INTERNATIONAL STANDARD

ISO 6430

Second edition
1992-05-15

Pneumatic fluid power — Single rod cylinders, 1 000 kPa (10 bar) series, with integral mountings, bores from 32 mm to 250 mm — Mounting dimensions

Transmissions pneumatiques — Vérins 1 000 kPa (10 bar) *à simple tige, à fixations intégrées, de diamètres d'alésage* 32 mm *à* 250 mm -- *Dimensions d'interchangeabilité*

Reference number
ISO 6430:1992(E)

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.

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.

International Standard ISO 6430 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Sub-Committee SC 3, *Cylinders*.

This second edition cancels and replaces the first edition (ISO 6430:1983), which has been technically revised.

Annex A of this International Standard is for information only.

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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 fluid power cylinder. This is a device that converts power into linear mechanical force and motion. It consists of a movable element, i.e. a piston and piston rod, operating within a cylindrical bore.

To enable them to be fastened to user mechanisms, pneumatic cylinders have devices called "mountings". This International Standard deals with pneumatic cylinders for which these mountings cannot be detached from the main body of the device. These integral mountings make it possible to reach compact mounting dimensions.

Pneumatic fluid power — Single rod cylinders, 1 000 kPa (10 bar) series, with integral mountings, bores from 32 mm to 250 mm — Mounting dimensions

1 Scope

This International Standard establishes a metric series of mounting dimensions required for interchangeability of commonly used pneumatic cylinders for a maximum working pressure of 1 000 kPa (10 bar)[1].

It applies to pneumatic cylinders with integral mountings.

NOTES

1 This International Standard allows manufacturers of pneumatic equipment freedom of design in metric cylinders and does not restrict technical development but provides basic guidelines.

2 ISO 6431 deals with cylinders for which mountings can be detached from the main body of the device without dismantling it.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 228-1:1982, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 4393:1978, *Fluid power systems and components — Cylinders — Basic series of piston strokes.*

ISO 4395:1978, *Fluid power systems and components — Cylinders — Piston rod thread dimensions and types.*

ISO 5598:1985, *Fluid power systems and components — Vocabulary.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 5598 apply.

4 Dimensions

Basic dimensions are shown in figure 1 and are given in table 2.

Mounting dimensions for cylinders manufactured in accordance with this International Standard shall be selected from tables 2 to 14.

NOTE 3 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 Nominal strokes shall be selected from the recommended values shown in ISO 4393.

1) 1 bar = 100 kPa = 10^5 Pa; 1 Pa = 1 N/m^2.

5.2 Nominal stroke tolerances are given in table 1.

Table 1 — Nominal stroke tolerances

Dimensions in millimetres

Cylinder bore	Nominal stroke, S	Nominal stroke tolerance[1)]
32 40 50	$S \leqslant 500$	$^{+2}_{0}$
	$500 < S \leqslant 1\,250$	$^{+3,2}_{0}$
63 80 100	$S \leqslant 500$	$^{+2,5}_{0}$
	$500 < S \leqslant 1\,250$	$^{+4}_{0}$
125 160 200 250	$S \leqslant 500$	$^{+4}_{0}$
	$500 < S \leqslant 1\,250$	$^{+5}_{0}$

1) See note 3 in clause 4.

6 Bore sizes

The following bore sizes, in millimetres, are included in this series:

32 — 40 — 50 — 63 — 80 — 100 — 125 — 160 — 200 — 250

7 Mounting styles

This International Standard includes the following mounting styles, as described in ISO 6099:

MF1 — Head, rectangular flange (see figure 3 and table 4)

MF2 — Cap, rectangular flange (see figure 4 and table 5)

MP1 — Cap, fixed clevis (see figure 5 and table 6)

MP3 — Cap, fixed eye (see figure 6 and table 7)

MS2 — Side lugs (see figure 7 and table 8)

MT1 — Head, integral trunnion (male) (see figure 8 and table 9)

MT2 — Cap, integral trunnion (male) (see figure 9 and table 10)

MT4 — Intermediate fixed or movable trunnion (male) (see figure 10 and table 11)

MX1 — Both ends, studs or tie rods extended (see figure 11 and table 12)

MX2 — Cap, studs or tie rods extended (see figure 12 and table 13)

MX3 — Head, studs or tie rods extended (see figure 13 and table 14)

8 Piston rod characteristics

8.1 This International Standard covers piston rods which have a shouldered male thread end (see figure 2 and table 3 for basic dimensions).

8.2 The dimensions of the piston rod threads are chosen in accordance with ISO 4395.

9 Identification statement (Reference to this International Standard)

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

"Interchangeable cylinder mounting dimensions are selected in accordance with ISO 6430:1992, *Pneumatic fluid power — Single rod cylinders, 1 000 kPa (10 bar) series, with integral mountings, bores from 32 mm to 250 mm — Mounting dimensions.*"

