2014-1

GAS SPRING DOCUMENTATION

Index

See also page E4.

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An update of this catalogue can be found on and downloaded from our WEB-site: www.t-technics.nl

The general terms and conditions can be looked at and downloaded from our website Www.t-technics.nl.

T.Technics is able to produce and to deliver all kind of gas springs, a standard product as as well a special custom made one.

Defination of a gas spring:
The gas spring consists of a pressure cylinder (filled with nitrogen and oil) in which slides a piston-rod sub-assembly.

The self-contained pressured gas generates an axial force on the cylinder-rod system, making the whole device work as a compression spring.
The rod speed is always under control with added dampening effect near the end of the rod extension stroke.

The inflate pressure x the surface of the piston rod determine the outward force at gas push springs or inward force at gas pull springs.

With all gas springs a users manual is delivered.

Read it carefully !!!!!!!!!!

Explanation AIRAX gas spring program:

Our standard program of gas springs is produced by AIRAX from France.

AIRAX - France is one of the largest gas spring manufacturers in Europe and is the one of the main suppliers to Citroën, Peugeot en Renault.

AIRAX gas springs are delivered with a black coated cylinder, a good corrosion resistance.

The piston rods are hard chronium plated. On request black nitride hardening is possible.

Fill up on the extendible force F1 is made by T.Technics, therefore every extendible force, within the limitation of the type of gas springs, is possible.
This prevents long delivery times.

The pressure of the gas springs can be increased afterwards. Decrease is not possible.

Explanation T.Technics home made gas springs specials programme:

Scope of delivery:

Gas pull and push springs in standard or stainless steel model.
Force releasable gas springs.
Safety gas springs with automatic interlock.
Oil dampers
Gas springs with built-in electrical contact or reed contact.
Hydraulic- and pneumatic cylinders.
Height adjustable units for workstations.
Gas spring sets with very low force progessiviness.
Tandem gas spring sets.

Some of the above mentioned products are developed in cooperation with our customers. T.Technics is always ready to solve your problems in using, as far as possible, standard parts to save time and money.

T.Technics gas springs are constructed with hard chronium plated steel or hard chronium plated stainless steel 316 or 431 rods.
The cylinders are silver zinc plated or chromated yellow or made from, grain 320 polished, stainless steel 316.

All gas springs are provided with a valve so that afterwards the extendible force can be increased.

T.Technics is able to manufacture gas push- and pull springs with a stroke length of several meters.

In case of using the complete stroke, a specific amount of oil gives a damping at the ingoing as well as the outgoing stroke. This damping kan be increased as well as decreased.

The gassprings canm be used at a temerature of -30 up to +80 degrees Celsius.
Lower or higher temperatures on request.

Gas springs must at all times be free of side-forces and the roth must at all times be free of Damages and dirt. Agressiv cleaning materials are not allowed.

general explanation gas springs

When using the total stroke, a certain quantity of oil takes care for a damping at the inward as well at the outward stroke. This damping can be de/increased on request.

Operating temperature ranges from -30 to 80 degrees Celsius.
Gas springs for higher or lower temperaturs on request.

Gas springs are designed to bear axial loads only. Consequently any side load forces should be avoided. The rods should be protected from particle blastings.
When possible use ball joints and/or rod heads.

When gas springs are equiped with eyelets, special attention should be paid to design of connecting shafts in order to provide appropriated clearence (according to each application).

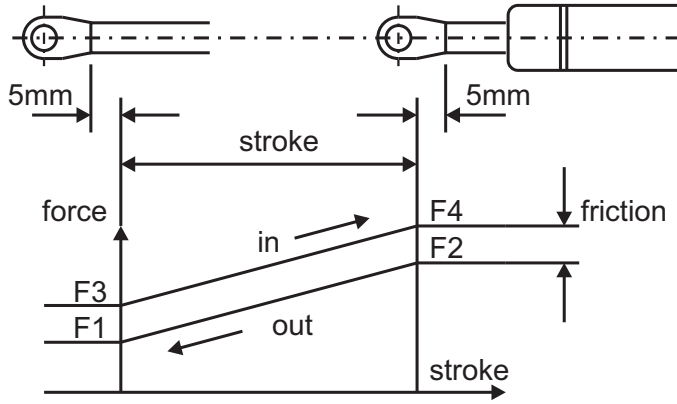
As an indication only, we would advise: 0,3 to 0,5 mm clearance on shaft diameters and 0,5 to 1,0 mm clearance on each side of the eyelet.

Working cycles per minute: maximum quantity of 5 full reciprocating strokes (max. 500mm) per minute at a stroke-speed of maximum 300 mm per second.

Endurance behaviour based on 30.000 working cycles test: 15% maximum performance loss. (actual test result will vary according to stroke length and nominal force value).

The extendible force F1 is measured at +20 graden Celsius.
Per 10 degrees Celsius there is a deviation of +/- 3,4 % pressure in/decrease.

stroke/force diagram



F1 = force at the end of the outward stroke

F2 = force at the start of the outward stroke

F3 = force needed at the start inward stroke

F4 = force at the end of the inward stroke

Gas springs cannot be exchanged or cannot be returned !!!

general information gas springs

A gas spring is not a safety product, that means: that extra security-actions should be taken in cases where a defect of a gas spring creates danger or risk for people or surroundings.

A gas spring may not be used as an end-stop. The gas springs may be used maximally with an extra force of 25% on top of the maximum push- or pull-strength of the specific gas spring.

The sealing of a gas spring is not suitable for applications where the rod can or must make a rotating movement.

Gas springs may only be used in the air- and space-flight-industrie after a written agreement of T-technics BV.

Tolerances on measurement of all gas springs: +/- 2 mm.

Progressiveness (at complete stroke) : AIRAX gas-push-springs:

6/15	=	F1 + 27 %
8/20	=	F1 + 25 %
10/22	=	F1 + 33 %
14/28	=	F1 + 45 %

T.Technics gas-push-springs:

4/12	=	F1 + 19 %	10/40	=	F1 + 8 %
6/15	=	F1 + 27 %	14/40-42	=	F1 + 17 %
8/19	=	F1 + 33 %	20/35	=	F1 + 80 %
10/23	=	F1 + 33 %	20/40-42	=	F1 + 45 %
10/28	=	F1 + 21 %	20/45	=	F1 + 33 %
12/25	=	F1 + 42 %	30/60	=	F1 + 40 %
14/28	=	F1 + 52 %	30/65	=	F1 + 33 %
14/35	=	F1 + 28 %	40/100	=	F1 + 25 %

T.Technics gas-pull-springs:

6/19	=	F1 + 33 %	10/28	=	F1 + 36 %
8/23	=	F1 + 26 %	14/40-42	=	F1 + 42 %

springy blockable gassprings	10/25	=	F1 +50%
Star blockable gassprings	10/25	=	F1 +65%

A wide range of progressiveness is realizable by making a specific combination of rod and cylinder-diameter or changing the cylinder length. Please ask for advise.

Tolerances on the push-force of gas springs:

20 < F1 <	50 +/- 10 Newton	750 < F1 <	1500 +/- 50 Newton
50 < F1 <	250 +/- 20 Newton	1500 < F1 <	2500 +/- 100 Newton
250 < F1 <	750 +/- 30 Newton	2500 < F1 <	meer +/- 250 Newton

Gas springs can not be exchanged or returned !!

general explanation gas springs

In larger quantities the gas springs can be provided with a sticker with your name, logo and/or part number.

A large range of fixing material is available.

Original quality of the rod surface finish is a key condition to provide the required good seal tightness. Make sure to avoid pollution of the rod surface by glue, putty, adhesives, corrosive products, paint, ... etc.
Solvents should not be used to clean the rod in order to avoid damaging the seal.
Protect the rod from blows, shocks, sparks from electric arc or grinding machines.
Never grip the rod with pliers or in a vice without using efficient protective lead, aluminium or copper jaws. Be careful of heating effect on infrared devices (+80 degrees Celsius maximum).

Storage: gas springs may be stored horizontally, with approx. 20 degrees Cesius, ambient temperatures, for three months. For longer storage periods, units should be stored vertically with rod pointing downward. For hot climates and/or high humidity, please contact us.

Warranty: Gas springs are guaranteed for one year from the date/ref. code on the cylinder tube. This code may not be removed. When dates are removed, warranty is lost.
When the cylinder has to be repainted, the original data/ref. code should still appear for the guarantee to remain valid. Without detailed specifications supplied to us at inquiry stage and our specific written agreement, our gas springs will not be guaranteed for special applications involving vibration, magnetic fields, stray currents or intense accidental-loads ... etc.

Refilling of any gas spring takes place at risk and responsibility of the customer. No guarantee will be granted and the original warranty period will not be expanded.

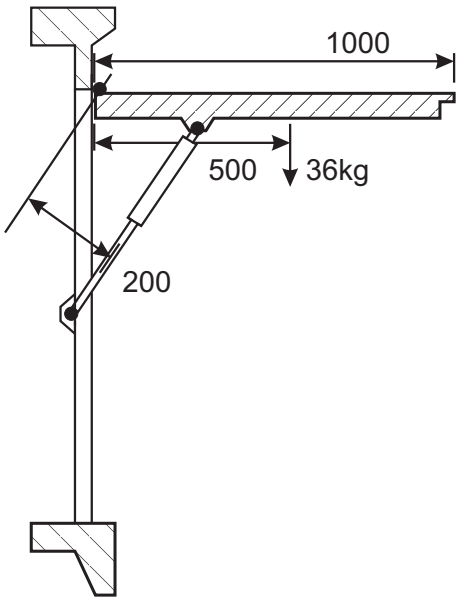
Environmental protection: The self-contained gas (Nitrogen) is a neutral component of the atmosphere, consequently gas release is totally safe. The other gas springs components, except the oil, are mainly steel, aluminium or bronze, so recycling of these components is similar to steel recycling. To avoid pollution, used oil should be collected according to specific industrial waste regulations of each country.

Scrapping: Gas springs inner pressure ranges from 1- to 250 bars. Consequently gas springs should be depressurized before scrapping. For safety reasons please apply the following procedure: Loosely clamp the cylinder in a vice. Slit the cylinder crosswise in an area located between 35 and 40 mm from the cylinder end (fitting side). For this operation wear safety glasses and use a metal cutting hand saw. During cutting, cover the saw blade with a rag. Stop sawing when a hissing sound is heard.

The gas springs is completely degassed when the rod can be moved by hand freely.

Gas springs cannot be exchanged and cannot be returned !!!

calculation of a panel gas spring



how to choose the correct gas spring:

calculation example:

weight of the panel	=	36 KG
height of the panel	=	1000 mm
half of the height	=	500 mm
distance of the hinge	=	200 mm

following formula may be used:

half height of panel : hinge distance x weight of panel + 10 %
500 mm 200 mm 36 kg

500 : 200 x 36 = 90 KP	=	900 Newton
+ 10 % tolerance	=	90 Newton
necessary force F1	=	1000 Newton

this 1000 Newton has to be divided through
the number of gas springs to be used.
for example: 2 gas springs with F1 each = 500 Newton.

by increasing or decreasing the distance of the hinge
different possibilities can be put side by side.

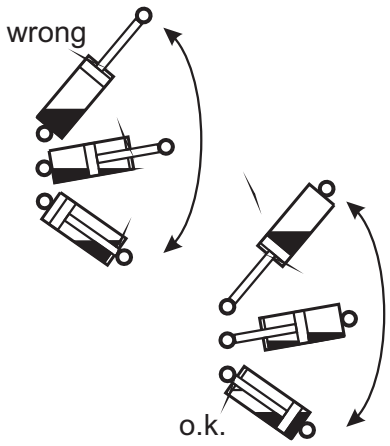
the stroke of the gas spring chosen must be
greater than the chosen distance of the hinge.

gas springs have to be free from lateral forces and
the piston rod must be free of dirt and damage.

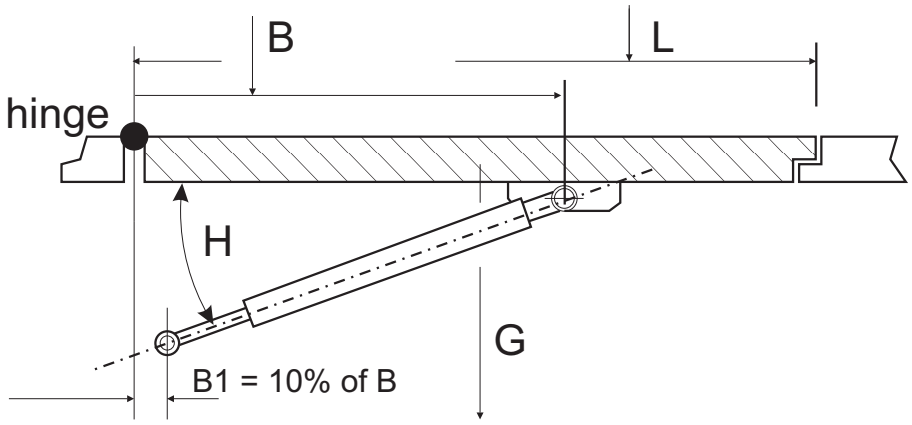
a quantity of oil takes care of end damp for the inward
as well as for the outward stroke. see drawing opposite.

it is preferable to mount the gas springs with the
piston rod downwards and use as far as possible
ball joints and protection tubes.

for your information 1 KP = 9,81 Newton.



calculation of a hatch gas spring



How to choose the correct gas spring:

calculation example:	weight of the hatch	G	=	25 kg	
	length of the hatch	L	=	1000 mm	
	half the length of the hatch	L1	=	500 mm	
	distance hinge-hinge	B	=	600 mm	
	angle of the gas spring with respect to the hatch	H	=	15 degrees	see H-sinus-table
	the progressiveness of the gas spring	P	=	0,66	type 14/28, see P-table

taking into account the progressiveness of the different types of gas springs (see P-table),
and assuming that the hatch must be closed the following formula is applicable:

F1 = (G x L1) / (B x H)) x P x 9,81

F1 = (25 x 500) / (600 x 0,26)) x 0,66 x 9,81 = 518 Newton

this is the compression force to be ordered, which has to be divided through the
number of quantity of gas springs to be applied.

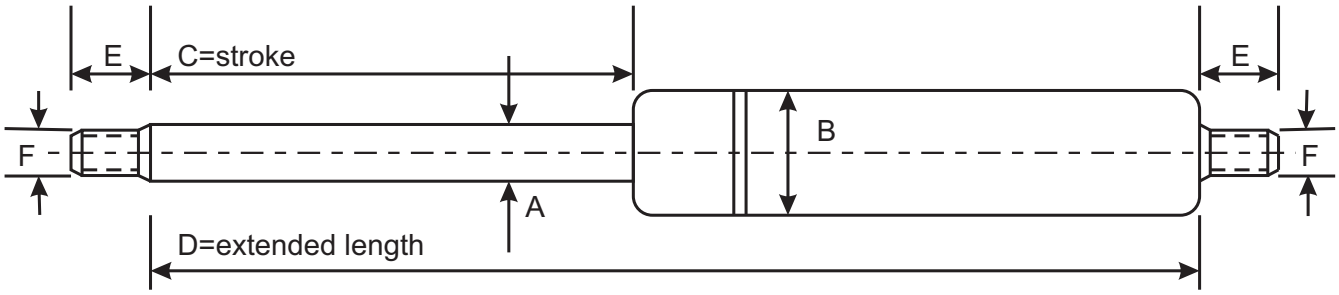
H-Sinus-table

number of degrees	factor	number of degrees	factor
10	0,17	30	0,50
15	0,26	35	0,57
20	0,34	40	0,64
25	0,42	45	0,70

P-table

gas spring type	factor	gas spring type	factor
4/12	0,84	10/22-23	0,75
6/15	0,79	14/28	0,66
8/19	0,75	20/40	0,69
8/20	0,84	20/45	0,75

AIRAX gas push springs type 6/15 - 8/20

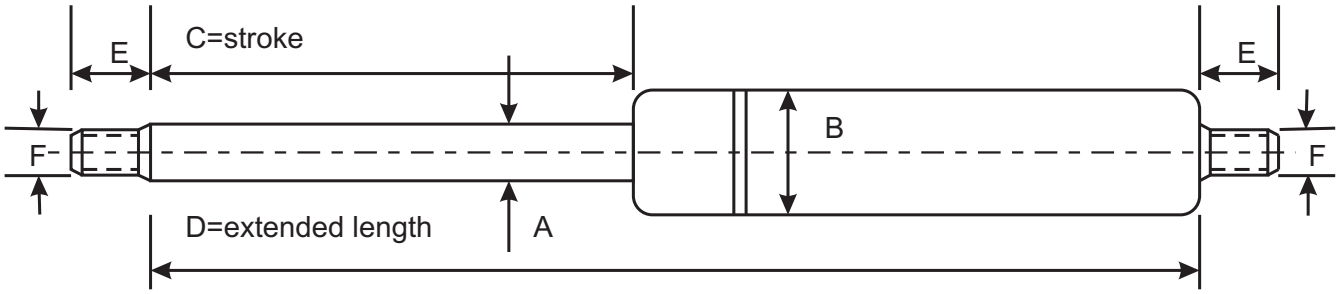


part number	type	A	B	C	D	E	F	deliverable extendible F1 from/to
563.400	6/15	6	15	40	115	10,5	M 6	25-400 Newton
563.401				60	155			25-400 Newton
563.402				80	195			25-400 Newton
563.403				100	235			25-400 Newton
563.404				120	275			25-400 Newton
563.405				150	335			25-350 Newton
588.430	8/20	8	20	60	165	12,5	M 6	100-750 Newton
588.431				80	205			100-750 Newton
588.432				100	245			100-750 Newton
588.433				120	285			100-750 Newton
588.434				140	325			100-750 Newton
588.435				160	365			100-750 Newton
588.436				180	405			100-750 Newton
588.437				200	445			100-700 Newton
588.438				220	485			100-650 Newton
588.439				250	545			100-600 Newton
588.384				300	655			100-550 Newton

F1 = the extendible force measured at 5 mm inward piston rod.

For fastening accessories see the applicable pages.

AIRAX gas push springs type 10/22 -14/28

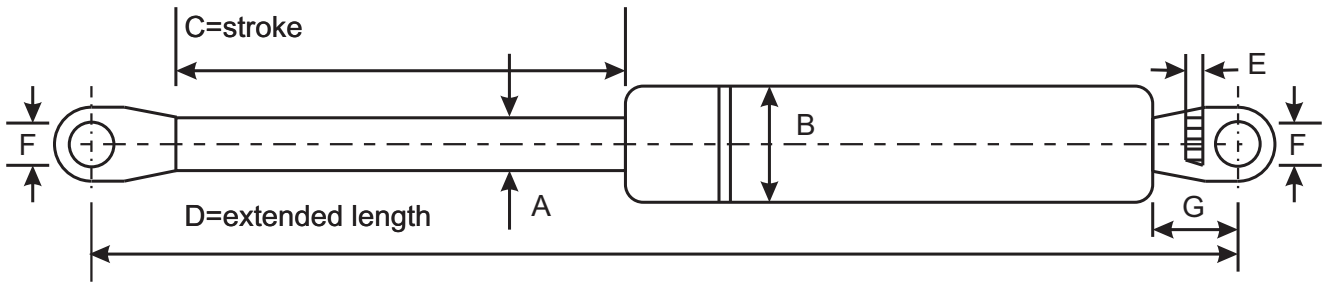


part number	type	A	B	C	D	E	F	deliverable extendible F1 from/to
512.420				100	255			150-1150 Newton
512.421				150	355			150-1150 Newton
512.422				200	455			150-1100 Newton
512.423	10/22	10	22	250	555	12,5	M 8	150-1075 Newton
512.424				300	655			150-1050 Newton
512.425				350	755			150-1000 Newton
512.426				400	855			150-0900 Newton
512.427				500	1055			150-0800 Newton
540.407				100	255			250-2100 Newton
540.427				150	355			250-2100 Newton
540.400				200	455			250-2100 Newton
540.402				250	555			250-2100 Newton
540.401	14/28	14	28	300	655	12,5	M 8	250-2100 Newton
540.412				325	705			250-2100 Newton
540.403				350	755			250-2100 Newton
540.404				400	855			250-1900 Newton
540.413				450	955			250-1900 Newton
540.405				500	1055			250-1900 Newton

F1 = the extendible force measured at 5 mm inward piston rod.

For fastening accessories see the aplicable pages.

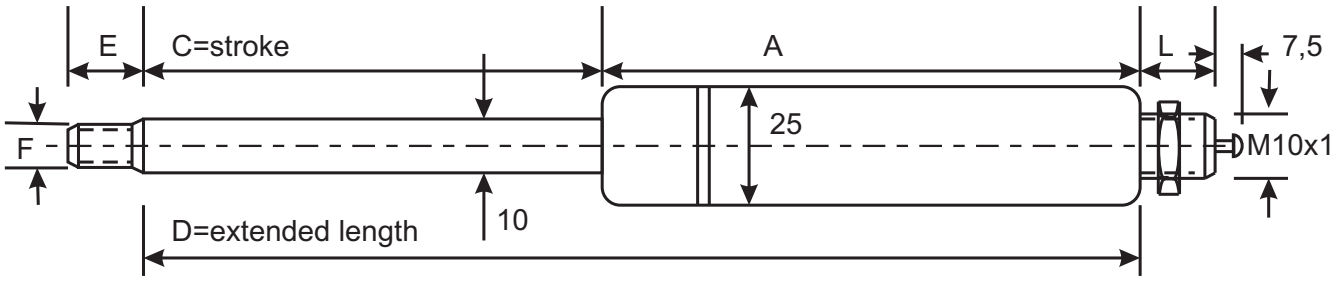
AIRAX gas push springs type 6/15 - 8/20 - 10/22



part number	type	A	B	C	D	E	F	G	deliverable extendible F1 from/to
563.500	6/15	6	15	20	94	3	6,5	13	25-400 Newton
563.501				40	145				25-400 Newton
563.502				60	185				25-400 Newton
563.503				80	225				25-400 Newton
563.504				100	265				25-400 Newton
563.505				120	305				25-400 Newton
563.506				150	365				25-350 Newton
588.530	8/20	8	20	60	205	5	8,5	14	100-750 Newton
588.531				80	245				100-750 Newton
588.532				100	285				100-750 Newton
588.533				120	325				100-750 Newton
588.534				140	365				100-750 Newton
588.535				160	405				100-750 Newton
588.536				180	445				100-750 Newton
588.537				200	485				100-700 Newton
588.538				220	525				100-650 Newton
588.539				250	585				100-600 Newton
588.559				300	685				100-550 Newton
512.520	10/22	10	22	100	285	5	8,5	14	150-1150 Newton
512.521				150	385				150-1150 Newton
512.522				200	485				150-1100 Newton
512.523				250	585				150-1075 Newton
512.524				300	685				150-1050 Newton
512.525				350	785				150-1000 Newton
512.526				400	885				150-0900 Newton

F1 = the extendible force measured at 5 mm inward piston rod.

