



IPH_T

An ISO 9001 Company

IPH_T Series 5

Cylinder mounting dimensions — 10 MPa (100 bar) series.

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IPH Series 5 establishes metric mounting dimensions for compact series cylinders, 10 MPa [100 bar] , as required for interchangeability of commonly-used hydraulic cylinders.

NOTE

IPH Series 5 allows manufacturers of hydraulic equipment flexibility in the design of metric cylinders and does not restrict technical development; however, it does provide basic guidelines.

References

The following referenced documents are applicable.

Sr No	Reference	Application
1	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
2	ISO 3320	Fluid power systems and components — Cylinder bores and pistons rod diameters — Metric series
3	ISO 4395	Fluid power systems and components — Cylinders — Piston rod thread dimensions and types
4	ISO 5598	Fluid power systems and components — Vocabulary
6	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
10	ISO 8133	Hydraulic fluid power — Single rod cylinders, 16 MPa (160 bar) compact series — Mounting dimensions for accessories

Technical Information

Sr No	Part	Construction Details
1	Barrel	ST-52, ASTM A-106 Gr. B Flanges are welded, machined and honed to 0.4 micron finish
2	Piston Rod	Made from medium Carbon Steel, ground, hard chrome plated and super finished
3	End Covers	Made from Steel IS 2062, Machined. CNC finish available for large quantities
4	Gland	As three options, PB Bush, Cast or made from Steel directly. Bush is inserted for smooth operation of piston rod and for suitable guidance
5	Mounting	Multiple mountings are available and correspond to as per ISO 10762
6	Self-Aligning Cushioning Boss	Enable accurate movement inside cushioning chamber at the end of stroke
7	Cushioning Screws	For free adjustment is available as an option
8	Air Bleed	Screw provided for releasing trapped air in cylinder

More Information

Standards: The installation dimensions and mounting types of the cylinders comply with standards ISO 10762

Nominal pressure: 160 bar (16 MPa)

Static test pressure: 240 bar (24 MPa)

Higher operating pressures up to 450 bar on request.

Minimum pressure: Depending on the application, a certain minimum pressure is required to ensure proper operation of the cylinder. If no load is applied, we recommend a minimum pressure of 10 bar for single-rod cylinders.

Installation position: Optional

Hydraulic fluid: Mineral oils DIN 51524 (HL, HLP)

Hydraulic fluid temperature range: -20 °C to +80 °C

Ambient temperature range: -20 °C to +80 °C

Viscosity range: 2.8 to 380 mm²/s

Permissible maximum degree of contamination of the hydraulic fluid to ISO 4406 (c) class 20/18/15.

Primer coating: As a standard, hydraulic cylinders are primed with one coating in a thickness of max 80 microns

SEALS

Sr No	Seal Type	Description
1	Piston Seal	Based on ISO 7425-1 and ISO 10766
2	Piston Seal	DAS™ variation for holding power, Step Seal for
3	Gland Seal	Dimensions correspond generally to RU3 ISO 5597
4	Wiper	Dimensions correspond generally to ISO 6195. Metallic Wipers available for high temperature (+80C).
5	Static	Nitrile Rubber 'O' Rings

Viton based variations are available for high temperature (> 80 degrees or > 176 Fahrenheit) applications

Bore sizes

IPH_r Series 5 covers the following bore sizes, expressed in millimeters, in accordance with ISO 3320:1987

