
**Tools for pressing — Gas springs —
Part 3:
Gas spring with increased spring force
and compact built height**

Outillage de presse — Ressorts à gaz —

Partie 3: Ressorts à gaz à force accrue à faible encombrement en hauteur



Reference number
ISO 11901-3:2014(E)

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 29, *Small tools*, Subcommittee SC 8, *Tools for pressing and moulding*.

ISO 11901 consists of the following parts, under the general title *Tools for pressing — Gas springs*:

- *Part 1: General specifications*
- *Part 2: Specification of accessories*
- *Part 3: Gas spring with increased spring force and compact built height*
- *Part 4: Gas springs with increased spring force and same built height*

Introduction

The attention of the user of ISO 11901 is drawn to the fact that gas springs will have to conform to the national regulations of the user country.

Tools for pressing — Gas springs —

Part 3: Gas spring with increased spring force and compact built height

1 Scope

This part of ISO 11901 specifies the dimensions (in millimetres), nominal initial forces and types of gas springs.

It is applicable to gas springs with increased spring force and compact built height of type 1 700 to 200 000, pressurized with nitrogen with a nominal initial force of between $1\,700\text{ N} \pm 5\%$ and $200\,000\text{ N} \pm 5\%$, for use in press tools.

It also specifies marking, technical delivery conditions and designation.

NOTE Specifications of mounting accessories for gas springs are given in ISO 11901-2.

2 Normative references

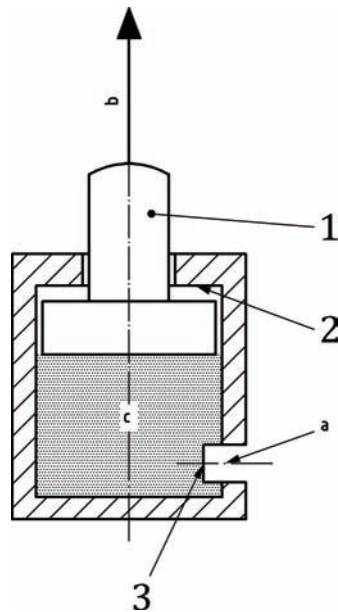
The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

3 Description and terminology

See [Figure 1](#).



Key

- 1 rod
- 2 positive stop
- 3 valve
- a Pressure filling inlet.
- b Force.
- c Nitrogen.

Figure 1 — Terminology

The gas spring is an autonomous spring pressurized with nitrogen.

At rest position, the rod is pushed out.

This gas spring feature has a gas inlet for pressurization or depressurization. The inlet is located on the casing or on the bottom and is capped.

The pressure filling inlet of gas springs of type of at least 42 000 includes a pipe thread ISO 7 - Rp 1/8 in accordance with ISO 7-1, and the pressure filling inlet of gas springs of type less than 42 000 includes an M6 thread.

4 Interchangeability dimensions and characteristics

4.1 General nominal specifications

See [Table 1](#).

Table 1 — General nominal specifications

Type	Nominal initial force N		Maximum filling pressure MPa	End of stroke nomi- nal force increase coefficient
1 700	1 700	±5 %	18	1,6
3 200	3 200			1,6
3 500	3 500			1,5
5 000	5 000		15	1,5
7 500	7 500			1,6
10 000	10 000			1,6
15 000	15 000			1,6
24 000	24 000			1,6
42 000	42 000			1,6
66 000	66 000			1,5
95 000	95 000			1,5
200 000	200 000			1,5

4.2 Gas springs of type 1 700 and 3 200

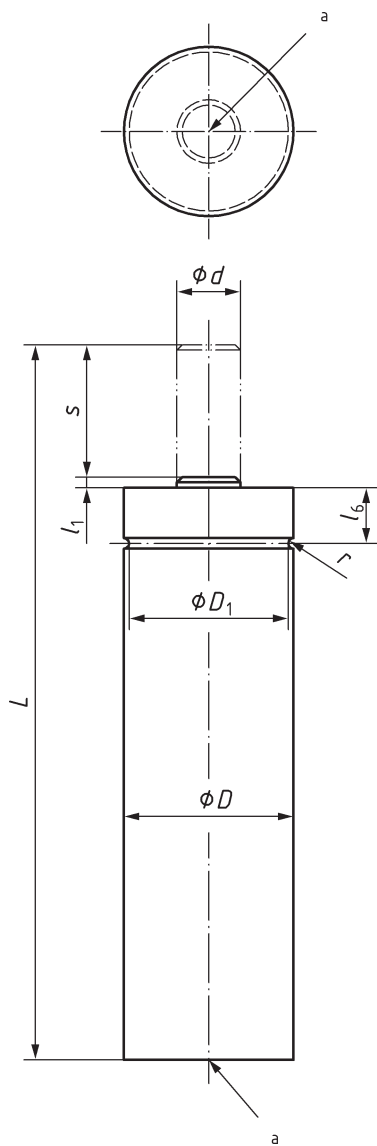
See [Figure 2](#) and [Table 2](#).

