

# Pneumatic cylinder

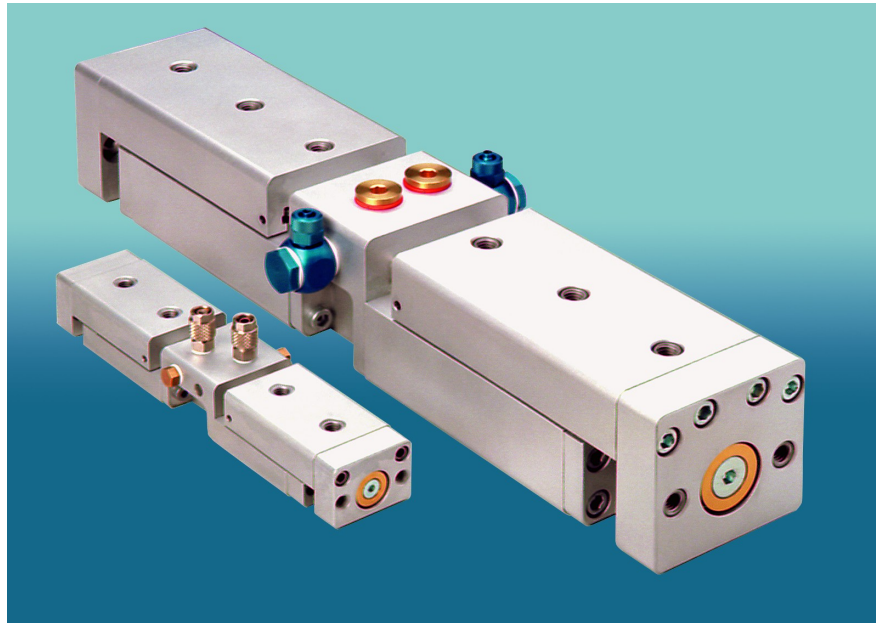
## Type B, Boxer

double-acting

Linear ball guide

Ø 10/25/32

40 mm



The air is uniformly distributed to both oppositely acting systems by a centred mounting plate (e.g. suitable for asymmetrical clamping and pressing).

### Technical data:

Type	10 - BB	25 - BB	32 - BB	40 - BB
Design type	Pneumatic cylinder with linear ball guide, opposed double stroke			
Stroke length [mm]	10, 25, 50, 80, 100, 125, 160, 200 (2 x)			
Fitting position	Any (as long as extended position is always possible)			
Adm. temperature range [°C]	-10 to +70			
Medium	Filtered, oiled or non-oiled compressed-air (min. fineness 40 µm)			
Compressed-air supply	Centre position (top and side)			
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 Seals: NBR, cylinder barrel: Ms 63			

