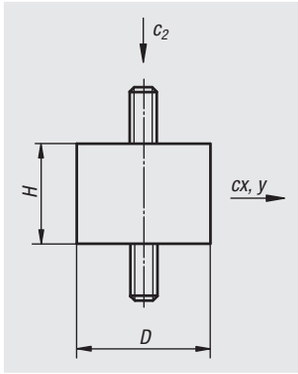
Technical information for rubber-metal buffers

Note:
Our rubber-metal buffers are simple and cost-efficient standard units for elastic mounting. They are ideally suited for compressive and axial loads of the most diverse ranges of application. With shear stress however, they are substantially less resilient than with compressive stress. The adjacent tables provide a guide to the static load values. By high dynamic alternating loads or high frequencies the loading should be reduced proportionately.

Guide values for static load (excerpt from 26100, 26102, 26104 and 26106)

Type	D	H	Compressive loads						Shear stresses					
			Spring rate c2 in N/mm			Permissible load F in N			Spring rate cx, y in N/mm			Permissible load F in N		
			hard	medium	soft	hard	medium	soft	hard	medium	soft	hard	medium	soft
A	20	15	300	190	120	500	320	200	60	40	30	190	120	70
A	30	15	670	410	250	1100	700	400	90	60	40	350	210	130
A	30	30	240	150	100	900	570	340	50	30	20	430	280	170
A	40	30	480	300	170	1800	1110	670	90	60	30	770	500	250
A	50	20	2400	1500	900	5000	3190	1870	240	160	100	1200	770	460
A	50	40	600	380	220	2800	1750	1050	120	80	50	1280	800	460
A	75	25	5000	2900	1700	8000	5000	3300	410	260	160	2800	1750	1030
A	75	55	650	400	240	4700	3000	1750	130	80	50	2100	1300	800
B	25	20	320	160	120	490	320	190	70	45	25	230	160	90
B	30	20	660	430	260	830	520	310	100	75	50	330	210	130
B	30	30	350	220	130	750	450	280	70	50	30	350	220	130
B	40	30	550	350	210	1250	750	450	110	70	40	520	330	200
B	50	40	560	370	220	2100	1270	760	120	80	45	930	580	350
B	50	50	350	220	130	1750	1100	650	80	50	30	800	510	310
B	75	50	950	630	330	4700	2910	1720	180	120	80	1900	1200	710
C	20	25	200	130	80	300	190	120	50	30	20	150	90	60
C	30	30	590	380	220	720	450	270	90	60	50	260	170	110
C	40	30	900	570	340	1080	680	410	150	90	60	380	240	140
C	50	30	1700	1090	650	2500	1750	950	210	150	70	470	290	170
C	50	50	360	220	140	1390	870	520	80	40	30	610	390	230
C	75	50	1010	630	370	3650	2050	1200	200	130	80	1560	980	580

Type	D	H	Compressive loads	
			Spring rate c2 in N/mm	Permissible load F in N
			medium	medium
D	25	20	150	260
D	30	20	330	730
D	40	30	250	950
D	50	20	660	1750
D	75	25	1430	4650



Rubber hardness:
hard = 70 Shore medium = 55 Shore soft = 45 Shore
For general guidance natural rubber is ca. 55 Shore.
static compression load: F (max.) = ca. 6.5 kg/cm² (63.77 N/cm²)
static axial load: F (max.) = ca. 1.5 kg/cm² (14.72 N/cm²)
by 10 % spring displacement, or transverse travel during axial load.
Naturally, much higher loads are possible without damage. However, these considerably effect the rubber-metal buffer in its primary purpose. Tensile loads are possible but should be avoided on account of the peak stress at the contact edges and the notch sensitivity of rubber.

Tolerances for rubber-metal buffers:
Permissible dimensional deviations per DIN 7751 Part 2. Permissible hardness deviation ±5 Shore A.

Synoptical Table - Properties of the Individual Material

Rubber material		Main Characteristics - Resistance to									
Abb.	Polymer	Temperature	Tensile strength	Fracture strain	Aging	Ozone	Petrol	Oil	Acid	Alkalis	Tensile strain
NR (NK)	Natural rubber	-30 °C – +80 °C	1	1	3	4	6	6	3	3	600%
SBR	Styrene-butadiene rubber	-30 °C – +80 °C	5	2	3	4	4	5	3	3	450%
CR	Chloroprene rubber	-20 °C – +110 °C	3	2	2	2	2	2	2	2	450%
NBR	Acrylonitrile-butadiene rubber	-30 °C – +120 °C	5	2	3	3	1	1	4	3	450%
EPDM	Ethylene propylene terpolymer	-30 °C – +130 °C	5	3	1	1	5	4	1	2	450%
SI	Silicone rubber	-60 °C – +200 °C	6	4	1	1	5	4	5	5	500%

1 = excellent 2 = very good 3 = good 4 = moderate 5 = low 6 = insufficient

Rubber-metal buffers

steel or stainless steel, type A

Material:
Metal parts steel grade 5.6 or stainless steel.
Elastomer natural rubber, medium hardness, 55 Shore A.

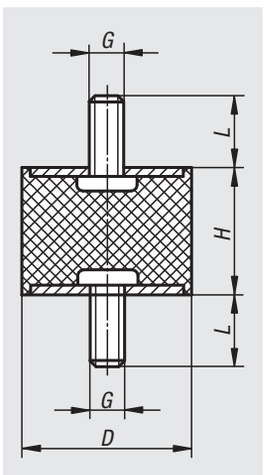
Version:
Steel galvanized.
Stainless steel bright.

Sample order:
nlm 26100-00800855

Note:
The rubber-metal buffers are widely-used construction devices for elastic mounting. They are used, among other things, as mountings for aggregates, motors, compressors, pumps and testing machinery.

Temperature range:
-30°C to +80°C.

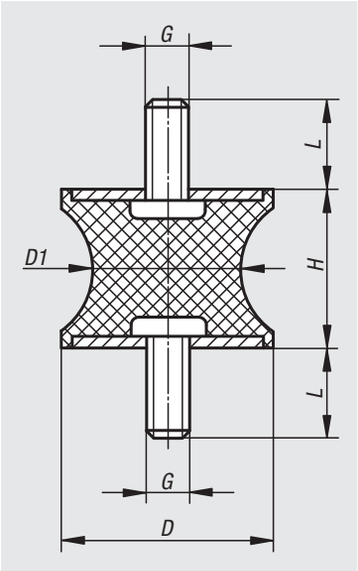
On request:
Other Shore grades.



