

Motion Control

**Gas Springs – Push Type, Gas Springs – Pull Type
Hydraulic Dampers, Hydraulic Feed Controls
Rotary Dampers**



Perfect Support for Muscle Power

Customised to suit your applications

The various products from ACE in this segment give a new quality to any type of movement. Anyone who wants to raise or lower loads, regulate the feed of an object to the precise millimetre or gently decelerate rotating or linear movements will find the right helper here.

ACE also convinces with industry quality in this area. And the innovative solutions also correspond with the maximum requirements of ergonomics and individuality, including with customised, fillable gas springs.



Industrial Gas Springs – Push Type

Lifting and lowering for smart people

Anyone who wants to lift or lower loads with control and without excessive strength relies on the industrial gas push type springs from ACE. These maintenance-free, ready-to-install machine elements, which are available from stock, support sheer muscle power and reliably open and hold.

Available with body diameters of 8 mm to 70 mm and forces from 10 N to 13,000 N, ACE gas push type springs are characterised by a huge variety and maximum service life. The first is achieved thanks to the number of available connections and fittings for simple attachment and the latter with high quality design and materials. Whether they are made of steel or stainless steel, these components make any work easier and also make a particularly good impression visually in every branch.

Ready-to-install and universally applicable

Modular end fittings and mounting brackets

Calculation program for individual design

No own construction costs

Maintenance-free

Available with valve ex stock



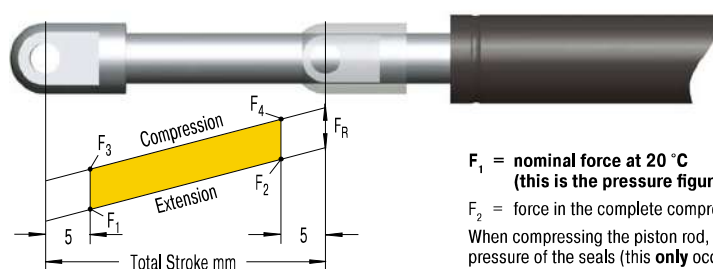
Function of a Gas Spring – Push Type

ACE gas springs are individually filled to a predetermined pressure to suit a customer's requirement (extension Force F_1). The cross-sectional area of the piston rod and filling pressure determines the extension force.

During the compression of the piston rod, nitrogen flows through an orifice in the piston from the full bore side of the piston to the annulus. The nitrogen is compressed by the volume of the piston rod. As the piston rod is compressed the pressure increases, so increasing the reaction force (progression). The force depends on the proportional relationship between the piston rod and the inner tube diameter, which is approximately linear.

Calculation Principles

Force-Stroke Characteristics of Gas Spring (Push Type)



Free
calculation service
see page 172!

F_1 = nominal force at 20 °C
(this is the pressure figure normally used when specifying the gas spring)

F_2 = force in the complete compressed position

When compressing the piston rod, there is an additional friction force caused by the contact pressure of the seals (this **only** occurs **during the compression stroke**):

F_3 = force at the beginning of the compression stroke

F_4 = force at the end of the compression stroke

Gas Springs (Push Type)

TYPES	Progression approx. %	¹ Friction F_R approx. in N
GS-8	29 - 33 ²	10
GS-10	13 - 16 ²	10
GS-12	20 - 35 ²	20
GS-15	30 - 40 ²	20
GS-19	24 - 35 ²	30
GS-22	30 - 40 ²	30
GS-28	63 - 76 ²	40
GS-40	38 - 50 ²	50
GS-70	25	50

¹ Depending on the filling force

² Depending on the stroke

Progression: (the slope of the force line in the diagram above) is due to the reduction of the internal gas volume as the piston rod moves from its initial position to its fully stroked position. The approx. progression values given above for standard springs can be altered on request.

Effect of temperature: The nominal F_1 figure is given at 20 °C. An increase of 10 °C will increase force by 3.4 %.

Filling tolerances: -20 N to +40 N or 5 % to 7 %. Depending on size and extension force the tolerances can differ.

Industrial Gas Springs – Push Type



GS-8 to GS-70

Valve Technology

Individual stroke length and extension forces

Hoods, Shutters, Machine housing, Conveyor systems

Page 134



GS-8-V4A to GS-40-VA

Valve Technology, Stainless Steel

With food grade oil according to FDA approval

Hoods, Shutters, Machine housing, Conveyor systems

Page 144



GST-40 Tandem

Valve Technology

Optimised dual force for heavy flaps and wide angle applications

Hoods, Shutters, Machine housing, Conveyor systems

Page 154

GS-8 to GS-70

Individual stroke length and extension forces

Valve Technology

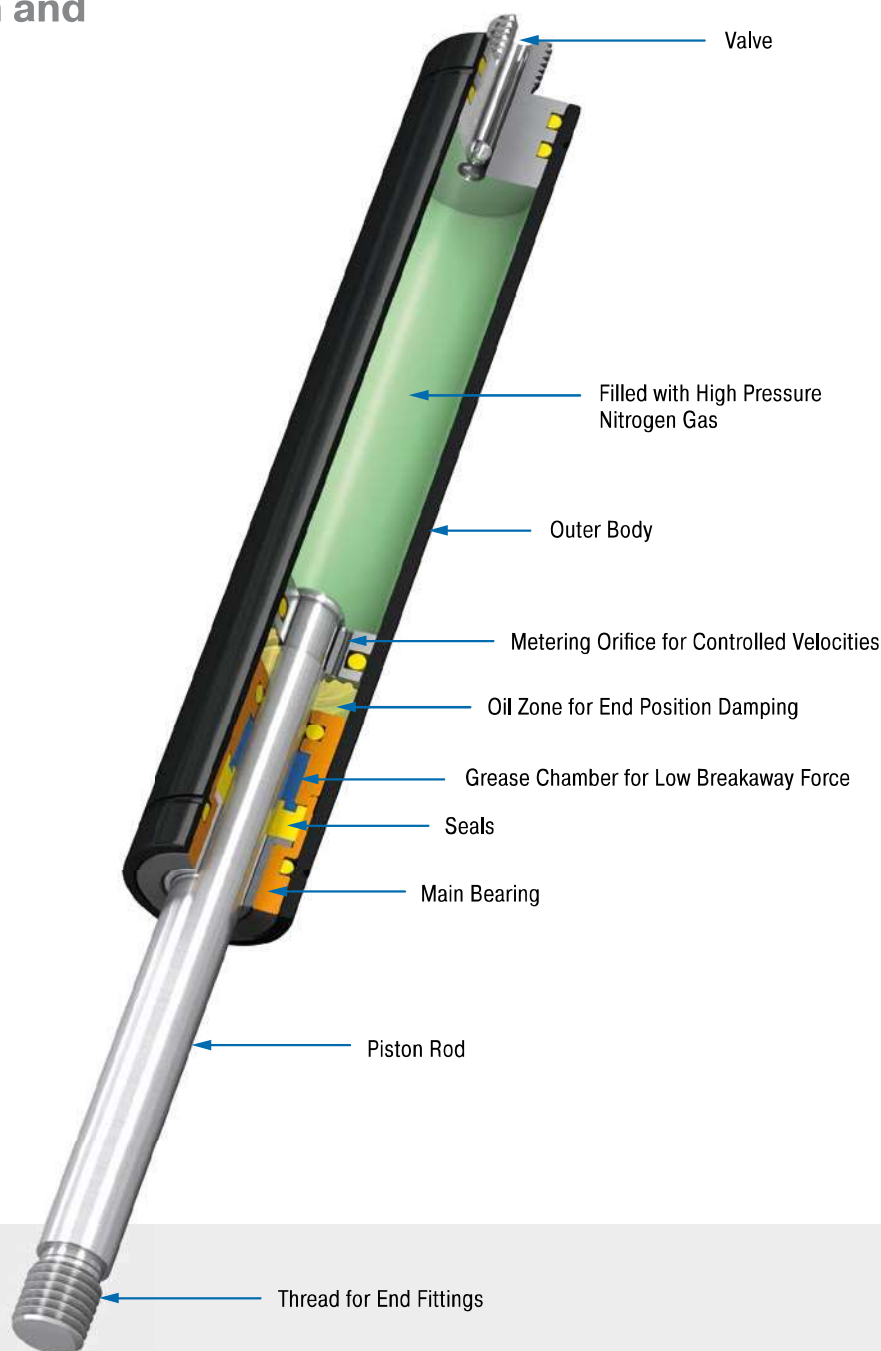
Force range 10 N to 13,000 N

Stroke 20 mm to 1,000 mm

Universal and tailor made: ACE industrial gas push type springs of the NEWTONLINE family offer perfect support of muscle power with forces from 10 to 13,000 N with body diameter of 8 to 70 mm. With their high quality features the NEWTONLINE gas springs form the industry standard. These durable and sealed systems are ready for installation, maintenance-free and filled with pressurised nitrogen gas.

They are supplied filled according to individual customer pressure requirements and maybe adjusted later by use of the inbuilt valve. The free of charge ACE calculation service designs the gas springs with mounting points specifically for the particular application. A variety of additional components makes assembly even easier and allows universal application of the gas springs.

ACE industrial gas push type springs are used in industrial applications, mechanical engineering and medical technology as well as in the electronics, automobile and furniture industries.



Technical Data

Extension force: 10 N to 13,000 N

Piston rod diameter: Ø 3 mm to Ø 30 mm

Progression: approx. 13 % to 76 % (depending on size and stroke)

Lifetime: Approx. 10,000 m

Operating temperature range: -20 °C to +80 °C

Material: Outer body: coated steel; Piston rod: steel or stainless steel with wear-resistant coating; End fittings: zinc plated steel

Operating fluid: nitrogen gas and oil

Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

End position damping length: Approx. 5 mm to 70 mm (depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Application field: hoods, shutters, machine housing, conveyor systems, control boxes, furniture industry, jacking applications, assembly stations, vehicle technology, folding elements

Note: Increased break-away force if unit has not moved for some time.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas springs (push type) should not be installed under pre-tension.

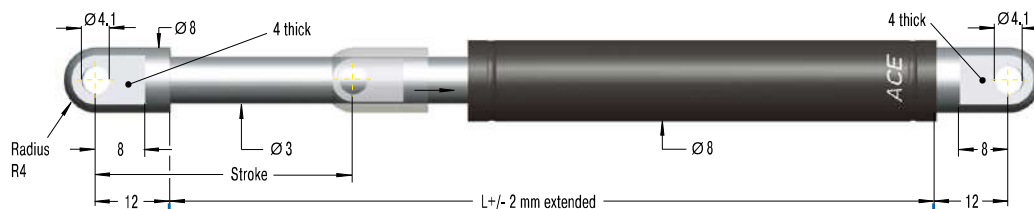
On request: Special oils and other special options. Alternative accessories. Different end position damping and extension speed.

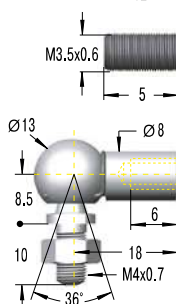
Valve Technology, Extension force 10 N to 100 N (compressed up to 133 N)

End Fitting

Standard Dimensions

End Fitting

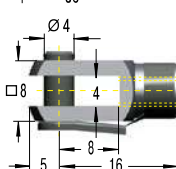
A3,5

Eye A3,5
max. force 370 N

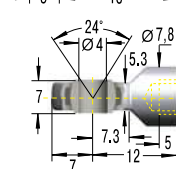
B3,5
C3,5


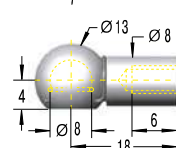
Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-8-20	20	72	100
GS-8-30	30	92	100
GS-8-40	40	112	100
GS-8-50	50	132	100
GS-8-60	60	152	100
GS-8-80	80	192	100

Stud Thread B3,5
Angle Ball Joint C3,5
max. force 370 N

D3,5

Clevis Fork D3,5
max. force 370 N

E3,5

Swivel Eye E3,5
max. force 370 N

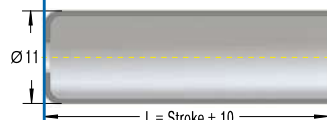
G3,5

Ball Socket G3,5
max. force 370 N

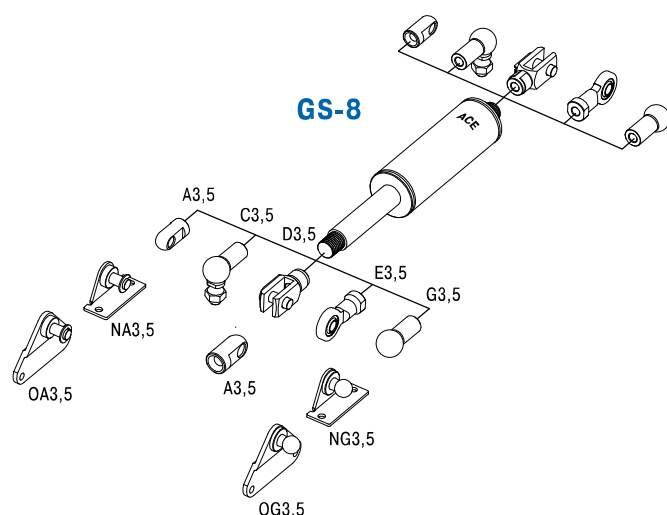
Ordering Example

Type (Push Type) _____
 Body Ø (8 mm) _____
 Stroke (30 mm) _____
 Piston Rod End Fitting A3,5 _____
 Body End Fitting C3,5 _____
 Nominal Force F₁ 30 N _____

GS-8-30-AC-30

Mounting accessories see from
page 200.

Rod Shroud W3,5-8

**Adjuster Knob
DE-GAS-3,5**
See page 175.

GS-8


Technical Data

Extension force: 10 N to 100 N (compressed up to 133 N)

Progression: Approx. 29 % to 33 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body: coated steel; Piston rod: stainless steel (1.4301/1.4305, AISI 304/303); End fittings: zinc plated steel

Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

End position damping length: approx. 5 mm (depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Increased break-away force if unit has not moved for some time.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas springs (push type) should not be installed under pre-tension.

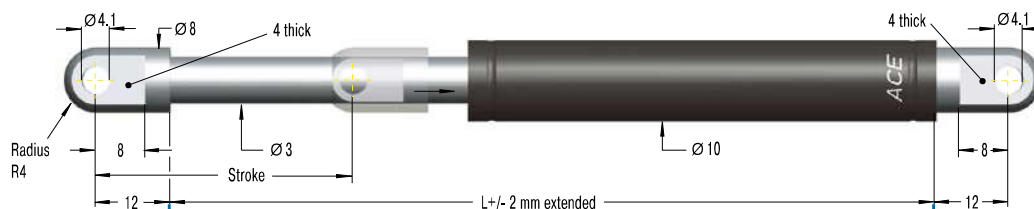
Valve Technology, Extension force 10 N to 100 N (compressed up to 116 N)

End Fitting

Standard Dimensions

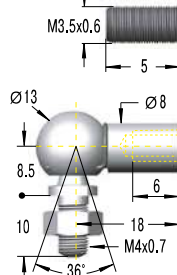
End Fitting

A3,5

Eye A3,5
max. force 370 N

B3,5

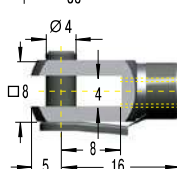
C3,5



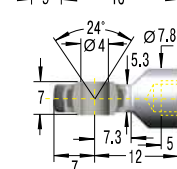
Stud Thread B3,5

Angle Ball Joint C3,5
max. force 370 N

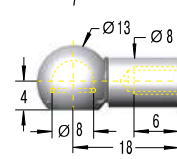
D3,5

Clevis Fork D3,5
max. force 370 N

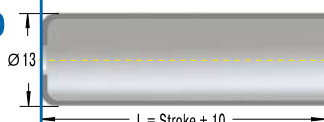
E3,5

Swivel Eye E3,5
max. force 370 N

G3,5

Ball Socket G3,5
max. force 370 N

Rod Shroud W3,5-10



Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-10-20	20	72	100
GS-10-30	30	92	100
GS-10-40	40	112	100
GS-10-50	50	132	100
GS-10-60	60	152	100
GS-10-80	80	192	100

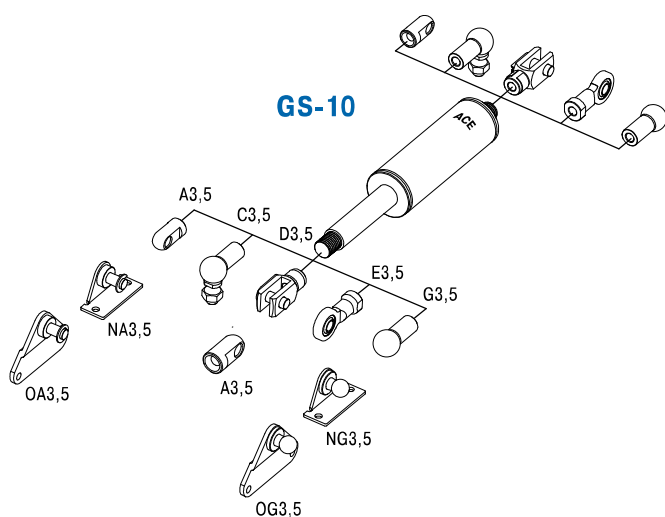
Ordering Example

Type (Push Type) _____
 Body Ø (10 mm) _____
 Stroke (80 mm) _____
 Piston Rod End Fitting A3,5 _____
 Body End Fitting C3,5 _____
 Nominal Force F_1 60 N _____

GS-10-80-AC-60

Mounting accessories see from
page 200.

