INTERNATIONAL STANDARD

ISO 10762

First edition
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Hydraulic fluid power — Cylinder mounting dimensions — 10 MPa (100 bar) series

Transmissions hydrauliques — Dimensions d'interchangeabilité des vérins — Série 10 MPa (100 bar)

Reference number
ISO 10762:1997(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 10762 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

Annex A of this International Standard is for information only.

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Introduction

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

One component of such systems is the fluid power 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 piston rod, operating within a cylindrical bore.

Hydraulic fluid power — Cylinder mounting dimensions — 10 MPa (100 bar) series

1 Scope

This International Standard establishes mounting dimensions for cylinders for use at 10 MPa [100 bar[1)]], as required for interchangeability of these cylinders.

NOTE — This International Standard allows manufacturers of hydraulic equipment flexibility in the design of 10 MPa (100 bar) cylinders and does not restrict technical development; however, it does provide basic guidelines.

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 273:1979, *Fasteners — Clearance holes for bolts and screws.*

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

ISO 1179-1:— [2)], *Connections for general use and fluid power — Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing — Part 1: Threaded ports.*

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

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

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

ISO 6149-1:1993, *Connections for fluid power and general use — Ports and stud ends with ISO 261 threads and O-ring sealing — Part 1: Ports with O-ring seal in truncated housing.*

ISO 8133:1991, *Hydraulic fluid power — Single rod cylinders, 16 MPa (160 bar) compact series — Accessory mounting dimensions.*

1) 1 bar = 0,1 MPa = 10^5 Pa; 1 MPa = 1 N/mm^2

2) To be published. (Revision, in part, of ISO 1179:1981)

3 Definitions

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

3.1 cylinder: Device which converts fluid power into linear mechanical force and motion.

3.2 cylinder bore: Internal diameter of the cylinder body.

3.3 piston rod: Element which transmits mechanical force and motion from the piston.

3.4 mounting: Device by which a cylinder is fastened to its mating element.

4 Dimensions

Mounting dimensions for cylinders manufactured in accordance with this International Standard shall be as given in figures 1 to 13 and tables 1 to 13. Most tolerances are in accordance with ISO 286-2.

5 Bore sizes

The following bore sizes in accordance with ISO 3320, in millimetres, are included in this series:

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

6 Mounting types

This International Standard includes the following mounting types which conform to ISO 6099:

ME5 — Rectangular flange, integral with head (see figure 3 and table 3)
ME6 — Cap, rectangular flange (see figure 4 and table 4)
MP1 — Cap, fixed clevis (see figure 5 and table 5)
MP3 — Cap, fixed eye (see figure 6 and table 6)
MP5 — Cap, fixed eye with spherical plain bearing (see figure 7 and table 7)
MS2 — Side lugs (see figure 8 and table 8)
MT1 — Head, integral trunnion (male) (see figure 9 and table 9)
MT4 — Intermediate, fixed or movable trunnion (male) (see figure 10 and table 10)
MX1 — Both ends, studs or tie rods extended (see figure 11 and table 11)
MX2 — Cap, studs or tie rods extended (see figure 12 and table 12)
MX3 — Head, studs or tie rods extended (see figure 13 and table 13)

7 Piston rod characteristics

7.1 This International Standard covers piston rods which have a shouldered male thread end (see figure 1 and table 1 for basic dimensions).

7.2 For internally threaded rod ends, see ISO 4395.

7.3 If other piston rod diameters or other piston rod threads are required, those specified in ISO 3320 and ISO 4395 shall be used.

8 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 mounting dimensions for 10 MPa (100 bar) cylinders are selected in accordance with ISO 10762:1997, *Hydraulic fluid power — Cylinder mounting dimensions — 10 MPa (100 bar) series.*"

