26000

Rubber-metal buffers
Shock absorbers
Gas springs

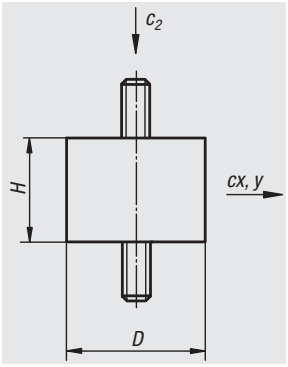
Technical information for rubber-metal buffers

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. In the case of shear stress, however, they are substantially less resilient than in compressive stress. The adjacent tables provide an overview of the guide values for static load. In the case of high dynamic alternating loads or that of high frequencies, the load indices are to 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.

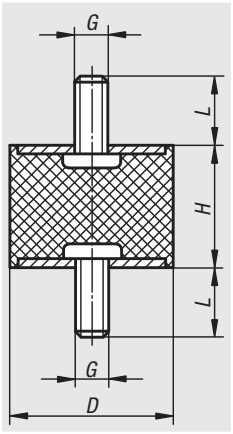
Synoptical Table - Properties of the Individual Material

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 buffer,

type A



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 55° Shore A

Sample order:
nlm 26100-00800855

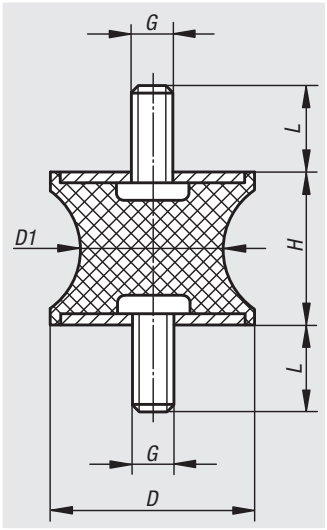
Note:
The rubber-metal buffers are widely-used construction devices for elastic bearings. They are used, among other things, as bearings for assemblies, motors, compressors, pumps and testing machines.

Temperature range:
-30 °C to +80 °C.

Order No.	D	G	L	H	Approx. weight g
26100-00800855	8	M3	6	8	1,0
26100-01001055	10	M4	10	10	3,2
26100-01001555	10	M4	10	15	3,9
26100-01500855	15	M4	10	8	6,0
26100-01501055	15	M4	10	10	6,4
26100-01501555	15	M4	10	15	7,8
26100-02000855	20	M6	18	8	15,0
26100-02001055	20	M6	18	10	15,0
26100-02001555	20	M6	18	15	20,0
26100-02002055	20	M6	18	20	19,0
26100-02002555	20	M6	18	25	20,0
26100-02501055	25	M6	18	10	20,0
26100-02501555	25	M6	18	15	27,5
26100-02502055	25	M6	18	20	30,0
26100-02502555	25	M6	18	25	32,0
26100-02503055	25	M6	18	30	40,0
26100-03001555	30	M8	23	15	37,0
26100-03002055	30	M8	23	20	56,0
26100-03002555	30	M8	23	25	58,0
26100-03003055	30	M8	23	30	65,0
26100-03004055	30	M8	23	40	74,0
26100-04001555	40	M8	23	15	79,0
26100-04002055	40	M8	23	20	82,0
26100-04003055	40	M8	23	30	102,0
26100-04004055	40	M8	23	40	115,0
26100-05002055	50	M10	28	20	141,0
26100-05002555	50	M10	28	25	155,0
26100-05003055	50	M10	28	30	163,0
26100-05004055	50	M10	28	40	178,0
26100-05005055	50	M10	28	50	199,0
26100-06004055	60	M10	28	40	231,0
26100-07004555	70	M10	28	45	401,0
26100-07502555	75	M12	37	25	369,0
26100-07504055	75	M12	37	40	420,0
26100-07505055	75	M12	37	50	483,0
26100-07505555	75	M12	37	55	514,0

Rubber-metal buffer

type AT tapered



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 57° Shore A

Sample order:
nlm 26101-01001057

Note:
The rubber-metal buffers are widely-used construction devices for elastic bearings. They are used, among other things, as bearings for assemblies, motors, compressors, pumps and testing machines.

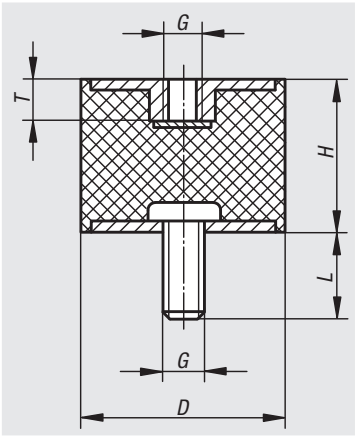
Rubber-metal buffers with tapered rubber contour reduce high edge loads of the rubber in case of axial excursion and thus increase the service life of the component.