Technical Data

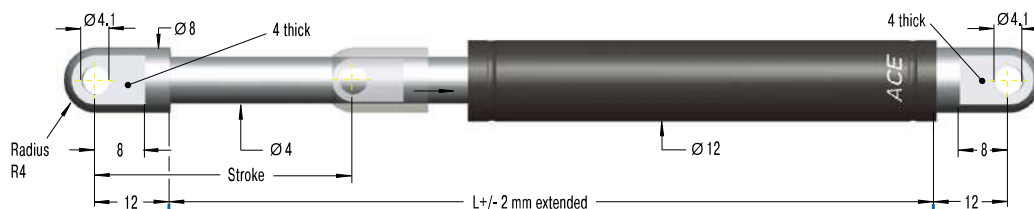
Extension force: 10 N to 100 N (compressed up to 116 N)**Progression:** Approx. 13 % to 16 %**Operating temperature range:** -20 °C to +80 °C**Material:** Outer body: coated steel; Piston rod: stainless steel (1.4301/1.4305, AISI 304/303); End fittings: zinc plated steel**Mounting:** We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.**End position damping length:** approx. 5 mm (depending on the stroke)**Positive stop:** External positive stop at the end of stroke provided by the customer.**Note:** Increased break-away force if unit has not moved for some time.**End fittings:** They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.**Safety instructions:** Gas springs (push type) should not be installed under pre-tension.

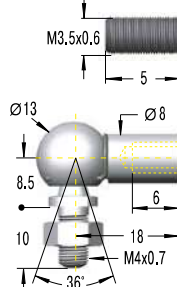
Valve Technology, Extension force 15 N to 180 N (compressed up to 243 N)

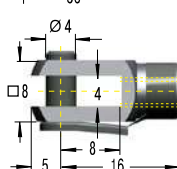
End Fitting

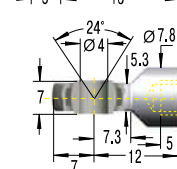
Standard Dimensions

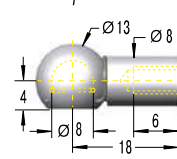
End Fitting

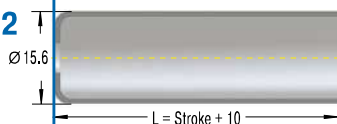
A3,5

Eye A3,5
max. force 370 N

B3,5
C3,5

Stud Thread B3,5
Angle Ball Joint C3,5
max. force 370 N

D3,5

Clevis Fork D3,5
max. force 370 N

E3,5

Swivel Eye E3,5
max. force 370 N

G3,5

Ball Socket G3,5
max. force 370 N

Rod Shroud W3,5-12


Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-12-20	20	72	180
GS-12-30	30	92	180
GS-12-40	40	112	180
GS-12-50	50	132	180
GS-12-60	60	152	180
GS-12-80	80	192	150
GS-12-100	100	232	150
GS-12-120	120	272	120
GS-12-150	150	332	100

Ordering Example

Type (Push Type) _____
 Body Ø (12 mm) _____
 Stroke (100 mm) _____
 Piston Rod End Fitting A3,5 _____
 Body End Fitting A3,5 _____
 Nominal Force F₁ 30 N _____

GS-12-100-AA-30

Mounting accessories see from
page 200.

Technical Data

Extension force: 15 N to 180 N (compressed up to 243 N)

Progression: Approx. 20 % to 35 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body: coated steel; Piston rod: stainless steel (1.4301/1.4305, AISI 304/303); End fittings: zinc plated steel

Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

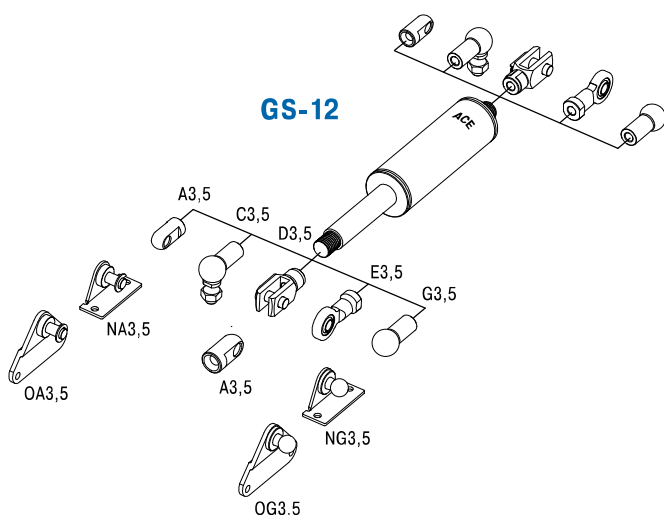
End position damping length: approx. 10 mm (depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Increased break-away force if unit has not moved for some time.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas springs (push type) should not be installed under pre-tension.

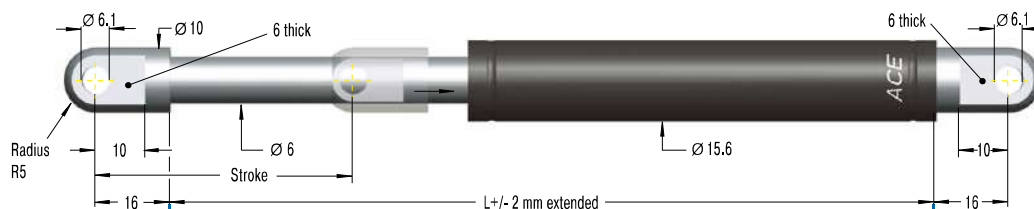
GS-12


End Fitting

Standard Dimensions

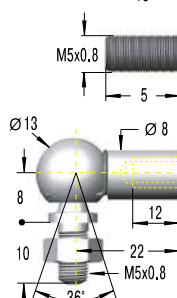
End Fitting

A5


Eye A5
max. force 800 N

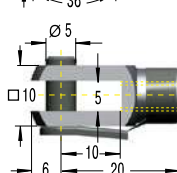
B5

C5

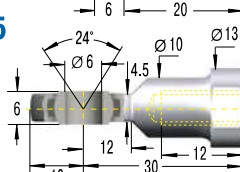


Stud Thread B5

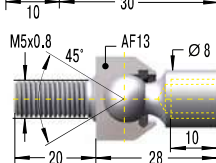
D5


Clevis Fork D5
max. force 800 N

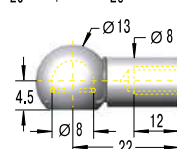
E5


Swivel Eye E5
max. force 800 N

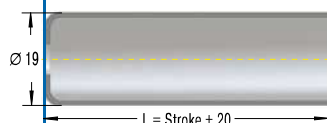
F5


Inline Ball Joint F5
max. force 500 N

G5


Ball Socket G5
max. force 500 N

Rod Shroud W5-15



Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-15-20	20	67	400
GS-15-40	40	107	400
GS-15-50	50	127	400
GS-15-60	60	147	400
GS-15-80	80	187	400
GS-15-100	100	227	400
GS-15-120	120	267	400
GS-15-150	150	327	400
GS-15-200	200	427	350

Ordering Example

Type (Push Type) _____
 Body Ø (15.6 mm) _____
 Stroke (150 mm) _____
 Piston Rod End Fitting A5 _____
 Body End Fitting C5 _____
 Nominal Force F₁ 150 N _____

GS-15-150-AC-150

 Mounting accessories see from
page 200.

 Adjuster Knob
DE-GAS-5
See page 175.

Technical Data

Extension force: 40 N to 400 N (compressed up to 560 N)

Progression: Approx. 30 % to 40 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body: steel coated with UV paint; Piston rod: steel with wear-resistant coating; End fittings: zinc plated steel

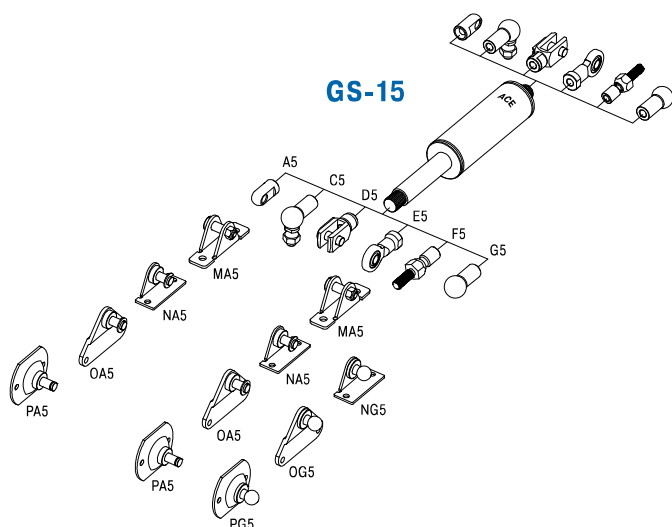
Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

End position damping length: approx. 10 mm
(depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Increased break-away force if unit has not moved for some time.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas springs (push type) should not be installed under pre-tension.


Valve Technology, Extension force 50 N to 700 N (compressed up to 945 N)

End Fitting

Standard Dimensions

End Fitting

A8

B8

C8

D8

E8

F8

G8

Rod Shroud W8-19

Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-19-50	50	164	700
GS-19-100	100	264	700
GS-19-150	150	364	700
GS-19-200	200	464	700
GS-19-250	250	564	600
GS-19-300	300	664	450

Ordering Example

GS-19-150-AC-600

Type (Push Type) _____
Body Ø (19 mm) _____
Stroke (150 mm) _____
Piston Rod End Fitting A8 _____
Body End Fitting C8 _____
Nominal Force F₁ 600 N _____

Mounting accessories see from page 200.

Eye A8
max. force 3,000 N

Stud Thread B8

Angle Ball Joint C8
max. force 1,200 N

Clevis Fork D8
max. force 3,000 N

Swivel Eye E8
max. force 3,000 N

Inline Ball Joint F8
max. force 1,200 N

Ball Socket G8
max. force 1,200 N

Adjuster Knob DE-GAS-8
See page 175.

Technical Data

Extension force: 50 N to 700 N (compressed up to 945 N)

Progression: Approx. 24 % to 35 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body: steel coated with UV paint; Piston rod: steel with wear-resistant coating; End fittings: zinc plated steel

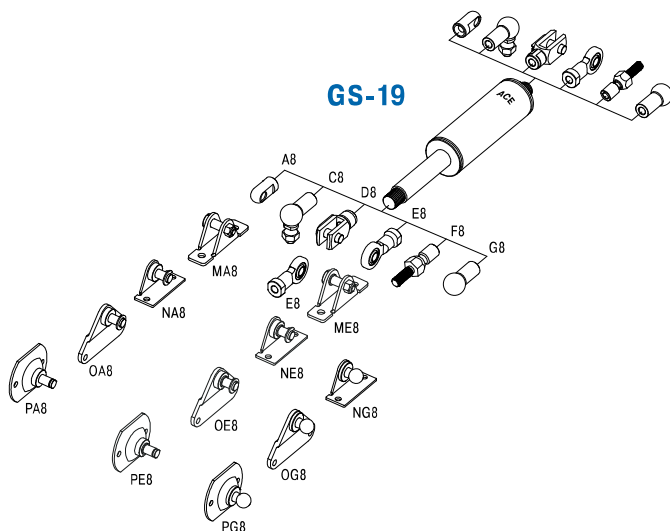
Mounting: In any position. Hint: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

End position damping length: approx. 20 mm to 60 mm (depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Integrated grease chamber reduces friction and wear and optimises lubrication.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

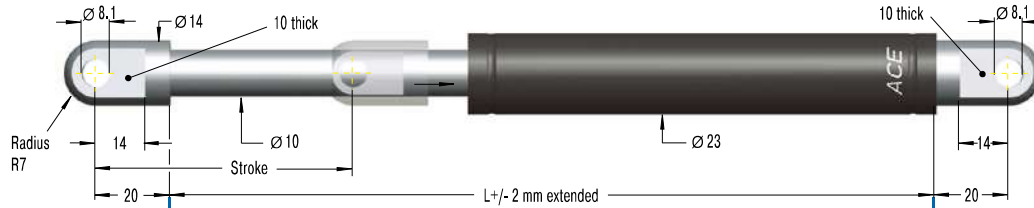
Safety instructions: Gas springs (push type) should not be installed under pre-tension.


End Fitting

Standard Dimensions

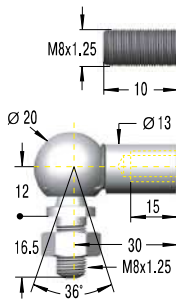
End Fitting

A8

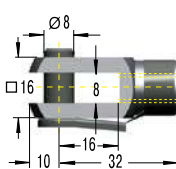

Eye A8
 max. force 3,000 N

B8

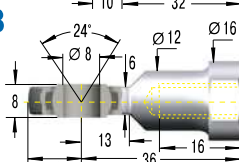
C8


Stud Thread B8
Angle Ball Joint C8
 max. force 1,200 N

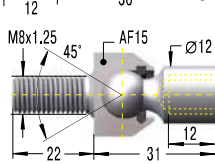
D8


Clevis Fork D8
 max. force 3,000 N

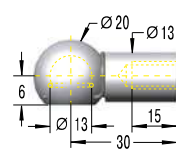
E8


Swivel Eye E8
 max. force 3,000 N

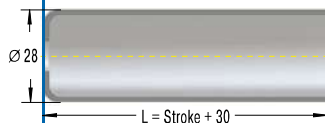
F8


Inline Ball Joint F8
 max. force 1,200 N

G8


Ball Socket G8
 max. force 1,200 N

Rod Shroud W8-22



Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-22-50	50	164	1,300
GS-22-100	100	264	1,300
GS-22-150	150	364	1,300
GS-22-200	200	464	1,300
GS-22-250	250	564	1,300
GS-22-300	300	664	1,100
GS-22-350	350	764	850
GS-22-400	400	864	650
GS-22-450	450	964	550
GS-22-500	500	1,064	450
GS-22-550	550	1,164	400
GS-22-600	600	1,264	350
GS-22-650	650	1,364	300
GS-22-700	700	1,464	250

Ordering Example

Type (Push Type) _____
 Body Ø (23 mm) _____
 Stroke (150 mm) _____
 Piston Rod End Fitting A8 _____
 Body End Fitting E8 _____
 Nominal Force F_1 800 N _____

GS-22-150-AE-800

 Mounting accessories see from
 page 200.

**Adjuster Knob
 DE-GAS-8**

See page 175.

Technical Data

Extension force: 80 N to 1,300 N (compressed up to 1,820 N)

Progression: Approx. 30 % to 40 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body: steel coated with UV paint; Piston rod: steel with wear-resistant coating; End fittings: zinc plated steel

Mounting: In any position. Hint: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

End position damping length: approx. 20 mm to 70 mm (depending on the stroke)

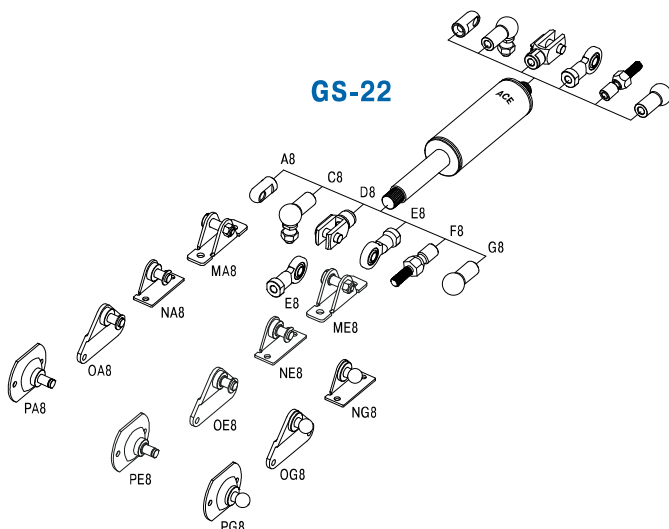
Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Integrated grease chamber reduces friction and wear and optimises lubrication.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas springs (push type) should not be installed under pre-tension.