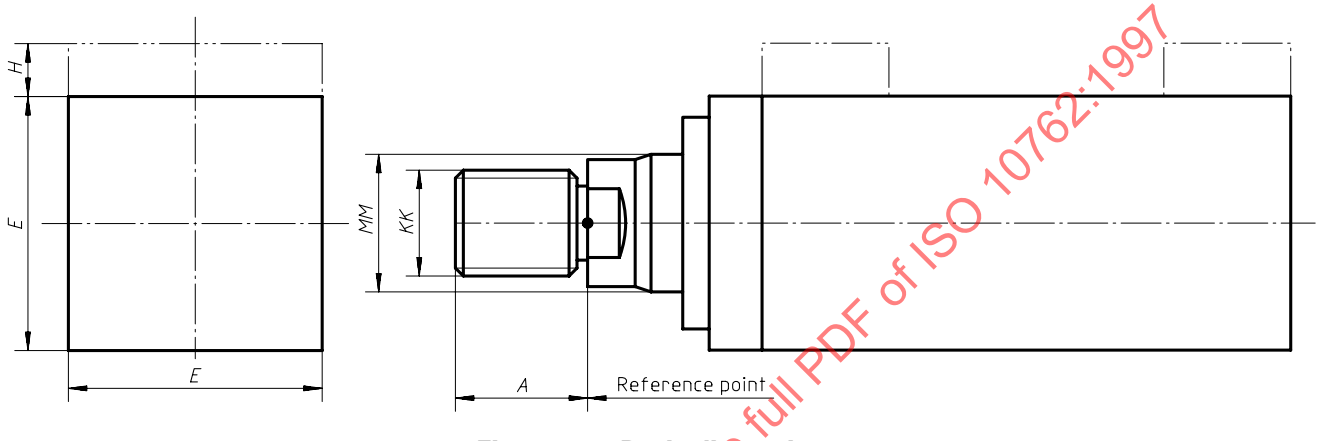

Figure 1 — Basic dimensions

Table 1 — Basic dimensions

Dimensions in millimetres

Bore	*MM*[1)]	*KK*	*A* max.	*E* max.	*H*[2)] max.
40	18 or 28	M14 × 1,5	18	52	5
	28	M20 × 1,5	28		
50	22 or 36	M16 × 1,5	22	65	5
	36	M27 × 2	36		
63	28 or 45	M20 × 1,5	28	77	3
	45	M33 × 2	45		
80	36 or 56	M27 × 2	36	96	4
	56	M42 × 2	56		
100	45 or 70	M33 × 2	45	115	5
	70	M48 × 2	63		
125	56 or 90	M42 × 2	56	140	—
	90	M64 × 3	85		
160	70 or 110	M48 × 2	63	180	—
	110	M80 × 3	95		
200	90 or 140	M64 × 3	85	225	—
	140	M100 × 3	112		

NOTE — For accessories, see ISO 8133. Port dimensions and positions are given in figure 2 and table 2.

1) See 7.3.

2) Extra height is provided for the reinforced rod head on all four bore sizes 50 mm, 63 mm, 80 mm and 100 mm, and is also provided for the head and cap on both rod sizes for the 40 mm bore.

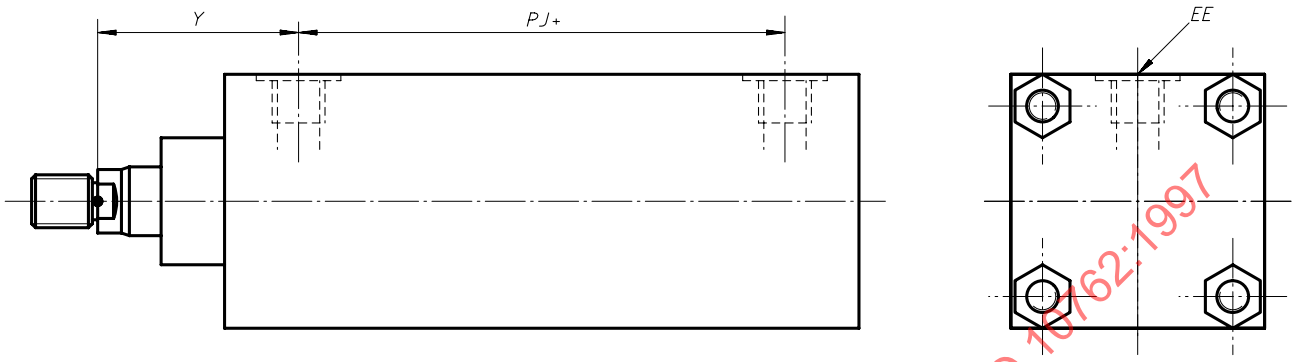

Figure 2 — Port dimensions and positions

Table 2 — Port dimensions and positions

Dimensions in millimetres

Bore	*EE*		*Y*[3]	*PJ*[3]
	inch[1]	metric[2]	± 2	± 1,25
40	G 3/8	M18 × 1,5	58	58
50	G 3/8	M18 × 1,5	65	58
63	G 1/2	M22 × 1,5	69	66
80	G 1/2	M22 × 1,5	77	74
100	G 3/4	M27 × 2	79	86
125	G 3/4	M27 × 2	80	93
160	G 1	M33 × 2	85	100
200	G1	M33 × 2	85	120

1) Ports in accordance with ISO 1179-1.
2) Threaded ports in accordance with ISO 6149-1 are preferred for new designs.
3) Stroke length ⩽ 1 250 mm.

