

INTERNATIONAL STANDARD

**ISO
7368**

First edition
1989-08-01

Hydraulic fluid power — Two-port slip-in cartridge valves — Cavities

*Transmissions hydrauliques — Distributeurs à cartouche, à bride, à deux orifices —
Logements*



Reference number
ISO 7368 : 1989 (E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7368 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*.

Annex A of this International Standard is for information only.

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International Organization for Standardization

Case postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

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. These devices control flow direction, pressure or flow rate of liquids in the enclosed circuit.

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Hydraulic fluid power — Two-port slip-in cartridge valves — Cavities

1 Scope

This International Standard specifies the dimensions and other data relating to cavities in which two-port hydraulic slip-in cartridge valves are mounted in order to ensure interchangeability.

It applies to cavities for two-port hydraulic slip-in cartridge valves which are generally applicable to industrial equipment.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 468 : 1982, *Surface roughness — Parameters, their values and general rules for specifying requirements*.

ISO 1101 : 1983, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings*.

ISO 1302 : 1978, *Technical drawings — Method of indicating surface texture on drawings*.

ISO 5598 : 1985, *Fluid power systems and components — Vocabulary*.

ISO 5783 : 1981, *Hydraulic fluid power — Code for identification of valve mounting surfaces*.

3 Definitions

For the 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, X, Y, Z₁ and Z₂ identify ports the operational usage of which, in some cases, may be different from that given in the following example:

Example of usage:

A: inlet, service, return corresponding to the placing in the hydraulic circuit

B: inlet, service, return corresponding to the placing in the hydraulic circuit

X: pilot, inlet

Y: pilot, return

Z₁: supplementary pilot, inlet

Z₂: supplementary pilot, return;

b) F₁, F₂, F₃, F₄, F₅, F₆, F₇ and F₈ identify threaded holes for fixing bolts;

c) G identifies the location of pin holes;

d) D identifies the fixing bolt diameter;

e) r_{max} identifies the mounting surface edge radius.

NOTE — Symbols to be used on cavities and valves will be dealt with in a future addendum.

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

5 Tolerances

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

— Surface roughness, R_a: as indicated on the figures (see ISO 468 and ISO 1302)

— Surface flatness: 0,01 mm over a distance of 100 mm (see ISO 1101)

— Locating pin hole, tolerance for diameters: H13

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

— Pin holes : ± 0,2 mm

— Bolt holes : ± 0,2 mm

— Port holes : ± 0,2 mm

As for other dimensions, see the figures.

6 Dimensions

6.1 Cavity dimensions for hydraulic slip-in cartridge valves with two main ports shall be selected from the figures and tables specified in 6.2 to 6.15.

6.2 Cavity dimensions for all types of valves, except main system pressure-relief valves, with main ports of 16 mm nominal diameter (size 06) (code ISO 7368 — BA-06-2-A) are given in figure 1.

6.3 Cavity dimensions for main system pressure-relief valves with main ports of 16 mm nominal diameter (size 06) (code ISO 7368 — BA-06-2-B) are given in figure 2.

6.4 Cavity dimensions for all types of valves, except main system pressure-relief valves, with main ports of 25 mm nominal diameter (size 08) (code ISO 7368 — BB-08-2-A) are given in figure 3.

6.5 Cavity dimensions for main system pressure-relief valves with main ports of 25 mm nominal diameter (size 08) (code ISO 7368 — BB-08-2-B) are given in figure 4.

6.6 Cavity dimensions for all types of valves, except main system pressure-relief valves, with main ports of 31,5 mm nominal diameter (size 09) (code ISO 7368 — BC-09-2-A) are given in figure 5.

6.7 Cavity dimensions for main system pressure-relief valves with main ports of 31,5 mm nominal diameter (size 09) (code ISO 7368 — BC-09-2-B) are given in figure 6.

6.8 Cavity dimensions for all types of valves, except main system pressure-relief valves, with main ports of 40 mm nominal diameter (size 10) (code ISO 7368 — BD-10-2-A) are given in figure 7.

6.9 Cavity dimensions for main system pressure-relief valves with main ports of 40 mm nominal diameter (size 10) (code ISO 7368 — BD-10-2-B) are given in figure 8.

6.10 Cavity dimensions for all types of valves, except main system pressure-relief valves with main ports of 50 mm nominal diameter (size 11) (code ISO 7368 — BE-11-2-A) are given in figure 9.

6.11 Cavity dimensions for main system pressure-relief valves with main ports of 50 mm nominal diameter (size 11) (code ISO 7368 — BE-11-2-B) are given in figure 10.

6.12 Cavity dimensions for all types of valves, except main system pressure-relief valves, with main ports of 63 mm nominal diameter (size 12) (code ISO 7368 — BF-12-2-A) are given in figure 11.

6.13 Cavity dimensions for main system pressure-relief valves with main ports of 63 mm nominal diameter (size 12) (code ISO 7368 — BF-12-2-B) are given in figure 12.

6.14 Cavity dimensions for all types of valves with main ports of 80 mm nominal diameter (size 13) (code ISO 7368 — BG-13-2-A) are given in figure 13.

6.15 Cavity dimensions for all types of valves with main ports of 100 mm nominal diameter (size 14) (code ISO 7368 — BH-14-2-A) are given in figure 14.

7 Working pressure

For the indication of the maximum limit of the working pressure, see note 8 to the figures.

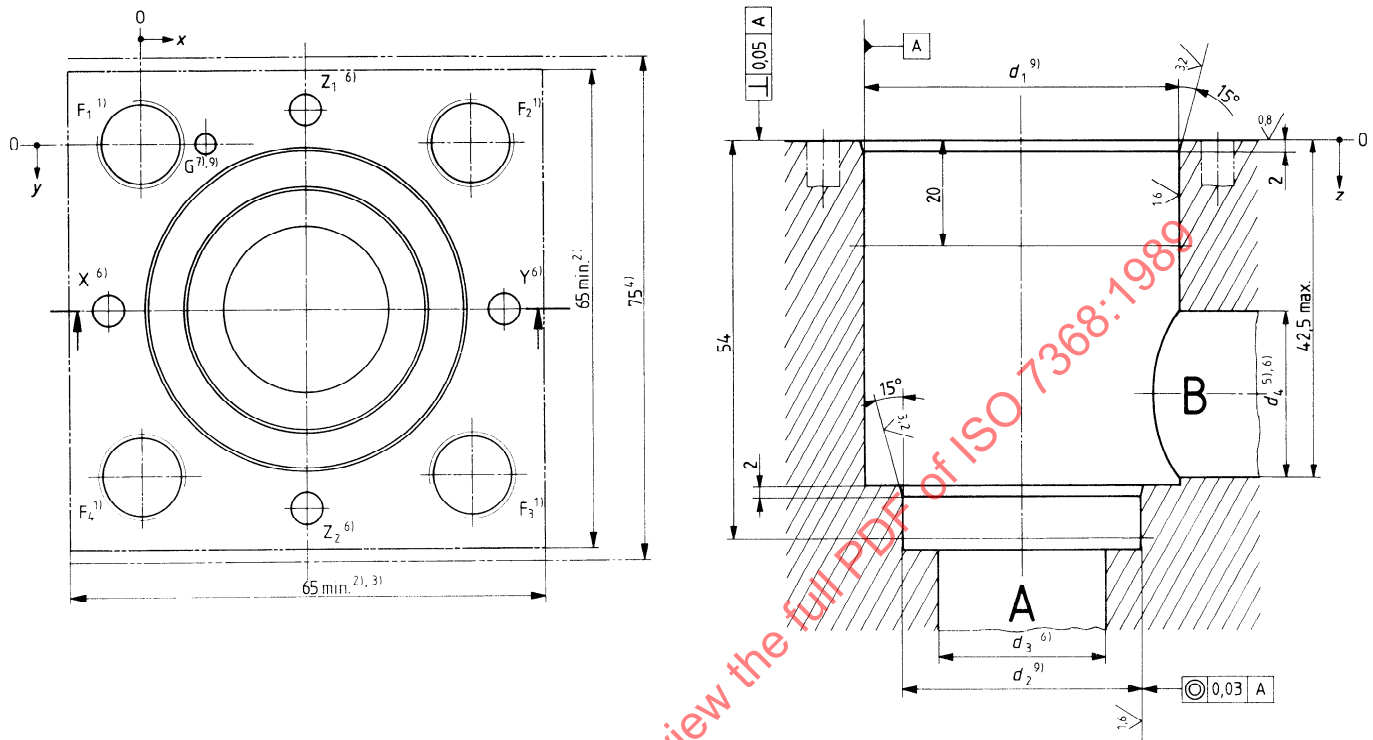
8 Identification statement (Reference of this International Standard)

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

"Cavity dimensions conform to ISO 7368, Hydraulic fluid power — Two-port slip-in cartridge valves — Cavities."

