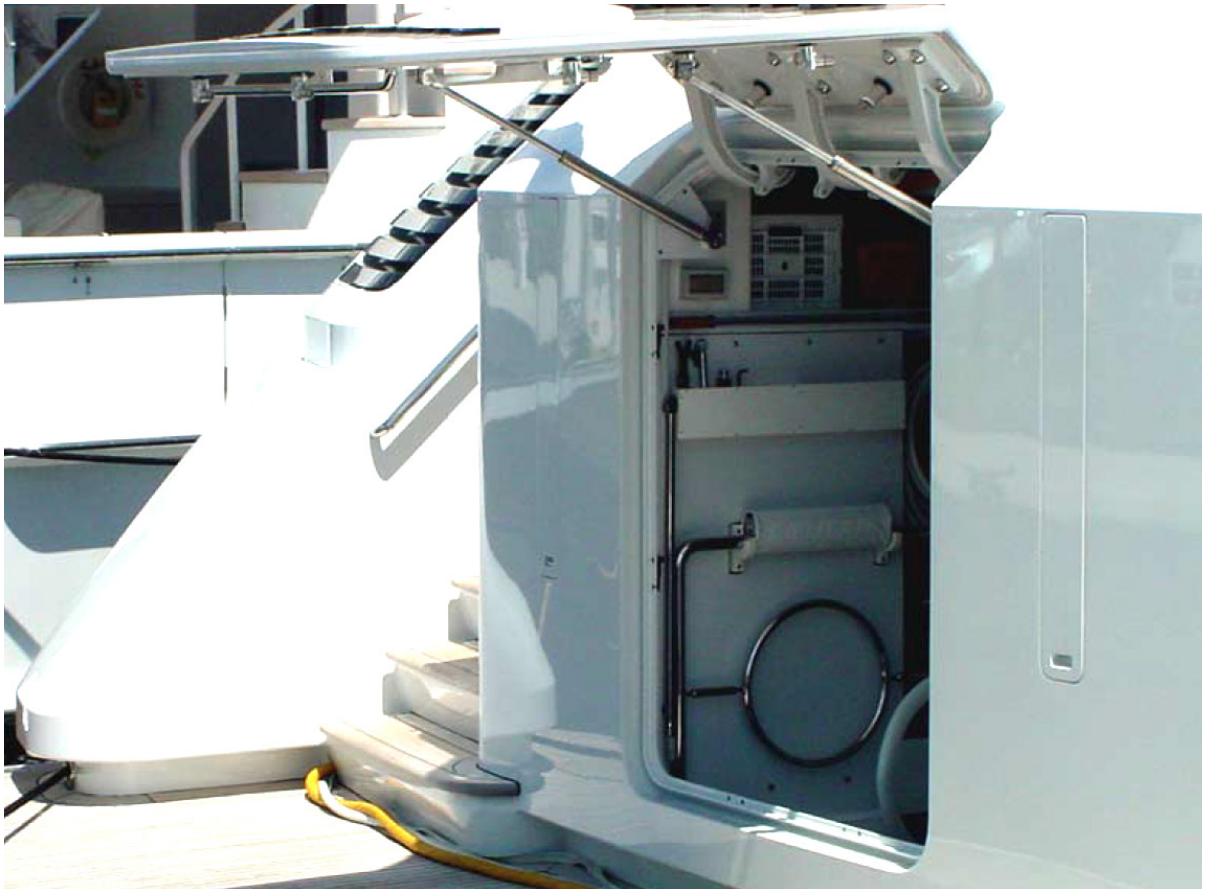
IZERWAREN

Gas Springs by Izerwaren

316 Stainless Steel Gas Springs
For Deck Hatches and Cabinet Doors, Cabin Doors and Gull Wing Doors.



IZERWAREN.COM & IZERWAREN.BIZ
SALES@IZERWAREN.COM

316 QUALITY STAINLESS STEEL GAS SPRINGS PROGRAM

ALL OUR GASSPRINGS ARE EXECUTED WITH VALVE AND NITRITE SEAL AND ARE PRODUCED UNDER LLOYDS CONTROLLED AND CERTIFIED CONDITIONS

Cert.953426

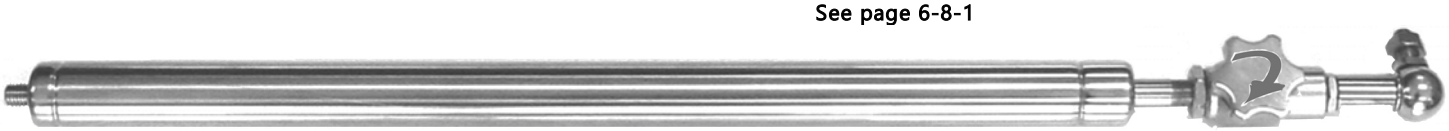
COMPRESSION GAS SPRINGS 316 STAINLESS STEEL WITH VALVE AND NITRITE SEAL. ALSO AVAILABLE IN CARBON STEEL

See page 6-5 to 6-9

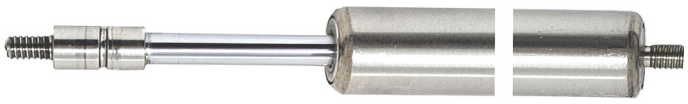
COMPRESSION GAS SPRINGS WITH PROTECTION TUBE made from 316 STAINLESS STEEL WITH VALVE

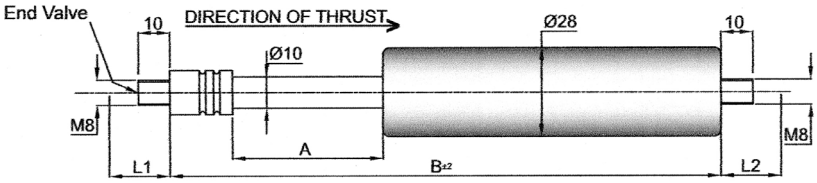
COMPRESSION GAS SPRINGS WITH LOCKING DEVISE LOCKS IN EXTENDED POSITION

See page 6-8-1

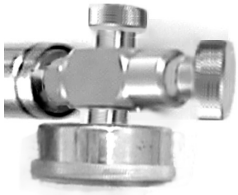


COMPRESSION GAS SPRINGS, BLOCKING TYPE CAN BE MANUALLY LOCKED IN ANY POSITION . Page 6-10

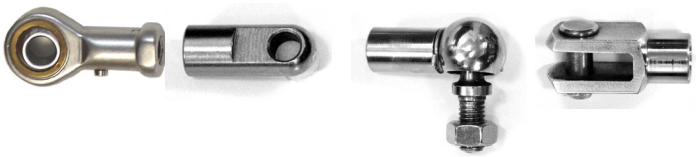




TENSION GAS SPRINGS FROM 400 TO 2500 Newton . Page 6-22



BLEEDING VALVES AND CHARGING KITS



ENDFITTINGS See pages 6-11- A and 6-11-B

ALLOWS CONTROLLED BLEEDING AND FILLING UP OF IZERWAREN GAS SPRINGS.

See page 6-13 page

STAINLESS STEEL BRACKETS AND END-FITTINGS

See page 6-14 and page 6-15

For technical information please call our office or visit our showroom:
Office and Show room: 2207 South Andrews Avenue, Fort Lauderdale, Florida 33316
Web site: www.gas-spring.net and www.izerwaren.com E-mail: sales@izerwaren.com

PRODUCT INFORMATION IZERWAREN STAINLESS STEEL GAS SPRINGS

Boutique Gas Spring Niche Set Up.

Izerwaren is focused on the special, hard to find gas spring applications, for which big companies have no time. Everything is geared to satisfy customers special needs, in small quantities. All standard gas springs offered in our program are low frequently gas springs. They should not be operated more then a few times per minute. Continuous operated gas springs, for instance damping devises, can be special ordered upon request.

316 Stainless Steel Quality

IZERWAREN stainless steel gas springs are made from the *316 stainless steel*. The rod is made of hard chrome plated 316 stainless steel. Tests and experience over time have proven that the gas spring withstands a corrosive environment very well. Our standard gas spring is build and continuously tested according to Lloyds Standard Cert. LRQ 0953426. We stock most sizes 316 stainless steel gas springs.

Hatch shown with 10-23-200 series Izerwaren Gas Springs. Picture: Freeman Marine Inc.

Construction of standard compression gas springs

IZERWAREN stocks stainless steel gas springs have a cylinder filled with nitrogen. Non Combustible Nitrogen gas is pressurized in the cylinder *(up to aprox. 2000 psi, depending on the series of gas springs (check our conversion tables for relations of Bar-Psi-Lb.-Kg-Newton).* The gas spring is filled through an orifice in the threaded rod on the cylinder side. By means of a Schrader type valve the pressure is maintained. Releasing pressure is possible by pressing lightly on the pin in the Schrader valve. The pressurized gas exert a force to the backside of the piston. The force is a function of the square surface of the rod and the pressure of the gas. The force is read in Newton's. The piston has a calibrated orifice. The size of the orifice determines the extension speed of the gas spring. Because of the orifice in the piston, gas flows on both side of the piston. It has no effect on the force on the rod. The compression speed is not calibrated. The rubber seal on the piston will simply drop away inside a internal grove when the gas spring is compressed. The rod-seal is made of special nitrite material that hardly needs any lubrication. Nevertheless a little vegetable based industrial oil is added to lubricate the seals.

It is therefore important to mount the gas spring with the cylinder up, and the rod down. This position also allows the outgoing stroke to be smoothly dampened towards the end of the stroke.

Quality Carbon Steel Gas Springs

The same high quality gas springs can be ordered made of carbon steel. The cylinder can be either black painted with an highly durable epoxy paint, or rubber coated. The rods are carbon steel hard chrome plated. We limited stock carbon steel gas springs, all sixes can be provided by special order.

Custom Calibrated Extension Speed

The extension speed can be changed by changing the size of the orifice in the piston. Please indicate when ordering if a special (mostly slow) extension speed is required.

Continuous Operated Gas Springs (Gas Shocks).

Continues operating gas springs, also called Gas Shocks, are acting like shock absorbers, are available upon special order. With this set up, the ingoing, the outgoing stroke, the speed and force can be completely custom determined. Available in Stainless steel and carbon steel version.

Maintenance

Like every stainless steel product, it needs to be maintained properly with the products that are available and especially made for this goal, i.e. stainless steel cleaning agents. The rod should be kept clear by wiping with a soft cloth and baby oil. Avoid foreign objects, paint, abrasive cleaners, etc. The gas spring cylinder can be cleaned with stainless steel wax type products. Do not apply wax to the rod.

Adjustable Force due to valve

Gas springs are charged by Izerwaren Inc. Our gas springs are provided with a valve, so charging and/or bleeding of the gas spring is possible. We provide in our program a **Bleeding Gage Set #63.001** on page 6-17 for controlled down bleeding and pressure hecking. Filling gas springs can be done in a industrial safe environment with the **Charging Kit #63.000** shown on page 6-17. Not recommended for accidental users.

Gas spring force

The compressing force and the force of extension are indicated in N. (Newton; 1 kilogram or 2.2 pounds = 9.81 N) The Newton force of the gas springs of our program have a range from 50N up till 10,000N. (2.200 lb.) That means that a weight 2200 lb. can be balanced by a Force of 10,000 Newton. The thickness of the rod determines the force that a gas spring can exert. The force range per gas spring between compressed and extended is approximately 15%. IZERWAREN gas springs sizes are specifically designed to fit in tight spaces. The shortest possible set up is per series chosen. By lengthening the cylinder, but not the rod of any given gas spring, a flatter run up in force can be achieved. We take orders for custom size gas springs.

Safety

The nitrogen filling of the gas spring is incombustible. Because of the way the gas spring is constructed, explosion of the gas spring is not possible. The seal will fail first, if the pressure becomes too high, due to overheating. Gas springs operating outside the temperature limits are void of warranty. Izerwaren is not responsible for failures of gas springs due to operating under these circumstances.

Minimum and Maximum Operating Temperature and Gas Pressure Change

Gas springs can be used in a temperature range of minus 15 to plus 50 degree Celsius. Special order gas springs are available for a range from 30 degree Celsius up to 80 degrees Celsius. The force of extension increases/decreases by 3.4 % per 10 degrees Celsius. Nominal operating temperature: 20 degrees Celsius.

Warranty

IZERWAREN gas springs have a one year factory warrantee on parts for manufacturing defects only.

Life term

The life span of a gas spring is almost unlimited, provided that the gas spring is correctly positioned (cylinder up, rod down) under axial load only, not being bent or receives lateral pressure by incorrect mounting. Also, the piston rod should be kept clean, undamaged and free from scratches. To extend the life of the gas spring it is recommended to compress the gas spring a few times a month to lubricate the seals and piston rod.

How To Choose The Right Gas Spring With The Right Charge.

Please collect the following data: or: let us do the calculating! Email your SCALED DRAWING!

A. The weight of the part (hatch) to be lifted.

B. The length of the hatch: This is the distance from the hinges to the lock (or locking) side.

C. The thickness of the hatch. (small hatches which are very thick -freezer hatches- need longer size gas spring

D. The degree to which the hatch will be opened. (90 degrees or more, up to 160 degrees)

To find the actual weight of an existing hatch, place a fish scale on the side of the hatch in a position as close as possible to the horizontal position and multiply the measured weight by 2. Keep in account the friction of the hinges, if any, and the weight of locking devises that can upset the center of gravity of the hatch. Adjust for these variables in the formula.

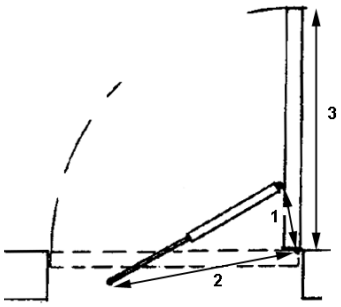
Determining The Stroke

As a rule of thumb the stroke of the gas spring is at least 1/4 of the total distance from the pivoting point to the locking side of the hatch. (See Diagram Application A on page 6-5; 6-6 and 6-7)

Illustration Application A,
Showing slightly over 90 degree opening

Sample of Application A

#1: Distance from center hatch bracket to hinge pin.
#2: Distance from center coaming bracket to hinge pin
#3: Total length of hatch, measuring always from hinge pin.
f hatch is 500 mm long, distance #1 is 125 mm.
The stroke will be 150 mm, The gas spring series (6-15, 8-18, 10-23 - in this case an 8-18-150) is determined by the force t can exert. With weak structures or Plexiglas, place the gas spring further away from the hinge. Choose the next size with a longer stroke. This rule is based on the hatch opening of 90 degrees; gas spring mounted in the rim (application A). If a different opening of the hatch is desired, the stroke has to be recalculated accordingly.



Application A
1 = distance top bracket to hinge pin
2 = distance bottom bracket /hinge
3 = length of hatch

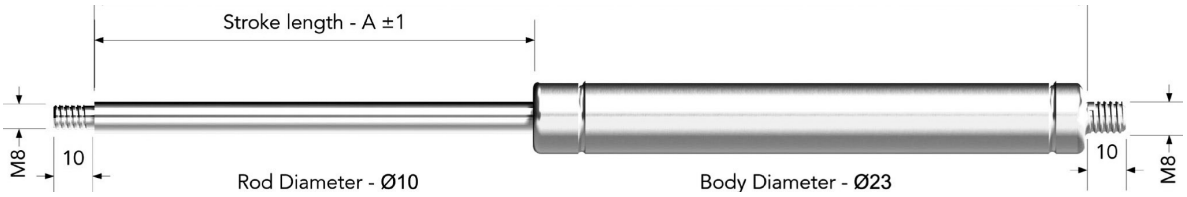
Formula for determining the Newton Force for application A:

Multiply the total unhinged weight of the hatch using Newton Force times 2. Add to this a recommended 10-15% extra force to allow for a positive force to hold the hatch open in place. (1 kg = 2.2 pounds = 9,81 Newton Force)

The hatches have a weight of 25 lbs. (11 kg or 113 N) each. As they are 500 mm wide, and the gas spring has a stroke of 150 mm, the gas springs are mounted at less than a quarter of the width, meaning that to balance the weight of the hatch, the force needs to be equal to two times the weight. Which is 50 Lbs. or 226N. To keep the hatch from falling easily, 10% extra force is added. This equals 248N total. If the situation requires installing 2 gas springs per hatch, the force for both gas springs is halved.

The table below shows the standard program of stainless steel gas springs available, non - standard sizes are available on special order.

The diagram also shows hatch size indication when mounting the gas spring in the rim of the hatch, with 90 degree opening. For other applications use the formula below or contact our office.