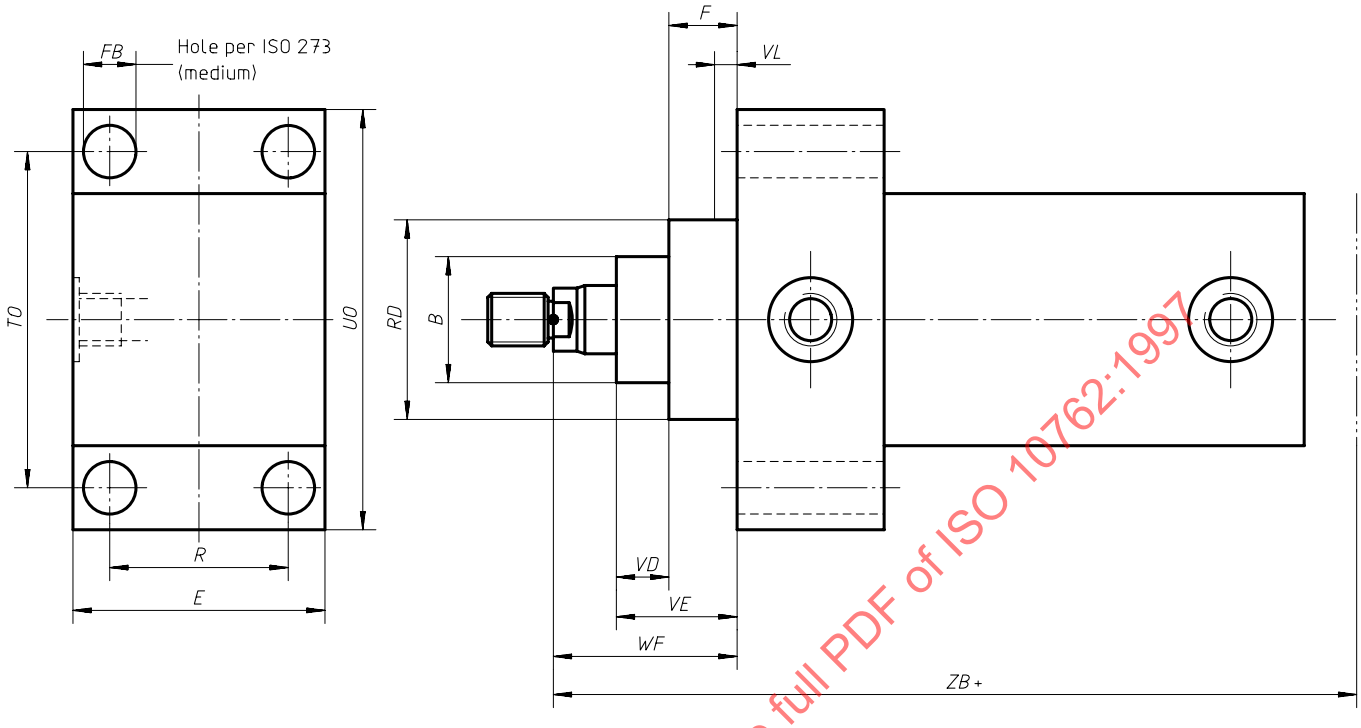

Figure 3 — ME5 — Rectangular flange, integral with head

Table 3 — Dimensions of rectangular flange, integral with head

Dimensions in millimetres

Bore	*MM*	*RD* f8	*TO* js13	*FB* H13	*R* js13	*WF* ± 2	*F* max.	*E* max.	*UO* max.	*ZB* max.	*VE* max.	*B* max.	*VL* min.
40	18	51	70	6,6	40	35	10	52	86	141	22	30	3
	28											42	
50	22	62	86	9	50	41	10	65	105	149	25	34	4
	36											50	
63	28	72	98	9	56	48	10	77	118	163	29	42	4
	45											60	
80	36	92	119	11	70	51	16	96	143	180	29	50	4
	56											72	
100	45	110	138	13,5	90	57	16	115	162	204	32	60	5
	70											88	
125	56	130	168	17,5	110	57	16	140	194	209	32	72	5
	90											108	
160	70	125	212	22	140	57	25	180	248	228	32	88	5
	110	170										133	
200	90	150	268	26	170	57	25	225	308	253	32	108	5
	140	210										163	