Temperature range:
-30 °C up to +80 °C.

Order No.	D	D1	H	G	L	Approx. weight g
26101-01001057	10	8	10	M4	13	3
26101-01501557	15	12	15	M4	13	7
26101-02001557	20	14	15	M6	18	17
26101-03002057	30	22	20	M8	23	55
26101-04003057	40	33	30	M8	23	81
26101-04004857	40	20	48	M8	23	87
26101-05003057	50	40	30	M10	28	170
26101-07504057	75	50	40	M12	37	350

Rubber-metal buffer

type B



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 55° Shore A

Sample order:
nlm 26102-00800855

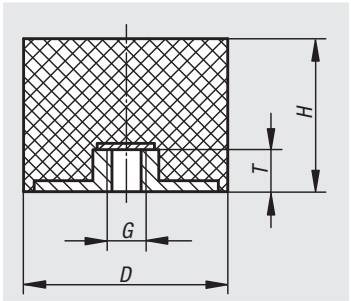
Note:
The rubber-metal buffers are widely-used construction devices for elastic bearings. They are used, among other things, as bearings for assemblies, motors, compressors, pumps and testing machines.

Temperature range:
-30 °C up to +80 °C.

Order No.	D	H	G	L	T	Approx. weight g
26102-00800855	8	8	M3	6	3	1,0
26102-01001055	10	10	M4	10	4	2,7
26102-01001555	10	15	M4	10	4	3,6
26102-01500855	15	10	M4	10	4	7,6
26102-01501555	15	15	M4	10	4	8,3
26102-02001555	20	15	M6	18	6	14,0
26102-02002055	20	20	M6	18	6	16,0
26102-02002555	20	25	M6	18	6	17,0
26102-02501555	25	15	M6	18	6	25,0
26102-02502055	25	20	M6	18	6	28,0
26102-02502555	25	25	M6	18	6	30,0
26102-02503055	25	30	M6	18	6	30,0
26102-03001555	30	15	M8	23	8	38,0
26102-03002055	30	20	M8	23	8	51,0
26102-03002555	30	25	M8	23	8	47,0
26102-03003055	30	30	M8	23	8	48,0
26102-03004055	30	40	M8	23	8	60,0
26102-04002055	40	20	M8	23	8	75,0
26102-04003055	40	30	M8	23	8	91,0
26102-04004055	40	40	M8	23	8	103,0
26102-05002055	50	20	M10	28	10	112,0
26102-05002555	50	25	M10	28	10	125,0
26102-05003055	50	30	M10	28	10	135,0
26102-05004055	50	40	M10	28	10	168,0
26102-05005055	50	50	M10	28	10	183,0
26102-06004055	60	40	M10	28	10	224,0
26102-07004555	70	45	M10	28	10	348,0
26102-07502555	75	25	M12	37	12	299,0
26102-07504055	75	40	M12	37	12	420,0
26102-07505055	75	50	M12	37	12	467,0
26102-07505555	75	55	M12	37	12	469,0

Rubber-metal buffer

type E



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 55° Shore A

Sample order:
nlm 26103-00800855

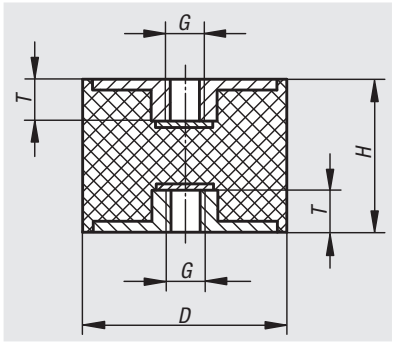
Note:
The rubber-metal buffers are widely-used construction devices for elastic bearings. They are used, among other things, as bearings for assemblies, motors, compressors, pumps and testing machines.

Temperature range:
- 30 °C to +80 °C.

