INTERNATIONAL STANDARD

ISO 6020-2

Third edition
2006-02-15

Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series —

Part 2: Compact series

Transmissions hydrauliques — Dimensions d'interchangeabilité des vérins 16 MPa (160 bar) à simple tige —

Partie 2: Série compacte

Reference number
ISO 6020-2:2006(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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 6020-2 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This third edition of ISO 6020-2 cancels and replaces the second edition of ISO 6020-2 (ISO 6020-2:1991) and ISO 8138 (ISO 8138:1998), both of which have been technically revised.

ISO 6020 consists of the following parts, under the general title *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series*:

— *Part 1: Medium series*

— *Part 2: Compact series*

— *Part 3: Compact series with bores from 250 mm to 500 mm*

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

Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series —

Part 2: Compact series

1 Scope

This part of ISO 6020 establishes metric mounting dimensions for compact series cylinders, 16 MPa [160 bar [1)]], as required for interchangeability of commonly-used hydraulic cylinders.

NOTE 1 This part of ISO 6020 allows manufacturers of hydraulic equipment flexibility in the design of metric cylinders and does not restrict technical development; however, it does provide basic guidelines.

NOTE 2 The compact series dimensions are most applicable to square head cylinders.

2 Normative references

The following referenced documents are indispensable for the application 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 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, *Fluid power systems and components — Cylinder bores and piston rod diameters — Metric series*

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

ISO 5598 [3)], *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 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 6162-1, *Hydraulic fluid power — Flange connectors with split or one-piece flange clamps and metric or inch screws — Part 1: Flange connectors for use at pressures of 3,5 MPa (35 bar) to 35 MPa (350 bar), DN 13 to DN 127*

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

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

3) Under revision. (Revision of ISO 5598:1985)

ISO 6162-2, *Hydraulic fluid power — Flange connectors with split or one-piece flange clamps and metric or inch screws — Part 2: Flange connectors for use at pressures of 35 MPa (350 bar) to 40 MPa (400 bar), DN 13 to DN 51*

ISO 8133, *Hydraulic fluid power — Single rod cylinders, 16 MPa (160 bar) compact series — Mounting dimensions for accessories*

3 Terms and definitions

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

4 Dimensions

4.1 Mounting dimensions for cylinders manufactured in accordance with this part of ISO 6020 shall be selected from Figures 1 through 13 and Tables 1 through 13.

4.2 Port and flange sizes and dimensions shall be selected from Table 14 and in the respective International Standards cited therein.

4.3 All the dimensions and methods of mounting in this part of ISO 6020 are identified by codes in conformance with ISO 6099.

5 Bore sizes

This part of ISO 6020 includes the following bore sizes, in millimetres, in accordance with ISO 3320:

25 — 32 — 40 — 50 — 63 — 80 — 100 — 125 — 160 — 200.

NOTE Mounting dimensions for compact hydraulic single rod cylinders with bores from 250 mm to 500 mm are specified in ISO 6020-3.

6 Stroke tolerances

6.1 The tolerance on strokes $\leqslant$ 1 250 mm shall be $^{+2}_{0}$ mm.

6.2 Tolerances on strokes $>$ 1 250 mm shall be in accordance with the manufacturer's specification or an agreement between the manufacturer and user.

7 Mounting types

This part of ISO 6020 includes the following mounting types, in accordance with ISO 6099:

— ME 5: Head, rectangular (see Figure 2 and Table 2)

— ME 6: Cap, rectangular (see Figure 3 and Table 3)

— MP 1: Cap, fixed clevis (see Figure 4 and Table 4)

— MP 3: Cap, fixed plain eye (see Figure 5 and Table 5)

— MP 5: Cap, fixed eye with spherical bearing (see Figure 6 and Table 6)

— MS 2: Side lugs (see Figure 7 and Table 7)

— MT 1: Head, integral trunnion (male) (see Figure 8 and Table 8)

— MT 2: Cap, integral trunnion (male) (see Figure 9 and Table 9)

— MT 4: Intermediate fixed or movable trunnion (male) (see Figure 10 and Table 10)

— MX 1: Both ends studs or tie rods extended (see Figure 11 and Table 11)

— MX 2: Cap studs or tie rods extended (see Figure 12 and Table 12)

— MX 3: Head studs or tie rods extended (see Figure 13 and Table 13)

8 Piston rod characteristics

8.1 This part of ISO 6020 covers piston rods that have shouldered male thread ends; see Figure 1 and Table 1 for basic dimensions.

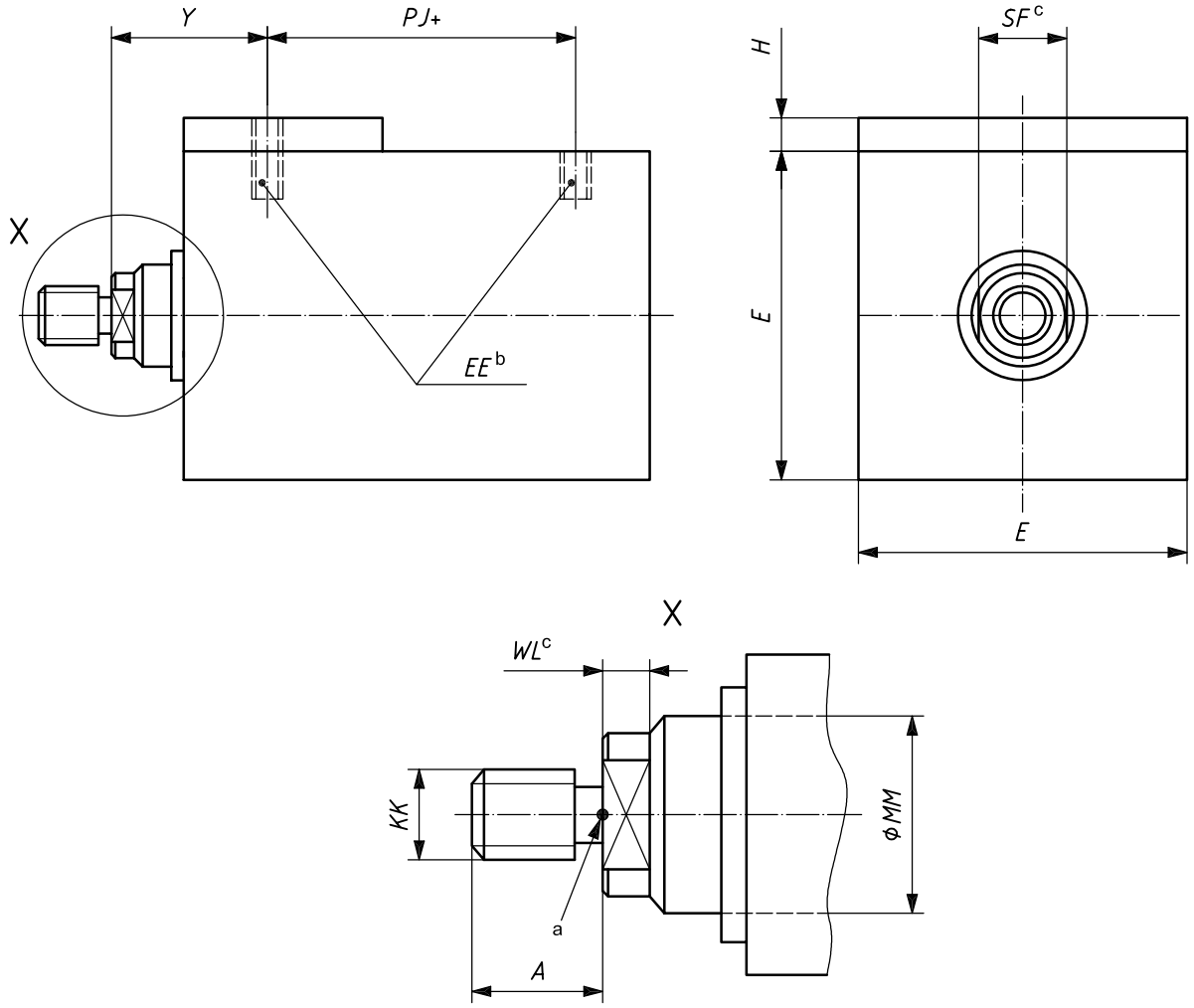
8.2 For rod end types, see ISO 4395.