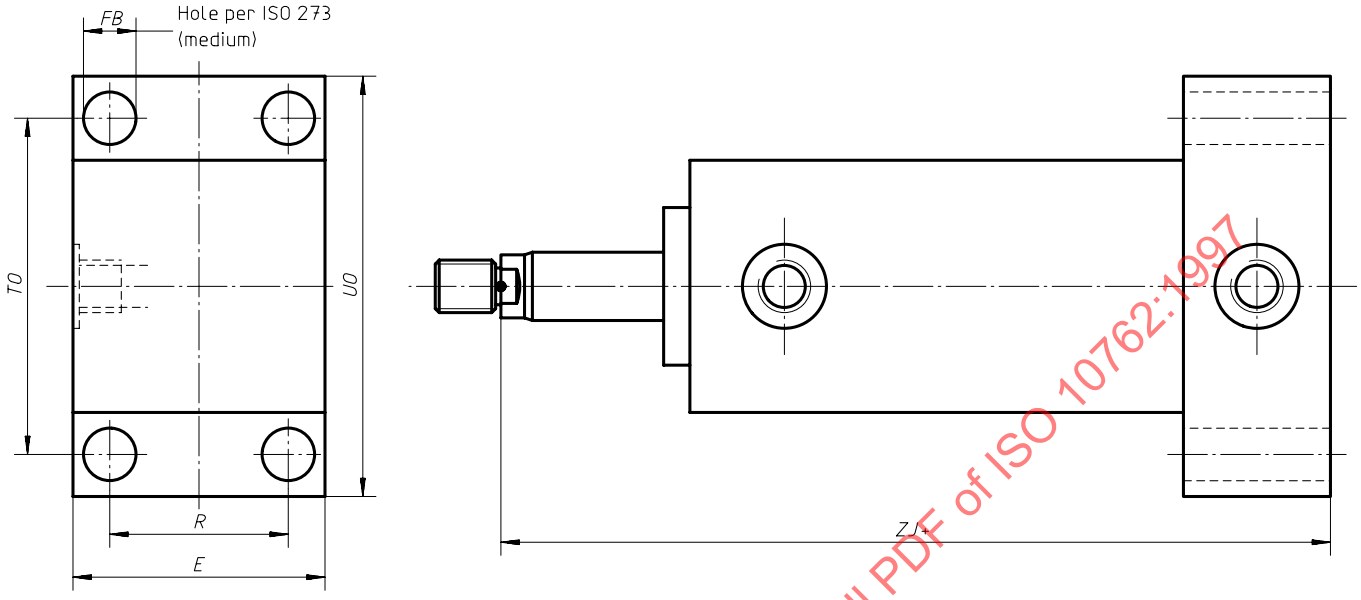

Figure 4 — ME6 — Cap, rectangular flange

Table 4 — Dimensions of cap, rectangular flange

Dimensions in millimetres

Bore	*E* max.	*TO* js13	*FB* H13	*R* js13	*ZJ* ± 1	*UO* max.
40	52	70	6,6	40	132	86
50	65	86	9	50	139	105
63	77	98	9	56	153	118
80	96	119	11	70	168	143
100	115	138	13,5	90	187	162
125	140	168	17,5	110	196	194
160	180	212	22	140	213	248
200	225	268	26	170	233	308

