



Gas springs, Dampers and Adjustment systems

[Product catalog](#)

Contents

Mechanical Systems	5
Gas Spring	8
Design and functionality	9
Gas springs, hydro-strut, dampers	10
Fittings, ball studs, brackets	16
Special functions	23
Lockable Gas Spring	27
Design and functionality	30
Technical specifications	31
Special functions	35
Hydraulic Damper Softline	37
Design and functionality	39
Standard program	40
Variations	41
Piston Rod and Tube	45

Height Adjustment	50
Office	52
Pneumatic Height Adjustment	53
Table column VariBase	53
Table column VariStand	54
Electric Height Adjustment	55
Columns ELS3	55
Table subframe VariFrame	57
Table subframe FixFrame	58
Table subframe for corner desks	59
Accessories and switches	61
Industry	63
Electric Height Adjustment	64
Actuator Movotec SMS	65
Column ELS3 HeavyDuty	66
Accessories and switches	68
Hydraulic Height Adjustment Movotec	69
Guided and Unguided Cylinders	73



Mechanical Systems

Industry

Office

Piston rods + Tubes

Dampers

Lockable Gas springs

Gas springs



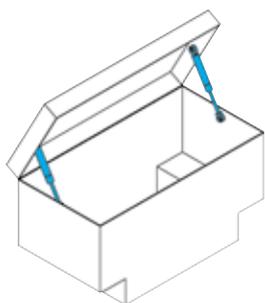
Gas Springs: Series 16

The SUSPA gas spring program includes six different types: 16-12, 16-1, 16-2, 16-3, 16-4 and 16-6.

The main differences are in the tube and piston rod diameters and the different extension forces. With so many combinations possible, 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)
16-12	12	4	150	40 - 180
16-1	15	6	150	45 - 350
16-2	18.5	8	250	60 - 600
16-3	22	8	495	100 - 600
16-4	22	10	495	89 - 1,000
16-6	28	14	500	200 - 2,490

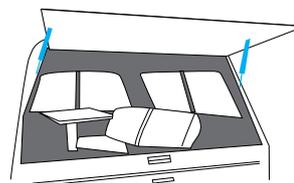
Applications



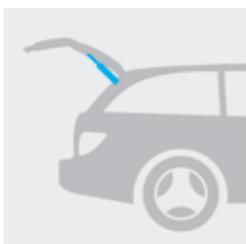
Tool Box



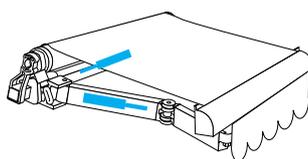
Steering column



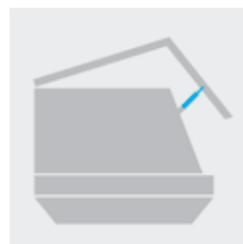
Truck Cap



Tailgate



Awning



Machinery lid

Gas Springs: Series 16

Design and functionality

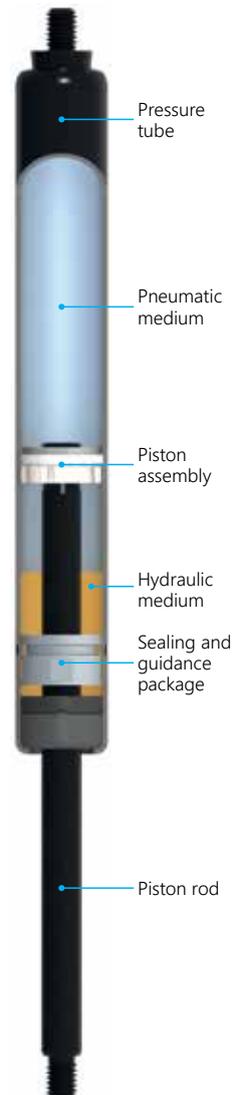
How force and effective cushioning are produced

Gas springs are hydropneumatic adjustment devices. They consist of a pressure tube plus piston rod with piston unit. End fittings 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.

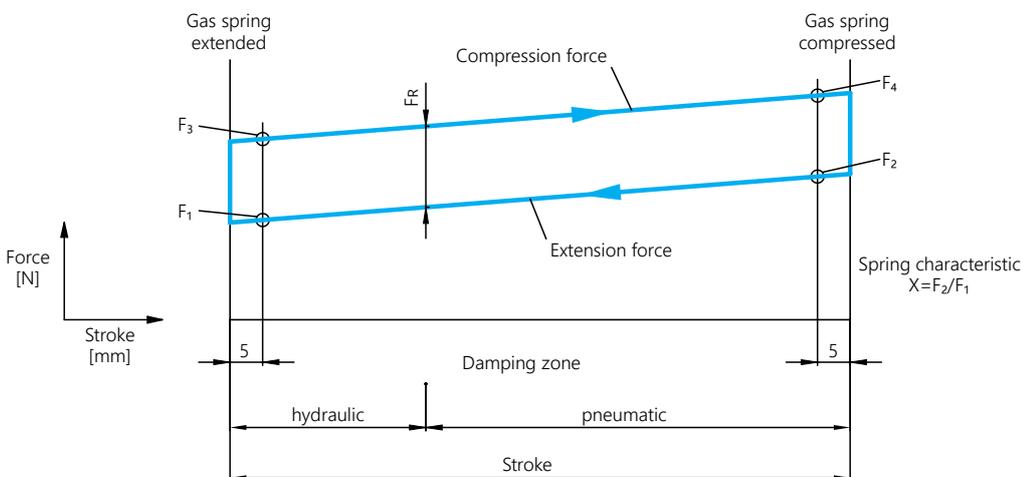
The gas spring is filled with non-toxic nitrogen at high pressures. This produces a charging pressure that in turn exerts an effect on the cross section of the piston rod, generating the extension force. If the extension force of the gas spring is greater than the force of the counterbalance, the piston rod extends; if the extension force is smaller, it compresses. 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.



Spring characteristic

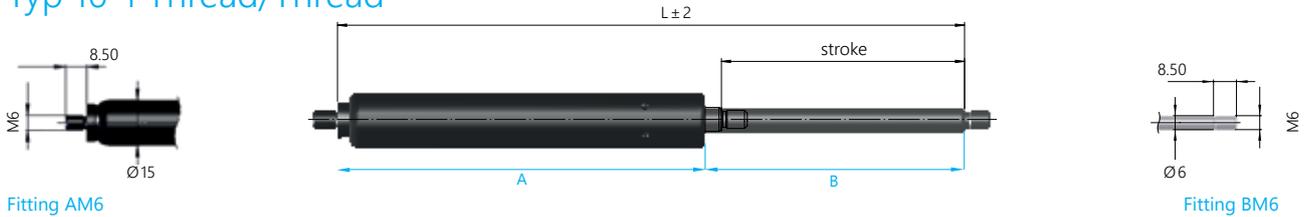
As seen in the graphic, the spring characteristic curve shows the force path of the gas spring over the stroke, from the extended to the retracted state and back. The spring characteristic illustrates the balance of power of F_2/F_1 . For the design of gas springs, the force F_1 is, in addition to the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



Series 16-1

Ø tube 15 mm, Ø piston rod 6 mm, max. stroke 100 mm, extension force 45-350 N

Typ 16-1 Thread/Thread



Fitting AM6

Fitting BM6

Select length, stroke and extension force

Length L (mm) ±2	Stroke (mm)	Technical data	Extension force F_1
81	20	16-1 - 56 - 25 - AM6 - BM6 -	Select the desired extension force F_1 ; $45 \text{ N} \leq F_1 \leq 350 \text{ N}$ Please contact us for your individual layout, more sizes are available upon request. Manufactured product may differ in appearance based on country of origin.
96	30	16-1 - 61 - 35 - AM6 - BM6 -	
127	45	16-1 - 77 - 50 - AM6 - BM6 -	
150	55	16-1 - 90 - 60 - AM6 - BM6 -	
207	85	16-1 - 117 - 90 - AM6 - BM6 -	
221	85	16-1 - 131 - 90 - AM6 - BM6 -	
273	100	16-1 - 168 - 105 - AM6 - BM6 -	

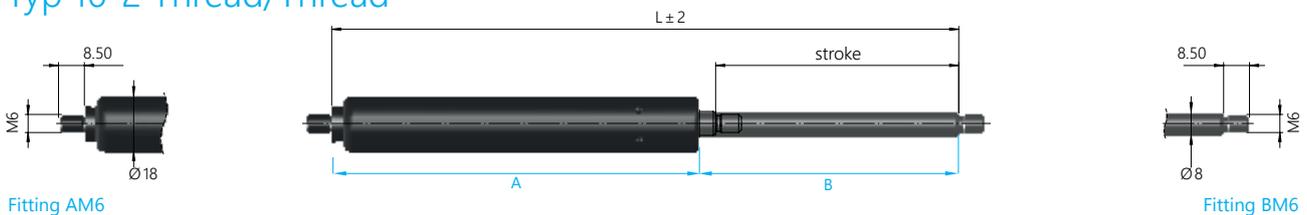
i Order example: **16-1** - **131** - **90** - **A101** - **B101** - **120N**
 Type Tube (A) Piston rod (B) Tube (A) Piston rod (B) Extension force F_1
 Length (mm) Fitting

i Please select your fittings on page 17-18
 Type 16-1 can be used as a damper without extension force.

Series 16-2

Ø tube 18 mm, Ø piston rod 8 mm, max. stroke 245 mm, extension force 60-600 N

Typ 16-2 Thread/Thread



Fitting AM6

Fitting BM6

Select length, stroke and extension force

Length L (mm) ±2	Stroke (mm)	Technical data	Extension force F_1
140	45	16-2 - 90 - 50 - AM6 - BM6 -	Select the desired extension force F_1 ; $60 \text{ N} \leq F_1 \leq 600 \text{ N}$ Please contact us for your individual layout, more sizes are available upon request. Manufactured product may differ in appearance based on country of origin.
212	75	16-2 - 132 - 80 - AM6 - BM6 -	
272	95	16-2 - 172 - 100 - AM6 - BM6 -	
293	120	16-2 - 168 - 125 - AM6 - BM6 -	
317	134	16-2 - 178 - 139 - AM6 - BM6 -	
361	155	16-2 - 201 - 160 - AM6 - BM6 -	
397	155	16-2 - 237 - 160 - AM6 - BM6 -	
437	195	16-2 - 237 - 200 - AM6 - BM6 -	
463	195	16-2 - 263 - 200 - AM6 - BM6 -	
473	205	16-2 - 263 - 210 - AM6 - BM6 -	
568	245	16-2 - 318 - 250 - AM6 - BM6 -	

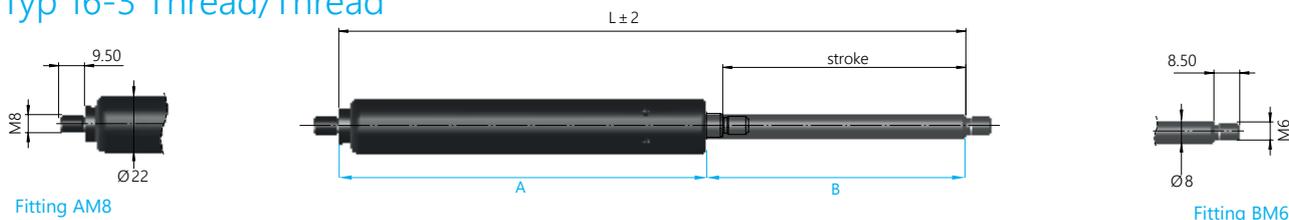
i Order example: **16-2** - **237** - **160** - **A101** - **B101** - **178N**
 Type Tube (A) Piston rod (B) Tube (A) Piston rod (B) Extension force F_1
 Length (mm) Fitting

i Please select your fittings on page 17-18

Series 16-3

Ø tube 22 mm, Ø piston rod 8 mm, max. stroke 195 mm, extension force 100-600N

Typ 16-3 Thread/Thread



Select length, stroke and extension force

Length L (mm) ±2	Stroke (mm)	Technical data	Extension force F ₁
397	155	16-3 - 237 160 - AM8 - BM6 -	Select the desired extension force F ₁ : 100N ≤ F ₁ ≤ 600N
437	195	16-3 - 237 200 - AM8 - BM6 -	
462	195	16-3 - 262 200 - AM8 - BM6 -	

i Order example: **16-3 - 237 - 160 - A198 - B101 - 267N**
Type Tube (A) Piston rod (B) Tube (A) Piston rod (B) Extension force F₁
Length (mm) Fitting

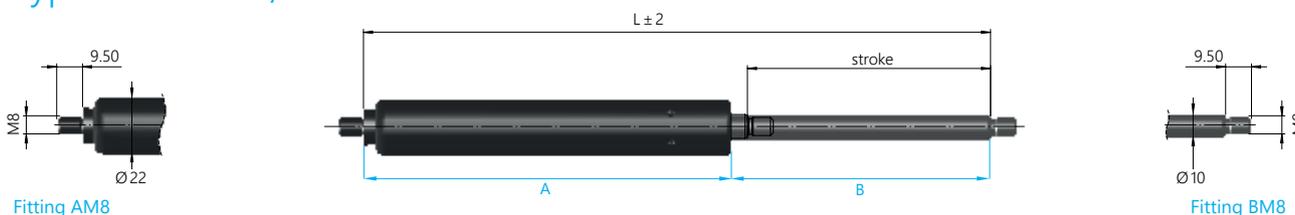
i Please select your fittings on page 17-19

Please contact us for your individual layout, more sizes are available upon request. Manufactured product may differ in appearance based on country of origin.

Series 16-4

Ø tube 22 mm, Ø piston rod 10 mm, max. stroke 405 mm, extension force 89-1,000N

Typ 16-4 Thread/Thread



Select length, stroke and extension force

Length L (mm) ±2	Stroke (mm)	Technical data	Extension force F ₁
140	45	16-4 - 90 50 - AM8 - BM8 -	Select the desired extension force F ₁ : 89N ≤ F ₁ ≤ 1,000N
207	80	16-4 - 122 85 - AM8 - BM8 -	
288	120	16-4 - 163 125 - AM8 - BM8 -	
387	170	16-4 - 212 175 - AM8 - BM8 -	
437	195	16-4 - 237 200 - AM8 - BM8 -	
462	195	16-4 - 262 200 - AM8 - BM8 -	
647	295	16-4 - 347 300 - AM8 - BM8 -	
631	255	16-4 - 371 260 - AM8 - BM8 -	
711	320	16-4 - 386 325 - AM8 - BM8 -	
670	255	16-4 - 410 260 - AM8 - BM8 -	
862	405	16-4 - 452 410 - AM8 - BM8 -	Please contact us for your individual layout, more sizes are available upon request. Manufactured product may differ in appearance based on country of origin.