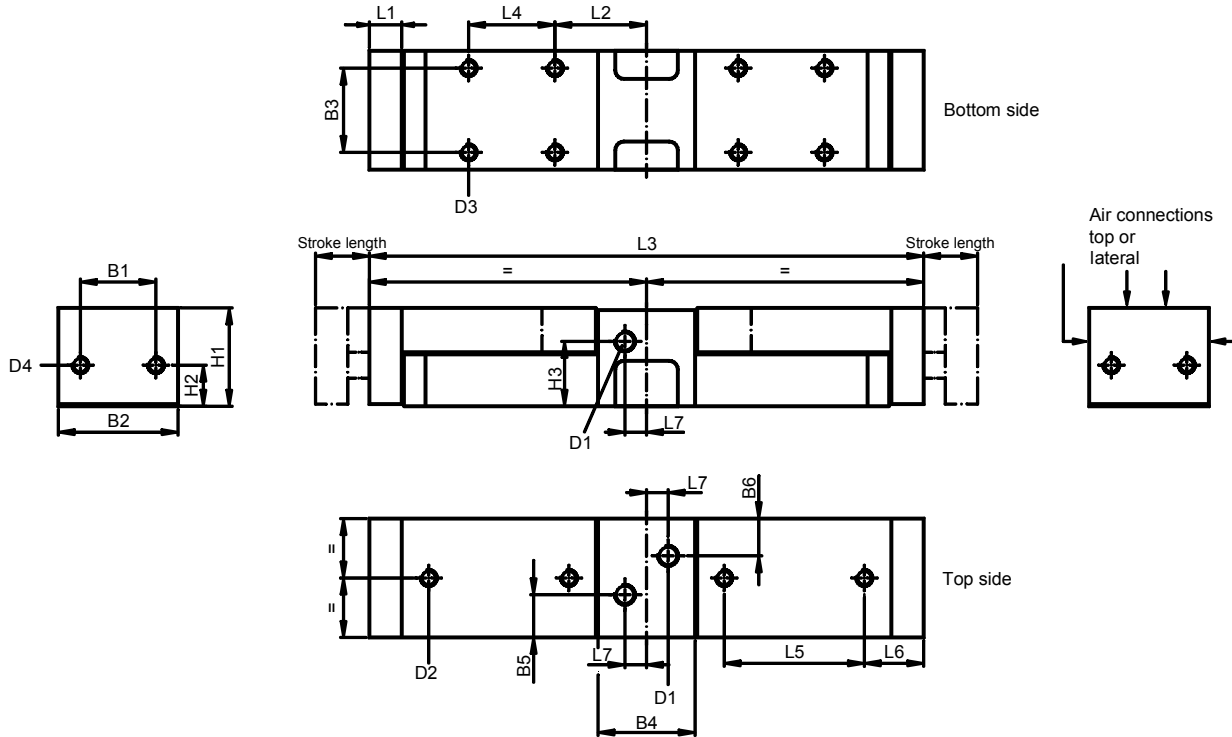
### Weights: (gramme)

Piston - Ø [mm]	Stroke length 2 x [mm]							
	10	25	50	80	100	125	160	200
10	400	480	680	880	1080	1180	1560	1780
25	1300	1500	2000	2700	3100	3700	4400	5200
32	1900	2100	2700	3600	4200	4900	5800	7000
40	2800	3200	3900	5100	5900	6700	8000	9400

# Pneumatic cylinder

# TOSS<sup>®</sup>

## Type B, Boxer 10



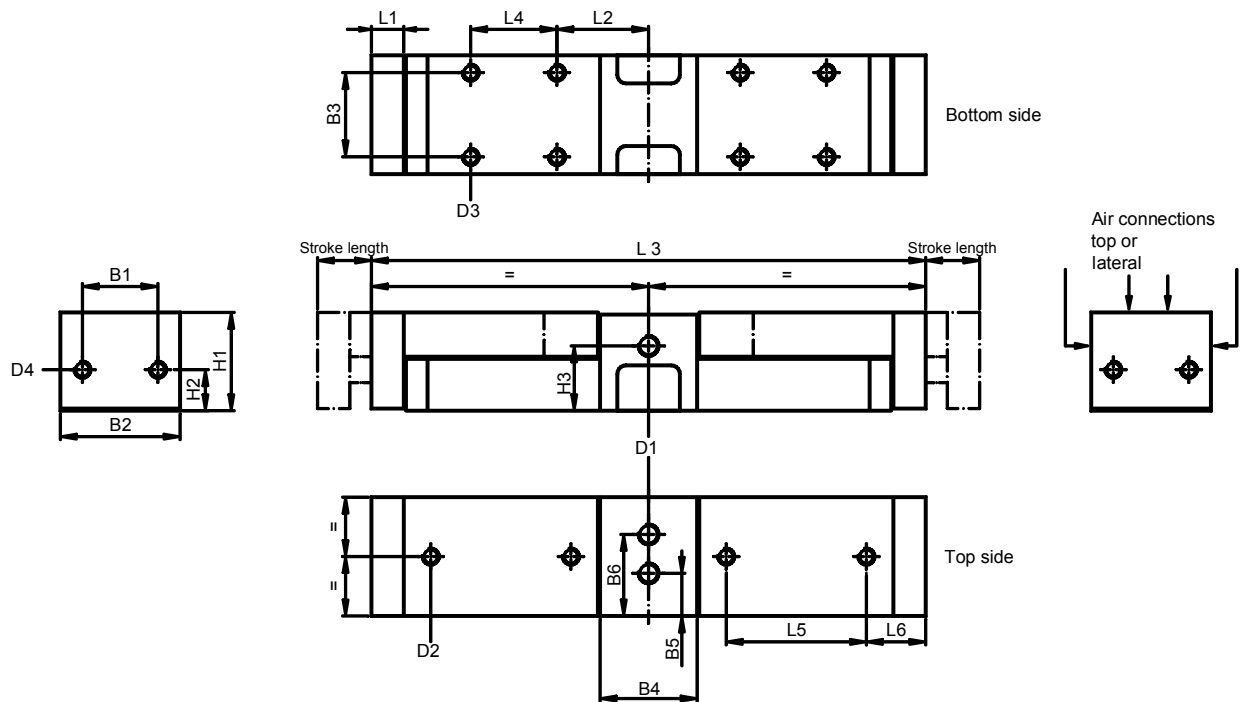
### Dimensions:

Piston ∅ [mm]	Piston rod ∅ [mm]	B1 [mm]	B2 [mm]	B3 [mm]	B4 [mm]	B5 [mm]	B6 [mm]	D1	D2/depth [mm]	D3/depth [mm]	D4/depth [mm]	H1 [mm]	H2 [mm]	H3 [mm]	L1 [mm]	L2 [mm]
10	5	26	35	25	35	12,25	14,25	M5	M6/5,5	M5/10	M6/11,5	26	10,5	18,8	12	32,5

Piston - ∅ [mm]		Stroke length 2 x [mm]							
		10	25	50	80	100	125	160	200
10	L3	171	201	281	361	411	501	621	731
	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	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5

# Pneumatic cylinder

## Type B, Boxer 25 - 40



### Dimensions:

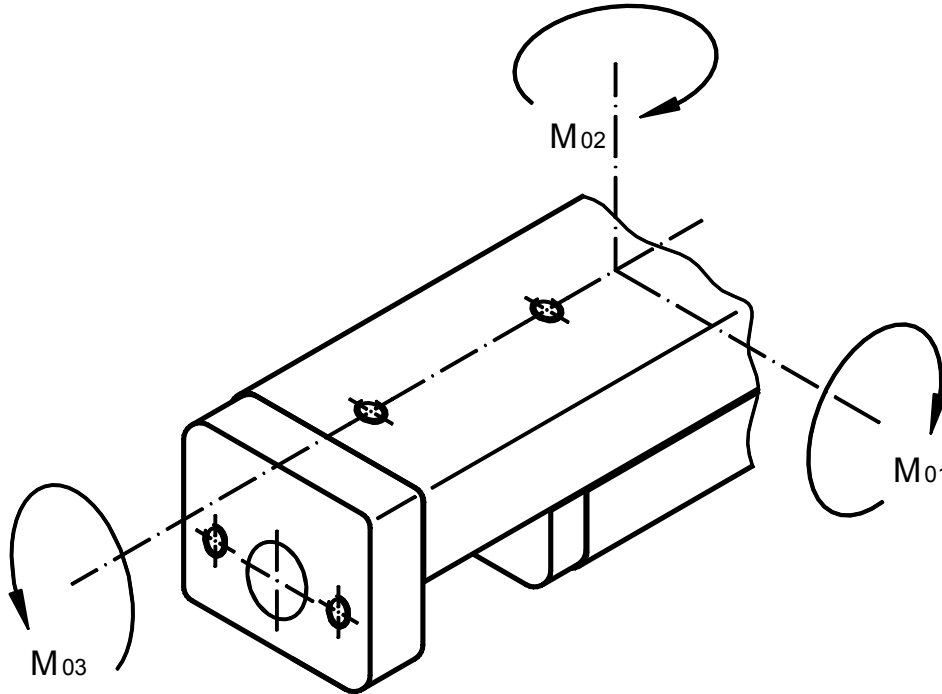
Piston $\varnothing$ [mm]	Piston rod $\varnothing$ [mm]	B1 [mm]	B2 [mm]	B3 [mm]	B4 [mm]	B5 [mm]	B6 [mm]	D1	D2/depth [mm]	D3/depth [mm]	D4/depth [mm]	H1 [mm]	H2 [mm]	H3 [mm]	L1 [mm]	L2 [mm]
25	10	35	55	39	45	17,5	35	G1/8	M8/7,5	M8/16	M8/10,5	45	19,0	29,25	15	42,5
32	12	45	65	49	45	19,25	38,75	G1/8	M8/7,5	M8/18	M8/10,5	50	20,0	36,3	15	42,5
40	15	50	70	54	50	19	44,5	G1/4	M8/10,5	M8/18	M8/10,5	65	27,0	46	20	45,0

