BS ISO 10762:2015

BSI Standards Publication

Hydraulic fluid power — Mounting dimensions for cylinders, 10 MPa (100 bar) series

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National foreword

This British Standard is the UK implementation of ISO 10762:2015. It supersedes BS ISO 10762:1997 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MCE/18/-/3, Cylinders.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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INTERNATIONAL STANDARD

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2015-05-01

Hydraulic fluid power — Mounting dimensions for cylinders, 10 MPa (100 bar) series

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

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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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 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This second edition cancels and replaces the first edition (ISO 10762:1997), which has been technically revised.

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 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.

INTERNATIONAL STANDARD ISO 10762:2015(E)

Hydraulic fluid power — Mounting dimensions for cylinders, 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 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 273, *Fasteners — Clearance holes for bolts and screws*

ISO 1179-1, *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, *Fluid power systems and components — Cylinder bores and piston rod diameters and area ratios — Metric series*

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

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

ISO 6099, *Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types*

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

3 Terms and definitions

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

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.

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

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

6 Stroke tolerances

The tolerance on piston strokes shall be as follows:

— piston strokes ≤1 250 mm: +2/-0 mm;

— piston strokes >1 250 mm and ≤3 150: +5/−0 mm;

— piston strokes >3 150 mm and ≤8 000: +8/−0 mm.

7 Mounting types

This International Standard includes the following mounting types, in accordance with 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 trunnion (male) with selectable position (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).

8 Piston rod characteristics

8.1 This International Standard covers piston rods that have a shouldered male thread end (see Figure 1 and Table 1 for basic dimensions).

8.2 For piston rod end types, see ISO 4395.

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

9 Identification statement (reference to this International Standard)

It is strongly recommended to fabricators who elect to conform to this International Standard to use the following statement in test reports, catalogues, and sales literature:

"Interchangeable mounting dimensions selected in accordance with ISO 10762:2015, *Hydraulic fluid power — Mounting dimensions for cylinders, 10 MPa (100 bar) series*."

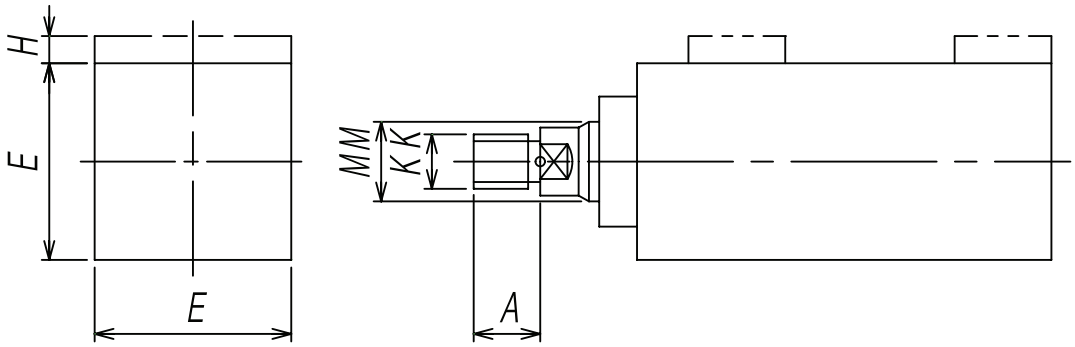


Figure 1 — Basic dimensions

Table 1 — Basic dimensions

Dimensions in millimetres

Bore	**Rod *MM*[a]**	*KK* 6g	*A* max.	*E* max.	*H*[b] max.
40	18	M14 × 1,5	18	52	5
	22	M14 × 1,5	18		
		M16 × 1,5	22		
	28	M14 × 1,5	18		
		M20 × 1,5	28		
50	22	M16 × 1,5	22	65	5
	28	M16 × 1,5	22		
		M20 × 1,5	28		
	36	M16 × 1,5	22		
		M27 × 2	36		
63	28	M20 × 1,5	28	77	3
	36	M20 × 1,5	28		
		M27 × 2	36		
	45	M20×1,5	28		
		M33 × 2	45		
80	36	M27 × 2	36	96	4
	45	M27 × 2	36		
		M33 × 2	45		
	56	M27 × 2	36		
		M42 × 2	56		
100	45	M33 × 2	45	115	5
	56	M33 × 2	45		
		M42 × 2	56		
	70	M33 × 2	45		
		M48 × 2	63		

NOTE For accessories, see ISO 8133. Port dimensions and positions are given in Figure 2 and Table 2.

[a] See 8.3.

[b] Extra height is provided for the reinforced rod cover on all four bore sizes 50 mm, 63 mm, 80 mm and 100 mm; also provided for both the rod and cap cover on rod sizes for the 40 mm bore.

