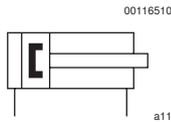
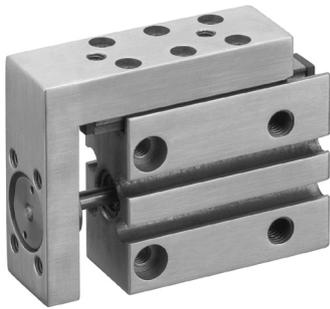


Piston rod cylinders → Guide cylinders

Mini slide narrow, Series MSN

► Ø 6 - 16 mm ► double-acting ► with magnetic piston ► cushioning: elastic ► with integrated ball rail guide



Ambient temperature min./max.	+0 °C / +60 °C
Medium	Compressed air
Max. particle size	5 µm
Oil content of compressed air	0 mg/m³ - 1 mg/m³
Pressure for determining piston forces	6,3 bar

Materials:	
Housing	Aluminum, anodized
Piston rod	Stainless steel
Seal	Polyurethane
Ball rail table	Aluminum, anodized
Guide rail	Steel, hardened

Technical Remarks

- The pressure dew point must be at least 15 °C under ambient and medium temperature and may not exceed 3 °C.
- The oil content of air pressure must remain constant during the life cycle.
- Use only the approved oils from Bosch Rexroth, see chapter „Technical information“.

Piston Ø	[mm]	6	10	16		
Port		M5	M5	M5		
Working pressure min./max.	[bar]	2 / 10	1 / 10	1 / 10		
Retracted piston force, theoretical	[N]	13	42	95		
Extended piston force, theoretical	[N]	18	49	127		
Speed max.	[m/s]	0.5	0.8	0.8		
Cushioning energy	[Nm]	0.01	0.05	0.15		
Moving mass, internal	[kg]	0.034	0.052	0.1		
Max. moving mass, external	[kg]	0.18	0.55	1.1		

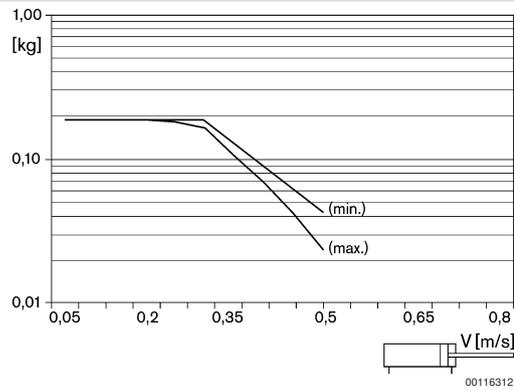
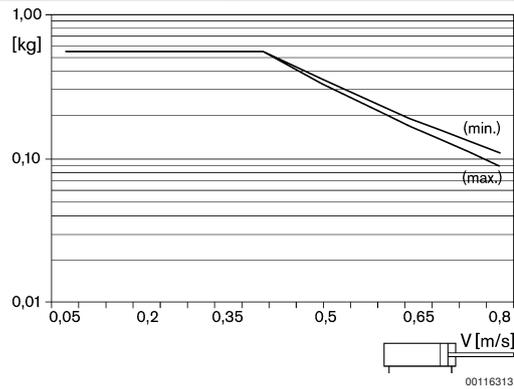
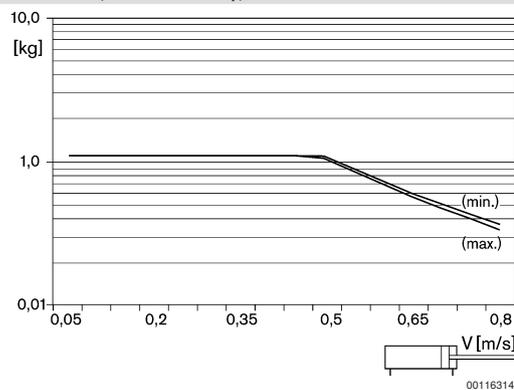
	Piston Ø	6	10	16		
	Stroke 5	0821406500	0821406506	0821406512		
	10	0821406501	0821406507	0821406513		
	15	0821406502	0821406508	0821406514		
	20	0821406503	0821406509	0821406515		
	25	0821406504	0821406510	0821406516		
	30	0821406505	0821406511	0821406517		