4.3 Gas springs of type 3 500 and 15 000

See [Figures 3](#) and [5](#) and [Tables 3](#) and [4](#).

4.4 Gas springs of type 24 000 to 200 000

See [Figures 4](#) and [5](#) and [Tables 3](#) and [4](#).



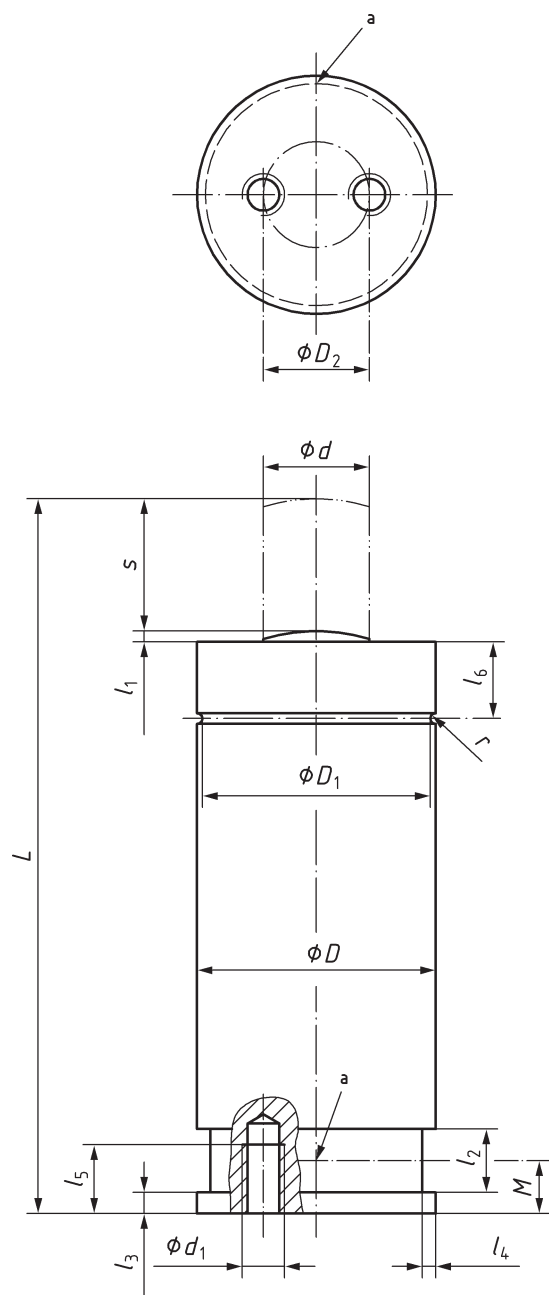
a Pressure filling inlet.

Figure 2 — Gas springs of type 1 700 and 3 200

Table 2 — Dimensions of gas springs of type 1 700 and 3 200 — Maximum filling pressure 18 MPa