Table 1 *(continued)*

Bore	**Rod *MM*[a]**	*KK* 6g	*A* max.	*E* max.	*H*[b] max.
125	56	M42 × 2	56	140	—
	70	M42 × 2	56		
		M48 × 2	63		
	90	M42 × 2	56		
		M64 × 3	85		
160	70	M48 × 2	63	180	—
	90	M48 × 2	63		
		M64 × 3	85		
	110	M48 × 2	63		
		M80 × 3	95		
200	90	M64 × 3	85	225	—
	110	M64 × 3	85		
		M80 × 3	95		
	140	M64 × 3	85		
		M100 × 3	112		

NOTE For accessories, see ISO 8133. Port dimensions and positions are given in Figure 2 and Table 2.

[a] See 8.3.

[b] Extra height is provided for the reinforced rod cover on all four bore sizes 50 mm, 63 mm, 80 mm and 100 mm; also provided for both the rod and cap cover on rod sizes for the 40 mm bore.

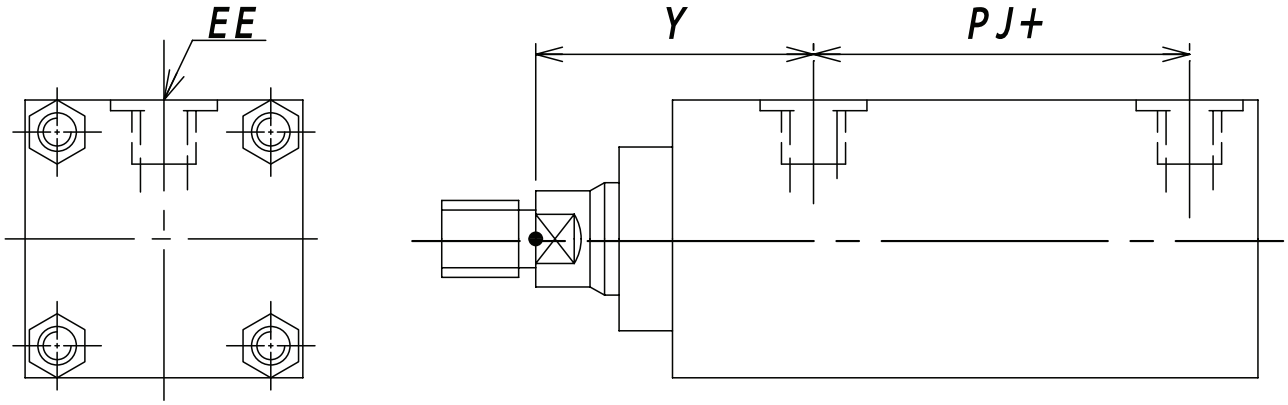


Figure 2 — Port dimensions and positions

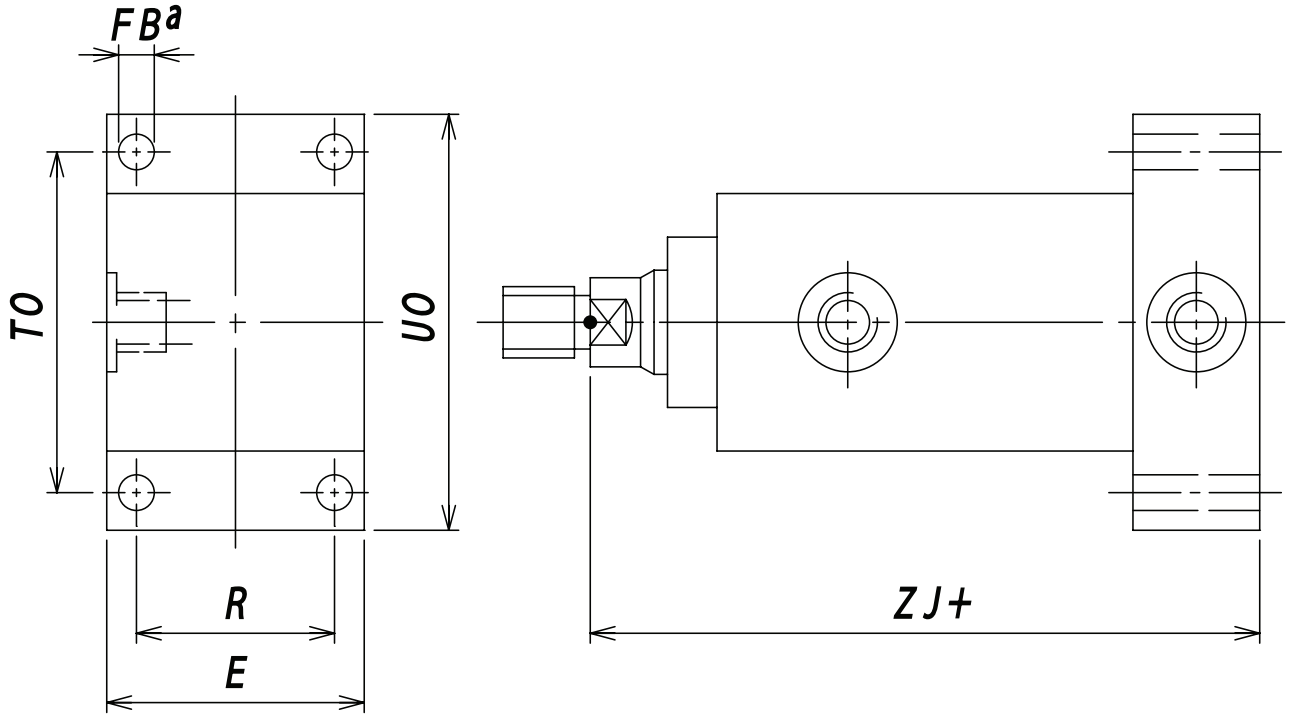
Table 2 — Port dimensions and positions

Dimensions in millimetres

Bore	*EE*		*Y*[b]	*PJ*[b]
	ISO 1179-1 port	ISO 6149-1 port[a]		
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	G 1	M33 × 2	85	120

