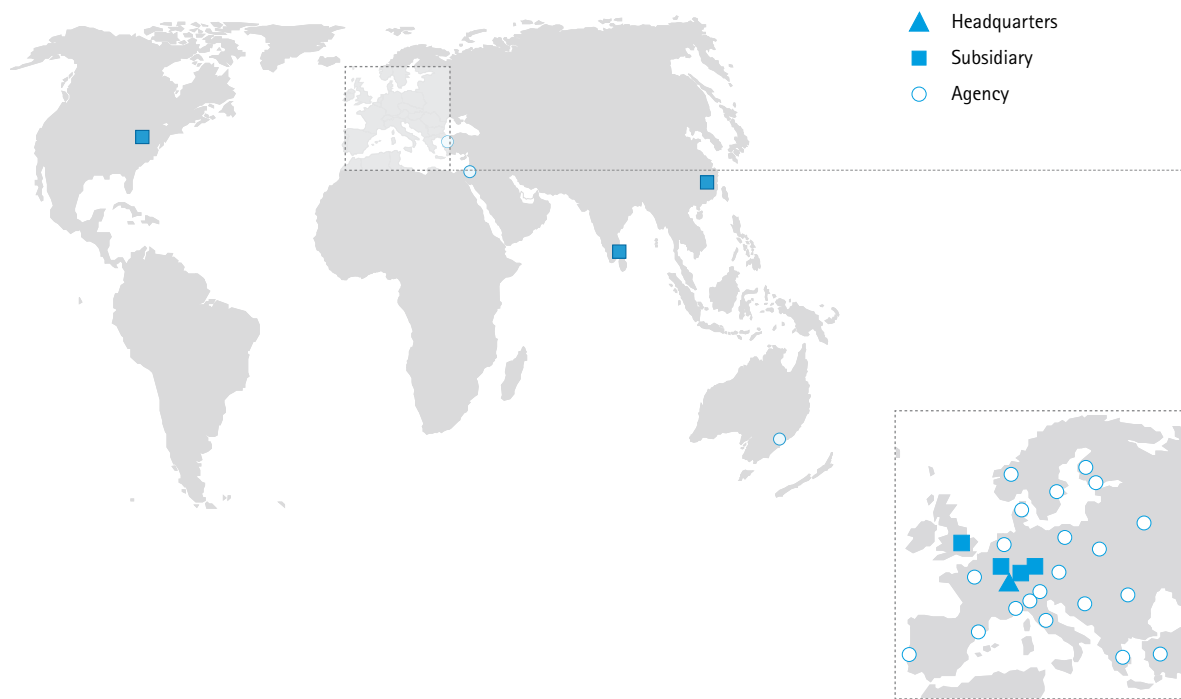




Liftline Gas Springs

Standard program, individual gas springs
and special functions



SUSPA – Your strong industrial partner

For more than 50 years, SUSPA products have been present in your daily life – at home in furniture, refrigerators and washing machines, in means of transport like buses, trains and planes, in modern office furniture, in leisure and fitness equipment, but also in hospital beds and operating tables in hospitals and rehab centers.

Although you may not be able to see our products, we are always there – increasing the comfort and safety level for all of you.

Major players in the automobile, office furniture, industrial, transportation, appliance, health care, leisure, and gaming industries depend on SUSPA as a developmental and systems solution partner. Our engineers and technical sales team will work seamlessly with your staff on a wide variety of projects, committed to providing the most effective solution for your organization.

SUSPA's worldwide sales and distribution network allows us to always be in touch with our customers – no matter where they are in the world! SUSPA has production facilities in Germany, the United States, China, India and the Czech Republic. This worldwide manufacturing capability gives SUSPA a competitive edge over other gas spring manufacturers.

Reliability as highest standard

Requirements on quality are increasing in the automotive industry as well as in other industry sectors. SUSPA certifications according to TS16949 have therefore been an integral part for quite some time.

Effective quality management from purchasing to production and sales and on to final application secures the worldwide great reputation and reliability of SUSPA gas springs.

We test gas springs 100% according to our internal quality standard. Without any maintenance required, SUSPA gas springs normally achieve a service life of over 50,000 load cycles.

Contents

Design, functionality and features	4-5
------------------------------------	-----

SUSPA ordering system	6
-----------------------	---

Standard program gas springs (Liftline)	7-15
---	------

Gas springs dampened on extension of the 16-series

16-12	Ø tube 12 mm	Ø piston rod 4 mm	max. stroke 150 mm	extension force 40-180 N	7
16-1	Ø tube 15 mm	Ø piston rod 6 mm	max. stroke 150 mm	extension force 50-420 N	8-9
16-2	Ø tube 18.5 mm	Ø piston rod 8 mm	max. stroke 250 mm	extension force 80-750 N	10-11
16-4	Ø tube 22 mm	Ø piston rod 10 mm	max. stroke 495 mm	extension force 100-1,200 N	12-13
16-6	Ø tube 28 mm	Ø piston rod 14 mm	max. stroke 500 mm	extension force 200-2,000 N	14-15

End fittings	16-19
--------------	-------

Clevis, fork heads, ball joints, angle plates

Assembly instructions	19
-----------------------	----

Special functions	20-22
-------------------	-------

TipUp® - opening system for storage beds, Soft-Stop, Positioning gas spring,
Space-mat, TouchLift

Technical advice	23
------------------	----

Storage, handling, utilization and assembly



www.suspa.com/uk/products/gas-springs

Design and functionality of gas springs

How force and effective cushioning are produced

Gas springs are hydropneumatic adjustment elements. They consist of a pressure tube plus piston rod with piston unit. Connecting elements on the pressure tube and the piston rod allow appropriate connection to your application.

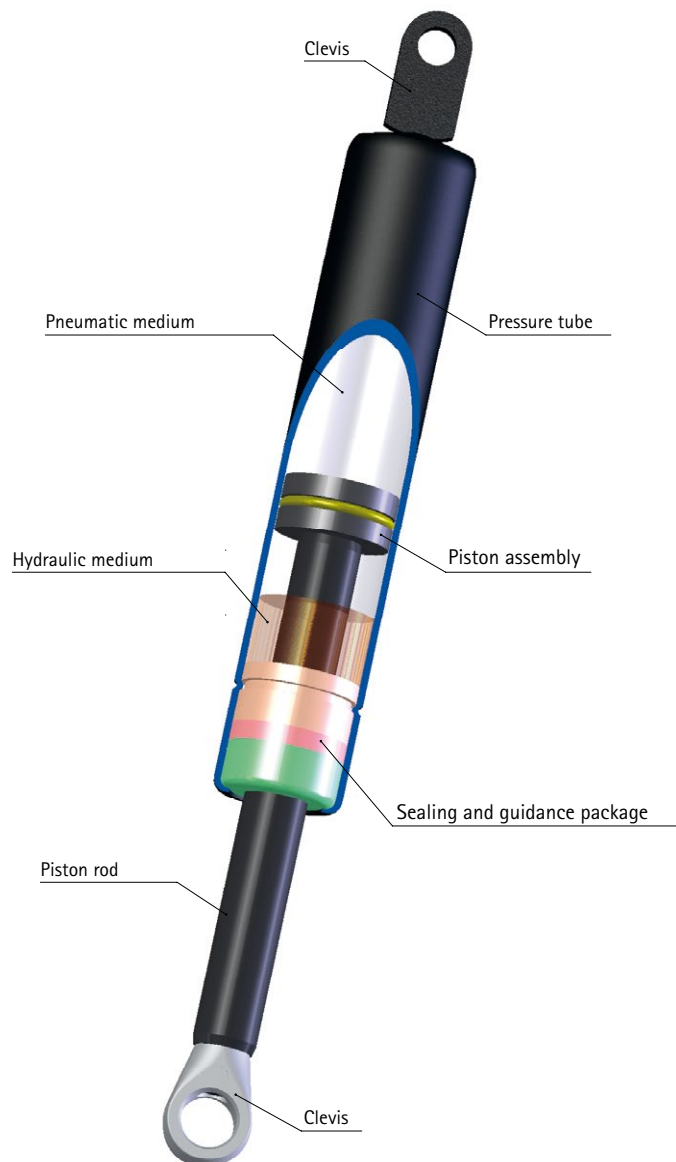
At the core of the SUSPA gas spring is the special seal and guide system. This ensures hermetic sealing of the cavity with low friction, even under extreme environmental conditions.

The gas spring is filled with non-toxic nitrogen at high pressures. This produces a charging pressure that in turn exerts an effect on the cross section of the piston rod, generating the extension force.

If the extension force of the gas spring is greater than the force of the counterbalance, the piston rod extends; if the extension force is smaller, it retracts. The speed of the extension is determined by the flow cross section in the damping system.

In addition to nitrogen, the cavity contains a defined quantity of oil for lubrication and end position cushioning.

The cushioning effect of a gas spring can be determined depending on the requirements and the task involved.