Order No.	D	H	G	T	Approx. weight kg
26103-00800855	8	8	M3	3	0,002
26103-01501255	15	12	M4	4	0,004
26103-01501555	15	15	M4	4	0,005
26103-01502055	15	20	M4	4	0,007
26103-02001555	20	15	M6	6	0,012
26103-02002055	20	20	M6	6	0,014
26103-02002555	20	25	M6	6	0,015
26103-02501555	25	15	M6	6	0,017
26103-02502555	25	25	M6	6	0,021
26103-02503055	25	30	M6	6	0,025
26103-02504055	25	40	M6	6	0,028
26103-03001555	30	15	M8	8	0,028
26103-03002555	30	25	M8	8	0,03
26103-03003055	30	30	M8	8	0,039
26103-03004055	30	40	M8	8	0,045
26103-04002055	40	20	M8	8	0,052
26103-04002555	40	25	M8	8	0,058
26103-04003055	40	30	M8	8	0,064
26103-04004055	40	40	M8	8	0,079
26103-05002055	50	20	M10	10	0,079
26103-05002555	50	25	M10	10	0,092
26103-05003055	50	30	M10	10	0,112
26103-05004055	50	40	M10	10	0,123
26103-05005055	50	50	M10	10	0,146
26103-06003055	60	30	M10	10	0,189
26103-06004055	60	40	M10	10	0,209
26103-06005055	60	50	M10	10	0,229
26103-07004255	70	42	M10	10	0,268
26103-07004555	70	45	M10	10	0,277
26103-07502555	75	25	M12	12	0,216
26103-07503055	75	30	M12	12	0,232
26103-07504055	75	40	M12	12	0,295
26103-07505055	75	50	M12	12	0,34

Rubber-metal buffer

type C



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 55° Shore A

Sample order:
nlm 26104-01001055

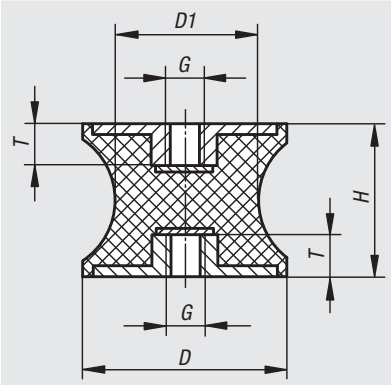
Note:
The rubber-metal buffers are widely-used construction devices for elastic bearings. They are used, among other things, as bearings for assemblies, motors, compressors, pumps and testing machines.

Temperature range:
-30 °C up to +80 °C.

Order No.	D	H	G	T	Approx. weight g
26104-01001055	10	10	M4	4	2,0
26104-01001555	10	15	M4	4	2,0
26104-01501555	15	15	M4	4	5,0
26104-02002055	20	20	M6	6	14,0
26104-02002555	20	25	M6	6	17,0
26104-02502055	25	20	M6	6	24,0
26104-02502555	25	25	M6	6	27,0
26104-02503055	25	30	M6	6	30,0
26104-03002055	30	20	M8	8	35,0
26104-03003055	30	30	M8	8	44,0
26104-03004055	30	40	M8	8	50,0
26104-04003055	40	30	M8	8	78,0
26104-04004055	40	40	M8	8	93,0
26104-05003055	50	30	M10	10	126,0
26104-05004055	50	40	M10	10	145,0
26104-05005055	50	50	M10	10	169,0
26104-07504055	75	40	M12	12	366,0
26104-07505055	75	50	M12	12	425,0

Rubber-metal buffer

type CT tapered



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 57° Shore A

Sample order:
nlm 26105-01001057

Note:
The rubber-metal buffers are widely-used construction devices for elastic bearings. They are used, among other things, as bearings for assemblies, motors, compressors, pumps and testing machines.

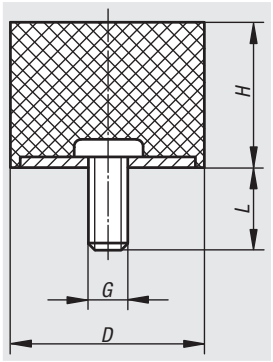
Rubber-metal buffers with tapered rubber contour reduce high edge loads of the rubber in case of axial excursion and thus increase the service life of the component.

Temperature range:
-30 °C up to +80 °C.

Order No.	D	D1	H	G	T	Approx. weight g
26105-01501557	15	12	15	M4	4	6
26105-02001557	20	14	15	M6	6	13
26105-03002057	30	22	20	M8	8	35
26105-04003057	40	33	30	M8	8	74
26105-04004857	40	20	48	M8	8	73
26105-05003057	50	40	30	M10	10	117
26105-07504057	75	50	40	M12	12	298

Rubber-metal buffer

type D



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 55° Shore A

Sample order:
nlm 26106-00800855

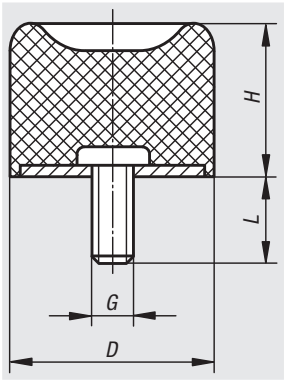
Note:
The rubber-metal buffers are used, among other things, for the bearing of aggregates and as a shock stop for the limitation of spring travel in the case of moving masses. Also used with machines that are not firmly anchored to a stand and rest on weak floorings, e.g., office machines.

Temperature range:
-30 °C to +80 °C.