[a] Threaded ports in accordance with ISO 6149-1 are preferred for new designs.

[b] The tolerance on dimensions *Y* and *PJ* is dependent on stroke; see Table 14.



Key

[a] Hole in accordance with ISO 273 (medium).

Figure 3 — ME5 — Rectangular flange, integral with head

Table 3 — Dimensions of rectangular flange, integral with head

Dimensions in millimetres

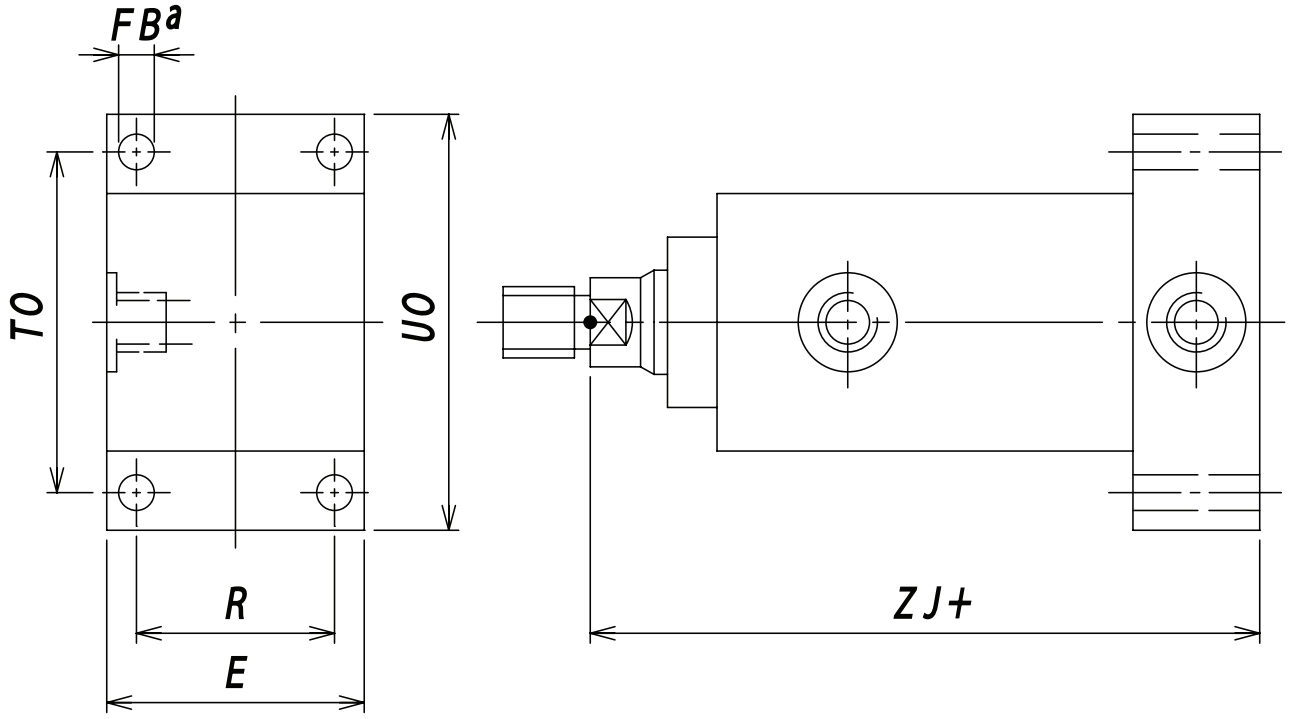
Bore	**Rod** *MM*	*RD* f8	*TO* js13	*FB* H13	*R* js13	*WF*[a]	*F* max	*E* max	*UO* max	*ZB*[a]	*VE* max	*B* max	*VL* min
40	18	51	70	6,6	40	35	10	52	86	141	22	30	3
	22											34	
	28											42	
50	22	62	86	9	50	41	10	65	105	149	25	34	4
	28											42	
	36											50	
63	28	72	98	9	56	48	10	77	118	163	29	42	4
	36											50	
	45											60	
80	36	92	119	11	70	51	16	96	143	180	29	50	4
	45											60	
	56											72	
100	45	110	138	13,5	90	57	16	115	162	204	32	60	5
	56											72	
	70											88	