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

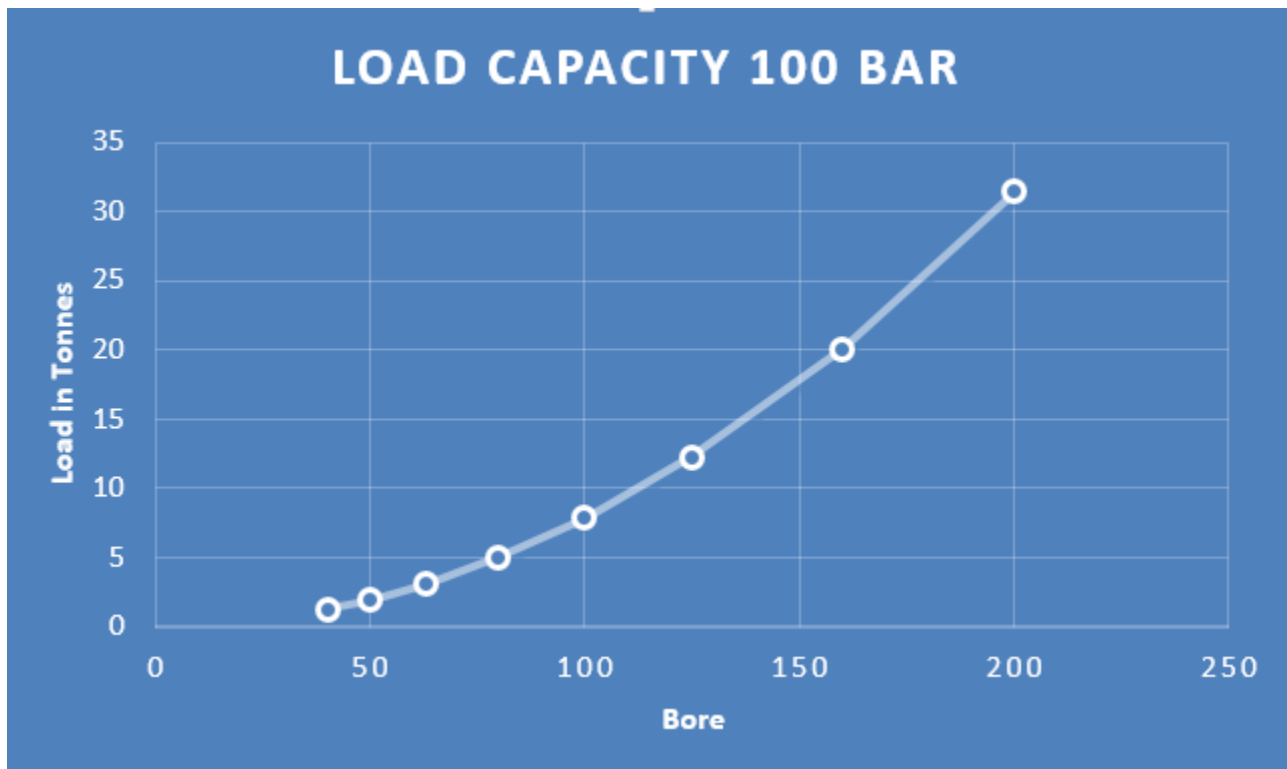
NOTE Mounting dimensions for compact hydraulic single rod cylinders with bores from 250 mm to 500 mm are specified in IPH_r Series 5.

Stroke tolerances

The tolerance on strokes under 1250 mm shall be ± 0.2 mm.

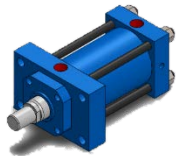
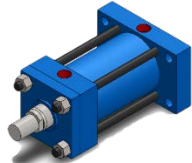
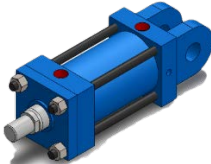
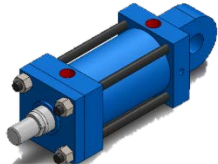
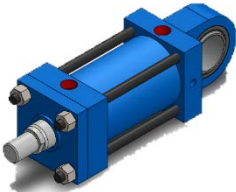
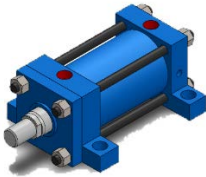
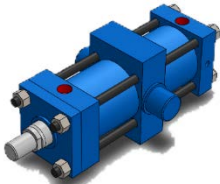
Tolerances on strokes > 1250 mm shall be in accordance with the IPH_r specification or an agreement between the IPH_r and customer.