Order No.	Material	D	G	L	H	Spring stiffness N/mm	Load N
26100-00800855	steel	8	M3	6	8	24	31
26100-01001055	steel	10	M4	10	10	35	32
26100-01001555	steel	10	M4	10	15	50	50
26100-01500855	steel	15	M4	10	8	130	104
26100-01501055	steel	15	M4	10	10	122	122
26100-01501555	steel	15	M4	10	15	59	88
26100-02000855	steel	20	M6	18	8	725	580
26100-02001055	steel	20	M6	18	10	300	300
26100-02001555	steel	20	M6	18	15	200	300
26100-02002055	steel	20	M6	18	20	133	332
26100-02002555	steel	20	M6	18	25	90	270
26100-02501055	steel	25	M6	18	10	800	800
26100-02501555	steel	25	M6	18	15	294	441
26100-02502055	steel	25	M6	18	20	200	500
26100-02502555	steel	25	M6	18	25	94	282
26100-02503055	steel	25	M6	18	30	70	280
26100-03001555	steel	30	M8	23	15	587	880
26100-03002055	steel	30	M8	23	20	318	795
26100-03002555	steel	30	M8	23	25	183	549
26100-03003055	steel	30	M8	23	30	150	600
26100-03004055	steel	30	M8	23	40	77	385
26100-04001555	steel	40	M8	23	15	1250	1875
26100-04002055	steel	40	M8	23	20	565	1412
26100-04003055	steel	40	M8	23	30	300	1200
26100-04004055	steel	40	M8	23	40	189	945
26100-05002055	steel	50	M10	28	20	1300	3250
26100-05002555	steel	50	M10	28	25	667	2000
26100-05003055	steel	50	M10	28	30	500	2000
26100-05004055	steel	50	M10	28	40	300	1500
26100-05005055	steel	50	M10	28	50	193	1153
26100-06004055	steel	60	M10	28	40	377	1885
26100-07004555	steel	70	M10	28	45	410	2255
26100-07502555	steel	75	M12	37	25	1655	4965
26100-07504055	steel	75	M12	37	40	717	3585
26100-07505055	steel	75	M12	37	50	470	2820
26100-07505555	steel	75	M12	37	55	405	2835
26100-015015551	Stainless steel	15	M4	12	15	59	88
26100-020015551	Stainless steel	20	M6	18	15	200	300
26100-025020551	Stainless steel	25	M6	18	20	200	500
26100-030020551	Stainless steel	30	M8	23	20	318	795
26100-030025551	Stainless steel	30	M8	23	25	183	549
26100-040030551	Stainless steel	40	M8	23	30	300	1200

Rubber-metal buffers

type AT tapered



Material:
Metal parts, steel, grade 5.6.
Elastomer natural rubber, medium hardness, 57 Shore A.

Version:
Steel galvanized.

Sample order:
nlm 26101-01001057

Note:
The rubber-metal buffers are widely-used construction devices for elastic mounting. They are used, among other things, as mountings for aggregates, motors, compressors, pumps and testing machinery.

Rubber-metal buffers with tapered rubber contour reduce high edge loads of the rubber by radial deflection and so increase the components service life.

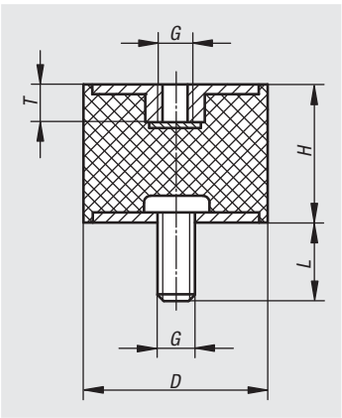
Temperature range:
-30°C to +80°C.

On request:
Other Shore grades.

Order No.	D	D1	H	G	L	Spring stiffness N/mm	Load N
26101-01001057	10	8	10	M4	13	31	37
26101-01501557	15	12	15	M4	13	71	135
26101-02001557	20	14	15	M6	18	177	283
26101-03002057	30	22	20	M8	23	212	763
26101-04003057	40	33	30	M8	23	202	1.111
26101-04004857	40	20	48	M8	23	101	626
26101-05003057	50	40	30	M10	28	351	1.229
26101-07504057	75	50	40	M12	37	466	2.330

Rubber-metal buffers

steel or stainless steel, type B



Material:
Metal parts steel grade 5.6 or stainless steel.
Elastomer natural rubber, medium hardness, 55 Shore A.

Version:
Steel galvanized.
Stainless steel bright.

Sample order:
nlm 26102-00800855

Note:
The rubber-metal buffers are widely-used construction devices for elastic mounting. They are used, among other things, as mountings for aggregates, motors, compressors, pumps and testing machinery.

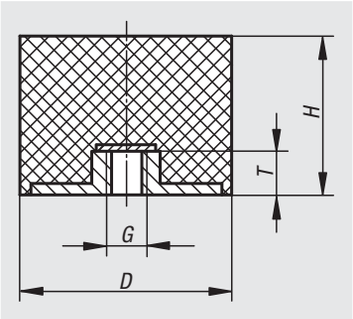
Temperature range:
-30°C to +80°C.

On request:
Other Shore grades.

Order No.	Material	D	H	G	L	T	Spring stiffness N/mm	Load N
26102-00800855	steel	8	8	M3	6	3	35	17
26102-01001055	steel	10	10	M4	10	4	75	75
26102-01001555	steel	10	15	M4	10	4	50	60
26102-01500855	steel	15	10	M4	10	4	130	130
26102-01501555	steel	15	15	M4	10	4	100	120
26102-02001555	steel	20	15	M6	18	6	325	390
26102-02002055	steel	20	20	M6	18	6	130	260
26102-02002555	steel	20	25	M6	18	6	95	210
26102-02501555	steel	25	15	M6	18	6	333	399
26102-02502055	steel	25	20	M6	18	6	195	410
26102-02502555	steel	25	25	M6	18	6	117	257
26102-02503055	steel	25	30	M6	18	6	100	300
26102-03001555	steel	30	15	M8	23	8	590	708
26102-03002055	steel	30	20	M8	23	8	280	560
26102-03002555	steel	30	25	M8	23	8	180	396
26102-03003055	steel	30	30	M8	23	8	168	504
26102-03004055	steel	30	40	M8	23	8	88	308
26102-04002055	steel	40	20	M8	23	8	700	840
26102-04003055	steel	40	30	M8	23	8	273	820
26102-04004055	steel	40	40	M8	23	8	189	660
26102-05002055	steel	50	20	M10	28	10	1471	2500
26102-05002555	steel	50	25	M10	28	10	630	1386
26102-05003055	steel	50	30	M10	28	10	545	1635
26102-05004055	steel	50	40	M10	28	10	310	1116
26102-05005055	steel	50	50	M10	28	10	180	900
26102-06004055	steel	60	40	M10	28	10	500	1750
26102-07004555	steel	70	45	M10	28	10	600	2400
26102-07502555	steel	75	25	M12	37	12	2440	3660
26102-07504055	steel	75	40	M12	37	12	700	2450
26102-07505055	steel	75	50	M12	37	12	520	2600
26102-07505555	steel	75	55	M12	37	12	396	2178
26102-008008551	Stainless steel	8	8	M3	8	3	35	17
26102-010010551	Stainless steel	10	10	M4	12	4	75	75
26102-015010551	Stainless steel	15	10	M4	12	4	-	-
26102-020020551	Stainless steel	20	20	M6	18	6	130	260
26102-025020551	Stainless steel	25	20	M6	18	6	195	410
26102-030020551	Stainless steel	30	20	M8	23	8	280	560
26102-040020551	Stainless steel	40	20	M8	23	8	700	840

Rubber-metal buffers

type E



Material:
Metal parts, steel, grade 5.6.
Elastomer natural rubber, medium hardness, 55 Shore A.

