HAPPICH
A Pelzer Family Company

Gasfedern
Gas Struts

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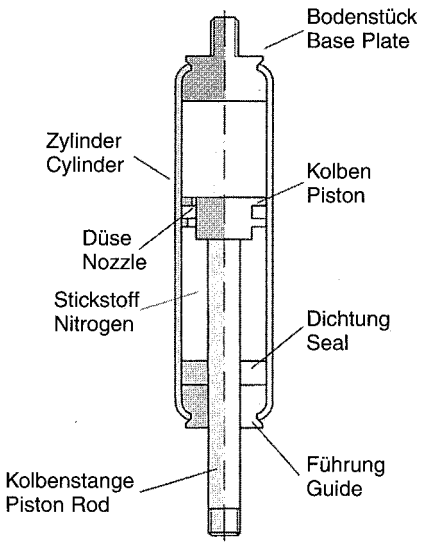
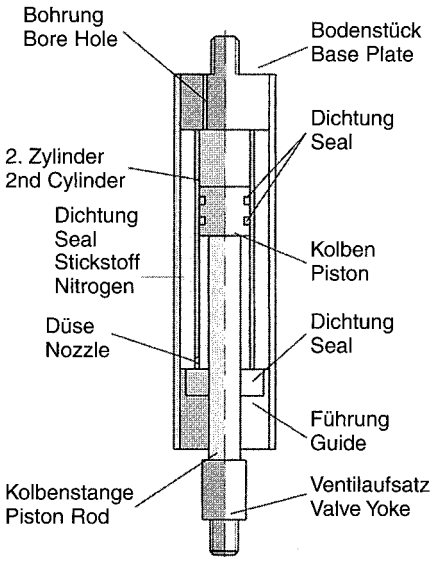
Funktionsweise einer Gasfeder
Functional Characteristics of a Gas Strut

Gasdruckfeder
Gas spring



Gaszugfeder
Gas Tension Strut



Anwendungsbeispiele

KFZ-Branche:

- Heckklappen
- Motorhauben
- Stauklappen
- Gepäckklappen
- Ladeklappen
- Ausstellfenster

Maschinenbau, sonstige Anwendungen:

- Maschinenhauben
- Klappen aller Art
- Handhabungsgeräte
- Verpackungsmaschinen
- Luken
- Arbeitstische
- Markisen

Examples of applications:

Vehicle Industry:

- Boot Lids
- Bonnets
- Stowage Compartment Flaps
- Luggage Compartment Flaps
- Loading Flaps
- Ventilator Windows

Machinery and Miscellaneous Applications:

- Machine Shrouds
- All Kinds of Flaps
- Handling Gear
- Packing Machines
- Hatches
- Work Tables
- Awnings

Die Gasfeder ist ein hydropneumatisches Verstellelement. Sie ist ein in sich geschlossener, wartungsfreier Energiespeicher bestehend aus Kolbenstange, Kolben, Zylinderrohr, Führung, Dichtung und einem Verschlussstück.

Die Federkraft ergibt sich aus dem Innendruck (max. 160 bar unbelastet) im Zylinder (Füllmedium Stickstoff), der bei einer Gasdruckfeder auf die Querschnittshälfte der Kolbenstange wirkt (F = P*A).

Bei der Gaszugfeder ist die Kolbenringfläche zwischen Kolbenstange und Rohrinnendurchmesser maßgebend. Im unbelasteten Zustand ist die Kolbenstange bei der Gasdruckfeder immer ausgefahren, bei der Gaszugfeder eingefahren.

Durch Einschieben (Gasdruckfeder), Ausziehen (Gaszugfeder) der Kolbenstange verringert sich das Volumen im Zylinder und das Gas wird komprimiert. Somit ergibt sich ein Kraftanstieg (Progression) der Gasfeder abhängig vom Durchmesser / Volumen der Kolbenstange und vom Durchmesser / Volumen des Zylinders.

Die Gasfeder enthält zusätzlich eine Ölfüllung zur Schmierung und Endlagendämpfung.

Angaben zu Eigenschaften, Toleranzen und zur Anwendung von Gasfedern finden Sie in der technischen Vorschrift.

Gas struts are hydropneumatic actuating components. They are inherently enclosed, maintenance-free energy reservoirs consisting of piston rods, pistons, cylinders, guides, seals and base plates.

Pressure is generated by gas inside the cylinder (nitrogen compressed to a maximum of 160 bar unloaded) which in the case of a gas pressure strut pushes against half of the surface area of the piston rod (F = P*A).

In the case of gas tension struts it is the piston ring surface between piston rod and inner cylinder diameter which provides the required effect. In an unloaded condition the piston rod inside a gas pressure strut is always extended and inside a gas tension strut always drawn in.

By either pushing the piston rod inwards (pressure struts) or outwards (tension struts) the volume inside the cylinder is reduced and the gas compressed which leads to a progressive increase in strut force dependent on diameter/volume of piston rod and on diameter/volume of cylinder respectively.

In addition gas struts also contain a measure of oil which provides lubrication and cushions the limit of piston travel.

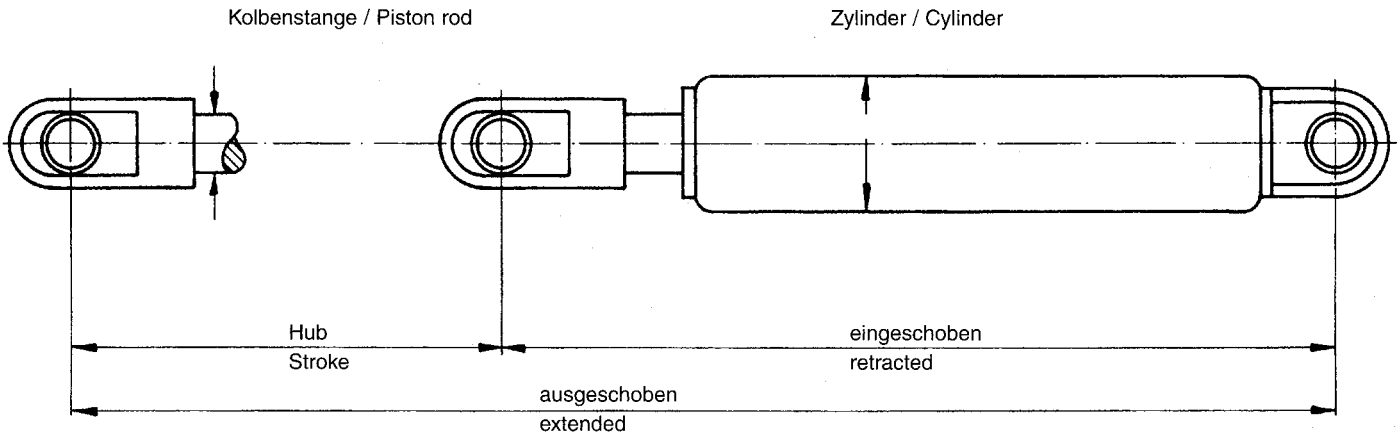
Please refer to chapter "Technical Documentation" for details on properties, tolerances and applications of gas struts.

Bestellcodierung bei vorhandener Gasfeder
Order code for existing gas struts

Keine Mindestabnahmemenge / No minimum sales quantity

Lieferzeit auf Anfrage / Delivery time on request

Regellieferzeit ca. 4 Wochen / Normal delivery time approx. 4 weeks



G – 10 – 23 – 250 – 1 / 80 – 400 – 650 – A – A

Anschluss Bodenstück (s. Anschluss-Tabellen S. 9 + 10) /
Base plate fittings (refer to tables on pages 9 and 10)

Anschluss Kolbenstange (s. Anschluss-Tabellen S. 9 + 10) /
Piston rod fittings (refer to tables on pages 9 and 10)

Länge ausgeschoben / Extended length (mm)

Länge eingeschoben / Retracted length (mm)

Federkraft / Force (N)

Dämpfungsart / Type of cushioning
0 = ohne Dämpfung / Without cushioning
1 = bei ausfahrender Kolbenstange / With piston rod extending
2 = bei einfahrender Kolbenstange / With piston rod retracting
3 = bei aus- und einfahrender Kolbenstange / With piston rod extending and retracting

Hub der Kolbenstange / Stroke of piston rod (mm)

Ø Zylinder / Cylinder dia.

Ø Kolbenstange / Piston rod dia.

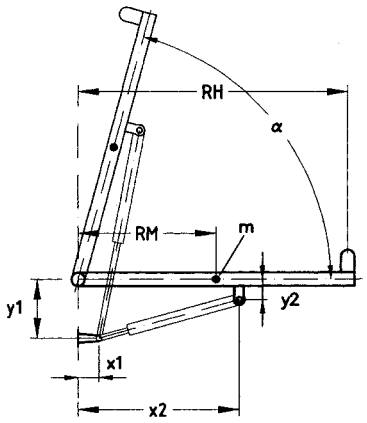
Federart / Type of Spring
G = Gasdruckfeder / Gas pressure strut
Z = Gaszugfeder / Gas tension strut

(Technische Vorschrift beachten Seite 12 / Please note the contents of chapter "Technical Documentation" page 13)

Anfrageblatt zur technischen Auslegung einer Gasfeder
Enquiry sheet detailing technical information required for a quotation

Bitte senden Sie uns eine ausgefüllte Kopie dieser Seite zur Angebotsausarbeitung.
Please send us a copy of this page duly filled in.