Features of gas springs

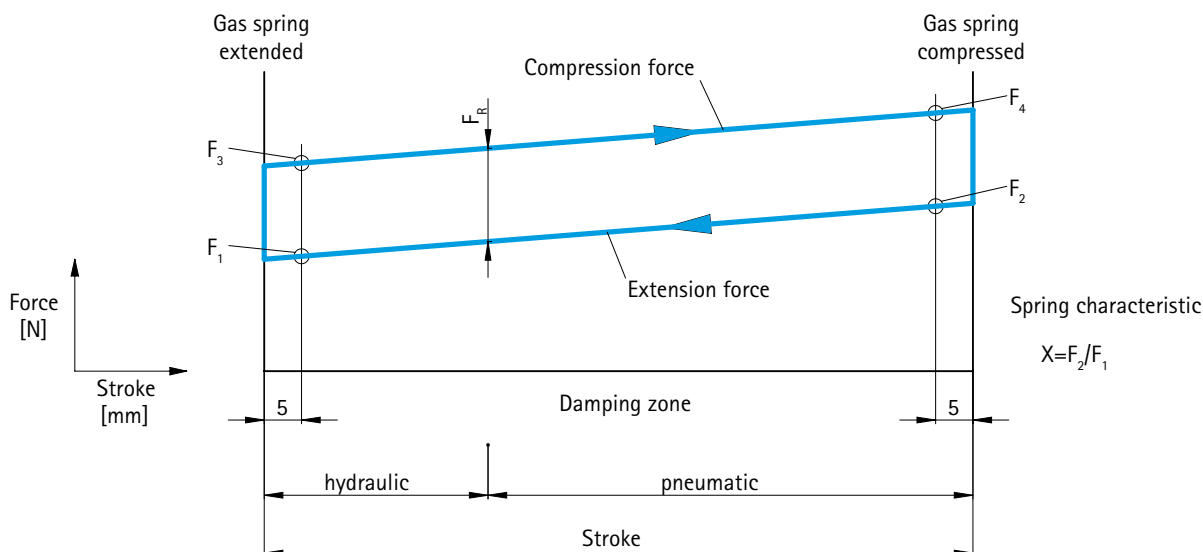
The SUSPA standard gas spring (Liftline) at a glance

Liftline is an excellent gas spring program offered by SUSPA. Successfully proven in the market for decades and always state-of-the-art through constant innovation. The SUSPA Liftline program includes five basic types: the types 16-12, 16-1, 16-2, 16-4 and 16-6.

The main differences are in the tube and piston rod diameters and the different extension forces. This way, we can meet your specific technical requirements with the optimal gas spring type.

Type	Ø Tube (mm)	Ø Piston rod (mm)	Stroke max. (mm)	Extension force F_1 (N)	Page
16-12	12	4	150	40 - 180	7
16-1	15	6	150	50 - 420	8
16-2	18.5	8	250	80 - 750	10
16-4	22	10	495	100 - 1,200	12
16-6	28	14	500	200 - 2,000	14

Spring characteristic



As seen in the graphic, the spring characteristic curve shows the force path of the gas spring over the stroke, from the extended to the retracted state and back. The spring characteristic illustrates the balance of power of F_2/F_1 . For the design of gas springs, the force F_1 is, in addition to the dimensions, the most important criterion.

The force F_1 is measured 5 mm before the end of the extension movement and thus defines the value of the spring force. The resulting friction force F_R is generated between the lines of force in the insertion and extension direction. The extension speed is divided into two types of dampers: In the case of the standard gas spring,

the extension speed is controlled via a pneumatic and hydraulic section. When installing the gas cylinder with the piston rod pointing downwards, the piston initially moves through the gas-filled part (pneumatic range), thereafter, through the oil-filled part of the pressure tube (hydraulic area). The piston rod is slowed down by the oil.

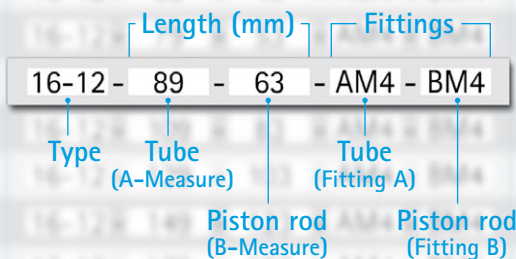
If desired, damping can also be performed dynamically by applying an axial groove in the tube, which allows damping independent of the gas spring position.

SUSPA ordering system – simple and transparent



The SUSPA part number consists of the technical details of the gas spring describing type, tube length, piston rod length and end-fittings.

Länge L [mm] ±2	Hub [mm]	Technical Data	Bestell-Nr.
72	20	16-12 - 49 - 23 - AM4 - BM4	01625540
92	30	16-12 - 59 - 33 - AM4 - BM4	01625541
112	40	16-12 - 69 - 43 - AM4 - BM4	01625542
132	50	16-12 - 79 - 53 - AM4 - BM4	01625543
152	60	16-12 - 89 - 63 - AM4 - BM4	01625544
182	80	16-12 - 119 - 83 - AM4 - BM4	01625545
232	100	16-12 - 149 - 113 - AM4 - BM4	01625546
272*	120	16-12 - 149 - 113 - AM4 - BM4	01625547
332*	150	16-12 - 179 - 153 - AM4 - BM4	01625548



Extension force

If necessary, the extension force F1 may be added to the end of the order number in Newton:

Order example: 16-12-49-23-AM4-BM4-120N

Extension force F1
(in Newton)

Thread-thread gas springs

When ordering thread-thread gas springs please specify the required end fittings (see pages 16 - 18):

Order example: 16-12-89-63-A457-B457-120N

Tube
(End fitting A)

Piston rod
(End fitting B)

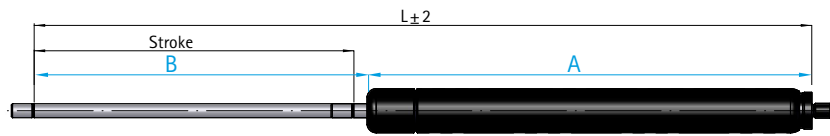
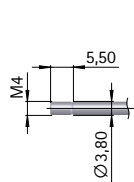
You will find our gas spring configurator online at www.suspa.com/uk/configurator

Standard program Liftline gas springs type 16-12

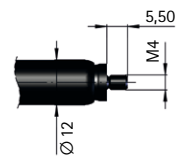
Type 16-12 Thread/Thread

Ø tube 12 mm, Ø piston rod 4 mm, max. stroke 150 mm, extension force 40-180 N, fitting AM4-BM4

Fitting B



Fitting A



All dimensions in mm. The standard color of the tube is black or white aluminium, and the piston rod is black.

1. Select length and stroke

Length L (mm) ±2	Stroke (mm)	Technical data
72	20	16-12 - 49 - 23 - AM4 - BM4
92	30	16-12 - 59 - 33 - AM4 - BM4
112	40	16-12 - 69 - 43 - AM4 - BM4
132	50	16-12 - 79 - 53 - AM4 - BM4
152	60	16-12 - 89 - 63 - AM4 - BM4
192	80	16-12 - 109 - 83 - AM4 - BM4
232	100	16-12 - 129 - 103 - AM4 - BM4
272*	120	16-12 - 149 - 123 - AM4 - BM4
332*	150	16-12 - 179 - 153 - AM4 - BM4

Please select your fittings
on pages 16-18!

Gas springs configurator

Construct your own individual gas spring with
our gas spring configurator on our website
www.suspa.com/en/configurator

* The maximum F_1 extension force depends on the
customer's application.

2. Select the desired extension force F_1 and fittings

The extension force F_1 can be at least 40N and maximum 180N,
the gradation of forces can be selected individually.

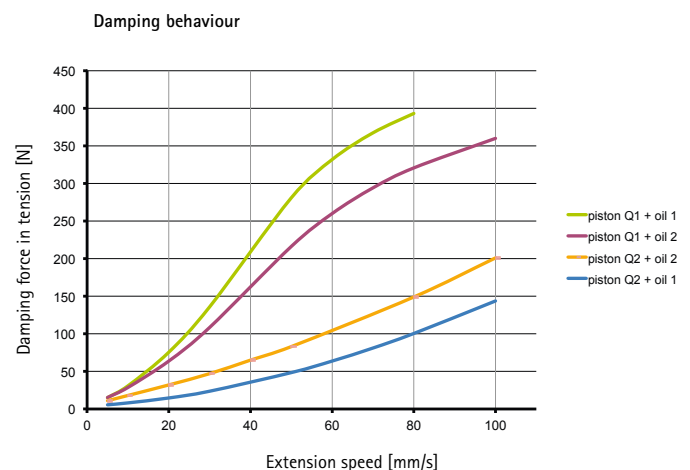
When ordering please indicate the extension force and the desired
fittings (see pages 16-18) as follows:

Order example: 16-12-49-23-AM4-BM4-120N

Please do not hesitate to contact us for individual layouts as for
example a different damping behavior of the gas spring!

3. Gas springs without extension force: damper

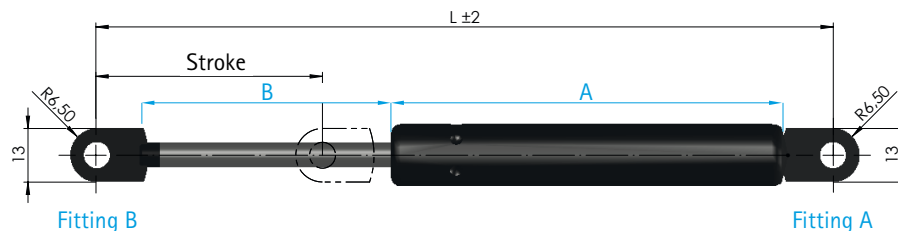
Type 16-12 can be used without extension force as a damper,
for example in automobiles, furniture, household appliances or
in industrial applications. The damping behavior can be chosen
according to your needs. The characteristic curve shows the damping
force depending on the extension speed.