GS-22



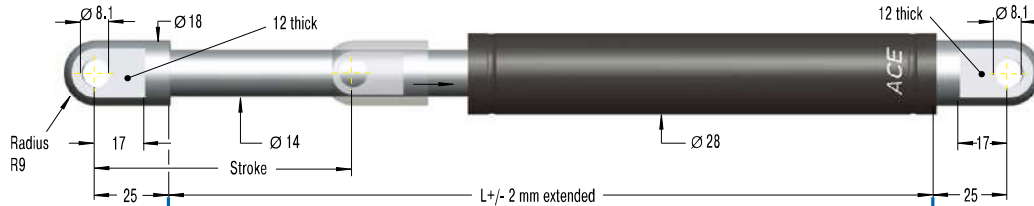
Valve Technology, Extension force 150 N to 2,500 N (compressed up to 4,400 N)

End Fitting

Standard Dimensions

End Fitting

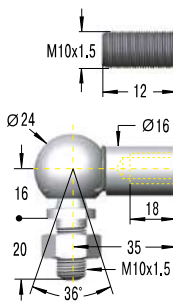
A10



Eye A10
max. force 10,000 N

B10

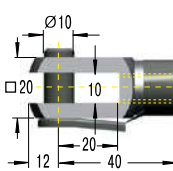
C10



Stud Thread B10

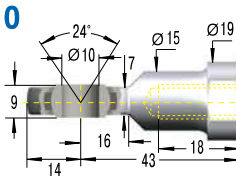
Angle Ball Joint C10
max. force 1,800 N

D10



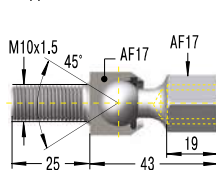
Clevis Fork D10
max. force 10,000 N

E10



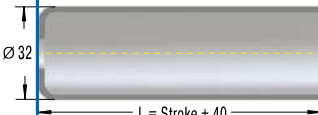
Swivel Eye E10
max. force 10,000 N

F10



Inline Ball Joint F10
max. force 1,800 N

Rod Shroud W10-28



Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-28-100	100	262	2,500
GS-28-150	150	362	2,500
GS-28-200	200	462	2,500
GS-28-250	250	562	2,500
GS-28-300	300	662	2,500
GS-28-350	350	762	2,500
GS-28-400	400	862	2,400
GS-28-450	450	962	1,950
GS-28-500	500	1,062	1,600
GS-28-550	550	1,162	1,350
GS-28-600	600	1,262	1,150
GS-28-650	650	1,362	1,000
GS-28-700	700	1,462	900
GS-28-750	750	1,562	800

Ordering Example

Type (Push Type) _____
Body Ø (28 mm) _____
Stroke (150 mm) _____
Piston Rod End Fitting E10 _____
Body End Fitting E10 _____
Nominal Force F₁ 1200 N _____

GS-28-150-EE-1200

Mounting accessories see from
page 200.

**Adjuster Knob
DE-GAS-10**
See page 175.

Technical Data

Extension force: 150 N to 2,500 N (compressed up to 4,400 N)

Progression: Approx. 63 % to 76 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body: steel coated with UV paint; Piston rod: steel with wear-resistant coating; End fittings: zinc plated steel

Mounting: In any position. Hint: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

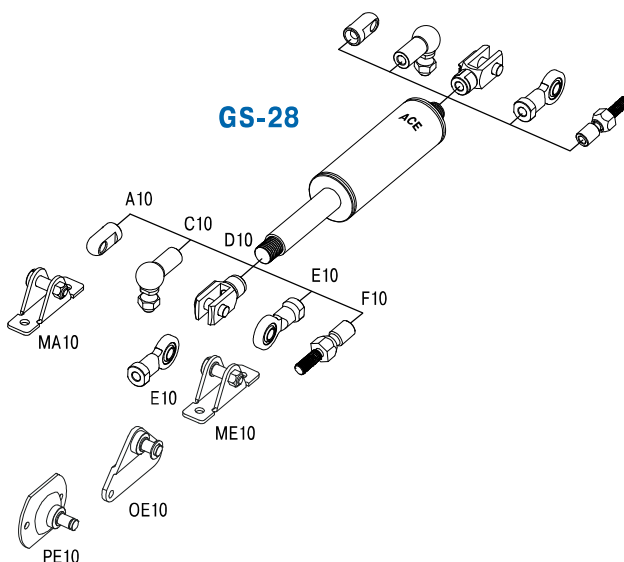
End position damping length: approx. 30 mm to 70 mm (depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Integrated grease chamber reduces friction and wear and optimises lubrication.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas springs (push type) should not be installed under pre-tension.



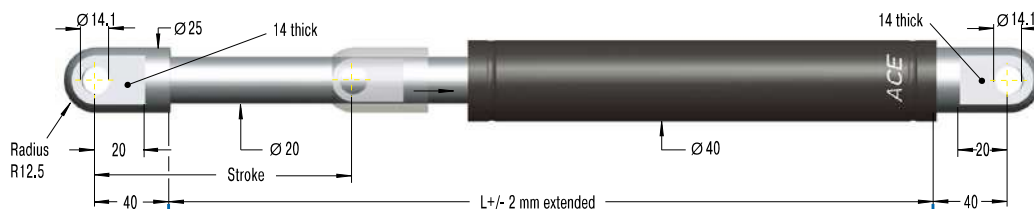
Valve Technology, Extension force 500 N to 5,000 N (compressed up to 7,500 N)

End Fitting

Standard Dimensions

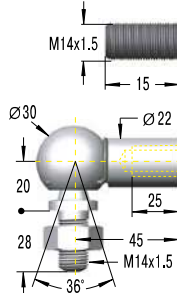
End Fitting

A14


Eye A14
max. force 10,000 N

B14

C14



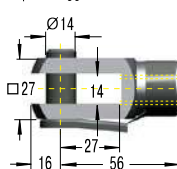
Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-40-100	100	317	5,000
GS-40-150	150	417	5,000
GS-40-200	200	517	5,000
GS-40-250	250	617	5,000
GS-40-300	300	717	5,000
GS-40-400	400	917	5,000
GS-40-500	500	1,117	5,000
GS-40-600	600	1,317	4,150
GS-40-800	800	1,717	2,550
GS-40-1000	1,000	2,117	1,700

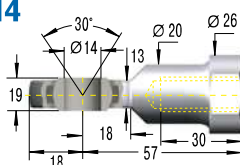
Stud Thread B14

Angle Ball Joint C14
max. force 3,200 N

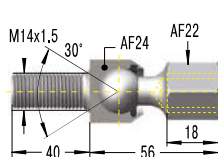
D14


Clevis Fork D14
max. force 10,000 N

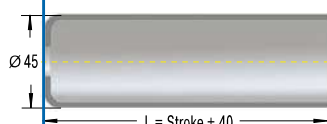
E14


Swivel Eye E14
max. force 10,000 N

F14

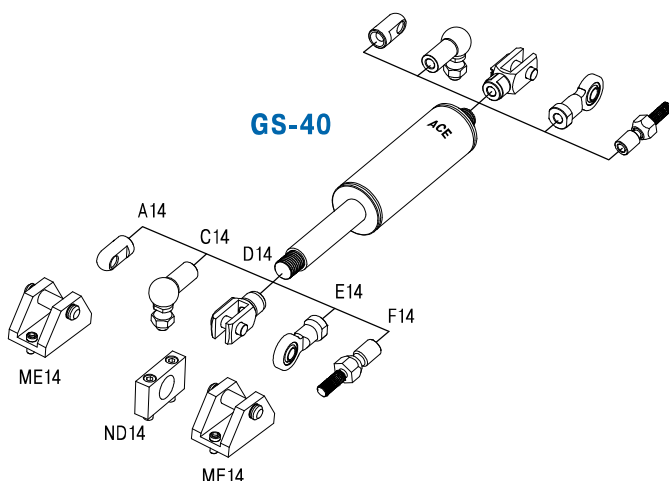

Inline Ball Joint F14
max. force 3,200 N

Rod Shroud W14-40



Mounting accessories see from page 200.

Technical Data

Extension force: 500 N to 5,000 N (compressed up to 7,500 N)**Progression:** Approx. 38 % to 50 %**Operating temperature range:** -20 °C to +80 °C**Material:** Outer body: steel coated with UV paint; Piston rod: steel with wear-resistant coating; End fittings: zinc plated steel**Mounting:** In any position. Hint: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.**End position damping length:** approx. 30 mm to 70 mm (depending on the stroke)**Positive stop:** External positive stop at the end of stroke provided by the customer.**Note:** Integrated grease chamber reduces friction and wear and optimises lubrication.**End fittings:** They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.**Safety instructions:** Gas springs (push type) should not be installed under pre-tension.
Adjuster Knob
DE-GAS-14

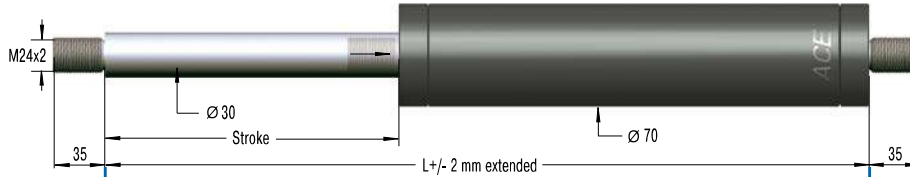
See page 175.

End Fitting

Standard Dimensions

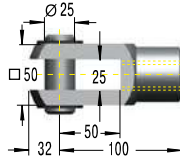
End Fitting

B24



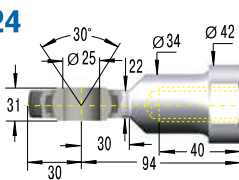
Stud Thread B24

D24



Clevis Fork D24
max. force 50,000 N

E24



Swivel Eye E24
max. force 50,000 N

Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-70-100	100	320	13,000
GS-70-200	200	520	13,000
GS-70-300	300	720	13,000
GS-70-400	400	920	13,000
GS-70-500	500	1,120	13,000
GS-70-600	600	1,320	13,000
GS-70-700	700	1,520	13,000
GS-70-800	800	1,720	11,550

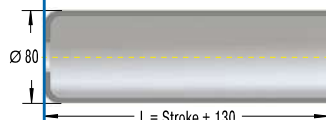
Ordering Example

GS-70-200-EE-8000

Type (Push Type) _____
 Body Ø (70 mm) _____
 Stroke (200 mm) _____
 Piston Rod End Fitting E24 _____
 Body End Fitting E24 _____
 Nominal Force F₁ 8000 N _____

Mounting accessories see from
page 200.

Rod Shroud W24-70



Technical Data

Extension force: 2,000 N to 13,000 N (compressed up to 16,250 N)

Progression: Approx. 25 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body: coated steel; Piston rod: hard chrome plated steel; End fittings: zinc plated steel

Mounting: In any position. Hint: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

End position damping length: approx. 10 mm to 20 mm (depending on the stroke)

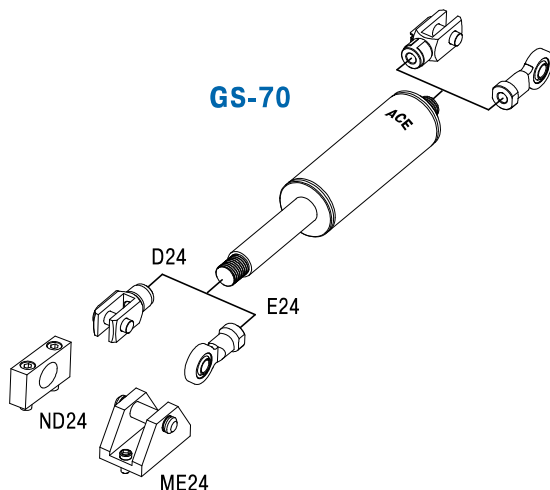
Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Increased break-away force if unit has not moved for some time.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas springs (push type) should not be installed under pre-tension.

GS-70



GS-8-V4A to GS-40-VA

With food grade oil according to FDA approval

Valve Technology, Stainless Steel

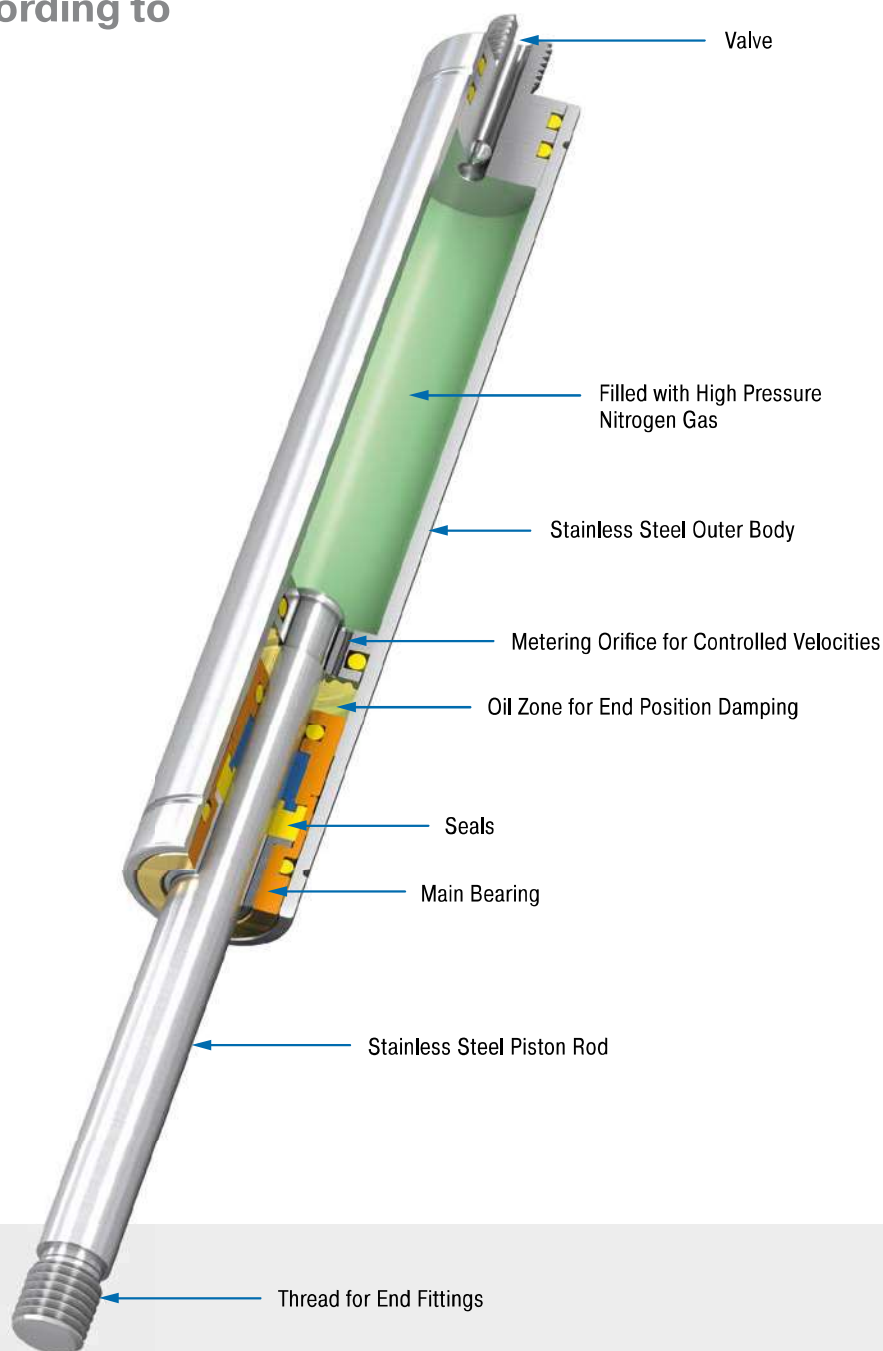
Force range 10 N to 5,000 N

Stroke 20 mm to 700 mm

Protection against corrosion and superior optics for even more sophisticated requirements: Based on ACE's industrial gas push type springs GS-8 to 40 made of steel, these models combine all advantages of stainless steel: they look great and are rust free. They are filled with food-grade oil as standard, which conforms to the requirements of FDA 21 CFR 178.3570.

These ACE gas push type springs do not only look good, they also are available in various stroke lengths and possible extension forces. A comprehensive range of accessories in stainless steel guarantees easy assembly and a broad range of uses.

ACE industrial gas pressure springs made of stainless steel are used in the automotive sector, in industrial applications, mechanical engineering and medical cleanroom technology as well as in the food, electronics and shipbuilding industries.



Technical Data

Extension force: 10 N to 5,000 N

Piston rod diameter: Ø 3 mm to Ø 20 mm

Progression: approx. 13 % to 59 % (depending on size and stroke)

Lifetime: Approx. 10.000 m

Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4301/1.4305, AISI 304/303 and 1.4404/1.4571, AISI 316L/316Ti)

Operating fluid: nitrogen gas and HLP oil according to DIN 51524, part 2

Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

End position damping length: Approx. 5 mm to 30 mm (depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Application field: hoods, shutters, machine housing, conveyor systems, control boxes, furniture industry, shipbuilding, food industry, pharmaceutical industry, folding elements

Note: Special oil according to FDA 21 CFR 178.3570 of the food industry

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas pressure springs should not be installed under pre-tension.

On request: Special oils and other special options. Alternative accessories. Different end position damping and extension speed. Other gas springs material 1.4404/1.4571, AISI 316L/316Ti (V4A) available on request.

End Fitting

Standard Dimensions

End Fitting

B3,5

A3,5-V4A

C3,5-V4A

D3,5-V4A

G3,5-V4A

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-8-20-V4A	20	72	100
GS-8-30-V4A	30	92	100
GS-8-40-V4A	40	112	100
GS-8-50-V4A	50	132	100
GS-8-60-V4A	60	152	100
GS-8-80-V4A	80	192	100

Ordering Example

Type (Push Type) _____

Body Ø (8 mm) _____

Stroke (30 mm) _____

Piston Rod End Fitting A3,5-V4A _____

Body End Fitting C3,5-V4A _____

Nominal Force F₁ 30 N _____

Material (1.4404/1.4571, AISI 316L/316Ti, V4A) _____

GS-8-30-AC-30-V4A

Mounting accessories see from page 208.

