ASME Y14.40.8-2002

(Identical to ISO 14617-8: 2002)

GRAPHICAL SYMBOLS FOR DIAGRAMS, PART 8: VALVES AND DAMPERS

An American National Standard

The American Society of Mechanical Engineers

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ASME Y14.40.8, Graphical Symbols for Diagrams, Part 8: Valves and Dampers, was adopted on 19 December 2002 for use by the Department of Defense, DoD. Proposed changes by DoD activities must be submitted to the DoD Adopting Activity: Commander, U.S. Army TACOM-ARDEC, ATTN: AMSTA-AR-QAW-E, Picatinny Arsenal, NJ 07806-5000. Copies of this document may be purchased from The American Society of Mechanical Engineers (ASME), 22 Law Drive, PO Box 2900, Fairfield, NJ 07007-2900; http://www.asme.org.

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The American Society of Mechanical Engineers

AN AMERICAN NATIONAL STANDARD

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(Identical to ISO 14617-8: 2002)

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The next edition of this Standard is scheduled for publication in 2008. There will be no addenda or written interpretations of the requirements of this Standard issued to this edition.

The American Society of Mechanical Engineers
Three Park Avenue, New York, NY 10016-5990

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FOREWORD

This Standard is the adoption as an American National Standard of ISO 14617-8: 2002. The Y14 ASME Standards Committee, Engineering Drawing Practices and Related Documentation, is responsible for this Standard and supervises the United States participation in the ISO Technical Committee 10 activity responsible for the development and maintenance of its counterpart, ISO 14617-8, through the U.S. Technical Advisory Group for ISO/TC 10.

This Standard is identical to ISO 14617-8: 2000 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 in this series are:

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.

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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Engineering Drawing and Related Documentation Practices

(The following is the roster of the Committee at the time of approval of this Standard.)

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GRAPHICAL SYMBOLS FOR DIAGRAMS, PART 8: VALVES AND DAMPERS

1 SCOPE

This Standard specifies graphical symbols for valves and dampers in diagrams, including symbols for general-purpose valves, those used in fluid power systems, and hygienic valves used in the food and pharmaceutical industries.

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.

2 REFERENCES

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

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

ASME Y14.40.4, Graphical Symbols for Diagrams, Part 4: Actuators and Related Devices

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3 TERMS AND DEFINITIONS

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

3.1

safety valve: valve that automatically, without the assistance of any energy other than that of the fluid concerned, discharges a certified quantity of the fluid so as to prevent a predetermined safe pressure being exceeded, and that is designed to reclose and prevent the further flow of fluid after normal pressure conditions of service have been restored.

3.2

vacuum valve: valve that automatically and without the assistance of any energy other than that of the gas concerned, admits gas to a pipeline or tank in order to prevent a predetermined safe underpressure being exceeded.

3.3

control valve: power-operated valve in an industrial-process control system for changing the flow rate of the process fluid.

3.4

restrictor: device that restricts the flow of a fluid, thereby creating a pressure drop.

3.5

restrictor valve: valve in which the inlet and outlet ports are interconnected through a restricted passageway.

NOTE: In a fixed restrictor valve, the cross-sectional area cannot be altered; in an adjustable restrictor valve, the cross-sectional area can be adjusted.

3.6

release valve: valve through which undesired air or steam in a pipe system may be released.

3.7

pressure-reducing valve pressure regulator: valve in which, with varying inlet pressure or outlet flow, the outlet pressure remains substantially constant, but in which the inlet pressure remains higher than the selected outlet pressure.

3.8

pressure-relief valve: valve that limits maximum pressure by exhausting fluid when the required pressure is reached.

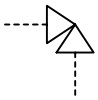
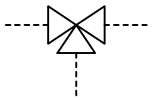
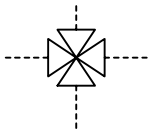
3.9

exhaust valve: valve in which the outlet is automatically opened to exhaust when the air pressure falls at the inlet.

4 GENERAL-PURPOSE VALVES

4.1 Symbols of a Basic Nature

NOTE: For general application rules, see R2101 (4.2.1).

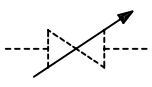
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.1.1	2101		Two-way valve. See R2102 (4.2.2).
4.1.2	2102		Angled two-way valve. See R2103 (4.2.3).
4.1.3	2103		Three-way valve.
4.1.4	2104		Four-way valve.

