





Berthold Marx is proud to have served industry since 1945

Since the beginning of the 1970s we have been developing both our knowledge in the gas spring market and a product quality on which our reputation is based.

Berthold Marx, whose head office is based in Strasbourg (67), continues to invest in its production facilities, and has established a new unit at Sain Vit (25).

Our strengths:

- Availability
- Quick delivery
- Quality
- Service



With more than 1000 gas spring models in stock and a technical sales team at your disposal, we are ready to respond to the specific needs of your industry.



Why use gas springs

When are gas springs needed?

To **manoeuvre**, raise, lower, pivot or counterbalance a load with a precise **movement** between two set points at a controlled speed.

There is a wide range of possible applications:

All types of industry are exposed to the "Gas Spring Revolution". Car manufacturers were the first users of them in the 1970s. Since then, all car hatchbacks are equipped with gas springs. Industrial engineers have developed many applications for them.

Gas springs are used on nearly all commercial **vehicles** (mobile sales vans, coaches, lorries, caravans...) hand luggage storage on planes, and also for garage doors, shop display cases (bakeries and butchers etc.) conservatory windows or vents, sunbeds, hospital beds, furniture for office equipment (computers, drafting tables, adjustable chairs.... even sporting equipment etc.)

The range is endless.

The advantages of gas springs

Over a mechanical spring:

A gas spring has a hydraulic damping length at the end of the stroke.

A gas spring is **more compact** than its mechanical equivalent.

A gas spring may reach a **10 year life span** in certain applications and still remain **completely** reliable.

A gas spring is corrosion-proof.

A gas spring is easy to use.

Choose wisely with BM® Gas Springs!



Definitions and recommendations for use of BM® Gas Springs

Important information Please read carefully.

A Gas spring is not a security device.

1 - DIMENSION AND PRESSURE UNITS

All dimensions are shown in millimetres (mm), all pressures/forces in Newtons (N / F1), and all temperatures are in degrees Celsius (C°).

2 - INSTALLATION CONDITIONS

The devices MUST be mounted with the rod facing downwards (with a minimum incline of 15°): For horizontal installation or with rod facing upwards, please contact us.

- The springs must not be under any lateral pressure.
- Warning: for devices with a welded eyes, allow a margin on the axis of 0.3 to 0.5mm, and a margin on each side of the eyes of between 0.5 and 1mm.
- In the event of particle release, be sure to protect the rod.
- If possible, avoid using the device at the maximum calibration.
- If the device is to be painted, protect the rod completely. Do not use solvents to clean the rod.
- The attachment points should be in line. There should be some margin allowed so that the rod
 is not put under lateral pressure.
- Avoid all impacts on the gas spring.
- Never take a gas spring apart: pressurised gas.
- Do not allow any paint to get on the piston / rod as this may cause a gas leak.

3 - INSTALLATION WARNINGS

Protect the rods against impacts, electric arc flashes, grinding sparks, paint and corrosive products. Do not tighten the rods with pliers or in a clamp without using protective lead, aluminium or copper grips.

4 - CONDITIONS OF USE

Number of returns/minute: maximum 5. For a higher rate, please contact us.

- Endurance level: 30,000 cycles. Loss of durability after cycles: maximum 15% (the endurance level varies according to the stroke length and calibration).
- Working temperature: from -30° C to +80° C (at maximum stroke).
- Recommended working temperature: $+20^{\circ}$ C Output force variation due to temperature: 1% per 3° C.

5 - STORAGE CONDITIONS BEFORE USE

- For a maximum duration of three months, the devices may be stored horizontally, in an ambient temperature.
- For a longer storage time, or in a hot country, store them vertically, with the rod facing down.

6 - GUARANTEE

- 1 year starting from the date marked on the device. Example of date marking: 1011 (10th week of 2011).
- For the guarantee to remain in force, if the device is to be repainted the manufacturing date must remain visible.

7 - NEUTRALIZATION

Gas springs hold a pressure of between 20 and 250 bar, and so it is necessary to release the gas before disposal. For your safety, please adhere to the following procedure:

- Grip the tube lightly in a clamp.
- Split the tube at right angles to the axis in an area of between 30 and 35 mm from the base of the tube.

To carry this out:

- It is ESSENTIAL to wear safety glasses.
- Use a metal handsaw.
- Place a cloth over the blade.
- As soon as a whistling sound is heard, stop sawing.
- The gas removal will be complete when the rod can easily be moved by hand.

8 - TOLERANCE MARGINS

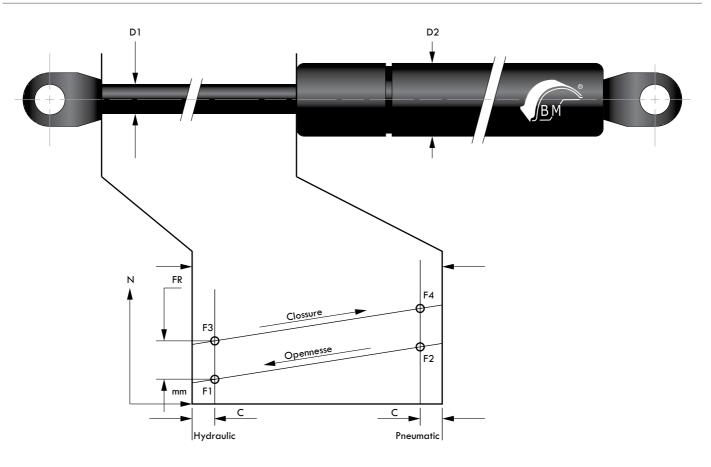
Force in Newtons	Margin of tolerance
50 < N < 250	+ or – 20 N
250 < N < 750	+ or – 30 N
750 < N	+ or – 40 N