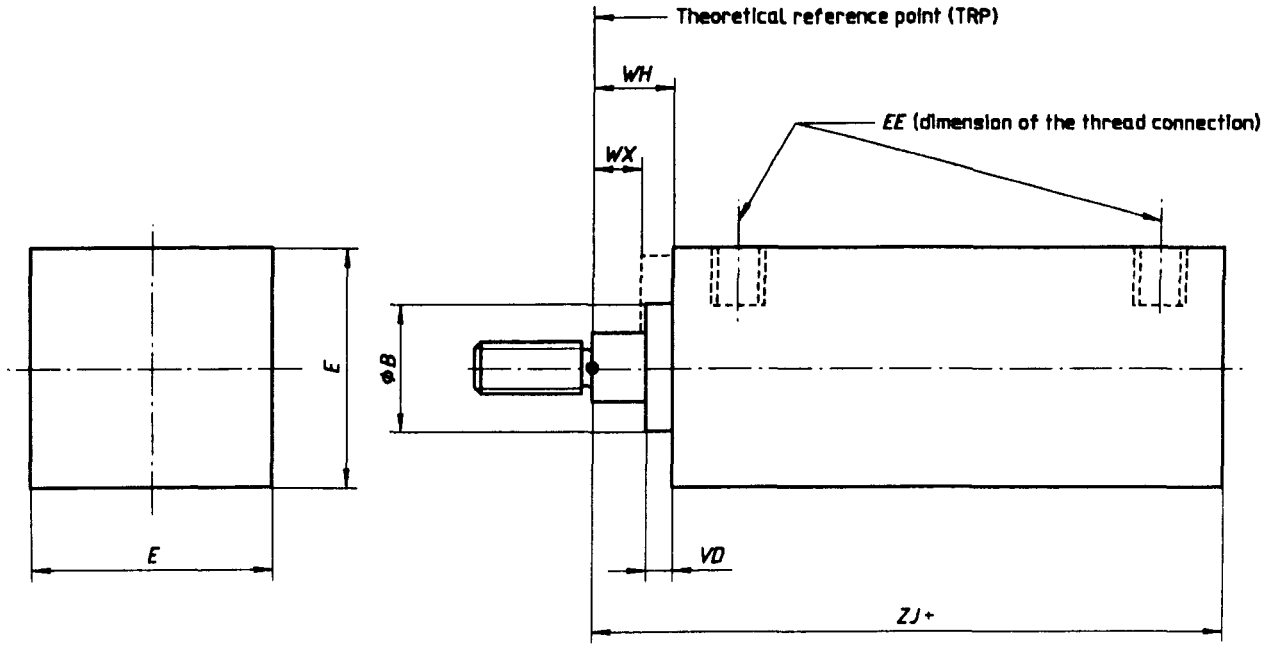

Figure 1 — Basic dimensions

Table 2 — Basic dimensions

Dimensions in millimetres

Bore	*E*	*B*	*WX* [1]	*VD*	*WH*		*ZJ* [2]		*EE* [3]	
	max.	f9	min.	min.	nom.	tol.	nom.	tol.	metric	inch
32	45	24	9	5	15	± 1,6	118	± 1,6	M10 × 1	G1/8
40	51	30	8	5	15	± 1,6	118	± 1,6	M14 × 1,5	G1/4
50	64	34	8	5	15	± 1,6	118	± 1,6	M14 × 1,5	G1/4
63	77	34	6	5	15	± 2	121	± 2	M18 × 1,5	G3/8
80	96	39	9	5	19	± 2	143	± 2	M18 × 1,5	G3/8
100	115	39	9	5	19	± 2	143	± 2	M22 × 1,5	G1/2
125	140	46	7	5	19	± 2,5	149	± 2,5	M22 × 1,5	G1/2
160	179	55	6	5	21	± 2,5	172	± 2,5	M27 × 2	G3/4
200	217	55	6	5	21	± 2,5	172	± 2,5	M27 × 2	G3/4
250	271	60	5	4	23	± 3	210	± 3	M33 × 2	G1

NOTE — The dimensions indicated relate to every type of mounting shown in all other figures.

1) *WX* includes consideration of tie rod nut height where it applies. Extension of the tie rods past nuts is not included.

2) See note 3 in clause 4.

3) The inch series of port threads *EE* is chosen in accordance with ISO 228-1. A definitive choice of port threads *EE* will be made later.

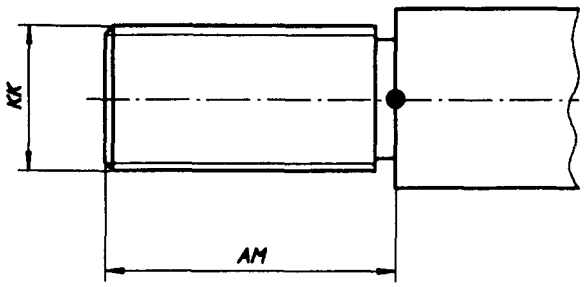

Figure 2 — Piston rod end threads

Table 3 — Dimensions of piston rod end threads

Dimensions in millimetres

Bore	*KK*	*AM*	
		nom.	tol.
32	M10 × 1,25	22	
40	M12 × 1,25	24	
50	M16 × 1,5	32	
63	M16 × 1,5	32	
80	M20 × 1,5	40	$^{0}_{-2}$
100	M20 × 1,5	40	
125	M27 × 2	54	
160	M36 × 2	72	
200	M36 × 2	72	
250	M42 × 2	84	

NOTE — Dimensions *KK* and *AM* given for piston rod end threads correspond to the "long" type as in ISO 4395.

