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**Connections for hydraulic fluid power  
and general use — Ports and stud  
ends with ISO 261 metric threads and  
O-ring sealing —**

Part 1:  
**Ports with truncated housing for  
O-ring seal**

*Raccordements pour transmissions hydrauliques et applications  
générales — Orifices et éléments mâles à filetage métrique ISO 261 et  
joint torique —*

*Partie 1: Orifices à joint torique dans un logement tronconique*



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ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
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## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 4, *Connectors and similar products and components*.

This third edition cancels and replaces the second edition (ISO 6149-1:2006), which has been technically revised.

The main change since the last version is the addition of a warning statement about the hazards of intermixing of stud ends with the various port types and a change to the port o-ring gland on sizes M8 and M10 to improve maximum volume fill.

A list of all the parts in the ISO 6149 series, can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. In general applications, a fluid (liquid or gas) may be conveyed under pressure.

Components are connected through their threaded ports by fluid conductor connectors to tubes and pipes or to hose connectors and hoses.

Ports are an integral part of fluid power components, i.e. pumps, motors, valves, cylinders.

For threaded ports and stud ends specified in new designs in hydraulic fluid power applications, ISO/TC 131/SC 4 recommends that the ISO 6149 series be used because these International Standards specify ports and stud ends with metric threads and O-ring sealing and because the subcommittee would like to help users by recommending one preferred system. ISO/TC 131/SC 4 further recommends that threaded ports and stud ends in accordance with the ISO 1179 series, the ISO 9974 series and the ISO 11926 series not be used for new designs in hydraulic fluid power applications; these International Standards are maintained because they specify ports and stud ends that are currently used in hydraulic systems worldwide

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# Connections for hydraulic fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing —

## Part 1: Ports with truncated housing for O-ring seal

### 1 Scope

This document specifies dimensions for metric ports for use with the adjustable and non-adjustable stud ends as described in ISO 6149-2 and ISO 6149-3.

Ports in accordance with this document can be used at working pressures up to 63 MPa [630 bar<sup>1)</sup>] for non-adjustable stud ends and 40 MPa (400 bar) for adjustable stud ends. The permissible working pressure depends upon port size, materials, design, working conditions, application, etc. See ISO 6149-2 and ISO 6149-3 for pressure ratings.

NOTE The Introduction of this document gives recommendations for ports and stud ends to be used for new designs in hydraulic fluid power applications.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 261, *ISO general purpose metric screw threads — General plan*

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

ISO 2306, *Drills for use prior to tapping screw threads*

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

ISO 6149-2, *Connections for hydraulic fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing — Part 2: Dimensions, design, test methods and requirements for heavy-duty (S series) stud ends*

ISO 6149-3, *Connections for hydraulic fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing — Part 3: Dimensions, design, test methods and requirements for light-duty (L series) stud ends*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5598 apply.

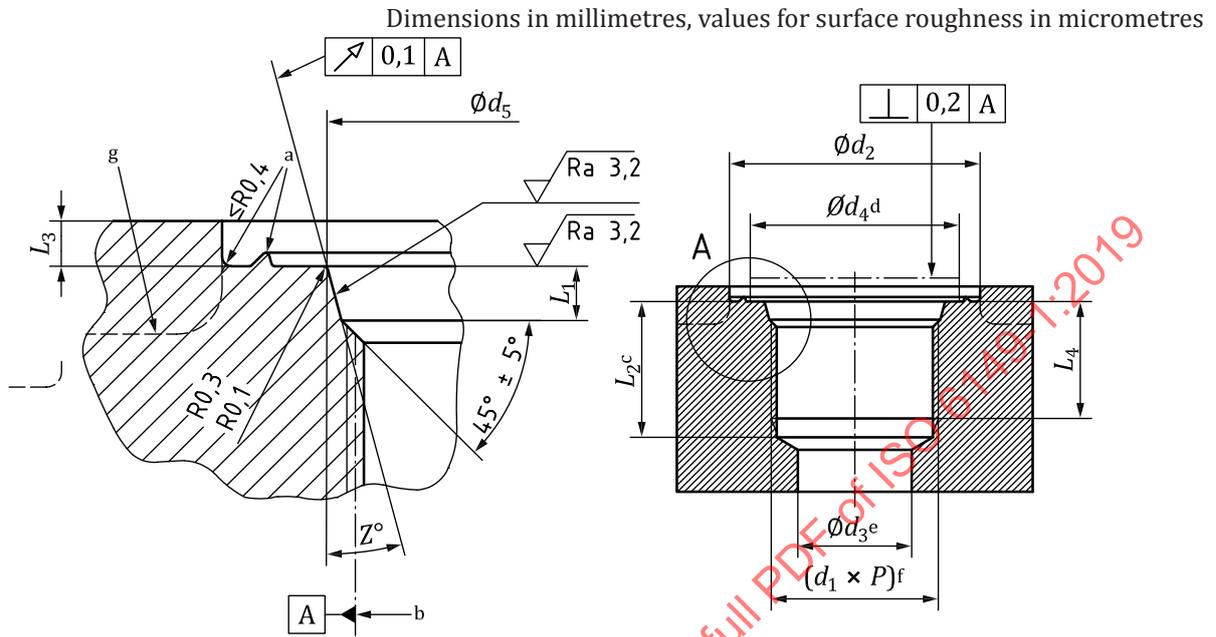
ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

