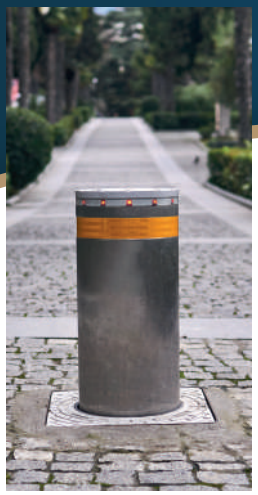
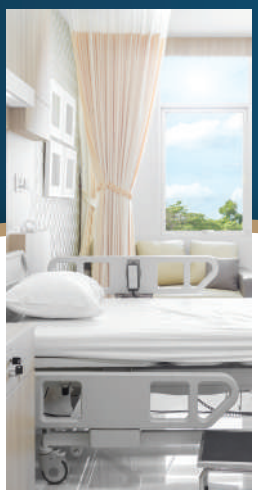
BERTHOLD MARX

GAS SPRINGS
FITTINGS & BRACKETS

MOVEMENT BECOMES A FORCE


2024 Edition

WWW.BERTHOLDMARX.COM

Always a step ahead.
Growing with our customers and employees
That's BERTHOLD MARX's DNA!

" Our consumer habits, our vision of the corporate world and the meaning we give to our work and our lives, are all changing!

Our company is particularly attentive to the new expectations of our customers, the needs of our employees, and the growing importance of our environmental impact

The company's aim is to keep up with the times, through creative, modern and above all concrete actions for our common future. "

Designed and
Printed in France

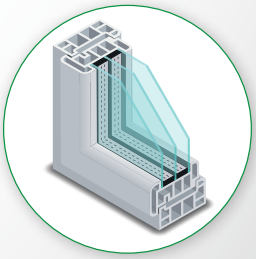
Paper from sustainably managed forests

OUR COMMITMENTS TO SUSTAINABLE DEVELOPMENT

50% of our electricity comes from solar power

Selective sorting of our industrial waste

Our vehicle fleet is equipped with hybrid vehicles



Triple glazing and exterior building insulation

Berthold Marx

is an eco-responsible French player. Our commitment extends from the design to the manufacture and packaging of our products. All our employees are committed to protecting the environment.

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Products

Technical information

INTRODUCTION TO BERTHOLD MARX

Head office Reichstett

Founded in 1948, Berthold Marx mainly supplied the transport vehicle industry with spare parts and consumables. After more than 30 years of growth in this market, it was in the 1970s that BM turned its attention to a new product: the gas spring!

The gas spring was first created to enable the French car manufacturer to insert a window into the hatchback, which contains a heavy glass part. The gas spring was therefore created to avoid the weight of this glass as much as possible. The gas spring became the centerpiece around which BM concentrated all its forces and built its strategy, culminating in the construction of its own gas spring factory in 2003.

Producing and developing gas springs in-house gives us access to a wide range of products for many different applications. Most situations involving weight compensation are covered by our range of gas springs.
To ensure a coherent, consistent product range in its catalog, Berthold Marx selects only gas spring-related parts in its product range, such as rubber seals and silent blocks.

Saint-Vit Warehouse

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67116 REICHSTETT - FRANCE

Phone : +33 3 88 40 31 61
Mail : info@bertholdmarx.com
Site : www.bertholdmarx.com

GAS SPRING OPERATING INSTRUCTIONS

Reminder: Gas springs contain nitrogen and oil under pressure.
This pressure can reach 160 bars when rod is out, and 250 bars when rod is inside.

Our gas springs can replace original parts from other brands in many cases. However, you can sometimes feel a difference between the original gas spring and ours. Mostly because each producer has its own production characteristics.

Always replace both gas springs for optimum performance and to avoid tension within the application due to force differences.

On an application equipped with a hatch under which the public may be present, we strongly recommend that you install a system for locking the hatch in the open position (e.g. locking tube, or similar equipment).

The gas spring is not a safety component.

Observe the following precautions: :

- Do not expose the gas spring to shock, vibration, electric or magnetic fields.
- Do not expose gas springs to temperatures exceeding 80°C.
- Keep the piston rod free of dirt, splashes, paint, adhesives, solvents, or corrosive materials.
- Do not force a gas spring whose rod is blocked (see paragraph Neutralization).
- Above 150 N, the gas spring can be difficult to compress by hand.
- Do not damage the tube of the gas spring (cuts, abrasion, blows) which could reduce the strength from the tube or an internal component.
- Do not remove the gas spring from the application as long as the rod is engaged in the tube, without first neutralizing it (unless it is completely open, rod out).
- Used gas spring must be neutralized before being recycled (see neutralization procedure on the following document «safety protocol»).
- Do not expose the gas spring excessively to the salt spray, except for the stainless-steel products. The resistance (h) to salt spray is as follows:

  Chrome rod = 150 h
  Nitride rod (QPQ) = 190 to 200 h
  Stainless-steel rod = more than 1000 h

1. Storage and carriage before use

For a maximum of **3 months,** the gas spring can be **stored horizontally** in a room at ambient temperature.

For a maximum of **6 months,** we recommend to **store them vertically** with rod downwards.

For a storage **longer as 6 months,** recommend to operate the gas spring at least once before the 6th month in order to lubricate the rod and the internal equipment.

Do not transport gas springs in a mess. Do not apply adhesive tape to the gas spring rod. **The rod must be free of any impurities.**

2 - Assembly

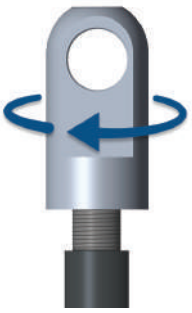
Compression gas springs must be mounted with the rod downwards at a minimum angle of 15°. If you have a traction spring, mount the rods upwards.

Allow 0.5 to 1mm lateral clearance between the gas spring end fittings and the application mounting bracket, in order to allow the end fittings rotate on their pins when in operation.

End fittings must be screwed on the gas spring without overtightening. If lateral forces cannot be eliminated, we recommend fitting the gas spring with ball joint.

If the end fitting is not in line with your fixing point, hold the gas spring body with your hand and use your over hand to turn the gas spring end fitting clockwise until desired position.

You can use a screwdriver or similar tool to put it in the end fitting hole, in order to help you turn the end fitting clockwise. Take care not to damage the rod surface.



Check that the gas spring is not subject to lateral forces.

In case of particles projection and/or in dusty environments, the rod must be protected. We propose wiper rings or protection tubes available on our website www.bertholdmarx.com

3 - Conditions of use

Number of cycles per minute: 5 max. For higher cycle rates, please consult us.

Endurance : 30 000 cycles on average. Loss of characteristics after endurance : 15% max (the level of endurance varies according to the stroke and the force).

Operating temperature: - 30° C to + 80° C.
Reference temperature: +20°C
Force variation due to temperature: 1% for 3°C.

4 - Force tolerance

Force in Newtons	Tolerance Margins
30 ≤ N < 50	+ or – 10N
50 ≤ N < 250	+ or – 20 N
250 ≤ N < 750	+ or – 30 N
750 ≤ N < 1500	+ or – 60 N
1500 ≤ N < 3000	+ or – 150 N
3000 ≤ N < 6000	+ or – 300 N

5 - Maintenance

Our gas springs do not require any maintenance. Please do not grease the rod.

Handle your application regularly in order to use the gas spring. If the gas spring remains static for more than 6 months, there is a risk of rod oxidation and loss of force.

6 - Neutralization

To neutralize a gas spring, it is necessary to release the pressure contained in its body.

This operation is necessary before scrapping it or before extracting it when the rod is blocked into the body, please proceed in the following way : (wear safety glasses)

- Block the application if the gas spring is still in position
- Lightly clamp the gas spring in a vice if it has been removed from the application.
- Use a hand hacksaw for metal to gently saw the body of the gas spring in an area between 20mm and 30mm from the bottom of the tube (opposite side of the spring rod).
- Cover the saw blade with a duster to prevent any projection of metal or oil.
- When you hear the gas coming out (hissing sound) stop the operation and wait for the gas to be completely evacuated from the body.
- Emptying process will be finish when the rod can be moved without any resistance. If not, make a second cut at the front of the body (approx. 40mm from front of the tube).
- Waste the gas spring in a suitable container (metallic) after removing the internal oil from gas spring. This mineral oil can be recycled in same containers as used motor oil.

7 - Warranty

2 years from deliver date of the gas spring. Example of marking: 1021 (10th week of 2021).
In order to obtain the warranty, in case the unit needs to be repainted, the marking of the manufacturing date and the serial number must remain clearly visible.

8 - Recycling

BM gas springs cannot be disposed of in the household waste. All materials used to manufacture the gas spring can be recycled. Please go to a specialised recycling centre. The oil inside the tube must be drained.

UNDERSTAND THE REFERENCES OF GAS SPRINGS

ST	450	0800	V	D14	- -
Standard	Stroke (mm)	Force (N)	With thread if V, Without if no V	Ø Rod (mm)	E = Extended Length (mm) VA = Valve M = Ø Thread (mm) T = Ø Hole (mm) iN = Stainless Steel

In the BLUE box : It's our empty gas spring reference that you can find in our brochure or website.

In the RED box : It's the reference including the force. The force is composed of 4 digits placed just before the V or D. In this case (see picture) it's 800N.

For the traction spring and also the damper, the force is at the end of the reference. (----N)

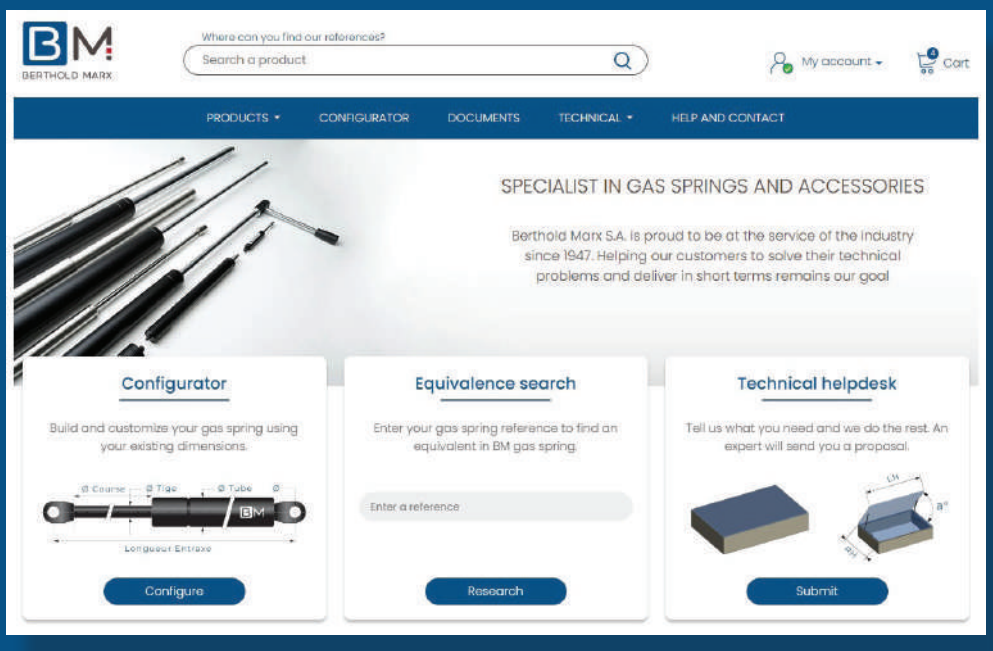
ORDER ON OUT WEBSITE WWW.BERTHOLDMARX.COM

Professional and private customers can order all our standard product range on our website : **http://www.bertholdmarx.com.**

As a professional, after logging in, you will automatically have your price conditions applied. Also, you can share your new project through our Decision Support Tool and access to our technical support and expert advises.

Through our configurator, choose the nearest gas spring in our standard range, in order to replace your old existing one.

Whatever your business, Berthold Marx has a large stock of gas springs available for delivery within 24 to 48 hours.



OUR COMPRESSION GAS SPRINGS

The piston is pushed forward inside the gas spring under gas pressure. This gas spring as an extension speed regulation.

Use example: Push hatches up

Welded eyes :

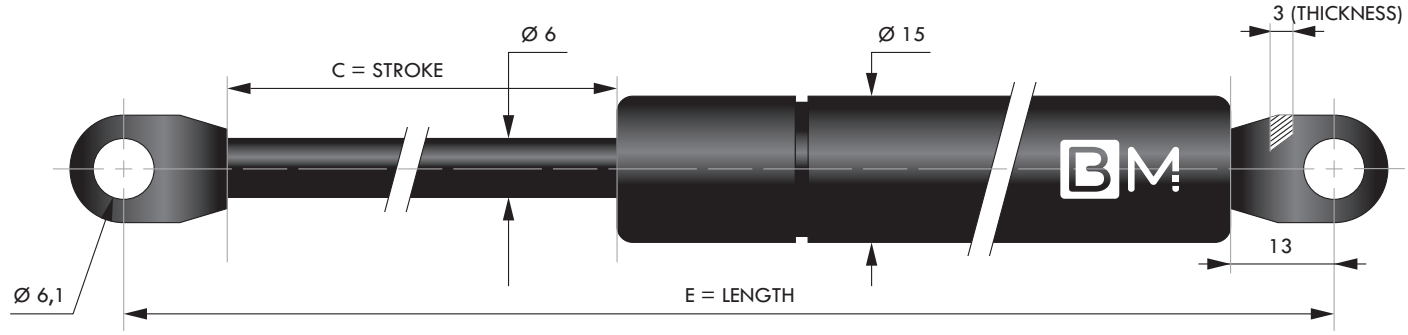
The welded eyes compression gas spring is equiped with 2 welded eyes assemble in factory. It's the most economical solution. Caution: does not tolerate lateral forces. Check the parallelism of the fixing points. Never tighten the gas springs on the axis (minimum gap of 0.5mm required).

Threaded ends :

The threaded end compression gas springs is compatible with a large range of end fittings according to your needs. Caution: does not tolerate lateral forces. Never tighten on the fixing points (minimum play of 0.5mm required). Screw the end fitting completely onto the gas spring thread without leaving any gap.

STEEL RANGE

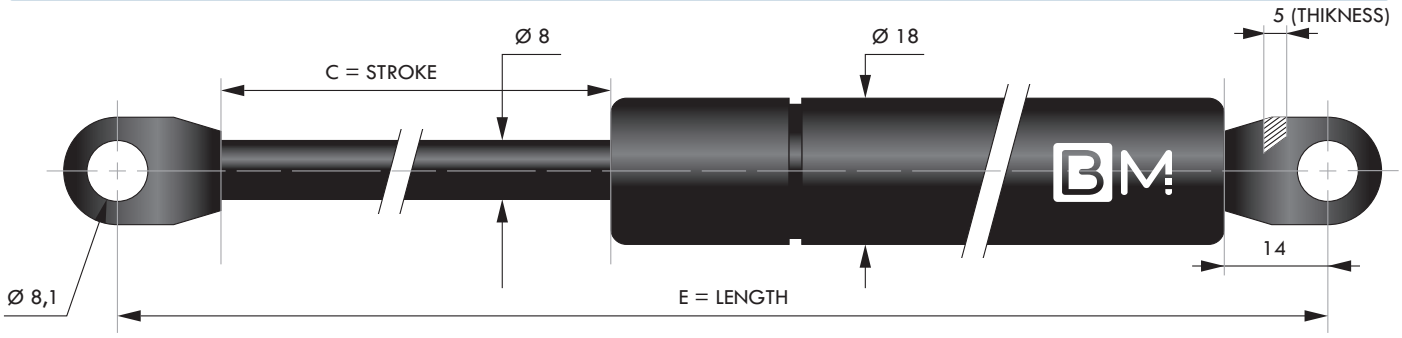
COMPRESSION - STEEL - WITH WELDED EYES - DIAMETER 6mm



C - Stroke (mm)	E - Length (mm)	F1 - Force (Newtons)	Reference
20	94	30 to 250	ST 020+F1+D6
20	106	30 to 350	ST 020+F1+D6E106
40	145	30 to 400	ST 040+F1+D6
60	185	30 to 400	ST 060+F1+D6
80	225	30 to 400	ST 080+F1+D6
100	265	30 to 400	ST 100+F1+D6
120	305	30 to 400	ST 120+F1+D6
150	365	30 to 400	ST 150+F1+D6

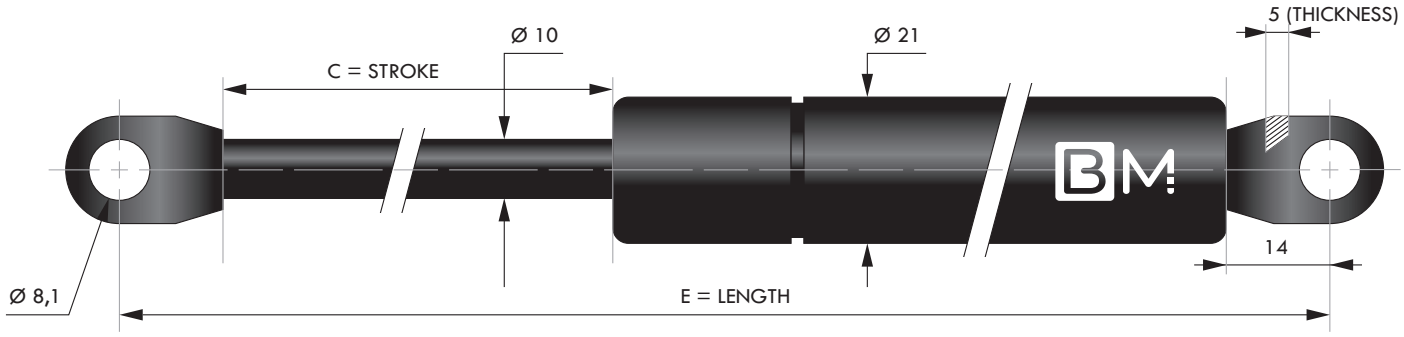
DELIVERY IN 24 TO 48 H

COMPRESSION - STEEL - WITH WELDED EYES - DIAMETER 8mm



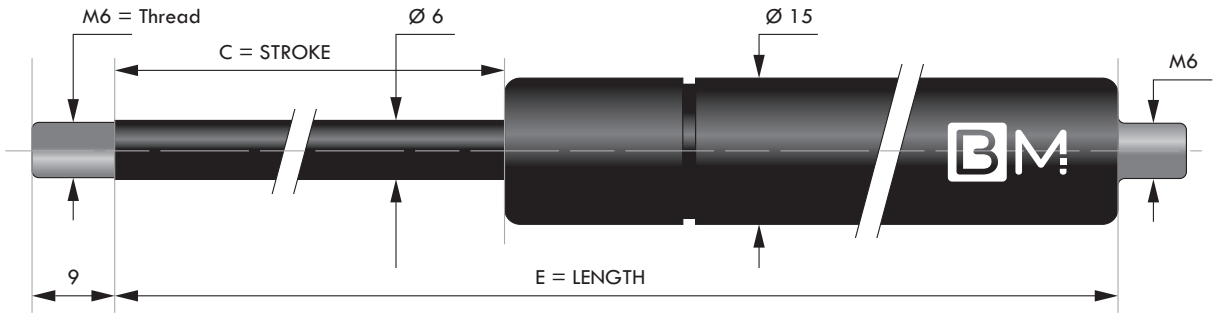
C - Stroke (mm)	E - Length (mm)	F1 - Force (Newtons)	Reference
40	155	50 to 750	ST 040+F1+D8E155
60	205	50 to 750	ST 060+F1+D8
72	225	50 to 750	ST 072+F1+D8
80	235	50 to 750	ST 080+F1+D8E235
80	245	50 to 750	ST 080+F1+D8
85	275	50 to 750	BM 204K
85	275	50 to 600	BM 204F (Hole diam 6mm)
90	255	50 to 750	ST 090+F1+D8
100	285	50 to 750	ST 100+F1+D8
120	325	50 to 750	ST 120+F1+D8
140	365	50 to 750	ST 140+F1+D8
150	385	50 to 750	ST 150+F1+D8
160	405	50 to 750	ST 160+F1+D8
180	445	50 to 700	ST 180+F1+D8
200	485	50 to 700	ST 200+F1+D8
200	485	50 to 700	ST 200+F1+D8T6 (Hole diam 6mm)
200	500	50 to 700	ST 200+F1+D8E500
220	525	50 to 700	ST 220+F1+D8
250	585	50 to 700	ST 250+F1+D8
250	600	50 to 700	ST 250+F1+D8E600