8.3 For accessories, see ISO 8133.

9 **Identification statement** (reference to this part of ISO 6020)

It is strongly recommended to fabricators who elect to conform to this part of ISO 6020 to use the following statement in test reports, catalogues and sales literature:

"Interchangeable mounting dimensions selected in accordance with ISO 6020-2:2006, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 2: Compact series.*"



a Reference point.

b See Table 14 for port options.

c Dimensions *SF* and *WL* are controlled by ISO 4395.

Figure 1 — General dimensions

Table 1 — General dimensions

Dimensions in millimetres

Bore	Rod MM [a]	KK [a] 6g	A max.	H max.	E	Y [b] ± 2	PJ [c] ± 1,5
25	12	M10 × 1,25	14	5	40 ± 1,5	50	53
	18	M10 × 1,25 M14 × 1,5	14 18				
32	14	M12 × 1,25	16	5	45 ± 1,5	60	56
	22	M12 × 1,25 M16 × 1,5	16 22				
40	18	M14 × 1,5	18	—	63 ± 1,5	62	73
	28	M14 × 1,5 M20 × 1,5	18 28				
50	22	M16 × 1,5	22	—	75 ± 1,5	67	74
	36	M16 × 1,5 M27 × 2	22 36				
63	28	M20 × 1,5	28	—	90 ± 1,5	71	80
	45	M20 × 1,5 M33 × 2	28 45				
80	36	M27 × 2	36	—	115 ± 1,5	77	93
	56	M27 × 2 M42 × 2	36 56				
100	45	M33 × 2	45	—	130 ± 2	82	101
	70	M33 × 2 M48 × 2	45 63				
125	56	M42 × 2	56	—	165 ± 2	86	117
	90	M42 × 2 M64 × 3	56 85				
160	70	M48 × 2	63	—	205 ± 2	86	130
	110	M48 × 2 M80 × 3	63 95				
200	90	M64 × 3	85	—	245 ± 2	98	165
	140	M64 × 3 M100 × 3	85 112				

[a] If other piston rod diameters or other piston rod threads are required, use those identified in ISO 3320 and ISO 4395.

[b] The tolerance on dimension Y applies to strokes $\leqslant$ 1 250 mm. Tolerances on strokes $>$ 1 250 mm can be in accordance with the manufacturer's specification or an agreement between the manufacturer and user (see 6.2).

[c] The tolerance on dimension PJ shall be added to the tolerance on the stroke.