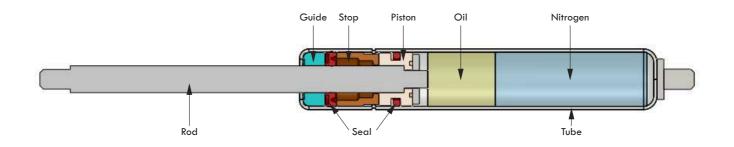
Mechanism diagram

- Forces "F1" and "F3" are measured at distance "C" from the ends of the stroke.
- The difference between the spring force and the force required to compress the spring is due to internal friction "FR".
- The SPRING STIFFNESS X = F2 / F1

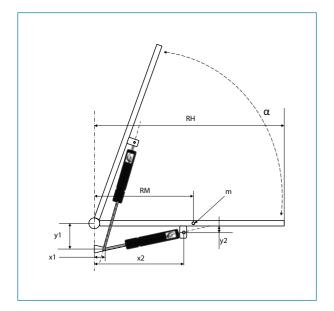
D1	D2	Spring Force	Maximum	X	C	Max FR
(mm)	(mm)	(F1 in N)	length (mm)	(~)	(mm)	(N)
6	15	400	150	1.30	5	50
8	18	750	250	1.35	5	60
10	21	1150	400	1.40	5	80
14	27	2100	500	1.50	5	80

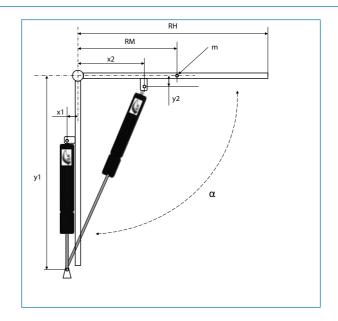


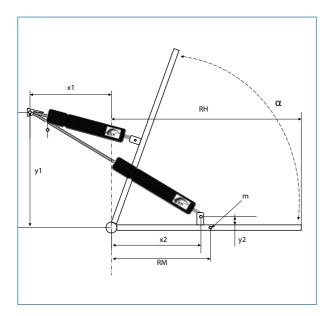
Function diagram for compression gas spring

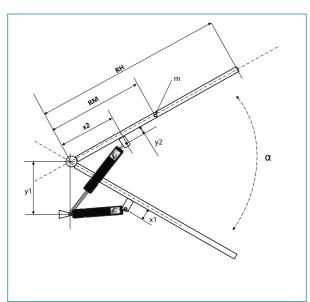


Choice guide









N = number of gas springs, RH = Meter, m = KG, x2=MeterSpring Force Calculation: F1 (N) = 9.81 x ((RH x m) / (2 x N x (x2))) + 5)

Warning - we suggest rounding up to the next tolerance (see page 5)

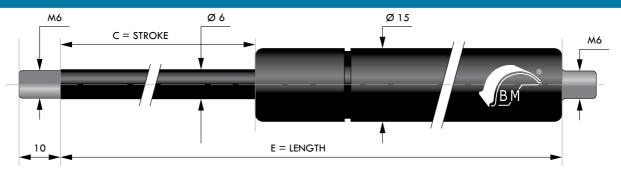
Other suggestion:

The spring stroke is directly associated with the opening angle of the hatchback, and so we recommend the following ratio:

Stroke = 1/3 of RH per 90°

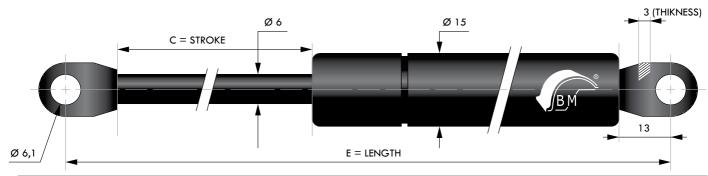
The installations noted above are examples only and do not in any way incur the liability of Berthold Marx.

COMPRESSION SPRINGS WITH THREADED ENDS DIAMETER 6



DIAMETER 6 AVAILABLE LENGTHS AND FORCES			
C - Stroke in mm	E - Length in mm	F1 - Force in Newtons	Reference
20	80	From 30 to 250	ST 020+F1 V+D6
40	115	From 30 to 400	ST 040+F1 V+D6
60	155	From 30 to 400	ST 060+F1 V+D6
80	195	From 30 to 400	ST 080+F1 V+D6
100	225	From 30 to 400	ST 100+F1 V+D6 E225
100	235	From 30 to 400	ST 100+F1 V+D6
120	275	From 30 to 400	ST 120+F1 V+D6
150	335	From 30 to 400	ST 150+F1 V+D6