☐ Anwendungsfall Gasdruckfeder
Application example of gas pressure strut



erforderliche Angaben:
Information required:

bewegte Masse:
Weight to be moved: m ____ kg

Radius Massenschwerpunkt:
Radius of centre of gravity: RM ____mm

Radius Handkraft:
Manual force radius: RH ____mm

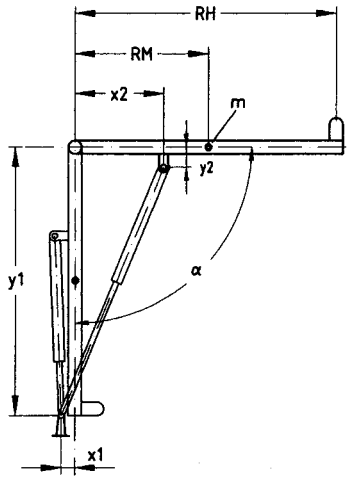
gewünschte max. Handkraft:
Maximum manual force required: FH ____ N

Startwinkel:
Starting angle: ____ [°]

Öffnungswinkel:
Opening angle: a ____ [°]

Abstandmaß:
Distance: y2 min ____ y2 max ____mm

☐ Anwendungsfall Gasdruckfeder
Application example of gas pressure strut



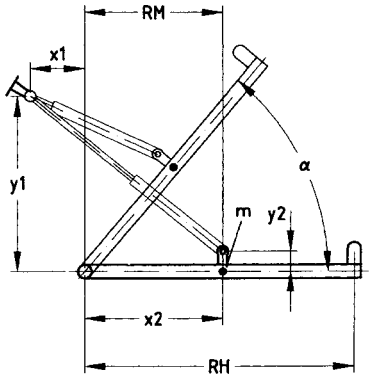
Feder-Anlenkpunkte (falls bekannt):
Linkage points (if known):

Abstandsmaß:
Distance: y1 min ____ y1 max ____mm

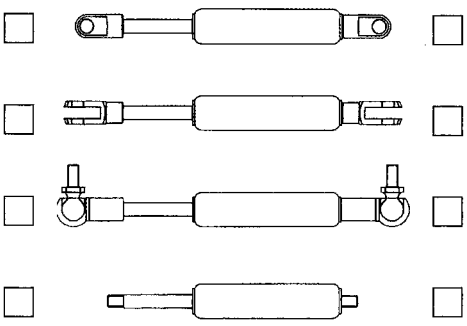
Abstandsmaß:
Distance: x1 min ____ x1 max ____mm

Abstandsmaß:
Distance: x2 min ____ x2 max ____mm

☐ Anwendungsfall Gaszugfeder
Application example of gas tension strut

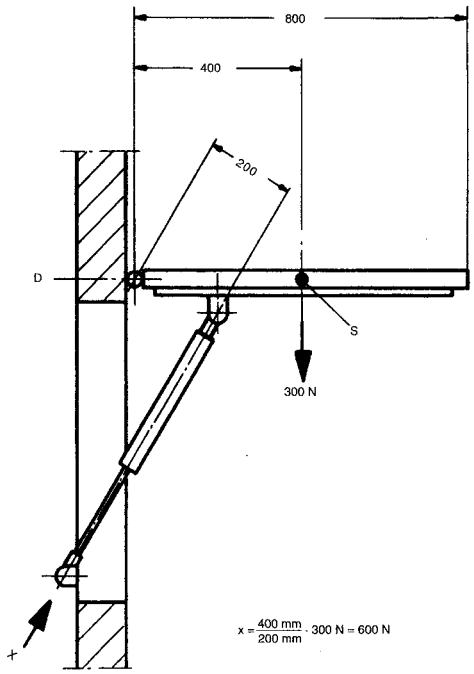


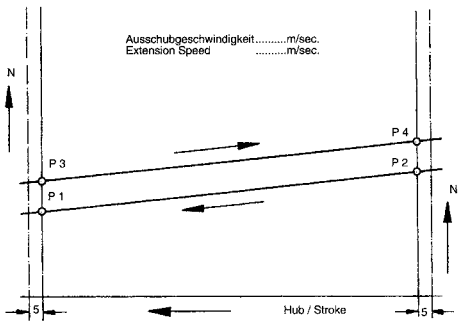
Anschlussteile
Fittings



(Technische Vorschrift beachten Seite 12 / Please note the contents of chapter "Technical Documentation" page 13)

Berechnungsbeispiel
Method of calculation





Hochstellbare Seitenwandklappe im Verkaufsfahrzeug.

Das Eigengewicht der Klappe von 300 N greift im Schwerpunkt S der Klappe im Abstand von 400 mm vom Drehpunkt an und wirkt lotrecht nach unten.

Die gesuchte Federkraft X wirkt in Richtung der Gasfederachse und greift im Abstand von 200 mm vom Drehpunkt an der Klappe an.

Für die in der Skizze dargestellte Offenstellung der Klappe gelten folgende Beziehungen:

Kraft mal Hebelarm des im Schwerpunkt S der Klappe angreifenden Eigengewichtes der Klappe ist gleich dem Klappengewicht von 300 N multipliziert mit dem Abstand des Schwerpunktes S vom Drehpunkt D der Klappe (= 400 mm).

Kraft mal Hebelarm der im Abstand von 200 mm vom Drehpunkt D an der Klappe angreifenden Tragkraft X der Gasfeder ist gleich der gesuchten Ausschubkraft der Feder multipliziert mit dem Abstand der Feder vom Drehpunkt D (= 200 mm).

Das Gewicht der Klappe versucht die Klappe am Drehpunkt nach unten zu drehen. Die Tragkraft X der Gasfeder wirkt dem Klappengewicht entgegen und versucht, die Klappe nach oben zu drehen. Beide an der Klappe angreifenden Kräfte sind also im Gleichgewicht, wenn sie multipliziert mit ihrem Hebelarm einander gleich, aber entgegengesetzt gerichtet sind, das heißt, wenn ihre Drehmomente entgegengesetzt gleich sind, also wenn

$300\ N \cdot 400\ mm = x\ N \cdot 200\ mm$

oder wenn

$$x = \frac{400\ mm}{200\ mm} \cdot 300\ N = 600\ N \text{ ist.}$$

Zu dieser Tragkraft der Gasfeder, die im voll geöffneten Zustand der Klappe das Gleichgewicht hält, muss ein Stützdruckzuschlag von 50 N hinzugerechnet werden, um unvermeidliche Abweichungen, beispielsweise durch Schneelast oder Wind, auszugleichen und ein sicheres Öffnen und Schließen der Klappe über ihren ganzen Öffnungswinkel von 90° zu gewährleisten.

Mit diesem Zuschlag ergibt sich eine Federkraft von 600 + 50 = 650 N.

This example shows how to calculate a strut suitable for an upward-swinging side wall flap of a mobile shop.

The 300 N dead weight of the flap is applied to the centre of gravity (S) of the flap at a distance of 400 mm from the pivot point and acts perpendicularly downwards.

The spring force "X" to be determined acts in the direction of the strut axis and at a distance of 200 mm from the flap's pivot point.

The following relations are applicable to the opened position of the flap as illustrated in this sketch:

The force times lever arm of the flap's dead weight acting on the flap's centre of gravity "S" is equal to the flap's weight of 300 N multiplied by the distance of centre of gravity "S" from the flap's pivotal point "D" (= 400 mm).

The force times lever arm of the struts supporting force "X" acting at a distance of 200 mm from the flap's pivotal point "D" is equal to the extension force to be determined multiplied by the distance of the strut from the pivotal point "D" (= 200 mm)

The flap's weight will attempt to push the flap downwards at its pivotal point. The strut's supporting force "X" counteracts this and attempts to push the flap upwards so that both forces acting upon the flap are in a state of equilibrium if – multiplied by their respective lever arms – they are equal to each other but acting in opposite directions, i.e. when their torques in either direction are identical when

$300\ N \cdot 400\ mm = x\ N \cdot 200\ mm,$

or when

$$x = \frac{400\ mm}{200\ mm} \cdot 300\ N = 600\ N.$$

A supplemental supporting force of 50 N must be added to the carrying power of the gas strut which in its fully extended position counteracts the weight of the lid, in order to compensate for any deviations which are bound to occur, e.g. the effects of wind gusts or snow, and also to ensure that the flap can be safely opened and closed throughout its entire opening angle of 90°.

This results in a gas strut force of 600 + 50 = 650 N.

(Technische Vorschrift beachten Seite 12 / Please note the contents of chapter "Technical Documentation" page 13)

Typenliste Gasfedern
List of available gas struts

Gasdruckfeder / Gas pressure strut									
Federkraft Strut force	5 - 100 N	10 - 180 N	40 - 400 N	50 - 700 N	100 - 1200 N	150 - 2500 N	300 - 5000 N	500 - 7500 N	750 - 10.000 N
Ø Kolbenstange (mm) Piston rod dia. (mm)	3	4	6	8	10	14	20	25	30
Ø Zylinder (mm) Cylinder dia. (mm)	10	12	15	19	23	28	40	55	65
Hub Stroke	10, 20, 30, 40 50, 60, 70, 80	10, 20, 30 40, 50, 60 70, 80, 100 120, 130, 140 150, 160	20, 30, 40 50, 60, 70 80, 100, 110 120, 140, 150 160, 170, 180 190, 200, 220 250, 300	40, 50, 60 70, 80, 100 120, 140, 150 160, 180, 200 220, 250, 300 350, 400, 500	40, 50, 60 70, 80, 85 100, 120, 140 150, 160, 180 200, 220, 250 270, 300, 325 350, 400, 450 500, 600, 700	50, 60, 80 100, 120, 150 160, 200, 210 220, 250, 300 350, 400, 450 500, 550, 600 650, 700	50, 70, 100 120, 150, 180 200, 220, 250 300, 350, 400 500, 600	100, 200, 300 400, 500, 600 700	100, 200, 300 400, 500, 600 700
Standardlänge (mm) Standard lengths (mm)	2 x Hub + 50 mm Stroke x 2 + 50 mm	2 x Hub + 50 mm Stroke x 2 + 50 mm	2 x Hub + 80 mm Stroke x 2 + 80 mm	2 x Hub + 100 mm Stroke x 2 + 100 mm	2 x Hub + 100 mm Stroke x 2 + 100 mm	2 x Hub + 150 mm Stroke x 2 + 150 mm	2 x Hub + 200 mm Stroke x 2 + 200 mm	2 x Hub + 300 mm Stroke x 2 + 300 mm	2 x Hub + 360 mm Stroke x 2 + 360 mm
Material Materials	Stahl rostfrei / Stainless steel Messing / Brass schwarz lackiert / Painted black		Stahl hartverchromt / schwarz lackiert Black painted hard chromed steel						

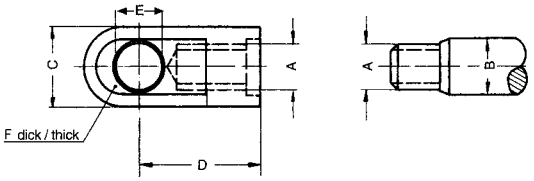
Gaszugfeder / Gas tension strut				
Federkraft Strut force	30 - 330 N	150 - 1200 N	200 - 2000 N	500 - 5000 N
Ø Kolbenstange (mm) Piston rod dia. (mm)	6	10	10	28
Ø Zylinder (mm) Cylinder dia. (mm)	19	28	40	40
Hub Stroke	30, 50, 60 70, 80, 100 120, 140, 150 180, 200, 250 300	20, 50, 60 70, 80, 100 110, 120, 130 150, 160, 180 200, 220, 250 300, 350, 400 450, 500	10, 40, 50 60, 70, 90 100, 110, 120 140, 150, 170 190, 210, 240 290, 340, 390 490	50, 80, 100 120, 150, 200 250, 300, 350 400, 450, 500 600, 700
Standardlänge (mm) Standard lengths (mm)	2 x Hub + 132 mm Stroke x 2 + 132 mm	2 x Hub + 138 mm Stroke x 2 + 138 mm	2 x Hub + 212 mm Stroke x 2 + 212 mm	2,5 x Hub + 187 mm Stroke x 2,5 + 187 mm
Material Materials	Stahl hartverchromt / schwarz lackiert Hard chromed steel painted black			

Maßtabellen für Gasfeder-Anschlüsse
Dimensional tables for gas strut connections

Anschluss A = Auge / Connection A = Lug
Anbringung an der Kolbenstange / Attached to a piston rod

