | GSD 4200 to GSD 4299 | GSD 900 to GSD 922 |
| Symbol examples | GSD X1 to GSD X3999 | GSD X8000 to GSD X9999 | GSD X6000 to GSD X7999 | — | — |

[a)] Withdrawn.

# Annex B
(informative)

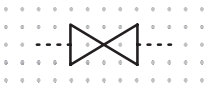
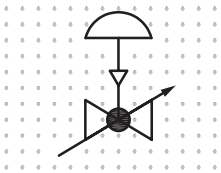
# Creation of new symbols

If a desired symbol does not exist neither as a symbol of basic nature nor a symbol example, then the desired symbol should be constructed by combining symbols of basic nature and symbols given supplementary information.

When a new symbol example is created by combining existing symbols, the new symbol example should be self-explanatory and legible for users.

Table B.1 specifies an example of how to create a new symbol example.

**Table B.1 — Example of creation of new symbol example on basis of ISO 14617-2 symbols**

| Symbol | Reg. No. | Description | Symbol example | Description |
|---|---|---|---|---|
|  | GSD 2101 | Two-way valve |  | Control valve, globe type, pneumatic diaphragm actuator |
|  | GSD 201 | Adjustability | | |
|  | GSD 725 | Actuator as single-action diaphragm | | |
|  | GSD 403 | Mechanical link, shaft, wire | | |
|  | GSD 654 | Automatic return device | | |
|  | GSD 2121 | Globe type valve | | |

# Annex C
(informative)

# Letter codes for process variables, control functions and modifying purposes

ISO 14617-6:2002 had defined letter symbols for data processing functions. These definitions were, however, moved to ISO 15519-2:2015 as letter codes for process variables and control functions. Therefore, ISO 14617-2:2025 does not include the definition of letter codes. Table C.1 and Table C.2 provide information about the letter codes defined in ISO 15519-2:2015. Note that IEC 62424:2016 defines letter codes for PCE categories and processing functions and related graphical symbols. These letter codes are not consistent with those defined in ISO 15519-2:2015. Therefore, the use of letter codes for process industry diagrams shall be agreed according to the relevant standard.

**Table C.1 — Letter codes for process variables and control functions defined in ISO 15519-2**

| Letter code | Process variables | Control functions |
|---|---|---|
| **A** | Electric voltage | Alarming, message |
| **B** | | |
| **C** | Electric current | Control (closed loop) |
| **D** | Density | |
| **E** | Electric or electromagnetic variables (except A and C) | |
| **F** | Flow rate | |
| **G** | Distance, position or length | |
| **H** | Human observation | |
| **I** | Not to be used | Indicating |
| **J** | Power | |
| **K** | Time | |
| **L** | Level | |
| **M** | Moisture, humidity | |
| **N** | | |
| **O** | Not to be used | |
| **P** | Pressure, vacuum | |
| **Q** | Quality | |
| **R** | Radiation | Recording |
| **S** | Speed, frequency | Switching (open loop) |
| **T** | Temperature | |
| **U** | Multivariable | |
| **V** | | |
| **W** | Weight, force | |
| **X** | | |
| **Y** | | |
| **Z** | Number of events, quantity | Switching (open-loop) safety or protection relevant |