

International Standard



6020/2

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Hydraulic fluid power — Single rod cylinders — Mounting dimensions — 160 bar (16 000 kPa) series — Part 2 : Compact series

Transmissions hydrauliques — Vérins 160 bar (16 000 kPa) à simple tige — Dimensions d'interchangeabilité — Partie 2 : Série compacte

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6020/2 was developed by Technical Committee ISO/TC 131, *Fluid power systems and components*, and was circulated to the member bodies in December 1978.

It has been approved by the member bodies of the following countries :

Austria	India	South Africa, Rep. of
Belgium	Ireland	Spain
Brazil	Italy	Sweden
Canada	Japan	Turkey
Chile	Korea, Rep. of	United Kingdom
Czechoslovakia	Netherlands	USA
Finland	Poland	USSR
Germany, F. R.	Romania	Yugoslavia

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Australia
France
Hungary
Norway

Hydraulic fluid power — Single rod cylinders — Mounting dimensions — 160 bar (16 000 kPa¹⁾) series — Part 2 : Compact series

0 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.

Two mounting standards have been provided to meet the needs required in the application of interchangeable cylinders. This International Standard is one of two parts relating to mounting dimensions for 160 bar hydraulic cylinders. The other part relating to 160 medium series, is ISO 6020/1, *Hydraulic fluid power — Single rod cylinders — Mounting dimensions — 160 bar (16 000 kPa) series — Part 1 : Medium series*.

1 Scope and field of application

This International Standard establishes metric mounting dimensions for compact series cylinders as required for interchangeability of commonly used hydraulic cylinders.

NOTES

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

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

2 References

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

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, *Fluid power systems and components — Vocabulary*.²⁾

3 Definitions

Definitions of other terms used in this International Standard are given in ISO 5598.

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

3.2 cylinder bore : The internal diameter of the cylinder.

3.3 piston rod : The element transmitting mechanical force and motion from the piston.

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

4 Dimensions

Select mounting dimensions for cylinders manufactured in accordance with this International Standard from tables 1 to 13 inclusive.

5 Bore sizes

Included in this compact series are the following bore sizes :

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

1) 1 Pa = 1 N/m²

2) At present at the stage of draft.

6 Mounting styles

This International Standard includes the following mounting styles :

- ME5 — Head rectangular mounting (see figure 2 and table 2)
- ME6 — Cap rectangular mounting (see figure 3 and table 3)
- MP1 — Cap fixed clevis mounting (see figure 4 and table 4)
- MP3 — Cap fixed eye mounting (see figure 5 and table 5)
- MP5 — Cap fixed eye with spherical plain bearing mounting (see figure 6 and table 6)
- MS2 — Side lugs mounting (see figure 7 and table 7)
- MT1 — Head integral trunnion (male) mounting (see figure 8 and table 8)
- MT2 — Cap integral trunnion (male) mounting (see figure 9 and table 9)
- MT4 — Intermediate fixed or movable trunnion (male) mounting (see figure 10 and table 10)
- MX1 — Both ends studs or tie rods extended mounting (see figure 11 and table 11)
- MX2 — Cap studs or tie rods extended mounting (see figure 12 and table 12)
- MX3 — Head studs or tie rods extended mounting (see figure 13 and table 13)

7 Piston rod characteristics

7.1 This International Standard covers piston rods having 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 For rod end eyes, International Standards are being prepared.

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 cylinder mounting dimensions selected in accordance with ISO 6020/2, *Hydraulic fluid power — Single rod cylinders — Mounting dimensions — 160 bar (16 000 kPa) series — Part 2 : Compact series.*"