	Gasdruckfeder / Gas pressure strut									Gaszugfeder / Gas tension strut			
	Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia.									Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia.			
Maß / Dimension	3/10	4/12	6/15	8/19	10/23	14/28	20/40	25/55	30/65	6/19	10/28	10/40	28/40
A	M 3,5	M 3,5	M 5	M 8	M 8	M 10	M 14x1,5	kein Auge möglich no suitable lugs available		M 5	M 8	M 14x1,5	M 14x1,5
B Ø / dia.	3	4	6	8	10	14	20			6	10	10	28
C Ø / dia.	8	8	10	14	14	18	25			10	14	25	25
D	11	11	16	19	19	27	42			16	19	42	4
E Ø / dia.	4,1	4,1	6,1	8,1	8,1	8,1	14,1			6,1	8,1	14,1	14,1
F	4	4	6	10	10	10	14			6	10	14	14

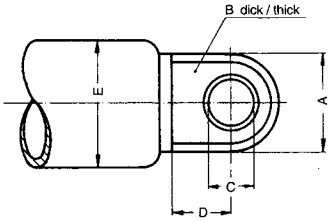
Alle Angaben in mm / All dimensions are in mm
Material: Stahl blau verzinkt / Material: Blue zinc-plated steel



Anschluss A = Auge / Connection A = Lug
Anbringung an Bodenstück / Attached to a base plate

	Gasdruckfeder / Gas pressure strut									Gaszugfeder / Gas tension strut			
	Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia.									Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia.			
Maß / Dimension	3/10	4/12	6/15	8/19	10/23	14/28	20/40	25/55	30/65	6/19	10/28	10/40	28/40
A	M 7	M 8	M 11	M 14	M 18	M 20	M 25	kein Auge möglich no suitable lugs available		M 10	M 14	M 24	M 24
B Ø / dia.	4	4	6	10	10	10	14			6	10	14	14
C Ø / dia.	4,1	4,1	6,1	8,1	8,1	8,1	14,1			6,1	8,1	14,1	14,1
D	7	7	9	11	11	16	20			16	19	20	20
E Ø / dia.	10	12	15	19	23	28	40			19	28	40	40

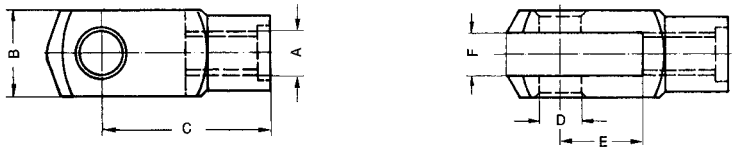
Alle Angaben in mm / All dimensions are in mm
Material: Stahl blau verzinkt / Material: Blue zinc-plated steel



Anschluss G = Gabel, DIN 71752 / Connection G = Fork to DIN 71752
Anbringung an der Kolbenstange/am Bodenstück / Attached to the piston rod/to the base plate

	Gasdruckfeder / Gas pressure strut									Gaszugfeder / Gas tension strut			
	Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia.									Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia.			
Maß / Dimension	3/10	4/12	6/15	8/19	10/23	14/28	20/40	25/55	30/65	6/19	10/28	10/40	28/40
A	M 3,5	M 3,5	M 5	M 8	M 8	M 10	M 14x1,5	M 20x1,5	M 24x1,5	M 5	M 8	M 14x1,5	M 14x1,5
B Ø / dia.	8	8	10	16	16	20	27	40	50	10	16	27	27
C Ø / dia.	16	16	20	32	32	40	56	80	100	20	24	42	42
D	4	4	5	8	8	10	14	20	25	5	8	14	14
E Ø / dia.	8	8	10	16	16	20	28	40	50	10	16	28	28
F	4	4	5	8	8	10	14	20	25	5	8	14	14

Alle Angaben in mm / All dimensions are in mm
Material: Stahl blau verzinkt / Material: Blue zinc-plated steel

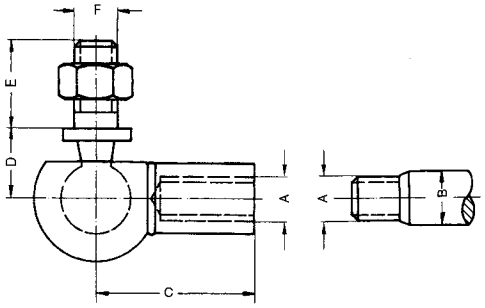


Maßtabellen für Gasfeder-Anschlüsse
Dimensional tables for gas strut connections

Anschluss WG = Winkelgelenk, DIN 71802 / Connection WG = Angle joint to DIN 71802
Anbringung an der Kolbenstange/am Bodenstück / Attached to the piston rod/base plate

	Gasdruckfeder / Gas pressure strut									Gaszugfeder / Gas tension strut			
Maß / Dimension	Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia. 3/10	4/12	6/15	8/19	10/23	14/28	20/40	25/55	30/65	Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia. 6/19	10/28	10/40	28/40
A	M 3,5	M 3,5	M 5	M 8	M 8	M 10	M 14x1,5	kein Winkelgelenk möglich / no angle joints available		M 5	M 8	M 14x1,5	M 14x1,5
B Ø / dia.	3	4	6	8	10	14	20			6	10	10	28
C Ø / dia.	18	1	22	30	30	35	45			22	30	45	45
D	9	9	9	13	13	16	20			9	13	20	20
E Ø / dia.	10,3	10,3	10	16	16	20	28			10	16	28	28
F	M 4	M 4	M 5	M 8	M 8	M 10	M14x1,5			M 5	M8	M 14x1,5	M 14x1,5

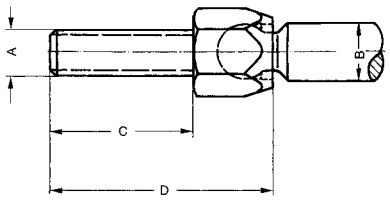
Alle Angaben in mm / All dimensions are in mm
Material: Stahl blau verzinkt / Material: Blue zinc-plated steel



Anschluss KG = Kugelgelenk / Connection KG = Ball point
Anbringung an der Kolbenstange/am Bodenstück / Attached to the piston rod/base plate

	Gasdruckfeder / Gas pressure strut									Gaszugfeder / Gas tension strut			
Maß / Dimension	Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia. 3/10	4/12	6/15	8/19	10/23	14/28	20/40	25/55	30/65	Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia. 6/19	10/28	10/40	28/40
A	kein KG möglich / no ball joints available		M 8	M 8	M 8	M 10	M 14x1,5	kein KG möglich / no ball joints available		M 8	M 8	M 14x1,5	M 14x1,5
B Ø / dia.			6	8	10	14	20			6	10	10	28
C Ø / dia.			35	35	35	25	40			35	35	40	40
D			28	31	31	43	56			28	31	56	56

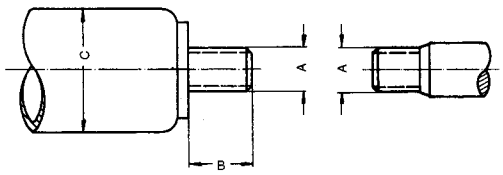
Alle Angaben in mm / All dimensions are in mm
Material: Stahl blau verzinkt / Material: Blue zinc-plated steel



Anschluss GZ = Gewindezapfen / Connection GZ = Threaded stem
Anbringung an der Kolbenstange/am Bodenstück / Attached to the piston rod/base plate

	Gasdruckfeder / Gas pressure strut									Gaszugfeder / Gas tension strut			
Maß / Dimension	Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia. 3/10	4/12	6/15	8/19	10/23	14/28	20/40	25/55	30/65	Ø Kolbenstange / Ø Zylinder Piston rod dia. / Cylinder dia. 6/19	10/28	10/40	28/40
A	M 3,5	M 3,5	M 5	M 8	M 8	M 10	M 14x1,5	M 20x1,5	M 24x1,5	M 5	M 8	M 14x1,5	M 14x1,5
B Ø / dia.	5	5	7	10	10	12	15	30	40	7	10	15	18
C Ø / dia.	10	12	15	19	23	28	40	55	65	19	28	40	40

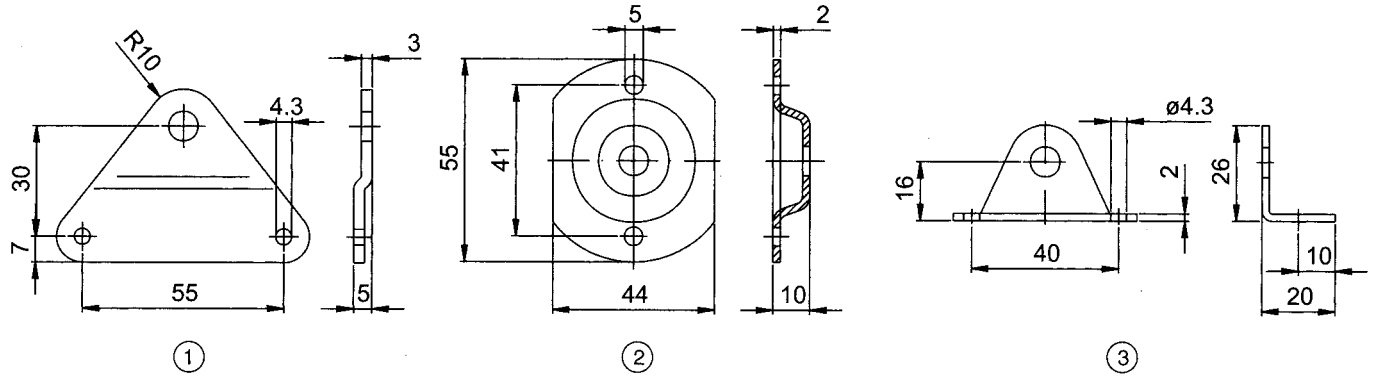
Alle Angaben in mm / All dimensions are in mm
Material: Stahl blau verzinkt / Material: Blue zinc-plated steel



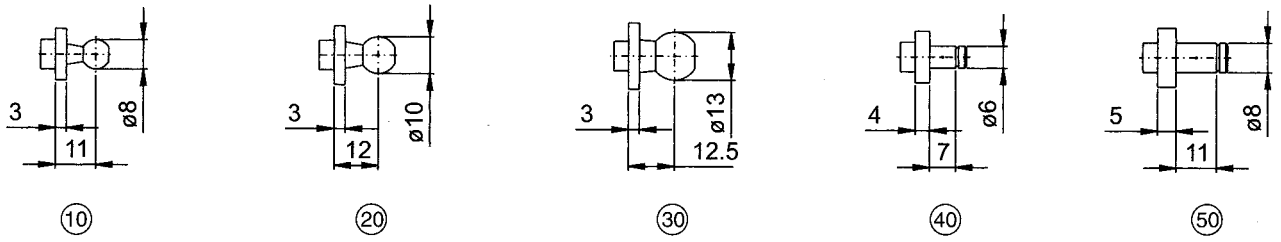
Beschläge
Brackets

Belastungsrichtung, Kraftanstieg und max. Belastungswerte beachten!
Please note direction of load, force rise and max. load!