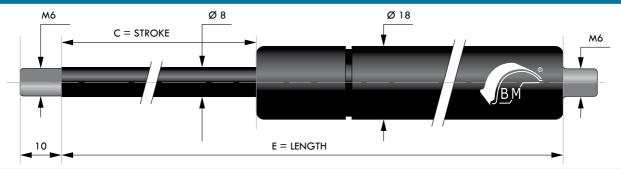
COMPRESSION SPRINGS WITH WELDED EYES DIAMETER 6



IAMETER 6 AVAILABLE LENGTHS AND FORCES			
C - Stroke in mm	E - Length in mm	F1 - Force in Newtons	Reference
20	94	From 30 to 250	ST 020+F1+D6
20	106	From 30 to 350	ST 020+F1+D6 E106
40	145	From 30 to 400	ST 040+F1+D6
60	185	From 30 to 400	ST 060+F1+D6
80	225	From 30 to 400	ST 080+F1+D6
100	265	From 30 to 400	ST 100+F1+D6
120	305	From 30 to 400	ST 120+F1+D6
150	365	From 30 to 400	ST 150+F1+D6

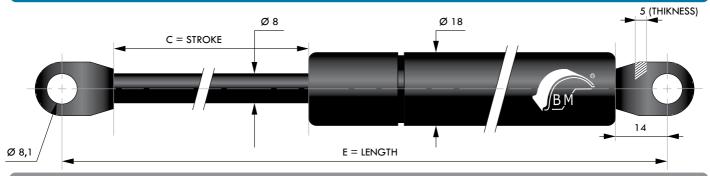


COMPRESSION SPRINGS WITH THREADED ENDS DIAMETER 8



DIAMETER 8 AVAILABLE LE	DIAMETER 8 AVAILABLE LENGTHS AND FORCES		
C - Stroke in mm	E - Length in mm	F1 - Force in Newtons	Reference
57	168	From 50 to 750	ST 057 + F1 V + D8
60	165	From 50 to 750	ST 060 + F1 V + D8
70	183	From 50 to 750	ST 070 + F1 V + D8
80	205	From 50 to 750	ST 080 + F1 V + D8
89	268	From 50 to 750	ST 089 + F1 V + D8
90	225	From 50 to 750	ST 090 + F1 V + D8
100	245	From 50 to 750	ST 100 + F1 V + D8
120	285	From 50 to 750	ST 120 + F1 V + D8
140	325	From 50 to 750	ST 140 + F1 V + D8
160	365	From 50 to 750	ST 160 + F1 V + D8
180	405	From 50 to 700	ST 180 + F1 V + D8
200	445	From 50 to 700	ST 200 + F1 V + D8
210	455	From 50 to 700	ST 210 + F1 V + D8 M6-M8
220	485	From 50 to 700	ST 220 + F1 V + D8
250	545	From 50 to 700	ST 250 + F1 V + D8
250	600	From 50 to 700	ST 250 + F1 V + D8E600

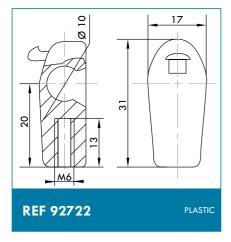
COMPRESSION SPRINGS WITH WELDED EYES DIAMETER 8

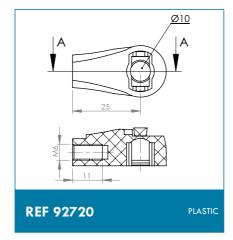


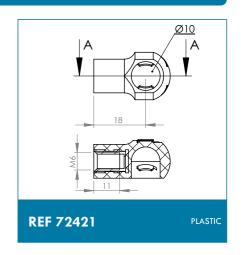
NAMETER 8 AVAILABLE LENGTHS AND FORCES			
C - Stroke in mm	E - Length in mm	F1 - Force in Newtons	Reference
40	155	From 50 to 750	ST 040 + F1 + D8 E155
60	205	From 50 to 750	ST 060 + F1 + D8
72	225	From 50 to 750	ST 072 + F1 + D8
80	235	From 50 to 750	ST 080 + F1 + D8 E235
80	245	From 50 to 750	ST 080 + F1 + D8
85	275	From 50 to 750	BM 204 K
85	275	From 50 to 600	BM 204 F (hole diam 6mm)
90	255	From 50 to 750	ST 090 + F1 + D8
100	285	From 50 to 750	ST 100 + F1 + D8
120	325	From 50 to 750	ST 120 + F1 + D8
140	365	From 50 to 750	ST 140 + F1 + D8
150	385	From 50 to 750	ST 150 + F1 +D8
160	405	From 50 to 750	ST 160 + F1 + D8
180	445	From 50 to 700	ST 180 + F1 + D8
200	485	From 50 to 700	ST 200 + F1 + D8
200	485	From 50 to 700	ST 200 + F1 + D8 T6
200	500	From 50 to 700	ST 200 + F1 + D8 E500
220	525	From 50 to 700	ST 220 + F1 + D8
250	585	From 50 to 700	ST 250 + F1 + D8
250	600	From 50 to 700	ST 250 + F1 + D8 E600