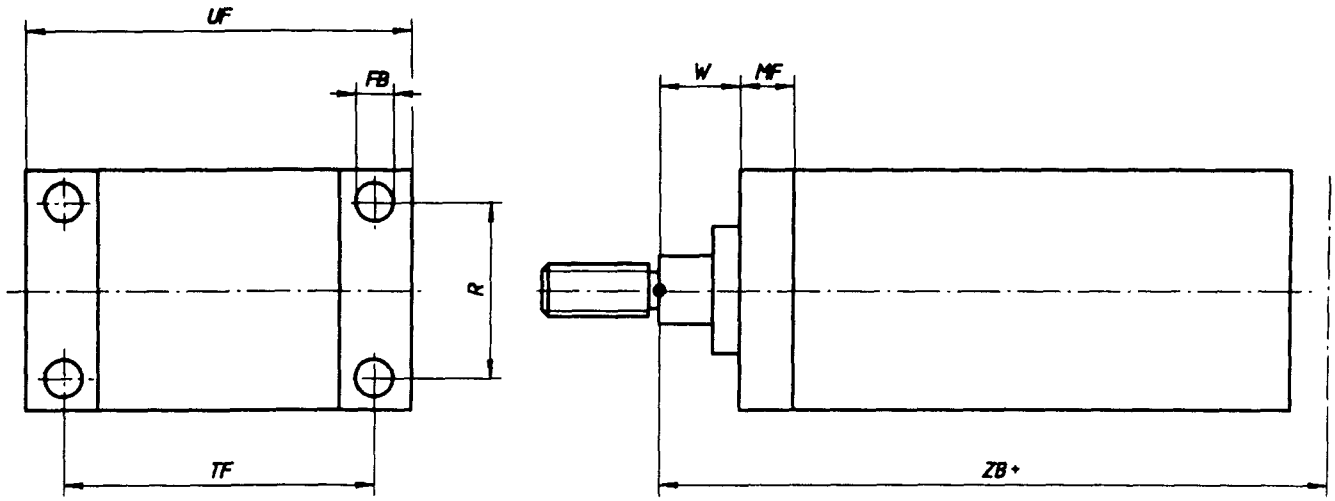

Figure 3 — MF1 — Head mounting, rectangular flange

Table 4 — Dimensions of head mountings, rectangular flange

Dimensions in millimetres

Bore	*UF*	*FB*	*TF*	*R*	*W*		*MF*		*ZB* [1]
	max.	H13	JS14	JS14	nom.	tol.	nom.	tol.	max.
32	72	7	58	33	15	± 1,6	10	± 0,3	125
40	84	7	70	36	15	± 1,6	10	± 0,3	125
50	104	9	86	47	15	± 1,6	10	± 0,3	125
63	116	9	98	56	15	± 2	10	± 0,3	130
80	143	12	119	70	19	± 2	16	± 0,3	153
100	162	12	138	84	19	± 2	16	± 0,3	153
125	196	14	168	104	19	± 2,5	16	± 0,3	162
160	248	18	212	134	21	± 2,5	20	± 0,5	188
200	286	18	250	163	21	± 2,5	20	± 0,5	188
250	356	22	312	201	23	± 3	25	± 0,5	229

1) *ZB* includes consideration of tie rods nut height where it applies. Extension of the tie rods past nuts is not included.

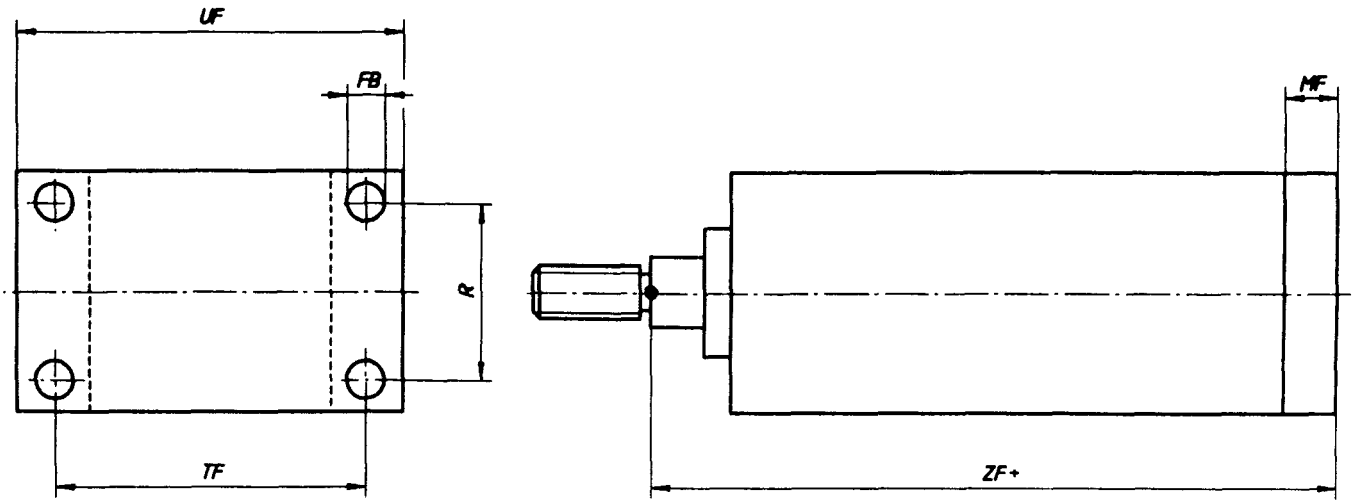

Figure 4 — MF2 — Cap mounting, rectangular flange

Table 5 — Dimensions of cap mountings, rectangular flange

Dimensions in millimetres

Bore	*UF*	*FB*	*TF*	*R*	*ZF* [1]		*MF*	
	max.	H13	JS14	JS14	nom.	tol.	nom.	tol.
32	72	7	58	33	128	± 1,2	10	± 0,3
40	84	7	70	36	128	± 1,2	10	± 0,3
50	104	9	86	47	128	± 1,2	10	± 0,3
63	116	9	98	56	131	± 1,6	10	± 0,3
80	143	12	119	70	159	± 1,6	16	± 0,3
100	162	12	138	84	159	± 1,6	16	± 0,3
125	194	14	168	104	165	± 2	16	± 0,3
160	248	18	212	134	192	± 2	20	± 0,5
200	286	18	250	163	192	± 2	20	± 0,5
250	356	22	312	201	235	± 2,5	25	± 0,5

1) See note 3 in clause 4.