AIRAX springy blockable gas push springs type10/25

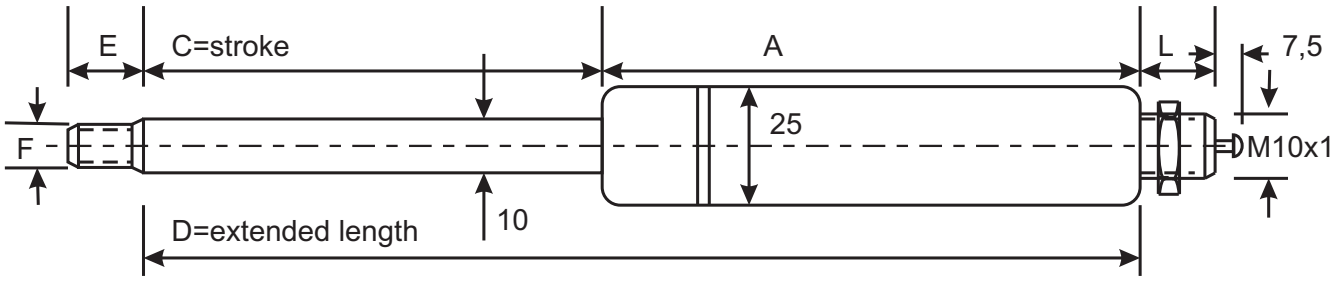


part number	C	D	A	F	L	deliverable extendible F1 from/to
500.520	25	110	85	M 8	20	100-800 Newton
500.514	39	140	101	M 8	16	100-800 Newton
500.511	44	157	113	M 8	20	100-800 Newton
500.510	56	178	113	M 6	13	100-800 Newton
500.517	65	215	150	M 6	16	100-800 Newton
500.504	100	256	156	M 8	16	100-800 Newton
500.518	130	400	270	M 8	20	100-800 Newton
500.509	200	514	314	M 8	20	100-800 Newton

Special control knobs and cables with handles are available from stock.
See pages “operating parts for blockable gas springs”.

F1 = the extendible force measured at 5 mm inward piston rod.

AIRAX semi-star blockable gas springs10/25



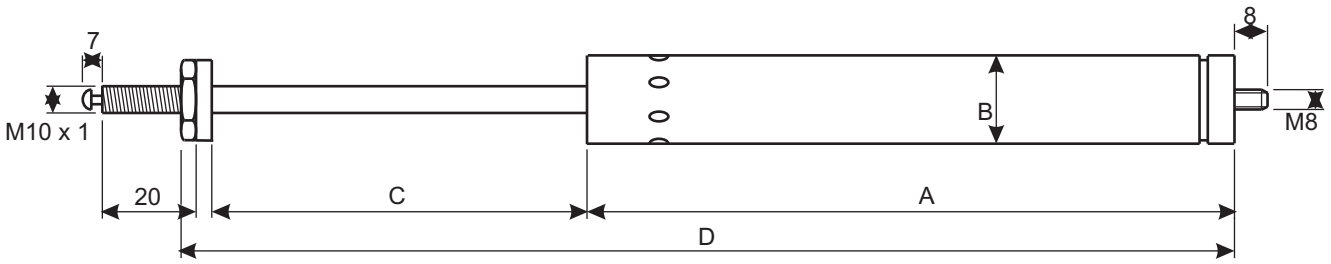
part number	C	D	A	F	L	deliverable extendible F1 from/to
500.507	47	197	150	M 8	20	100-800 Newton
500.512	65	215	150	M 6	16	100-800 Newton
500.515	65	239	174	M 6	16	100-800 Newton
500.522	100	256	156	M 8	16	100-800 Newton
500.531	150	420	270	M 8	20	100-800 Newton
500.555	200	543	343	M 8	20	100-800 Newton
500.553	300	723	423	M 8	20	100-800 Newton
500.558	350	764	414	M 8	20	100-800 Newton

These semi-star blockable gas springs are particulary suitable for chairs and benches.

Special control knobs and cables with handles are available from stock.
See pages “operating parts for blockable gas springs”.

F1 = the extendible force measured at 5 mm inward piston rod.

SUSPA star blockable gas springs



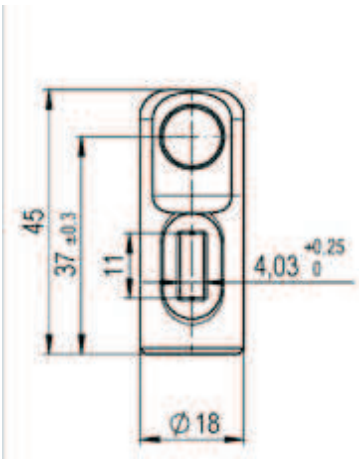
Part number	C Stroke	A	B	D	Force-Progressiveness	Push-force
490.010	100	227	28	359	1,40 x F1	80-1000N
490.020	200	386	28	618	1,46 x F1	80-1000N
490.030	300	550	28	882	1,58 x F1	80-1000N

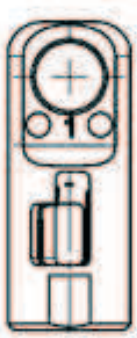
-Other sizes on request (at a minimum purchase of 10 pieces).

-Maximum block-force by pushing is 10.000N.
-Maximum block-force by pulling is 4,8xF1 (max. 7.000N).
-Speed at run-out is 0,09m/seconde.
-unlock-stroke is max. 3,5 mm.
-Rod by preference pointing down.
-Maximum load at blocked state in the push-direction is 10.000N.
-Maximum load at blocked state in the push-direction is 7.000N.
-For actuation parts see pages E18, E19, E20 and E21.
-Piston rod is hard chronium plated.
-Cylinder is coated black (RAL 9005).
-Corrosion resistant for 120 uur according to DIN EN ISO 6270-2.
-Keep gas spring and piston rod free of damages and dirt.
-Keep gas spring free of side-forces.
-Before destructing the gas spring, it should be undone of the pressure.

Actuation parts SUSPA star blockable gas springs

Actuation-head
Part number: 491.020

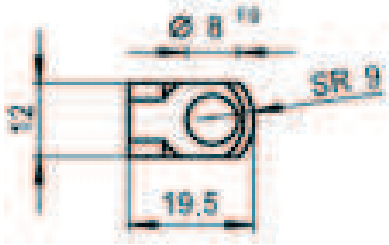




Actuation-head, blockkable
Part number: 491.030

Actuation-handle
Part number: 491.200

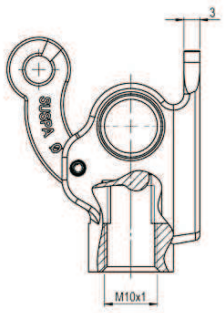
Total length 130mm
Other measurement on request.



Eye for gas spring 490.010-20/30
Inside threath M8
Part number: 490.500

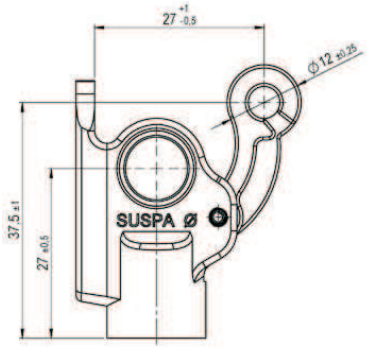
For other actuation parts like forks and / or Ball joints, see specific pages in this documentation.

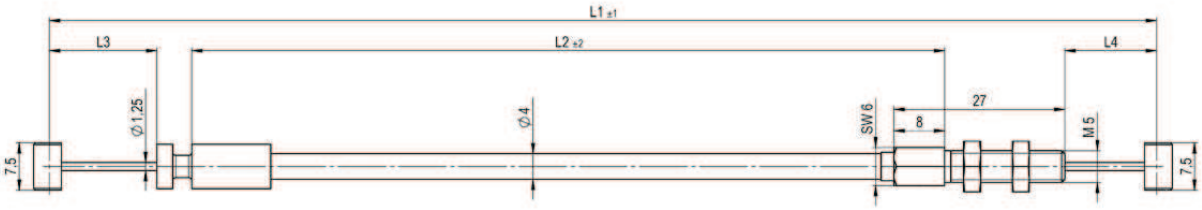
Actuation parts SUSPA star blockable gas springs



Actuation-head, square

Part number: 491.010



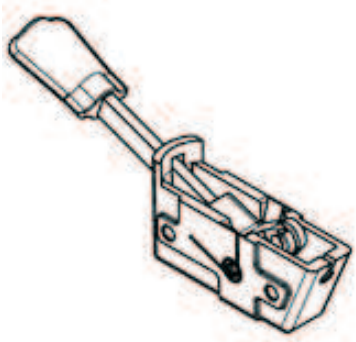


Bowdenkable

Part number: 491.340

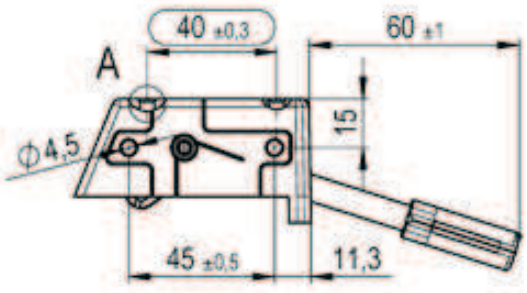
L1=1009 L2=951 L3=17 L4=16,5

Other measurements on request.

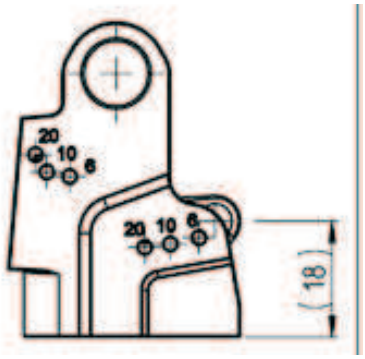


Actuation-handle

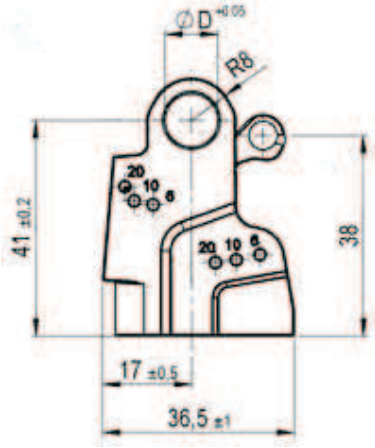
Part number: 491.700

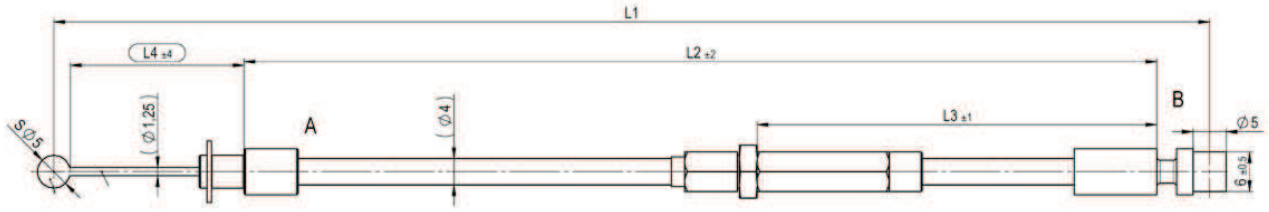


Actuation parts SUSPA star blockable gas springs



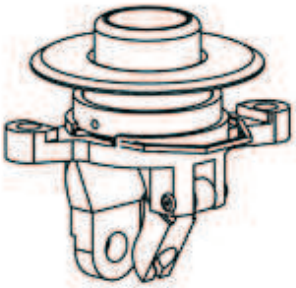
Actuation-head
Part number: 491.040



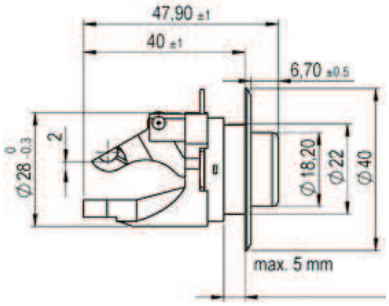


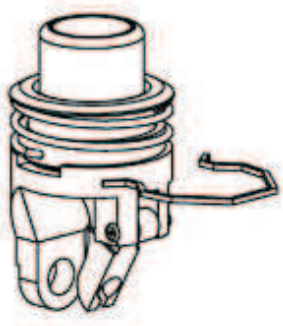
Bowdenkable
Part number: 491.400

L1=257 L2=200 L3=50 L4=46,5
Other measurements on request.



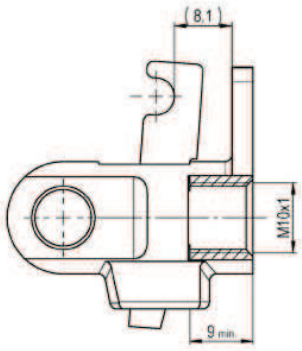
Push button, screwable
Part number: 491.600



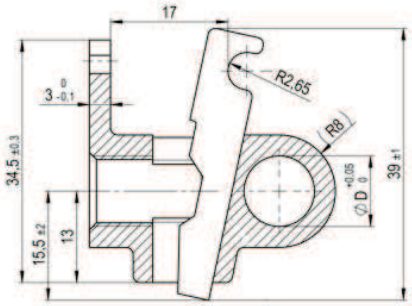


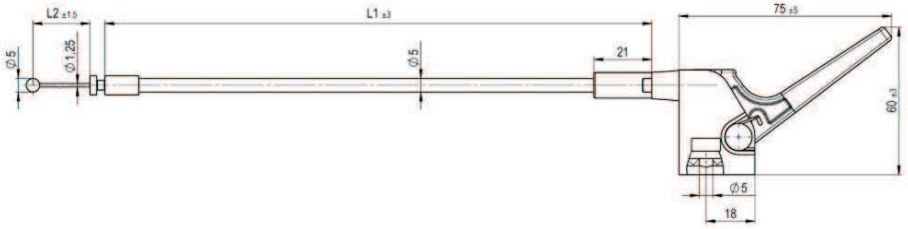
Push button, clampable
Part number: 491.610

Actuation parts SUSPA star blockable gas springs



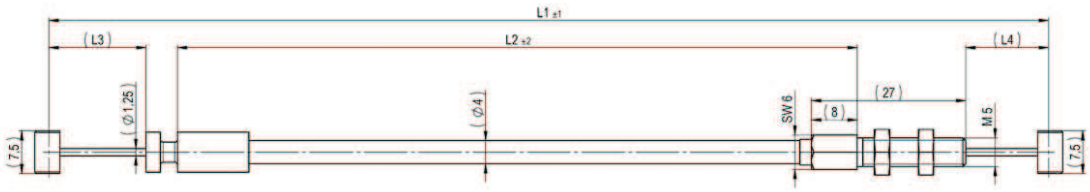
Actuation-head
Part number: 491.000





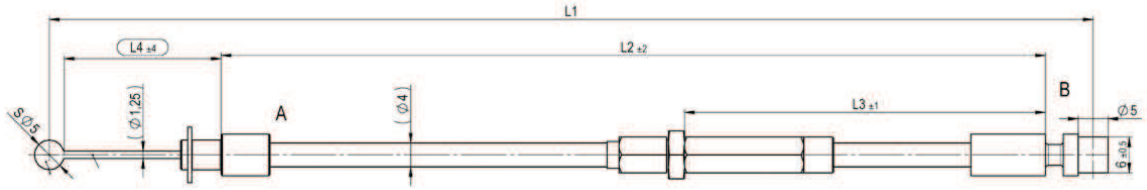
Bowdenkable
Part number: 491.300

L1=600 L2=21
Other measurements on request.



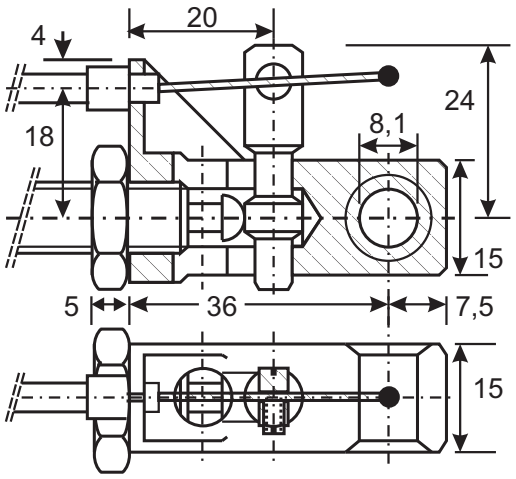
Bowdenkable
Part number: 491.340

L1=1009 L2=951 L3=17 L4=16,5
Other measurements on request.



Bowdenkable
Part number: 491.400

L1=257 L2=200 L3=50 L4=46,5
Other measurements on request.



operating knob

:for gas spring type 10/25
:material: samac
:inner thread M 10x1
:bore eye 8,1 mm
:width 15 mm
:effective length 36+5 mm

part number :72.480
:72.482 with bore Ø 8.1 vertically

:
:
:
:

:

:

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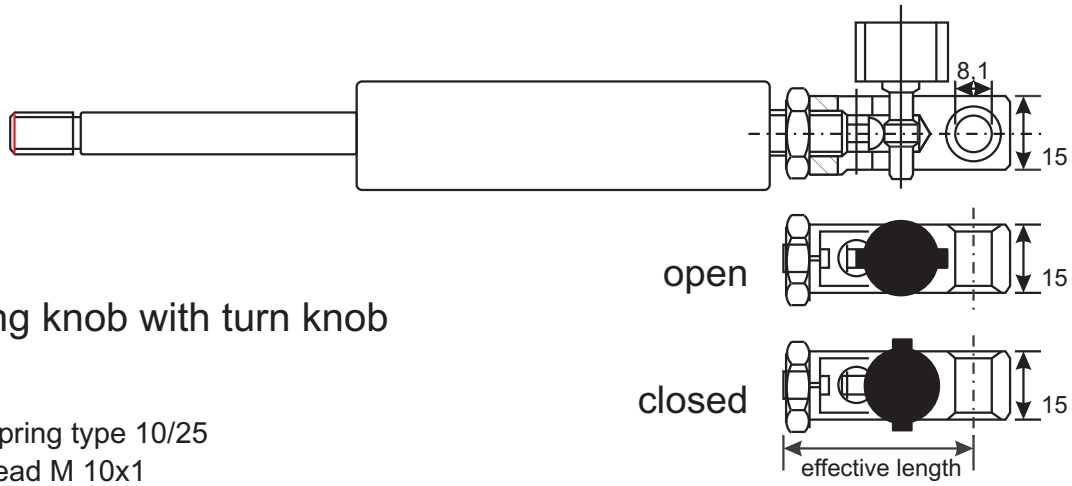
:
:
:

:

:



operating knob with turn knob

: for gas spring type 10/25
: inner thread M 10x1
: material knob: samac
: material turn knob: bakelite
: bore eye 8,1 mm
: width eye 15 mm

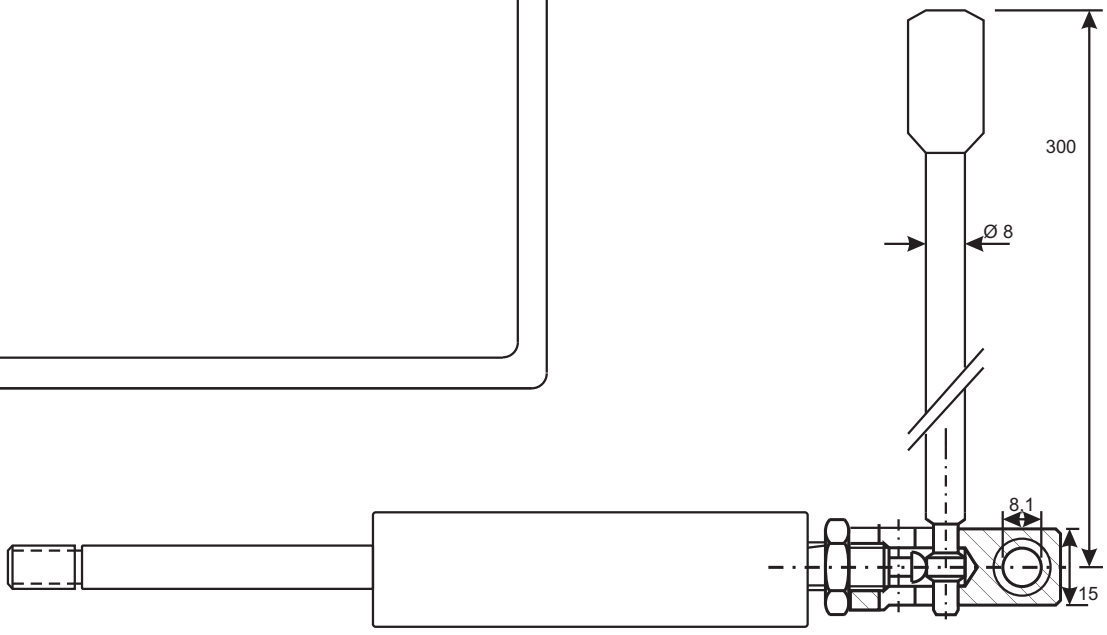
: effective length circa 36+5 mm
(depends on adjustment)