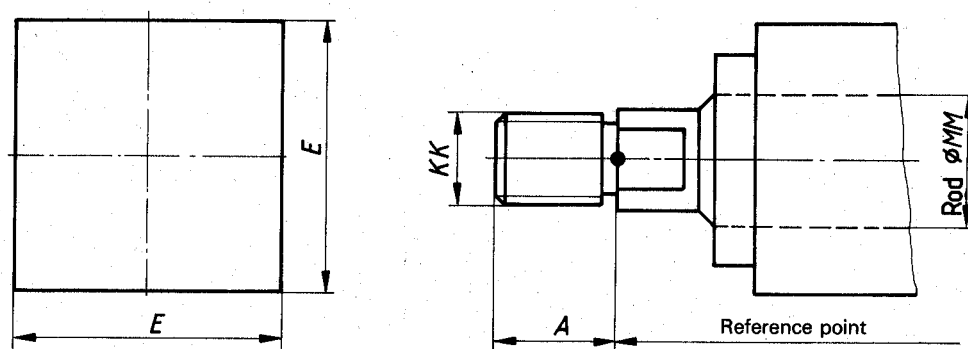


Figure 1 — General dimensions

Table 1 — General dimensions

Dimensions in millimetres

Bore	Rod MM	KK	A	E max.
25	12	M10 × 1,25	14	42
	18	M14 × 1,5	18	
32	14	M12 × 1,25	16	50
	22	M16 × 1,5	22	
40	18	M14 × 1,5	18	68
	28	M20 × 1,5	28	
50	22	M16 × 1,5	22	80
	36	M27 × 2	36	
63	28	M20 × 1,5	28	95
	45	M33 × 2	45	
80	36	M27 × 2	36	120
	56	M42 × 2	56	
100	45	M33 × 2	45	132
	70	M48 × 2	63	
125	56	M42 × 2	56	170
	90	M64 × 3	85	
160	70	M48 × 2	63	210
	110	M80 × 3	95	
200	90	M64 × 3	85	250
	140	M100 × 3	112	

NOTE — If other piston rod diameters or other piston rod threads are required, use those identified in ISO 3320 and ISO 4395.