[a] The tolerance on dimensions *WF* and *ZB* is dependent on stroke; see Table 14.

Table 3 *(continued)*

Bore	**Rod** *MM*	*RD* f8	*TO* js13	*FB* H13	*R* js13	*WF*[a]	*F* max	*E* max	*UO* max	*ZB*[a]	*VE* max	*B* max	*VL* min
125	56	130	168	17,5	110	57	16	140	194	209	32	72	5
	70											88	
	90											108	
160	70	125	212	22	140	57	25	180	248	228	32	88	5
	90	150										108	
	110	170										133	
200	90	150	268	26	170	57	25	225	308	253	32	108	5
	110	170										133	
	140	210										163	

[a] The tolerance on dimensions *WF* and *ZB* is dependent on stroke; see Table 14.



Key

[a] Hole in accordance with ISO 273 (medium).

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*[a]	*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

[a] The tolerance on dimension *ZJ* is dependent on stroke; see Table 14.

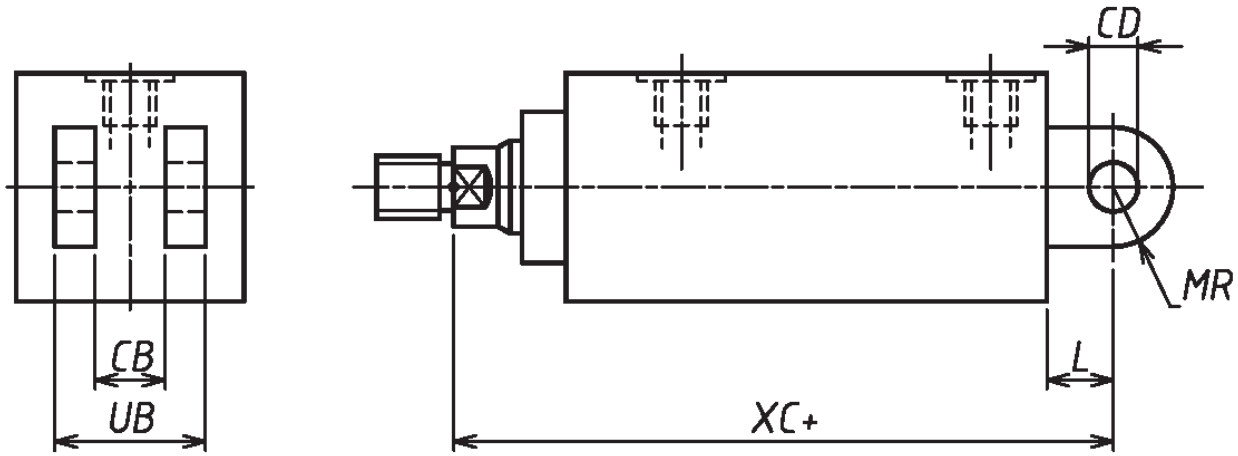


Figure 5 — MP1 — Cap, fixed clevis

Table 5 — Dimensions of cap, fixed clevis

Dimensions in millimetres

Bore	*UB* max	*CB* A16	*CD* H9	*MR* max	*L* min	*XC*[a]
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

[a] The tolerance on dimension *XC* is dependent on stroke; see Table 14.