Load Capacity Chart



Available Mounting types

Mounting types are in accordance with ISO 6099

Sr No	Code	Type	
1	ME 5	Head, rectangular flange	
2	ME 6	Cap, rectangular flange	
3	MP 1	Cap, Fixed Clevis	
4	MP 3	Cap, fixed plain eye	
5	MP 5	- Cap, detachable eye with spherical bearing	
6	MS 2	Side lugs	
7	MT 4	Intermediate fixed or movable trunnion (male)	

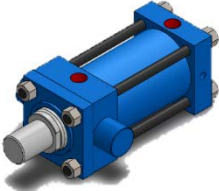
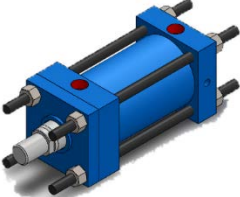
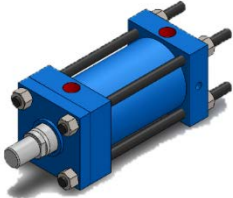
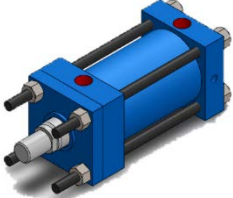
8	MT 1	Head, integral trunnion (male)	
9	MX 1	Both ends studs or tie rods extended	
10	MX 2	Cap studs or tie rods extended	
11	MX 3	Head Studs or Tie Rod extended	

Table 1 — Basic dimensions

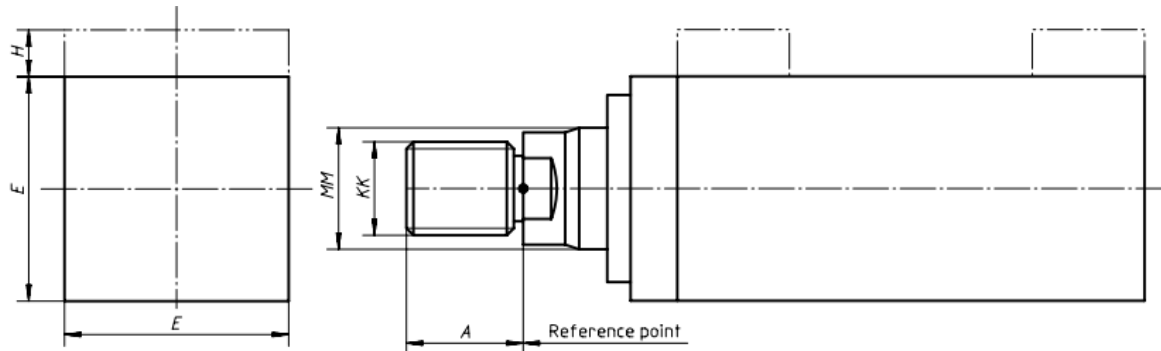


Figure 1 — Basic dimensions

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.

Table 2 — Port dimensions and Positions

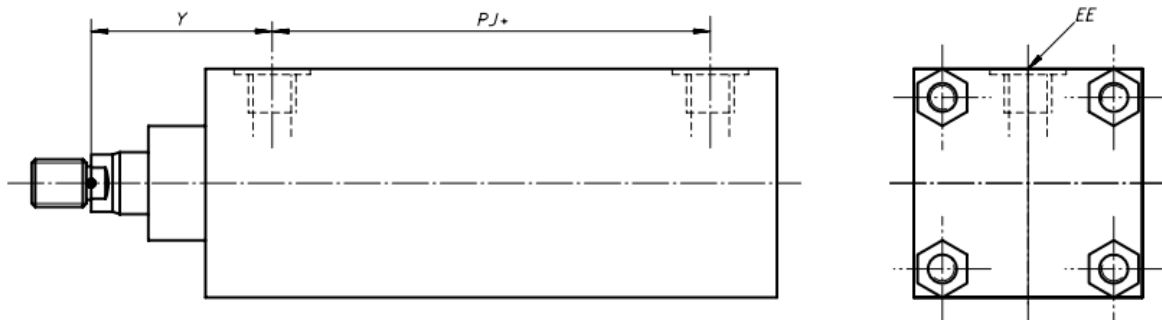


Figure 2 — Port dimensions and positions

Table 2 — Port dimensions and positions

Dimensions in millimetres

Bore	<i>EE</i>		<i>y</i> ³⁾ ± 2	<i>PJ</i> ³⁾ ± 1,25
	inch ¹⁾	metric ²⁾		
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.