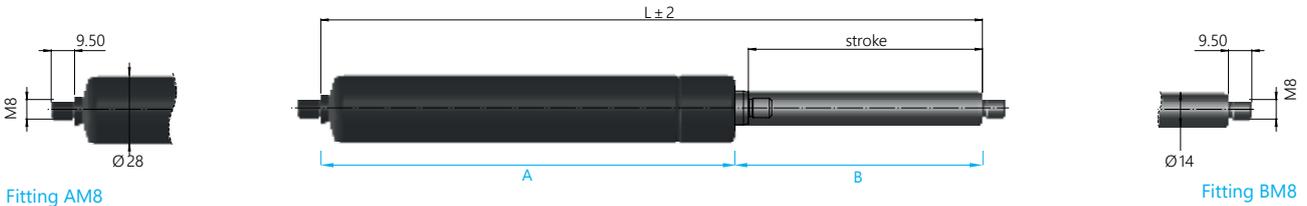
i Order example: **16-4 - 386 - 325 - A144 - B144 - 667N**
Type Tube (A) Piston rod (B) Tube (A) Piston rod (B) Extension force F₁
Length (mm) Fitting

i Please select your fittings on page 19

Series 16-6

Ø tube 28 mm, Ø piston rod 14 mm, max. stroke 500 mm, extension force 200-1,800 N

Type 16-6 Thread/Thread



Select length, stroke and extension force

Length L (mm) ±2	Stroke (mm)	Technical data	Extension force F_1
218	70	16-6 - 118 - 100 - AM8 - BM8 -	Select the desired extension force F_1 : $200\text{ N} \leq F_1 \leq 1,800\text{ N}$
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 -	

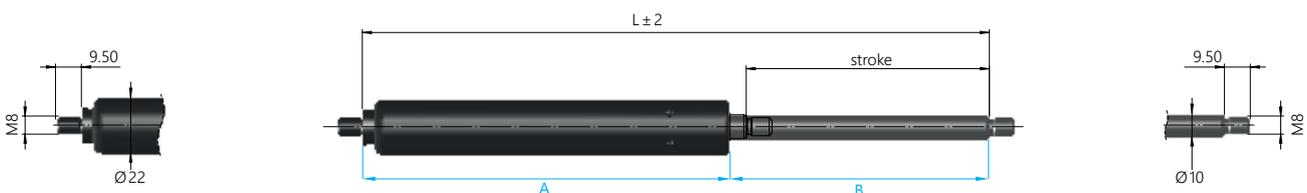
Please contact us for your individual layout, more sizes are available upon request. Manufactured product may differ in appearance based on country of origin.

i Order example: **16-6** - **168** - **100** - **A199** - **B199** - **500N**
 Type Tube (A) Piston rod (B) Tube (A) Piston rod (B) Extension force F_1
 Length (mm) Fitting

i Please select your fittings on page 19

Hydro-Strut 29-4

Ø tube 22 mm, Ø piston rod 10 mm, max. stroke 395 mm, extension force 200-1,000 N



Length L (mm) ±2	Stroke (mm)	Technical data	Extension force F_1
202	70	29-4 - 127 75 - AM8 - BM8 -	Select the desired extension force F_1 : $200\text{ N} \leq F_1 \leq 1,000\text{ N}$
219	75	29-4 - 139 80 - AM8 - BM8 -	
250	95	29-4 - 150 100 - AM8 - BM8 -	
337	95	29-4 - 237 100 - AM8 - BM8 -	
387	145	29-4 - 237 150 - AM8 - BM8 -	
450	195	29-4 - 250 200 - AM8 - BM8 -	
462	195	29-4 - 262 200 - AM8 - BM8 -	
524	195	29-4 324 200 AM8 BM8 -	
750	345	29-4 400 350 AM8 BM8 -	
852	395	29-4 452 400 AM8 BM8 -	

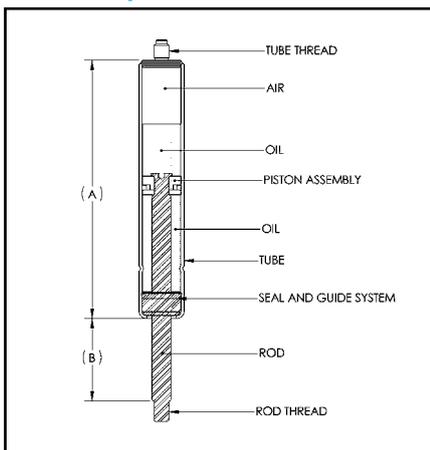
Blocking on compression is available in light (200N), medium (400-600N) or heavy (800-1000N). Please specify.

Please contact us for your individual layout, more sizes are available upon request. Manufactured product may differ in appearance based on country of origin.

i Order example: **29-4** - **161** - **124** - **A220** - **B220** - **220N**
 Type Tube (A) Piston rod (B) Tube (A) Piston rod (B) Extension force F_1
 Length (mm) Fitting

i Please select your fittings on page 19

Dampers

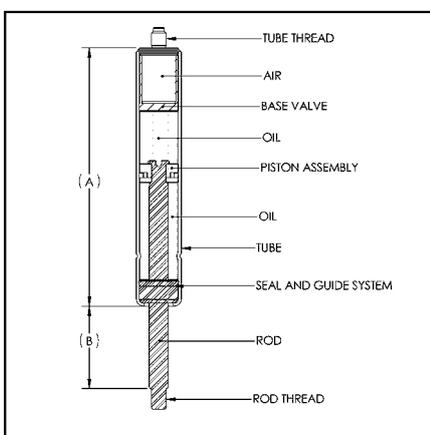


Standard Dampers

Standard non-pressurized dampers are designed for low force, motion control applications. The dampers are filled with a combination of oil and air. The ratio between the oil and the air effects the amount of dampened stroke length. *Idle stroke is present because the oil and the air are not separated. This type of damper is ideal for applications that do not utilize the entire stroke length or require constant damping in one direction only.

Characteristics

- Available in all 16 Series sizes.
- No extension force.
- Idle stroke.*
- Mounting position- Piston rod down.
- Damping available on extension, compression or both.
- Damping force may vary with different orifices and oil viscosity.

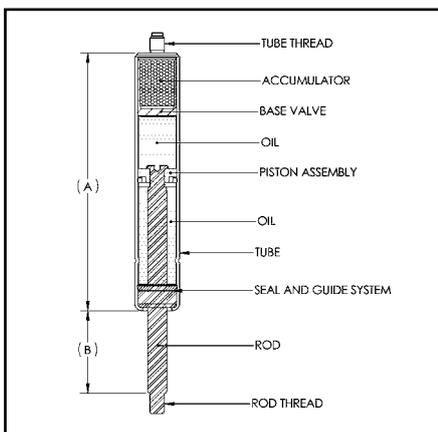


Dampers with base valve

This damper is very similar to the standard damper with an added component. A base valve is inserted into the bottom of the tube to separate the air from the oil. The base valve eliminates the *idle stroke that is present in standard dampers. This leads to a smoother, more consistent damping force along the entire stroke length.

Characteristics

- Only available in 16-2 Series.
- No extension force.
- Minimal idle stroke.*
- Mounting position- Piston rod down.
- Damping available on extension, compression or both.
- Damping force may vary with different orifices and oil viscosity.



Dampers with base valve and accumulator

A foam accumulator is inserted in the base valve to replace the air. The accumulator contracts and expands when the damper is compressed or extended to accommodate the rod volume change. This allows the damper to be mounted horizontally or vertically. The function of the accumulator produces a damper that provides consistent damping force along the entire stroke length.

Characteristics

- Only available in 16-2 Series.
- No extension force.
- Minimal idle stroke.*
- Mounting position- Horizontal or vertical regardless of piston rod orientation.
- Damping available on extension, compression or both.
- Damping force may vary with different orifices and oil viscosity.

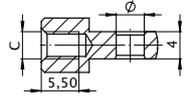
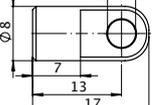
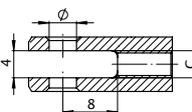
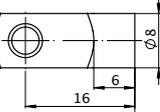
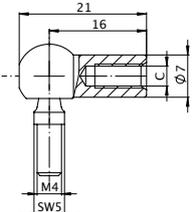
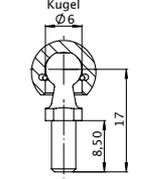
Series	16-1	16-2	16-3	16-4
Rod Length (B)	25-175mm	50-285mm	50-285mm	50-500mm
Rod Diameter	6mm	8mm	8mm	10mm
Thread Rod End	M6X1.0mm	M6X1.0mm	M6X1.0mm	M8X1.25mm
Tube Length (A)	61-225mm	85-340mm	85-535mm	85-535mm
Min. Tube Length (A) = Rod (B) +	27mm	37-114mm+	37mm	37mm
Tube Diameter	15mm	19mm	22mm	22mm
Thread Tube End	M6X1.0mm	M6X1.0mm	M8X1.25mm	M8X1.25mm

*Idle Stroke: Area of reduced damping caused by the air pocket compressing or by air and oil mixing. | +Minimum tube length depends on base valve chosen.

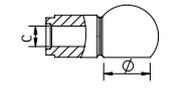
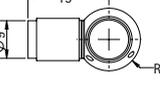
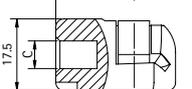
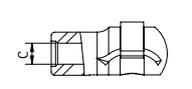
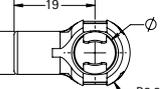
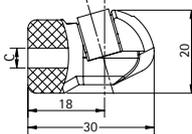
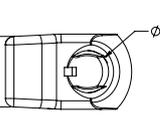
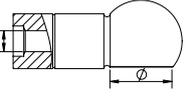
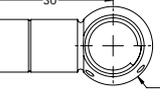
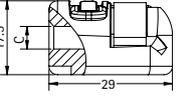
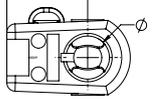
Notes

Fittings

Series 16-12

Fitting	Material	Attachement name	Part number	∅	C		
	steel galvanized	A457 - B457	067-10559	4.1	M4		
	steel galvanized	A446 - B446	067-10497	4	M4		
	steel galvanized	A456 - B456	168-10007		M4		

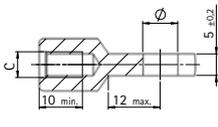
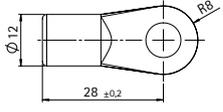
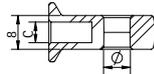
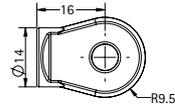
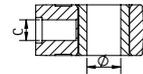
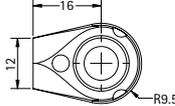
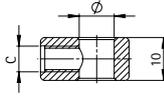
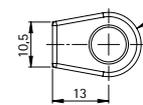
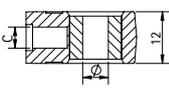
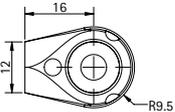
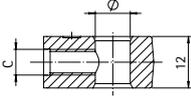
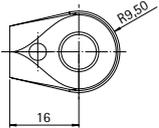
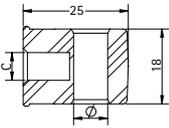
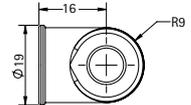
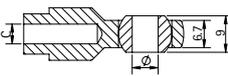
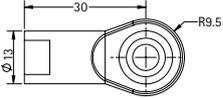
Series 16-1 & 16-2

Fitting	Material	Attachement name	Part number	∅	C		
	zinc	A3 - B3	P68-00010	10	M6		
	plastic	A101 - B101	162-10139	10	M6		
	zinc	A144 - B144	168-00052	10	M6		
	plastic	A190 - B190	162-00641	10	M6		
	zinc	A319 - B319	P97-00017	13	M6		
	plastic quick release	A329 - B329	D68-01094	10	M6		

* More end fitting options including welded ends are available in M6, ask for details.

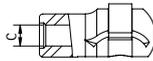
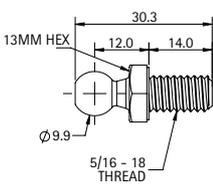
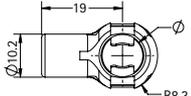
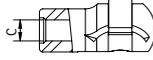
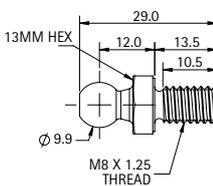
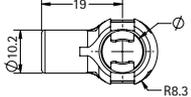
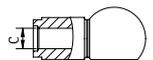
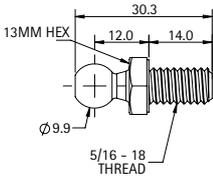
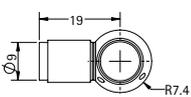
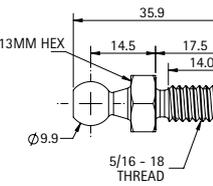
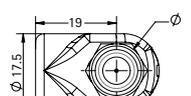
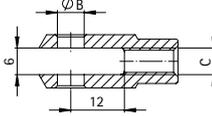
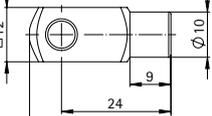
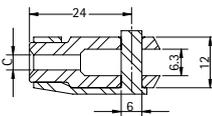
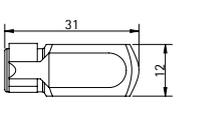
Fittings

Series 16-1 & 16-2

Fitting	Material	Attachement name	Part number	∅	C			
	Clevis	zinc	A1 - B1	065-00094	6.2	M6		
			A2 - B2	065-00070	8.1	M6		
	Clevis	plastic	A4 - B4	P68-00586	6.2	M6		
			A6 - B6	P68-00583	8.2	M6		
 	Clevis	zinc	A8 - B8	D68-01003	8.0	M6		
			A9 - B9	D68-01009	8.0	M6		
	Clevis	zinc	A10 - B10	065-00164	8.1	M6		
	Clevis	zinc	A95 - B95	D68-01027	6	M6		
	Clevis	zinc	A104 - B104	065-00078	12	M6		
			A220 - B220	065-10005	6.1	M6		
			A221 - B221	065-10006	8.1	M6		
			A222 - B222	065-10007	10.1	M6		
	Clevis	plastic	A393 - B393	P68-00636	8.2	M6		
	Swivel Clevis	steel	A331 - B331	P68-00610	6.5	M6		

* More end fitting options including welded ends are available in M6, ask for details.

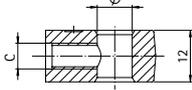
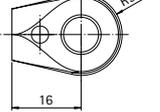
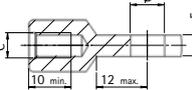
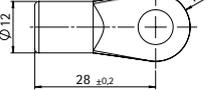
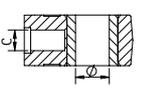
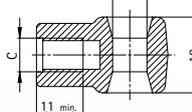
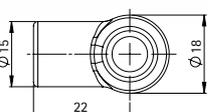
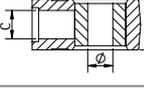
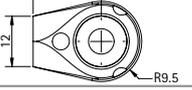
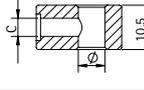
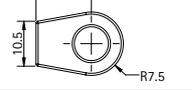
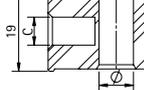
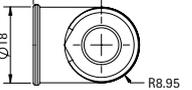
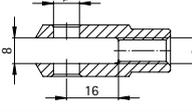
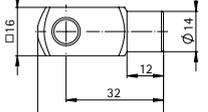
Series 16-1 & 16-2

Fitting	Material	Attachement name	Part number	∅	C			
	Ball socket	zinc black	A144 - B144	168-00052	10	M6		<p>Ball Stud</p> 
	Ball stud		Kit #D68-01080 socket & ball stud	P67-00001				
	Ball socket	zinc black	A144 - B144	168-00052	10	M6		<p>Ball Stud</p> 
	Ball stud		Kit #D68-01083 socket & ball stud	P67-00047				
	Ball socket	zinc	A265 - B265	P68-00010	10	M6		<p>Ball Stud</p> 
	Ball stud		Kit #D68-01057 socket & ball stud	P67-00001				
	Ball socket	plastic	A377 - B377	162-00439	10	M6		<p>Ball Stud</p> 
	Ball stud		Kit #D68-01130 socket & ball stud	P68-00008				
	Fork-head	zinc	A232 - B232	P68-00591	6	M6		
	Fork-head	zinc	A314 - B314	D68-01081	6	M6		

* More end fitting options including welded ends are available in M6, ask for details.