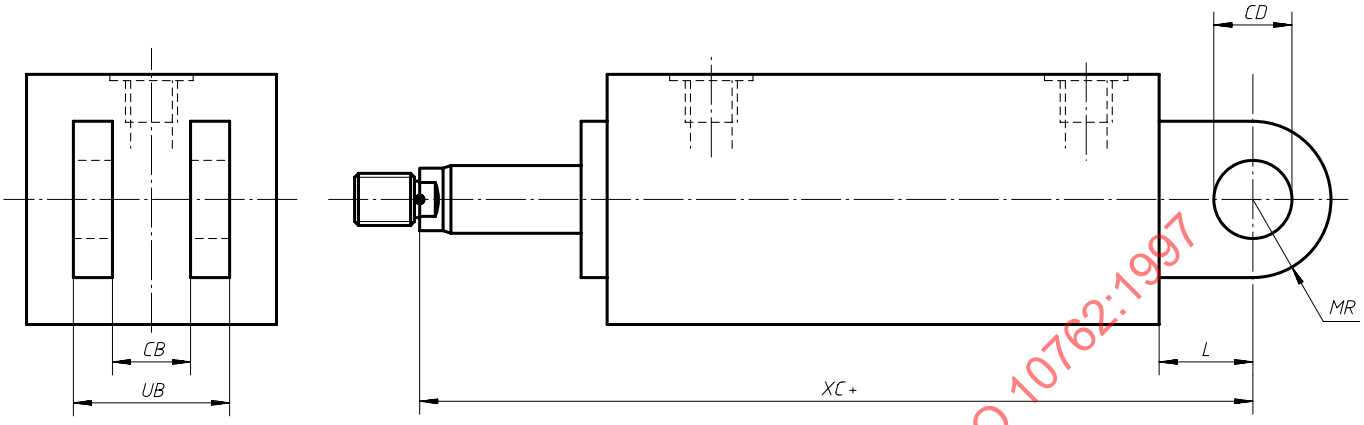

Figure 5 — MP1 — Cap, fixed clevis

Table 5 — Dimensions of cap, fixed clevis

Dimensions in millimetres

Bore	*UB* max.	*CB* A16	*CD* H9	*MR* max.	*L* min.	*XC* ± 1,25
40	43	20	14	17	19	151
50	43	20	14	17	19	158
63	65	30	20	29	32	185
80	65	30	20	29	32	200
100	83	40	28	34	39	226
125	103	50	36	50	54	250
160	125	60	45	53	57	270
200	145	70	56	59	63	296

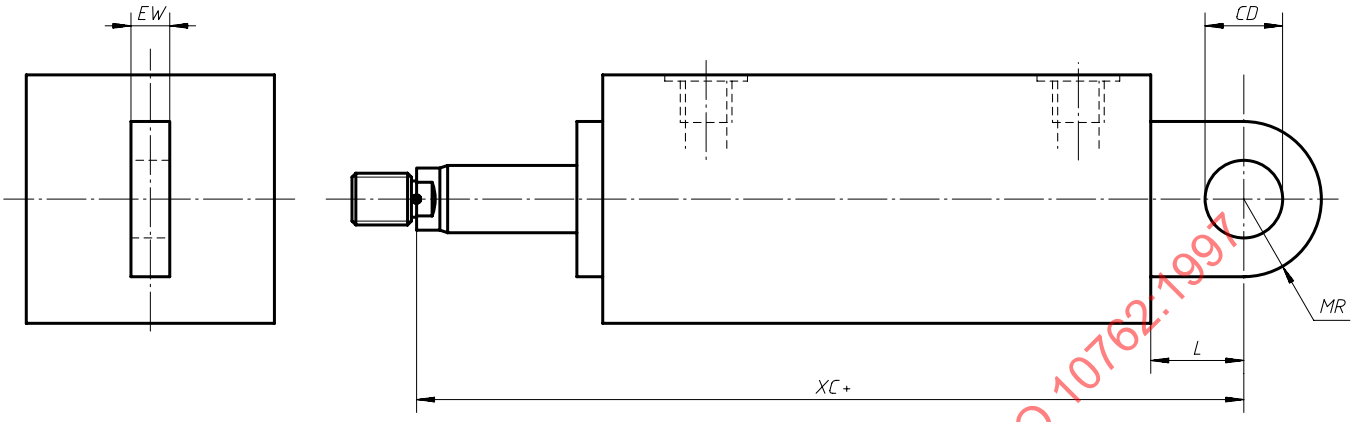

Figure 6 — MP3 — Cap, fixed eye

Table 6 — Dimensions of cap, fixed eye

Dimensions in millimetres

Bore	*EW* h14	*CD* H9	*MR* max.	*L* min.	*XC* ± 1,25
40	14	16	22,5	20	152
50	16	20	29	25	164
63	20	25	33	31	184
80	22	30	40	38	206
100	28	40	50	48	235
125	35	50	62	58	254
160	44	60	80	72	285
200	55	80	100	92	325