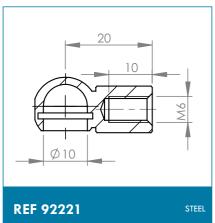


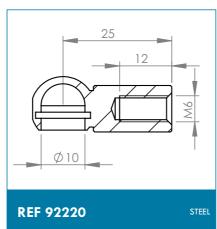
STANDARD M6 ACCESSORIES

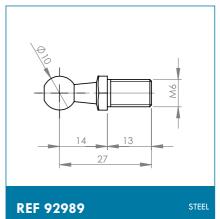


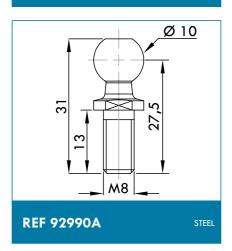


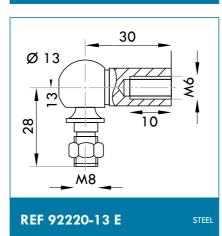


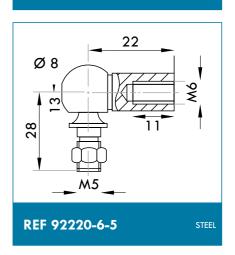




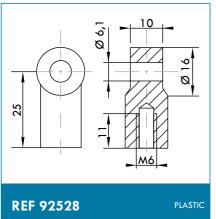


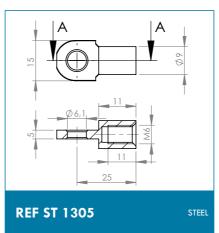


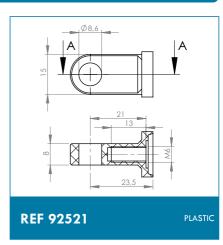


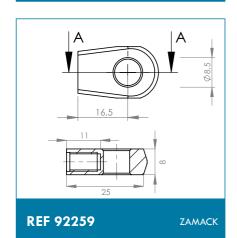


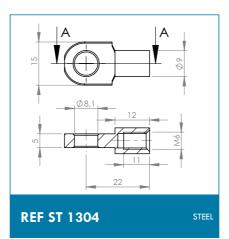


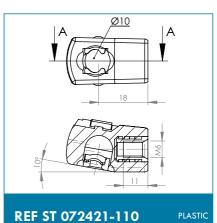


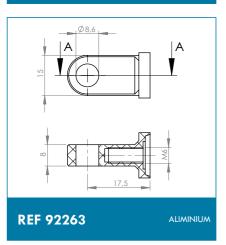


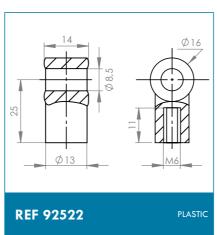


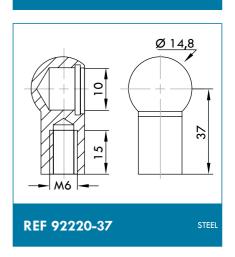




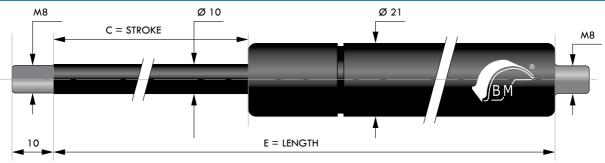






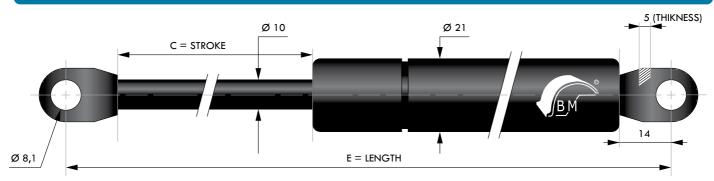


COMPRESSION SPRINGS WITH THREADED ENDS DIAMETER 10



DIAMETER 10 AVAILABLE L	ENGTHS AND FORCES		
C - Stroke in mm	E - Length in mm	F1 - Force in Newtons	Reference
60	180	From 50 to 1150	ST 060 + F1 V + D10
100	255	From 50 to 1150	ST 100 + F1 V + D10
115	275	From 50 to 1150	ST 115 + F1 V + D10
150	355	From 50 to 1150	ST 150 + F1 V + D10
150	405	From 50 to 1150	ST 150 + F1 V + D10 E405
200	455	From 50 to 1150	ST 200 + F1 V + D10
250	555	From 50 to 1050	ST 250 + F1 V + D10
300	655	From 50 to 1050	ST 300 + F1 V + D10
300	<i>7</i> 11	From 50 to 1050	ST 300 + F1 V + D10 E711
350	735	From 50 to 1000	ST 350 + F1 + V D10 E735
350	755	From 50 to 1000	ST 350 + F1 V + D10
400	855	From 50 to 900	ST 400 + F1 V + D10
440	960	From 50 to 900	ST 400+F1 V+D10 E960
500	1055	From 50 to 700	ST 500 + F1 V + D10

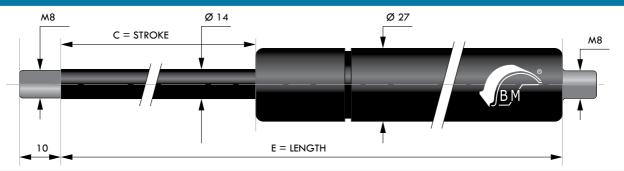
COMPRESSION SPRINGS WITH WELDED EYES DIAMETER 10



