
**Pneumatic fluid power — Five-port
directional control valves, sizes 18 mm
and 26 mm —**

Part 2:
**Mounting interface surfaces with optional
electrical connector**

*Transmissions pneumatiques — Distributeurs de commande
directionnels à cinq orifices, tailles 18 mm et 26 mm —*

*Partie 2: Surfaces d'interface de montage avec connecteur électrique
facultatif*



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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15407-2 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 5, *Control products and components*.

ISO 15407 consists of the following parts, under the general title *Pneumatic fluid power — Five-port directional control valves, sizes 18 mm and 26 mm*:

- *Part 1: Mounting interface surfaces without electrical connector*
- *Part 2: Mounting interface surfaces with optional electrical connector*

Introduction

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

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

Pneumatic directional control valves of the five-port type, as used on mounting interface surfaces complying with the requirements of this part of ISO 15407, control the flow of compressed gas. When the valve is electrically operated, it may be desirable to use an electrical connector at the interface of the valve body and base. Users of pneumatic valves benefit when this electrical connector is standardized, allowing easy electrical connection interchangeability between valves produced by different manufacturers.

Standardization of port and orifice identification, the result of control-mechanism actuation and a system of dimensional tolerances are provided to enhance mounting interchangeability of pneumatic control valves used on the mounting surfaces complying with the requirements of this part of ISO 15407.

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Pneumatic fluid power — Five-port directional control valves, sizes 18 mm and 26 mm —

Part 2: Mounting interface surfaces with optional electrical connector

1 Scope

This part of ISO 15407 specifies the following requirements for a mounting interface and electrical connector for five-port pneumatic directional control valves, sizes 18 mm and 26 mm, for use at a maximum rated pressure of 1,6 MPa [16 bar¹):

- dimensions and tolerances of the interface features;
- port identification;
- identification of the result of control-mechanism actuation;
- dimensions, tolerances and specifications for optional interface electrical connector mateability.

It is not applicable to the functional characteristics of interfaces.

NOTE The requirements for mounting interfaces of five-port directional control valves, sizes 18 mm and 26 mm, without electrical connector are specified in ISO 15407-1.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1101:—², *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

ISO 4288, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

1) 1 bar = 0,1 MPa = 10⁵ Pa; 1 Pa = 1 N/m²

2) To be published. (Revision of ISO 1101:1983)

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

ISO 11727, *Pneumatic fluid power — Identification of ports and control mechanisms of control valves and other components*

3 Terms and definitions

For the purposes of this part of ISO 15407, the terms and definitions given in ISO 5598 and the following apply.

3.1 electrical connector
device consisting of two parts (contact and housing) that, when they are joined, provide electrical and mechanical continuity

3.2 contact
current-carrying component used at a removable junction of an electric circuit

3.3 socket
contact with an opening or hollow designed to be the mechanical holder of a pin-type contact

3.4 pin
pointed contact designed to mate with a socket contact

3.5 housing
device designed to orient, secure and insulate contacts

4 Dimensional requirements and tolerances

4.1 Dimensional requirements for sizes 18 mm and 26 mm are shown in Figure 1 and given in Table 1.

4.2 The tolerances of form and location of the interface features, and position tolerance are shown in Figure 2.

4.3 Tolerances on surface condition, within the continuous wide outer boundary lines in Figure 1, shall be as follows:

- surface roughness: $R_a = 1,6 \mu\text{m}$ (see ISO 1302, ISO 4287 and ISO 4288);
- surface flatness: 0,1 mm over a distance of 100 mm (see ISO 1101).

EXAMPLE

▭	0,1 / 100
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4.4 The mounting surface shall not include any orifices other than those shown in the figures. All passages shown in the interface shall be included, and connected to open ports in the base.

5 Identification of ports and orifices

5.1 Identification of ports and electrical leads shall conform to ISO 11727.

5.2 The flow path orifices in the mounting surface interface, and the ports serving these orifices, shall be designated as follows (see Figures 1 and 2):

- ports 1, 2, 3, 4 and 5 are the principal flow paths;
- ports 12 and 14 are the actuation orifices.

