

SELF-CENTERING DAMPERS GGS-316L STAINLESS STEEL GGS-SAFELOCK GGS-FRICTION STOP

# Gas Springs & Dampers



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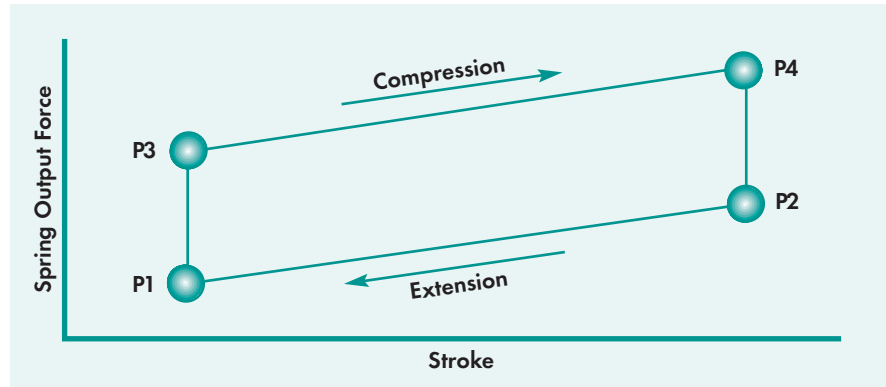
# GAS SPRINGS AND DAMPERS

## GUDEN GAS SPRINGS

### WE'VE GOT IT UNDER CONTROL

Whether you want to lift, lower or dampen, Guden Gas Springs will provide the controlled motion you need. These dependable energy storage devices are tough no matter what industrial or commercial arena you put them in.

Built to go the distance, Guden Gas Springs are constructed from high gauge steel to make them highly resistant to bending and buckling.



### HOW IT WORKS

Gas springs work on the simple properties of gas pressure. The gas spring is fully extended by internal pressure acting on the shaft, P1. At the start of compression, P3, the shaft enters the tube, displacing gas and decreasing the available volume, thereby increasing the output force until the spring is fully compressed, P4.

During compression, oil in the gas spring coats the shaft end between the piston and the bushing. When the gas spring begins to extend from its fully compressed position, the output of the spring is reduced from P4 to P2 as a result of spring friction. Then as the shaft extends, the force approaches P1. The gas springs are pressurized with non-hazardous nitrogen.

### APPLICATIONS

From printer covers to hatches and resistance equipment—if the application requires lifting and holding, there's a Guden Gas Spring to do the job.

### GUDEN STOCKS THE FULL LINE

In most cases, Guden can satisfy your application with a gas spring we have in stock. This allows you to specify a gas spring for any concept or configuration, even if only a small quantity is required.

### CUSTOM GAS SPRINGS

We can custom make almost any size or pressure gas spring to suit your application. Damping or double damping can also be incorporated into the gas spring. In addition to our stock end connectors, there are a wide variety of end connectors available on custom order.

### CUSTOM ORDER GAS SPRING P1 PRESSURE RANGES

Series	Min.	Max.
GG2X / GGN2X	10	150
GG3X / GGN3X	75	250
GG4X / GGN4X*	15	100
GG7X / GGN7X	100	500

Note: Custom forces (and sizes) may be specified for the GGN or GGS 20, 30 & 40 series by using these P1 pressure ranges.

\* GGN pressure range is 10 - 90 lbs

**GGN BLACK NITRATE ROD GAS SPRINGS**

- Superior Corrosion Resistance • Attractive "All Black" Appearance • Lower Cost • 2-Year Warranty