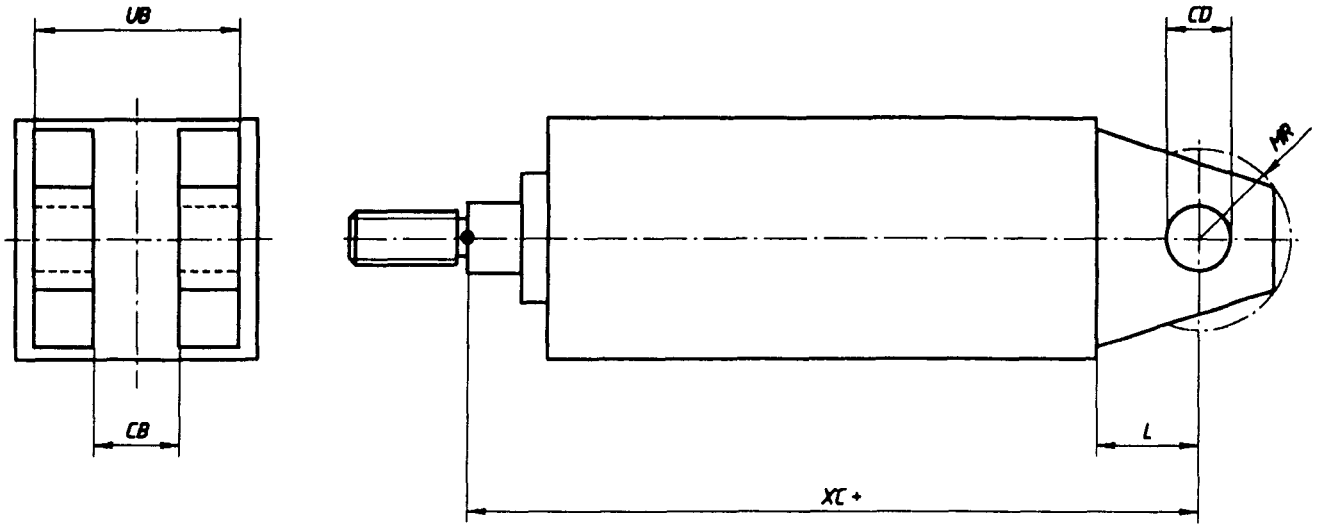

Figure 5 — MP1 — Cap mounting, fixed clevis

Table 6 — Dimensions of cap mountings, fixed clevis

Dimensions in millimetres

Bore	*UB* max.	*CB* A16	*XC* [1] nom.	*XC* [1] tol.	*CD* H9	*MR* max.	*L* min.
32	38	16	137	± 1,2	12	17	19
40	46	20	137	± 1,2	14	17	19
50	52	20	137	± 1,2	14	17	19
63	52	20	140	± 1,6	14	17	19
80	65	32	175	± 1,6	20	29	32
100	65	32	175	± 1,6	20	29	32
125	65	32	181	± 2	20	29	32
160	83	40	210	± 2	28	34	38
200	83	40	210	± 2	28	34	38
250	115	50	264	± 2,5	36	50	54

1) See note 3 in clause 4.