1) 1 bar = 0,1 MPa = 10<sup>5</sup> Pa; 1 MPa = 1 N/mm<sup>2</sup>.

### 4 Dimensions

Ports shall conform to the dimensions shown in [Figure 1](#) and given in [Table 1](#). Users of this document shall ensure that there is sufficient material around the port to maintain the pressure.



**Key**

- a Optional identification of port; see [Figure 2](#) and [Clause 7](#).
- b Pitch diameter.
- c This dimension only applies when tap drill cannot pass through entire boss.
- d Gauging.
- e Reference only.
- f Thread.
- g Counterbore diameter or minimum diameter for raised bosses.

**Figure 1 — Port**

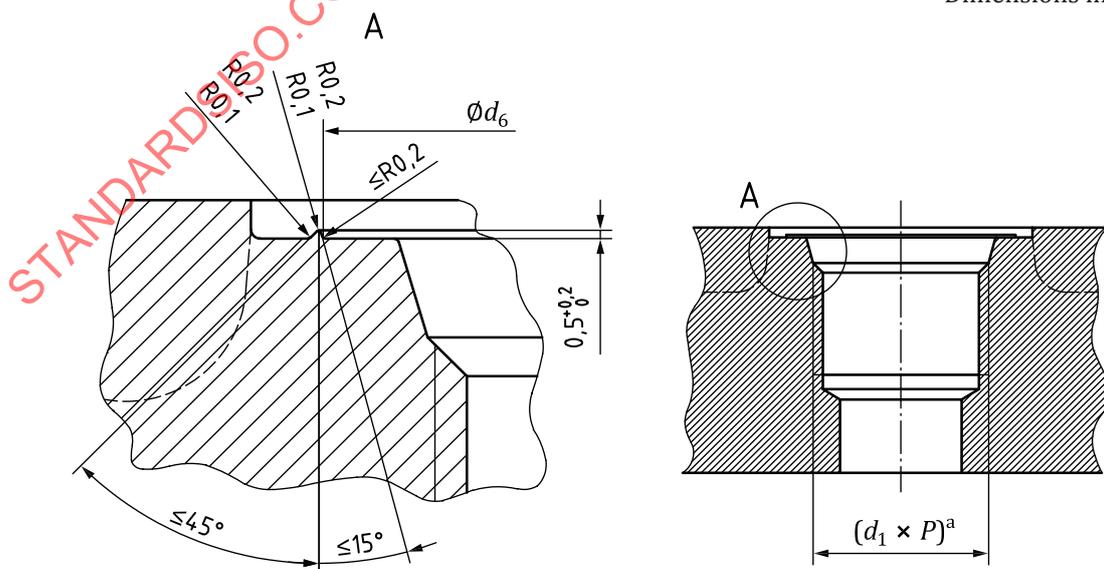
**Table 1 — Port dimensions**

Dimensions in millimetres

Thread <sup>a</sup> ( $d_1 \times P$ )	$d_2$		$d_3^b$ ref.	$d_4$	$d_5$ +0,1 0	$L_1$ +0,4 0	$L_2^c$ min.	$L_3$ max.	$L_4$ min.	$Z^\circ$ $\pm 1^\circ$
	Wide <sup>d</sup> min.	Narrow <sup>e</sup> min.								
M8 × 1	17	14	3	12,5	9,1	2,2	11,5	1	10	12
M10 × 1	20	16	4,5	14,5	11,1	2,2	11,5	1	10	12
M12 × 1,5	23	19	6	17,5	13,8	2,4	14	1,5	11,5	15
M14 × 1,5 <sup>f</sup>	25	21	7,5	19,5	15,8	2,4	14	1,5	11,5	15
M16 × 1,5	28	24	9	22,5	17,8	2,4	15,5	1,5	13	15
M18 × 1,5	30	26	11	24,5	19,8	2,4	17	2	14,5	15
M20 × 1,5 <sup>g</sup>	33	29	—	27,5	21,8	2,4	—	2	14,5	15
M22 × 1,5	33	29	14	27,5	23,8	2,4	18	2	15,5	15
M27 × 2	40	34	18	32,5	29,4	3,1	22	2	19	15
M30 × 2	44	38	21	36,5	32,4	3,1	22	2	19	15
M33 × 2	49	43	23	41,5	35,4	3,1	22	2,5	19	15
M42 × 2	58	52	30	50,5	44,4	3,1	22,5	2,5	19,5	15
M48 × 2	63	57	36	55,5	50,4	3,1	25	2,5	22	15
M60 × 2	74	67	44	65,5	62,4	3,1	27,5	2,5	24,5	15

- a Conforming to ISO 261, tolerance grade 6H in accordance with ISO 965-1. Tap drills in accordance with ISO 2306, class 6H.
- b For reference only. Connecting hole application may require a different size.
- c The tap drill depths given require the use of a bottoming tap to produce the specified full thread lengths. Where standard taps are used, the tap drill depths shall be increased accordingly.
- d Spotface diameter with identification ridge.
- e Spotface diameter without identification ridge.
- f Preferred for diagnostic port applications.