**STOCK PART NUMBERS AND SIZES**

Rod Dia. (in.) .315 Tube Dia. (in.) .748

Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
GGN20	9.6	6.35	3.25	K	20
GGN21	11.9	9.4	3.5	I	20, 30, 60, 80, 90, 120
GGN21	11.9	9.4	3.5	K	20, 30, 40, 60, 90, 120
GGN22	15.25	10.25	5	I	20, 30, 60, 85, 90, 110, 120
GGN22	15.25	10.25	5	K	20, 30, 40, 45, 60, 90, 120
GGN26	15.27	9.77	5.5	K	20, 30, 60, 90, 120, 150
GGN23	17	11	6	I	20, 30, 60, 90, 120
GGN23	17	11	6	K	20, 30, 40, 45, 60, 90, 120
GGN24	19.63	12.63	7	I	20, 30, 60, 90, 120
GGN24	19.63	12.63	7	K	20, 30, 45, 60, 90, 120
GGN203	23.03	14.53	8.5	K	20, 30, 90, 150

Rod Dia. (in.) .394 Tube Dia. (in.) .866

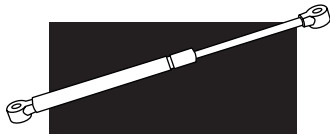
Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
GGN31	27.8	17.8	10	C	200
GGN31	27.8	17.8	10	I	100, 150, 200, 250
GGN31	27.8	17.8	10	J	140, 200
GGN31	27.8	17.8	10	K	100, 120, 150
GGN35	26.32	15.85	10.5	K	75, 120
GGN36	28	16.5	11.5	I	110, 230
GGN38	35.30	20.30	15	C	200
GGN38	35.30	20.30	15	J	150, 200, 250

Rod Dia. (in.) .25 Tube Dia. (in.) .591

Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
GGN40	7.5	5.5	2	I	20, 40, 60, 80, 100
GGN40	7.5	5.5	2	K	20, 30, 40, 60, 80, 100
GGN43	9.60	6.45	3.15	K	20, 30, 40, 50, 60, 80, 90, 100
GGN44	12	8.5	3.5	K	20, 40, 60, 70, 80, 100
GGN45	14.50	9.5	5	K	20, 30, 40, 60, 80, 90, 100
GGN47	17.18	11	6.18	I	60
GGN47	17.18	11	6.18	K	20, 30, 40, 60, 80, 100
GGN48	19.68	11.68	8	K	20, 30, 40, 50, 60, 70, 80, 90, 100
GGN49	20.00	11.88	8.12	K	40, 60

**Notes:**

1. Complete part number consists of stock part number plus the P1 force in lbs. plus the end fitting suffix, i.e., GGN21-060-K.
2. The P1 forces and end fittings listed are the standard sizes we normally stock.
3. See page 50 for ordering information on end fittings, ball studs, brackets and clips used for mounting.
4. End threads are 5/16-18 unc.
5. J fitting is available on GGN30 series springs only.
6. C fitting is available on all series.



# GAS SPRINGS AND DAMPERS

## GGG CHROME PLATED ROD GAS SPRINGS

• Superior Lubrication for Potentially Longer Life • 2-Year Warranty



### STOCK PART NUMBERS AND SIZES

Rod Dia. (in.) .315 Tube Dia. (in.) .748

Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
GGG20	9.6	6.35	3.25	K	20
GGG21	11.9	9.4	3.5	I	20, 30, 60, 80, 90, 120
GGG21	11.9	9.4	3.5	K	20, 30, 40, 60, 90, 120
GGG22	15.25	10.25	5	I	20, 30, 60, 85, 90, 110, 120
GGG22	15.25	10.25	5	K	20, 30, 40, 45, 60, 90, 120
GGG26	15.27	9.77	5.5	K	20, 30, 60, 90, 120, 150
GGG23	17	11	6	I	20, 30, 60, 90, 120
GGG23	17	11	6	K	20, 30, 40, 45, 60, 90, 120
GGG24	19.63	12.63	7	I	20, 30, 60, 90, 120
GGG24	19.63	12.63	7	K	20, 30, 45, 60, 90, 120
GGG203	23.03	14.53	8.5	K	20, 30, 90, 150

Rod Dia. (in.) .394 Tube Dia. (in.) .866

Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
GGG31	27.8	17.8	10	C	200
GGG31	27.8	17.8	10	I	100, 150, 200, 250
GGG31	27.8	17.8	10	J	140, 200
GGG31	27.8	17.8	10	K	100, 120, 150
GGG35	26.32	15.85	10.5	K	75, 120
GGG36	28	16.5	11.5	I	110, 230
GGG38	35.30	20.30	15	C	200
GGG38	35.30	20.30	15	J	150, 200, 250