Version:
Steel galvanized.

Sample order:
nlm 26103-00800855

Note:
The rubber-metal buffers are widely-used construction devices for elastic mounting. They are used, among other things, as mountings for aggregates, motors, compressors, pumps and testing machinery.

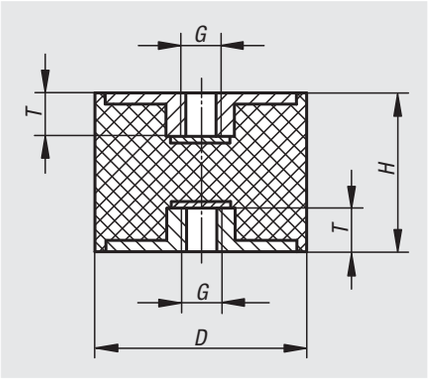
Temperature range:
-30°C to +80°C.

On request:
Other Shore grades.

Order No.	D	H	G	T	Spring stiffness N/mm	Load N
26103-00800855	8	8	M3	3	88	44
26103-01501255	15	12	M4	4	165	182
26103-01501555	15	15	M4	4	100	130
26103-01502055	15	20	M4	4	75	113
26103-02001555	20	15	M6	6	145	246
26103-02002055	20	20	M6	6	94	216
26103-02002555	20	25	M6	6	65	169
26103-02501555	25	15	M6	6	270	540
26103-02502555	25	25	M6	6	105	315
26103-02503055	25	30	M6	6	85	281
26103-02504055	25	40	M6	6	75	300
26103-03001555	30	15	M8	8	545	491
26103-03002555	30	25	M8	8	160	416
26103-03003055	30	30	M8	8	125	425
26103-03004055	30	40	M8	8	85	315
26103-04002055	40	20	M8	8	550	660
26103-04002555	40	25	M8	8	500	1000
26103-04003055	40	30	M8	8	300	870
26103-04004055	40	40	M8	8	260	1040
26103-05002055	50	20	M10	10	860	860
26103-05002555	50	25	M10	10	700	1400
26103-05003055	50	30	M10	10	450	1575
26103-05004055	50	40	M10	10	350	1400
26103-05005055	50	50	M10	10	170	850
26103-06003055	60	30	M10	10	700	1400
26103-06004055	60	40	M10	10	400	1600
26103-06005055	60	50	M10	10	240	1200
26103-07004255	70	42	M10	10	520	2600
26103-07004555	70	45	M10	10	680	3060
26103-07502555	75	25	M12	12	1211	1816
26103-07503055	75	30	M12	12	1090	2289
26103-07504055	75	40	M12	12	500	2000
26103-07505055	75	50	M12	12	550	2750

Rubber-metal buffers

steel or stainless steel, type C



Material:
Metal parts steel grade 5.6 or stainless steel.
Elastomer natural rubber, medium hardness, 55 Shore A.

Version:
Steel galvanized.
Stainless steel bright.

Sample order:
nlm 26104-01001055

Note:
The rubber-metal buffers are widely-used construction devices for elastic mounting. They are used, among other things, as mountings for aggregates, motors, compressors, pumps and testing machinery.

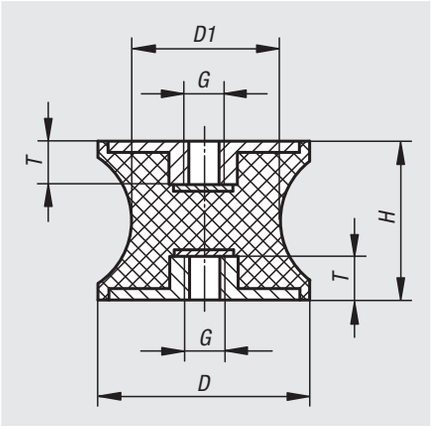
Temperature range:
-30°C to +80°C.

On request:
Other Shore grades.

Order No.	Material	D	H	G	T	Spring stiffness N/mm	Load N
26104-01001055	steel	10	10	M4	4	100	50
26104-01001555	steel	10	15	M4	4	50	50
26104-01501555	steel	15	15	M4	4	100	100
26104-02002055	steel	20	20	M6	6	230	276
26104-02002555	steel	20	25	M6	6	120	180
26104-02502055	steel	25	20	M6	6	230	276
26104-02502555	steel	25	25	M6	6	110	165
26104-02503055	steel	25	30	M6	6	80	160
26104-03002055	steel	30	20	M8	8	425	637
26104-03003055	steel	30	30	M8	8	175	350
26104-03004055	steel	30	40	M8	8	133	400
26104-04003055	steel	40	30	M8	8	530	1060
26104-04004055	steel	40	40	M8	8	222	666
26104-05003055	steel	50	30	M10	10	680	1360
26104-05004055	steel	50	40	M10	10	333	1000
26104-05005055	steel	50	50	M10	10	190	665
26104-07504055	steel	75	40	M12	12	750	2250
26104-07505055	steel	75	50	M12	12	636	2225
26104-010010551	Stainless steel	10	10	M4	4	100	50
26104-015015551	Stainless steel	15	15	M4	4	100	100
26104-020020551	Stainless steel	20	20	M6	6	230	276
26104-025025551	Stainless steel	25	25	M6	6	110	165
26104-030020551	Stainless steel	30	20	M8	8	425	637
26104-030030551	Stainless steel	30	30	M8	8	175	350
26104-040030551	Stainless steel	40	30	M8	8	530	1060

Rubber-metal buffers

type CT tapered



Material:
Metal parts, steel, grade 5.6.
Elastomer natural rubber, medium hardness, 57 Shore A.

Version:
Steel galvanized.

Sample order:
nlm 26105-01001057

Note:
The rubber-metal buffers are widely-used construction devices for elastic mounting. They are used, among other things, as mountings for aggregates, motors, compressors, pumps and testing machinery.

Rubber-metal buffers with tapered rubber contour reduce high edge loads of the rubber by radial deflection and so increase the components service life.

Temperature range:
-30°C to +80°C.

On request:
Other Shore grades.

Order No.	D	D1	H	G	T	Spring stiffness N/mm	Load N
26105-01501557	15	12	15	M4	4	111	122
26105-02001557	20	14	15	M6	6	227	227
26105-03002057	30	22	20	M8	8	252	504
26105-04003057	40	33	30	M8	8	199	796
26105-04004857	40	20	48	M8	8	111	555
26105-05003057	50	40	30	M10	10	499	998
26105-07504057	75	50	40	M12	12	597	2.030

Rubber-metal buffers

steel or stainless steel, type D

Material:
Metal parts steel grade 5.6 or stainless steel.
Elastomer natural rubber, medium hardness, 55 Shore A.