Table 3 — Dimensions Of Rectangular Flange, Integral With Head

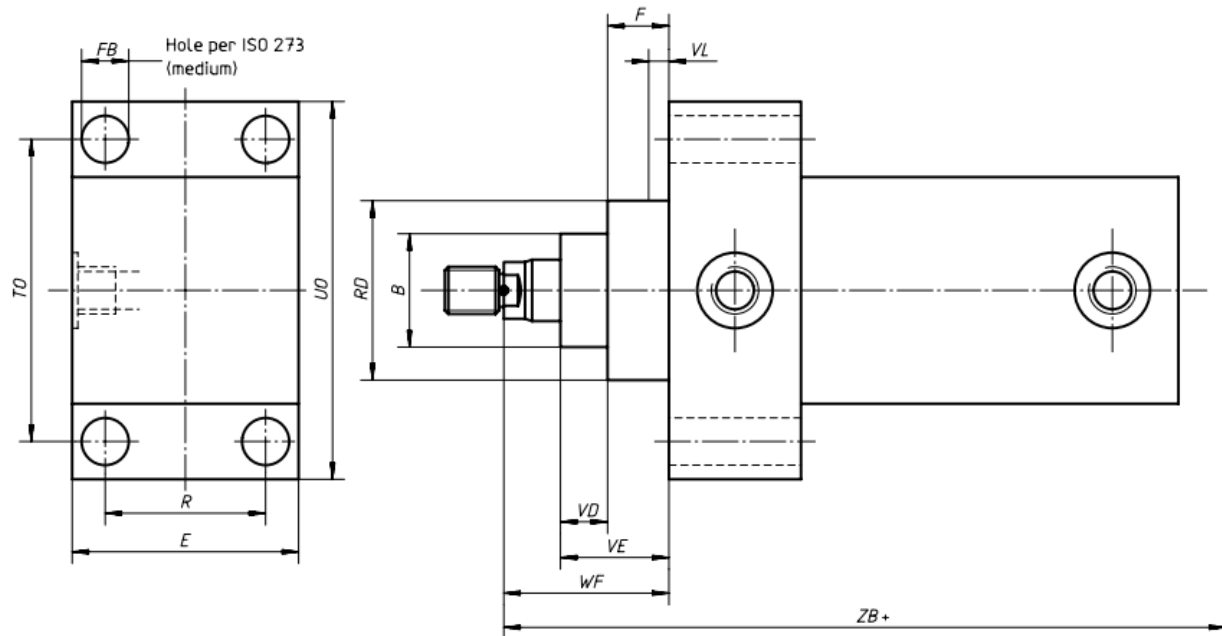


Figure 3 — ME5 — Rectangular flange, integral with head

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	

Table 4 — Dimensions Of Cap, Rectangular Flange

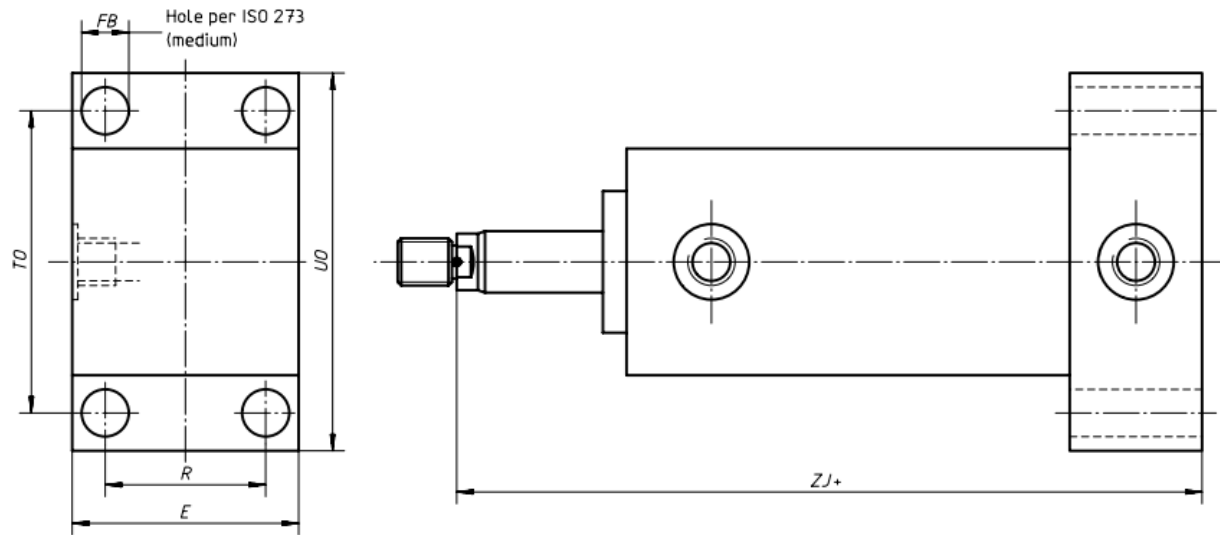


Figure 4 — ME6 — Cap, rectangular flange