Weight [kg]	Piston Ø	6	10	16		
	Stroke 5	0.071	0.112	0.231		
	10	0.078	0.122	0.231		
	15	0.084	0.131	0.262		
	20	0.089	0.147	0.262		
	25	0.104	0.159	0.295		
	30	0.11	0.17	0.295		

Piston rod cylinders → Guide cylinders

Mini slide narrow, Series MSN

▶ Ø 6 - 16 mm ▶ double-acting ▶ with magnetic piston ▶ cushioning: elastic ▶ with integrated ball rail guide

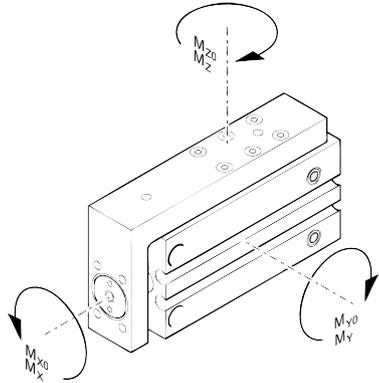
Maximum additionally moving mass (min. stroke, max. stroke), MSN - 6**Maximum additionally moving mass (min. stroke, max. stroke), MSN - 10****Maximum additionally moving mass (min. stroke, max. stroke), MSN-16**

Piston rod cylinders → Guide cylinders

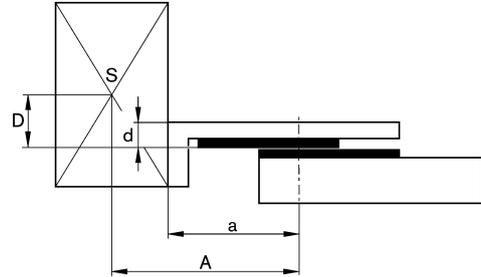
Mini slide narrow, Series MSN

► Ø 6 - 16 mm ► double-acting ► with magnetic piston ► cushioning: elastic ► with integrated ball rail guide

M = max. permissible torque **correction factor (a, d)**



00116294



00116281

Piston Ø	S	a [mm] 1)	d [mm] 2)	Mx0 3)	My0 3)	Mz0 3)	Mx 4)	My 4)	Mz 4)				
6	5	27	6	3	3.2	3.2	0.6	0.9	0.9				
6	10	32	6	3	3.2	3.2	0.6	0.9	0.9				
6	15	32	6	3	3.2	3.2	0.6	0.9	0.9				
6	20	37	6	3	3.2	3.2	0.6	0.9	0.9				
6	25	42	6	3	3.2	3.2	0.6	0.9	0.9				
6	30	47	6	3	3.2	3.2	0.6	0.9	0.9				
10	5	31	6.8	2.3	2.4	2.4	0.6	0.8	0.8				
10	10	36	6.8	2.3	2.4	2.4	0.6	0.8	0.8				
10	15	41	6.8	2.3	2.4	2.4	0.6	0.8	0.8				
10	20	41	6.8	3.2	3.3	3.3	0.7	1.2	1.2				
10	25	48	6.8	3.2	3.3	3.3	0.7	1.2	1.2				
10	30	53	6.8	3.2	3.3	3.3	0.7	1.2	1.2				
16	5	40	7.5	6.8	6.9	6.9	1.7	2.1	2.1				
16	10	40	7.5	6.8	6.9	6.9	1.7	2.1	2.1				
16	15	50	7.5	6.8	6.9	6.9	1.7	2.1	2.1				
16	20	50	7.5	6.8	6.9	6.9	1.7	2.1	2.1				
16	25	55	7.5	10	12.3	12.3	1.9	2.7	2.7				
16	30	60	7.5	10	12.3	12.3	1.9	2.7	2.7				

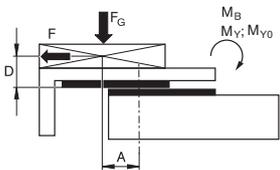
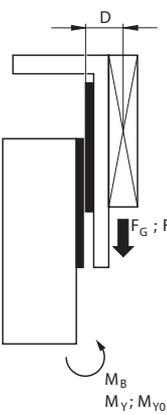
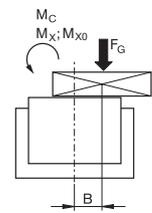
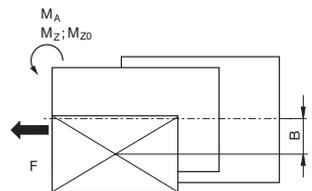
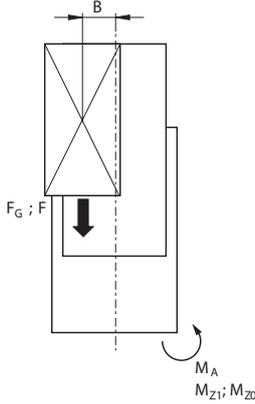
S = stroke

