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Pneumatic fluid power — Cylinders with detachable mountings, 1 000 kPa (10 bar) series, bores from 32 mm to 320 mm — Basic, mounting and accessories dimensions

Transmissions pneumatiques — Vérins avec fixations détachables, série 1 000 kPa (10 bar), alésages de 32 mm à 320 mm — Dimensions de base, des fixations et des accessoires

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

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This second edition cancels and replaces the first edition (ISO 15552:2004), which has been technically revised.

The main changes made are:

— Symbols for the accessory types have been made to be the same as the symbols in ISO 6099;

— Characteristics of the piston rod were added to 4.1;

— Product designation codes were added;

— The port size for each piston bore diameter was added to "Basic dimensions".

Introduction

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

One component of such systems is the pneumatic cylinder. This is a device which converts power into linear mechanical force and motion. It consists of a movable element, i.e. a piston, and a piston rod, operating within a cylindrical bore.

To enable them to be fastened to user mechanisms, pneumatic cylinders comprise, in addition, some devices called “mountings”.

Pneumatic fluid power — Cylinders with detachable mountings, 1 000 kPa (10 bar) series, bores from 32 mm to 320 mm — Basic, mounting and accessories dimensions

1 Scope

This document establishes a metric series of basic, mounting and accessories dimensions as required for interchangeability of single or double rod pneumatic cylinders with or without provision for magnetic sensors for a maximum rated pressure of 1 000 kPa (10 bar).

It applies to pneumatic cylinders with detachable mountings.

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 273, *Fasteners — Clearance holes for bolts and screws*

ISO 3320, *Fluid power systems and components — Cylinder bores and piston rod diameters and area ratios — Metric series*

ISO 4393, *Fluid power systems and components — Cylinders — Basic series of piston strokes*

ISO 4395, *Fluid power systems and components — Cylinder piston rod end types and dimensions*

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

ISO 16030, *Pneumatic fluid power — Connections — Ports and 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

4 Dimensions

4.1 Basic dimensions

The basic dimensions are given in Tables 2 and 3 and shown in Figures 2 and 3. The piston rod diameter shall be larger than the thread diameter (KK) to have a shouldered male thread end.

4.2 Mounting dimensions

The mounting dimensions are given in Tables 4 to 9 and shown in Figures 4 to 9.

The sign + after letters means that the stroke is to be added to the actual dimension.

4.3 Accessories dimensions

The accessories dimensions are given in Tables 10 to 14 and shown in Figures 10 to 14.

The tolerances of dimensions dependent on stroke included in the tables apply for strokes up to and including 1 250 mm. If strokes are longer than 1 250 mm, tolerances should be selected from national standards or by agreement between the manufacturer and user.

5 Nominal stroke

5.1 The nominal strokes shall be selected from the recommended values given in ISO 4393.

5.2 The nominal stroke tolerances are given in Table 1 and shown in Figure 1.

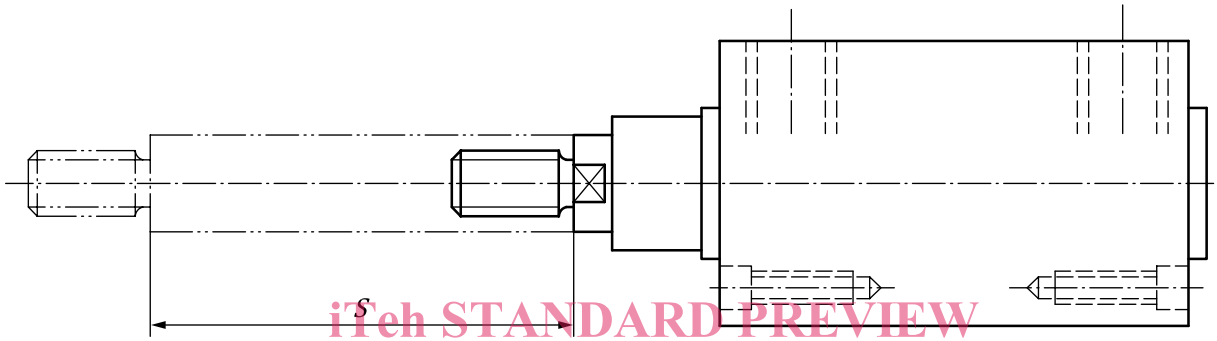


Figure 1 — Nominal stroke tolerances

Table 1 — Nominal stroke tolerances

Dimensions in millimetres

Bore *AL*	Nominal stroke *S*	Nominal stroke tolerance[a]
32 40 50	$S \leq 500$	+2 0
	$500 < S \leq 1\,250$	+3,2 0
63 80 100	$S \leq 500$	+2,5 0
	$500 < S \leq 1\,250$	+4 0
125 160 200 250 320	$S \leq 500$	+4 0
	$500 < S \leq 1\,250$	+5 0

[a] See 4.3, paragraph 2.