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

5.3 For monostable valves, the mandatory stable position of the valve shall always be identical to the result of actuation by control mechanism 12, as shown in Figure 4.

5.4 When a positive signal is applied to control mechanism 12, flow port 1 shall be connected with flow port 2 (and 4 with 5). When a positive signal is applied to control mechanism 14, flow port 1 shall be connected with flow port 4 (and 2 with 3) (see Figure 5 and ISO 11727).

5.5 The orientation of control mechanisms 12 and 14 on the valve relative to flow ports 2, 3, 4 and 5 in the base shall be as shown in Figures 4 and 5.

6 Electrical connector

6.1 General

Figure 3 is an illustration of an electrical connector, showing pin, socket and housing, for use with mounting surfaces with openings for an electrical connector. Figure 3 also shows dimensions for this electrical connector.

6.2 Connectors

The connector shall be readily removable, if not required, and shall comply with the requirements of 6.2.1 to 6.2.3.

6.2.1 Connectors shall be rated at a nominal voltage of 125 V maximum d.c. or a.c.

6.2.2 Connectors shall be rated at not less than 1 A.

6.2.3 Dielectric withstanding voltage shall be 1 500 V a.c. minimum rms (sea level).

6.3 Contacts

6.3.1 Connectors shall comprise three live contacts and one earth contact.

6.3.2 The pins shall be 0,64 mm square.

6.3.3 The pins shall be located at 2,54 mm centrelines.

6.3.4 Receptacle contacts shall have an opening that allows friction fits on the pins.

6.4 Dimensions, orientation and pin assignments

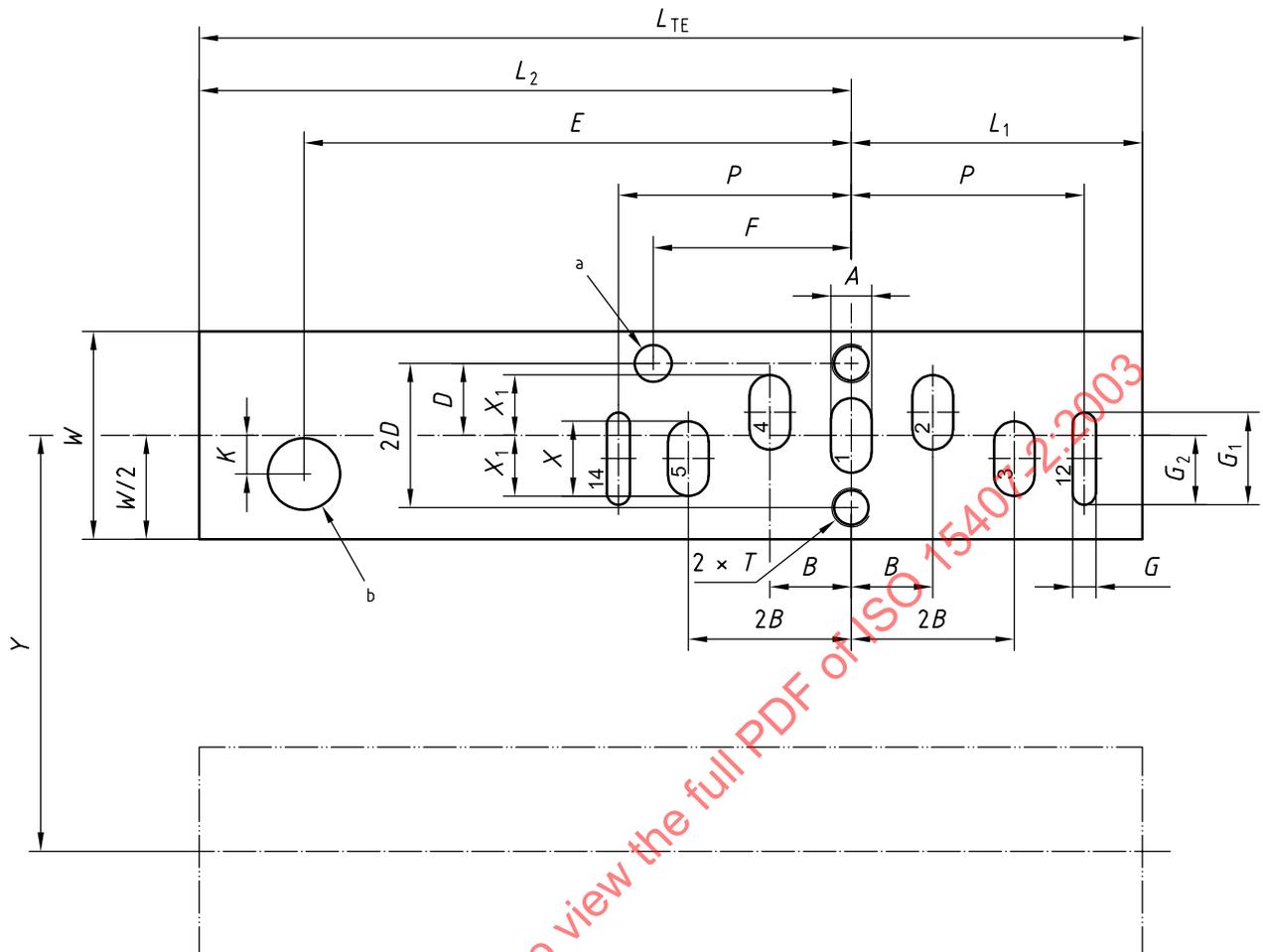
- 6.4.1 The dimensions of the electrical connector shall conform to those given in Figure 3.
- 6.4.2 The contacts shall be located at the corners of a square.
- 6.4.3 Contacts 2 and 4 shall be oriented parallel to the valve port slots and towards the valve interior.
- 6.4.4 Contacts 1 and 4 shall be used with single solenoid valves.
- 6.4.5 Contacts 2 and 4 shall be used with the second solenoid of a double solenoid valve.
- 6.4.6 Contact 4 shall be the common return for solenoids 14 and 12.
- 6.4.7 Contact 3 shall be the earth contact.
- 6.4.8 Indicator lights and/or surge suppression are optional but shall be insensitive to polarity.