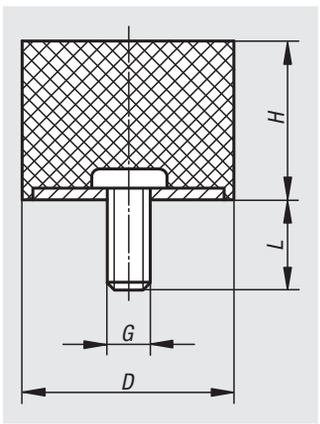
Version:
Steel galvanized.
Stainless steel bright.

Sample order:
nlm 26106-00800855

Note:
Rubber-metal buffers are used among other things, for mounting aggregates and as elastic buffers to limit the travel by moving masses or as feet that are not firmly fixed in the floor and where the floor is sensitive i.e. office machinery.

Temperature range:
-30°C to +80°C.

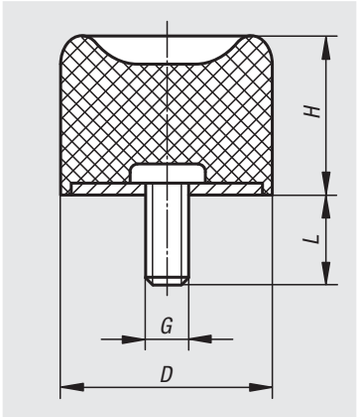
On request:
Other Shore grades.



Order No.	Material	D	H	G	L	Spring stiffness N/mm	Load N
26106-00800855	steel	8	8	M3	6	40	40
26106-01001055	steel	10	10	M4	10	35	35
26106-01001555	steel	10	15	M4	10	26	40
26106-01500655	steel	15	6	M4	10	175	88
26106-01500855	steel	15	8	M4	10	187	187
26106-01501055	steel	15	10	M4	10	100	100
26106-01501555	steel	15	15	M4	10	50	100
26106-02000555	steel	20	5	M6	18	135	95
26106-02000855	steel	20	8	M6	18	250	250
26106-02001055	steel	20	10	M6	18	240	240
26106-02001555	steel	20	15	M6	18	110	220
26106-02002055	steel	20	20	M6	18	75	225
26106-02002555	steel	20	25	M6	18	65	227,5
26106-02500855	steel	25	8	M6	18	850	850
26106-02501055	steel	25	10	M6	18	400	400
26106-02501555	steel	25	15	M6	18	210	420
26106-02502055	steel	25	20	M6	18	140	420
26106-02502555	steel	25	25	M6	18	100	350
26106-02503055	steel	25	30	M6	18	79	316
26106-03001555	steel	30	15	M8	23	270	540
26106-03002055	steel	30	20	M8	23	238	714
26106-03002555	steel	30	25	M8	23	153	535,5
26106-03003055	steel	30	30	M8	23	127	508
26106-03004055	steel	30	40	M8	23	88	528
26106-04001555	steel	40	15	M8	23	710	1420
26106-04002055	steel	40	20	M8	23	365	1095
26106-04003055	steel	40	30	M8	23	205	820
26106-04004055	steel	40	40	M8	23	143	858
26106-05002055	steel	50	20	M10	28	646	1938
26106-05003055	steel	50	30	M10	28	354	1416
26106-05004055	steel	50	40	M10	28	230	1380
26106-05005055	steel	50	50	M10	28	160	1280
26106-06004055	steel	60	40	M10	28	317	1902
26106-07002555	steel	70	25	M10	28	980	3430
26106-07004555	steel	70	45	M10	28	438	3066
26106-07502555	steel	75	25	M12	37	1318	4613
26106-07504055	steel	75	40	M12	37	643	3858
26106-07505055	steel	75	50	M12	37	472	3776
26106-07505555	steel	75	55	M12	37	310	3100
26106-008008551	Stainless steel	8	8	M3	8	40	40
26106-010010551	Stainless steel	10	10	M4	10	35	35
26106-015015551	Stainless steel	15	15	M4	10	50	100
26106-020015551	Stainless steel	20	15	M6	18	110	220
26106-025020551	Stainless steel	25	20	M6	18	140	420
26106-030030551	Stainless steel	30	30	M8	23	127	508
26106-040030551	Stainless steel	40	30	M8	23	205	820

Rubber-metal buffers

type DS suction base



Material:
Metal parts, steel, grade 5.6.
Elastomer natural rubber, medium hardness, 57 Shore A.

Version:
Steel galvanized.

Sample order:
nlm 26107-01501457

Note:
Rubber-metal buffers are used among other things, for mounting aggregates and as elastic buffers to limit the travel by moving masses.

Temperature range:
-30°C to +80°C.

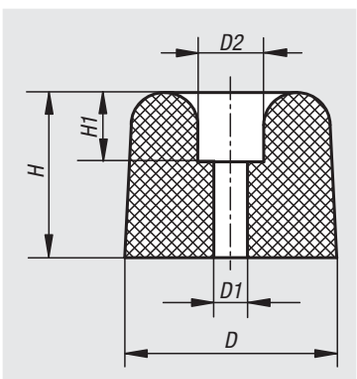
On request:
Other Shore grades.

Order No.	D	H	G	L	Spring stiffness N/mm	Load N
26107-01501457	15	14	M4	13	50	100
26107-02501857	25	18,5	M6	18	95	285
26107-03002857	30	28,5	M8	23	97	340
26107-04002857	40	28	M8	23	120	480
26107-05002857	50	28	M10	28	220	990
26107-07003057	70	30	M10	28	360	2160
26107-07503757	75	37	M12	37	390	3510
26107-10005057	100	50	M16	42	540	8100

26108

Rubber impact buffers

type TP door buffer



Material:
Elastomer, natural rubber, medium hardness, 60 Shore A

Sample order:
nlm 26108-02601560

Note:
Screw on rubber impact buffers can also be used as equipment or machine feet.

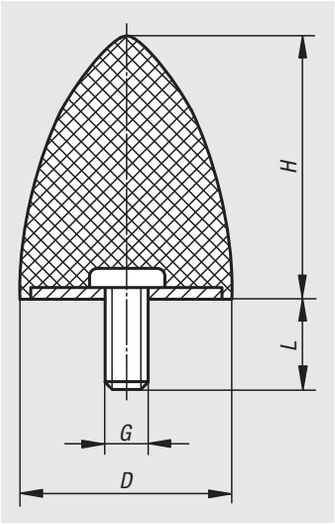
Temperature range:
-30°C to +80°C.

On request:
Other Shore grades.

Order No.	D	D1	D2	H	H1
26108-02601560	26	4	12	15	9
26108-03002260	30	7	11	21	5
26108-03503060	35	8	17	30	10
26108-04003560	40	7	20	35	8

Rubber impact buffers

parabolic



Material:
Metal parts, steel, grade 5.6.
Elastomer natural rubber, medium hardness, 55 Shore A.

Version:
Steel galvanized.

Sample order:
nlm 26110-02002455

Note:
Rubber impact buffers are robust and effective elastic cushioning elements and shock absorbers. They are ideal for elastic travel limitation and cushioning knocks by mobile and immobile aggregates and machines and as use as door stops.