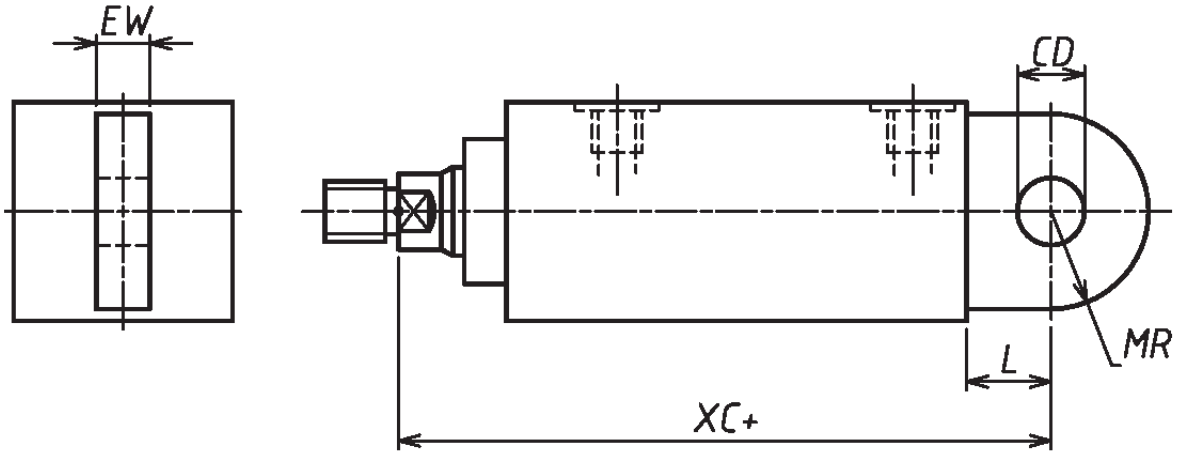


Figure 6 — MP3 — Cap, fixed eye

Table 6 — Dimensions of cap, fixed eye

Dimensions in millimetres

Bore	*EW* h14	*CD* H9	*MR* max	*L* min	*XC*[a]
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

[a] The tolerance on dimension *XC* is dependent on stroke; see Table 14.

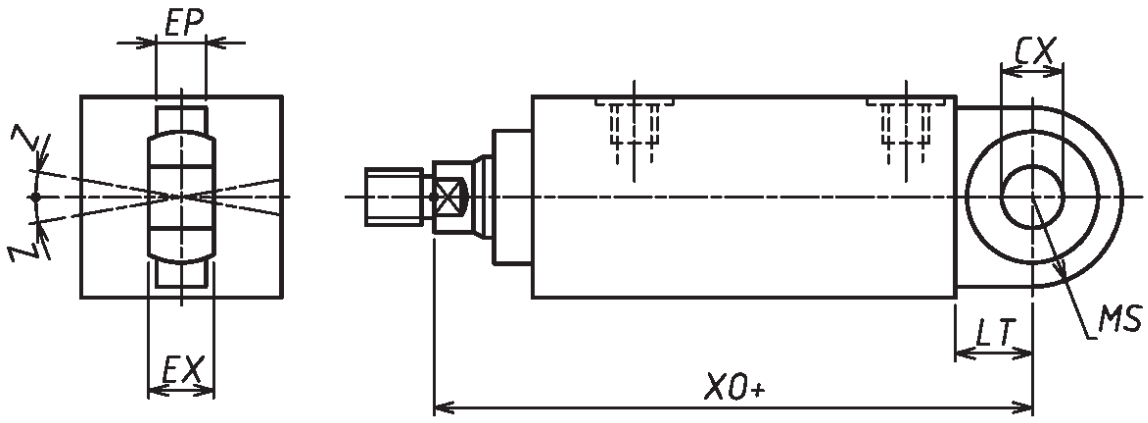


Figure 7 — MP5 — Cap, fixed eye with spherical plain bearing

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

Dimensions in millimetres

Bore	*EP*	*EX*		*CX*		*MS*	*LT*	*XO*[a]	**Tilting angle** *Z*
	h15	nom.	tol.	nom.	tol.	max	min		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	

[a] The tolerance on dimension *XO* is dependent on stroke; see Table 14.

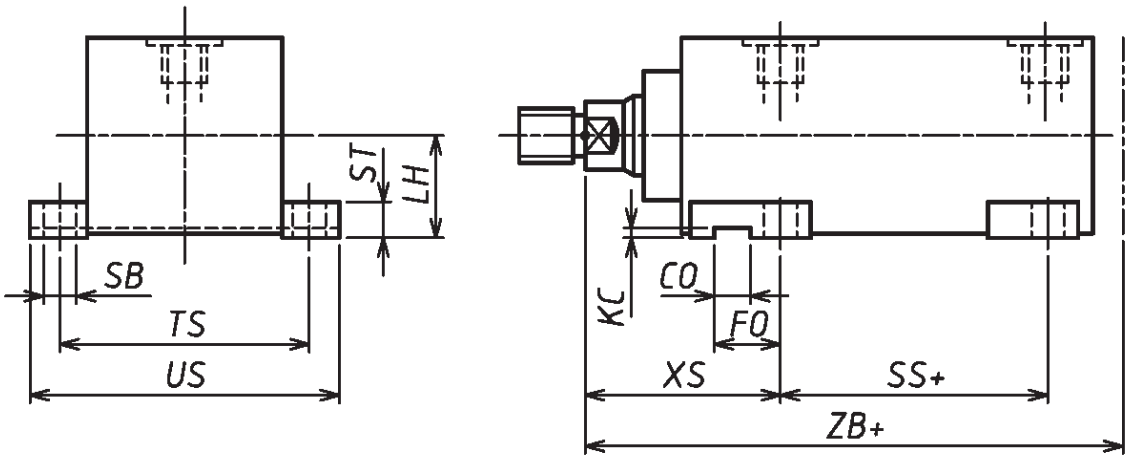


Figure 8 — MS2 — Side lugs

Table 8 — Dimensions of side lugs

Dimensions in millimetres

Bore	*TS* js13	*SB* H13	*LH* h10	*XS*[a]	*SS*[a]	*ZB*[a]	*FO*[b] ±0,.2	*CO*[b] N9	*KC*[b] +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

[a] The tolerances on dimensions *XS*, *SS* and *ZB* are dependent on stroke; see Table 14.