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code: ISO 7368 — BA-06-2-A



Axis	d_1	d_2	d_3	d_4	X	Y	Z_1	Z_2	F_1	F_2	F_3	F_4	G
	$\phi 32$ H8	$\phi 25$ H8	$\phi 16$ max.	$\phi 16$	4 max.	4 max.	4 max.	4 max.	M8	M8	M8	M8	$\phi 4$ H13
x	23	23	23	—	—2	48	23	23	0	46	46	0	12,5
y	23	23	23	—	23	23	—2	48	0	0	46	46	0
z	$43^{+0,1}_0$	$56^{+0,1}_0$	—	—	—	—	—	—	—	—	—	—	8 min.

Figure 1 — Cavity for two-port hydraulic slip-in cartridge valves of all types, except main system pressure-relief valves, with main ports of 16 mm nominal diameter (size 06) and square flange cover

1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is $1,25 D$.

2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.

3) Pilot valves and adjustment devices may exceed this dimension.

4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.

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

5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 20 and 42,5; port B is not necessarily machined and may be provided by casting.

6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.

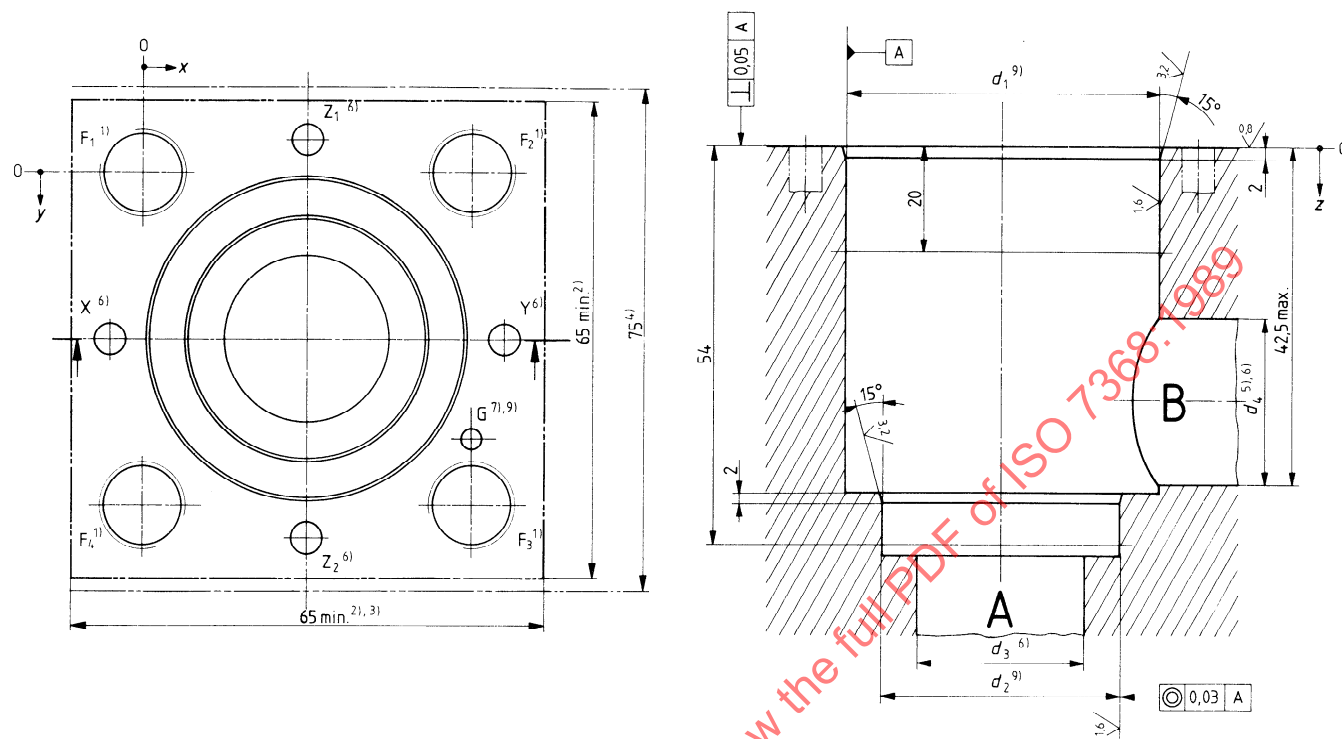
7) Blind hole to accommodate the locating pin on the valve cover.

8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.

9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code: ISO 7368 — BA-06-2-B



Axis	d_1	d_2	d_3	d_4	X	Y	Z ₁	Z ₂	F ₁	F ₂	F ₃	F ₄	G
	φ32 H8	φ25 H8	φ16 max.	φ16	4 max.	4 max.	4 max.	4 max.	M8	M8	M8	M8	φ4 H13
x	23	23	23	—	—2	48	23	23	0	46	46	0	46
y	23	23	23	—	23	23	—2	48	0	0	46	46	33,5
z	$43^{+0,1}_0$	$56^{+0,1}_0$	—	—	—	—	—	—	—	—	—	—	4 min.

Figure 2 — Cavity for two-port hydraulic slip-in cartridge main system pressure-relief valves with main ports of 16 mm nominal diameter (size 06) and square flange cover

1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is 1,25 D .

2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.

3) Pilot valves and adjustment devices may exceed this dimension.

4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.

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

5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 20 and 42,5; port B is not necessarily machined and may be provided by casting.

6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.