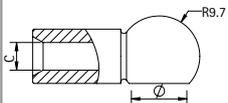
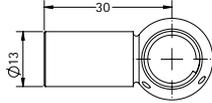
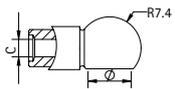
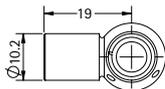
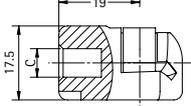
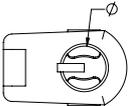
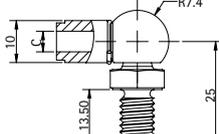
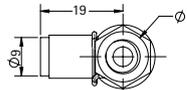
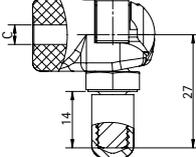
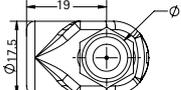
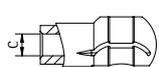
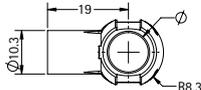
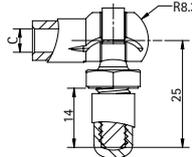
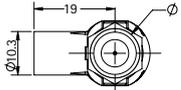
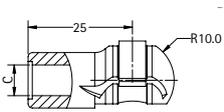
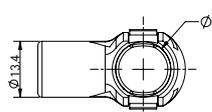
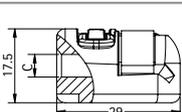
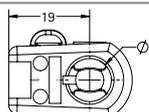
Fittings

Series 16-4 & 16-6

Fitting	Material	Attachement name	Part number	ø	C			
	Clevis	zinc	A26 - B26	065-00029	12	M8		
			A30 - B30	065-00155	8.1	M8		
			A31 - B31	065-00145	10.1	M8		
	Clevis	zinc	A13 - B13	065-00071	8.1	M8		
			A36 - B36	065-00095	6.2	M8		
	Clevis	zinc	A15 - B15	D68-01005	8.0	M8		
			A16 - B16	D68-01006	8.0	M8		
	Eyelet	zinc	A20 - B20	065-00191	8.1	M8		
			A111 - B111	065-00525	10.1	M8		
	Clevis	zinc	A37 - B37	D68-01004	6	M8		
	Clevis	zinc	A44 - B44	065-00277	8	M8		
	Clevis	plastic	A290 - B290	P68-00581	8.2	M8		
	Fork head	zinc	A21 - B21	068-00124	8	M8		

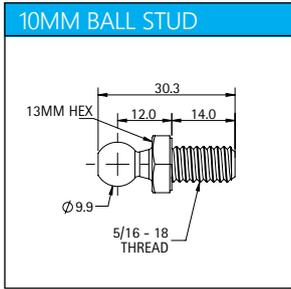
* More end fitting options including welded ends are available in M8, ask for details.

Series 16-4 & 16-6

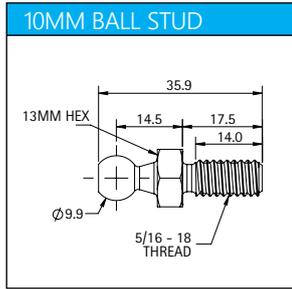
Fitting	Material	Attachement name	Part number	∅	C			
	Ball socket	zinc	A11 - B11	097-00087	13	M8		
	Ball socket	zinc	A14 - B14	068-00006	10	M8		
	Ball socket	plastic	A198 - B198	D68-01030	10	M8		
	Ball socket w/ stud	zinc	A268 - B268	D68-01060	10	M8		
	Ball socket w/ stud	plastic	A278 - B278	D68-01069	10	M8		
	Ball socket	zinc black	A285 - B285	168-00055	10	M8		
	Ball socket w/ stud	zinc black	A311 - B311	D68-01079	10	M8		
	Ball socket	zinc black	A321 - B321	P68-00034	13	M8		
	Ball socket quick release	plastic	A332 - B332	D68-01095	10	M8		

* More end fitting options including welded ends are available in M8, ask for details.

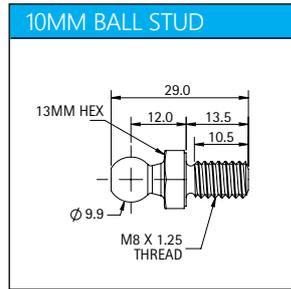
Ball Stud & Brackets



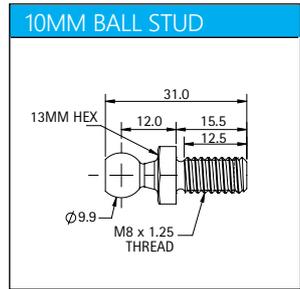
P67-00001
ZINC-PLATED STEEL



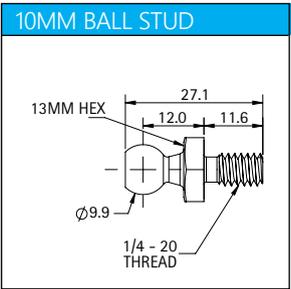
P67-00008
ZINC-PLATED STEEL



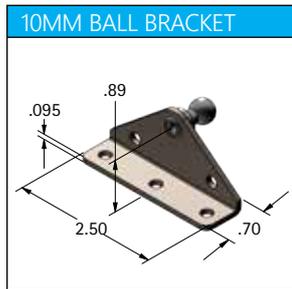
P67-00047
ZINC-PLATED STEEL



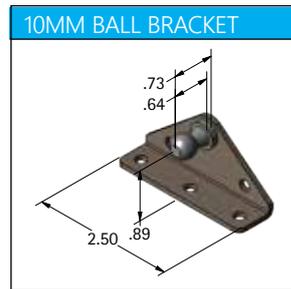
P67-00049
ZINC-PLATED STEEL



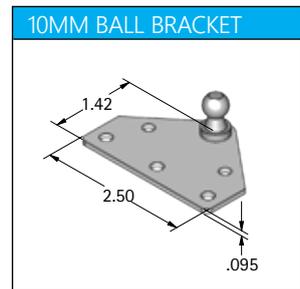
P67-00118
ZINC-PLATED STEEL



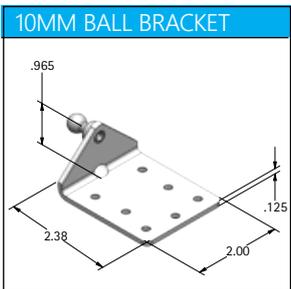
P67-00200 ZINC
P67-00201 BLACK



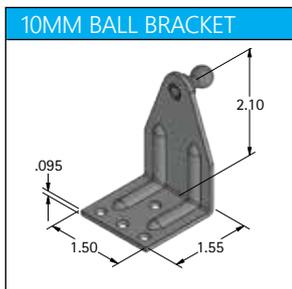
P67-00202 ZINC
P67-00203 BLACK



P67-00204 ZINC
P67-00205 BLACK

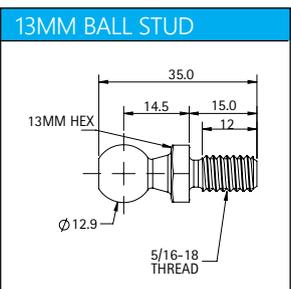


P67-00206 ZINC
P67-00207 BLACK

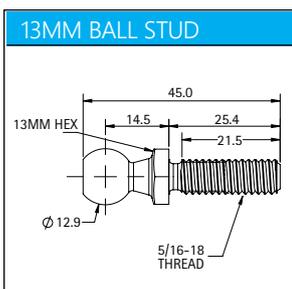


P67-00208 ZINC
P67-00209 BLACK

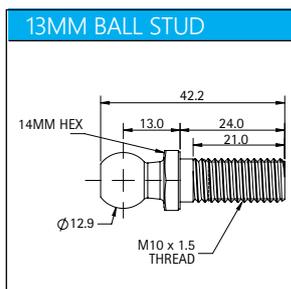
- SUSPA's 16-1, and 16-2 gas springs have M6 threads.
- SUSPA's 16-4 gas springs have M8 threads.
- Brackets not recommended for gas spring forces over 100lbs.
- Brackets mounting holes are .20"



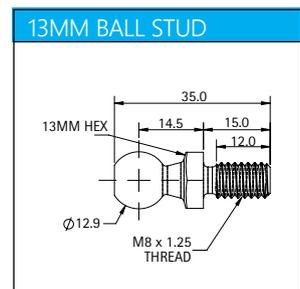
P67-00002
ZINC-PLATED STEEL



P67-00006
ZINC-PLATED STEEL

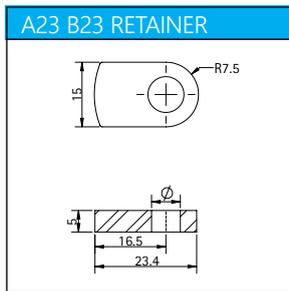


P67-00075
ZINC-PLATED STEEL

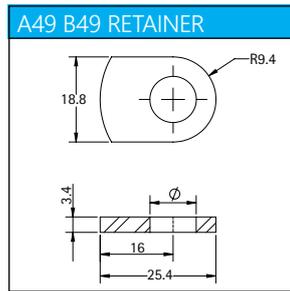


P67-00116
ZINC-PLATED STEEL

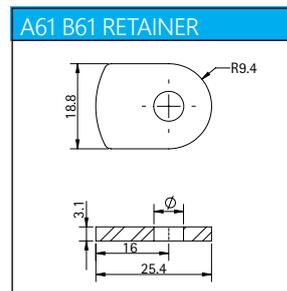
Welded Ends



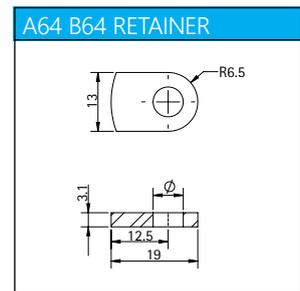
058-00237 Ø 8.2
STEEL / BLACK PAINTED



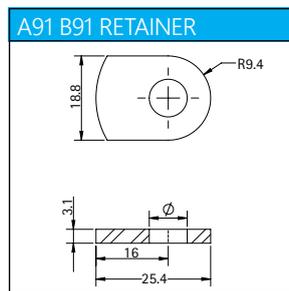
P68-00506 Ø 10.1
STEEL / BLACK PAINTED



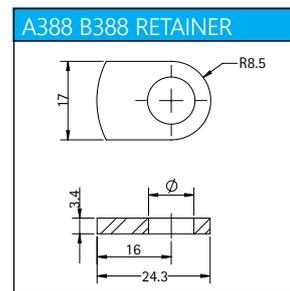
P68-00513 Ø 6.5
STEEL / BLACK PAINTED



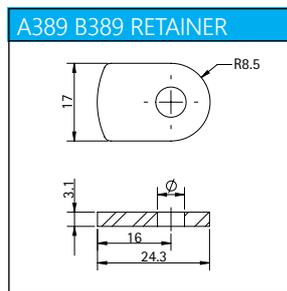
P68-00514 Ø 6.5
STEEL / BLACK PAINTED



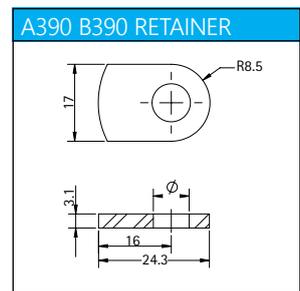
P68-00570 Ø 8.2
STEEL / BLACK PAINTED



P68-00632 Ø 10.2
STEEL / BLACK PAINTED



P68-00633 Ø 6.6
STEEL / BLACK PAINTED



P68-00634 Ø 8.4
STEEL / BLACK PAINTED

Storage, Disposal Guidelines

The proper storage of SUSPA gas springs contributes to their performance and life expectancy. This includes protecting them from moisture, spray and salt water, dirt and mechanical damage.

Horizontal or vertical storage is acceptable for up to three months. Beyond this time, gas springs should be stored vertically with the piston rod pointing downward.

Maximum storage without actuation should be limited to six months. An increased release force at first actuation after storage is possible.

Temperatures during storage should not range beyond -10°C (14°F) to $+60^{\circ}\text{C}$ (140°F). The range may be extended during a short period (transportation), but condensation can damage the cylinders.

Optimal relative humidity is approximately 50%.

Use the original packaging from the SUSPA factory for the best storage environment.

All SUSPA gas springs are nearly 100% recyclable. They must be decompressed, with the remaining oil drained, before reprocessing.

Special functions

Standard Gas Spring or Soft-Stop Gas Spring

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

- 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

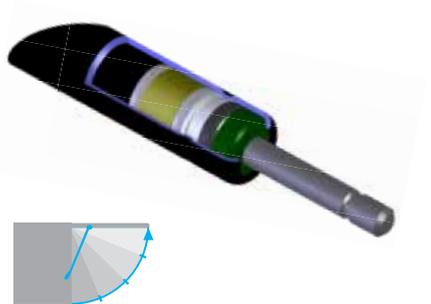


Positioning Gas Spring (Friction gas spring)

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

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



Gas Spring with protective cap

If the gas spring is used in a particularly dirty or dusty environment, it may be necessary to protect the seal by using protective caps made of rubber or plastic. The protective cap is intended to ensure that no dirt and dust particles in the environment penetrate into the pneumatic spring seal when actuating the flap. Using the protective cap therefore also has a positive effect on the service life of the gas spring in these installation situations.

In an extremely dirty environment, the protection that is guaranteed by the protective cap may not be sufficient. In these extreme environmental conditions, it is advisable to use a Space-Mat gas spring (gas spring with lubrication reservoir).



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

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



TouchLift: Gas Spring that locks in the retracted position

The SUSPA TouchLift is a gas spring that locks itself in the retracted position. In this way, for example, covers can be kept in the lowered position. Slight pressure on the cover releases the lock and the gas spring extends.

The lock works according to the so-called ballpoint pen principle:

- 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.

- 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 7 mm 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.



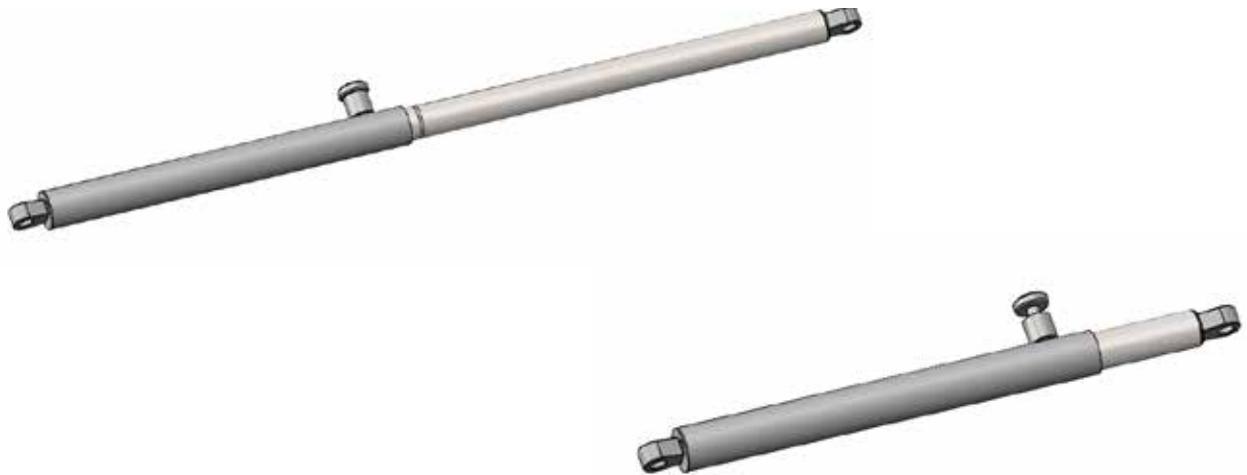
Special functions

Mechanical Lockouts for Gas Springs and Dampers

- Locks springs mechanically on full extension (open position)
- Available in 16-2 and 16-4 spring sizes
- End fitting orientation is required for correct mounting
- Two different variations
 - o Push to release locking mechanism



- o Pull to release locking mechanism



Advantages

- Spring loaded locking mechanism for automatic activation on full extension
- Additional protection against unintentional closing
- Lock can be released with one handed operation
- Configurable with various end fittings

Applications

- Vehicle hoods
- Maintenance hatches
- Fold-up storage
- Conveyor systems



Grooved Tube Design - Series 16-2 only

- Grooved tube controls the speed of the extension stroke
- *Speeds from 25mm/s to 500mm/s*
- Customize depth, length and position of the groove to vary the damping along the entire stroke
- Available specifically on 16-2 series gas springs and dampers at this time - *Tube O.D. 18mm / Rod O.D 8mm*
- Improve the feel of your application by tuning the speed at various points throughout it's opening and closing movements





Lockable Gas Spring

The locking gas strut aids the ergonomics and comfort for conveniently safely changing seated and lying positions, for effortlessly and precisely operating machine covers and are used in many other applications.

Our lockable gas struts make it possible to variably lock them in any stroke position, whether elastically ("spring-loaded") or rigidly. Our special functions offer particular advantages when it comes to convenience and operation.

Different connection elements and release systems complete our range of products and give you the appropriate lockable gas strut for any application.

