

# Pneumatic cylinder

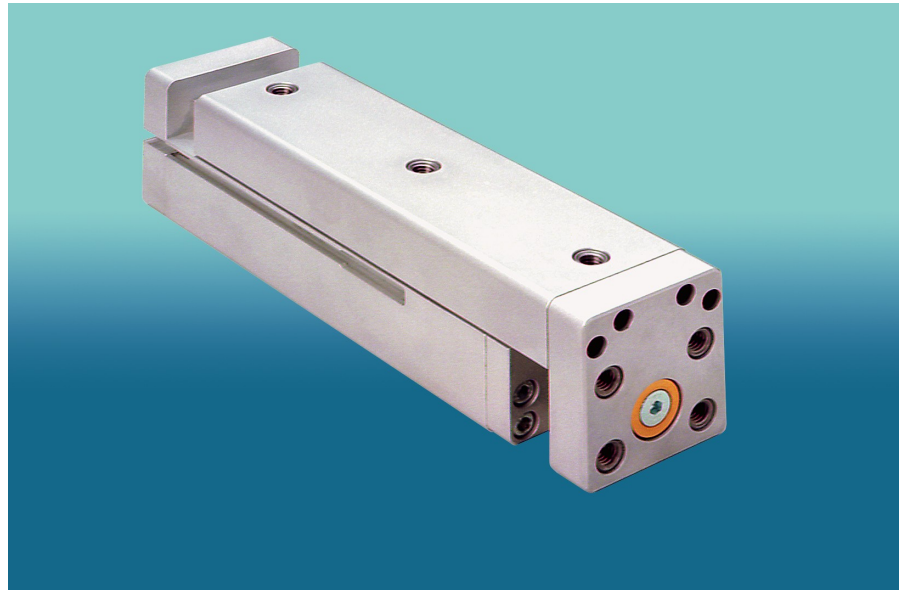
## Type C

double-acting

Recirculating ball  
guide

∅ 10/16/20

25/32/40 mm



The guides are made of hardened and ground steel rods. The balls run in continuous ways integrated in the base body. These pneumatic cylinders are equipped with integrated sensor grooves for electrical/electronic limit switches. The cylinders can be supplied with end position cushioning with external and adjustable limit stops or small hydraulic shock-absorbers (see accessories).

### Technical data:

Type	10 - C	16 - C	20 - C	25 - C	32 - C	40 - C
Design type	Pneumatic cylinder with recirculating ball guide					
Stroke length [mm]	25, 50, 80, 100, 125, 160, 200					
Fitting position	Any					
Adm. temperature range [°C]	-10 to +70					
Medium	Filtered, oiled or non-oiled compressed-air (min. fineness 40 µm)					
Compressed-air supply	Front, lateral or combi-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 (∅ 10: Ms 58) Seals: NBR, cylinder barrel: Ms 63					

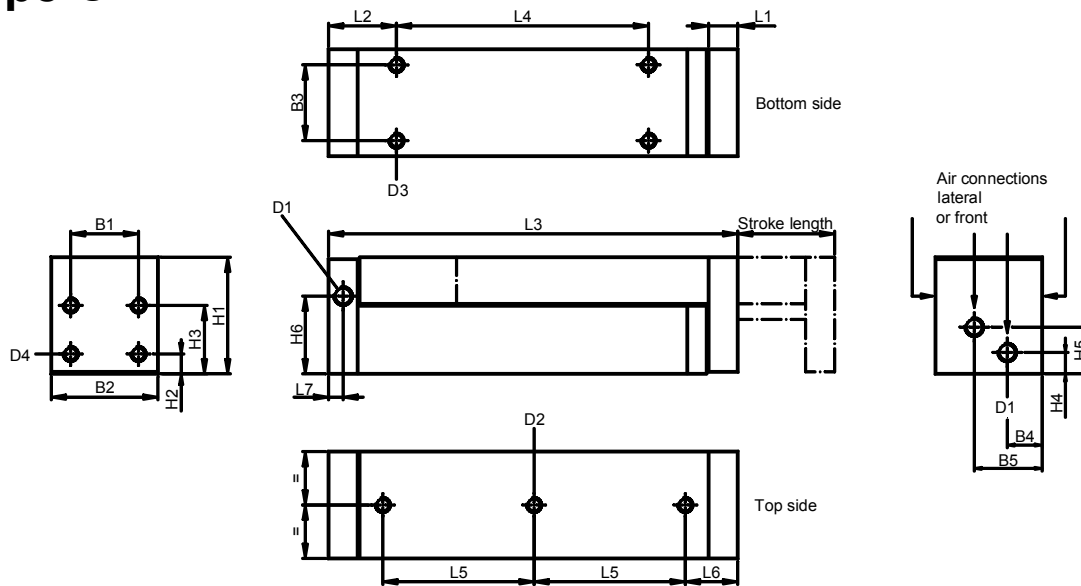
### Weights: (gramme)