Adjuster Knob DE-GAS-3,5
See page 175.

Stud Thread B3,5

Eye A3,5-V4A
max. force 370 N

Angle Ball Joint C3,5-V4A
max. force 370 N

Clevis Fork D3,5-V4A
max. force 370 N

Ball Socket G3,5-V4A
max. force 370 N

Technical Data

Extension force: 10 N to 100 N (compressed up to 131 N)

Progression: Approx. 28 % to 31 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4404/1.4571, AISI 316L/316Ti)

Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

End position damping length: approx. 5 mm (depending on the stroke)

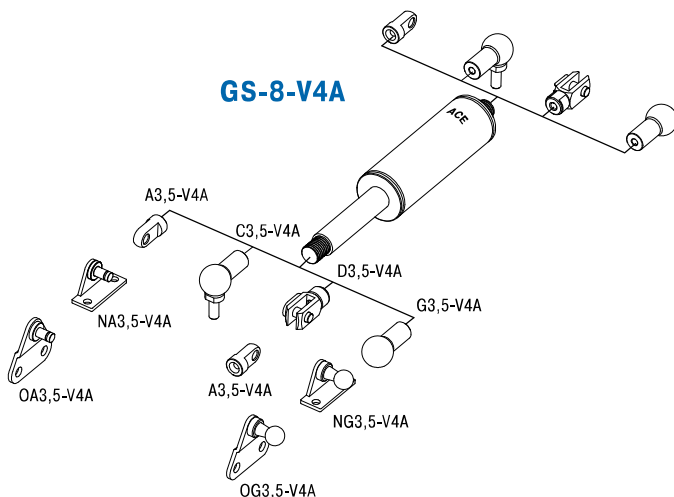
Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Special oil according to FDA 21 CFR 178.3570 of the food industry

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas pressure springs should not be installed under pre-tension.

GS-8-V4A





Safety instructions: Gas pressure springs should not be installed under pre-tension.



Valve Technology, Stainless Steel, Extension force 15 N to 180 N (compressed up to 225 N)

End Fitting

Standard Dimensions

End Fitting

B3,5

A3,5-V4A

C3,5-V4A

D3,5-V4A

G3,5-V4A

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-12-20-V4A	20	72	180
GS-12-30-V4A	30	92	180
GS-12-40-V4A	40	112	180
GS-12-50-V4A	50	132	180
GS-12-60-V4A	60	152	180
GS-12-80-V4A	80	192	150
GS-12-100-V4A	100	232	150
GS-12-120-V4A	120	272	120
GS-12-150-V4A	150	332	100

Ordering Example

Type (Push Type) _____

Body Ø (12 mm) _____

Stroke (100 mm) _____

Piston Rod End Fitting A3,5-V4A _____

Body End Fitting A3,5-V4A _____

Nominal Force F₁ 30 N _____

Material (1.4404/1.4571, AISI 316L/316Ti, V4A) _____

GS-12-100-AA-30-V4A

Mounting accessories see from page 208.

Adjuster Knob DE-GAS-3,5
See page 175.

Stud Thread B3,5

Eye A3,5-V4A
max. force 370 N

Angle Ball Joint C3,5-V4A
max. force 370 N

Clevis Fork D3,5-V4A
max. force 370 N

Ball Socket G3,5-V4A
max. force 370 N

Technical Data

Extension force: 15 N to 180 N (compressed up to 225 N)

Progression: Approx. 20 % to 25 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4404/1.4571, AISI 316L/316Ti)

Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

End position damping length: approx. 10 mm (depending on the stroke)

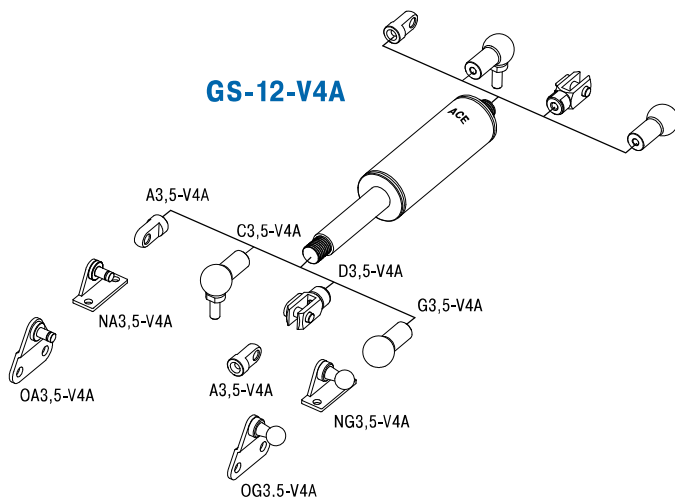
Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Special oil according to FDA 21 CFR 178.3570 of the food industry

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas pressure springs should not be installed under pre-tension.

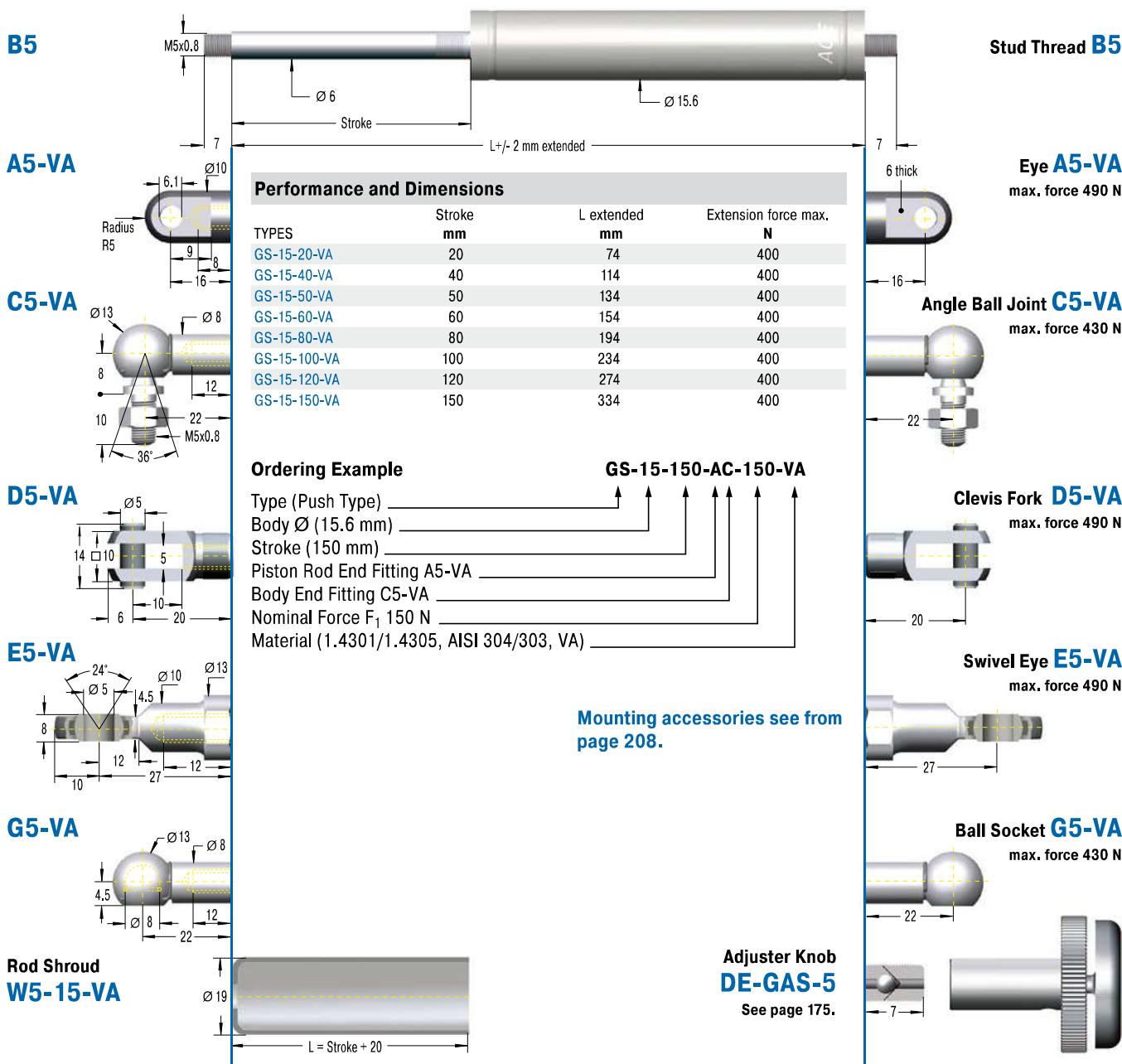
GS-12-V4A



End Fitting

Standard Dimensions

End Fitting



Technical Data

Extension force: 40 N to 400 N (compressed up to 612 N)

Progression: Approx. 30 % to 53 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4301/1.4305, AISI 304/303)

Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

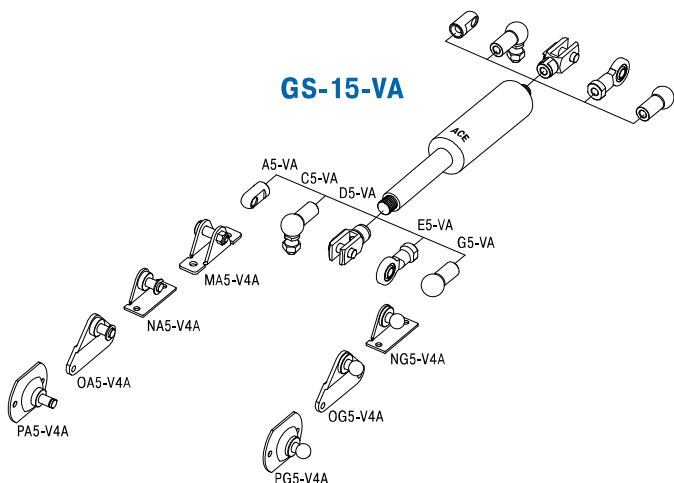
End position damping length: approx. 20 mm (depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Special oil according to FDA 21 CFR 178.3570 of the food industry

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas pressure springs should not be installed under pre-tension.



End Fitting

Standard Dimensions

End Fitting

Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-19-50-VA	50	164	700
GS-19-100-VA	100	264	700
GS-19-150-VA	150	364	700
GS-19-200-VA	200	464	700
GS-19-250-VA	250	564	600
GS-19-300-VA	300	664	450

Ordering Example

GS-19-150-AC-600-VA

Type (Push Type) _____
 Body Ø (19 mm) _____
 Stroke (150 mm) _____
 Piston Rod End Fitting A8-VA _____
 Body End Fitting C8-VA _____
 Nominal Force F₁ 600 N _____
 Material (1.4301/1.4305, AISI 304/303, VA) _____

Mounting accessories see from page 208.

Adjuster Knob DE-GAS-8
See page 175.

End Fitting Details:

- B8**: Stud Thread
- A8-VA**: Eye, max. force 1,560 N
- C8-VA**: Angle Ball Joint, max. force 1,140 N
- D8-VA**: Clevis Fork, max. force 1,560 N
- E8-VA**: Swivel Eye, max. force 1,560 N
- G8-VA**: Ball Socket, max. force 1,140 N

Rod Shroud W8-19-VA: Ø 23, L = Stroke + 30

Technical Data

Extension force: 50 N to 700 N (compressed up to 924 N)

Progression: Approx. 28 % to 32 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4301/1.4305, AISI 304/303)

Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

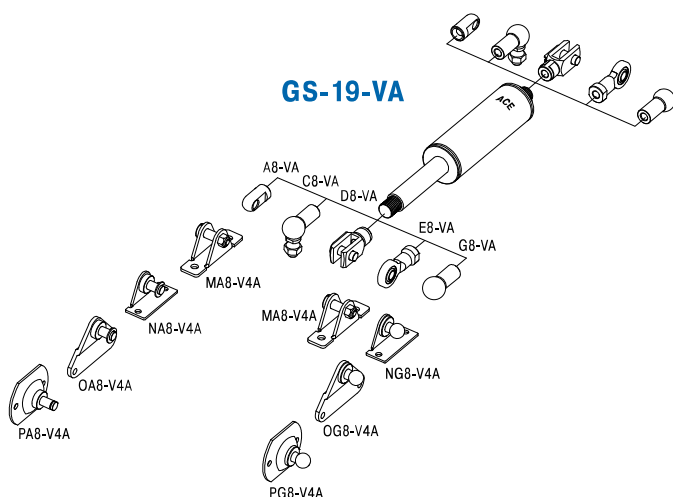
End position damping length: approx. 20 mm (depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Special oil according to FDA 21 CFR 178.3570 of the food industry

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

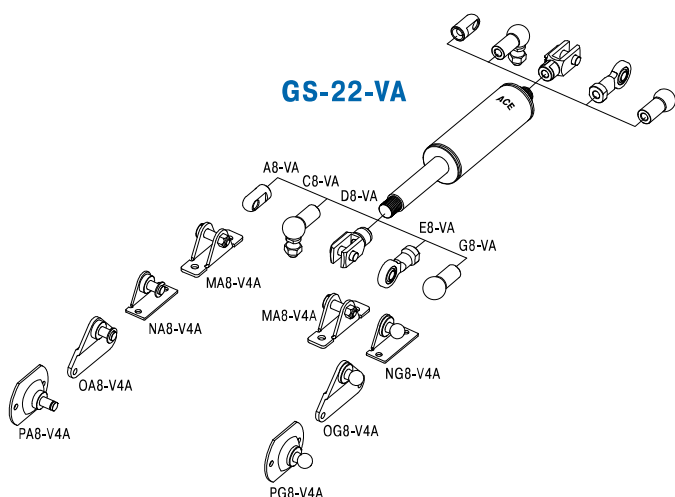
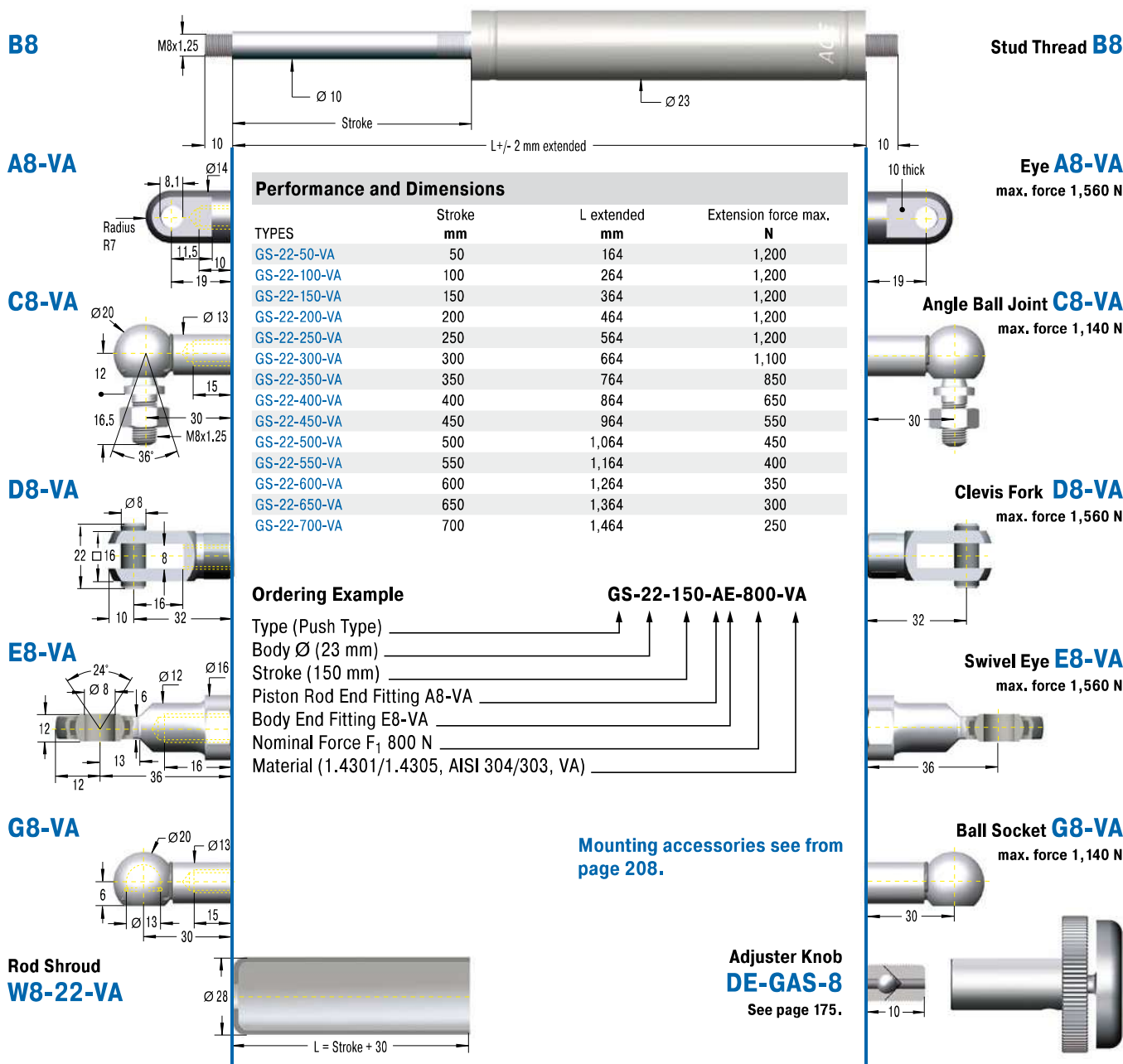
Safety instructions: Gas pressure springs should not be installed under pre-tension.