Order No.	D	H	G	L	Approx. weight g
26106-00800855	8	8	M3	6	2,0
26106-01001055	10	10	M4	10	2,6
26106-01001555	10	15	M4	10	2,9
26106-01500655	15	6	M4	10	3,4
26106-01500855	15	8	M4	10	3,6
26106-01501055	15	10	M4	10	3,8
26106-01501555	15	15	M4	10	7,3
26106-02000555	20	5	M6	18	7,0
26106-02000855	20	8	M6	18	7,9
26106-02001055	20	10	M6	18	8,5
26106-02001555	20	15	M6	18	10,3
26106-02002055	20	20	M6	18	11,0
26106-02002555	20	25	M6	18	14,0
26106-02500855	25	8	M6	18	14,0
26106-02501055	25	10	M6	18	14,0
26106-02501555	25	15	M6	18	17,2
26106-02502055	25	20	M6	18	20,0
26106-02502555	25	25	M6	18	24,0
26106-02503055	25	30	M6	18	30,0
26106-03001555	30	15	M8	23	27,0
26106-03002055	30	20	M8	23	29,0
26106-03002555	30	25	M8	23	35,0
26106-03003055	30	30	M8	23	35,0
26106-03004055	30	40	M8	23	48,0
26106-04001555	40	15	M8	23	50,0
26106-04002055	40	20	M8	23	52,0
26106-04003055	40	30	M8	23	75,0
26106-04004055	40	40	M8	23	80,0
26106-05002055	50	20	M10	28	85,0
26106-05003055	50	30	M10	28	100,0
26106-05004055	50	40	M10	28	132,0
26106-05005055	50	50	M10	28	152,0
26106-06004055	60	40	M10	28	179,0
26106-07002555	70	25	M10	28	198,0
26106-07004555	70	45	M10	28	292,0
26106-07502555	75	25	M12	37	241,0
26106-07504055	75	40	M12	37	320,0
26106-07505055	75	50	M12	37	357,0
26106-07505555	75	55	M12	37	384,0

Rubber-metal buffer

type DS suction base



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 57° Shore A

Sample order:
nlm 26107-01501457

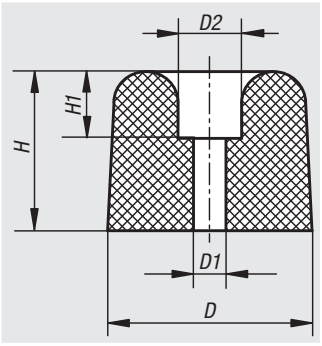
Note:
The rubber-metal buffers are used, among other things, for the bearing of aggregates and as a shock stop for the limitation of spring travel in the case of moving masses.

Temperature range:
-30 °C up to +80 °C.

Order No.	D	H	G	L	Approx. weight g
26107-01501457	15	14	M4	13	5
26107-02501857	25	18,5	M6	18	20
26107-03002857	30	28,5	M8	23	41
26107-04002857	40	28	M8	23	60
26107-05002857	50	28	M10	28	100
26107-07003057	70	30	M10	28	300
26107-07503757	75	37	M12	37	270
26107-10005057	100	50	M16	42	623

Rubber impact buffer

type TP door buffer



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

Sample order:
nlm 26108-02601560

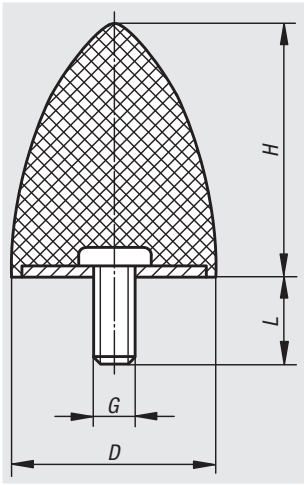
Note:
Rubber impact buffers to be screwed on. Also can be used as equipment feet for machines.

Temperature range:
-30 °C up to +80 °C.

Order No.	D	D1	D2	H	H1	Approx. weight g
26108-02601560	26	4	12	15	9	7
26108-03002260	30	7	11	21	5	17
26108-03503060	35	8	17	30	10	32
26108-04003560	40	7	20	35	8	48

Rubber impact buffers

parabolic



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 55° Shore A

Sample order:
nlm 26110-02002455

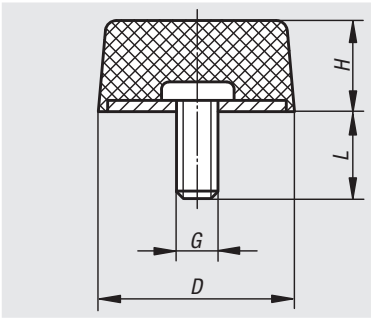
Note:
Rubber impact buffers excel in their robustness and the effective cushioning and abatement of shocks. Rubber impact buffers are ideally suited for elastic travel limitation and for the cushioning of shocks in the case of mobile and immobile aggregates, machines as well as stops in general.