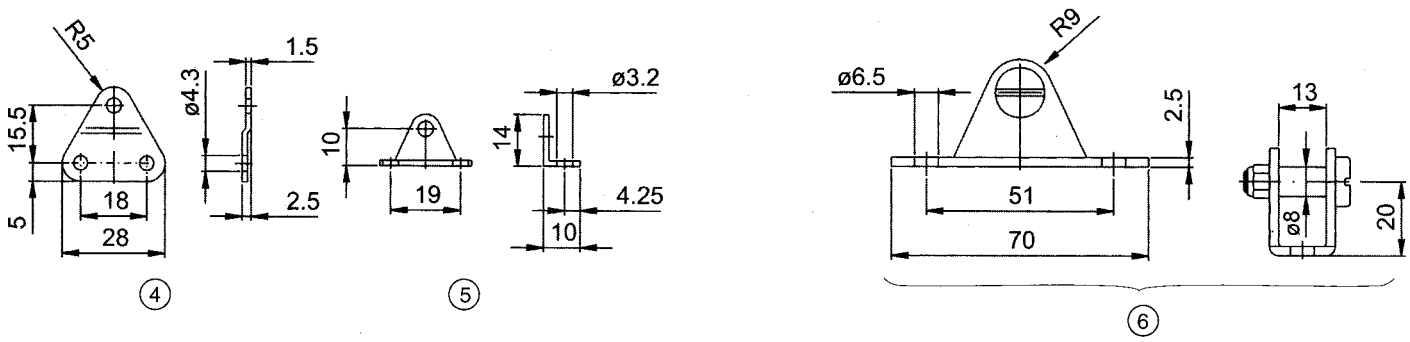
Grundplatten / Base sections



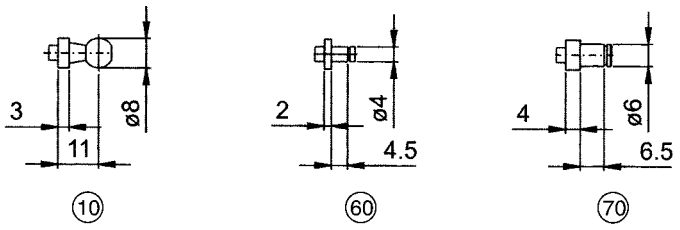
Anschlüsse / Connections beliebig kombinierbar / can be combined at will



Grundplatten / Base sections



Anschlüsse / Connections beliebig kombinierbar / can be combined at will



Technische Daten / Technical Data:

Werkstoff: Grundplatte: St1203, Anschlüsse: 9 SMnPb 28 k
Material: Base Section: St1203, Connection: 9 SMnPb 28 k

Oberfläche: blau verzinkt
Surface finish: Zinc plated

Festigkeit / Stability		
Grundplatte Bracket	Anschluss Connection	max. N Max. N
1, 2, 3	10, 40	500
1, 2, 3	20	800
1, 2, 3	30, 50	1200
4, 5	20, 60, 70	500
6	6	1800

HAPPICH RIU
A Pelzer Family Company

Gasfedern
Gas Struts

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08918 Badalona
Spain

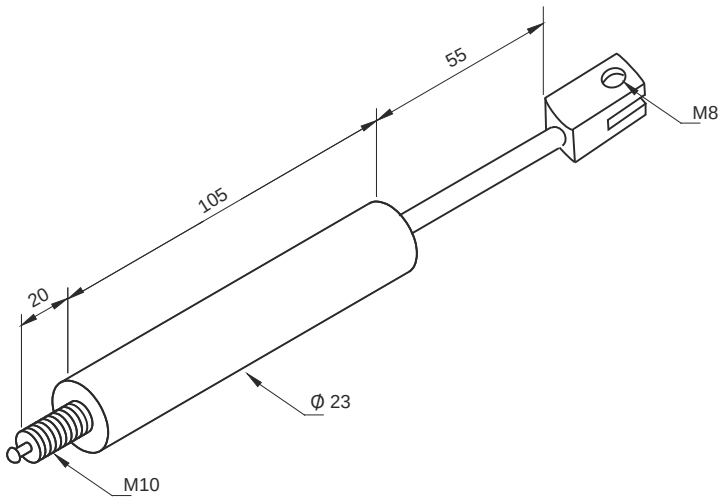
Phone +34 933 037 600
Fax +34 933 037 610
E- Mail acriu@acriu.com

