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Graphical symbols for diagrams —

Part 12: Devices for separating, purification and mixing

Symboles graphiques pour schémas —

Partie 12: Dispositifs de séparation, de purification et de mélange

Reference number
ISO 14617-12:2002(E)

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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 14617-12 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.

Graphical symbols for diagrams —

Part 12:
Devices for separating, purification and mixing

1 Scope

This part of ISO 14617 specifies graphical symbols for the representation of devices for separating, purification and mixing 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.

2 Normative references

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

ISO 14617-2:2002, *Graphical symbols for diagrams — Part 2: Symbols having general application*

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

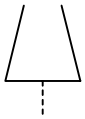
3 Terms and definitions

For the purposes of this part of ISO 14617, the terms and definitions given in ISO 14617-1 and ISO 14617-2 apply.

4 Devices for separating

4.1 Symbols of a basic nature

NOTE For general rules for the construction of symbols for devices for separating, see R2601 (4.2.1).

4.1.1	**2601**		Device for separating See R2601 (4.2.1).
4.1.2	**301**		Envelope (tank) See R301 (4.2.2).
4.1.3	**2602**		Screen or filter element See R2602 (4.2.3).
4.1.4	**2603**		Bed filter element of fixed type
4.1.5	**2604**		Bed filter element of fluidized type
4.1.6	**2605**		Scraper
4.1.7	**2606**		Disc with knife
4.1.8	**2607**		Plate for separating EXAMPLE Impingement plate.
4.1.9	**2608**		Centrifuge rotor See R2602 (4.2.3).
4.1.10	**2037**		Spray nozzle

4.2 Application rules for the symbols in 4.1

4.2.1	**R2601**	A symbol for a device for separating may be built up by symbol 2601 (4.1.1) and, if necessary, an appropriate symbol for supplementary information that replaces the asterisk, or else by symbol 301 (4.1.2) for an envelope (tank) with an appropriate symbol for the elements inside the envelope, vessel.
4.2.2	**R301**	Another shape may be used, for example, rectangular or circular. A specific shape shall be used if it is necessary to indicate a certain function or property associated with the shape of the envelope. For an example, see X2617 (4.5.17). The symbol shall be used only when the envelope is of significance for the primary function. For example, it should not be used to represent enclosures for the protection against ingress of dust and protection against contact with movable or electrically live parts. If necessary, the nature of the envelope shall be stated, for example, conductive material.
4.2.3	**R2602**	The symbol may be drawn with another shape if the shape of the component affects the function.

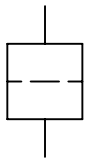
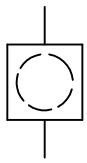
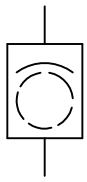
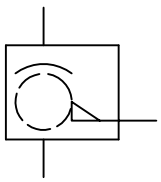
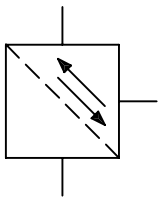
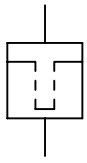
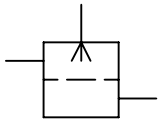
4.3 Symbols giving supplementary information

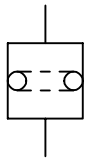
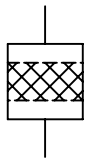
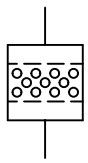
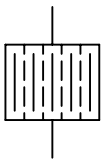
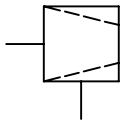
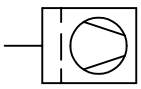
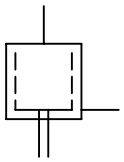
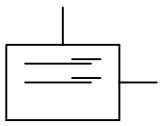
4.3.1	**254**		Circular motion, unspecified direction See R248 (4.4.1).
4.3.2	**255**		Circular motion See R248 (4.4.1) and R249 (4.4.2).
4.3.3	**2621**		Cyclonic type
4.3.4	**IEC**		Electrostatic type
4.3.5	**IEC**		Electromagnetic type
4.3.6	**326**		Permanent-magnet type
4.3.7	**2501**		Heat-exchanger type
4.3.8	**IEC**		Electro-thermal type
4.3.9	**2541**		Fired type
4.3.10	**2622**	CH	Chemical type
4.3.11	**2623**	BIO	Biological type
4.3.12	**2624**	ION	Ion exchange type