Stainless steel Gas spring	Hatch weight lb.	Hatch in inches	Force IN Newton	Stroke length		Rod	Cylinder	Overall length, extended and compressed, not counting the threads, without attachments		Thread
I.D.#	for 1 spring	Max. size		mm	inches	diameter	diameter	mm	inch	on both sides
61.650	4 / 30lb	8"	25 / 400 N	50	2"	6 mm	15 mm	130 / 80	5 1/8" / 3 1/8"	M 5 x 0.8
61.665	4 / 30lb	10"	25 / 400 N	65	2 3/8"	6 mm	15 mm	160 / 95	6 1/4" / 3 3/4"	
61.680	4 / 30lb	12 1/2"	25 / 400 N	80	3"	6 mm	15 mm	190 / 110	8 1/4" / 5 1/8"	M 5 x 0.8
61.610	4 / 30lb	15 3/4"	25 / 400 N	100	4"	6 mm	15 mm	230 / 130	9 1/16" / 5 1/8"	M 5 x 0.8
61.612	4 / 30lb	19 1/2""	25 / 400 N	120	4 3/4"	6 mm	15 mm	270 / 150	10 5/8" / 5 7/8"	M 5 x 0.8
61.615	4 / 30lb	23 1/2"	25 / 300 N	150	5 7/8"	6 mm	15 mm	330 / 180	13" / 7 1/16"	M 5 x 0.8
61.620	4 / 30lb	31 1/4"	25 / 300 N	200	7 7/8"	6 mm	15 mm	430 / 230	16 15/16" / 9 1/16"	M 5 x 0.8
61.810	10/70lb	15 3/4"	100 / 750 N	100	4"	8 mm	19 mm	245 / 145	9 5/8" / 5 3/4"	M 8 x 1.25
61.815	10/70lb	23 1/2"	100 / 750 N	150	5 7/8"	8 mm	19 mm	345 / 195	13 3/4" / 7 3/4"	M 8 x 1.25
61.820	10/70lb	31 1/4"	100 / 700 N	200	7 7/8"	8 mm	19 mm	445 / 245	17 1/2" / 9 5/8"	M 8 x 1.25
61.825	10/70lb	39 3/8"	100 / 700 N	250	9 7/8"	8 mm	19 mm	545 / 295	21 1/2" / 11 5/8"	M 8 x 1.25
61.110	15/120lb	15 3/4"	150 /1200 N	100	4"	10 mm	23 mm	245 / 145	9 5/8" / 5 3/4"	M 8 x 1.25
61.115	15/120lb	23 1/2"	150 /1200 N	150	5 7/8"	10 mm	23 mm	345 / 195	13 3/4" / 7 3/4"	M 8 x 1.25
61.120	15/120lb	31 1/4"	150 /1200 N	200	7 7/8"	10 mm	23 mm	445 / 245	17 1/2" / 9 5/8"	M 8 x 1.25
61.125	15/110lb	39 3/8"	150 /1100 N	250	9 7/8"	10 mm	23 mm	545 / 295	21 1/2" / 11 5/8"	M 8 x 1.25
61.130	15/100lb	47 1/4"	150 /900 N	300	11 13/16	10 mm	23 mm	645 / 345	25 5/8" / 13 3/4"	M 8 x 1.25
61.135	15/77lb	55 1/8"	150 /700 N	350	13 3/4"	10 mm	23 mm	745 / 395	29 5/16" / 15 9/16"	M 8 x 1.25
61.140	15/65lb	63"	150 /500 N	400	15 3/4"	10 mm	23 mm	845 / 445	33 1/4" / 17 1/2"	M 8 x 1.25
10-23-series	120 lb:	with	protection	tube	1200N					
61.410 to 61.450	25/250lb	15 3/4" 63"	250 /2500 N	100 / 500	4 / 19 11/16	14 mm	28 mm	on request	on request	M 10 x 1.5
61.220 to 61.210	50/500lb	15 3/4" 63"	500 / 5000 N		7 7/8 to 39 3/8"	22 mm	38 mm	on request	on request	M 14 x 1.5
61.310 series	--/1650lb --/2200lb	15 3/4" to 63"	5000N / 10000N	1000 1000	39 3/8"			on request	on request	M 24 x 3

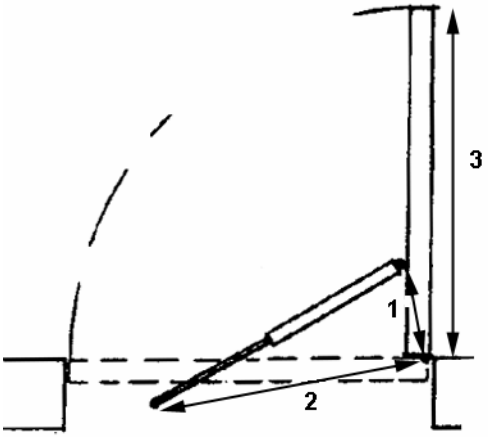
Compression Gas Springs Details per size: Please see page 6-5 to 6-10. For attachments: Please see page 6-11, 6-14 and 6-15.
For Blocking Gas Springs: Please see Page 6-10

HOW TO CHOOSE THE RIGHT GAS SPRING WITH THE RIGHT CHARGE:

Please find the following data:

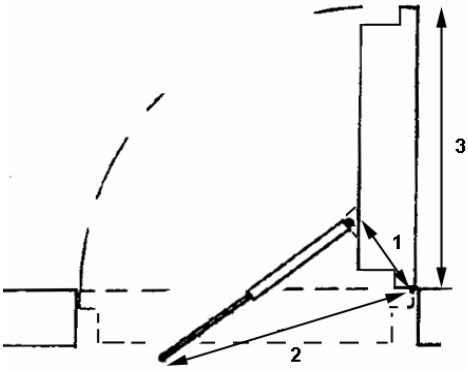
1. **The weight of the part (hatch) to be lifted**.
2. **The length of the hatch.** This is the distance from the hinges to the locking side.
3. **The thickness of the hatch**. (small hatches which are very thick – like freezer hatches- need longer size gas springs)
4. **The degree to which the hatch will be opened**. (90 degrees or more, up to 160 degrees)

To find the actual weight of an existing hatch, without removing it from the deck, place a hanging scale on the side of the hatch in a position as close as possible to the horizontal position and multiply the measured weight by 2. Keep in account the friction of the hinges, if any, and the weight of locks and hatch dogging devises that can upset the center of gravity of the hatch. Adjust for these variables in the formula. See also pages 6-0-2-0 and 6-0-2-1.



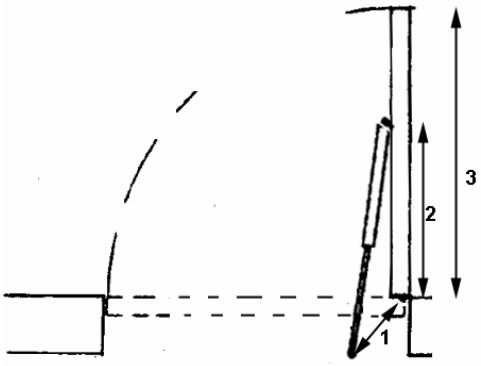
size 3: length of hatch	gas spring ID	weight hatch up to:	size 1: bracket hatch to hinge pin	size 2: bracket coaming to hinge pin balljoints installed
400 mm ~ 16”	6-15-100 mm	33 lbs	75 mm ~ 3”	260 ~ 10 ¼”
	8-19-100 mm	77 lbs	75 mm ~ 3”	280 ~ 11”
600 mm ~ 23 ½”	6-15-150 mm	33 lbs	125 mm ~ 5”	362 mm ~ 14 1/8”
	8-19-150 mm	77 lbs	125 mm ~ 5”	396 mm ~ 15 ½”
	10-23-150 mm	132 lbs	125 mm ~ 5”	396 mm ~ 15 ½”
800 mm ~ 31 ½”	6-15-200 mm	33 lbs	175 mm ~ 6 7/8”	463 mm ~ 18 1/4”
	8-19-200 mm	77 lbs	175 mm ~ 6 7/8”	495 mm ~ 19 ½”
1000 mm ~ 39½”	10-23-200 mm	132 lbs	175 mm ~ 6 7/8”	495 mm ~ 19 ½”
	8-19-250 mm	77 lbs	225 mm ~ 8 7/8”	595 mm ~ 23½”
1200 mm ~47 ¼”	10-23-250 mm	132 lbs	225 mm ~ 8 7/8”	595 mm ~ 23½”
	10-23-300 mm	77 lbs	270 mm ~ 10 ½”	690 mm ~ 27 1/8”
1400 mm ~ 55”	14-28-300 mm	132 lbs	270 mm ~ 10 ½”	690 mm ~ 27 1/8”
	10-23-350 mm	132 lbs	320 mm ~ 12 ½”	790 mm ~ 31”
1600 mm ~ 63”	14-28-350 mm	275 lbs.	320 mm ~ 12 ½”	790 mm ~ 31”
	14-28-400 mm	275 lbs	365 mm ~ 14 ¾”	885 mm ~ 34 3/4”

Application A *Recommended: For fishing cockpit hatches and floor hatches up to 50 lbs. Function gas spring: Holds hatch closed, holds hatch open at 90 degree. Does not support hatch first 20 degrees;*



size 3: length of hatch	gas spring ID	weight hatch up to:	size 1: bracket hatch to hinge pin	size 2: bracket coaming to hinge pin with ball joint
400 mm ~ 16”	6-15-150 mm	33 lbs	125 mm ~ 5”	376 mm ~ 14 ¾”
	8-19-150 mm	77 lbs	125 mm ~ 5”	405 mm ~ 16”
600 mm ~ 23 ½”	10-23-150 mm	132 lbs	125 mm ~ 5”	405 mm ~ 16”
	6-15-200 mm	33 lbs	175 mm ~ 6 7/8”	500 mm ~ 19 ½”
	8-19-200 mm	77 lbs	175 mm ~ 6 7/8”	500 mm ~ 19 ½”
800 mm ~ 31 ½”	10-23-200 mm	132 lbs	175 mm ~ 6 7/8”	500 mm ~ 19 ½”
	8-19-250 mm	77 lbs	225 mm ~ 8 7/8”	610 mm ~ 24”
1000 mm ~ 39½”	10-23-250 mm	132 lbs	225 mm ~ 8 7/8”	610 mm ~ 24”
	10-23-300 mm	77 lbs	270 mm ~ 10 ½”	700 mm ~ 27 1/2”
	14-28-300 mm	132 lbs	270 mm ~ 10 ½”	700 mm ~ 27 1/2”

Application B *Recommended: For refrigerator hatches up to 50 lbs. Function gas spring: Holds hatch firmly closed, holds hatch open at 90 degree. Does not support hatch first 30 degrees*

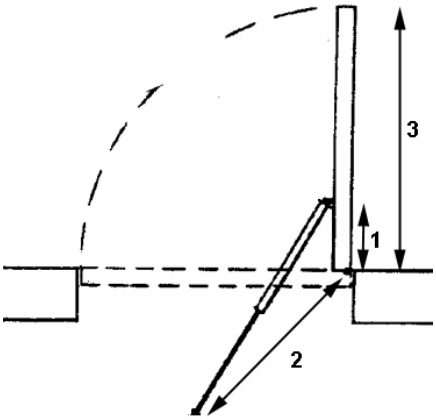


size 3: length of hatch	gas spring ID	weight hatch up to:	size 1: angle 45º distance bracket to hinge pin	size 2: bracket on hatch: depending on angle no 1
400 mm ~ 16”	6-15-100 mm	33 lbs	68 mm ~ 2 3/4””	
	8-19-100 mm	77 lbs	68 mm ~ 2 3/4””	check distance
600 mm ~ 23 ½”	6-15-150 mm	33 lbs	106 mm ~ 4 1/8”	in open and
	8-19-150 mm	77 lbs	106 mm ~ 4 1/8”	closed position
	10-23-150 mm	132 lbs	106 mm ~ 4 1/8”	before mounting
800 mm ~ 31 ½”	6-15-200 mm	77 lbs	141 mm ~ 5 1/2”	
	8-19-200 mm	33 lbs	141 mm ~ 5 1/2”	Our office
1000 mm ~ 39½”	10-23-200 mm	132 lbs	141 mm ~ 5 1/2”	provides custom
	8-19-250 mm	77 lbs	177 mm ~ 7”	applications upon
1200 mm ~47 ¼”	10-23-250 mm	132 lbs	177 mm ~ 7”	request.
	10-23-300 mm	77 lbs	212 mm ~ 8 3/8”	
	14-28-300 mm	132 lbs	212 mm ~ 8 3/8”	

Application C *Recommended: For cockpit hatches and hatches up to 40 lbs., like hatches above sinks, cooking plates. Function gas spring: Support hatch through the 90 degree swing . Angle and distance figure no. 1 important*

Application E *100% support, use for hatches of more then 50 lbs.* **Application F** *100% support, up to 75 lbs*
For applications **E** and **F** please see page 6; inquire with our office for more details.

INSTALL GAS SPRING ALWAYS WITH ROD DOWN, CYLINDER UP.
The oil inside the cylinder should be allowed to lubricate the seal and the rod. The oil also allows for end damping

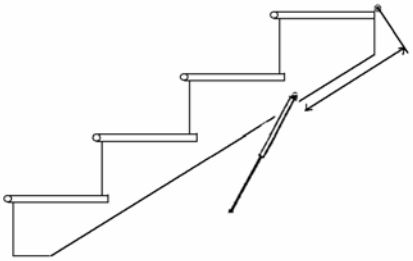


Application D

Recommended: For hatches of 50 to 75 lbs.

Function gas spring: Holds hatch closed, holds hatch open at 90 degree. Support hatch 50% for the first 20 degrees; then holds hatch open

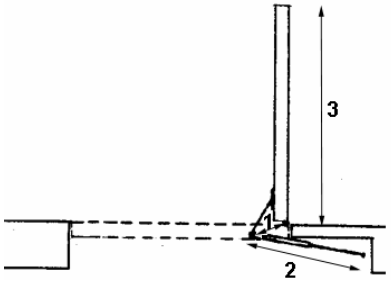
size 3: length of hatch	gas spring ID	weight hatch up to:	size 1: bracket hatch to hinge pin balljoints installed	size 2: bracket coaming to hinge pin 45 degree angle balljoints installed
400 mm ~ 16”	6-15-100 mm	33 lbs	62 mm ~ 2 ½”	278 ~ 7”
	8-19-100 mm	77 lbs	62 mm ~ 3”	278 ~ 7”
600 mm ~ 23 ½”	6-15-150 mm	33 lbs	100 mm ~ 4”	376 mm ~ 14 ¾”
	8-19-150 mm	77 lbs	100 mm ~ 4”	396 mm ~ 15 ½”
	10-23-150 mm	132 lbs	100 mm ~ 4”	396 mm ~ 15 ½”
800 mm ~ 31 ½”	6-15-200 mm	33 lbs	100 mm ~ 4”	445 mm ~ 17 ½”
	8-19-200 mm	77 lbs	150 mm ~ 6 ”	445 mm ~ 17 ½”
1000 mm ~ 39½”	10-23-200 mm	132 lbs	150 mm ~ 6”	445 mm ~ 17 ½”
	8-19-250 mm	77 lbs	200 mm ~ 8”	595 mm ~ 23½”
1200 mm ~47 ¼”	10-23-250 mm	132 lbs	200 mm ~ 8”	595 mm ~ 23½”
	10-23-300 mm	77 lbs	240 mm ~ 9 ½”	690 mm ~ 27 1/8”
1400 mm ~ 55”	14-28-300 mm	132 lbs	240 mm ~ 9 ½”	690 mm ~ 27 1/8”
	10-23-350 mm	132 lbs	290 mm ~ 11 ½”	790 mm ~ 31”
1600 mm ~ 63”	14-28-350 mm	275 lbs	290 mm ~ 11 ½”	790 mm ~ 31”
	14-28-400 mm	275 lbs	350 mm ~ 13 ¾”	885 mm ~ 34 3/4”



Application G

size 3: length of stair measure from hinge pin	gas spring ID	weight stair up to:	size 1: bracket stair to hinge pin balljoints installed	size 2: bracket bulkhead to hinge pin 33 degree angle balljoints installed check
800 mm ~ 31 ½”	8-19-250 mm	77 lbs	200 mm ~ 8”	
	10-23-250 mm	132 lbs	200 mm ~ 8”	
1000 mm ~ 39½”	10-23-300 mm	132 lbs	240 mm ~ 9 ½”	
	14-28-300 mm	275 lbs	240 mm ~ 9 ½”	
	10-23-350 mm	132 lbs	290 mm ~ 11 ½”	
	14-28-350 mm	275 lbs	290 mm ~ 11 ½”	
	14-28-400 mm	275 lbs	350 mm ~ 13 ¾”	

Recommended: For stairs. Function gas spring: Holds stairs closed, supports weight from 75% to 120%; holds stairs up at 80 to 90 degree. Hinge structure must be able to carry 2.5x weight stairs!! Gas spring angle should be approx. 33 degrees measured from hinge pin. See picture App. G.

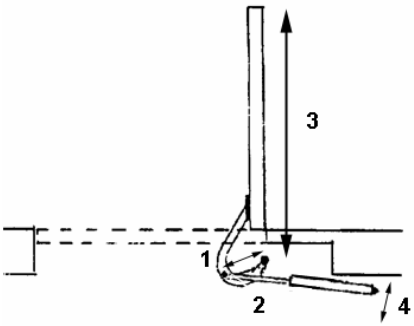


Application F

Recommended: For hatches and doors that cannot be executed with application E. Recommended for light weight application and vertical hanging doors and hatches only. . Function gas spring: Supports hatch evenly and gradually throughout the 90 or 100 degree swing.

size 3: length of hatch	size 2: extended length gas spring with ball joint	size 1: distance bracket to hinge pin	gas spring ID	weight hatch:
400 mm 16”			6-15-100 mm	33 lbs
			8-19-100 mm	77 lbs
600 mm 23 ½”			6-15-150 mm	33 lbs
			8-19-150 mm	77 lbs
			10-23-150 mm	132 lbs
800 mm 31 ½”			6-15-200 mm	33 lbs
			8-19-200 mm	77 lbs
1000 mm 39½”			10-23-200 mm	132 lbs
			8-19-250 mm	77 lbs
1200 mm 47 ¼”			10-23-250 mm	132 lbs
			10-23-300 mm	77 lbs
1400 mm 55”			14-28-300 mm	132 lbs
			10-23-350 mm	132 lbs
1600 mm 63”			14-28-350 mm	275 lbs.
			14-28-400 mm	275 lbs

Vertical hanging doors: Drawing By changing the angle of the gas spring using vertical hanging hatches and cabinet doors a door closing and door opening assist situation is achieved. By using gas springs with low pressure and extra damping a cushioning effect is achieved. For mirrored doors, and for doors with shelves attached very attractive. Using special angle brackets the gas spring can be placed invisible in overhead or toe-kick.



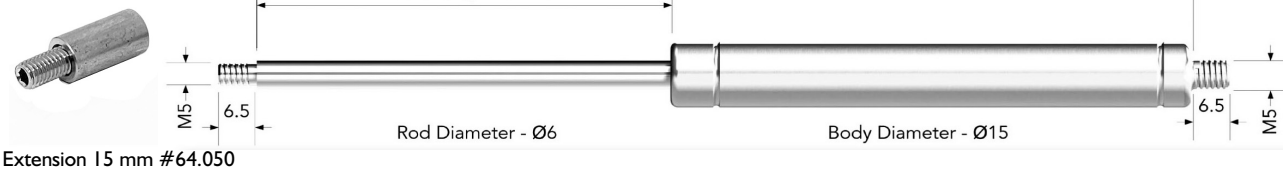
Application E

Recommended: For any hatch above 50 lbs.

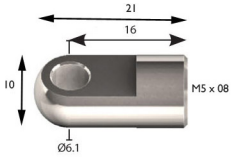
size 3: length of hatch	size 2: extended length gas spring with ball joint	size 1: distance bracket to hinge pin	gas spring ID	weight hatch up to:
400 mm 16”			5-16-100 mm	33 lbs
			8-19-100 mm	77 lbs
600 mm 23 ½”			5-16-150 mm	33 lbs
			8-19-150 mm	77 lbs
			10-23-150 mm	132 lbs
800 mm 31 ½”			8-19-200 mm	77 lbs
			10-23-200 mm	132 lbs
1000 mm 39½”			8-19-250 mm	77 lbs
			10-23-250 mm	132 lbs
1200 mm 47 ¼”			10-23-300 mm	77 lbs
			14-28-300 mm	132 lbs
1400 mm 55”			10-23-350 mm	132 lbs
			14-28-350 mm	275 lbs.
1600 mm 63”			14-28-400 mm	275 lbs

Function gas spring: Supports hatch evenly and gradually throughout the 90 or 100 degree swing. When the gas spring is well charged, little pressure is needed to close or open the hatch. Set up and calculation only through scaled drawing or CAD. Check with our office for details

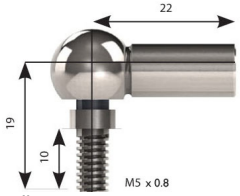
INSTALL GAS SPRING ALWAYS WITH ROD DOWN, CYLINDER UP.