End Fitting

Standard Dimensions

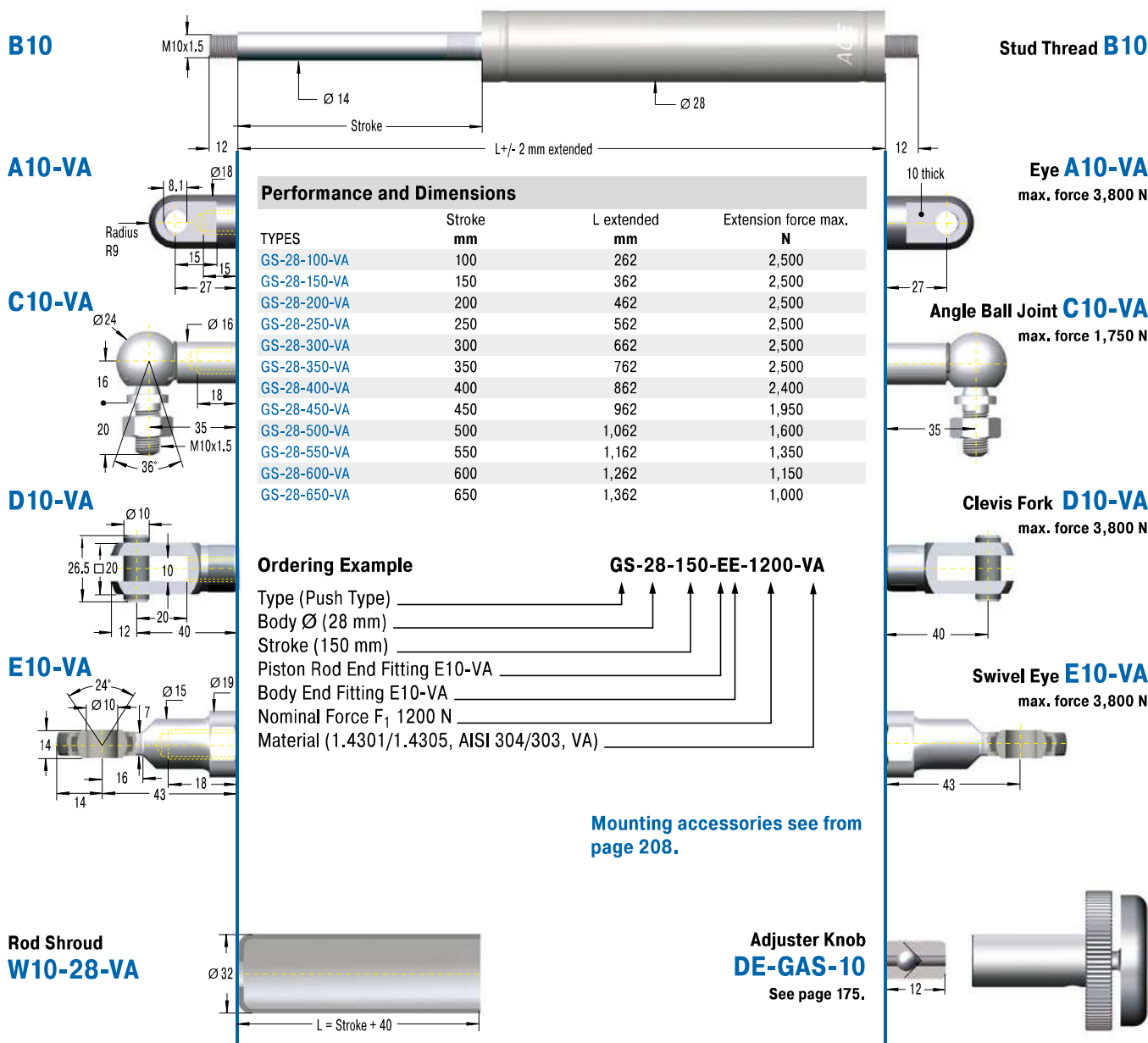
End Fitting



End Fitting

Standard Dimensions

End Fitting



Technical Data

Extension force: 150 N to 2,500 N (compressed up to 3,975 N)

Progression: Approx. 53 % to 59 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4301/1.4305, AISI 304/303)

Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

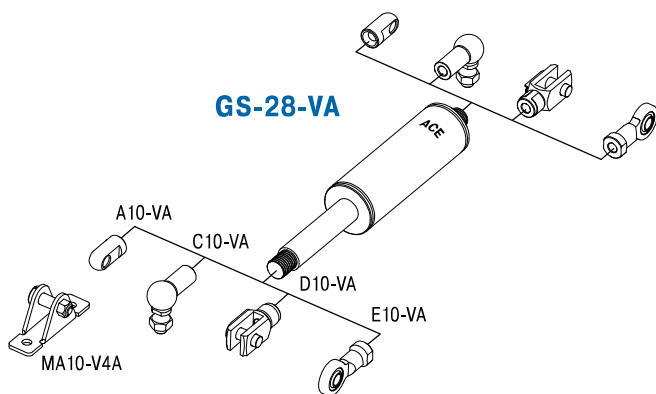
End position damping length: approx. 20 mm (depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Special oil according to FDA 21 CFR 178.3570 of the food industry

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas pressure springs should not be installed under pre-tension.

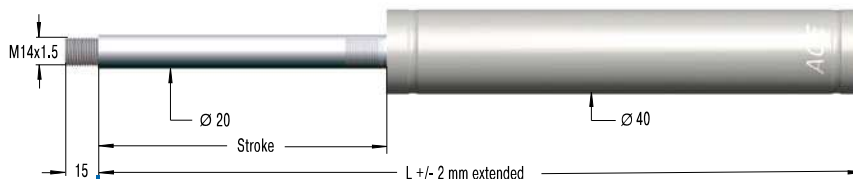


End Fitting

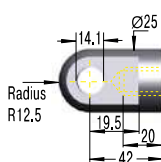
Standard Dimensions

End Fitting

B14



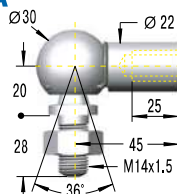
A14-VA



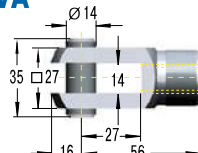
Performance and Dimensions

TYPES	Stroke mm	L extended mm	Extension force max. N
GS-40-100-VA	100	317	5,000
GS-40-150-VA	150	417	5,000
GS-40-200-VA	200	517	5,000
GS-40-300-VA	300	717	5,000
GS-40-400-VA	400	917	5,000
GS-40-500-VA	500	1,117	5,000
GS-40-600-VA	600	1,317	4,150

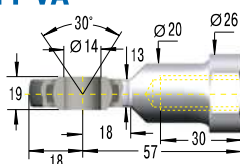
C14-VA



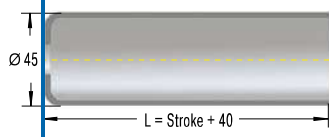
D14-VA



E14-VA



Rod Shroud W14-40-VA



Ordering Example

Type (Push Type) **GS-40-150-DD-3500-VA**
 Body Ø (40 mm)
 Stroke (150 mm)
 Piston Rod End Fitting D14-VA
 Body End Fitting D14-VA
 Nominal Force F₁ 3500 N
 Material (1.4301/1.4305, AISI 304/303, VA)

Mounting accessories see from page 208.

Stud Thread B14

Eye A14-VA max. force 7,000 N

Angle Ball Joint C14-VA max. force 3,200 N

Clevis Fork D14-VA max. force 7,000 N

Swivel Eye E14-VA max. force 7,000 N

Adjuster Knob DE-GAS-14 See page 175.

Technical Data

Extension force: 500 N to 5,000 N (compressed up to 7,100 N)

Progression: Approx. 34 % to 42 %

Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4301/1.4305, AISI 304/303)

Mounting: We recommend mounting with piston rod downwards to take advantage of the built-in end position damping.

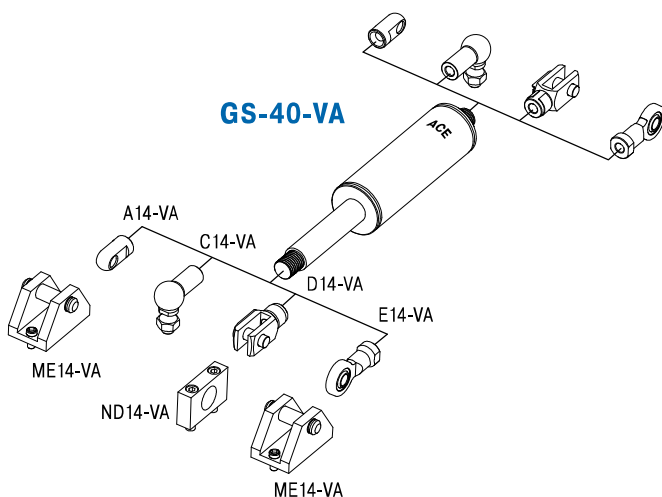
End position damping length: approx. 30 mm (depending on the stroke)

Positive stop: External positive stop at the end of stroke provided by the customer.

Note: Special oil according to FDA 21 CFR 178.3570 of the food industry

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Safety instructions: Gas pressure springs should not be installed under pre-tension.



Stainless Steel Gas Springs (Push Type), V4A

TYPES	Stroke mm	L extended mm	Dimensions see Page
GS-15-20-V4A	20	74	148
GS-15-40-V4A	40	114	148
GS-15-50-V4A	50	134	148
GS-15-60-V4A	60	154	148
GS-15-80-V4A	80	194	148
GS-15-100-V4A	100	234	148
GS-15-120-V4A	120	274	148
GS-15-150-V4A	150	334	148
GS-19-50-V4A	50	164	149
GS-19-100-V4A	100	264	149
GS-19-150-V4A	150	364	149
GS-19-200-V4A	200	464	149
GS-19-250-V4A	250	564	149
GS-19-300-V4A	300	664	149
GS-22-50-V4A	50	164	150
GS-22-100-V4A	100	264	150
GS-22-150-V4A	150	364	150
GS-22-200-V4A	200	464	150
GS-22-250-V4A	250	564	150
GS-22-300-V4A	300	664	150
GS-22-350-V4A	350	764	150
GS-22-400-V4A	400	864	150
GS-22-450-V4A	450	964	150
GS-22-500-V4A	500	1,064	150
GS-22-550-V4A	550	1,164	150
GS-22-600-V4A	600	1,264	150
GS-22-650-V4A	650	1,364	150
GS-22-700-V4A	700	1,464	150
GS-28-100-V4A	100	262	151
GS-28-150-V4A	150	362	151
GS-28-200-V4A	200	462	151
GS-28-250-V4A	250	562	151
GS-28-300-V4A	300	662	151
GS-28-350-V4A	350	762	151
GS-28-400-V4A	400	862	151
GS-28-450-V4A	450	962	151
GS-28-500-V4A	500	1,062	151
GS-28-550-V4A	550	1,162	151
GS-28-600-V4A	600	1,262	151
GS-28-650-V4A	650	1,362	151
GS-40-100-V4A	100	317	152
GS-40-150-V4A	150	417	152
GS-40-200-V4A	200	517	152
GS-40-300-V4A	300	717	152
GS-40-400-V4A	400	917	152
GS-40-500-V4A	500	1,117	152
GS-40-600-V4A	600	1,317	152

Stainless Steel Accessories, V4A

TYPES	Dimensions see Page
A5-V4A	210
C5-V4A	210
D5-V4A	210
E5-V4A	210
G5-V4A	210
A8-V4A	211
C8-V4A	211
D8-V4A	211
E8-V4A	211
G8-V4A	212
A10-V4A	212
C10-V4A	212
D10-V4A	212
E10-V4A	212
A14-V4A	213
C14-V4A	213
D14-V4A	213
E14-V4A	213

GST-40 Tandem

Optimised dual force for heavy flaps and wide angle applications

Valve Technology

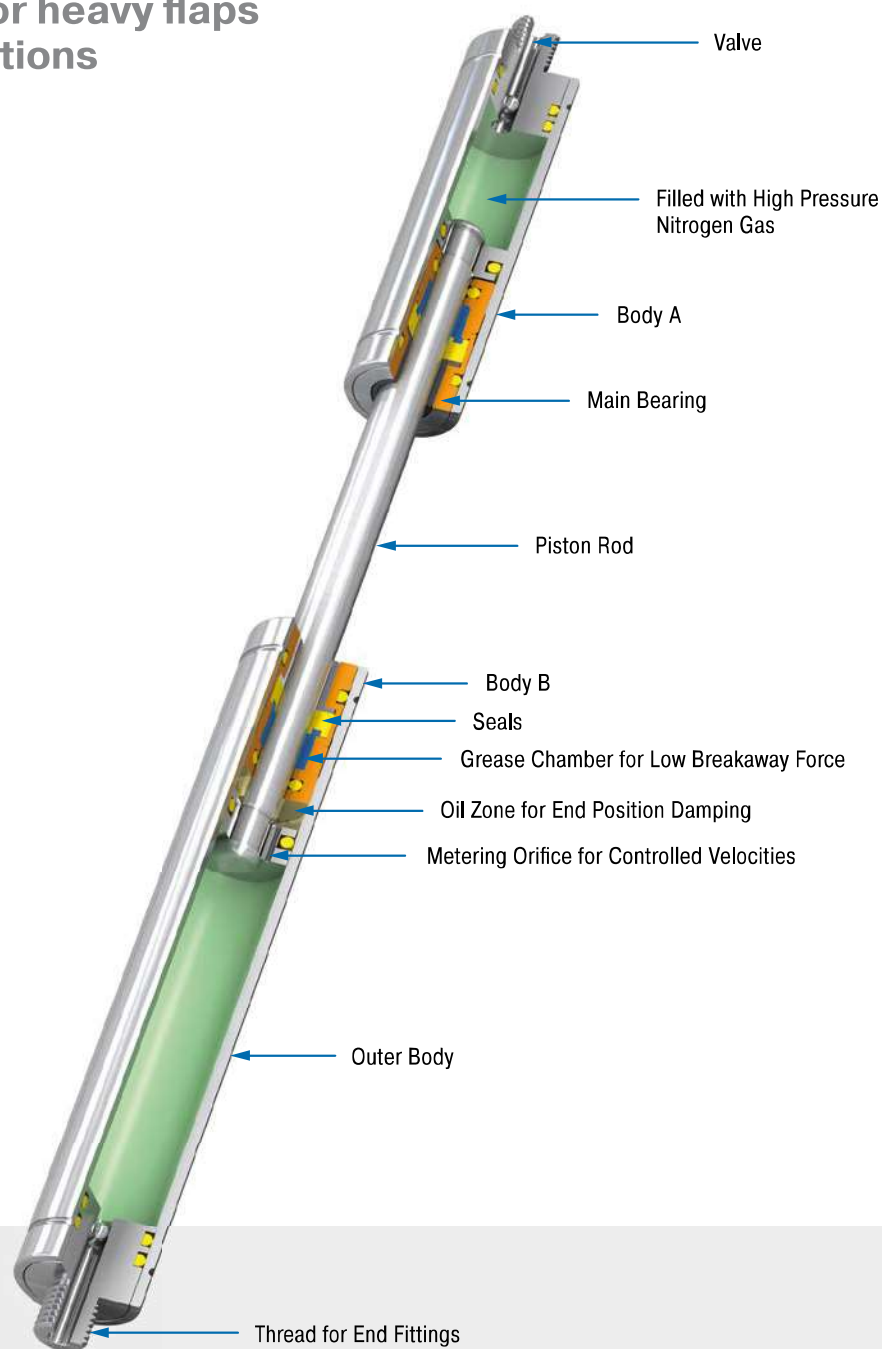
Force range 300 N to 5,000 N

Stroke 50 mm to 400 mm

Cover two differing force ranges: Tandem push type gas springs by ACE are maintenance-free and ready-to-install with two pressure tubes with different extension forces and progression curves. With this type of gas spring you cover the different force ranges between the start and end of an application. These force ranges are adjusted and complement each other, designed individually for the relevant application by the free of charge ACE calculation service, then are specifically manufactured adjusted precisely to the required dynamics of the application.

The customer specific systems, for which there are many fitting parts, are specifically suitable for heavy loads with large opening angle and can also be delivered in stainless steel versions.

Tandem push type gas springs from ACE are used in industrial applications such as in mechanical engineering, in the automobile, electronics and furniture industries, but also in medical technology as well as for service hatches.