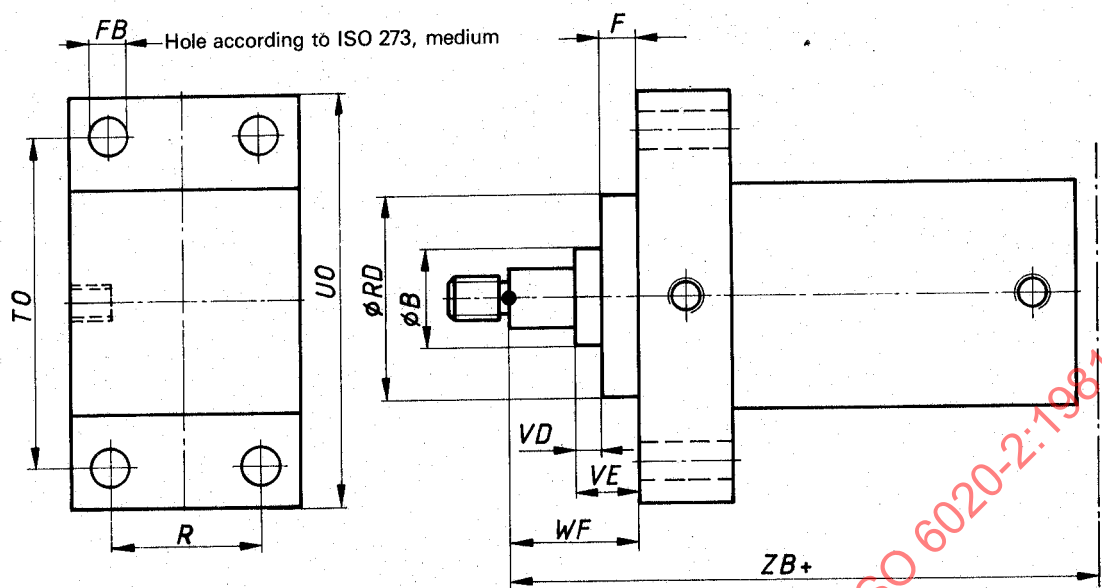


Figure 2 — ME5 — Head rectangular mounting

Table 2 — Dimensions of head rectangular mounting

Dimensions in millimetres

Bore	Rod MM	RD max.	TO	FB	R	WF	F max.	VE	VD min.	B	UO max.	ZB max.
25	12	50	51	5,5	27	25	10	16	5	24	65	121
	18	50								30		
32	14	57	58	6,6	33	35	10	22	5	26	80	137
	22	57								34		
40	18	57	87	11	41	35	10	16	5	30	115	166
	28	76						22		42		
50	22	76	105	13,5	52	41	16	22	5	34	142	176
	36	89						25		50		
63	28	76	117	13,5	65	48	16	22	5	42	160	185
	45	100						29		60		
80	36	89	149	17,5	83	51	20	25	5	50	190	212
	56	120						29		72		
100	45	100	162	17,5	97	57	22	29	5	60	220	225
	70	135						32		88		
125	56	120	208	22	126	57	22	29	5	72	260	244
	90	165						32		108		
160	70	135	253	26	155	57	25	32	5	88	320	279
	110	202						32		133		
200	90	165	300	33	190	57	25	32	5	108	380	336
	140	240						32		163		

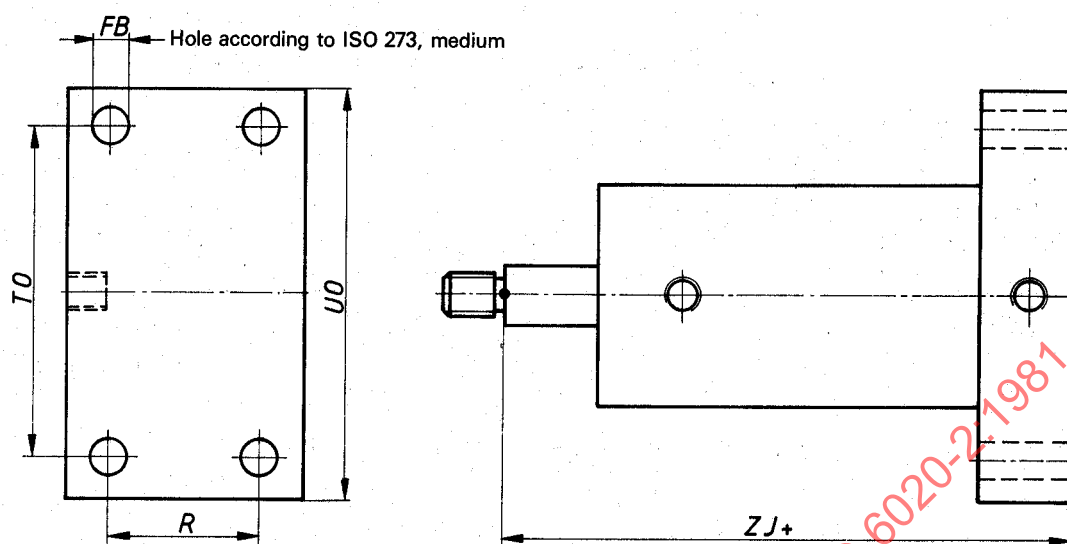


Figure 3 — ME6 — Cap rectangular mounting

Table 3 — Dimensions of cap rectangular mounting

Dimensions in millimetres

Bore	Rod MM	TO	FB	R	ZJ	UO max.
25	12	51	5,5	27	114	65
	18					
32	14	58	6,6	33	128	80
	22					
40	18	87	11	41	153	115
	28					
50	22	105	13,5	52	159	142
	36					
63	28	117	13,5	65	168	160
	45					
80	36	149	17,5	83	190	190
	56					
100	45	162	17,5	97	203	220
	70					
125	56	208	22	126	216	240
	90					
160	70	253	26	155	245	320
	110					
200	90	300	33	190	299	380
	140					

