
British Standard

Hydraulic fluid power valve mounting surfaces

Part 5. Specification for compensated flow-control valves

[ISO title: Hydraulic fluid power — Compensated flow-control valves — Mounting surfaces]

Plan de pose pour transmissions hydrauliques
Partie 5. Régulateurs de débit - Spécifications

Fluidtechnik; Lochbilder für den Einbau von Hydroventilen
Teil 5. Stromregelventile

Contents

	Page		Page
National foreword		Inside front cover	
Committees responsible		Back cover	
Specification			
0 Introduction	2	6 Compensated flow-control valves with three main ports of 14,7 mm maximum port diameter (code: ISO 6263 — AL — 06 — 3 — A)	10
1 Scope and field of application	2	7 Mounting surface for compensated flow-control valves with two main ports of 17,5 mm maximum port diameter (size 07)	11
2 References	2	8 Compensated flow-control valves with two main ports of 17,5 mm maximum port diameter (code: ISO 6263 — AM — 07 — 2 — A)	12
3 Definitions	2	9 Mounting surface for compensated flow-control valves with three main ports of 17,5 mm maximum port diameter (size 07)	13
4 Symbols	2	10 Compensated flow-control valves with three main ports of 17,5 mm maximum port diameter (code: ISO 6263 — AN — 07 — 3 — A)	14
5 Tolerances	2	11 Mounting surface for compensated flow-control valves with two main ports of 23,4 mm maximum port diameter (size 08)	15
6 Dimensions	3	12 Compensated flow-control valves with two main ports of 23,4 mm maximum port diameter (code: ISO 6263 — AP — 08 — 2 — A)	16
7 Port marking	3	13 Mounting surface for compensated flow-control valves with three main ports of 23,4 mm maximum port diameter (size 08)	17
8 Modular stack valves	3	14 Compensated flow-control valves with three main ports of 23,4 mm maximum port diameter (code: ISO 6263 — AQ — 08 — 3 — A)	18
9 Working pressure	3		
10 Identification statement	3	Bibliography	4
Figures			
1 Mounting surface for compensated flow-control valves with two main ports of 7,5 mm maximum port diameter (size 03)	5		
2 Compensated flow-control valves with two main ports of 7,5 mm maximum port diameter (code: ISO 6263 — AB — 03 — 4 — B)	6		
3 Mounting surface for compensated flow-control valves with two main ports of 14,7 mm maximum port diameter (size 06)	7		
4 Compensated flow-control valves with two main ports of 14,7 mm maximum port diameter (code: ISO 6263 — AK — 06 — 2 — A)	8		
5 Mounting surface for compensated flow-control valves with three main ports of 14,7 mm maximum port diameter (size 06)	9		

National foreword

This Part of BS 6494 has been prepared under the direction of the Machinery and Components Standards Committee and is one of a series of standards specifying dimensions and tolerances for subplate surfaces upon which hydraulic control valves are mounted. It is identical with ISO 6263 : 1987 'Hydraulic fluid power — Compensated flow-control valves — Mounting surfaces', published by the International Organization for Standardization (ISO).

The identification codes used throughout this standard are explained in ISO 5783.

The other Parts of BS 6494 are as follows, the international standards with which they are identical being given in brackets.

- Part 1 Specification for four-port directional control valves (ISO 4401-1980)
- Part 2 Specification for four-port and five-port servo-valves
- Part 3 Specification for pressure-relief valves (ISO 6264 : 1987)
- Part 4 Specification for clamping dimensions of four-port, size 03 and 05, modular stack valves and directional control valves (ISO 7790-1986)
- Part 6 Specification for pressure-control valves (excluding pressure-relief valves), sequence valves, unloading valves, throttle valves and check valves (ISO 5781 : 1987)

Attention is drawn to the fact that the port usage of two-stage pressure-control valves may vary from that shown in figures 6, 10 and 14.

Similar British Standards specifying the dimensions of mounting surfaces for hydraulic stacking valves and the dimensions of cavities for cartridge types of hydraulic valve are in preparation.

Terminology and conventions. The text of the international standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Part of BS 6494'.

In clause 6 and figures 1 to 14, the first letters 'ISO 6263' in the codification should be read as 'BS 6494 : Part 5'.

The identification statement specified in clause 10 should be read as follows.

'Mounting surface dimensions conform to BS 6494 'Hydraulic fluid power valve mounting surfaces' Part 5
'Specification for compensated flow-control valves'.'