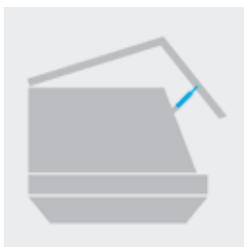
Elastic locking

Type	Ø Tube (mm)	Stroke (mm)	Extension force F_i (N)	Type of locking
EL1	22	10 - 450	80 - 800	elastic
EL2	28	10 - 450	80 - 1,000	elastic

Rigid locking

HY1	22	10 - 300	80 - 800	rigid in the tensile direction
HY3	28	10 - 450	80 - 1,000	rigid in the tensile direction
HY4	28	10 - 300	80 - 1,000	rigid in the compressive direction
HY6	27	150 - 450	70 - 400	rigid in the compressive direction
VOB	28	70 - 300	150 - 1,000	rigid in the compressive direction

Applications



Machinery lid



Massage table



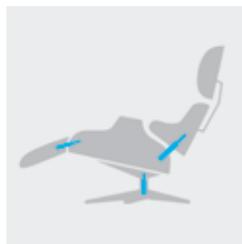
Vehicle seat



Side table



Steering column



Reclining chair

Notes

Lockable Gas Spring

Design and functionality

Working principle

Gas springs consist of a gas pressurized tube together with a piston rod and piston. The piston is fitted with a valve that is actuated by the release pin. When the valve is shut, the gas spring does not move, thus providing locking in the desired position.

Depending on the pressure medium, this locking feature can be either **rigid** or **elastic**.

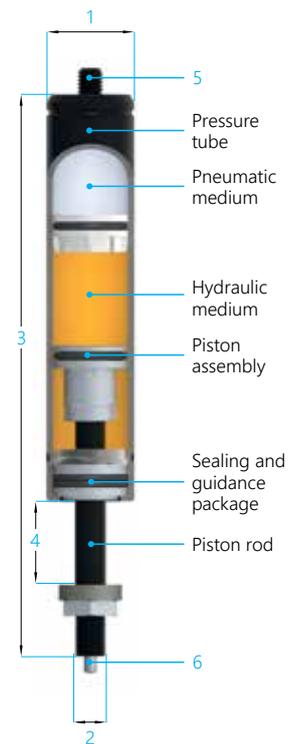
Type of locking

Rigid locking in extension (HY1 and HY3) is used when a cushioning effect in the locking position is not desired – for example, for safety reasons. Rigid locking in compression (HY4 and HY6) is recommended for light weight applications that are subject to high compression forces when locked and require no movement. The VOB 18-1 and HY6 are ideal for applications that require a short installation length and a large stroke (detailed information www.suspa.com/us/products/lockable-gas-springs/rigid-locking).

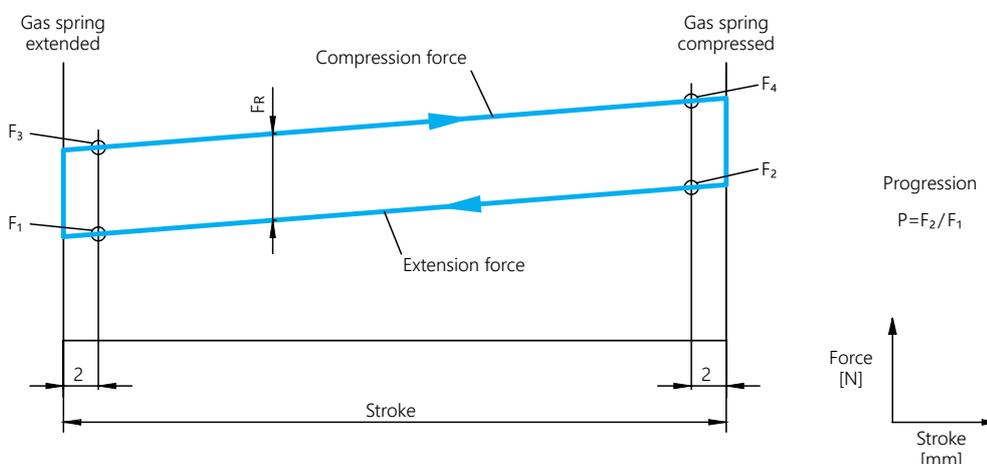
Elastic-locking gas springs EL1 and EL2 are recommended when the locking feature is required to have a cushioning effect. Sudden jolted loads can thus be dampened or even completely avoided.

Spring characteristic

As the graphic illustration indicates, the spring characteristic curve represents the force curve of the gas spring over the stroke, from the extended to the compressed state. The progression thereby represents the force ratio F_2/F_1 in extension direction. To be able to design a gas spring, force F_1 apart from the dimensions, is an important measuring criterion. Force F_1 is measured 2 mm from the end of the extension movement and defines the value of the spring force. Force F_R , resulting from friction, develops between the force lines in the direction of retraction and extension. The extension speed can be defined by adjusting the piston assembly corresponding to available stages.



- 1 Diameter tube
- 2 Diameter piston rod
- 3 Installation length
- 4 Stroke
- 5 Fitting tube
- 6 Release pin



The Varilock basic range: Technical specifications

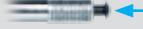
Elastic locking

Specification	EL1	EL2
Release pin	on piston rod side	
Locking	elastic	
In compression direction: max. load [N]/(lbs)	6,500 (1,460)	10,000 (2,245)
In extension direction: max. load [N]/(lbs)	3,500 (785)	7,000 (1,572)
1 Tube diameter [mm]/(inch)	22 (0.866)	28 (1.102)
2 Piston rod diameter [mm]/(inch)	10 (0.394)	
3 Min. installation length excluding eyelet [mm]/(inch)	2 x stroke + 70 (2.756)	
4 Stroke C [mm]/(inch)	10 - 339 (0.394-13.346)	10 - 450 (0.394 - 17.717)
Extension forces F_1 [N]/(lbs)	80 - 800 (18-180)	80-1,000 (18-225)
Progression ratio (F_2/F_1)	< 1.25	< 1.2
Release force [N]/(lbs)	0.25 x F_1	
Release travel, short [mm]/(inch)	< 0.5 (< 0.02)	
Release travel, normal [mm]/(inch)	2.5 ≤ x ≤ 3.5 (0.098 ≤ x ≤ 0.138)	
Recommended installation position	piston rod pointing downwards	
Permissible operating temperature	-20 °C to +60 °C (-4 °F to 140 °F)	
Permissible storage temperature	-20 °C to +80 °C (-4 °F to 176 °F)	

Special modules	EL1	EL2
AS - AntiShock	x	x
ES - EasySwitch	x	x
TR - TimeReset	-	-
OR - OverRide	-	-
CH / CL ComfortRelease High / Low	x	x



Rigid locking

Specification	HY1	HY3	HY4	HY6
Release pin	on piston rod side 			
Locking	rigid in tensile direction		rigid in compressive direction	
In compression direction: rigid to [N]/(lbs) / max. load [N]/(lbs)	3.6 x F ₁ / 6,500 (3.6 x F ₁ / 1,460)	5.8 x F ₁ / 10,000 (5.8 x F ₁ / 2,245)	10,000 (2,245)	1,200 (270)
In extension direction: rigid to [N]/(lbs) / max. load [N]/(lbs)	3,500 (785)	7,000 (1,572)	4.8 x F ₁ / 7,000 (4.8 x F ₁ / 1,572)	1.6 x F ₁
1 Tube diameter [mm]/(inch)	22 (0.866)	28 (1.102)		
2 Piston rod diameter [mm]/(inch)	10 (0.394)			
3 Min. installation length excluding eyelet [mm]/(inch)	2.6 x stroke + 76 (2.992)	2.4 x stroke + 76 (2.992)	2.6 x stroke + 85 (3.346)	2 x stroke + 110 (4.331)
4 Stroke C [mm]/(inch)	10 - 300 (0.394 - 11.811)	10 - 450 (0.394 - 17.717)	10 - 300 (0.394 - 11.811)	10 - 450 (0.394 - 17.717)
Extension forces F₁ [N]/(lbs)	80 - 800 (18 - 180)	80 - 1,000 (18 - 225)		70 - 400 (16 - 90)
Progression ratio (F₂/F₁)	< 1.6	< 1.5	< 1.6	< 1.6
Release force [N]/(lbs)	0.25 x F ₁			
Release travel, short [mm]/(inch)	< 0.5 (0.020)			
Release travel, normal [mm]/(inch)	2.5 ≤ x ≤ 3.5 (0.098 ≤ x ≤ 0.138)			
Recommended installation position	any	any	piston rod pointing downwards	any
Permissible operating temperature	-20°C to +60°C (-4°F to 140°F)			-10°C to +60°C (14°F to 140°F)
Permissible storage temperature	-20°C to +80°C (-4°F to 176°F)			

Special modules	HY1	HY3	HY4	HY6
AS - AntiShock	x	x	x	-
ES - EasySwitch	x	x	x	-
TR - TimeReset	-	x	x	-
OR - OverRide	-	-	-	x
CH / CL ComfortRelease High / Low	x	x	x	x

Lockable Gas Spring

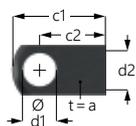
EL2/HY3 Standard

Specification elastic locking

Type	Ø Tube (mm)	Ø Piston rod (mm)	Stroke (mm)	Extension force * F ₁ (N)	Color tube	Color piston rod	Type of locking
EL1	22	10	20 - 250	200 - 800	black	black	elastic
EL2	28	10	20 - 250	200 - 1,000	black	black	elastic

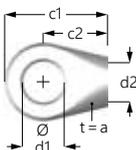
* The extension force is selectable in steps of 50 Newton.

End fittings A



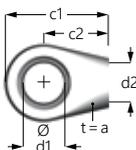
Steel joint eyelets

Order no.	a	c1	c2	d1	d2
06752017	10	19.5	13	8	M8
06700338	10	20.5	14	8	M8
06700344	10	22.5	16	8	M8
06750019	10	23.5	14	10	M8
06700343	12	21.5	14	10	M8
06700336	12	23.5	16	10	M8



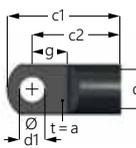
Zinc joint eyelets

Order no.	a	c1	c2	d1	d2
06500155	12	25.5	16	8	M8
06500145	12	25.5	16	10	M8
06500029	12	25.5	16	12	M8



Zinc joint eyelets with a plastic bushing

Order no.	a	c1	c2	d1	d2
16560002	12	25.5	16	8	M8
16560003	12	25.5	16	10	M8



Steel joint eyelets

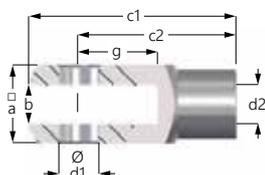
Order no.	a	c1	c2	d1	d2	g
06750017	5	38	28	10	M8	10.5
06700348	5	36	28	8	M8	10.5



All figures in mm.

Technical data

Length (mm)	Stroke (mm)		Type	Order no.
	L _{out}	L _{in}		
110	90	20	EL1	02752293
			EL2	02752304
130	100	30	EL1	02752294
			EL2	02752305
150	110	40	EL1	02752295
			EL2	02752306
190	130	60	EL1	02752296
			EL2	02752307
230	150	80	EL1	02752297
			EL2	02752308
270	170	100	EL1	02752298
			EL2	02752309
310	190	120	EL1	02752299
			EL2	02752310
390	230	160	EL1	02752300
			EL2	02752311
470	270	200	EL1	02752301
			EL2	02752312
590	340	250	EL1	02752302
			EL2	02752313



Steel fork heads

Order no.	a	b	c1	c2	d1	d2	g
06800124	16	8	42	32	8	M8	16
06800132	20	10	52	40	10	M8	20

All figures in mm.



Ordering system: 02752293

- 300N

- 06500155

- 02150106

Order no.

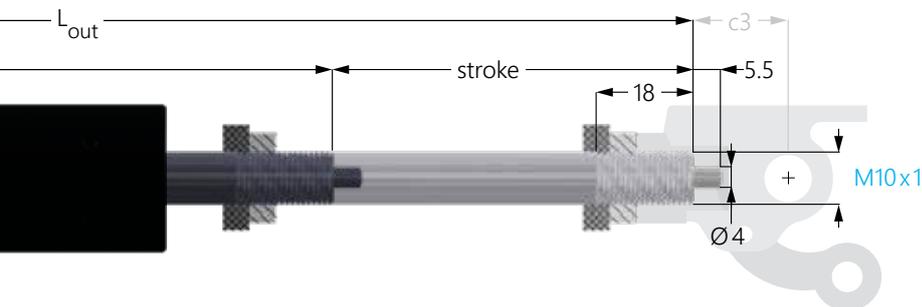
Extension force F₁ Tube end fitting (A) Piston rod end fitting (B)

Fittings

Specification rigid locking

Type	Ø Tube (mm)	Ø Piston rod (mm)	Stroke (mm)	Extension force * F_1 (N)	Color tube	Color piston rod	Type of locking
HY1	22	10	20 - 250	200 - 800	black	black	rigid
HY3	28	10	20 - 250	200 - 1,000	black	black	rigid

* The extension force is selectable in steps of 50 Newton.



Technical data

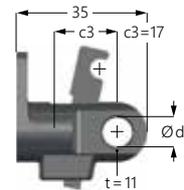
Length (mm)		Stroke (mm)	Type	Order no.
L_{out}	L_{in}			
130	110	20	HY1	02852477
			HY3	02852488
160	130	30	HY1	02852478
			HY3	02852489
190	150	40	HY1	02852479
			HY3	02852490
230	170	60	HY1	02852480
			HY3	02852491
270	190	80	HY1	02852481
			HY3	02852492
330	230	100	HY1	02852482
			HY3	02852493
390	270	120	HY1	02852483
			HY3	02852494
470	310	160	HY1	02852484
			HY3	02852495
570	370	200	HY1	02852485
			HY3	02852496
710	460	250	HY1	02852486
			HY3	02852497

End fittings B

SusflexRegular

axial release: cable mounted
parallel to gas spring

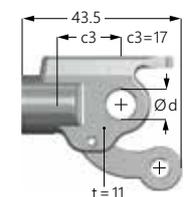
Force ratio	Clevis d = 8 mm	Clevis d = 10 mm
1:2	06550018 + 06550020	06550019 + 06550020



SusflexSide

90° release: cable mounted
perpendicular to gas spring

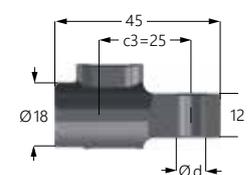
Force ratio	Clevis d = 8 mm	Clevis d = 10 mm
1:2	02152022	02152021



SusflexDirect

for lever release

Type	Clevis d = 8 mm	Clevis d = 10 mm
standard	02100075	02150102

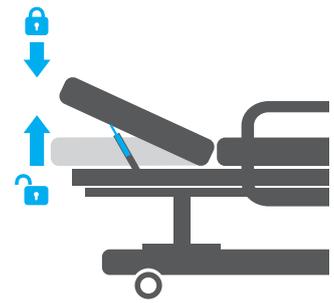


 Please find various release levers and buttons in our Lockline catalog: www.suspa.com/downloads/SUSPA_Lockline_EN.pdf

Special functions

OverloadProtection OP Comfortable adjustment in extension direction

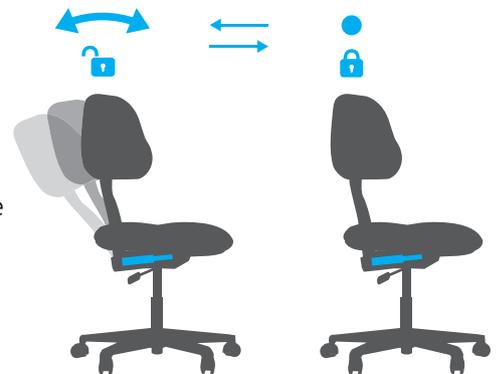
The special function OverloadProtection OP for the lockable gas struts HY3 and HY4 is used for the safe adjustment of the application in the extension direction without release. Thus, for example, massage couches, armrests and footrests can be adjusted comfortably and intuitively with one hand.