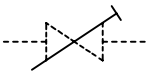
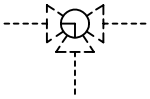
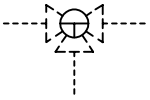
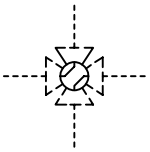
4.2 Application Rules for the Symbols in Para. 4.1

Reference Number	Registration Number	Application Rule
4.2.1	R2101	Symbols for actuators and devices for delaying, automatic return, detaining, latching, and blocking shall be chosen from ASME Y14.40.4. The imaginary direction of movement of the link between the symbol for a valve and that of the actuator or actuating function shall be *(a)* towards the valve: valve closing, and *(b)* from the valve: valve opening, independent of construction.
4.2.2	R2102	The symbol may be used as a symbol for a two-way valve in general or, in those installation diagrams where it is necessary to indicate whether a valve is straight or angled, as a symbol for a straight valve.
4.2.3	R2103	The symbol shall be used only when it is necessary to indicate the angled construction, e.g., in certain installation diagrams.

4.3 Symbols Giving Supplementary Information

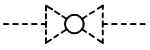
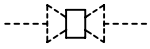
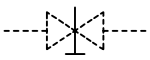
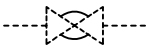
4.3.1 Functions

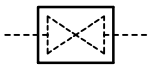
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.3.1.1	2111		Nonreturn function; check function. Flow from left to right possible.
4.3.1.2	2112		Safety function. Inlet or internal side to the left.
4.3.1.3	201		Adjustability. See R201 (4.4.1).

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.3.1.4	203		Preset adjustability. See R201 (4.4.1).
4.3.1.5	171	* >	Change of state when characteristic quantity passes set value from below, e.g., in a safety valve or a pilot switch. See R115 (4.4.2) and R121 (2-4.4.10).
4.3.1.6	172	* <	Change of state when characteristic quantity passes set value from above, e.g., in a vacuum valve or pilot switch. See R115 (4.4.2) and R122 (2-4.4.11).
4.3.1.7	2113		L-bore in a three- or four-way valve.
4.3.1.8	2114		T-bore in a three- or four-way valve.
4.3.1.9	2115		Double L-bore in a four-way valve.

4.3.2 Construction

NOTE: For the use of the symbols, see R2121 (4.4.3).

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.3.2.1	2121		Globe type.
4.3.2.2	2122		Ball type.
4.3.2.3	2123		Plug type.
4.3.2.4	2124		Gate type.
4.3.2.5	2125		Needle type.
4.3.2.6	2126		Disc or butterfly type.
4.3.2.7	2127		Piston type; plunger type.
4.3.2.8	2128		Diaphragm type.
4.3.2.9	2129		Hose type.
4.3.2.10	2130		Reduced bore.

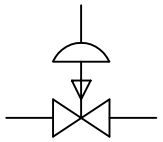
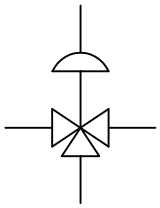
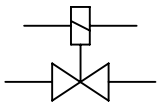
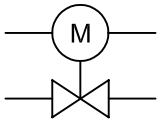
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.3.2.11	2131		Jacket.

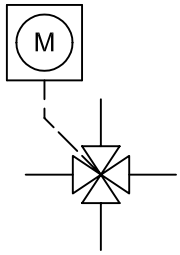
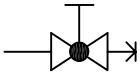
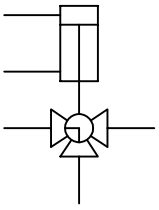
4.4 Application Rules for the Symbols in Para. 4.3

Reference Number	Registration Number	Application Rule
4.4.1	R201	The symbol should cross the center of the symbol to which it is added. For examples, see X201 (2-5.5.1) to X206 (2-5.5.6), X2131 (4.5.4.1), and X2141 (4.5.5.1). If the symbol consists of an outline in the form of a square, rectangle, or circle and a symbol inside indicating the function, another location could be more appropriate. For an example, see X207 (2-5.5.7).
4.4.2	R115	The asterisk shall be replaced with the letter symbol for the quantity or else shall be omitted. For examples, see X2121 (4.5.3.1) to X2125 (4.5.3.5).
4.4.3	R2121	The symbols shall be used only when it is necessary to show the construction.

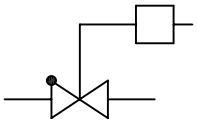
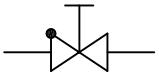
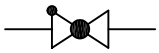
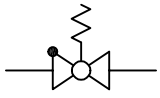
4.5 Application Examples

4.5.1 Shutoff Valves

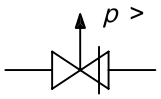
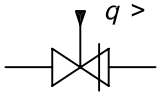
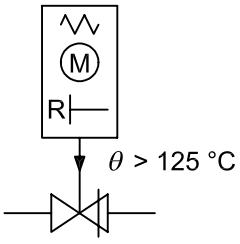
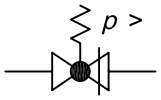
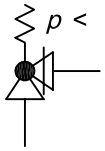
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.1.1	X2101	 403, 654, 725, 2101	Two-way valve with diaphragm actuator, opening when actuated and returning automatically to closed position at cessation of actuation.
4.5.1.2	X2102	 403, 725, 2103	Three-way valve with diaphragm actuator.
4.5.1.3	X2103	 403, 2101, IEC	Two-way valve with solenoid actuator.
4.5.1.4	X2104	 403, 2101, IEC	Two-way valve with electric motor actuator.