COMPRESSION - STEEL - WITH WELDED EYES - DIAMETER 10mm



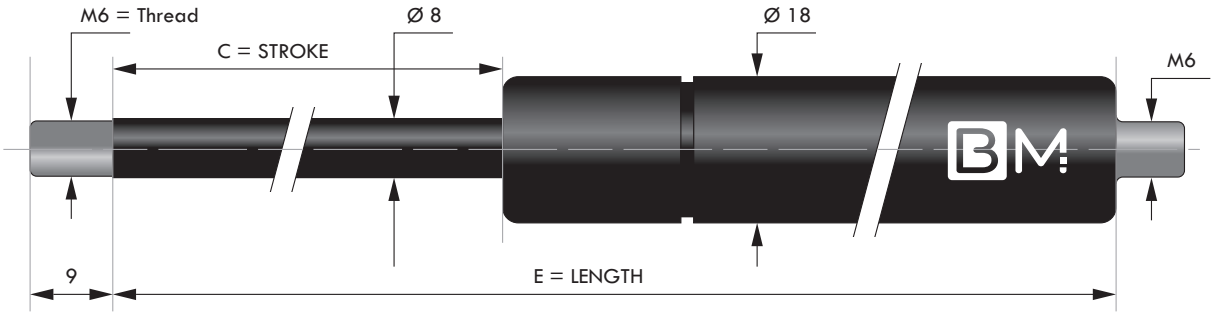
C - Stroke (mm)	E - Length (mm)	F1 - Force (Newtons)	Reference
100	285	100 to 1150	ST 100+F1+D10
150	385	100 to 1150	ST 150+F1+D10
200	485	100 to 1150	ST 200+F1+D10
250	585	100 to 1050	ST 250+F1+D10
300	685	100 to 1050	ST 300+F1+D10
330	740	100 to 1050	ST 330+F1+D10
350	785	100 to 1000	ST 350+F1+D10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

COMPRESSION - STEEL - WITH THREADED ENDS - DIAMETER 6mm (M6)



C - Stroke (mm)	E - Length (mm)	F1 - Force (Newtons)	Reference
20	80	30 to 250	ST 020+F1V+D6
40	115	30 to 400	ST 040+F1V+D6
60	155	30 to 400	ST 060+F1V+D6
80	195	30 to 400	ST 080+F1V+D6
100	225	50 to 400	ST 100+F1V+D6E225
100	235	30 to 400	ST 100+F1V+D6
120	275	30 to 400	ST 120+F1V+D6
150	335	30 to 400	ST 150+F1V+D6

COMPRESSION - STEEL - WITH THREADED ENDS - DIAMETER 8mm (M6)

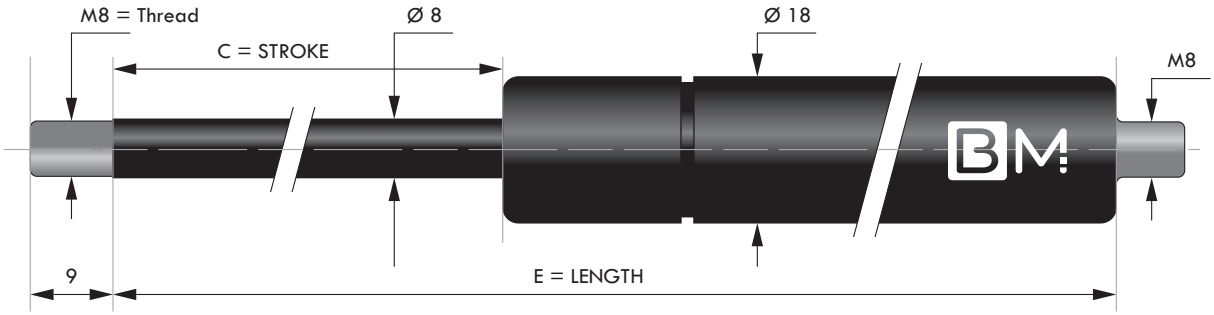


C - Stroke (mm)	E - Length (mm)	Valve	F1 - Force (Newtons)	Reference
40	125		50 to 750	ST 040+F1V+D8
60	165		50 to 750	ST 060+F1V+D8
70	183		50 to 750	ST 070+F1V+D8
80	205		50 to 750	ST 080+F1V+D8
89	268		50 to 750	ST 089+F1V+D8
90	225		50 to 750	ST 090+F1V+D8M6
100	245		50 to 750	ST 100+F1V+D8
120	285		50 to 750	ST 120+F1V+D8
120	285	X	50 to 750	ST 120+F1V+D8VA
140	325		50 to 750	ST 140+F1V+D8
140	325	X	50 to 750	ST 140+F1V+D8VA
150	345		50 to 750	ST 150+F1V+D8
160	365		50 to 750	ST 160+F1V+D8
180	405		50 to 700	ST 180+F1V+D8
180	405	X	50 to 700	ST 180+F1V+D8VA
200	445		50 to 700	ST 200+F1V+D8
200	445	X	50 to 700	ST 200+F1V+D8VA
210	455		50 to 700	ST 210+F1V+D8M6-M8 *
220	485		50 to 700	ST 220+F1V+D8
250	545		50 to 700	ST 250+F1V+D8
250	545	X	50 to 700	ST 250+F1V+D8VA
250	600		50 to 700	ST 250+F1V+D8E600
300	645		50 to 500	ST 300+F1V+D8

* Reference ST 210+F1V+D8M6-M8 has an M6 threaded end on the ROD side and an M8 threaded end on the TUBE side.

DELIVERY IN 24 TO 48 H

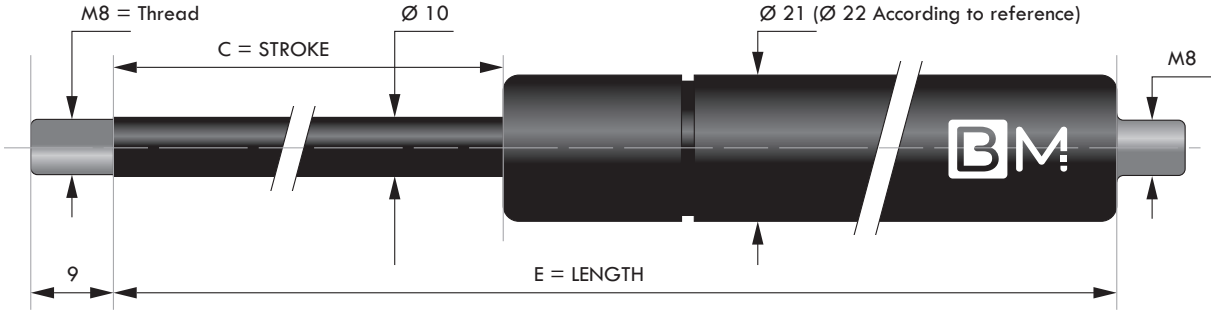
COMPRESSION - STEEL - WITH THREADED ENDS - DIAMETER 8mm (M8)



C - Stroke (mm)	E - Length (mm)	Valve	F1 - Force (Newtons)	Reference
90	225		50 to 750	ST 090+F1V+D8M8
210	455		50 to 700	ST 210+F1V+D8M6-M8 *

* Reference ST 210+F1V+D8M6-M8 has an M6 threaded end on the ROD side and an M8 threaded end on the TUBE side.

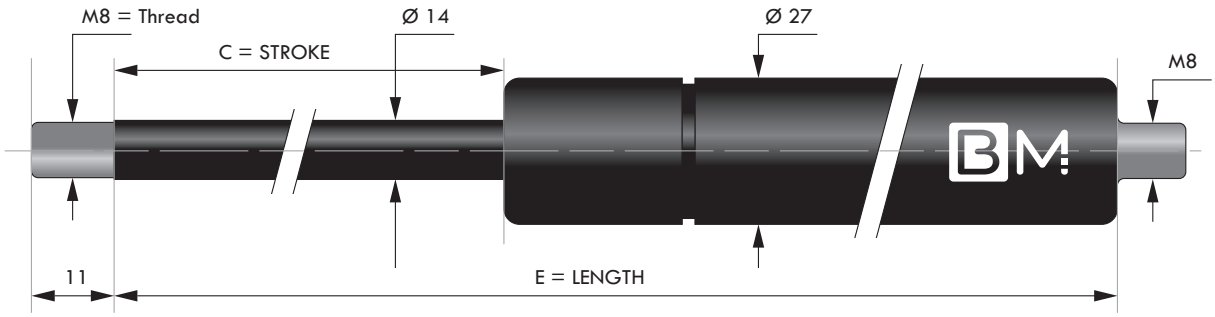
COMPRESSION - STEEL - WITH THREADED ENDS - DIAMETER 10mm (M8)



C - Stroke (mm)	E - Length (mm)	Valve	F1 - Force (Newtons)	Reference
60	180		100 to 1150	ST 060+F1V+D10
100	255		100 to 1150	ST 100+F1V+D10
115	275		100 to 1150	ST 115+F1V+D10
150	355		100 to 1150	ST 150+F1V+D10
150	405		250 to 1150	ST 150+F1V+D10E405
200	455		100 to 1150	ST 200+F1V+D10
200	455	X	100 to 1150	ST 200+F1V+D10VA
250	555		100 to 1150	ST 250+F1V+D10
250	555	X	100 to 1150	ST 250+F1V+D10VA
250	610		100 to 1150	ST 250+F1V+D10E610
300	655		100 to 1150	ST 300+F1V+D10
300	655	X	100 to 1150	ST 300+F1V+D10VA
300	711		100 to 1150	ST 300+F1V+D10E711
350	735		100 to 1000	ST 350+F1+VD10E735
350	755		100 to 1000	ST 350+F1V+D10
350	755	X	100 to 1000	ST 350+F1V+D10VA
400	855		100 to 900	ST 400+F1V+D10
400	855	X	100 to 900	ST 400+F1V+D10VA
440	960		100 to 900	ST 440+F1V+D10E960
500	1055		100 to 700	ST 500+F1V+D10
500	1055	X	100 to 700	ST 500+F1V+D10VA
550	1155	X	100 to 700	ST 550+F1V+D10VA *
600	1255	X	100 to 700	ST 600+F1V+D10VA *
650	1355	X	100 to 700	ST 650+F1V+D10VA *
700	1455	X	100 to 700	ST 700+F1V+D10VA *

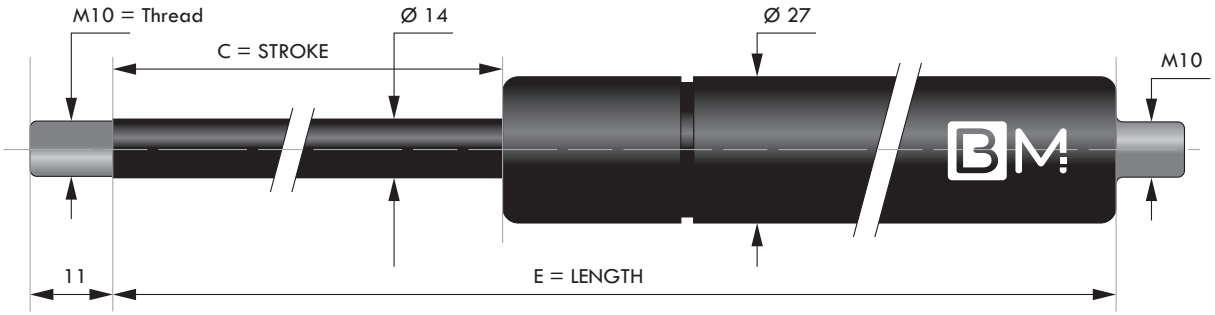
* For strokes from 550 to 700 mm, the tube diameter is 22 mm. **We recommend the use of protection tube to limit the bending risk (see protection tubes section page 32)**

COMPRESSION - STEEL - WITH THREADED ENDS - DIAMETER 14mm (M8)



C - Stroke (mm)	E - Length (mm)	Valve	F1 - Force (Newtons)	Reference
60	180		100 to 2100	ST 060+F1V+D14
100	255		100 to 2100	ST 100+F1V+D14
100	255	X	100 to 2100	ST 100+F1V+D14VA
150	355		200 to 2100	ST 150+F1V+D14
200	455		200 to 2100	ST 200+F1V+D14
250	555		300 to 2100	ST 250+F1V+D14
300	655		300 to 2100	ST 300+F1V+D14
300	655	X	300 to 2100	ST 300+F1V+D14VA
350	755		300 to 2100	ST 350+F1V+D14
400	855		300 to 2100	ST 400+F1V+D14
450	955		300 to 2100	ST 450+F1V+D14
450	955	X	300 to 2100	ST 450+F1V+D14VA
500	1055		300 to 2100	ST 500+F1V+D14

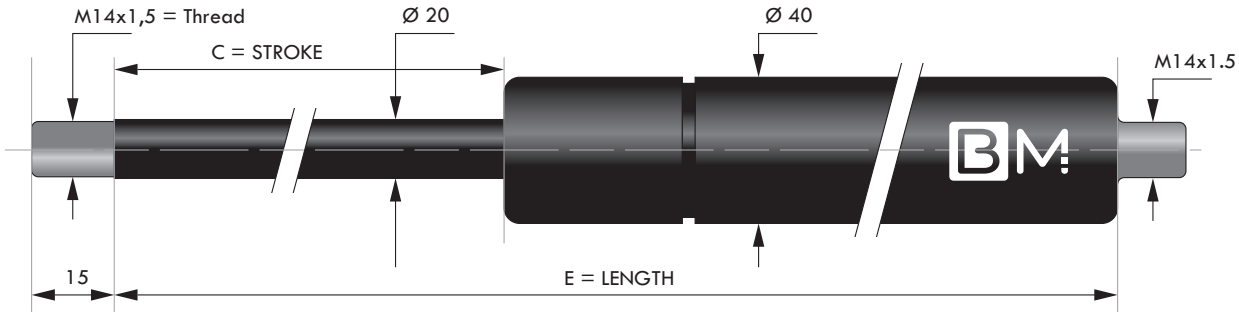
COMPRESSION - STEEL - WITH THREADED ENDS - DIAMETER 14mm (M10)



C - Course (mm)	E - Longueur (mm)	Valve	F1 - Force (Newtons)	Référence
150	368		200 to 2400	ST 150+F1V+D14E368M10
200	455	X	200 to 2400	ST 200+F1V+D14M10
250	555	X	300 to 2400	ST 250+F1V+D14M10
300	655	X	300 to 2400	ST 300+F1V+D14M10
350	755	X	300 to 2400	ST 350+F1V+D14M10
400	855	X	300 to 2400	ST 400+F1V+D14M10
450	955	X	300 to 2400	ST 450+F1V+D14M10
500	1055		300 to 2100	ST 500+F1V+D14M10
600	1255	X	300 to 2100	ST 600+F1V+D14VA *
650	1355	X	300 to 2100	ST 650+F1V+D14VA *
700	1455	X	300 to 1800	ST 700+F1V+D14VA *
750	1555	X	300 to 1800	ST 750+F1V+D14VA *
800	1655	X	300 to 1500	ST 800+F1V+D14VA *
900	1855	X	300 to 1500	ST 900+F1V+D14VA *

* We recommend the use of protection tube to limit the bending risk (see protection tubes section page 32)

COMPRESSION - STEEL - WITH THREADED ENDS - DIAMETER 20mm (M14)



C - Stroke (mm)	E - Length (mm)	Valve	F1 - Force (Newtons)	Reference
100	316	X	300 to 5200	ST 100+F1V+D20
150	416	X	300 to 5200	ST 150+F1V+D20
200	516	X	300 to 5200	ST 200+F1V+D20
250	616	X	300 to 5200	ST 250+F1V+D20
300	716	X	300 to 5200	ST 300+F1V+D20
350	816	X	300 to 5200	ST 350+F1V+D20
400	916	X	300 to 5200	ST 400+F1V+D20
500	1116	X	300 to 5200	ST 500+F1V+D20
600	1316	X	300 to 5000	ST 600+F1V+D20 *
700	1516	X	300 to 4000	ST 700+F1V+D20 *
800	1716	X	300 to 4000	ST 800+F1V+D20 *

*** Protection tubes delivered with the gas spring in order to minimize the bending risk.**

See page 21 for our custom gas spring manufacturing options.

STAINLESS STEEL RANGE

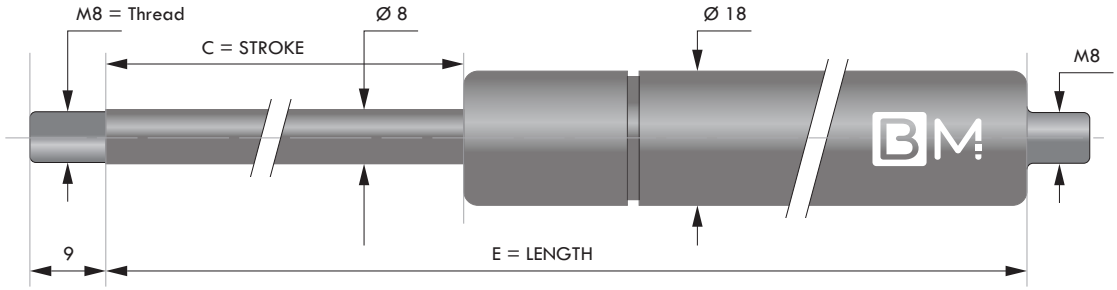
Made in 316 Stainless steel, these gas spring range are perfect for harsh environmental conditions and will not rust or corrode. Mostly used for salt water/marine applications, medical, chemical, etc….
They also look better than steel gas springs, giving your products a superior appearance.

The dimensions are the same as the standard steel gas springs, excepted for the threads all in M8.

Our stainless steel gas spring using standard mineral oil (Not food oil).

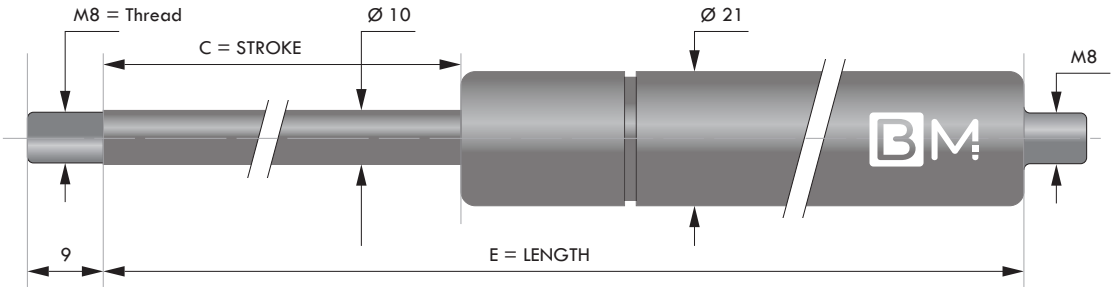
Upgrade your products by using the **Berthold Marx stainless Steel Gas springs** !