EasySwitch ES Locking that can be switched on and off

With the "EasySwitch" module, the user controls the valve "digitally", alternating between the closed and permanently open position and back again. You switch between the two modes by activating the pin through the release mechanism.

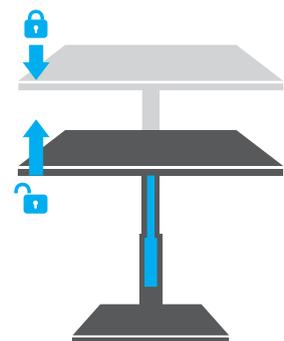
With EasySwitch, the valve stays either open (swinging function) or closed (locked backrest) as per the user's settings.



OverRide OR Smooth extension without actuation

The "OverRide" module allows a person to move the application in the extension direction without having to activate the release function. In the case of desk or table applications, a gentle upwards force applied to the tabletop adjusts the height of the table. Once the desired position has been achieved, locking in the compression direction is rigid.

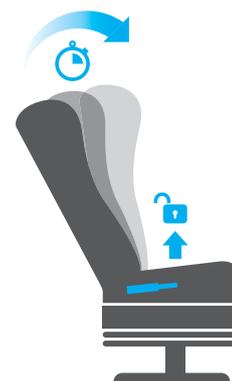
OverRide provides smooth, comfortable operation and was first designed for use in hospital beds and over-bed tables. It also allows for single-hand operation of the application.



TimeReset TR Automatic return

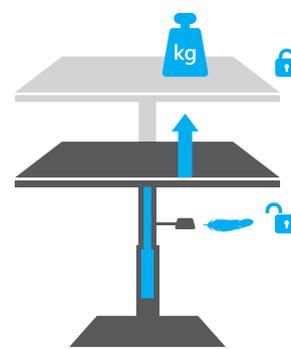
The "TimeReset" automatically detects whether the application is charged with a person's weight or not. When loaded, the lockable gas strut operates in the usual manner and permits locking at any position. When the application is not loaded, the lockable gas strut returns it to the starting position (vertical backrest) within a custom defined time period.

TimeReset is particularly suitable for passenger seats, cinema and theatre seating or conference chairs.



ComfortReleaseLow CL Extremely easy operation of gas struts

Using the "ComfortReleaseLow" module can adjust the lockable gas strut to the requirements of any release system in order to achieve maximum operating comfort. Conventional valve designs (standard release) cannot be conveniently triggered in the event of high extension forces. SUSPA ensures a convenient release through the lowest possible manual force on the actuating element (button, lever). We are happy to advise you in the optimization of your application.



Lightweight lockable gas strut

Lockable gas struts for aviation are ideal for the comfortable and safe adjustment of the sitting and lying position of passenger and pilot seats.

Characteristics

- Optimized weight due to the aluminum piston rod (60% weight savings compared to a conventional piston rod made of steel with the same performance)
- High strength of the tube even with a smaller wall thickness (25% compared to conventional tubes)
- Low release force
- High spring stiffness

Application examples

- Backrest adjustment in passenger and pilot seats
- Leg rest for business and first class seats





Damper Softline

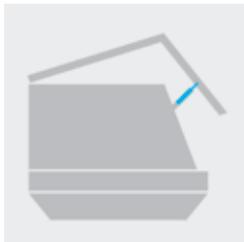
The SUSPA hydraulic dampers, also called shock absorbers, industrial shock absorbers or vibration dampers, are designed for the respective product application so that an optimal movement sequence or optimal vibration behavior is achieved. We use our decades of experience in the field of damping technology to solve your individual requirements for damping vibrations and impacts.

Type	Ø Tube (mm)	Ø Piston rod (mm)	Damping forces (N)
HD12	12	4	50 - 400
HD13	13	5	50 - 400
HD15	15	6	50 - 500
HD18	18	8	0 - 2,000
HD22	22	10	50 - 2,500
HD25	25	8	100 - 4,000
HD34	34	8	100 - 5,000
HD38	38	10	100 - 6,000

Applications



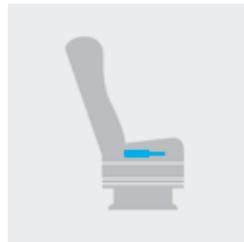
Overrun brake



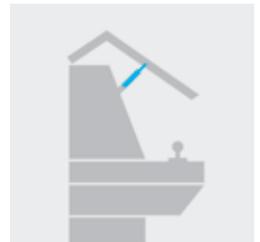
Machinery lid



Massage table



Vehicle seat



Slot machine

Damper Softline

Design and functionality

When the piston rod is moved, the damping medium of oil is pressed through the bores in the piston system. The damping force results from the resistance of the oil when flowing through the piston system. Due to the internal design of the piston system, the pull and push direction can be set independently of each other. The damping forces are dependent on the piston speed.

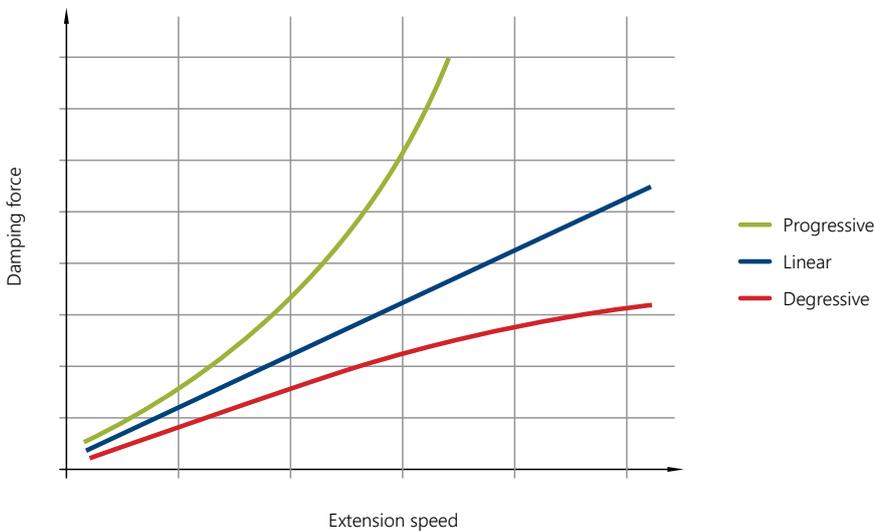
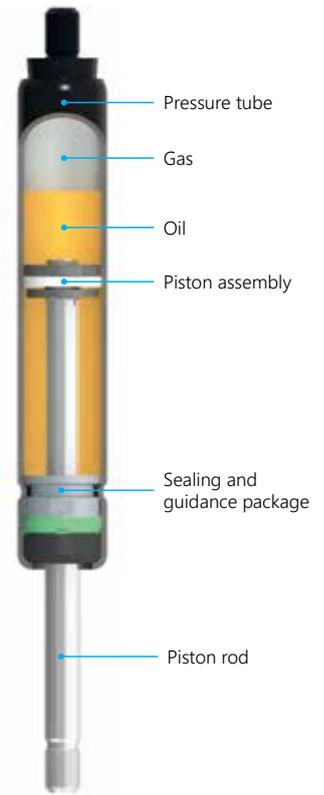
When the piston rod is moved, the damping medium of oil is pressed through the bores in the piston system. The damping forces are dependent on the piston speed.

Damping forces

Because the damping holes can be closed respectively to either side by way of valve washers, it is possible to regulate the damping forces in extension and compression directions largely independent of one another. The damping force upon compression determines the hardness of a shock absorber upon retraction. The damping force upon extension regulates the extension speed.

Characteristic curve

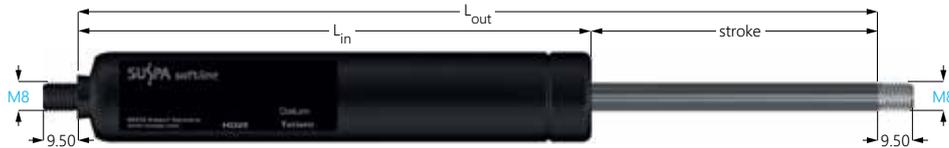
Adjustable linear, progressive or degressive characteristic curves allow for the application-oriented design of the hydraulic damper.



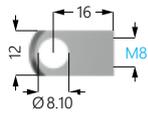
Damper Softline Type HD25

Type	Ø Tube (mm)	Ø Piston rod (mm)	Hydr. stroke (mm)	Mech. stroke (mm)	Damping forces (N)	Color tube	Color piston rod
HD25	25	8	91 - 206	91 - 206	100 - 4,000	black	chrome

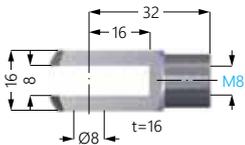
Hydraulic damper



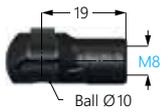
End fittings A



Eyelet A412



Fork head A21



Ball joint A202



Ball joint A207

Technical data

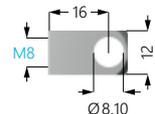
Length (mm)		Stroke (mm)		Damping forces (N) ¹		Order no.
L _{out}	L _{in}	Hydr.	Mech.	Tension	Comp.	
231	140	91	91	650	< 100	01110650
				1,500	< 100	01110651
308	179	105	129	< 100	650	01110653
				< 100	1,500	01110654
				< 100	4,000	01110655
320	179	141	141	650	< 100	01110656
				1,500	< 100	01110657
426	238	153	188	< 100	650	01110659
				< 100	1,500	01110660
				< 100	4,000	01110661
498	292 ²	206	206	650	< 100	01110662
				1,500	< 100	01110663
498	292 ²	166	206	< 100	650	01110665
				< 100	1,500	01110666
				< 100	4,000	01110667

¹ Test speed linear: 100 mm/s

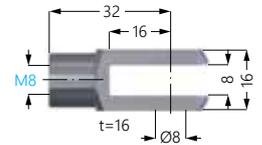
² With this length the actual value of the compressed length is different from the list above.

All figures in mm

End fittings B



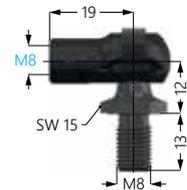
Eyelet B412



Fork head B21



Ball joint B202



Ball joint B207



Ordering system
(only for orders with end fittings)

Order number

End fittings

01110653

- A412 - B202

Tube-
end fitting A

Piston rod-
end fitting B

Damper Softline Variations

Depending on the applications you can choose the dampers in the following versions:

Version	Idle stroke	Independence of position	Extension force	Adjustability
Standard	yes	no	no	no
with gas pressure (GD)	yes	no	yes	no
with gas pressure and separator piston (GDTK)	no	yes	yes	no
with bottom valve (BV)	no	no	no	no
with bottom valve and diaphragm (BVM)	no	yes	no	no
Twin tube	no	no	no	yes

Type	Standard	Gas pressure (GD)	Gas pressure and separator piston (GDTK)	Bottom valve (BV)	Bottom valve and diaphragm (BVM)	Twin-Tube
HD12	•	•				
HD13	•	•				
HD15	•	•				
HD18	•	•	•			
HD22	•	•				
HD25	•		•	•	•	
HD34						•
HD38						•

Damper Softline Variations

Standard

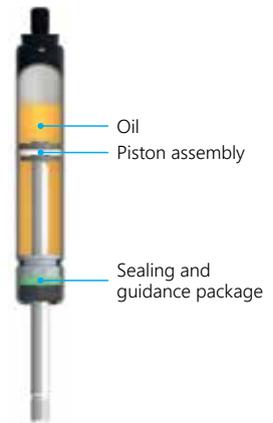
The classical standard damper with throttling port and valve system for diverse applications. A vacant space remains in the pressure tube for the volume of the piston rod. A slight idle stroke results, meaning that damping force only occurs after several millimeters of path.

Characteristics

- Without extension force F_1
- With idle stroke
- Fixed position

Application examples

Waste container, counter, medical, furniture, automotive interior, overhead compartments



Damper with gas pressure

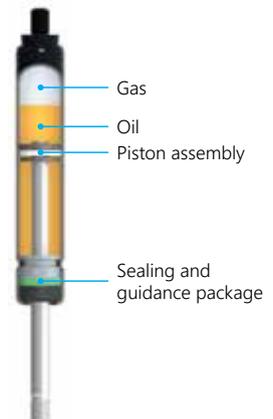
The vacant space is filled with gas in this version. This damper is therefore usable independent of installation position.

Characteristics

- With extension force F_1
- With idle stroke
- Fixed position

Application examples

Automobile trunks, glove compartments, various flaps



Damper with gas pressure and separator piston

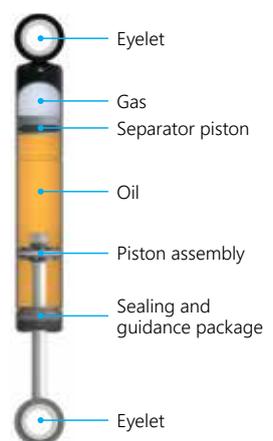
In this version, the oil chamber is separated from the gas compartment, which is under pressure, by a sealing separator piston. The damper can therefore be installed in any position desired and possesses no idle stroke. This has as a consequence that the damping force immediately sets in upon load condition.

Characteristics

- With extension force F_1
- Without idle stroke
- Independent position

Application examples

Waste container, overrun brakes, automotive interior, commercial vehicle seats



Damper Softline Versions

Damper with bottom valve

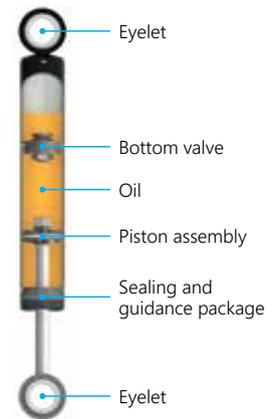
The oil chamber is separated from the gas compartment by way of a bottom valve in this type of damper. For specific applications: Idle stroke freedom is achieved without extension force.

Characteristics

- Without extension force F_1
- Without idle stroke
- Fixed position (installation with piston rod pointing downward)

Application examples

Counter, automotive interior, motor vibration damper, belt tensioners, commercial vehicle seats



Damper with bottom valve and diaphragm

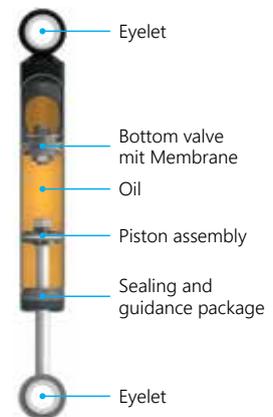
The diaphragm in the balance chamber, behind the bottom valve, expands upon load (compression) and contracts upon extension. For specific applications: Idle stroke freedom without extension force is achieved for independent choice of installation position.

Characteristics

- Without extension force F_1
- Without idle stroke
- Independent position

Application examples

Overrun brakes, commercial vehicle seats, belt tensioners



Twin-Tube

Two tubes with unlike diameters are arranged concentrically. The inner tube represents the working area. The space between the inner and outer tubes is the balance chamber that takes up the oil pressed out by the retracting piston rod.

Especially worthy of mention are the freely adjustable forces possible in the extension and compression directions. In addition, the extremely light weight of the damper which is achieved by the use of an aluminum outer tube.

Characteristics

- Without extension force F_1
- Without idle stroke
- Fixed position (installation with piston rod pointing upward)
- Adjustable (HD38)

Application examples

Commercial vehicle seats (vertical damping)



Damper for aviation

The lightweight damper is in particular used in stowage compartments and guarantees a gentle downward-opening. The optimized weight is achieved with this damper due to the small design.

Characteristics

- Wide range of the damping force
- Optional manual force support
- Elegant due to the compact design

Application example

Overhead compartments



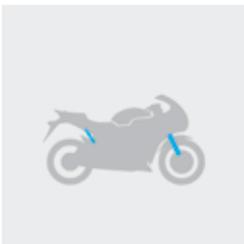


Piston rods and Tubes

Rotary and translatory moving piston rods, shafts and tubes meet the highest quality standards due to our decades-long expertise. The precisely coordinated production steps of turning, hardening, grinding, surface coating and polishing ensure a high surface quality. Even complex geometries can be manufactured with high accuracy on CNC machines with several axis - economical and established in millions of applications.