[b] Keyway is optional.

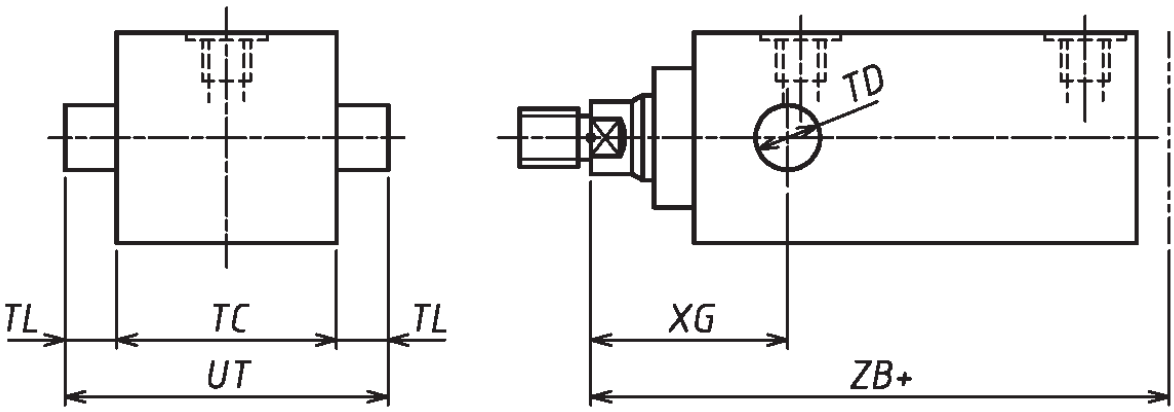


Figure 9 — MT1 — Head, integral trunnion (male)

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

Dimensions in millimetres

Bore	*TC* h14	*TL* js13	*UT*	*TD* f8	*XG*[a]	*ZB*[a]
40	55	12	79	16	54	141
50	68	16	100	20	61	149
63	80	20	120	25	67	163
80	100	25	150	32	73	180
100	120	32	184	40	79	204
125	145	40	225	50	71	209
160	185	50	285	63	72	228
200	230	63	356	80	72,5	253

[a] The tolerances on dimensions *XG* and *ZB* are dependent on stroke; see Table 14.

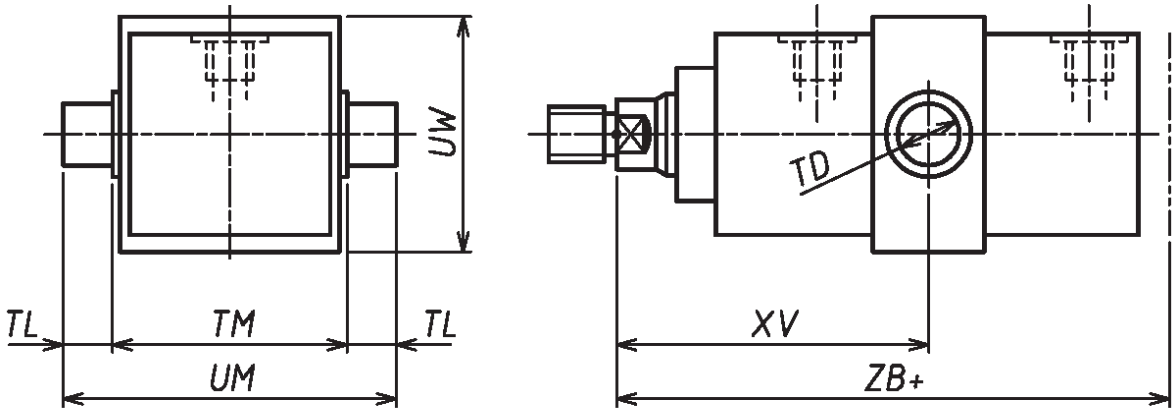


Figure 10 — MT4 — Intermediate trunnion (male) with selectable position

Table 10 — Dimensions of intermediate trunnion (male) with selectable position

Dimensions in millimetres

Bore	*UW* max.	*TM* h14	*TL* js13	*UM*	*TD* f8	*XV*[a]	*ZB*[a]
40	64	63	12	87	16	According to requirements	141
50	76	76	15	108	20		149
63	89	88	20	128	25		163
80	108	114	25	164	32		180
100	127	132	32	196	40		204
125	158	165	40	245	50		209
160	195	210	50	310	63		228
200	247	270	63	396	80		253

[a] The tolerances on dimensions *XV* and *ZB* are dependent on stroke; see Table 14.