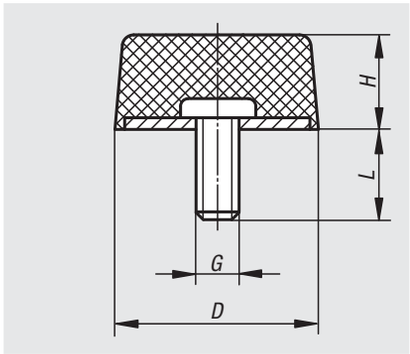
Temperature range:
-30°C to +80°C.

On request:
Other Shore grades.

Order No.	D	H	G	L	Spring stiffness N/mm	Load N
26110-02002455	20	24	M6	18	14	500
26110-03003655	30	36	M8	20	15	750
26110-03504055	35	40	M8	20	-	-
26110-05005855	50	58	M10	28	30	3000
26110-05006755	50	67	M8	38	30	3200
26110-07508955	75	89	M12	37	50	8000

Rubber impact buffers

conical



Material:
Metal parts, steel, grade 5.6.
Elastomer natural rubber, medium hardness, 55 Shore A.

Version:
Steel galvanized.

Sample order:
nlm 26112-02501755

Note:
Rubber impact buffers are robust and effective elastic cushioning elements and shock absorbers. They are ideal for elastic travel limitation and cushioning knocks by mobile and immobile aggregates and machines and as use as door stops.

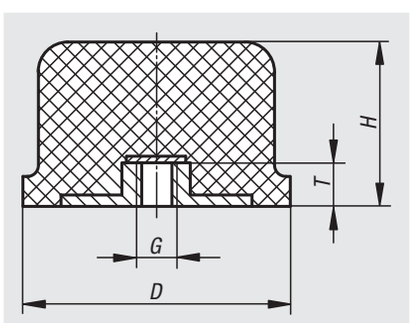
Temperature range:
-30°C to +80°C.

On request:
Other Shore grades.

Order No.	D	H	G	L	Spring stiffness N/mm	Load N
26112-02501755	25	17	M6	18	3,7	678
26112-05001855	50	18	M10	28	4	3600

Rubber impact buffers

spherical



Material:
Metal parts, steel, grade 5.6.
Elastomer natural rubber, medium hardness, 55 Shore A.

Version:
Steel galvanized.

Sample order:
nlm 26115-05003555

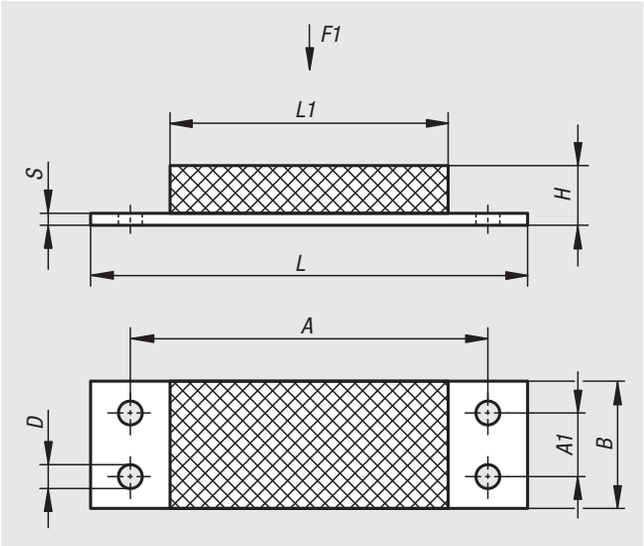
Note:
Rubber impact buffers are robust and effective elastic cushioning elements and shock absorbers. They are ideal for elastic travel limitation and cushioning knocks by mobile and immobile aggregates and machines and as use as door stops.

Temperature range:
-30°C to +80°C.

On request:
Other Shore grades.

Order No.	D	H	G	T	Spring stiffness N/mm	Load N
26115-05003555	50	35	M10	10	120	3000
26115-08006055	80	60	M12	12	150	11000
26115-12509055	125	93	M16	16	200	20000

Rubber-metal impact buffer rails



Material:
Steel.
Elastomer, natural rubber, medium hardness, 57 Shore A.

Version:
Steel, painted black.

Sample order:
nlm 26120-02501904557

Note:
For absorbing large impact forces and supporting heavy weights.

The indicated load data apply for static long-term load with a rubber hardness of 57 Shore A.

* Metal part 30 mm wide.

Temperature range:
-30°C to +80°C.

Order No.	A	A1	B	D	H	L	L1	S	F1 (N)
26120-02501904557	68,6	-	25*	6,5	19	84	45	3	500
26120-05003507057	100	-	50	8,5	35	130	70	5	3100
26120-05007007057	100	-	50	8,5	70	130	70	5	2500
26120-10004512057	160	50	100	13	45	200	120	10	14000
26120-10008012057	160	50	100	13	80	200	120	10	8500
26120-12004515057	200	60	120	15	45	250	150	10	18000
26120-15005020057	250	80	150	17	50	300	200	15	34000

O-shaped mounts

Material:
Metal parts, steel, grade 5.6.
Elastomer natural rubber, medium hardness, 57 Shore A.

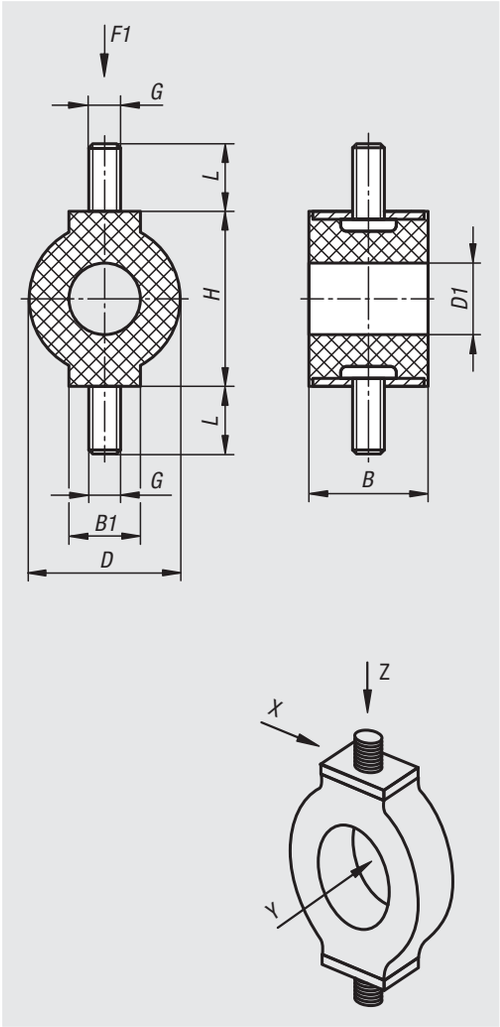
Version:
Steel galvanized.

Sample order:
nlm 26130-01201257

Note:
O-shapes mounts have a very soft spring characteristic, which is why they are also called low-frequency supports. They serve for low-vibration support of instruments, and electrical components, as well as for mounting light assemblies and precision mechanical equipment.