Technical Data

Extension force: 300 N to 5,000 N

Piston rod diameter: Ø 20 mm

Progression: according to calculation relating to your application

Lifetime: Approx. 10,000 m

Operating temperature range: -20 °C to +80 °C

Material: Outer body, End fittings: zinc plated steel; Piston rod: steel with wear-resistant coating

Operating fluid: nitrogen gas and oil

Mounting: in any position. Please adopt the mounting points determined by ACE.

End position damping length: Application-specific end position damping and extension speed.

Positive stop: External positive stop at the end of stroke provided by the customer.

Application field: hoods, shutters, machine housing, conveyor systems, folding elements, loading and lifting equipment

Note: These gas springs are tailored to the relevant application and are therefore not available ex stock.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

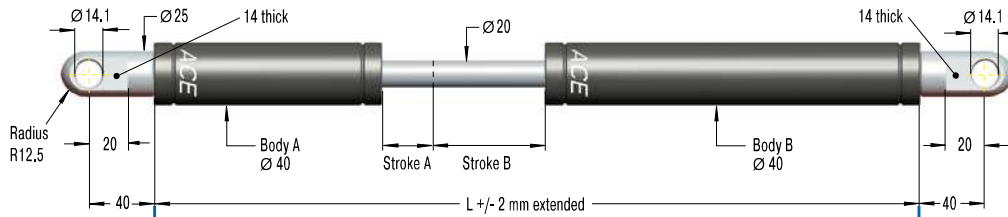
On request: Special oils and other special options. Alternative accessories. Material 1.4301/1.4305, AISI 304/303 (V2A) and 1.4404/1.4571, AISI 316L/316Ti (V4A).

End Fitting

Standard Dimensions

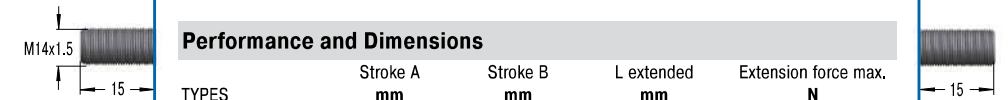
End Fitting

A14



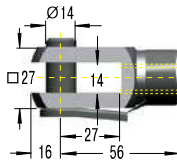
Eye A14
max. force 10,000 N

B14



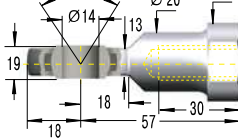
Stud Thread B14

D14



Clevis Fork D14
max. force 10,000 N

E14



Swivel Eye E14
max. force 10,000 N

Performance and Dimensions

TYPES	Stroke A mm	Stroke B mm	L extended mm	Extension force max. N
GST-40-50-100	50	100	485	5,000
GST-40-50-150	50	150	585	5,000
GST-40-50-200	50	200	685	5,000
GST-40-70-250	70	250	825	5,000
GST-40-70-300	70	300	925	5,000
GST-40-70-350	70	350	1,025	5,000
GST-40-70-400	70	400	1,125	5,000

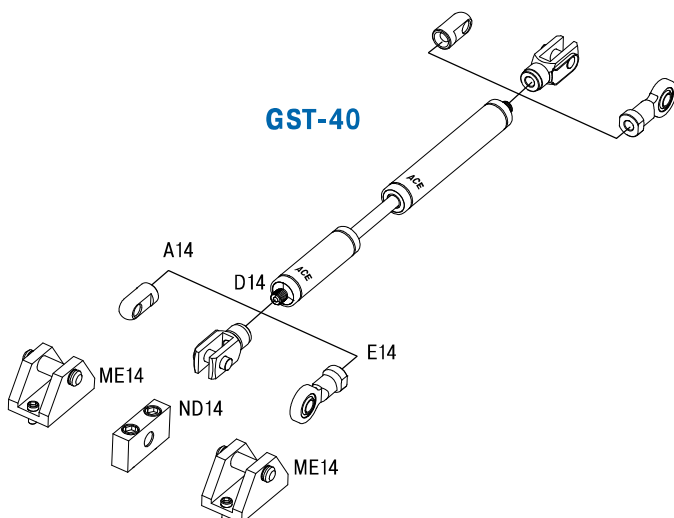
Ordering Example

GST-40-50-150-AD-900N-2500N

Type (Tandem Gas Spring) _____
 Body Ø (40 mm) _____
 Stroke A (50 mm) _____
 Stroke B (150 mm) _____
 Body A End Fitting, A14 _____
 Body B End Fitting, D14 _____
 Nominal Force Body A, 900 N _____
 Nominal Force Body B, 2500 N _____

Mounting accessories see from
page 200.

GST-40



Technical Data

Extension force: 300 N to 5,000 N

Progression: according to calculation relating to your application

Operating temperature range: -20 °C to +80 °C

Material: Outer body, End fittings: zinc plated steel; Piston rod: steel with wear-resistant coating

Mounting: in any position. Please adopt the mounting points determined by ACE.

End position damping length: Application-specific end position damping and extension speed.

Positive stop: External positive stop at the end of stroke provided by the customer.

Note: These gas springs are tailored to the relevant application and are therefore not available ex stock.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

Application Examples

GS-12

Safe opening and closing

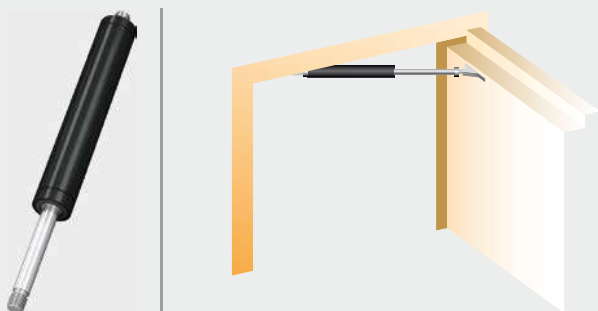
ACE industrial gas springs (push type) protect samples in an incubator, which is used for chemical and biochemical applications. The plexiglass hood, under which may be found valuable laboratory goods, is securely held open by two maintenance-free, ready-to-install ACE industrial gas springs (push type) of the type GS-12-60-AA-X. With an end-position damping of 5 mm and an extension force of 10 to 180 N, they help to handle the forces generated. The hood is always easily opened and remains in this position. It also remains securely shut when the incubator is in operation.



GS-19

Doors open and close safely

ACE industrial gas springs make opening and closing doors of rescue helicopters easier. The maintenance-free, sealed systems are installed in the access doors of helicopters of the type EC 135. There, they allow the crew to enter or exit the helicopter quickly, thus contributing to enhanced safety. The GS-19-300-CC gas springs provide a defined retraction speed and secure engagement of the door lock. The integrated end position damper allows gentle closing of the door and saves wear and tear on the valuable, lightweight material.



Very small ACE industrial gas springs (push type) enable careful opening and closing movements of a mini-incubator hood, under which may be found laboratory products

GFL Gesellschaft für Labortechnik mbH, 30938 Burgwedel, Germany

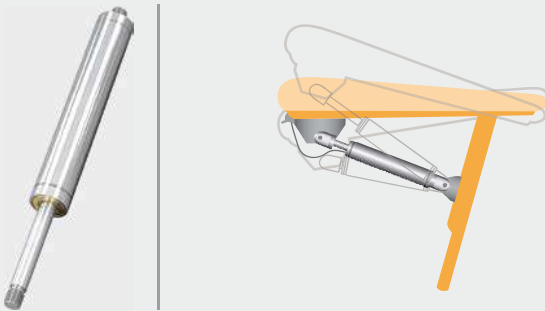


Industrial gas springs: For safe entry and exit

GS-22-VA

Made-to-measure stainless steel gas springs

A special hygiene and toilet chair, designed for children and young people with disabilities, must be firmly lockable in the sit and tilt positions. The practical aid thereby provided for relatives and carers can be attributed to two lockable ACE industrial gas springs (push type) which were especially developed and manufactured for this application and operate on the basis of the so-called tilt-in-space function. This allows the chair to be tilted forwards and backwards and provides significantly more convenience for users and patients. In order to meet all hygiene requirements, the gas springs are constructed in stainless steel.



With inclination angles of 15 degrees to the front and rear, the ACE stainless steel gas springs facilitate the work of nurses
Rifton Equipment, Rifton, New York 12471, USA

GST-40

Tandem-operated large flaps securely under control

Underground distribution systems are visually advantageous. To facilitate their servicing, the heavy covers of the often large supply systems are brought back to the surface with the help of ACE industrial tandem gas springs (push type). This is quite easily achieved thanks to the use of two pressure pipes, the result of which is two different force ranges. This means fitters must not endure laborious bending and a downward passage into the system of channels. In addition to these advantages, the springs benefit from their long service life and their capacity to be used, as stainless steel variants, in even the most hygienically-sensitive areas.



ACE industrial tandem gas springs (push type) enable easy maintenance of supply boxes by making the heavy flaps easier to operate
Langmatz GmbH, 82467 Garmisch-Partenkirchen, Germany

Industrial Gas Springs – Pull Type

Takes over when things get too tight for gas pressure springs

If ACE gas push type springs cannot be used due to a lack of space, ACE's industrial gas pull type springs come into their own. The compact assistants with body diameters of 15 mm to 40 mm are effective in the direction of traction and work in the opposite way to the principle of gas push type springs.

This means that the gas pressure in the cylinder draws the piston rod in and, when closing a flap for example, supports the manual force with the pressure springs. ACE's gas pull type springs are also self-contained, maintenance-free machine elements and equipped with a standard valve to individually regulate the gas pressure, whereby they cover forces between 30 N and 5,000 N. Any installation position, extensive DIN standardised accessories and various models enable universal use.

Compact design

Individual filling valve technology

Calculation program for specific design

Universally applicable

Delivery time within 24 hours



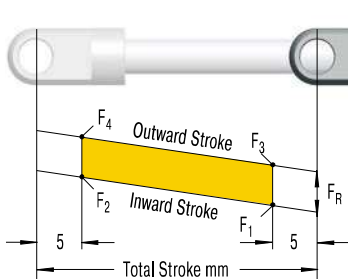
Function of a Gas Spring – Pull Type

Gas pull type springs work based on the reverse principle of a gas push type spring. They are also individually filled according to customer request to a certain pressure (traction force F_1). However, the piston rod here is pulled inwards by the gas pressure in the cylinder. The higher the pressure, the greater the traction force.

The piston ring surface between the piston rod and the inner tube is decisive for the function. When the piston rod pulls out, the nitrogen from the piston is compressed in the inner tube. The force increase (progression) of the gas spring is due to the rising pressure. The force increase is almost linear.

Calculation Principles

Force-Stroke Characteristics of Traction Gas Spring (Pull Type)



F_1 = nominal force at 20 °C
(this is the pressure figure normally used when specifying the gas spring)

F_2 = force in the complete extended position

When extending the piston rod, there is an additional friction force caused by the contact pressure of the seals (this **only** occurs **during the extension stroke**):

F_3 = force at the beginning of the extension stroke

F_4 = force at the end of the extension stroke

Gas Springs (Pull Type)

TYPES	Progression approx. %	¹ Friction F_R approx. in N
GZ-15	12 - 22 ²	55 - 140
GZ-19	21 - 28 ²	20 - 40
GZ-28	28 - 30 ²	100 - 200
GZ-40	43 - 45 ²	

¹ Depending on the filling force

² Depending on the stroke

Progression: (the slope of the force line in the diagram above) is due to the reduction of the internal gas volume as the piston rod moves from its initial position to its fully stroked position. The approx. progression values given above for standard springs can be altered on request.

Effect of temperature: The nominal F_1 figure is given at 20 °C. An increase of 10 °C will increase force by 3.4 %.

Filling tolerances: -20 N to +40 N or 5 % to 7 %. Depending on size and traction force the tolerances can differ.

Free calculation service see page 172!

Industrial Gas Springs – Pull Type



GZ-15 to GZ-40

Valve Technology

Very low progression rate

Hoods, Shutters, Machine housing, Conveyor systems

Page 160



GZ-15-V4A to GZ-40-VA

Valve Technology, Stainless Steel

Very low progression rate with FDA approval

Hoods, Shutters, Machine housing, Conveyor systems

Page 166

GZ-15 to GZ-40

Very low progression rate

Valve Technology

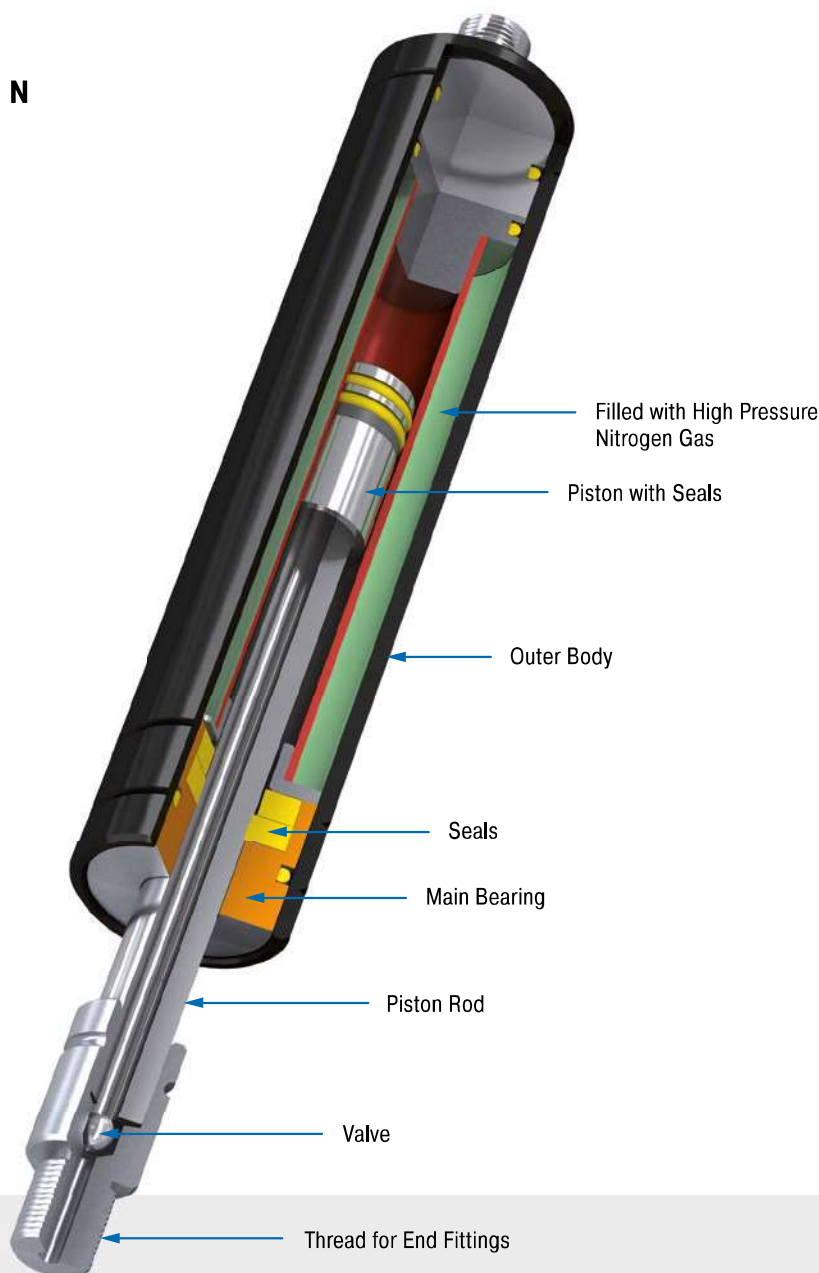
Traction force range 40 N to 5,000 N

Stroke 20 mm to 650 mm

The solution to a lack of space: If standard push type gas springs cannot be used due to a lack of space, ACE's industrial pull type gas springs come into their own. They work in the opposite way to standard push type gas springs. The piston rod is retracted when the cylinder is unloaded. The gas pressure in the cylinder draws the piston rod in.

ACE pull type gas springs offer the maximum service life thanks to the solid chrome-plated piston rod and an integrated sliding bearing. The maintenance-free and ready-to-install products are available in body diameters of 15 to 40 mm as well as forces from 40 to 5,000 N and are available from stock with valve and large selection of accessories. The traction force can be subsequently adjusted using the valve.

Gas traction springs from ACE are used in industrial applications, especially in mechanical engineering and in medical technology as well as in the electronics and furniture industries.



Technical Data

Traction force: 40 N to 5,000 N

Piston rod diameter: Ø 4 mm to Ø 28 mm

Progression: approx. 12 % to 45 %

Lifetime: Approx. 2,000 m

Operating temperature range: -20 °C to +80 °C

Material: Outer body, End fittings: zinc plated steel; Piston rod: steel or stainless steel with wear-resistant coating

Operating fluid: nitrogen gas

Mounting: with piston rod upwards

End position damping length: Without damping. For end position damping use damping material (e.g. TUBUS or SLAB).

Positive stop: External positive stop at the end of stroke provided by the customer.