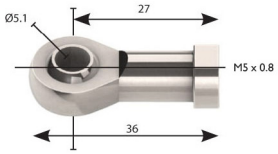
Extension 15 mm #64.050



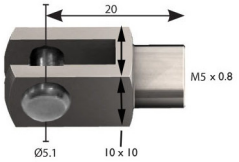
#62.516 Eye M5x16 6mm thick



#62.522 Balljoint M5x22



62.527 Ball Swivel End M5x27



#62.520 Fork with pin M5x20

Eye end fittings: #62.515L Eye M5x15

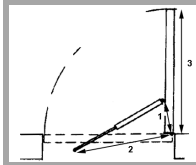
with 3 mm thick leaf

#62.520L Eye M5x20

Series 6-15		"A"	"B"	#62.516	#62.522	#62.520	#62.527	Force & thread
Part ID Series 6-15	Series 6-15 stainless steel gas spring with valve	Stroke Length In mm	Total length without attachments (not counting the thread) 2 x stroke +30 mm	Eyes, add 2 x 16 mm	Ball joints, add 2 x 22 mm	Forks, add 2 x 20 mm	Swivel rod ends, add 2 x 27 mm	Thread size and max. N force per length rod
61.650	Extended	50 mm	130 mm	162 mm	174 mm	170 mm	178 mm	M5; 25N-400N
	Compressed	50 mm	80 mm	112 mm	124 mm	120 mm	134 mm	M5; 25N-400N
61.665	Extended	65 mm	160 mm	192 mm	204 mm	200 mm	214 mm	M5; 25N-400N
	Compressed	65 mm	95 mm	127 mm	139 mm	135 mm	149 mm	M5; 25N-400N
61.680	Extended	80 mm	190 mm	222 mm	234 mm	230 mm	244 mm	M5; 25N-400N
	Compressed	80 mm	110 mm	142 mm	154 mm	150 mm	164 mm	M5; 25N-400N
61.610	Extended	100mm	230mm	262 mm	274 mm	270 mm	284 mm	M5; 25N-400N
	Compressed	100 mm	130 mm	162 mm	174 mm	170 mm	184 mm	M5; 25N-400N
61.612	Extended	120mm	270 mm	302 mm	314 mm	310 mm	324 mm	M5; 25N-400N
	Compressed	120 mm	150 mm	177 mm	189 mm	185 mm	199 mm	M5; 25N-400N
61.615	Extended	150 mm	330 mm	362 mm	374 mm	370 mm	384 mm	M5; 25N-400N
	Compressed	150 mm	180 mm	212 mm	224 mm	220 mm	234 mm	M5; 25N-400N
61.617	Extended	175 mm	380 mm	412 mm	424 mm	390 mm	404 mm	M5; 25N-400N
	Compressed	175 mm	205 mm	237 mm	249 mm	215 mm	229 mm	M5; 25N-400N
61.620	Extended	200 mm	430 mm	462 mm	474 mm	470 mm	484 mm	M5; 25N-400N
	Compressed	200 mm	230 mm	262 mm	274 mm	270 mm	284 mm	M5; 25N-400N

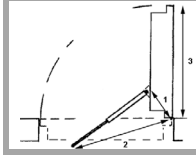
Maximum force in Newtons* *Depends on rod length	400N* (88 lb.)*	Check also pages 6-0-2-0 and 6-0-2-1 for force calculation
Minimum charge in Newtons	25N (5.5 lb.)	For custom sizes please email our office at

Application:"A" Gas spring Series: 6-15: Samples, indicating possible setups:



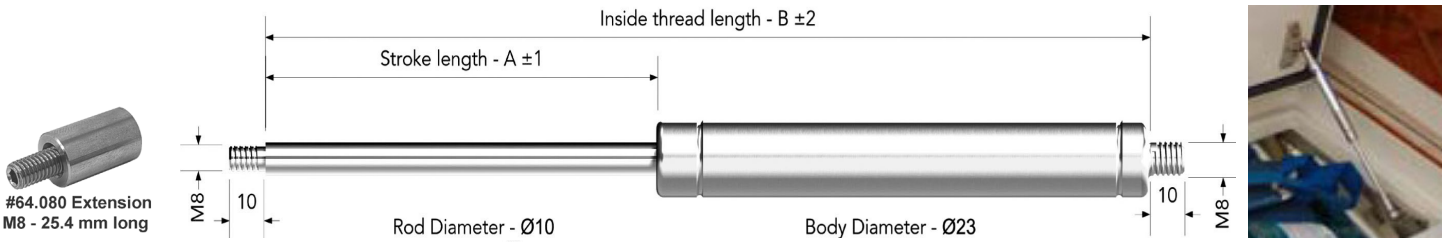
size 3: length of hatch	gas spring ID	weight hatch up to:	size 1: hatch bracket to hinge pin	size 2: coaming bracket to hinge pin with balljoints installed
400 mm ~ 16"	6-15-100 mm	33 lbs	75 mm ~ 3"	260 ~ 10 ¼"
600 mm ~ 23 ½"	6-15-150 mm	33 lbs	125 mm ~ 5"	362 mm ~ 14 1/8"
800 mm ~ 31 ½"	6-15-200 mm	33 lbs	175 mm ~ 6 7/8"	463 mm ~ 18 1/4"

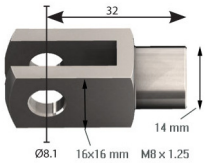
Application:"B" Gas spring Series: 6-15: Samples, indicating possible setups:



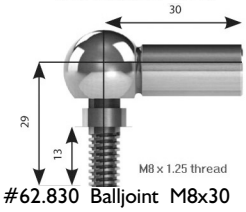
size 3: length of hatch	gas spring ID	weight hatch up to:	size 1: hatch bracket to hinge pin	size 2: coaming bracket to hinge pin with ball joint
400 mm ~ 16"	6-15-150 mm	33 lbs	125 mm ~ 5"	376 mm ~ 14 ¾"
400 mm ~ 16"	6-15-200 mm	33 lbs	175 mm ~ 6 7/8"	500 mm ~ 19 ½"

ALWAYS INSTALL GAS SPRING WITH ROD DOWN AND CYLINDER UP

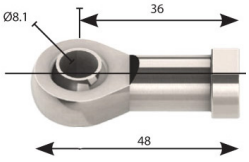




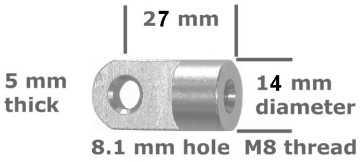
#62.833 Fork with pin M8x32



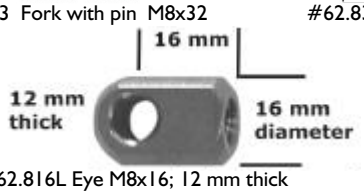
#62.830 Balljoint M8x30



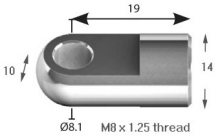
62.536 Ball Swivel End M8x36



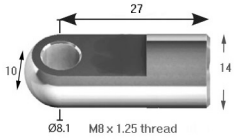
#62.827L Eye M8x27; 5 mm thick



#62.816L Eye M8x16; 12 mm thick



#62.819 Eye M8x19; 10 mm thick

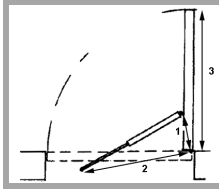


#62.827 Eye M8x27 10 mm thick

Serie 8-18 Part ID	# Series 8-18- stainless steel gas spring with valve	"A" Stroke Length in mm	"B" Total length without attachments (not counting the thread) 2 x stroke+ 45 mm)	62.819 Short eyes, add 2 x 19 mm	62.827 big eyes, add 2 x 27 mm	62.830 Ball joints, add 2 x 30 mm	62.833 Forks Add 2 x 32 mm	Thread size and max. N force per length rod
61.810	Extended	100mm	245 mm	283 mm	299 mm	305 mm	310 mm	M8 50N-750N
	Compressed	100 mm	145 mm	183 mm	199 mm	205 mm	210 mm	M8 50N-750N
61.815	Extended	150 mm	345 mm	383 mm	399 mm	405 mm	410 mm	M8 50N-750N
	Compressed	150 mm	195 mm	233 mm	249 mm	255 mm	260 mm	M8 50N-750N
61.817	Extended	175 mm	395 mm	433 mm	449 mm	455 mm	459 mm	M8 50N-750N
	Compressed	175 mm	220 mm	258 mm	275 mm	280 mm	284 mm	M8 50N-750N
61.820	Extended	200 mm	445 mm	483 mm	499 mm	505 mm	510 mm	M8 50N-750N
	Compressed	200 mm	245 mm	283 mm	299 mm	305 mm	310 mm	M8 50N-750N
61.825	Extended	250 mm	545 mm	583 mm	599 mm	605 mm	610 mm	M8 50N-750N
	Compressed	250 mm	295 mm	333 mm	349 mm	355 mm	360 mm	M8 50N-750N

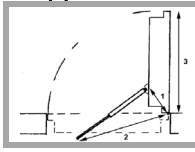
Maximum force in Newtons* *Depends on rod length	750N* (165 lb.)*	Check also pages 6-0-2-0 and 6-0-2-1 for force calculation
Minimum charge in Newtons	100N (22 lb.)	*For custom sizes please call office.

Application:"A" Gas spring Series: 8-18:



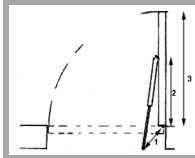
size 3: length of hatch	**gas spring ID**	**weight hatch** up to:	**size 1:** hatch bracket to hinge pin	**size 2:** coaming bracket to hinge pin with balljoints installed
400 mm ~ 16"	8-19-100 mm	77 lbs	75 mm ~ 3"	280 ~ 11"
600 mm ~ 23 ½"	8-19-150 mm	77 lbs	125 mm ~ 5"	396 mm ~ 15 ½"
800 mm ~ 31 ½"	8-19-200 mm	77 lbs	175 mm ~ 6 7/8"	495 mm ~ 19 ½"
1000 mm ~ 39½"	8-19-250 mm	77 lbs	225 mm ~ 8 7/8"	595 mm ~ 23½"

Application:"B" Gas spring Series: 8-18:



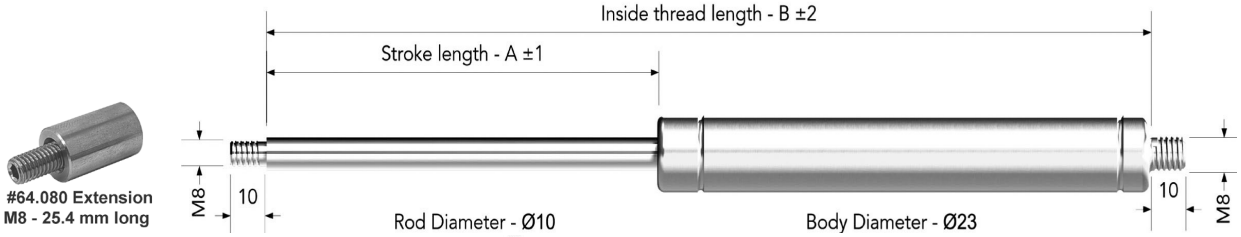
size 3: length of hatch	**gas spring ID**	**weight hatch** up to:	**size 1:** hatch bracket to hinge pin	**size 2:** coaming bracket to hinge pin with ball joint
400 mm ~ 16"	8-19-150 mm	77 lbs	125 mm ~ 5"	405 mm ~ 16"
600 mm ~ 23 ½"	8-19-200 mm	77 lbs	175 mm ~ 6 7/8"	500 mm ~ 19 ½"
800 mm ~ 31 ½"	8-19-250 mm	77 lbs	225 mm ~ 8 7/8"	610 mm ~ 24"

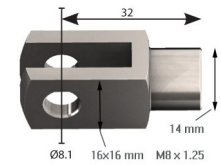
Application:"C" Gas spring Series: 8-18:



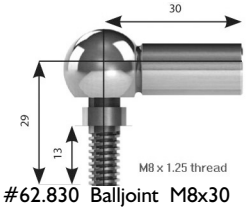
size 3: length of hatch	gas spring ID	weight hatch up to:	**size 1:angle45º** distance bracket to hinge pin	**size 2:** check distance
400 mm ~ 16"	8-19-100 mm	77 lbs	68 mm ~ 2 3/4""	in open and closed position
600 mm ~ 23 ½"	8-19-150 mm	77 lbs	106 mm ~ 4 1/8"	before mounting
800 mm ~ 31 ½"	8-19-200 mm	77 lbs	141 mm ~ 5 1/2"	Our office provides custom
1000 mm ~ 39½"	8-19-250 mm	77 lbs	177 mm ~ 7"	applications upon request.

ALWAYS INSTALL GAS SPRING WITH ROD DOWN AND CYLINDER UP

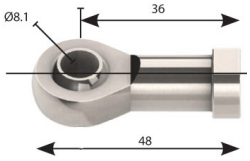




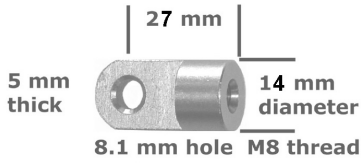
#62.833 Fork with pin M8x32



#62.830 Balljoint M8x30

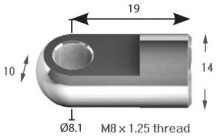


62.536 Ball Swivel End M8x36

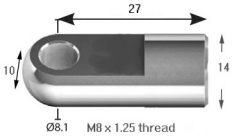


#62.827L Eye M8x27; 5 mm thick

#62.816L Eye M8x16; 12 mm thick



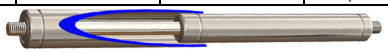
#62.819 Eye M8x19; 10 mm thick



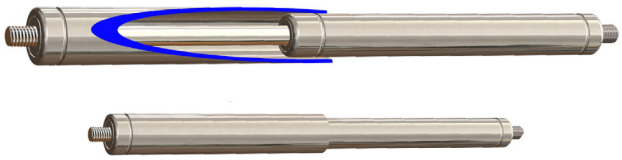
#62.827 Eye M8x27 10 mm thick

10-23 series	#	"A"	"B"	62.819	62.827	62.830	62.833	Newton Force
Part ID	Series 10-23-stainless steel gas spring with valve	Stroke Length in mm	Total length without attachments (not counting the thread) 2 x stroke+ 45 mm)	Short eyes, add 2 x 19 mm	big eyes, add 2 x 27 mm	Ball joints, add 2 x 30 mm	Forks Add 2 x 32 mm	Thread size M8 x 1.25 Newton Force per rod length
61.110	Extended	100mm	245 mm	283 mm	299 mm	305 mm	309 mm	M8; 100N–1250N
	Compressed	100 mm	145 mm	183 mm	199 mm	205 mm	209 mm	M8; 100N–1250N
61.150	Extended	150 mm	345 mm	383 mm	399 mm	405 mm	409 mm	M8; 100N–1250N
	Compressed	150 mm	195 mm	233 mm	249 mm	255 mm	259 mm	M8; 100N–1250N
61.120	Extended	200 mm	445 mm	483 mm	499 mm	505 mm	509 mm	M8; 100N–1250N
	Compressed	200 mm	245 mm	283 mm	299 mm	305 mm	309 mm	M8; 100N–1250N
61.125	Extended	250 mm	545 mm	583 mm	599 mm	605 mm	609 mm	M8; 100N–**1100N***
	Compressed	250 mm	295 mm	333 mm	349 mm	355 mm	359 mm	M8; 100N–**1100N***
61.130	Extended	300 mm	645 mm	683 mm	699 mm	705 mm	709 mm	M8; 100N–**900N***
	Compressed	300 mm	345 mm	383 mm	399 mm	405 mm	409 mm	M8; 100N–**900N***
61.135	Extended	350 mm	745 mm	683 mm	799 mm	805 mm	809 mm	M8; 100N–**700N***
	Compressed	350 mm	395 mm	433 mm	449 mm	455 mm	459 mm	M8; 100N–**700N***
61.140	Extended	400 mm	845 mm	883 mm	899 mm	905 mm	909 mm	M8; 100N–**500N***
	Compressed	400 mm	445 mm	483 mm	499 mm	505 mm	509 mm	M8; 100N–**500N***
61.P400	**W. PROTECTION TUBE**	400 mm	848 mm	886 mm	902 mm	908 mm	912 mm	M8; 100N–**1200N***

*10-23 Series gas spring are supplied with protection tube when force is above nominal set force

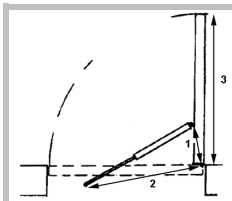


Maximum force depends on rod length	1250N* (275 lb.)*	Check also pages 6-0-2-0 and 6-0-2-1 for force calculation
Minimum charge in Newtons	100N (22 lb.)	*For custom sizes please call office.



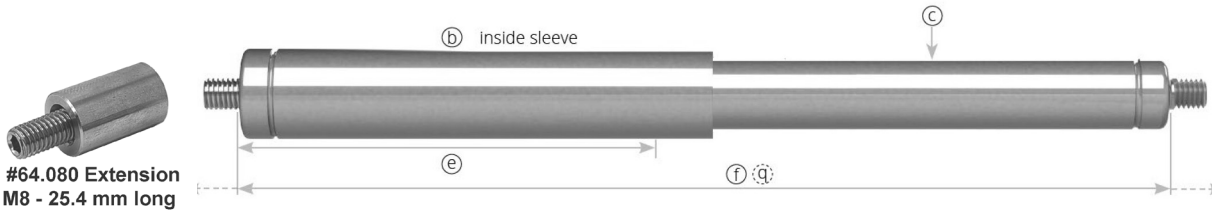
10-23 Series Gas Spring with Protection Tube

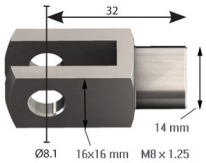
10-23 Series Gas Spring with Protection Tubes. See page 6-7-B Protection tubes offer higher bending resistance and protection against dust, dirt and scratching.
If 10-23 series gas springs are ordered with above nominal force (see table above for max allowed nominal force) a protection tube is supplied. Maximum force with protection tube: 1200N (264lb.)