6 Bore sizes

Included in this series are the following bore sizes AL in accordance with ISO 3320:

32 – 40 – 50 – 63 – 80 – 100 – 125 – 160 – 200 – 250 – 320 (in millimetres)

7 Mounting types

This document includes the following mounting types as described in ISO 6099:

— MF1 Head, rectangular flange (see Table 4 and Figure 4);

— MF2 Cap, rectangular flange (see Table 4 and Figure 4);

— MP2 Cap, detachable clevis (see Table 5 and Figure 5);

— MP4 Cap, detachable plain eye (see Table 6 and Figure 6);

— MP6 Cap, detachable eye with spherical bearing (see Table 7 and Figure 7);

— MS1 End angles (see Table 8 and Figure 8);

— MT4 Intermediate trunnion (male) fixed or mobile (see Table 9 and Figure 9).

8 Accessory types

This document includes the following accessory types as described in ISO 6099:

— AA4-R Pivot pin plain (cotter pin or snap ring type) (see Table 10 and Figure 10);

— AA4-S Pivot pin plain (split pins) (see Table 10 and Figure 10);

— AA6-R Pivot pin, spherical bearing (cotter pin or snap ring type) (see Table 11 and Figure 11);

— AA6-S Pivot pin, spherical bearing (split pins) (see Table 11 and Figure 11);

— AB6 Clevis bracket, spherical eye, straight (see Table 12 and Figure 12);

— AB7 Eye bracket, in angle (see Table 13 and Figure 13);

— AT4 Trunnion bracket (see Table 14 and Figure 14).

9 Product designation codes

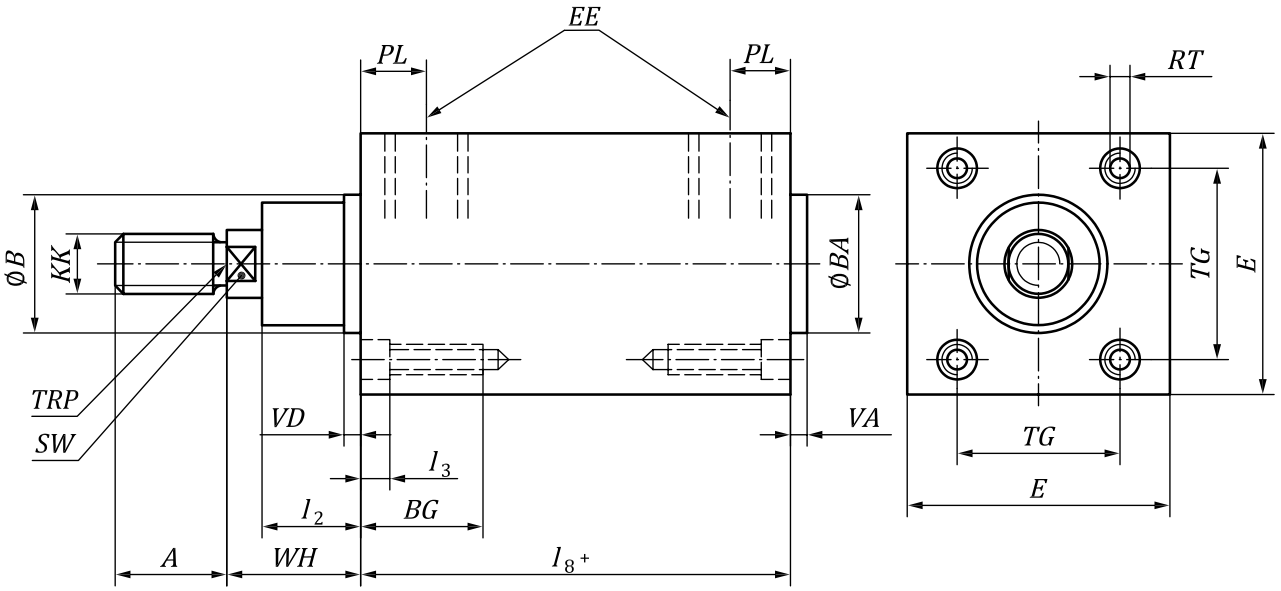
A pneumatic cylinder with detachable mountings, mounting type = MT 4, bore = 80 mm, stroke = 200 mm, shall be designated as follows:

ISO 15552 – MT 4 – 80×200

10 Identification statement (reference to this document)

Use the following statement in test reports, catalogues, and sales literature when electing to comply with this document:

Basic, mounting and accessories dimensions of pneumatic cylinder according to ISO 15552 "*Pneumatic fluid power — Cylinders with detachable mountings, 1 000 kPa (10 bar) series, bores from 32 mm to 320 mm — Basic, mounting and accessories dimensions*".



Key

TRP theoretical reference point

Figure 2 — Basic dimensions — Single rod cylinder

The connecting port and the cushion adjusting screw is placed on the same side as the port connection. The cushion adjusting screw has to be located within dimension *E*.

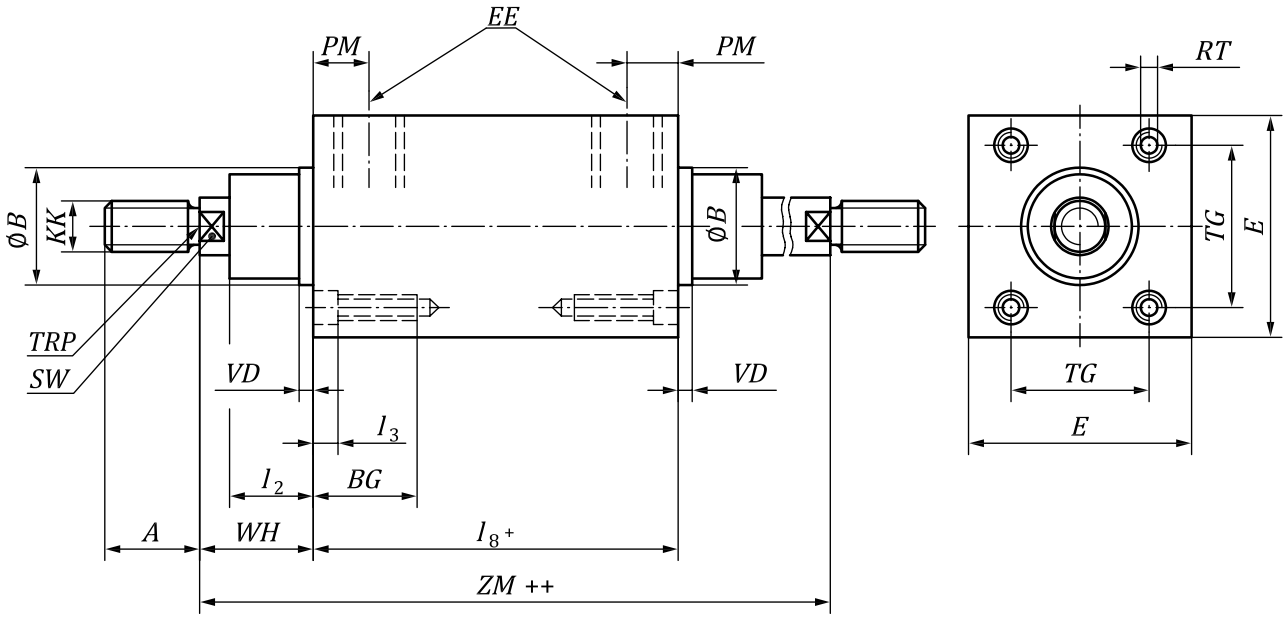
Table 2 — Basic dimensions — Single rod cylinder