COMPRESSION - STAINLESS STEEL - WITH THREADED ENDS - DIAMETER 8mm (M8)



C - Stroke (mm)	E - Length (mm)	F1 - Force (Newtons)	Reference
60	165	50 to 650	ST 060+F1V+D8iN
80	205	50 to 650	ST 080+F1V+D8iN
100	245	50 to 650	ST 100+F1V+D8iN
120	285	50 to 650	ST 120+F1V+D8iN
140	325	50 to 650	ST 140+F1V+D8iN
160	365	50 to 650	ST 160+F1V+D8iN
180	405	50 to 650	ST 180+F1V+D8iN
200	445	50 to 650	ST 200+F1V+D8iN
220	485	50 to 650	ST 220+F1V+D8iN
250	545	50 to 650	ST 250+F1V+D8iN

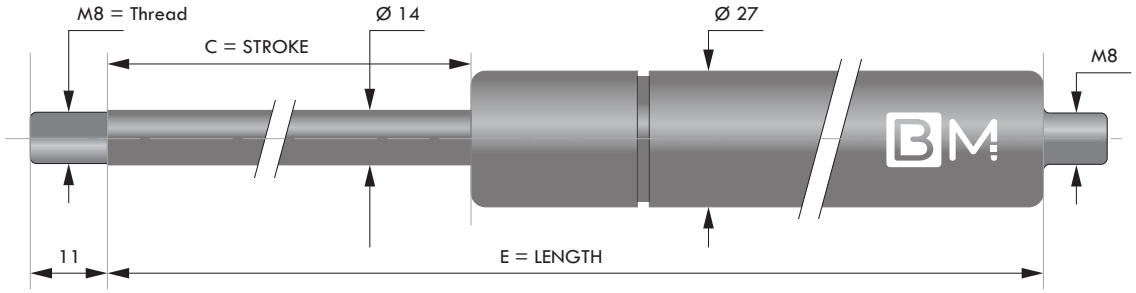
COMPRESSION - STAINLESS STEEL - WITH THREADED ENDS - DIAMETER 10mm (M8)



C - Stroke (mm)	E - Length (mm)	F1 - Force (Newtons)	Reference
100	255	100 to 1000	ST 100+F1V+D10iN
150	355	100 to 1000	ST 150+F1V+D10iN
200	455	100 to 1000	ST 200+F1V+D10iN
250	555	100 to 1000	ST 250+F1V+D10iN
300	655	100 to 1000	ST 300+F1V+D10iN
350	755	100 to 900	ST 350+F1V+D10iN
400	855	100 to 800	ST 400+F1V+D10iN
500	1055	100 to 800	ST 500+F1V+D10iN

DELIVERY IN 24 TO 48 H

COMPRESSION - STAINLESS STEEL - WITH THREADED ENDS - DIAMETER 14mm (M8)



C - Stroke (mm)	E - Longueur (mm)	F1 - Force (Newtons)	Reference
100	255	200 to 2100	ST 100+F1V+D14iN
150	355	200 to 2100	ST 150+F1V+D14iN
200	455	200 to 2100	ST 200+F1V+D14iN
250	555	200 to 2100	ST 250+F1V+D14iN
300	655	200 to 2100	ST 300+F1V+D14iN
350	755	200 to 2100	ST 350+F1V+D14iN
400	855	200 to 2100	ST 400+F1V+D14iN
500	1055	200 to 2100	ST 500+F1V+D14iN

SPECIAL STAINLESS STEEL GAS SPRINGS

A lot of options available on demand (Food oil, Tread valve, etc....)
We can produce customized gas springs in 5 weeks with following options :

Material :	**Rods**	1.4305 / AISI 303	or	1.4404 / AISI 316L
	Bodies	1.4301 / AISI 304	or	1.4571 / AISI 316TI
	End fittings	1.4305 / AISI 303	or	1.4404 / AISI 316L

Below dimensions range :

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

OUR DAMPED GAS SPRINGS

This damped gas spring works like a standard compression gas spring but with a lot more oil inside to damped the extension speed.

The standard oil volume is 65% of the body volume. This allows a damping extension speed of around 0.1mm/s for 65% of the end of the stroke. Rod retraction is not damped.
Please notice that the maximum Force is reduced due to less space inside the gas spring.

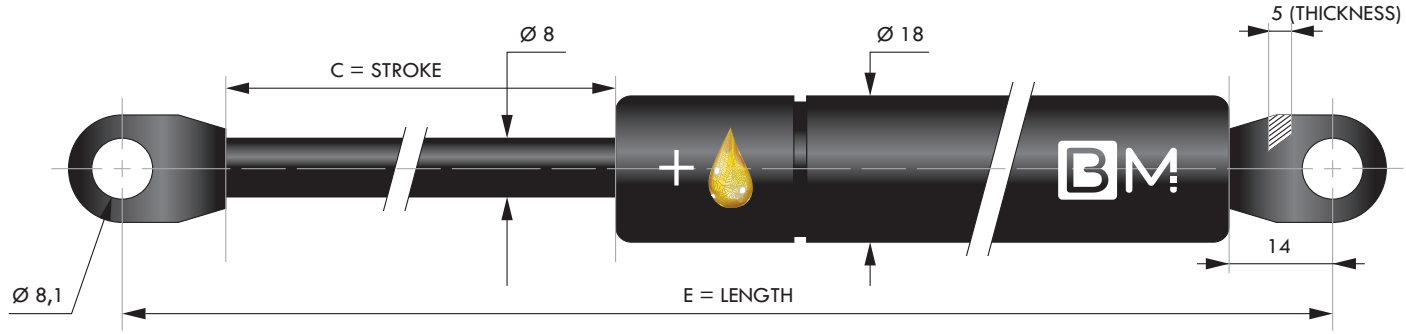
Welded eyes :

The welded eyes compression gas spring is equiped with 2 welded eyes assemble in factory. It's the most economical solution. Caution: does not tolerate lateral forces. Check the parallelism of the fixing points. Never tighten the gas springs on the axis (minimum gap of 0.5mm required).

Threaded ends :

The threaded end compression gas springs is compatible with a large range of end fittings according to your needs. Caution: does not tolerate lateral forces. Never tighten on the fixing points (minimum play of 0.5mm required). Screw the end fitting completely onto the gas spring thread without leaving any gap.

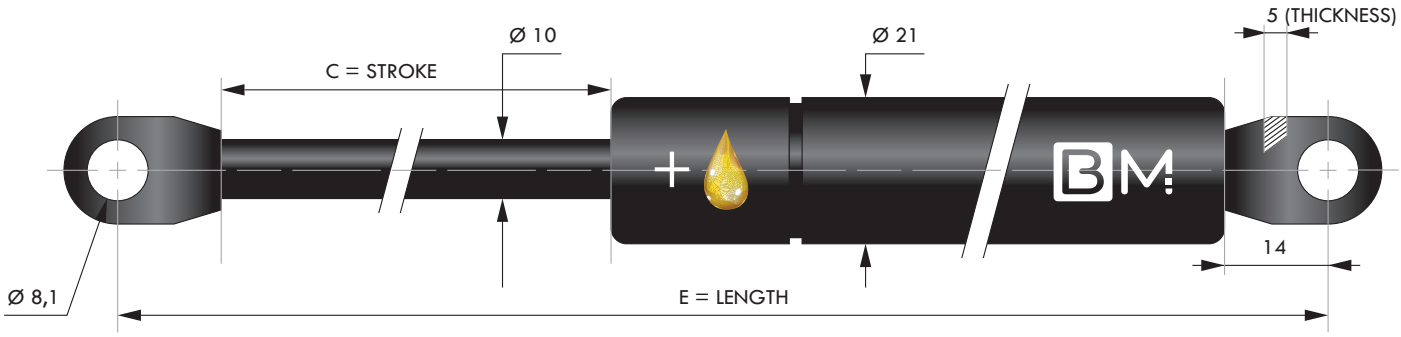
DAMPED - STEEL - WITH WELDED EYES - DIAMETER 8mm



C - Stroke (mm)	E - Length (mm)	F1 - Force (Newtons)	Reference
100	285	0 to 225	ST A100D8NM+F1
160	405	0 to 225	ST A160D8NM+F1
200	485	0 to 225	ST A200D8NM+F1
250	585	0 to 225	ST A250D8NM+F1

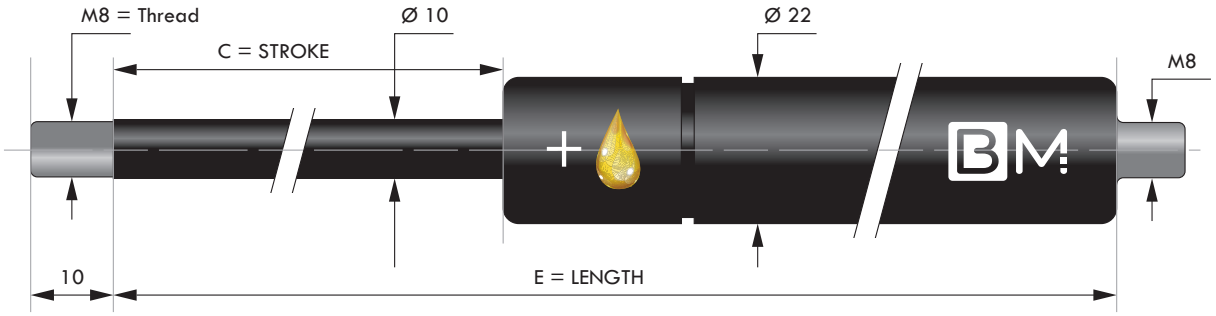
DELIVERY IN 24 TO 48 H

DAMPED - STEEL - WITH WELDED EYES - DIAMETER 10mm



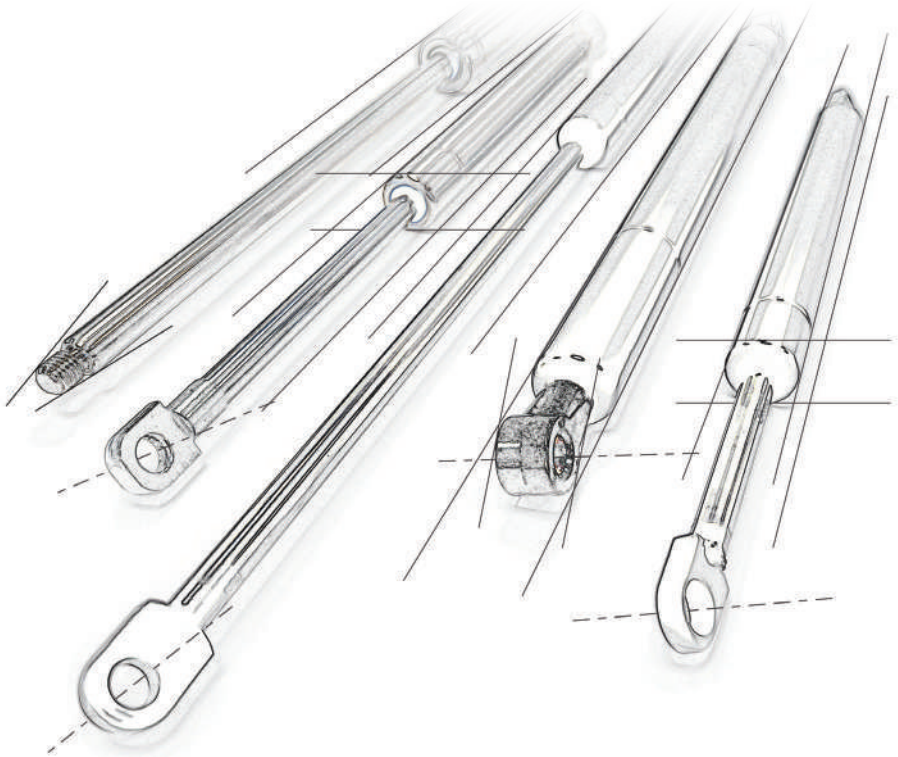
C - Stroke (mm)	E - Length (mm)	F1 - Force (Newtons)	Reference
100	285	0 to 300	ST A100D10NM+F1
150	385	0 to 300	ST A150D10NM+F1
200	485	0 to 300	ST A200D10NM+F1
250	585	0 to 300	ST A250D10NM+F1
300	685	0 to 300	ST A300D10NM+F1
350	785	0 to 300	ST A350D10NM+F1
400	885	0 to 300	ST A400D10NM+F1

DAMPED - STEEL - WITH THREADED ENDS - DIAMETER 10mm (M8)



C - Stroke (mm)	E - Length (mm)	Valve	F1 - Force (Newtons)	Reference
500	1055		0 to 300	ST A500VD10NM+F1

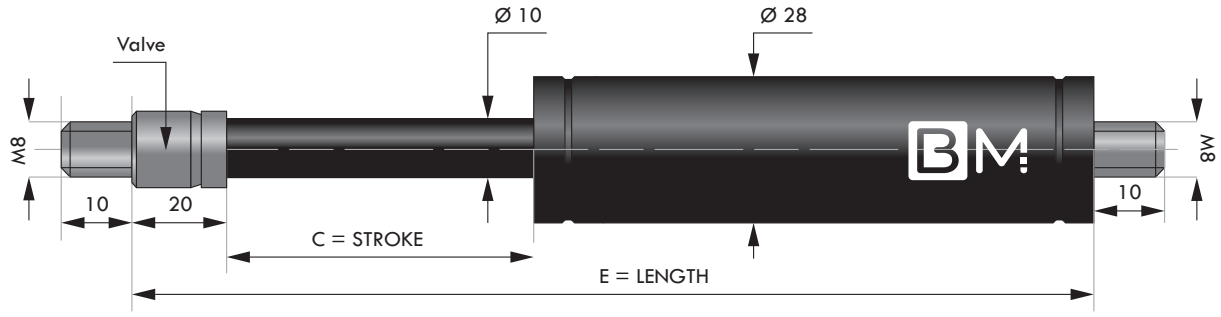
See page 21 for our custom gas spring manufacturing options.



STEEL TENSION GAS SPRINGS WITH THREADED ENDS

Tension gas springs also named traction gas springs operate in the direction opposite of compression gas springs. Used mostly to hold or pull hatches. Caution: Does not accept lateral forces.
Never tighten on fixing points those gas springs, let a gap of 0.5mm between end fitting and the bracket. Screw end fittings completely on the gas spring without any gap.

Compatible with M8 end fittings, available on page 25, 26 and 27.



C - Stroke (mm)	E - Length (mm)	F1 - Force (Newtons)	Reference
100	300	150 to 1200	ST T28100+F1V
150	400	150 to 1200	ST T28150+F1V
200	500	150 to 1200	ST T28200+F1V
250	600	150 to 1200	ST T28250+F1V
300	700	150 to 1200	ST T28300+F1V
350	800	150 to 1200	ST T28350+F1V
400	900	150 to 1200	ST T28400+F1V

OTHER DIMENSIONS: PLEASE CONSULT US

Our custom manufacturing capabilities can be found on page 21.

CUSTOM STEEL GAS SPRINGS

Berthold Marx can make customised steel Gas Springs within 5 weeks :

Material :	**Rod**	Steel chrome plated
	Bodies	Black painted steel, RAL or galvanised
	End fittings	Steel zinc plated

COMPRESSION AND DAMPED GAS SPRINGS

RODS / BODIES (mm)	FORCES (N)	STROKE (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

TRACTION GAS SPRINGS

RODS / BODIES (mm)	FORCES (N)	STROKE (mm)
6mm / 19mm	30-350	30-400
10mm / 28mm	150-1200	60-600
10mm / 40mm	200-2000	10-590
28mm / 40mm	500-5000	50-700

The options below are available on special production with threaded ends (lead time of approximately 3-5 weeks):

- Valve into the body thread
- Valve at 90° in the body thread
- Rod wiper ring
- Internal rod seal for locking gas spring
- Grease chamber
- Protection tube (possible on standard gas springs)
- Locking tube (possible on standard gas springs)
- Special construction for high temperatures
- Special construction for low temperatures
- Full 304 stainless steel construction (Wk 1.4305)
- Full 316 stainless steel construction (Wk 1.4571)
- Food oil inside the gas springs

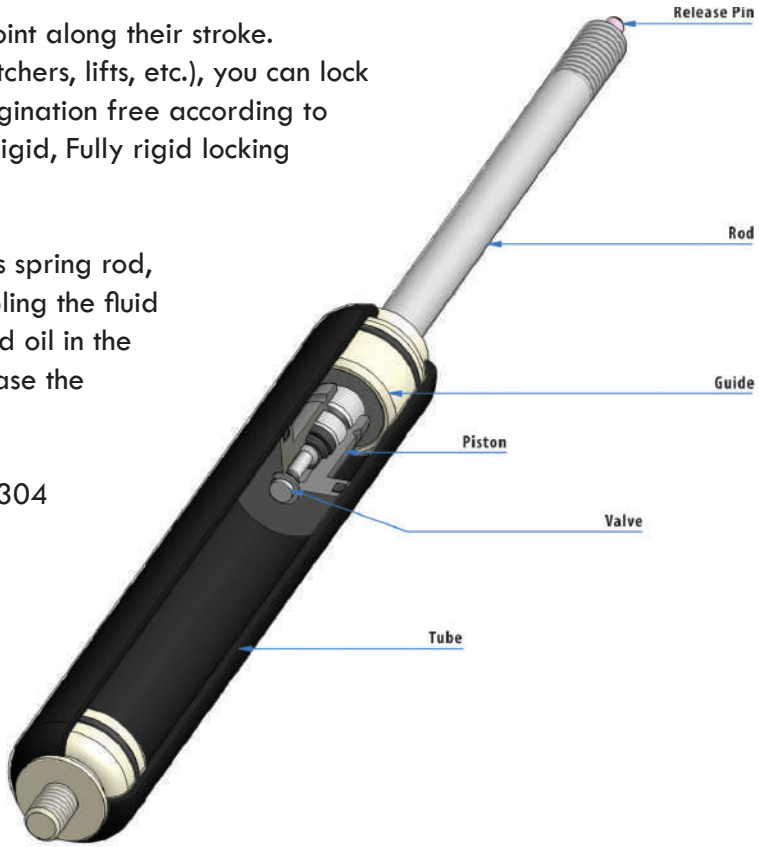
SPECIAL MADE LOCKING GAS SPRINGS

BM© locking gas springs can be locked at any point along their stroke. Regardless of the application (medical beds, stretchers, lifts, etc.), you can lock and unlock the spring as required. Give your imagination free according to the various models offered in the range: Elastic, Rigid, Fully rigid locking components.