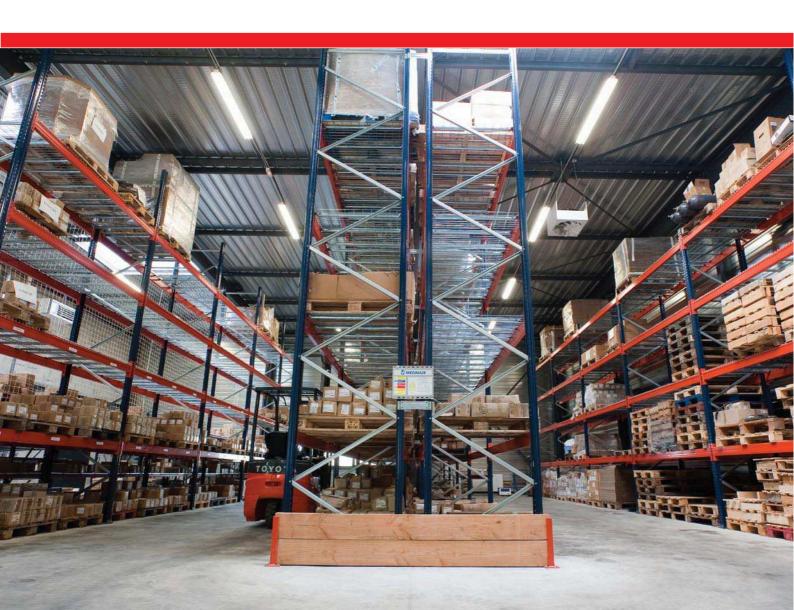
C - Stroke in mm	E - Length in mm	F1 - Force in Newtons	Reference
100	285	From 50 to 1150	ST 100 + F1 + D10
150	385	From 50 to 1150	ST 150 + F1 + D10
200	485	From 50 to 1150	ST 200 + F1 + D10
250	585	From 50 to 1050	ST 250 + F1 + D10
300	685	From 50 to 1050	ST 300 + F1 + D10
330	740	From 50 to 1050	ST 330 + F1 + D10
350	785	From 50 to 1000	ST 350 + F1 + D10
400	885	From 50 to 900	ST 400 + F1 + D10

BROCHURE GAS SPRINGS

COMPRESSION SPRINGS WITH THREADED ENDS DIAMETER 14

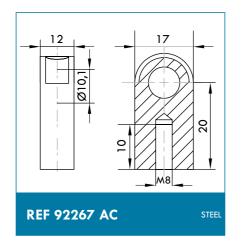


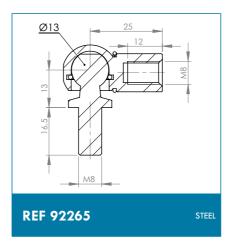
DIAMETER 14 AVAILABLE I	ENGTHS AND FORCES		
C - Stroke in mm	E - Length in mm	F1 - Force in Newtons	Reference
60	180	From 100 to 2100	ST 060 + F1 V + D14
100	255	From 100 to 2100	ST 100 + F1 V + D14
150	355	From 200 to 2100	ST 150 + F1 V + D14
200	455	From 200 to 2100	ST 200 + F1 V + D14
200	455	From 200 to 2100	ST 200 + F1 V + D14 M10
250	555	From 300 to 2100	ST 250 + F1 V + D14
300	655	From 300 to 2100	ST 300 + F1 V + D14
350	755	From 300 to 2100	ST 350 + F1 V + D14
400	855	From 300 to 2100	ST 400 + F1 V + D14
400	855	From 300 to 2100	ST 400 + F1 V + D14 M10
450	955	From 300 to 2100	ST 450 + F1 V + D14
450	955	From 300 to 2100	ST 450 + F1 V + D14 M10
500	1055	From 300 to 2100	ST 500 + F1 V + D14
500	1055	From 300 to 2100	ST 500 + F1 V + D14 M10