Temperature range:
-30 °C to +80 °C.

Order No.	D	H	G	L	Approx. weight kg
26110-02002455	20	24	M6	18	0,011
26110-03003655	30	36	M8	20	0,037
26110-03504055	35	40	M8	20	0,045
26110-05005855	50	58	M10	28	0,127
26110-05006755	50	67	M8	38	0,136
26110-07508955	75	89	M12	37	0,341

Rubber impact buffers

tapered



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 55° Shore A

Sample order:
nlm 26112-02501755

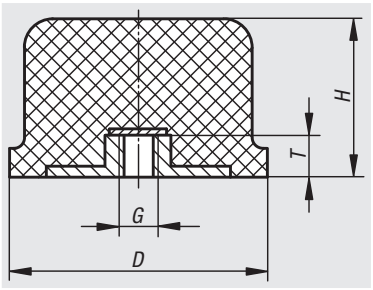
Note:
Rubber impact buffers excel in their robustness and the effective cushioning and abatement of shocks. Rubber impact buffers are ideally suited for elastic travel limitation and for the cushioning of shocks in the case of mobile and immobile aggregates, machines as well as stops in general.

Temperature range:
-30 °C .to +80 °C.

Order No.	D	H	G	L	Approx. weight kg
26112-02501755	25	17	M6	18	0,015
26112-05001855	50	18	M10	28	0,075

Rubber impact buffer,

spherical



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 55° Shore A

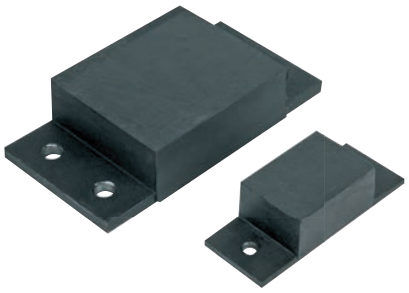
Sample order:
nlm 26115-05003555

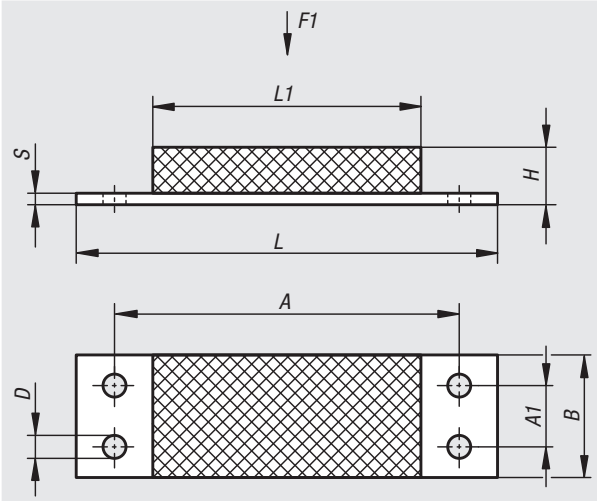
Note:
Rubber impact buffers excel in their robustness and the effective cushioning and abatement of shocks. Rubber impact buffers are ideally suited for elastic travel limitation and for the cushioning of shocks in the case of mobile and immobile aggregates, machines as well as stops in general.

Temperature range:
-30 °C .to +80 °C.

Order No.	D	H	G	T	Approx. weight kg
26115-05003555	50	35	M10	10	0,088
26115-08006055	80	60	M12	12	0,308
26115-12509055	125	90	M16	16	0,830

Rubber-metal impact buffer rails





Material, version:
Steel, black paint finish;
elastomer, natural rubber, medium hardness, 57° Shore A

Sample order:
nlm 26120-02501904557

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

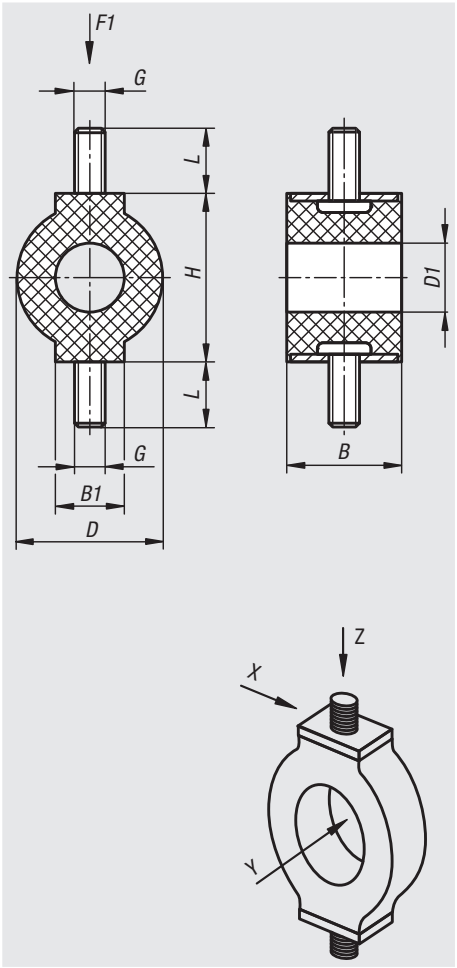
The indicated load data apply for static long-term load with a rubber hardness of 57° Shore A.