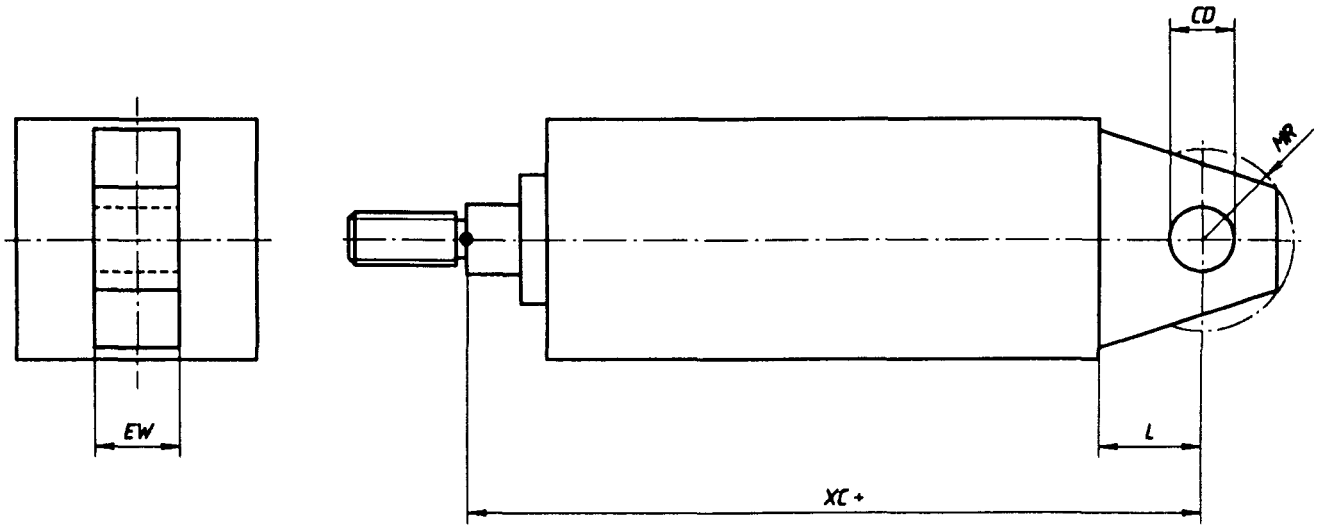

Figure 6 — MP3 — Cap mounting, fixed eye

Table 7 — Dimensions of cap mountings, fixed eye

Dimensions in millimetres

Bore	*EW*	*XC* [1]		*CD*	*MR*	*L*
	h10	nom.	tol.	H9	max.	min.
32	16	137	± 1,2	12	17	19
40	20	137	± 1,2	14	17	19
50	20	137	± 1,2	14	17	19
63	20	140	± 1,6	14	17	19
80	32	175	± 1,6	20	29	32
100	32	175	± 1,6	20	29	32
125	32	181	± 2	20	29	32
150	40	210	± 2	28	34	38
200	40	210	± 2	28	34	38
250	50	264	± 2,5	36	50	54

1) See note 3 in clause 4.

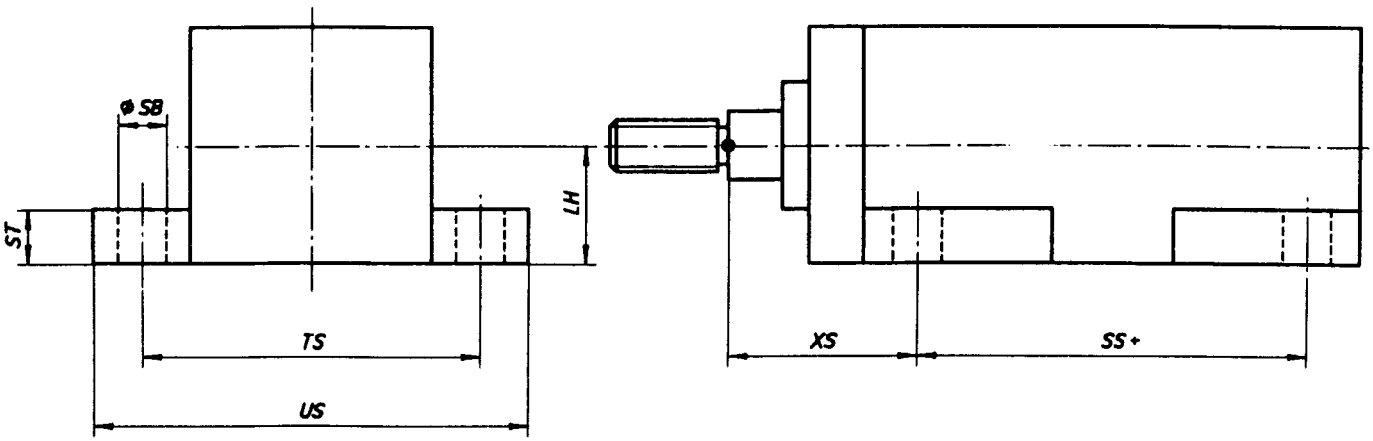

Figure 7 — MS2 — Mounting with side lugs

Table 8 — Dimensions of mountings with side lugs

Dimensions in millimetres

Bore	*SB*	*TS*	*LH*	*XS*		*SS* [1]		*US*	*ST*
	H13	JS14	a10	nom.	tol.	nom.	tol.	max.	min.
32	9	63	22	35	± 1,2	73	± 1,2	81	10
40	12	70	25	35	± 1,2	73	± 1,2	94	10
50	12	83	31	35	± 1,2	73	± 1,2	107	10
63	12	95	38	35	± 1,6	76	± 1,6	119	10
80	14	121	47	48	± 1,6	82	± 1,6	149	16
100	14	140	57	48	± 1,6	82	± 1,6	168	16
125	18	175	69	52	± 2	80	± 2	211	16
160	22	213	89	59	± 2	95	± 2	257	20
200	22	251	108	59	± 2	95	± 2	295	20
250	26	314	135	70	± 2,5	118	± 2,5	366	25

1) See note 3 in clause 4.

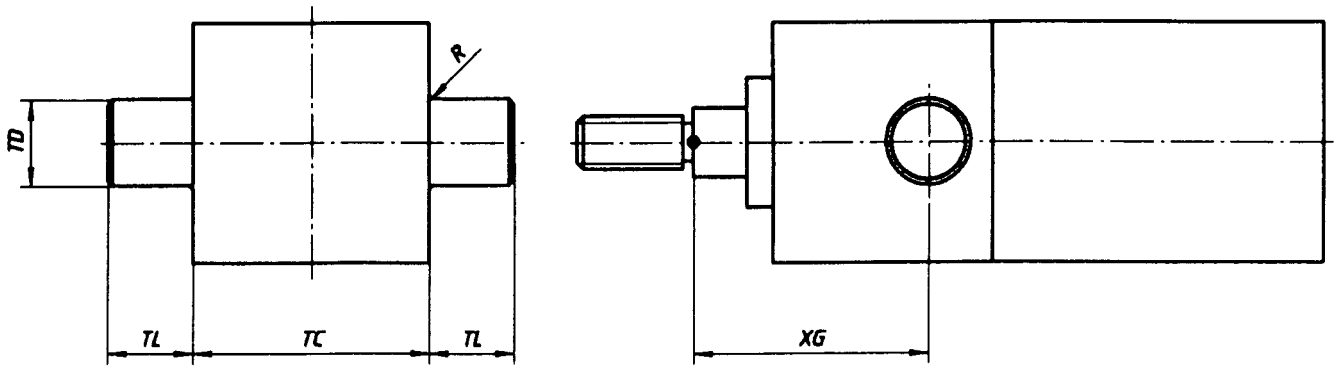

Figure 8 — MT1 — Head mounting, integral trunnion (male)