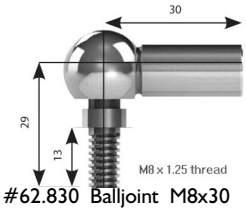
size 3: length of hatch:	gas spring ID	weight hatch up to:	size 1: hatch bracket to hinge pin:	size 2: Coaming bracket to hinge pin with balljoints installed:
600 mm ~ 23 ½"	10-23-150 mm	132 lbs	125 mm ~ 5"	396 mm ~ 15 ½"
800 mm ~ 31 ½"	10-23-200 mm	132 lbs	175 mm ~ 6 7/8"	495 mm ~ 19 ½"
1000mm ~ 39½"	10-23-250 mm	132 lbs	225 mm ~ 8 7/8"	595 mm ~ 23½"
1200 mm ~ 47 ¼"	10-23-300 mm	132 lbs	270 mm ~ 10 ½"	690 mm ~ 27 1/8"
1400 mm ~ 55"	10-23-350 mm	132 lbs	320 mm ~ 12 ½"	790 mm ~ 31"
1600 mm ~ 63"	10-23-400 mm	132 lbs	365 mm ~ 14 ¾"	885 mm ~ 34 3/4"

GAS SPRING 10-23 SERIES WITH PROTECTION TUBE ADDS 15 MM TO OVERALL LENGTH

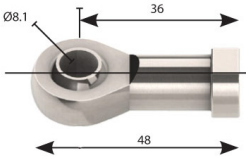




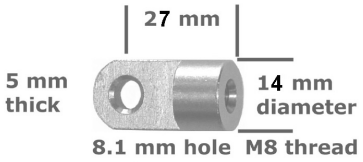
#62.833 Fork with pin M8x32



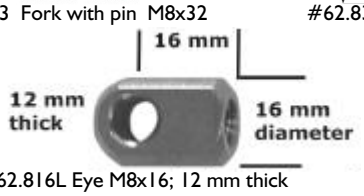
#62.830 Balljoint M8x30



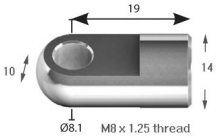
62.536 Ball Swivel End M8x36



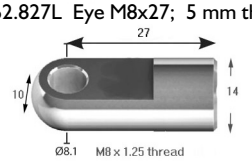
#62.827L Eye M8x27; 5 mm thick



#62.816L Eye M8x16; 12 mm thick



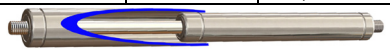
#62.819 Eye M8x19; 10 mm thick



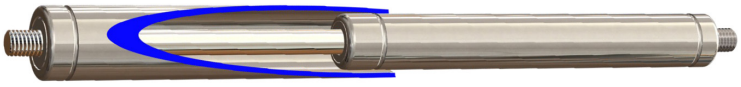
#62.827 Eye M8x27 10 mm thick

10-23 series	#	"E"	"F"	"B"	62.819	62.827	62.830	Newton Force
Part ID+ Protection tube	Series 10-23-stainless steel gas spring with valve and protection tube	Stroke Length in mm	Total length without attachments with protection tube (not counting the thread) 2 x stroke+15+45 mm)	Sleeve length 35.5 mm + rod length	Short eyes, Add 2 x 19 mm	big eyes, add 2 x 27 mm	Ball joints, add 2 x 30 mm	Thread size M8 x 1.25 Newton Force per rod length
61.P110	Extended	100mm	260 mm	135.5 mm	298 mm	314 mm	320 mm	M8; 100N–1250N
	Compressed	100 mm	160 mm		198 mm	214 mm	220 mm	M8; 100N–1250N
61.P150	Extended	150 mm	360 mm	221 mm	398 mm	414 mm	420 mm	M8; 100N–1250N
	Compressed	150 mm	210 mm		248 mm	264 mm	270 mm	M8; 100N–1250N
61.P120	Extended	200 mm	460 mm	235.5 mm	498 mm	514 mm	520 mm	M8; 100N–1250N
	Compressed	200 mm	260 mm		298 mm	314 mm	320 mm	M8; 100N–1250N
61.P125	Extended	250 mm	560 mm	285.5 mm	598 mm	614 mm	620 mm	M8; 100N–1250N
	Compressed	250 mm	310 mm		348 mm	364 mm	370 mm	M8; 100N–1250N
61.P130	Extended	300 mm	660 mm	335.5 mm	698 mm	714 mm	720 mm	M8; 100N–1250N
	Compressed	300 mm	360 mm		398 mm	414 mm	420 mm	M8; 100N–1250N
61.P135	Extended	350 mm	760 mm	385.5 mm	698 mm	814 mm	820 mm	M8; 100N–1250N
	Compressed	350 mm	410 mm		448 mm	464 mm	470 mm	M8; 100N–1250N
61.P140	Extended	400 mm	860 mm	435.5 mm	898 mm	914 mm	920 mm	M8; 100N–1250N
	Compressed	400 mm	460 mm		498 mm	514 mm	520 mm	M8; 100N–1250N

*10-23 Series gas spring are supplied with protection tube when force is above nominal set force

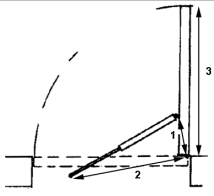


Maximum force depends on rod length	1250N* (275 lb.)*	
Minimum charge in Newtons	100N (22 lb.)	*For custom sizes please call office.



10-23 Series Gas Spring with Protection Tube

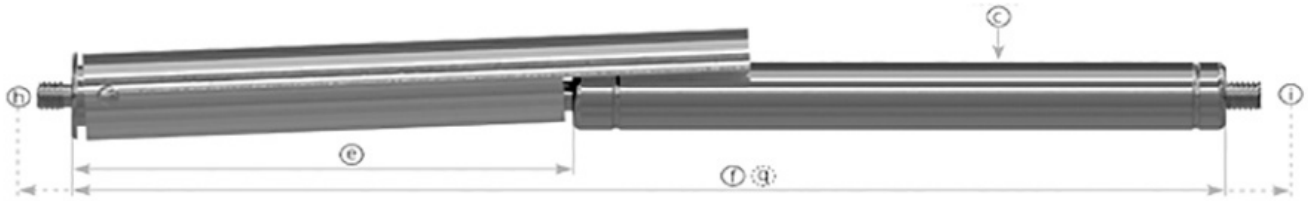
10-23 Series Gas Spring with Protection Tubes.
Protection tubes offer higher bending resistance and protection against dust, dirt and scratching.
Certain seizes10-23 series gas springs charged with High Pressure require a with Protection Tubes against bending.
Check on standard 10-23 series gas springs for details.
Maximum force with protection tube: 1250N (275lbs.)
Add 15 mm to the overall length when using a protection tube



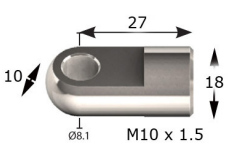
size 3: length of hatch:	gas spring ID	weight hatch up to:	size 1: hatch bracket to hinge pin:	size 2: Coaming bracket to hinge pin with balljoints installed:
600 mm ~ 23 ½"	10-23-150 mm	132 lbs	125 mm ~ 5"	396 mm ~ 15 ½"
800 mm ~ 31 ½"	10-23-200 mm	132 lbs	175 mm ~ 6 7/8"	495 mm ~ 19 ½"
1000mm ~ 39½"	10-23-250 mm	132 lbs	225 mm ~ 8 7/8"	595 mm ~ 23½"
1200 mm ~ 47 ¼"	10-23-300 mm	132 lbs	270 mm ~ 10 ½"	690 mm ~ 27 1/8"
1400 mm ~ 55"	10-23-350 mm	132 lbs	320 mm ~ 12 ½"	790 mm ~ 31"
1600 mm ~ 63"	10-23-400 mm	132 lbs	365 mm ~ 14 ¾"	885 mm ~ 34 3/4"

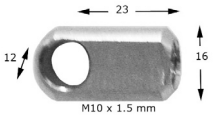
ALWAYS INSTALL GAS SPRING WITH ROD DOWN AND CYLINDER UP

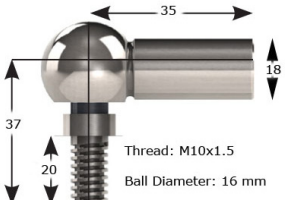
Gas springs with Locking Sleeve - featuring 10-23 series stainless steel gas springs
For applications that require extra safety by locking the hatch in an open position.
To close the hatch, release sleeve by depressing it. Hatch may have to be slightly lifted to allow for release the sleeve

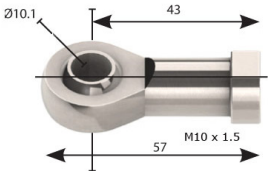


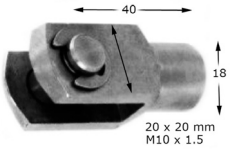
The swivel mounted threaded rod allows the sleeve to be pushed to one side and automatically lock in open position.











#62.127 Eye M10x27 **#62.123L M10x23** **#62.135 Ball Joint M10x35** **# 62.443 Ball Swivel End M10x43** **#62.140 Fork M10x43**

10-23 series	#	"E"	"F"	"B"	62.819	62.827	62.830	Newton Force
Part ID+ Locking tube	Series 10-23-stainless steel gas spring with valve and protection tube	Stroke Length in mm	Total length without attachments with locking tube (not counting the thread) 2 x stroke+15+45 mm)	Sleeve length 35.5 mm + rod length	Short eyes, Add 2 x 19 mm	big eyes, add 2 x 27 mm	Ball joints, add 2 x 30 mm	Thread size M8 x 1.25 Newton Force per rod length
61.L110	Extended	100mm	260 mm	135.5 mm	298 mm	314 mm	320 mm	M8; 100N–1250N
	Compressed	100 mm	160 mm		198 mm	214 mm	220 mm	M8; 100N–1250N
61.L150	Extended	150 mm	360 mm	221 mm	398 mm	414 mm	420 mm	M8; 100N–1250N
	Compressed	150 mm	210 mm		248 mm	264 mm	270 mm	M8; 100N–1250N
61.L120	Extended	200 mm	460 mm	235.5 mm	498 mm	514 mm	520 mm	M8; 100N–1250N
	Compressed	200 mm	260 mm		298 mm	314 mm	320 mm	M8; 100N–1250N
61.L125	Extended	250 mm	560 mm	285.5 mm	598 mm	614 mm	620 mm	M8; 100N–1000N
	Compressed	250 mm	310 mm		348 mm	364 mm	370 mm	M8; 100N–1000N
61.L130	Extended	300 mm	660 mm	335.5 mm	698 mm	714 mm	720 mm	M8; 100N–800N
	Compressed	300 mm	360 mm		398 mm	414 mm	420 mm	M8; 100N–800N
61.L135	Extended	350 mm	760 mm	385.5 mm	698 mm	814 mm	820 mm	M8; 100N–700N
	Compressed	350 mm	410 mm		448 mm	464 mm	470 mm	M8; 100N–700N
61.L140	Extended	400 mm	860 mm	435.5 mm	898 mm	914 mm	920 mm	M8; 100N–700N
	Compressed	400 mm	460 mm		498 mm	514 mm	520 mm	M8; 100N–700N

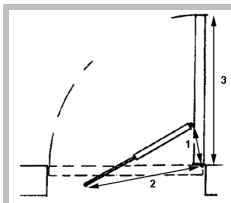
***10-23 Series gas spring are supplied with protection tube when force is above nominal set force**

Maximum force depends on rod length See table.	1250N* (275 lb.)*	
Minimum charge in Newtons	100N (22 lb.)	*For custom sizes and special forces please email our office.

10-23 Series Gas Spring with Locking Tube

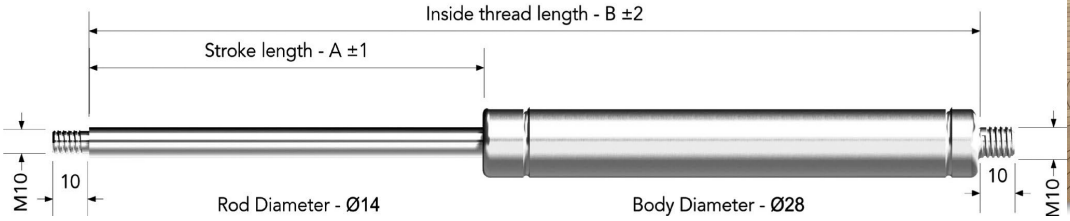
Recommended to use one locking gas spring and one standard gas spring in combination on one hatch. The sleeve automatically locks into place.
Release by depressing the sleeve

10-23 Series Gas Spring with Locking Tube.
A Locking tube prevent that the hatch will close down during operation. Maximum force with locking tube depends on the length of the stroke: See table above.
Add 15 mm to the overall length of the gas spring when using a locking tube on an existing standard 10-23 series gas spring

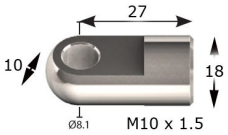


size 3: length of hatch:	**gas spring ID**	**weight hatch** up to:	**size 1:** hatch bracket to hinge pin:	**size 2:** Coaming bracket to hinge pin with balljoints installed:
600 mm ~ 23 ½"	10-23-150 mm	132 lbs	125 mm ~ 5"	396 mm ~ 15 ½"
800 mm ~ 31 ½"	10-23-200 mm	132 lbs	175 mm ~ 6 7/8"	495 mm ~ 19 ½"
1000mm ~ 39½"	10-23-250 mm	132 lbs	225 mm ~ 8 7/8"	595 mm ~ 23½"
1200 mm ~ 47 ¼"	10-23-300 mm	132 lbs	270 mm ~ 10 ½"	690 mm ~ 27 1/8"
1400 mm ~ 55"	10-23-350 mm	132 lbs	320 mm ~ 12 ½"	790 mm ~ 31"
1600 mm ~ 63"	10-23-400 mm	132 lbs	365 mm ~ 14 ¾"	885 mm ~ 34 3/4"

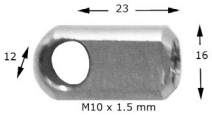
ALWAYS INSTALL GAS SPRING WITH ROD DOWN AND CYLINDER UP



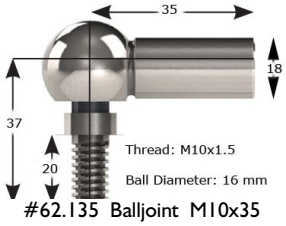
Extension #64.010
32 mm long ~ 1 1/4"



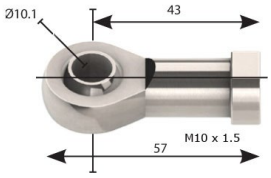
#62.127 Eye M10x27



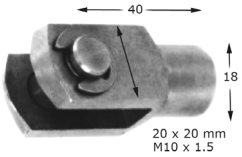
#62.123L M10x23



#62.135 Balljoint M10x35



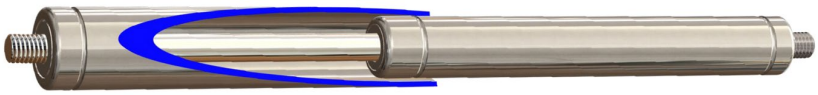
62.443 Ball Swivel End M10x43



#62.140 Fork M10x43

	14-28	"A"	"B"	62.123L	62.127	62.135	62.140	
Part ID	Series 14-28-stainless steel gas spring with valve	Stroke Length in mm	Total length without attachments (not counting the thread) 2 x stroke+ 50 mm)	Short Eyes, add 2 x 23 mm	Long Eyes, add 2 x 27 mm	Ball Joints, add 2 x 35 mm	Forks Add 2 x 40 mm	Thread size and max. N force per rod length*
14-28-100	Extended	100mm	250 mm	296 mm	304 mm	320 mm	330 mm	M10x1.5 – 2500N
	Compressed	100 mm	150 mm	196 mm	204 mm	220 mm	230 mm	M10x1.5 – 2500N
14-28-150	Extended	150 mm	350 mm	396 mm	404 mm	420 mm	430 mm	M10x1.5 – 2500N
	Compressed	150 mm	200 mm	246 mm	254 mm	270 mm	280 mm	M10x1.5 – 2500N
14-28-200	Extended	200 mm	450 mm	496 mm	504 mm	520 mm	530 mm	M10x1.5 – 2500N
	Compressed	200 mm	250 mm	296 mm	304 mm	320 mm	330 mm	M10x1.5 – 2500N
14-28-250	Extended	250 mm	550 mm	596 mm	604 mm	620 mm	630 mm	M10x1.5 – 2500N
	Compressed	250 mm	300 mm	346 mm	354 mm	370 mm	380 mm	M10x1.5 – 2500N
14-28-300	Extended	300 mm	650 mm	696 mm	704 mm	720 mm	730 mm	M10x1.5 – 2500N
	Compressed	300 mm	350 mm	396 mm	404 mm	420 mm	430 mm	M10x1.5 – 2500N
14-28-350	Extended	350 mm	750 mm	796 mm	804 mm	820 mm	830 mm	M10x1.5 – 2500N
	Compressed	350 mm	400 mm	446 mm	454 mm	470 mm	480 mm	M10x1.5 – 2500N
14-28-400	Extended	400 mm	850 mm	896 mm	904 mm	920 mm	930 mm	M10x1.5 – **1900N***
	Compressed	400 mm	450 mm	496 mm	504 mm	520 mm	530 mm	M10x1.5 – **1900N***
14-28-500	Extended	500 mm	1050 mm	1096 mm	1104 mm	1120 mm	1130 mm	M10x1.5 – **1500N***
	Compressed	500 mm	550 mm	596 mm	604 mm	620 mm	630 mm	M10x1.5 – **1500N***

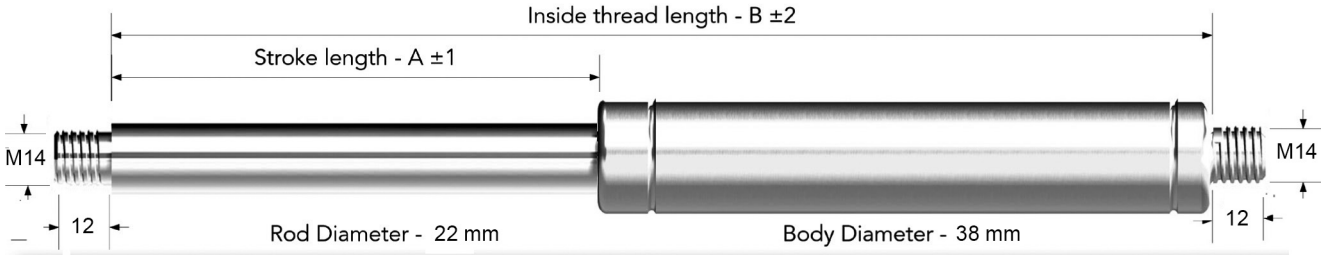
*Maximum force depends on rod length	2500N* (550 lb.)*	Check also pages 6-0-2-0 and 6-0-2-1 for force calculations
Minimum charge in Newtons	250N (55 lb.)	Please contact our office for Custom sizes

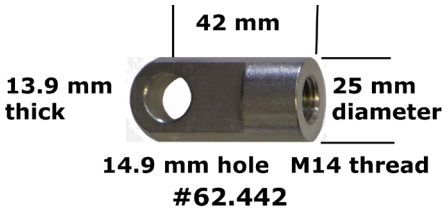


14-28 Series Gas Spring with Protection Tube

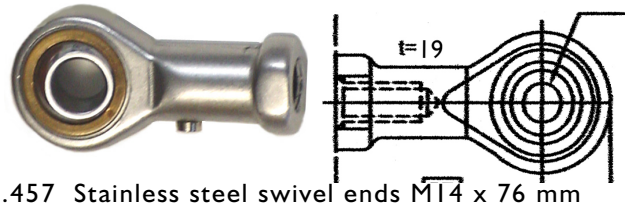
***14-28 Series Gas Spring with Protection Tubes.**
Protection tubes offer higher bending resistance and protection of the rod against dust, dirt and scratching.