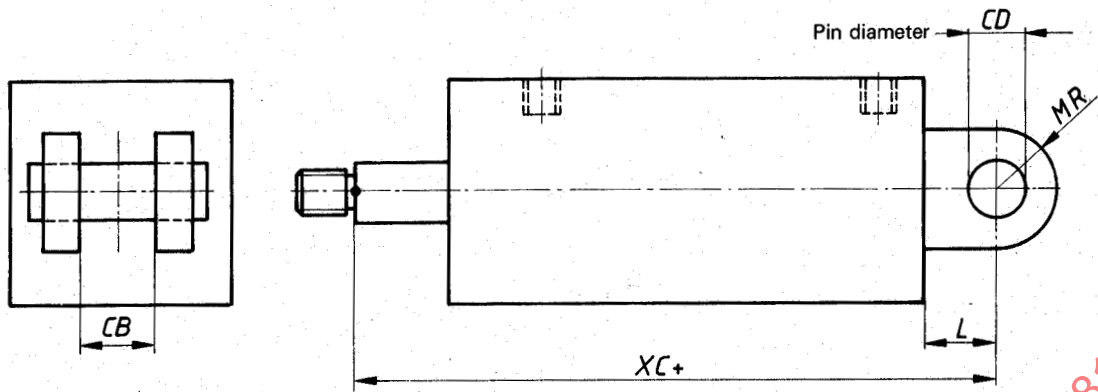


Figure 4 – MP1 – Cap fixed clevis mounting

Table 4 – Dimensions of cap fixed clevis mounting

Dimensions in millimetres

Bore	Rod MM	CB	CD	MR max.	L	XC
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	273
	90					
160	70	70	56	59	63	308
	110					
200	90	80	70	78	82	381
	140					

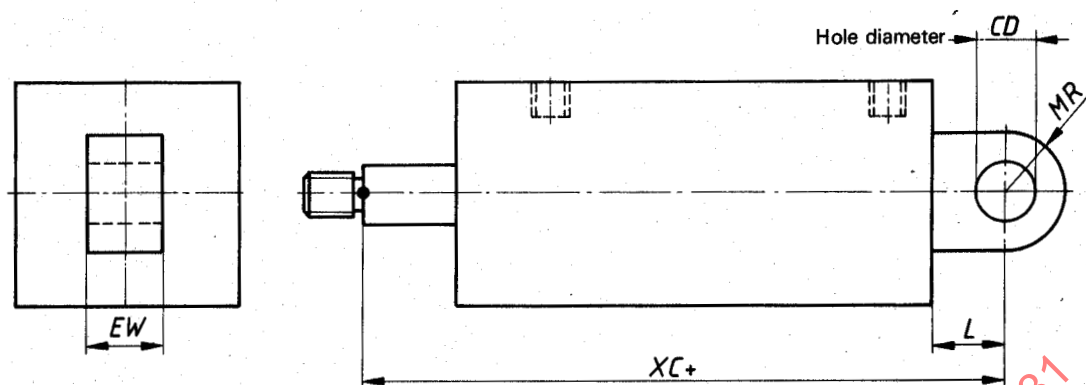


Figure 5 — MP3 — Cap fixed eye mounting

Table 5 — Dimensions of cap fixed eye mounting

Dimensions in millimetres

Bore	Rod MM	EW	CD	MR max	L	XC
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	273
	90					
160	70	70	56	59	63	308
	110					
200	90	80	70	78	82	381
	140					