The spring characteristic of the O-shaped mounts increases in the order X, Y and Z. The main load direction is the longitudinal axis of the threaded bolts (Z direction).

Temperature range:
-30°C to +80°C.



Order No.	B	B1	D	D1	G	H	L	F1 (N)
26130-01201257	9,5	9,5	10	6	M4	12,5	10	8
26130-01401757	13	6	14	6	M4	17	10	18
26130-02503057	20	12	25	12	M5	30	10	55

Technical information for gas springs

Assembly position:
Gas pressure springs in the sizes 04/12 and 06/15 should if possible always be assembled with the piston rod extending downward. In this way, optimal lubrication of the guide and the sealing system is ensured. For gas springs sized 08/19 and up the assembly position is discretionary. Keep in mind, however, that end-of-travel damping is effective only when the piston rod extends downward. In order to prevent increased loss of gas, gas springs cannot be subject to bending loads, tensile loads or lateral forces. Whenever possible, we recommend the use of ball head connections.

The fitting and removal of gas springs may only be carried out in the no-load state.

Gas springs may be used as an end stop if the nominal force +30% is not exceeded in the process.

Gas springs must not be subjected to tensile stress.

Maintenance:
The gas springs are maintenance-free. Lubrication or service is not required.

Temperature range:
-20 °C up to +80 °C.

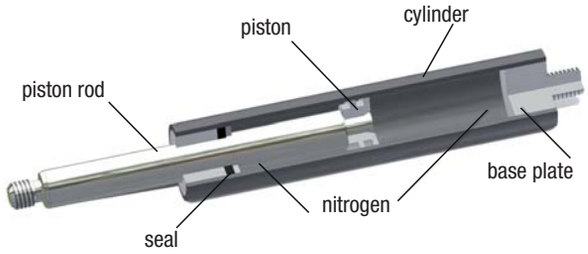
Influence of temperature:
Nominal force is measured at 20 °C. Subject to physical conditions, the gas springs' force changes every 10 °C by 3.4 %.

Transport and storage:
Gas pressure springs in the sizes 04/12 and 06/15 should be stored with the piston rod extending downward at an ambient temperature of approx. 20 °C. As of size 08/19, storage in any orientation is possible. Actuate the gas springs after 6 months' storage at the latest. Storage of gas springs for a period of over 1 year should be avoided.

Valve:
The gas springs have a check valve inside the the pressure tube thread for subsequent increase and decrease of the nitrogen pressure.

Disposal
If gas springs are no longer needed, they must be disposed of in an environmentally responsible way. For this purpose, a hole is drilled at a suitable spot in order to release the compressed nitrogen gas and drain the oil contained in them. Our opening and disposal instructions are available at our website under the menu item Download.

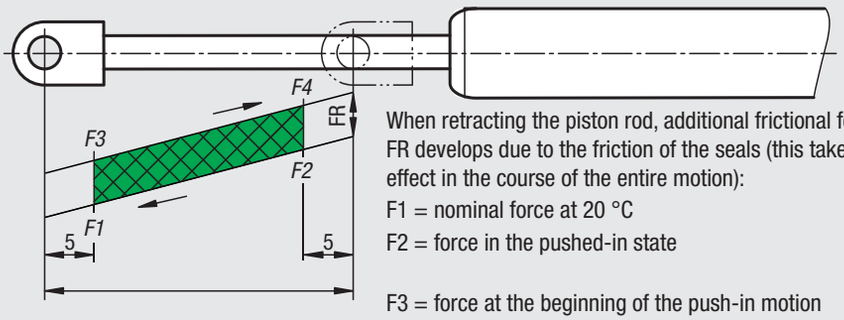
Design and function principle of norelem gas springs



norelem gas springs are hydropneumatic, self-contained and maintenance-free adjustment elements. Spring force F1 results from the internal pressure (maximum 160 bar on no-load) in the cylinder, which is produced by the nitrogen fill medium. This pressure on the gas spring acts on the cross-sectional area of the piston rod. The piston rod is always extended in the no-load state.

In the course of pushing the piston rod in, the volume in the cylinder is reduced and the gas is compressed.. By doing this, an increase in the force (progression) of the gas springs results subject to the diameter of the piston rod and the cylinder volume. Norelem gas springs contain an oil filling for lubrication and end-of-travel damping.

Gas spring characteristic in the force/distance diagram

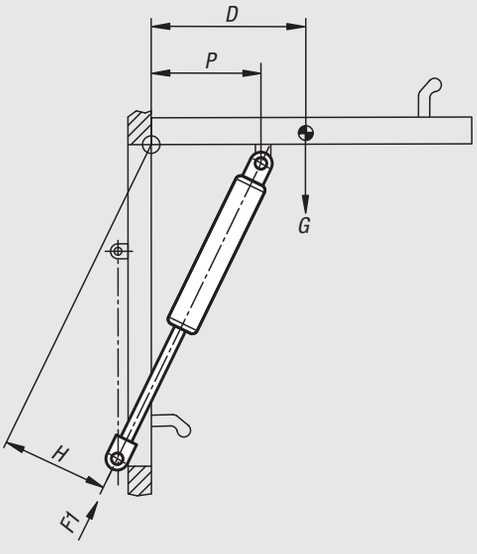


When retracting the piston rod, additional frictional force FR develops due to the friction of the seals (this takes effect in the course of the entire motion):
F1 = nominal force at 20 °C
F2 = force in the pushed-in state

F3 = force at the beginning of the push-in motion
F4 = force at the end of the push-in motion

The approximation formula and application sketch shown below assist in providing a rough estimate and in selecting the appropriate gas spring from the standard programme.

Calculating push-out force F1



Approximation formula for calculating the thrust F1 [N] at 20 °C

$$F1 = \frac{G \cdot D}{H \cdot n} \times 13\ [N]$$

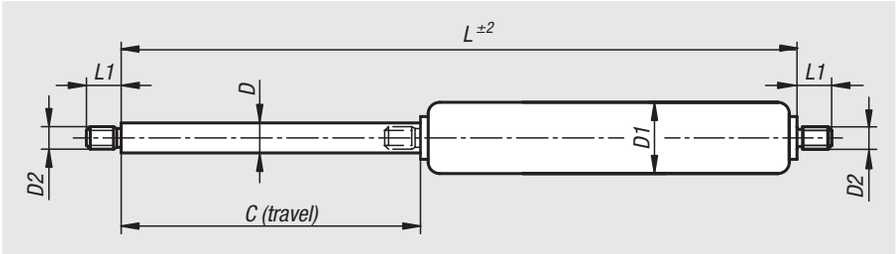
G = hatch weight in kg
H = effective lever arm of gas spring in mm, hatch open
13 = conversion factor kg → N + safety margin
P = hatch fastening ca. 2/3 D
n = No. off gas springs (standard: n = 2)
D = effective centre of gravity in mm, hatch open

Example:

G = 25 kg, D = 300 mm, H = 150 mm, n = 2

$$F1 = \frac{25 \cdot 300}{150 \cdot 2} \times 13 = 325\ N$$

Gas springs



Material:
Piston rod and pressure tube steel.
Fill medium: oil, nitrogen.