ALWAYS INSTALL GAS SPRING WITH ROD DOWN AND CYLINDER UP

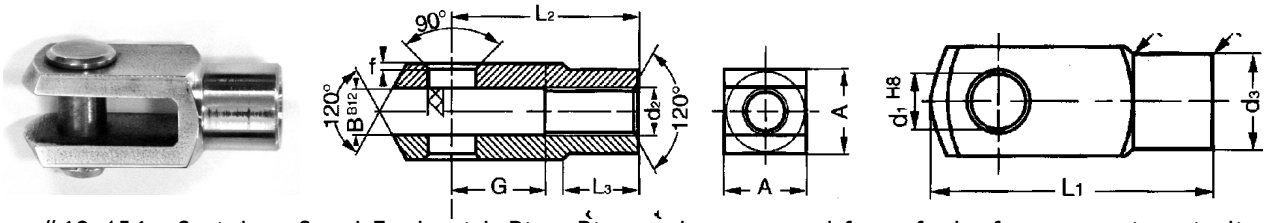




#62.442 Stainless steel eye M14 x 42 mm



#62.457 Stainless steel swivel ends M14 x 76 mm

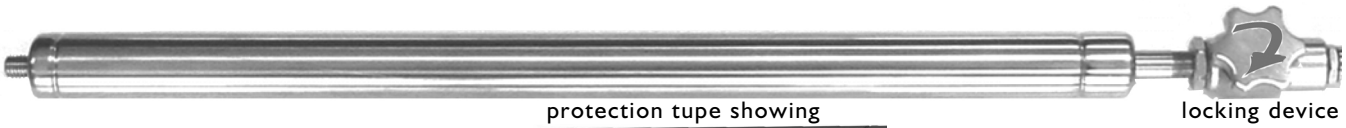


#62.456 Stainless Steel Fork with Pin. Pin can be removed from fork after removing circlip

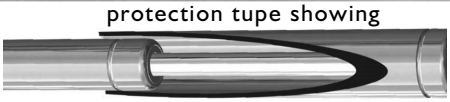
Application: Two 22-38-400 gas springs, 2342 Newton force each with custom made brackets.

	22-38	'A'	'B'	#62.422	#62.456	Thread size
Series 22-38	Stainless steel gas spring with valve	Stroke	Total length without attachments; 2 x the stroke + 70 mm	With Eyes, add 2 x 42 mm	With Forks, add 2 x 56 mm	Maximum Newton Force*
61.220	Extended	200mm	470 mm	554 mm	582 mm	M14 x 1.5 – 5000N
	Compressed		270 mm	354 mm	382 mm	M14 x 1.5 – 5000N
61.240	Extended	400mm	870 mm	954 mm	982 mm	M14 x 1.5 – **4000N**
(4000N MAX)	Compressed		470 mm	554 mm	582 mm	M14 x 1.5 – **4000N**
61.250	Extended	500 mm	1070 mm	1154 mm	1382 mm	M14 x 1.5 – **3500N**
(3500N MAX)	Compressed		570 mm	754 mm	782mm	M14 x 1.5 – **3500N**
61.260	Extended	600 mm	1270 mm	1154 mm	1382 mm	M14 x 1.5 – **3500N**
(3500N MAX)	Compressed		670 mm	754 mm	782mm	M14 x 1.5 – **3500N**
61.280	Extended	800 mm	1670 mm	1754 mm	1782 mm	M14 x 1.5 – 30**00N**
(3000N MAX)	Compressed		870 mm	954 mm	982 mm	M14 x 1.5 – 30**00N**
61.2100	Extended	1000 mm	2070 mm	2154 mm	2182 mm	M14 x 1.5 – **2500N**
(2500N MAX)	Compressed		1070 mm	1154 mm	1182 mm	M14 x 1.5 – **2500N**
Maximum charge in Newton force			5000N (1100lb.)*	*Maximum Newton force rating depends on application and rod length		
Minimum Charge in Newton force			500N (110 lb.)	***22-38 Series Gas Springs are special order only; lead-times apply.***		

Stainless steel gas springs with stainless steel hand operated blocking valve. The blocking valve allows the gas spring to be stopped in any position by turning the wheel.



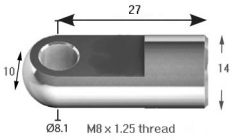
protection tupe showing



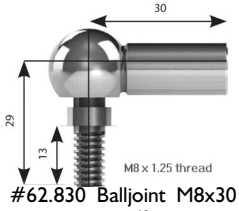
Blocking Gas Spring Set as complete assembly: #63.120 (Series 10-23-200) and #63.125 (Series 10-23-250)
Parts of set include: Gas spring; **with protection tube**, blocking lever set. Please order endfittings separate.

Picture: Blocking gas sping and standard gas spring installed side by side Stainless steel knob lever set assembly #62.143
Operation: Turn knob lever from blocking position to not blocking position: 1/2 turn with click.

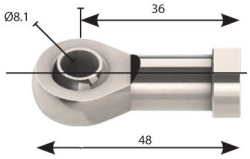
END FITTINGS:



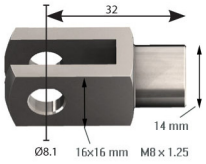
#62.827 Eye M8x27 ;10 mm thick



#62.830 Balljoint M8x30 mm

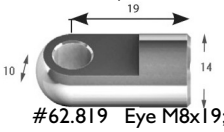


62.536 Ball Swivel End M8x36 mm

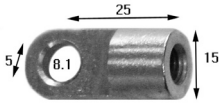


#62.833 Fork with pin M8x32 mm

Other eye end fittings:



#62.819 Eye M8x19; end 10 mm thick

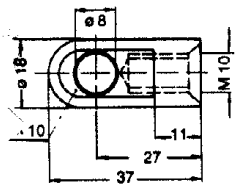


#62.825L Eye M8x25; end 5 mm thick

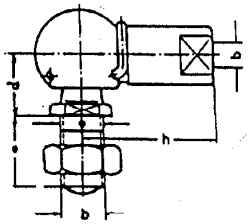
Series 10-23 Part #	Blocking Stainless steel gas spring with valve	Stroke	Length with protection tube without attachments (not counting the thread) 2 x stroke + 188.5 + 15 mm	62.819 Short Eyes: add 2 x 19 mm	62.827 Long Eyes: add 2 x 27 mm	62.830 Ball Joints: add 2 x 30 mm	Rod thread size	Cylinder Thread size Newton Force
63.120	Extended	200 mm	603.5 mm	626.5 mm	642.5 mm	648.5 mm	M10x1	M8x1.25 – 500N
	Compressed	200 mm	403.5 mm	426.5 mm	442.5 mm	448.5 mm	M10x1	M8x1.25 – 500N
63.125	Extended	250 mm	703.5 mm	726.5 mm	742.5 mm	748.5 mm	M10x1	M8x1.25 – 500N
	Compressed	250 mm	453.5 mm	476.5 mm	492.5 mm	498.5 mm	M10x1	M8x1.25 – 500N
Max / min. charge in Newton force			500N to 150N / 110lbs. to 33 lbs.					

The use of a blocking gas springs allows hatches to be opened and locked in any position.
Maximum weight hatch using one blocking gas spring: 55 lbs./ 25 kg
Recommended weight hatch using two gas springs, with one standard and with one blocking gas spring is 120 lbs.
Please email Sales@Izerwaren.com for further inquiries and different sizes and applications.

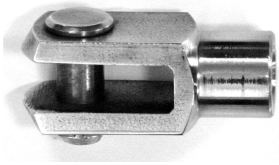
GAS SPRING: WITH TWO CYLINDERS (252 MM LONG EACH; 28 MM DIAMETER) ONE ROD. (400 MM LONG, 14 MM DIAMETER)

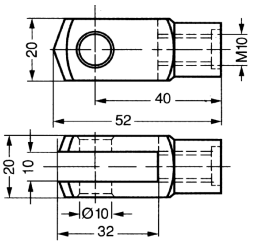


Stainless steel eye M10 x 27 mm

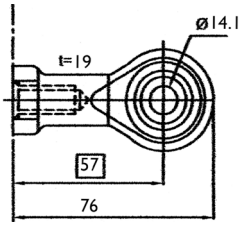


Stainless steel ball joint M10 x 35 mm

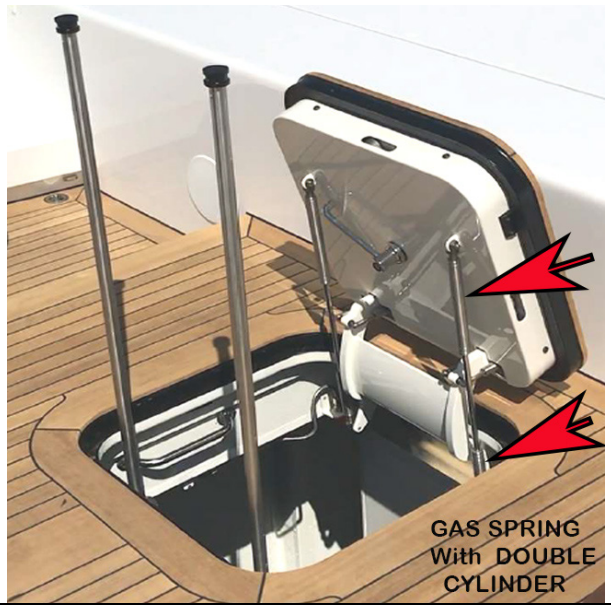




Stainless steel Forks M10 x 40 mm



Stainless Steel Swivel Ball Ends M10 x 43 mm



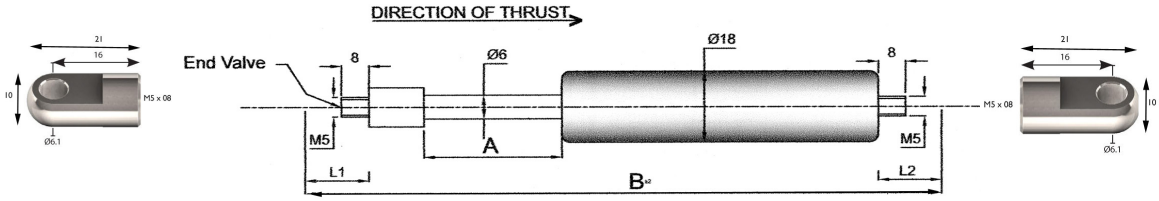
The advantage of a double cylinder configuration is
that hatch to be easily opened ***and*** easily closed, by varying the Newton force for each cylinder.

Most suitable for heavy hatches of 100 lbs. or more, with ample room for installation

Cert.953426

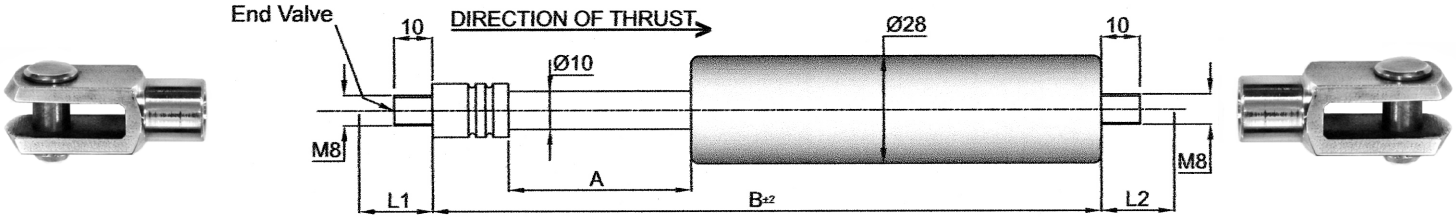
Order # Series 14-28	C+D Stainless steel gas spring with valve	B Stroke	E Total length without attachments (not counting the thread) (x stroke + 50 + 50)	Total Length with eyes, c. to c. hole; (add 2 x 27 mm)	Total length with ball joints, c. to c. hole (add 2 x 35 mm)	Total length with forks, c. to c. hole (add 2 x 40 mm)	F Thread size
66.440D double cylinder	Extended	400 mm	904 mm	958 mm	974 mm	984 mm	M10
	Compressed	400 mm	504 mm	558 mm	574 mm	584 mm	M10
Maximum charge in Newton force			2500N (550lb.)	2500N	1300N	2000N	
Minimum Charge in Newton force			250N (55 lb.)	250N	250N	250N	

Note: Sizes and Charging Pressure depending on application / cylinder length.
This size in stock; Custom sizes available on order.
Double cylinder can have a different force applied in each cylinder, allowing for special applications



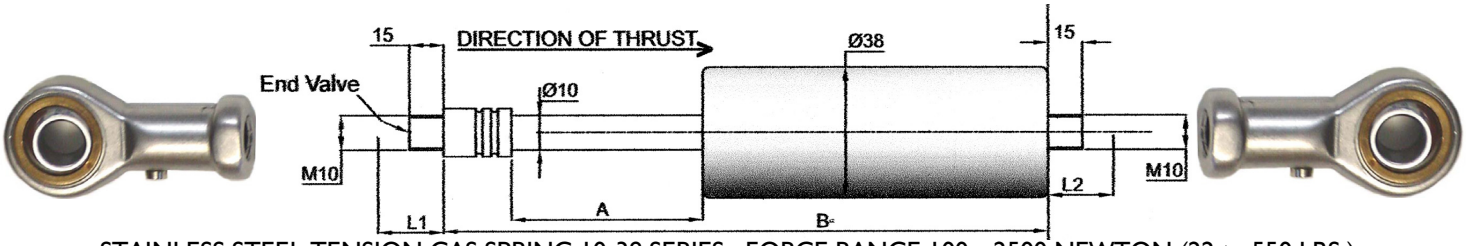
STAINLESS STEEL TENSION GAS SPRING 6-18 SERIES FORCE RANGE 25 --400 NEWTON (5.5 to 88 LBS)

Series 6-18 Tension Gas spring	Tension gas spring with valve	Stroke	Total length without attachments 2 x stroke + 67 mm	with _Eyes, add 2 x 16 mm	With forks, add 2 x 20 mm	Swivel ends add 2 x 27 mm	Thread size Max. Newton Force
65.650	Extended	50 mm	167 mm	199 mm	207 mm	221 mm	M5 x 08 – 400N
	Compressed	50 mm	117 mm	149 mm	157 mm	171 mm	M5 x 08 – 400N
65.610	Extended	100 mm	267 mm	299 mm	307 mm	321 mm	M5 x 08 – 400N
	Compressed	100 mm	167 mm	199 mm	207 mm	221 mm	M5 x 08 – 400N
65.615	Extended	150 mm	367 mm	399 mm	407 mm	421 mm	M5 x 08 – 400N
	Compressed	150 mm	217 mm	249 mm	257 mm	271 mm	M5 x 08 – 400N
65.520	Extended	200 mm	467 mm	499 mm	507 mm	521 mm	M5 x 08 – 400N
	Compressed	200 mm	267 mm	299 mm	307 mm	321 mm	M5 x 08 – 400N



STAINLESS STEEL TENSION GAS SPRING 10-28 SERIES FORCE RANGE 50 --1250 NEWTON (11 to 275 LBS)

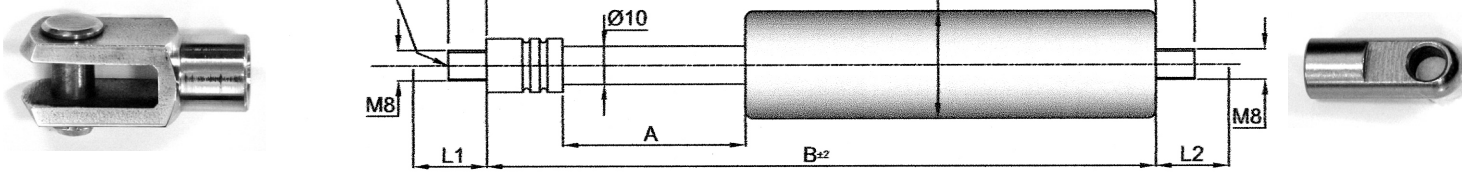
Series 10-28 Tension Gas spring	Tension gas spring with valve	Stroke	Total length without attachments 2 x stroke + 107 mm	Small eyes, #62.819 add 2 x 19 mm	Big eyes, #62.827 add 2 x 27 mm	Forks, #62.833 (add 2 x 32 mm)	Thread size And Max Newton force
65.110	Extended	100mm	307 mm	345 mm	361 mm	371 mm	M8 x 1.25 – 1250N
	Compressed	100 mm	207 mm	245 mm	261 mm	271 mm	M8 x 1.25 – 1250N
65.115	Extended	150mm	407 mm	445 Mm	461 mm	471 mm	M8 x 1.25 – 1250N
	Compressed	150 mm	257 mm	295 mm	311 mm	321 mm	M8 x 1.25 – 1250N
65..120	Extended	200mm	507 mm	545 mm	561 mm	571 mm	M8 x 1.25 – 1250N
	Compressed	200 mm	307 mm	345 mm	361 mm	371 mm	M8 x 1.25 – 1250N
65.125	Extended	250mm	607 mm	645 mm	661 mm	671 mm	M8 x 1.25 – 1250N
	Compressed	250 mm	357 mm	395 mm	411 mm	421 mm	M8 x 1.25 – 1250N
65.130	Extended	300mm	707 mm	745 mm	761 mm	771 mm	M8 x 1.25 – 1250N
	Compressed	300 mm	407 mm	445 mm	461 mm	471 mm	M8 x 1.25 – 1250N
65.140	Extended	400mm	907 mm	945 mm	961 mm	971 mm	M8 x 1.25 – 1250N
	Compressed	400 mm	507 mm	545 mm	561 mm	571 mm	M8 x 1.25 – 1250N
65.150	Extended	500mm	1107 mm	445 mm	1161 mm	1171 mm	M8 x 1.25 – 1250N
	Compressed	500 mm	607 mm	645 mm	661 mm	671 mm	M8 x 1.25 – 1250N



STAINLESS STEEL TENSION GAS SPRING 10-38 SERIES FORCE RANGE 100 --2500 NEWTON (22 to 550 LBS)