Dimensions in millimetres

AL	*EE*[b]	*A*	*B* *BA*	*BG*	*E*	*KK*[a]	l_2		l_3	l_8		*PL*	*RT*	*SW*	*TG*		*VA*	*VD*	*WH*	
		$^{0}_{-2}$	d11	min	max		nom	tol	max	nom	tol	min			nom	tol	$^{0}_{-1}$	min	nom	tol
32	G1/8”	22	30	16	50	M10 × 1,25	20	$^{0}_{-5}$	5	94	±0,4	13	M6	10	32,5	±0,5	4	4	26	±1,4
40	G1/4”	24	35	16	58	M12 × 1,25	22		5	105	±0,7	14	M6	13	38	±0,5	4	4	30	±1,4
50	G1/4”	32	40	16	70	M16 × 1,5	29		5	106	±0,7	14	M8	17	46,5	±0,6	4	4	37	±1,4
63	G3/8”	32	45	16	85	M16 × 1,5	29		5	121	±0,8	16	M8	17	56,5	±0,7	4	4	37	±1,8
80	G3/8”	40	45	17	105	M20 × 1,5	35		0	128	±0,8	16	M10	22	72	±0,7	4	4	46	±1,8
100	G1/2”	40	55	17	130	M20 × 1,5	38		0	138	±1	18	M10	22	89	±0,7	4	4	51	±1,8
125	G1/2”	54	60	20	157	M27 × 2	50	$^{0}_{-10}$	0	160	±1	18	M12	27	110	±1,1	6	6	65	±2,2
160	G3/4”	72	65	24	195	M36 × 2	60		0	180	±1,1	25	M16	36	140	±1,1	6	6	80	±2,2
200	G3/4”	72	75	24	238	M36 × 2	70	$^{0}_{-15}$	0	180	±1,6	25	M16	36	175	±1,1	6	6	95	±2,2
250	G1”	84	90	25	290	M42 × 2	80		0	200	±1,6	31	M20	46	220	±1,5	10	10	105	±2,2
320	G1”	96	110	28	353	M48 × 2	90		0	220	±2,2	31	M24	55	270	±1,5	10	10	120	±2,2

[a] According to ISO 4395.

[b] According to ISO 16030.



Key

TRP theoretical reference point

Figure 3 — Basic dimensions — Double rod cylinder

The connecting port and the cushion adjusting screw is placed on the same side as the port connection. The cushion adjusting screw has to be located within dimension *E*.

Table 3 — Basic dimensions — Double rod cylinder

AL	*EE*[b]	*A*	*B*	*BG*	*E*	*KK*[a]	l_2		l_3	l_8		*PM*	*RT*	*SW*	*TG*		*VD*	*WH*		*ZM*	
		$^{0}_{-2}$	d11	min	max		nom	tol	max	nom	tol	min			nom	tol	min	nom	tol	nom	tol
32	G1/8”	22	30	16	50	M10 × 1,25	20	$^{0}_{-5}$	5	94	±0,4	13	M6	10	32,5	±0,5	4	26	±1,4	146	$^{+3}_{-1,5}$
40	G1/4”	24	35	16	58	M12 × 1,25	22		5	105	±0,7	14	M6	13	38	±0,5	4	30	±1,4	165	
50	G1/4”	32	40	16	70	M16 × 1,5	29		5	106	±0,7	14	M8	17	46,5	±0,6	4	37	±1,4	180	
63	G3/8”	32	45	16	85	M16 × 1,5	29		5	121	±0,8	16	M8	17	56,5	±0,7	4	37	±1,8	195	
80	G3/8”	40	45	17	105	M20 × 1,5	35		0	128	±0,8	16	M10	22	72	±0,7	4	46	±1,8	220	
100	G1/2”	40	55	17	130	M20 × 1,5	38		0	138	±1	18	M10	22	89	±0,7	4	51	±1,8	240	$^{+3,5}_{-2}$
125	G1/2”	54	60	20	157	M27 × 2	50	$^{0}_{-10}$	0	160	±1	18	M12	27	110	±1,1	6	65	±2,2	290	
160	G3/4”	72	65	24	195	M36 × 2	60		0	180	±1,1	25	M16	36	140	±1,1	6	80	±2,2	340	
200	G3/4”	72	75	24	238	M36 × 2	70	$^{0}_{-15}$	0	180	±1,6	25	M16	36	175	±1,1	6	95	±2,2	370	$^{+4}_{-2,5}$
250	G1”	84	90	25	290	M42 × 2	80		0	200	±1,6	31	M20	46	220	±1,5	10	105	±2,2	410	
320	G1”	96	110	28	353	M48 × 2	90		0	220	±2,2	31	M24	55	270	±1,5	10	120	±2,2	460	

[a] According to ISO 4395.

[b] According to ISO 16030.