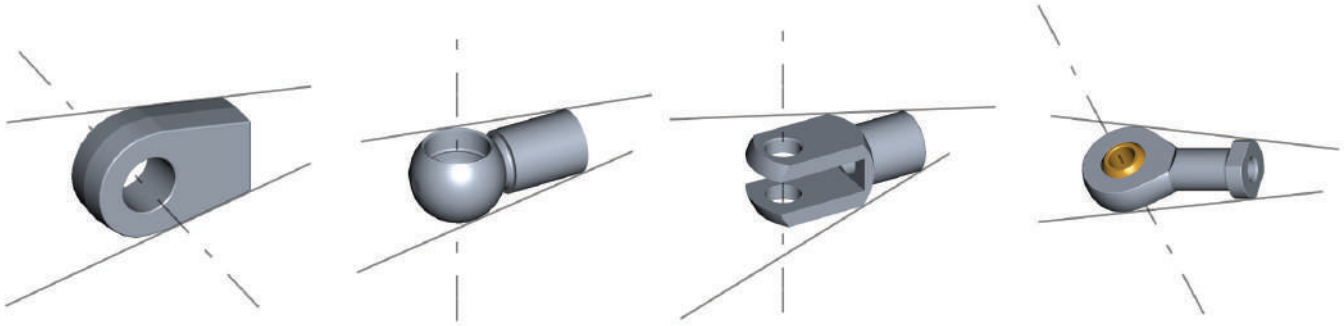
By pushing the release pin integrated into the gas spring rod, you will actuate opening of the piston valve enabling the fluid to move: nitrogen in the case of elastic locking and oil in the case of rigid locking components. When you release the pin, the spring will lock in position.

BM© gas springs may be made from steel, 303/304 stainless steel or 316L/316Ti stainless steel.

We have the trust of many customers in the medical sector, thanks to them.



END FITTINGS FOR THREADED GAS SPRINGS



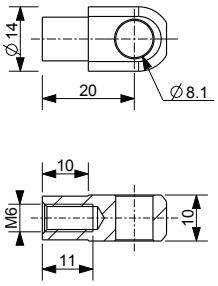
We offer a wide choice of 80 different end fittings for an optimum fit in your application.

Most of our end fittings are electro-galvanized, or made of plastic or Zamac (Zinc,Alu,Mg,Cu) and therefore corrosion resistant.

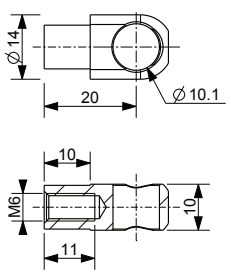
For each BM gas spring, you will find a range of compatible end fittings.

Caution : Always screw on the end fitting completely without any gap with the gas spring. Do not overtighten, just screw at the end your end fitting.

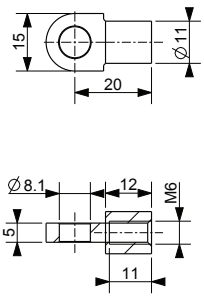
END FITTINGS M6

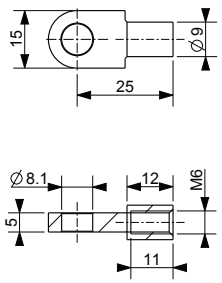
HG CHM6
ZINC PLATED STEEL

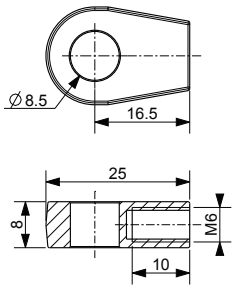
HG CHM6-10
ZINC PLATED STEEL

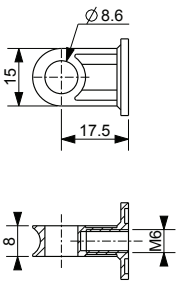
ST 092217
QPQ STEEL

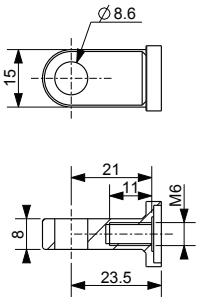
ST 092218
QPQ STEEL

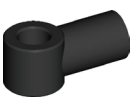
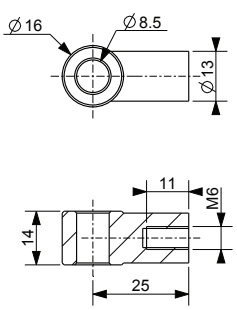
ST 092259
ZAMAK

ST 092263
ALUMINIUM

ST 092521
PLASTIC

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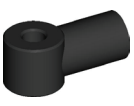
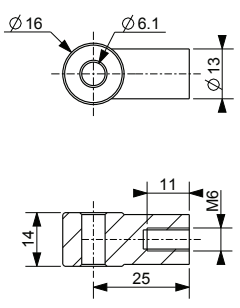
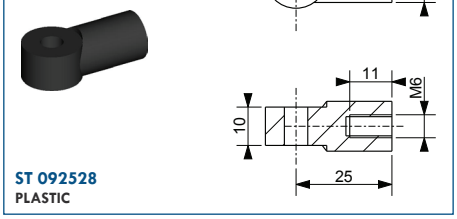



ST 092522-6
PLASTIC



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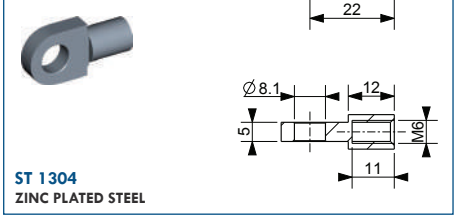
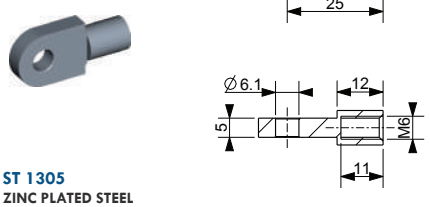
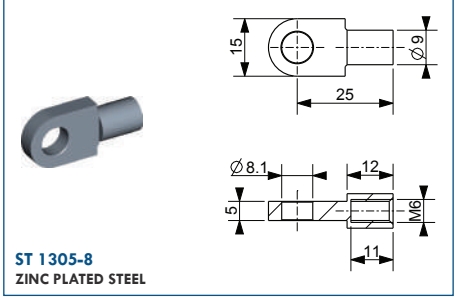
PLASTIC



ST 1304
ZINC PLATED STEEL



ST 1305
ZINC PLATED STEEL



ST 1305-8
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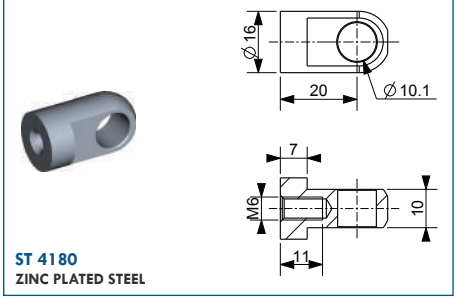

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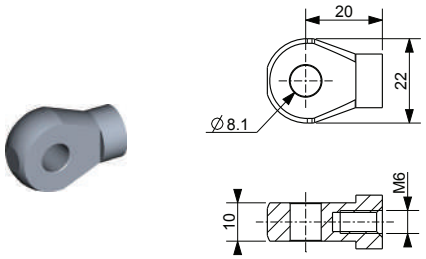
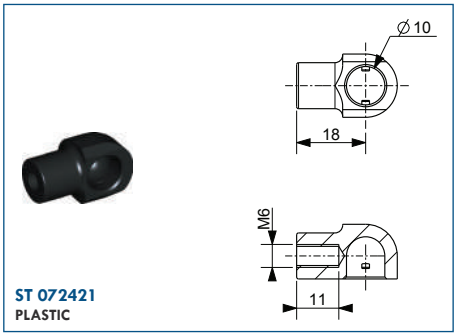
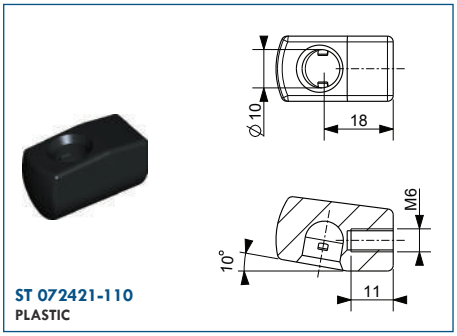
ZINC PLATED STEEL



ST 4185
ZINC PLATED STEEL



ST 072421
PLASTIC



ST 072421-110
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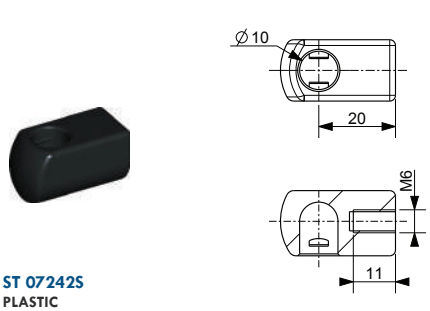
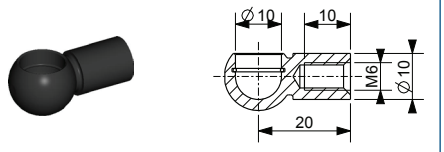
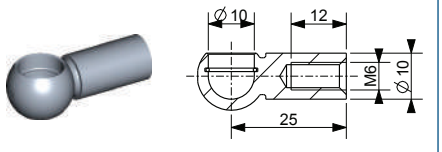


ST 07242S
PLASTIC



ST 092216
QPQ STEEL



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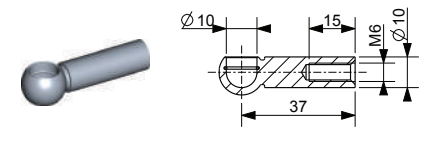

ST 092220-37
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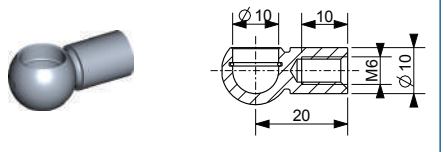

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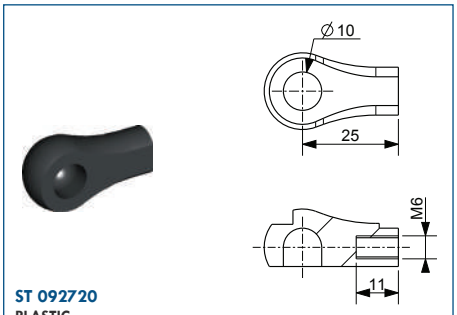

ST 092720
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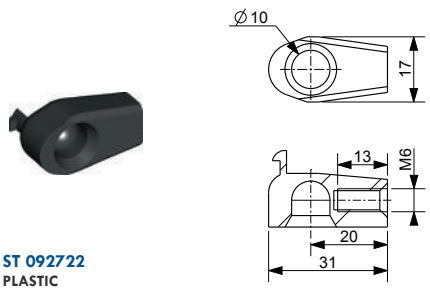

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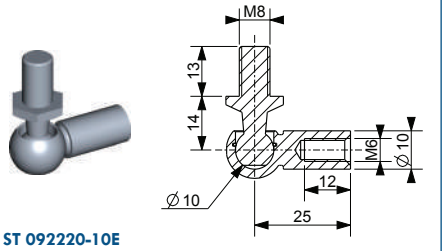
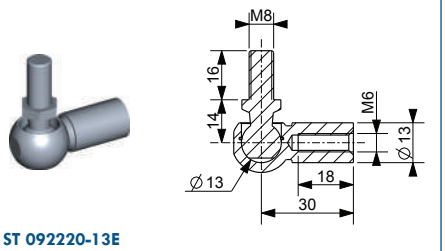
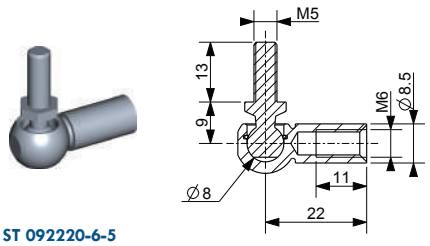