Table 9 — Dimensions of head mountings, integral trunnion (male)

Dimensions in millimetres

Bore	*TD*	*R*	*TL*	*TC*	*XG*	
	e9	max.	h14	h14	nom.	tol.
32	16	1	16	44	44	± 1,6
40	25	1,6	25	50	44	± 1,6
50	25	1,6	25	63	44	± 1,6
63	25	1,6	25	76	44	± 2
80	25	1,6	25	95	57	± 2
100	25	2	25	114	57	± 2
125	25	2	25	139	57	± 2,5
160	36	2,5	36	178	66	± 2,5
200	36	2,5	36	216	66	± 2,5
250	45	3,2	45	270	76	± 2,5

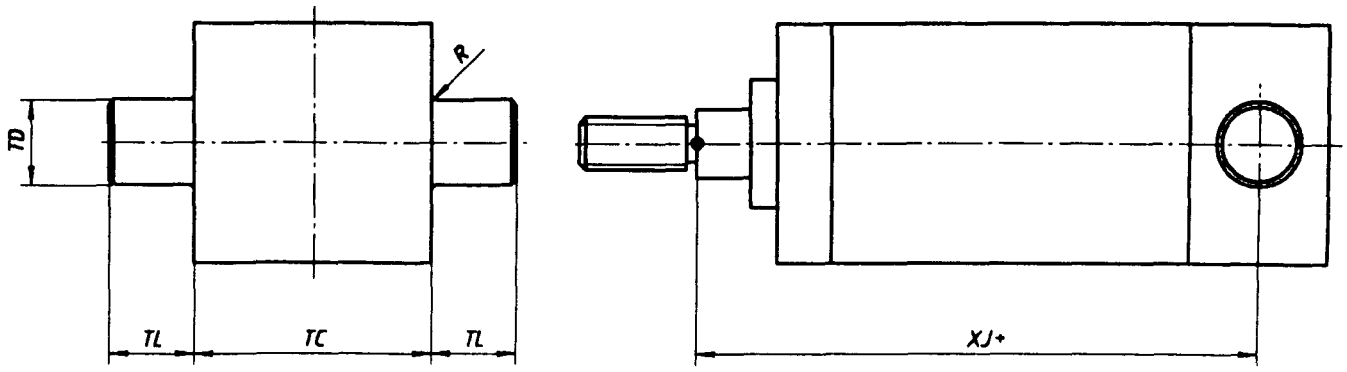

Figure 9 — MT2 — Cap mounting, integral trunnion (male)

Table 10 — Dimensions of cap mountings, integral trunnion (male)

Dimensions in millimetres

Bore	*TD*	*R*	*TL*	*TC*	*XJ* [1]	
	e9	max.	h14	h14	nom.	tol.
32	16	1	16	44	105	± 1,2
40	25	1,6	25	50	105	± 1,2
50	25	1,6	25	63	105	± 1,2
63	25	1,6	25	76	108	± 1,6
80	25	1,6	25	95	127	± 1,6
100	25	2	25	114	127	± 1,6
125	25	2	25	139	133	± 2
160	36	2,5	36	178	153	± 2
200	36	2,5	36	216	153	± 2
250	45	3,2	45	270	185	± 2,5

1) See note 3 in clause 4.

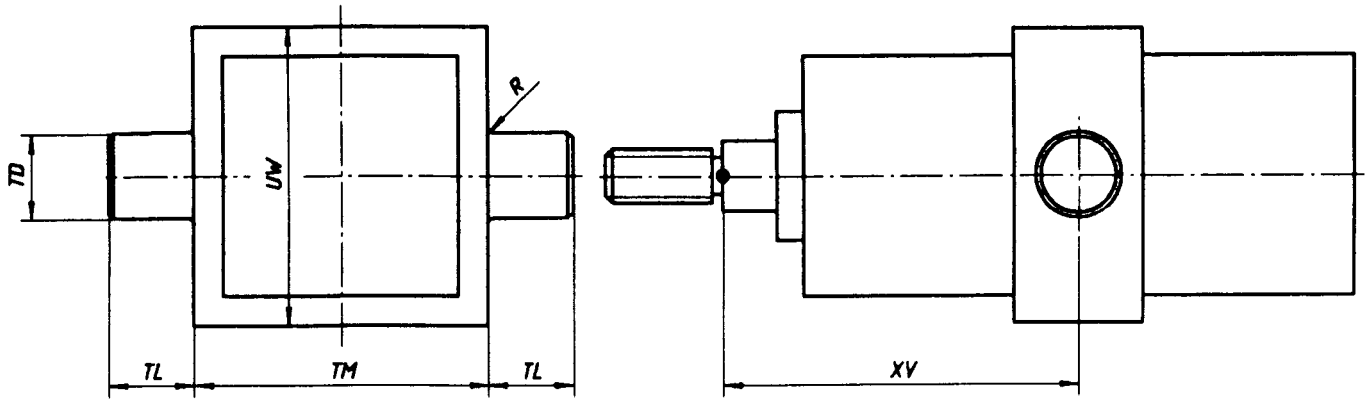

Figure 10 — MT4 — Mounting with intermediate fixed or movable trunnion (male)

Table 11 — Dimensions of mountings with intermediate fixed or movable trunnions (male)

Dimensions in millimetres

Bore	*UW* max.	*TD* e9	*R* max.	*TL* h14	*TM* h14	*XV* [1] nom.	*XV* [1] tol.
32	55	16	1	16	55		± 2
40	63	25	1,6	25	63		± 2
50	76	25	1,6	25	76		± 2
63	88	25	1,6	25	88		± 2
80	114	25	1,6	25	114		± 2
100	132	25	2	25	132	variable	± 2
125	158	25	2	25	158		± 2,5
160	200	36	2,5	36	200		± 2,5
200	246	36	2,5	36	246		± 2,5
250	304	45	3,2	45	304		± 2,5

1) See note 3 in clause 4.