Dimensions in millimetres

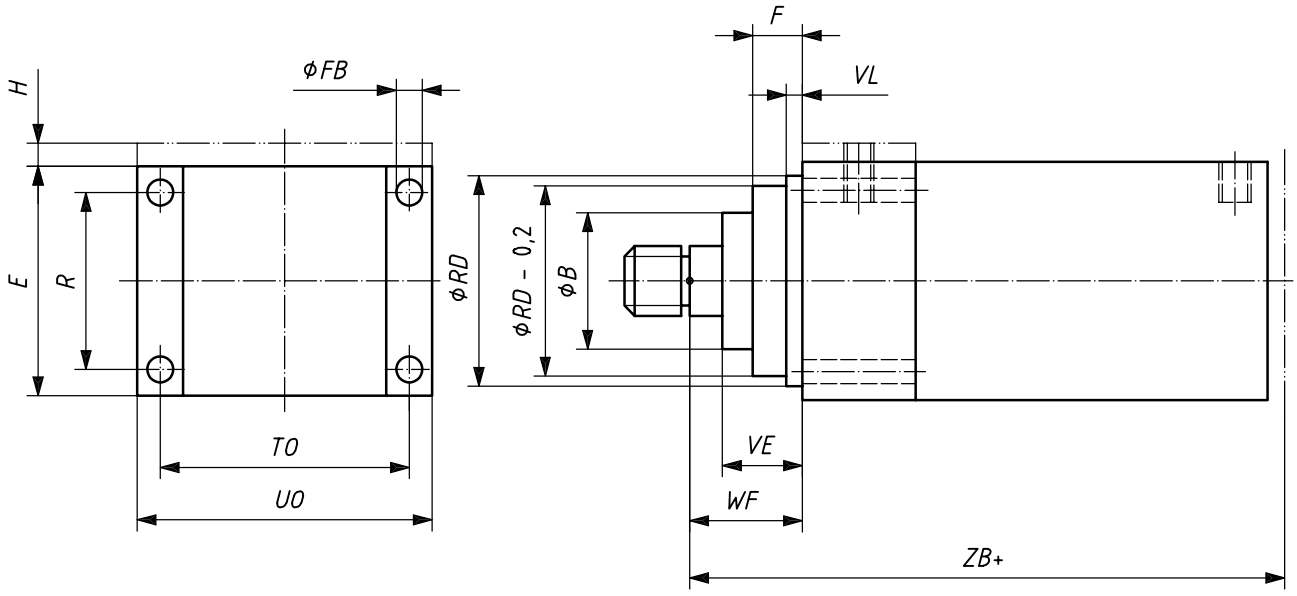


Figure 2 — ME 5 — Head, rectangular

Table 2 — Dimensions of head, rectangular

Dimensions in millimetres

Bore	Rod *MM*	*RD* f8	*E*	*TO* js13	*FB* [a] H13	*R* js13	*WF* ± 2	*F* max.	*VE* max.	*VL* min.	*B* max.	*UO* max.	*ZB* [b] max.	*H* max.
25	12	38	40 ± 1,5	51	5,5	27	25	10	16	3	24	65	121	5
	18	38									30			
32	14	42	45 ± 1,5	58	6,6	33	35	10	22	3	26	70	137	5
	22	42									34			
40	18	62	63 ± 1,5	87	11	41	35	10	22	3	30	110	166	—
	28	62									42			
50	22	74	75 ± 1,5	105	14	52	41	16	25	4	34	130	176	—
	36	74									50			
63	28	75	90 ± 1,5	117	14	65	48	16	29	4	42	145	185	—
	45	88									60			
80	36	82	115 ± 1,5	149	18	83	51	20	29	4	50	180	212	—
	56	105									72			
100	45	92	130 ± 2	162	18	97	57	22	32	5	60	200	225	—
	70	125									88			
125	56	105	165 ± 2	208	22	126	57	22	32	5	72	250	260	—
	90	150									108			
160	70	125	205 ± 2	253	26	155	57	25	32	5	88	300	279	—
	110	170									133			
200	90	150	245 ± 2	300	33	190	57	25	32	5	108	360	336	—
	140	210									163			

[a] Hole in accordance with ISO 273, medium series.

[b] The tolerances referred to apply to strokes ⩽ 1250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

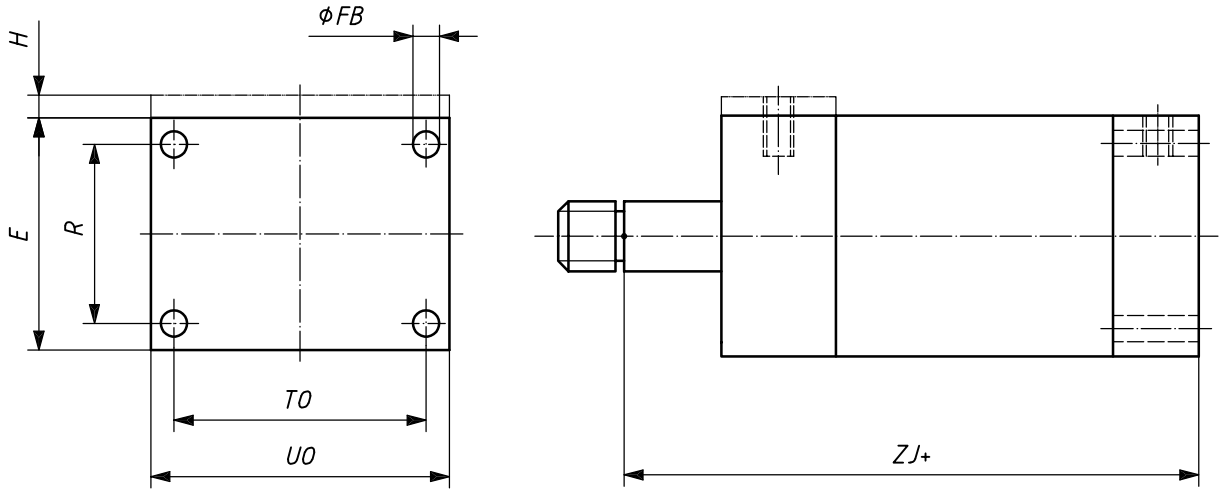


Figure 3 — ME 6 — Cap, rectangular

Table 3 — Dimensions of cap, rectangular

Dimensions in millimetres

Bore	**Rod** *MM*	*E*	*TO* js13	*FB* [a] H13	*R* js13	*ZJ* [b] ± 1	*UO* max.	*H* max.
25	12	40 ± 1,5	51	5,5	27	114	65	5
	18							
32	14	45 ± 1,5	58	6,6	33	128	70	5
	22							
40	18	63 ± 1,5	87	11	41	153	110	—
	28							
50	22	75 ± 1,5	105	14	52	159	130	—
	36							
63	28	90 ± 1,5	117	14	65	168	145	—
	45							
80	36	115 ± 1,5	149	18	83	190	180	—
	56							
100	45	130 ± 2	162	18	97	203	200	—
	70							
125	56	165 ± 2	208	22	126	232	250	—
	90							
160	70	205 ± 2	253	26	155	245	300	—
	110							
200	90	245 ± 2	300	33	190	299	360	—
	140							

[a] Hole in accordance with ISO 273, medium series.

[b] The tolerance on dimension *ZJ* applies to strokes ⩽ 1 250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

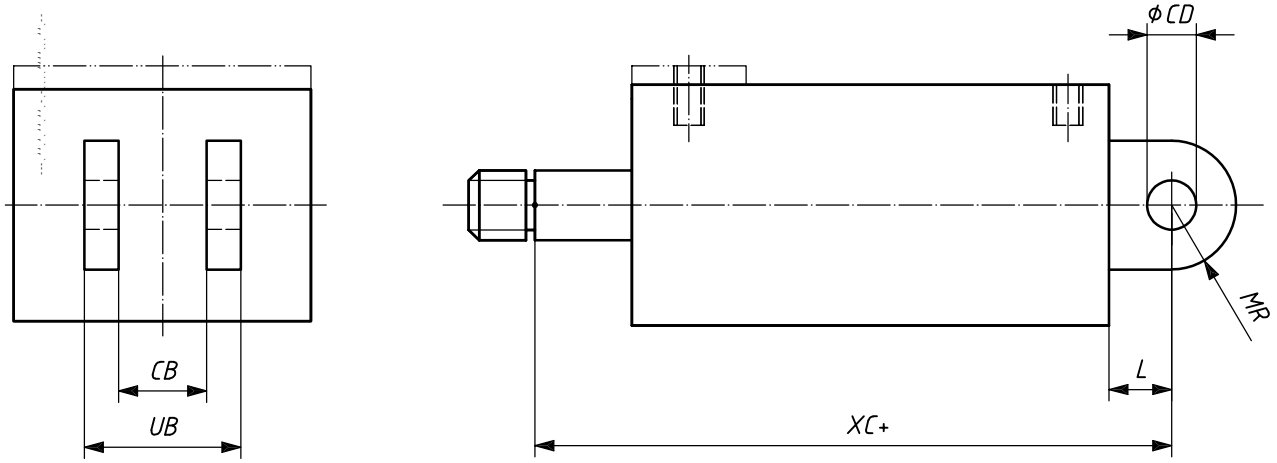


Figure 4 — MP 1 — Cap, fixed clevis

Table 4 — Dimensions of cap, fixed clevis

Dimensions in millimetres

Bore	Rod *MM*	*CB* A13	*CD* H9	*MR* max.	*L* min.	*UB* max.	*XC* [a] ± 1,5
25	12	12	10	12	13	25	127
	18						
32	14	16	12	17	19	34	147
	22						
40	18	20	14	17	19	42	172
	28						
50	22	30	20	29	32	62	191
	36						
63	28	30	20	29	32	62	200
	45						
80	36	40	28	34	39	83	229
	56						
100	45	50	36	50	54	103	257
	70						
125	56	60	45	53	57	123	289
	90						
160	70	70	56	59	63	143	308
	110						
200	90	80	70	78	82	163	381
	140						