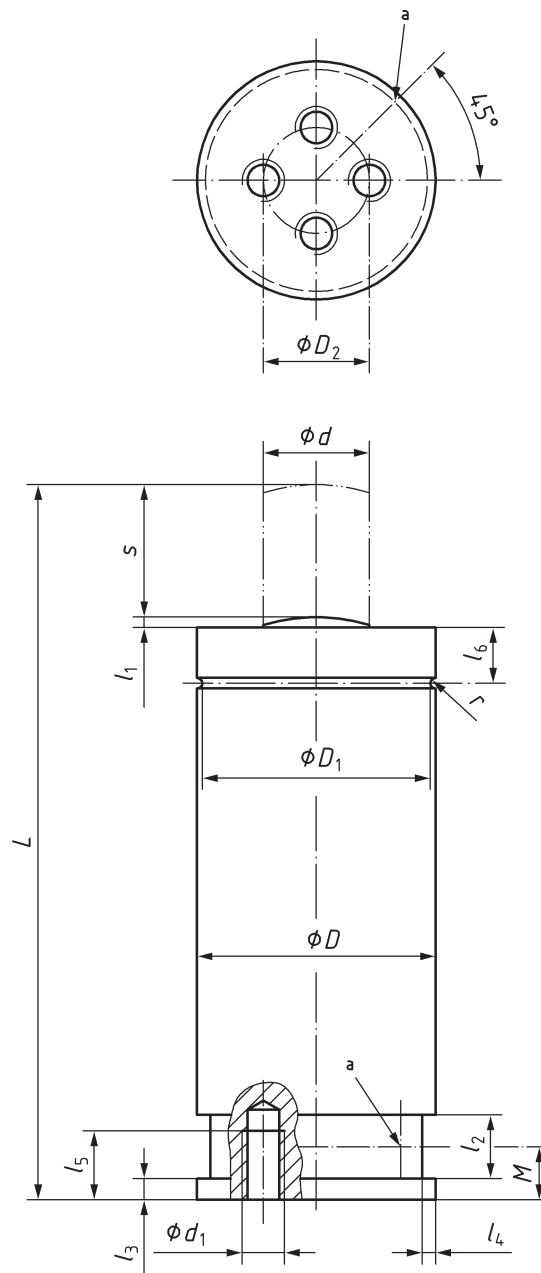
Dimensions in millimetres

Type	Nominal stroke <i>s</i>	<i>L</i> ±0,25	<i>l</i> ₁ $\begin{matrix} +1 \\ 0 \end{matrix}$	<i>l</i> ₆ $\begin{matrix} +1 \\ 0 \end{matrix}$	<i>r</i>	<i>d</i>	<i>D</i> ±0,3	<i>D</i> ₁ $\begin{matrix} 0 \\ -0,1 \end{matrix}$
1 700	10	50	1	16	1	11	19	17
	15	60						
	25	80						
	38	106						
	50	130						
	63	156						
	80	195						
	100	235						
3 200	10	50	1	16	1	15	25	23
	15	60						
	25	80						
	38	106						
	50	130						
	63	156						
	80	195						
	100	235						
125	285							



a Pressure filling inlet.

Figure 3 — Gas springs of type 3 500 to 15 000



a Pressure filling inlet.

Figure 4 — Gas springs of type 24 000 to 200 000

Table 3 — Dimensions of gas springs of type 3 500 to 200 000 — Maximum filling pressure 18 MPa for type 3 500 and 15 MPa for type 5 000 to 200 000

Dimensions in millimetres

Type	Nominal stroke <i>s</i>	<i>L</i> ±0,25	<i>l</i> ₁	<i>l</i> ₂ min	<i>l</i> ₃ ^{+0,15} ₀	<i>l</i> ₄ min	<i>l</i> ₅ min	<i>l</i> ₆	<i>r</i>	<i>d</i>	<i>D</i> ±0,3	<i>D</i> ₁ ⁰ _{-0,1}	<i>d</i> ₁	<i>D</i> ₂	Number of holes
3 500	10	50	2	3,5	4	2,5	6	10,5	1	16	32	30	M6	20	2
	13	56													
	16	62													
	25	80													
	38	106													
	50	130													
	63	156													
	80	190													
	100	230													
	125	280													
5 000	10	50	2	3,5	4	2,5	6	10,5	1	20	38	36	M6	20	2
	13	56													
	16	62													
	25	80													
	38	106													
	50	130													
	63	156													
	80	190													
	100	230													
	125	280													
7 500	13	58	2	3,5	4	2,5	6	14,5	1	25	45	43	M8	20	2
	25	82													
	38	108													
	50	132													
	63	158													
	80	192													
	100	232													
	125	282													
10 000	13	64	3	5	8	3,5	6	14,5	2	28	50	46	M8	20	2
	25	88													
	38	114													
	50	138													
	63	164													
	80	198													
	100	238													
	125	288													

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Table 3 (continued)

Type	Nominal stroke <i>s</i>	<i>L</i> ±0,25	<i>l</i> ₁	<i>l</i> ₂ min	<i>l</i> ₃ ^{+0,15} ₀	<i>l</i> ₄ min	<i>l</i> ₅ min	<i>l</i> ₆	<i>r</i>	<i>d</i>	<i>D</i> ±0,3	<i>D</i> ₁ ₀ -0,1	<i>d</i> ₁	<i>D</i> ₂	Number of holes
15 000	13	70	3	5	8	3,5	6	16	2	36	63	59	M8	20	2
	25	94													
	38	120													
	50	144													
	63	170													
	80	204													
	100	244													
125	294														
24 000	25	95	3	5	8	4	6	18	2,5	45	75	70	M8	40	4
	38	121													
	50	145													
	63	171													
	80	205													
	100	245													
125	295														
42 000	25	108	3	5	8	4	12	21	2,5	60	95	90	M8	60	4
	38	134													
	50	158													
	63	184													
	80	218													
	100	258													
125	308														
66 000	25	118	3	5	8	4	12	22,5	2,5	75	120	115	M10	80	4
	38	144													
	50	168													
	63	194													
	80	228													
	100	268													
125	318														
95 000	25	128	3	5	8	4	13	24,5	2,5	90	150	145	M10	100	4
	38	154													
	50	178													
	63	204													
	80	238													
	100	278													
125	328														