www.happich-riu.com

AMORTIGUADORES
*
GAS SPRINGS

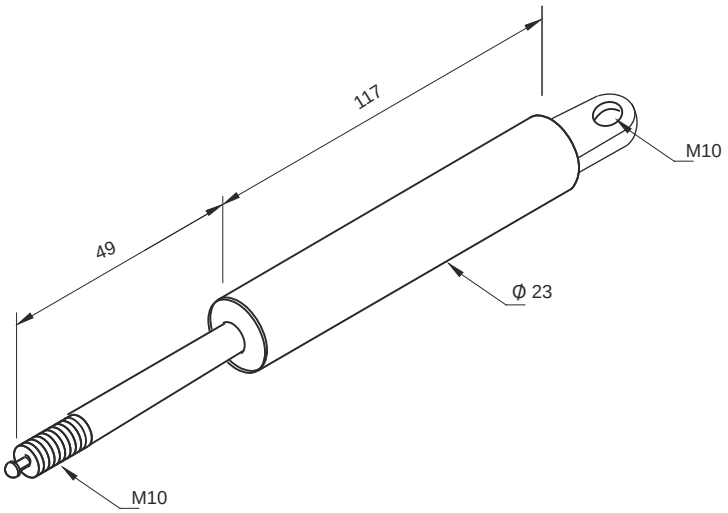
1505 00
AMORTIGUADOR A GAS
RESPALDO BUTACA
BACK SEAT GAS SPRING
500 N

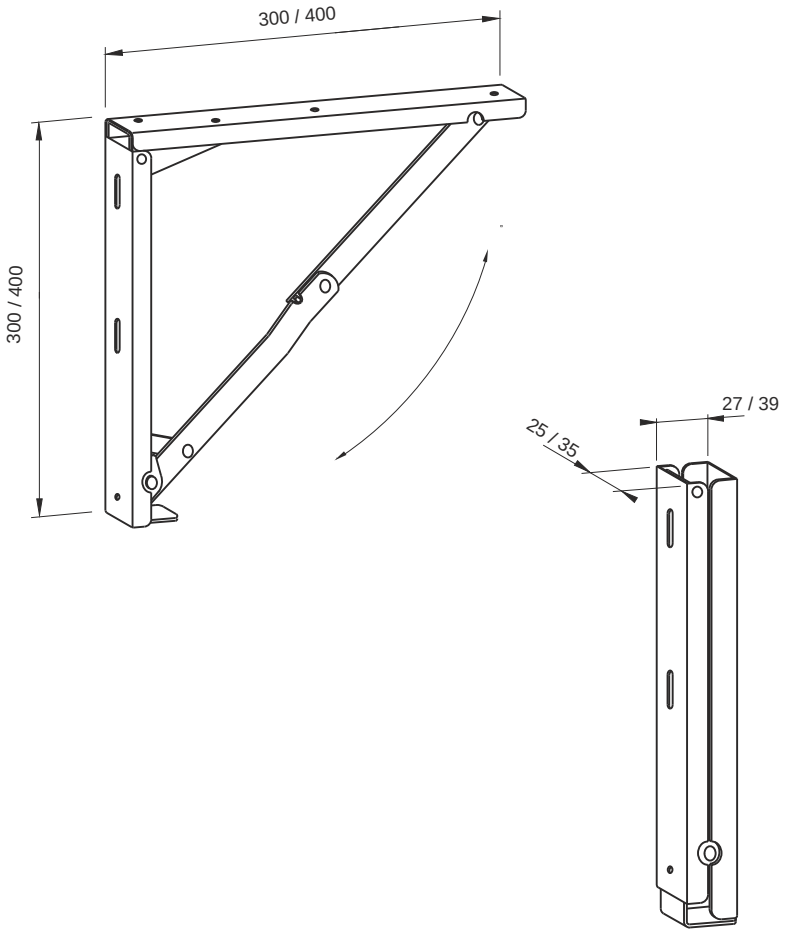
Peso / Weight 210 g



1505 50
AMORTIGUADOR A GAS
RESPALDO BUTACA
BACK SEAT GAS SPRING
600 N

Peso / Weight 195 g





1525 30
ESCUADRA ABATIBLE
FOLDABLE SQUAD
300 x 300 mm

Acero cromado / Chromed steel

120 Kg de resistencia entre 2 escuadras
120 Kg strenght between two squads
Acepta 450 mm de mesa
Takes 450 mm of table

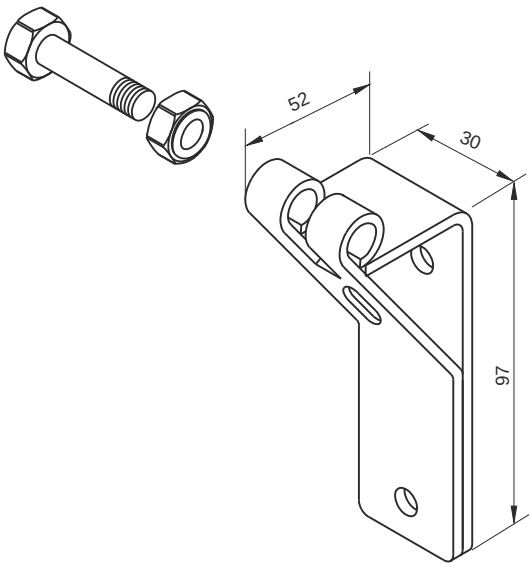
Peso /Weight 590 g

1525 40
ESCUADRA ABATIBLE
FOLDABLE SQUAD
400 x 400 mm

Acero cromado / Chromed steel

500 Kg de resistencia entre 2 escuadras
500 Kg strenght between two squads
Acepta 600 mm de mesa
Takes 600 mm of table

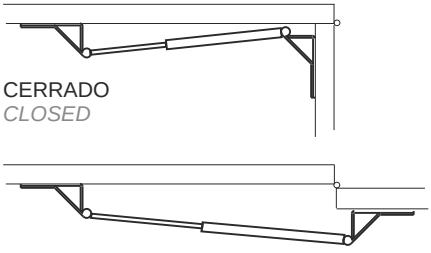
Peso /Weight 1410 g



1528 00
SOPORTE AMORTIGUADOR
ALTA RESISTENCIA
HIGH STRENGHT
GAS SPRING BRACKET

Acero cincado
Zinc plated steel

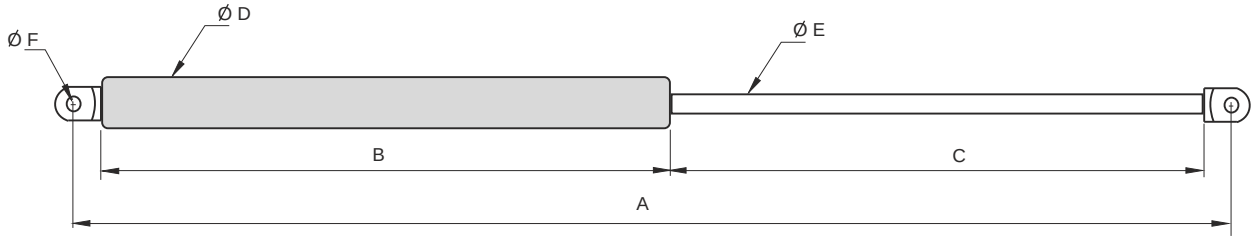
Peso / Weight 200 g



CERRADO
CLOSED

ABIERTO
OPENED

AMORTIGUADORES DE GAS / *GAS SPRINGS*



Código *Code*	**A** Longitud Total *Total Length*	**B** Longitud Botella *Cylinder Length*	**C** Longitud Vástago *Piston rod Length*	**D** Diametro Cilindro *Cylinder Diameter*	**E** Diametro Vástago *Piston rod Diameter*	**F** Diametro Taladro *Hole Diameter*	**K** Esfuerzo en Kg. *Strenght in Kg*	Peso en g. *Weight in g.*
1496 90	500	255	210	22	10	8	90	412
1498 10	770	420	320	22	11	8	10	588
1498 25	770	405	320	22	10	8	25	582
1498 55	770	420	320	22	11	8	55	602
1499 15	335	165	143	18,5	8	8	15	206
1506 11	700	345	310	23	10	8	110	650
1506 22	700	360	300	28	14	10	220	580
1507 60	700	360	300	22	10	8	60	550
1509 30	365	175	140	19	8	8	10	218
1509 40	515	250	215	19	8	8	40	288
1510 10	548	270	245	19	8	8	10	275
1510 37	548	270	245	19	8	8	37	275
1511 22	340	175	125	19	8	8	22	220
1512 35	340	170	135	19	8	8	35	250
1513 15	170	80	50	19	8	8	15	130
1514 45	554	276	240	19	8	8	45	360
1515 54	600	290	260	19	8	8	54	310
1515 70	600	310	250	22	10	8	70	480
1516 60	554	268	230	19	8	8	60	410
1517 25	550	290	220	19	8	8	24	300
1517 69	554	275	240	19	8	8	70	335
1517 70	554	286	224	28	10	10	70	710
1518 42	600	290	255	19	8	8	42	250
1518 43	700	360	300	19	8	8	42	350
1519 70	1003	510	450	28	14	10	70	1150
1539 10	105	55	20	15	6	6	10	38
1520 35	748	380	335	22	10	10	35	560

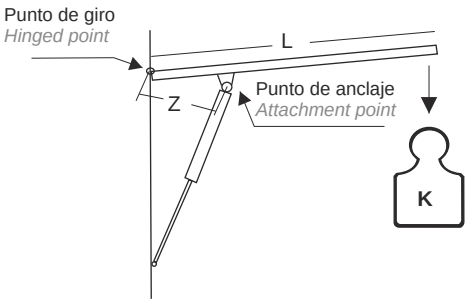
POR SU LONGITUD *BY LENGHT*

A Longitud Total *Total Length*	**K** Esfuerzo en Kg. *Strenght in Kg*	Código *Code*
105	10	**1539 10**
170	15	**1513 15**
335	15	**1499 15**
340	22	**1511 22**
340	35	**1512 35**
365	10	**1509 30**
500	90	**1496 90**
515	40	**1509 40**
548	10	**1510 10**
548	37	**1510 37**
550	24	**1517 25**
554	45	**1514 45**
554	60	**1516 60**
554	70	**1517 69**
554	70	**1517 70**
600	54	**1515 54**
600	70	**1515 70**
600	42	**1518 42**
700	110	**1506 11**
700	220	**1506 22**
700	60	**1507 60**
700	42	**1518 43**
748	35	**1520 35**
770	10	**1498 10**
770	25	**1498 25**
770	55	**1498 55**
1003	70	**1519 70**

POR SU RESISTENCIA *BY STRENGHT*

K Esfuerzo en Kg. *Strenght in Kg*	**A** Longitud Total *Total Length*	Código *Code*
10	105	**1539 10**
10	365	**1509 30**
10	548	**1510 10**
10	770	**1498 10**
15	170	**1513 15**
15	335	**1499 15**
22	340	**1511 22**
24	550	**1517 25**
25	770	**1498 25**
35	340	**1512 35**
35	748	**1520 35**
37	548	**1510 37**
40	515	**1509 40**
42	600	**1518 42**
42	700	**1518 43**
45	554	**1514 45**
54	600	**1515 54**
55	770	**1498 55**
60	554	**1516 60**
60	700	**1507 60**
70	554	**1517 69**
70	554	**1517 70**
70	600	**1515 70**
70	1003	**1519 70**
90	500	**1496 90**
110	700	**1506 11**
220	700	**1506 22**

CALCULO DEL AMORTIGUADOR MAS APROPIADO
HOW TO EVALUATE PROPER GAS SPRING

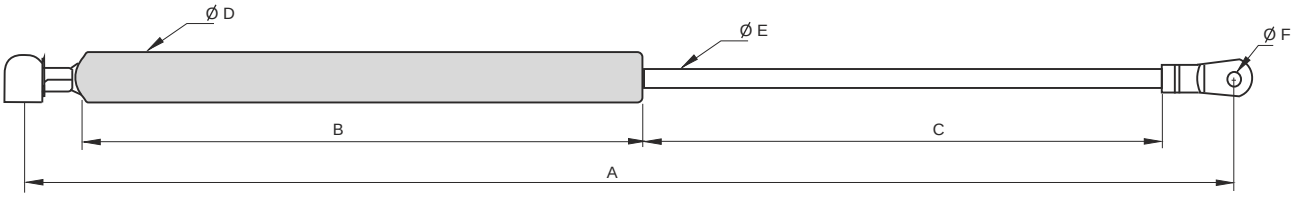


$$X = \frac{L * K}{Z * N * 2} + 4$$

X = Resistencia en kgs de cada amortiguador
Strenght of each gas spring
L = Longitud de la puerta en metros
Door lenght
K = Peso de la puerta en kgs
Door weight
Z = Distancia desde el punto de giro de la puerta , al punto de anclaje del amortiguador en la puerta en metros
Distance in meeters between the hinged point and the attachment point
N = Número de amortiguadores por puerta
Number of the gas springs

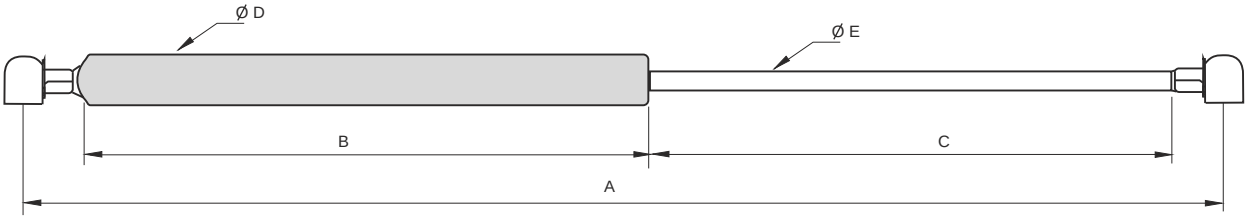
Nota: Esta fórmula es una ayuda para el cálculo del amortiguador .Sin embargo diversas variables (rozamientos etc) pueden modificar en más o menos el resultado final
This is just an extra help for best evaluate proper gas spring.
Many factors may influence and determinate a plus or a minus final result.

UNA ROTULA / *ONE KNEECAP*



Código *Code*	**A** Longitud Total *Total Length*	**B** Longitud Botella *Cylinder Length*	**C** Longitud Vástago *Piston Rod Length*	**D** Diámetro Cilindro *Cylinder Diameter*	**E** Diámetro Vástago *Piston Rod Diameter*	**K** Esfuerzo en Kg. *Strenght in Kg*	Peso en g. *Weight in g.*
1530 20	585	285	242	19	8	20	320
1530 25	585	285	148	19	8	25	320
1530 30	585	285	125	19	8	30	320
1530 35	585	285	225	19	8	35	320
1530 40	585	285	225	19	8	40	320
1530 50	585	285	225	19	8	50	320
1530 60	585	285	225	19	8	60	320

DOS ROTULAS / *TWO KNEECAPS*



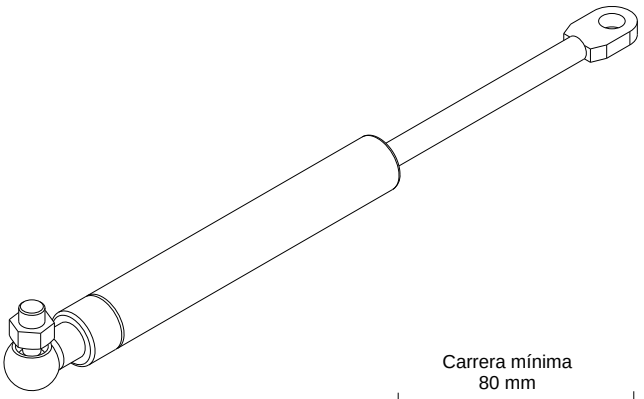
Código *Code*	**A** Longitud Total *Total Length*	**B** Longitud Botella *Cylinder Length*	**C** Longitud Vástago *Piston Rod Length*	**D** Diámetro Cilindro *Cylinder Diameter*	**E** Diámetro Vástago *Piston Rod Diameter*	**K** Esfuerzo en Kg. *Strenght in Kg*	Peso en g. *Weight in g.*
1497 60	565	281	242	22	10	60	400
1531 20	375	185	148	19	8	20	213
1531 35	340	175	125	19	8	35	206
1532 25	525	260	225	19	8	25	292
1532 40	525	260	225	19	8	40	292
1532 50	525	260	225	19	8	50	292
1532 70	525	260	225	19	8	70	292
1532 80	525	260	225	19	8	80	292
1533 30	586	285	260	19	8	30	309
1533 40	590	300	260	19	8	40	322
1533 70	600	300	260	19	8	70	326
1533 92	586	285	260	23	10	115	534
1534 34	412	217	155	19	8	34	228
1534 35	412	217	155	19	8	45	228
1534 45	340	179	128	19	8	45	194
1534 50	405	195	160	19	8	52	224
1534 70	405	195	170	22	10	68	322

POR SU LONGITUD
BY LENGTH

A Longitud Total *Total Lenght*	**K** Esfuerzo en Kg. *Strenght in Kg*	Código *Code*
340	35	**1531 35**
340	45	**1534 45**
375	20	**1531 20**
405	52	**1534 50**
405	68	**1534 70**
412	34	**1534 34**
525	25	**1532 25**
525	40	**1532 40**
525	50	**1532 50**
525	70	**1532 70**
525	80	**1532 80**
565	60	**1497 60**
586	30	**1533 30**
586	115	**1533 92**
590	40	**1533 40**
600	70	**1533 70**