[a] The tolerance on dimension *XC* applies to strokes ⩽ 1 250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

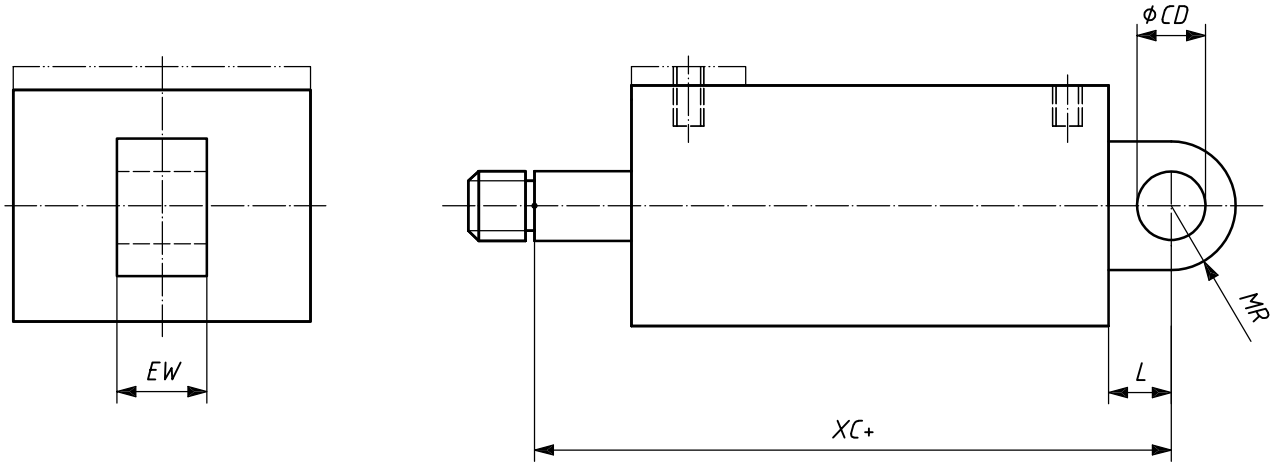


Figure 5 — MP 3 — Cap, fixed plain eye

Table 5 — Dimensions of cap, fixed plain eye

Dimensions in millimetres

Bore	**Rod** *MM*	*EW* h14	*CD* H9	*MR* max.	*L* min.	*XC* [a] ± 1,5
25	12	12	10	12	13	127
	18					
32	14	16	12	17	19	147
	22					
40	18	20	14	17	19	172
	28					
50	22	30	20	29	32	191
	36					
63	28	30	20	29	32	200
	45					
80	36	40	28	34	39	229
	56					
100	45	50	36	50	54	257
	70					
125	56	60	45	53	57	289
	90					
160	70	70	56	59	63	308
	110					
200	90	80	70	78	82	381
	140					

[a] The tolerance on dimension *XC* applies to strokes ⩽ 1 250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

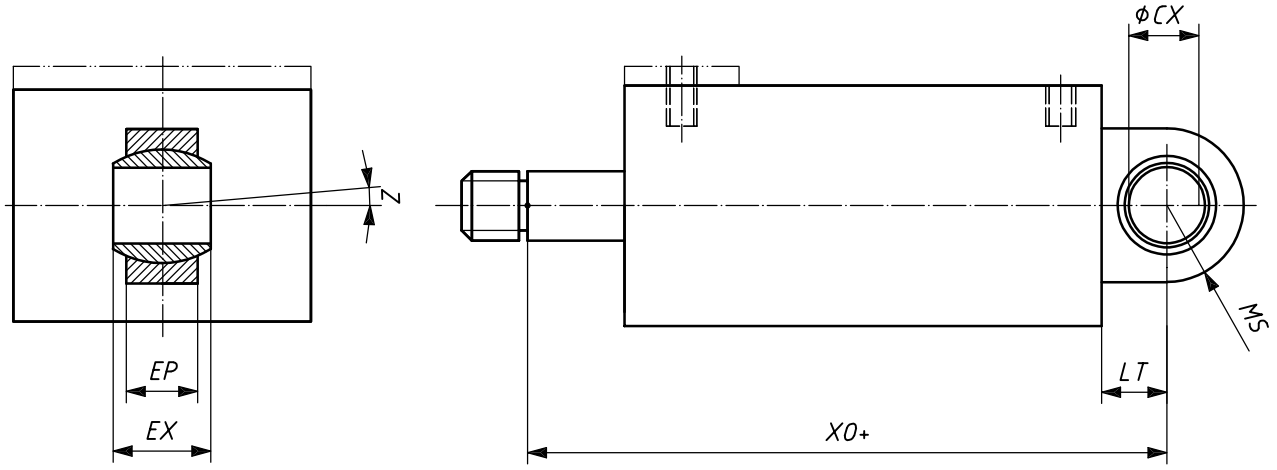


Figure 6 — MP 5 — Cap, fixed eye with spherical bearing

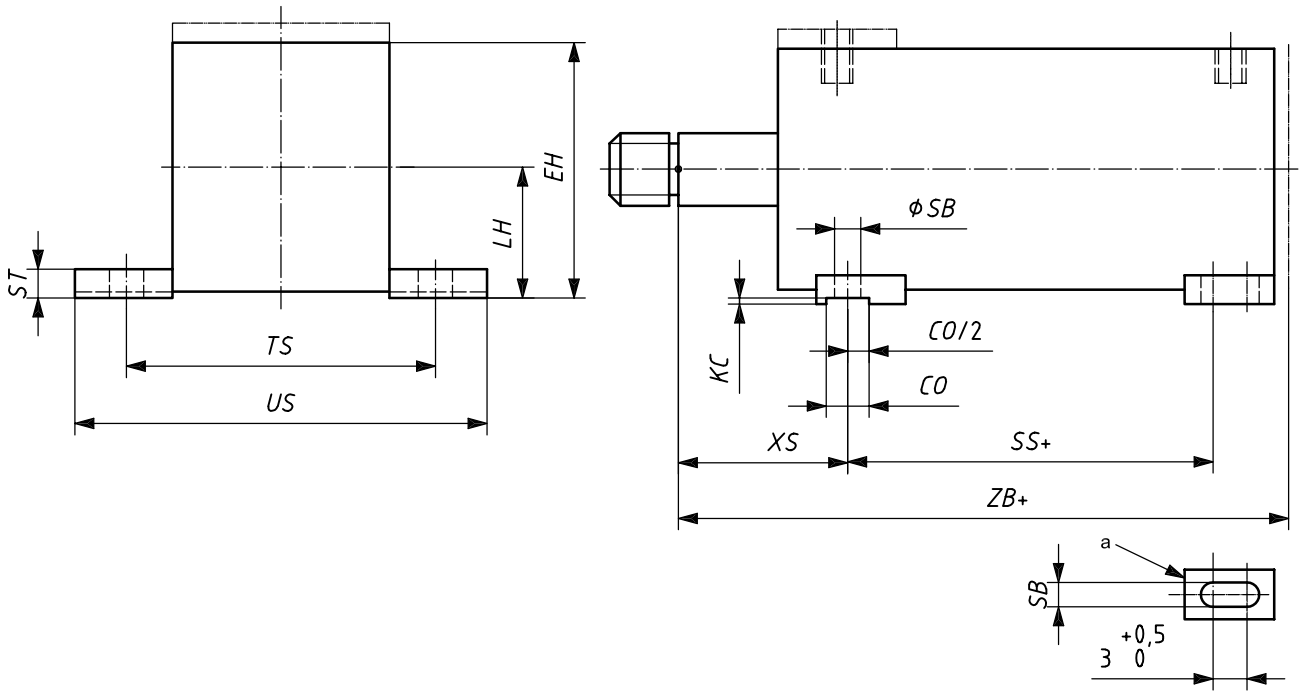
Table 6 — Dimensions on cap, fixed eye with spherical bearing

