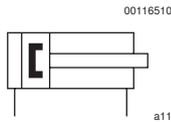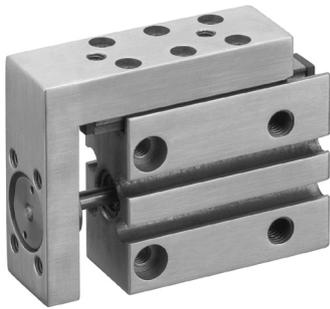**Piston rod cylinders → Guide cylinders**

Mini slide narrow, Series MSN
► Ø 6 - 16 mm ► double-acting ► with magnetic piston ► cushioning: elastic ► with integrated ball rail guide

00116510

a11

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

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

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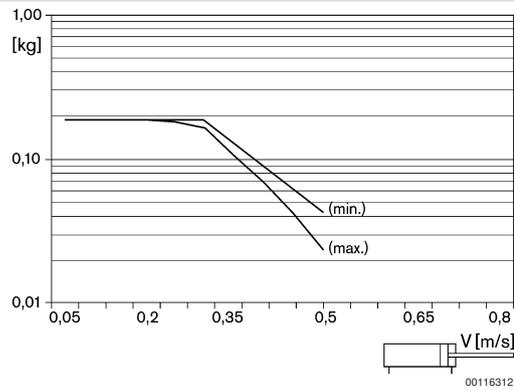
Maximum additionally moving mass (min. stroke, max. stroke), MSN - 10

00116313
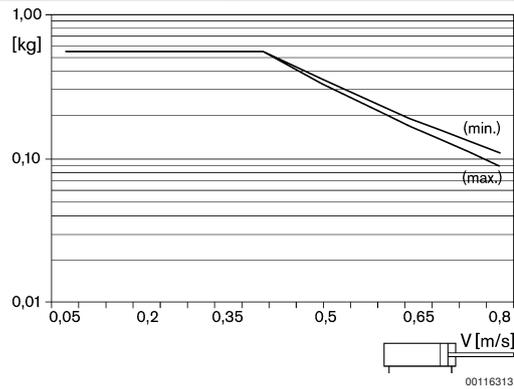
Maximum additionally moving mass (min. stroke, max. stroke), MSN-16
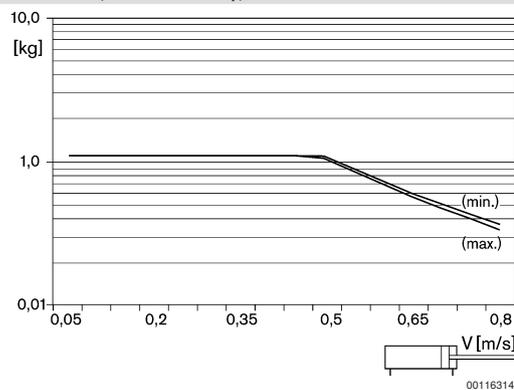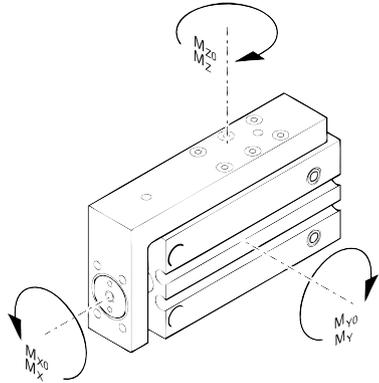

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Piston rod cylinders → Guide cylinders

Mini slide narrow, Series MSN
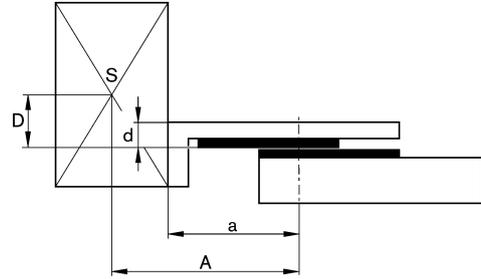► Ø 6 - 16 mm ► double-acting ► with magnetic piston ► cushioning: elastic ► with integrated ball rail guide

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				

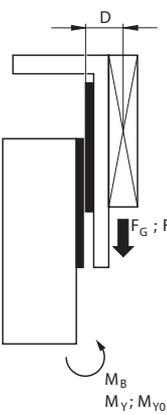S = stroke
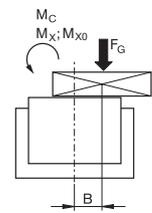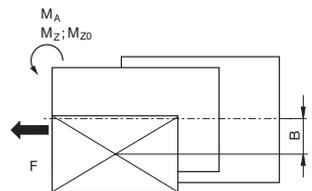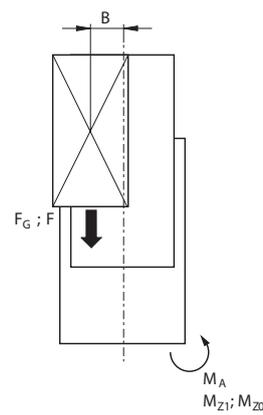1) correction factor (a)
2) correction factor (d)
3) Static moment M [Nm]
4) Dynamic moment M [Nm]