POR SU RESISTENCIA
BY STRENGTH

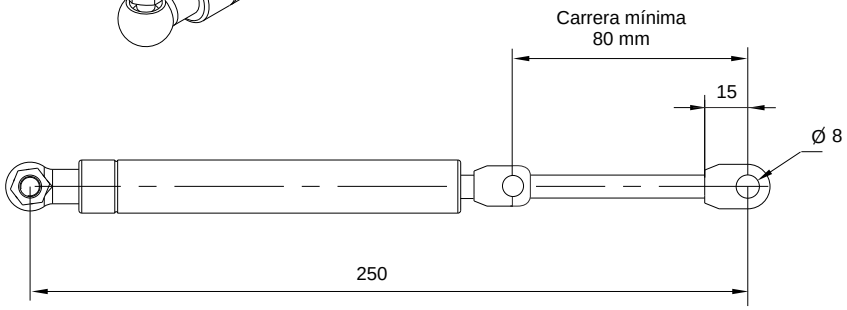
A Longitud Total *Total Lenght*	**K** Esfuerzo en Kg. *Strenght in Kg*	Código *Code*
375	20	**1531 20**
525	25	**1532 25**
586	30	**1533 30**
412	34	**1534 34**
340	35	**1531 35**
525	40	**1532 40**
590	40	**1533 40**
340	45	**1534 45**
525	50	**1532 50**
405	52	**1534 50**
565	60	**1497 60**
405	68	**1534 70**
525	70	**1532 70**
600	70	**1533 70**
525	80	**1532 80**
586	115	**1533 92**

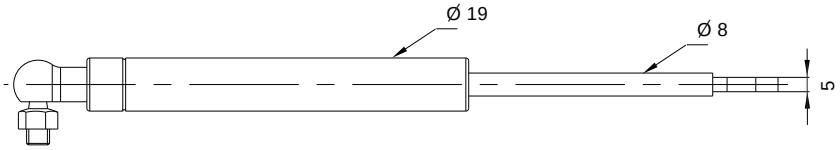


1500 30
AMORTIGUADOR DE GAS
GAS SPRING

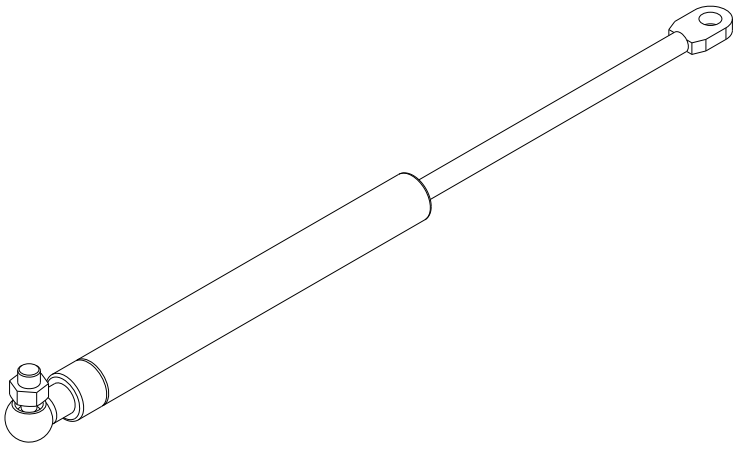
Fuerza en kg / *Strenght in kg* 30 kg

Peso / Weight 170 g





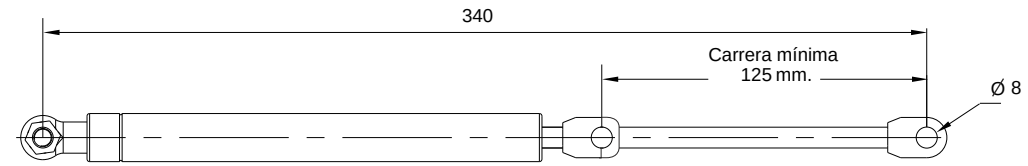
DIMENSIONES PAR MONTAR EN BISAGRAS 0341 03 / 0341 04
DIMENSIONS TO MOUNTING ON 0341 03 / 0341 04 HINGES

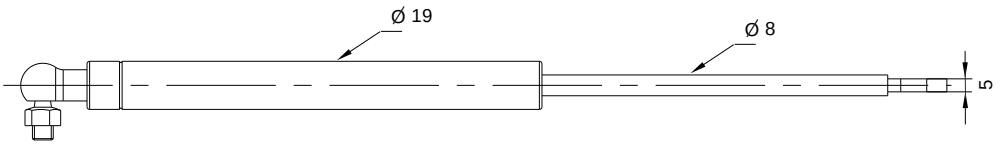


1500 70
AMORTIGUADOR DE GAS
GAS SPRING

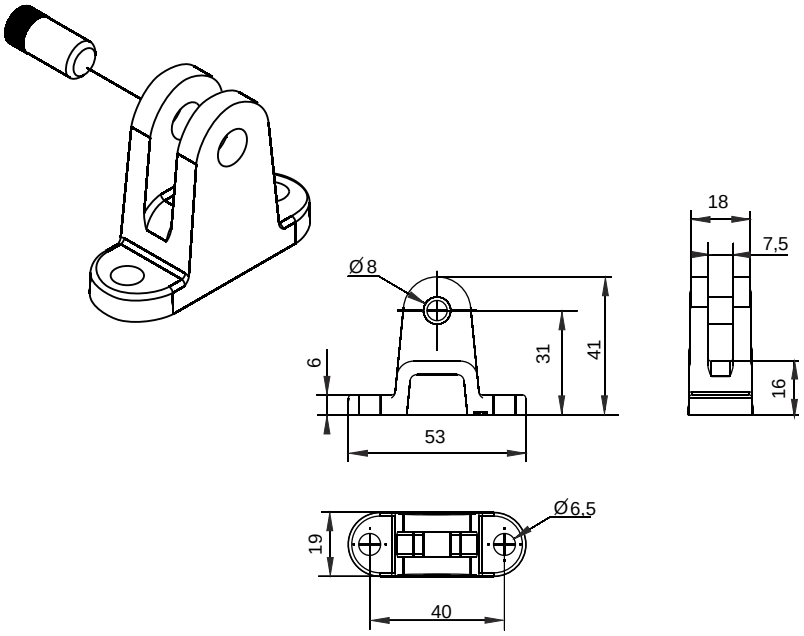
Fuerza en kg / *Strenght in kg* 70 kg

Peso / Weight 250 g





DIMENSIONES PAR MONTAR EN BISAGRAS 0341 31 / 0341 32
DIMENSIONS TO MOUNTING ON 0341 31 / 0341 32 HINGES



1521 40
SOPORTE AMORTIGUADOR
ALTURA 40 mm EJE 8 mm
PASADOR INCLUIDO
GAS SPRING BRACKET
40 mm HEIGHT, PIN HOLE 8 mm
PIN INCLUDED

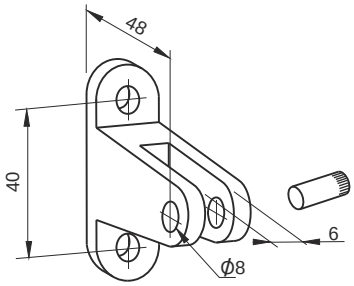
Aluminio fundido
Diecast aluminium

Peso / Weigth 40 g

1521 56
RECAMBIO EJE
PARA SOPORTE 152140
152140 SPARE PART PIN

Acero cincado
Cinc plated steel

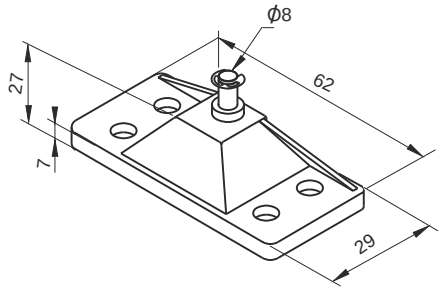
Peso / Weigth 40 g



1522 55
SOPORTE AMORTIGUADOR
ALTURA 55 mm EJE 8 mm
PASADOR INCLUIDO
GAS SPRING BRACKET
55 mm HEIGHT, PIN HOLE 8 mm
PIN INCLUDED

Aluminio fundido
Diecast aluminium

Peso / Weight 64 g



1526 00
SOPORTE AMORTIGUADOR PLANO
GAS SPRING FLAT BRACKET

Poliamida negra
Eje acero cincado
Black poliamid
Zinc plated steel axis

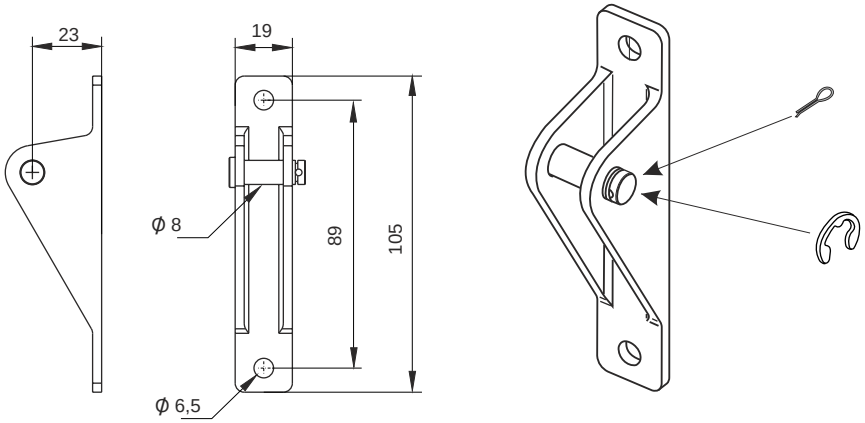
Peso / Weight 36 g

1541 00
SOPORTE AMORTIGUADOR
GAS SPRING BRACKET

Acero cincado
Zinc plated steel

Peso / Weigth 100 g

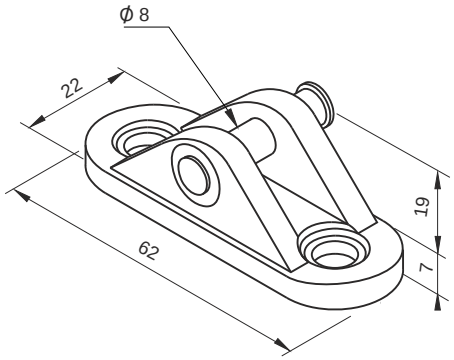
SE SUMINISTRA CON 1 ARANDELA Y 1 PASADOR DE ALETAS, PARA USAR EL MAS CONVENIENTE.
SUPPLIED WITH 1 WASHER AND 1 PIN, FOR USE THE MOST CONVENIENT ONE