Dimensions in millimetres

Bore	**Rod** *MM*	*EP*	*EX*		*CX*		*MS*	*LT*	*XO* [a]	**Tilting angle** *Z*
		max.	nom.	tol.	nom.	tol.	max.	min.	± 1,5	min.
25	12 18	8	10	0 −0,12	12	0 −0,008	20	16	130	3°
32	14 22	11	14	0 −0,12	16	0 −0,008	22,5	20	148	
40	18 28	13	16	0 −0,12	20	0 −0,012	29	25	178	
50	22 36	17	20	0 −0,12	25	0 −0,012	33	31	190	
63	28 45	19	22	0 −0,12	30	0 −0,012	40	38	206	
80	36 56	23	28	0 −0,12	40	0 −0,012	50	48	238	
100	45 70	30	35	0 −0,12	50	0 −0,012	62	58	261	
125	56 90	38	44	0 −0,15	60	0 −0,015	80	72	304	
160	70 110	47	55	0 −0,15	80	0 −0,015	100	92	337	
200	90 140	57	70	0 −0,20	100	0 −0,020	120	116	415	

[a] The tolerance on dimension *XO* applies to strokes ⩽ 1250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

Dimensions in millimetres



a Two lugs.

Figure 7 — MS 2 — Side lugs

Table 7 — Dimensions of side lugs

Dimensions in millimetres

Bore	Rod *MM*	*TS* js13	*SB* [a] H13	*LH* h10	*XS* [b] ± 2	*SS* [b] ± 1,25	*ZB* max.	*ST* js13	*US* max.	*CO* [c] N9	*KC* [c] min.	*EH* nom.	*EH* tol.
25	12 18	54	6,6	19	33	72	121	8,5	72	—	—	39	± 1,5
32	14 22	63	9	22	45	72	137	12,5	84	—	—	44,5	± 1,5
40	18 28	83	11	31	45	97	166	12,5	103	12	4	62,5	± 1,5
50	22 36	102	14	37	54	91	176	19	127	12	4,5	74,5	± 1,5
63	28 45	124	18	44	65	85	185	26	161	16	4,5	89	± 1,5
80	36 56	149	18	57	68	104	212	26	186	16	5	114,5	± 1,5
100	45 70	172	26	63	79	101	225	32	216	16	6	128	± 2
125	56 90	210	26	82	79	130	260	32	254	20	6	164,5	± 2
160	70 110	260	33	101	86	129	279	38	318	30	8	203,5	± 2
200	90 140	311	39	122	92	171	336	44	381	40	8	244,5	± 2

a Hole in accordance with ISO 273, medium series.

b The tolerances on dimensions *XS* and *SS*+ apply to strokes ⩽ 1 250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

c Keyway is optional.

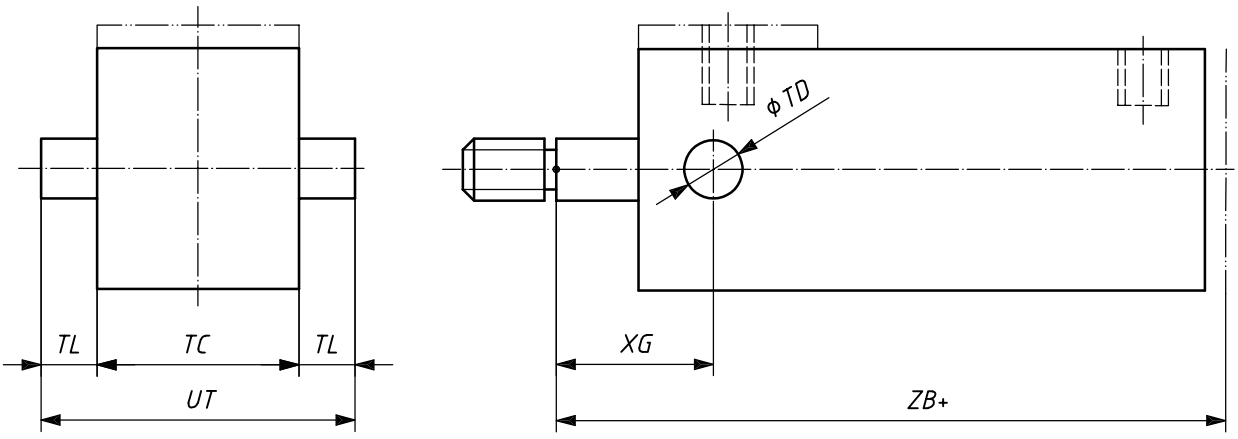


Figure 8 — MT 1 — Head, integral trunnion (male)

Table 8 — Dimensions of head, integral trunnion (male)

Dimensions in millimetres

Bore	Rod *MM*	*TC* h14	*UT* ref.	*TD* f8	*TL* js13	*XG* [a] ± 2	*ZB* max.
25	12	38	58	12	10	44	121
	18						
32	14	44	68	16	12	54	137
	22						
40	18	63	95	20	16	57	166
	28						
50	22	76	116	25	20	64	176
	36						
63	28	89	139	32	25	70	185
	45						
80	36	114	178	40	32	76	212
	56						
100	45	127	207	50	40	71	225
	70						
125	56	165	265	63	50	75	260
	90						
160	70	203	329	80	63	75	279
	110						
200	90	241	401	100	80	85	336
	140						

[a] The tolerance on dimension *XG* applies to strokes ⩽ 1250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