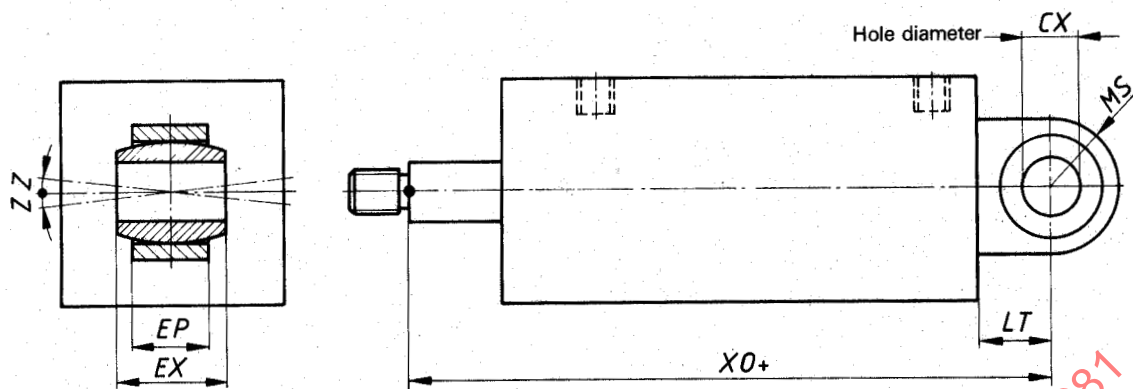


Figure 6 — MP5 — Cap fixed eye with spherical plain bearing mounting

Table 6 — Dimensions of cap fixed eye with spherical plain bearing mounting

Dimensions in millimetres

Bore	Rod MM	EP	EX	CX	MS max.	LT	XO	Tilting angle Z
25	12	6	9	10	20	13	127	4°
	18							
32	14	7	10	12	23	19	147	
	22							
40	18	10	14	16	29	22	175	
	28							
50	22	12	16	20	32	32	191	
	36							
63	28	16	20	25	45	36	204	
	45							
80	36	18	22	30	41	39	229	
	56							
100	45	22	28	40	74	58	261	
	70							
125	56	28	35	50	86	62	278	
	90							
160	70	36	44	60	85	63	308	
	110							
200	90	45	55	80	111	82	381	
	140							

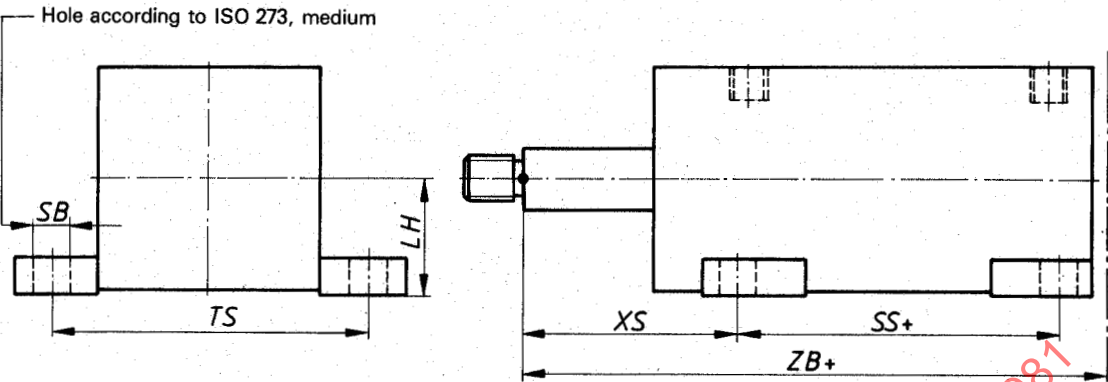


Figure 7 — MS2 — Side lugs mounting

Table 7 — Dimensions of side lugs mounting

Dimensions in millimetres							
Bore	Rod MM	TS	SB	LH	XS	SS	ZB max.
25	12	54	6,6	19	33	73	121
	18						
32	14	63	9	22	45	73	137
	22						
40	18	83	11	31	45	98	166
	28						
50	22	102	14	38	54	92	176
	36						
63	28	124	20	44	65	86	185
	45						
80	36	149	20	57	68	105	212
	56						
100	45	172	26	63	79	102	225
	70						
125	56	210	26	82	79	115	244
	90						
160	70	260	33	101	86	130	279
	110						
200	90	311	39	120	92	172	336
	140						