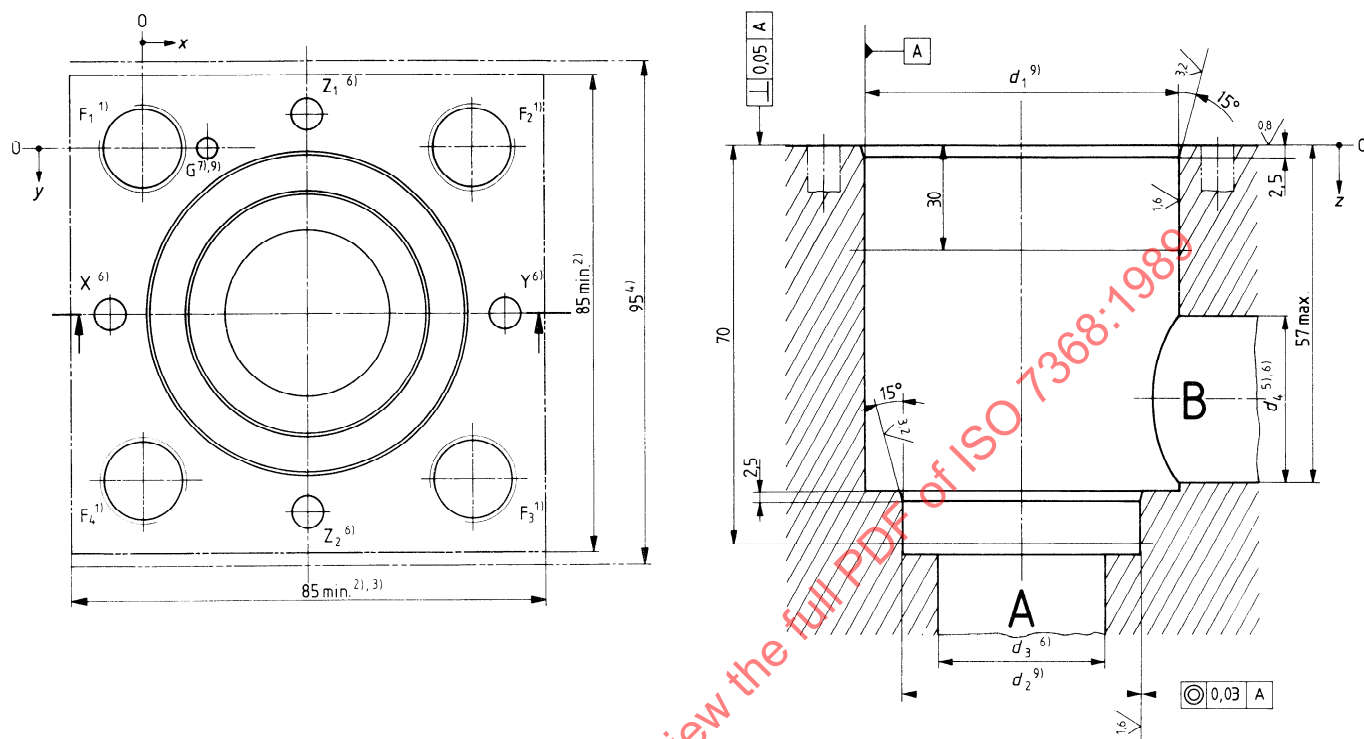
7) Blind hole to accommodate the locating pin on the valve cover.

8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.

9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code : ISO 7368 — BB-08-2-A



Axis	d_1	d_2	d_3	d_4	X	Y	Z_1	Z_2	F_1	F_2	F_3	F_4	G
	$\phi 45$ H8	$\phi 34$ H8	$\phi 25$ max.	$\phi 25$	6 max.	6 max.	6 max.	6 max.	M12	M12	M12	M12	$\phi 6$ H13
x	29	29	29	—	4	62	29	29	0	58	58	0	13
y	29	29	29	—	29	29	—4	62	0	0	58	58	0
z	$58^{+0,1}_0$	$72^{+0,1}_0$	—	—	—	—	—	—	—	—	—	—	8 min.

Figure 3 — Cavity for two-port hydraulic slip-in cartridge valves of all types, except main system pressure-relief valves, with main ports of 25 mm nominal diameter (size 08) and square flange cover

1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is 1,25 D .

2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.

3) Pilot valves and adjustment devices may exceed this dimension.

4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.

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

5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 30 and 57; port B is not necessarily machined and may be provided by casting.

6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.

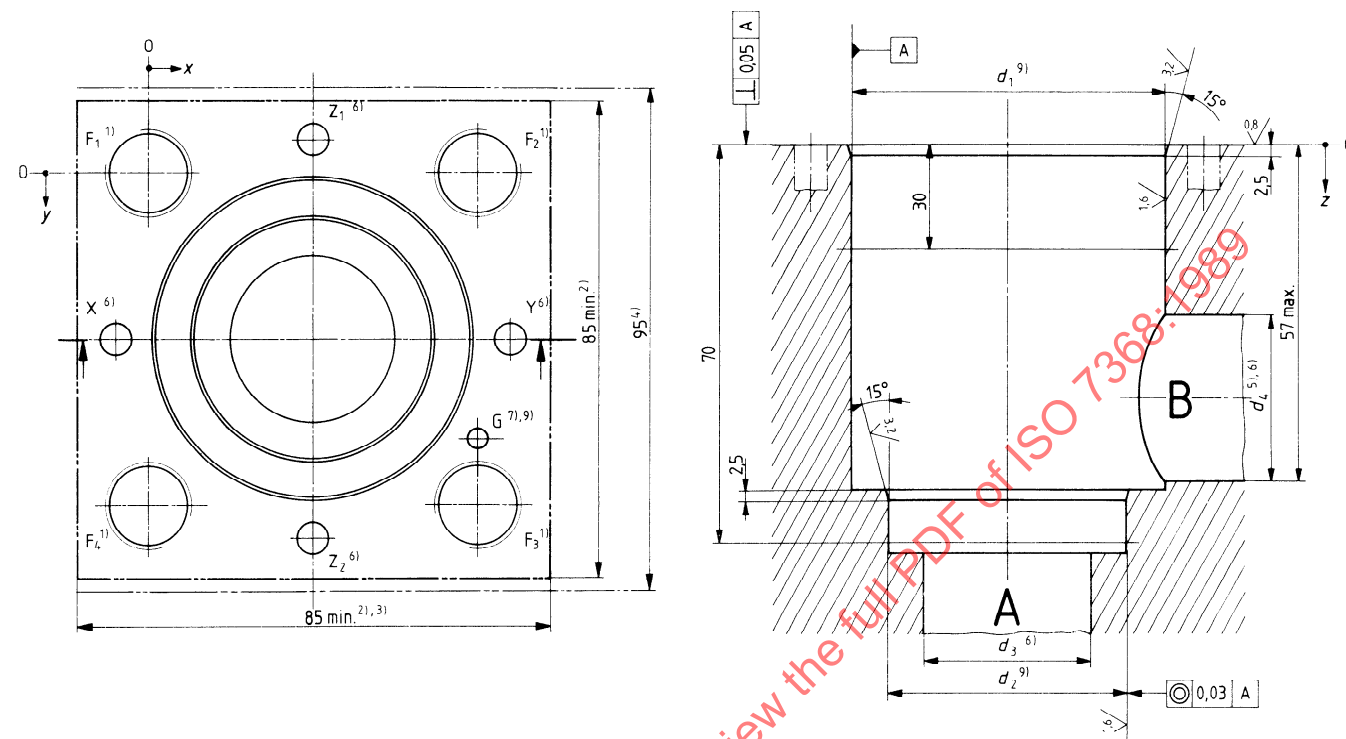
7) Blind hole to accommodate the locating pin on the valve cover.

8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.

9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code: ISO 7368 — BB-08-2-B



Axis	d_1	d_2	d_3	d_4	X	Y	Z ₁	Z ₂	F ₁	F ₂	F ₃	F ₄	G
	φ45 H8	φ34 H8	φ25 max.	φ25	6 max.	6 max.	6 max.	6 max.	M12	M12	M12	M12	φ6 H13
x	29	29	29	—	—4	62	29	29	0	58	58	0	58
y	29	29	29	—	29	29	—4	62	0	0	58	58	45
z	$58^{+0,1}_0$	$72^{+0,1}_0$	—	—	—	—	—	—	—	—	—	—	6 min.

Figure 4 — Cavity for two-port hydraulic slip-in cartridge main system pressure-relief valves with main ports of 25 mm nominal diameter (size 08) and square flange cover

1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is 1,25 D .

2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.

3) Pilot valves and adjustment devices may exceed this dimension.

4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.

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

5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 30 and 57; port B is not necessarily machined and may be provided by casting.

6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.