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

Table 5 — Dimensions Of Cap, fixed Clevis

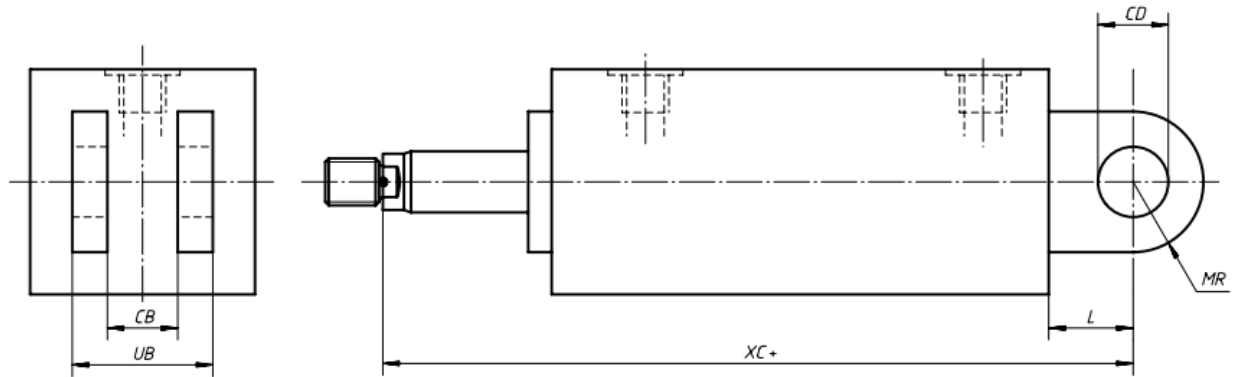


Figure 5 — MP1 — Cap, fixed clevis

Table 5 — Dimensions of cap, fixed clevis

Dimensions in millimetres

Bore	<i>UB</i> max.	<i>CB</i> A16	<i>CD</i> H9	<i>MR</i> max.	<i>L</i> min.	<i>XC</i> ± 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