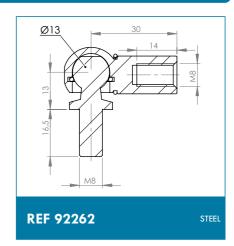


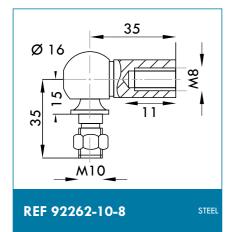
STANDARD M8 ACCESSORIES

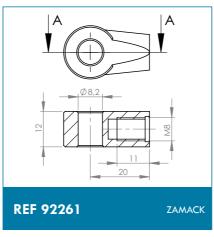


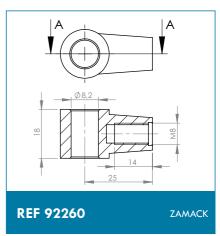


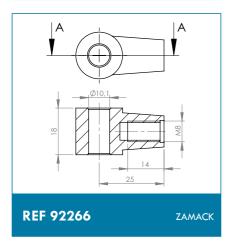


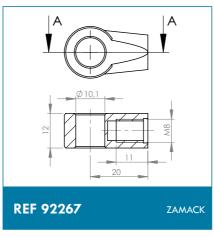


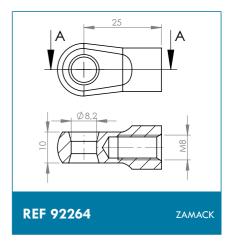








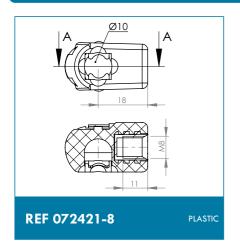


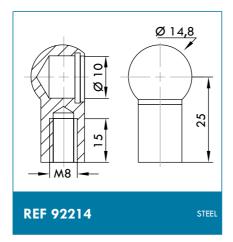


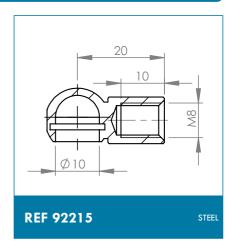


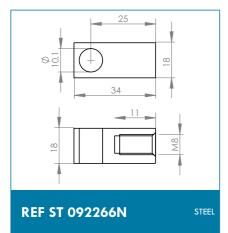
STANDARD M8 ACCESSORIES

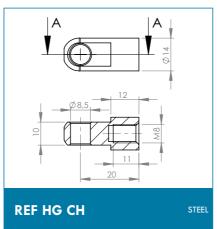


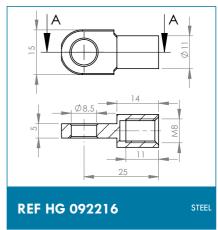


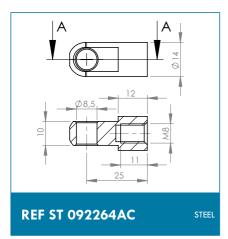


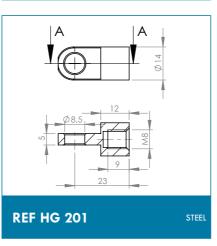


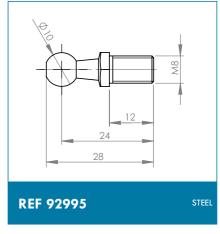






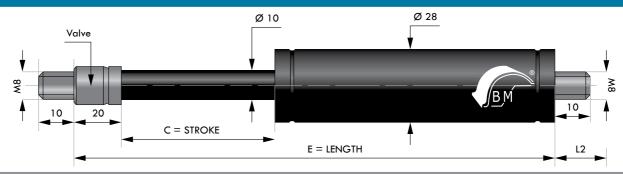








TRACTION GAS SPRINGS WITH THREADED END, ROD DIAMETER 10

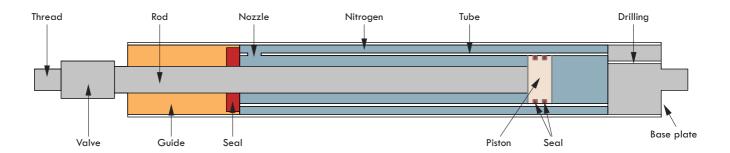


DIAMETER 10 AVAILABLE LENGTHS AND FORCES			
C - Stroke in mm	E - Length in mm	F1 - Force in Newtons	Reference
100	300	From 100 to 1200	ST T28 100 + F1 V
150	400	From 100 to 1200	ST T28 150 + F1 V
200	500	From 100 to 1200	ST T28 200 + F1 V
250	600	From 100 to 1200	ST T28 250 + F1 V
300	700	From 100 to 1200	ST T28 300 + F1 V
350	800	From 100 to 1200	ST T28 350 + F1V
400	900	From 100 to 1200	ST T28 400 + F1 V

OTHER SIZES: CONTACT US

FUNCTION DIAGRAM FOR TRACTION GAS SPRING



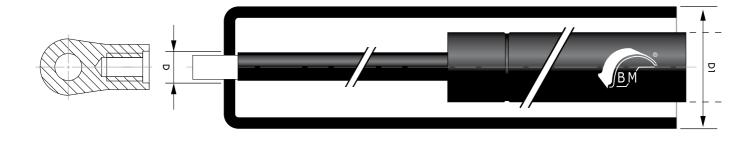




PROTECTION TUBES

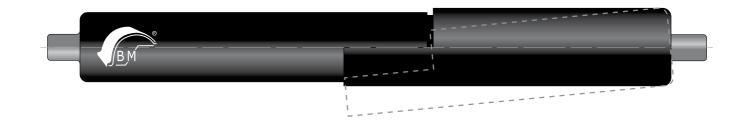
Available for all BM® gas spring models

Use Protects the gas spring rod against mechanical, chemical or heat damage for an improved alignment of the rod.	
Application	Coating bath, manufacturing assembly line, extremely polluted areas etc.
Material	St 34 steel tubing
Surface coating	Black epoxy, matte, galvanised or stainless steel.



LOCKING TUBES

The locking tube secures the gas spring in an open position.



