Pneumatic cylinder

TOSS®

Type B

double-acting

Linear Ball Slide
∅ 8/10/16/20
25/32/40 mm

The ball slides consist of hardened and ground angular rails provided with linear cages for balls, which allows to apply stress on all sides. These pneumatic cylinders can also be supplied with end position cushioning (see order data).

Technical data:

Type	8 - B	10 - B	16 - B	20 - B	25 - B	32 - B	40 - B
Design type	Pneumatic cylinder with linear ball guide						
Stroke length [mm]	10, 25, 50, 80, 100, 125, 160, 200 (∅ 8 up to stroke 100)						
Fitting position	any (as long as extended position is possible)						
Adm. temperature range [℃]	-10 to +70						
Medium	Filtered, oiled or non-oiled compressed-air (min. fineness 40 µm)						
Compressed-air supply	Front, lateral or combi-type (∅ 8 only front type)						
Compressed-air [bar]	min. 2 ... max. 6						
Materials	Base body, upper part, mounting plate, cover, piston plate: Al Guides: 100 Cr 6, piston rod: Ck 45 SL f7 Piston: NBR (∅ 8 and ∅ 10: Ms 58) Seals: NBR, cylinder barrel: Ms 63						

Weights: (gramme)

Stroke length [mm]	Piston - ∅ [mm]						
	8	10	16	20	25	32	40
10	100	190	290	390	640	840	1340
25	150	240	380	440	740	1000	1540
50	200	340	530	580	1000	1300	1900
80	260	440	630	730	1340	1740	2500
100	300	540	730	830	1540	2040	2900
125	-	590	880	1030	1840	2400	3300
160	-	780	1080	1280	2200	2840	3940
200	-	890	1280	1530	2600	3440	4640

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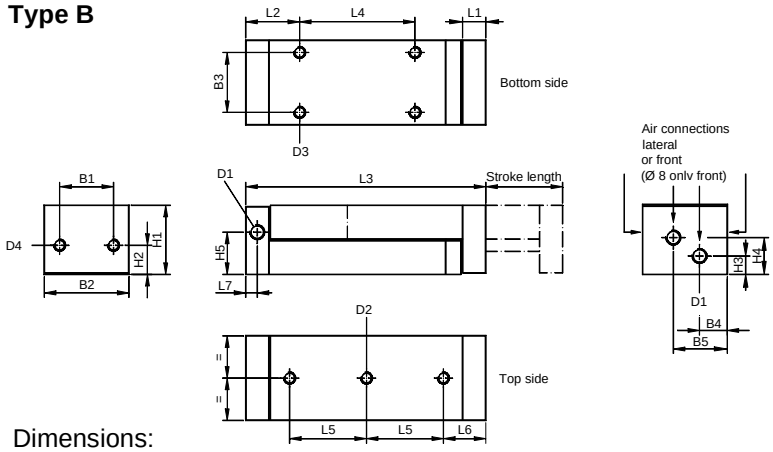


Dimensions:

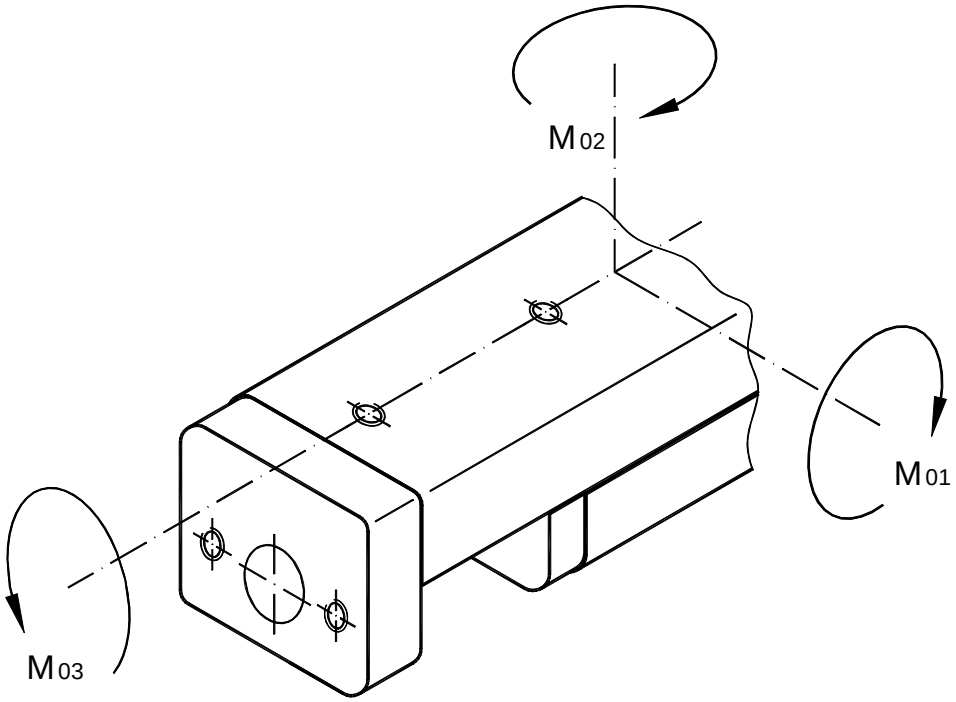
Piston ø [mm]	Piston rod ø [mm]	B1 [mm]	B2 [mm]	B3 [mm]	B4 [mm]	B5 [mm]	D1	D2/depth [mm]	D3/depth [mm]	D4/depth [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H4 [mm]	H5 [mm]	L1 [mm]
8	4	16	25	18	12,5		M5	M4/6,0	M4/8,0	M4/9,5	25	11,7	6,2	18,5	-	10
10	5	26	35	25	12,0	21	M5	M6/5,0	M5/10	M6/11,5	26	10,5	7,0	14,0	14,5	12
16	8	30	40	30	13,0	25,5	M5	M6/5,5	M6/11	M6/11,5	32	12,0	7,5	15,5	18,5	12
20	8	30	40	30	12,5	24,5	M5	M6/8,0	M6/14	M6/11,5	39,5	15,5	8,0	20,0	8,3	12
25	10	35	55	39	17,5	34,75	G1/8	M8/7,5	M8/16	M8/10,5	45	19,0	11,0	24,0	28,0	15
32	12	45	65	49	20,0	40,5	G1/8	M8/7,5	M8/18	M8/10,5	50	20,0	10,8	28,3	31,3	15
40	15	50	70	54	22,0	44,5	G1/4	M8/10,5	M8/18	M8/10,5	65	27,0	14,0	36,5	40,5	20