Standard program Liftline gas springs type 16-1

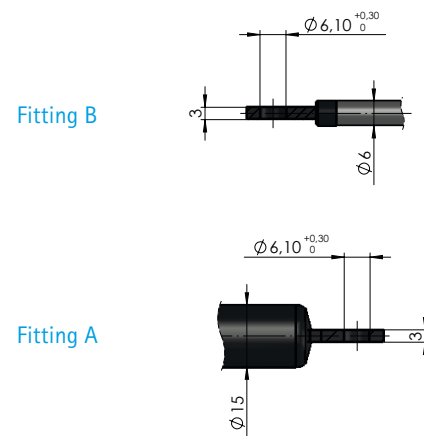
Type 16-1 Clevis/Clevis, welded

Ø tube 15 mm, Ø piston rod 6 mm, max. stroke 150 mm, extension force 50-420 N, fitting A17-B17



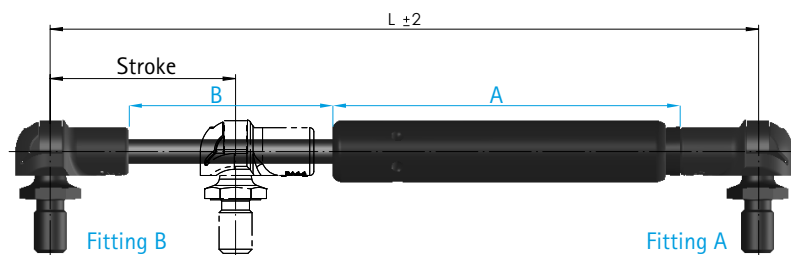
Length L (mm) ±2	Stroke (mm)	Technical data	Ordering number
106	20	16-1 - 57 - 26 - A17 - B17	01625007
146	40	16-1 - 78 - 45 - A17 - B17	01625008
160	45	16-1 - 86 - 51 - A17 - B17	01625075
179	55	16-1 - 96 - 60 - A17 - B17	01625076
186	60	16-1 - 96 - 67 - A17 - B17	01625009
224	80	16-1 - 111 - 90 - A17 - B17	01625010
264	100	16-1 - 131 - 110 - A17 - B17	01625011
306	110	16-1 - 168 - 115 - A17 - B17	01625077
305.5	120	16-1 - 157.5 - 125 - A17 - B17	01625012
366	150	16-1 - 189 - 154 - A17 - B17	01625013

All dimensions in mm. The standard color of the gas spring and the piston rod is black.

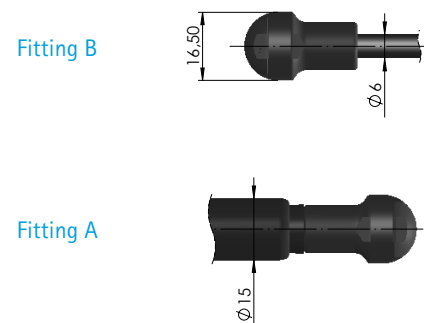
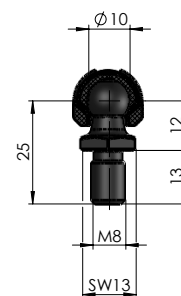


Type 16-1 Ball joint/Ball joint

Ø tube 15 mm, Ø piston rod 6 mm, max. stroke 150 mm, extension force 50-420 N, fitting A246-B246

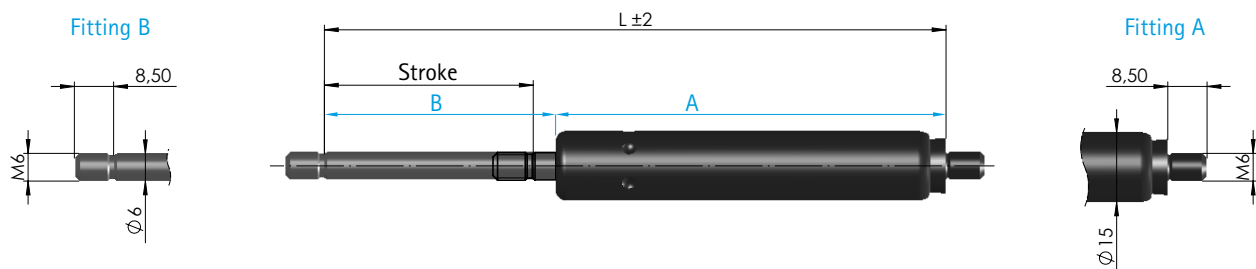


Length L (mm) ±2	Stroke (mm)	Technical data	Ordering number
115.5	20	16-1 - 53.5 - 24 - A246 - B246	01625000
145	35	16-1 - 67 - 40 - A246 - B246	01625070
155.5	40	16-1 - 72.5 - 45 - A246 - B246	01625001
194.5	60	16-1 - 91 - 65.5 - A246 - B246	01625002
235	80	16-1 - 113 - 84 - A246 - B246	01625003
245	85	16-1 - 117 - 90 - A246 - B246	01625071
273	100	16-1 - 131 - 104 - A246 - B246	01625004
316	120	16-1 - 154 - 124 - A246 - B246	01625005
323	120	16-1 - 161 - 124 - A246 - B246	01625072
354	135	16-1 - 168 - 148 - A246 - B246	01625073
375.5	150	16-1 - 183.5 - 154 - A246 - B246	01625006



Type 16-1 Thread/Thread

Ø tube 15 mm, Ø piston rod 6 mm, max. stroke 150 mm, extension force 50-420 N, fitting AM6-BM6



1. Select length and stroke

Length L (mm) ±2	Stroke (mm)	Technical data
77.5	20	16-1 - 53.5 - 24 - AM6 - BM6
107	35	16-1 - 67 - 40 - AM6 - BM6
117.5	40	16-1 - 72.5 - 45 - AM6 - BM6
156.5	60	16-1 - 91 - 65.5 - AM6 - BM6
197	80	16-1 - 113 - 84 - AM6 - BM6
207	85	16-1 - 117 - 90 - AM6 - BM6
235	100	16-1 - 131 - 104 - AM6 - BM6
278	120	16-1 - 154 - 124 - AM6 - BM6
285	120	16-1 - 161 - 124 - AM6 - BM6
316	135	16-1 - 168 - 148 - AM6 - BM6
337.5	150	16-1 - 183.5 - 154 - AM6 - BM6

All dimensions in mm. The standard color of the tube and the piston rod is black.

Please select your fittings on pages 16-18!

⚙ Gas springs configurator

Construct your own individual gas spring with our gas spring configurator on our website www.suspa.com/en/configurator

2. Select the desired extension force F₁ and fittings

The extension force F₁ can be at least 50 N and maximum 420 N, the gradation of forces can be selected individually.

When ordering please indicate the extension force and the desired fittings (see pages 16-18) as follows:

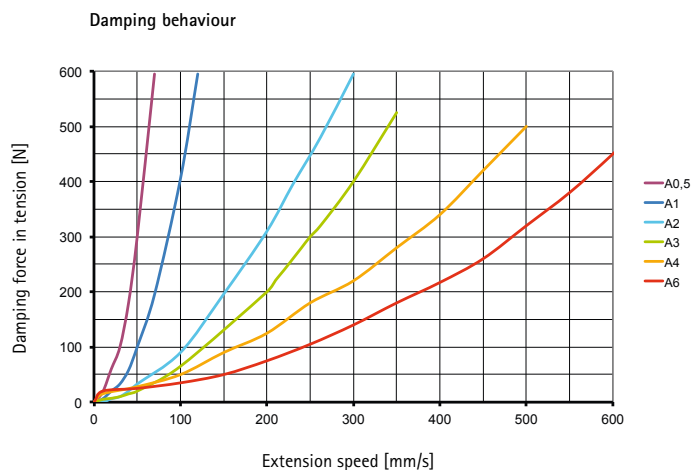
Order example: 16-1-117-90-A104-B232-250N

Please do not hesitate to contact us for individual layouts as for example a different damping behavior of the gas spring!

3. Gas springs without extension force: damper

Type 16-1 can also be used as a damper (without extension force), e.g. in cars, furniture and household or industrial appliances.

The damping behavior A1 is described in the chart on the right side. For your individual damper you can also choose a stronger damping (A 0.5) or a weaker damping (A2, A3, A4, A6). The characteristic curve shows the damping force depending on the extension speed.