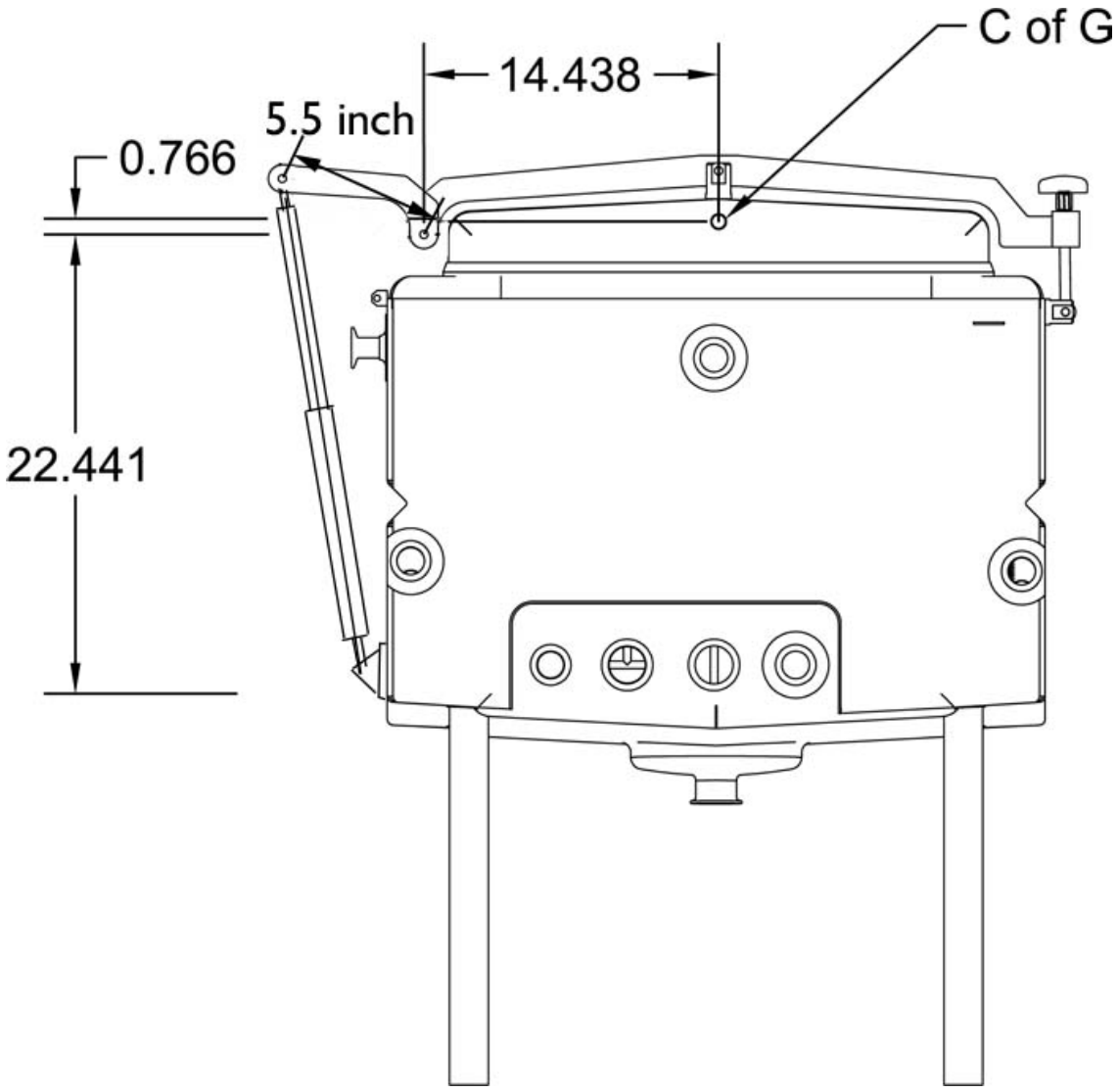
Available with Stroke from 50 mm to 1000 mm long. Add 121 mm to length of cylinder. Uses Size M10 #62.457 end fittings

Email our office at sales@izerwaren with your requirements for tensions gas springs.



STAINLESS STEEL TENSION GAS SPRING 10-28 SERIES FORCE RANGE 50 --1250 NEWTON (11 to 275 LBS)

Series 10-28	Stainless steel tension gas spring with valve	Stroke	Total length without attachments (not counting the thread) (.. x stroke + 107 mm)	Total Length with *small* eyes, c. to c. hole; (add 2 x 19 mm)	Total Length with *big* eyes, c. to c. hole; (add 2 x 27 mm)	Total length with forks, c. to c. hole (add 2 x 32 mm)	Thread size
65.220	Extended	200mm	507 mm	545 mm	561 mm	571 mm	M8
	Compressed	200 mm	307 mm	345 mm	361 mm	371 mm	M8



Sample Application Stainless Steel Tension Gas Spring
Note: Computer sketch not to scale
Proposed Solution: 2 Tension gas spring T10-28-200-307 with M8M8 thread
1023 Newton force each.
Container and Brackets on this page not for sale by Izerwaren Inc.

MEDIUM DUTY GAS SPRING BRACKETS 5/32" ~ 2.5 mm thick

#64.582H5
with hole M5

#64.582H8
with hole M8

#64.8825
Ball joint M8 outside

#64.5825B
Ball joint M5 outside

#64.5825A
Ball joint M5 inside

ANGLE BRACKET 90 degree H: 1 3/16". L x W: 2"x 1 1/2"
5/32" thick. 316 stainless steel.

#64.584H5
with hole M5

#64.584H8
with hole M8

#64.8845
with ball joint M8

#64.5845
with ball joint M5

OFFSET BRACKET W: 2" x H: 1 3/4". 3/16" offset
2.5 mm thick or 5/32" thick. 316 stainless steel.

#64.583H5
with hole M5

#64.583H8
with hole M8

#64.8835
with ball joint M8

#64.5835
with ball joint M5

FLUSH BRACKET
2" wide x 1 11/16" high. 5/32" thick. 316 stainless steel

More gas spring brackets on page 6-14 and page 6-15-1 and page 6-15-2.

Izerwaren order numbers

64.088 Hatch mounting bracket for ball joints M8

64.089 Hatch mounting bracket for ball joints M10
Cast stainless steel
1 1/2" x 2 3/8" footprint; 3/4" stand off

#64.741 Angle bracket

64.205 Hatch mounting bracket for Eyes M8
1 1/4" stand off

64.206 Hatch mounting bracket for Eyes M10
1 1/4" stand off

#64.088 Hatch mounting bracket: 1 1/2" x 2 3/8" footprint 3/4"
Ball joints to be ordered separately

#64.089 for M10

#64.205 Bracket for eyes
using M8 or M10 eyes

When using M10 ball joints order: #64.206

ball joints and eyes sold separately

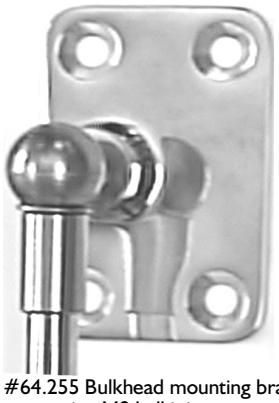
64.255 Bulkhead mounting bracket
for ball joints M8

64.256 Bulkhead mounting bracket for
ball joints M10

64.257 Bulkhead mounting bracket
for eyes M8

64.258 Bulkhead mounting bracket
for eyes M10

Cast stainless steel
1 7/8" x 2 7/8" footprint; 3/4" stand off



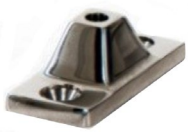
#64.255 Bulkhead mounting bracket
using M8 ball joints

#64.257 Bulkhead mounting bracket
using M8 eye

Cast stainless steel 1 7/8" x 2 7/8" footprint; 3/4" stand off
ball joints and eyes sold separately

64.250 Bulkhead mounting bracket
for ball joints M5
Cast stainless steel, polished
2" x 7/8" footprint
3/4" stand off

64.200 Hatch mounting bracket for
ball joints M5
Cast stainless steel, polished
2 3/8" x 3/4" footprint
1 1/4" stand off



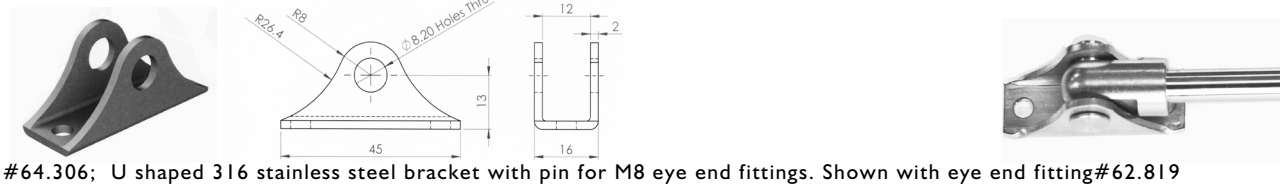
#64.250
Bulkhead mounting bracket
2" x 7/8" footprint 3/4" stand off

#64.200
Hatch mounting bracket M5 eye
2 3/8" x 3/4" footprint 1 1/4" stand off

ball joints and eyes sold separately

Part #

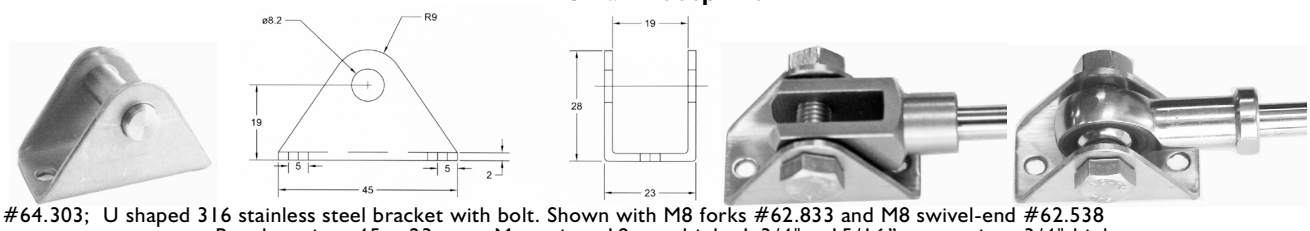
MEDIUM DUTY GAS SPRING BRACKETS for Eyes M8
Small Footprint



#64.306; U shaped 316 stainless steel bracket with pin for M8 eye end fittings. Shown with eye end fitting#62.819
Bracket size: 45 x 16 mm; mounting: 13 mm high. 1 3/4" x 5/8"; mounting: 1/2" high.

MEDIUM DUTY GAS SPRING BRACKETS for Forks M8
Small Footprint

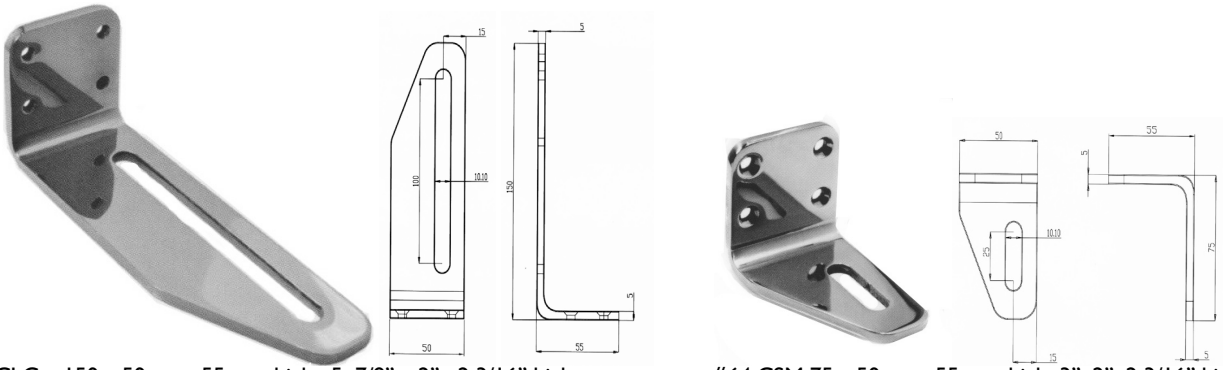
64.306



#64.303; U shaped 316 stainless steel bracket with bolt. Shown with M8 forks #62.833 and M8 swivel-end #62.538
Bracket size: 45 x 23 mm; Mounting: 19 mm high. 1 3/4" x 15/16"; mounting: 3/4" high

HEAVY DUTY BRACKETS f

64.303



64.CLG
64.CSM

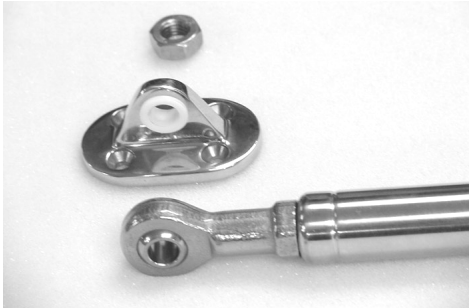
#64.CLG; 150 x 50 mm; 55 mm high; 5 7/8" x 2"; 2 3/16" high. #64.CSM 75 x 50 mm; 55 mm high. 3"x2"; 2 3/16" high.

Heavy duty brackets. Can also be used for Door Closer Gas Springs for Weather Doors.

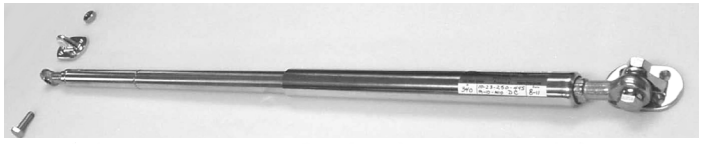
65.D125

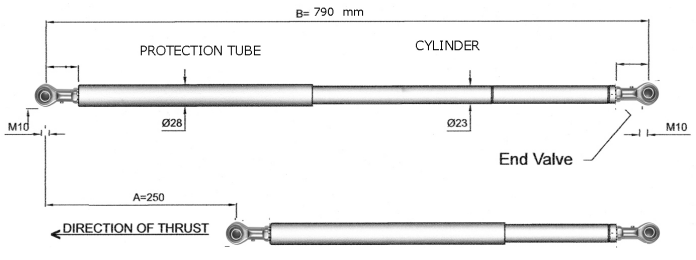
#65.D125 **DOOR CLOSER GAS SPRING**. HEAVY DUTY
For use on weather doors on yachts and ships with a weight op to 300 lbs

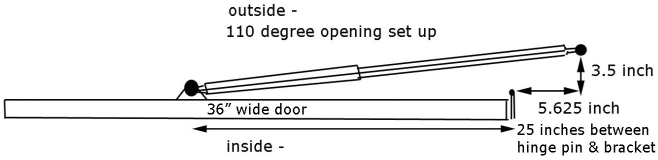
* Stainless steel Door closer gas spring #10-23-250-790
* with stainless steel swivel eyes M 10
* Stroke: 250 mm overall.
* Length not counting threads, without end fittings: 700 mm
* Center to Center distance end fitting: 790 mm
* Please note stainless steel protection tube over rod.
* This door closer has a controlled extension speed
* Recommended Force setting: 500N
* Force range: 150 to 500 Newton



Set up with swivel ends #62.443 and #64.088 brackets



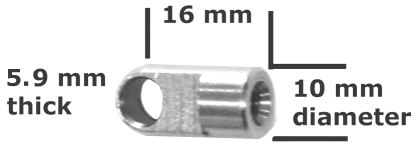




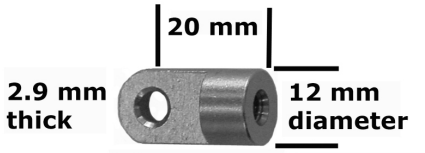
Possible set up of the 65.D125 door closer gas spring, using one bracket #62.443 and one bracket #64.CLG

Stainless Steel Eyes M5 x 0.08 thread

#62.515L

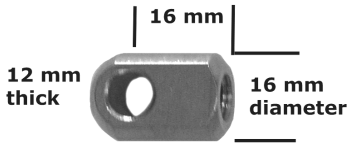


#62.516

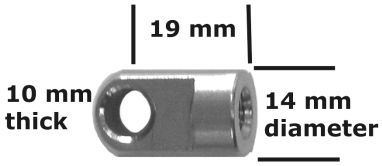


#62.520L

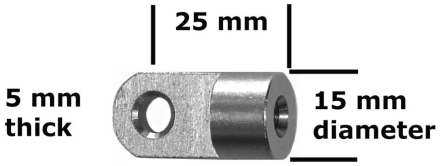
Stainless Steel Eyes M8 x 1.25 thread



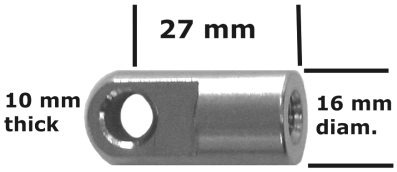
62.816L



#62.819

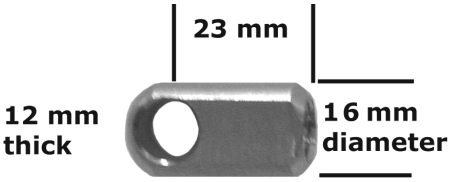


#62.825L

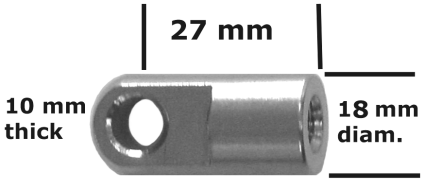


#62.827L

Stainless Steel Eyes M10 x 1.5 thread

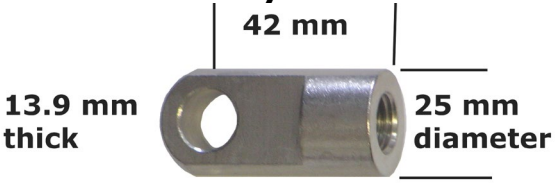


#62.123L



#62.127

Stainless Steel Eyes M14 x 1.5 thread



#62.442

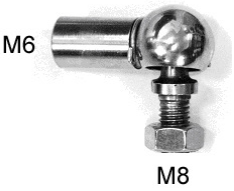
Note: All Eye End Fittings are supplied in stainless steel in standard mill finish.