Rod Dia. (in.) .25 Tube Dia. (in.) .591

Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
GGG40	7.5	5.5	2	I	20, 40, 60, 80, 100
GGG40	7.5	5.5	2	K	20, 30, 40, 60, 80, 100
GGG43	9.60	6.45	3.15	K	20, 30, 40, 50, 60, 80, 90, 100
GGG44	12	8.5	3.5	K	20, 40, 60, 70, 80, 100
GGG45	14.50	9.5	5	K	20, 30, 40, 60, 80, 90, 100
GGG47	17.18	11	6.18	I	60
GGG47	17.18	11	6.18	K	20, 30, 40, 60, 80, 100
GGG48	19.68	11.68	8	K	20, 30, 40, 50, 60, 70, 80, 90, 100
GGG49	20.00	11.88	8.12	K	40, 60

#### Notes:

1. Complete part number consists of stock part number plus the P1 force in lbs. plus the end fitting suffix, i.e., GGG21-060-K.
2. The P1 forces and end fittings listed are the standard sizes we normally stock. See page 50 for ordering information on end fittings, ball studs, brackets and clips used for mounting.
3. End threads are 5/16-18 unc.
4. J fitting is available on GGG30 series springs only.
5. C fitting is available on all series.

## STS-316L STAINLESS STEEL GAS SPRINGS

The STS-316L is manufactured of 316L stainless steel, which offers increased corrosion resistance for industrial, marine and sterile environments. Our stainless steel gas springs have a polished tube, and the rods are hard chrome plated to give additional hardness and corrosion resistance.



### STOCK PART NUMBERS AND SIZES

#### Rod Dia. (in.) .315 Tube Dia. (in.) .748

Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
STS21	11.9	8.4	3.5	K	20, 30, 60, 90, 120, 150
STS22	15.25	10.25	5	K	20, 30, 60, 90, 120, 150
STS26	15.27	9.77	5.5	K	90, 120, 150
STS23	17	11	6	K	20, 30, 60, 90, 120, 150
STS208	18.5	11.25	7.25	K	120, 150
STS24	19.63	12.63	7	K	20, 30, 60, 90, 120, 150
STS201	20	12	8	K	90, 120, 150

#### Rod Dia. (in.) .394 Tube Dia. (in.) .866

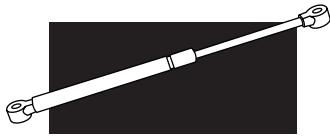
Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
STS31	278	178	10	K	100, 120, 150, 200
STS35	26.32	15.85	10.5	K	75, 120, 150, 200
STS36	28	16.5	11.5	J	100, 120, 150, 175, 200, 250
STS38	35.30	20.30	15	C	120, 150, 200, 250
STS38	35.50	20.50	15	J	120, 150, 200, 250

#### Rod Dia. (in.) .24 Tube Dia. (in.) .591

Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
STS40	7.5	5.5	2	K	10, 20, 30, 60, 80, 100
STS43	9.6	6.45	3.15	K	20, 30, 60, 80, 100
STS42	10	7	3	K	20, 30, 40, 60, 90
STS44	12	8.5	3.5	K	20, 40, 60, 80, 100
STS45	14.5	9.5	5	K	20, 40, 60, 80, 100
STS46	15	9.5	5.5	K	20, 30, 40, 60, 80, 90
STS402	17	10.25	6.75	K	20, 30, 40, 50, 60, 75, 90
STS404	18.50	11.25	7.25	K	20, 30, 45, 60, 75, 90
STS48	19.68	11.68	8	K	20, 40, 60, 80, 100
STS49	20	12	8	K	20, 30, 40, 50, 60, 80, 90

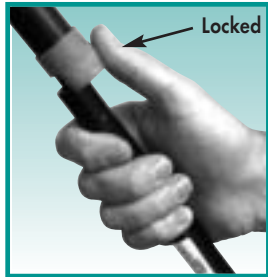
#### Notes:

1. Complete part number consists of stock part number plus the P1 force in lbs. plus the end fitting suffix, i.e., STS21-060-K.
2. The P1 forces and end fittings listed are the standard sizes we normally stock.
3. See page 49 for ordering information on end fittings, ball studs, brackets and clips used for mounting.