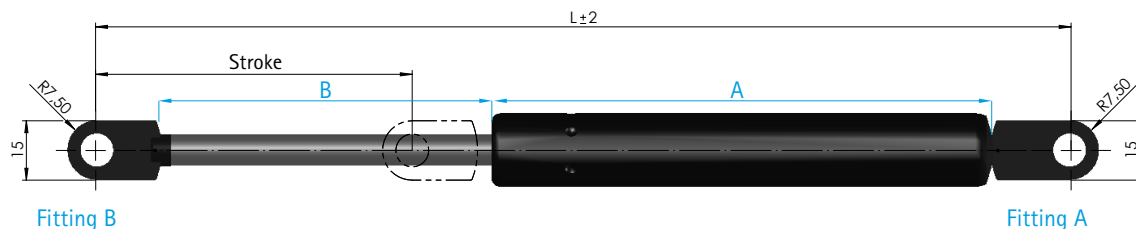


Explanation of technical data:	Length (mm)			Fittings	
	Type	Tube (A)	Piston rod (B)	Tube (A)	Piston rod (B)
	16-1	53.5	24	AM6	BM6

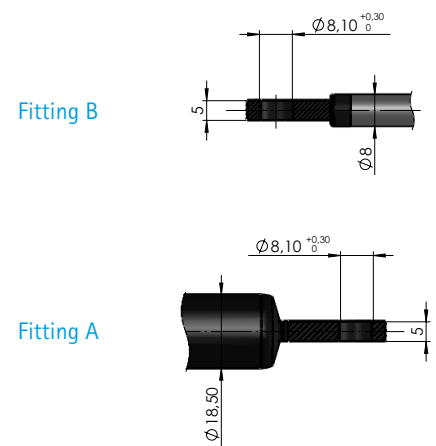
Standard program Liftline gas springs type 16-2

Type 16-2 Clevis/Clevis, welded

Ø tube 18,5 mm, Ø piston rod 8 mm, max. stroke 250 mm, extension force 80-750 N, fitting A107-B23



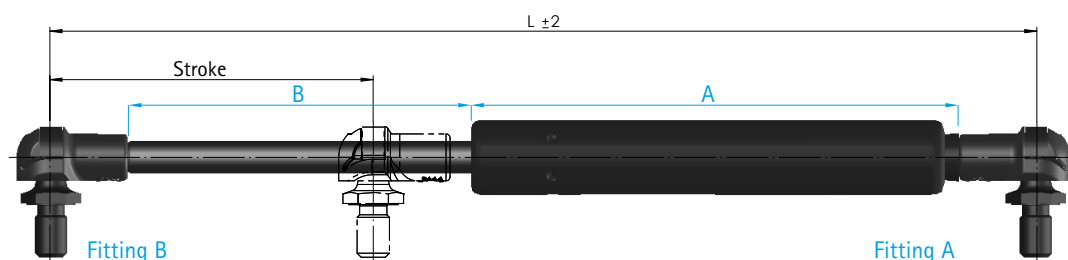
Length L (mm) ±2	Stroke (mm)	Technical data	Ordering number
206.5	60	16-2 - 108 - 65 - A107 - B23	01625024
246.5	80	16-2 - 128 - 85 - A107 - B23	01625025
256.5	90	16-2 - 128 - 95 - A107 - B23	01625082
286.5	100	16-2 - 143 - 110 - A107 - B23	01625026
316.5	120	16-2 - 158 - 125 - A107 - B23	01625083
326.5	120	16-2 - 168 - 125 - A107 - B23	01625027
354.5	133	16-2 - 183 - 138 - A107 - B23	01625084
364.5	140	16-2 - 186 - 145 - A107 - B23	01625028
407.5	160	16-2 - 201 - 173 - A107 - B23	01625029
444.0	178	16-2 - 229.5 - 181 - A107 - B23	01625030
485.5	200	16-2 - 240 - 212 - A107 - B23	01625031
525.5	220	16-2 - 267 - 225 - A107 - B23	01625032
586.5	250	16-2 - 291 - 262 - A107 - B23	01625033



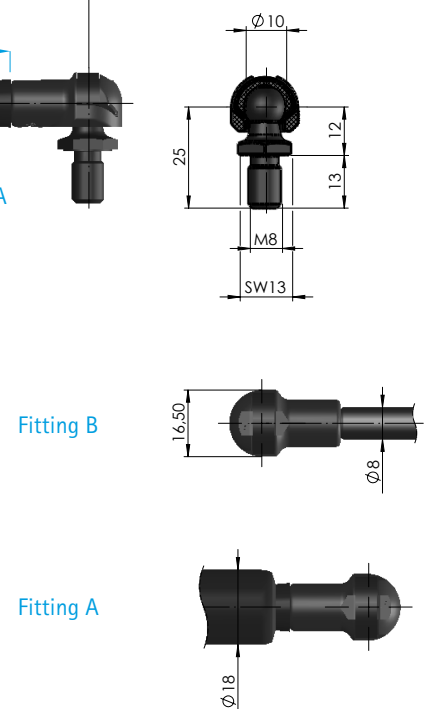
All dimensions in mm. The standard color of the tube and the piston rod is black.

Type 16-2 Ball joint/Ball joint

Ø tube 18,5 mm, Ø piston rod 8 mm, max. stroke 250 mm, extension force 80-750 N, fitting A246-B246

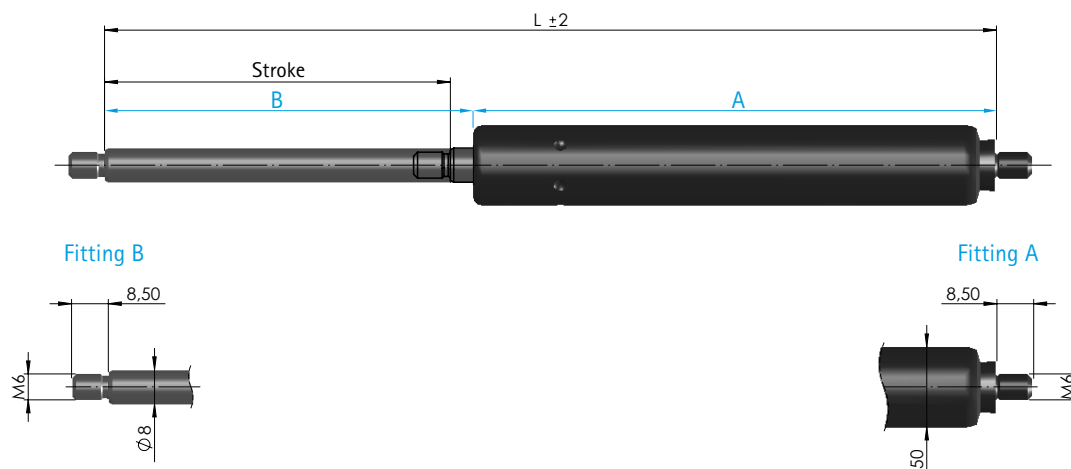


Length L (mm) ±2	Stroke (mm)	Technical data	Ordering number
166	40	16-2 - 78 - 50 - A246 - B246	01625078
206	57	16-2 - 109 - 59 - A246 - B246	01625014
244	80	16-2 - 121 - 85 - A246 - B246	01625015
256	85	16-2 - 128 - 90 - A246 - B246	01625079
286	100	16-2 - 138 - 110 - A246 - B246	01625016
306	105	16-2 - 158 - 110 - A246 - B246	01625080
326	120	16-2 - 163 - 125 - A246 - B246	01625017
366	140	16-2 - 178 - 150 - A246 - B246	01625018
405	160	16-2 - 203 - 164 - A246 - B246	01625019
446	180	16-2 - 223 - 185 - A246 - B246	01625020
491	195	16-2 - 253 - 200 - A246 - B246	01625081
485.5	200	16-2 - 240 - 207.5 - A246 - B246	01625021
527	220	16-2 - 264 - 225 - A246 - B246	01625022
585.5	250	16-2 - 294 - 253.5 - A246 - B246	01625023



Type 16-2 Thread/Thread

Ø tube 18,5 mm, Ø piston rod 8 mm, max. stroke 250 mm, extension force 80-750 N, fitting AM6-BM6



1. Select length and stroke

Length L (mm) ±2	Stroke (mm)	Technical data
128	40	16-2 - 78 - 50 - AM6 - BM6
168	57	16-2 - 109 - 59 - AM6 - BM6
206	80	16-2 - 121 - 85 - AM6 - BM6
218	85	16-2 - 128 - 90 - AM6 - BM6
248	100	16-2 - 138 - 110 - AM6 - BM6
268	105	16-2 - 158 - 110 - AM6 - BM6
288	120	16-2 - 163 - 125 - AM6 - BM6
328	140	16-2 - 178 - 150 - AM6 - BM6
367	160	16-2 - 203 - 164 - AM6 - BM6
408	180	16-2 - 223 - 185 - AM6 - BM6
453	195	16-2 - 253 - 200 - AM6 - BM6
447.5	200	16-2 - 240 - 207.5 - AM6 - BM6
489	220	16-2 - 264 - 225 - AM6 - BM6
547.5	250	16-2 - 294 - 253.5 - AM6 - BM6

All dimensions in mm. The standard color of the tube and the piston rod is black.

Please select your fittings
on pages 16-18!

⚙ Gas springs configurator

Construct your own individual gas spring with
our gas spring configurator on our website
www.suspa.com/en/configurator

2. Select the desired extension force F₁ and fittings

The extension force F₁ can be at least 80 N and maximum 750 N, the gradation of forces can be selected individually (exception: a gas spring measuring 128 mm with a stroke of 40 mm has a maximum F₁ extension force of 600 N).