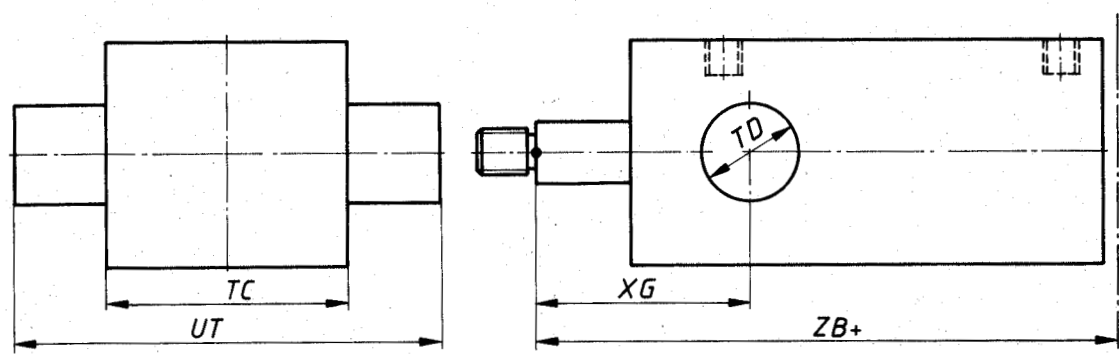


Figure 8 — MT1 — Head integral trunnion (male) mounting

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

Dimensions in millimetres

Bore	Rod MM	TC	UT	TD	XG	ZB max.
25	12	38	62	12	44	121
	18					
32	14	44	76	16	54	137
	22					
40	18	63	113	25	57	166
	28					
50	22	76	140	32	64	176
	36					
63	28	89	153	32	70	185
	45					
80	36	114	186	36	76	212
	56					
100	45	127	207	40	83	225
	70					
125	56	165	249	42	83	244
	90					
160	70	203	315	56	86	279
	110					
200	90	241	391	75	95	336
	140					

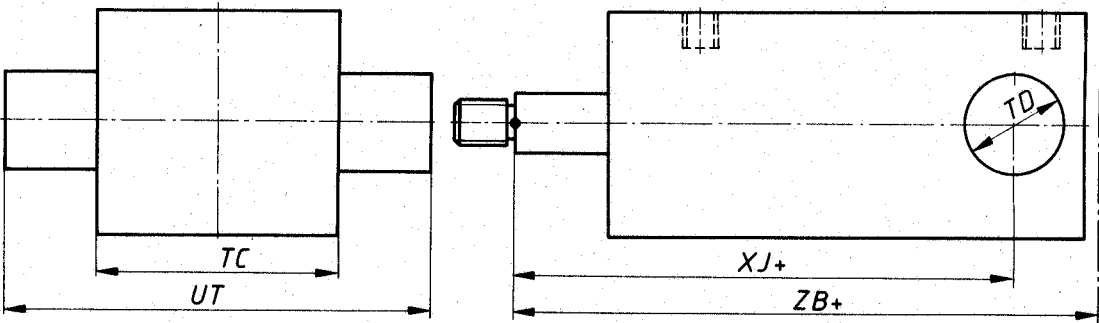


Figure 9 — MT2 — Cap integral trunnion (male) mounting

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

Dimensions in millimetres

Bore	Rod MM	TC	UT	TD	XJ	ZB max.
25	12	38	62	12	101	121
	18					
32	14	44	76	16	115	137
	22					
40	18	63	113	25	134	166
	28					
50	22	76	140	32	140	176
	36					
63	28	89	153	32	149	185
	45					
80	36	114	186	36	168	212
	56					
100	45	127	207	40	181	225
	70					
125	56	165	249	42	194	244
	90					
160	70	203	315	56	216	279
	110					
200	90	241	391	75	261	336
	140					

