TECHNICAL REPORT

ISO/TR 10946

First edition
2019-08

Hydraulic fluid power — Gas-loaded accumulators with separator — Selection of preferred hydraulic ports

Transmissions hydrauliques — Accumulateurs hydropneumatiques avec séparateur — Sélection des orifices hydrauliques préférentiels

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Foreword

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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).

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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.

This document was prepared by Technical Committee ISO/TC 131, *Fluid power systems*.

This first edition cancels and replaces ISO 10946:1999, which has been technically revised.

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.

Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit.

Gas-loaded accumulators are components that are able to store and to return energy in accordance with the principle of the compressibility of gases. Hydraulic fluid enters and leaves these accumulators through ports.

Hydraulic fluid power — Gas-loaded accumulators with separator — Selection of preferred hydraulic ports

1 Scope

This document specifies the types and selection of hydraulic ports of gas-loaded accumulators with separator, which are used in hydraulic fluid power systems.

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 5598, *Fluid power systems and components — Vocabulary*

3 Terms and definitions

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

3.1
bladder type accumulator
gas-loaded accumulator in which the liquid and gas are separated by a flexible bag or bladder that is normally retained at one end of the shell

3.2
diaphragm type accumulator
gas-loaded accumulator in which the liquid and gas are separated by a flexible membrane that is normally retained at its largest diameter to the shell

3.3
piston type accumulator
gas-loaded accumulator in which the liquid and gas are separated by a rigid sliding piston

3.4
reducing bush
interface between accumulator and its connection to the hydraulic circuit

4 Symbols

The following symbols are used in the present document:

D_1 internal thread of accumulator port

D_2 internal thread of accumulator reducing bush

d_1 external thread of reducing bush (or external thread of accumulator port for diaphragm type)

ID inside diameter of the accumulator shell

5 Dimensions

5.1 General recommendations

For threaded ports, those specified in ISO 6149-1 should be preferred. For flange ports, those specified in ISO 6162-1, ISO 6162-2, ISO 6164, should be preferred. The threaded ports specified in ISO 7-1, ISO 1179-1:2013 and ISO 11926-1 are optional and may be used for existing applications.

5.2 Thread connections

Thread connection possibilities are illustrated in Figure 1.

5.3 Recommendations for ports used with diaphragm type accumulators

Thread sizes of diaphragm type accumulator port should be selected from those given in Table 1.

5.4 Recommendations for ports used with bladder or piston type accumulators

Thread sizes of bladder or piston type accumulator port should be selected from those given in Table 2.

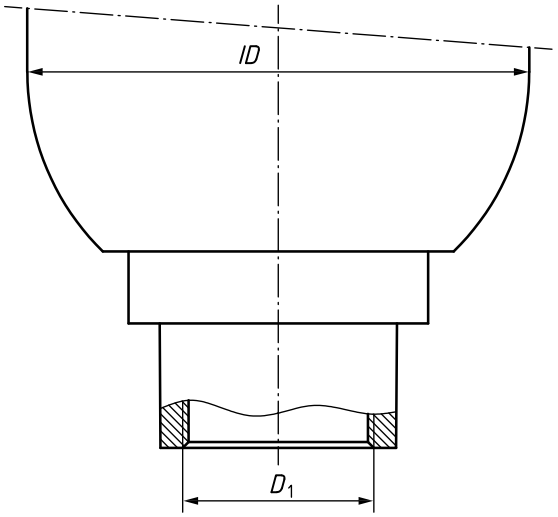
5.5 Recommendations for ports used with piston type accumulators

Thread sizes of piston type accumulator port should be selected from those given in Table 3.

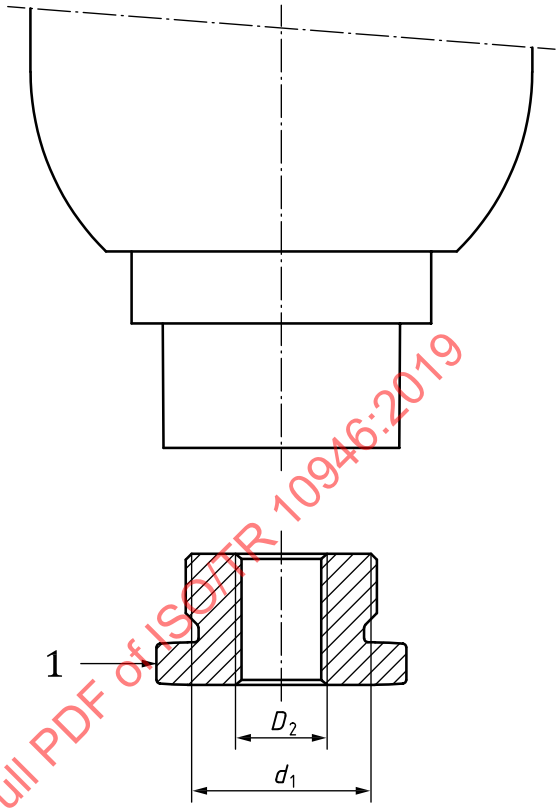
6 Identification statement (reference to this document)