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.1.5	X2105	 404, 741, 2104, IEC	Four-way valve with actuating device of electric-motor type.
4.5.1.6	X2106	 403, 405, 565, 681, 2101, 2121	Globe-type two-way valve with quick-release coupling, e.g., for fire hydrant.
4.5.1.7	X2107	 403, 2103, 2113, 2442	Ball-type three-way valve with double-acting fluid cylinder actuator.

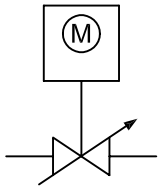
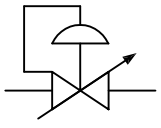
4.5.2 Nonreturn Valves and Check Valves

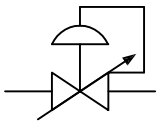
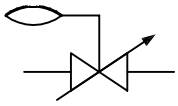
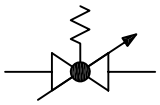
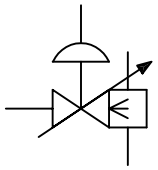
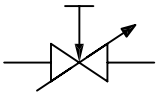
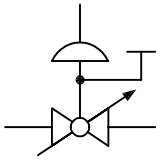
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.2.1	X2111	 403, 2001, 2101, 2111	Weight-loaded nonreturn valve.
4.5.2.2	X2112	 403, 681, 2101, 2111	Combined nonreturn valve and manually actuated stop valve.
4.5.2.3	X2113	 2101, 2111, 2121	Globe-type nonreturn valve; lift-type nonreturn valve.
4.5.2.4	X2114	 2101, 2111, 2126	Swing-type nonreturn valve.
4.5.2.5	X2115	 403, 2002, 2101, 2122	Spring-loaded ball-type nonreturn valve.

4.5.3 Valves With Safety Function

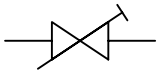
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.3.1	X2121	 171, 242, 403, 2101, 2112	Safety valve that opens when pressure p higher than set value.
4.5.3.2	X2122	 171, 242, 403, 2101, 2112	Pipe break valve that closes when flow rate q higher than set value.
4.5.3.3	X2123	 171, 242, 403, 681, 741, 2002, 2101, 2112, IEC	Quick-acting valve that closes by spring actuator when temperature θ higher than 125°C, with manual reset. The spring is charged by an electric motor.
4.5.3.4	X2124	 171, 403, 2002, 2101, 2112, 2121	Globe-type spring-loaded safety valve operating when pressure p higher than set value.
4.5.3.5	X2125	 172, 403, 2002, 2102, 2112, 2121	Angled, globe-type, spring-loaded vacuum valve operating when pressure p lower than set value.

4.5.4 Control Valves

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.4.1	X2131	 201, 403, 741, 2101, IEC	Control valve with actuating device of electric motor type.
4.5.4.2	X2132	 201, 403, 405, 725, 2101	Self-operating back-pressure control valve. NOTE: Flow from left to right is assumed.

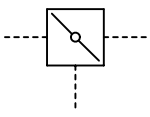
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.4.3	X2133	 201, 403, 405, 725, 2101	Self-operating pressure-reducing control valve. NOTE: Flow from left to right is assumed.
4.5.4.4	X2134	 201, 403, 715, 2101	Float-operated control valve.
4.5.4.5	X2135	 201, 403, 2002, 2101, 2121	Spring-loaded globe-type relief valve.
4.5.4.6	X2136	 201, 301, 403, 725, 2037, 2101	Diaphragm-operated desuperheater control valve.
4.5.4.7	X2137	 201, 403, 681, 2101, 2125	Manually operated needle-type control valve.
4.5.4.8	X2138	 201, 403, 501, 681, 725, 2101, 2122	Ball-type control valve, operated by diaphragm actuator or manual actuator.

4.5.5 Other Valves

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
4.5.5.1	X2141	 203, 2101	Restrictor valve.

5 DAMPERS

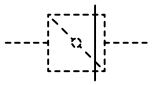
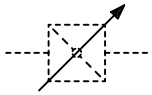
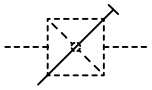
5.1 Symbols of a Basic Nature

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
5.1.1	2151		Two- or three-way damper. See R2101 (4.2.1).

5.2 Application Rules for the Symbols in Para. 5.1

See R2101 (4.2.1).

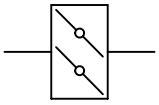
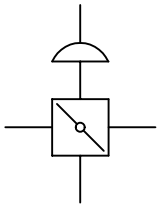
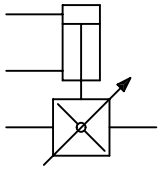
5.3 Symbols Giving Supplementary Information

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
5.3.1	2111		Nonreturn function; check function. Flow from left to right possible.
5.3.2	2112		Safety function. Inlet is to the left.
5.3.3	201		Adjustability. See R201 (4.4.1).
5.3.4	203		Preset adjustability. See R201 (4.4.1).