When ordering please indicate the extension force and the desired fittings (see pages 16-18) as follows:

Order example: 16-2-121-85-A104-B232-250N

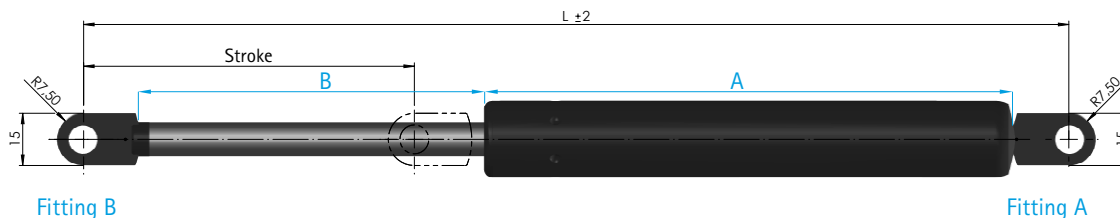
Please do not hesitate to contact us for individual layouts as for example a different damping behavior of the gas spring!

Explanation of technical data:	Length (mm)		Fittings	
	Type	Tube (A)	Piston rod (B)	Piston rod (B)
	16-2	78	50	AM6 - BM6

Standard program Liftline gas springs type 16-4

Type 16-4 Clevis/Clevis, welded

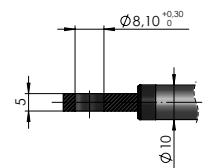
Ø tube 22 mm, Ø piston rod 10 mm, max. stroke 495 mm, extension force 100-1,200 N, fitting A23-B23



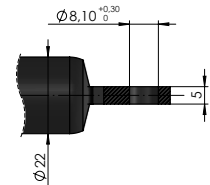
Length L (mm) ±2	Stroke (mm)	Technical data	Ordering number
283	95	16-4 - 153 - 100 - A23 - B23	01625043
383	145	16-4 - 203 - 150 - A23 - B23	01625044
483	195	16-4 - 253 - 200 - A23 - B23	01625045
586	245	16-4 - 294 - 262 - A23 - B23	01625046
683	295	16-4 - 353 - 300 - A23 - B23	01625047
783	345	16-4 - 403 - 350 - A23 - B23	01625048
883	395	16-4 - 453 - 400 - A23 - B23	01625049
983	445	16-4 - 503 - 450 - A23 - B23	01625050
1083	495	16-4 - 553 - 500 - A23 - B23	01625051

All dimensions in mm. The standard color of the tube and the piston rod is black.

Fitting B

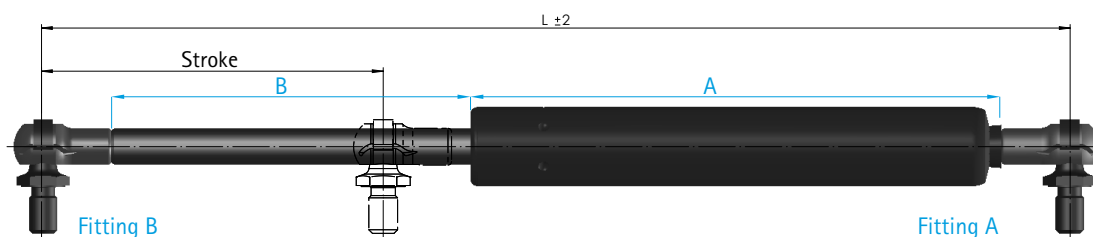


Fitting A



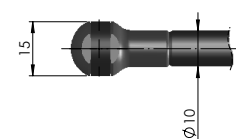
Type 16-4 Ball joint/Ball joint

Ø tube 22 mm, Ø piston rod 10 mm, max. stroke 495 mm, extension force 100-1,200 N, fitting A207-B207

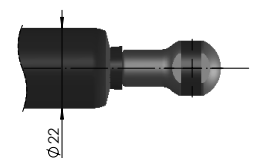


Length L (mm) ±2	Stroke (mm)	Technical data	Ordering number
286	98	16-4 - 148 - 100 - A207 - B207	01625034
326	120	16-4 - 163 - 125 - A207 - B207	01625085
386	148	16-4 - 198 - 150 - A207 - B207	01625035
405	150	16-4 - 198 - 170 - A207 - B207	01625086
444	168	16-4 - 236 - 170 - A207 - B207	01625087
486	198	16-4 - 248 - 200 - A207 - B207	01625036
586	248	16-4 - 298 - 250 - A207 - B207	01625037
686	295	16-4 - 348 - 300 - A207 - B207	01625038
786	345	16-4 - 398 - 350 - A207 - B207	01625039
806	345	16-4 - 418 - 350 - A207 - B207	01625088
886	395	16-4 - 448 - 400 - A207 - B207	01625040
986	445	16-4 - 498 - 450 - A207 - B207	01625041
1,086	495	16-4 - 548 - 500 - A207 - B207	01625042

Fitting B

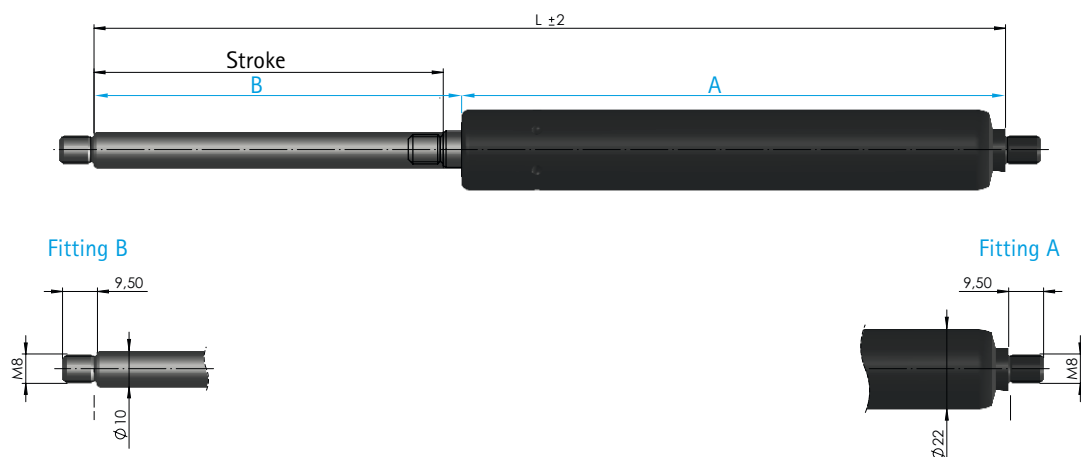


Fitting A



Type 16-4 Thread/Thread

Ø tube 22 mm, Ø piston rod 10 mm, max. stroke 495 mm, extension force 100-1,200 N, fitting AM8-BM8



1. Select length and stroke

Length L (mm) ±2	Stroke (mm)	Technical data
248	98	16-4 - 148 - 100 - AM8 - BM8
288	120	16-4 - 163 - 125 - AM8 - BM8
348	148	16-4 - 198 - 150 - AM8 - BM8
367	150	16-4 - 198 - 170 - AM8 - BM8
406	168	16-4 - 236 - 170 - AM8 - BM8
448	198	16-4 - 248 - 200 - AM8 - BM8
548	248	16-4 - 298 - 250 - AM8 - BM8
648	295	16-4 - 348 - 300 - AM8 - BM8
748	345	16-4 - 398 - 350 - AM8 - BM8
768	345	16-4 - 418 - 350 - AM8 - BM8
848	395	16-4 - 448 - 400 - AM8 - BM8
948	445	16-4 - 498 - 450 - AM8 - BM8
1,048	495	16-4 - 548 - 500 - AM8 - BM8

All dimensions in mm. The standard color of the tube and the piston rod is black.

Please select your fittings on pages 16-18!

Gas springs configurator

Construct your own individual gas spring with our gas spring configurator on our website www.suspa.com/en/configurator

2. Select the desired extension force F₁ and fittings

The extension force F₁ can be at least 100 N and maximum 1,200 N, the gradation of forces can be selected individually.

When ordering please indicate the extension force and the desired fittings (see pages 16-18) as follows:

Order example: 16-4-163-125-A31-B21-500N

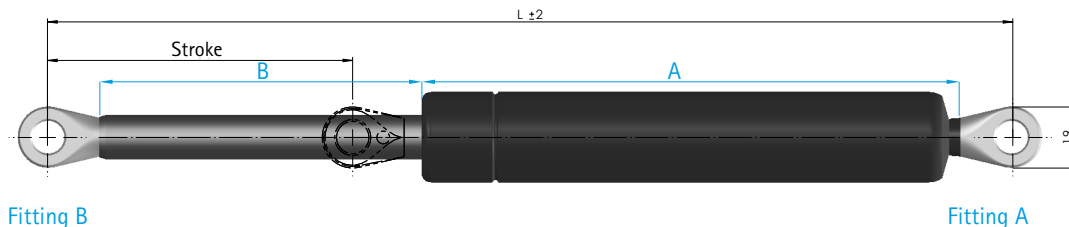
Please do not hesitate to contact us for individual layouts as for example a different damping behavior of the gas spring!