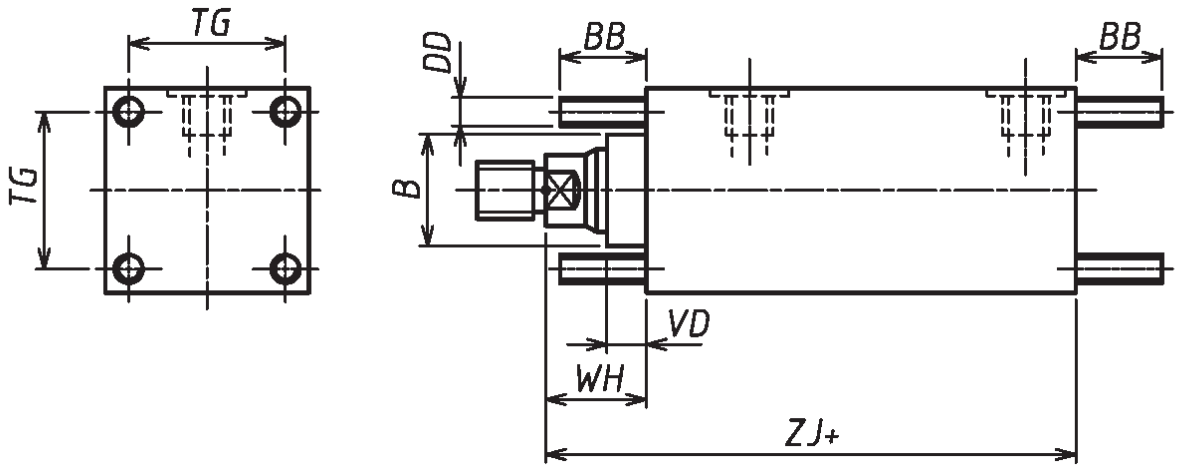


Figure 11 — MX1 — Both ends, studs or tie rods extended

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

Dimensions in millimetres

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

[a] The tolerances on dimensions *WH* and *ZJ* are dependent on stroke; see Table 14.

Table 11 *(continued)*

Bore	**Rod** *MM*	*DD*	*BB* +3 0	*WH*[a]	*ZJ*[a]	*B* f9	*VD* max.	*TG* js13
200	90	M24 × 2	90	37	233	108	12	182
	110					133		
	140					163		

[a] The tolerances on dimensions *WH* and *ZJ* are dependent on stroke; see Table 14.

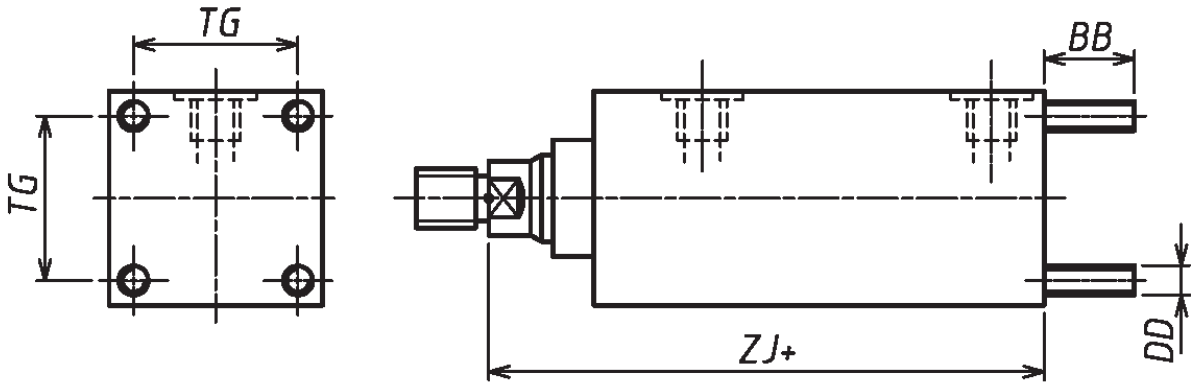


Figure 12 — MX2 — Cap, studs or tie rods extended

Table 12 — Dimensions of cap, studs or tie rods extended

Dimensions in millimetres

Bore	*DD*	*BB* +3 0	*ZJ*[a]	*TG* js13
40	M6 × 1	24	132	40
50	M8 × 1	35	139	50
63	M8 × 1	35	153	58
80	M10 × 1,25	35	168	75
100	M14 × 1,5	46	187	90
125	M16 × 1,5	59	196	112
160	M20 × 1,5	80	213	145
200	M24 × 2	90	233	182

[a] The tolerance on dimension *ZJ* is dependent on stroke; see Table 14.