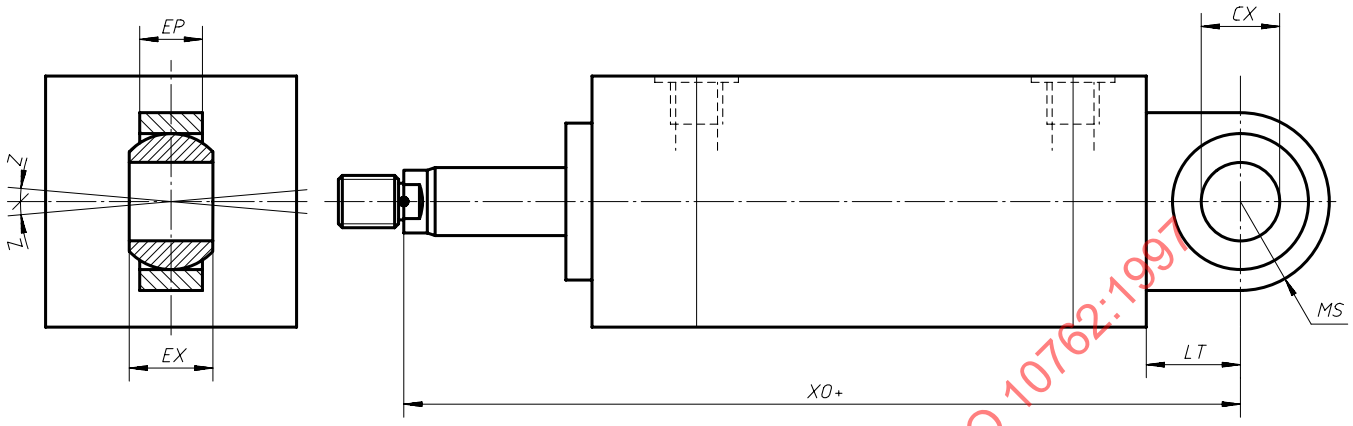

Figure 7 — MP5 — Cap, fixed eye with spherical plain bearing

Table 7 — Dimensions of cap, fixed eye with spherical plain bearing

Dimensions in millimetres

Bore	*EP*	*EX*		*CX*		*MS*	*LT*	*XO*	Tilting angle
	h15	nom.	tol.	nom.	tol.	max.	min.	± 1,25	*Z* min.
40	11	14	$^{0}_{-0,12}$	16	$^{0}_{-0,008}$	22,5	20	152	4°
50	13	16	$^{0}_{-0,12}$	20	$^{0}_{-0,012}$	29	25	164	
63	17	20	$^{0}_{-0,12}$	25	$^{0}_{-0,012}$	33	31	184	
80	19	22	$^{0}_{-0,12}$	30	$^{0}_{-0,012}$	40	38	206	
100	23	28	$^{0}_{-0,12}$	40	$^{0}_{-0,012}$	50	48	235	
125	30	35	$^{0}_{-0,12}$	50	$^{0}_{-0,012}$	62	58	254	
160	38	44	$^{0}_{-0,15}$	60	$^{0}_{-0,015}$	80	72	285	
200	47	55	$^{0}_{-0,15}$	80	$^{0}_{-0,015}$	100	92	325	