: part number 72.500

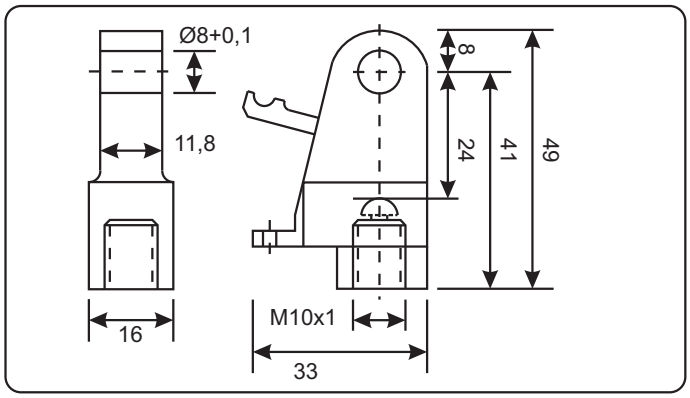
operating knob with handle

: like above, but with handle
: material handle: chromated aluminium
: material knob: plastic

: part number 72.510



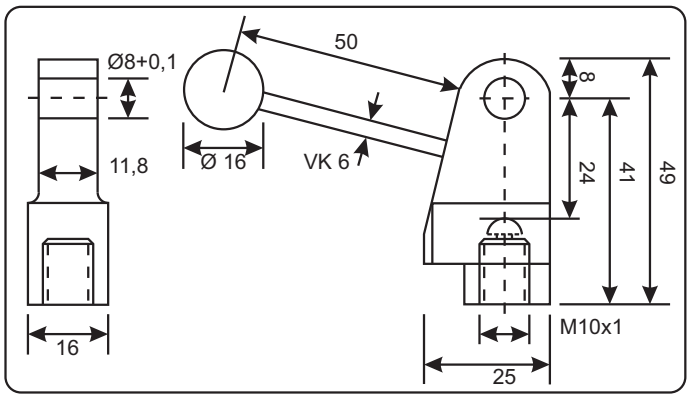
operating parts blockable gas springs



operating knob

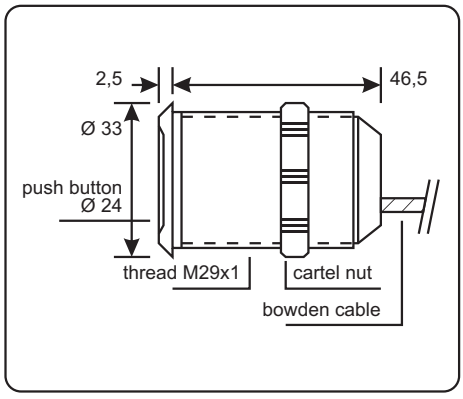
: ultra light release
material : zinc pressure die-casting/steel

part number	: 72.550	72.555
cable stroke	: ca. 15 mm	ca. 23 mm
valve lifter gas spring	: max.1mm	max.2,5mm
release power	: 1% van F1	2% van F1
gear ratio	: 1:21	1:10



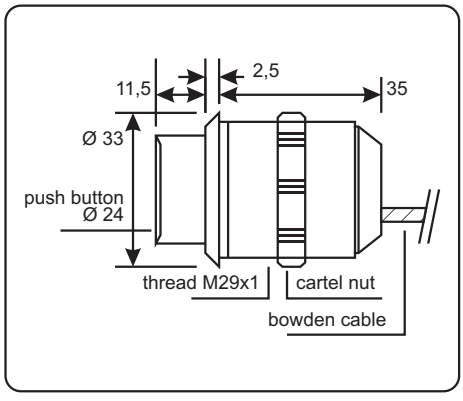
operating knob

: ultra light release
material : zinc pressure die-casting/steel
actuating distance : ca. 48 mm
valve lifter gas spring : max. 2,5 mm
release power : 1% van F1
gear ratio : 1:20
part number : 72.560



built-in push button

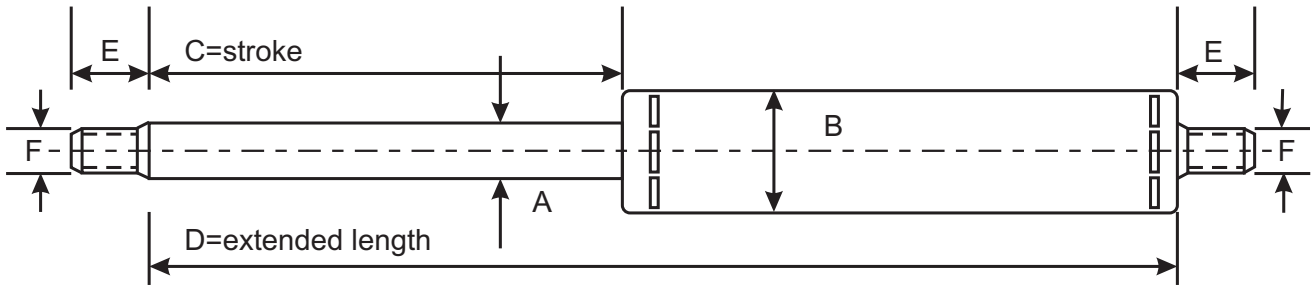
type	: plain button
material	: aluminium/plastic
gear ratio	: 1:1
controlled gas springs	: 1
way of actuate	: 11 mm
length of bowden wire	: 500, 750, 1000 en 1500 mm
other types on request	



built-in push button

type	: top button
material	: aluminium/plastic
gear ratio	: 1:1
controlled gas springs	: 1
way of actuate	: 11 mm
length of bowden wire	: 500, 750, 1000 en 1500 mm
other types on request	

gas push springs 12/25



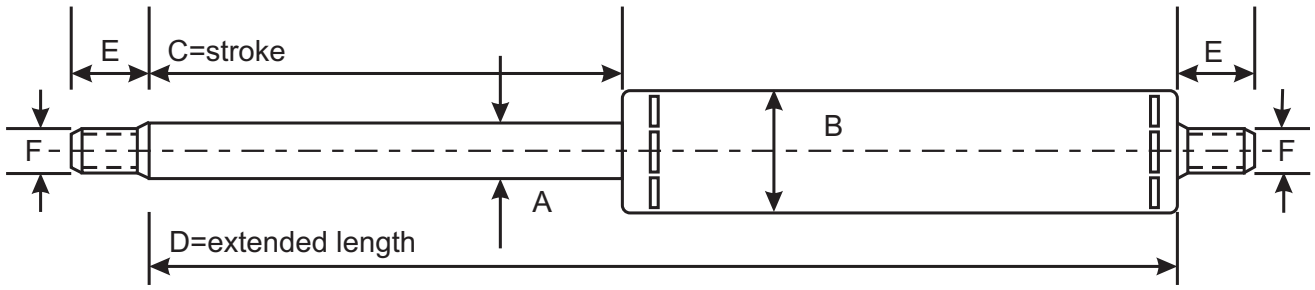
part number	type	A	B	C	D	E	F	deliverable extendible F1 from/to
590.070				100	255			250-2000 Newton
590.072				150	355			250-2000 Newton
590.074				200	455			250-2000 Newton
590.076	12/25	12	25	250	555	11	M 8	250-1900 Newton
590.078				300	655			250-1800 Newton
590.079				325	705			250-1800 Newton
590.080				350	755			250-1700 Newton
590.082				400	855			250-1600 Newton
590.084				500	1055			250-1500 Newton

The piston rod is hard chronium plated and the cylindertube is zink plated.

These gas springs are provided with a valve so that afterwards the extendible force can be changed, as well as increased or decreased.
F1 = the extendible force measured at 5 mm inward piston rod.

For fastening accessoiries see the applicable pages.

gas push springs 14/30



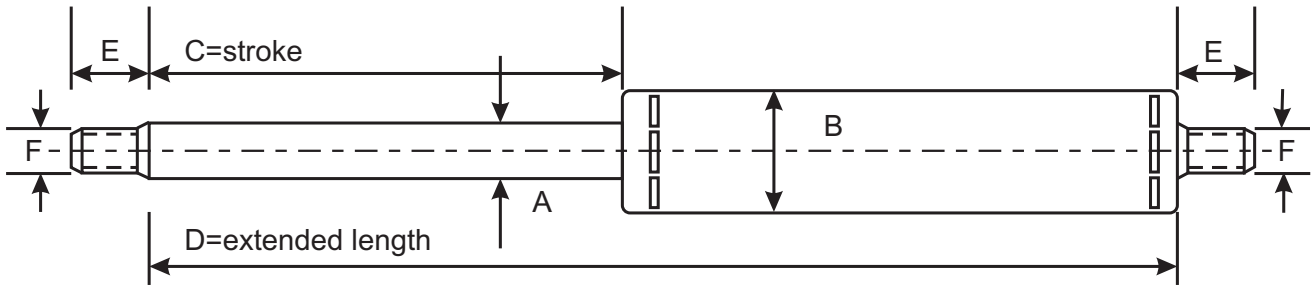
Part-Number	type	A	B	C	D	E	F	Deliverable Extendible F1 from/to
590.090	14/30	14	30	50	155	15	M 10	100-3300 Newton
590.091				100	255			100-3200 Newton
590.092				150	355			100-3100 Newton
590.093				200	455			100-3000 Newton

The piston rod is hard chronium and the cylindertube is zink plated.

These gas springs are provided with a valve so that afterwards the extendible force can be changed, as well as increased or decreased.
F1 = the extendible force measured at 5 mm inward piston rod.

For fastening accessories see the applicable pages.

gas push springs 20/40



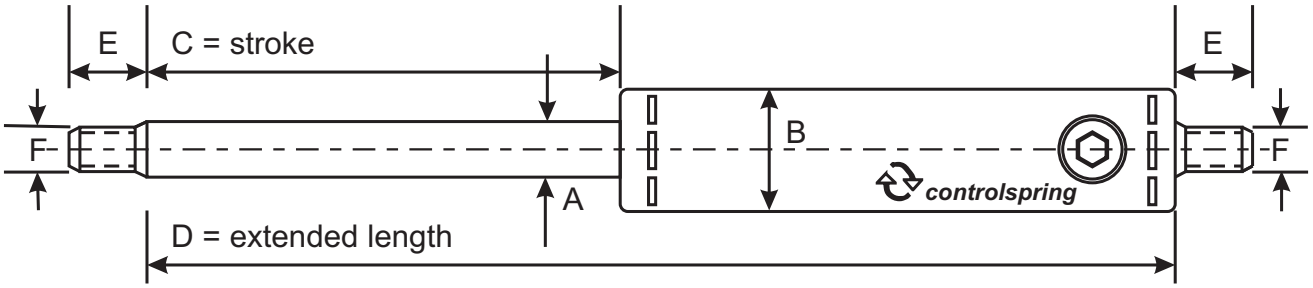
part number	type	A	B	C	D	E	F	deliverable extendible F1 from/to
590.100				100	335			500-5000 Newton
590.110				150	435			500-5000 Newton
590.120				200	535			500-5000 Newton
590.130				250	635			500-5000 Newton
590.140				300	735			500-5000 Newton
590.150	20/40	20	40	350	835	15	M 14	500-5000 Newton
590.160				400	935			500-5000 Newton
590.170				500	1135			500-5000 Newton
590.180				600	1335			500-5000 Newton
590.190				700	1535			500-5000 Newton
590.200				800	1735			500-5000 Newton
590.210				900	1935			500-5000 Newton
590.220				1000	2135			500-5000 Newton

The piston rod is hard chronium plated and the cylindertube is zink plated.

These gas springs are provided with a valve so that afterwards the extendible force can be changed, as well as increased or decreased.
F1 = the extendible force measured at 5 mm inward piston rod.

For fastening accessories see the applicable pages.

controlspring type 14/28



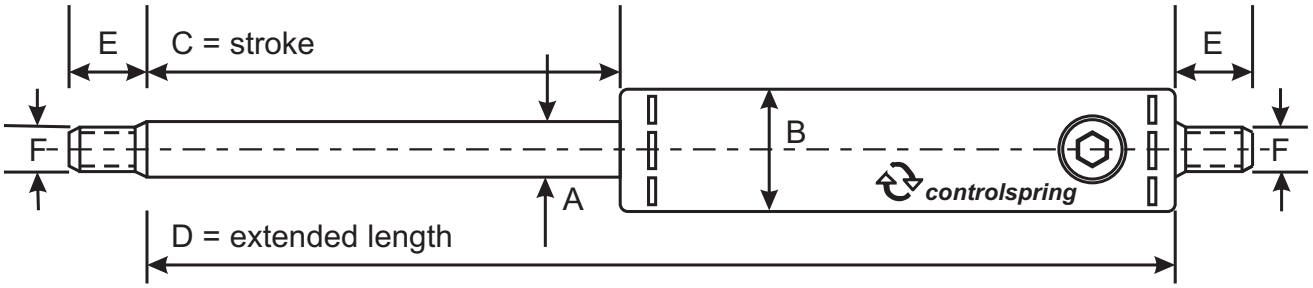
part number	type	A	B	C	D	E	F	filled up to extendible force F1
593.300				100	305			2500 Newton
593.305				150	405			2500 Newton
593.310				200	505			2500 Newton
593.315				250	605			2500 Newton
593.320				300	705			2500 Newton
593.325	14/28	14	28	350	805	12,5	M 8	2500 Newton
593.330				400	905			2500 Newton
593.335				500	1105			2500 Newton

This type of gas spring is a more advanced type of our force releasable gas spring.
When turning the valve slowly by means of an allen key clockwise, a small quantity of air will escape. These gas springs only drop a small measured amount of pressure and can never loose all pressure at once. When using more than one gas spring and the same number of turns all gas springs will retain the same force. These gas springs can of course be topped up, if more pressure is needed.

Other lengths, maximum forces and screwthreads are possible.
The piston rod is hard chronium plated and the cylindertube is zink plated.

F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

controlspring type 20/40



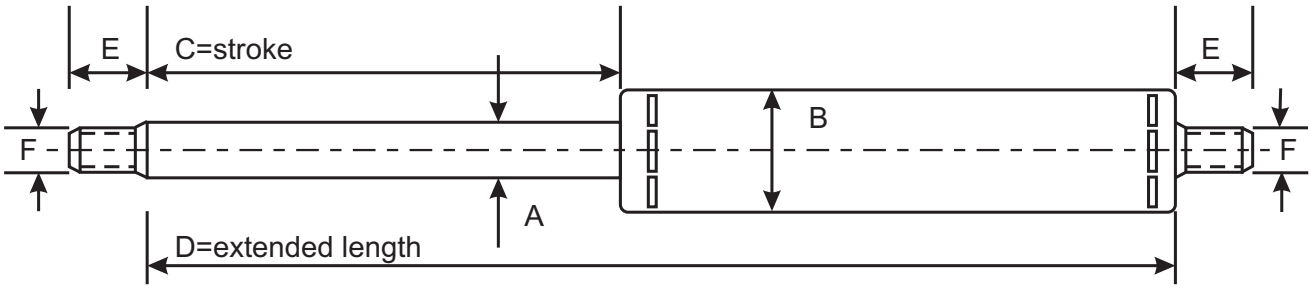
number	type	A	B	C	D	E	F	filled up to extendible force F1
593.400				100	350			5000 Newton
593.405				150	450			5000 Newton
593.410				200	550			5000 Newton
593.415				250	650			5000 Newton
593.420				300	750			5000 Newton
593.425	20/40	20	40	350	850	15	M 14	5000 Newton
593.430				400	950			5000 Newton
593.435				500	1150			5000 Newton
593.440				600	1350			5000 Newton
593.445				700	1550			5000 Newton
593.450				800	1750			5000 Newton
593.455				900	1950			5000 Newton
593.460				1000	2150			5000 Newton

This type of gas spring is a more advanced type of our force releasable gas spring.
When turning the valve slowly by means of an allen key clockwise, a small quantity of air will escape. These gas springs only drop a small measured amount of pressure and can never loose all pressure at once. When using more than one gas spring and the same number of turns all gas springs will retain the same force. These gas springs can of course be topped up, if more pressure is needed.

Other lengths, maximum forces and screwthreads are possible.
The pistonrod is hard chronium plated and the cylindertube is zink plated.

F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

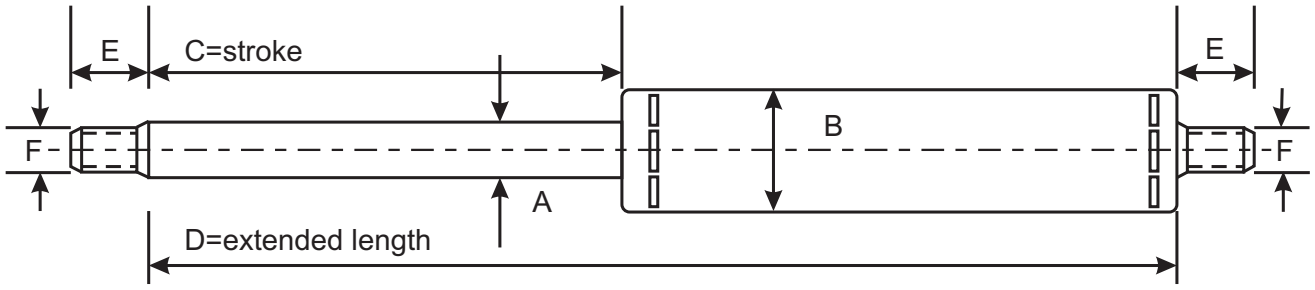
custom made gas push springs



part number	type	piston-rod A 1*	cylinder-tube B 1*	standard price till stroke C= 2*	F x E 3*	D = minimum 2xC + ... mm 4*	5*
999.000	4/12	4	12	100	M4x6	+ 40 mm	25-150 Newton
999.001	6/15	6	15	150	M6x11	+ 50 mm	25-400 Newton
999.002	8/19	8	19	250	M8x11	+ 55 mm	100-750 Newton
999.003	10/23	10	23	500	M8x11	+ 55 mm	250-1000 Newton
999.004	10/28	10	28	500	M8x11	+ 55 mm	250-1000 Newton
999.008	12/25	12	25	500	M8x11	+ 55 mm	250-2000 Newton
999.005	14/28	14	28	500	M8x11	+ 55 mm	250-2500 Newton
999.013	14/40	14	40	500	M8/M14	+ 135 mm	250-2500 Newton
999.010	20/35	20	35	500	M14x15	+ 135 mm	250-5000 Newton
999.006	20/40	20	40	500	M14x15	+ 135 mm	250-5000 Newton
999.007	20/45	20	45	500	M14x15	+ 135 mm	250-5000 Newton
999.009	30/65	30	65	500	M14x20	+ 135 mm	500-10000 Newton
999.012	40/100	40	100	500	M16x20	+ 135 mm	500-17500 Newton

The piston rod is hard chronium plated and the cylindertube is zink plated.
1* Other combinations due to other force progressiviness are possible.
2* For additional costs due to greater stroke-lengths see our pricelists.
3* Other screwthreads are possible.
4* Other ratio, for instance, shorter stroke C and longer cylinder B are possible.
5* The stroke chosen (C) depends on the max. extendible force.
For fastening accessories see the applicable pages.

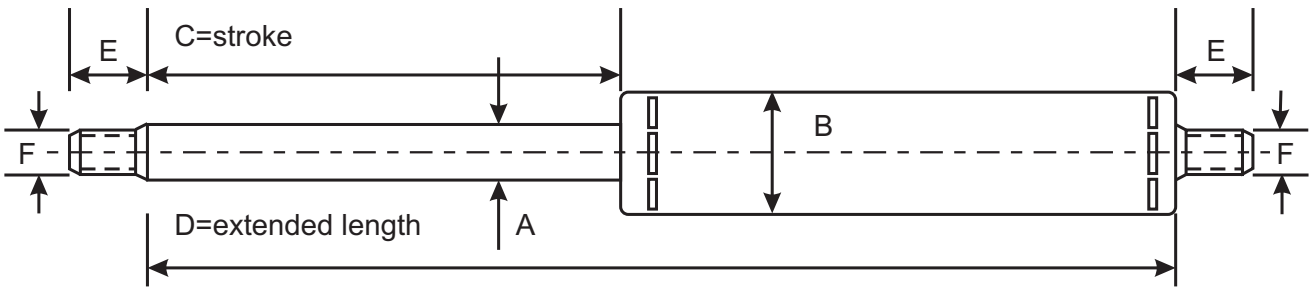
gas push springs type 4/12 stainless steel



part number	type	A	B	C	D	E	F	deliverable extendible F1 from/to
591.010				10	60			25-150 Newton
591.015				20	80			25-150 Newton
591.020				30	100			25-150 Newton
591.025				40	120			25-150 Newton
591.030				50	140			25-150 Newton
591.035	4/12	4	12	60	160	6	M 4	25-125 Newton
591.040				70	180			25-125 Newton
591.045				80	200			25-100 Newton
591.050				90	220			25-100 Newton
591.055				100	240			25-100 Newton

The piston rod is made from stainless steel AISI 316 or AISI 431 hard chronium plated and the cylinder is made from stainless steel 316, grinded.
The bottom piece and the guiding are made from seaworthy bronze.
These gas springs are provided with a valve so the extendible force can be changed (increased).
Decrease is not possible !!
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages “fastenings parts stainless steel”.