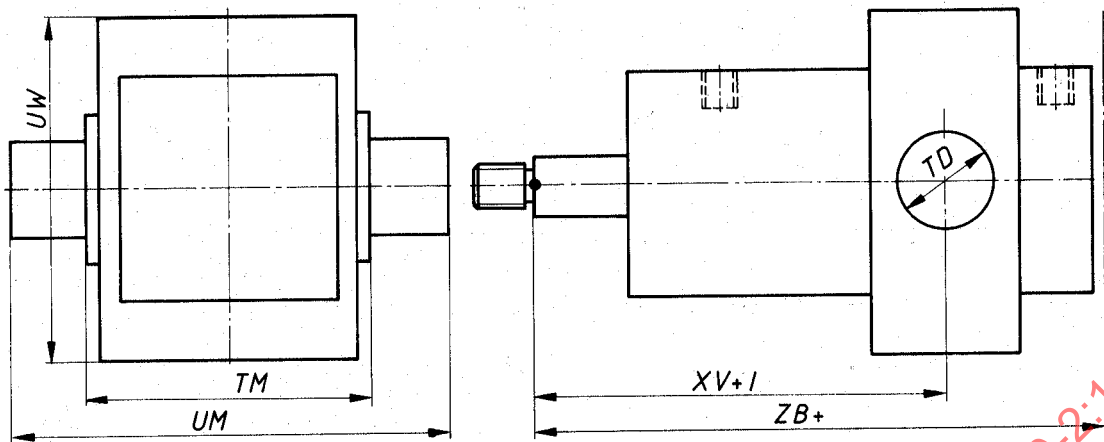


Figure 10 – MT4 – Intermediate fixed or movable trunnion (male) mounting

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

Dimensions in millimetres

Bore	Rod MM	UW max.	TM	UM	TD	XV	ZB max.
25	12	63	48	72	12	(Variable)	121
	18						137
32	14	75	55	87	16		166
	22						176
40	18	92	76	126	25		185
	28						212
50	22	112	89	153	32		225
	36						244
63	28	126	100	164	32		279
	45						336
80	36	160	127	199	36		
	56						
100	45	180	140	220	40		
	70						
125	56	215	178	262	42		
	90						
160	70	260	215	327	56		
	110						
200	90	355	279	429	75		
	140						

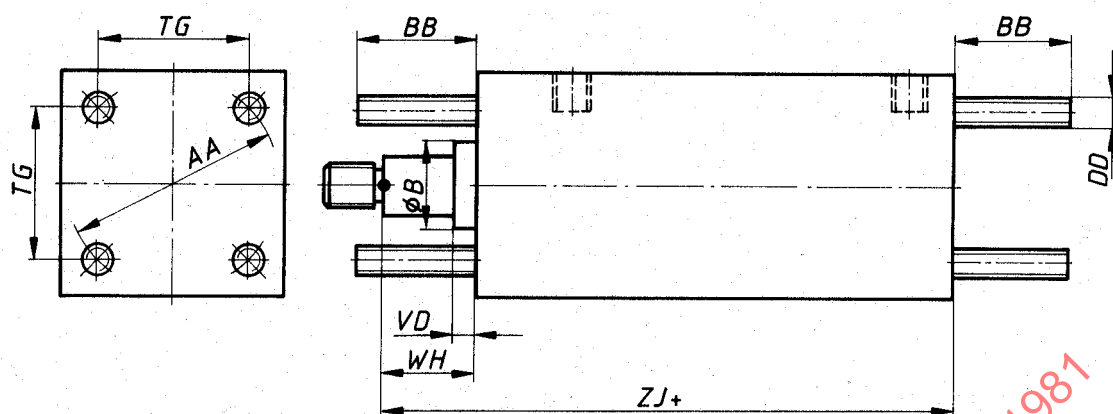


Figure 11 — MX1 — Both ends studs or tie rods extended mounting

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

Dimensions in millimetres

Bore	Rod MM	DD	BB	AA	WH	ZJ	B	VD min.	TG
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	216	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		

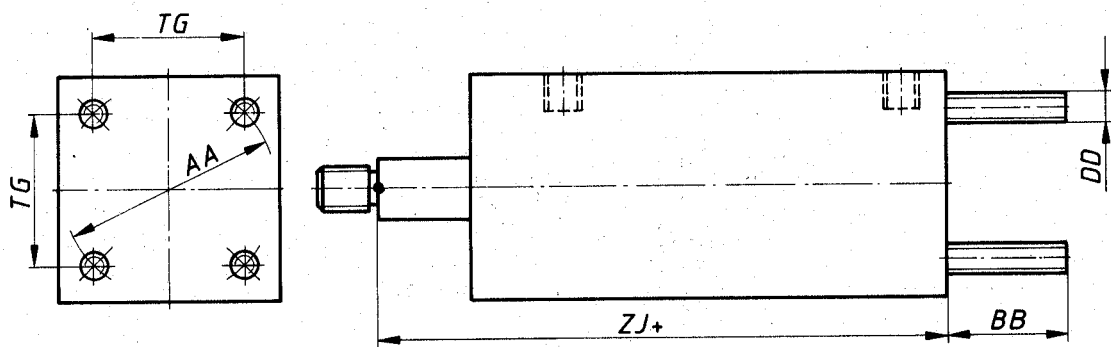


Figure 12 — MX2 — Cap studs or tie rods extended mounting

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

Dimensions in millimetres

Bore	Rod MM	DD	BB	AA	ZJ	TG
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	216	125,9
	90					
160	70	M27 × 2	92	219	245	154,9
	110					
200	90	M30 × 2	115	269	299	190,2
	140					