Cross-references

International standards	Corresponding British Standards
ISO 129-1985 and ISO 1302-1978	BS 308 Engineering drawing practice Part 2 : 1985 Recommendations for dimensioning and tolerancing of size (Technically equivalent)
ISO 286-1962	BS 4500 ISO limits and fits Part 1 : 1969 General, tolerances and deviations (Technically equivalent)
ISO 965/1-1980	BS 3643 Specification for ISO metric screw threads Part 1 : 1981 Principles and basic data (Technically equivalent)
ISO 1219-1976*	BS 2917 : 1977 Specification for graphical symbols used on diagrams for fluid power systems and components (Identical)
ISO 4401-1980	BS 6494 Hydraulic fluid power valve mounting surfaces Part 1 : 1984 Specification for four-port directional control valves (Identical)

The Technical Committee has reviewed the provisions of ISO 468, ISO 1101, ISO 5598 and ISO 5783, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard. Related British Standards for ISO 468 and ISO 1101 are as follows.

ISO 468-1982	BS 1134 Assessment of surface texture Part 1 : 1988 Methods and instrumentation *Part 2 : 1972 General information and guidance
ISO 1101-1983	BS 308 Engineering drawing practice Part 3 : 1972 Geometrical tolerancing

There are no corresponding British Standards for ISO 5598 and ISO 5783. ISO 5783 is currently under review by the relevant ISO committee. It will not be considered for implementation as a Part of BS 6494 until a revised edition is published.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

* A revision is in preparation.

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Part 5. Specification for compensated flow-control valves

0 Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Typical components found in such systems are hydraulic valves. The devices control flow direction, pressure or flow rate of liquids in the enclosed circuit.

1 Scope and field of application

This International Standard specifies the dimensions and other data relating to surfaces on which hydraulic compensated flow-control valves are mounted in order to ensure interchangeability.

It applies to mounting surfaces for hydraulic compensated flow-control valves which represent current practice. They are generally applicable to industrial equipment.

2 References

ISO 468, *Surface roughness — Parameters, their values and general rules for specifying requirements*.

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerances of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings*.

ISO 1219, *Fluid power systems and components — Graphic symbols*.

ISO 1302, *Technical drawings — Method of indicating surface texture on drawings*.

ISO 4401, *Hydraulic fluid power — Four-port directional control valves — Mounting surfaces*.

ISO 5598, *Fluid power systems and components — Vocabulary*.

ISO 5783, *Hydraulic fluid power — Code for identification of valve mounting surfaces*.

3 Definitions

For purposes of this International Standard, the definitions given in ISO 5598 apply.

4 Symbols

4.1 For the purposes of this International Standard, the following symbols apply:

- a) A, B, L, P, T and V identify ports;
- b) F_1 , F_2 , F_3 and F_4 identify threaded holes for fixing bolts;
- c) G, G_1 and G_2 identify the location of pin holes;
- d) D identifies the fixing bolt diameter;
- e) $r_{\max}$ identifies mounting surface edge radius.

4.2 The graphical symbols used in figures 2, 4, 6, 8, 10, 12 and 14 are in accordance with ISO 1219.

4.3 The code system used in this International Standard is defined in ISO 5783.

NOTE — For size 03 mounting surfaces for all valves, the maximum diameter of main ports, which used to be 6,3 mm, has been increased to 7,5 mm in line with widespread usage. This amendment will be made to ISO 5783 at the next revision stage.

5 Tolerances

5.1 The following values shall be applied to the mounting surface, i.e. that area within the chain thick lines:

- Surface roughness: $R_a < 0,8 \mu\text{m}$ (see ISO 468 and ISO 1302)
- Surface flatness: 0,01 mm over a distance of 100 mm (see ISO 1101)
- Locating pin holes, tolerance for diameters: H12

5.2 The following tolerances shall be complied with along the x and y axes with respect to the origin:

- Pin holes: $\pm 0,1 \text{ mm}$
- Bolt holes: $\pm 0,1 \text{ mm}$
- Port holes: $\pm 0,2 \text{ mm}$

As for other dimensions, see the figures.

6 Dimensions

6.1 Mounting surface dimensions for hydraulic compensated flow-control valves shall be selected from the figures and tables specified in 6.2 to 6.8.

6.2 Mounting surface dimensions for compensated flow-control valves with two main ports of 7,5 mm maximum port diameter (code: ISO 6263 — AB — 03 — 4 — B) are given in figure 1.

6.3 Mounting surface dimensions for compensated flow-control valves with two main ports of 14,7 mm maximum port diameter (code: ISO 6263 — AK — 06 — 2 — A) are given in figure 3.

6.4 Mounting surface dimensions for compensated flow-control valves with three main ports of 14,7 mm maximum port diameter (code: ISO 6263 — AL — 06 — 3 — A) are given in figure 5.

6.5 Mounting surface dimensions for compensated flow-control valves with two main ports of 17,5 mm maximum port diameter (code: ISO 6263 — AM — 07 — 2 — A) are given in figure 7.

6.6 Mounting surface dimensions for compensated flow-control valves with three main ports of 17,5 mm maximum port diameter (code: ISO 6263 — AN — 07 — 3 — A) are given in figure 9.