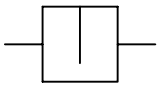
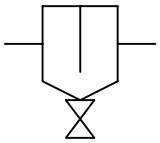
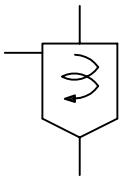
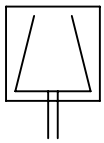
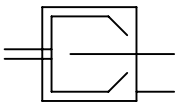
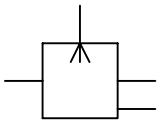
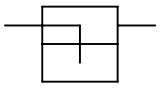
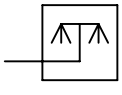
4.4 Application rules for the symbols in 4.3

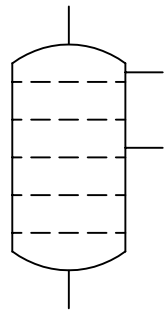
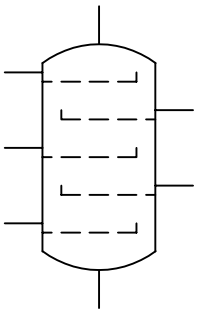
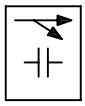
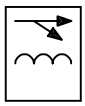
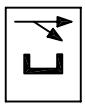
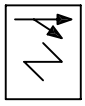
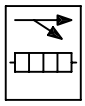
4.4.1	**R248**	The symbol may be drawn twice, with the two representations located adjacent to one another, to indicate a higher speed compared to that indicated by a single symbol. For an example, see X249 (2-7.5.4).
4.4.2	**R249**	The symbol shall cross the symbol for the mechanical link and be interpreted as if it were located in front of the mechanical link. For examples, see X249 (2-7.5.4) and X250 (2-7.5.5). Alternatively, the symbol may be shown adjacent to the symbol for the components that the link connects. For an example, see X251 (2-7.5.6). In order to avoid confusion between the two alternatives, in the first method, the symbol should be located at a sufficient distance from the two symbols representing the components connected. In the second method, the symbol should be located such that it does not cross the symbol for the mechanical link.

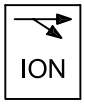
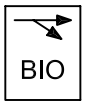
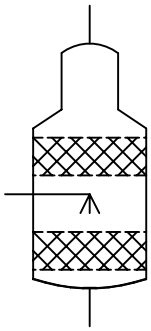
4.5 Application examples

4.5.1	**X2601**	 301, 2602	Screen, sieve, strainer, filter
4.5.2	**X2602**	 301, 2602	
4.5.3	**X2603**	 254, 301, 2602	Screen, filter with rotating drum
4.5.4	**X2604**	 254, 301, 2602, 2605	Screen, filter with rotating drum and scraper
4.5.5	**X2605**	 241, 301, 2602	Vibrating screen, sieve
4.5.6	**X2606**	 301, 2602	Bag filter, candle filter, leaf filter, cartridge filter
4.5.7	**X2607**	 301, 2602, 2037	Filter with spray

4.5.8	**X2608**	 301, 2013, 2602	Belt filter, roll filter
4.5.9	**X2609**	 301, 2603	Bed filter of fixed type
4.5.10	**X2610**	 301, 2604	Bed filter of fluidized type
4.5.11	**X2611**	 301, 2602, 2607	Filter press; press filter
4.5.12	**X2612**	 301, 2602	Compression filter, compression by piston, screw, plate or membrane
4.5.13	**X2613**	 301, 2302, 2602	Vacuum cleaner
4.5.14	**X2614**	 301, 402, 2602	Centrifugal filter
4.5.15	**X2615**	 301, 2606	Disc and plate (knife) separator