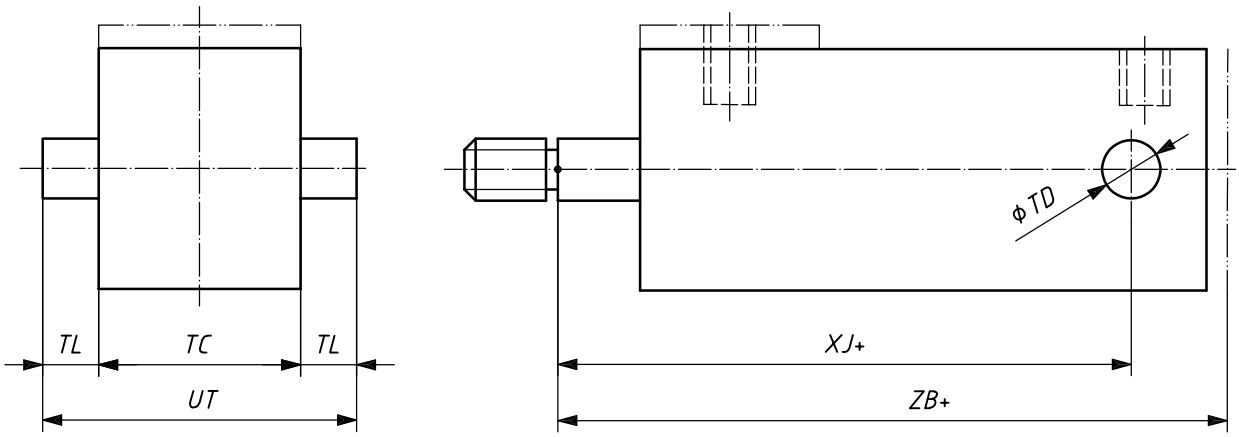


Figure 9 — MT 2 — Cap, integral trunnion (male)

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

Dimensions in millimetres

Bore	**Rod** *MM*	*TC* h14	*UT* ref	*TD* f8	*XJ* [a] ± 1,5	*TL* js13	*ZB* max.
25	12	38	58	12	101	10	121
	18						
32	14	44	68	16	115	12	137
	22						
40	18	63	95	20	134	16	166
	28						
50	22	76	116	25	140	20	176
	36						
63	28	89	139	32	149	25	185
	45						
80	36	114	178	40	168	32	212
	56						
100	45	127	207	50	187	40	225
	70						
125	56	165	265	63	209	50	260
	90						
160	70	203	329	80	230	63	279
	110						
200	90	241	401	100	276	80	336
	140						

[a] The tolerance on dimension *XJ* applies to strokes ⩽ 1250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

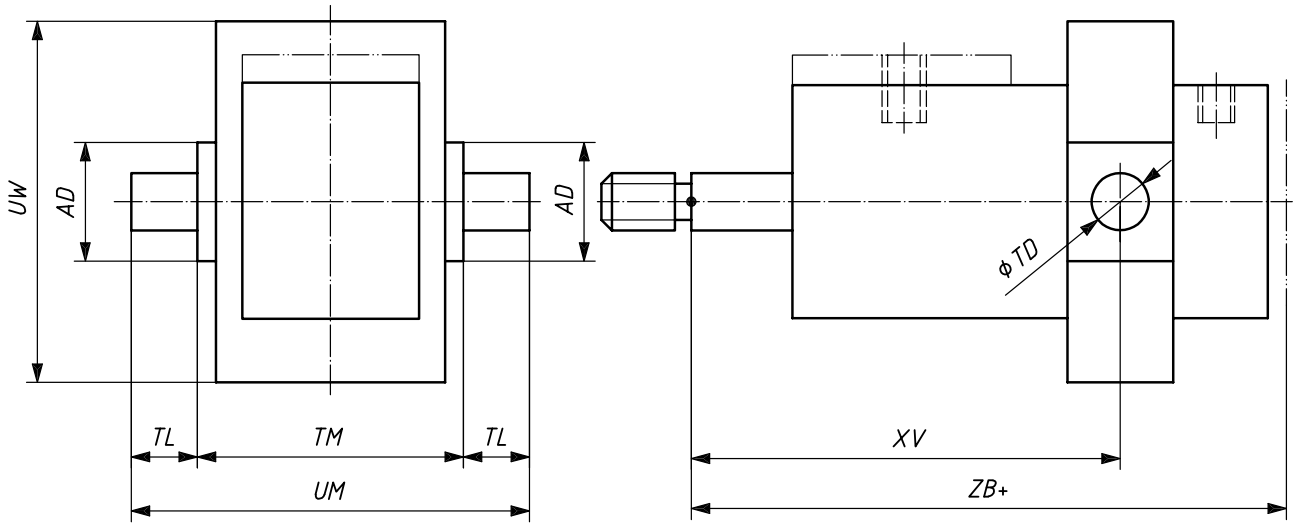


Figure 10 — MT 4 — Intermediate fixed or movable trunnion (male)

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

Dimensions in millimetres

Bore	**Rod** *MM*	*AD*	*UW*	*TM*	*UM*	*TD*	*TL*	*XV* [a, b] ± 2		*ZB*	**Stroke**[b]
		min.	max.	h14	ref.	f8	js13	min.	max.	max.	min.
25	12 18	20	63	48	68	12	10	82	72 + stroke	121	10
32	14 22	25	75	55	79	16	12	96	82 + stroke	137	14
40	18 28	30	92	76	108	20	16	107	88 + stroke	166	19
50	22 36	40	112	89	129	25	20	117	90 + stroke	176	27
63	28 45	40	126	100	150	32	25	132	91 + stroke	185	41
80	36 56	50	160	127	191	40	32	147	99 + stroke	212	48
100	45 70	60	180	140	220	50	40	158	107 + stroke	225	51
125	56 90	73	215	178	278	63	50	180	109 + stroke	260	71
160	70 110	90	260	215	341	80	63	198	104 + stroke	279	94
200	90 140	110	355	279	439	100	80	226	130 + stroke	336	96

[a] The tolerance on dimension *XV* applies to strokes ⩽ 1 250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

[b] For the maximum and minimum values of *XV* to be valid, the cylinder shall have a minimum stroke, as listed in this table.