Application field: hoods, shutters, machine housing, conveyor systems, control boxes, furniture industry, shipbuilding, assembly stations, vehicle technology, folding elements

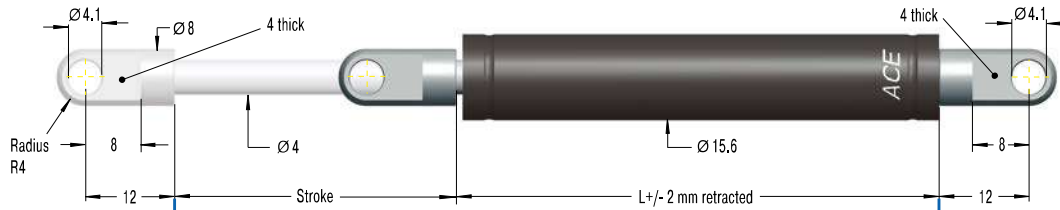
End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

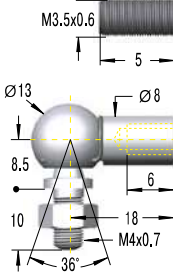
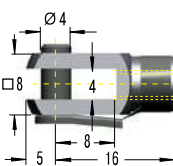
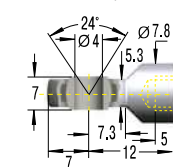
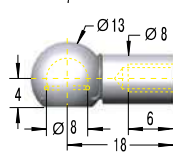
On request: Special oils and other special options. Alternative accessories. Traction gas springs with end position damping also available on request.

End Fitting

Standard Dimensions

End Fitting

A3,5

Eye A3,5
max. force 370 N

B3,5
C3,5

D3,5

E3,5

G3,5


Performance and Dimensions

TYPES	Stroke mm	L retracted mm	Traction force max. N
GZ-15-20	20	87	150
GZ-15-40	40	107	150
GZ-15-50	50	117	150
GZ-15-60	60	127	150
GZ-15-80	80	147	150
GZ-15-100	100	167	150
GZ-15-120	120	187	150
GZ-15-150	150	217	150

Ordering Example

Type (Pull Type) _____
 Body Ø (15.6 mm) _____
 Stroke (150 mm) _____
 Piston Rod End Fitting A3,5 _____
 Body End Fitting C3,5 _____
 Traction Force F_1 150 N _____

GZ-15-150-AC-150

Mounting accessories see from
page 200.

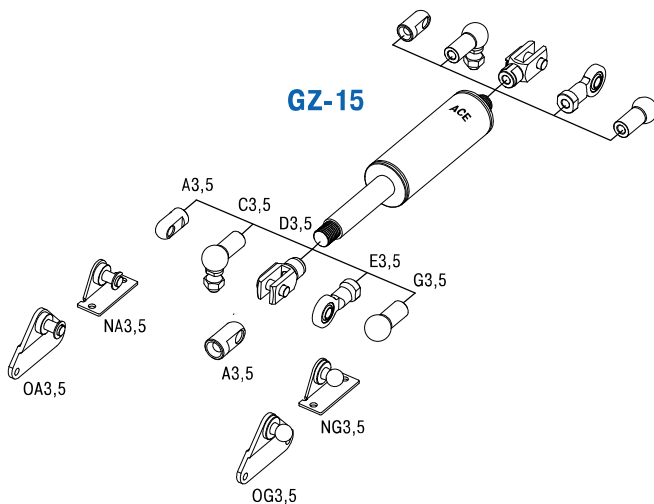
Stud Thread B3,5
Angle Ball Joint C3,5
max. force 370 N

Clevis Fork D3,5
max. force 370 N

Swivel Eye E3,5
max. force 370 N

Ball Socket G3,5
max. force 370 N

**Adjuster Knob
DE-GAS-3,5**
See page 175.

GZ-15


Technical Data

Traction force: 50 N to 150 N (extended up to 183 N)

Progression: Approx. 12 % to 22 %

Lifetime: Approx. 2,000 m

Operating temperature range: -20 °C to +80 °C

Material: Outer body, End fittings: zinc plated steel; Piston rod: stainless steel (1.4301/1.4305, AISI 304/303)

Mounting: with piston rod upwards

End position damping length: Without damping. For end position damping use damping material (e.g. TUBUS or SLAB).

Positive stop: External positive stop at the end of stroke provided by the customer.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

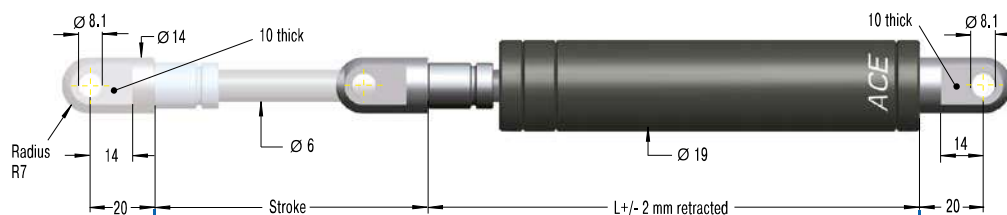
Valve Technology, Traction force 40 N to 350 N (extended up to 448 N)

End Fitting

Standard Dimensions

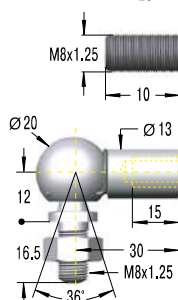
End Fitting

A8

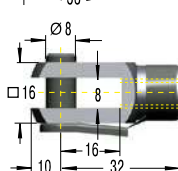

Eye A8
max. force 3,000 N

B8

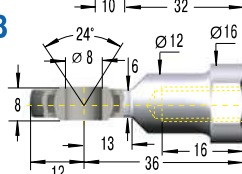
C8


Stud Thread B8
Angle Ball Joint C8
max. force 1,200 N

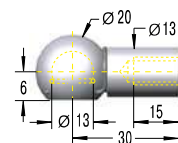
D8


Clevis Fork D8
max. force 3,000 N

E8


Swivel Eye E8
max. force 3,000 N

G8


Ball Socket G8
max. force 1,200 N

Performance and Dimensions

TYPES	Stroke mm	L retracted mm	Traction force max. N
GZ-19-30	30	112	350
GZ-19-50	50	132	350
GZ-19-100	100	182	350
GZ-19-150	150	232	350
GZ-19-200	200	282	350
GZ-19-250	250	332	350

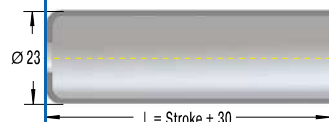
Ordering Example

GZ-19-150-AC-250

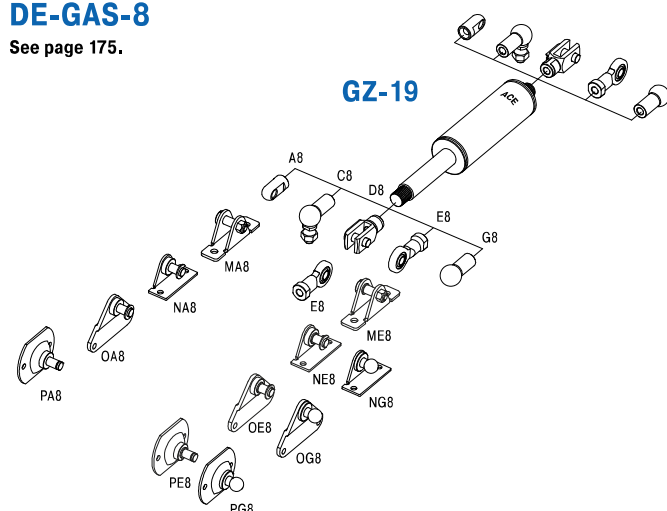
Type (Pull Type) _____
 Body Ø (19 mm) _____
 Stroke (150 mm) _____
 Piston Rod End Fitting A8 _____
 Body End Fitting C8 _____
 Traction Force F_1 250 N _____

Mounting accessories see from page 200.

Rod Shroud W8-19

Adjuster Knob
DE-GAS-8

See page 175.



Technical Data

Traction force: 40 N to 350 N (extended up to 448 N)**Progression:** Approx. 21 % to 28 %**Lifetime:** Approx. 2,000 m**Operating temperature range:** -20 °C to +80 °C**Material:** Outer body, End fittings: zinc plated steel; Piston rod: steel with wear-resistant coating**Mounting:** with piston rod upwards**End position damping length:** Without damping. For end position damping use damping material (e.g. TUBUS or SLAB).**Positive stop:** External positive stop at the end of stroke provided by the customer.**End fittings:** They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

End Fitting

Standard Dimensions

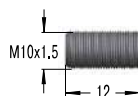
End Fitting

A10



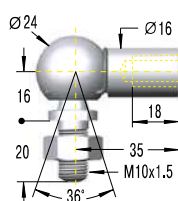
Eye A10
max. force 10,000 N

B10



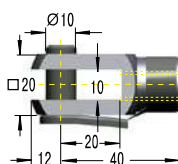
Stud Thread B10

C10



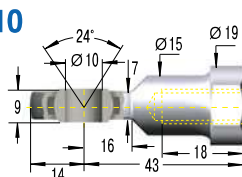
Angle Ball Joint C10
max. force 1,800 N

D10



Clevis Fork D10
max. force 10,000 N

E10



Swivel Eye E10
max. force 10,000 N

Performance and Dimensions

TYPES	Stroke mm	L retracted mm	Traction force max. N
GZ-28-30	30	130	1,200
GZ-28-50	50	150	1,200
GZ-28-100	100	200	1,200
GZ-28-150	150	250	1,200
GZ-28-200	200	300	1,200
GZ-28-250	250	350	1,200
GZ-28-300	300	400	1,200
GZ-28-350	350	450	1,200
GZ-28-400	400	500	1,200
GZ-28-450	450	550	1,200
GZ-28-500	500	600	1,200
GZ-28-550	550	650	1,200
GZ-28-600	600	700	1,200
GZ-28-650	650	750	1,200

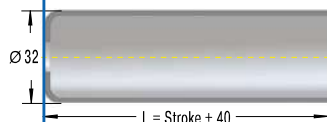
Ordering Example

Type (Pull Type) _____
 Body Ø (28 mm) _____
 Stroke (150 mm) _____
 Piston Rod End Fitting E10 _____
 Body End Fitting E10 _____
 Traction Force F_1 800 N _____

GZ-28-150-EE-800

Mounting accessories see from
page 200.

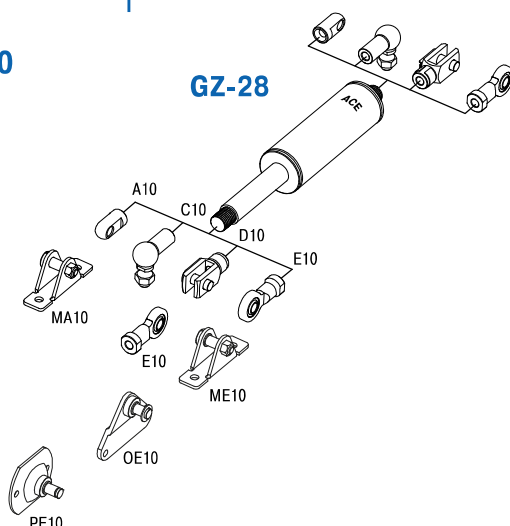
Rod Shroud W10-28



Adjuster Knob DE-GAS-10

See page 175.

GZ-28



Technical Data

Traction force: 150 N to 1,200 N (extended up to 1,560 N)

Progression: Approx. 28 % to 30 %

Lifetime: Approx. 2,000 m

Operating temperature range: -20 °C to +80 °C

Material: Outer body, End fittings: zinc plated steel; Piston rod: steel with wear-resistant coating

Mounting: with piston rod upwards

End position damping length: Without damping. For end position damping use damping material (e.g. TUBUS or SLAB).

Positive stop: External positive stop at the end of stroke provided by the customer.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

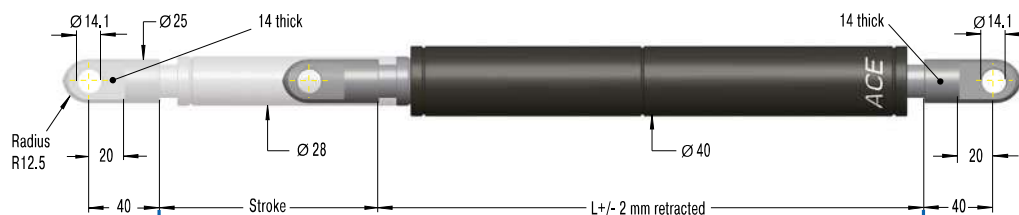
Valve Technology, Traction force 500 N to 5,000 N (extended up to 7,250 N)

End Fitting

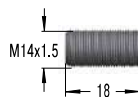
Standard Dimensions

End Fitting

A14

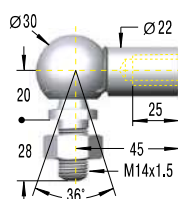

Eye A14
max. force 10,000 N

B14

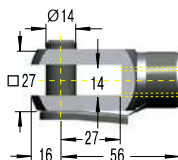


Stud Thread B14

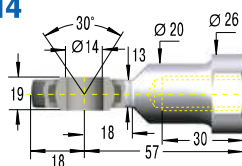
C14


Angle Ball Joint C14
max. force 3,200 N

D14


Clevis Fork D14
max. force 10,000 N

E14


Swivel Eye E14
max. force 10,000 N

Performance and Dimensions

TYPES	Stroke mm	L retracted mm	Traction force max. N
GZ-40-100	100	250	5,000
GZ-40-150	150	325	5,000
GZ-40-200	200	400	5,000
GZ-40-250	250	475	5,000
GZ-40-300	300	550	5,000
GZ-40-400	400	700	5,000
GZ-40-500	500	850	5,000
GZ-40-600	600	1,000	5,000

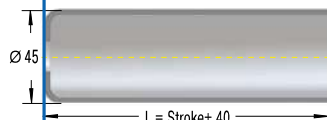
Ordering Example

GZ-40-150-EE-800

Type (Pull Type) _____
 Body Ø (40 mm) _____
 Stroke (150 mm) _____
 Piston Rod End Fitting E14 _____
 Body End Fitting E14 _____
 Traction Force F_1 800 N _____

Mounting accessories see from page 200.

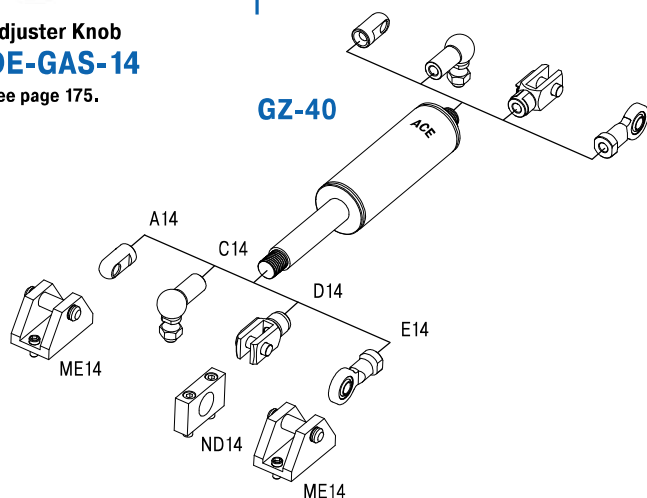
Rod Shroud W14-40


Adjuster Knob
DE-GAS-14

See page 175.

GZ-40

Technical Data

Traction force: 500 N to 5,000 N (extended up to 7,250 N)**Progression:** Approx. 43 % to 45 %**Lifetime:** Approx. 2,000 m**Operating temperature range:** -20 °C to +80 °C**Material:** Outer body, End fittings: zinc plated steel; Piston rod: steel with wear-resistant coating**Mounting:** with piston rod upwards**End position damping length:** Without damping. For end position damping use damping material (e.g. TUBUS or SLAB).**Positive stop:** External positive stop at the end of stroke provided by the customer.**End fittings:** They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

ACE Digital Tools



For more information
about the calculation
service see page 172!