Version:
Piston rod, hard chromed.
Piston rod Ø4 is stainless steel.
Pressure tube painted black.

Sample order:
nlm 26200-0412030X20
(include extension force F1)

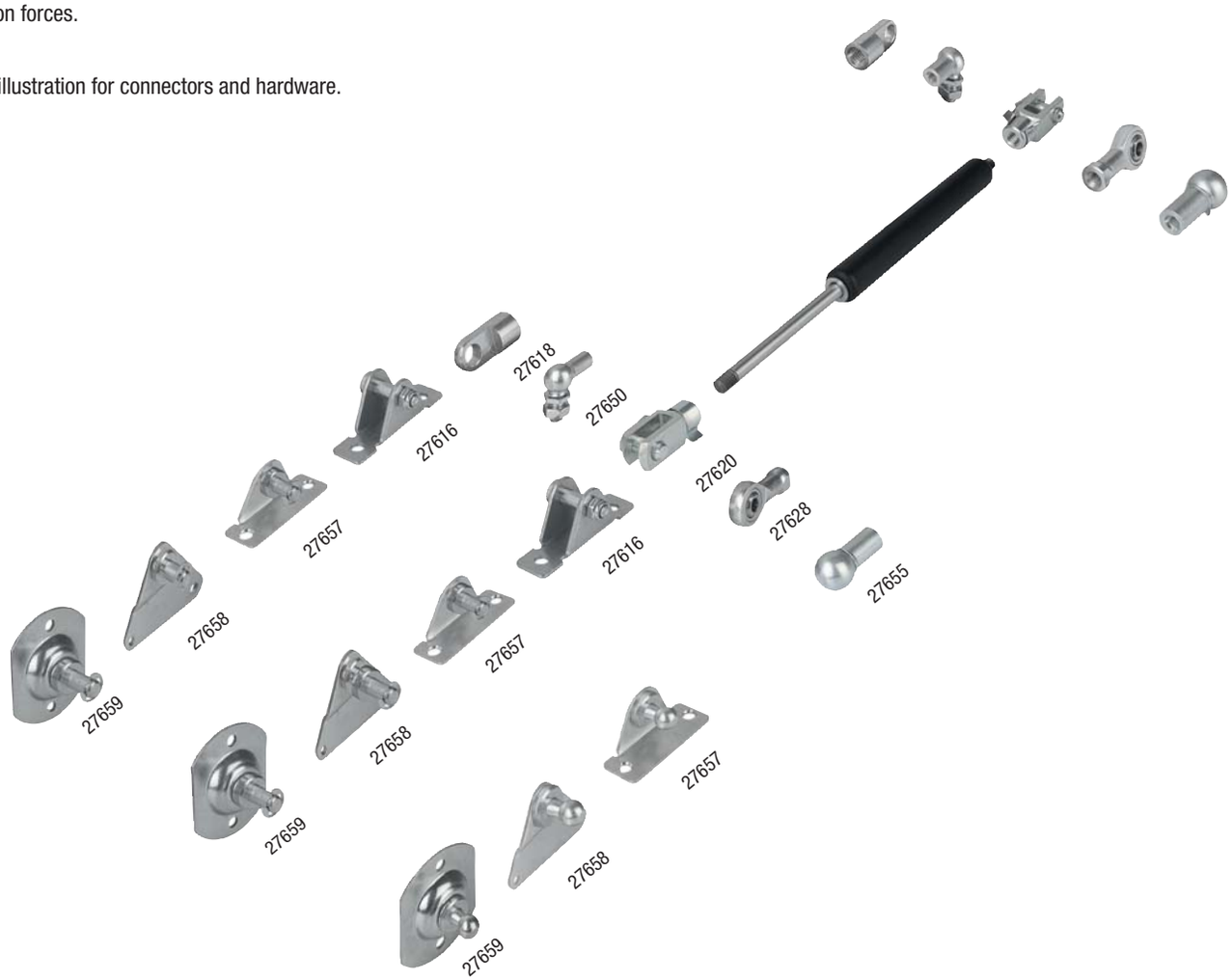
Note:
Gas springs are maintenance-free, self-contained systems that are filled with nitrogen under high pressure. For end-of-travel damping and lubrication, a defined amount of oil is also contained inside. The gas springs contain a nonreturn valve in a threaded pin on the pressurised pipe, which allows the pushing force to be lowered at a later time.

Gas pressure springs in the sizes 04/12 and 06/15 must be stored and installed with the piston rod extending downwards. As of size 08/19, storage and installation in any orientation is possible. Keep in mind, however, that end-of-travel damping is effective only when the piston rod extends downwards.
As a consequence of the physical properties when filling a gas spring, a tolerance range of ±5% results for the rated pushing force.

Gas springs are filled with nitrogen under high pressure and under no circumstances should they be opened or overloaded.

On request:
Other extension forces.

Accessories:
See adjacent illustration for connectors and hardware.