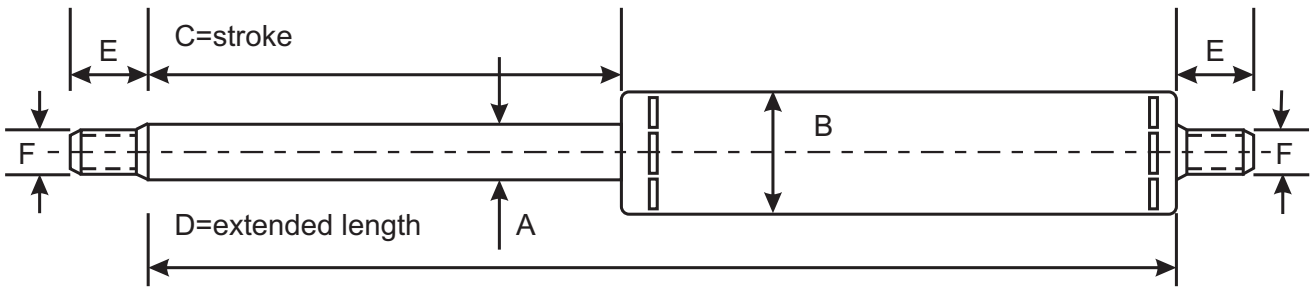
gas push springs type 10/23 - 14/28 stainless steel



part number	type	A	B	C	D	E	F	deliverable extendible F1 from/to
592.100	10/23	10	23	100	265	12,5	M 8	150-1150 Newton
592.110				150	365			150-1000 Newton
592.120				200	465			150-0900 Newton
592.130				250	565			150-0800 Newton
592.140				300	665			150-0700 Newton
592.150				350	765			150-0600 Newton
592.160				400	865			150-0550 Newton
592.170				500	1065			150-0500 Newton
592.500	14/28	14	28	100	265	12,5	M 8	250-2500 Newton
592.510				150	365			250-2250 Newton
592.520				200	465			250-2000 Newton
592.530				250	565			250-1900 Newton
592.540				300	665			250-1800 Newton
592.550				350	765			250-1700 Newton
592.560				400	865			250-1600 Newton
592.570				500	1065			250-1500 Newton

The piston rod is made from stainless steel AISI 316 or AISI 431 hard chronium plated and the cylinder is made from stainless steel 316, grinded.
The bottom piece and the guiding (with dirt skimmer) are made from seaworthy bronze.
These gas springs are provided with a valve so the extendible force can be in/decreased afterwards.
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages “fastenings parts stainless steel”.

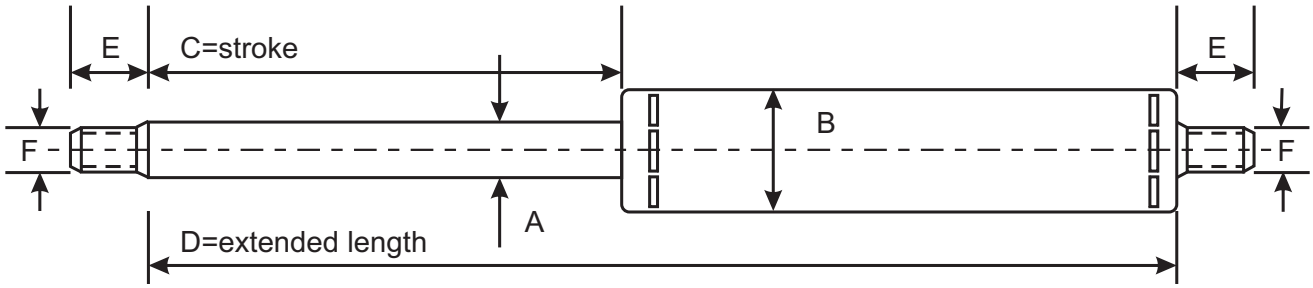
gas push springs type 6/15 - 8/20 stainless steel



part number	type	A	B	C	D	E	F	deliverable extendible F1 from/to
591.100	6/15	6	15	25	106	10	M 6	25-400 Newton
591.110				50	156			25-400 Newton
591.120				75	206			25-375 Newton
591.130				100	256			25-350 Newton
591.140				125	306			25-325 Newton
591.150				150	356			25-300 Newton
591.500	8/20	8	20	25	115	12,5	M 8	100-750 Newton
591.510				50	165			100-750 Newton
591.520				75	215			100-700 Newton
591.530				100	265			100-650 Newton
591.540				150	365			100-600 Newton
591.550				200	465			100-550 Newton
591.560				250	565			100-500 Newton

The piston rod is made from stainless steel AISI 316 or AISI 431 hard chronium plated and the cylinder is made from stainless steel 316, grinded.
The bottom piece and the guiding are made from seaworthy bronze.
These gas springs are provided with a valve so the extendible force can be in/decreased afterwards.
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages “fastenings parts stainless steel”.

gas push springs type 14/30 stainles steel

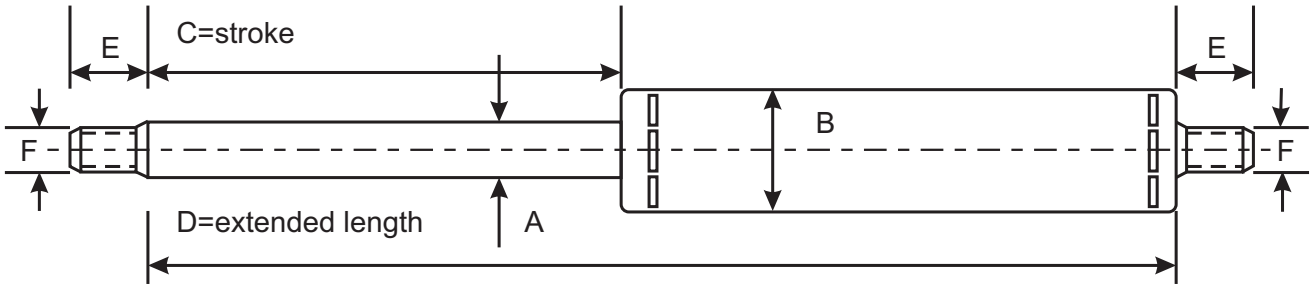


Part Number	type	A	B	C	D	E	F	Deliverable Extentible F1 from/to
592.580				50	165			100-3000 Newton
592.581				100	265			100-2500 Newton
592.582	14/30	14	30	150	365	15	M 10	100-2250 Newton
592.583				200	465			100-2000 Newton

The piston rod is made from stainless steel AISI 316 or AISI 431 hard chronium plated and the cylinder Is made from stainless steel 316, grinded.
The bottom piece and the guiding (with dirt skimmer) are made from seaworthy bronze.
These gas springs are provided with a valve so the extendible force can be in-/ decreased afterwards.

F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages “fastenings parts stainless steel”.

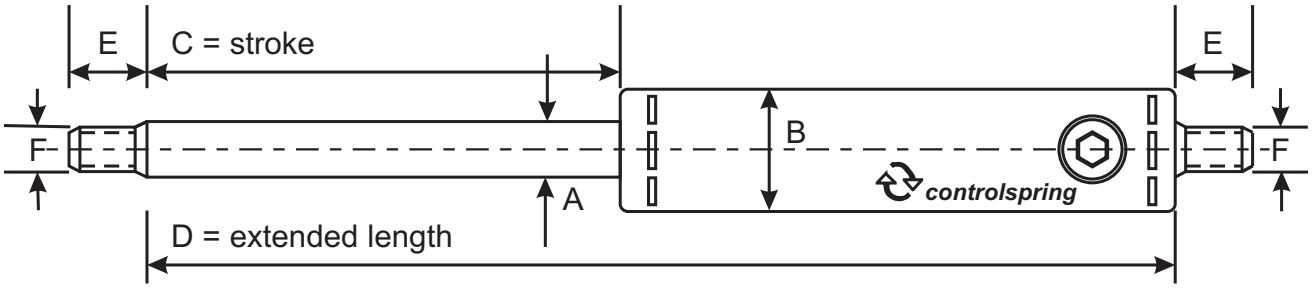
gas push springs type 20/42 stainless steel



part number	type	A	B	C	D	E	F	deliverable extendible F1 from/to
593.100				100	335			500-5000 Newton
593.110				150	435			500-5000 Newton
593.120				200	535			500-5000 Newton
593.130				250	635			500-5000 Newton
593.140				300	735			500-5000 Newton
593.150				350	835			500-5000 Newton
593.160	20/42	20	42	400	935	15	M 14	500-4000 Newton
593.170				500	1135			500-3500 Newton
593.180				600	1335			500-3000 Newton
593.190				700	1535			500-2800 Newton
593.200				800	1735			500-2700 Newton
593.210				900	1935			500-2600 Newton
593.220				1000	2135			500-2500 Newton

The piston rod is made from stainless steel AISI 316 or AISI 431 hard chronium plated and the cylinder is made from stainless steel 316, grinded.
The bottom piece and the guiding (with dirt skimmer) are made from seaworthy bronze.
These gas springs are provided with a valve so the extendible force can be in/decreased afterwards.
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages “fastenings parts stainless steel”.

controlspring type 14/28 stainless steel

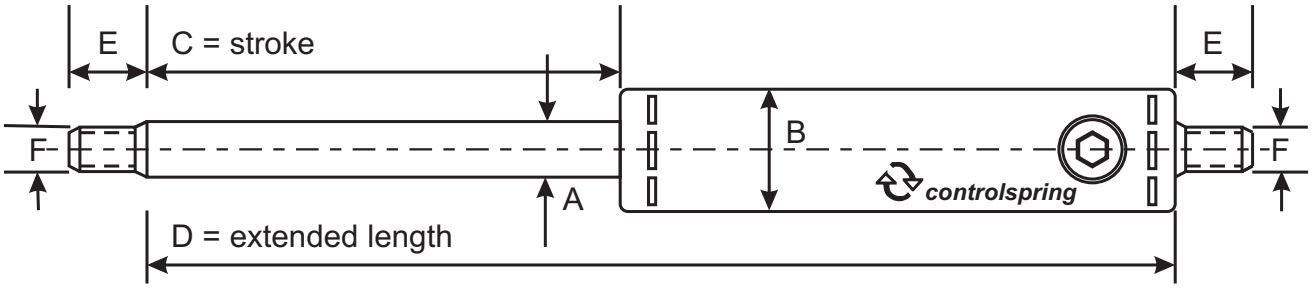


part number	type	A	B	C	D	E	F	filled up to extendible force F1
593.500				100	305			2500 Newton
593.505				150	405			2250 Newton
593.510				200	505			2000 Newton
593.515				250	605			1900 Newton
593.520				300	705			1800 Newton
593.525	14/28	14	28	350	805	12,5	M 8	1700 Newton
593.530				400	905			1600 Newton
593.535				500	1105			1500 Newton

This type of gas spring is a more advanced type of our force releasable gas spring.
When turning the valve slowly by means of an allen key clockwise, a small quantity of air will escape. These gas springs only drop a small measured amount of pressure and can never loose all pressure at once. When using more than one gas spring and the same number of turns all gas springs will retain the same force. These gas springs can of course be topped up, if more pressure is needed.

Other lengths, maximum forces and screwthreads are possible.
The pistonrod is made from stainless steel AISI 316 or AISI 431 - hard chronium plated and the cylinder is made from stainless steel 316, grinded.
The bottom piece and the guiding (with dirt skimmer) are made from seaworthy bronze.
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages “fastenings parts stainless steel”.

controlspring type 20/42 stainless steel

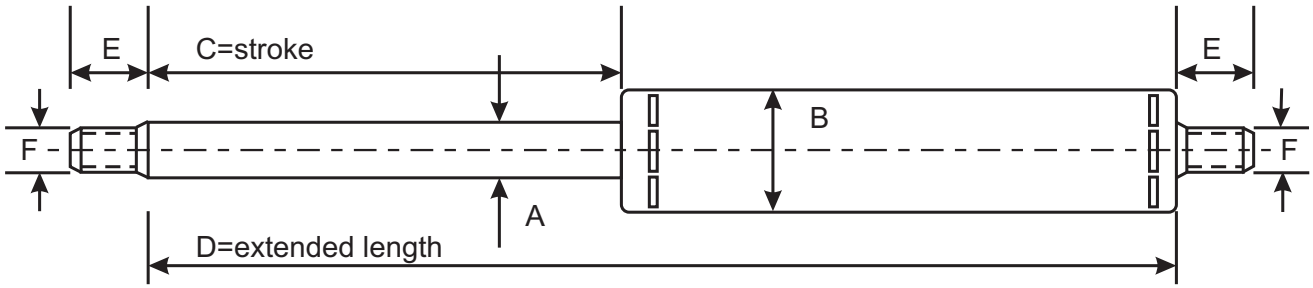


part number	type	A	B	C	D	E	F	filled up to extendible force F1
593.600				100	350			5000 Newton
593.605				150	450			5000 Newton
593.610				200	550			5000 Newton
593.615				250	650			5000 Newton
593.620				300	750			5000 Newton
593.625	20/42	20	42	350	850	15	M 14	5000 Newton
593.630				400	950			4000 Newton
593.635				500	1150			3500 Newton
593.640				600	1350			3000 Newton
593.645				700	1550			2800 Newton
593.650				800	1750			2700 Newton
593.655				900	1950			2600 Newton
593.660				1000	2150			2500 Newton

This type of gas spring is a more advanced type of our force releasable gas spring.
When turning the valve slowly by means of an allen key clockwise, a small quantity of air will escape. These gas springs only drop a small measured amount of pressure and can never loose all pressure at once. When using more than one gas spring and the same number of turns all gas springs will retain the same force. These gas springs can of course be topped up, if more pressure is needed.

Other lengths, maximum forces and screwthreads are possible.
The pistonrod is made from stainless steel AISI 316 or AISI 431 - hard chronium plated and the cylinder is made from stainless steel 316, grinded.
The bottom piece and the guiding (with dirt skimmer) are made from seaworthy bronze.
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages “fastenings parts stainless steel”.

custom made gas push springs stainless steel

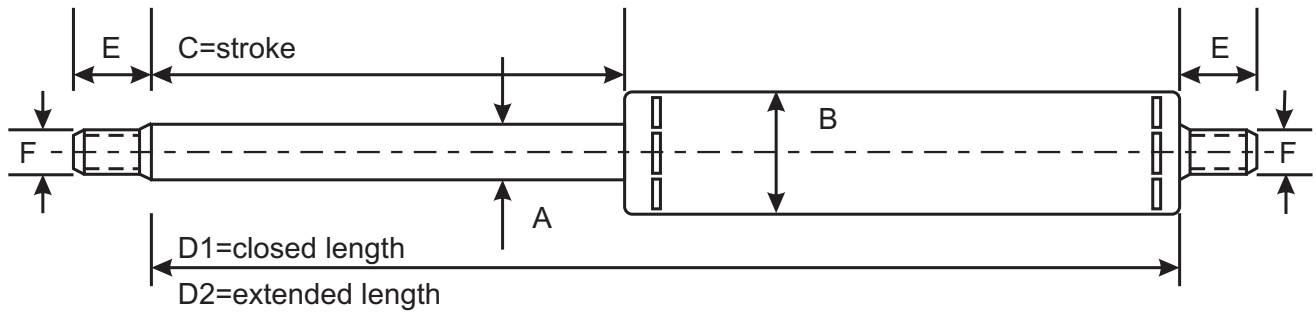


part number		piston-rod A 1*	cylinder-tube B 1*	standard price till stroke C= 2*	F x E 3*	D = minimum 2xC + ... mm 4*	deliverable extendible F1 from/to 5*
999.190	4/12	4	12	100	M4x6	+ 40 mm	25-150 Newton
999.200	6/15	6	15	150	M6x11	+ 56 mm	25-400 Newton
999.210	8/20	8	19	250	M8x11	+ 65 mm	100-750 Newton
999.220	10/23	10	23	400	M8x11	+ 65 mm	150-1150 Newton
999.230	14/28	14	28	500	M8x11	+ 65 mm	250-2500 Newton
999.235	14/42	14	42	500	M14x15	+ 135 mm	250-2500 Newton
999.240	20/42	20	42	500	M14x15	+ 135 mm	250-5000 Newton
999.245	30/60	30	60	500	M14x15	+ 135 mm	250-6500 Newton

The piston rod is made from stainless steel AISI 316 or AISI 431 hard chronium plated and the cylinder is made from stainless steel 316, grinded.
The bottom piece and the guiding (some types with dirt skimmer) are made from seaworthy bronze.
All types of these gas springs are provided with a valve so the extendible force can be increased, some types can also be decreased afterwards.
F1 = the extendible force measured at 5 mm inward piston rod.

1* Other combinations due to other force progressiviness are possible.
2* For additional costs due to greater stroke-lengths see our pricelists.
3* Other screwthreads are possible.
4* Other ratio, for instance, shorter stroke C and longer cylinder B are possible.
5* The stroke chosen (C) depends on the max. extendible force.
For fastening accessories see the applicable pages “fastenings parts stainless steel”.

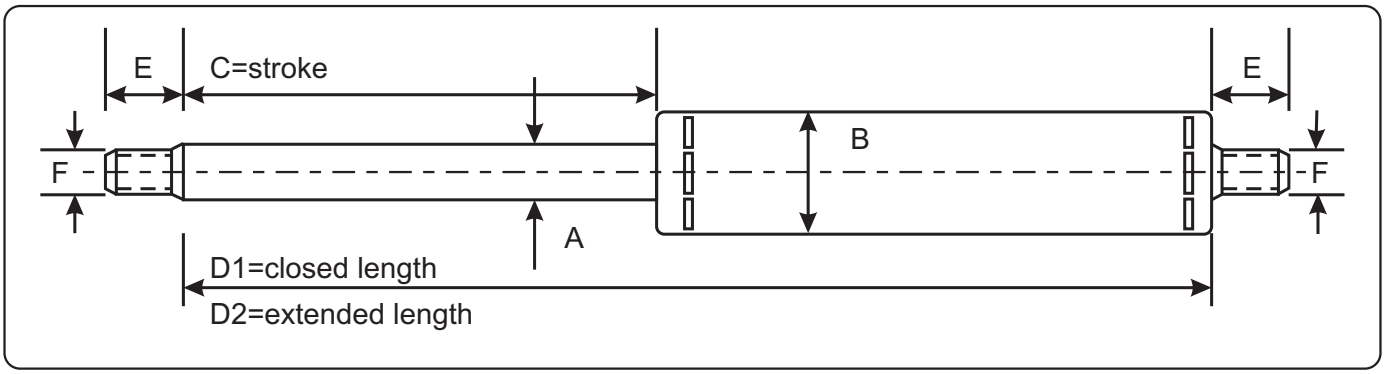
Gas pull springs type 6/19



Part-Number	type	A	B	C	Length in D1	Length Out D2	E	F	Deliverable Pullforce F1 from/to
594.000				25	110	135			50-750 Newton
594.010				50	135	185			50-750 Newton
594.020				75	160	235			50-750 Newton
594.030	6/19	6	19	100	185	285	11	M 6	50-750 Newton
594.040				150	235	385			50-750 Newton
594.050				200	285	485			50-750 Newton
594.060				250	335	585			50-750 Newton

The piston rod is hard chronium plated and the cylindertube is zink plated.
These gas springs are provided with a valve so that the extendible force can be increased afterwards.
Not decreased !!
The ventilation hole in the cylindertube must remain open !!
F1= the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

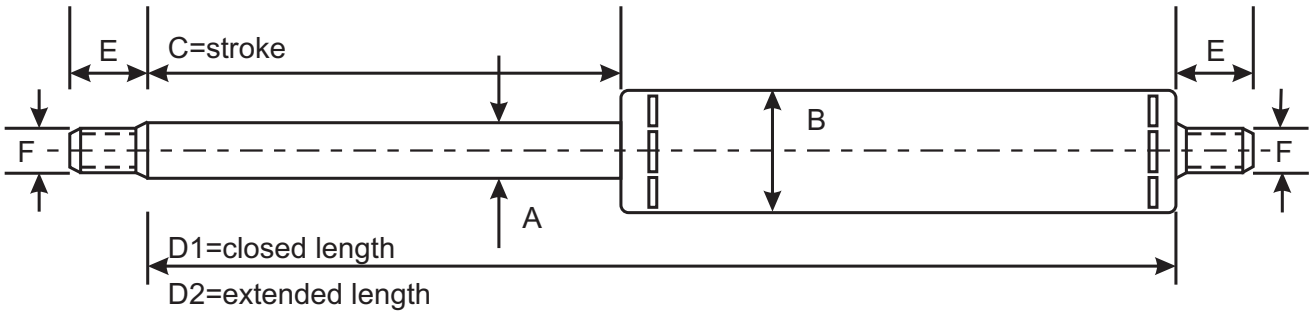
gas pull springs type 8/23 - 10/28



part number	type	A	B	C	length in D1	length out D2	E	F	deliverable pullforce F1 from/to
594.100				25	110	135			100-1000 Newton
594.110				50	135	185			100-1000 Newton
594.120				75	160	235			100-1000 Newton
594.130	8/23	8	23	100	185	285	12,5	M 8	100-1000 Newton
594.140				150	235	385			100-1000 Newton
594.150				200	285	485			100-1000 Newton
594.160				250	335	585			100-1000 Newton
594.170				300	385	685			100-1000 Newton
594.180				350	435	785			100-1000 Newton
594.190				400	485	885			100-1000 Newton
594.200				500	585	1085			100-1000 Newton
594.500				100	185	285			150-1750 Newton
594.510				150	235	385			150-1750 Newton
594.520				200	285	485			150-1750 Newton
594.530	10/28	10	28	250	335	585	12,5	M 8	150-1750 Newton
594.540				300	385	685			150-1750 Newton
594.550				350	435	785			150-1750 Newton
594.560				400	485	885			150-1750 Newton
594.570				500	585	1085			

The piston rod is hard chronium plated and the cylindertube is zink plated.
The guiding of the piston rod is provided with a dirt skimmer.
These gas springs are provided with a valve so that the extendible force can be increased afterwards. Not decreased !!
The ventilation hole in the cylindertube must remain open!!
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