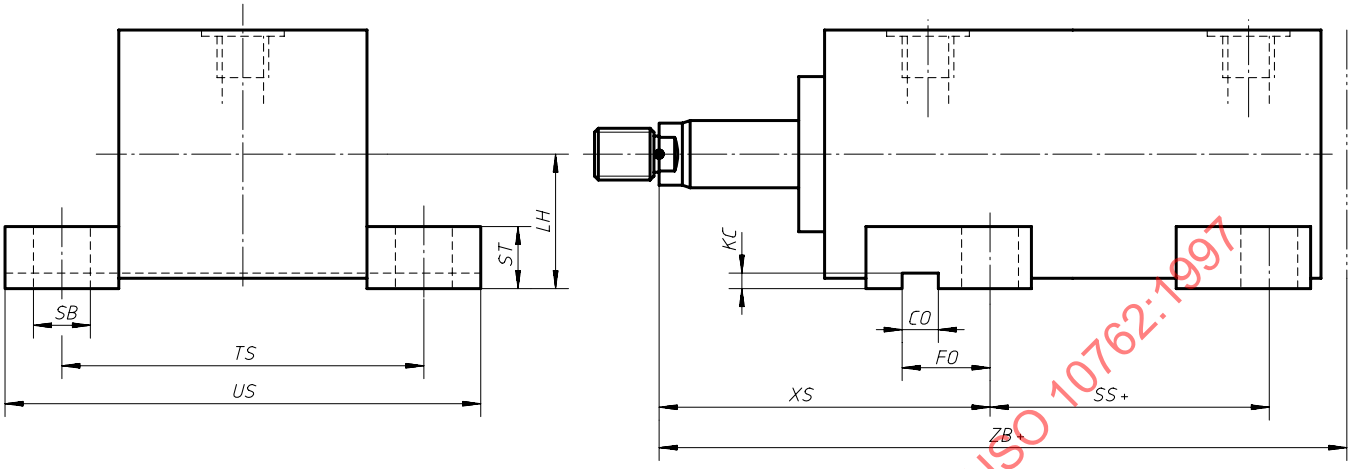

Figure 8 — MS2 — Side lugs

Table 8 — Dimensions of side lugs

Dimensions in millimetres

Bore	*TS* js13	*SB* H13	*LH* h10	*XS* ± 2	*SS* ± 1,25	*ZB* max.	*FO*[1)] ± 0,2	*CO*[1)] N9	*KC*[1)] + 0,3 0	*ST* js18	*US* max.
40	70	11	25,5	58	59	141	18	6	1,8	12	90
50	83	11	32	65	59	149	19	6	1,8	12	103
63	95	11	38	68	68	163	21	12	3,3	12	115
80	121	14	47,5	77	74	180	30	14	3,8	18	147
100	145	18	57	79	86	204	30	14	3,8	25	179
125	175	22	69,5	79	95	209	30	14	3,8	31	216
160	220	26	89,5	83,5	103	228	36	20	4,9	31	269
200	264	26	112	83,5	123	253	36	22	5,4	31	318

1) Keyway is optional.

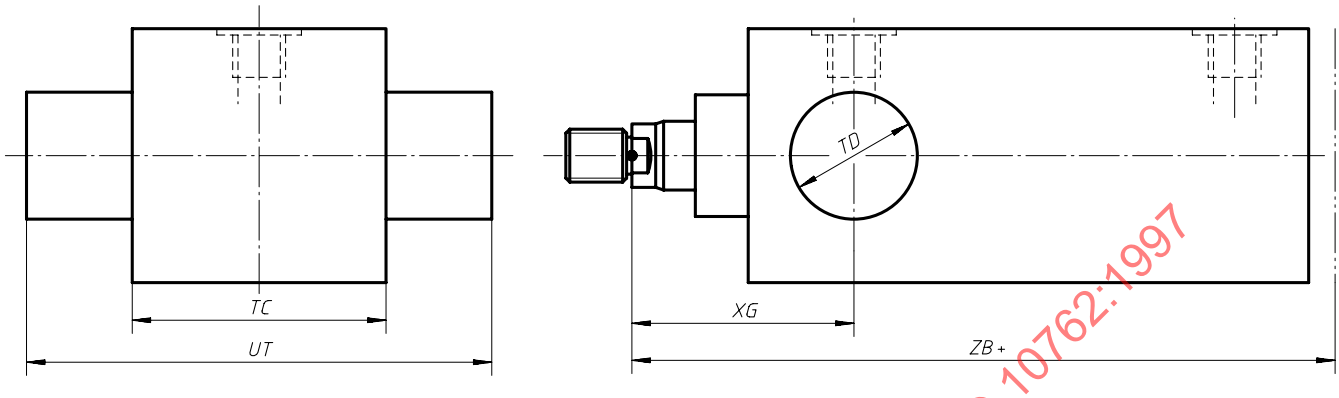

Figure 9 — MT1 — Head, integral trunnion (male)

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

Dimensions in millimetres

Bore	*TC* h14	*UT* h15	*TD* f8	*XG* ± 2	*ZB* max.
40	55	79	16	54	141
50	68	100	20	61	149
63	80	120	25	67	163
80	100	150	32	73	180
100	120	184	40	79	204
125	145	225	50	71	209
160	185	285	63	72	228
200	230	356	80	72,5	253