The following statement should be used in test reports, catalogues, and sales literature when electing to comply with this document:

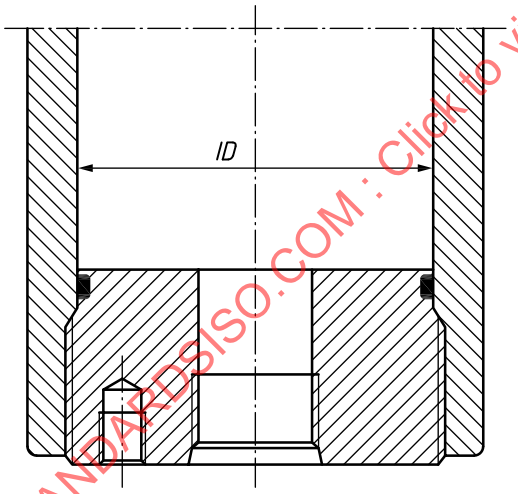
"Hydraulic ports for gas-loaded accumulators with separator selected in accordance with ISO/TR 10946:2019, *Hydraulic fluid power — Gas-loaded accumulators with separator — Selection of preferred hydraulic ports*."



or



a) Bladder type **b)**



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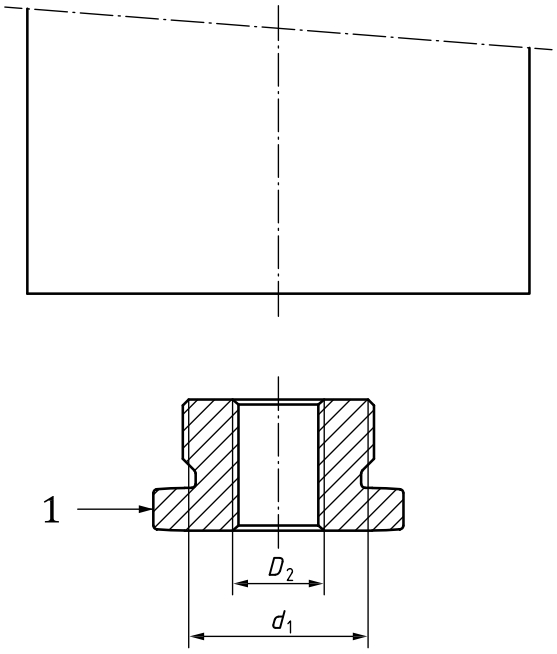
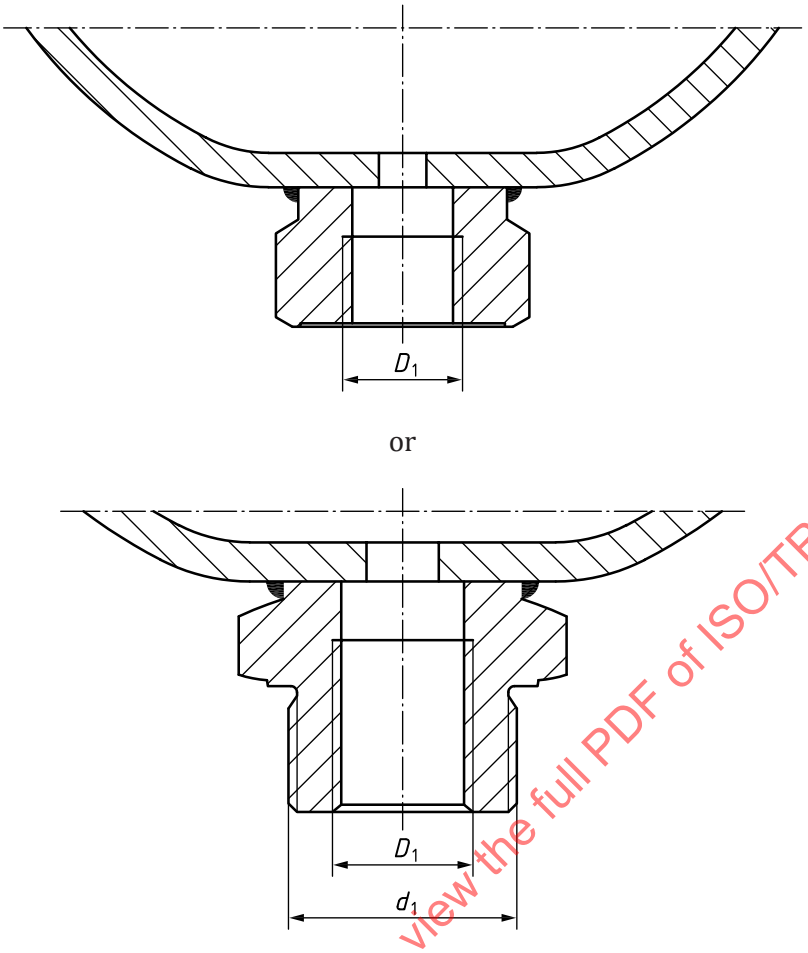