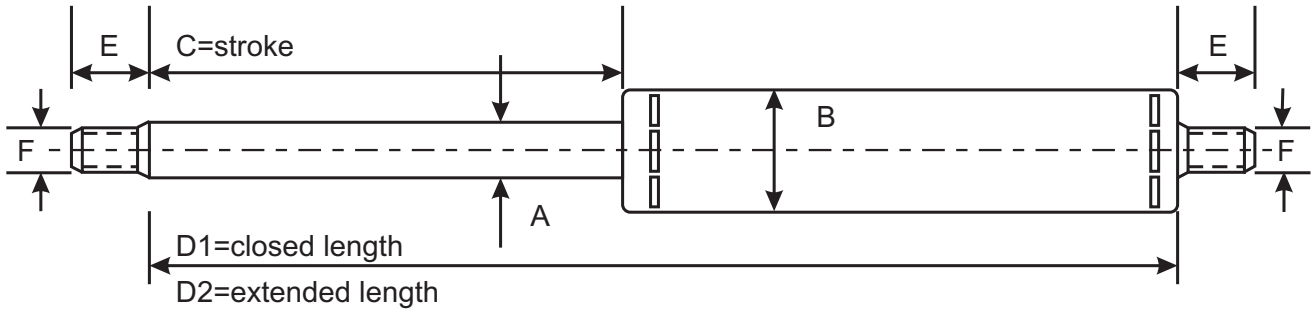
gas pull springs type 14/40



part number	type	A	B	C	length in D1	length out D2	E	F	deliverable pullforce F1 from/to
595.100				100	185	285			250-4000 Newton
595.110				150	235	385			250-4000 Newton
595.120				200	285	485			250-4000 Newton
595.130				250	335	585			250-4000 Newton
595.140				300	385	685			250-4000 Newton
595.150				350	435	785			250-4000 Newton
595.160	14/40	14	40	400	485	885	15	M 10	250-4000 Newton
595.170				500	585	1085			250-4000 Newton
595.180				600	685	1285			250-4000 Newton
595.190				700	785	1485			250-4000 Newton
595.200				800	885	1685			250-4000 Newton
595.210				900	985	1885			250-4000 Newton
595.220				1000	1085	2085			250-4000 Newton

The piston rod is hard chronium plated and the cylindertube is zink plated.
The guiding of the piston rod is provided with a dirt skimmer.
These gas springs are provided with a valve so that the extendible force can be increased afterwards. Not decreased !!
The ventilation hole in the cylindertube must remain open!!
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

gas pull springs, custom made

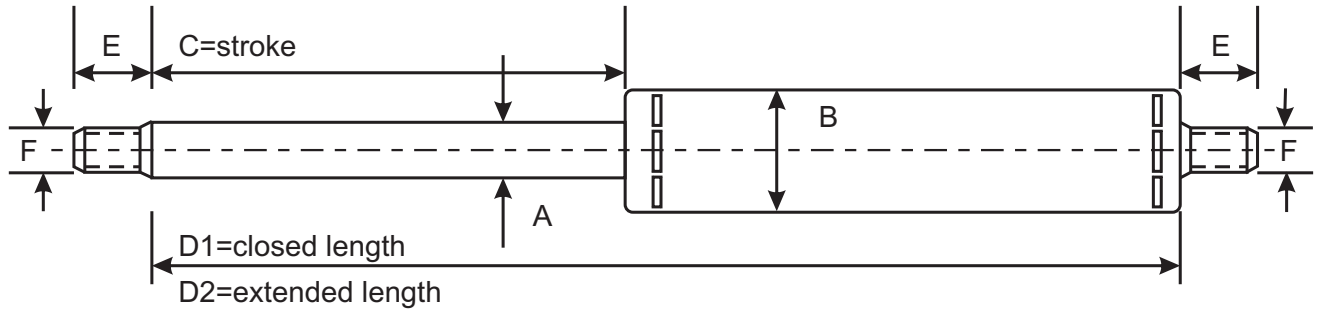


part-number	type	piston-rod A	cylinder-tube B	standaard price up to stroke C=	F x E	D1 = minimum (closed length) C + ... mm	deliverable pullforce F1 from / to
999.495	6/19	6	19	250mm	M6x11	+ 85 mm	50-750 Newton
999.500	8/23**	8	23	500mm	M8x11	+ 85 mm	100-1000 Newton
999.505	10/28**	10	28	500mm	M8x11	+ 85 mm	150-1750 Newton
999.510	14/40**	14	40	1000mm	M10x15	+ 85 mm	250-4000 Newton
999.513	20/60**	20	60	1000mm	M14x15	+ 162 mm	250-5500 Newton

999.496	6/19	price uplift per 50 mm stroke
999.501	8/23	price uplift per 50 mm stroke
999.506	10/28	price uplift per 50 mm stroke
999.511	14/40	price uplift per 50 mm stroke
999.514	20/60	price uplift per 50 mm stroke

The piston rod is hard chronium plated and the cylindertube is zink plated.
**These gas springs are provided with a valve so that afterwards the extendible force can be changed, as well as increased or decreased.
Gas-pull-springs must at all time be mounted with the piston rod pointing upwards.
The ventilation hole in the cylindertube must remain open !!
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

Gas pull springs with damping 6/23 - 20/60



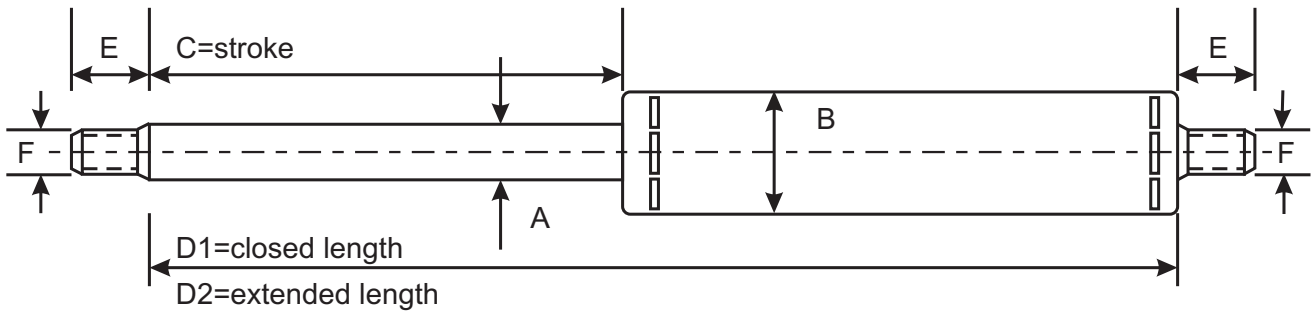
part-number	type	piston-rod A	cylinder-tube B	standard price up to stroke C=	F x E	D1 = minimum (closed length) 2xC + ... mm	max. pullforce F1	incl. progres-siviness
595.310	6/23	6/10	23	250mm	M6x10	2xC+100	750N	975N
595.320	10/28	10/14	28	500mm	M8x11	2xC+100	1200N	2200N
595.330	14/40	14/20	40	500mm	M10x15	2xC+110	2500N	3600N
595.340	20/60	20/30	65	1000mm	M14x15	2xC+210	6250N	7400N

595.311	6/23	price uplift per 50 mm stroke
595.321	10/28	price uplift per 50 mm stroke
595.331	14/40	price uplift per 50 mm stroke
595.341	20/60	price uplift per 50 mm stroke

These gas pull springs poses an excellant end-damping which can be defined in advance.
Other types, connected to progessiveness, are available after consultation.
The piston rod is hard chronium and the cylindertube is zink plated.
The guiding of the piston rod is provided with a dirt skimmer.
The pressure of these gas pull springs cannot be increased or decreased afterwards.
F1 = the extendible force measured at 5mm inward piston rod.
For fastening accessories see the applicable pages.

For fastening accesories see the aplicable pages.

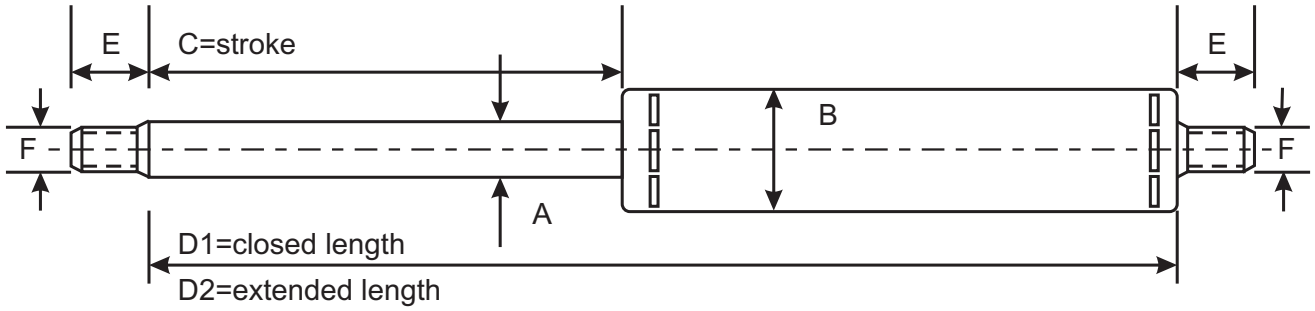
gas pull springs type 6/18 stainless steel



part-number	type	A	B	C	length in D1	length out D2	E	F	deliverable pullforce F1 from / to
595.400				25	110	135			50-750 Newton
595.410				50	135	185			50-750 Newton
595.420				75	160	235			50-750 Newton
595.430	6/18	6	18	100	185	285	11	M 6	50-750 Newton
595.440				150	235	385			50-750 Newton
595.450				200	285	485			50-750 Newton
595.460				250	335	585			50-750 Newton

The piston rod is made from stainless steel AISI 316 or AISI 431hard chronium plated and the cylinder is made from stainless steel 316, grinded.
The bottom piece and the guiding (with dirt skimmer) are made from seaworthy bronze.
These gas springs are provided with a valve so that the extendible force can be increased Afterwards. Not decreased !!
Gas-pull-springs must at all times be mounted with the piston rod pointing upwards.
The ventilation hole in the cylindertube must remain open !!
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

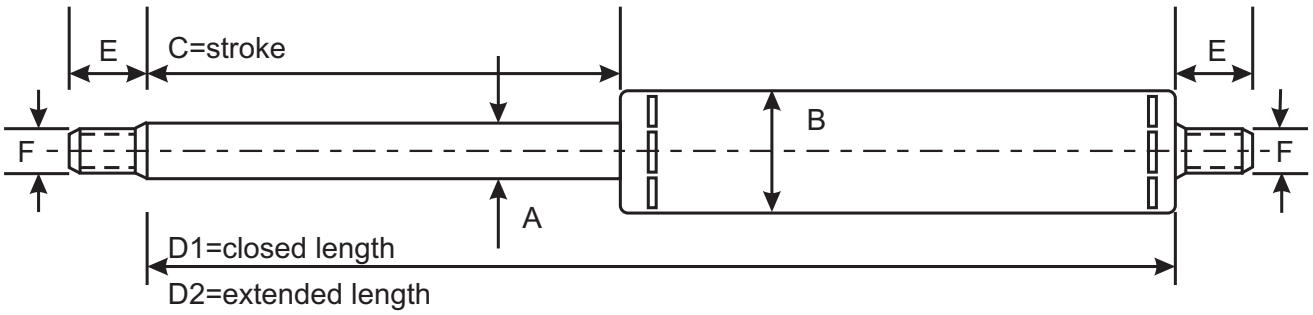
gas pull springs type 8/23 - 10/28 stainless steel



part number	type	A	B	C	length in D1	length out D2	E	F	deliverable pullforce F1 from/to
595.500				25	110	135			100-1000 Newton
595.510				50	135	185			100-1000 Newton
595.520				75	160	235			100-1000 Newton
595.530	8/23	8	23	100	185	285	12,5	M 8	100-1000 Newton
595.540				150	235	385			100-1000 Newton
595.550				200	285	485			100-1000 Newton
595.560				250	335	585			100-1000 Newton
595.570				300	385	685			100-1000 Newton
595.580				350	435	785			100-1000 Newton
595.590				400	485	1085			100-1000 Newton
595.600				500	585	885			100-1000 Newton
596.100				100	185	285			150-1500 Newton
596.110				150	235	385			150-1500 Newton
596.120				200	285	485			150-1500 Newton
596.130	10/28	10	28	250	335	585	12,5	M 8	150-1500 Newton
596.140				300	385	685			150-1500 Newton
596.150				350	435	785			150-1500 Newton
596.160				400	485	885			150-1500 Newton
596.170				500	585	1085			150-1500 Newton

The piston rod is made from stainless steel AISI 316 or AISI 431 hard chronium plated and the cylinder is made from stainless steel 316, grinded.
The bottom piece and the guiding (with dirt skimmer) are made from seaworthy bronze.
These gas springs are provided with a valve so that the extendible force can be increased afterwards. Not decreased !!
The ventilation hole in the cylindertube must remain open!!
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

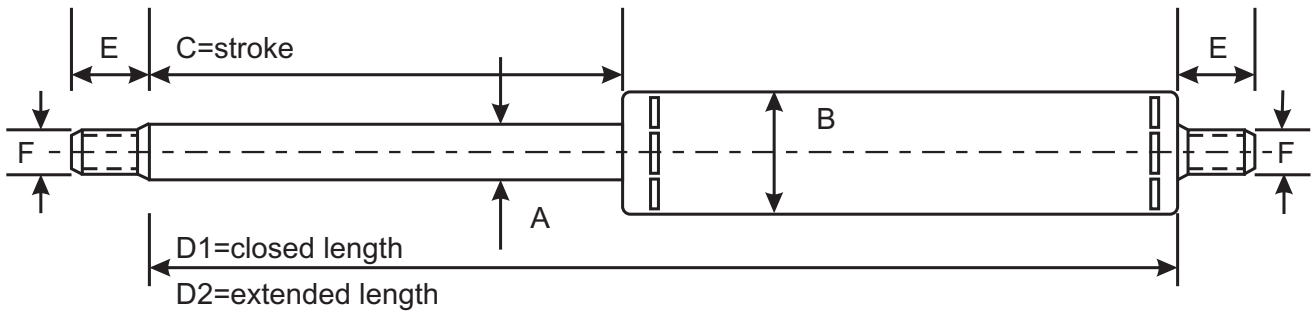
gas pull springs type 14/42 stainless steel



part number	type	A	B	C	length in D1	length out D2	E	F	deliverable pullforce F1 from/to
596.500				100	185	285			250-4000 Newton
596.510				150	235	385			250-4000 Newton
596.520				200	285	485			250-4000 Newton
596.530				250	335	585			250-4000 Newton
596.540				300	385	685			250-4000 Newton
596.550				350	435	785			250-4000 Newton
596.560	14/42	14	42	400	485	885	15	M 10	250-4000 Newton
596.570				500	585	1085			250-4000 Newton
596.580				600	685	1285			250-4000 Newton
596.590				700	785	1485			250-4000 Newton
596.600				800	885	1685			250-4000 Newton
596.610				900	985	1885			250-4000 Newton
596.620				1000	1085	2085			250-4000 Newton

The piston rod is made from stainless steel AISI 316 or AISI 431 hard chronium plated and the cylinder is made from stainless steel 316, grinded.
The bottom piece and the guiding (with dirt skimmer) are made from seaworthy bronze.
These gas springs are provided with a valve so that the extendible force can be increased afterwards. Not decreased !!
The ventilation hole in the cylindertube must remain open!!
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

Gas pull springs, custom made stainless steel

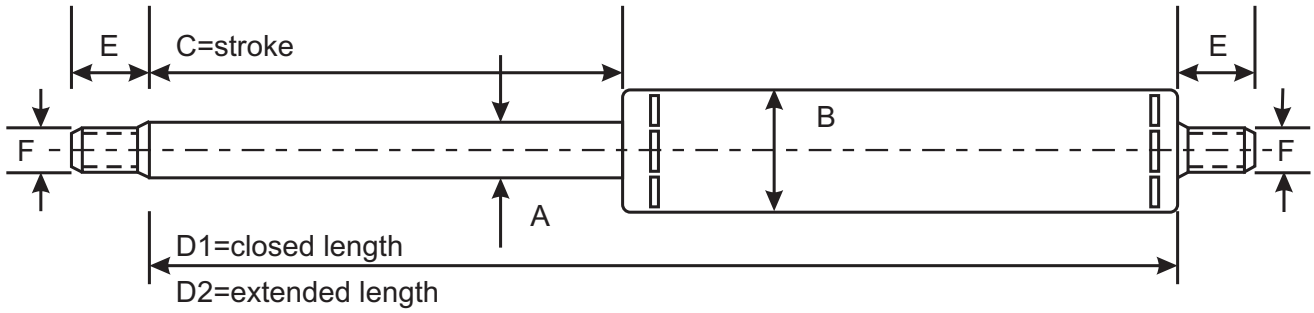


part-number	type	piston-rod A	cylinder-tube B	standard prise up to stroke C=	F x E	D1 = minimum (closed length) C + ... mm	deliverable pullforce F1 from / to
999.515	6/18	6	18	250mm	M6x11	+ 85 mm	50-750 Newton
999.520	8/23**	8	23	500mm	M8x11	+ 85 mm	100-1000 Newton
999.525	10/28**	10	28	500mm	M8x11	+ 85 mm	150-1500 Newton
999.530	14/42**	14	42	1000mm	M10x15	+ 85 mm	250-4000 Newton
999.540	20/60**	20	60	1000mm	M14x15	+ 162 mm	250-5500 Newton

999.516	6/18	price uplift per 50 mm stroke
999.521	8/23	price uplift per 50 mm stroke
999.526	10/28	price uplift per 50 mm stroke
999.531	14/42	price uplift per 50 mm stroke
999.541	20/60	price uplift per 50 mm stroke

The piston rod is made from stainless steel AISI 316 or AISI 431 hard chronium plated and the cylinder Is made from stainless steel 316, grinded.
The bottom piece ande the guiding (with dirt skimmer) are made frrom seaworthy bronze.
**These gas springs are provided with a valve so that the extendible force can be increased and decreased afterwards.
Gas-pull-springs must at all times be mounted with the piston rod pointing upwards.
The ventilation hole in the cylindertube must remain open !!
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

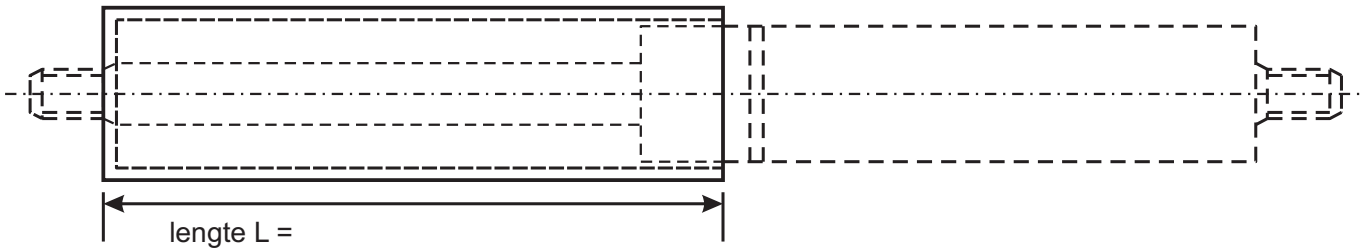
Gas pull springs with damping 4/15 - 20/60 stainless steel



part-number	type	piston-rod A	cylinder-tube B	standard price up to stroke C=	F x E	D1 = minimum (closed length) 2xC + ... mm	max. pullforce F1	incl. progres-siviness
596.700	4/15	4/6	15	150mm	M4x6	2xC+75	250N	290N
596.710	6/23	6/10	23	250mm	M6x10	2xC+100	750N	975N
596.720	10/28	10/14	28	500mm	M8x11	2xC+100	1200N	2200N
596.730	14/42	14/20	42	500mm	M10x15	2xC+110	2500N	3600N
596.740	20/60	20/30	60	1000mm	M14x15	2xC+210	6250N	7650N

596.701	4/15	price uplift per 50 mm stroke
596.711	6/23	price uplift per 50 mm stroke
596.721	10/28	price uplift per 50 mm stroke
596.731	14/42	price uplift per 50 mm stroke
596.741	20/60	Price uplift per 50 mm stroke

These gas pull springs poses an excellant end-damping which can be defined in advance.
Other types, connected to progressiviness, are available after consultation.
The piston rod is hard chronium plated and the cylinder tube is zink plated.
The piston rod is made from stainless steel AISI 316 or AISI 431 hard chronium plated and the cylinder Is made from stainless steel 316, grinded.
The bottom piece and the guiding (with dirt skimmer) are made from seaworthy bronze.
These gas springs are provided with a valve so that the extendible force can be increased afterwards. Not decreased !!
The ventilation hole in the cylindertube must remain open !!
F1 = the extendible force measured at 5 mm inward piston rod.
For fastening accessories see the applicable pages.