5.4 Application Rules for the Symbols in Para. 5.3

See para. 4.4.

5.5 Application Examples

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
5.5.1	X2151	 2151	Multileaf damper.
5.5.2	X2152	 403, 725, 2151	Three-way damper with diaphragm actuator.
5.5.3	X2153	 201, 403, 724, 2151	Control damper with double-acting fluid cylinder.

6 VALVES FOR FLUID POWER SYSTEMS

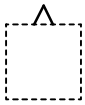
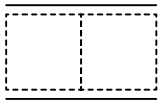
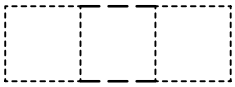
6.1 Symbols of a Basic Nature

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.1.1	2161		Valve. See R2161 (6.2.1) and R2162 (6.2.2).
6.1.2	2162		Seat of a nonreturn valve.
6.1.3	2163		Moving part of a nonreturn valve.

6.2 Application Rules for the Symbols in Para. 6.1

Reference Number	Registration Number	Application Rule
6.2.1	R2161	Symbols for actuators and devices for delaying, automatic return, detaining, latching, and blocking shall be chosen from ASME Y14.40.4.
6.2.2	R2162	The symbol shall be divided into a number of equal rectangles, one for each distinctive valve position. In each rectangle, the asterisk shall be replaced with symbols for the flow paths. However, for certain valves, a simplified representation with only one rectangle may be used. See 2175 (6.3.5) and R2172 (6.4.2).

6.3 Symbols Giving Supplementary Information

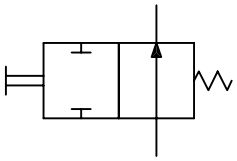
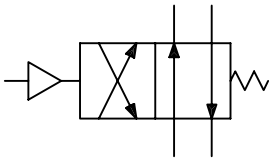
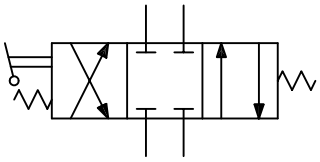
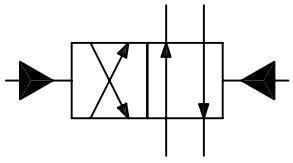
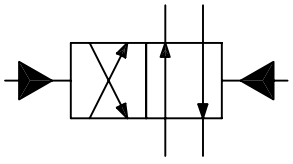
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.3.1	2171		Open flow path. See R2171 (6.4.1).
6.3.2	2172		Closed flow path.
6.3.3	2173		Closed flow path of a leak-free valve.
6.3.4	2174		Flow to open air.
6.3.5	2175		Infinite number of intermediate positions of a valve. See R2172 (6.4.2).
6.3.6	2176		Transitory position. See R2173 (6.4.3).
6.3.7	2177		Affected area. See R2174 (6.4.4).

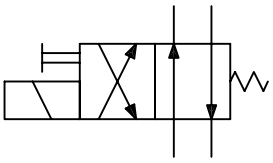
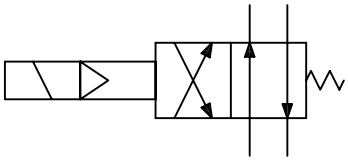
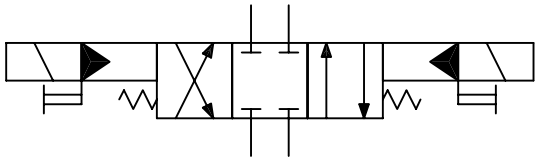
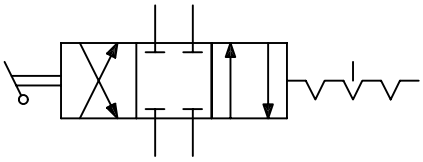
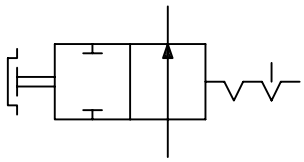
6.4 Application Rules for the Symbols in Para. 6.3