# GAS SPRINGS AND DAMPERS

## ECL-SAFELOCK GAS SPRINGS



ECL-SafeLock Gas Springs eliminate the need for separate rods in critical lift-assist applications and protect the operator from potential injury in the unlikely event of gas spring failure through overload or misuse. When the ECL-SafeLock is fully extended a spring-loaded locking shroud springs into place, preventing the gas spring from compressing. Applying thumb pressure to the locking shroud allows the gas spring to compress in a controlled manner.

### STOCK PART NUMBERS AND SIZES

Rod Dia. (in.) .236 Tube Dia. (in.) .591

Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
ECL40	7.5	5.5	2	K	20, 30, 40, 60, 80, 100
ECL42	10	7	3	K	20, 30, 40, 60, 80, 100
ECL46	15	9.5	5.5	K	20, 30, 40, 60, 90
ECL402	17	10.25	6.75	K	20, 30, 40, 50, 60, 75, 90
ECL404	18.50	11.25	7.25	K	20, 30, 45, 60, 75, 90
ECL49	20	12	8	K	20, 30, 40, 50, 60, 70, 80, 90

Rod Dia. (in.) .315 Tube Dia. (in.) .715

Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
ECL21	11.9	8.4	3.5	K	90, 120, 150
ECL26	15.27	9.77	5.5	K	90, 120, 150
ECL23	17	11	6	K	60, 90, 120, 150
ECL208	18.5	11.25	7.25	K	120, 150
ECL201	20	12	8	K	90, 120, 150

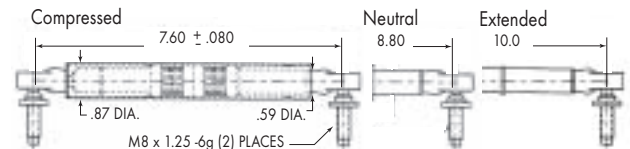
Rod Dia. (in.) .39 Tube Dia. (in.) .87

Stock Part No.	Extended Size (in.)	Compressed Size (in.)	Stroke Size (in.)	Standard End Fittings	P1 Force (lbs) Standard Stock Sizes
ECL31	27.8	17.8	10	J	200
ECL36	28	16.5	11.5	K	100, 120, 150, 175, 200

## SELF-CENTERING DAMPERS



Guden's Self-Centering Dampers are a unique, patented damper that allows controlled movement in extension and compression while providing a controlled rate of return from either direction to a neutral position. The Self-Centering Damper replaces a combination of springs and dampers with a single, compact, cost-effective unit. The damping speed is controlled by the oil passing through an orifice while the return to neutral position is produced by the springs.



### TWO STANDARD TYPES

There are two types of Self-Centering Dampers offered, the SCD09 and SCD12, providing centering forces of 9 lbs. and 12 lbs., respectively. Each type can be ordered with light or heavy damping. Both dampers extend or compress 1.20" from a neutral length of 8.80" between mounting centers.

### STOCK PART NUMBERS AND SIZES

Stock Part Number	Centering Force	Body Diameter	Damping Rate	Damping Direction
SCD09-L	9 lbs.	.866	Light	Extension & Compression
SCD09-H	9 lbs.	.866	Heavy	Extension & Compression
SCD12-L	12 lbs.	.866	Light	Extension & Compression
SCD12-H	12 lbs.	.866	Heavy	Extension & Compression

**DAMPERS**



Gas springs apply a controlled force and dampers control an external force. One or the other will satisfy any lid or door control situation.

Dampers are used primarily where a heavy load or door must be lowered or swung in a controlled motion at a constant speed. For example, dampers prevent a door from slamming shut or swinging wildly open.