1527 19
SOPORTE AMORTIGUADOR
GAS SPRING BRACKET

Poliamida negra,
eje acero cincado
Black poliamid,
Zinc plated steel axis

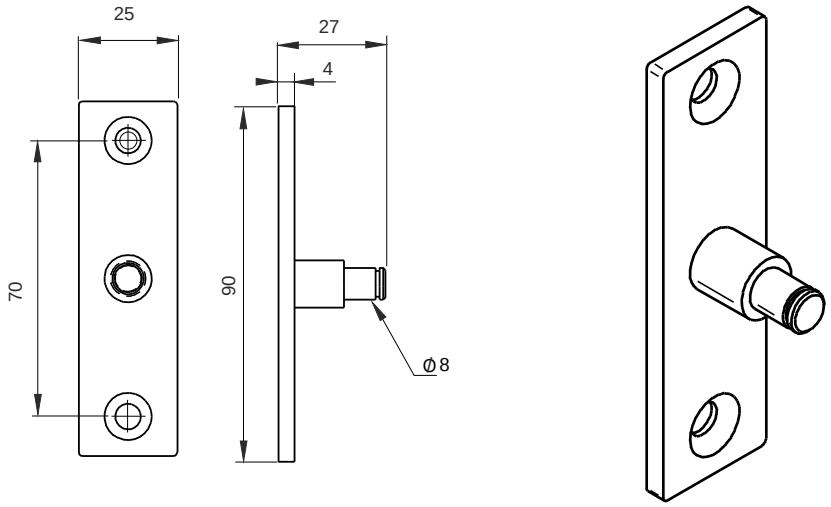
Peso / Weight 24 g

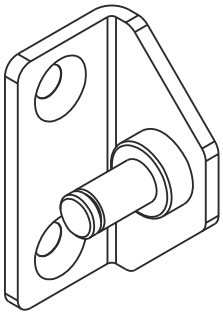


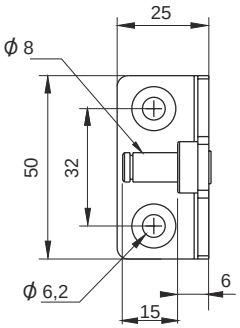
1401 00
SOPORTE AMORTIGUADOR
GAS SPRING BRACKET