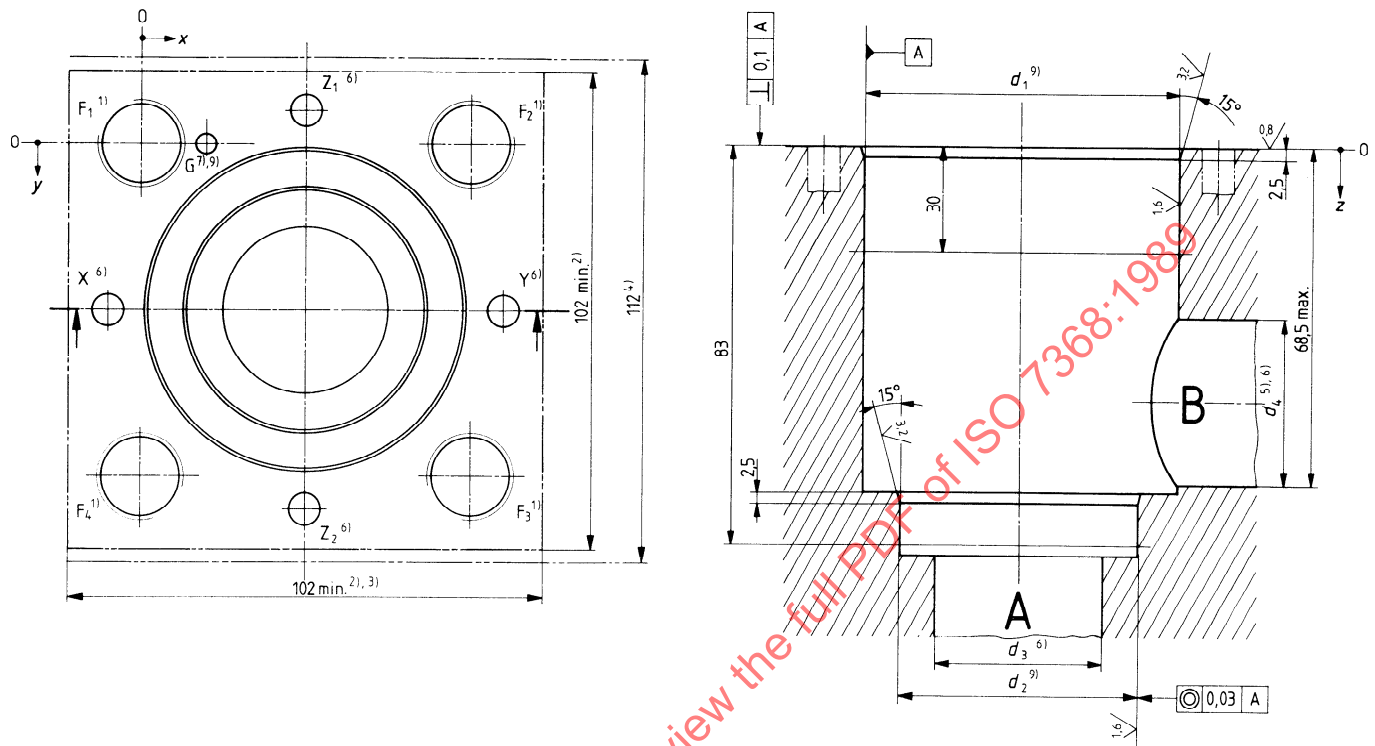
7) Blind hole to accommodate the locating pin on the valve cover.

8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.

9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code: ISO 7368 — BC-09-2-A



Axis	d_1	d_2	d_3	d_4	X	Y	Z_1	Z_2	F_1	F_2	F_3	F_4	G
	$\phi 60 \text{ H8}$	$\phi 45 \text{ H8}$	$\phi 32 \text{ max.}$	$\phi 31,5$	8 max.	8 max.	8 max.	8 max.	M16	M16	M16	M16	$\phi 6 \text{ H13}$
x	35	35	35	—	—	76	35	35	0	70	70	0	18
y	35	35	35	—	35	35	—6	76	0	0	70	70	0
z	$70^{+0,1}_0$	$85^{+0,1}_0$	—	—	—	—	—	—	—	—	—	—	8 min.

Figure 5 — Cavity for two-port hydraulic slip-in cartridge valves of all types, except main system pressure-relief valves, with main ports of 31,5 mm nominal diameter (size 09) and square flange cover

1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is $1,25 D$.

2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.

3) Pilot valves and adjustment devices may exceed this dimension.

4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.

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

5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 30 and 68,5; port B is not necessarily machined and may be provided by casting.

6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.

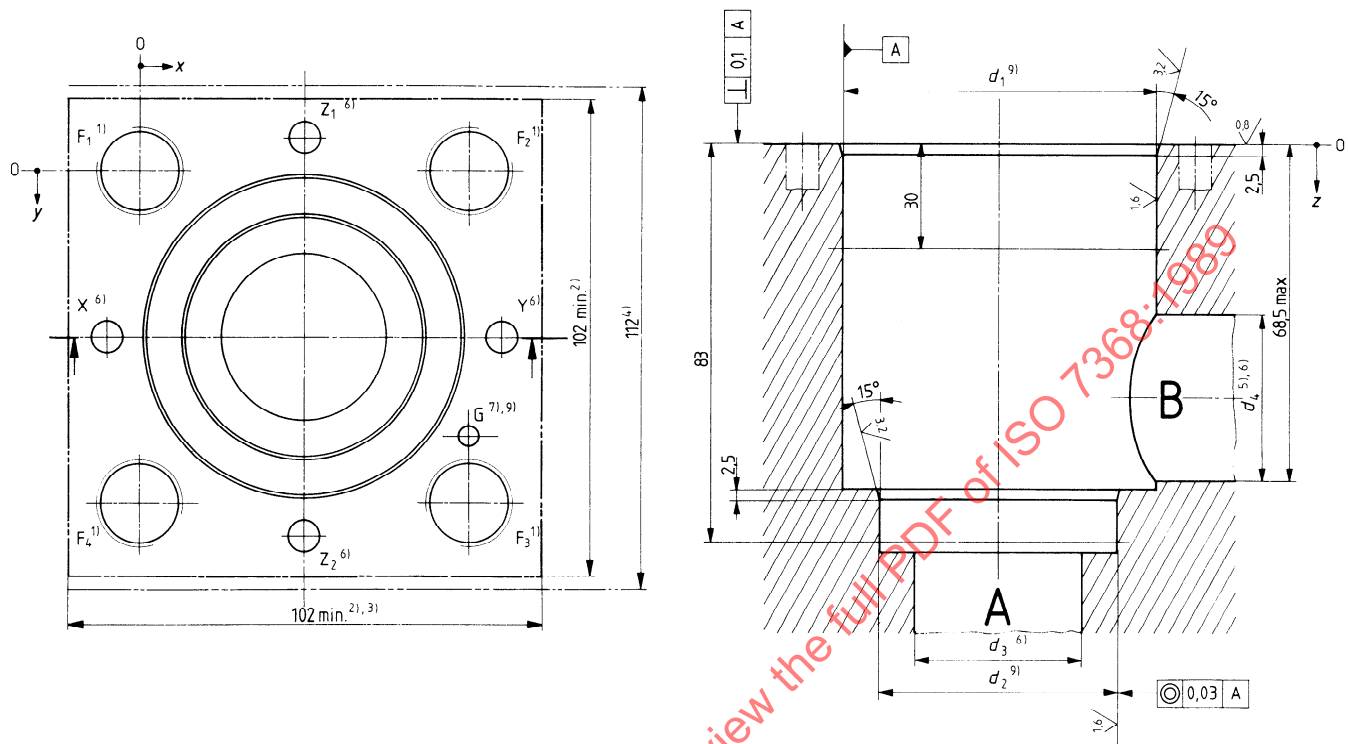
7) Blind hole to accommodate the locating pin on the valve cover.

8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.