	Characteristics
Ø Piston rod	4 - 28 mm
Ø Tube	4 - 70 mm
Length	35 - 700 mm
Roughness	Ra 0.05 µm/Rz 0.5 µm
Material	steel, stainless steel, aluminum
Surface refinement	hard chrome plating, salt bath or gas nitration, DLC, browning, galvanizing, passivating

Applications



Damper



Convertible

Piston rods and tubes

Production Expertise

CNC Turning

With the latest multi-axis CNC turning machines, we offer you conventional cam-controlled, simple turning as well as the economical complete machining of turned parts in one clamping.

Hardening

Inductive through-hardening ensures the hardening of predetermined zones in the component. It is a technology that can be customized to your needs.

Centerless through-feed grinding

SUSPA grinding lines ensure high throughput speeds and optimal economic efficiency. You can expect an optimal surface quality with roughness values up to Ra 0.1 μm , depending on the material and diameter requirement.

Surfaces

Hard chrome plating, salt bath nitriding, gas nitriding, DLC, black finishing, zinc plating, passivation achieve high corrosion resistance and wear resistance. This means extremely large load changes over the entire service life for your products.

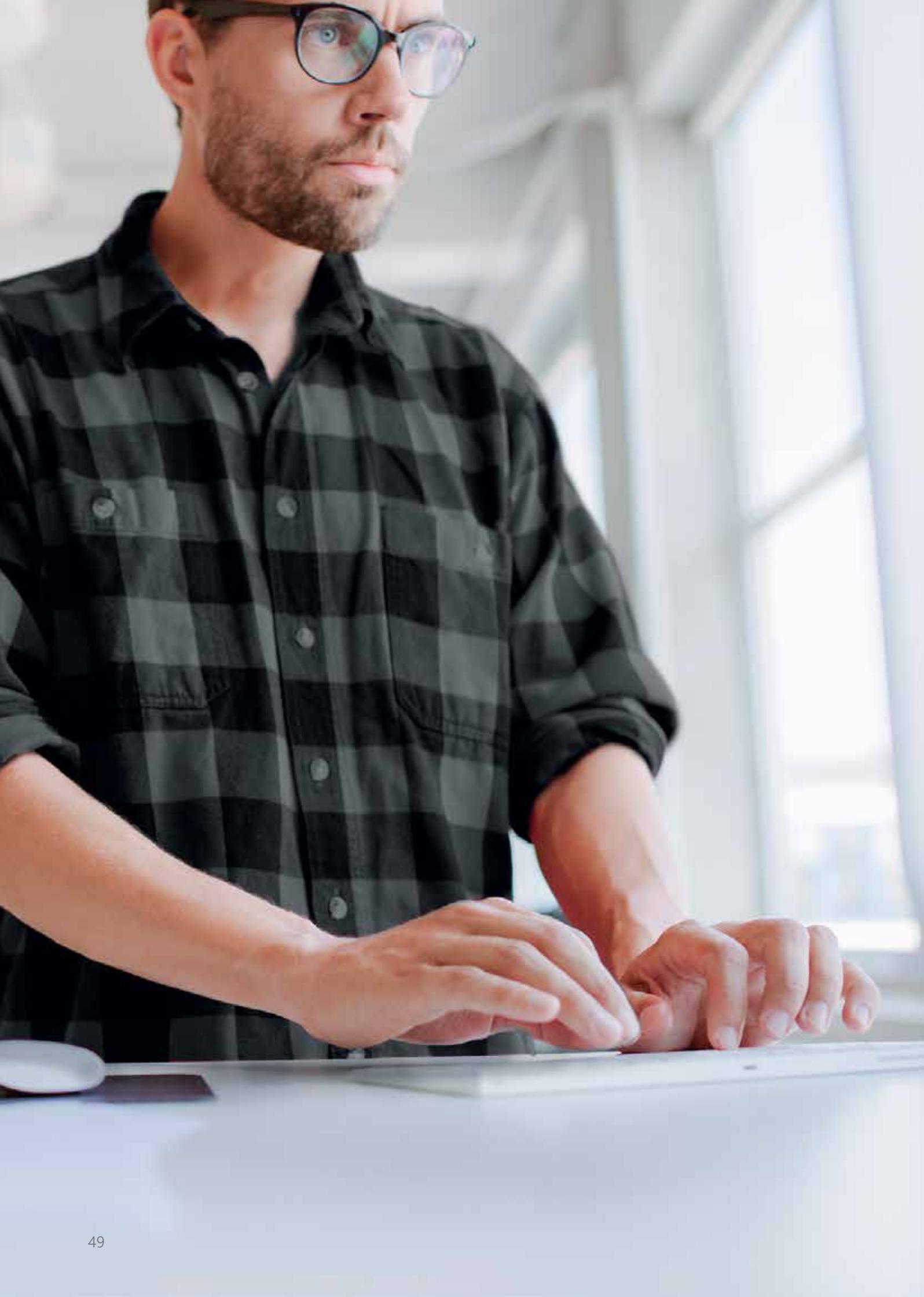
Polishing

The prerequisite of a tribological system is a flawless surface, which we achieve through a final optimized finishing, without a significant removal of material.

Flexibility

A provision of our components adapted to your logistics requirements in the batch sizes you need is a matter of course.





Height Adjustment



Height Adjustment Office

Ergonomics in the workplace

SUSPA has become established as one of the leading suppliers of electric height adjustment systems. Over recent years ergonomics in the workplace is increasing in importance throughout companies.

The best way of countering the lack of movement in the office is to use sit-stand desks.

Type	Characteristics
Pneumatic table column VariBase	<ul style="list-style-type: none"> • 1-leg table • table column square
Pneumatic table column VariStand	<ul style="list-style-type: none"> • 1-leg table • table column round
Electric columns ELS3	<ul style="list-style-type: none"> • elegant design, multiple colors and profiles • adjustment range up to 650 mm • fast and quiet movement
Table base frame VariFrame	<ul style="list-style-type: none"> • split and variable crossbeam (for different table top sizes)
Table base frame FixFrame	<ul style="list-style-type: none"> • fixed cross beam • available in five sizes
Table base frame for duo workplace (3-leg-table frame)	<ul style="list-style-type: none"> • for corner desks • available in five sizes or for table base frame VariFrame
Table base frame accessories	<ul style="list-style-type: none"> • controllers • switches

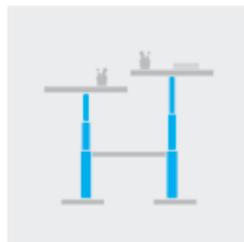
Applications



Office table



Side table



Duo workplace



Please find the assembly instructions for all adjustment systems online at www.suspa.com/global/downloads/

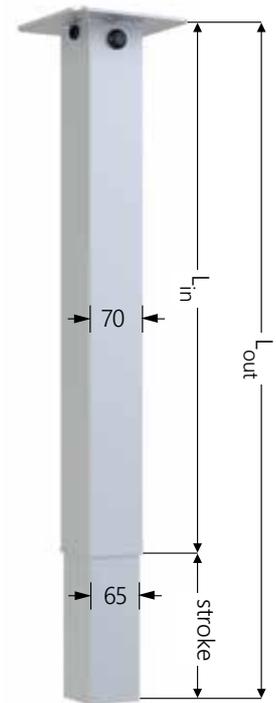
VariBase

Height-adjustable table column (square column)

The VariBase pneumatic height adjustable system is a professional and extremely robust solution for table applications. It is particularly characterized by its ease of handling and Plug & Play installation. VariBase excels with a long service life and offers comfortable height adjustment.

VariBase is available in the version Big Tube Up (BTU).

Characteristics	Technical data		
Dimension BTU (Big Tube Up)	□ 70 mm / □ 65 mm		
Dimension BTD (Big Tube Down)	□ 63.5 mm / □ 57.15 mm		
Length when extended (L_{out})	1,040 mm	815 mm	655 mm
Stroke	400 mm	290 mm	215 mm
Length when compressed (L_{in})	640 mm	525 mm	440 mm
Surface finishing	Powder coated (RAL9006), further RAL-colors on request		
Stroke force	120 N, recommended weight of table top ~ 6 kg, further F_1 -force on request (70 - 400 N)		
Activation/ release	Lever, cable release		
Tabletop fitting	Flange adapter (with 12 thru-holes, distance 32 mm, Ø 6.5 mm)		
Base fitting	Flange with 4xM6		
Non-rotation function	Standard		



Big Tube Up (BTU)

All dimensions in mm.

Features

- Elegant design with square tubes
- Available in versions BTU - Big Tube Up and BTD - Big Tube Down
- Robust guide system
- Available in two versions of gas springs (rigid and elastic locking)
- Non-rotational column
- Quick and easy to adjust
- Plug & Play assembly

Applications

- Side table
- Speaker's desk
- Trolleys, carts
- Overbed tables



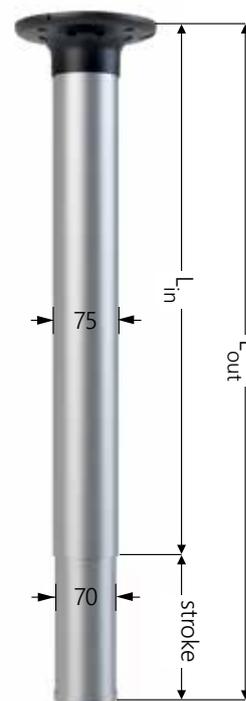
VariStand

Height-adjustable table column (round column)

The VariStand table column is a professional, sophisticated, design-orientated solution for all table and cart applications. It is characterized by its ease of use and plug & play assembly.

VariStand is available in version Big Tube Up (BTU).

Characteristics	Technical data			
Order number	13652065	13652067	13652064	13652066
Dimension BTU (Big Tube Up)	Ø 75 mm / Ø 70 mm			
Length when extended (L_{out})	1,040 mm	660 mm	1,040 mm	660 mm
Stroke	415 mm	225 mm	415 mm	225 mm
Length when compressed (L_{in})	625 mm	435 mm	625 mm	435 mm
Surface finishing	Chromium plated		Powder coated (RAL 9006), further colors on request	
Stroke force	120 N			
Activation/release	Cable release (lever on request)			
Tabletop fitting	Flange adapter (with 12 thru-holes, distance 32 mm)			
Base fitting	Flange or cone with 3 x M6			
Non-rotation function	Standard			



Big Tube Up (BTU)

All dimensions in mm.

Features

- Elegant design with round tubes
- Precise and silent guide system
- Rigid and elastic locking in any position
- Constant remaining adjustment force in any position
- Optimal anti-twist protection
- Large adjustment range with small installation length
- Quick and easy adjustability
- Easy installation due to plug & play
- Override function: lifting without release actuation (optional)

Applications

- Side table
- Speaker's desk
- Trolleys, carts
- Overbed tables

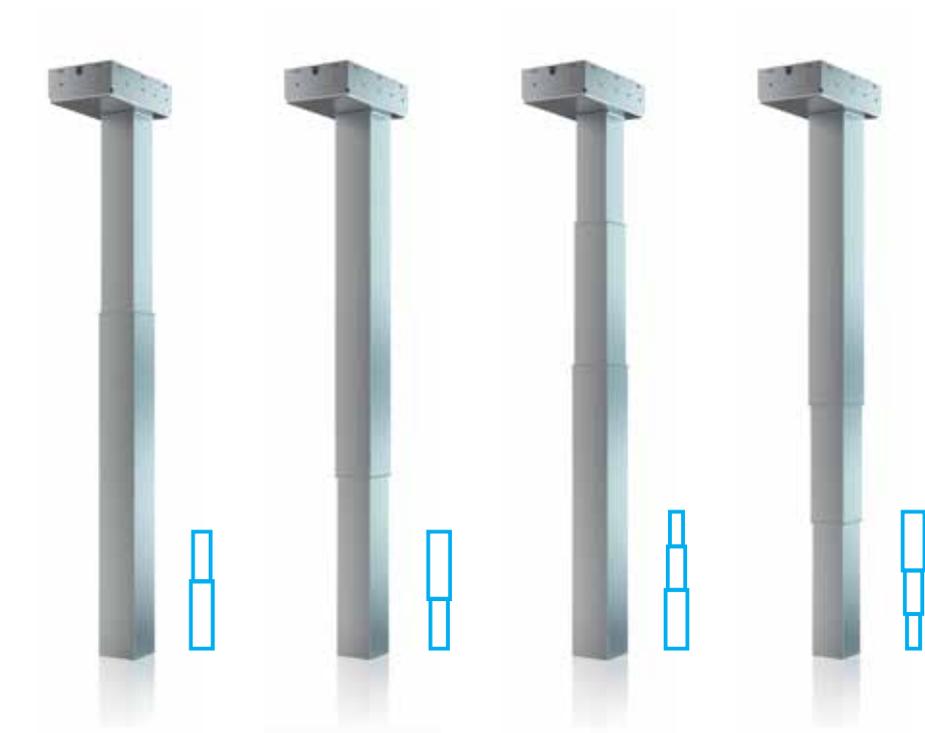


ELS3 Electric Lifting Columns at a glance

With the ELS3 electrical lifting column from SUSPA, you can easily change your working position from sitting to standing. The main features of the lifting columns are the elegant design, quiet movement (<48dB) and a long adjustment range. All ELS3 systems have the option for collision detection, which will stop the system automatically if an obstruction is detected.



Lifting column
square version



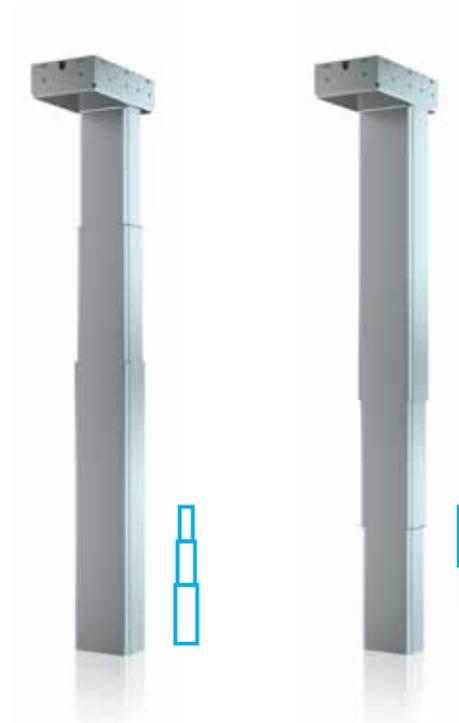
Model name	ELS3-500S-BTD-Q	ELS3-500S-BTU-Q	ELS3-650-BTD-Q	ELS3-650-BTU-Q
Profile	square version			
Position of largest tube	Big Tube Down (BTD)	Big Tube Up (BTU)	Big Tube Down (BTD)	Big Tube Up (BTU)
Material	steel profile			
Color	● silver-gray RAL 9006	○ white RAL 9003	● black RAL 9005	● graphite similar to RAL 7024 further colors available on request
Design	1-stage telescopic	1-stage telescopic	2-stage telescopic	2-stage telescopic
Compressed length	650 mm	650 mm	565 mm	565 mm
Adjustment range (stroke)	500 mm	500 mm	650 mm	650 mm
Extended length	1,150 mm	1,150 mm	1,215 mm	1,215 mm
Maximum load	with controller SMART with controller COMPACT	50 kg per leg 60 kg per leg	50 kg per leg 60 kg per leg	50 kg per leg 60 kg per leg
Adjustment speed	35 mm/s	35 mm/s	38 mm/s	38 mm/s
Dimensions of column	top middle bottom	65 x 65 mm - 70 x 70 mm	70 x 70 mm - 65 x 65 mm	60 x 60 mm 65 x 65 mm 70 x 70 mm
Dimensions of motor casing/top	202 x 120 x 56 mm			
Fixing for the footbase	4 x M8 x 1.25			



Further colors available on request



Lifting column
rectangle version



Model name		ELS3-650-BTD-RE	ELS3-650-BTU-RE
Profile		rectangle version	
Position of largest tube		Big Tube Down (BTD)	Big Tube Up (BTU)
Material		steel profile	
Color		 silver-gray RAL 9006 white RAL 9003 black RAL 9005 graphite similar to RAL 7024 further colors available on request	
Design		2-stage telescopic	2-stage telescopic
Compressed length		565 mm	565 mm
Adjustment range (stroke)		650 mm	650 mm
Extended length		1,215 mm	1,215 mm
Maximum load	with controller SMART	50 kg per leg	50 kg per leg
	with controller COMPACT	60 kg per leg	60 kg per leg
Adjustment speed		38 mm/s	38 mm/s
Dimensions of column	top	95 x 55 mm	107 x 67 mm
	middle	101 x 61 mm	101 x 61 mm
	bottom	107 x 67 mm	95 x 55 mm
Dimensions of motor casing/top		202 x 120 x 56 mm	
Fixing for the footbase		4 x M8 x 1.25	

Electrically Adjustable Table Base Frames

VariFrame

The adjustable table base VariFrame comes with a split cross beam which is variable and can be adjusted to different table top sizes.



