

Specification for

Graphical symbols for general engineering —

Part 1: Piping systems and plant

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Chartered Institute of Patent Agents	North East Coast Institution of Engineers and Shipbuilders
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Institution of Chemical Engineers	Society of Chemical Industry
Institution of Civil Engineering	United Kingdom Atomic Energy Authority

This British Standard, having been prepared under the direction of the Mechanical and the Chemical Standards Committees, was published under the authority of the Executive Board on 31 March 1977

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Committee references MEE/88 and CHE/17
Drafts for comment 71/34910, 71/34911 and 71/35726

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Amendments issued since publication

Amd. No.	Date of issue	Comments

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Foreword

For many years BSI has published separate specifications for graphical symbols used on engineering diagrams relating to individual technical disciplines; this has inevitably led to a few inconsistencies between standards. In this revision of BS 1553-1:1949, which has been prepared under the authority of the Mechanical and the Chemical Standards Committees, an attempt has been made to eliminate such differences and produce a standard which specifies symbols which will be common to heating and ventilating installations and to process plants of all types. To accomplish this aim BS 1553-4:1956 “Graphical symbols for heating and ventilating installations” and BS 974:1953 “Symbols for use on flow diagrams of chemical and petroleum plant”, have also been revised and incorporated into this standard. BS 1553-4 and BS 974 have accordingly been withdrawn.

It is intended that the symbols specified in this standard should be applied in accordance with the practice recommended in BS 5070.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 40, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

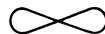
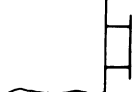
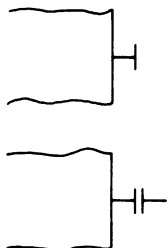
This Part of BS 1553 specifies graphical symbols for use in the creation of flow and piping diagrams for process plant and heating and ventilating installations. It is intended that diagrams employing these symbols should be drawn in accordance with the practice recommended in BS 5070.

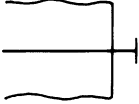
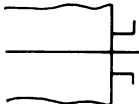
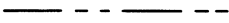
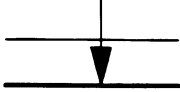
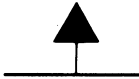
2 References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

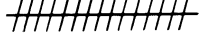
3 Symbols (or elements of symbols) used in conjunction with other symbols

3.1 General

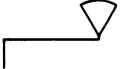
No.	Description	Symbol
3.1.1	Mechanical linkage	
3.1.2	Weight device	
3.1.3	Electrical device	
3.1.4	Vibratory or loading device (any type)	
3.1.5	Spray device	
3.1.6	Rotary movement	
3.1.7	Stirring device	
3.1.8	Fan	
3.1.9	Access point	
3.1.10	Equipment branch: general symbol NOTE The upper representation does not necessarily imply a flange, merely the termination point. Where a breakable connection is required the branch/pipe would be as shown in the lower symbol.	

No.	Description	Symbol
3.1.11	Equipment penetration (fixed)	
3.1.12	Equipment penetration (removable)	
3.1.13	Boundary line	
3.1.14	Point of change (See 4.1.12 for specific examples)	
3.1.15	Discharge to atmosphere	
3.1.16	Intake from atmosphere	
3.1.17	Trap: release or retention	
3.1.18	Flow restrictor (fixed)	
3.1.19	Flow restrictor (variable)	

3.2 Pipelines

No.	Description	Symbol
3.2.1	Pipeline (major flow line)	
3.2.2	Pipeline (minor flow line)	
3.2.3	Pipeline (existing)	
3.2.4	Pipeline (undeground, or concealed)	
3.2.5	Existing pipeline (to be removed)	
3.2.6	Pipeline (future)	

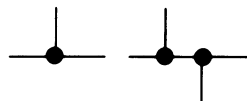
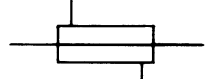
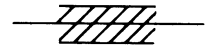
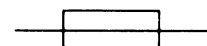
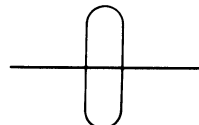
3.3 Valves: actuating methods