9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code: ISO 7368 — BC-09-2-B



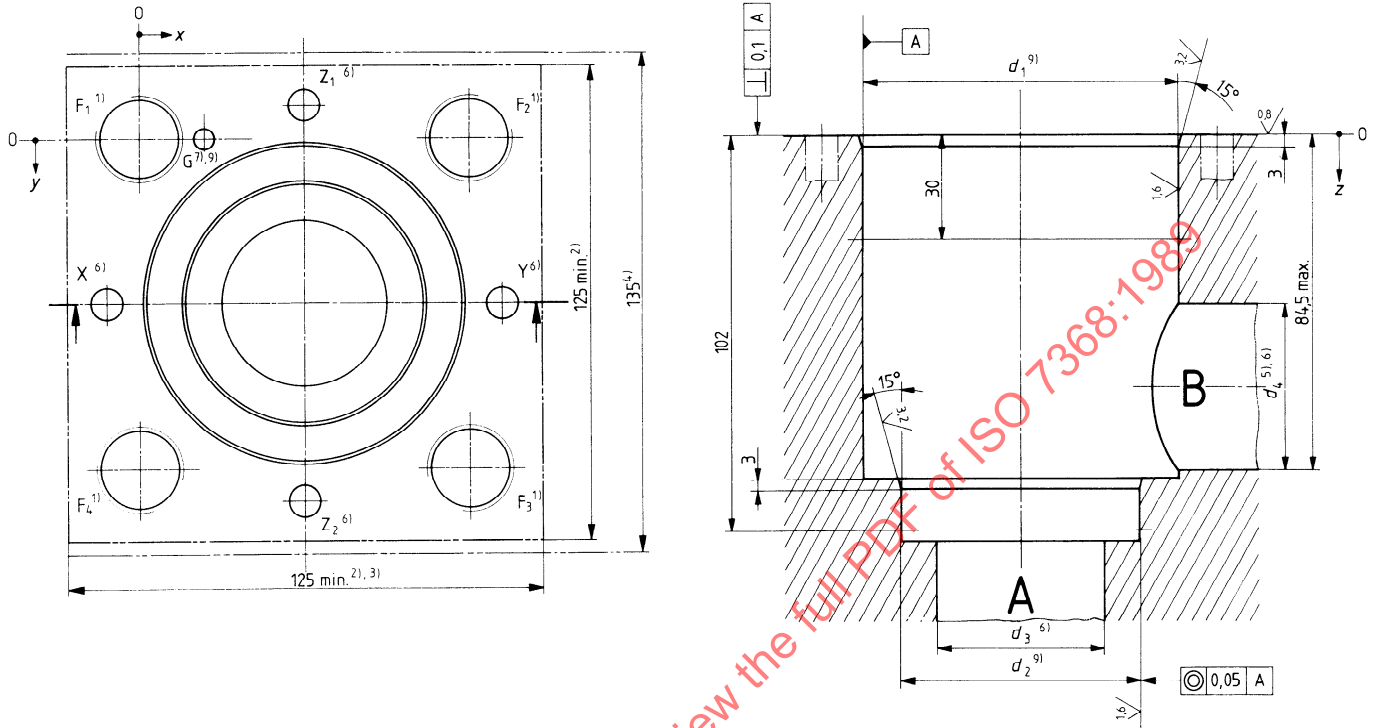
Axis	d_1	d_2	d_3	d_4	X	Y	Z ₁	Z ₂	F ₁	F ₂	F ₃	F ₄	G
	φ60 H8	φ45 H8	φ32 max.	φ31,5	8 max.	8 max.	8 max.	8 max.	M16	M16	M16	M16	φ6 H13
x	35	35	35	—	—6	76	35	35	0	70	70	0	70
y	35	35	35	—	35	35	—6	76	0	0	70	70	52
z	$70^{+0,1}_0$	$85^{+0,1}_0$	—	—	—	—	—	—	—	—	—	—	6 min.

Figure 6 — Cavity for two-port hydraulic slip-in cartridge main system pressure-relief valves with main ports of 31.5 mm nominal diameter (size 09) and square flange cover

- 1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is $1,25 D$.
- 2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.
- 3) Pilot valves and adjustment devices may exceed this dimension.
- 4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.
The valve manufacturer's attention is drawn to the fact that no part of the complete valve assembly shall exceed this dimension.
- 5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 30 and 68,5; port B is not necessarily machined and may be provided by casting.
- 6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.
- 7) Blind hole to accommodate the locating pin on the valve cover.
- 8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.
- 9) The depths of d_1 , d_2 and G are given in the table as dimension z.

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Codification : ISO 7368 — BD-10-2-A



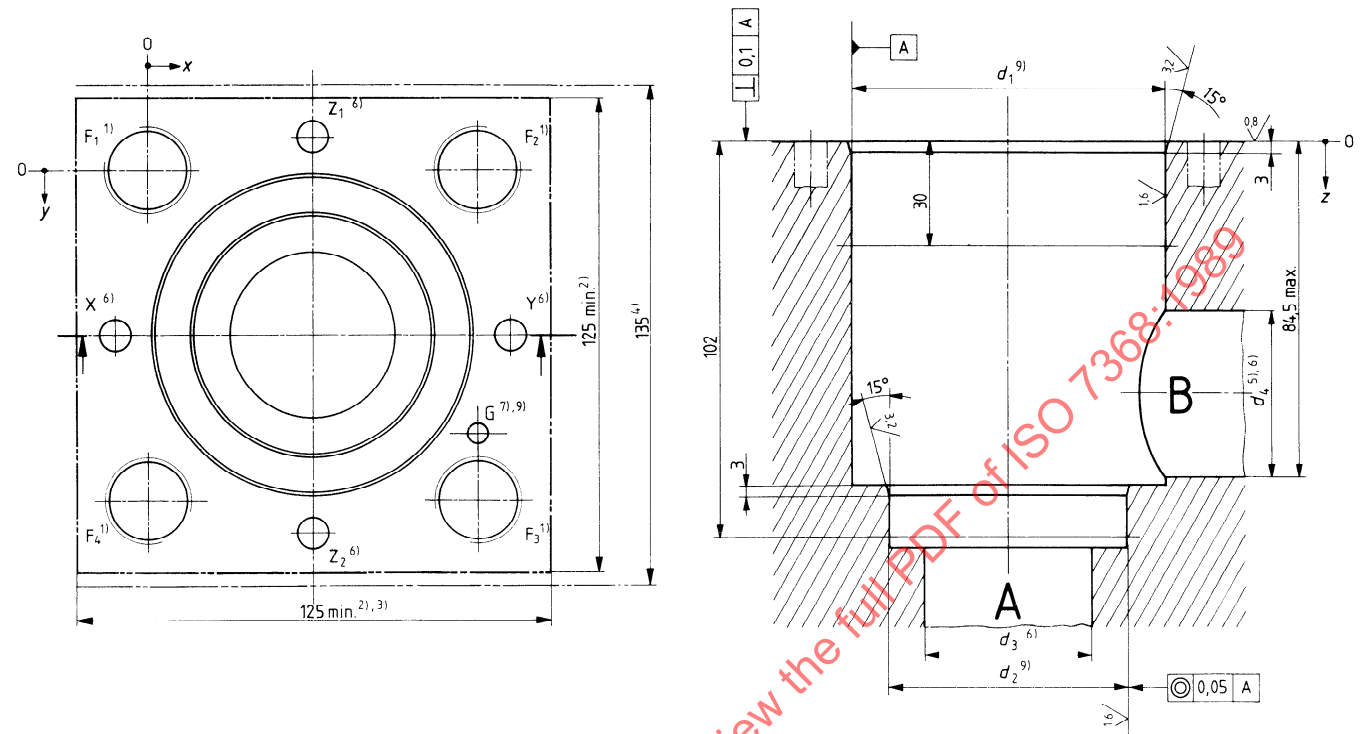
Axis	d_1	d_2	d_3	d_4	X	Y	Z ₁	Z ₂	F ₁	F ₂	F ₃	F ₄	G
	φ 75 H8	φ 55 H8	φ 40 max.	φ 40	10 max.	10 max.	10 max.	10 max.	M20	M20	M20	M20	φ 6 H13
x	42,5	42,5	42,5	—	—7,5	92,5	42,5	42,5	0	85	85	0	19,5
y	42,5	42,5	42,5	—	42,5	42,5	7,5	92,5	0	0	85	85	0
z	87 ^{+0,1} ₀	105 ^{+0,1} ₀	—	—	—	—	—	—	—	—	—	—	8 min.