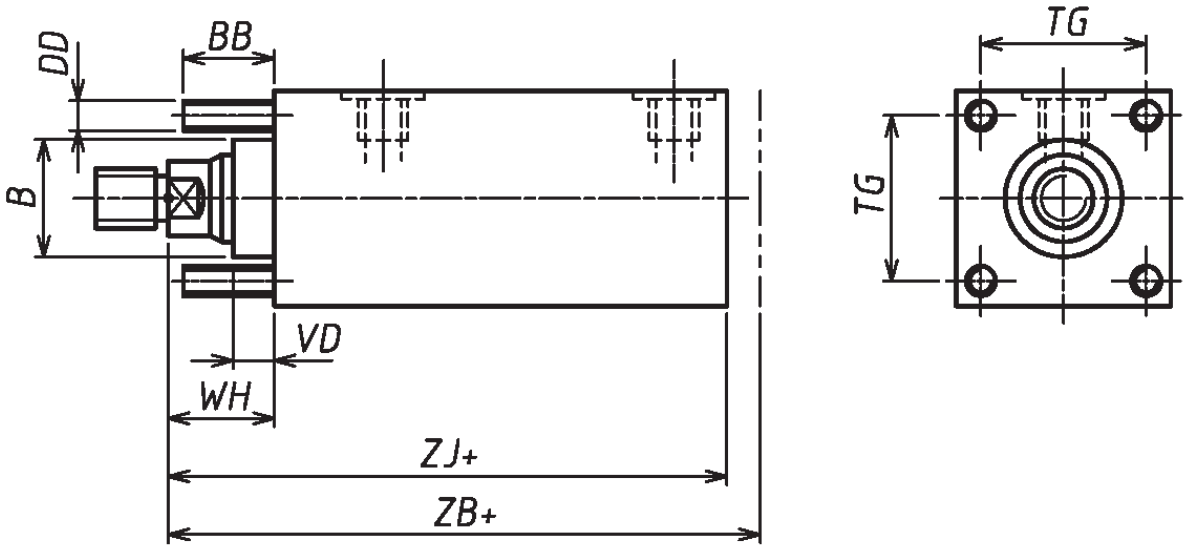


Figure 13 — MX3 — Head, studs or tie rods extended

Table 13 — Dimensions of head, studs or tie rods extended

Dimensions in millimetres

Bore	**Rod** *MM*	*DD*	*BB* +3 0	*WH*[a]	*ZJ*[a]	*B* f9	*VD* max.	*TG* js13	*ZB*[a]
40	18	M6 × 1	24	25	132	30	12	40	141
	22					34			
	28					42			
50	22	M8 × 1	35	32	139	34	15	50	149
	28					42			
	36					50			
63	28	M8 × 1	35	38	153	42	19	58	163
	36					50			
	45					60			
80	36	M10 × 1,25	35	35	168	50	13	75	180
	45					60			
	56					72			
100	45	M14 × 1,5	46	41	187	60	16	90	204
	56					72			
	70					88			
125	56	M16 × 1,5	59	41	196	72	16	112	209
	70					88			
	90					108			
160	70	M20 × 1,5	80	37	213	88	12	145	228
	90					108			
	110					133			

[a] The tolerances on dimensions *WH*, *ZJ* and *ZB* are dependent on stroke; see Table 14.

Table 13 *(continued)*

Bore	**Rod** *MM*	*DD*	*BB* +3 0	*WH*[a]	*ZJ*[a]	*B* f9	*VD* max.	*TG* js13	*ZB*[a]
200	90	M24 × 2	90	37	233	108	12	182	253
	110					133			
	140					163			

[a] The tolerances on dimensions *WH*, *ZJ* and *ZB* are dependent on stroke; see Table 14.

Table 14 — Tolerances for mounting dimensions which are dependent on stroke

Dimensions in millimetres

Code for mounting dimension	*SS*[a]	*PJ*[a]	*WF*	*WH*	*XC or XO*[a]	*XG*	*XS*	*XV*	*Y*	*ZB*[a]	*ZJ*[a]
Nominal stroke	**Tolerances**										
≤1 250	±1,5	±1,5	±2	±2	±1,5	±2	±2	±2	±2	max.	±1,5
>1 250 ≤ 3 150	±3	±3	±4	±4	±3	±4	±4	±4	±4		±3
>3 150 ≤ 8 000	±5	±5	±8	±8	±5	±8	±8	±8	±8		±5

[a] Length including stroke. Stroke tolerances from Clause 6 shall not be added to the tolerances in this table.

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