Piston - $\varnothing$ [mm]		Stroke length 2 x [mm]							
		10	25	50	80	100	125	160	200
25/32	L3	217	257	327	437	507	587	697	837
	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
40	L3	242	272	342	452	522	602	712	852
	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

# Pneumatic cylinder

Admissible stress

**Type B, Boxer**



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

# Pneumatic cylinder

## Admissible stress

Stroke length [mm]	10		25		50		80		100		125	
∅ / Type	M1/M2 Nm	M3 Nm	M1/M2 Nm	M3 Nm	M1/M2 Nm	M3 Nm	M1/M2 Nm	M3 Nm	M1/M2 Nm	M3 Nm	M1/M2 Nm	M3 Nm
<b>10 - BB</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
<b>25 - BB</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
<b>32 - BB</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
<b>40 - BB</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	M1/M2 Nm	M3 Nm	M1/M2 Nm	M3 Nm
<b>10 - BB</b>	5,22	2,18	6,13	2,18
<b>25 - BB</b>	11,38	6,82	13,71	6,82
<b>32 - BB</b>	14,78	9,75	18,48	9,75
<b>40 - BB</b>	16,26	11,04	20,32	11,04

## Correction factors:

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
<b>10 - BB</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]
<b>25 - BB</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		

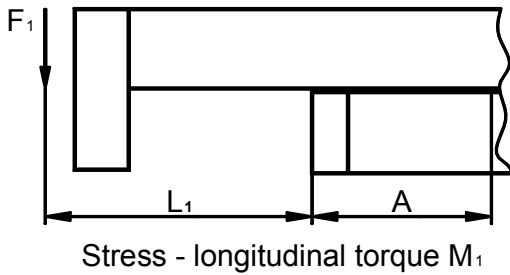
∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
<b>32 - BB</b>	10	49,7	32,25	17,7
	25	57,2		
	50	75,8		
	80	103,2		
	100	119,4		
	125	141,2		
	160	164,9		
	200	200,4		

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
<b>40 - BB</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		

# Pneumatic cylinder

## Admissible stress

### Example of calculation:



Given qty: 32 - BB with a stroke length of 100 mm  
Lever arm  $L_1 = 50 \text{ mm} = 0,05 \text{ m}$   
Longitudinal torque  $M_1 = 10,84 \text{ Nm}$   
Correction factor  $A = 119,4 \text{ mm} = 0,1194 \text{ m}$

$$\text{Required qty: } F_1 \leq \frac{M_1}{L_1 + A} = \frac{10,84 \text{ Nm}}{0,05 \text{ m} + 0,1194 \text{ m}} = 64 \text{ N}$$

The stress values apply to both sides !