4.5.16	**X2616**	 301, 2607	Settling separator
4.5.17	**X2617**	 301, 2101, 2607	Settling separator with space for reject and having reject outlet
4.5.18	**X2618**	 301, 2621	Cyclone separator
4.5.19	**X2619**	 301, 402, 2608	High-speed centrifuge
4.5.20	**X2620**	 301, 402, 2608	Decanter centrifuge
4.5.21	**X2621**	 301, 2037	Spray scrubber
4.5.22	**X2622**	 301, 405	Bath scrubber
4.5.23	**X2623**	 254, 301, 2602	Washing machine with spinning
4.5.24	**X2624**	 301, 405, 2037	Dish-washer

4.5.25	**X2625**	 2062, 2602	Tray column; fractionating column
4.5.26	**X2626**	 2062, 2602	Tray column; fractionating column with passage for gas
4.5.27	**X2627**	 2601, IEC	Electrostatic separator
4.5.28	**X2628**	 2601, IEC	Electromagnetic separator
4.5.29	**X2629**	 326, 2601	Permanent-magnet separator
4.5.30	**X2630**	 2501, 2601	Thermal separator using heating or cooling medium in coil
4.5.31	**X2631**	 2601, IEC	Thermal separator using electrical heating

4.5.32	**X2632**	 2541, 2601	Thermal separator using direct-heating source
4.5.33	**X2633**	 2601, 2624	Ion exchange separator
4.5.34	**X2634**	 2601, 2623	Biological filter EXAMPLE Active mass filter.
4.5.35	**X2635**	 2037, 2062, 2603	Reaction vessel with two fixed bed sections and spray nozzles

5 Devices for purification by conversion

5.1 Symbol of a basic nature

5.1.1	**2651**		Purifier using conversion See R2651 (5.2.1).

5.2 Application rules for the symbol in 5.1

5.2.1	**R2651**	The asterisk shall be replaced with a symbol indicating the method or shall be omitted.

5.3 Symbol giving supplementary information

5.3.1	**2661**	CAT	Catalytic type

5.4 Application rule for the symbol in 5.3

None.

5.5 Application example

5.5.1	**X2651**	 2651, 2661	Purifier of catalytic type

6 Devices for mixing

6.1 Symbols of a basic nature

NOTE For general rules for the construction of symbols for devices for mixing, see R2671 (6.2.1).

6.1.1	**2671**		Device for mixing
6.1.2	**2672**		Rotary mixing element
6.1.3	**2673**		Static mixing element

6.2 Application rule for the symbols in 6.1

6.2.1	**R2671**	A symbol for a device for mixing may be built up by symbol 2671 (6.1.1) and, if necessary, with an appropriate symbol for supplementary information to replace the asterisk, or else by symbol 301 (4.1.2) for an envelope (tank) with an appropriate symbol for the elements inside the envelope, vessel.

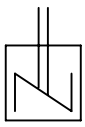
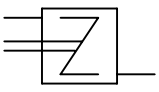
6.3 Symbol giving supplementary information

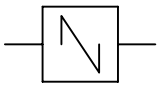
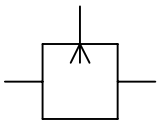
None.

6.4 Application rules for the symbol in 6.3

None.

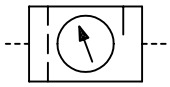
6.5 Application examples

6.5.1	**X2671**	 301, 402, 2672	Mixer, stirrer
6.5.2	**X2672**	 301, 402, 2672	In-line rotary mixer

6.5.3	**X2673**	 301, 2673	In-line static mixer
6.5.4	**X2674**	 301, 2037	Pneumatic-air lubricator

7 Air conditioners for pneumatic systems

7.1 Symbol of basic nature

7.1.1	**2691**		Air conditioner for pneumatic systems EXAMPLE Device consisting of a filter, pressure regulator, measuring instrument for indicating the pressure and a lubricator.

7.2 Application rule for the symbol in 7.1

None.

7.3 Symbol giving supplementary information

None.

7.4 Application rule for the symbol in 7.3

None.

7.5 Application example

None.

ICS 01.080.30

Price based on 10 pages