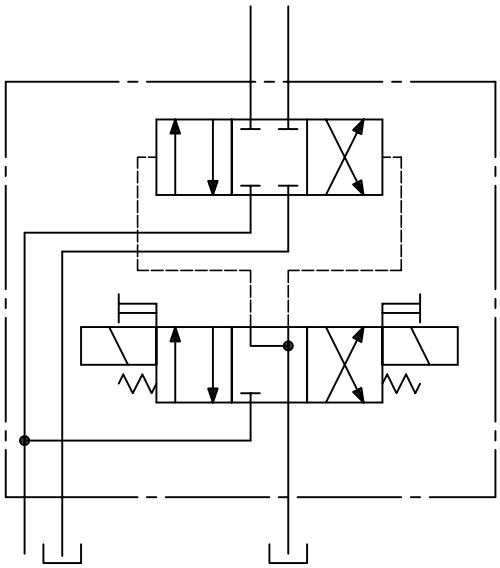
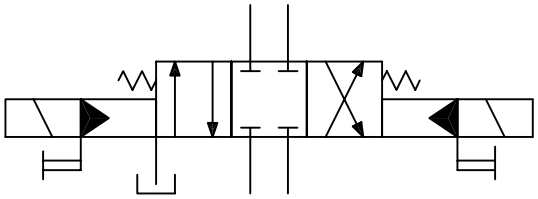
Reference Number	Registration Number	Application Rule
6.4.1	R2171	When applicable, the symbol shall be supplemented with an indication of the actual flow direction. See the application examples in para. 6.5.
6.4.2	R2172	For a valve with two distinct positions and an infinite number of intermediate positions, a simplified representation is permitted, implying that the symbol is omitted, and only one rectangle drawn. For an example, see X2192 (6.5.2.2).
6.4.3	R2173	The symbol for a transitory position shall be shown only when the flow paths in this position are necessary for the function of the circuit.
6.4.4	R2174	The symbol for the affected area shall be used when it is necessary to show that two or more fluid circuits affect a valve on different areas. The width of the symbols shall correspond approximately to the different areas. For an example, see X2165 (6.5.1.5). Instead, the different areas may be indicated by symbols having the same width, supplemented with numerical values.

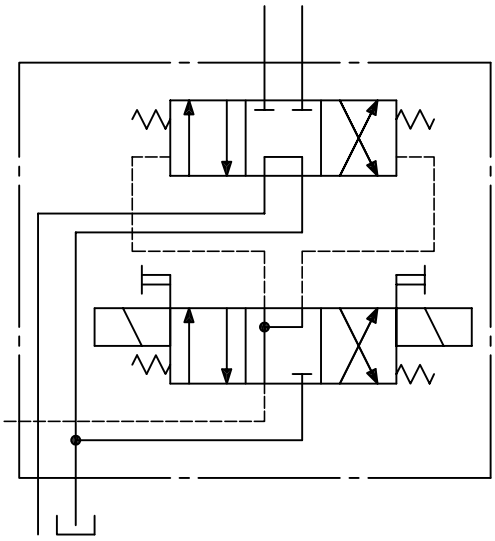
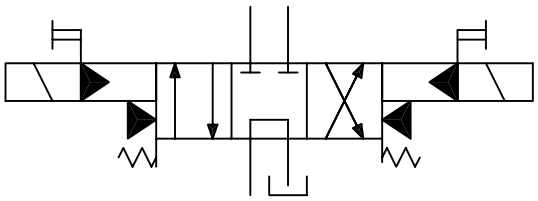
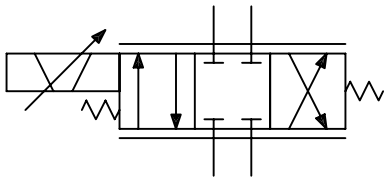
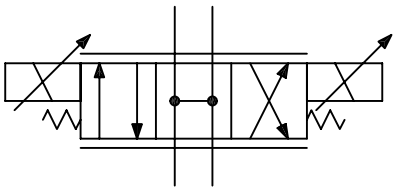
6.5 Application Examples

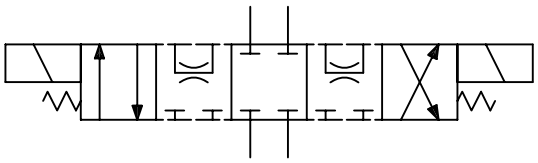
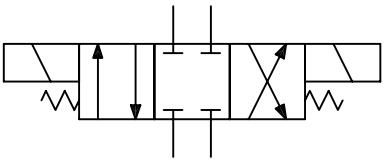
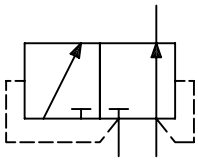
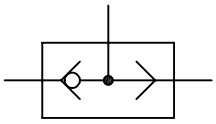
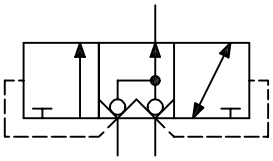
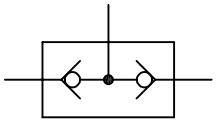
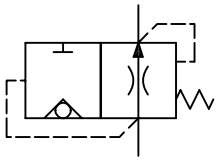
6.5.1 Directional Control Valves

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.5.1.1	X2161	 242, 402, 681, 2002, 2161, 2171, 2172	Manually operated directional control valve with spring return to resting position.
6.5.1.2	X2162	 242, 244, 2002, 2161, 2171	Direct, pneumatically operated directional control valve with spring return to resting position.
6.5.1.3	X2163	 242, 402, 688, 2002, 2161, 2171, 2172	Lever-operated directional control valve with three positions and spring return to resting position (mid-position).
6.5.1.4	X2164	 242, 243, 2161, 2171	Direct, hydraulically operated directional control valve.
6.5.1.5	X2165	 242, 243, 2161, 2171, 2177	Direct, hydraulically operated directional control valve. Different affecting areas are indicated.