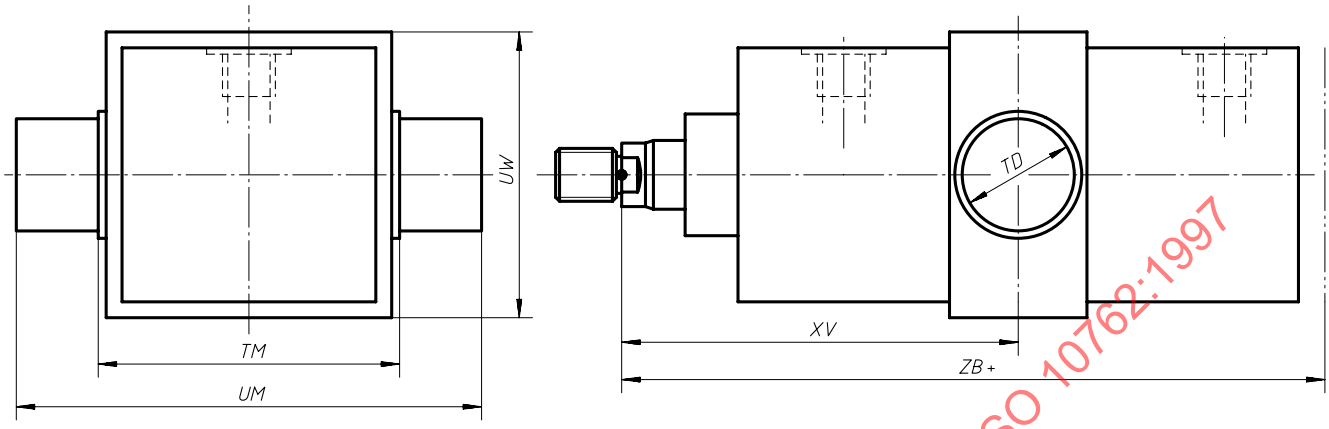

Figure 10 — MT4 — Intermediate, fixed or movable trunnion (male)

Table 10 — Dimensions of intermediate, fixed or movable trunnion (male)

Dimensions in millimetres

Bore	*UW* max.	*TM* h14	*UM* h15	*TD* f8	*XV*	*ZB* max.
40	64	63	87	16	According to requirements	141
50	76	76	108	20		149
63	89	88	128	25		163
80	108	114	164	32		180
100	127	132	196	40		204
125	158	165	245	50		209
160	195	210	310	63		228
200	247	270	396	80		253

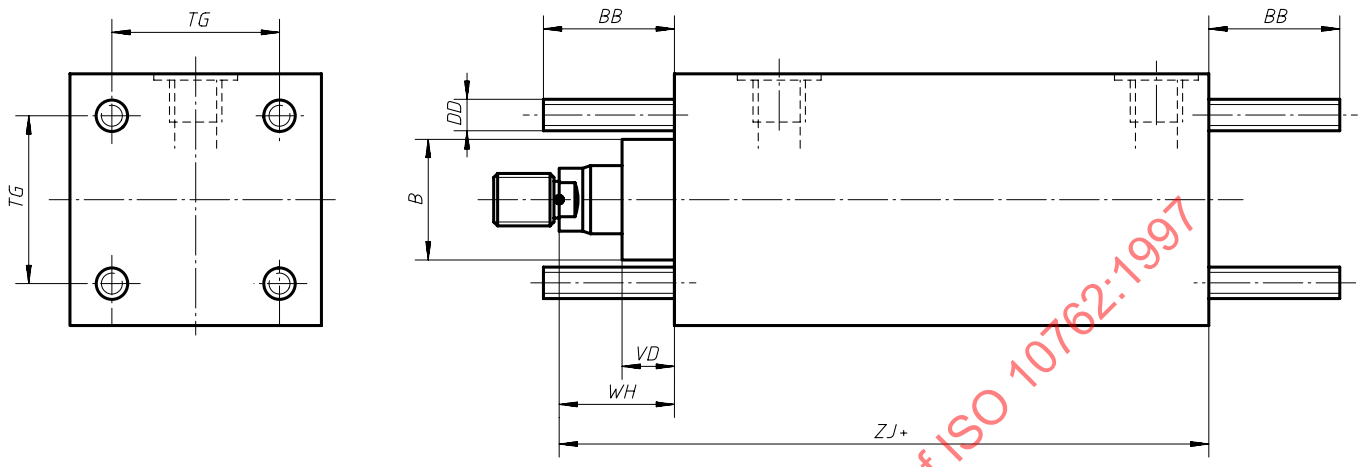

Figure 11 — MX1 — Both ends, studs or tie rods extended

Table 11 — Dimensions of both ends, studs or tie rods extended

Dimensions in millimetres

Bore	*MM*	*DD*	*BB* + 3 0	*WH* ± 2	*ZJ* ± 1	*B* f9	*VD* max.	*TG* js13
40	18	M6 × 1	24	25	132	30	12	40
	28					42		
50	22	M8 × 1	35	32	139	34	15	50
	36					50		
63	28	M8 × 1	35	38	153	42	19	58
	45					60		
80	36	M10 × 1,25	35	35	168	50	13	75
	56					72		
100	45	M14 × 1,5	46	41	187	60	16	90
	70					88		
125	56	M16 × 1,5	59	41	196	72	16	112
	90					108		
160	70	M20 × 1,5	80	37	213	88	12	145
	110					133		
200	90	M24 × 2	90	37	233	108	12	182
	140					163		