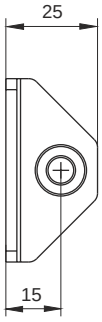
Acero cincado
Zinc plated steel

Peso / Weigth 80 g





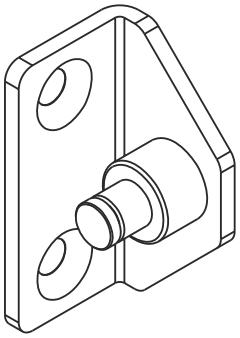


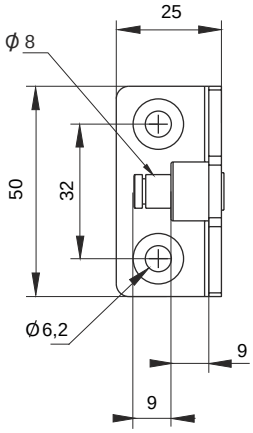


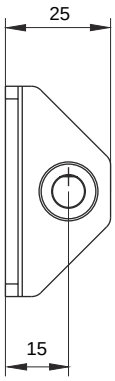
1542 00
SOPORTE AMORTIGUADOR
ESCUADRA
GAS SPRING SQUAD BRACKET

Acero cincado
Zinc plated steel

Peso / Weigth 56 g



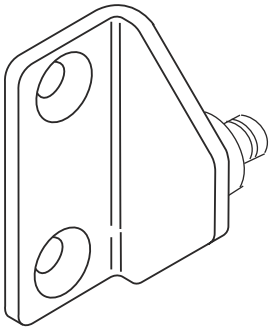


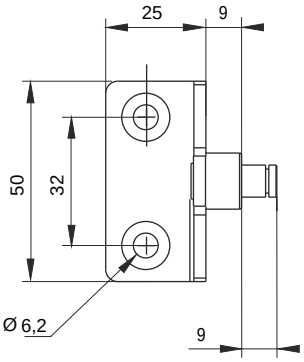


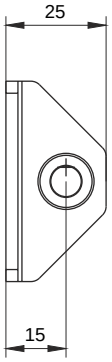
1542 10
SOPORTE AMORTIGUADOR
CORTO ESCUADRA
SHORT PIN GAS SPRING
SQUAD BRACKET

Acero cincado
Zinc plated steel

Peso / Weigth 58 g







1542 30
SOPORTE AMORTIGUADOR
CORTO ESCUADRA EXTERIOR
SHORT GAS SPRING
SQUAD BRACKET

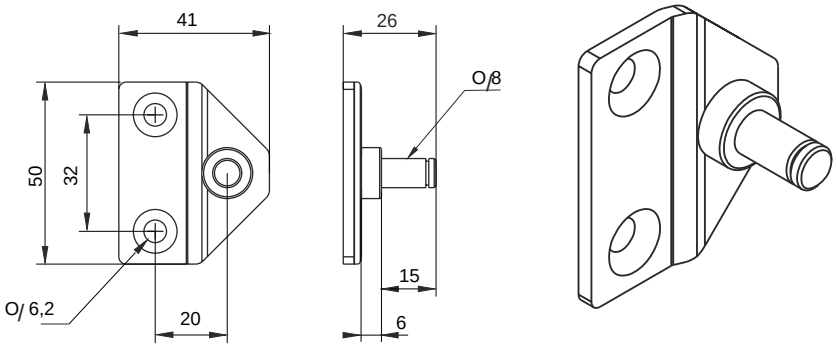
Acero cincado
Zinc plated steel

Peso / Weigth 58 g

1542 50
SOPORTE AMORTIGUADOR PLANO
FLAT GAS SPRING BRACKET

Acero cincado
Zinc plated steel

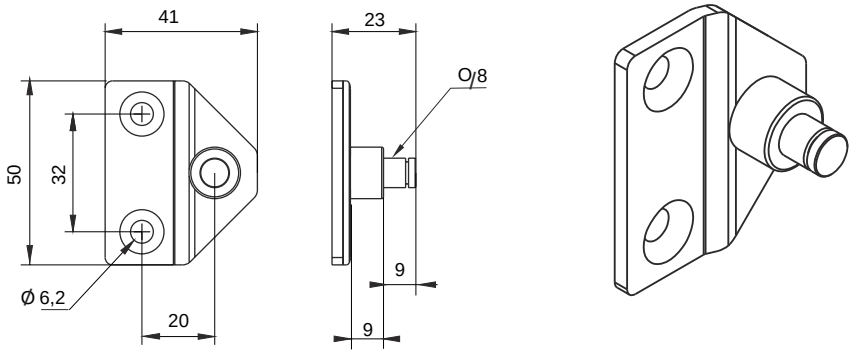
Peso / Weigth 56 g



1542 60
SOPORTE CORTO AMORTIGUADOR PLANO
SHORT PIN FLAT GAS SPRING BRACKET

Acero cincado
Zinc plated steel

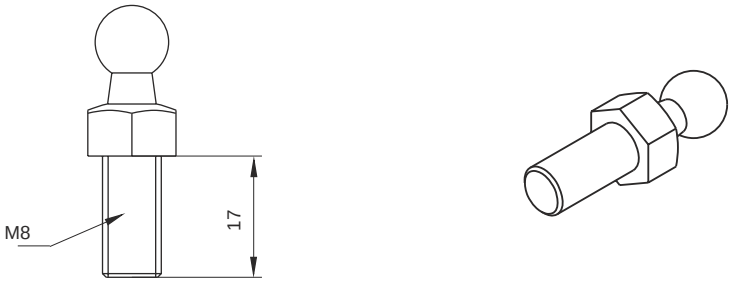
Peso / Weigth 60 g



1540 08
ROTULA SOPORTE AMORTIGUADOR
SPHERICAL GAS SPRING ATTACHMENT

Acero cincado
Zinc plated stee

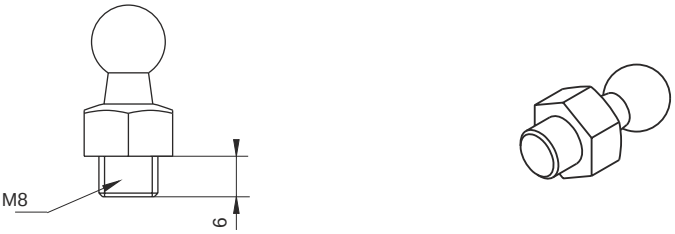
Peso / Weigth 14 g

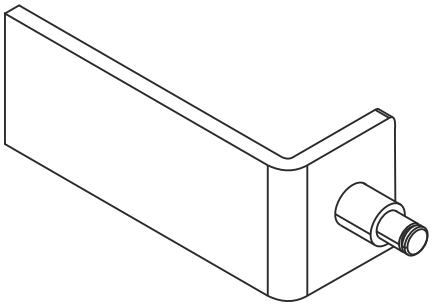


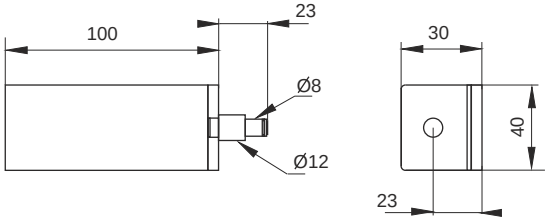
0344 00
ROTULA SOPORTE AMORTIGUADOR
SPHERICAL GAS SPRING ATTACHMENT

Acero cincado
Zinc plated steel

Peso / Weigth 8 g



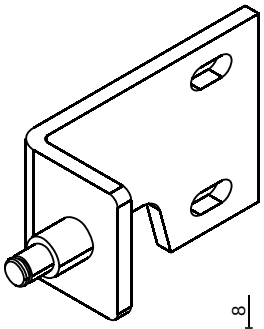


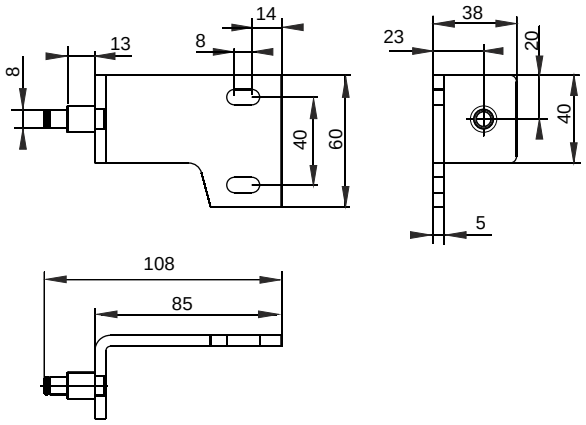


1402 00
SOPORTE AMORTIGUADOR
ANGULO PARA SOLDAR
GAS SPRING
WELDING ANGLE BRACKET

Acero cincado
Zinc plated steel

Peso / Weigth 335 g

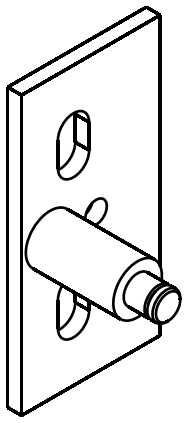


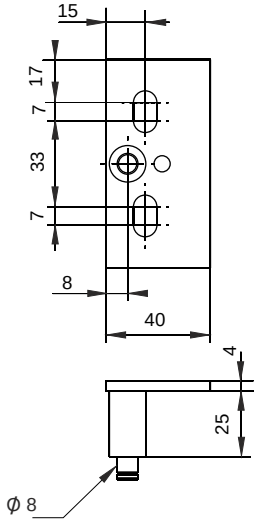


1403 00
SOPORTE
AMORTIGUADOR ANGULO
GAS SPRING
ANGLE BRACKET

Acero cincado
Zinc plated stee

Peso / Weigth 215 g





1406 00
SOPORTE
AMORTIGUADOR PLANO
GAS SPRING
FLAT BRACKET

Acero cincado
Zinc plated steel

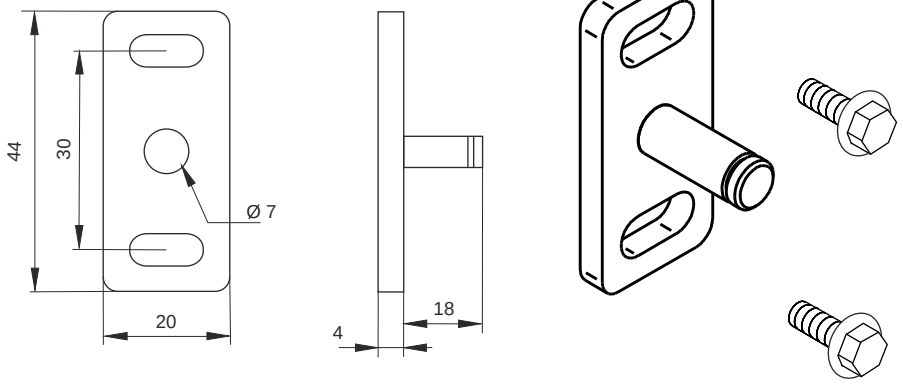
Peso / Weigth 120 g

1545 00
SOPORTE COMPAS
GAS SPRING BRACKET

Acero cincado plata
Zinc plated steel

Peso / Weigth 28 g

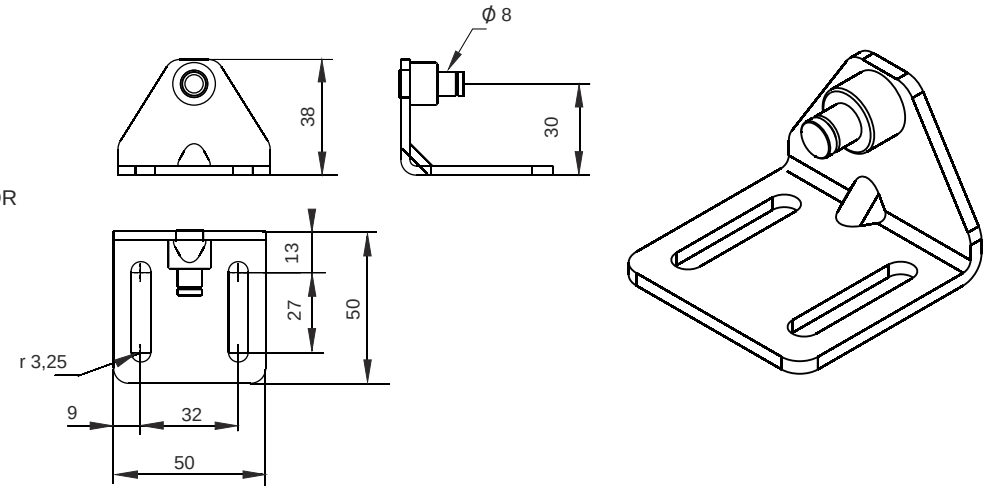
SE MONTA CON
SOPORTE 7142 59
MOUNTED WITH
7142 59 BRACKET



1542 40
SOPORTE AMORTIGUADOR
ESCUADRA
GAS SPRING
SQUAD BRACKET

Acero cincado
Zinc plated steel

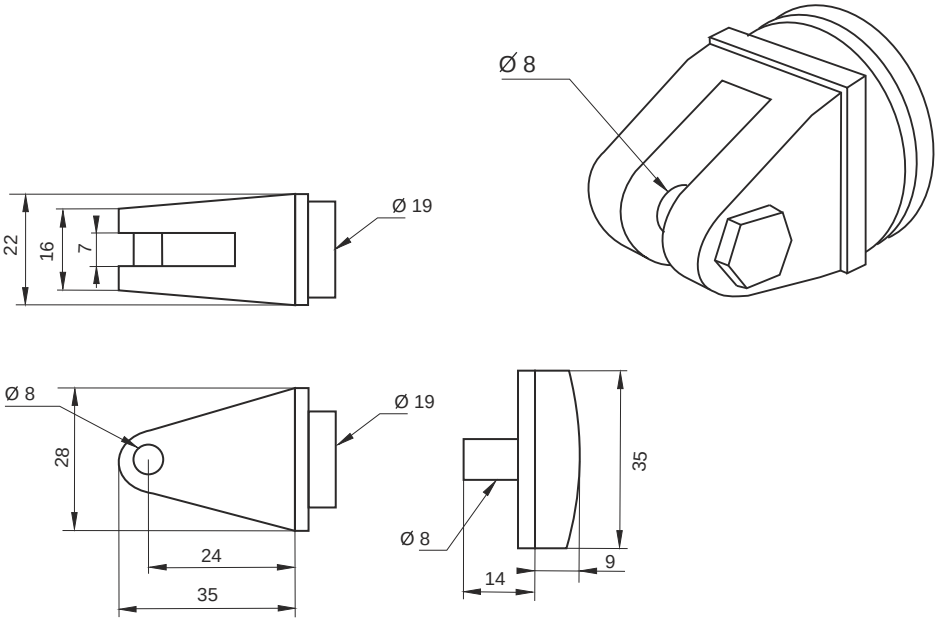
Peso / Weight 120 g



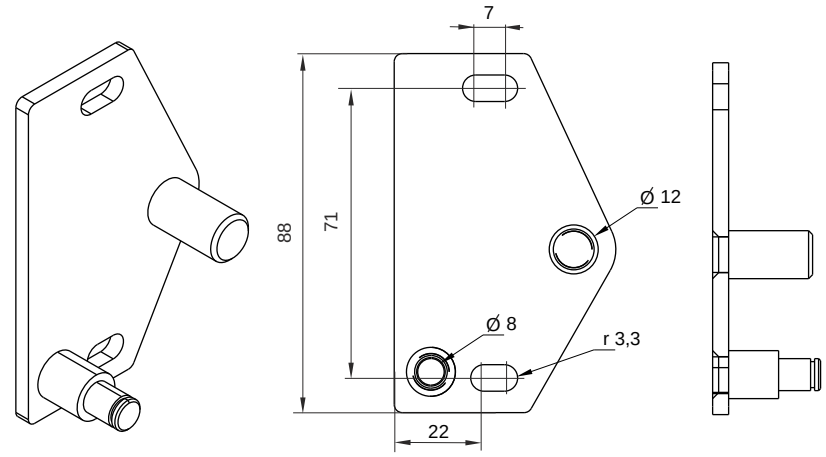
1529 00
SOPORTE
AMORTIGUADOR
PARA CRISTAL
GAS SPRING BRACKET
FOR GLASSES

Plástico negro
Black plastic

Peso / Weight 64 g



DIBUJO MANO IZQUIERDA
LEFT HAND DRAWING



0416 51
SOPORTE CIERRE Y RESORTE IZQUIERDA
LEFT LOCK AND GAS SPRING SUPPORT

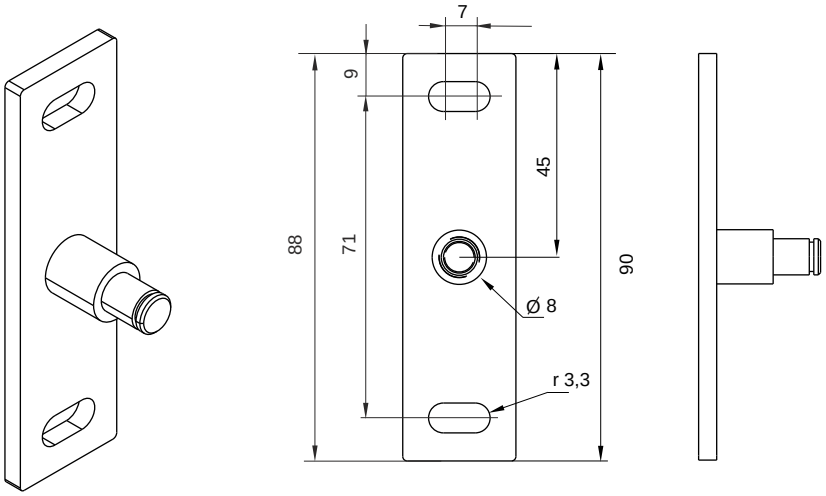
Acero cincado
Zinc plated steel

Peso / Weigth 520 g

0416 52
SOPORTE CIERRE Y RESORTE DERECHA
RIGHT LOCK AND GAS SPRING SUPPORT

Acero cincado
Zinc plated steel

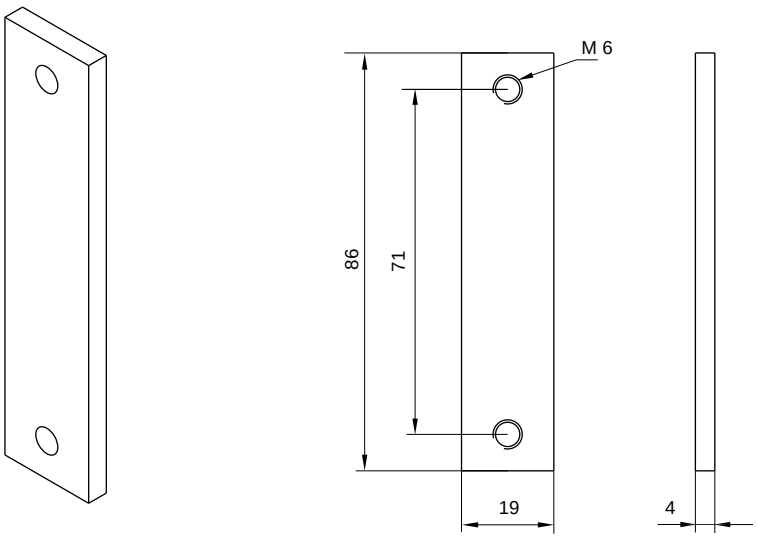
Peso / Weigth 520 g



1546 00
SOPORTE RESORTE
GAS SPRING SUPPORT

Acero cincado
Zinc plated steel

Peso / Weigth 200 g



1546 89
SOPORTE INTERIOR PARA PERFIL
INTERIOR SUPPORT TO PROFILE

Acero cincado
Zinc plated steel

Peso / Weigth 200 g

Se monta con soportes
Mounted with supports
0416 51 / 0416 52 / 1546 00