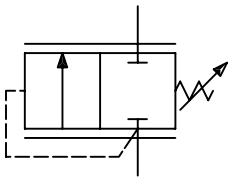
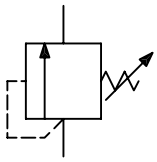
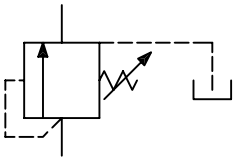
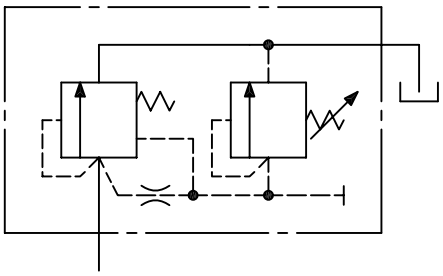
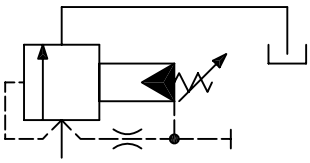
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.5.1.6	X2166	 242, 402, 681, 2002, 2161, 2171, IEC	Manually or electrically operated directional control valve with spring return.
6.5.1.7	X2167	 242, 718, 2002, 2161, 2171, IEC	Electropneumatically operated directional control valve with spring return.
6.5.1.8	X2168	 242, 402, 681, 717, 2002, 2161, 2171, 2172, IEC	Electrohydraulically or manually operated directional control valve with spring return to resting position (mid-position).
6.5.1.9	X2169	 242, 402, 656, 657, 688, 2161, 2171, 2172	Lever-operated directional control valve, detained in all three positions.
6.5.1.10	X2170	 242, 402, 656, 657, 681, 692, 2161, 2171, 2172	Manually operated directional control valve, detained in both positions with restricted access to actuator.

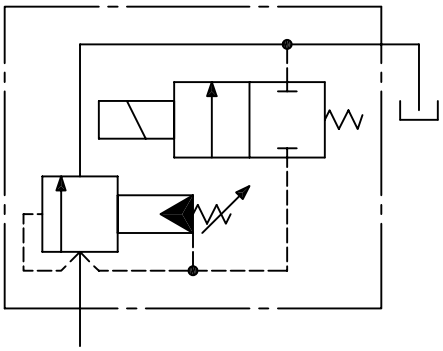
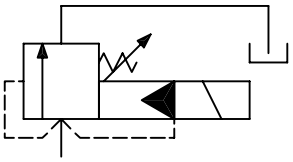
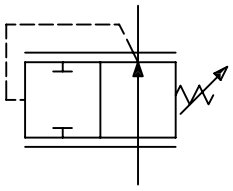
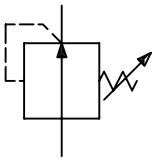
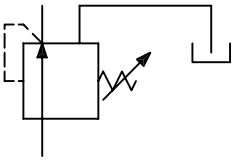
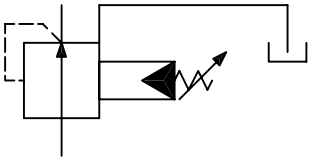
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.5.1.11	X2171	 242, 243, 402, 405, 422, 501, 681, 2002, 2061, 2161, 2171, 2172, IEC	Directional control valve with pilot valve: main valve having three positions, actuated by internal pilot pressure, with spring return to mid-position; pilot valve having three positions, actuated electrically or manually, with spring return to mid-position. Detailed and simplified forms shown.
6.5.1.12	X2172	 242, 243, 402, 681, 717, 2002, 2061, 2161, 2171, 2172, IEC	

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.5.1.13	X2173	 242, 402, 405, 422, 501, 681, 2002, 2061, 2161, 2171, 2172, IEC	Directional control valve with pilot valve: main valve having three positions, actuated by internal pilot pressure, with spring return to mid-position controlled by release of pilot pressure; pilot valve with three positions, actuated electrically or manually, with spring return to mid-position. Detailed and simplified forms shown.
6.5.1.14	X2174	 242, 243, 402, 681, 717, 2002, 2061, 2161, 2171, 2172, IEC	
6.5.1.15	X2175	 201, 242, 2002, 2161, 2171, 2172, 2175, IEC	Directional servo-control valve with positive overlapping in mid-position, operated by double-acting solenoid, with spring return to mid-position.
6.5.1.16	X2176	 201, 242, 501, 2002, 2161, 2171, 2175, IEC	Directional servo-control valve with negative overlapping in mid-position, operated by two counteracting solenoids, with spring return to mid-position.

