

INTERNATIONAL STANDARD

ISO
5599-1

Second edition
1989-11-01

Pneumatic fluid power — Five-port directional control valves —

Part 1: Mounting interface surfaces without electrical connector

*Transmissions pneumatiques — Distributeurs à cinq orifices principaux —
Partie 1: Plans de pose sans connecteur électrique*



Reference number
ISO 5599-1 : 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 5599-1 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*.

This second edition cancels and replaces the first edition (ISO 5599-1: 1978), of which it constitutes a technical revision in part.

ISO 5599-1 : 1978 specified requirements both for mounting interface surfaces without electrical connector and for mounting interface surfaces with optional electrical connector. This part of ISO 5599 specifies requirements for mounting interface surfaces without electrical connector only. Part 2 specifies requirements for mounting interface surfaces with optional electrical connector.

ISO 5599 consists of the following parts, under the general title *Pneumatic fluid power* — *Five-port directional control valves*:

- *Part 1: Mounting interface surfaces without electrical connector*
- *Part 2: Mounting interface surfaces with optional electrical connector*
- *Part 3: Code system for communication of valve functions*

Annex A of this part of ISO 5599 is for information only.

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Introduction

In pneumatic fluid power systems, power is transmitted and controlled through gas under pressure within an enclosed circuit.

The various devices for gas distribution and control can be either mounted directly onto the pipeline, or mounted on interface surfaces, allowing quicker dismantling and promoting equipment interchangeability.

Pneumatic directional control valves of the five-port, four-way type, as used on mounting interface surfaces complying with the requirements of this International Standard control the flow of compressed gas.

Standardization of port and orifice identification, the result of operator actuation and a system of dimensional tolerances are provided to enhance mounting interchangeability of pneumatic control valves used on the mounting interface surfaces complying with the requirements of this part of ISO 5599.

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Pneumatic fluid power — Five-port directional control valves —

Part 1: Mounting interface surfaces without electrical connector

1 Scope

This part of ISO 5599 is applicable to mounting interface surfaces for five-port pneumatic directional control valves, for a maximum working pressure of 1,6 MPa [16 bar¹⁾]. It specifies

- dimensions and tolerances of the interface features;
- port identification;
- identification of the result of operator actuation.

It does not apply to the functional characteristics of interfaces.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 5599. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 5599 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*.

3 Dimensional requirements and tolerances

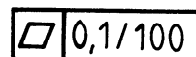
3.1 Dimensional requirements for sizes 1, 2 and 3 are shown in figure 1 and given in table 1.

3.2 Dimensional requirements for sizes 4, 5 and 6 are shown in figure 2 and given in table 2.

3.3 The main dimensions and tolerances of form and location of the interface features are shown in figures 3 and 4, and given in table 3.

3.4 Tolerances on surface condition, within the continuous line, shall be as follows:

- Surface roughness: 1,6 µm (class N7) (see ISO 468 and ISO 1302)
- Surface flatness: 0,1 mm over a distance of 100 mm (see ISO 1101)



3.5 The mounting surface shall not include any orifices other than those shown on the figures. All passages shown in the interface shall be included, and connected to open ports in the sub-base.

4 Identification of ports and orifices

4.1 The flow path orifices in the mounting surface interface, and the ports serving these orifices, shall be designated as follows (see figure 4):

- ports 1, 2, 3, 4 and 5 are the principal flow paths;

1) 1 bar = 0,1 MPa = 10⁵ N/m²

- ports 12 and 14 are the actuation orifices.

NOTE — Port 14 is preferred for single-source external solenoid pilot supply.

4.2 For monostable valves, the mandatory stable position of the valve shall always be identical to the result of control by actuator 12, as shown in figure 5.

4.3 When a positive pressure signal is applied to port 12, flow port 1 shall be connected with flow port 2 (and 4 with 5). When a positive signal is applied to port 14, flow port 1 shall be connected with flow port 4 (and 2 with 3). See figure 6.

