

ASME Y14.40.12-2002

(Identical to ISO 14617-12: 2002)

GRAPHICAL SYMBOLS FOR DIAGRAMS, PART 12: DEVICES FOR SEPARATING, PURIFICATION, AND MIXING

An American National Standard



**The American Society of
Mechanical Engineers**

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GRAPHICAL SYMBOLS FOR DIAGRAMMS, PART 12: DEVICES FOR SEPARATING, PURIFICATION, AND MIXING

ASME Y14.40.12-2002
(Identical to ISO 14617-12: 2002)

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FOREWORD

This Standard is the adoption as an American National Standard of ISO 14617-12:2002. The ASME Standards Committee Y14, Engineering Drawing Practices and Related Documentation, is responsible for this Standard and supervises the U.S. participation in the ISO Technical Committee 10 activity responsible for the development and maintenance of its counterpart ISO 14617-12 through the U.S. Technical Advisory Group for ISO/TC 10.

This Standard is identical to ISO 14617-12:2002 as that term is defined in ISO/IEC Guide 21:1999 and part of a series of standards providing graphical symbols for diagrams in a variety of technical disciplines. The titles of the series are:

- Part 1: General information and indexes
- 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.

Suggestions for improvement of this Standard are welcome. They should be sent to The American Society of Mechanical Engineers, Attention: Secretary, Y14 Standards Committee, Three Park Avenue, New York, NY 10016. This Standard was approved as an American National Standard on December 19, 2002.

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Graphical Symbols for Diagrams, Part 12: Devices for Separating, Purification and Mixing

1 SCOPE

This Standard 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 ASME Y14.40.0. For an overview of the ASME Y14.40 series, 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 ASME Y14.40.1.

ASME Y14.40.0, Basic Rules for the Design of Graphical Symbols for Use in the Technical Documentation of Products

ASME Y14.40.1, Graphical Symbols for Diagrams, Part 1: General Information and Indexes

ASME Y14.40.2, Graphical Symbols for Diagrams, Part 2: Symbols Having General Application

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2 REFERENCES

The following references contain provisions that, through reference in this text, constitute provisions of this Standard. The latest edition shall apply.








3 TERMS AND DEFINITIONS




For the purposes of this Standard, the terms and definitions given in ASME Y14.40.1 and ASME Y14.40.2 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).










Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
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.

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
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 Para. 4.1

Reference Number	Registration Number	Application Rules
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

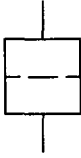


Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.3.1	254		Circular motion, unspecified direction. See R248 (4.4.1).
4.3.2	255		Circular motion. See R248 (4.4.1) and R249 (4.4.2).
4.3.3	2621		Cyclonic type.
4.3.4	IEC		Electrostatic type.
4.3.5	IEC		Electromagnetic type.
4.3.6	326		Permanent-magnet type.
4.3.7	2501		Heat-exchanger type.
4.3.8	IEC		Electro-thermal type.
4.3.9	2541		Fired type.

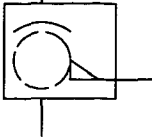
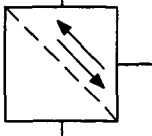
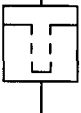
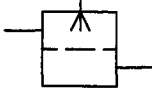



Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.3.10	2622	CH	Chemical type.
4.3.11	2623	BIO	Biological type.
4.3.12	2624	ION	ion exchange type.

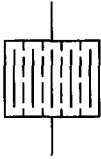
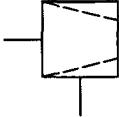

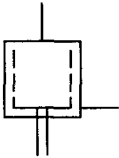
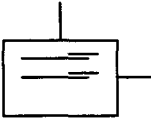

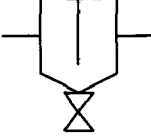
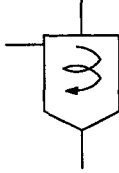
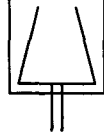
4.4 Application Rules for the Symbols in Para. 4.3

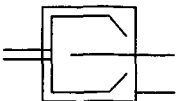
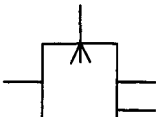
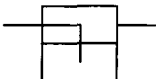