* Metal part 30 mm wide.

Temperature range:
-30 °C .to +80 °C.

Order No.	A	A1	B	D	H	L	L1	S	F1 (N)	Approx. weight kg
26120-02501904557	68,6	-	25*	6,5	19	84	45	3	500	0,075
26120-05003507057	100	-	50	8,5	35	130	70	5	3100	0,382
26120-05007007057	100	-	50	8,5	70	130	70	5	2500	0,526
26120-10004512057	160	50	100	13	45	200	120	10	14000	2,030
26120-10008012057	160	50	100	13	80	200	120	10	8500	2,440
26120-12004515057	200	60	120	15	45	250	150	10	18000	2,980
26120-15005020057	250	80	150	17	50	300	200	15	34000	6,420

O-shaped mounts



Material, version:
Metal parts, galvanized steel, class 5.6;
elastomer, natural rubber, medium hardness, 57° Shore A

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)	Approx. weight g
26130-01201257	9,5	9,5	12,5	6	M4	12,5	10	8	6
26130-01401757	13	6	14	6	M4	17	10	18	7
26130-02503057	20	12	25	12	M5	30	10	55	18

Notes

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.

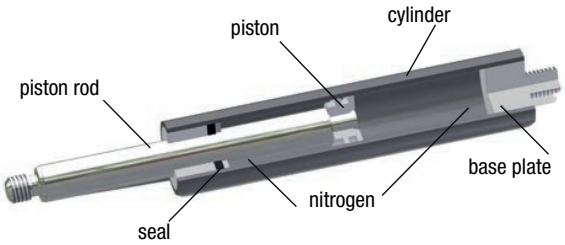
Influence of temperature:
Nominal force is measured at 20 °C.
Subject to physical conditions, the gas springs' force changes every 10 °C by 3.4 %.

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.

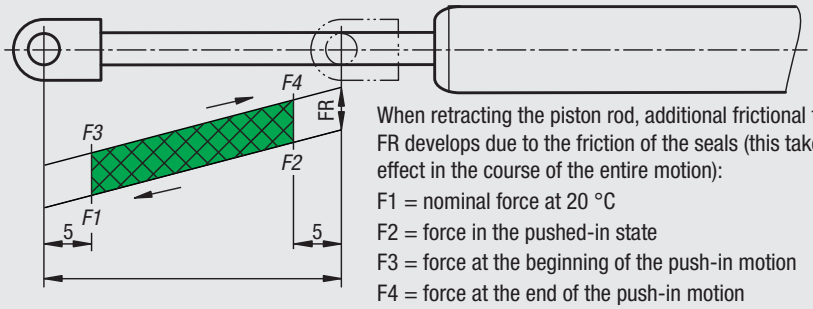
Design and function principle of norelem gas springs



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.

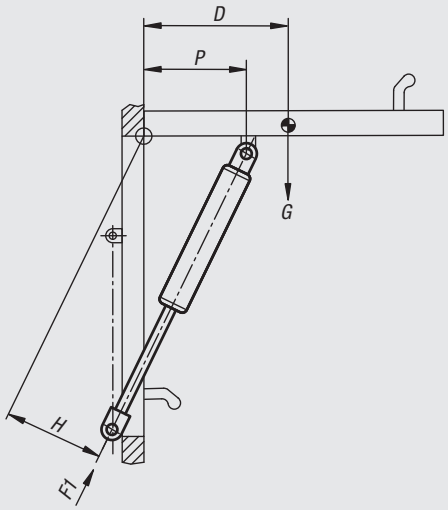
Gas spring characteristic in the force/distance diagram