**TWO STANDARD TYPES**

Two types of standard dampers are available, depending on the physical position in which they are to be used:

- Compression dampers provide controlled speed in the compressive direction.
- Extension dampers provide controlled speed in the extensive direction.

**HOW DAMPERS WORK**

Guden dampers are similar in appearance and construction to our Guden Gas Springs, except:

- (1) The tube is filled with hydraulic oil instead of non-hazardous nitrogen.
- (2) Dampers are force-absorbing instead of force-supplying. The oil inside the damper must pass through an orifice plate, thus controlling speed.

**DAMPERS INSTALLATION/OPERATING TIPS**

Compression dampers operate best in the shaft up position so that the internal piston remains in the oil. The lid or door should be closed before full compression is reached.

Extension dampers work best in the shaft down position. An extension damper is an excellent end-of-motion stop with appropriate end fittings: metal for heavier loads, plastic for lighter loads.

**SELECTING THE RIGHT DAMPER**

As with Guden Gas Springs, size of load, weight of load, direction of motion and location of mounting points determine the correct size. Guden dampers are available in rod/tube diameter sizes .24" x .59" and .32" x .87", with stroke lengths from 2" to 7", extended lengths from 7.89" to 19.65" and maximum load capacities from 50 lbs. to 100 lbs.

**CUSTOM DAMPERS**

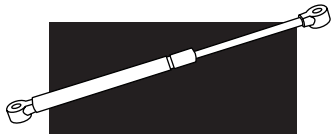
We can custom make almost any size damper to suit your application. Dampers are available on special order with custom damping rates, and also double damped in both compression and extension.

**STOCK PART NUMBERS AND SIZES (See page 50 for end fittings)**

Stock Part Number		Extended Length' (Inches)	Stroke (Inches)	Rod Dia. (Inches)	Tube Dia. (Inches)	Minimum Load (lbs.)	Maximum Load (lbs.)	Orifice Plate Damping Identification				
Compression	Extension							Heavy Damping	Med. Heavy Damping	Medium Damping	Med.Light Damping	Light Damping
GDC50	GDE50	7.89	2	.24	.59	3	50	C	J	D	N	E
GDC51	GDE51	10.02	3	.24	.59	3	50	C	J	D	N	E
GDC52	GDE52	12.50	4	.24	.59	3	50	C	J	D	N	E
GDC53	GDE53	15.02	5	.24	.59	3	50	C	J	D	N	E
GDC60	GDE60	12.24	4	.315	.87	20	100	J	D	E	F	S
GDC61	GDE61	14.49	5	.315	.87	20	100	J	D	E	F	S
GDC62	GDE62	17.01	6	.315	.87	20	100	J	D	E	F	S
GDC63	GDE63	19.65	7	.315	.87	20	100	J	D	E	F	S

Note: The complete part number consists of the Stock Part Number (above) plus the Orifice Plate Damping Identification (above) and the end fitting you require (see page 50), i.e., GDC50-D-K. The I\*, K and Fat Blade end fittings are stock.

\* Extended length is .24" longer with the "I" end fitting.

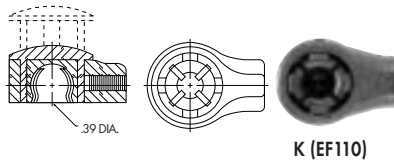


# GAS SPRINGS AND DAMPERS

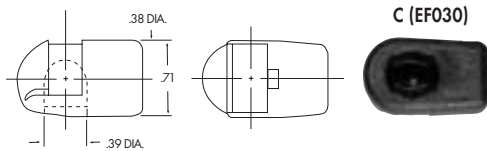
## END FITTINGS FOR GAS SPRINGS AND DAMPERS

To complete the part number, specify the stock part number, P1 Pressure and then the end connector suffix, i.e., GGS21-060-K. Details on end connector applications and materials are available from Guden. All end fittings threaded for M6-1.0-6H thread except the "J" end fitting which is threaded for M8-1.25-6H. Units are in inches.