Table 6 — Dimensions Of Cap, fixed Eye

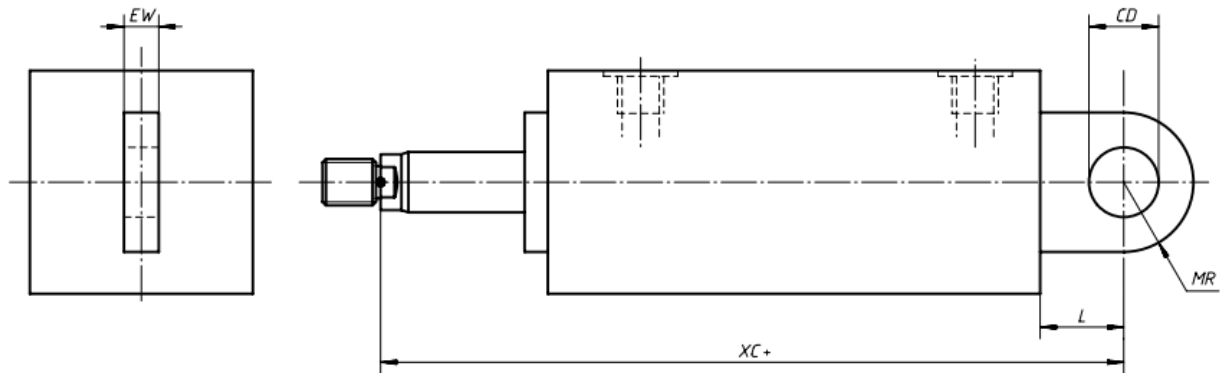


Figure 6 — MP3 — Cap, fixed eye

Table 6 — Dimensions of cap, fixed eye

Dimensions in millimetres

Bore	EW h14	CD H9	MR max.	L min.	XC $\pm 1,25$
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

Table 7 — Dimensions Of Cap, fixed Eye With Spherical Bearing

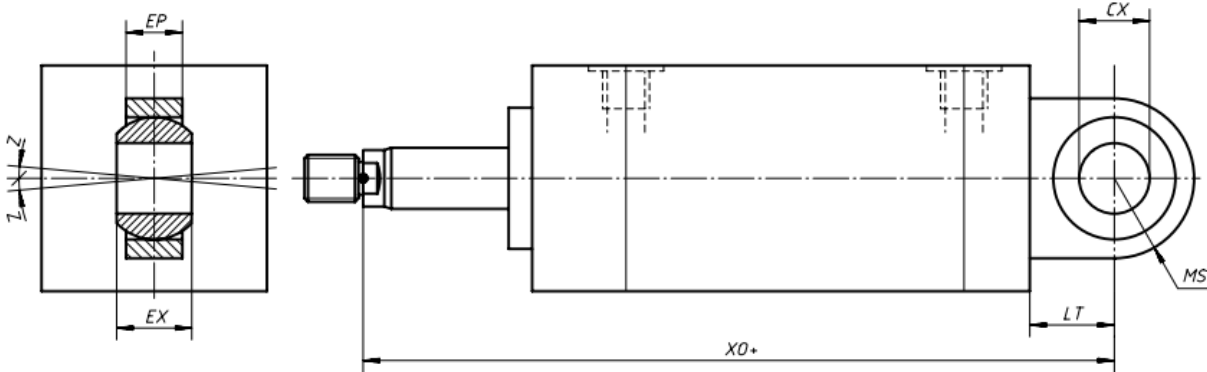


Figure 7 — MP5 — Cap, fixed eye with spherical plain bearing

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

Dimensions in millimetres

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

Table 8 — Dimensions Of Side Lugs

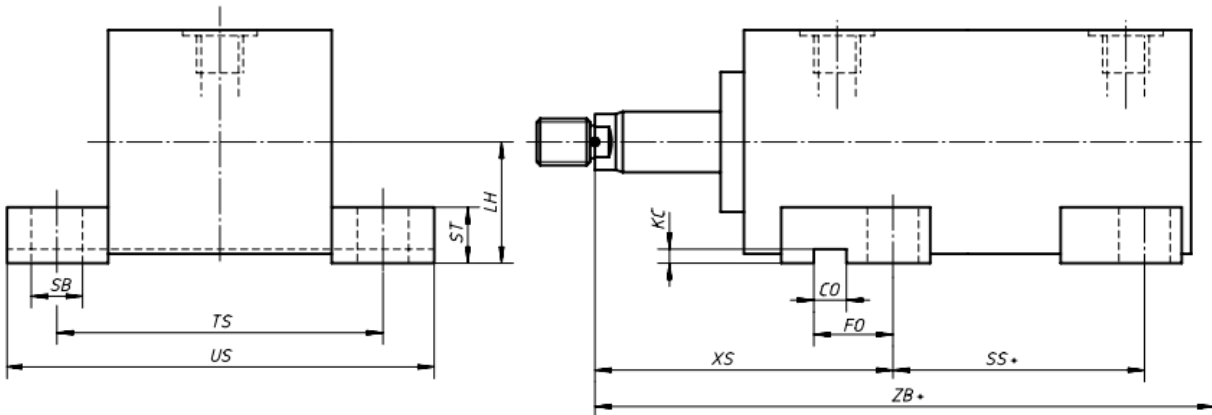


Figure 8 — MS2 — Side lugs

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.