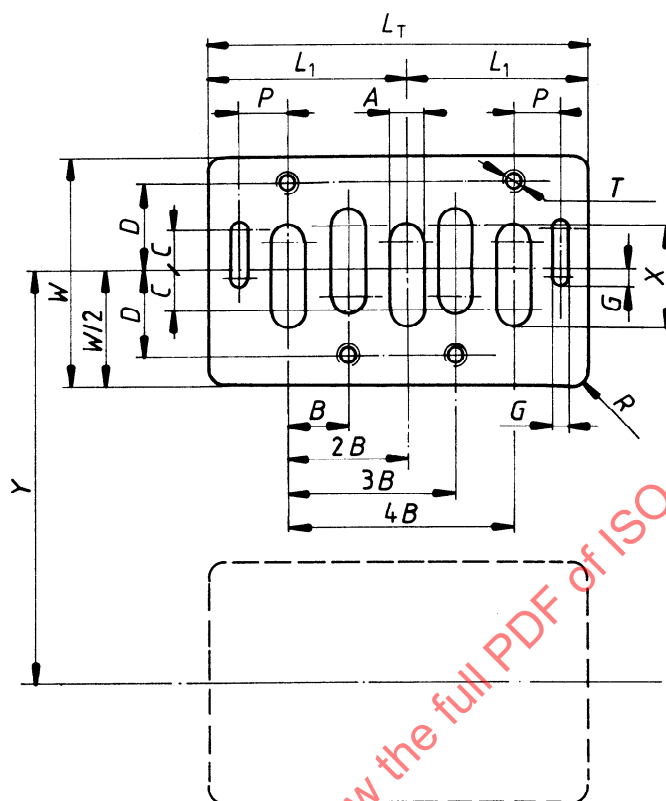
4.4 The orientation of operators 12 and 14 on the valve relative to flow ports 2, 3, 4 and 5 in the sub-base shall be as shown in figures 5 and 6.

5 Identification statement (Reference to this part of ISO 5599)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this part of ISO 5599:

"Mounting interface dimensions conform to ISO 5599-1, *Pneumatic fluid power — Five-port directional control valves — Part 1: Mounting interface surfaces without electrical connector.*"

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NOTE — A plane Y wide by $4 L_1$ min. long, centred on and including the mounting surface, shall be free from any encroachment, except for mounting bolts.

Figure 1 — Mounting surface — Sizes 1, 2 and 3

Table 1 — Dimensions — Sizes 1, 2 and 3

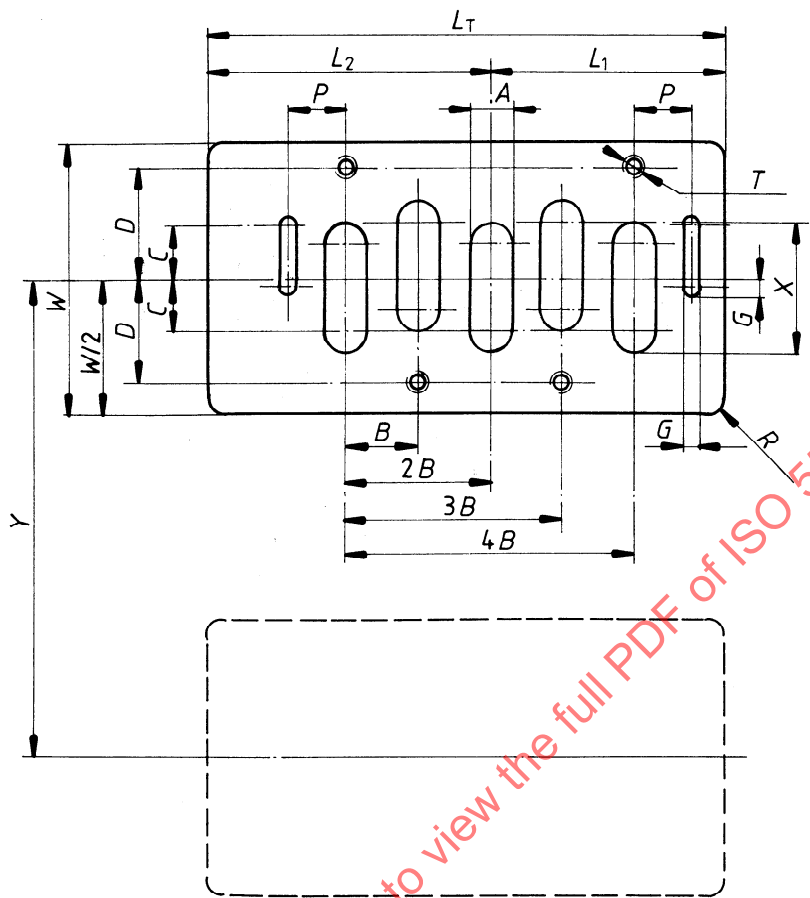
Dimensions in millimetres

Size	A	B	C	D	$G^{1)}$	L_1 min.	L_T min.	P	R max.	$T^{2)}$	W min.	X	$Y^{3)}$	Orifice area mm ²
1	4,5	9	9	14	3	32,5	65	8,5	2,5	M5 × 0,8	38	16,5	43	79
2	7	12	10	19	3	40,5	81	10	3	M6 × 1	50	22	56	143
3	10	16	11,5	24	4	53	106	13	4	M8 × 1,25	64	29	71	269

1) The minimum depth of orifices of width G shall be equal to G .