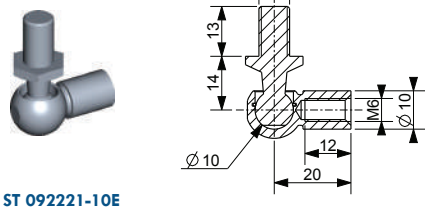
ST 092220-10E
ZINC PLATED STEEL



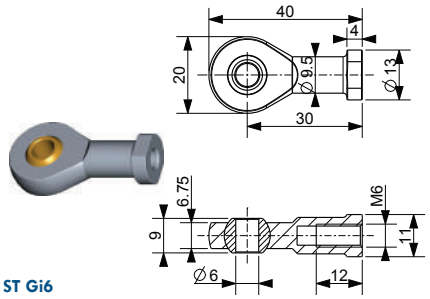
ST 092220-13E
ZINC PLATED STEEL



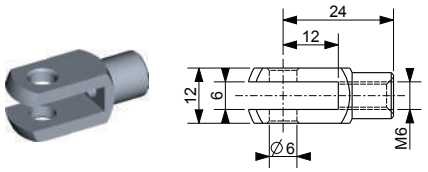
ST 092220-6-5
ZINC PLATED STEEL



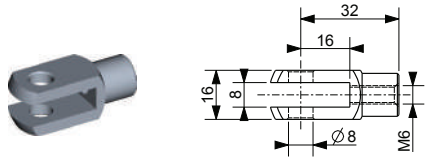
ST 092221-10E
ZINC PLATED STEEL



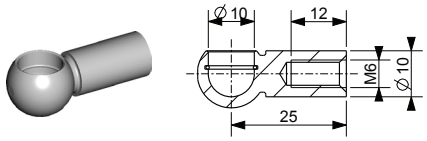
ST Gi6
ZINC PLATED STEEL / BRASS



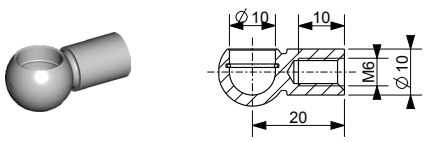
ST F6
ZINC PLATED STEEL



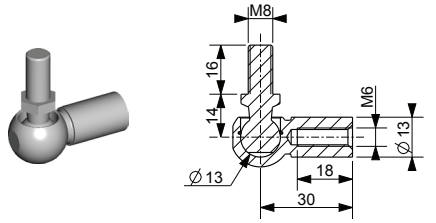
ST F8M6
ZINC PLATED STEEL



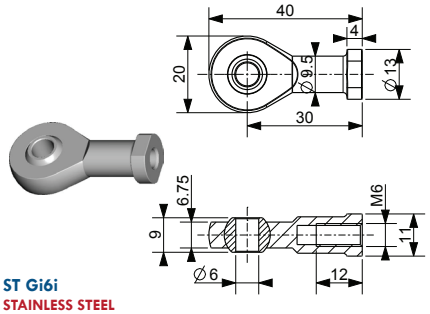
ST 092220i
STAINLESS STEEL



ST 092221i
STAINLESS STEEL

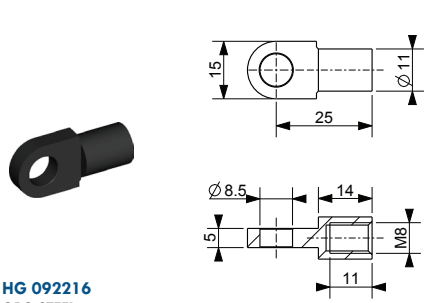


ST 092220-13iE
STAINLESS STEEL

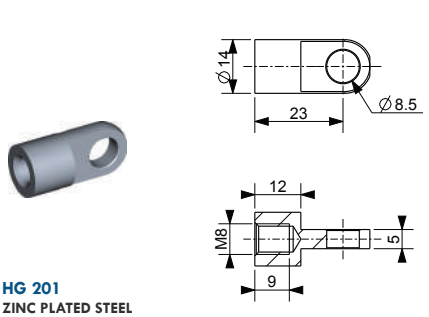


ST Gi6i
STAINLESS STEEL

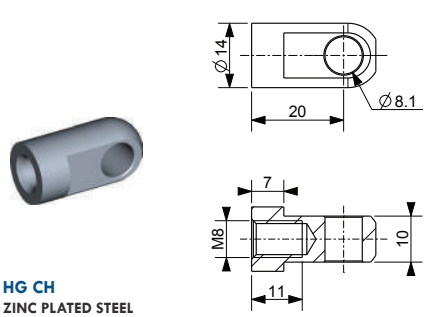
END FITTINGS M8



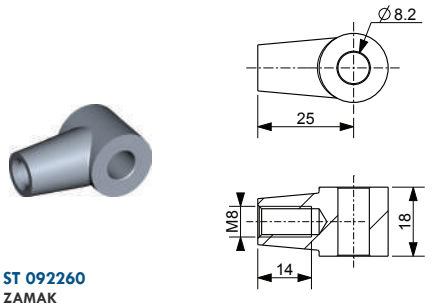
HG 092216
QPQ STEEL



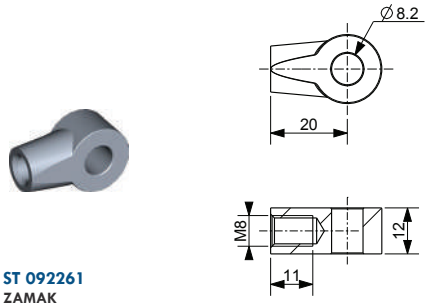
HG 201
ZINC PLATED STEEL



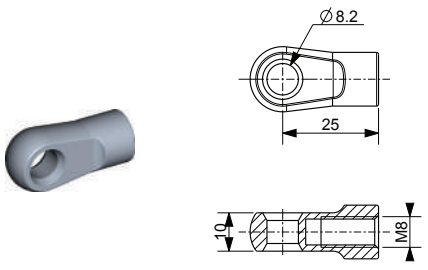
HG CH
ZINC PLATED STEEL



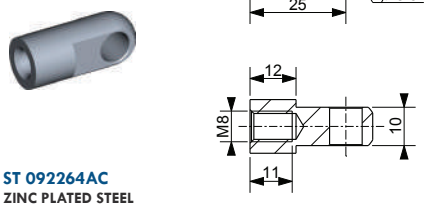
ST 092260
ZAMAK



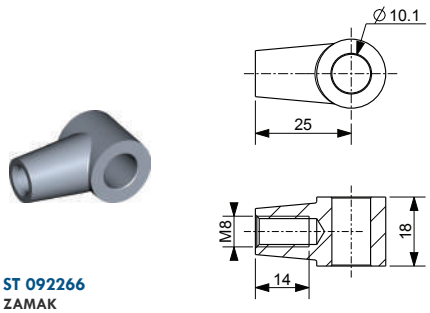
ST 092261
ZAMAK



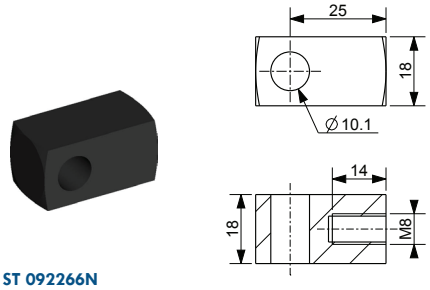
ST 092264
ZAMAK



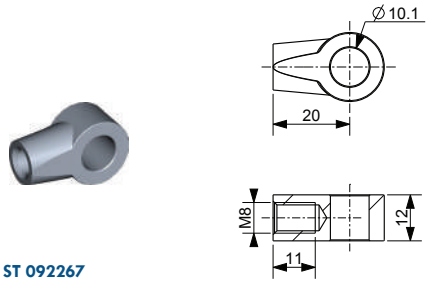
ST 092264AC
ZINC PLATED STEEL



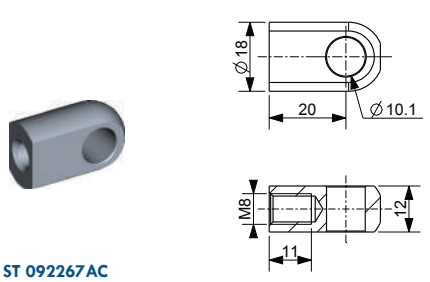
ST 092266
ZAMAK



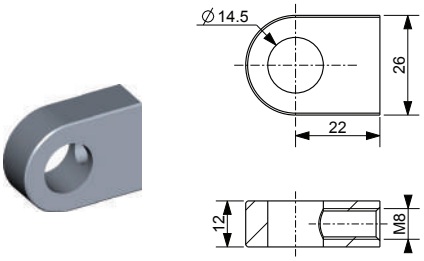
ST 092266N
QPQ STEEL



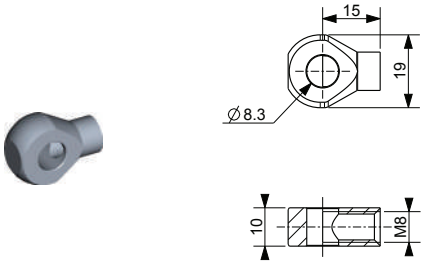
ST 092267
ZAMAK



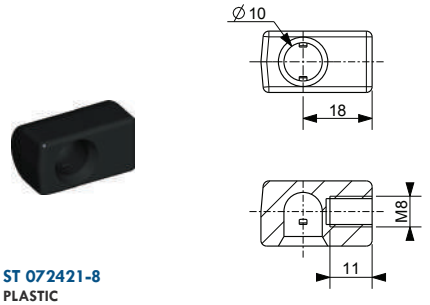
ST 092267AC
ZINC PLATED STEEL



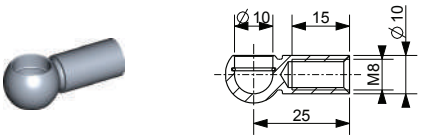
ST M1
ZINC PLATED STEEL



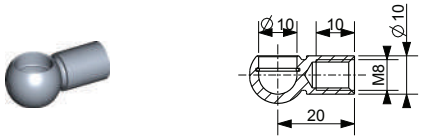
ST M2
ZINC PLATED STEEL



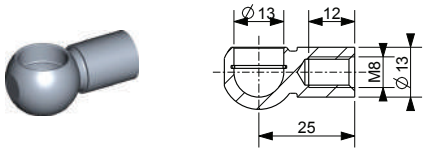
ST 072421-8
PLASTIC



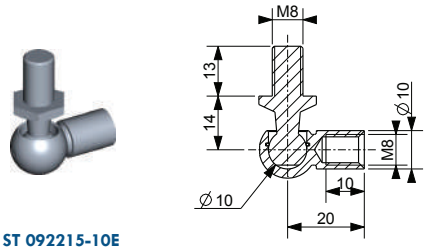
ST 092214
ZINC PLATED STEEL



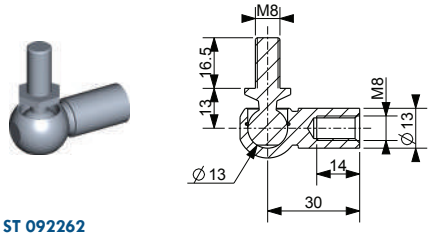
ST 092215
ZINC PLATED STEEL



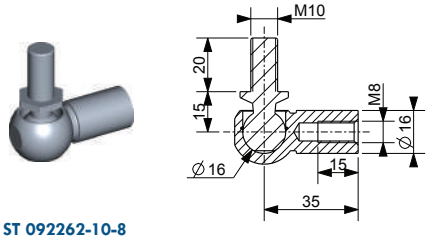
ST 092265C
ZINC PLATED STEEL



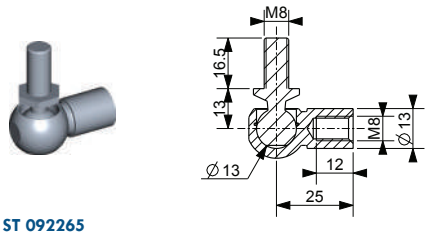
ST 092215-10E
ZINC PLATED STEEL



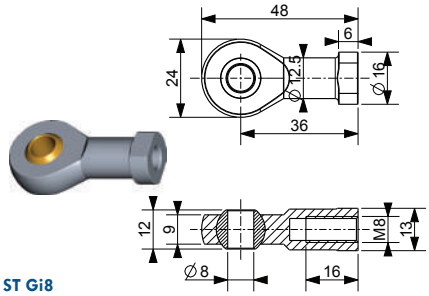
ST 092262
ZINC PLATED STEEL



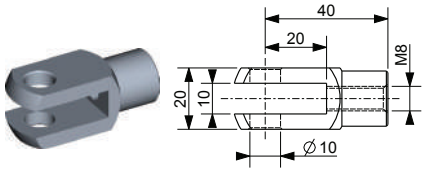
ST 092262-10-8
ZINC PLATED STEEL



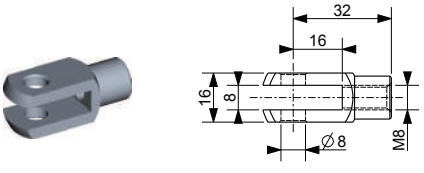
ST 092265
ZINC PLATED STEEL



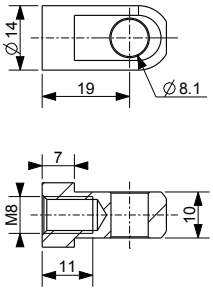
ST Gi8
ZINC PLATED STEEL / BRASS



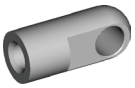
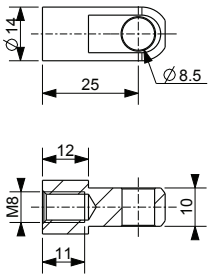
ST F10-8
ZINC PLATED STEEL



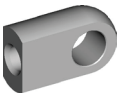
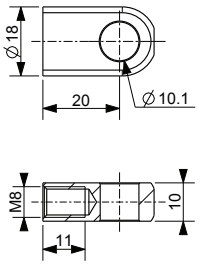
ST F8
ZINC PLATED STEEL

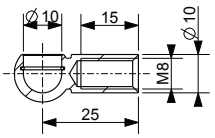
HG CHi
STAINLESS STEEL

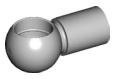
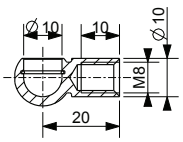
ST 092264i
STAINLESS STEEL

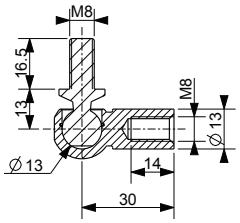
ST 092267i
STAINLESS STEEL

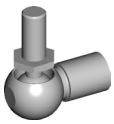
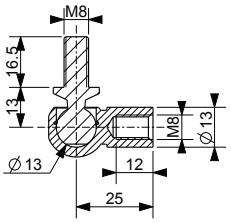
ST 092214i
STAINLESS STEEL

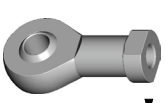
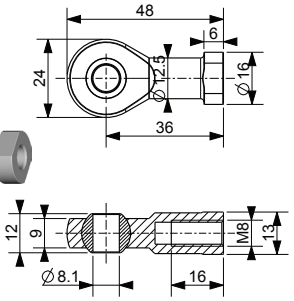
ST 092215i
STAINLESS STEEL

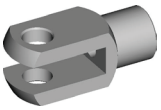
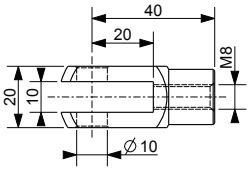
ST 092262i
STAINLESS STEEL

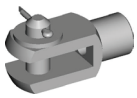
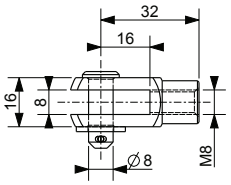
ST 092265i
STAINLESS STEEL

ST Gi8i
STAINLESS STEEL

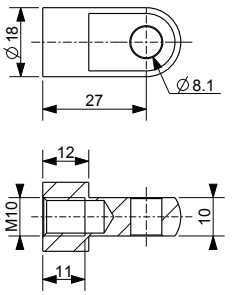



ST F10-8iN
STAINLESS STEEL

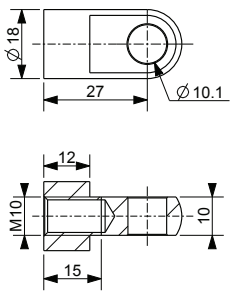



ST F8iN
STAINLESS STEEL

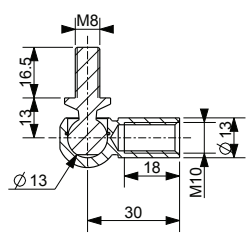
END FITTINGS M10

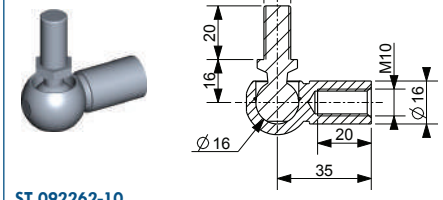
HG CH10
ZINC PLATED STEEL

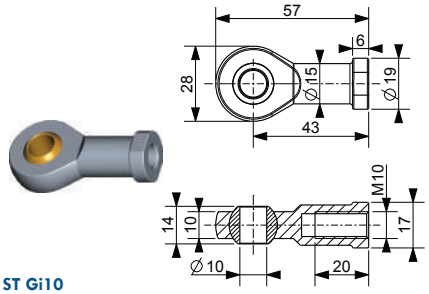
HG CH1010
ZINC PLATED STEEL

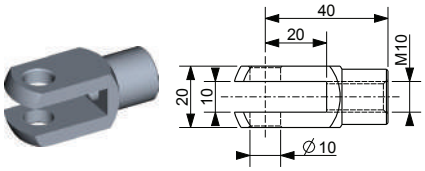
ST 092200
ZINC PLATED STEEL



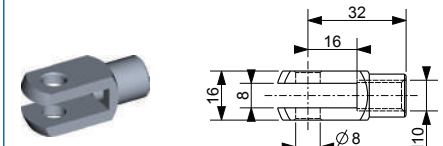
ST 092262-10
ZINC PLATED STEEL



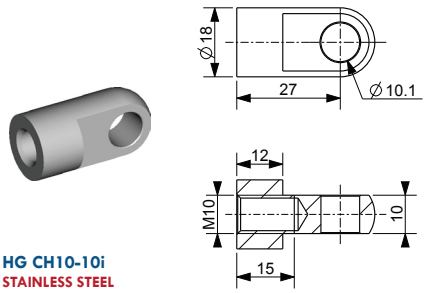
ST Gi10
ZINC PLATED STEEL / BRASS



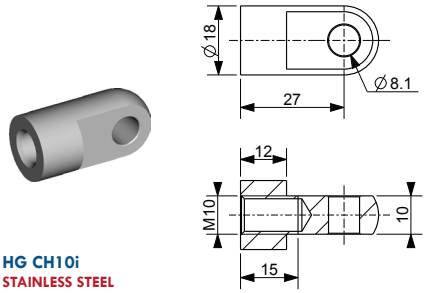
ST F10
ZINC PLATED STEEL



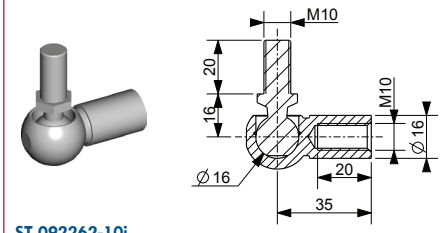
ST F8M10
ZINC PLATED STEEL



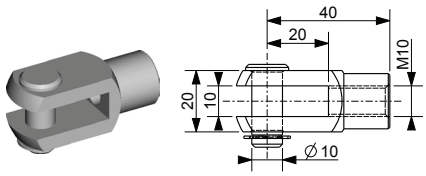
HG CH10-10i
STAINLESS STEEL



HG CH10i
STAINLESS STEEL

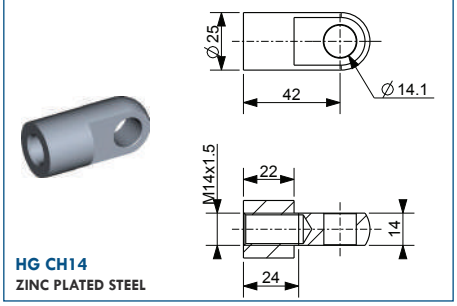


ST 092262-10i
STAINLESS STEEL

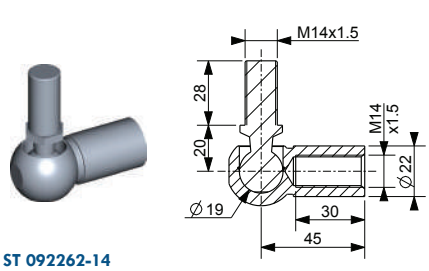


ST F10iN
STAINLESS STEEL

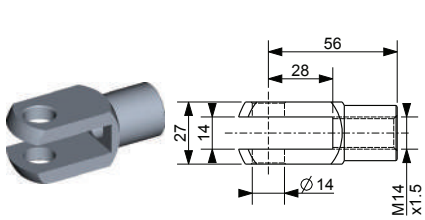
END FITTINGS M14



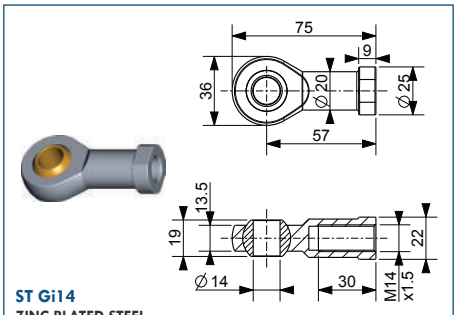
HG CH14
ZINC PLATED STEEL



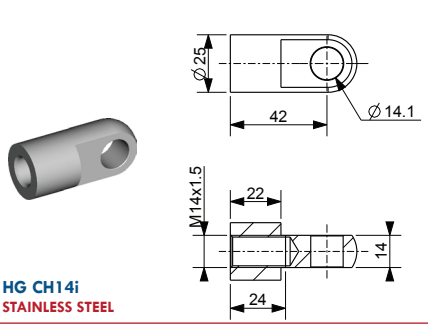
ST 092262-14
ZINC PLATED STEEL



ST F14
ZINC PLATED STEEL

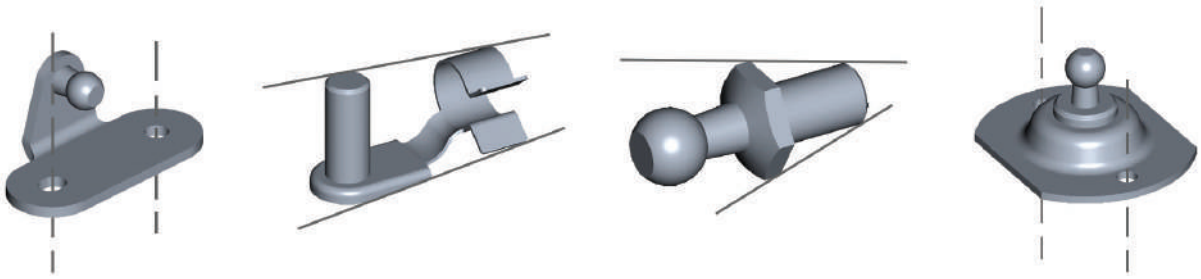


ST Gi14
ZINC PLATED STEEL



HG CH14i
STAINLESS STEEL

BRACKETS AND SPECIAL FITTINGS



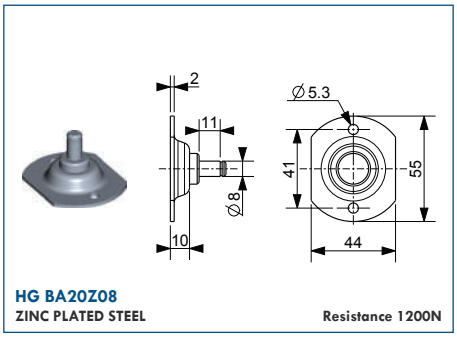
We offer more than 30 brackets to fix your gas spring in any situation.

For each Berthold Marx gas spring, you'll find a range of compatible brackets to match your chosen end fittings. If you've lost a needle on one of your brackets, we offer them individually.

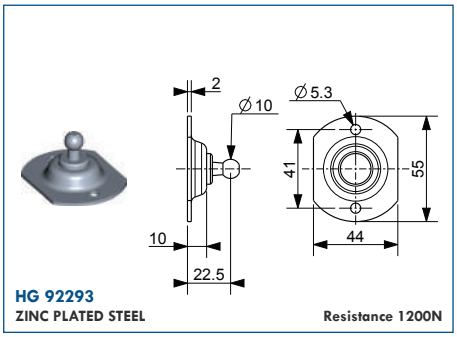
Caution : Depending on the Force of your gas spring, not all brackets are suitable. Please check of the chosen bracket drawing, the maximum resistance capacity.

Axle brackets are supplied complete with circlip..