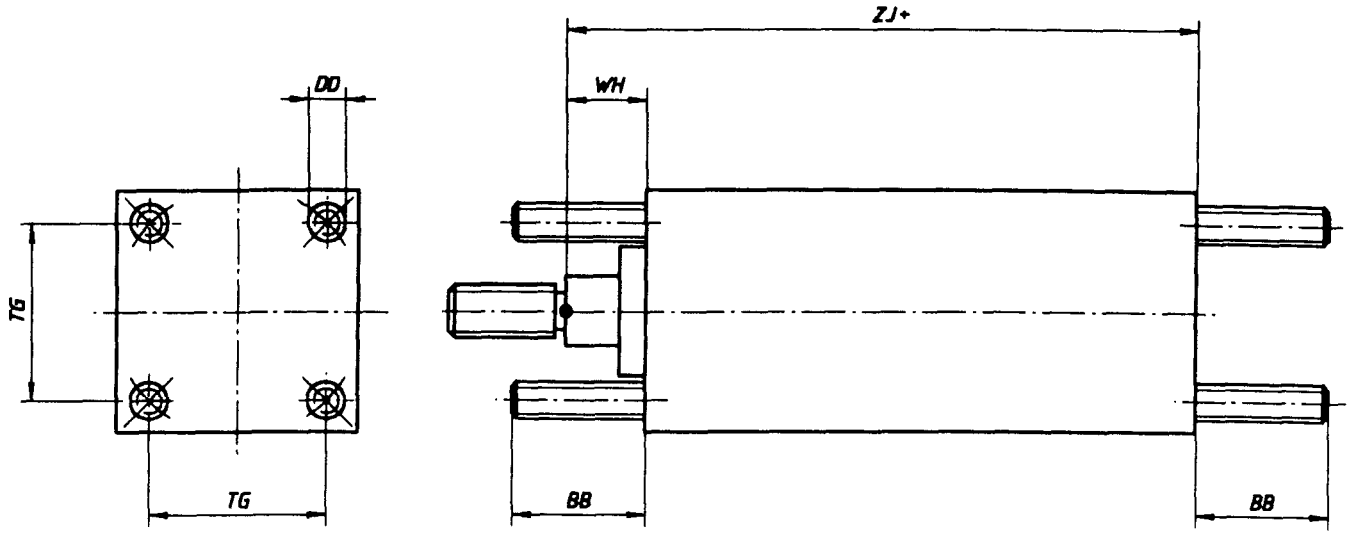

Figure 11 — MX1 — Mounting with studs or tie rods extended at both ends

Table 12 — Dimensions of mountings with studs or tie rods extended at both ends

Dimensions in millimetres

Bore	*DD*	*TG*	*WH*		*BB*		*ZJ* [1]	
		JS14	nom.	tol.	nom.	tol.	nom.	tol.
32	M6	33	15	± 1,6	25	$^{+3}_{0}$	118	± 1,6
40	M6	37	15	± 1,6	25		118	± 1,6
50	M6	47	15	± 1,6	25		118	± 1,6
63	M8	56	15	± 2	28	$^{+3}_{0}$	121	± 2
80	M10	70	19	± 2	35		143	± 2
100	M10	84	19	± 2	35		143	± 2
125	M12	104	19	± 2,5	46	$^{+5}_{0}$	149	± 2,5
160	M16	134	21	± 2,5	59		172	± 2,5
200	M16	163	21	± 2,5	59		172	± 2,5
250	M20	202	23	± 3	68	$^{+5}_{0}$	210	± 3

1) See note 3 in clause 4.