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

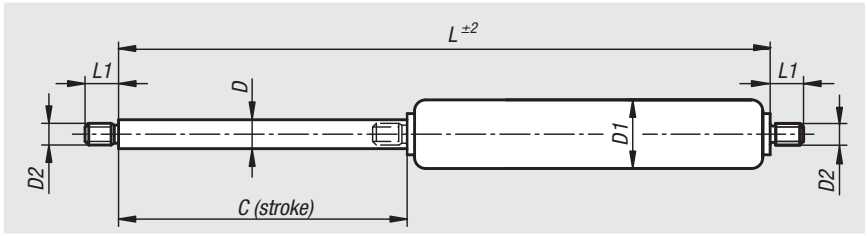
$$F1 = \frac{G \cdot D}{H \cdot n} \times 13\ [N]$$

G = weight of the flap in kg
H = effective lever arm of the gas spring in mm, flap open.
13 = conversion facto kg → N + safety margin
P = flap attachment approx. 2/3 D
n = number of gas springs (standard: n = 2)
D = effective lever arm of gravity in mm, flap 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, version:
Piston rod, steel, hard chrome-plated.
In the case of piston rod Ø4, stainless steel.
Pressurised pipe, steel, painted black.
Fill medium: oil, nitrogen.

Sample order:
nlm 26200-0412030X20
(pushing force F1 also stated)

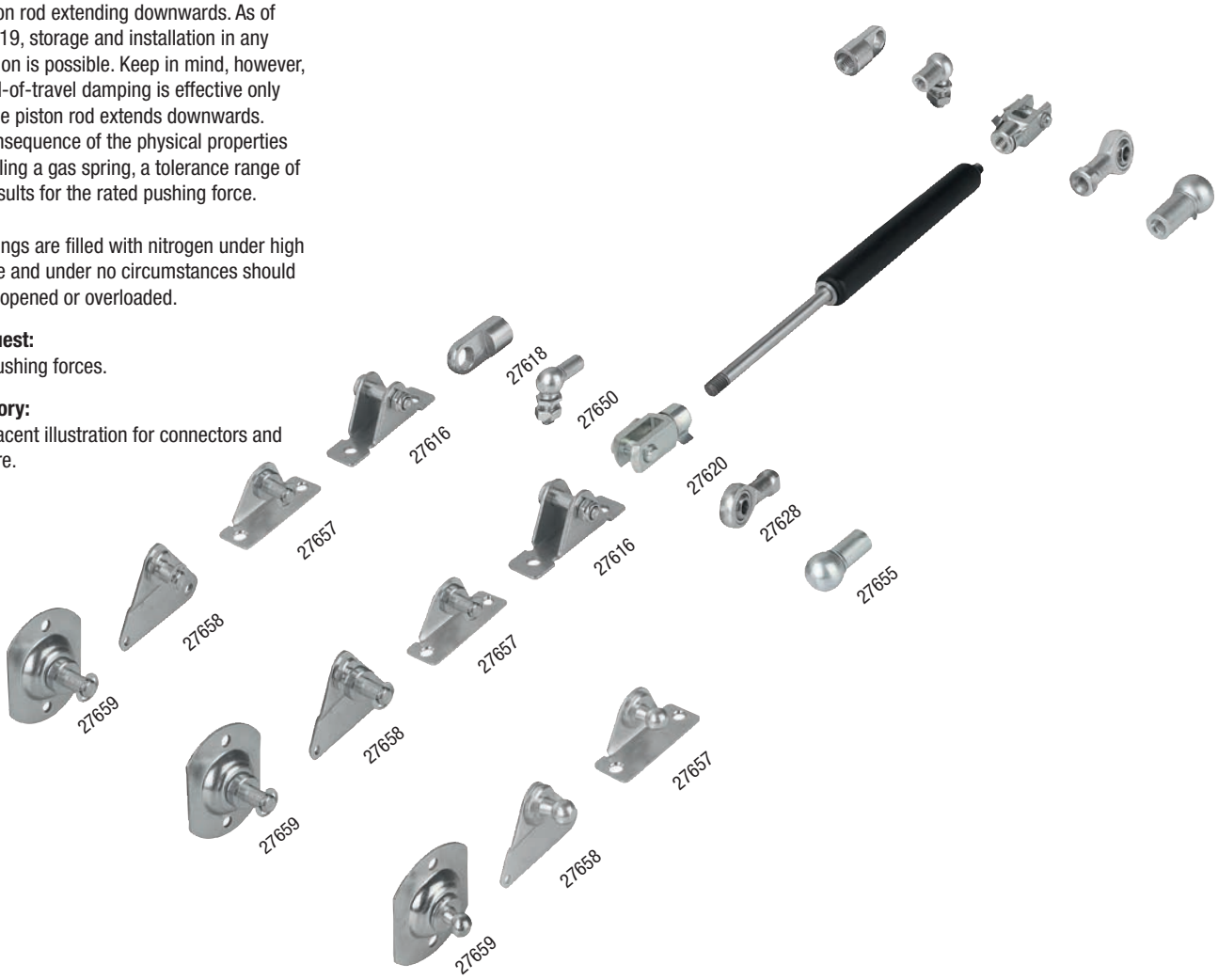
Note:
Gas springs are maintenance-free, self-contained systems that are filled with nitrogen under high pressure. For end-of-travel damping and lubrication, a defined amount of oil is also contained inside. The gas springs contain a nonreturn valve in a threaded pin on the pressurised pipe, which allows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

Accessory:
See adjacent illustration for connectors and hardware.