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	

horizontal

stat.	$M_{B0} = F_G \cdot A + F \cdot D$
dyn.	$M_B = F_G \cdot A$

stat.	$M_{CO} = F_G \cdot B$
dyn.	$M_C = F_G \cdot B$

stat.	$M_{A0} = F \cdot B$
dyn.	$M_A = 0$

dyn.	$\dfrac{M_A}{M_1} + \dfrac{M_B}{M_2} + \dfrac{M_C}{M_3} \leq 1$
stat.	$\dfrac{M_{A0}}{M_{Z0}} + \dfrac{M_{B0}}{M_{Y0}} + \dfrac{M_{C0}}{M_{X0}} \leq 1$

00116296

vertical

stat.	$M_{B0} = (F_G + F) \cdot D$
dyn.	$M_B = F_G \cdot D$

stat.	$M_{AO} = (F_G + F) \cdot B$
dyn.	$M_A = F_G \cdot B$

dyn.	$\dfrac{M_A}{M_1} + \dfrac{M_B}{M_2} \leq 1$
stat.	$\dfrac{M_{A0}}{M_{Z0}} + \dfrac{M_{B0}}{M_{Y0}} \leq 1$

00116297

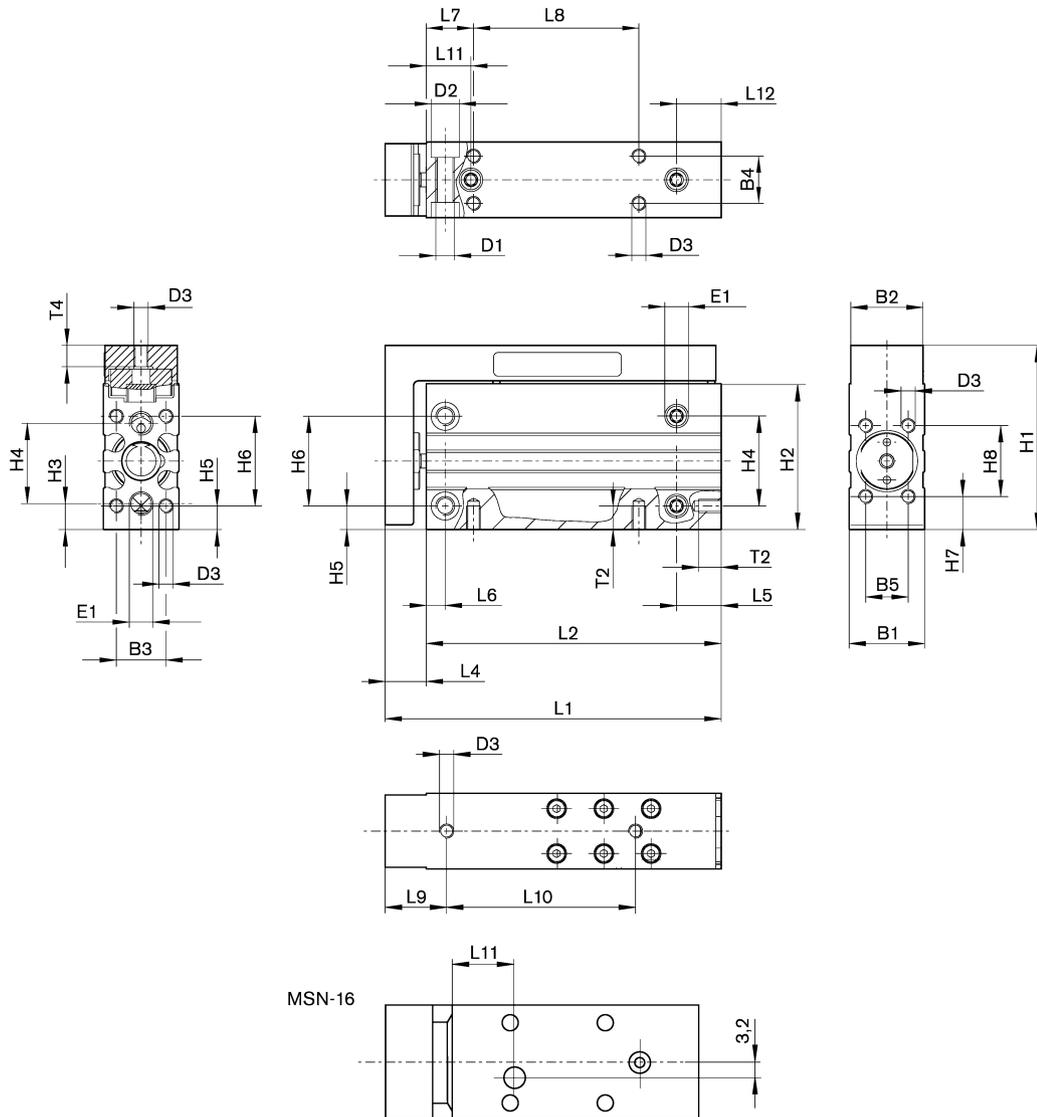$F = m \cdot a$
$F_G = m \cdot g$
$a = 1600 \cdot V^2$

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

MSN-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