No.	Description	Symbol
3.3.1	Manual isolation	
3.3.2	Power signal	
3.3.3	Statically loaded	 i.e symbol 3.1.4
3.3.4	Spring loaded	
3.3.5	Weight loaded	
3.3.6	Quick opening	
3.3.7	Quick closing	
3.3.8	Float control	
3.3.9	Dash pot checked	
3.3.10	Piston	
3.3.11	Diaphragm	
3.3.12	Solenoid	
3.3.13	Automatic actuating element	
3.3.14	Automatic actuating element, with integral manual actuating element	

No.	Description	Symbol
3.3.15	Manual actuating element	
3.3.16	Motor	

4 Basic functional symbols

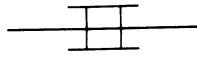
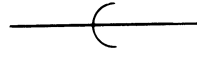
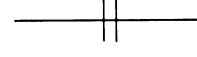
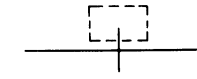
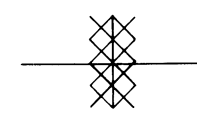
4.1 Pipelines

No.	Description	Symbol
4.1.1	Crossing (unconnected) (See Appendix A)	
4.1.2	Junction (connected) (see Appendix A)	
4.1.3	Heated or cooled NOTE Heating or cooling medium to be annotated adjacent to symbol	
4.1.4	Jacketed NOTE Heating or cooling medium to be annotated adjacent to symbol	
4.1.5	Lagged	
4.1.6	Sleeved NOTE Fluid or fill of the annulus to be annotated adjacent to symbol	
4.1.7	Provision for flexibility (See 4.7 for specific methods)	
4.1.8	Indication of flow direction NOTE Included angle of arrow = 30°	
4.1.9	Indication of pipe size $\phi 150$ mm example	

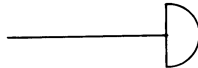
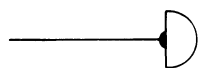
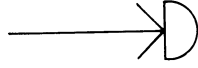
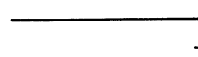
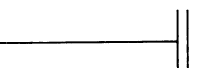
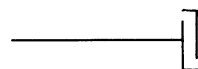
No.	Description	Symbol
4.1.10	Indication of fall (or rise)	FALL 1:60
4.1.11	Indication of support points (See 4.4 for specific types of supports and hangers)	
4.1.12	Indication of point of change (i.e. size, specification, level, responsibility, etc. added to symbol 3.1.14) NOTE Changes in conditions should embrace the arrow Examples: Responsibility change Pipe bore change Change in fall	COMP. CONT. 150 100 FALL 1:100 LEVEL
4.1.13	Coincident point of change	COMP. CONT. 150 100
4.1.14	Pipe bore change (unspecified)	

4.2 Joints

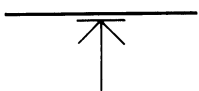
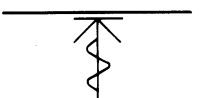
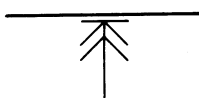
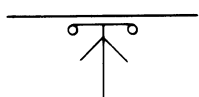
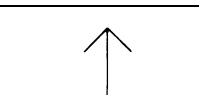
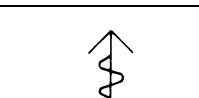
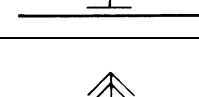
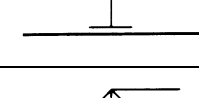
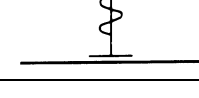
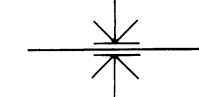
No.	Description	Symbol
4.2.1	Butt welded NOTE The proportions of the weld should be thus: 4 x line thickness	
4.2.2	Soldered or solvent welded	
4.2.3	Screwed	
4.2.4	Compression	
4.2.5	Sleeve: BS 534	