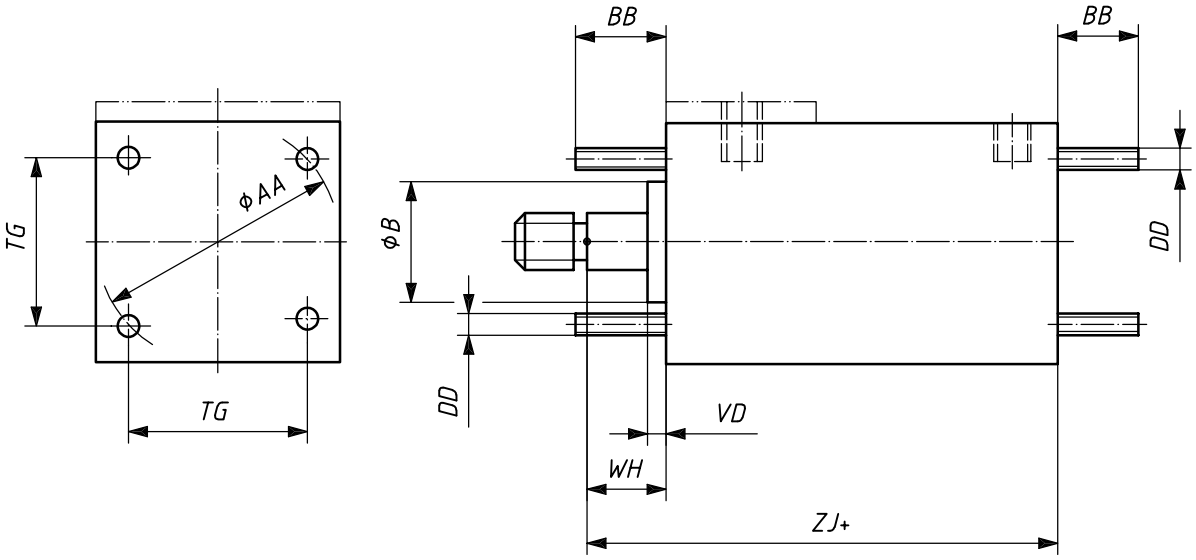


Figure 11 — MX 1 — Both ends studs or tie rods extended

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

Dimensions in millimetres

Bore	**Rod** *MM*	*DD* 6g	*BB* +3 0	*AA* ref.	*WH* ± 2	*ZJ* [a] ± 1	*B* f9	*VD* min.	*TG* js13
25	12	M5 × 0,8	19	40	15	114	24	5	28,3
	18						30		
32	14	M6 × 1	24	47	25	128	26	5	33,2
	22						34		
40	18	M8 × 1	35	59	25	153	30	5	41,7
	28						42		
50	22	M12 × 1,25	46	74	25	159	34	5	52,3
	36						50		
63	28	M12 × 1,25	46	91	32	168	42	5	64,3
	45						60		
80	36	M16 × 1,5	59	117	31	190	50	5	82,7
	56						72		
100	45	M16 × 1,5	59	137	35	203	60	5	96,9
	70						88		
125	56	M22 × 1,5	81	178	35	232	72	5	125,9
	90						108		
160	70	M27 × 2	92	219	32	245	88	5	154,9
	110						133		
200	90	M30 × 2	115	269	32	299	108	5	190,2
	140						163		

[a] The tolerance on dimension *ZJ* applies to strokes ⩽ 1 250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

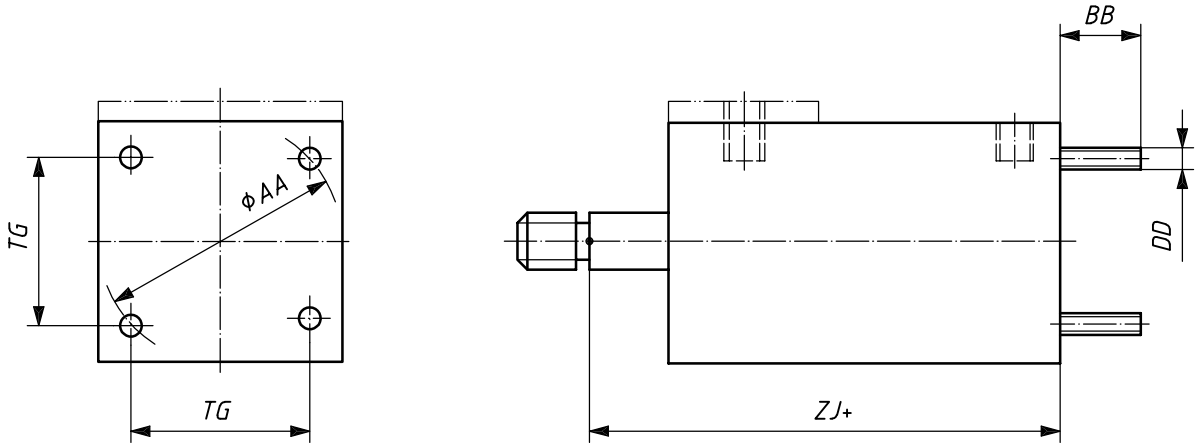


Figure 12 — MX 2 — Cap studs or tie rods extended

Table 12 — Cap studs or tie rods extended

Dimensions in millimetres

Bore	**Rod** *MM*	*DD* g6	*BB* +3 0	*AA* ref.	*ZJ* [a] ± 1	*TG* js13
25	12	M5 × 0,8	19	40	114	28,3
	18					
32	14	M6 × 1	24	47	128	33,2
	22					
40	18	M8 × 1	35	59	153	41,7
	28					
50	22	M12 × 1,25	46	74	159	52,3
	36					
63	28	M12 × 1,25	46	91	168	64,3
	45					
80	36	M16 × 1,5	59	117	190	82,7
	56					
100	45	M16 × 1,5	59	137	203	96,9
	70					
125	56	M22 × 1,5	81	178	232	125,9
	90					
160	70	M27 × 2	92	219	245	154,9
	110					
200	90	M30 × 2	115	269	299	190,2
	140					

[a] The tolerance on dimension *ZJ* applies to strokes ⩽ 1 250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