- 1) correction factor (a)
- 2) correction factor (d)
- 3) Static moment M [Nm]
- 4) Dynamic moment M [Nm]

Piston rod cylinders → Guide cylinders

Mini slide narrow, Series MSN

▶ Ø 6 - 16 mm ▶ double-acting ▶ with magnetic piston ▶ cushioning: elastic ▶ with integrated ball rail guide

horizontal	vertical								
 <table border="1" data-bbox="430 372 718 478"> <tr> <td>stat.</td> <td>$M_{B0} = F_G \cdot A + F \cdot D$</td> </tr> <tr> <td>dyn.</td> <td>$M_B = F_G \cdot A$</td> </tr> </table>	stat.	$M_{B0} = F_G \cdot A + F \cdot D$	dyn.	$M_B = F_G \cdot A$	 <table border="1" data-bbox="1053 351 1404 478"> <tr> <td>stat.</td> <td>$M_{B0} = (F_G + F) \cdot D$</td> </tr> <tr> <td>dyn.</td> <td>$M_B = F_G \cdot D$</td> </tr> </table>	stat.	$M_{B0} = (F_G + F) \cdot D$	dyn.	$M_B = F_G \cdot D$
stat.	$M_{B0} = F_G \cdot A + F \cdot D$								
dyn.	$M_B = F_G \cdot A$								
stat.	$M_{B0} = (F_G + F) \cdot D$								
dyn.	$M_B = F_G \cdot D$								
 <table border="1" data-bbox="430 649 638 755"> <tr> <td>stat.</td> <td>$M_{C0} = F_G \cdot B$</td> </tr> <tr> <td>dyn.</td> <td>$M_C = F_G \cdot B$</td> </tr> </table>	stat.	$M_{C0} = F_G \cdot B$	dyn.	$M_C = F_G \cdot B$					
stat.	$M_{C0} = F_G \cdot B$								
dyn.	$M_C = F_G \cdot B$								
 <table border="1" data-bbox="430 936 638 1042"> <tr> <td>stat.</td> <td>$M_{A0} = F \cdot B$</td> </tr> <tr> <td>dyn.</td> <td>$M_A = 0$</td> </tr> </table>	stat.	$M_{A0} = F \cdot B$	dyn.	$M_A = 0$	 <table border="1" data-bbox="1053 840 1404 957"> <tr> <td>stat.</td> <td>$M_{A0} = (F_G + F) \cdot B$</td> </tr> <tr> <td>dyn.</td> <td>$M_A = F_G \cdot B$</td> </tr> </table>	stat.	$M_{A0} = (F_G + F) \cdot B$	dyn.	$M_A = F_G \cdot B$
stat.	$M_{A0} = F \cdot B$								
dyn.	$M_A = 0$								
stat.	$M_{A0} = (F_G + F) \cdot B$								
dyn.	$M_A = F_G \cdot B$								
<table border="1" data-bbox="183 1106 510 1234"> <tr> <td>dyn.</td> <td>$\frac{M_A}{M_1} + \frac{M_B}{M_2} + \frac{M_C}{M_3} \leq 1$</td> </tr> <tr> <td>stat.</td> <td>$\frac{M_{A0}}{M_{Z0}} + \frac{M_{B0}}{M_{Y0}} + \frac{M_{C0}}{M_{X0}} \leq 1$</td> </tr> </table>	dyn.	$\frac{M_A}{M_1} + \frac{M_B}{M_2} + \frac{M_C}{M_3} \leq 1$	stat.	$\frac{M_{A0}}{M_{Z0}} + \frac{M_{B0}}{M_{Y0}} + \frac{M_{C0}}{M_{X0}} \leq 1$	<table border="1" data-bbox="813 1266 1212 1415"> <tr> <td>dyn.</td> <td>$\frac{M_A}{M_1} + \frac{M_B}{M_2} \leq 1$</td> </tr> <tr> <td>stat.</td> <td>$\frac{M_{A0}}{M_{Z0}} + \frac{M_{B0}}{M_{Y0}} \leq 1$</td> </tr> </table>	dyn.	$\frac{M_A}{M_1} + \frac{M_B}{M_2} \leq 1$	stat.	$\frac{M_{A0}}{M_{Z0}} + \frac{M_{B0}}{M_{Y0}} \leq 1$
dyn.	$\frac{M_A}{M_1} + \frac{M_B}{M_2} + \frac{M_C}{M_3} \leq 1$								
stat.	$\frac{M_{A0}}{M_{Z0}} + \frac{M_{B0}}{M_{Y0}} + \frac{M_{C0}}{M_{X0}} \leq 1$								
dyn.	$\frac{M_A}{M_1} + \frac{M_B}{M_2} \leq 1$								
stat.	$\frac{M_{A0}}{M_{Z0}} + \frac{M_{B0}}{M_{Y0}} \leq 1$								