AVAILABLE SIZES: CONTACT US



MADE TO MEASURE STEEL GAS SPRINGS

Berthold Marx can produce manufactured Steel Gas Springs in under 5 weeks, as follows:

Material:	Rod	Chrome-plated steel
	Body	Steel - painted black, RAL or zinc treated
	Ends	Zinc-coated steel

AVAILABLE SIZES		
RODS / BODIES (mm)	FORCES (N)	STROKES (mm)
2mm / 6mm	5-40	5-50
3mm / 8mm	5-100	10-80
3mm / 10mm	5-100	10-80
4mm / 12mm	10-180	10-200
6mm / 15mm	40-400	20-300
6mm / 19mm	40-400	20-300
8mm / 19mm	50-700	40-500
8mm / 23mm	50-700	40-500
10mm / 23mm	100-1200	40-700
10mm / 28mm	100-1200	40-700
10mm / 40mm	150-1200	30-700
14mm / 28mm	150-2500	50-700
14mm / 40mm	150-2500	50-700
20mm / 40mm	300-5000	50-600
22mm / 40mm	500-6000	50-1000
25mm / 55mm	500-7500	100-1000
30mm / 65mm	750-10000	100-1000

The options below are available as special orders WITH THREADED ENDS (Allow around 3-5 weeks):

- Drain and fill valve in body thread
- Valve at 90° in body thread
- Rod wiper seal
- Internal rod seal for locking gas spring
- Grease chamber
- Protection tube (available on standard gas springs)
- Locking tube (available on standard gas springs)
- Special fabrication for high temperatures
- Special fabrication for low temperatures
- Completely stainless steel 304 (Wk 1.4305) fabrication
- Completely stainless steel 316 (Wk 1.4571) fabrication
- Food Hydraulic Fluid

STAINLESS STEEL GAS SPRINGS

Berthold Marx has a range of STAINLESS STEEL Gas Springs in STOCK.

We can also produce manufactured STAINLESS STEEL Gas Springs in under 5 weeks, as follows:

Material:	Rod	1.4305 / AISI 303	or	1.4404 / AISI 316L
	Body	1.4301 / AISI 304	or	1.4571 / AISI 316TI
	Ends	1.4305 / AISI 303	or	1.4404 / AISI 316L

AVAILABLE SIZES				
RODS / BODIES (mm)	FORCES (N)	STROKES (mm)	304	316L
4mm / 12mm	10-180	10-200	X	Χ
6mm / 15mm	40-400	20-300	Х	X
6mm / 19mm	40-400	20-300	Х	Х
8mm / 19mm	50-700	40-500	Х	X
8mm / 23mm	50-700	40-500	Х	X
10mm / 23mm	100-1100	40-700	Х	X
10mm / 28mm	100-1100	40-700	Х	Х
10mm / 40mm	150-1100	30-700	Х	Х
14mm / 28mm	150-2100	50-700	Х	X
14mm / 40mm	150-2100	50-700	Х	Х
20mm / 40mm	300-5000	50-600	Х	Χ
22mm / 40mm	500-6000	50-1000	Х	

ACCESSORIES: RANGE OF STAINLESS STEEL ENDS AND BALL JOINTS IN STOCK





LOCKING ON REQUEST

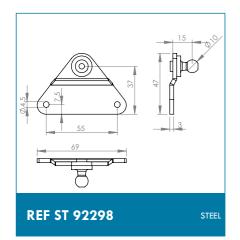
BM® locking Gas Springs are lockable along the complete stroke. Whatever the application (hospital beds, stretchers, standers etc) you can lock and release the spring as you wish. The possibilities are endless with the various models offered in the range: Elastic lockable, Rigid lockable and Absolute rigid lockables.

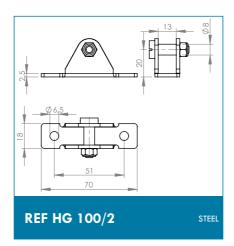
By opening the valve control integrated in the gas spring rod you are opening the piston valve which allows the fluid to flow: nitrogen in the case of elastic lockable springs and oil for rigid lockables. When you release the control the spring locks in position.

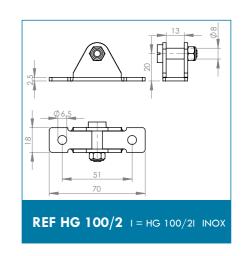
BM® Gas springs can be manufactured in steel, 303/304 stainless steel or 316L/316Ti stainless steel.