Figure 7 — Cavity for two-port hydraulic slip-in cartridge valves of all types, except main system pressure-relief valves, with main ports of 40 mm nominal diameter (size 10) and square flange cover

- 1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is 1,25 D .
- 2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.
- 3) Pilot valves and adjustment devices may exceed this dimension.
- 4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block. The valve manufacturer's attention is drawn to the fact that no part of the complete valve assembly shall exceed this dimension.
- 5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 30 and 84,5; port B is not necessarily machined and may be provided by casting.
- 6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.
- 7) Blind hole to accommodate the locating pin on the valve cover.
- 8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.
- 9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code : ISO 7368 — BD-10-2-B



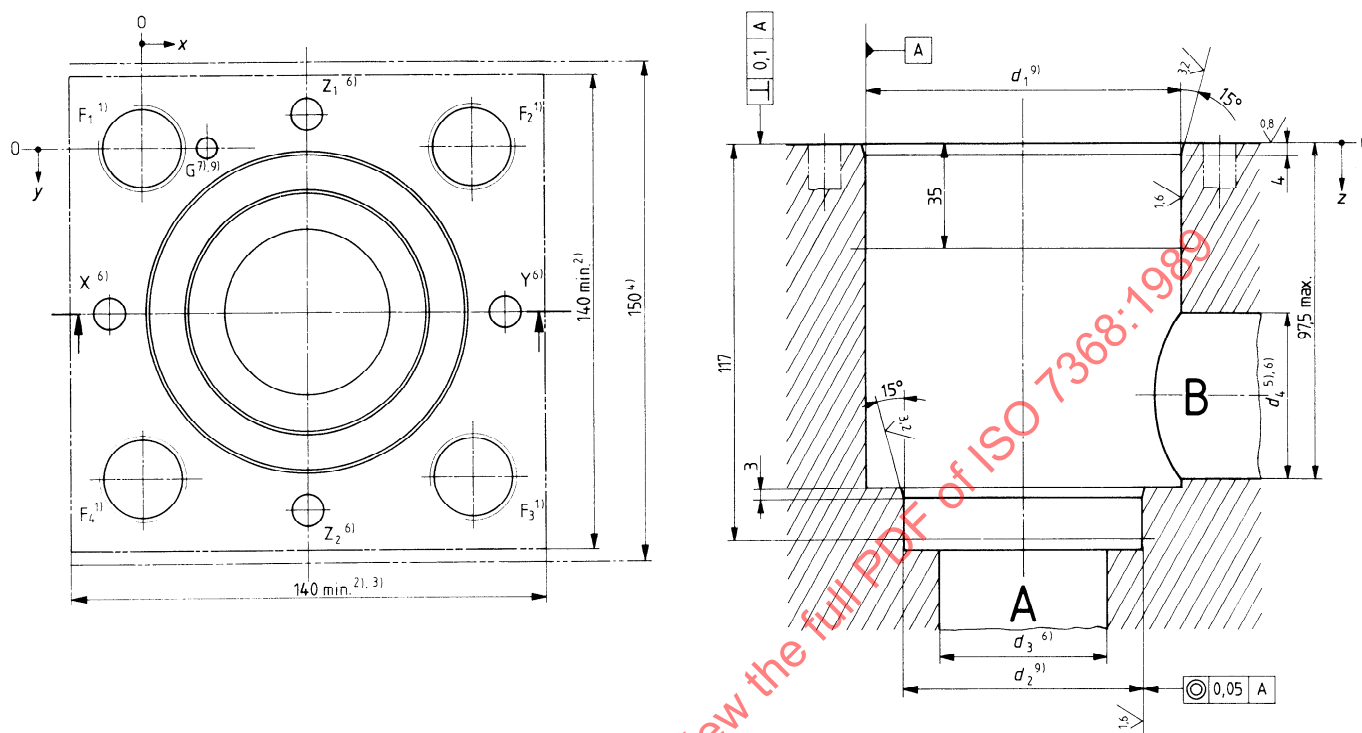
Axis	d_1	d_2	d_3	d_4	X	Y	Z ₁	Z ₂	F ₁	F ₂	F ₃	F ₄	G
	φ 75 H8	φ 55 H8	φ 40 max.	φ 40	10 max.	10 max.	10 max.	10 max.	M20	M20	M20	M20	φ 6 H13
x	42,5	42,5	42,5	—	—7,5	92,5	42,5	42,5	0	85	85	0	85
y	42,5	42,5	42,5	—	42,5	42,5	—7,5	92,5	0	0	85	85	65,5
z	87 +0,1 0	105 +0,1 0	—	—	—	—	—	—	—	—	—	—	6 min.

Figure 8 — Cavity for two-port hydraulic slip-in cartridge main system pressure-relief valves with main ports of 40 mm nominal diameter (size 10) and square flange cover

- 1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is $1,25 D$.
- 2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.
- 3) Pilot valves and adjustment devices may exceed this dimension.
- 4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block. The valve manufacturer's attention is drawn to the fact that no part of the complete valve assembly shall exceed this dimension.
- 5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 30 and 84,5; port B is not necessarily machined and may be provided by casting.
- 6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.
- 7) Blind hole to accommodate the locating pin on the valve cover.
- 8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.
- 9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code : ISO 7368 — BE-11-2-A



Axis	d_1	d_2	d_3	d_4	X	Y	Z ₁	Z ₂	F ₁	F ₂	F ₃	F ₄	G
	φ90 H8	φ68 H8	φ50 max.	φ50	10 max.	10 max.	10 max.	10 max.	M20	M20	M20	M20	φ8 H13
x	50	50	50	—	—8	108	50	50	0	100	100	0	20
y	50	50	50	—	50	50	—8	108	0	0	100	100	0
z	100 ^{+0,1} ₀	122 ^{+0,1} ₀	—	—	—	—	—	—	—	—	—	—	8 min.

Figure 9 — Cavity for two-port hydraulic slip-in cartridge valves of all types, except main system pressure-relief valves, with main ports of 50 mm nominal diameter (size 11) and square flange cover

1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is $1,25 D$.

2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.

3) Pilot valves and adjustment devices may exceed this dimension.

4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.

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

5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 35 and 97,5; port B is not necessarily machined and may be provided by casting.

6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.

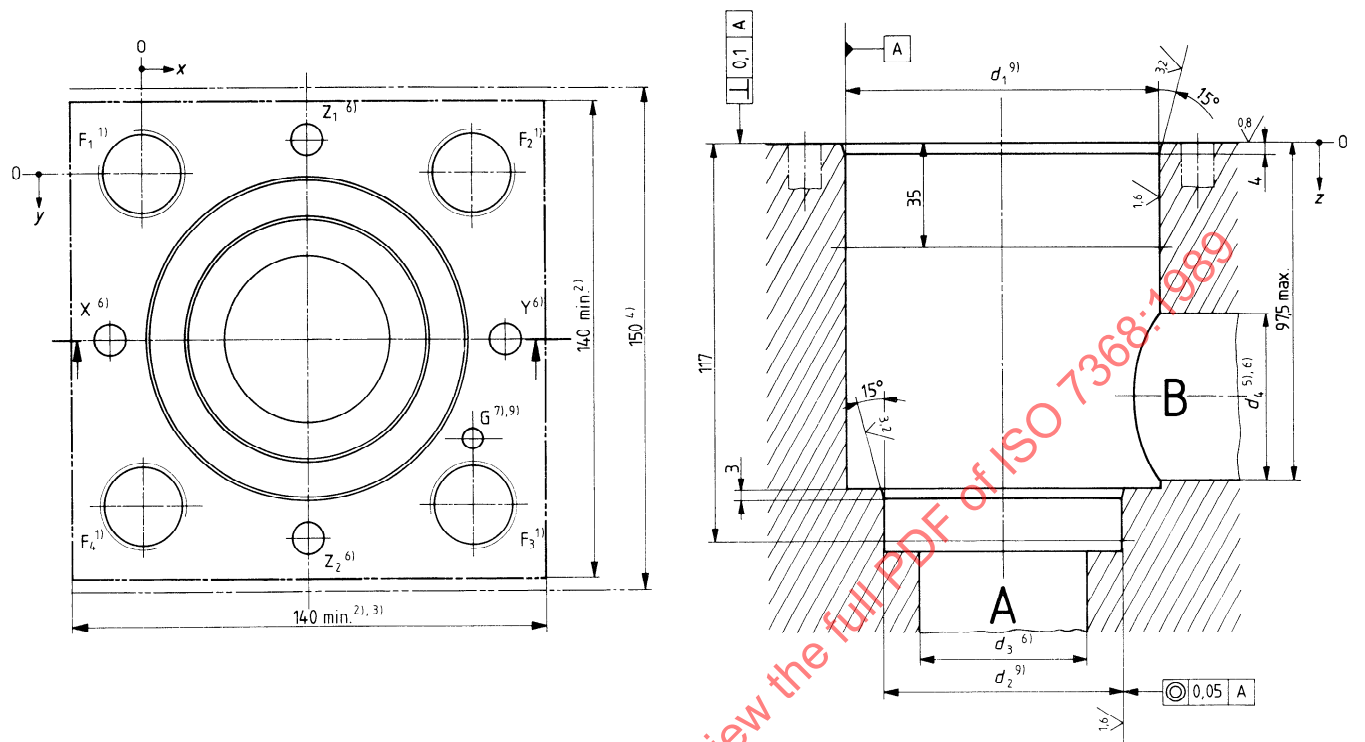
7) Blind hole to accommodate the locating pin on the valve cover.