c) Piston type **d)**



e) Diaphragm type

Key

1 reducing bush

Figure 1 — Thread connection possibilities

Table 1 — Thread sizes of diaphragm type accumulator port

Preferred port in accordance with ISO 1179-1:2013	G 1/4	G 3/8	G 1/2	G 3/4
Optional port in accordance with ISO 6149-1 for existing applications	M14 × 1,5	M18 × 1,5	M22 × 1,5	M27 × 2
Optional port in accordance with ISO 7-1 for existing applications	Rc 1/4	Rc 3/8	Rc 1/2	Rc 3/4
Optional port in accordance with ISO 11926-1 for existing applications	9/16-18 UNF-2B	3/4-16 UNF-2B	3/4-16 UNF-2B	3/4-16 UNF-2B

Table 2 — Thread sizes of bladder or piston type accumulator port

Preferred port in accordance with ISO 1179-1:2013	G 1/4	G 3/8	G 1/2	G 3/4	G 1	G 1 ¼	G 1 1/2	G 2[b]	—	—
Optional port in accordance with ISO 6149-1 for existing applications	M14 × 1,5	M18 × 1,5	M22 × 1,5	M27 × 2	M33 × 2	M42 × 2	M48 × 2	M60 × 2	M75 × 2[a]	M90 × 2[a]
Optional port in accordance with ISO 7-1 for existing applications	Rc 1/4	Rc 3/8	Rc 1/2	Rc 3/4	Rc 1	Rc 1 1/4	Rc 1 1/2	Rc 2	—	—
Optional port in accordance with ISO 11926-1 for existing applications	½-20 UNF-2B	9/16-18 UNF-2B	¾-16 UNF-2B	7/8-14 UN-2B	1 1/16-12 UN-2B	1 5/16-12 UN-2B	1 5/8-12 UN-2B	1 7/8-12 UN-2B	2 1/2-12 UN-2B	—
Flange port[c] in accordance with ISO 6162-1, ISO 6162-2 or ISO 6164, DN	—	—	—	13	19	25	32	38	51	—

[a] ISO 6149-1 does not include these specific port sizes.

[b] ISO 1179-1:2013 does not include these specific port sizes.

[c] Flange port series should be selected according to the allowable pressure of the accumulator (p_4), i.e., the maximum permissible pressure for which the accumulator has been designed and/or qualified (see Annex A).

Table 3 — Thread sizes of piston type accumulator port

Preferred port in accordance with ISO 1179-1:2013		Optional port in accordance with ISO 6149-1		Optional port in accordance with ISO 7-1		Optional port in accordance with ISO 11926-1		Flange port[c] in accordance with ISO 6162-1, ISO 6162-2 or ISO 6164, DN	
Port size	**Min ID mm**	**Port size**	**Min ID mm**	**Port size**	**Min ID mm**	**Port size**	**Min ID mm**	**Port size**	**Min ID mm**
G 1/4	40	M14 × 1,5	50	Rc 1/4	40	1/2-20 UNF-2B	50	13	75
G 3/8	50	M18 × 1,5	50	Rc 3/8	50	9/16-18 UNF-2B	50	19	75
G 1/2	50	M22 × 1,5	50	Rc 1/2	50	3/4-16 UNF-2B	50	25	75
G 3/4	50	M27 × 2	50	Rc 3/4	50	7/8-14 UN-2B	50	32	75
G1	75	M33 × 2	75	Rc 1	75	1 1/16-12 UN-2B	50	38	100
G1 1/4	75	M42 × 2	75	Rc 1 11/4	75	1 5/16-12 UN-2B	75	51	150
G1 1/2	100	M48 × 2	100	Rc 1 1/2	100	1 5/8-12 UN-2B	75	64	150
G2[b]	100	M60 × 2	175	Rc 2	100	1 7/8-12 UN-2B	100	—	—
—	—	M75 × 2[a]	175	—	—	2 1/2-12 UN-2B	175	—	—

[a] ISO 6149-1 does not include these specific port sizes.

[b] ISO 1179-1:2013 does not include these specific port sizes.

[c] Flange port series should be selected according to the allowable pressure of the accumulator (p_4), i.e., the maximum permissible pressure for which the accumulator has been designed and/or qualified (see Annex A).