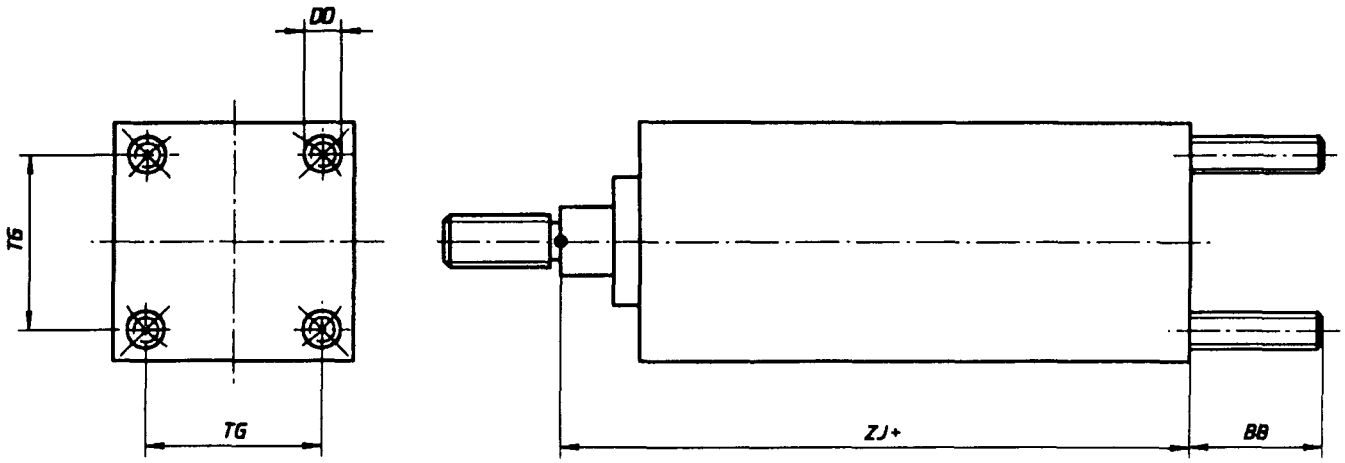

Figure 12 — MX2 — Cap mounting with studs or tie rods extended

Table 13 — Dimensions of cap mountings with studs or tie rods extended

Dimensions in millimetres

Bore	*DD*	*TG*	*ZJ* [1]		*BB*	
		JS14	nom.	tol.	nom.	tol.
32	M6	33	118	± 1,6	25	$^{+3}_{0}$
40	M6	37	118	± 1,6	25	
50	M6	47	118	± 1,6	25	
63	M8	56	121	± 2	28	$^{+3}_{0}$
80	M10	70	143	± 2	35	
100	M10	84	143	± 2	35	
125	M12	104	149	± 2,5	46	$^{+5}_{0}$
160	M16	134	172	± 2,5	59	
200	M16	163	172	± 2,5	59	
250	M20	202	210	± 3	68	$^{+5}_{0}$

1) See note 3 in clause 4.

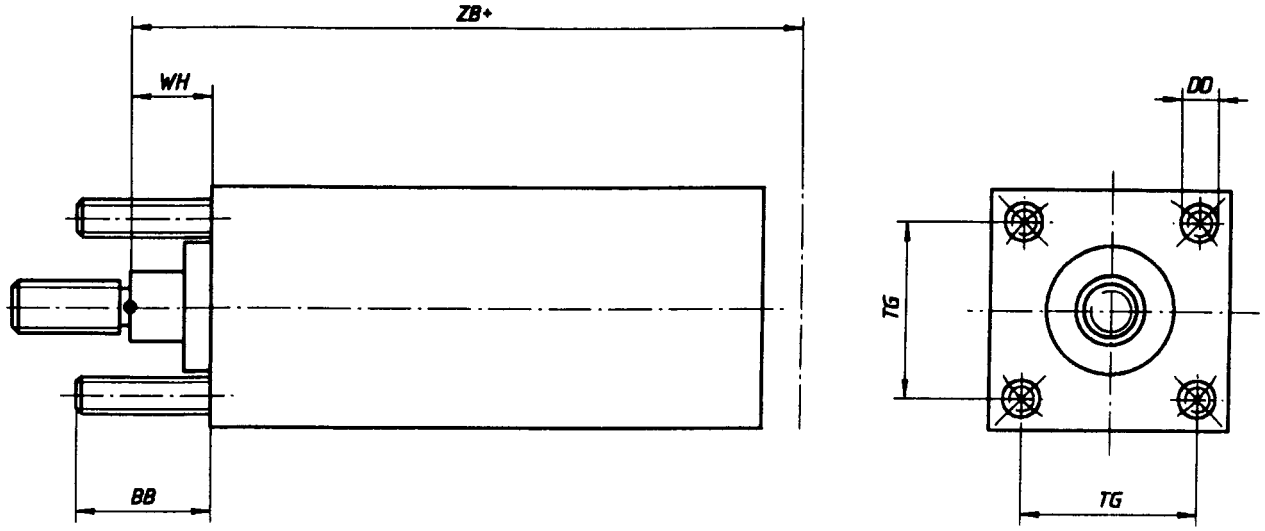

Figure 13 — MX3 — Head mounting with studs or tie rods extended

Table 14 — Dimensions of head mountings with studs or tie rods extended

Dimensions in millimetres

Bore	*DD*	*TG*	*WH*		*BB*		*ZB* [1]
		JS14	nom.	tol.	nom.	tol.	max.
32	M6	33	15	± 1,6	25	$^{+3}_{0}$	125
40	M6	37	15	± 1,6	25		125
50	M6	47	15	± 1,6	25		125
63	M8	56	15	± 2	28	$^{+3}_{0}$	130
80	M10	70	19	± 2	35		153
100	M10	84	19	± 2	35		153
125	M12	104	19	± 2,5	46	$^{+5}_{0}$	162
160	M16	134	21	± 2,5	59		188
200	M16	163	21	± 2,5	59		188
250	M20	202	23	± 3	68	$^{+5}_{0}$	229

1) *ZB* includes consideration of the tie rod nut height where it applies. Extension of the tie rods past the nut is not included.

Annex A
(informative)

Bibliography

[1] ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts.*

[2] ISO 3320:1987, *Fluid power systems and components — Cylinder bores and piston rod diameters — Metric series.*

[3] ISO 3322:1985, *Fluid power systems and components — Cylinders — Nominal pressures.*

[4] ISO 6099:1985, *Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types.*

[5] ISO 6431:1992, *Pneumatic fluid power — Single rod cylinders, 1 000 kPa (10 bar) series, with detachable mountings, bores from 32 mm to 320 mm — Mounting dimensions.*

UDC 621.5-222:621.8.033

Descriptors: pneumatic fluid power, pneumatic equipment, pneumatic cylinders, single rod cylinders, bores, dimensions, mounting dimensions, interchangeability.

Price based on 16 pages