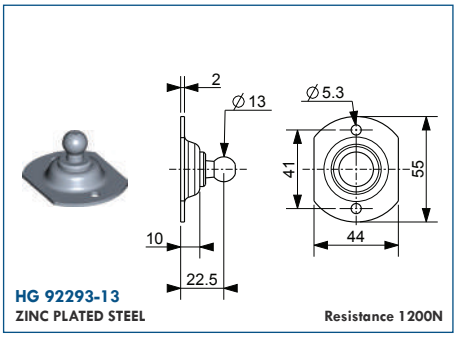
BRACKETS



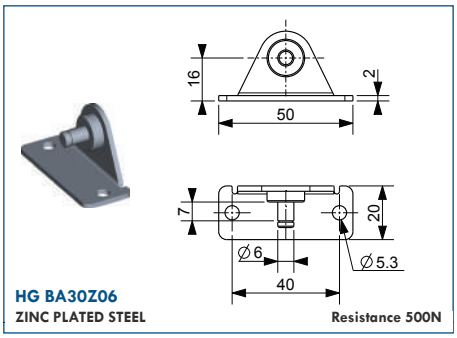
HG BA20Z08
ZINC PLATED STEEL — Resistance 1200N



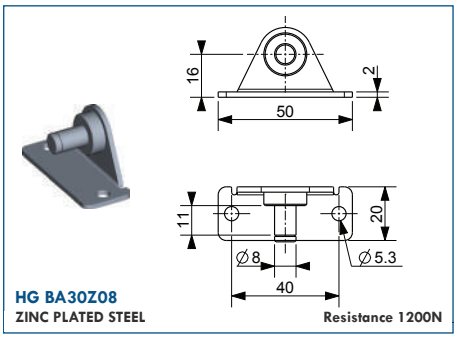
HG 92293
ZINC PLATED STEEL — Resistance 1200N



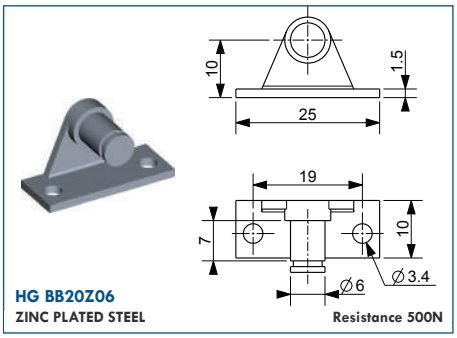
HG 92293-13
ZINC PLATED STEEL — Resistance 1200N



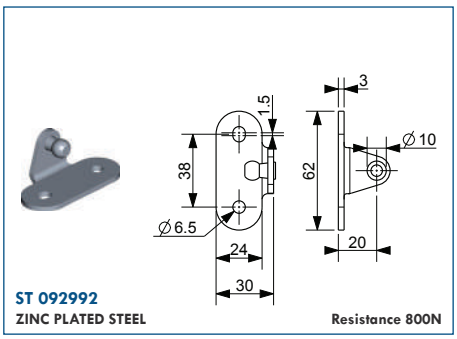
HG BA30Z06
ZINC PLATED STEEL — Resistance 500N



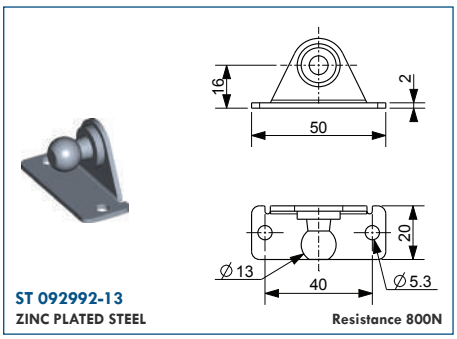
HG BA30Z08
ZINC PLATED STEEL — Resistance 1200N



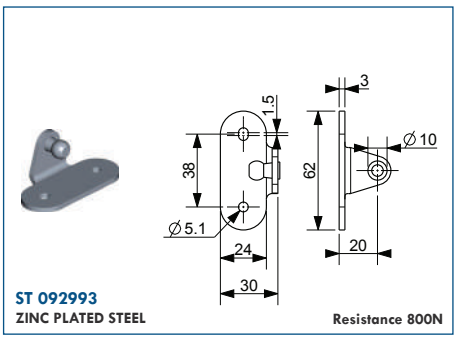
HG BB20Z06
ZINC PLATED STEEL — Resistance 500N



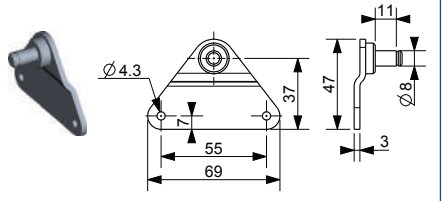
ST 092992
ZINC PLATED STEEL — Resistance 800N



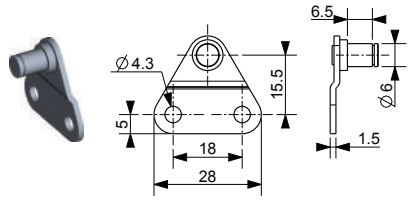
ST 092992-13
ZINC PLATED STEEL — Resistance 800N



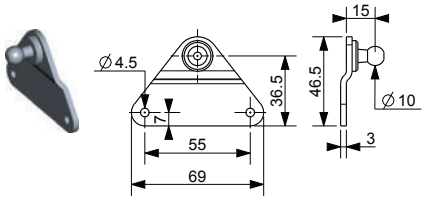
ST 092993
ZINC PLATED STEEL — Resistance 800N



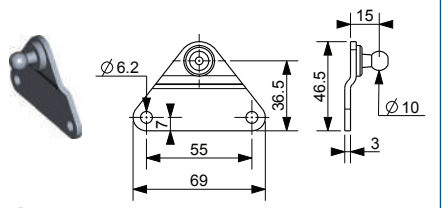
HG 101
ZINC PLATED STEEL — Resistance 1200N



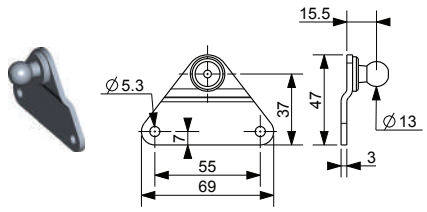
HG BB01Z06
ZINC PLATED STEEL — Resistance 500N



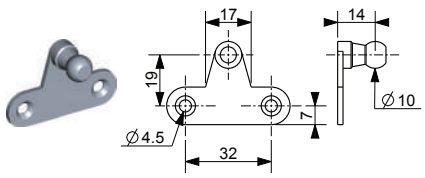
HG 092298
ZINC PLATED STEEL — Resistance 800N



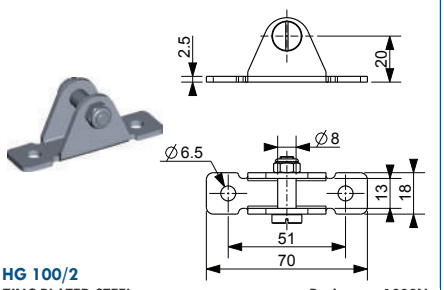
HG 092298-2
ZINC PLATED STEEL — Resistance 800N



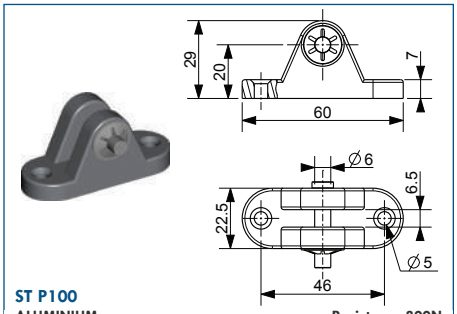
HG BA01K13
ZINC PLATED STEEL — Resistance 1200N



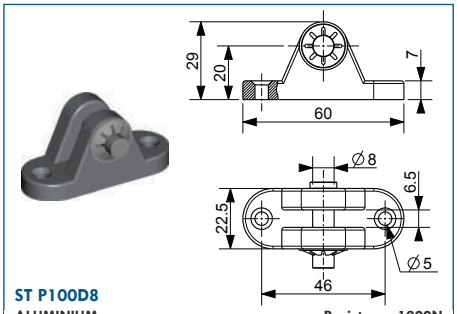
ST 092994
ZINC PLATED STEEL — Resistance 180N



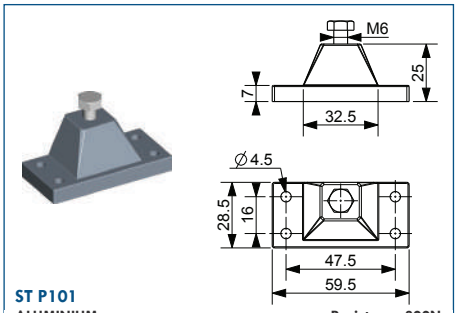
HG 100/2
ZINC PLATED STEEL — Resistance 1800N



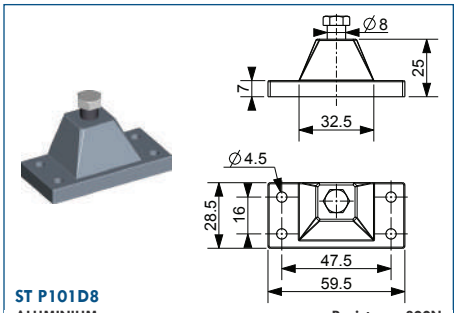
ST P100
ALUMINIUM — Resistance 800N



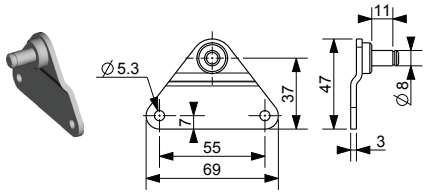
ST P100D8
ALUMINIUM — Resistance 1200N



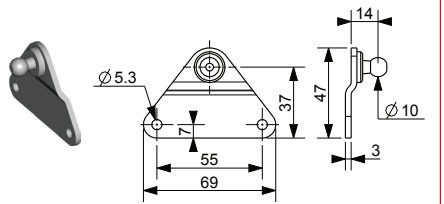
ST P101
ALUMINIUM — Resistance 800N



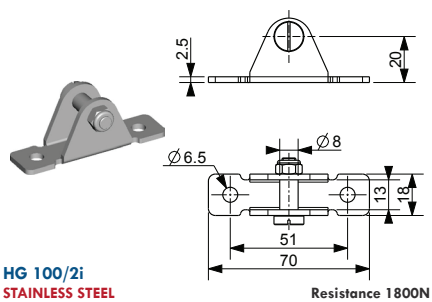
ST P101D8
ALUMINIUM — Resistance 800N



HG101i
STAINLESS STEEL — Resistance 1200N

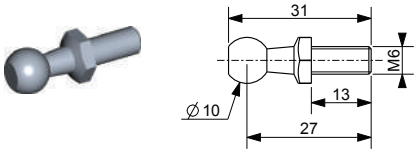


HG BA01K10iNOX
STAINLESS STEEL — Resistance 800N

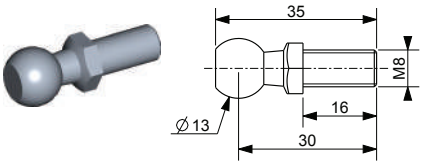


HG 100/2i
STAINLESS STEEL — Resistance 1800N

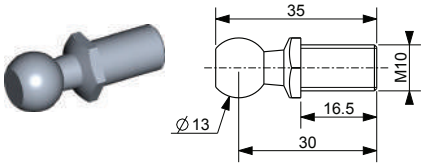
SPECIAL FITTINGS



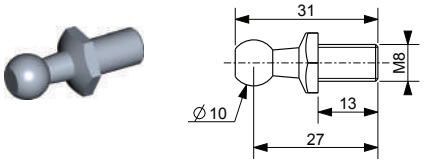
ST 092989
ZINC PLATED STEEL



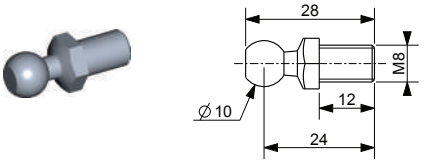
ST 092990-13
ZINC PLATED STEEL



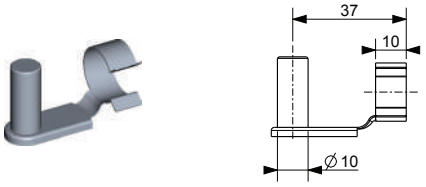
ST 092990-13M10
ZINC PLATED STEEL



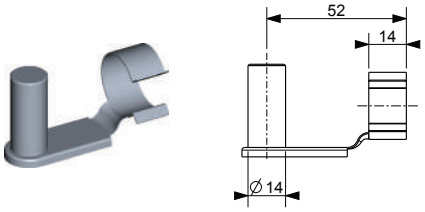
ST 092990A
ZINC PLATED STEEL



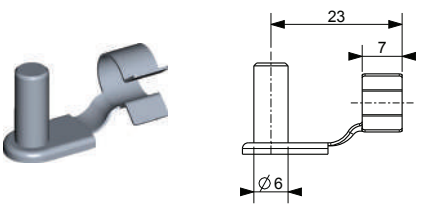
ST 092995
ZINC PLATED STEEL



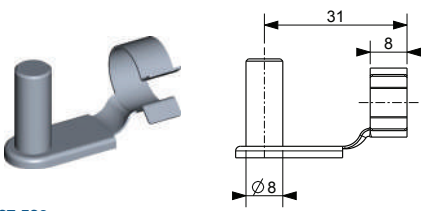
ST ES10
ZINC PLATED STEEL



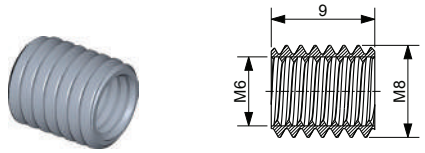
ST ES14
ZINC PLATED STEEL



ST ES6
ZINC PLATED STEEL



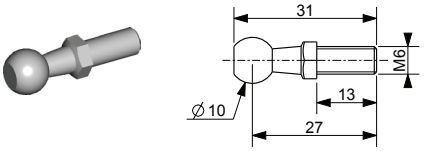
ST ES8
ZINC PLATED STEEL



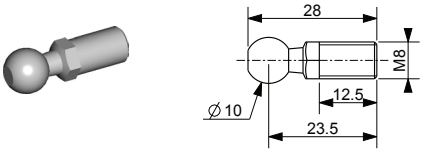
ST M6M8
ZINC PLATED STEEL

ST Ai
ZINC PLATED STEEL

ST Ai13
ZINC PLATED STEEL

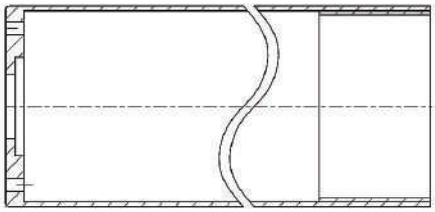


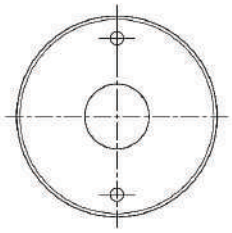
ST 092989i
STAINLESS STEEL



ST 092990i
STAINLESS STEEL

PROTECTION TUBES





Our protection tubes can be used as rod protection tube against chemical or mechanical splashes.
For long stroke gas springs (more than 400mm stroke) it can be used as a guiding tube against binding risks.
Please notice that you cannot fit a protection tube on a welded eye gas spring.

Caution : You can also extend the life of your gas springs by using a wiper ring (page 34) but in this case, you cannot use a protection tube at the same time.

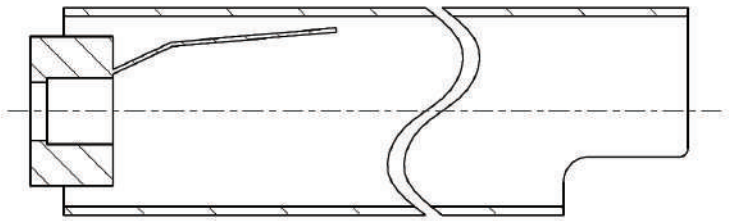
Features of compatible gas springs			Protective tube features		
Stroke (mm)	Rod Diameter (mm)	Spring Gas Ref	Tube Diameter (mm)	Drilling (mm)	Tube Ref
100	8	ST 100+F1V+D8	25	6.1	ST TU08100
120	8	ST 120+F1V+D8	25	6.1	ST TU08120
160	8	ST 160+F1V+D8	25	6.1	ST TU08160
180	8	ST 180+F1V+D8	25	6.1	ST TU08180
250	8	ST 250+F1V+D8	25	6.1	ST TU08250

Stroke (mm)	Rod Diameter (mm)	Spring Gas Ref	Tube Diameter (mm)	Drilling (mm)	Tube Ref
200	10	ST 200+F1V+D10 (+VA)	28	8.1	ST TU10200N
250	10	ST 250+F1V+D10 (+VA)	28	8.1	ST TU10250
350	10	ST 350+F1V+D10 (+VA)	28	8.1	ST TU10350
500	10	ST 500+F1V+D10 (+VA)	28	8.1	ST TU10500
600	10	ST 600+F1V+D10VA	28	8.1	ST TU10600
650	10	ST 650+F1V+D10VA	28	8.1	ST TU10650
700	10	ST 700+F1V+D10VA	28	8.1	ST TU10700

Stroke (mm)	Rod Diameter (mm)	Spring Gas Ref	Tube Diameter (mm)	Drilling (mm)	Tube Ref
100	14	ST 100+F1V+D14 (+VA)	32	8.5	ST TU14100
200 150	14 10	ST 200+F1V+D14 (+VA) ST T28150+F1V (Traction)	32	8.5	ST TU14200
250 200	14 10	ST 250+F1V+D14 ST T28200+F1V (Traction)	32	8.5	ST TU14250
400 300 350	14 10 10	ST 400+F1V+D14 ST T28300+F1V (Traction) ST T28350+F1V (Traction)	32	8.5	ST TU14400
500 400	14 10	ST 500+F1V+D14 ST T28400+F1V (Traction)	32	8.5	ST TU14500
550	14	ST 550+F1V+D14	32	10.5	ST TU14550
600	14	ST 600+F1V+D14VA	32	10.5	ST TU14600
650	14	ST 650+F1V+D14VA	32	10.5	ST TU14650
700	14	ST 700+F1V+D14VA	32	10.5	ST TU14700
750	14	ST 750+F1V+D14VA	32	10.5	ST TU14750
800	14	ST 800+F1V+D14VA	32	10.5	ST TU14800
900	14	ST 900+F1V+D14VA	32	10.5	ST TU14900

Stroke (mm)	Rod Diameter (mm)	Spring Gas Ref	Tube Diameter (mm)	Drilling (mm)	Tube Ref
150	20	ST 150+F1V+D20	45	14.5	ST TU20150

LOCKING TUBES



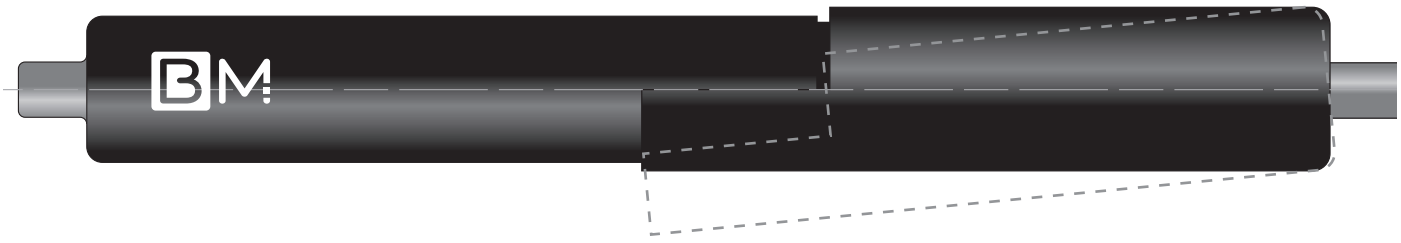
Our locking tube are used to secure the gas spring in an open position (completely extended). Mostly used when people can stay under the hatch, in order to avoid an none expected close of them.
To release, simply press of the press sticker to put the tube in line with the tube and the gas spring will close. Please notice that the locking tube will use approx. 20mm of the existing stroke.

Caution : Locking tubes are not suitable of welded eyes gas springs, or if you have already a wiper ring installed.

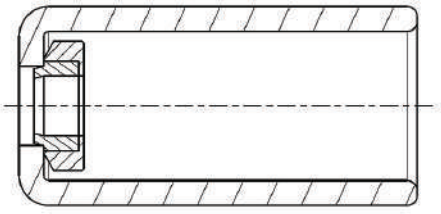
Features of compatible gas springs			Locking tube features		
Stroke (mm)	Rod Diameter (mm)	Spring Gas Ref	Tube Diameter (mm)	Drilling (mm)	Tube Ref
120	8	ST 120+F1V+D8	25	7	ST TUB08120
140	8	ST 140+F1V+D8	25	7	ST TUB08140
160	8	ST 160+F1V+D8	25	7	ST TUB08160
180	8	ST 180+F1V+D8	25	7	ST TUB08180
200	8	ST 200+F1V+D8	25	7	ST TUB08200
250	8	ST 250+F1V+D8	25	7	ST TUB08250

Stroke (mm)	Rod Diameter (mm)	Spring Gas Ref	Tube Diameter (mm)	Drilling (mm)	Tube Ref
200	10	ST 200+F1V+D10 (+VA)	28	9	ST TUB10200
250	10	ST 250+F1V+D10 (+VA)	28	9	ST TUB10250
300	10	ST 300+F1V+D10 (+VA)	28	9	ST TUB10300
350	10	ST 350+F1V+D10 (+VA)	28	9	ST TUB10350
400	10	ST 400+F1V+D10 (+VA)	28	9	ST TUB10400
500	10	ST 500+F1V+D10 (+VA)	28	9	ST TUB10500

Stroke (mm)	Rod Diameter (mm)	Spring Gas Ref	Tube Diameter (mm)	Drilling (mm)	Tube Ref
200	14	ST 200+F1V+D14 (+VA)	32	9	ST TUB14200
250	14	ST 250+F1V+D14	32	9	ST TUB14250
300	14	ST 300+F1V+D14 (+VA)	32	9	ST TUB14300
350	14	ST 350+F1V+D14	32	9	ST TUB14350
400	14	ST 400+F1V+D14	32	9	ST TUB14400
450	14	ST 450+F1V+D14 (+VA)	32	9	ST TUB14450
500	14	ST 500+F1V+D14	32	9	ST TUB14500
600	14	ST 600+F1V+D14	32	10.1	ST TUB14600
650	14	ST 650+F1V+D14	32	10.1	ST TUB14650



WIPER RINGS

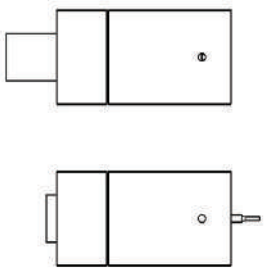


Composed of a ring, a seal and a cap, the wiper ring is used for cleaning the rod surface each time you use your gas spring. This part can extend the life of the internal sealing from gas spring.
The material is Alu/NBR/PVC.