Stainless Steel Ball joints, swivel 18 degrees; ball can be separated from cup after removing circlip

M5 to M5
#62.522

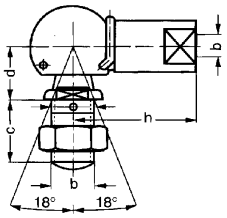
M5 to ball M6
#62.635

M6 to M6
#62.625



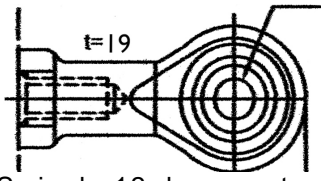
M6 to Ball M8
#62.836

M8 to M8
#62.830



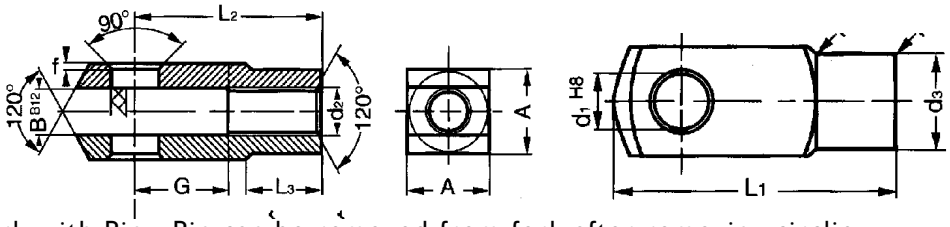
M10 x M10
#62.135

Ball joints Order numbers	OD diameter	For size hole	Overall length	Thread (b)	Distance To ball (h)	size ball	For gas spring series
62.522	10 mm	5.1 mm	**28 mm**	M5 x 0.8	22 mm	8 mm	**6-15**
62.635	10 mm	6.1 mm	**28 mm**	M5 x 0.8 M6 x 1	22 mm	8 mm	**6-15**
62.625	10 mm	5.1 mm	**32 mm**	M6 x 1	25 mm	10 mm	Not applicable
62.836	14 mm	8.1 mm	**39 mm**	M6 x 1 M8 x 1.25	30 mm	13 mm	Not applicable
62.830	14 mm	8.1 mm	**39 mm**	M8 x 1.25	30 mm	13 mm	**8-19 and 10-23**
62.135	18 mm	10.1 mm	**47 mm**	M10 x 1.5	35 mm	16 mm	**14-28**



Stainless Steel Swivel Ball Ends. Swivels 12 degrees to either side

Swivel Ends Order numbers	OD diameter	size hole Ø	Overall length	Thread	Distance		For gas spring series
62.527	9 / 11 mm	5.1 mm	36 mm	M5 x 0.80	27 mm		6-15
62.536	12.5 / 16 mm	8.1 mm	48 mm	M8 x 1.25	36 mm		8-19 and 10-23
62.443	15 /19 mm	10.1 mm	58 mm	M10x 1.5	43 mm		14-28
62.457	20 / 25 mm	14.1 mm	76 mm	M14 x 15	57 mm		22-38



Stainless Steel Fork with Pin. Pin can be removed from fork after removing circlip

Forks with Pin Order number	D3 diameter	pin diameter	L1 Overall length	L2 Length to pin	A= square dimension	Circlip size	For gas spring series
62.520	9 mm	5 mm	26 mm	20 mm	10x10 mm	5	6-15
62.833	14 mm	8 mm	42 mm	33 mm	16x16 mm	8	8-19 and 10-23
62.140	18 mm	10 mm	52 mm	40 mm	20x20 mm	10	14-28
62.456	24 mm	14 mm	72 mm	56 mm	27x27 mm	14	22-38

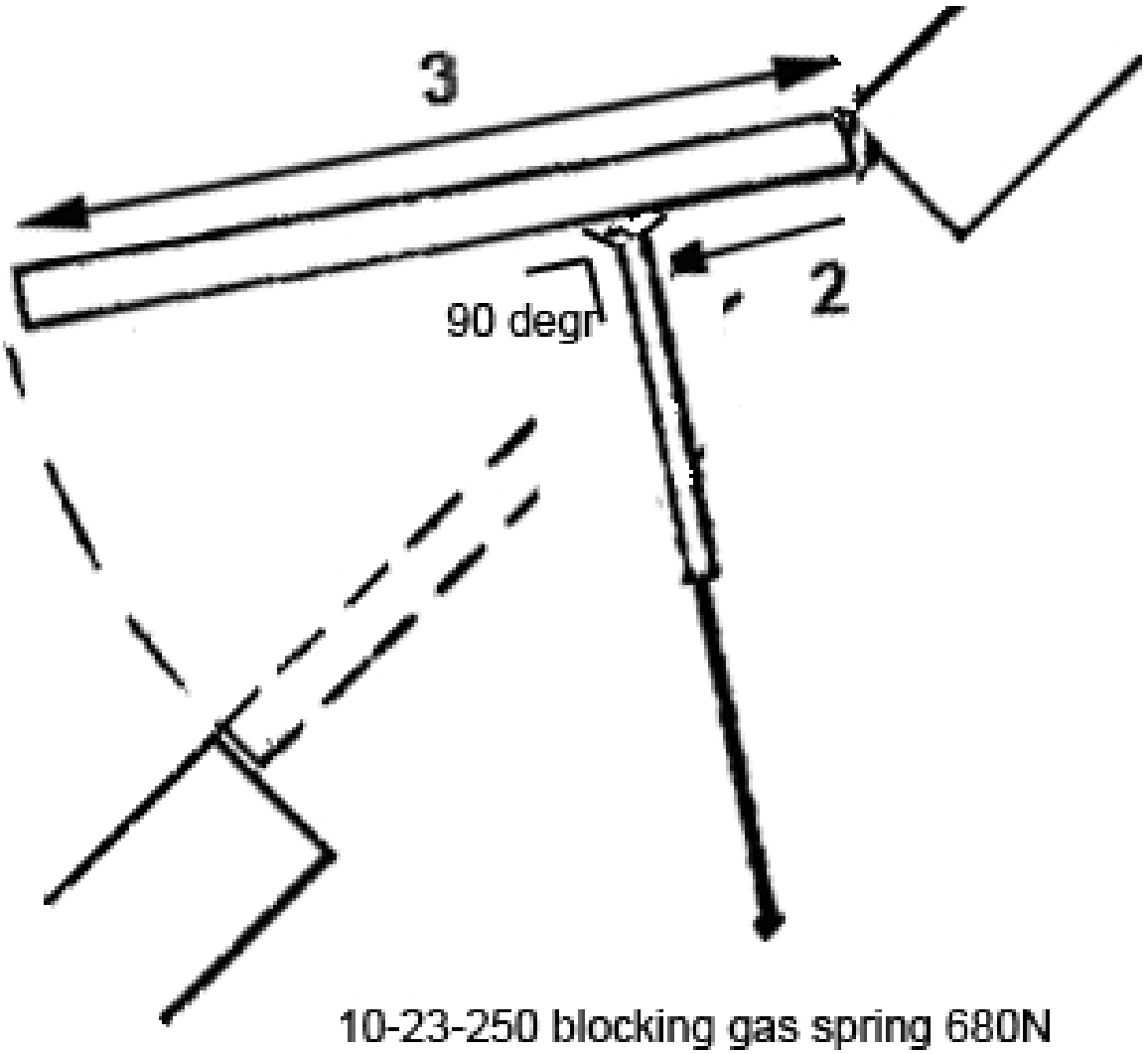
Note: All parts listed above are available from stock.

Please see for other eye-endfittings page 6-11-A

I Z E R W A R E N

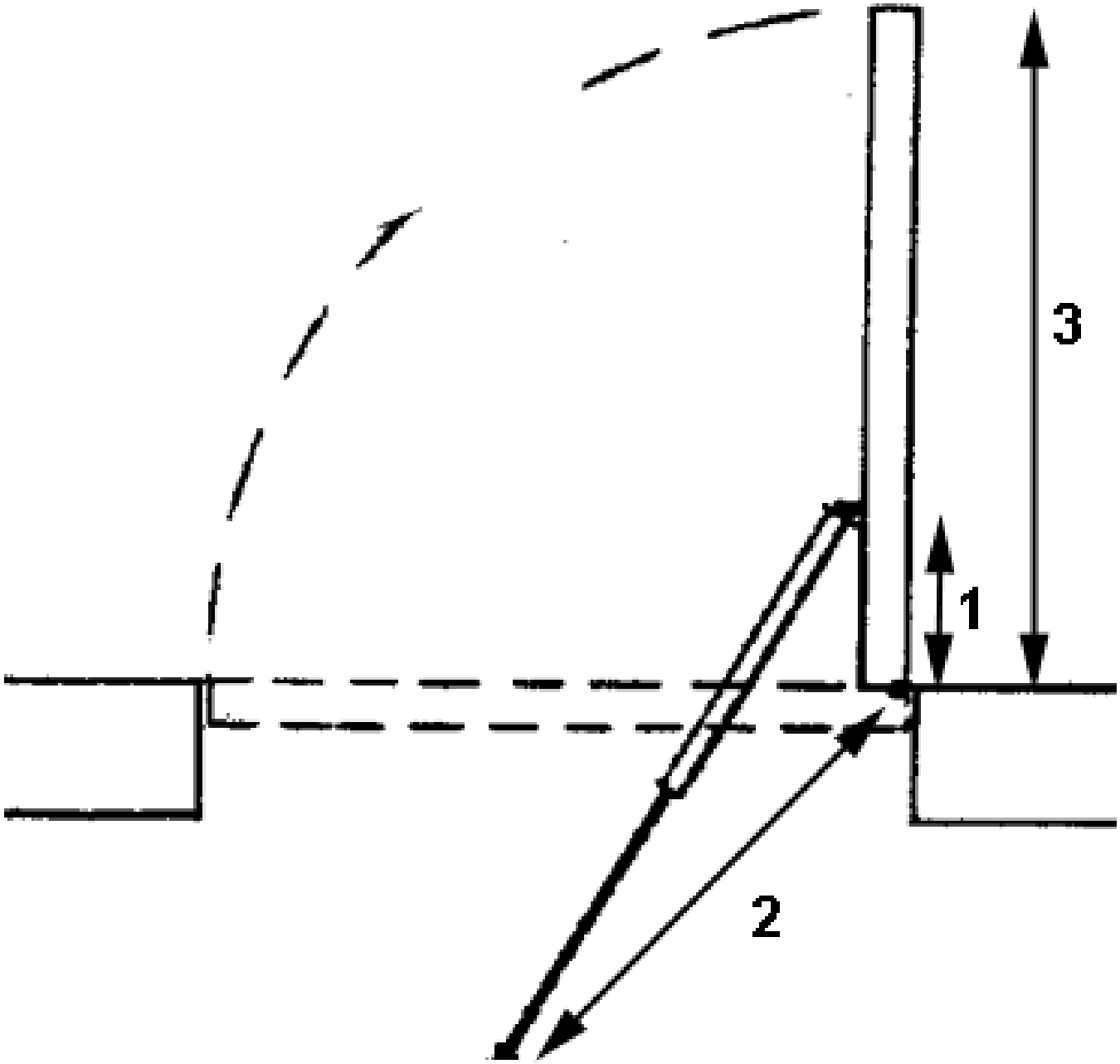
Ranges of functional and decorative Izerwaren hardware displayed

GAS SPRING SOLUTION GAMEFISHERMAN



ANGLE 90 DEGREE VERY IMPORTANT..
TOTAL FREE HANGING WEIGHT 72 LBS
3= SIZE 943 MM - 37 ½"
2= 235 MM - 13 ¼" FROM HINGE PIN TO CENTER BRACKET
1= POSITION GAS SPRING ON BULKHEAD.
ONE BLOCKING GAS SPRING 10-23-250 WITH 680 N FORCE.

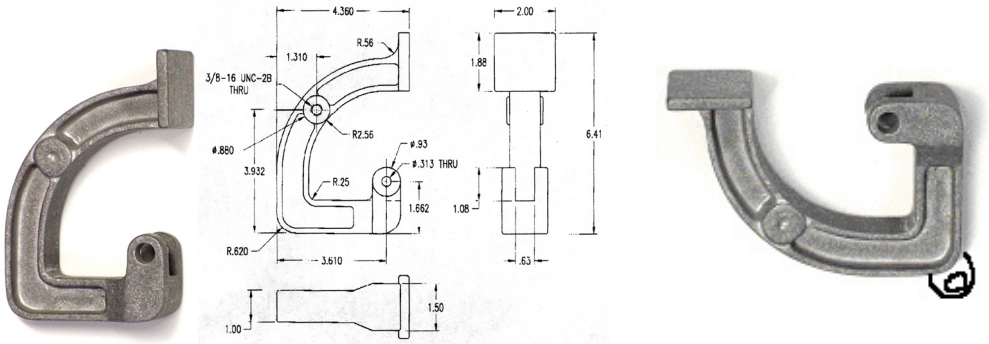
sample



Application D only

hatch 65 lbs;
2 gas spring 8-18-150 mm Newton Force: 330 each
using each 2 ball joint M8, brackets.
90 degree opening
distance 1= 4";

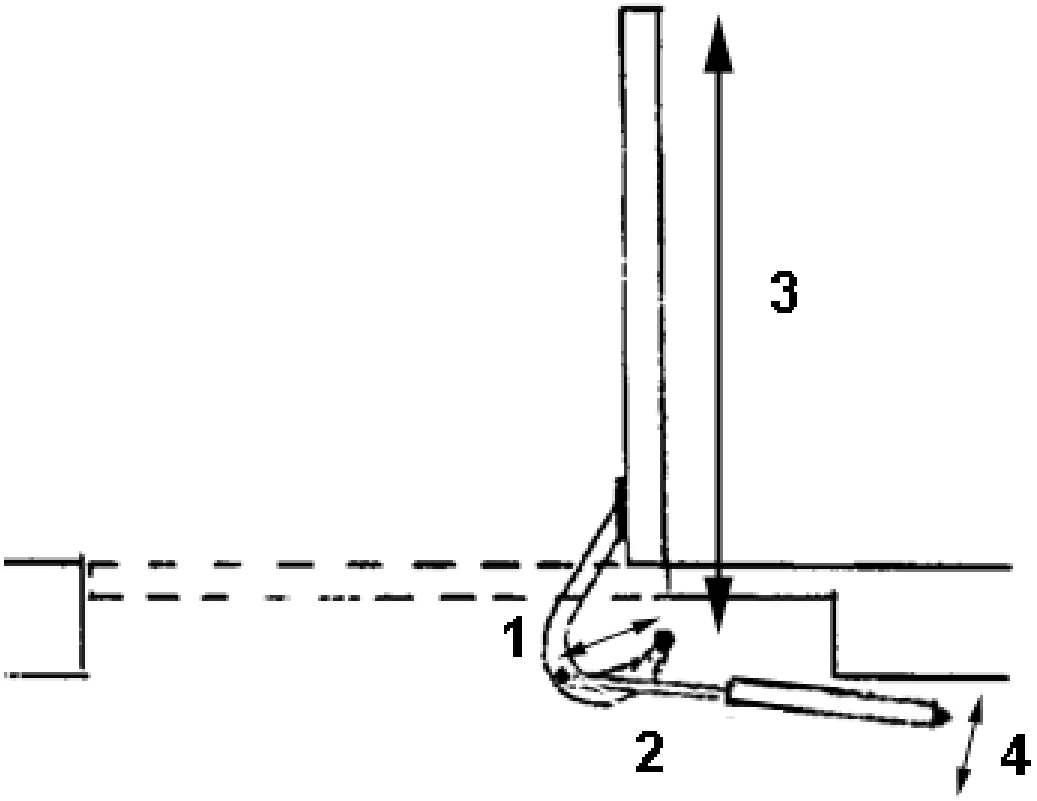
INSTALL GAS SPRING ALWAYS WITH ROD DOWN, CYLINDER UP



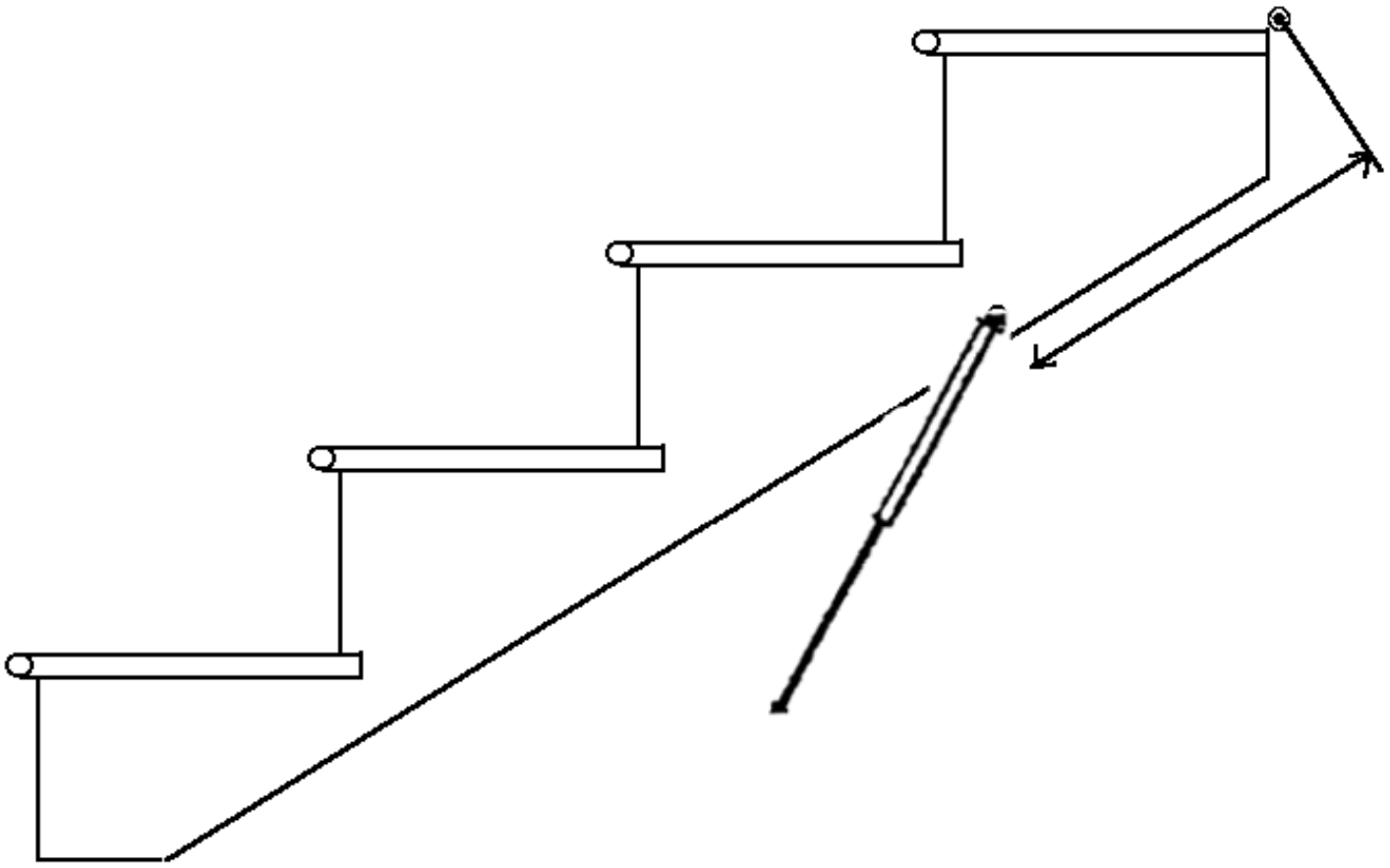
hinge #42.739C eye needs to be welded on by user

INSTALL GAS SPRING ALWAYS WITH ROD DOWN, CYLINDER UP

(Application E. Using our hinge 42.739C)



BEST APPLICATION #E:
Distance # 1: 8" or 202 mm distance
Distance # 2: mm: Center Eye To Eye gas spring series: 10-23-300 mm N180 each
Distance # 3: 26" 662 mm
Weight 47.4 lbs / 21.5 kg 90 degree opening
NOTE:
GAS SPRINGS SHOULD BE INSTALLED WITH ANGLES EXACTLY AS DEPICTED.
!!!CANNOT BE INSTALLED VERTICAL!!!