00116296

00116297

$$F = m \cdot a$$

$$F_G = m \cdot g$$

$$a = 1600 \cdot V^2$$

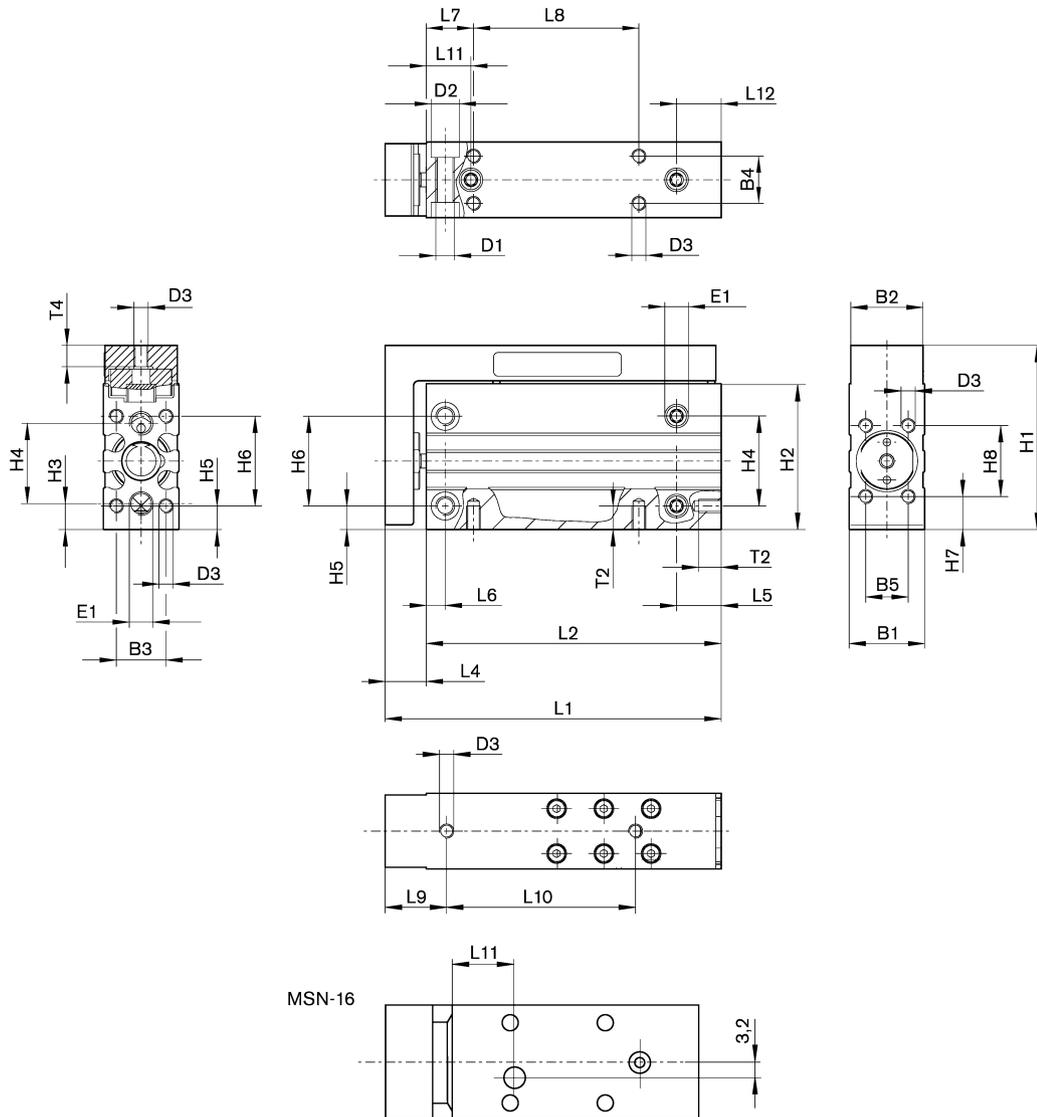
F = deceleration force [N]
 F_G = force due to weight [N]
 m = load mass [kg]
 a = deceleration [m/s²]
 g = gravitational acceleration 9,81 [m/s²]
 V = velocity [m/s]