8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.

9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code : ISO 7368 — BE-11-2-B



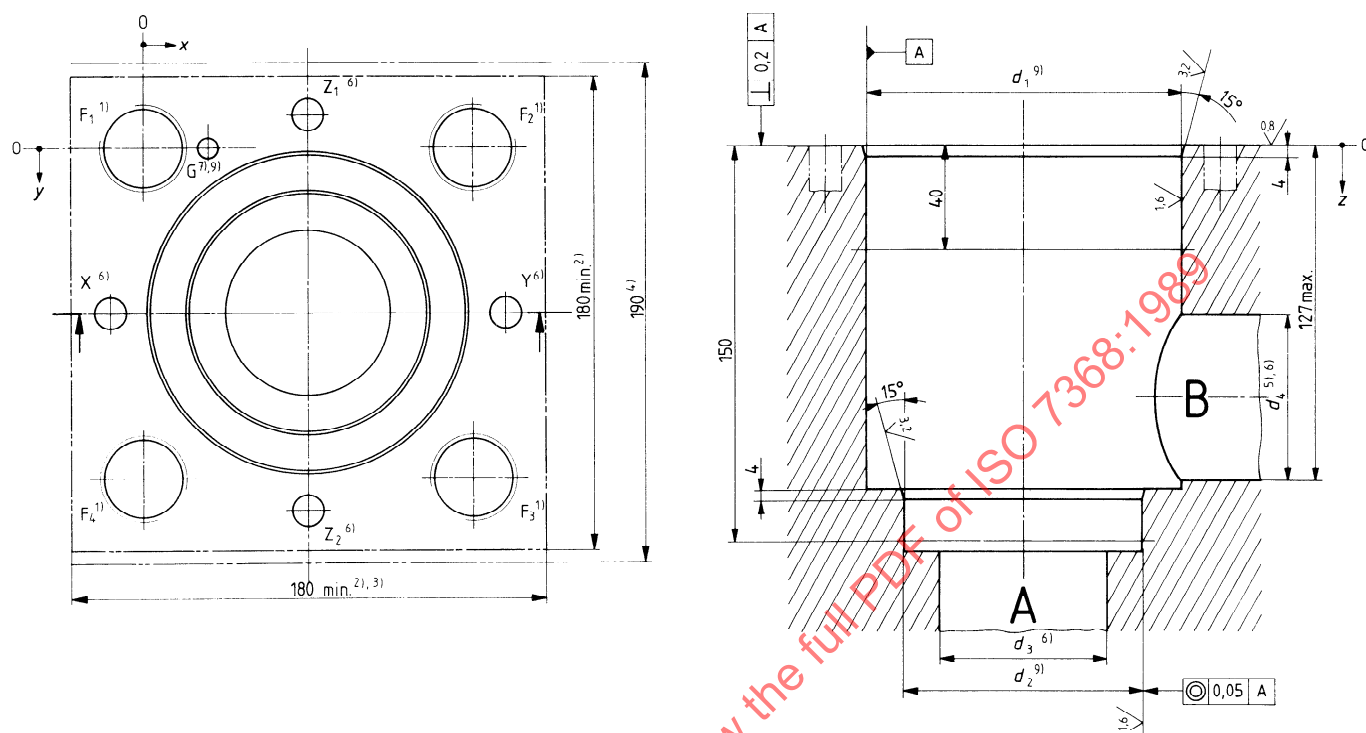
Axis	d_1	d_2	d_3	d_4	X	Y	Z ₁	Z ₂	F ₁	F ₂	F ₃	F ₄	G
	φ90 H8	φ68 H8	φ50 max.	φ50	10 max.	10 max.	10 max.	10 max.	M20	M20	M20	M20	φ8 H13
x	50	50	50	—	—8	108	50	50	0	100	100	0	100
y	50	50	50	—	50	50	—8	108	0	0	100	100	80
z	100 ^{+0,1} ₀	122 ^{+0,1} ₀	—	—	—	—	—	—	—	—	—	—	8 min.

Figure 10 — Cavity for two-port hydraulic slip-in cartridge main system pressure-relief valves with main ports of 50 mm nominal diameter (size 11) and square flange cover

- 1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is $1,25 D$.
- 2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.
- 3) Pilot valves and adjustment devices may exceed this dimension.
- 4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.
The valve manufacturer's attention is drawn to the fact that no part of the complete valve assembly shall exceed this dimension.
- 5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 35 and 97,5; port B is not necessarily machined and may be provided by casting.
- 6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.
- 7) Blind hole to accommodate the locating pin on the valve cover.
- 8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.
- 9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code: ISO 7368 — BF-12-2-A



Axis	d_1	d_2	d_3	d_4	X	Y	Z ₁	Z ₂	F ₁	F ₂	F ₃	F ₄	G
	φ 120 H8	φ 90 H8	φ 63 max.	φ 63	12 max.	12 max.	12 max.	12 max.	M30	M30	M30	M30	φ 8 H13
x	62,5	62,5	62,5	—	—12,5	137,5	62,5	62,5	0	125	125	0	24,5
y	62,5	62,5	62,5	—	62,5	62,5	—12,5	137,5	0	0	125	125	0
z	130 ^{+0,1} ₀	155 ^{+0,1} ₀	—	—	—	—	—	—	—	—	—	—	8 min.

Figure 11 — Cavity for two-port hydraulic slip-in cartridge valves of all types, except main system pressure-relief valves, with main ports of 63 mm nominal diameter (size 12) and square flange cover

1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is 1,25 D .

2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.

3) Pilot valves and adjustment devices may exceed this dimension.

4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.

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

5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 40 and 127; port B is not necessarily machined and may be provided by casting.

6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.