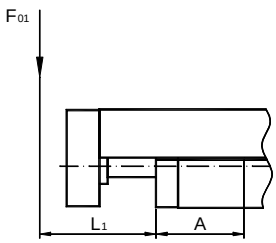
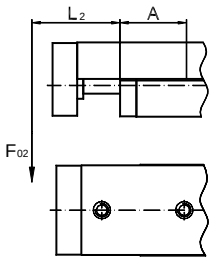
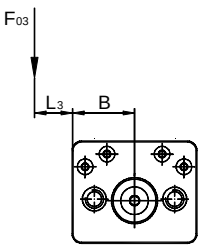
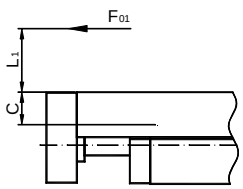
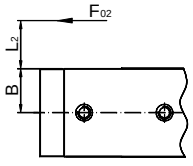
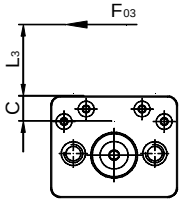
Piston - Ø [mm]		**Stroke length [mm]**							
		10	**25**	**50**	**80**	**100**	**125**	**160**	**200**
8	L2	22	22	22	22	22	-	-	-
	L3	74	89	129	169	192	-	-	-
	L4	21	36	76	116	2 x 69,5	-	-	-
	L5	29	44	2 x 42	2 x 62	3 x 49	-	-	-
	L6	22	22	22	22	22	-	-	-
10 / 16	L2	27	27	27	27	27	27	27	27
	L3	80	95	135	175	200	245	305	360
	L4	15	30	70	2 x 55	2 x 67,5	2 x 90	2 x 120	2 x 147,5
	L5	31	2 x 23	2 x 43	3 x 42	3 x 50	3 x 65	3 x 85	4 x 78
	L6	24,0	24,0	24,0	24,0	24,5	24,5	24,5	23,5
	L7	6	6	6	6	6	6	6	6
20	L2	22	27	27	27	27	27	27	27
	L3	80	95	135	175	200	245	305	360
	L4	25	30	70	2 x 55	2 x 67,5	2 x 90	2 x 120	2 x 147,5
	L5	31	2 x 23	2 x 43	3 x 42	3 x 50	3 x 65	3 x 85	4 x 78
	L6	24,0	24,0	24,0	24,0	24,5	24,5	24,5	23,5
	L7	6	6	6	6	6	6	6	6
25 / 32	L2	35	35	35	35	35	35	35	35
	L3	101	121	156	211	246	286	341	411
	L4	20	40	75	130	2 x 82,5	2 x 102,5	2 x 130	2 x 165
	L5	45	65	2 x 50	2 x 78	2 x 95	3 x 77	3 x 95	3 x 115
	L6	27,5	27,5	27,5	27,0	27,5	27,0	27,5	32,5
	L7	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5
40	L2	40	40	40	40	40	40	40	40
	L3	116	131	166	221	256	296	351	421
	L4	25	40	75	130	2 x 82,5	2 x 102,5	2 x 130	2 x 165
	L5	50	65	2 x 50	2 x 78	2 x 95	3 x 77	3 x 95	3 x 115
	L6	32,5	32,5	32,5	32,0	32,5	32,0	32,5	37,5
	L7	10	10	10	10	10	10	10	10