Application G Recommended: For stairs.
Function gas spring: Holds stairs closed, supports weight from 75% to 120%; holds stairs up at 80 to 90 degree. Hinge structure must be able to carry 2.5x weight stairs!!

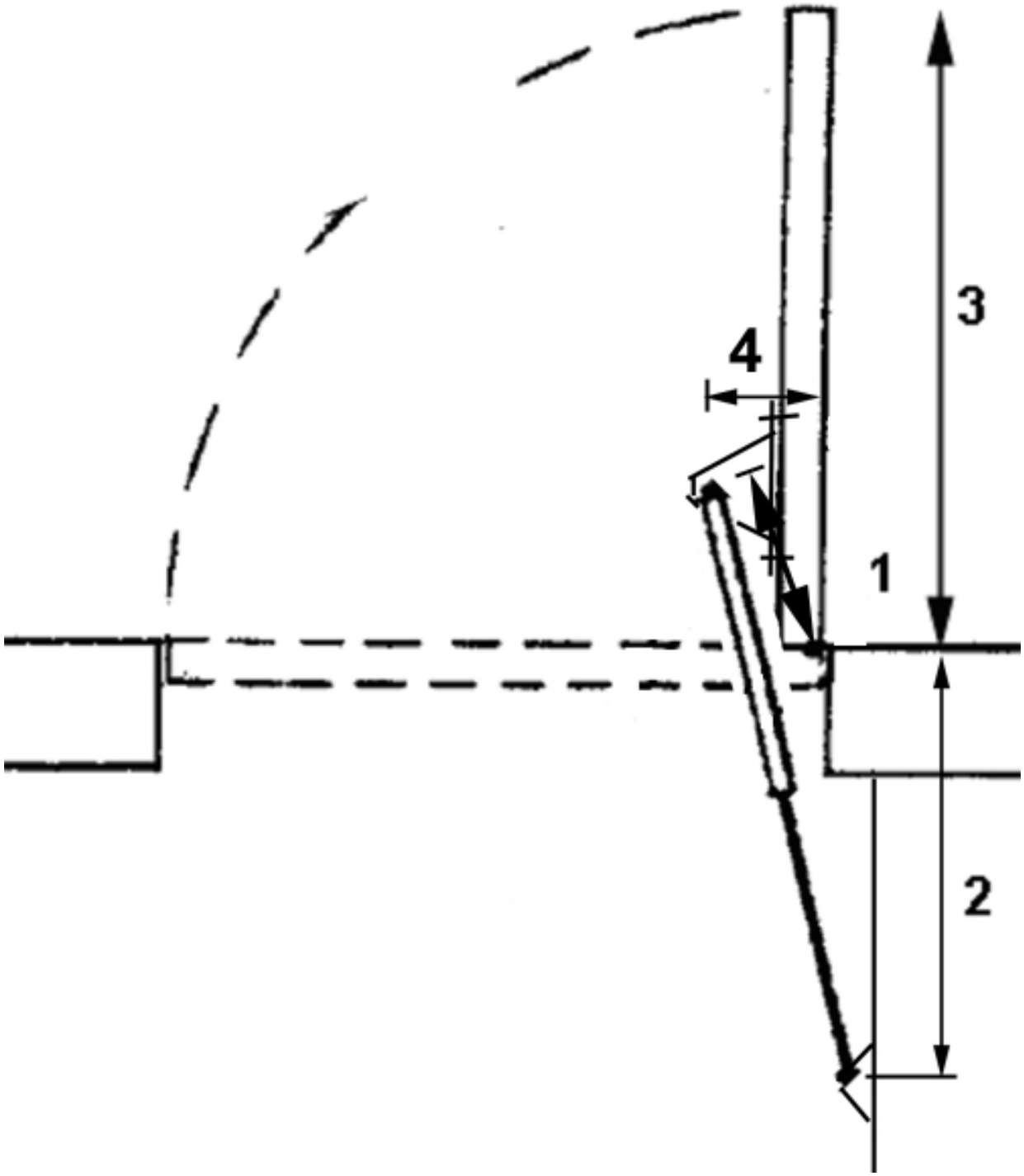
Gas spring angle should be approx. 33 degrees measured from hinge pin in closed position

Two gas springs 10-23-300 with 250N each
Step/stair application
Size stairs: Length: 1127 mm ~ 44 3/8"
Weight: 76 lbs./ 345.5 Newton; Opening stairs: 90 degrees.

Distance A	Degree angle from hinge pin	Degree angle open hatch / relative weight	N on gas springs to balance hatch + 10%	Per gas spring
186.2 mm leverage f.: 3.03	Fully open: 105 degrees=74%	145 degrees weight: 120 N	364N + 35%= 491N	245N
186.2 mm leverage f.: 3.03	90 degrees=100%	130 degree weight: 151 N	457N + 10%= 503 N	252N
186.2 mm leverage f.: 3.03	70 degrees=77%	110 degree weight: 242 N	732N+43%= 1046 N	523N
186.2 mm leverage f.: 3.03	30 degrees=33%	70 degree weight: 242 N	732N +67 %= 1433N	717N

Force exerted on hinge: 2.5 x the weight of the stairs.

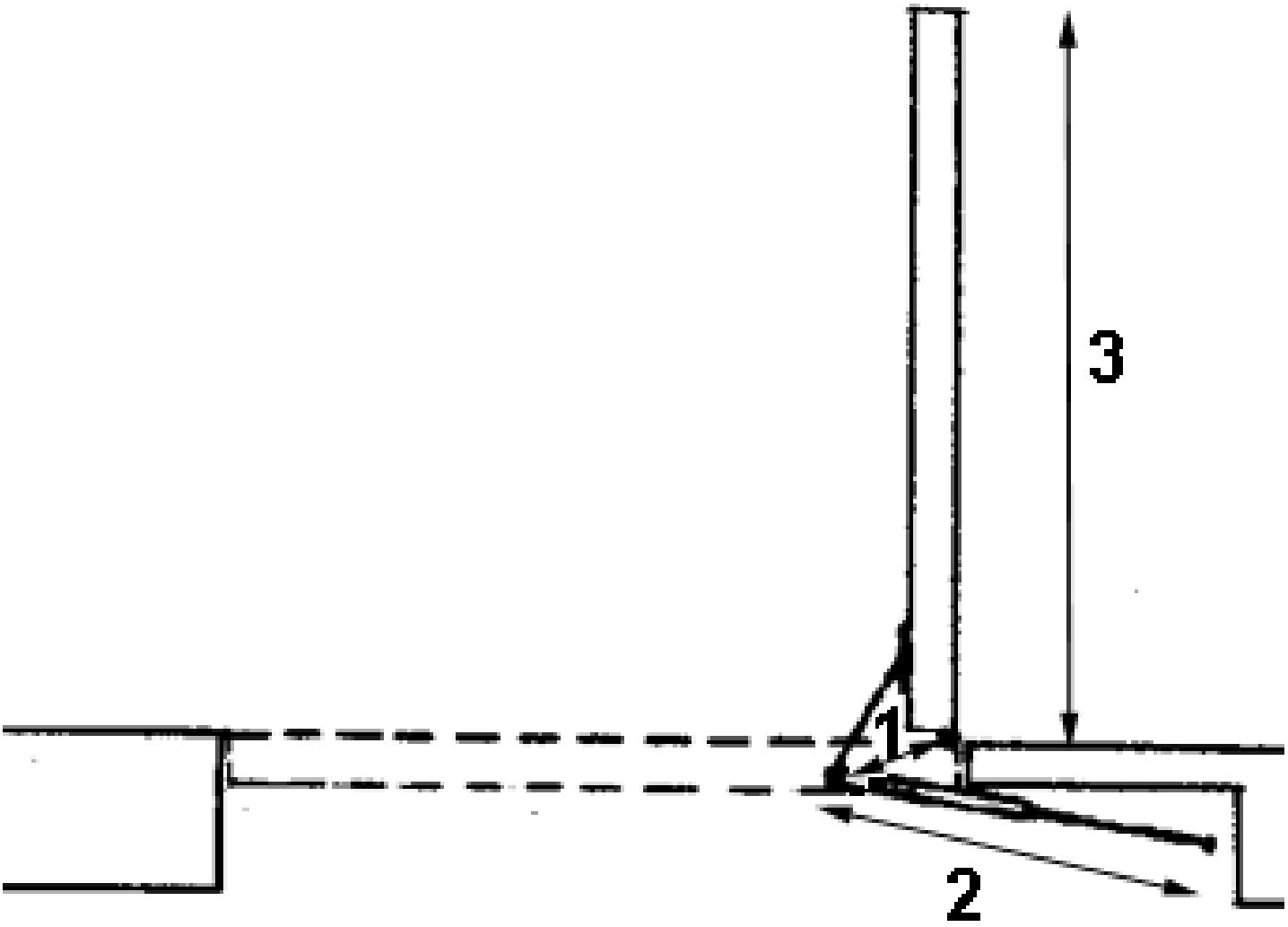
INSTALL GAS SPRING ALWAYS WITH ROD DOWN, CYLINDER UP



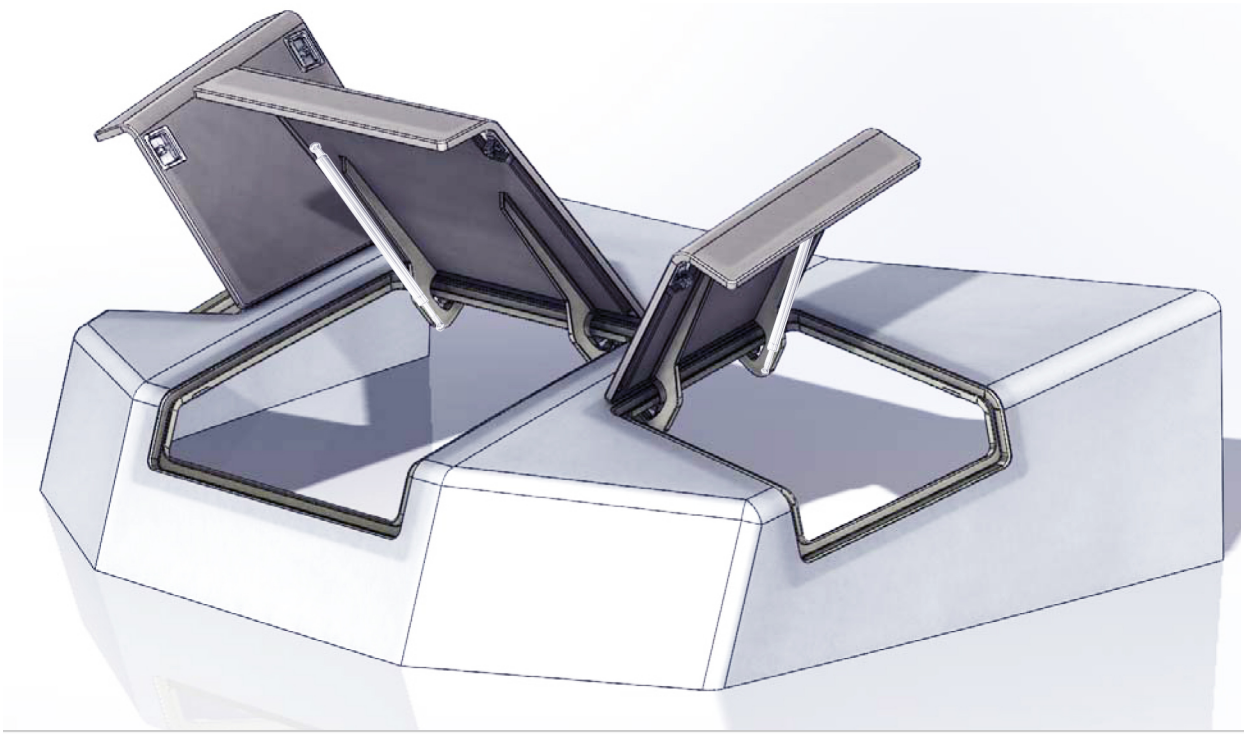
Gas spring Solution F (modified)

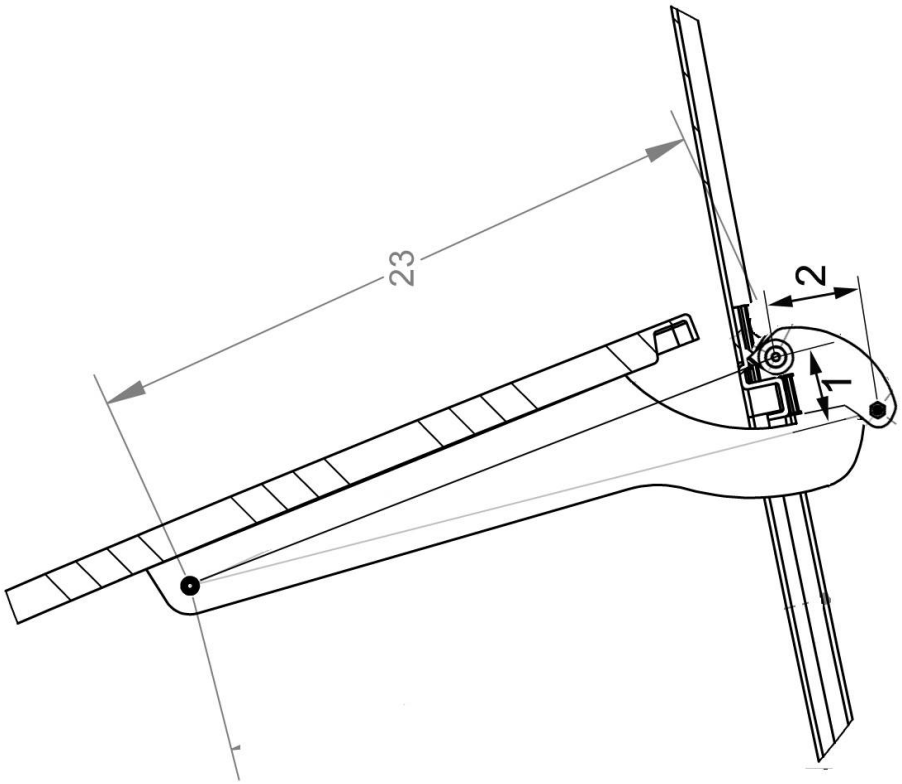
Distance # 1: 6.5” or 165 mm distance
Distance # 2: 13 5/8” 346 mm; measured in a straight line from hinge pin
Distance # 3: 26” 662 mm
Distance # 4: 3.5” 89 mm measured from hinge pin / 90 degree angle
Weight 47.4 lbs / 21.5 kg 90 degree opening
Gas spring series: 2x 10-23-200 mm N 215 each

INSTALL GAS SPRINGS WITH CYLINDER UP, ROD DOWN

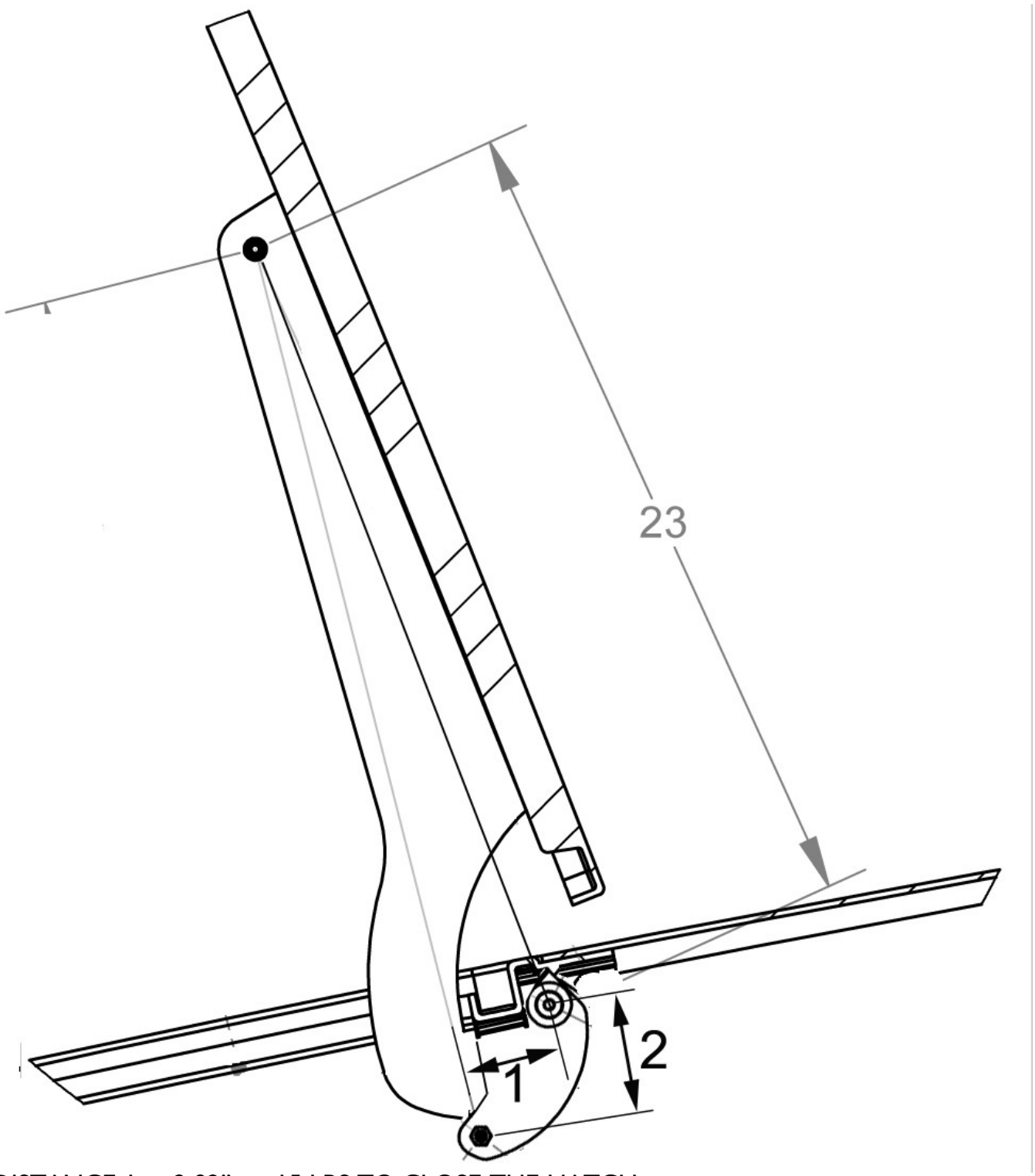


Compression gas spring series 10-23-series set up.
Available from stock





2x stainless steel gas springs 8-18-200 190N



DISTANCE 1= 2.82" = 15 LBS TO CLOSE THE HATCH
DISTANCE 2= 3.43" HATCH 30.2":2=15.1:3.43=4.4 X 123N = 542N: 270N PER GAS SPRING
70% FORCE SETTING: 2 X 8-18-200 WITH 190N
A PERSON NEEDS TO LIFT 8.5 LBS TO OPEN THE HATCH.