Stroke length [mm]	Piston - ∅ [mm]					
	10	16	20	25	32	40
25			630			3240
50	520	720	860	1780	2420	3240
80	605	815	960	2060	2800	3540
100	740	1000	1200	2400	3260	
125		1240	1460	2920	3900	
160	1080	1460	1740	3460	4760	
200	1320		2160		5800	

# Pneumatic cylinder

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## Type C



### Dimensions:

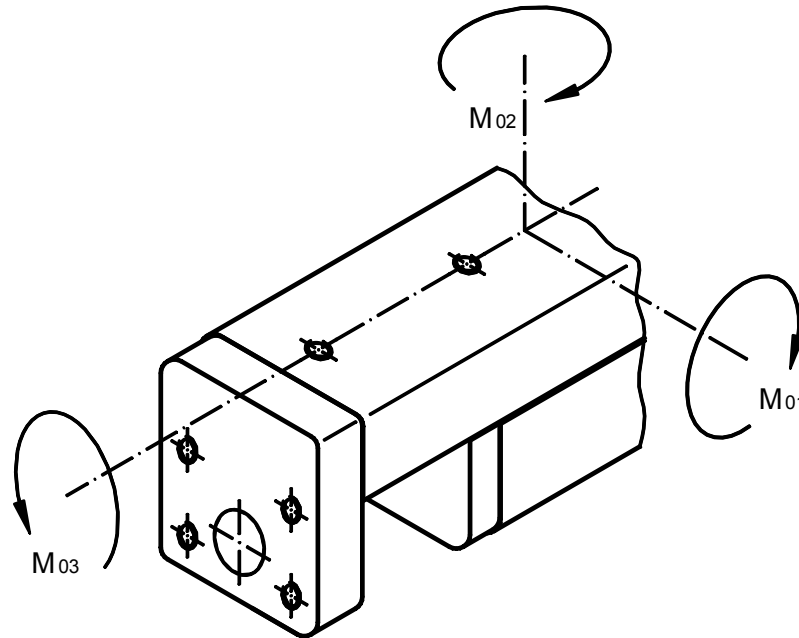
Piston ∅ [mm]	Piston rod ∅ [mm]	B1 [mm]	B2 [mm]	B3 [mm]	B4 [mm]	B5 [mm]	D1	D2/depth [mm]	D3/depth [mm]	D4/depth [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H4 [mm]	H5 [mm]	H6 [mm]
10	5	24	35	25	12	21,0	M5	M6/5,0	M5/6	M6/11,5	35	5,7	20,7	7	14	20,3
16	8	28	40	30	13	25,5	M5	M6/5,0	M6/10	M6/11,5	40	6,2	21,2	7,5	15,5	25,5
20	8	28	40	30	12,5	24,5	M5	M6/8,0	M6/14	M6/11,5	48	6,2	26,2	8	20	8,8
25	10	35	55	39	17,5	34,75	G1/8	M8/7,5	M8/15	M8/10,5	60	10,2	35,2	11	24	40,25
32	12	45	65	49	20	40,5	G1/8	M8/7,5	M8/18	M8/10,5	70	10,2	40,2	10,8	28,3	45,3
40	15	50	70	54	22	44,5	G1/4	M8/7,5	M8/18	M8/10,5	80	10,2	45,2	14	36,5	58,5

Piston - ∅ [mm]	Stroke length [mm]							
	25	50	80	100	125	160	200	
10/16 20	L1	12	12	12	12	12	12	
	L2	27	27	27	27	27	27	
	L3	135	175	200	245	305	360	
	L4	70	2 x 55	2 x 67,5	2 x 90	2 x 120	2 x 147,5	3 x 125
	L5	2 x 43	3 x 42	3 x 50	3 x 65	3 x 85	4 x 78	4 x 98
	L6	24,0	24,0	24,5	24,5	24,5	23,5	23,5
	L7	6	6	6	6	6	6	6
25/32	L1	15	15	15	15	15	15	
	L2	35	35	35	35	35	35	
	L3	156/211	211	246	286	341	411	501
	L4	75/130	130	2 x 82,5	2 x 102,5	2 x 130	2 x 165	3 x 140
	L5	2 x 50/2 x 78	2 x 78	2 x 95	3 x 77	3 x 95	3 x 115	4 x 110
	L6	27,5/27,0	27,0	27,5	27,0	27,5	32,5	30,0
	L7	7,5	7,5	7,5	7,5	7,5	7,5	7,5
40	L1	20	20	20	20	20	20	
	L2	40	40	40	40	40	40	
	L3	221	221	256	296	351	421	511
	L4	130	130	2 x 82,5	2 x 102,5	2 x 130	2 x 165	3 x 140
	L5	2 x 78	2 x 78	2 x 95	3 x 77	3 x 95	3 x 115	4 x 110
	L6	32,0	32,0	32,5	32,0	32,5	37,5	35,0
	L7	10	10	10	10	10	10	10