Table 9 — Dimensions Of Head, Integral Trunnion (male)

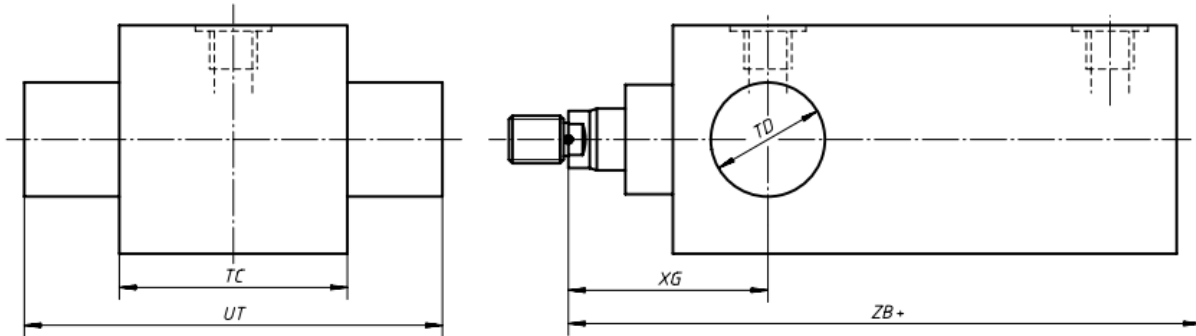


Figure 9 — MT1 — Head, integral trunnion (male)