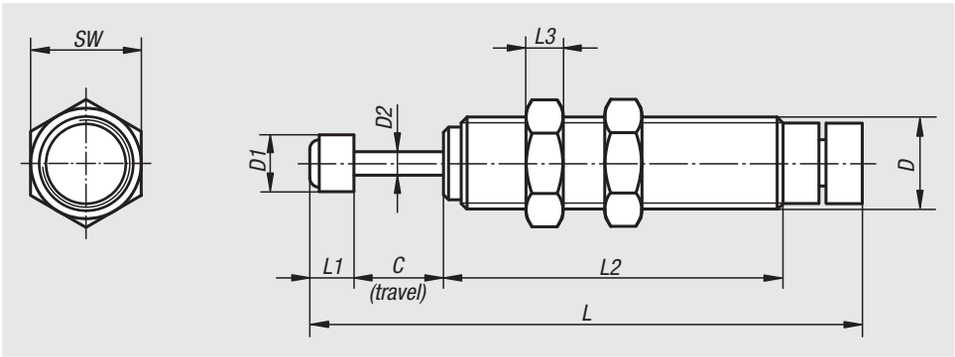


Gas springs

Order No.	Size	D	D1	D2	C (travel)	L	L1	Progression %	Extension force F1 N
26200-0412030X	04/12	4	12	M3,5	30	92	5	20	20/40/70/100/130/150/180
26200-0412040X	04/12	4	12	M3,5	40	112	5	20	20/40/70/100/130/150/180
26200-0412050X	04/12	4	12	M3,5	50	132	5	20	20/40/70/100/130/150/180
26200-0412060X	04/12	4	12	M3,5	60	152	5	20	20/40/70/100/130/150/180
26200-0412070X	04/12	4	12	M3,5	70	172	5	20	20/40/70/100/130/150/180
26200-0412080X	04/12	4	12	M3,5	80	192	5	20	20/40/70/100/130/150/180
26200-0412100X	04/12	4	12	M3,5	100	232	5	20	20/40/70/100/130/150/180
26200-0615020X	06/15	6	15,6	M5	20	95	5	22	100/150/200/250/300/350/400
26200-0615040X	06/15	6	15,6	M5	40	135	5	22	100/150/200/250/300/350/400
26200-0615060X	06/15	6	15,6	M5	60	175	5	22	100/150/200/250/300/350/400
26200-0615080X	06/15	6	15,6	M5	80	215	5	22	100/150/200/250/300/350/400
26200-0615100X	06/15	6	15,6	M5	100	255	5	22	100/150/200/250/300/350/400
26200-0615120X	06/15	6	15,6	M5	120	295	5	22	100/150/200/250/300/350/400
26200-0615150X	06/15	6	15,6	M5	150	355	5	22	100/150/200/250/300/350/400
26200-0819060X	08/19	8	19	M8	60	190	10	30	100/150/200/250/300/350/400/500/600/700
26200-0819080X	08/19	8	19	M8	80	230	10	30	100/150/200/250/300/350/400/500/600/700
26200-0819100X	08/19	8	19	M8	100	270	10	30	100/150/200/250/300/350/400/500/600/700
26200-0819120X	08/19	8	19	M8	120	310	10	30	100/150/200/250/300/350/400/500/600/700
26200-0819140X	08/19	8	19	M8	140	350	10	30	100/150/200/250/300/350/400/500/600/700
26200-0819160X	08/19	8	19	M8	160	390	10	30	100/150/200/250/300/350/400/500/600/700
26200-0819180X	08/19	8	19	M8	180	430	10	30	100/150/200/250/300/350/400/500/600/700
26200-0819200X	08/19	8	19	M8	200	470	10	30	100/150/200/250/300/350/400/500/600/700
26200-0819220X	08/19	8	19	M8	220	510	10	30	100/150/200/250/300/350/400/500/600/700
26200-0819250X	08/19	8	19	M8	250	570	10	30	100/150/200/250/300/350/400/500/600/700
26200-1023050X	10/23	10	23	M8	50	170	10	30	150/200/250/300/350/400/500/600/700/800
26200-1023100X	10/23	10	23	M8	100	270	10	30	150/200/250/300/350/400/500/600/700/800
26200-1023150X	10/23	10	23	M8	150	370	10	30	150/200/250/300/350/400/500/600/700/800
26200-1023200X	10/23	10	23	M8	200	470	10	30	150/200/250/300/350/400/500/600/700/800
26200-1023250X	10/23	10	23	M8	250	570	10	30	150/200/250/300/350/400/500/600/700/800
26200-1023300X	10/23	10	23	M8	300	670	10	30	150/200/250/300/350/400/500/600/700/800
26200-1023350X	10/23	10	23	M8	350	770	10	30	150/200/250/300/350/400/500/600/700/800
26200-1428050X	14/28	14	28	M10	50	207	12	40	200/250/300/350/400/500/600/700/800
26200-1428100X	14/28	14	28	M10	100	307	12	40	200/250/300/350/400/500/600/700/800
26200-1428150X	14/28	14	28	M10	150	407	12	40	200/250/300/350/400/500/600/700/800
26200-1428200X	14/28	14	28	M10	200	507	12	40	200/250/300/350/400/500/600/700/800
26200-1428250X	14/28	14	28	M10	250	607	12	40	200/250/300/350/400/500/600/700/800
26200-1428300X	14/28	14	28	M10	300	707	12	40	200/250/300/350/400/500/600/700/800
26200-1428400X	14/28	14	28	M10	400	907	12	40	200/250/300/350/400/500/600/700/800

Industrial shock absorbers

adjustable



Material:
Housing, steel.
M8x0.75 housing in stainless steel.
Steel piston rod.
Steel nut.
Collision head in steel, plastic.

Version:
Housing nickel plated.
Housing M8x0.75, bright.
Housing M8x1 black oxidised.
Piston rod hard chromed.
Nut nickel plated.

Sample order:
nlm 26300-0807506

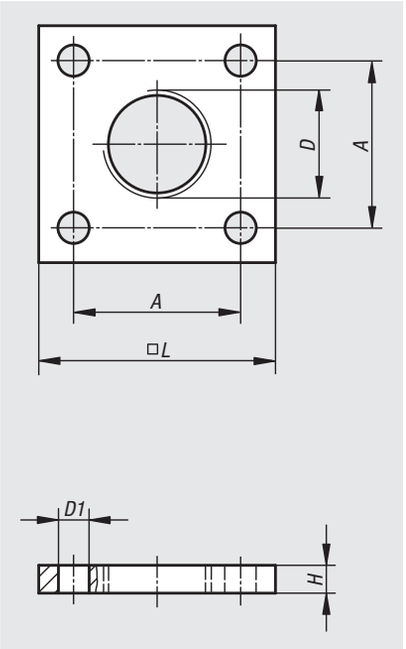
Note:
Industrial shock absorbers are maintenance-free, ready to install hydraulic components. They have an integrated fixed stop. The damping strength can be precisely set with the adjustable version. After installation, the equipment is run a few times and the adjustment screw rotated until the optimal braking is achieved.
Exceeding the max. energy input per hour is possible if a pause is made every now and then or the shock absorber is air cooled. The end position is optional.

Temperature range:
-5 °C to +70 °C.

Order No.	D	D1	D2	C (travel)	L	L1	L2	L3	SW
26300-0807506	M8x0,75	6	2,5	6	58	5	41	2	11
26300-0810008	M8x1	6,4	2,5	8	61,1	5,1	43,9	3	10
26300-1010008	M10x1	6	2,4	8	65	6	41	3	13
26300-1210010	M12x1	8	3,5	10	84	8	61	4	14
26300-1415010	M14x1,5	10	3,5	10	88	8	59	6	17
26300-2015016	M20x1,5	18	6	16	127	17	76	8	24
26300-2515030	M25x1,5	22	8	30	173	18	111	10	32

Order No.	max. energy input per stroke Nm	max. energy input per hour Nm	effective mass max. kg	speed range m/s	return force N	axis deviation max. (°)
26300-0807506	1,4	2202	15	0,3 - 2	9	2,5
26300-0810008	3,5	5650	15	0,3 - 2	5,3	2
26300-1010008	1,76	3528	10	0,3 - 2	5,88	2,5
26300-1210010	4,9	5880	30	0,3 - 2	9,8	2,5
26300-1415010	5,88	8820	35	0,3 - 2	9,8	2,5
26300-2015016	29,4	20580	200	0,3 - 2	18,1	2,5
26300-2515030	49	29400	300	0,3 - 2	33,2	2,5

Mounting flange



Material:
Steel.

Version:
nickel-plated.

Sample order:
nlm 26320-08075

Note:
When using the mounting flange use a locknut to secure the shock absorber. The compact form allows for space saving designs.

Order No.	A	D	D1	H	L
26320-08075	18	M8x0,75	3,2	4	25
26320-10100	18	M10x1	3,2	4	25
26320-12100	18	M12x1	3,2	4	25
26320-14150	24	M14x1,5	4,5	4	34
26320-20150	28	M20x1,5	6,5	12	40
26320-25150	40	M25x1,5	9	12	54