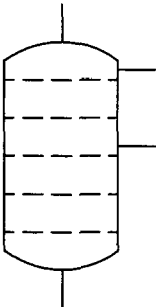
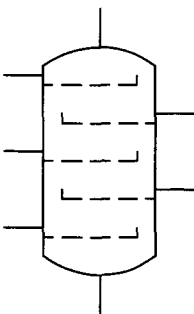
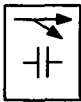
Reference Number	Registration Number	Application Rules
4.4.1	R248	The symbol may be drawn twice, with the two representations located adjacent to one another, to indicate a higher speed compared to that indicated by a single symbol. For an example, see X249 (2-7.5.4).
4.4.2	R249	<p>The symbol shall cross 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).</p> <p>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).</p> <p>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.</p>








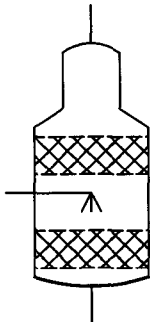
4.5 Application Examples

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.1	X2601	 <p>301, 2602</p>	Screen, sieve, strainer, filter.
4.5.2	X2602	 <p>301, 2602</p>	
4.5.3	X2603	 <p>254, 301, 2602</p>	Screen, filter with rotating drum.


Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.4	X2604		Screen, filter with rotating drum and scraper.
		254, 301, 2602, 2605	
4.5.5	X2605		Vibrating screen, sieve.
		241, 301, 2602	
4.5.6	X2606		Bag filter, candle filter, leaf filter, cartridge filter.
		301, 2602	
4.5.7	X2607		Filter with spray.
		301, 2602, 2037	
4.5.8	X2608		Belt filter, roll filter.
		301, 2013, 2602	
4.5.9	X2609		Bed filter of fixed type.
		301, 2603	
4.5.10	X2610		Bed filter of fluidized type.
		301, 2604	

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.11	X2611		Filter press; press filter.
		301, 2602, 2607	
4.5.12	X2612		Compression filter, compression by piston, screw, plate, or membrane.
		301, 2602	
4.5.13	X2613		Vacuum cleaner.
		301, 2302, 2602	
4.5.14	X2614		Centrifugal filter.
		301, 402, 2602	
4.5.15	X2615		Disc and plate (knife) separator.
		301, 2606	
4.5.16	X2616		Settling separator.
		301, 2607	
4.5.17	X2617		Settling separator with space for reject and having reject outlet.
		301, 2101, 2607	
4.5.18	X2618		Cyclone separator.
		301, 2621	
4.5.19	X2619		High-speed centrifuge.
		301, 402, 2608	

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
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.

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.28	X2628		Electromagnetic separator.
		2601, IEC	
4.5.29	X2629		Permanent-magnet separator.
		326, 2601	
4.5.30	X2630		Thermal separator using heating or cooling medium in coil.
		2501, 2601	
4.5.31	X2631		Thermal separator using electrical heating.
		2601, IEC	
4.5.32	X2632		Thermal separator using direct-heating source.
		2541, 2601	
4.5.33	X2633		Ion exchange separator.
		2601, 2624	
4.5.34	X2634		Biological filter. EXAMPLE Active mass filter.
		2601, 2623	
4.5.35	X2635		Reaction vessel with two fixed bed sections and spray nozzles.
		2037, 2062, 2603	

5 DEVICES FOR PURIFICATION BY CONVERSION**5.1 Symbol of a Basic Nature**

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
5.1.1	2651		Purifier using conversion. See R2651 (5.2.1).

5.2 Application Rules for the Symbol in Para. 5.1

Reference Number	Registration Number	Application Rules
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

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
5.3.1	2661	CAT	Catalytic type.

5.4 Application Rule for the Symbol in Para. 5.3

None.




5.5 Application Example

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
5.5.1	X2651		Purifier of catalytic type.

2651, 2661

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).

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
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 Para. 6.1

Reference Number	Registration Number	Application Rules
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.

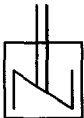


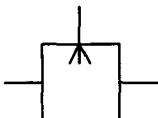
6.3 Symbol Giving Supplementary Information

None.

6.4 Application Rules for the Symbol in Para. 6.3


None.

6.5 Application Examples

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
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

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
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 Para. 7.1

None.

7.3 Symbol Giving Supplementary Information

None.

7.4 Application Rule for the Symbol in Para. 7.3

None.

7.5 Application Example

None.

RELATED DOCUMENTS

Engineering Drawing and Related Documentation Practices

Decimal Inch Drawing Sheet Size and Format	Y14.1-1995(R2002)
Metric Drawing Sheet Size and Format	Y14.1M-1995(R2002)
Line Conventions and Lettering	Y14.2M-1992(R1998)
Multiview and Sectional View Drawings.....	Y14.3M-1994(R1999)
Pictorial Drawings	Y14.4M-1989(R1999)
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