7 Identification statement (Reference to this part of ISO 15407)

Use of the following statement in test reports, catalogues and sales literature when electing to comply with this part of ISO 15407 is strongly recommended:

"Mounting interface dimensions conforming to ISO 15407-2:2003, *Pneumatic fluid power — Five-port directional control valves, sizes 18 mm and 26 mm — Part 2: Mounting interface surfaces with optional electrical connector.*"

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Key

- a Location hole $\varnothing U$, depth V
- b See Figure 3.

Figure 1 — Mounting surface with opening for electrical connector — Sizes 18 mm and 26 mm

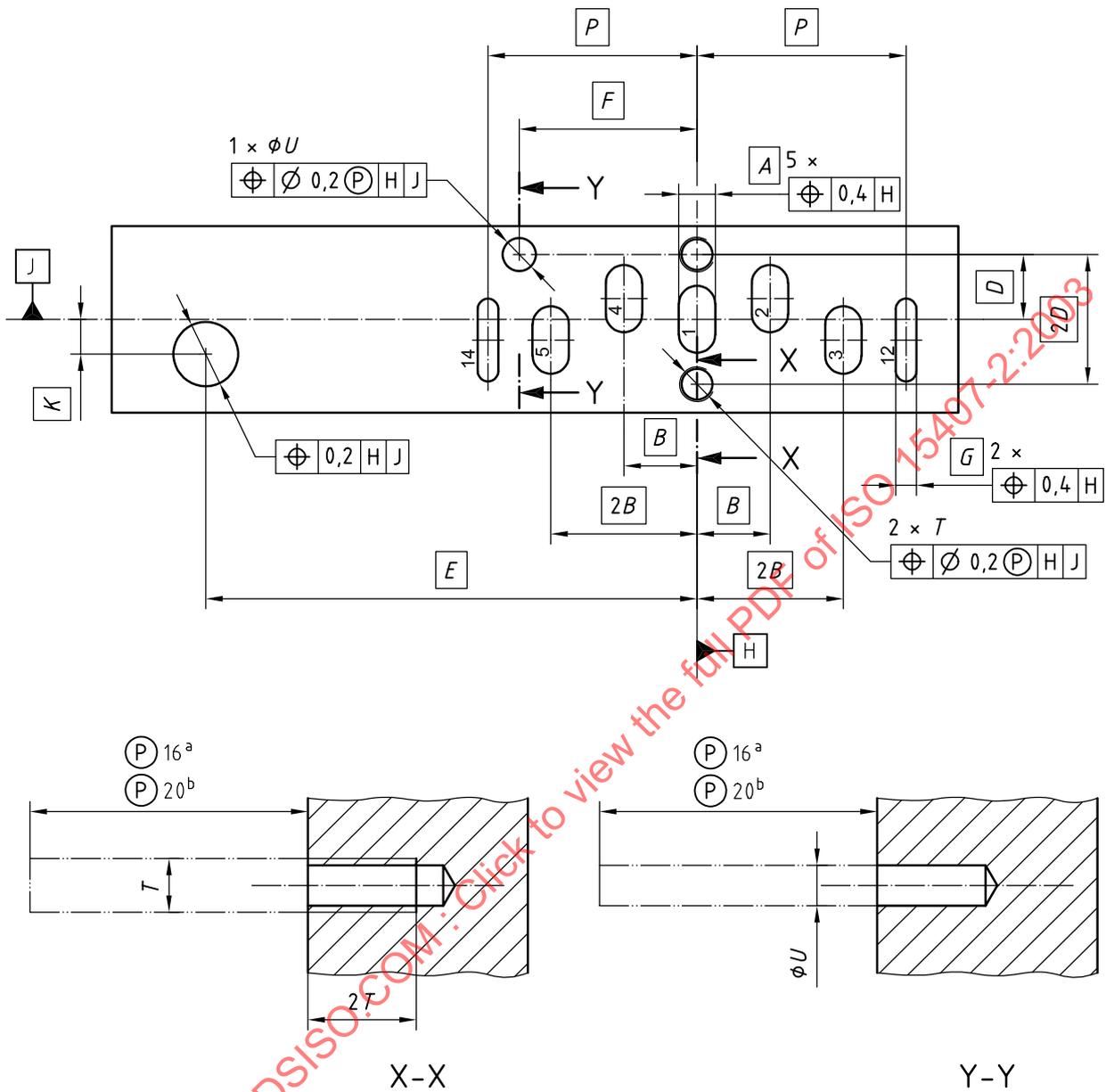
Table 1 — Dimensions of mounting surfaces with opening for electrical connector — Sizes 18 mm and 26 mm

Dimensions in millimetres

Size	A	B	D	E	F	G	G ₁	G ₂	K	L ₁ min.	L ₂ min.	L _{TE} min.	P	T	U	V	W min.	X	X ₁	Y ^a
18	3,5	7	6,25	50	17	2	8	6	3,35	25	55,5	80,5	20	M3	∅3,2	4	18	6,5	5,25	19
26	5,5	9,5	9,5	58	24	3	13	9	7,35	33	63,5	96,5	27,5	M4	∅3,2	4	26	9	8,5	27