6.7 Mounting surface dimensions for compensated flow-control valves with two main ports of 23,4 mm maximum port diameter (code: ISO 6263 — AP — 08 — 2 — A) are given in figure 11.

6.8 Mounting surface dimensions for compensated flow-control valves with three main ports of 23,4 mm maximum port diameter (code: ISO 6263 — AQ — 08 — 3 — A) are given in figure 13.

7 Port marking

7.1 The port symbols for compensated flow-control valves shall be selected from the figures specified in 7.2 to 7.8.

7.2 Port symbols for compensated flow-control valves with two main ports of 7,5 mm maximum port diameter (code: ISO 6263 — AB — 03 — 4 — B) are given in figure 2.

7.3 Port symbols for compensated flow-control valves with two main ports of 14,7 mm maximum port diameter (code: ISO 6263 — AK — 06 — 2 — A) are given in figure 4.

7.4 Port symbols for compensated flow-control valves with three main ports of 14,7 mm maximum port diameter (code: ISO 6263 — AL — 06 — 3 — A) are given in figure 6.

7.5 Port symbols for compensated flow-control valves with two main ports of 17,5 mm maximum port diameter (code: ISO 6263 — AM — 07 — 2 — A) are given in figure 8.

7.6 Port symbols for compensated flow-control valves with three main ports of 17,5 mm maximum port diameter (code: ISO 6263 — AN — 07 — 3 — A) are given in figure 10.

7.7 Port symbols for compensated flow-control valves with two main ports of 23,4 mm maximum port diameter (code: ISO 6263 — AP — 08 — 2 — A) are given in figure 12.

7.8 Port symbols for compensated flow-control valves with three main ports of 23,4 mm maximum port diameter (code: ISO 6263 — AQ — 08 — 3 — A) are given in figure 14.

8 Modular stack valves

For modular stack valves, mounting surfaces and port marking shown in ISO 4401 shall be used.

9 Working pressure

For indication of the maximum limit of the working pressure, see note 5 on the figures.

10 Identification statement (Reference to this International Standard)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this International Standard:

"Mounting surface dimensions conform to ISO 6263, Hydraulic fluid power — Compensated flow-control valves — Mounting surfaces."

Bibliography

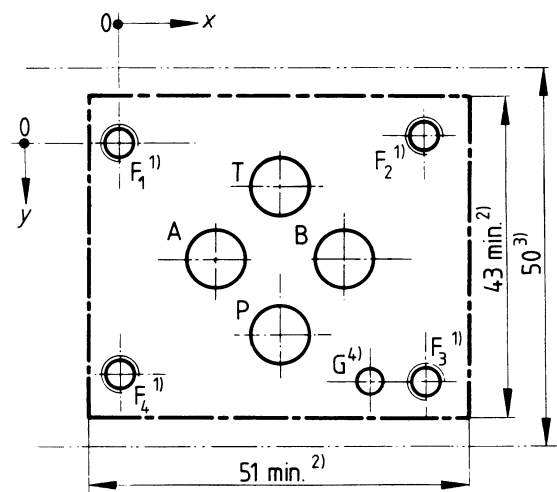
The following documents served as a reference in the preparation of this International Standard and will be helpful when using it:

ISO 129, *Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications*.

ISO 286, *ISO system of limits and fits*.

ISO 965-1, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data*.

Code: ISO 6263 — AB — 03 — 4 — B



NOTE — See figure 2 for symbols.

Axis	P	A	T	B	G	F ₁	F ₂	F ₃	F ₄
	φ 7,5 max.	φ 7,5 max.	φ 7,5 max.	φ 7,5 max.	φ 4	M5	M5	M5	M5
x	21,5	12,7	21,5	30,2	33	0	40,5	40,5	0
y	25,9	15,5	5,1	15,5	31,75	0	−0,75	31,75	31

Figure 1 — Mounting surface for compensated flow-control valves with two main ports of 7,5 mm maximum port diameter (size 03)⁵⁾

1) The minimum thread depth is 1,5 bolt diameter, D . The recommended full thread depth is $2D + 6$ mm to facilitate interchangeability of valves and to reduce the number of fixing bolt lengths. The recommended engagement of fixing bolt thread for ferrous mountings is $1,25D$.

2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for the mounting surface. The corners of the rectangle may be radiused to a maximum radius, $r_{\max}$, equal to the thread diameter of the fixing bolts.

Along each axis the fixing holes are at equal distances to the mounting surface edges.

3) This dimension gives the minimum space required for a valve with this mounting surface. The dimension is also the minimum distance from centreline to centreline of two identical mounting surfaces placed on a manifold block.

The valve manufacturer's attention is drawn to the fact that no part of the width of the complete valve assembly shall exceed this dimension.

4) Blind hole in the mounting surface to accommodate the locating pin on the valves. The minimum depth is 4 mm.

5) The supplier shall establish the maximum working pressure for subplates or manifold blocks.