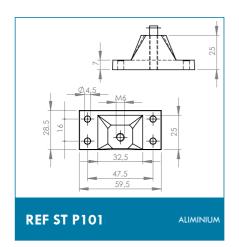


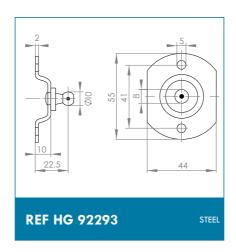
SPECIFIC ACCESSORIES

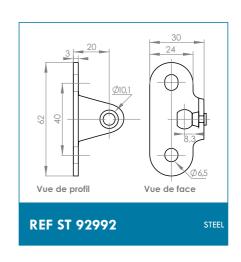


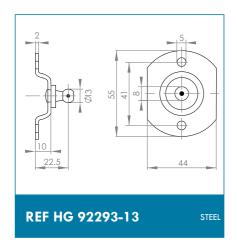


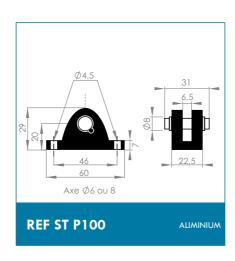


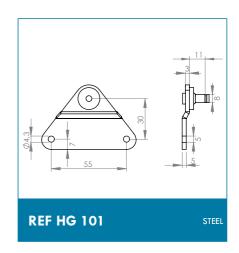




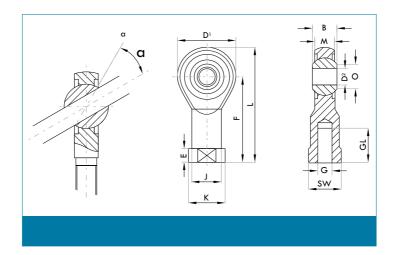






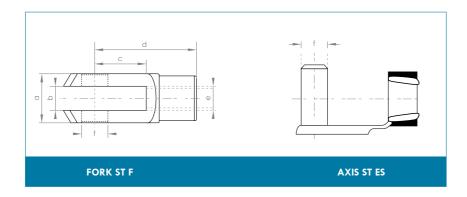


SPECIFIC ACCESSORIES



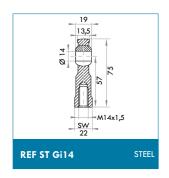
Reference	D2	В	M	0	D1	F	L	GL	K	J	Е	Eye	Thread	SW	Angle	Weight
ST GI 6	6	9	6,75	8,9	20	30	40	12	13	10	5	12 <i>,</i> 7	M6	11	13	27
ST GI 8	8	12	9	10,4	24	36	48	16	16	12,5	5	1 <i>5</i> ,87 <i>5</i>	M8	13	13	46

OTHER SIZES: CONTACT US

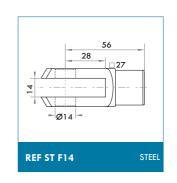


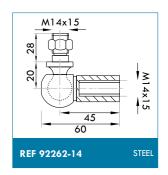
Reference	Size	а	b	С	d	е	f	g
ST F6	6x12	12	6	12	24	M6	6	14,5
ST F8	8x16	16	8	16	32	M8	8	18,5
ST ES6	Ø6	-	-	-	-	-	6	-
ST ES8	Ø8	_	_	_	_	_	8	_

OTHER SIZES: CONTACT US









General Conditions of Sale

Our product guarantee only covers an exchange and cannot in any case be a payment for replacement costs or for any other costs subsequent to this replacement. All claims relating to product conformity, excluding any claims for transportation should be made in a recorded letter with proof of receipt within five days of delivery.

No returned merchandise will be accepted except in the event of it being expressly authorised in writing by BERTHOLD MARX. In this case, the merchandise will be transported at the risk of the Buyer and must be sent carriage-paid in the original packaging, undamaged and with the return document provided by us. Any return accepted will require a reduction of the returned goods value, equal to at least 40% of the invoiced total before taxes and this will be issued only as a credit note.

The studies and recommendations are shown for illustrative purposes only and may not be considered as constituting the object of the sale. They may not therefore incur the liability of BERTHOLD MARX in any way. In any event, it is the responsibility of the buyer to have them confirmed by his research department or his client or any other qualified professional service provider.

The delivery dates shown on documentation issued by BERTHOLD MARX are estimates and will not in any case incur our company's liability.

In the event of non-collection or refusal to take delivery of merchandise specially manufactured for or ordered by the buyer, within a week, after notification by recorded letter with proof of receipt, this latter will remain liable for the entire sale cost and expenses associated with the merchandise.

A Gas spring is not a security device.

Our merchandise, even when sold "Carriage-paid" is transported at the risk of the buyer. We may consider special delivery methods with our clients. We request that you check the weight of all packages upon delivery. We are not liable in the event of shortages or damage due to transportation if confirmation to the carrier has not been carried out on receipt of the merchandise.

By express agreement, a default in payment for our merchandise on the agreed due date will require the immediate payment of all remaining amounts, regardless of the payment terms agreed with the application, and as per the Penal Clause, with compensation equal to 15% of the amounts due.

In compliance with law N°80335 of 12.05.1980, the present sale will not be closed until after the complete payment of the price has been received. Whilst the price is not paid in full, the sales merchandise remains the property of the seller.

Payment:The normal payment of accounts by clients is 30 days from the invoice date; other payment plans may be considered, according to the current law of modernization of the economy (LME). A discount of 0.5% is available for all payments made within ten days. In the event of payment with the discount, the amount of recoverable VAT will be decreased accordingly.

After the due date shown on the invoice and in compliance with the law $N^{\circ}92-1442$ of 31.12.1992, a late penalty of an amount equal to one and a half times the legal rate of interest may be applied.

In the absence of payment by the buyer of part of the price at the agreed due dates, and one week after legal notice with no response, the present sale with be legally cancelled, if this is in the seller's interest.

The same decision will potentially designate an expert to assess the state of the returned merchandise, and to value it, on this basis the parties' accounts will be settled, taking into account the compensation for which the buyer is liable to complete the sale.

Only French law is applicable. In the event of dispute, only the jurisdiction and courts in Strasbourg will be competent in the event of proceedings.



OUR OTHER BROCHURES

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