No.	Description	Symbol
4.2.6	Socket welded: BS 3799	
4.2.7	Socket and spigot	
4.2.8	Swivel	
4.2.9	Flanged and bolted	
4.2.10	Electrically bonded	
4.2.11	Electrically insulated	

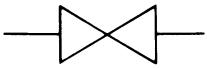
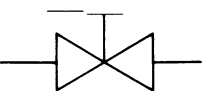
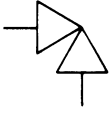
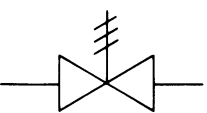
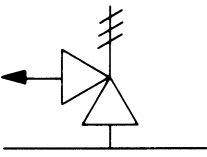
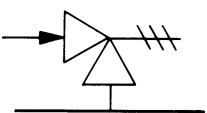
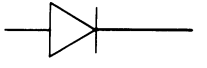
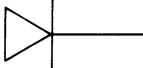
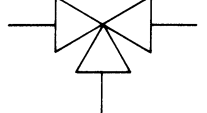
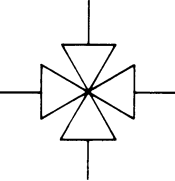
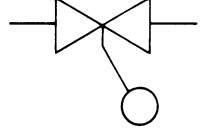
4.3 End closures

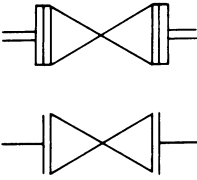
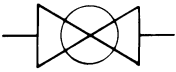
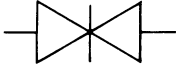
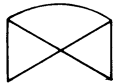
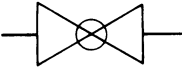
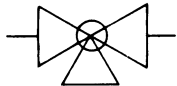
No.	Description	Symbol
4.3.1	End cap: general symbol (method unspecified) (Annotate as “detachable”, when appropriate)	
4.3.2	End cap: butt welded	
4.3.3	End cap: screwed	
4.3.4	End cap: fillet welded	
4.3.5	End screwed and plugged	
4.3.6	End flanged and bolted	
4.3.7	End closure: quick release	
4.3.8	End socket and spigot	

4.4 Supports and hangers

No.	Description	Symbol
4.4.1	Support: basic symbol (Use symbol 4.1.11 when a detailed support or hanger is not required)	See 4.1.11
4.4.2	Simple support	
4.4.3	Resilient support	
4.4.4	Adjustable support	
4.4.5	Roller support	
4.4.6	Simple hanger	
4.4.7	Resilient hanger	
4.4.8	Adjustable hanger	
4.4.9	Constant load hanger	
4.4.10	Guide	
4.4.11	Anchor	

4.5 Valves

No.	Description	Symbol
4.5.1	In-line (any type or pattern)	
4.5.2	In-line (simple screw-down)	
4.5.3	Angle (simple screw-down)	
4.5.4	Relief (in-line)	
4.5.5	Relief (angle, pressure)	
4.5.6	Relief (angle, vacuum)	
4.5.7	Check (non-return or reflux)	
4.5.8	Check (non-return or reflux) screw down	
4.5.9	3-way	
4.5.10	4-way	
4.5.11	In-line (float operated)	

No.	Description	Symbol
4.5.12	Flanged or alternatively	
4.5.13	Butterfly	
4.5.14	Globe	
4.5.15	Ball	
4.5.16	Wedge gate	
4.5.17	Parallel slide	
4.5.18	Needle	
4.5.19	Diaphragm	
4.5.20	Plug Annotate type of port adjacent to symbol i.e. T (Tee port) L (L port)	
4.5.21	Plug 3-way Annotate type of port adjacent to symbol i.e. T (Tee port) L (L port)	

4.6 Trap functions

No.	Description	Symbol
4.6.1	Trap drain, e.g. condensate release	
4.6.2	Trapped vent, e.g. automatic air valve	

4.7 Pipeline flexibility

No.	Description	Symbol
4.7.1	Bellows	
4.7.2	Sleeve extension	
4.7.3	Expansion loop	
4.7.4	Flexible hose, flanged example	