# Pneumatic cylinder

Admissible stress

## Type C



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

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## Admissible stress

Stroke length [mm]	25		50		80		100		125		160	
∅ / 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
10 - C	2,6	1,03	2,9	1,35	2,7	1,23	3,7	1,85	5,0	2,07	5,7	2,07
16 - C	2,9	1,15	3,2	1,5	3,0	1,37	4,1	2,06	5,5	2,3	6,3	2,3
20 - C	3,2	1,27	3,5	1,65	3,3	1,51	4,5	2,26	6,0	2,53	6,9	2,53
25 - C	4,4	2,65	6,5	4,24	6,8	4,77	8,2	6,1	10,0	5,3	12,3	5,3
32 - C	7,8	4,56	7,8	4,56	8,3	5,0	10,3	6,83	13,2	9,57	15,8	8,65
40 - C	8,6	5,0	8,6	5,0	9,2	5,5	11,3	7,5	14,5	10,5	17,4	9,5

Stroke length [mm]	200	
∅ / Type	M1/M2 Nm	M3 Nm
10 - C	7,1	2,07
16 - C	7,9	2,30
20 - C	8,7	2,53
25 - C	15,5	5,30
32 - C	20,2	8,65
40 - C	22,2	9,50

## Correction factors:

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
10 - C	25	58,5	17,25	12
	50	66,5		
	80	64,0		
	100	76,5		
	125	87,5		
	160	97,5		
	200	117,5		

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
16 - C	25	59,5	19,75	12
	50	66,5		
	80	64,0		
	100	76,5		
	125	87,0		
	160	97,0		
	200	117,0		

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
20 - C	25	59,5	19,75	15
	50	66,5		
	80	64,0		
	100	76,5		
	125	87,0		
	160	97,0		
	200	117,0		

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
25 - C	25	68,0	27,25	18
	50	84,5		
	80	87,0		
	100	97,0		
	125	101,5		
	160	119,0		
	200	144,0		

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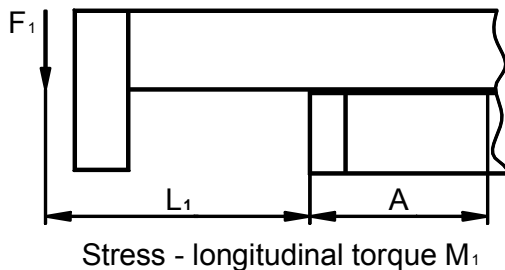
## Admissible stress

Correction factors:

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
32 - C	25	84,5	32,25	21,8
	50	84,5		
	80	87,0		
	100	97,0		
	125	112,0		
	160	116,0		
	200	141,0		

∅ / Type	Stroke length	A	B	C
	[mm]	[mm]	[mm]	[mm]
40 - C	25	89,5	34,75	21,8
	50	89,5		
	80	92,0		
	100	102,0		
	125	117,0		
	160	120,5		
	200	145,5		

Example of calculation:



Given qty: 32 - C with a stroke length of 50 mm  
 Lever arm  $L_1 = 20 \text{ mm} = 0,02 \text{ m}$   
 Longitudinal torque  $M_1 = 7,8 \text{ Nm}$   
 Correction factor  $A = 84,5 \text{ mm} = 0,0845 \text{ m}$

$$\text{Required qty: } F_1 \leq \frac{M_1}{L_1 + A} = \frac{7,8 \text{ Nm}}{0,02 \text{ m} + 0,0845 \text{ m}} = 74,6 \text{ N}$$

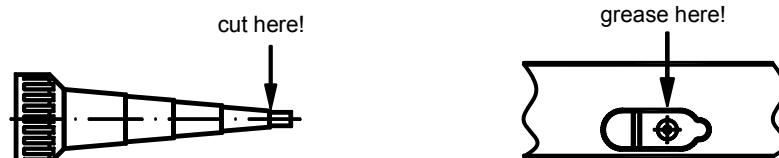
## Lubrication of the slideways of the pneumatic cylinder type C (∅ 10 to ∅ 40)

In principle, the lubrication is carried out through the lubrication hole while the cylinders are in retracted position. This applies to all diameters and strokes. The lubrication hole is opened and closed by a locking clip (on both sides).

Longer strokes (∅ 10 to ∅ 25 from stroke 125 mm upwards and ∅ 32 & ∅ 40 from stroke 160 mm upwards) need an additional lubrication. To repeat the lubrication process the lubrication hole at the upper part must be aligned with a marking (centre hole) on the base body.

The grease is uniformly distributed on the ball guides by extending and retracting the pneumatic cylinder by hand several times.

Before using the grease tube remove the cylindrical part of the tube point.



All data based on tests conducted by TOSS.