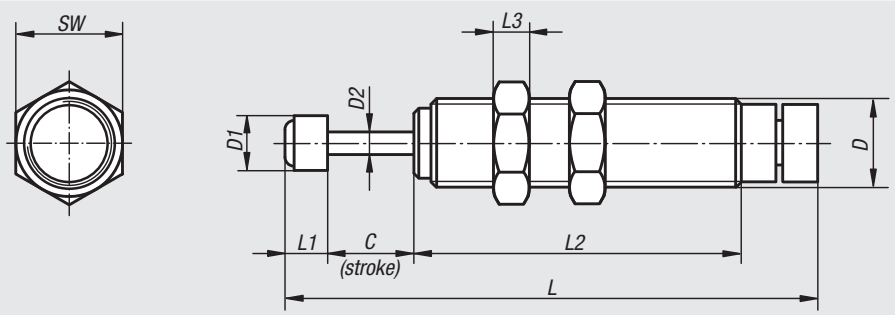


Gas springs

Order No.	Size	D	D1	D2	C (stroke)	L	L1	Progression %	Pushing 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, version:
Housing, steel, nickel-plated;
housing M8x0.75, stainless steel, natural finish;
piston rod, steel, hard-chrome plated;
nut, steel, nickel-plated;
collision head, steel, plastic

Sample order:
nlm 26300-0807506

Note:
Industrial shock absorbers are maintenance-free, ready-to-install hydraulic components. They have an integrated fixed stop. The adjustable version makes precise adjustment of the abatement possible. After installation of the shock absorber, the device is run a few times, whereby the adjustment is rotated until the optimal breaking is reached.
Exceeding the max. energy intake per hour is possible if temporarily disconnected or the shock absorber is cooled with cylinder exhaust air.

Temperature range:
-5 °C up to +70 °C.

Order No.	D	D1	D2	C (stroke)	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

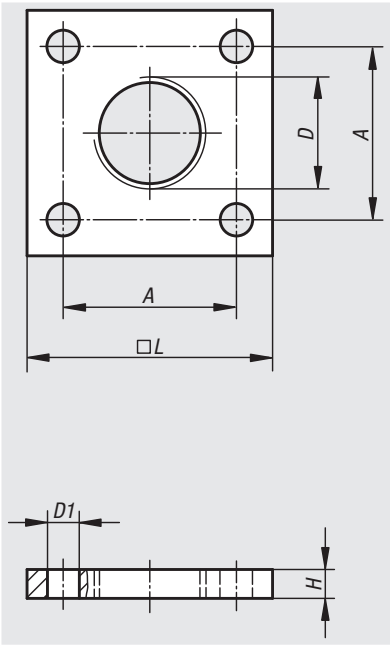
Order No.	max. power consumption per stroke Nm	max. power consumption per hour Nm	Defective mass max. kg	Speed range m/s	Restoring force N	Axis deviation max. (°)	Approx. weight kg
26300-0807506	1,4	2202	15	0,3 - 2	9	2,5	0,014
26300-0810008	3,5	5650	15	0,3 - 2	5,3	2	0,009
26300-1010008	1,76	3528	10	0,3 - 2	5,88	2,5	0,027
26300-1210010	4,9	5880	30	0,3 - 2	9,8	2,5	0,047
26300-1415010	5,88	8820	35	0,3 - 2	9,8	2,5	0,073
26300-2015016	29,4	20580	200	0,3 - 2	18,1	2,5	0,202
26300-2515030	49	29400	300	0,3 - 2	33,2	2,5	0,436

Installation flange

Material, version:
Steel, nickel-plated

Sample order:
nlm 26320-08075

Note:
When using the installation flange, a locking nut for securing shock absorber must be provided. Owing to its compact construction, it can be engineered to save space.



Order No.	A	D	D1	H	L	Approx. weight kg
26320-08075	18	M8x0,75	3,2	4	25	0,017
26320-10100	18	M10x1	3,2	4	25	0,016
26320-12100	18	M12x1	3,2	4	25	0,015
26320-14150	24	M14x1,5	4,5	4	34	0,029
26320-20150	28	M20x1,5	6,5	12	40	0,109
26320-25150	40	M25x1,5	9	12	54	0,204