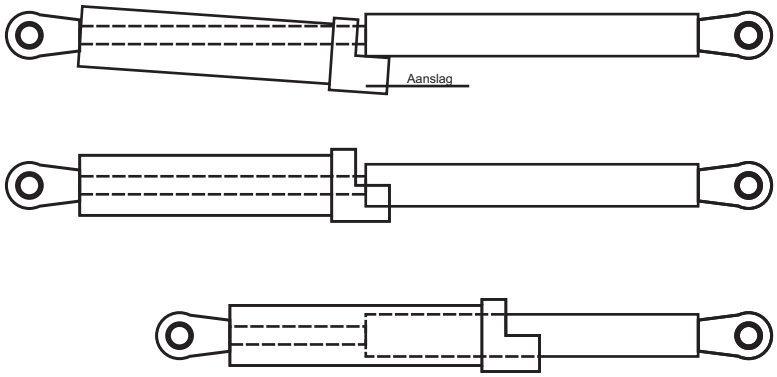


part number	length L=	for gas spring type	number
600.200	70 mm	6/15	563.400/1
600.210	110 mm	6/15	563.402/3
600.220	130 mm	6/15	563.404
600.230	160 mm	6/15	563.405
600.250	100 mm	8/20	588.430/1
600.270	140 mm	8/20	588.432/3
600.280	180 mm	8/20	588.434/5
600.290	220 mm	8/20	588.436/7
600.300	260 mm	8/20	588.438/9
600.310	120 mm	10/22	512.420
600.320	170 mm	10/22	512.421
600.330	220 mm	10/22	512.422
600.340	270 mm	10/22	512.423
600.350	320 mm	10/22	512.424
600.360	370 mm	10/22	512.425
600.370	420 mm	10/22	512.426
600.380	520 mm	10/22	512.427

part number	length L=	for gas spring type	number
600.400	220 mm	14/28	540.400
600.410	270 mm	14/28	540.402
600.420	345 mm	14/28	540.401/12
600.430	370 mm	14/28	540.403
600.440	420 mm	14/28	540.404
600.450	470 mm	14/28	540.413
600.460	520 mm	14/28	540.405
600.500	150 mm	20/40	590.100
600.510	200 mm	20/40	590.110
600.520	250 mm	20/40	590.120
600.530	300 mm	20/40	590.130
600.540	350 mm	20/40	590.140
600.550	400 mm	20/40	590.150
600.560	450 mm	20/40	590.160
600.570	550 mm	20/40	590.170
600.580	650 mm	20/40	590.180
600.590	750 mm	20/40	590.190
600.600	850 mm	20/40	590.200
600.610	950 mm	20/40	590.210
600.620	1050 mm	20/40	590.220

These protection tubes protect the piston rod against dirt and damage.
Standard version is available in zink plated.
Powder coated, black or white, or stainless steel is possible at extra cost.
All protection tubes are provided with a drainage hole.
In principle, for all types of gas springs, with the exception of gas springs with welded-on eyes, protection tubes are available.

Safety / protection tubes stainless steel



These safety / protection tubes offer protection against unintentional closing of hatches / covers and pro-. tects the piston rods from damaging. Are complete stainless and therefor Usable with stainless steel gas push and pull springs.
Not to be used in combination with welded eyes.
At the extending of the spring, the Tube snaps sideways and blocks The ingoing stroke. After pushing the stop against the cylindertube, the spring can be pressed in again. Please notice that the length of the springs differ by using safety / protection tubes. See the tabel underneath. For the second spring an extension piece is added.
These safety / protection tubes can also be used with existing springs. Only 1 safetytube is to be used in every construction. On the other spring a simmellary looking protection tube should be used.
Unless otherwise prescribed, the fastening accessories will be mounted square at the end of the safety tube.

Safetytube for type:		manufacturer		partnumber incl. extensionpart	aditional protectiontube	aditional length
pushsprings	pullsprings					
6/15		Airax	T.Technics	601.100	601.101	43 mm
	6/18-19		T.Technics	601.105	601.106	43 mm
8/19-20-M8			T.Technics	601.110	601.111	43 mm
8/20-M6		Airax		601.120	601.121	43 mm
10/22-23	8/23	Airax	T.Technics	601.125	601.126	43 mm
12/25			T.Technics	601.130	601.131	50 mm
14/28	10/28	Airax	T.Technics	601.135	601.136	50 mm
20/40-42	14/40-42		T.Technics	601.140	601.141	50 mm

tandem-housing for stainless steel gas springs

tandem-housing provided with
3 stainless steel gas springs, extend the stroke, while the length pushed in does not change.

the case is made from stainless steel 304 and grinded with grain 320.

the end and begin damp of the gas springs maintain.

either side of the gas springs can have different forces.

these tandem-housings can also be provided with stainless steel gas pull springs.

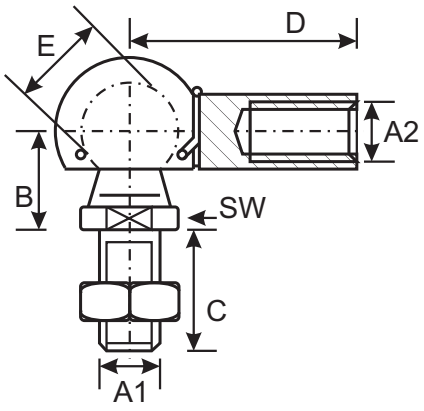
the usual fasteners can be used.
see the appropriate pages in our catalogue.

other lengths and constructions on request.

the prices of these tandem-housings are exclusive to the 3 gas springs.

part number	gas springs to be used	A1 mm	A2 mm	= total stroke mm	D1 mm	D2 mm
597.500	3 x 592.100	90	90	180	190	370
597.510	3 x 592.110	140	140	280	240	520
597.520	3 x 592.120	190	190	380	290	670
597.530	3 x 592.130	240	240	480	340	820
597.540	3 x 592.140	290	290	580	390	970
597.550	3 x 592.150	340	340	680	440	1120
597.560	3 x 592.160	390	390	780	490	1270
597.570	3 x 592.170	490	490	980	590	1570

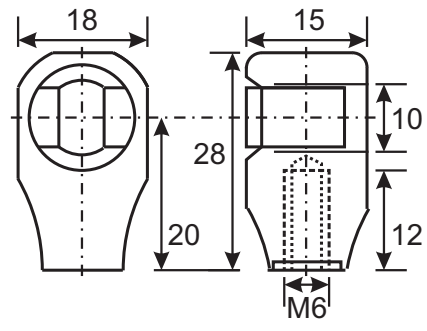
ball joints, ball sockets, ball studs



for stainless steel see page E62

ball joints radial according to DIN 71802

part-number	A1	A2	B	C	D	E	SW	static force pull / push
98.490	M 4		7	6	17	6	5	90 N
98.500	M 5		9	11	22	8	7	300 N
98.502	M 5	M 4	9	11	22	8	7	300 N
98.504	M 5	M 6	9	11	22	8	7	300 N
98.508	M 6	M 8	11	13	25	10	8	700 N
98.510	M 6		11	13	25	10	8	700 N
98.518	M 8	M 6	13	16	30	13	11	1500 N
98.520	M 8		13	16	30	13	11	1500 N
98.523	M 8		13	16	20	13	11	1500 N
98.526	M 8		13	25	30	13	11	1500 N
98.530	M10		16	20	35	16	13	2000 N
98.532	M10	M 8	16	20	35	16	13	2000 N
98.540	M12		16	20	35	16	13	2000 N
98.550	M14X1,5		20	28	45	19	17	3000 N
98.552	M14X2		20	28	45	19	17	3000 N
98.560	M16		20	28	45	19	17	3000 N

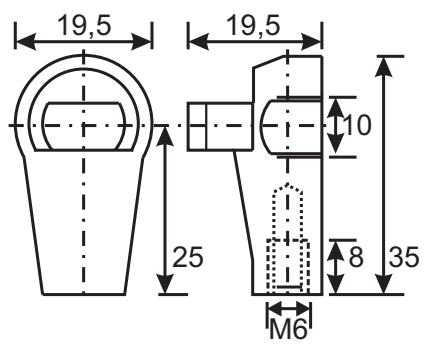


ball socket

: for ball stud 10 mm
: female taper thread M 6
: for ball stud 92.990 en 92.998
: for base plate 92.992

part.number : 72.421 : nylon black
: 72.423 : steel, black zink coated

part.number : 72.425 : nylon black, 10 degree angle

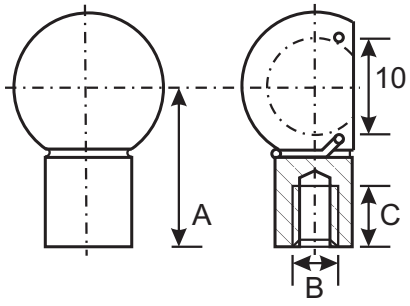


ball socket

: for ball stud 10 mm
: material: nylon black
: female taper thread M 6
: for ball stud 92.990 + 92.998
: for base plate 92.992
: effective length 25 mm

part.number : 92.721

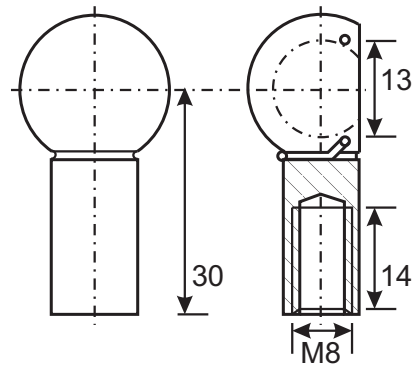
ball joints, ball sockets, ball studs



ball socked

: steel, zink plated
: for ball stud 10 mm
: female taper thread M6
: for ball stud 92.990 + 92.998
: for base plate 92.992 + 95.060

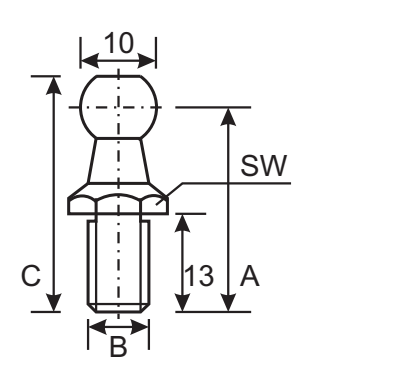
		A	B	C
part.number 92.216	:	20	M 6	10
part.number 92.220	:	25	M 6	10
part.number 92.215	:	20	M 8	11
part.number 92.214	:	18	M 8	11



ball socked

: steel, zink plated
: for ball stud 13 mm
: female taper thread M 8
: effective length 30 mm
: for base plate 92.995 + 95.070

part.number : 92.996



ball stud

: steel, zink plated

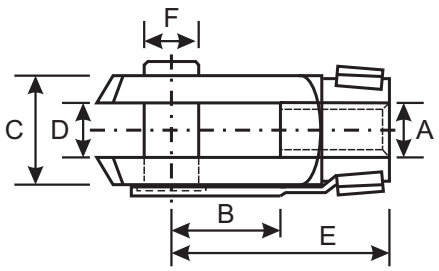
: for ball socket 72.421 + 92.721
+ 92.215 + 92.216

		A	B	C	SW
part.number 92.998	:	24	M 6	28	10
part.number 92.990	:	27	M 8	31	13

:
:
:
:

:

forks with clips

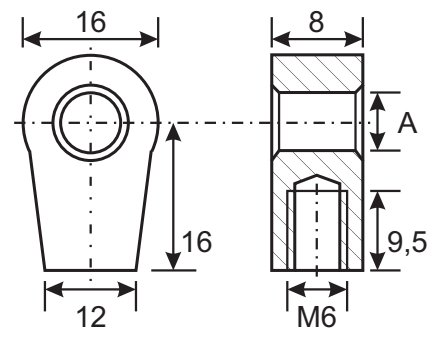


for stainless steel see page E61

forks with clip according to DIN 71751

steel, zink plated

part.nr.	A	B	C	D	E	F	static force pull / push
98.070	M 4	8	9	4	16	4	1500N
98.080	M 5	10	10	5	20	5	2500N
98.090	M 5	20	10	5	30	5	2500N
98.100	M 6	12	12	6	24	6	3500N
98.110	M 6	24	12	6	36	6	3500N
98.112	M 8 !!	12	12	6	24	6	3500N
98.114	M 8 !!	24	12	6	36	6	3500N
98.118	M 6 !!	16	16	8	32	8	3500N
98.120	M 8	16	16	8	32	8	6000N
98.130	M 8	32	16	8	48	8	6000N
98.140	M10	20	20	10	40	10	10000N
98.150	M10	40	20	10	60	10	10000N
98.160	M12	24	24	12	48	12	12000N
98.170	M12	48	24	12	72	12	12000N
98.200	M14X1,5	28	27	14	56	14	16000N
98.210	M14X1,5	56	27	14	85	14	16000N
98.202	M14X2	28	27	14	56	14	16000N
98.212	M14X2	56	27	14	85	14	16000N
98.214	M16	32	32	16	64	16	22000N
98.220	M20X2,5	40	40	20	80	20	32000N

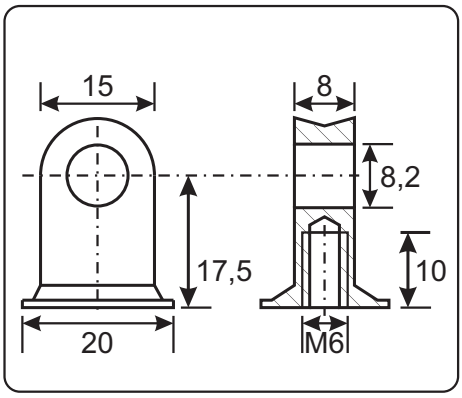


eyelet

: for gas spring type 6/15 + 8/20
: material: samac

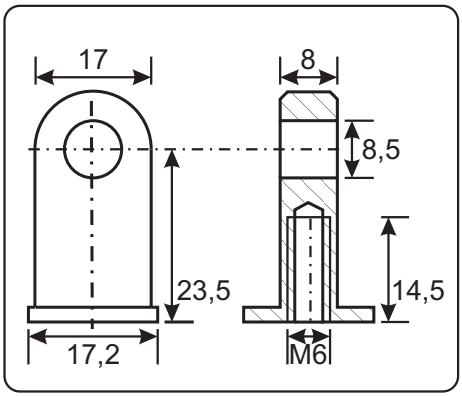
part.number		A
	: 92.258	6
	: 92.259	8

fastening eye lets



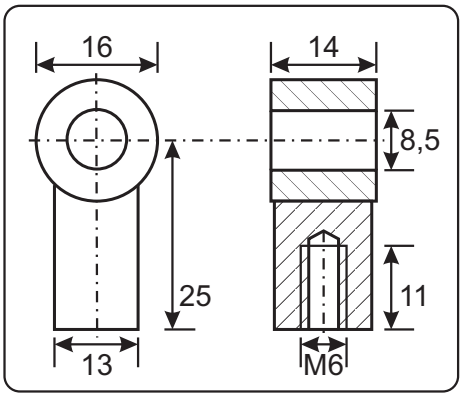
eyelet
: for gas spring type 6/15 + 8/20
: material: samac
: female taper thread M 6
: bore eye 8,2 mm
: width eye 8 mm
: effective length 17,5 mm

part.number : 92.263



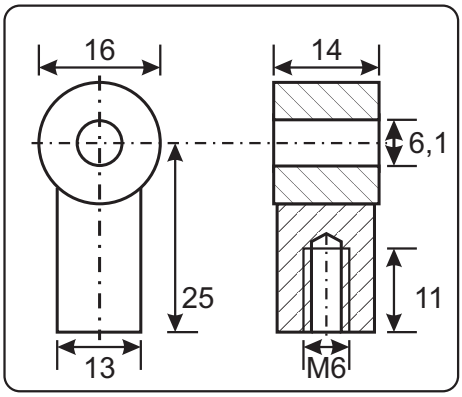
eyelet
: for gas spring type 6/15 + 8/20
: material: nylon black
: female taper thread M6
: bore eye 8,5 mm
: width eye 8 mm
: effective length 23,5 mm

part.number : 92.521



eyelet
: for gas spring type 6/15 + 8/20
: material: nylon black
: female taper thread M 6
: bore eye 8,5 mm
: width eye 14 mm
: effective length 25 mm

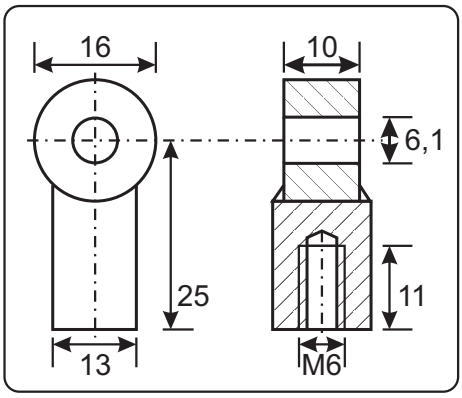
part.number : 92.522



eyelet
: for gas spring type 6/15 + 8/20
: material: nylon black
: female taper thread M 6
: bore eye 6,1 mm
: Width eye 14 mm
: effective length 25 mm

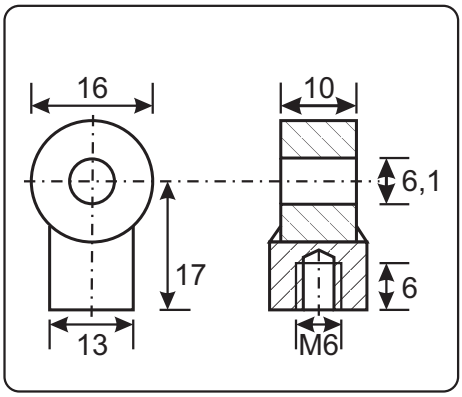
part.number : 92.527

fastening eyelets



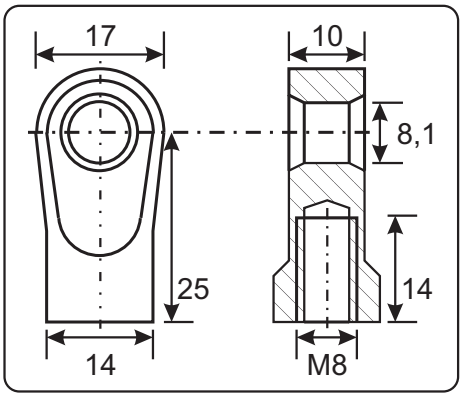
eyelet
: for gas spring type 6/15 + 8/20
: material: nylon black
: female taper thread M 6
: bore eye 6,1 mm
: width eye 10 mm
: effective length 25 mm

part.number : 92.528



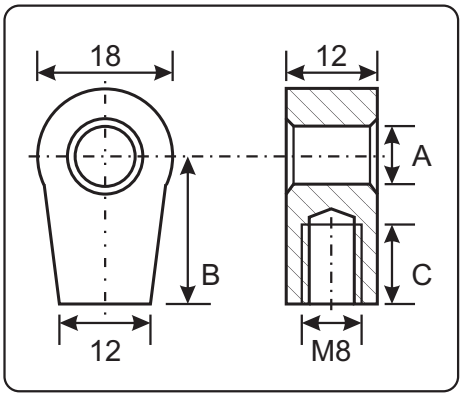
eyelet
: for gas spring type 6/15 + 8/20
: material: nylon black
: Female taper thread M 6
: bore eye 6,1 mm
: width eye 10 mm
: effective length 17 mm

part.number : 92.530



eyelet
: for gas spring type 10/22 + 14/28
: material: samac
: Female taper thread M 8
: bore eye 8,1 mm
: width eye 10 mm
: effective length 25 mm

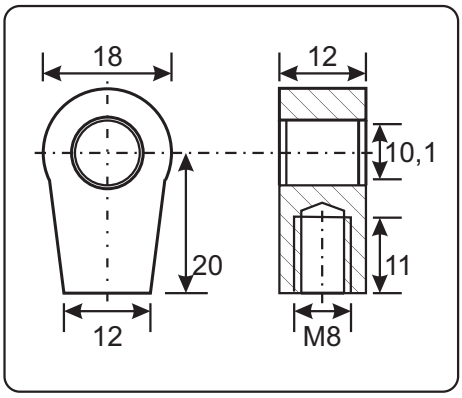
part.number : 92.264



eyelet
: for gas spring type 10/22 + 14/28
: material: samac
: female taper thread M 8
: width eye 12 mm

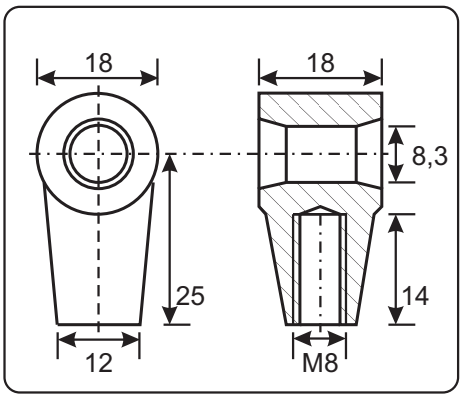
part.number		A	B	C
	92.268	6,2	16	9
	92.261	8,3	20	11
	92.271 :	10,1	16	9
	92.270 :	12,2	16	9

fastening eyelets



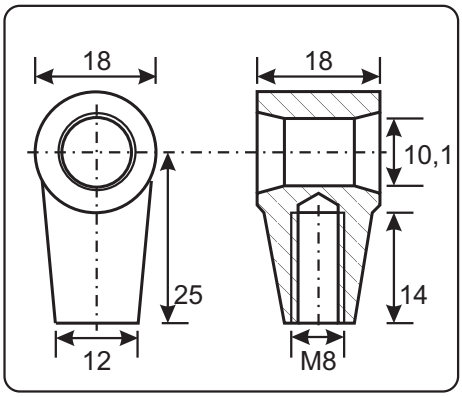
eyelet
: for gas spring type 10/22 + 14/28
: material: samac
: female taper thread M 8
: bore eye 10,1 mm
: width eye 12 mm
: effective length 20 mm

part.number : 92.267



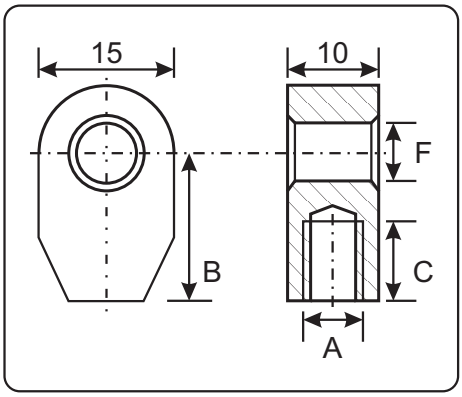
eyelet
: for gas spring type 10/22 + 14/28
: material: samac
: female taper thread M 8
: bore eye 8,3 mm
: width eye 18 mm
: effective length 25 mm

part.number : 92.260



eyelet
: for gas spring type 10/22 + 14/28
: material: samac
: female taper thread M 8
: bore eye 10,1 mm
: width eye 18 mm
: effective length 25 mm

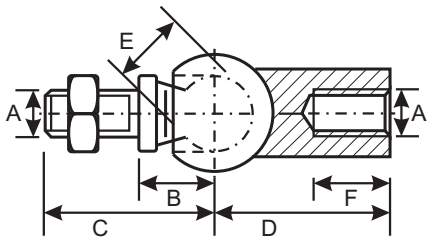
part.number : 92.266



eyelet
: material: steel, zink plated
: for stainless steel see page E61

part-number	A	B	C	F	
98.750	M 6	16	12	8	aluminum
98.785	M 8	16	12	8	steel, zink plated
98.760	M 6	20	12	8	steel, zink plated without edges

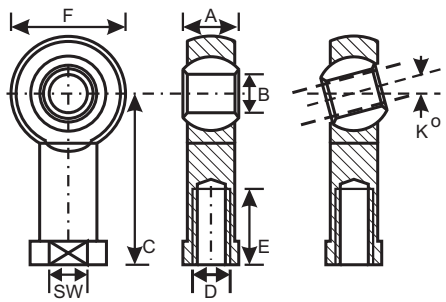
ball joints axial and rod eyes



ball joints axial according to DIN 71802

material: steel, zink plated
(not to be used for gas pull springs !!