Pneumatic cylinder

Admissible stress

Type B



Longitudinal torque	Lateral torque	Transverse torque
		
$F_{01} \leq \frac{M_{01\ zul.}}{L_1 + A}$	$F_{02} \leq \frac{M_{02\ zul.}}{L_2 + A}$	$F_{03} \leq \frac{M_{03\ zul.}}{L_3 + B}$
		
$F_{01} \leq \frac{M_{01\ zul.}}{L_1 + C}$	$F_{02} \leq \frac{M_{02\ zul.}}{L_2 + B}$	$F_{03} \leq \frac{M_{03\ zul.}}{L_3 + C}$

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Pneumatic cylinder

Admissible stress

Stroke length [mm]	10		25		50		80		100		125	
∅ / Type	M_1/M_2 Nm	M_3 Nm	M_1/M_2 Nm	M_3 Nm	M_1/M_2 Nm	M_3 Nm	M_1/M_2 Nm	M_3 Nm	M_1/M_2 Nm	M_3 Nm	M_1/M_2 Nm	M_3 Nm
8 - B	1,28	0,58	1,55	0,58	2,08	0,81	2,63	0,98	3,37	1,22	-	-
10 - B	1,37	1,04	1,42	1,04	2,12	1,45	2,60	1,76	3,23	2,18	3,93	2,18
16 - B	1,52	1,15	1,58	1,15	2,35	1,61	2,88	1,96	3,59	2,42	4,37	2,42
20 - B	1,67	1,27	1,74	1,27	2,58	1,77	3,17	2,16	3,95	2,67	4,80	2,67
25 - B	3,32	2,65	3,83	2,65	4,86	4,16	6,70	5,68	8,07	6,82	13,00	6,82
32 - B	4,60	3,87	4,78	4,56	6,36	5,88	9,31	8,48	10,84	9,75	13,07	9,75
40 - B	5,06	4,42	5,26	5,17	7,00	6,67	10,24	9,59	11,92	11,04	14,38	11,04

Stroke length [mm]	160		200	
∅ / Type	M_1/M_2 Nm	M_3 Nm	M_1/M_2 Nm	M_3 Nm
8 - B	-	-	-	-
10 - B	5,22	2,18	6,13	2,18
16 - B	5,80	2,42	6,81	2,42
20 - B	6,38	2,67	7,50	2,67
25 - B	11,38	6,82	13,71	6,82
32 - B	14,78	9,75	18,48	9,75
40 - B	16,26	11,04	20,32	11,04

Correction factors:

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
8 - B	10	34,5	12,25	11,4
	25	42,0		
	50	60,8		
	80	80,0		
	100	96,3		

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
10 - B	10	40,6	17,25	10,4
	25	48,1		
	50	66,9		
	80	86,1		
	100	98,4		
	125	121,2		
	160	151,3		
	200	178,1		

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
16 - B	10	40,6	19,75	11,5
	25	48,1		
	50	66,9		
	80	86,1		
	100	98,4		
	125	121,2		
	160	151,3		
	200	178,1		

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
20 - B	10	40,6	19,75	13,6
	25	48,1		
	50	66,9		
	80	86,1		
	100	98,4		
	125	121,2		
	160	151,3		
	200	178,1		

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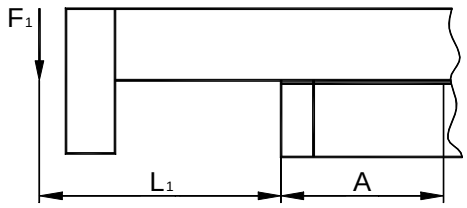
Correction factors:

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
25 - B	10	49,2	27,25	16,0
	25	56,7		
	50	77,0		
	80	102,4		
	100	120,2		
	125	140,5		
	160	168,4		
	200	201,4		

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
32 - B	10	49,7	32,25	17,7
	25	57,2		
	50	75,8		
	80	103,2		
	100	119,4		
	125	141,2		
	160	164,9		
	200	200,4		

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
40 - B	10	49,7	34,75	20,8
	25	57,2		
	50	75,8		
	80	103,2		
	100	119,4		
	125	141,2		
	160	164,9		
	200	200,4		

Example of calculation:



Stress - longitudinal torque M_1

Given qty: 25 - B with a stroke length of 80 mm
Lever arm L_1 = 40 mm = 0,04 m
Longitudinal torque M_1 = 6,7 Nm
Correction factor A = 102,4 mm = 0,1024 m

Required qty: $F_1 \leq \frac{M_1}{L_1 + A} = \frac{6{,}7\ \text{Nm}}{0{,}04\ \text{m} + 0{,}1024\ \text{m}} = 47\ \text{N}$