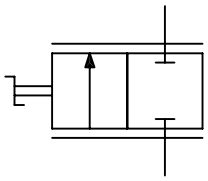
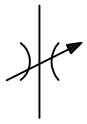
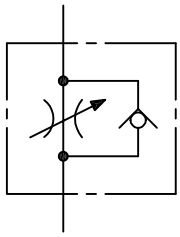
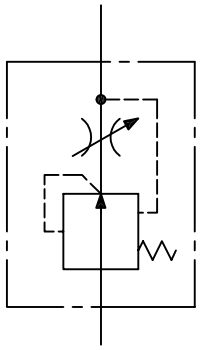
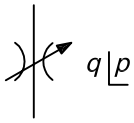
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.5.1.17	X2177	 242, 2002, 2031, 2161, 2171, 2172, IEC	Electrically operated directional control valve. Detailed and simplified forms shown. In the detailed form, the transitory positions are shown.
6.5.1.18	X2178	 242, 2002, 2161, 2171, 2172, IEC	
6.5.1.19	X2179	 242, 422, 2161, 2171, 2172	Directional control valve with three ports and two positions. EXAMPLE: Shuttle valve with OR function. The inlet port connected to the higher pressure is automatically connected to the outlet port while the other inlet port is closed. Detailed and simplified forms shown.
6.5.1.20	X2180	 501, 2161, 2162, 2163, 2171	
6.5.1.21	X2181	 242, 246, 405, 422, 501, 561, 2161, 2171, 2172, 2173	Directional control valve with three ports and three positions. EXAMPLE: Shuttle valve with AND function. The outlet port is only under pressure if both inlet ports are under pressure. Detailed and simplified forms shown.
6.5.1.22	X2182	 501, 2161, 2162, 2163, 2171	
6.5.1.23	X2183	 242, 422, 2002, 2031, 2161, 2171, 2172, 2173	Directional leak-free control valve with two ports and two positions. EXAMPLE: Pipe break valve.

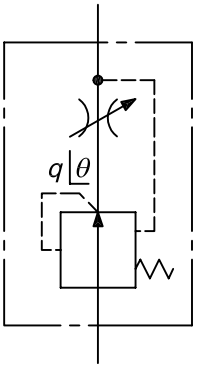
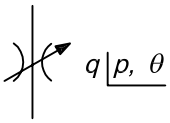
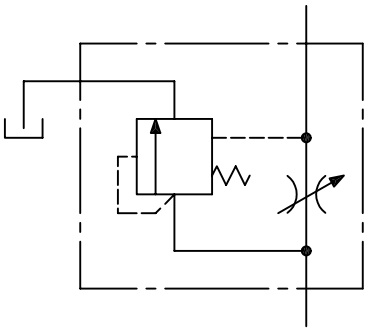
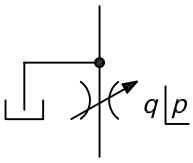
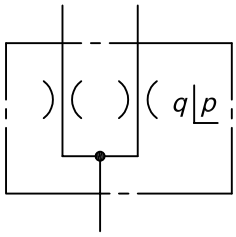
6.5.2 Pressure Control Valves

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.5.2.1	X2191	 201, 242, 422, 2002, 2161, 2171, 2172, 2175	Single-stage pressure-relief valve. Detailed and simplified forms shown.
6.5.2.2	X2192	 201, 242, 422, 2002, 2161, 2171	
6.5.2.3	X2193	 201, 242, 405, 422, 2002, 2061, 2161, 2171	Single-stage pressure-relief valve with external drain, for use, e.g., as sequence valve.
6.5.2.4	X2194	 201, 242, 405, 422, 501, 503, 2002, 2031, 2061, 2161, 2171	Two-stage pressure-relief valve with provision for remote control. Detailed and simplified forms shown.
6.5.2.5	X2195	 201, 242, 405, 422, 501, 503, 717, 2002, 2031, 2061, 2161, 2171	

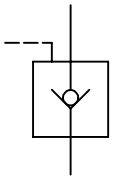
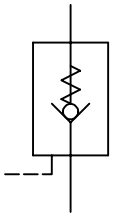
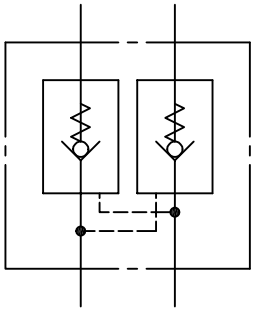
Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.5.2.6	X2196	 201, 242, 405, 422, 501, 717, 2002, 2061, 2161, 2171, 2172, IEC	Electrohydraulically operated two-stage pressure-relief valve. Detailed and simplified forms shown.
6.5.2.7	X2197	 201, 242, 405, 422, 717, 2002, 2061, 2161, 2171, IEC	
6.5.2.8	X2198	 201, 242, 422, 2002, 2161, 2171, 2172, 2175	Pressure-reducing valve. Detailed and simplified forms shown.
6.5.2.9	X2199	 201, 242, 422, 2002, 2161, 2171	
6.5.2.10	X2200	 201, 242, 405, 422, 2002, 2061, 2161, 2171	Single-stage pressure-reducing valve.
6.5.2.11	X2201	 201, 242, 405, 422, 717, 2002, 2061, 2161, 2171	Two-stage pressure-reducing valve.