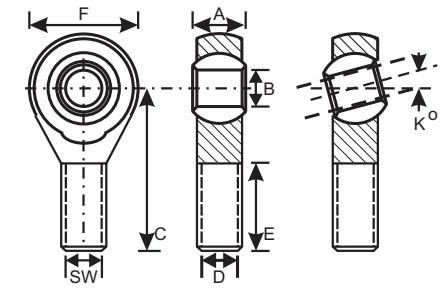
part-number	A	B	C	D	E	F	max.pull-force
98.590	M 5	10	20	22	8	10	25 N
98.600	M 6	11	23,5	25	10	11,5	40 N
98.610	M 8	13	29,5	30	13	14	60 N
98.620	M10	16	36	35	16	15,5	80 N
98.630	M14X1,5	20	48	45	19	21,5	100 N



rod heads

: female taper thread, maintenance free
: bearing: steel with PTFE
: long life
: for stainless steel see page E61

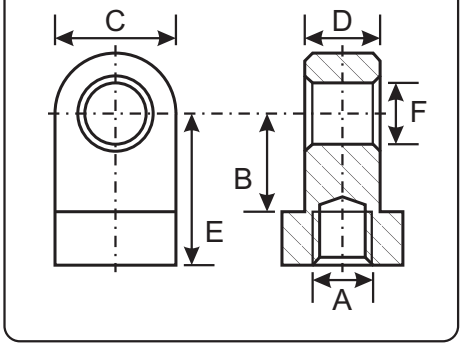
part-number	A	B	C	D	E	F	K	SW
96.090	8	5	27	M 4 !!	10	18	13	9
96.100	9	6	30	M 6	12	20	13	11
96.110	12	8	36	M 8	16	24	13	13
96.120	14	10	43	M10	20	28	13	17
96.125	16	12	50	M12	22	32	13	19
96.130	19	14	57	M14	25	36	15	22



rod heads

: with male thread
: completely maintenance free
: bearing: steel with PTFE
: long life

part-number	A	B	C	D	E	F	K
96.200	9	6	36	M 6	22	20	13
96.210	12	8	42	M 8	25	24	13
96.212	14	10	48	M10	29	28	13
96.214	16	12	54	M12	33	32	13
96.216	19	14	60	M14	36	36	15

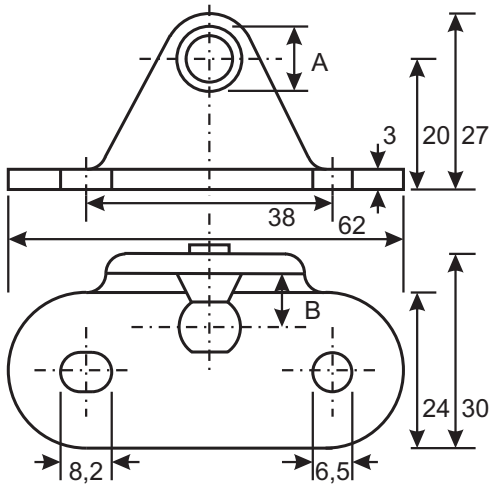


eyelet

: material: steel, zink plated
: for stainless steel see page E61

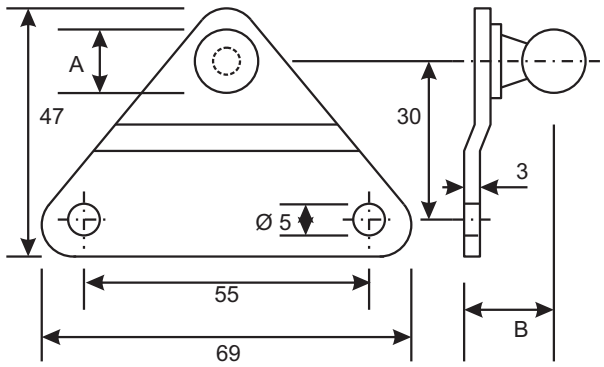
part-number	A	B	C	D	E	F
98.765	M 8	13	14	10	20	8
98.795	M10	17	18	10	30	8

base plates and fastening brackets



base plate :steel, zink plated
:for ball socket 72.421 + 92.720
:A = 10 mm
:B = 8,3 mm
part.number :92.992

base plate :steel, zink plated
:for ball socket 92.996
:ball stud = reversable
:A = 13 mm
:B = 13 mm
part.number :92.995



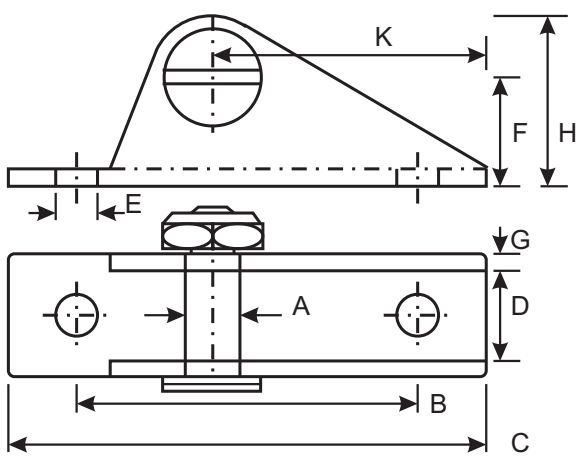
triangle plate with ball joint

:steel, zink plated

95.060 :for ball socket 72.421 + 92.215 + 92.216 + 92.220 + 92.721

95.070 :for ball socket 92.996

part.number		95.060	95.070
A	:	Ø 10	Ø 13
B	:	17	17,5

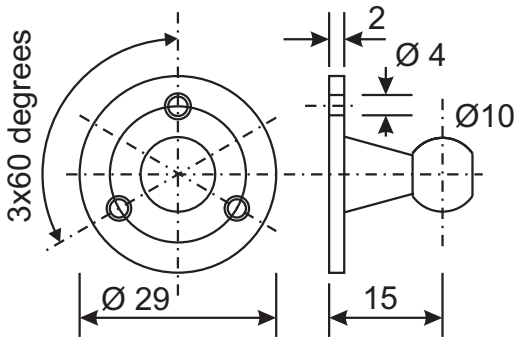


fastening bracket

:steel, zink plated
:with bolt and nut

part.number		95.020
A	:	8
B	:	75
C	:	95
D	:	13
E	:	6,3
F	:	20
G	:	2,5
H	:	30
K	:	65

base plates and fastening brackets

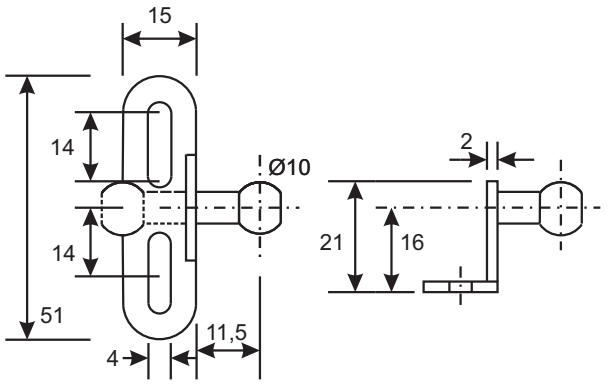


base plate with ball joint

: steel, zink plated
: max. gasspringforce 150N

for ball socket : 72.421 + 72.425
92.215 + 92.216
92.220 + 92.721

part.number : 95.080

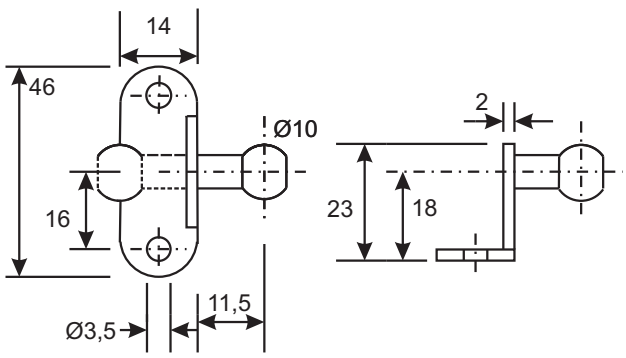


base plate with ball joint

: steel, zink plated
: max. gasspringforce 150N

for ball socket : 72.421 + 72.425
92.215 + 92.216
92.220 + 92.721

	part.number
ball stud at the inside :	95.090
ball stud at the outside :	95.091



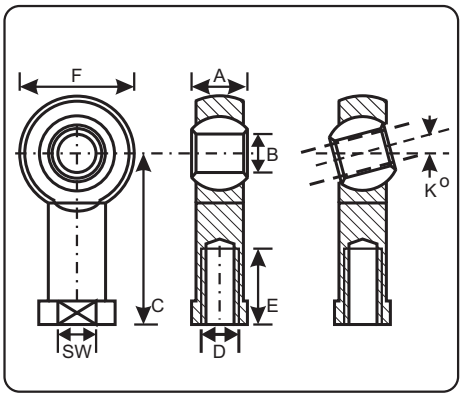
base plate with ball stud

: steel, zink plated
: max. gasspringforce 150N

for ball socket : 72.421 + 72.425
92.215 + 92.216
92.220 + 92.721

	part.number
ball stud at the inside :	95.094
ball stud at the outside :	95.095

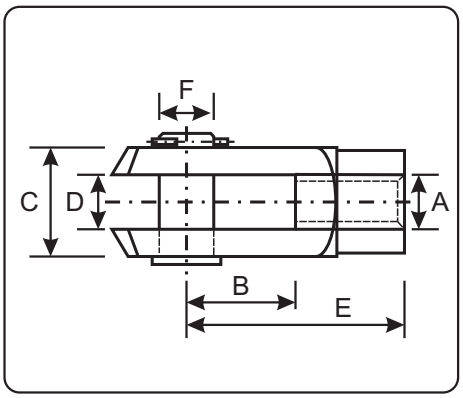
Fastening accessories stainless steel



rod heads, stainless steel

part.number

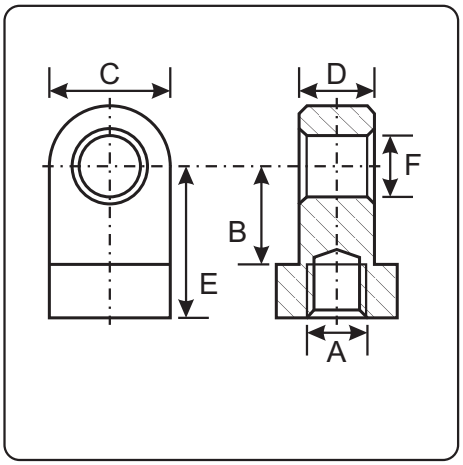
st.steel 1.4305 (AISI 304)	st.steel 1.4404 (AISI 316)	A	B	C	D	E	F	K	SW
999.465		8	5	27	M 4 !!	10	17	13	10
	999.420	9	6	30	M 6	12	20	13	11
	999.422	12	8	36	M 8	16	24	13	14
	999.424	14	10	43	M10	20	30	13	17
	999.426	19	14	57	M14	25	38	15	22



fork with pen, acc. to DIN 71751, stainless steel

part.number

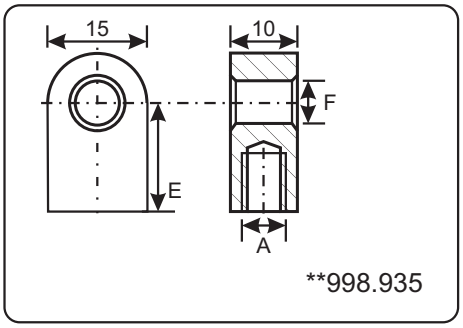
st. steel 1.4305 (AISI 304)	st. steel 1.4404 (AISI 316)	A	B	C	D	E	F
999.306		M 4	8	9	4	18	4
999.308		M 6	12	12	6	24	6
	998.810	M 8	16	16	8	32	8
	998.820	M10	20	20	10	40	10
999.322		M14	28	28	14	56	14
999.324		M14x1,5	28	28	14	56	14



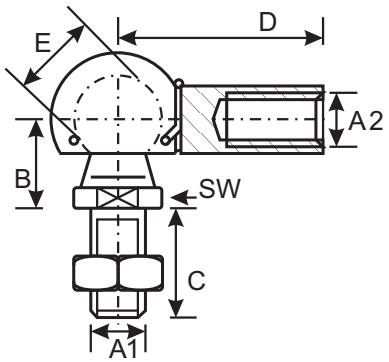
eyelet, stainless steel

part.number

st. steel 1.4305 (AISI 304)	st. steel 1.4404 (AISI 316)	A	B	C	D	E	F
999.326		M 4	7	8	4	12	4
	998.928	M 6	9	10	6	16	6
999.330		M 6	12	14	5	26	6
999.332		M 6	12	14	5	26	8
	998.933	M 8	12	14	5	26	8
	998.934	M 8	13	15	10	19	8
	**998.935	M 8	16	15	10	16	8
999.331		M 8	16	15	10	26	8
999.336	998.936	M 8	16	18	10	30	8
	998.938	M 8	16	18	10	30	10
999.340		M10	16	18	10	30	8
999.342		M10	16	18	10	30	10
999.350		M14	17	22	14	38	14
999.380 (mail thread)		M14	17	22	14	27	14



**998.935



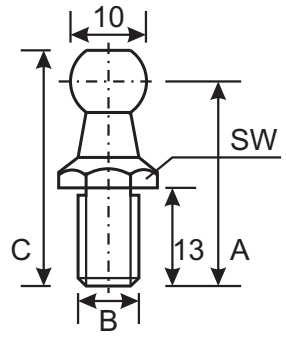
ball joints radial according to DIN 71802

material: stainless steel 1.4305 (AISI 304)

part-number	A1-A2	B	C	D	E	SW	static force pull / push
999.296	M5-M6	9	11	22	8	7	300 N
999.302	M10	16	20	35	16	13	2000 N
999.304	M14x1,5	20	28	45	19	17	3000 N
999.305	M14x2	20	28	45	19	17	3000 N

material: stainless steel 1.4404 (AISI 316)

part-number	A1-A2	B	C	D	E	SW	static force pull / push
999.475	M 4	7	6	17	6	5	90 N
999.477	M 5	9	11	22	8	7	300 N
999.476	M 6	11	13	25	10	8	700 N
999.478-20	M 8	13	16	20	13	11	1500 N
999.478-25	M 8	13	16	25	13	11	1500 N
999.478	M 8	13	16	30	13	11	1500 N
999.480	M10-M8	16	20	35	16	13	2000 N
999.482	M10	16	20	35	16	13	2000 N

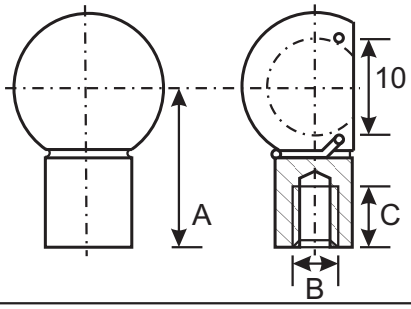


ball stud

material: stainless steel 1.4305 (AISI 304)

: for ball socket 72.421 + 92.721 + 92.215 + 92.216 + stainless steel 999.277

	A	B	C	SW
part.number 98.980 :	24	M 6	28	10



ball socket

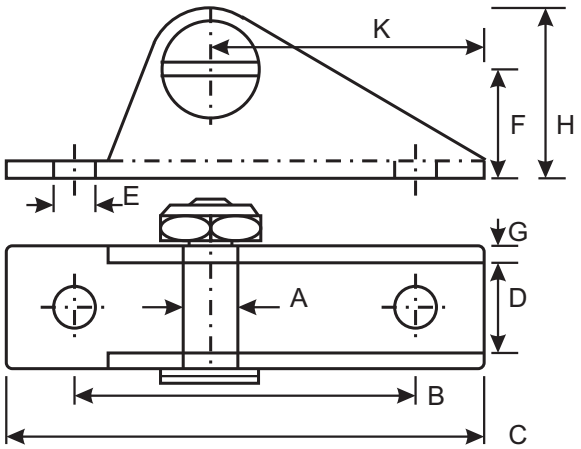
material: stainless steel 1.4305 (AISI 304)

: for ball stud 10 mm
: female taper thread M 6
: for base plate 999.276

	A	B	C
part.number 999.277 :	25	M 6	10

base plates and fastening brackets

stainless steel



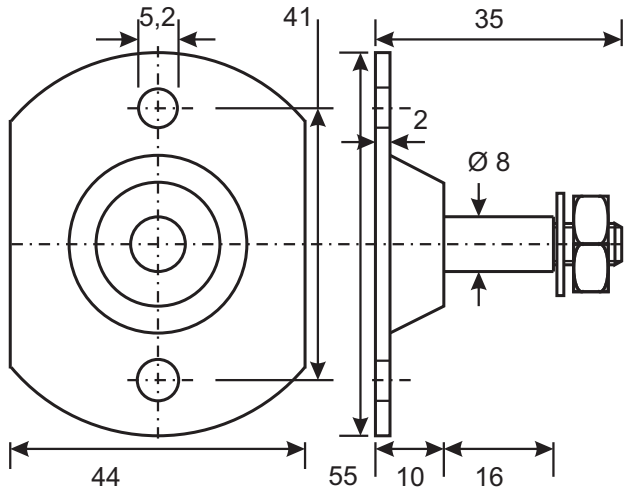
fastening bracket

: stainless steel 1.4305
:with bolt and nut

part.nr.	999.253	999.258	999.260	999.265
A :	6	6	8	8
B :	40	50	50	85
C :	55	70	70	105
D :	11	13	13	13
E :	4,5	6,3	6,3	6,3
F :	10	16	16	22
G :	2	2,5	2,5	2,5
H :	17	25	25	30
K :	35	40	40	70

additional bolt, disc and nut for fastening bracket

	part.number
999.253 and 999.258	999.254
999.260 and 999.265	999.268



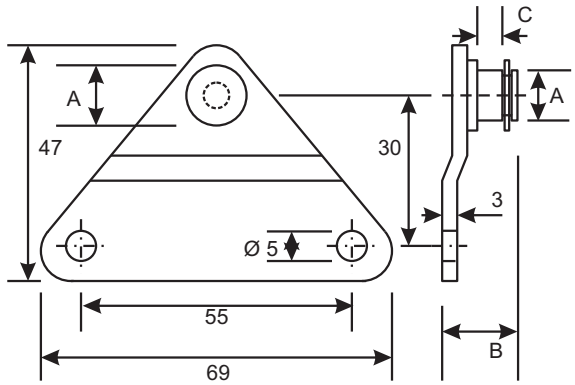
base plate

:stainless steel 1.4305
:with bolt and nut

part.number :999.270

base plates and fastening brackets

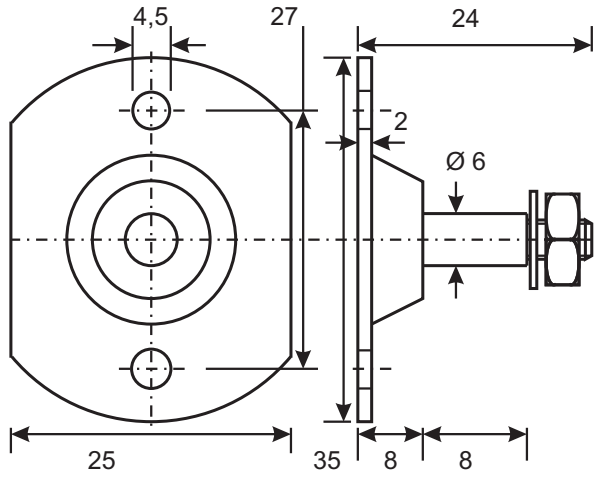
stainless steel



triangle plate for eyelets

:stainless steel 1.4305

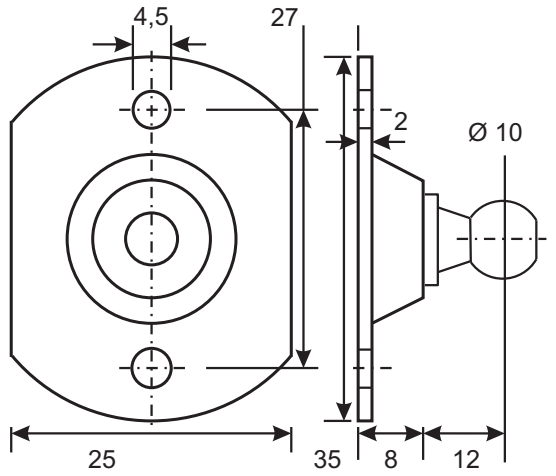
part.number		999.272	999.273
A	:	Ø 6	Ø 8
B	:	17	25
C	:	7	11



base plate

:stainless steel 1.4305
:with bolt and nut
:
:
:

part.number :999.275



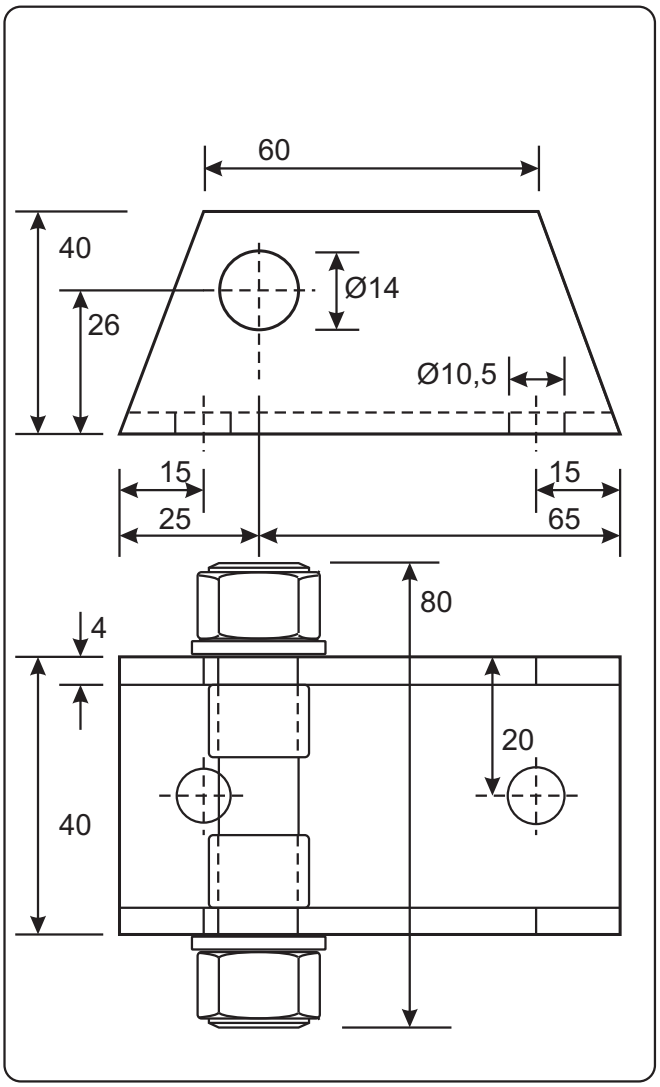
base plate

:stainless steel 1.4305
:with ball stud Ø 10 mm
:for ball socket 72.421 + 74.425
+ 92.215 + 92.216 + 92.220
+ 92.721 + stainless
steel 999.277

part.number :999.276

base plates and fastening brackets

stainless steel

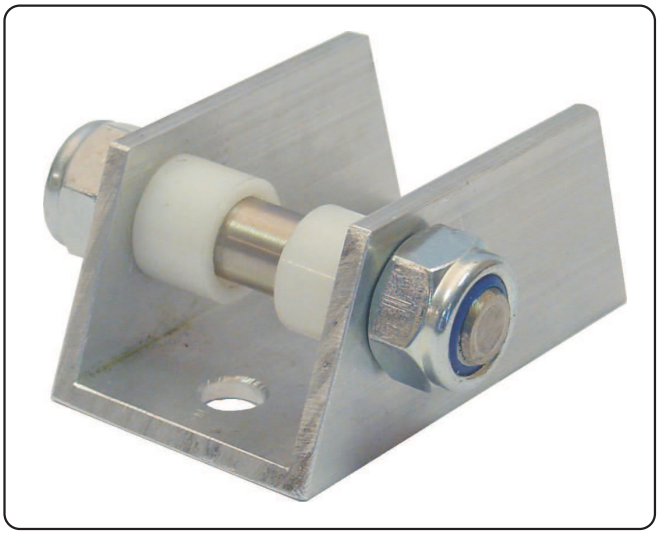


fastening bracket

: for gasspring type 20/40 and 20/42

: stainless steel 1.4301 (304)
: with pen and self-locking nut in stain-
: less steel

part.number : 999.280



custom made products

In the past we have developed, in cooperation with a number of customers, some new products, which may also be suitable for you:

We can also develop specific products for you. To save time and money we will use, as far as possible, standard parts.

part number: 997.050
valve: 997.060
key: 997.070

force releasable gas spring

this gas spring will be, -type dependable- filled to it's largest possible force (by T.Technics).

after assembly the force can be released by means of a key delivered together with the gas spring.

it is not necessary to assemble or disassemble the gas spring every time.

these gas springs are ideal when working on the job, or if it is not possible to calculate the gas spring force before. Also during the proto type phase.

if too much force has been released, we can fill the gas spring again.

the total length of the gas spring is 15 mm longer than the standard gas spring.

this model is available in almost all T.Technics gas springs.

gas springs with electrical contacts

gas springs with electrical contacts

to reduce weight of hatches and panels but also secure these items.

the reed contact can activate a led or sound signal on a control panel when the hatch or panel is opened or closed.

Type 1: with built-in mechanical switch and cable length on request.

Type 2: with built-in magnetic switch and about 400mm cable.

also available with sabotage-circle and 4-vain cable.

Types 1 and 2 switch at the end of the inward stroke.

Type 3: with built-on adjustable contact with led.

cable length 2,5 mtr.
3-vains, 12-30V AC/DC

also available in rust-free performance.

combinations of types 2 and 3 are possible.

exact technical data on request.

Hydraulic cylinders

single and/or double acting.

with 4mm hydraulic hose with clamping bracket in the bottom for a pressure of 75 bar max.

on request other hose fittings and forces are available.

length of stroke optional.

part number 998.600

blocspring **

a continuous variable blockable series of gas springs.

by means of a knob you can fix the piston rod in any position you want.

the locking force is 50 KG.

these gas springs are suitable for height adjustable workstations or similar constructions where a counter weight is available.

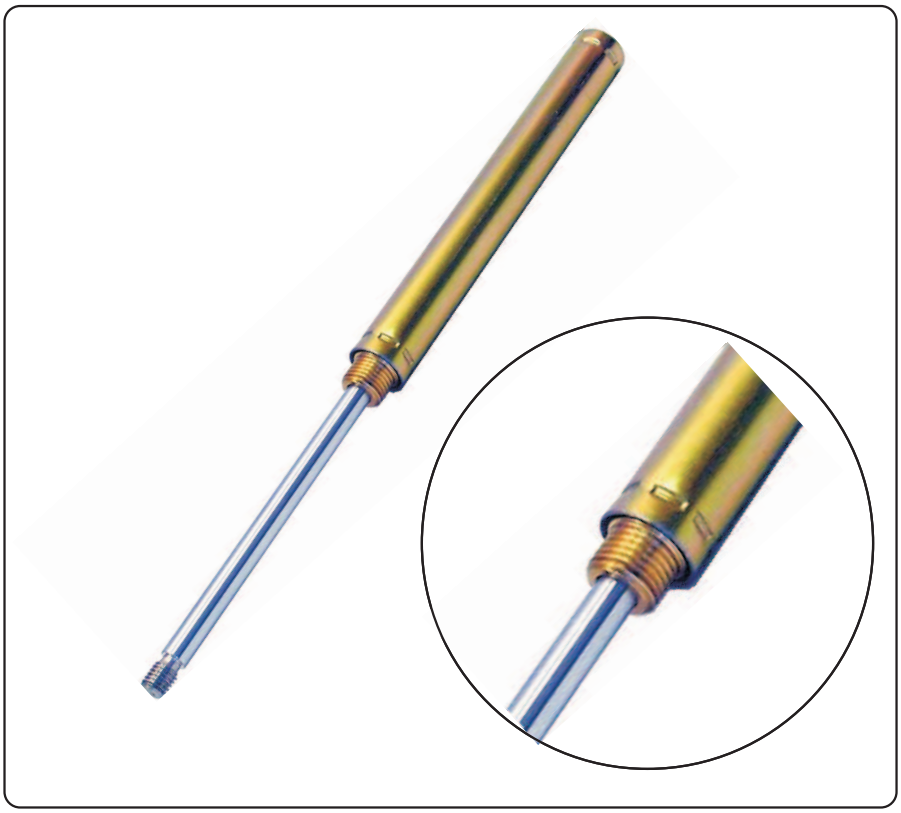
damaging the piston rod has no consequences for the good function of the gas spring.

deliverable are gas springs with a hexagon piston rod of 8, 10 and 13 mm and a force of 100 up to 2500 Newton.

these blocsprings can be provided with all kinds of fixing devices as ball joints, forks and eyes.

available with release valve and stainless steel model.

** patent granted.



oil/gas dampers

as the oil reservoir is always under pressure, a “dead’ stroke is avoided and there is always an inward or outward stroke, as desired, available.

the dampers can be provided with eyes, forks, ball joints or a threaded bus in front of the cylinder.

height adjustable unit, operated manually

Monitor-height- and incline adjustment

Support with hand pressure pump

hydraulic mini-agregate with cylinder

GENERAL TERMS AND CONDITIONS OF SALE, SUPPLY AND PAYMENT

Article 1 APPLICABILITY.
1. These terms and conditions apply to all offers and deliveries made by us to third parties, to all work carried out by us on the assignment of third parties, as well as to all agreements in the broadest meaning of the word entered into by us with third parties.

2. These terms and conditions apply within the Netherlands as well as abroad, regardless of the place of residence or business of any parties involved in any agreement, also regardless of the place where the agreement has come into effect, or should have been performed.

Article 2. OFFERS.
All offers and price quotes are without obligation, unless expressly stated otherwise, and are based on any data provided with the request. All our offers are valid for thirty days from the offer but are made without obligation.
The measurements, weights or results stated by us in images, catalogues, drawings or in any other manner must be deemed to have been provided as an estimate and without obligation.
We will not be bound by these statements and do not accept any liability for any inaccuracies in that data.

Article 3. AGREEMENTS/ASSIGNMENTS.
1. Assignments include every agreement with us, regardless of whether we undertake to deliver items or carry out work, or make materials or space available, or execute whatsoever other performance, all this in the broadest meaning of the word.
2. All agreements concluded with us will only become binding by means of our confirmation in writing. Any addendums or amendments of aforesaid agreements will only bind us after, and insofar as, these have been accepted by us in writing.
Only the management and any person who is authorised thereto in writing by the management can and may enter into agreements on our behalf.
3. Unless this should be expressly agreed otherwise in writing, we will at all times have the right to have the assignment executed, wholly or in part, by third parties, whereby these terms and conditions will also apply for the benefit of such third parties, subject to the condition that we, if necessary retrospectively, authorise them in writing to rely on these terms and conditions without this authorisation being able to result in any obligation arising towards us.

Article 4. MOUNTING, DISASSEMBLY AND REPAIR.
1. Unless expressly agreed otherwise in writing it is agreed that all mounting, installation, repair and construction work, hereinafter referred to as "mounting" will be on the account and risk of the client.
2. In the event of repairs being carried out the replacement materials can be retained by us subject to retention of title. However, client can after 14 days from the date of the invoice request the return thereof.
3. If mounting takes place on our account then the following applies:
A. The client will provide all assistance which can reasonably be expected of client:
B. The client will for this purpose make available to those who are engaged by us for the mounting, hereinafter referred to as "mechanics", workers, fuel, lubricants, electrical power, water and suchlike free of charge.
C. The client will also make available scaffolding, containers, lift, hoist and transport equipment, ladders, mounting resources and similar materials, however this will be at market prices;
D. If, through circumstances beyond our control, the mechanics cannot continue in a regular manner, or must work outside normal working hours, then all costs ensuing therefrom will be charged to the client.

Article 5. LIABILITY.
1. The execution of the assignment will take place entirely on the account and responsibility of the purchaser or client, also in the event of fault or negligence on our part, our staff or other servants or agents.
2. All damage or disadvantages, directly or indirectly caused through incidents through, or in any manner related to, the execution of the assignment, in particular also consequential loss caused by whomever (including ourselves, our staff, or other servants or agents), will be on the account of the purchaser or client, who if necessary has indemnified us fully against claims of third parties, including also the other party to agreements concluded by us / or by purchaser or client.
3. The exclusion of our liability and therewith corresponding obligations to indemnify the client are universal.
They comprise therefore inter alia of the liability for brands, numbers of items, quantities, weights, measurements and suchlike, regarding duration of time and delay or all damage or disadvantages related thereto, such as the becoming due and payable of extra rates, financial penalties, demurrages, etc.: for storage sites, storage places, moorings and suchlike: for all installations, equipment and resources, for personal and other staff and engaged foreign firms, etc.: for the drawing up of documents, declarations, notifications, payments, etc.: for damage suffered by third parties through the transportation.
4. The exclusions of liability and the corresponding obligations to indemnify ensuing from these terms and conditions for the client also apply for the benefit of our staff and servants or agents, who are present during the execution of the assignment, as well as for the benefit of any of our advisers and suchlike.
5. In all events the level of our liability and the liability of persons used by us, will be limited to the amount for which we would execute the assignment or the delivery.

Article 6. DELIVERY PERIODS AND PLACE OF DELIVERY.
1. Delivery periods stated will never be deemed to be final deadlines, unless expressly agreed otherwise in writing. In case of untimely delivery we must be given notice of default accordingly.
2. Exceeding of these periods through whatsoever cause will never give the purchaser or client the right to compensation, termination of the agreement or non-fulfilment of any obligation which might ensue to them from the agreement concerned or any other agreement related to this agreement.
3. In case of exceeding of the delivery period we will enter into further consultation with the purchaser or the client.
4. Delivery will take place from our company or other location to be stated by us.
5. When items sold by us or services offered, after having been offered to the purchaser or the client, are not accepted by them, they will be available to them for the duration of three weeks.
The items will in that case be stored during this period on their account and risk. After aforesaid period the total amount which would be owed in case of taking receipt thereof by the purchaser or the client can be claimed from them, also without delivery of aforesaid items or services.
6. We can consider the address stated by client as such and continue to deem this as such, until any new address has been notified to us in writing.
7. If the purchaser or the client does not or does not in a timely manner fulfil any obligation ensuing from this agreement or any other agreement related to the assignment then we will be entitled, after having given the purchaser or the client notice of default in writing, to without judicial intervention suspend the performance without us becoming obliged to any compensation.

Article 7. RISK.
All items and materials will from the time of sale be on the risk of the purchaser or the client, also when delivery carriage paid might have been agreed. The purchaser or the client is liable for the remainder for all damage (such as transport, fire and water damage, theft or misappropriation) suffered during the transport. On arrival of the items the purchaser or the client must ascertain the condition of the items. If delivery has been agreed other than from our company, then the transport will take place in a manner to be determined by us.

Article 8. PRICES AND COSTS.
1. We record for each assignment separately a price or a rate. These prices or this rate are exclusively intended as the remuneration for the performance accepted by us including the normal costs forming part thereof. The price or rate therefore does not fall under duties from the government or other authorities, such as when concerning import duties, financial penalty, etc., nor guarantees, nor securities to be furnished to whomsoever, nor costs of police escort or costs of barrier materials or of other prescribed obligations. These will be charged separately.
If between acceptance of the assignment and delivery the prices of the matters or services to be purchased by us from third parties increase due to fluctuations of market prices or exchange rates, or otherwise, we will be entitled to charge on these increases to the purchaser or the client. If the delivery appears to amount to less or more than was expected in advance then the total price will be accordingly increased or reduced.
2. We will be entitled to require advance payments of deposit or security. If we have obvious misgivings with regard to the payment capacity of the purchaser, then we will be entitled to postpone the delivery of the purchased items, until the purchaser has furnished security for the payment.
The purchaser is personally liable for any damage to be suffered through this delayed delivery.
3. We include for deliveries an amount always to be determined by us prior to the delivery, as charge for the freight and administrative costs.
4. We can increase the agreed prices in a binding manner for the client. If we increase the prices after the coming into effect of the agreement, the client has the right to terminate the agreement.

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GENERAL TERMS AND CONDITIONS OF SALE, SUPPLY AND PAYMENT

Article 9. PAYMENT TERMS.
Unless expressly agreed otherwise in writing it is agreed that the payment of our invoice must take place within 30 days from the invoice date, without deduction or reductions which are not expressly permitted by us.
We are entitled, for the purpose of prompt payment discount, to charge a surcharge, which surcharge will exclusively in case of payment within 30 days be deducted from the invoice amount. All payments will take place without deduction or setoff at our company or a bank or giro account to be designated by us.

Article 10. INTER COMMUNITY TRADE.
In the event that the VAT number stated to us is not or no longer the client's, then we will not be obliged to any payment. We can, if necessary, recover all damage or still to be paid VAT at all times from the client.

Article 11. COMPENSATION IN CASE OF LATE OR NO PAYMENT.
From the date of the expiry of the aforesaid payment term the other party will owe the statutory interest. The other party will also, after first a reminder or demand in writing, owe extrajudicial costs to an amount to be calculated in accordance with the usual collection rates of the Netherlands Bar Association, with a minimum of € 75.-

over the first	€ 3,000.-	:15%
over the remainder up to	€ 6,000.-	:10%
over the remainder up to	€ 15,000.-	:8%
over the remainder up to	€ 60,000.-	:5%
over the remainder		:3%

Article 12. GUARANTEE AND COMPLAINTS.
1. We provide a guarantee for the items delivered by us during the period which is provided to us by our subcontractors, however only for the materials used and manufacturing faults.
2. We do not guarantee that the items are suitable for the purpose for which the purchaser intends these, even if that purpose has been known to us, unless the contrary is agreed between parties.
3. Any complaints, about delivered goods as well as invoice amounts, must be submitted in writing by registered letter within 7 days from the defect becoming apparent to the purchaser, including precise statement of the facts to which the complaint relates. Complaints about number of items and type can only be submitted at delivery. If submitted complaints do not fulfil the aforesaid they can no longer be received and the purchaser or the client will be deemed to have approved the delivery. When we are of the opinion that a complaint is justifiably submitted, we will have the right to pay a monetary amount, to be determined after further consultation, as compensation to the purchaser or the client, or to proceed with a new delivery with the maintaining of the existing agreement, this subject to the obligation of the purchaser or client in that case to return the wrongly or unsatisfactory delivery, carriage paid. We will only be obliged to take cognisance of submitted complaints when the purchaser or the client involved at the time of the submission of the complaint has fulfilled all their existing obligations towards us, ensuing from whatsoever agreement between them and us. A submitted complaint does not suspend the payment obligation for payment of the prices for delivered goods and services.
No complaint can be received if delivered goods are no longer in every aspect in the same condition as at the time of delivery. Return consignments are not permitted unless we have provided express permission in writing for this purpose.

Article 13. RETENTION OF TITLE.
All items delivered or still to be delivered remain exclusively the property of the seller until all claims which the seller has or will have against the purchaser, on whatsoever basis, are paid in full. As long as the ownership of the items has not been transferred to the purchaser, the purchaser may not pledge, transfer in ownership for security, or provide third parties with any right to the items. The purchaser is obliged to keep the items which are delivered subject to retention of title, with the necessary carefulness and as recognisably the property of the purchaser. If the purchaser is in default of its payment obligation or is in payment difficulties, then the seller will be entitled to take back the goods which have been delivered subject to retention of title, and which are still present at the purchaser's, without any notice of default, in which case the agreement will also be terminated without judicial intervention, without prejudice to our right, if necessary by bringing legal proceedings, to claim compensation of any damage suffered by us, including lost profit and interest.
Purchaser or client authorise us hereby irrevocably to enter their site and buildings for this purpose. This is without prejudice to the other rights accruing to seller.

Article 14. PURCHASE CONDITIONS.
If the purchaser or the client applies (purchase) conditions, then these will not apply to us insofar as these derogate from these terms and conditions of supply. The purchaser will inform us in writing if the purchaser wishes to apply its personal purchase conditions. This will be deemed by us to be a new offer which will not bind us earlier than when we have confirmed this in writing.

Article 15. DEROGATION FROM TERMS AND CONDITIONS.
Any derogation from these terms and conditions applied by us at any time for the benefit of the purchaser or the client will never retrospectively provide the latter with the right to rely on, or to claim such derogation as definite for the purchaser or the client.

Article 16. FORCE MAJEURE.
Force majeure will release us from our obligation towards the purchaser or the client. Force majeure factors are considered to be those events and situations that occur either at home or abroad, which have a demonstrable direct and indirect impact on our company, if there are inter alia prohibited on the part of the Dutch or foreign governments, livestock diseases, serious disruptions of our production process, war, riot, epidemic, transport disruptions, job strike, exclusion, loss or damage in case of transport, embargos, bankruptcy, or breach of contract of suppliers, lack of raw materials and fuel. In the event of hindrance to the performance of the agreement resulting from force majeure we will either be entitled to suspend the performance of the agreement for no more than 6 months, or to terminate the agreement wholly or in part, without us ever being obliged to payment of compensation.

Article 17. CANCELLATION.
If the purchaser or the client cancels an assignment or order, then purchaser or client will owe us a financial penalty of 25% of the value of that assignment or order, to be paid within 30 days from the sending of the invoice concerned by us, without prejudice to our right to claim compensation in full and/or specific performance of the agreement.

Article 18. DISPUTES.
1. With regard to all obligations and legal actions between parties the law of the Netherlands is applicable.
2. Any legal claims which the other party has against the seller on whatsoever basis must be brought, subject to lapse of all rights, within one year from the coming into effect of the agreement between parties.
3. Any disputes regarding all obligations and legal claims which ensue from the agreement will according to the subject matter jurisdiction at first instance be adjudicated by the subdistrict court with territorial jurisdiction over this, or at least the District Court of the district in which our company has its business location. The purchaser will be given the opportunity within one month after we have relied in writing on this clause for adjudication of the dispute to still choose in accordance with the law the court of competent jurisdiction.
4. In case of any differences between the Dutch and a text of these terms and conditions in another language the Dutch text will prevail.

Hengelo, 15 September 1994.

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