Explanation of technical data:	Length (mm)			Fittings	
	Type	Tube (A)	Piston rod (B)	Tube (A)	Piston rod (B)
	16-4	148	100	AM8	BM8

Standard program Liftline gas springs type 16-6

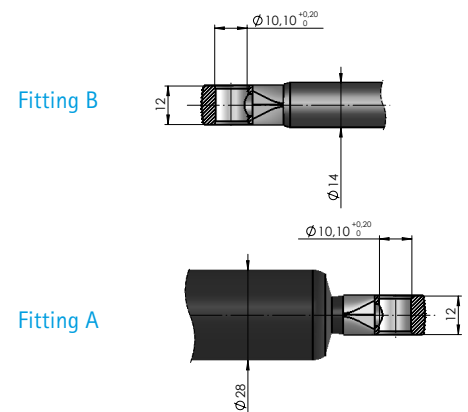
Type 16-6 Clevis/Clevis, threaded

Ø tube 28 mm, Ø piston rod 14 mm, max. stroke 500 mm, extension force 200-2,000 N, fitting A31-B31



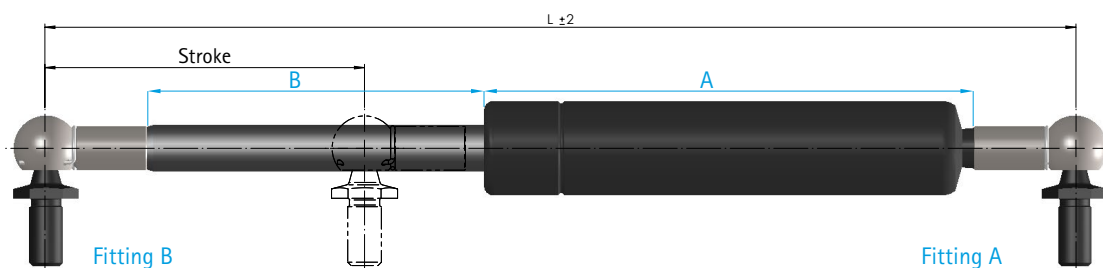
Length L (mm) ±2	Stroke (mm)	Technical data	Ordering number
250	70	16-6 - 118 - 100 - A31 - B31	01625089
300	98	16-6 - 168 - 100 - A31 - B31	01625061
400	145	16-6 - 218 - 150 - A31 - B31	01625062
500	198	16-6 - 268 - 200 - A31 - B31	01625063
600	248	16-6 - 318 - 250 - A31 - B31	01625064
700	298	16-6 - 368 - 300 - A31 - B31	01625065
800	348	16-6 - 418 - 350 - A31 - B31	01625066
906	398	16-6 - 474 - 400 - A31 - B31	01625067
995	450	16-6 - 508 - 455 - A31 - B31	01625068
1,102	500	16-6 - 565 - 505 - A31 - B31	01625069

All dimensions in mm. The standard color of the gas spring and the piston rod is black.

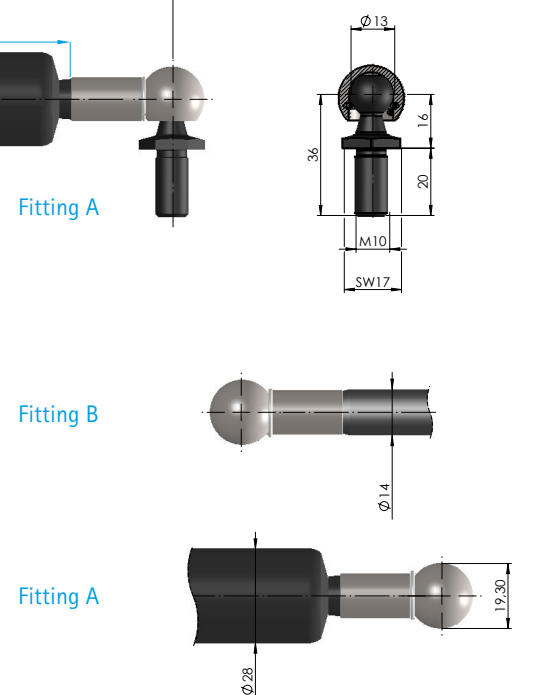


Type 16-6 Ball joint/Ball joint

Ø tube 28 mm, Ø piston rod 14 mm, max. stroke 500 mm, extension force 200-2,000 N, fitting A199-B199

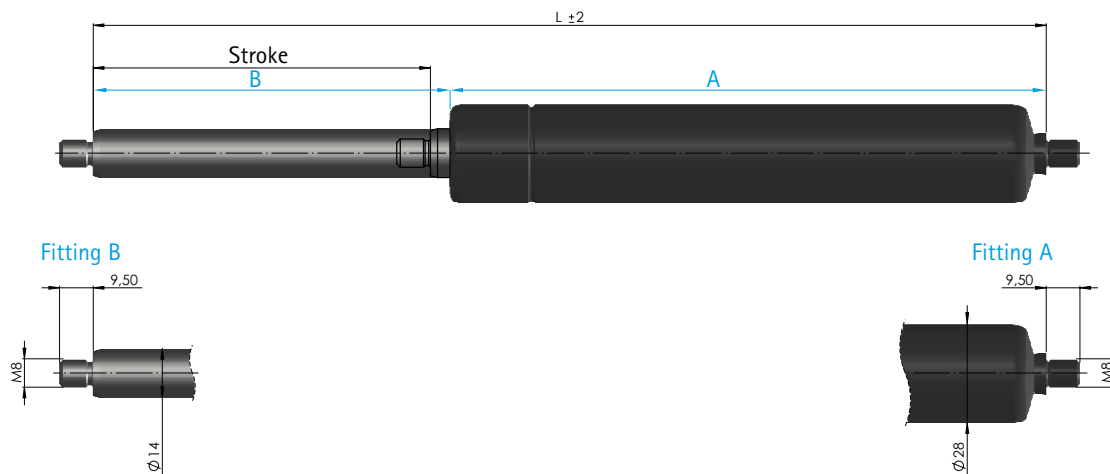


Length L (mm) ±2	Stroke (mm)	Technical data	Ordering number
278	70	16-6 - 118 - 100 - A199 - B199	01625090
328	98	16-6 - 168 - 100 - A199 - B199	01625052
428	145	16-6 - 218 - 150 - A199 - B199	01625053
528	198	16-6 - 268 - 200 - A199 - B199	01625054
628	248	16-6 - 318 - 250 - A199 - B199	01625055
728	298	16-6 - 368 - 300 - A199 - B199	01625056
828	348	16-6 - 418 - 350 - A199 - B199	01625057
934	398	16-6 - 474 - 400 - A199 - B199	01625058
1,023	450	16-6 - 508 - 455 - A199 - B199	01625059
1,130	500	16-6 - 565 - 505 - A199 - B199	01625060



Type 16-6 Thread/Thread

Ø tube 28 mm, Ø piston rod 14 mm, max. stroke 500 mm, extension force 200-2,000 N, fitting AM8-BM8



1. Select length and stroke

Length L (mm) ± 2	Stroke (mm)	Technical data
218	70	16-6 - 118 - 100 - AM8 - BM8
268	98	16-6 - 168 - 100 - AM8 - BM8
368	145	16-6 - 218 - 150 - AM8 - BM8
468	198	16-6 - 268 - 200 - AM8 - BM8
568	248	16-6 - 318 - 250 - AM8 - BM8
668	298	16-6 - 368 - 300 - AM8 - BM8
768	348	16-6 - 418 - 350 - AM8 - BM8
874	398	16-6 - 474 - 400 - AM8 - BM8
963	450	16-6 - 508 - 455 - AM8 - BM8
1,070	500	16-6 - 565 - 505 - AM8 - BM8

All dimensions in mm. The standard color of the tube and the piston rod is black.

Please select your fittings on pages 16-18!

Gas springs configurator

Construct your own individual gas spring with our gas spring configurator on our website www.suspa.com/en/configurator

2. Select the desired extension force F_1 and fittings

The extension force F_1 can be at least 200 N and maximum 2,000 N, the gradation of forces can be selected individually.

When ordering please indicate the extension force and the desired fittings (see pages 16-18) as follows:

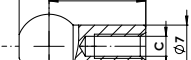
Order example: 16-6-168-100-A31-B21-500N

Please do not hesitate to contact us for individual layouts as for example a different damping behavior of the gas spring!