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

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

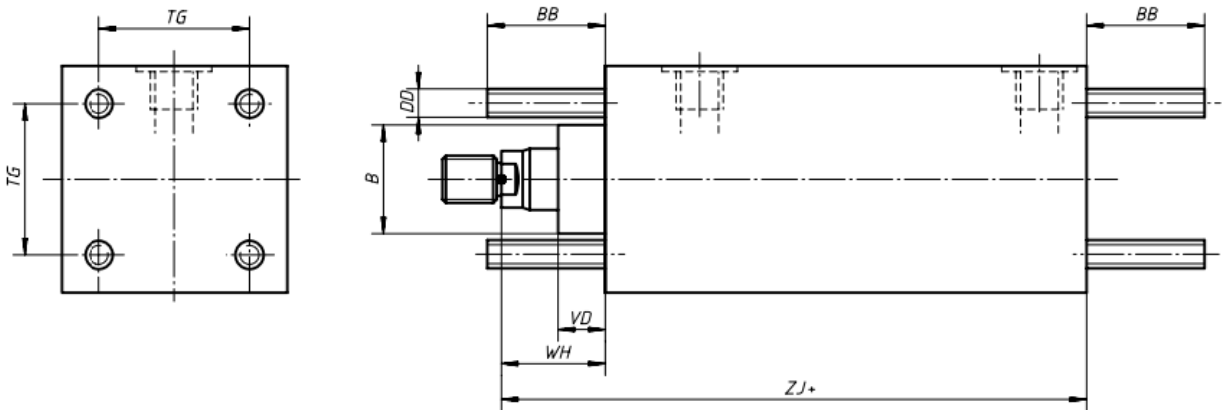


Figure 11 — MX1 — Both ends, studs or tie rods extended

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		

Table 12 — Dimensions Of Cap, studs or tie rods extended

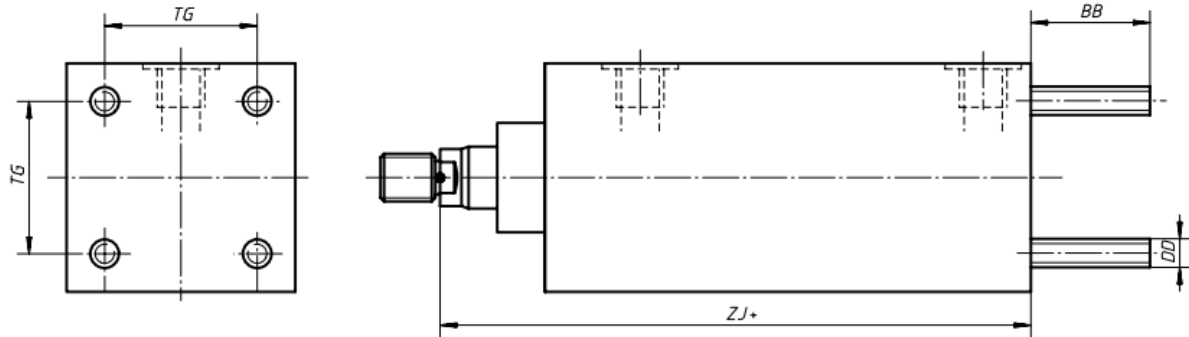


Figure 12 — MX2 — Cap, studs or tie rods extended

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

Dimensions in millimetres

Bore	<i>MM</i>	<i>DD</i>	<i>BB</i> + 3 0	<i>ZJ</i> ± 1	<i>TG</i> js13
40	18	M6 × 1	24	132	40
	28				
50	22	M8 × 1	35	139	50
	36				
63	28	M8 × 1	35	153	58
	45				
80	36	M10 × 1,25	35	168	75
	56				
100	45	M14 × 1,5	46	187	90
	70				
125	56	M16 × 1,5	59	196	112
	90				
160	70	M20 × 1,5	80	213	145
	110				
200	90	M24 × 2	90	233	182
	140				

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

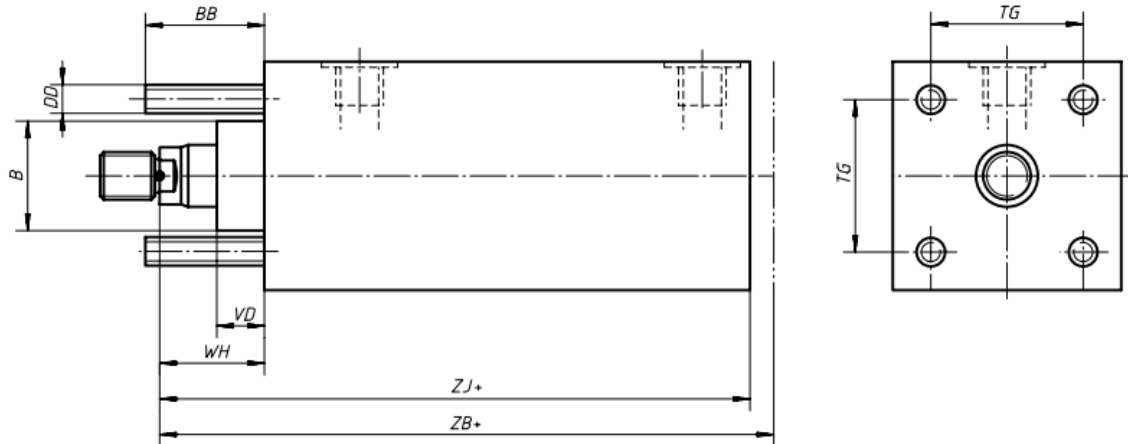


Figure 13 — MX3 — Head, studs or tie rods extended

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

Dimensions in millimetres

Bore	MM	DD	BB + 3 0	WH ± 2	ZJ ± 1	B f9	VD max.	TG js13	ZB max.
40	18	M6 × 1	24	25	132	30	12	40	141
	28					42			
50	22	M8 × 1	35	32	139	34	15	50	149
	36					50			
63	28	M8 × 1	35	38	153	42	19	58	163
	45					60			
80	36	M10 × 1,25	35	35	168	50	13	75	180
	56					72			
100	45	M14 × 1,5	46	41	187	60	16	90	204
	70					88			
125	56	M16 × 1,5	59	41	196	72	16	112	209
	90					108			
160	70	M20 × 1,5	80	37	213	88	12	145	228
	110					133			
200	90	M24 × 2	90	37	233	108	12	182	253
	140					163			

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