Piston rod cylinders → Guide cylinders

Mini slide narrow, Series MSN

▶ Ø 6 - 16 mm ▶ double-acting ▶ with magnetic piston ▶ cushioning: elastic ▶ with integrated ball rail guide

MSN-6/-10/-16



00116293

MSN-6/-10/-16

Piston Ø	B1	B2	B3	B4	B5	D1	D2	D3	E1 *	H1	H2	H3	H4	H5	H6	H7	H8
6	16	15.3	10.5	10	9	M4	6	M3	M5	39	31	5.5	17	5	19	7	15
10	20	19.3	13	13	11	M5	7.5	M4	M5	45	36	6.5	20	5	23	7.5	18
16	24	23.3	17	17	16	M5	7.5	M4	M5	51	41	6	25	5.5	27	6	26

* air connection

MSN-6

Piston Ø	S	L1	L2	L4	L5	L6	L7	L8	L9	L10	L11	L12	T2
6	5	46	37.5	8.5	10	4	10	10	13	20	9.5	9.5	4.8
6	10	51	42.5	8.5	10	4	10	15	13	20	9.5	9.5	4.8

Part numbers marked in bold are available from the central warehouse in Germany, see the shopping basket for detailed information Pneumatics catalog, online PDF, as of 2010-01-23, © Bosch Rexroth AG, subject to change

Piston rod cylinders → Guide cylinders

Mini slide narrow, Series MSN

► Ø 6 - 16 mm ► double-acting ► with magnetic piston ► cushioning: elastic ► with integrated ball rail guide

Piston Ø	S	L1	L2	L4	L5	L6	L7	L8	L9	L10	L11	L12	T2
6	15	56	47.5	8.5	10	4	10	20	13	25	9.5	9.5	4.8
6	20	61	52.5	8.5	10	4	10	25	13	30	9.5	9.5	4.8
6	25	66	57.5	8.5	10	4	10	30	13	40	9.5	9.5	4.8
6	30	71	62.5	8.5	10	4	10	35	13	40	9.5	9.5	4.8

Piston Ø	T4												
6	5												
6	5												
6	5												
6	5												
6	5												
6	5												

S = stroke

MSN-10

Piston Ø	S	L1	L2	L4	L5	L6	L7	L8	L9	L10	L11	L12	T2
10	5	51.5	40	11.5	12.5	5	12	10	15	14	11	9.5	6
10	10	65.5	45	11.5	12.5	5	12	14	15	19	11	9.5	6
10	15	61.5	50	11.5	12.5	5	12	18	15	25	11	9.5	6
10	20	66.5	55	11.5	12.5	5	12	24	15	30	11	9.5	6
10	25	73.5	62	11.5	12.5	5	12	32	15	40	12	10.5	6
10	30	78.5	67	11.5	12.5	5	12	35	15	45	12	10.5	6

Piston Ø	T4												
10	5.5												
10	5.5												
10	5.5												
10	5.5												
10	5.5												
10	5.5												

S = stroke

MSN-16

Piston Ø	S	L1	L2	L4	L5	L6	L7	L8	L9	L10	L11	L12	T2
16	5	66	52	14	12.5	5	12	20	18	24	13	12.5	6
16	10	66	52	14	12.5	5	12	20	18	35	13	12.5	6
16	15	76	62	14	12.5	5	12	30	18	45	13.5	12.5	6
16	20	76	62	14	12.5	5	12	30	18	50	13.5	12.5	6
16	25	86	72	14	12.5	5	12	40	18	50	17.5	12.5	6
16	30	91	77	14	12.5	5	12	45	18	55	17.5	12.5	6

Piston Ø	T4												
16	6												
16	6												
16	6												
16	6												
16	6												
16	6												

S = stroke