Explanation of technical data:	Length (mm)			Fittings	
	Type	Tube (A)	Piston rod (B)	Tube (A)	Piston rod (B)
	16-6	118	100	AM8	BM8

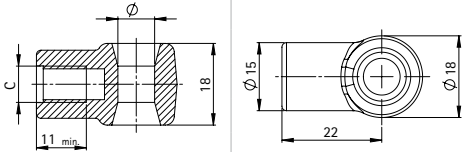
The fittings in this overview are sorted by thread diameter.
You can find further fittings on: www.suspa.com/en/fittings

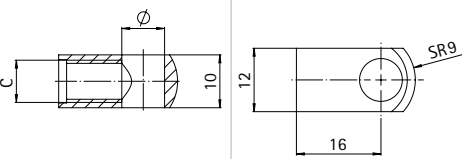
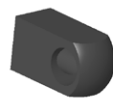
Clevis / steel galvanized			Attachment name	Part number	Ø	C	suitable for 16-12
			A457-B457	06710559	4,1	M4	•

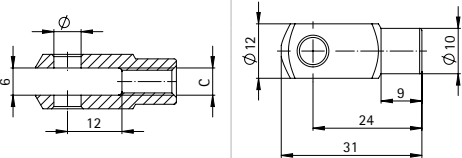
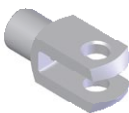
Ball joint / steel galvanized			Attachment name	Part number	C	suitable for 16-12
			A456-B456	1681007	M4	•

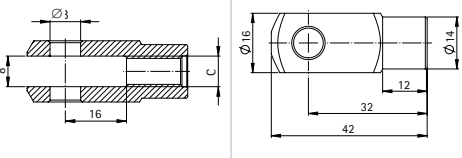
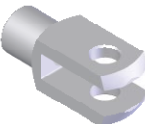
Clevis / zinc			Attachment name	Part number	Ø	C	suitable for			
							16-1	16-2	16-4	16-6
			A26-B26	06500029	12	M8			•	•
			A30-B30	06500155	8,1	M8			•	•
			A31-B31	06500145	10,1	M8			•	•
			A104-B104	06500078	12	M6	•	•		
			A220-B220	06510005	6,1	M6	•	•		
			A221-B221	06510006	8,1	M6	•	•		
			A222-B222	06510007	10,1	M6	•	•		

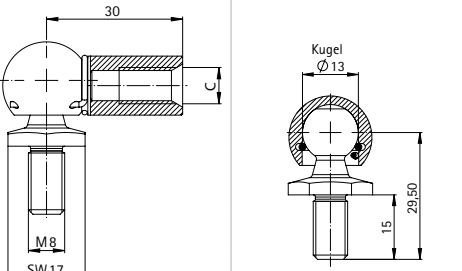
Clevis / zinc			Attachment name	Part number	Ø	C	suitable for			
							16-1	16-2	16-4	16-6
			A10-B10	06500164	8,1	M6	•	•		
			A223-B223	06510008	6,1	M6	•	•		

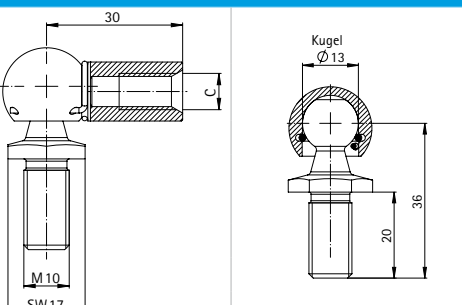
Clevis / zinc			Attachment name	Part number	Ø	C	suitable for			
							16-1	16-2	16-4	16-6
			A20-B20	06500191	8,1	M8			•	•
			A111-B111	06500525	10,1	M8			•	•

Clevis / steel black			Attachment name	Part number	Ø	C	suitable for			
							16-1	16-2	16-4	16-6
			A412 - B412	06760017	8,1	M8			•	•

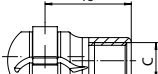
Fork head / steel galvanized			Attachment name	Part number	Ø	C	suitable for			
							16-1	16-2	16-4	16-6
			A232-B232	06810029	6	M6	•	•		

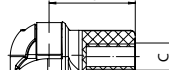
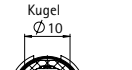
Fork head / steel galvanized			Attachment name	Part number	Ø	C	suitable for			
							16-1	16-2	16-4	16-6
			A21-B21	06800124	8	M8			•	•

Ball joint			Attachment name	Name	Part number	Material/ Color	C	suitable for			
								16-1	16-2	16-4	16-6
			A129-B129	Ball socket	09700087	Steel/ galvanized	M8			•	•
				Ball stud	06700116	Steel/ black					
				Safety clip	06800019	Niro					

Ball joint			Attachment name	Name	Part number	Material/ Color	C	suitable for			
								16-1	16-2	16-4	16-6
			A199-B199	Ball socket	09700087	Steel/ galvanized	M8			•	•
				Ball stud	06700205	Steel/ black					
				Safety clip	06800019	Niro					

End fittings and attachments

Ball joint			Attachment name	Name	Part number	Material/ Color	C	suitable for			
								16-1	16-2	16-4	16-6
		A201-B201	Ball socket	16800052	Steel/ black	M6	•	•			
			Ball stud	06710041	Steel/ black						
		A207-B207	Ball socket	16800055	Steel/ black	M8				•	•
			Ball stud	06710041	Steel/ black						

Ball joint				Attachment name	Name	Part number	Material/ Color	C	suitable for			
									16-1	16-2	16-4	16-6
			A246-B246	Ball socket	16210000	Plastic/ black	M6	•	•			
				Ball stud	06710041	Steel/ black						

Quick Release ball socket: for a quick, tool-free disassembly

Ball socket				Attachment name	Name	Part number	Material/ Color	C	suitable for			
									16-1	16-2	16-4	16-6
				A329-B329	Ball socket	16210021	Plastic/ black	M6	•	•		
												

Angle plate (bracket): Applicable up to $F_{1\max}=450\text{ N}$

Angle plate			Name	Material/Color	Part number
		Angle plate	Steel/galvanized	15810019	
		Angle plate	Steel/black	15810020	

Angle plate		Name	Material/Color	Part number
	Angle plate	Steel/galvanized	15810021	
	Angle plate	Steel/black	15810022	

Angle plate			Name	Material/Color	Part number
			Angle plate	Steel/galvanized	15810023
			Angle plate	Steel/black	15810024

Angle plate			Name	Material/Color	Part number
			Angle plate	Steel/galvanized	15810025
			Angle plate	Steel/black	15810026

Angle plate			Name	Material/Color	Part number
			Angle plate	Steel/galvanized	15810102
			Angle plate	Steel/black	15810103

Assembly instructions

Instructions on installation and use

We will send you an installation proposal based on your application.
We require the following data or coordinates for your installation proposal:

W = Hatch weight [kg]

α = Opening angle

R = Rotation point

G = Center of gravitation of the hatch

P1 = Connection point between gas spring and damper

P2 = Connection point of gas spring and frame

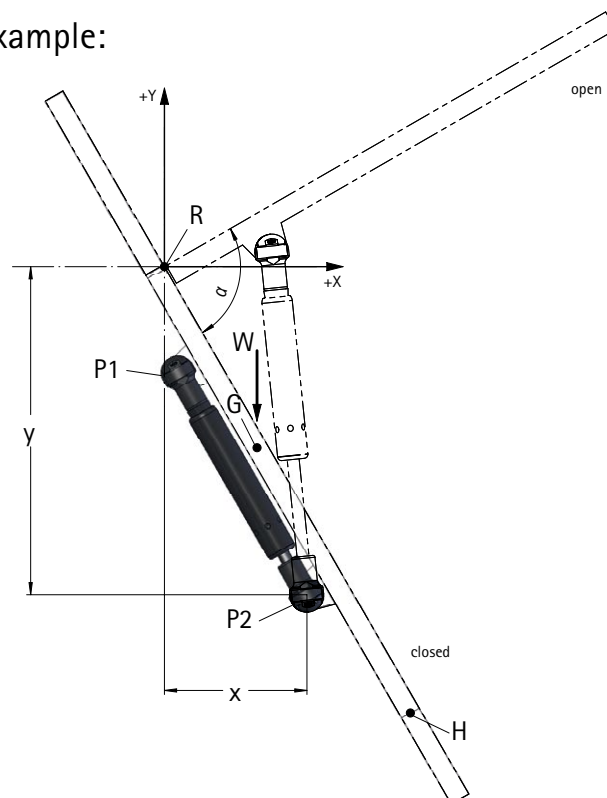
H = Handling point (open)

x = Distance in X-direction

y = Distance in Y-direction

All geometrical points required for dimensioning (R, G, P1, P2, H), must be indicated as x/y coordinates in a closed position.

Example:



Special functions

TipUp® - opening system for storage beds

The innovative mechanism defines the concept for opening and closing storage beds completely new. The bed can be opened, closed and stopped in any position effortless with just one finger.

TipUp® fits to any type of bed frame, if wooden or steel, spring wood frame or box spring and is useable for loads between 25 and 100 kg. This is ensured by the key component of the system using a gas spring with different lifting forces. Since the system can even be assembled

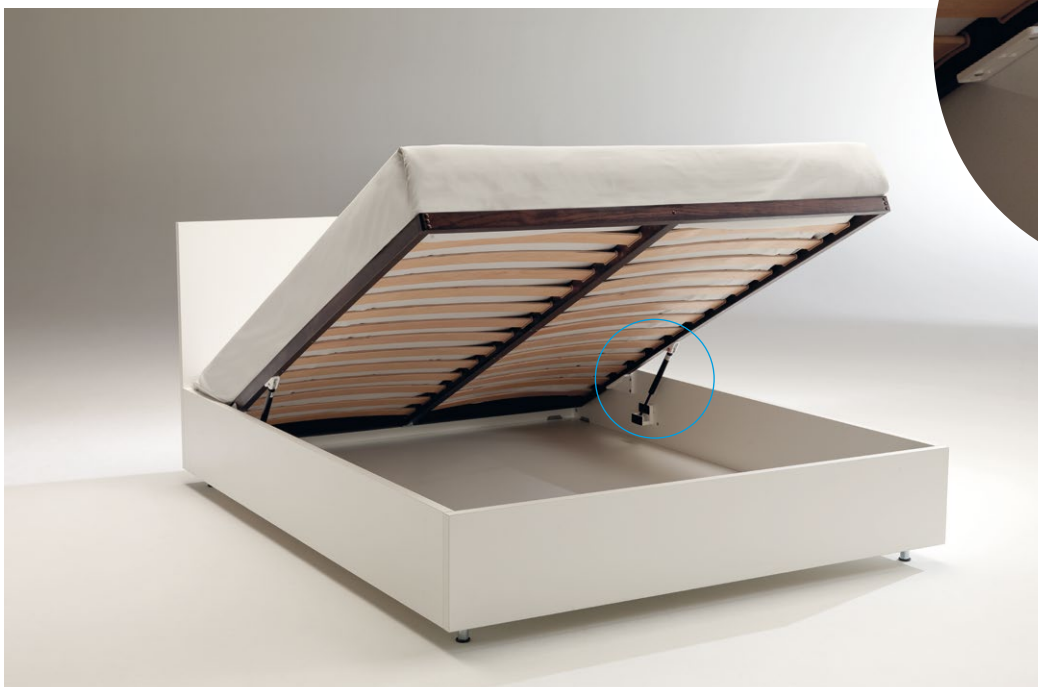
in four different mounting positions, the range of gas springs can be reduced to a minimum.