Caution : Not compatible with a protection tube or locking tube. Will use a little bit of the gas spring Force.

Available sizes according to BM standards			
Dimensions (mm)	**Used Strokes (mm)**	**Force consumed (N)**	**Reference**
Tige 6 - Corps 15	7	De 10 à 25	ST RAC06-15
Tige 8 - Corps 18-19	7.5	De 10 à 20	ST RAC08-19
Tige 10 - Corps 21-23	8	De 10 à 20	ST RAC10-23
Tige 14 - Corps 27-28	8.5	De 10 à 20	ST RAC14-28
Tige 20 - Corps 40	9.5	De 15 à 35	ST RAC20-40

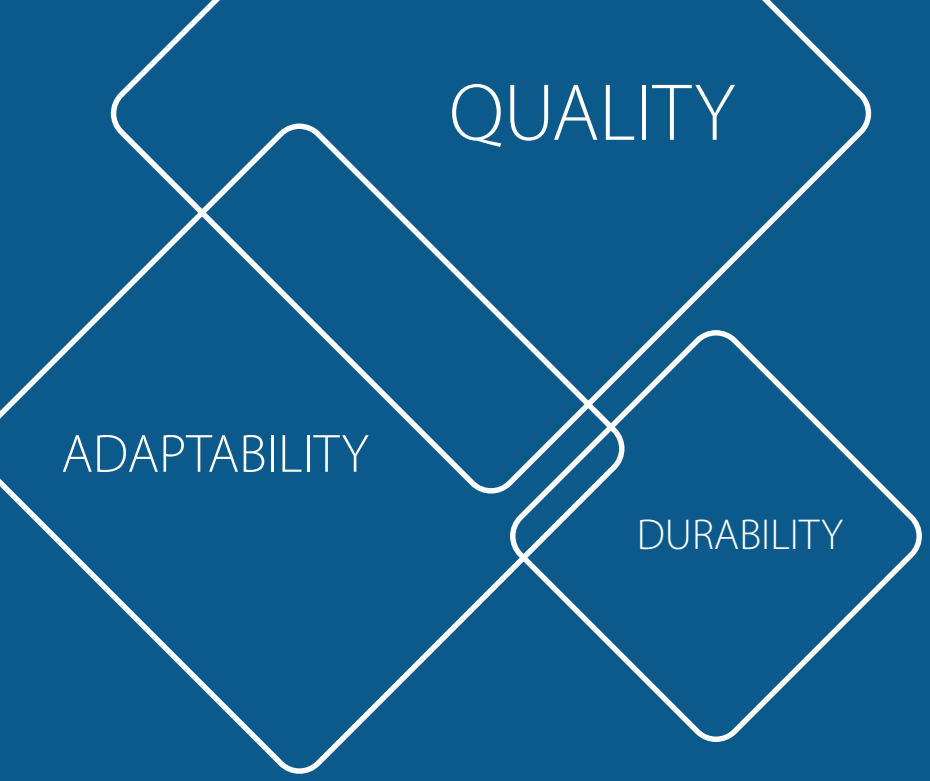
GAS RELEASE TOOLS



This tool is used to reduce the pressure inside the gas spring so finally he's Force. You screw on the tool and push of the button to release the gas. Press by short pushes, not to release too fast the pressure and decrease too much for Force. If you reduce too much the pressure, please contact use for a refill operation.

Caution : Evacuate Nitrogen by briefly pressing the button to avoid emptying all the gas.
Available in different Threads

Valve Thread	Reference
M6	ST OUT6
M8	ST OUT8
M10	ST OUT10
M14	ST OUT14



TECHNICAL INFORMATION

INFORMATIONS TECHNIQUES

INFORMATIONES TECHNIQUES

BERTHOLD MARX GAS SPRINGS

• Producing a **good quality product for an attractive price** is our guiding principle during all the production.

• The gas springs **do not require any particular maintenance.**

• The majority of our range is **AVAILABLE on stock!**

• Our standard gas springs have the same extended lenght as the majority of our competitors, therefore **easily interchangeable.**

• Most of our gas springs integrate a **QPQ treated rod (Nitriding).** Treatment performed inside our factory

• The tubes of our gas springs are coated with a **black electrostatic epoxy paint,** for a better corrosion resistance.

• Most of our end fittings are electro-galvanized, or made of plastic or Zamac (Zinc,Alu,Mg,Cu) and therefore **corrosion resistant.**

• We can produce **custom made gas springs** a especially for you!

• More than **100 end fittings and brackets available** for optimal fixation.

• In option, we can add a grease chamber in the gas spring in order **to use it in any position you want and store them longer.** A minimum production quantity is required to produce them.

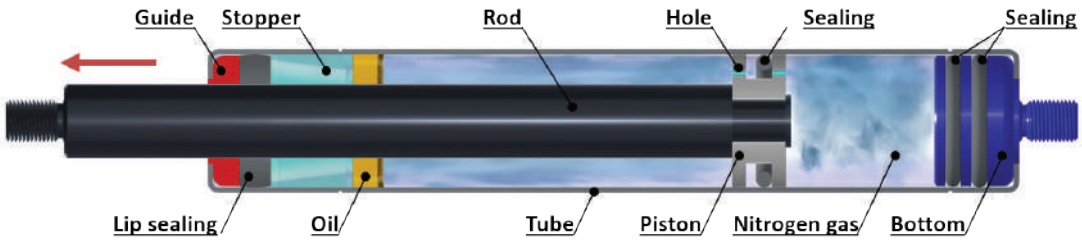
• A gas release tool can be used **to reduce the pressure** inside the gas spring so finally his Force (for valve gas springs).

• The protection tube will **reduce the risk to damage the rod from gas spring.**

• In most cases, the wiper ring removes any dirt from the gas spring rod and **protects the internal seal from wear.**

• The locking tube is used **to secure the gas spring** in open position when people are staying under the hatch.

HOW A COMPRESSION GAS SPRING WORKS



The piston is pushed forward inside the gas spring under gas pressure. This gas spring as an extension speed regulation.

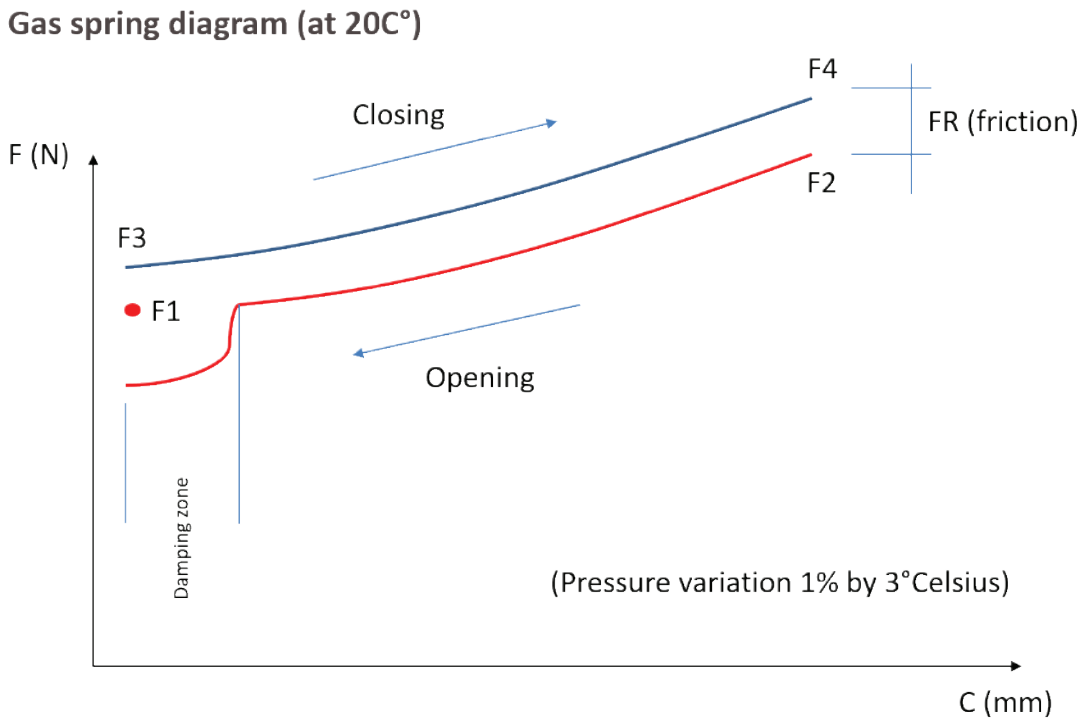
Use example: Push hatches up

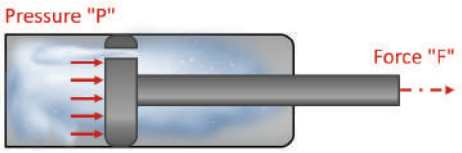
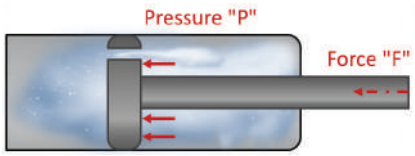
Detailed operation :
The compression gas spring consists of a carbon steel tube (also called body) and a **Piston** at the end of a **Rod,** which operate compression and extension cycles inside the **Tube.** Inside the gas spring **Tube,** you have pressurized **Nitrogen** and a small quantity of **Oil.**

During the compression phase, when **Rod** enter in the closed volume inside the **Tube,** the pressure increases and therefore the **Force** of the gas spring. And opposite when **Rod** goes out (volume increase again and pressure decrease)

You can regulate the extending speed by adjusting **Hole** diameter from **Piston.** Standard 0.25m/s

The progression rate is the ratio between **Force** rod inside and **Force** rod outside. It can be modified by using different couples of **Rods** and **Tubes.** Smaller is the **Rod** and bigger is the **Tube,** less progression you will have.



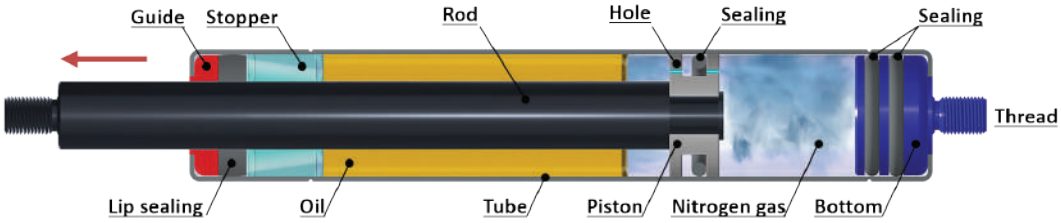
Determination of a FORCE: Force = Pressure x Surface (DaN) (bars) (cm2 of piston) (1 DaN = 10N) (P Max 160 bars)		Volume increases therefore pressure and force decreases
Mariotte's law : Pressure x Volume = Constant (at ISO temperature) P in Pascal (100 000 Pascal = 1 bars) V in M3		Volume decreases therefore pressure and force increases

HOW A DAMPER GAS SPRING WORKS

Same as for the compression gas spring but with more oil inside (65% of internal volume).

Advantage : The damping zone will be longer then for a standard gas spring
When piston enter in Oil, speed will decrease at 0.1m/s

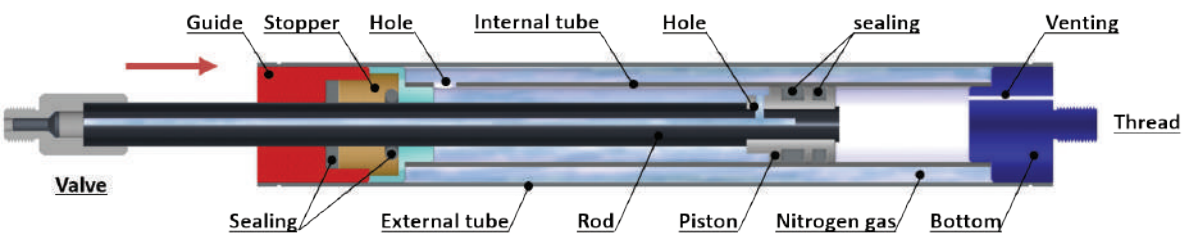
Disadvantage : Progression rate is higher than of a standard gas spring
Maximum Force is less than of a standard gas spring



HOW A TENSION (TRACTION) GAS SPRING WORKS

Tension gas springs also named traction gas springs operate in the direction opposite of compression gas springs. Behind the piston you have atmospheric pressure. In front of the piston you have Nitrogen pressure. So logically, piston goes from left out position to right in position under Nitrogen pressure.

The result is a pulling movement from gas spring. The inner tube is made of stainless steel to avoid the risk of corrosion caused by air intake.

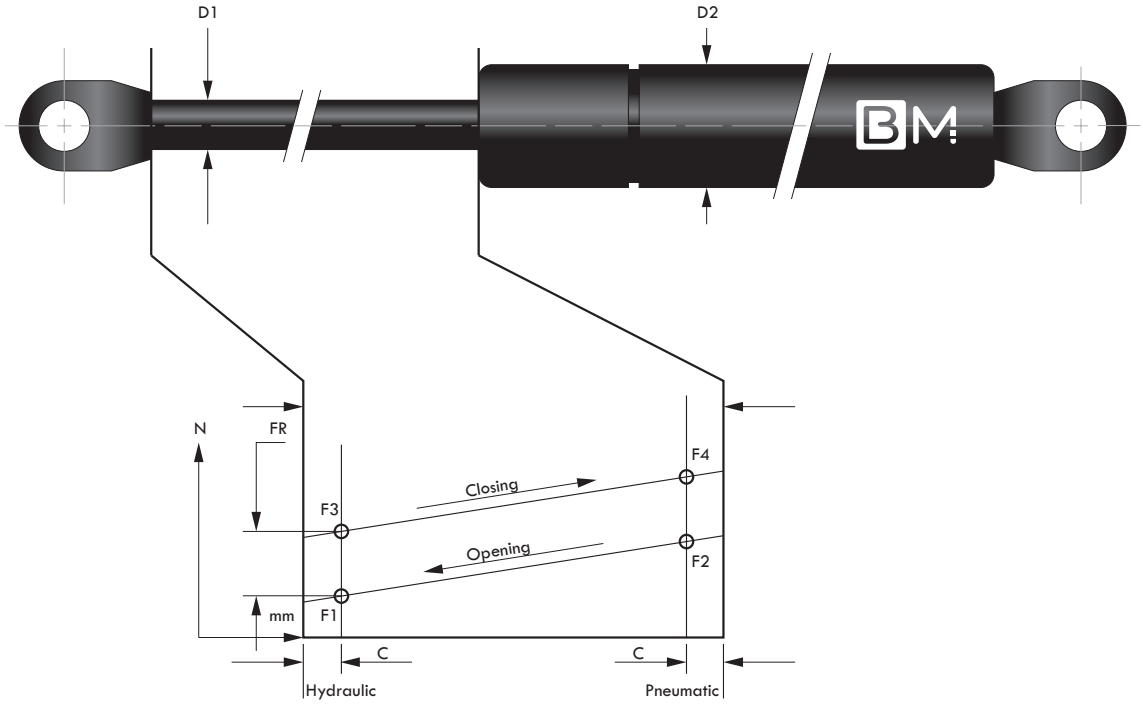


FORCE DIAGRAM

• The forces «**F1**» and «**F3**» are measured at the distance «**C**» from the ends.
• The difference between the extension force and the compression force of the spring at the same rod position is due to internal friction «**FR**»
• The **Progression X = F2/F1.**

Table for standard compression gas springs :

D1 (mm)	D2 (mm)	Pushing Force (F1 in N)	Max stroke (mm)	X (~)	C (mm)	Max FR (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	150
20	40	5200	500	1.45	5	300



HOW TO INSTALL A GAS SPRING IN AN APPLICATION?

Please note that the more information you have, the more accurate and therefore efficient the gas spring will be.

First of all, it is necessary to know the environment in which the gas springs will evolve : temperature, dust, aggressive environment, food etc.

The dimensions of the moving part (RH and LH) and the Weight to be lifted should be taken into account when choosing the diameter of the gas spring rod and the type of end fitting (environment, frequency of use, operator etc).

Force calculation

To calculate the **force F1** of a gas spring in these two cases, the following formula should be applied:

- **N**= Number of gas springs, **RH**= in meters, **m**= Weight in Kg, **X2**= in meters, **5**= Friction force
- You can use our website to do this operation *https://www.bertholdmarx.com/en*

$$\left(\frac{(RH \times m)}{2 \times N \times (X2)} + 5 \right) X\ 9.81 = \textbf{force F1 (N)}$$

Adjust the force at upper tolerance:

F1 = 30 < N < 50 Add + 0N

F1 = 50 < N < 250 Add + 20N

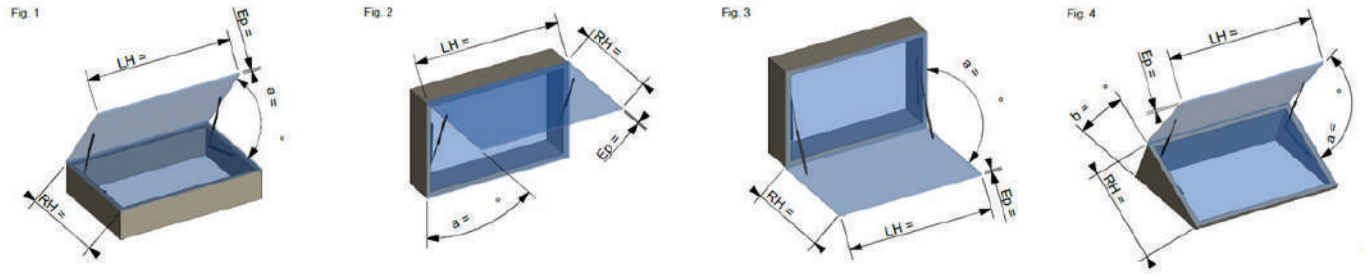
F1 = 250 < N < 750 Add + 30N

F1 = 750 < N < 1500 Add + 60N

F1 = 1500 < N < 3000 Add + 150N

F1 = 3000 < N < 6000 Add+ 300N

Application type



*Dimensions are in mm

Case study with Fig. 1

• Application type: Floor hatch – Ground level trapdoor (Most common)

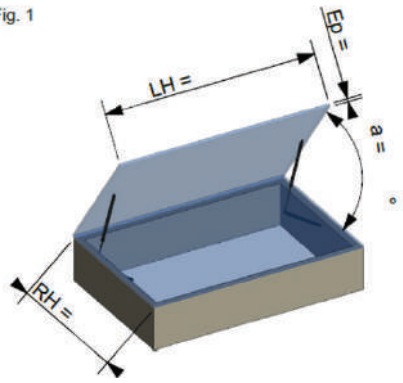
• To open a door with a 90° opening angle, the following rule must be observed: **Stroke = 1/3 of RH**

Exemple :

• RH = 950mm, LH = 1500mm, Weight = 30Kg, Opening angle = 90°, Number of gas springs=2
• Stroke: 950/3= 316mm => see our catalogue to choose the closest stroke = in this case : 300mm

• We can use the reference: ST 300 +F1+ D10

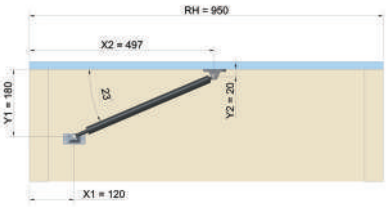
Fig. 1



Fixing

Important : All the dimensions are taken from the axis of rotation

On the frame: The dimension **Y1** will be less than the stroke, **X1** will give the gas spring the necessary angle to the lever arm to start the movement, an ideal position will give an angle of 15° to 25° to the gas spring when the door is closed.