### NEOPRENE PLASTIC



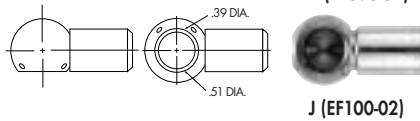
K (EF110)



C (EF030)

### STEEL ZINC PLATED

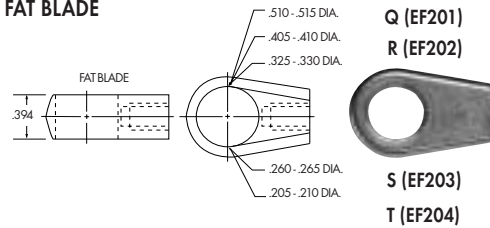
Supplied with safety clip.



I (EF090-02)

J (EF100-02)

### FAT BLADE



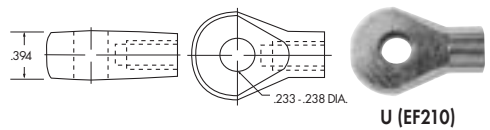
P (EF200)

Q (EF201)

R (EF202)

S (EF203)

T (EF204)



U (EF210)

### Maximum P1 Pressures:

"I" end fitting - Max P1=200 lbs.

"J" end fitting is only available on the GGN3 / GGS3 series

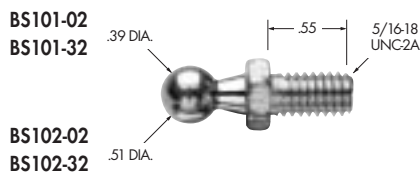
"K" end fitting - Max P1=150 lbs.

"C" end fitting - Max P1= 250 lbs.

"P - U" end fittings - Max P1= 250lbs.

## BALL STUDS & CLIPS FOR GAS SPRINGS AND DAMPERS

Specify part numbers for the brackets or ball studs required, including the material/finish suffix, as follows: -02 for steel with commercial zinc finish, or -32 for stainless steel.

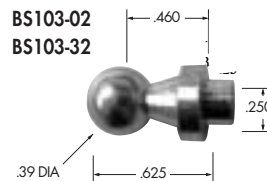


BS101-02

BS101-32

BS102-02

BS102-32



BS103-02

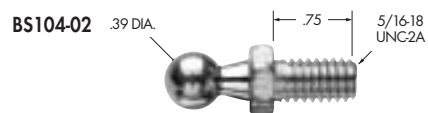
BS103-32

### RIVETABLE BALL STUD

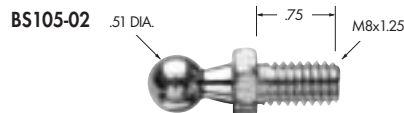
SC90  
SC100



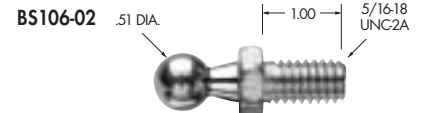
Spring clips are supplied for end fittings I (SC90) and J (SC100).



BS104-02



BS105-02



BS106-02

**BRACKETS for Gas Springs of 90 lbs Pressure and Under**

Note: Supplied with a clear zinc finish.

"R" in part number indicates ball is opposite of what is shown. "O2B" finish indicates black powdercoat finish. Please see individual drawings for designation. All brackets have a .39 diameter ball.



BR201-02 (shown)  
BR201-02B  
BR201-32  
BR201R-02



BR204-02 (shown)  
BR204-02B  
BR204-32  
BR204R-02B  
BR204R-02



BR202-02 (shown)  
BR202-02B  
BR202-32



BR205-02 (shown)  
BR205-02B  
BR205R-02  
BR205-32  
BR205R-02B

**BRACKETS for All Pressures**

Note: Supplied with a yellow zinc finish.



BR206-02



BR210-02



BR213-02  
BR213-26



BR208-02



BR211-02



BR216-02

Please go to [www.guden.com](http://www.guden.com) for individual drawings with sizes and hole placements.