Model name		Table base frame VariFrame			
Color		● silver-gray RAL 9006	○ white RAL 9003	● black RAL 9005	● graphite similar to RAL 7024
Cross beam	length	two-piece traverse, adjustable length of frame from 1,140 mm to 1,940 mm			
Desk top dimensions	length	1,200 - 2,000 mm			
	depth	700 - 800 mm			
Material		steel profile			
Fixing plate	length	545 mm			
Adjustment range (stroke) until top of frame		ELS3-500S: 680 - 1,180 mm ELS3-650: 600 - 1,250 mm			
Maximum load table frame		100 kg			
Adjustment speed		ELS3-500S: 35 mm/s ELS3-650: 38 mm/s			
Accessories		screws, adjustable feet			
For lifting columns		can be combined with all SUSPA ELS3 columns			
Foot base	length	750 mm			
	depth	90 mm			
	height	30 mm			

FixFrame

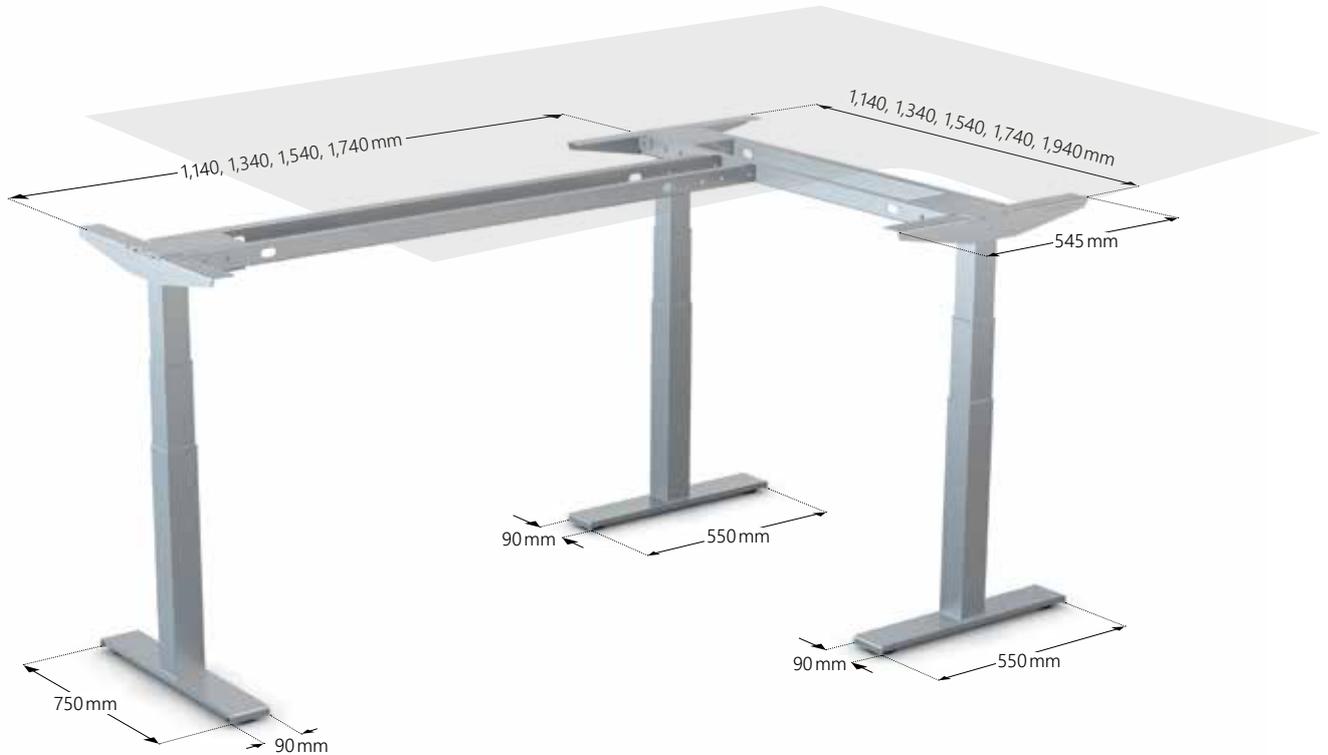
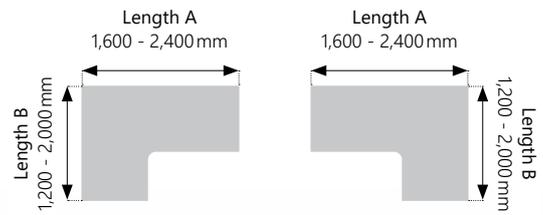
The table base FixFrame consists of a fixed cross beam, available in five different sizes.



Model name		Table base frame FixFrame			
Color		● silver-gray RAL 9006	○ white RAL 9003	● black RAL 9005	● graphite similar to RAL 7024
Cross beam	length	fixed cross beam lengths: 1,140 mm, 1,340 mm, 1,540 mm, 1,740 mm, 1,940 mm			
Desk top dimensions	length depth	1,200 mm, 1,400 mm, 1,600 mm, 1,800 mm, 2,000 mm 700 - 800 mm			
Material		steel profile			
Fixing plate	length	545 mm			
Adjustment range (stroke) until top of frame		ELS3-500S: 680 - 1,180 mm ELS3-650: 600 - 1,250 mm			
Maximum load table frame		100 kg			
Adjustment speed		ELS3-500S: 35 mm/s ELS3-650: 38 mm/s			
Accessories		screws, adjustable feet			
For lifting columns		can be combined with all SUSPA ELS3 columns			
Foot base	length depth height	750 mm 90 mm 30 mm			

for corner desks

Our 3-leg-table frame offers a very big work place for corner desks.



Model name		Table base frame corner desk			
Color		<input type="radio"/> silver-gray RAL 9006	<input type="radio"/> white RAL 9003	<input type="radio"/> black RAL 9005	<input type="radio"/> graphite similar to RAL 7024
Cross beam	length	fixed cross beam: 1,140 mm, 1,340 mm, 1,540 mm, 1,740 mm, 1,940 mm adjustable cross beam: 1,140 mm - 1,940 mm			
Desk top dimension		see pictogram above			
Material		steel profile			
Fixing plate (3 pieces)	length	545 mm			
Adjustment range (stroke) until top of frame		ELS3-500S: 680 - 1,180 mm ELS3-650: 600 - 1,250 mm			
Maximum load table frame		150 kg			
Adjustment speed		ELS3-500S: 35 mm/s ELS3-650: 38 mm/s			
Accessories		screws, adjustable feet			
For lifting columns		can be combined with all SUSPA ELS3 columns			
Foot base	length depth height	1x750 mm and 2x550 mm 90 mm 30 mm			

Notes

Accessories and Switches

Accessories

The highly efficient control boxes have a flat and compact design. In combination with the switches, they guarantee a reliable and economical operation for all tables.

LAING LTC 302/384 controller

- low standby power consumption: 250mW
- overload protection
- small size and aluminum design
- weight: 305g
- dimensions: 265.5 x 62 x 38.5 mm
- controls for EU- and US-voltage available
- supply voltage
EU: 207-253V / 50-60Hz, US: 90-127V / 50-60Hz
- nominal voltage
EU: 230V / 50Hz, US: 120V / 60Hz
- output voltage: 216VA (2-leg) 24V DC
- operating time 10% at maximum load (2 min / 18 min)



COMPACT controller

- low standby power consumption: ≤ 0.3 W
- Soft-Start and Soft-Stop
- overload protection
- weight: 418g / 523g (3-leg-controller)
- dimensions: 264x103x37 mm
- controls for EU- and US-voltage available
- supply voltage
EU: 207-254,4V / 50Hz, US: 90-127V / 50-60Hz
- nominal voltage: 230V / 50Hz, US: 120V / 60Hz
- output voltage: 288VA (2-leg) 24V DC / 360 VA (3-leg) 24V DC
- operating time: 10% at maximum load (1 min / 9 min)
- external sensor collision detector possible with LOGIC-CONNECTOR



Power Cable

- Available for the control boxes COMPACT and SMART for different countries

Switches

SUSPA provides switch solutions for installation below the table and within the table top. From a simple hand switch with Up/Down function, to a comfort switch with four memory functions and display – all operational elements demonstrate through the surface design and the pleasing haptics.



Display Switch 645-03112



Office Switch 645-03103



Modern Basic 645-03106



Modern Display 645-03107



Inlay Modern Basic 645-03108



Inlay Modern Display 645-03109



Foot Switch D45-02375



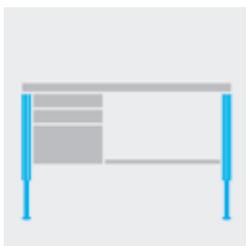
Height Adjustment Industry

Ergonomics at the workplace

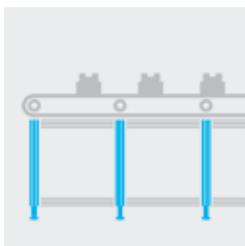
SUSPA height adjustment options supports you and your workspace efficiently and individually. From height adjustment of various industrial facilities, workbenches, conveyor belts and all types of industrial worktables. SUSPA gives you the flexibility to meet the requirements of your employees and production.

Type	Characteristics	Drive
Movotec SMS Bolt-On	<ul style="list-style-type: none"> • Height adjustment system for existing workplaces • Load performance 150kg/lift element • Adjustable range up to 400 mm 	electric
Assembly profile Movotec SMS	<ul style="list-style-type: none"> • Actuators built in profiles • Load performance 150kg/lift element • Dimension 40x80 mm or 45x90 mm • Adjustable range up to 400 mm 	electric
Lifting Columns ELS3 HeavyDuty	<ul style="list-style-type: none"> • Elegant solution for heavy loads • Load performance 100kg/lift element • Square guiding tube • Adjustable range up to 500 mm 	electric
Movotec Lift Systems	<ul style="list-style-type: none"> • Drive via hand crank or electric motor • Load performance 150kg/lift element • Adjustable range up to 500 mm 	hydraulic

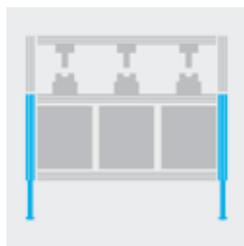
Applications



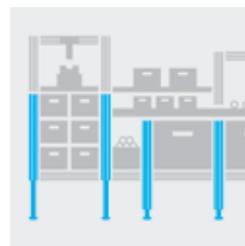
Workbench



Conveyor belt



System construction



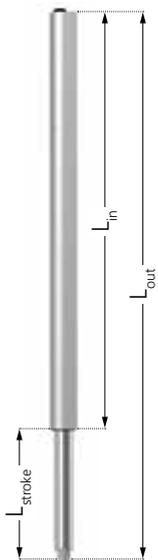
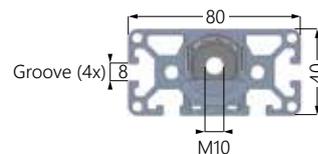
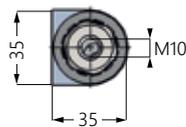
Workplace system



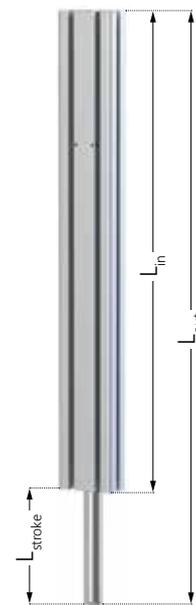
Please find the assembly instruction for all adjustment systems online at www.suspa.com/global/downloads/

Movotec SMS and ELS3 Heavy Duty

Height adjustment for work systems and work benches



retrofit or
new construction



for work systems

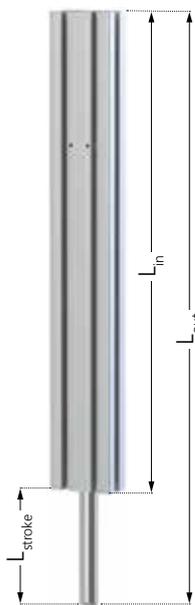
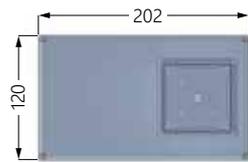
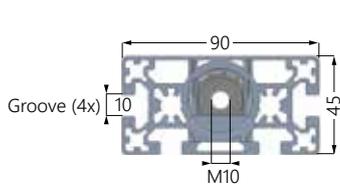
	Movotec SMS Bolt-On				Movotec SMS-I-40x80			
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Installation dimensions

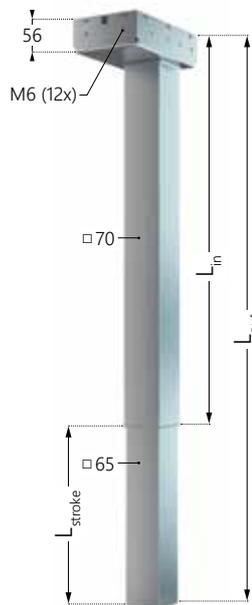
Dimensions of external profile/tube	CB profile 35 mm				Installation profile 40x80 mm			
External tube material	Aluminum, silver anodized				Aluminum, silver anodized			
Internal tube dimensions	Ø 25 mm				Ø 25 mm			
Internal tube material	Aluminum, anodized				Aluminum, anodized			
Motor housing dimensions	Motor integrated into extruded profile				Motor integrated into extruded profile			
Part number	00410211	00410212	00410213	00410214	00410268	00410269	00410270	
Stroke (L_{stroke})	150 mm	200 mm	300 mm	400 mm	150 mm	200 mm	300 mm	400 mm
Retracted length (L_{in})	485 mm	535 mm	635 mm	735 mm	510 mm	560 mm	660 mm	760 mm
Extended length (L_{out})	635 mm	735 mm	935 mm	1,135 mm	660 mm	760 mm	960 mm	1,160 mm
Fastening structure	4 x M5 (screw-in depth max. 7 mm)				4 x 8 mm wide grooves			
Fastening on foot stabilizer	1 x M10 x 1.5 (internal thread)				1 x M10 x 1.5 (internal thread)			

Performance data

Max. extension force per lifting element	150 kg / 75 kg				150 kg / 75 kg			
Max. extension force with 4-leg system	600 kg / 300 kg				600 kg / 300 kg			
Max. extension force with 8-leg system	1,200 kg / 600 kg				1,200 kg / 600 kg			
Travel speed	~ 8 mm/s		~ 16 mm/s		~ 8 mm/s		~ 16 mm/s	
Functional operating range	+5°C to +40°C				+5°C to +40°C			
Protection class	IP 40				IP 40			



for work systems



for work benches

All dimensions in mm.