- g For cartridge valve cavity applications only (see ISO 7789).

Dimensions in millimetres



**Key**

- a Thread.

**Figure 2 — Optional port identification**

**Table 2 — Optional port identification<sup>a</sup>**

Dimensions in millimetres

Thread ( $d_1 \times P$ )	$d_6$ +0,5 0
M8 × 1	14
M10 × 1	16
M12 × 1,5	19
M14 × 1,5	21
M16 × 1,5	24
M18 × 1,5	26
M20 × 1,5 <sup>a</sup>	29
M22 × 1,5	29
M27 × 2	34
M30 × 2	38
M33 × 2	43
M42 × 2	52
M48 × 2	57
M60 × 2	67

<sup>a</sup> See Clause 7.  
<sup>b</sup> For cartridge valve cavities only (see ISO 7789).

## 5 Interchangeability warning

**WARNING** — The use of stud ends conforming to this document with ports conforming to the relevant parts of ISO 1179, ISO 9974 and ISO 11926 could lead to a hazardous situation.

## 6 Test methods

Ports shall be tested along with stud ends in accordance with the test methods and requirements given in ISO 6149-2 and ISO 6149-3. For rated pressures lower than those specified in ISO 6149-2 and ISO 6149-3, the test pressures shall be agreed upon between the manufacturer and user.

## 7 Designation of ports

The ports shall be designated by

- “Port”;
- reference to this document, i.e. ISO 6149-1:2019;
- thread size ( $d_1 \times P$ ).

EXAMPLE A port in accordance with this document, with a thread M18× 1,5 is designated as follows:

**Port** ISO 6149-1:2019, M18 × 1,5

## 8 Identification

Each port in accordance with this document shall be identified by a raised ring conforming to the dimensions given in [Figure 2](#) and [Table 2](#), or by permanently marking “metric” or “M” next to the port, or by a permanent identification label on the component to read “ISO 6149-1 metric ports”.

## 9 Identification statement (reference to this document)

It is strongly recommended to manufacturers who have chosen to conform to this document that the following statement be used in test reports, catalogues and sales literature:

*“Ports conform to ISO 6149-1:2019, Connections for hydraulic fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing — Part 1: Ports with truncated housing for O-ring seal.”*

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