6.5.3 Flow Control Valves

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.5.3.1	X2211	 242, 402, 685, 2161, 2171, 2172, 2175	Adjustable restrictor (valve). Detailed and simplified forms shown.
6.5.3.2	X2212	 201, 2031, 2171	
6.5.3.3	X2213	 201, 405, 501, 2031, 2162, 2163, 2171	Adjustable restrictor (valve) with adjustable flow in one direction and restricted flow in other direction.
6.5.3.4	X2214	 201, 242, 405, 422, 501, 2002, 2031, 2161, 2171	Flow control valve, pressure compensated. Detailed and simplified forms shown.
6.5.3.5	X2215	 128, 201, 2031, 2171	

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.5.3.6	X2216	 128, 201, 242, 405, 422, 501, 2002, 2031, 2161, 2171	Flow control valve, pressure and temperature compensated. Detailed and simplified forms shown.
6.5.3.7	X2217	 128, 201, 2031, 2171	
6.5.3.8	X2218	 201, 242, 405, 422, 501, 2002, 2031, 2061, 2161, 2171	Flow control valve, pressure compensated, with overflow to reservoir. Detailed and simplified forms shown.
6.5.3.9	X2219	 128, 201, 405, 501, 2031, 2061, 2171	
6.5.3.10	X2220	 128, 405, 501, 2031, 2171	Flow divider, pressure compensated. The flow is divided into two flows in a fixed ratio.

6.5.4 Nonreturn/Check Valves

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
6.5.4.1	X2231	 2002, 2162, 2163, 2171	Spring-loaded nonreturn valve.
6.5.4.2	X2232	 2161, 2162, 2163, 2171	Pilot-operated nonreturn valve, closed by pilot pressure.
6.5.4.3	X2233	 2002, 2161, 2162, 2163, 2171	Pilot-operated nonreturn valve, opened by pilot pressure against return spring. EXAMPLE: Exhaust valve.
6.5.4.4	X2234	 405, 422, 501, 2002, 2161, 2162, 2163, 2171	Pilot-controlled double nonreturn valve.

7 HYGIENIC VALVES

7.1 Symbols of a Basic Nature

The symbols of para. 6.1 shall be used.

7.2 Application Rules for the Symbols in Para. 7.1

The application rules of para. 6.2 shall be used.

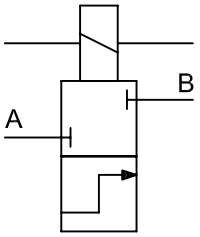
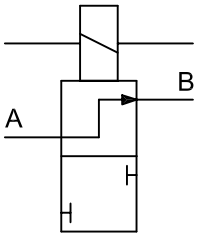
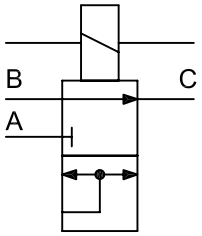
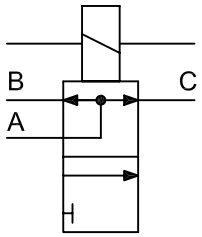
7.3 Symbols Giving Supplementary Information

The symbols of para. 6.3 shall be used.

7.4 Application Rules for the Symbols in Para. 7.3

The symbols and application rules of para. 6.4 shall be used.

7.5 Application Examples

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
7.5.1	X2241	 242, 2161, 2171, 2172, IEC	Hygienic valve; flow A ⇒ B when valve is actuated.
7.5.2	X2242	 242, 2161, 2171, 2172, IEC	Hygienic valve; flow A ⇒ B when valve in at-rest position.
7.5.3	X2243	 242, 501, 2161, 2171, 2172, IEC	Hygienic valve; flow B ⇒ C when valve is in at-rest position; flow A ⇒ B and A ⇒ C when valve is actuated.
7.5.4	X2244	 242, 501, 2161, 2171, 2172, IEC	Hygienic valve; flow A ⇒ B and A ⇒ C when valve is in at-rest position; flow B ⇒ C when valve is actuated.

8 VALVES WITH SPECIAL FUNCTIONS

8.1 Symbol of a Basic Nature

Reference Number	Registration Number	Symbol Form/Shape	Symbol Description
8.1.1	2181		Self-operating release valve. EXAMPLES: Steam trap, vent.

8.2 Application Rule for the Symbol in Para. 8.1

None.

8.3 Symbol Giving Supplementary Information

None.

8.4 Application Rule for the Symbol in Para. 8.3

None.

8.5 Application Example

None.

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