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

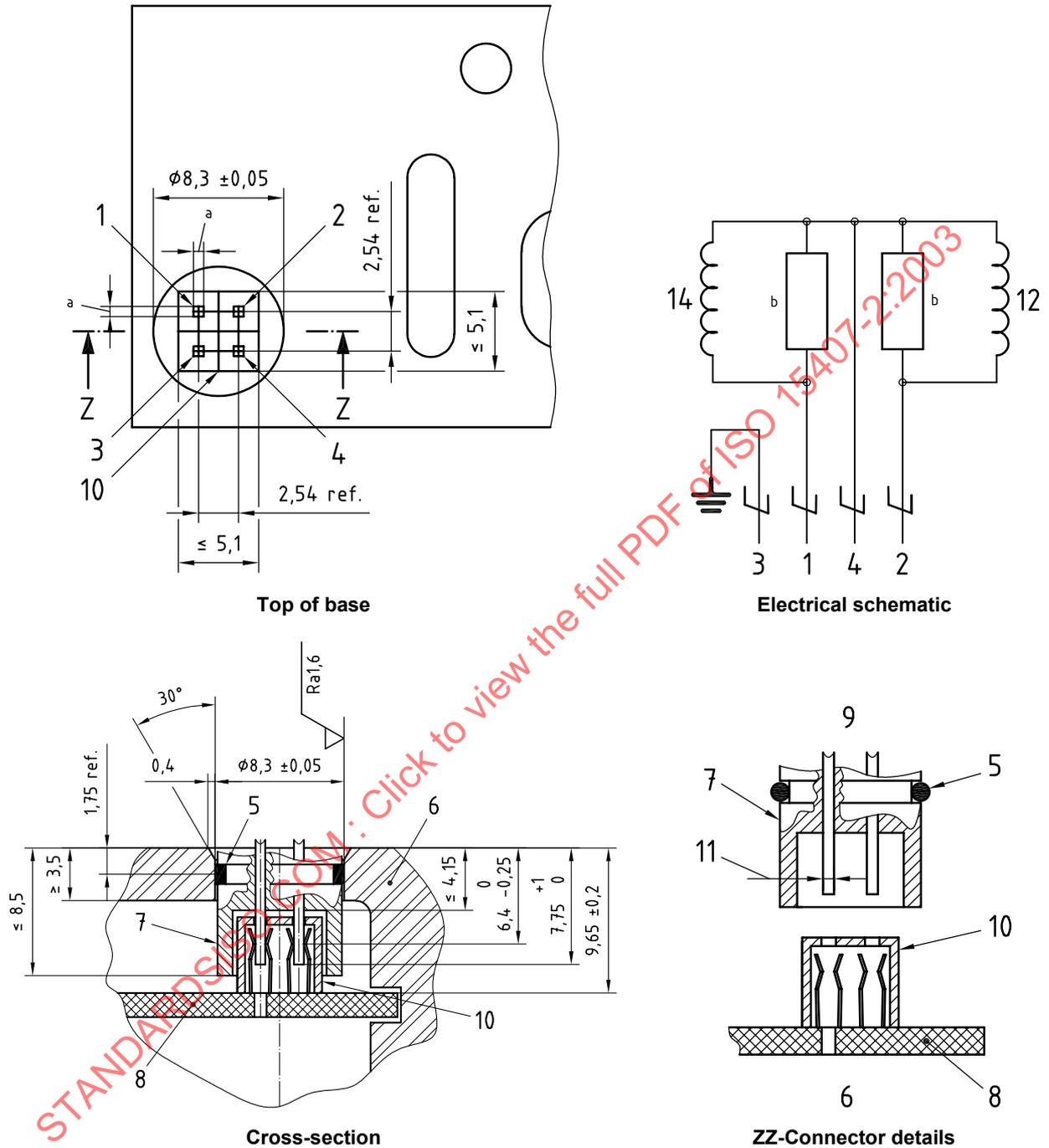
Dimensions in millimetres



- a For size 18 mm
- b For size 26 mm

Figure 2 — Form and position tolerances of the features of the mounting interface surfaces

Dimensions in millimetres,
surface roughness values in micrometres



Key

- | | | | |
|---|---|----|-----------------------------------|
| 1 | Opening for solenoid 14, socket 1 | 6 | Base |
| 2 | Opening for solenoid 12, socket 2 | 7 | Pin housing secured to valve body |
| 3 | Opening for earth contact, socket 3 | 8 | Optional circuit board in base |
| 4 | Opening for common, socket 4 | 9 | Valve connected to pin housing |
| 5 | Seal (O-ring is shown as an example; other seal types may be used, as long as intermateability is maintained) | 10 | Optional socket housing |
| | | 11 | Square pin, 0,64 mm × 0,64 mm |
- a Square opening on top of socket housing, if used, shall be large enough for a 0,64 mm by 0,64 mm square pin to pass through.
- b See 6.4.8 for electrical devices

Figure 3 — Electrical connector