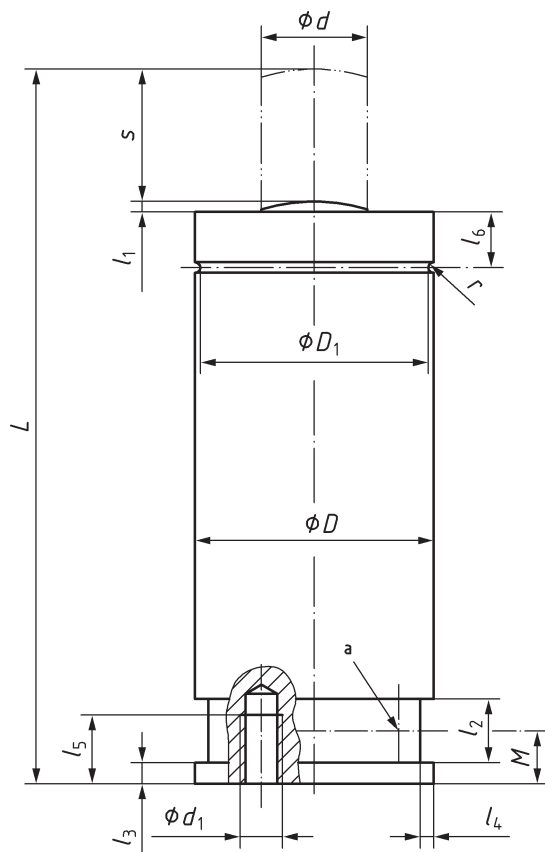
Table 3 (continued)

Type	Nominal stroke s	L $\pm 0,25$	l_1	l_2 min	l_3 $^{+0,15}_0$	l_4 min	l_5 min	l_6	r	d	D $\pm 0,3$	D_1 $^0_{-0,1}$	d_1	D_2	Number of holes
200 000	25	160	3	8	8	4	16	30,5	2,5	130	195	190	M12	120	4
	38	186													
	50	210													
	63	236													
	80	270													
	100	310													
	125	360													

5 Filling pressure

Pressure filling inlet, a, is M6 for gas springs of type 1 700 to 24 000 and ISO 7 - Rp 1/8 in accordance with ISO 7-1 for gas springs of type 42 000 to 200 000 (see [Figure 5](#) and [Table 4](#)).

For gas springs of type 1 700 and 3 200 the pressure filling inlet is located on the bottom.



a Pressure filling inlet.

Figure 5 — Filling pressure inlet

Table 4 — Location of pressure filling inlet

Type	Distance to inlet, <i>M</i> mm
3 500	6
5 000	6
7 500	6
10 000	6
15 000	6
24 000	6
42 000	10,5
66 000	10,5
95 000	10,5
200 000	15

6 Marking

Gas springs shall be labelled in an indelible way, with at least the following information:

- a) the manufacturer's name;
- b) the gas used;
- c) the date of manufacture;
- d) the maximum filling pressure;
- e) the type.

7 Technical delivery conditions

Gas springs shall be supplied at the nominal pressure at a reference temperature of 20 °C.

NOTE Increase in temperature increases pressure at constant volume according to the following formulae:

$$p_t = p_0 (1 + 0,003\ 6 \Delta t)$$

where

- p_t is the nitrogen pressure, in megapascals, at temperature t ;
- p_0 is the nitrogen pressure, in megapascals, at reference temperature;
- Δt is the temperature variation.

The rod shall be slightly oiled and protected against shocks.

8 Designation

A gas spring in accordance with this part of ISO 11901 shall be designated by:

- "Gas spring";
- reference to this part of ISO 11901, i.e. ISO 11901-3;

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- the type;
- the nominal stroke, in millimetres;
- the location of the pressure filling inlet for gas spring of type 1 700 to 3 200.

EXAMPLE A gas spring of type 15 000, nominal stroke of 25 mm is designated as follows:

Gas spring ISO 11901-3 - 15 000 × 25

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Bibliography

- [1] ISO 11901-2, *Tools for pressing — Gas springs — Part 2: Specification of accessories*
- [2] Council directive 97/23/CE “Pressure equipment”

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