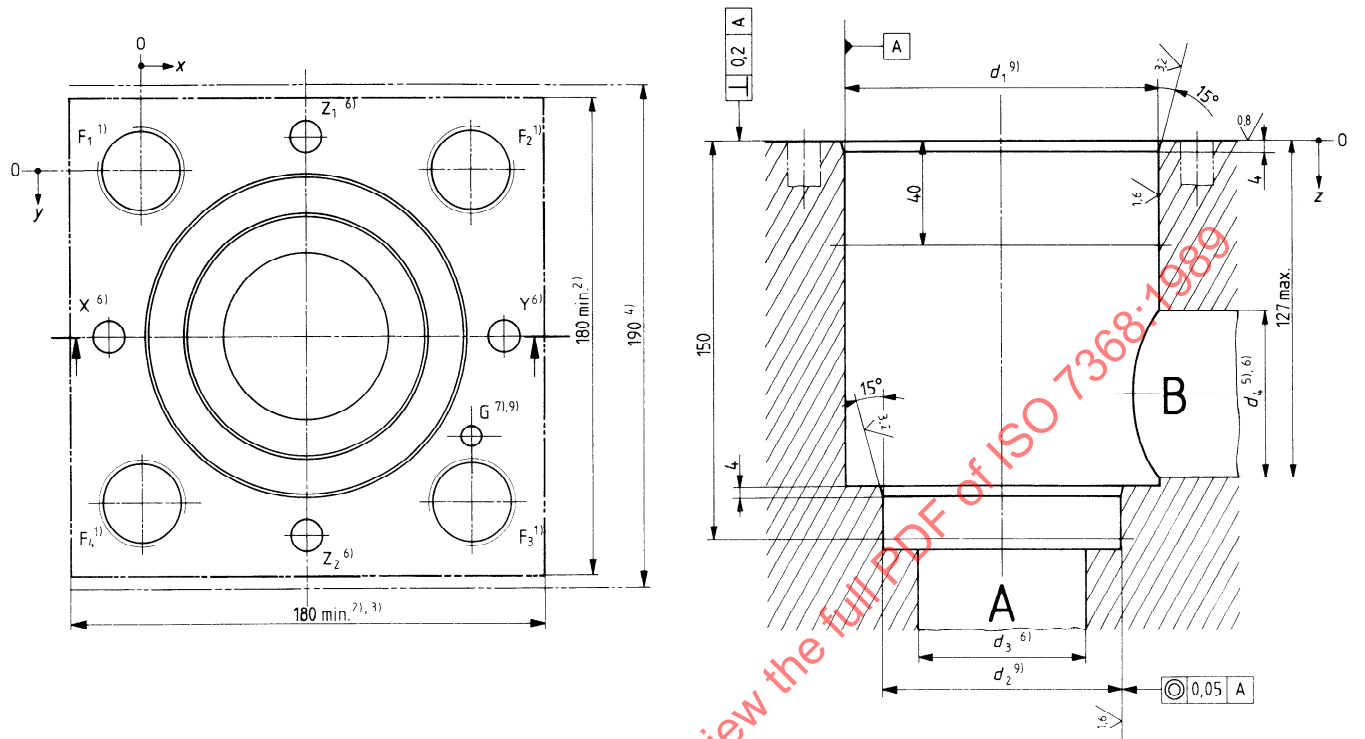
7) Blind hole to accommodate the locating pin on the valve cover.

8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.

9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code: ISO 7368 — BF-12-2-B



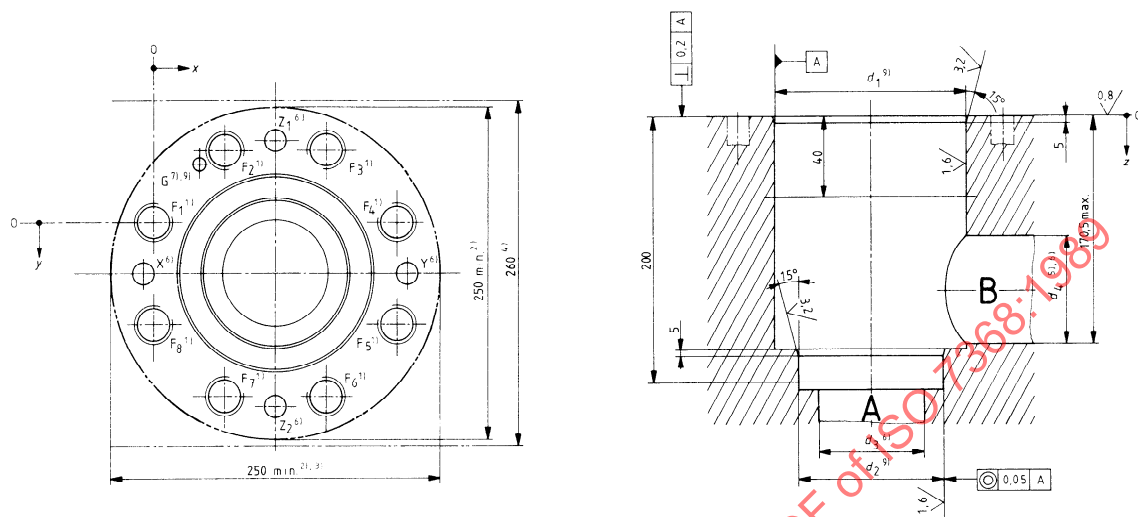
Axis	d_1	d_2	d_3	d_4	X	Y	Z_1	Z_2	F_1	F_2	F_3	F_4	G
	$\phi 120\text{ H8}$	$\phi 90\text{ H8}$	$\phi 63\text{ max.}$	$\phi 63$	12 max.	12 max.	12 max.	12 max.	M30	M30	M30	M30	$\phi 8\text{ H13}$
x	62,5	62,5	62,5	—	-12,5	137,5	62,5	62,5	0	125	125	0	125
y	62,5	62,5	62,5	—	62,5	62,5	-12,5	137,5	0	0	125	125	100,5
z	$130^{+0,1}_0$	$155^{+0,1}_0$	—	—	—	—	—	—	—	—	—	—	8 min.

Figure 12 — Cavity for two-port hydraulic slip-in cartridge main system pressure-relief valves with main ports of 63 mm nominal diameter (size 12) and square flange cover

- 1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is $1,25 D$.
- 2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.
- 3) Pilot valves and adjustment devices may exceed this dimension.
- 4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.
The valve manufacturer's attention is drawn to the fact that no part of the complete valve assembly shall exceed this dimension.
- 5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 40 and 127; port B is not necessarily machined and may be provided by casting.
- 6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.
- 7) Blind hole to accommodate the locating pin on the valve cover.
- 8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.
- 9) The depths of d_1 , d_2 and G are given in the table as dimension z .

Dimensions and geometrical tolerances in millimetres;
surface roughness values in micrometres

Code : ISO 7368 — BG-13-2-A



Axis	d_1	d_2	d_3	d_4	X	Y	Z ₁	Z ₂	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆	F ₇	F ₈	G
	φ 145 H8	φ 110 H8	φ 80 max.	φ 80	16 max.	16 max.	16 max.	16 max.	M24	M24	M24	M24	M24	M24	M24	M24	φ 10 H13
x	92,4	92,4	92,4	—	— 7,6	192,4	92,4	92,4	0	54,1	130,7	184,8	184,8	130,7	54,1	0	35
y	38,3	38,3	38,3	—	38,3	38,3	— 61,7	138,3	0	— 54,1	— 54,1	0	76,6	130,7	130,7	76,6	— 43,5
z	175 $^{+0,2}_0$	205 $^{+0,2}_0$	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8 min.

Figure 13 — Cavity for two-port hydraulic slip-in cartridge valves with main ports of 80 mm nominal diameter (size 13) and circular flange cover

1) The minimum thread depth is 1,5 times the 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. However, sufficient distance from fixing hole to port B shall be respected. The recommended engagement of fixing bolt thread for ferrous mountings is 1,25 D .

2) The dimensions specifying the area within the chain thick lines are the minimum dimensions for mounting the cartridge valve cover. The corners of the square 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 valve cover mounting surface edges.

3) Pilot valves and adjustment devices may exceed this dimension.

4) This dimension gives the minimum space required for two-port hydraulic slip-in cartridge valve and its cover with this cavity. The dimension is also the minimum distance from centreline to centreline of two identical cavities on a manifold block.

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

5) Port B (suggested diameter d_4) shall be located within the space between the dimensions indicated as 40 and 170,5; port B is not necessarily machined and may be provided by casting.

6) The depth and angle of both the pilot ports and the main ports are determined by the graphical layout of the circuit and by the location of the valves in the manifold block.

7) Blind hole to accommodate the locating pin on the valve cover.

8) The manifold block shall be clearly and permanently marked with the maximum working pressure as defined by the supplier of the block.

9) The depths of d_1 , d_2 and G are given in the table as dimension z .