2) The minimum thread depth provided in the base shall be twice the bolt diameter, T (see figure 4, cross-section XX).

3) Y represents the minimum distance between the axes of successive mounting surfaces of interfaces of the same size on a multiple block.



NOTE — A plane Y wide by $4 L_2$ min. long, centred on and including the mounting surface, shall be free from any encroachment, except for mounting bolts.

Figure 2 — Mounting surface — Sizes 4, 5 and 6

Table 2 — Dimensions — Sizes 4, 5 and 6

Dimensions in millimetres

Size	A	B	C	D	$G^{1)}$	L_1 min.	$L_2^{2)}$ min.	L_T min.	P	R max.	$T^{3)}$	W min.	X	$Y^{4)}$	Orifice area mm ²
4	13	20	14,5	29	4	64,5	77,5	142	15,5	4	M8 × 1,25	74	36,5	82	438
5	17	25	18	34	5	79,5	91,5	171	19	5	M10 × 1,5	88	42	97	652
6	20	30	22	44	5	95	105	200	22,5	5	M10 × 1,5	108	50,5	119	924

- 1) The minimum depth of orifices of width G shall be equal to G .
- 2) L_2 is not equal to L_1 for sizes 4, 5, 6 in order to accommodate optional electrical connector requirements.
- 3) The minimum thread depth provided in the base shall be twice the bolt diameter, T (see figure 4, cross-section XX).
- 4) Y represents the minimum distance between the axes of successive mounting surfaces of interfaces of the same size on a multiple block.

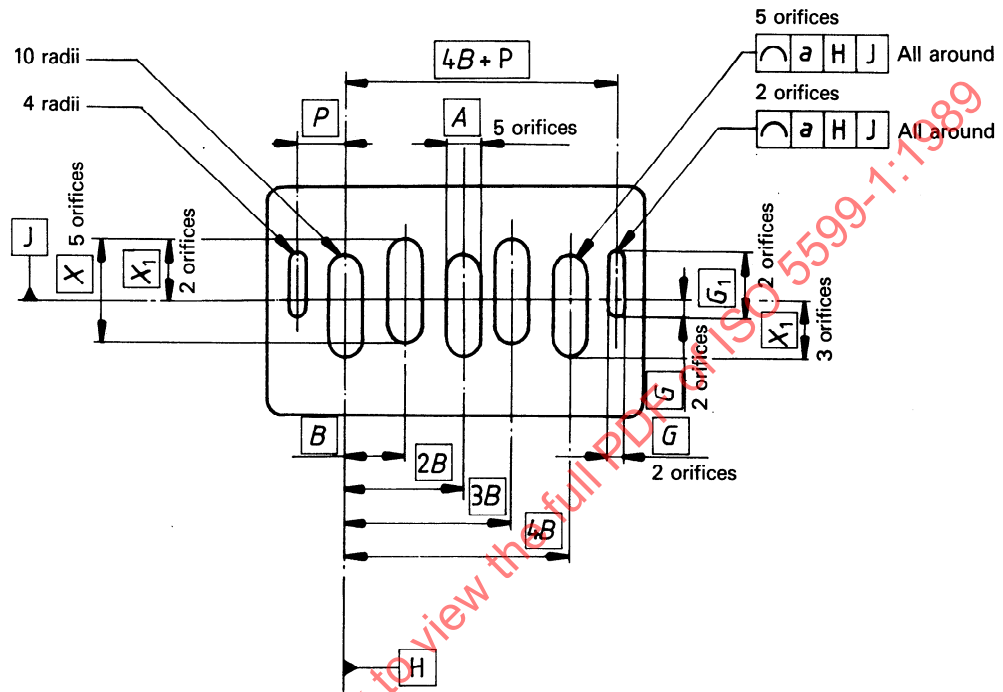


Figure 3 – Dimensions and tolerances of form of interface features