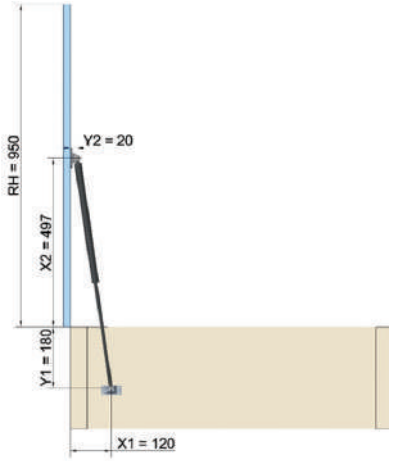
On the opening

The dimension **X2** will be defined by the extended length of the gas spring and the maximal opening angle.

Y2 will take into account the thickness of the door as well as the type of fixing bracket chosen.

In this example: **X2** = 497mm, **Y2** = 20mm

If all the parameters are accurate, the hatch should be closed with is own weight.



MAIN APPLICATIONS

VEHICLES

- Car
- Truck
- Motorhome
- Food truck
- Tractor
- Backhoe loader
- Trailer
- Boat

INDUSTRY

- Machine cover
- Conveyor belt
- Oven door
- Scanner

BUILDING AND FURNITURE

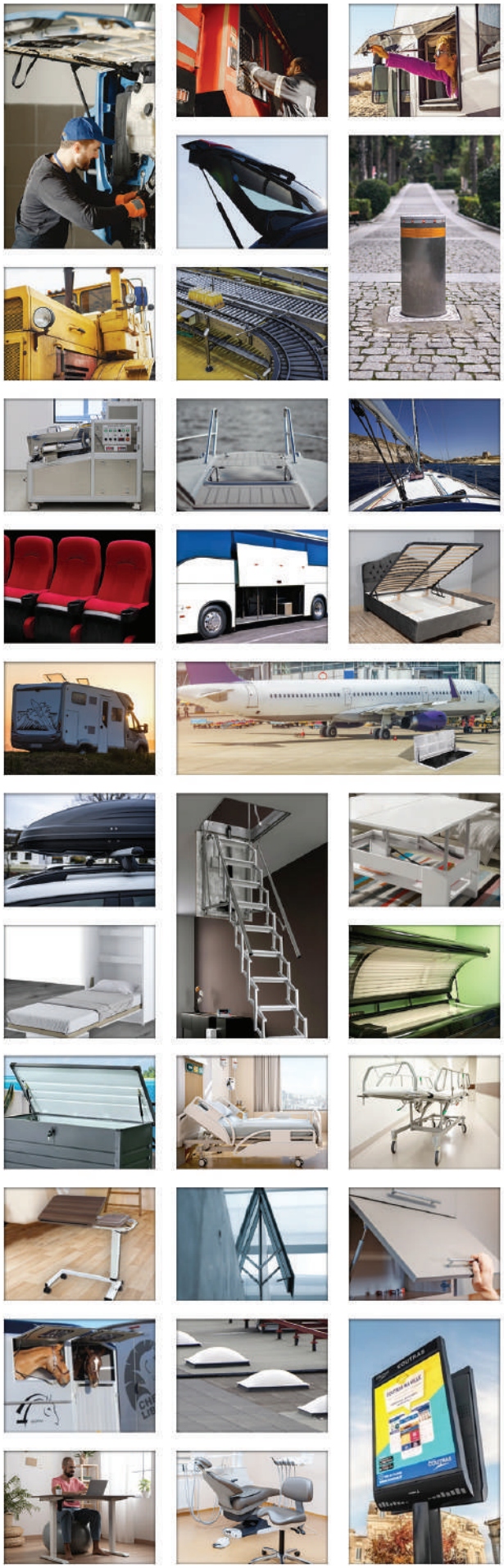
- Street furniture
- Smoke extraction window
- Hatche
- Cinema seat
- Kitchen

MEDICAL

- Ambulance
- Stretcher
- Medical bed
- Lift table

OTHERS APPLICATIONS

- Bus and coach luggage compartment
- Farm cabin
- Van
- Caravan trunk
- Lift-up bed
- Machine arms
- Lift-up seat
- Roof box
- Garden box tailgate
- Lift-up desk
- Retractable attic ladder
- Solarium
- Garage door
- TV Stand



REQUEST FOR EQUIVALENCE (THREADED OR WELDED EYES)

D84BISV02

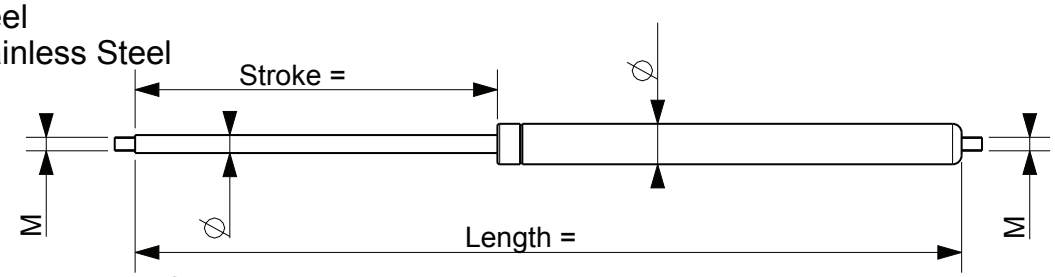
Brand :
Reference :

Please send back this document to :
info@bertholdmarx.com

☐ Threaded end

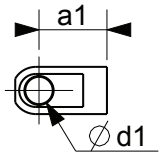
F1 Force : N

☐ Steel
☐ Stainless Steel



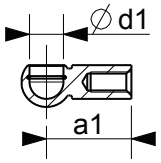
Rod end fitting

Eyelet



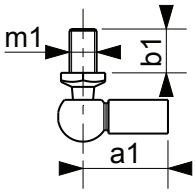
Length a1 : mm
∅ Hole d1 : mm
Thickness : mm

Ball socket



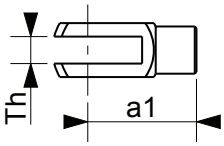
Length a1 : mm
∅ Ball d1 : mm
Material :
☐ Steel ☐ Plastic

Ball joint



Length a1 : mm
Length b1 : mm
Thread m1 : M
Material :
☐ Steel ☐ Plastic

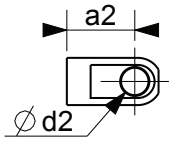
Fork



Length a1 : mm
∅ Hole : mm
Thickness : mm

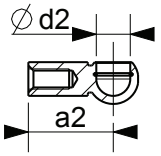
Cylinder end fitting

Eyelet



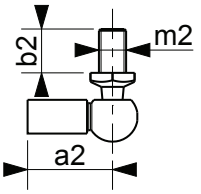
Length a2 : mm
∅ Hole d2 : mm
Thickness : mm

Ball socket



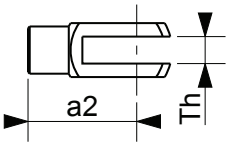
Length a1 : mm
∅ Ball d1 : mm
Material :
☐ Steel ☐ Plastic

Ball joint



Length a1 : mm
Length b1 : mm
Thread m1 : M
Material :
☐ Steel ☐ Plastic

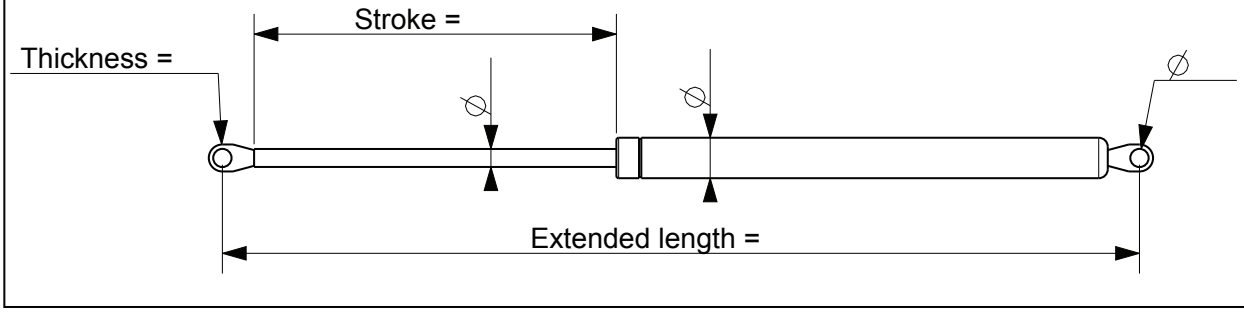
Fork



Length a2 : mm
∅ Hole : mm
Thickness : mm

☐ Welded eyes

F1 Force : N



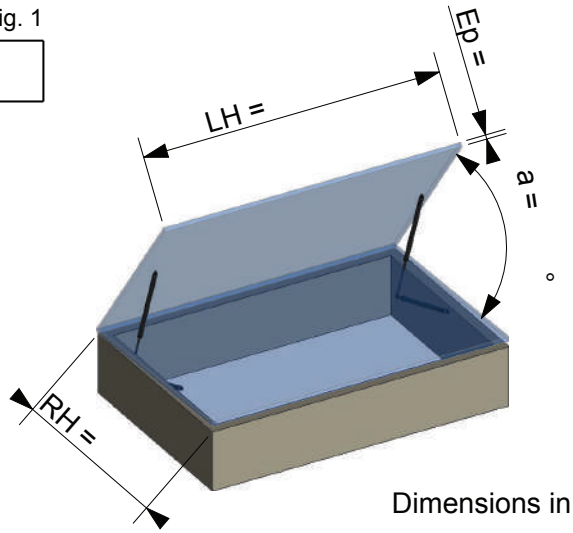
Dimensions should be taken with the rod fully extended

REQUEST OF DETERMINATION

Application type :

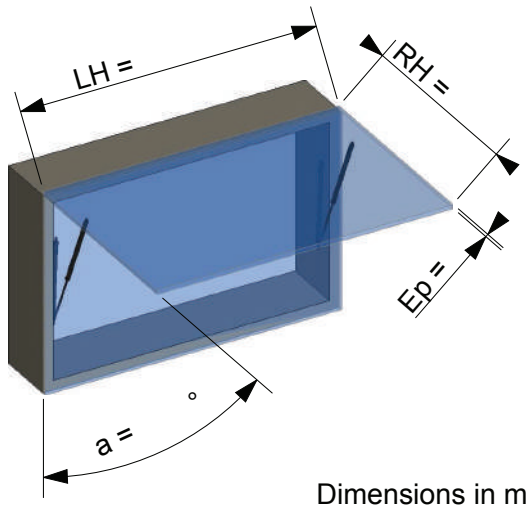
D74BIS

Fig. 1



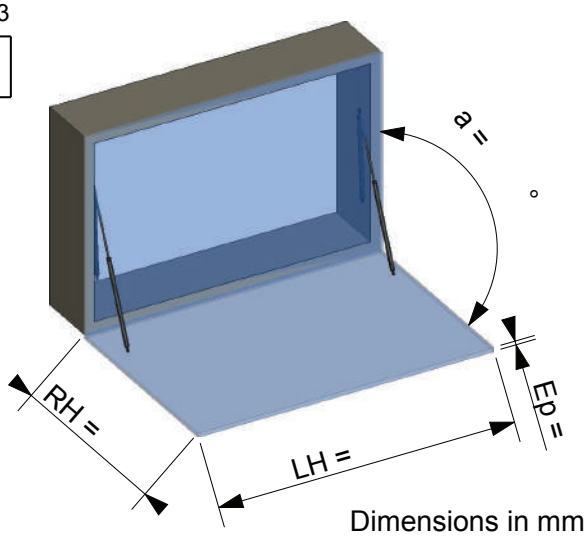
Dimensions in mm

Fig. 2



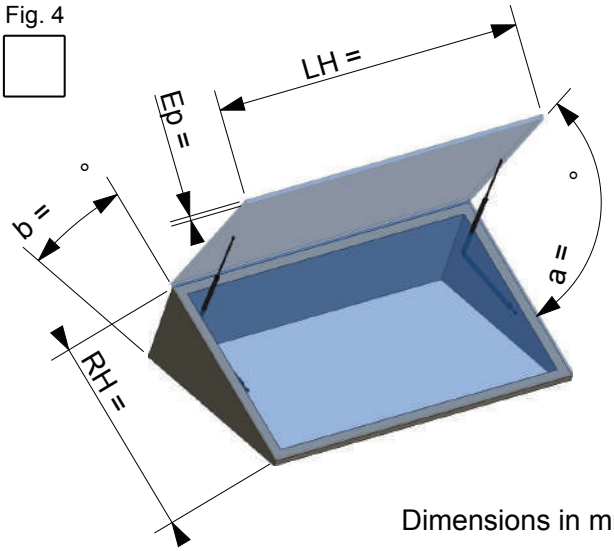
Dimensions in mm

Fig. 3



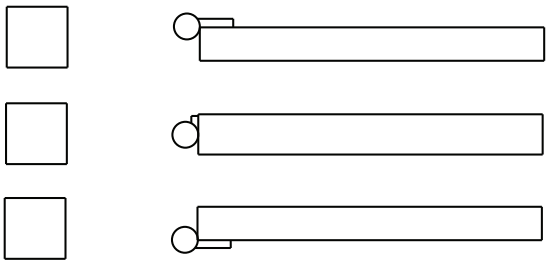
Dimensions in mm

Fig. 4



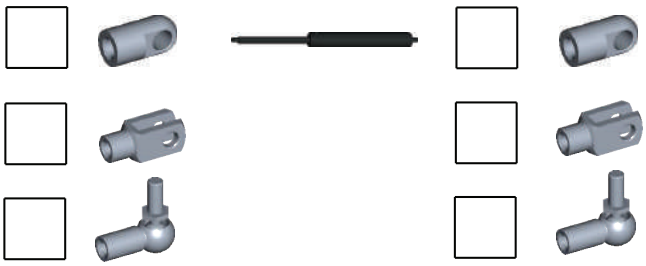
Dimensions in mm

Position of the hinge on the oppening part :



Rod end fitting :

Cylinder end fitting :



The precision is important to obtain a reliable result

Weight of the opening part : Kg

Other informations (temperature, wet environement, dusty, stainless steel,...) : .....

.....

.....

.....

Please send back this document to :

info@bertholdmarx.com

BERTHOLD MARX

MANUFACTURE FRANCAISE DE RESSORTS A GAZ

ISO CERTIFICATE 9001

Certificate

Standard	**ISO 9001:2015**
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Certificate Holder:

BERTHOLD MARX

MANUFACTURE FRANCAISE
DE RESSORTS A GAZ

Berthold Marx
1, rue de la Gravière,
67116 Reichstett
France

avec les lieux d'implantation selon l'annexe

Scope : Production and trade of gas springs, rubber profiles, silentbloc accessories and industrial supplies

Proof has been furnished by means of an audit that the requirements of standard are met.

Certification decision on: 08.12.2021
Valid from 08.12.2021 to 07.12.2024
Expiry of previous certificate: 07.12.2021

Edited on 01.03.2022

TÜV Rheinland France
20ter rue de Bezons
92400 COURBEVOIE

www.tuv.com

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WWW.BERTHOLDMARX.COM

General Sales conditions

The warranty relating to our products only covers their exchange and can under no circumstances cover replacement costs or other costs resulting from this replacement. Any claim relating to the conformity of products, to the exclusion of any transportation dispute, must be made by recorded delivery with acknowledgement slip, within five days of the delivery date.

No returned goods shall be accepted unless explicitly authorised in writing by BERTHOLD MARX. In this instance, the goods will be sent at the Purchaser's risk and shipped carriage paid in their original packing, in perfect condition and accompanied by a return document completed by us. Any return accepted will result in a reduction in the trade-in value of the goods of at least 40% of the price excluding VAT and will result in the issue of a credit note.

The diagrams and recommendations are given for information only and cannot be considered as consisting the object of sale. They can therefore, under no circumstances, engage the liability of BERTHOLD MARX. Whatever the circumstances, it is up to the purchaser to have them confirmed by its engineering office, or its customer, or any other qualified professional service provider.

The delivery deadlines stated in the documents from BERTHOLD MARX are for illustrative purposes only and can under no circumstances engage the liability of our company, nor be the subject of penalties for delays.

In the event of a failure to collect or take delivery of goods manufactured or ordered specifically for the purchaser, within a period of eight days, after notification by registered letter with acknowledgement slip, the latter remains liable for the full sale price and associated costs of the goods.

The gas spring is not a safety component by itself and shall be supplemented by a locking system if necessary. (cf. our safety protocol available on our website www.bertholdmarx.com)

Our goods, even sold carriage paid are shipped at the consignee's risk. Special delivery arrangements can be looked into with the customer. We kindly request you to check the weight of the package upon arrival. We accept no liability for missing items or breakages linked to transportation, if reservations have not been made upon reception of the goods from the transport company.

By express agreement, failure to pay for our goods by the deadline, will result in the immediate request for all remaining sums due regardless of the method payment set out in the application, pursuant to the Penalty Clause, of a penalty equal to 15% of the due amounts.

In accordance with Law No. 80335 of 12/05/1980, this sale will only be complete after payment of the full price. For as long as the price shall not be fully paid, the goods sold will remain the property of the seller.

Regulation: The usual payment terms for customers is 30 days net from the date of the invoice, other payment terms may be considered in accordance with the current economic modernisation law in force (LME). A discount of 0.5% is available for payments within ten days. In the case of paying with a discount, the total VAT that can be recovered shall be reduced as a consequence of this
Beyond the deadline stated on the invoice, and in accordance with the law, a late penalty of a rate equal to three times the legal interest rate can be applied. A standard penalty of €40 for recovery costs will be added to the penalties which are already due for delays in payment (Decree No. 2012-1115 of 02/10/2012).

Failure by the purchaser to pay a single fraction of the price at the agreed deadline and 8 days after a formal notice, the sale concerned will be fully cancelled, at the seller's discretion.

This may also result in the appointment of an expert to observe the condition of the returned goods and to set the value; on this basis, the accounts of the parties are liquid, given the damages-interest incurred by the purchaser to complete the sale.

Only French law is applicable. In the event of a dispute, only courts and tribunals in Strasbourg have authority in the event of legal proceedings.

BERTHOLD MARX

MOVEMENT BECOMES A FORCE

OUR OTHER CATALOGUES

- Silentbloc Accessories (French)
- Rubber Sealing (French)

Our contact details :

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DISTRIBUTOR

WWW.BERTHOLDMARX.COM