The new SUSPA gas spring with a special damper and "AntiShock" – function not only ensures comfort, but especially increases the safety during closing.

The system can be assembled without any special tools just requiring an Allen key and the assembly time per bed is reduced by over 65% compared to traditional systems.

TipUp® is manufactured from fiberglass reinforced polyamide which makes it especially light and compact.

SUSPA provides the whole system including gas springs, polyamide fittings and screws.

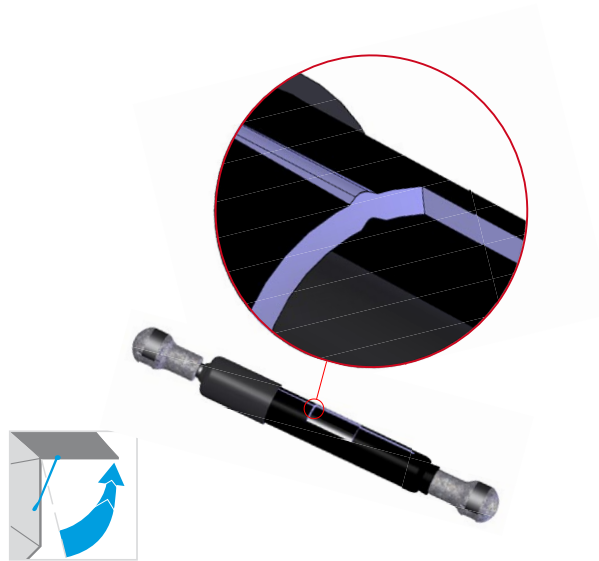


Soft-Stop: gas spring with groove

Standard gas springs as well as Soft-Stop gas springs are dampened on extension. After opening the flap slightly (as little as 10 degrees) both gas spring types will automatically lift the flap to the fully open position of approximately 90 degrees unassisted. In order to minimize vibrations, the speed is controlled over the entire range of opening by using a special hydraulic dampening (extension dampening) thus enabling a smooth opening. By presetting the filling pressure, it is possible to optimize the gas spring to any installation situation.

Advantages of the Soft-Stop gas spring

- Extension speed is defined
- Automatic and noiseless opening function
- Smoothly cushioned movement throughout the entire opening procedure
- Gently slowing down the door / lid as it reaches full extension

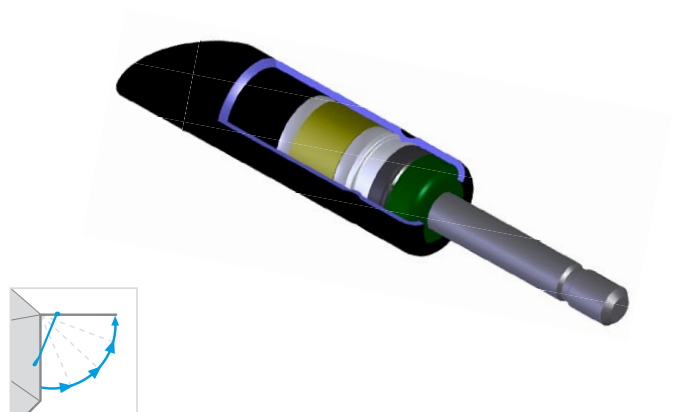


Positioning gas spring (Friction gas spring)

If a furniture flap needs to be used in many different positions, the positioning gas spring may be the right solution. This gas spring supports the load in any position desired by the user. Doors / lids can be positioned infinitely throughout their complete range of motion. By careful adjustment of the pressure during filling, the gas spring can be optimized to the application.

Advantages of the Positioning gas spring

- Counterbalance for loads during the opening function
- The ability to hold or position the door infinitely at any position in its range of motion

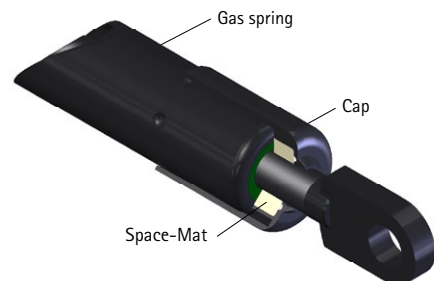


Space-mat: gas spring with lubrication reservoir

The gas spring with lubrication reservoir is based on the space-mat principle. This principle means that a plastic foam placed around the piston rod absorbs lubricants into the cavities by capillary action and releases them again purposefully when lubrication is required. The service life of the gas spring is markedly improved as a result, especially if used in technically demanding surroundings (dirt and dust).

Advantages of the Space-mat gas spring

- Suitable for technically demanding surroundings (dirt and dust)
- Suitable for special installation situations (e.g. piston rod upside)



Special functions

TouchLift: gas spring that locks in the retracted position

SUSPA TouchLift is a gas spring that locks when fully compressed. One possible application is to hold lid covers in place in the lowered position. The lock is released by gently pressing the cover.

The locking works similar to a ballpoint pen:

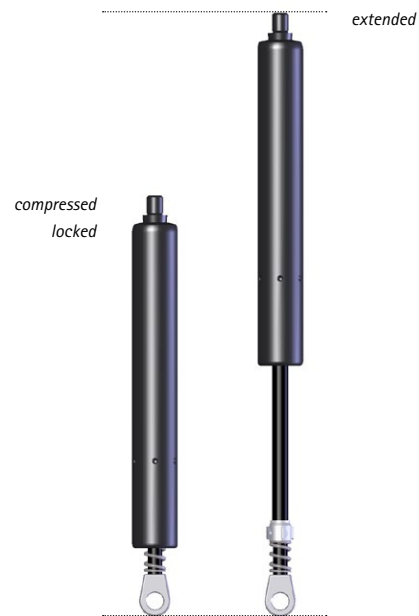
- Press once and the gas spring locks in place
- Press once more and the gas spring extends

Applications

By using the SUSPA TouchLift gas spring, furniture elements can be retracted so that their lid cover is flush with the respective surface. The objects can be raised and retracted simply by pressing the cover.

Application examples

- Retracting flat screens
- Retracting outlet strips
- A minibar to be retracted
- Lifting and lowering functions for head rests or arm rests of sofas



Advantages

The main advantages of the SUSPA TouchLift is the very low noise and the 7mm travel of release.

The TouchLift gas spring works without electricity, therefore, no cables or batteries are required and no electricity costs are incurred. Its service life corresponds with that of a classic gas spring, i. e. approximately 50,000 cycles.



Technical advice

Storage

After longer periods of storage, a slight oil film may occur at the piston rod side of the product. Such surface film is system-specific and has no impact on the function. Storage of the parts should be piston rod downward. Please activate the parts at least once after six months of storage.

Handling

SUSPA products may stand under high pressure. In order to avoid reduction of service life, safety and function, piston rods are not to be damaged, painted, or treated with aggressive materials. Keep away from foil and paper packaging (statical charging). Radial stress effects, impact effects, any type of alteration or manipulation (f. e. opening), tensile load, heating, re-painting, removal of imprints, bulk handling, as well as extreme influence of wastewater, splash or salt water are not permissible. The outer tube is not to be deformed or damaged. Products that were modified or damaged in any kind should not be put into operation and have to be exchanged.

Utilization

Your specific application is the basis for the technical design of SUSPA products. Please discuss your particular requirements with our application technicians in advance. Our products fulfil the specifications shown in SUSPA drawings. Unless otherwise specified, the products are to be used with the piston rods pointing down within a temperature range of -30°C up to $+80^{\circ}\text{C}$.

Assembly

SUSPA gas springs are under high pressure, should not be exposed to high temperatures, nor should they be opened. SUSPA gas springs should be assembled only with specified end fittings supplied by SUSPA. Fixed mounting is to be avoided. Standard safety protection applicable. The gas springs are to be mounted with the rod pointing down, unless otherwise agreed upon.



SUSPA GmbH
Industriestr. 12-14
90518 Altdorf
Germany

Telephone +49 9187 930 355
Fax +49 9187 930 311

E-mail infoindustry@de.suspa.com
Internet www.suspa.com

www.suspa.com