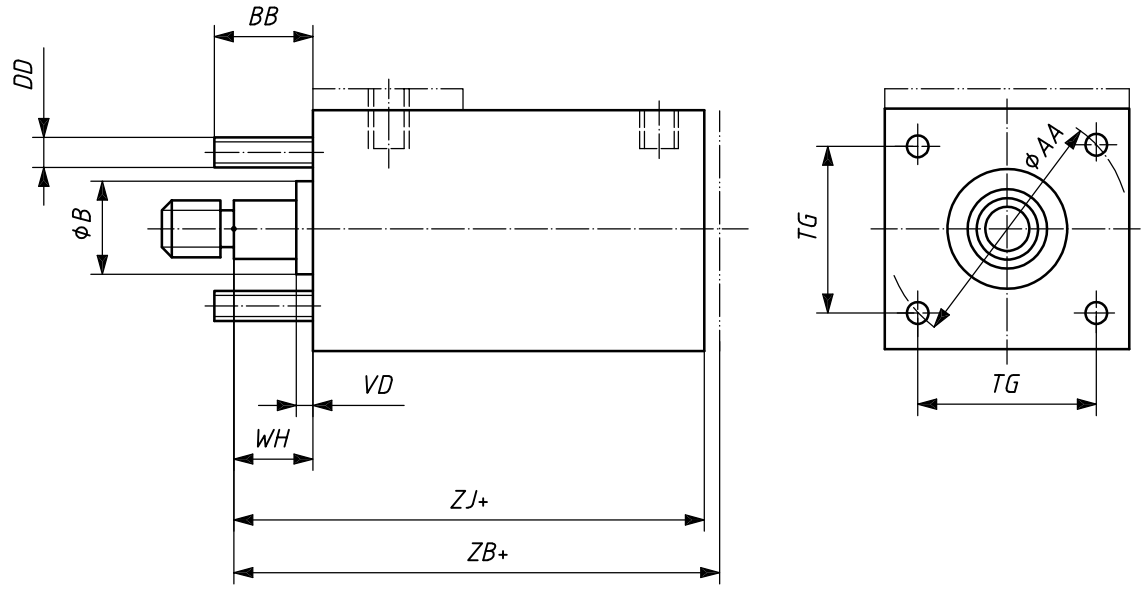


Figure 13 — MX 3 — Head studs or tie rods extended

Table 13 — Dimensions of head studs or tie rods extended

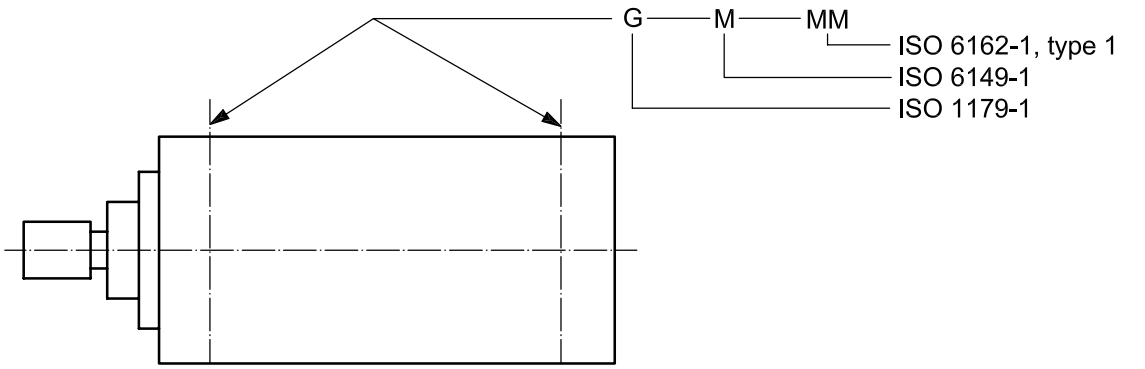
Dimensions in millimetres

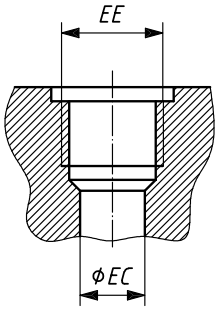
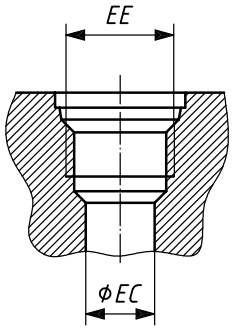
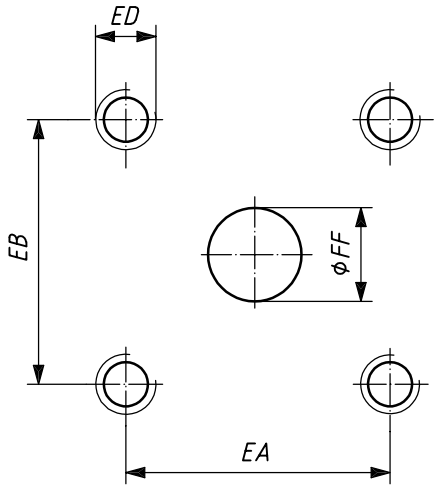
Bore	Rod *MM*	*AA* ref.	*DD* g6	*BB* +3 0	*WH* [a] ± 2	*ZJ* [a] ± 1	*B* f9	*VD* min.	*TG* js13	*ZB* max.
25	12	40	M5 × 0,8	19	15	114	24	5	28,3	121
	18						30			
32	14	47	M6 × 1	24	25	128	26	5	33,2	137
	22						34			
40	18	59	M8 × 1	35	25	153	30	5	41,7	166
	28						42			
50	22	74	M12 × 1,25	46	25	159	34	5	52,3	176
	36						50			
63	28	91	M12 × 1,25	46	32	168	42	5	64,3	185
	45						60			
80	36	117	M16 × 1,5	59	31	190	50	5	82,7	212
	56						72			
100	45	137	M16 × 1,5	59	35	203	60	5	96,9	225
	70						88			
125	56	178	M22 × 1,5	81	35	232	72	5	125,9	260
	90						108			
160	70	219	M27 × 2	92	32	245	88	5	154,9	279
	110						133			
200	90	269	M30 × 2	115	32	299	108	5	190,2	336
	140						163			

[a] The tolerance on dimensions *WH* and *ZJ* apply to strokes ⩽ 1 250 mm. For longer strokes, tolerances can be in accordance with the manufacturer's standard or by agreement between the manufacturer and user.

Table 14 — Port and flange sizes and dimensions

Dimensions in millimetres



Bore	ISO 1179-1 port		ISO 6149-1 port		ISO 6162-1 rectangular flange, type 1				
									
	G		**M**		**MM**				
	EE 6g	*EC* min.	*EE* 6g	*EC* min.	**Nominal flange size DN**	*FF* max.	*EA* ± 0,25	*EB* ± 0,25	*ED*
25	G 1/4	7,5	M14 × 1,5	7,5	—	—	—	—	—
32									
40	G 3/8	9	M18 × 1,5	11	—	—	—	—	—
50	G 1/2	14	M22 × 1,5	14	—	—	—	—	—
63									
80	G 3/4	18	M27 × 2	18	—	—	—	—	—
100									
125	G 1	23	M33 × 2	23	25	25	26,2	52,4	M10 × 1,5
160									
200	G 1¼	30	M42 × 2	30	32	32	30,2	58,7	M10 × 1,5

CAUTION — When selecting the largest diameter piston rod in a given bore size in connection with hydraulic systems where pull loads and/or pressure intensification effects may be generated, the pressure in the piston rod cavity of the cylinder can be two or more times the working pressure of the hydraulic system. In these cases, flange ports in accordance with ISO 6162-1, as shown in this table, may not have sufficient pressure ratings. When flange ports with a higher pressure rating are needed, they can be selected from the higher pressure series specified in ISO 6162-2.

Bibliography

[1] ISO 273, *Fasteners — Clearance holes for bolts and screws*

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

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

[4] ISO 4394-1, *Fluid power systems and components — Cylinder barrels — Part 1: Requirements for steel tubes with specially finished bores*

[5] ISO 6020-3, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 3: Compact series with bores from 250 mm to 500 mm*

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