Movotec SMS-B-45x90

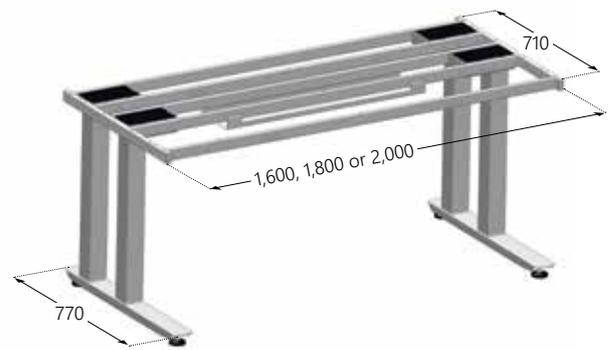
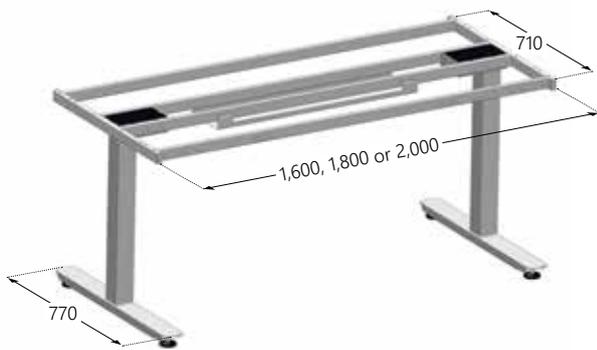
ELS3-500S-BTU-Q-HeavyDuty

Installation profile 45x90 mm				70x70 mm
Aluminum, silver anodized				Steel profile, painted silver-gray
Ø 25 mm				65x65 mm
Aluminum, anodized				Steel profile, painted silver-gray
Motor integrated into profile				202x120x56 mm
00410272	00410273	00410274	00410275	00410267
150 mm	200 mm	300 mm	400 mm	500 mm
510 mm	560 mm	660 mm	760 mm	680 mm
660 mm	760 mm	960 mm	1.160 mm	1,180 mm
4x10 mm wide grooves				12xM6 (screw-in depth max. 5 mm)
1xM10 x 1.5 (internal thread)				4xM8 x 1.25 (internal thread)
150 kg / 75 kg				100 kg
600 kg / 300 kg				400 kg
1,200 kg / 600 kg				800 kg (on request)
~ 8 mm/s		~ 16 mm/s		~ 20 mm/s
+5°C to +40°C				+5°C to +40°C
IP 40				IP 20

Movotec SMS and ELS3 Heavy Duty Accessories

ELS3 Heavy Duty Subframe

SUSPA offers a complete table subframe made of steel extrusion (silver-gray color RAL 9006) for two or four ELS3 Heavy Duty lifting columns with screws and adjustable bases (for the lifting column specification, see the table on page 58). The table subframe is suitable for table tops with the dimension 1,600x800 mm, 1,800x800 mm or 2,000x800 mm.



All dimensions in mm.

2-leg HeavyDuty subframe		
Table frame length	Part number	Description
1,600 mm	15311964	EAT3-HD-1600-002-01-S
1,800 mm	15311965	EAT3-HD-1800-002-01-S
2,000 mm	15311966	EAT3-HD-2000-002-01-S

4-leg HeavyDuty subframe		
Table frame length	Part number	Description
1,600 mm	15311967	EAT3-HD-1600-004-01-S
1,800 mm	15311968	EAT3-HD-1800-004-01-S
2,000 mm	15311969	EAT3-HD-2000-004-01-S



Please find the assembly instruction online at www.suspa.com/global/downloads/

Glides and Brackets



Standard Mounting Glide
Part no. D44-01030

- Standard with anti-skid function
- Polyamide base with non-skid TPE pad with M10x1.5-threaded steel bolts with locknut for adjustment



Mounting Glide
Part no. D44-00003

- For fastening the actuators to the floor or to work surfaces
- Aluminum base with M10x1.5-threaded steel bolts with locknut for adjustment



Olympic Mounting Glide
Part no. 644-01037

- Standard sliding feet without anti-skid function
- Polyamide base with M10x1.5-threaded steel bolts with locknut for adjustment



Small Mounting Bracket Set
Part no. D44-00002A



Large Mounting Bracket Set
Part no. D44-00001



L Mounting Bracket Set
Part no. D44-00018



**Creform®
Bracket Adaptor Set**
Part no. D44-00027*
*for easy fastening of
Creform® connectors
(connectors not included)

- Mounting fasteners can be used if the threaded holes of the SMS CB actuators are not at an optimal place for the application
- Order one bracket set order for each SMS actuator used

Movotec Lift Systems

The hydraulic adjustment system for heavy loads

Height adjustment for retrofit

The Bolt-On system is delivered as a kit for retrofitting. Using the retrofit system, you can retrofit your work table that previously could not be adjusted in height with just a few steps, thus making it a height-adjustable workplace. The system includes four to eight Bolt-On cylinders and a pump with hand crank or electric motor.

Movotec Bolt-On Systems



System with hand crank



System with electric motor

* The adjusting range of systems with electric motor is 6-8mm less Other adjustment ranges available upon request

System Lift Capacity (kg / lbs.)	Adjustment Range (mm / in.)	Crank-Driven System Part Number	Motor-Driven System (120V) Part Number	Motor-Driven System (230V) Part Number	Includes Pump	Includes Cylinders (x4)
340 / 750	150 / 5.9	MLS-00001	MLS-00001E	MLS-00009E	Q4809	CB415
340 / 750	200 / 7.9	MLS-00002	MLS-00002E	MLS-00010E	Q4812	CB420
340 / 750	300 / 11.8	MLS-00003	MLS-00003E	MLS-00011E	Q4818	CB431
340 / 750	400 / 15.7	MLS-00004	MLS-00004E	MLS-00012E	Q4824	CB440
454 / 1000	150 / 5.9	MLS-00005	MLS-00005E	MLS-00013E	Q4612	CB415
454 / 1000	200 / 7.9	MLS-00006	MLS-00006E	MLS-00014E	Q4615	CB420
454 / 1000	300 / 11.8	MLS-00007	MLS-00007E	MLS-00015E	Q4623	CB431
454 / 1000	400 / 15.7	MLS-00008	MLS-00008E	MLS-00016E	Q4631	CB440
590 / 1300	150 / 5.9	MLS-00080	MLS-00080E	MLS-00084E	Q4615	CB615
590 / 1300	230 / 9.1	MLS-00081	MLS-00081E	MLS-00085E	Q4623	CB631
590 / 1300	300 / 11.8	MLS-00082	MLS-00082E	MLS-00086E	Q4631	CB631
590 / 1300	393 / 15.5	MLS-00083	MLS-00083E	MLS-00087E	Q4639	CB640

The system includes

- Crank or motor driven system (incl. control box and switches)
 - 4 Bolt-On lift cylinders
 - Hydraulic flexible tubing in individual lengths
 - Glides for each lift cylinder
 - Drilling templates, tubing clips and cable ties
 - Installation and operating instructions
- Movotec "Bolt-On" lift systems are readily available, shipped completely assembled and ready for installation. (Custom options available for 1-4 and 5-8 cylinders)

Movotec Bolt-On Dual Drive Systems for 6 to 8 cylinders

Synchronized 8-leg-system with electric motor



Castor
Part no. D44-00038
*Movotec only



* The adjusting range of systems with electric motor is 6-8 mm less.

i Please find pumps, components and accessories in our Movotec catalog under www.suspa.com/downloads/SUSPA_Movotec_US.pdf

System Lift Capacity (kg / lbs.)	Adjustment Range (mm / in.)	Motor-Driven System (120V) Part Number	Motor-Driven System (230V) Part Number	Includes Pump (X2)	Includes Cylinders (x6)
680 / 1500	150 / 5.9	MLS-00020	MLS-00028	Q3612	CB415
680 / 1500	200 / 7.9	MLS-00021	MLS-00029	Q3615	CB420
680 / 1500	300 / 11.8	MLS-00022	MLS-00030	Q3612	CB431
680 / 1500	400 / 15.7	MLS-00023	MLS-00031	Q3631	CB440
907 / 2000	150 / 5.9	MLS-00024	MLS-00032	Q4612	CB415
907 / 2000	200 / 7.9	MLS-00025	MLS-00033	Q4615	CB420
907 / 2000	300 / 11.8	MLS-00026	MLS-00034	Q4623	CB431
907 / 2000	400 / 15.7	MLS-00027	MLS-00035	Q4631	CB440
1134 / 2500	150 / 5.9	MLS-00090	MLS-00094	Q4615	CB615
1134 / 2500	230 / 9.01	MLS-00091	MLS-00095	Q4623	CB631
1134 / 2500	300 / 11.8	MLS-00092	MLS-00096	Q4631	CB631
1134 / 2500	400 / 15.7	MLS-00093	MLS-00097	Q4639	CB640

The system includes

- Two synchronized motor driven systems with controllers and switch
- 8 Bolt-On lift cylinders
- Hydraulic flexible tubing in individual lengths
- Glides for each lift cylinder
- Drilling templates, tubing clips and cable ties
- Installation and operating instructions

Movotec Dual Drive Lift Systems are shipped assembled and ready for installation.



Locking Castor
Part no. D44-00037
*Movotec only



Corner Leg System



System Lift Capacity (kg / lbs.)	Adjustment Range (mm / in.)	Crank-Driven Part Number	Motor-Driven System (120V) Part Number	Motor-Driven System (230V) Part Number	Includes Pump (X2)	Includes Cylinders (x6)
340 / 750	150 / 5.9	MLS-00040	MLS-00044	MLS-00048	Q4809	CL450 (150)
340 / 750	200 / 7.9	MLS-00041	MLS-00045	MLS-00049	Q4812	CL450 (200)
340 / 750	300 / 11.8	MLS-00042	MLS-00046	MLS-00050	Q4818	CL450 (300)
340 / 750	400 / 15.7	MLS-00043	MLS-00047	MLS-00051	Q4824	CL450 (400)

The system includes

- A crank or motor driven system with controller and switch
- Four corner leg lift cylinders
- Two 2.5m, (8 ft.) and two 3m (10 ft.) sections of flexible tubing
- Four glides
- Tubing clips and cable ties
- Installation and operating instructions

ATU Lift System



System Lift Capacity (kg / lbs.)	Adjustment Range (mm / in.)	Crank-Driven Part Number	Motor-Driven System (120V) Part Number	Motor-Driven System (230V) Part Number	Includes Pump	Includes Cylinders
200 / 7.9	500 / 19.7	MLS-00060	MLS-00062	MLS-00064	Q2812	CE420
300 / 11.8	600 / 23.6	MLS-00061	MLS-00063	MLS-00065	Q2818	CE430

The system includes

- A crank or motor drive system
- Two lift cylinders with ATU bracket
- Two ATU's
- Two flexible tubing sections 0.9m (3 ft.) and 1.8m (6 ft.)

*Workstation components and kits can be purchased separately or as a complete kit, ask for details

Guided Cylinders

For O.E.M. or retrofit applications, the patented CB and CN cylinder were designed to bolt on to virtually any structure for height adjustability. CB "Bolt-On" cylinders have an in-line tubing port and can be used for most applications. CN "Bolt-On" cylinders have a 90° tubing port and are designed for applications where tubing bend radius clearance is limited.

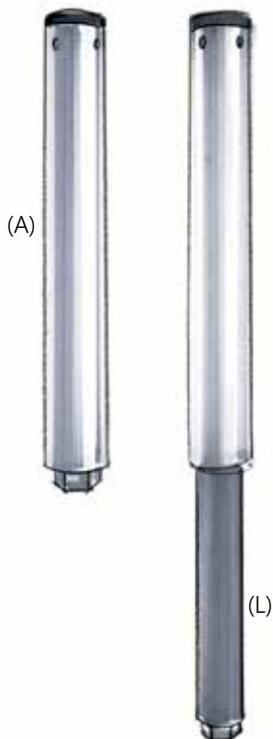
Both cylinders have 4 - M5 X 0.8 X 7mm tapped holes that make mounting easy, or choose mounting brackets.

Technical Data

- Anodized aluminum housing
- Corrosion resistant



The CN cylinder port rotates to any desired angle



CB Cylinder Model Number	CN Cylinder Model Number	Length (A) (mm / in)	Stroke (L) (mm / in)
CB415	CN415	258.5 / 10.2	150 / 5.9
CB420	CN420	333.5 / 13.1	200 / 7.9
CB431	CN431	463.5 / 18.2	300 / 11.8
CB440	CN440	558.5 / 22.0	400 / 15.7

Unguided Cylinders

Designed for O.E.M. applications, each cylinder utilizes a unique set of end-fitting configurations to assist in your design and manufacturing process. CE & CS cylinders are secured with retaining rings (not included). CH cylinders are secured with pins (not included). These cylinders must be used in conjunction with an external guide mechanism to prevent non-anial loading of the cylinder. Custom combination or unique rod & tube ends available.

Technical Data

- Brass cylinder tubes
- Stainless steel rods



CE

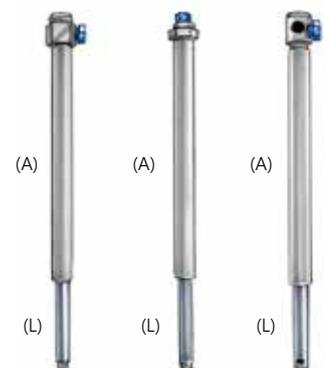


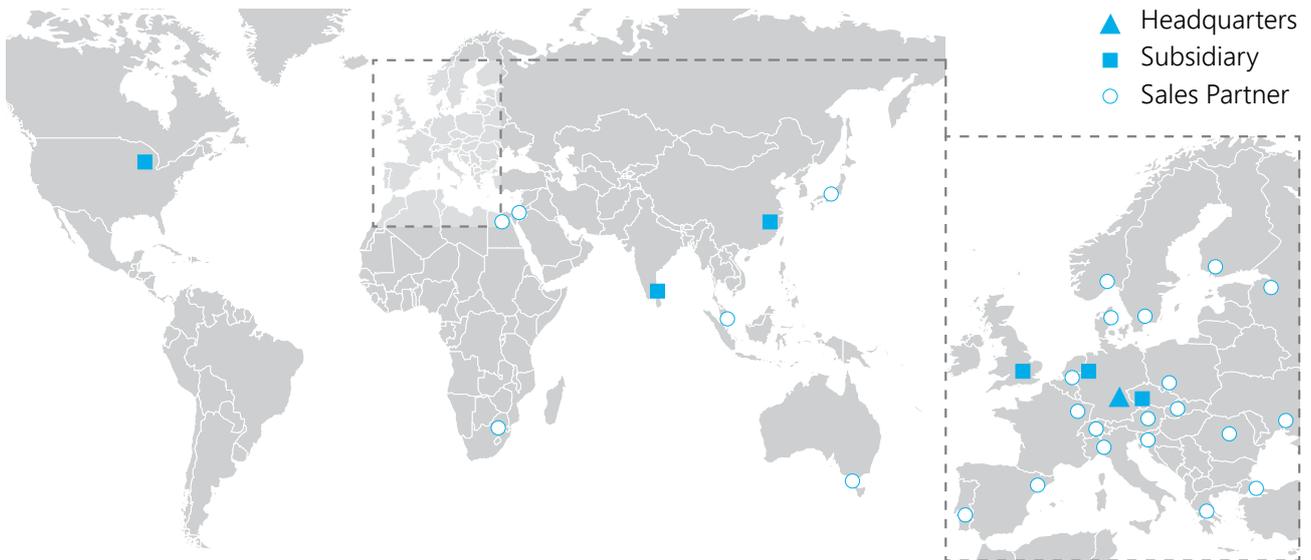
CH



CS

CE Cylinder Model Number	CS Cylinder Model Number	CN Cylinder Model Number	Length (A) (mm / in)	Stroke (L) (mm / in)
CH415	CS415	CH415	188 / 7.4	150 / 5.9
CH420	CS420	CH420	238 / 9.4	200 / 7.9
CH430	CS430	CH430	338 / 13.3	300 / 11.8
CH440	CS440	CH440	438 / 17.2	400 / 15.7





SUSPA – Your strong industrial partner

For more than 60 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 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.

Reliability as the highest standard

Requirements on quality are increasing in the automotive industry as well as in other industry sectors. SUSPA certifications according to IATF 16949 have therefore been an integral part.

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

SUSPA moves.

With more than 2,000 employees worldwide SUSPA manufactures gas springs, dampers, adjustment systems as well as crash and safety systems for many sectors; from furniture through to automobile industry.

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