Print catalogue? Everyone can. ACE offers more:

- ▶ Downloads: Product information in many languages
- ▶ PC calculation software & online calculation service
- ▶ Extensive CAD component libraries
- ▶ ACE-YouTube-Channel with video tips
- ▶ VibroChecker – awarded free iPhone App

All information on our Website: www.ace-ace.com

GZ-15-V4A to GZ-40-VA

Very low progression rate with FDA approval

Valve Technology, Stainless Steel

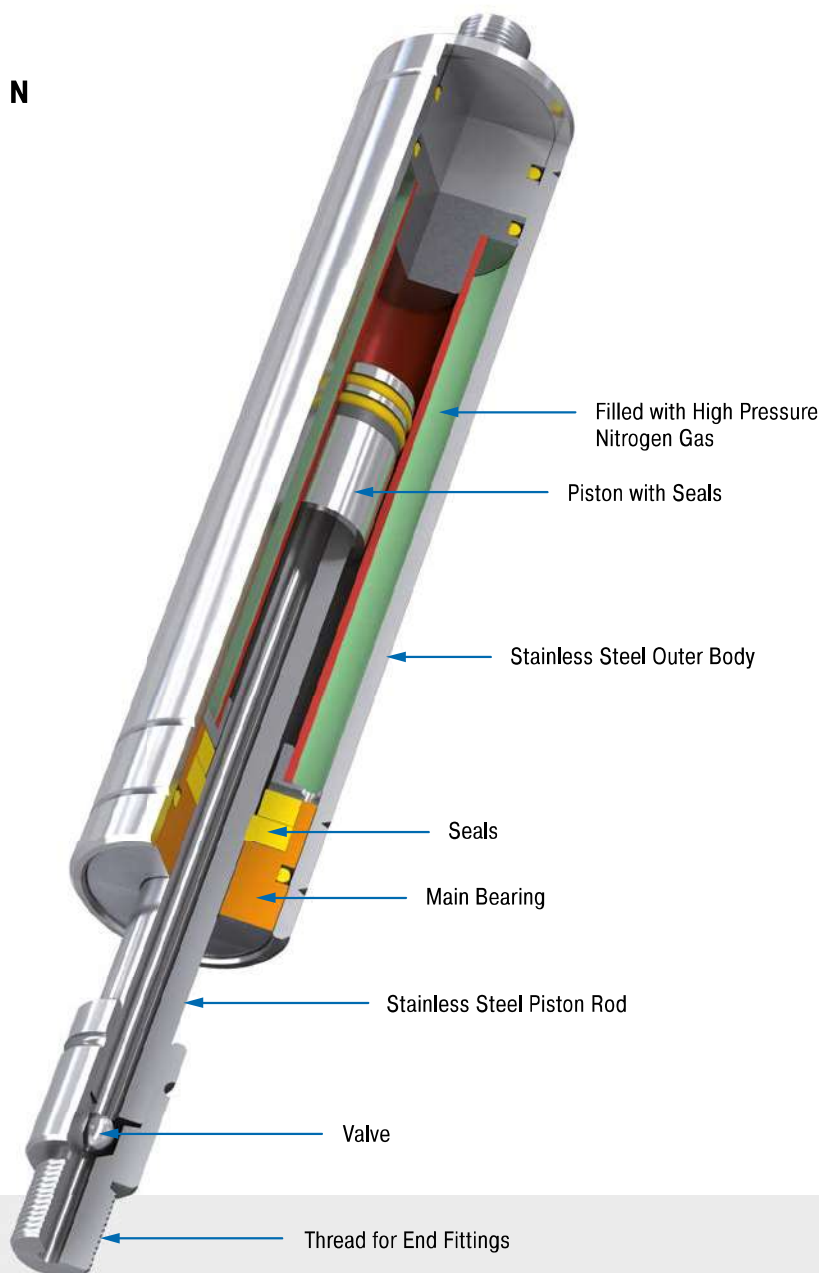
Traction force range 40 N to 5,000 N

Stroke 20 mm to 600 mm

Brilliant performance when things become tight: For specific use e.g. in tough surroundings or small spaces, the broad spectrum of ACE industrial pull type gas springs made of stainless steel with body diameters from 15 mm to 40 mm supplements the comprehensive programme of the ACE industrial pull type gas springs with valves.

This high quality design is rust free and is more robust against environmental impact compared with standard gas pull type springs. These stainless steel gas springs are also optically appealing, very durable and available, upon request, in many stroke lengths and are also possible in many traction forces in combination with the suitable stainless steel accessories.

ACE industrial push type springs made of stainless steel are used in industries such as the chemical and food industry, in automobiles, plant engineering and shipbuilding and also in medical, military, environmental and water supply technology.



Technical Data

Traction force: 40 N to 5,000 N

Piston rod diameter: Ø 4 mm to Ø 28 mm

Progression: approx. 11 % to 45 %

Lifetime: Approx. 2,000 m

Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4301/1.4305, AISI 304/303 and 1.4404/1.4571, AISI 316L/316Ti)

Operating fluid: nitrogen gas

Mounting: with piston rod upwards

End position damping length: Without damping. For end position damping use damping material (e.g. TUBUS or SLAB).

Positive stop: External positive stop in the pulling direction provided by the customer.

Application field: hoods, shutters, machine housing, conveyor systems, control boxes, furniture industry, shipbuilding, food industry, pharmaceutical industry, folding elements

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

On request: Special oils and other special options. Alternative accessories. Traction gas springs with end position damping also available on request. Other traction gas springs material 1.4404/1.4571, AISI 316L/316Ti (V4A) available on request.

End Fitting

Standard Dimensions

End Fitting

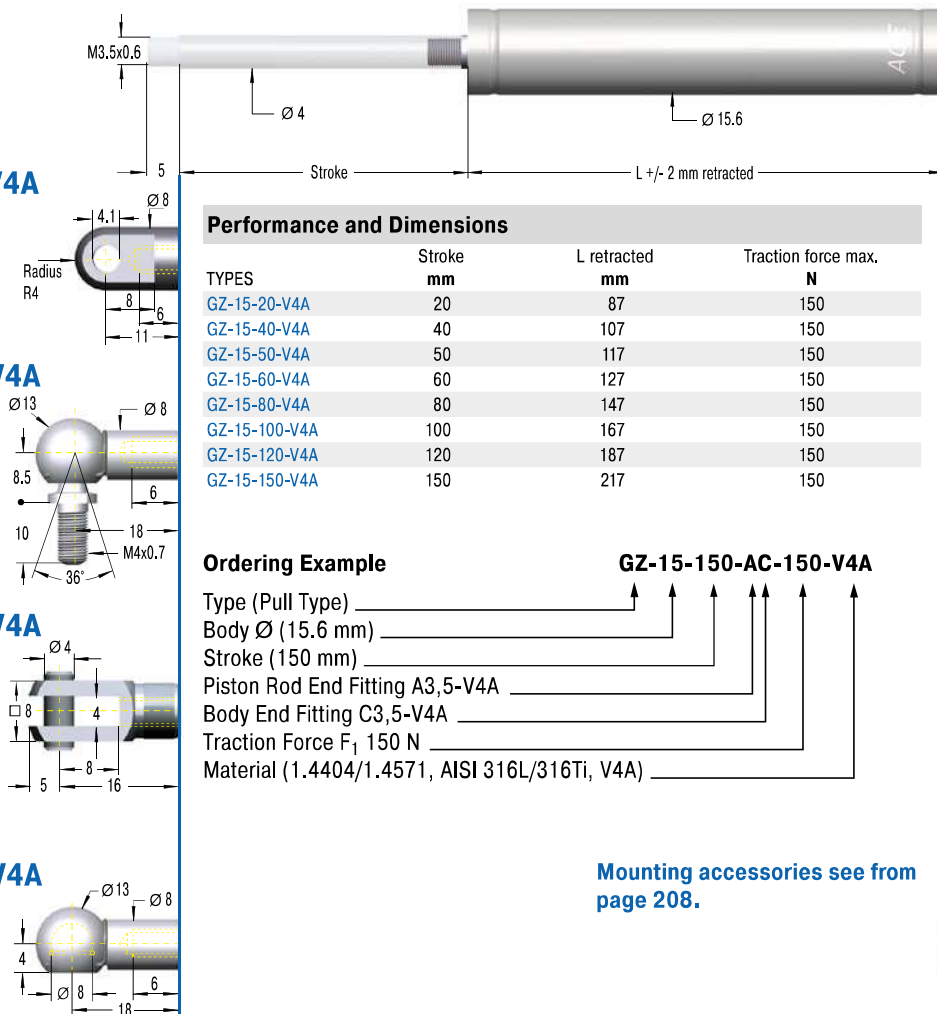
B3,5

A3,5-V4A

C3,5-V4A

D3,5-V4A

G3,5-V4A



Performance and Dimensions

TYPES	Stroke mm	L retracted mm	Traction force max. N
GZ-15-20-V4A	20	87	150
GZ-15-40-V4A	40	107	150
GZ-15-50-V4A	50	117	150
GZ-15-60-V4A	60	127	150
GZ-15-80-V4A	80	147	150
GZ-15-100-V4A	100	167	150
GZ-15-120-V4A	120	187	150
GZ-15-150-V4A	150	217	150

Ordering Example

Type (Pull Type) **GZ-15-150-AC-150-V4A**
 Body Ø (15.6 mm) **150**
 Stroke (150 mm) **150**
 Piston Rod End Fitting A3,5-V4A **A3,5-V4A**
 Body End Fitting C3,5-V4A **C3,5-V4A**
 Traction Force F_1 150 N **150**
 Material (1.4404/1.4571, AISI 316L/316Ti, V4A) **V4A**

Mounting accessories see from page 208.

Stud Thread B3,5

Eye A3,5-V4A
max. force 370 N

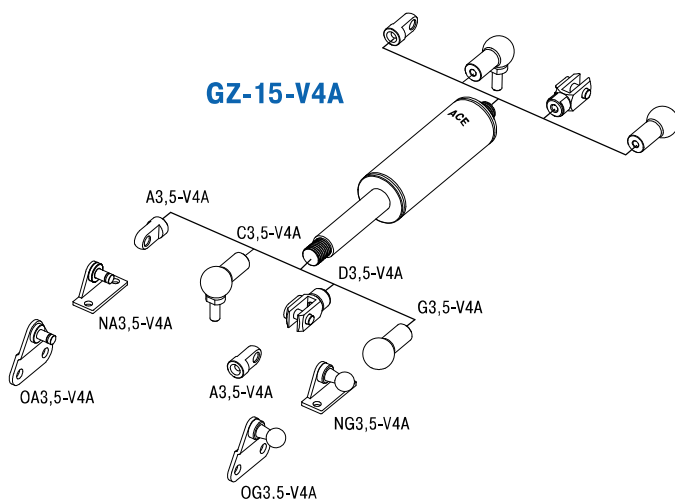
Angle Ball Joint C3,5-V4A
max. force 370 N

Clevis Fork D3,5-V4A
max. force 370 N

Ball Socket G3,5-V4A
max. force 370 N

Adjuster Knob
DE-GAS-3,5
See page 175.

GZ-15-V4A



Technical Data

Traction force: 50 N to 150 N (extended up to 182 N)

Progression: Approx. 11 % to 21 %

Lifetime: Approx. 2,000 m

Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4404/1.4571, AISI 316L/316Ti)

Mounting: with piston rod upwards

End position damping length: Without damping. For end position damping use damping material (e.g. TUBUS or SLAB).

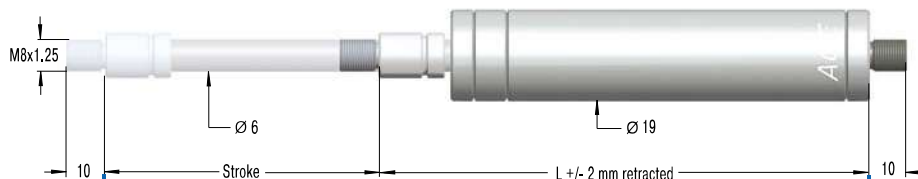
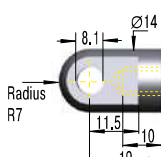
Positive stop: External positive stop in the pulling direction provided by the customer.

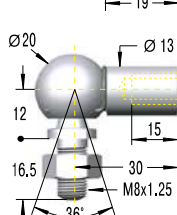
End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

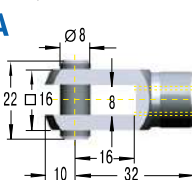
End Fitting

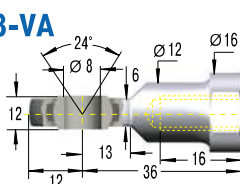
Standard Dimensions

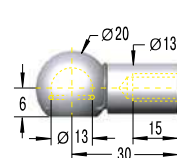
End Fitting

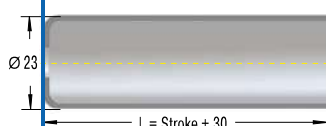
B8

Stud Thread B8
A8-VA

Eye A8-VA
max. force 1,560 N

C8-VA

Angle Ball Joint C8-VA
max. force 1,140 N

D8-VA

Clevis Fork D8-VA
max. force 1,560 N

E8-VA

Swivel Eye E8-VA
max. force 1,560 N

G8-VA

Ball Socket G8-VA
max. force 1,140 N

Rod Shroud
W8-19-VA

Adjuster Knob
DE-GAS-8

See page 175.

GZ-19-VA
Technical Data
Traction force: 40 N to 350 N (extended up to 448 N)

Progression: Approx. 23 % to 28 %

Lifetime: Approx. 2,000 m

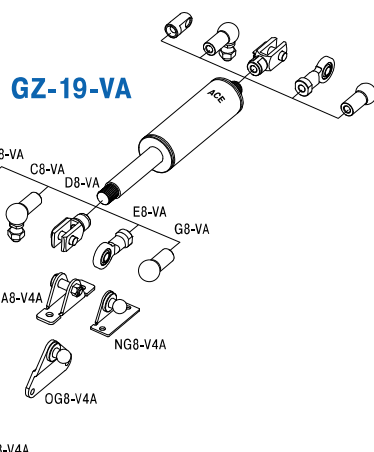
Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4301/1.4305, AISI 304/303)

Mounting: with piston rod upwards

End position damping length: Without damping. For end position damping use damping material (e.g. TUBUS or SLAB).

Positive stop: External positive stop in the pulling direction provided by the customer.

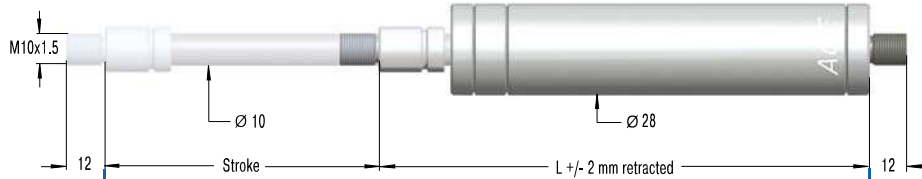
End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.


End Fitting

Standard Dimensions

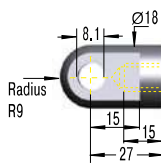
End Fitting

B10



Stud Thread B10

A10-VA

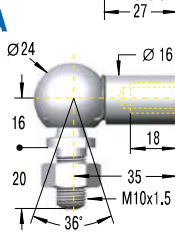


Performance and Dimensions

TYPES	Stroke mm	L retracted mm	Traction force max. N
GZ-28-50-VA	50	165	1,200
GZ-28-100-VA	100	215	1,200
GZ-28-150-VA	150	265	1,200
GZ-28-200-VA	200	315	1,200
GZ-28-250-VA	250	365	1,200
GZ-28-300-VA	300	415	1,200
GZ-28-350-VA	350	465	1,200
GZ-28-400-VA	400	515	1,200
GZ-28-450-VA	450	565	1,200
GZ-28-500-VA	500	615	1,200
GZ-28-550-VA	550	665	1,200
GZ-28-600-VA	600	715	1,200

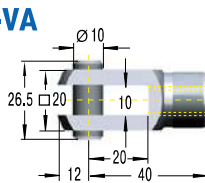
Eye A10-VA max. force 3,800 N

C10-VA



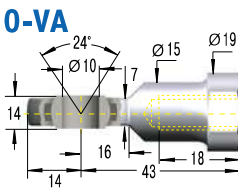
Angle Ball Joint C10-VA max. force 1,750 N

D10-VA



Clevis Fork D10-VA max. force 3,800 N

E10-VA



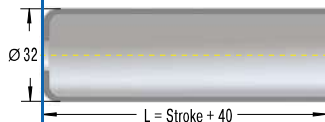
Swivel Eye E10-VA max. force 3,800 N

Ordering Example

Type (Pull Type) **GZ-28-150-EE-800-VA**
 Body Ø (28 mm)
 Stroke (150 mm)
 Piston Rod End Fitting E10-VA
 Body End Fitting E10-VA
 Traction Force F_1 800 N
 Material (1.4301/1.4305, AISI 304/303, VA)

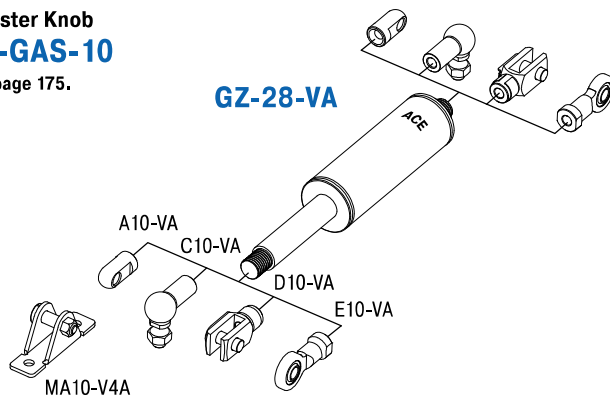
Mounting accessories see from page 208.

Rod Shroud W10-28-VA



Adjuster Knob DE-GAS-10 See page 175.

GZ-28-VA



Technical Data

Traction force: 150 N to 1,200 N (extended up to 1,560 N)

Progression: Approx. 29 % to 30 %

Lifetime: Approx. 2,000 m

Operating temperature range: -20 °C to +80 °C

Material: Outer body, Piston rod, End fittings: stainless steel (1.4301/1.4305, AISI 304/303)

Mounting: with piston rod upwards

End position damping length: Without damping. For end position damping use damping material (e.g. TUBUS or SLAB).

Positive stop: External positive stop in the pulling direction provided by the customer.

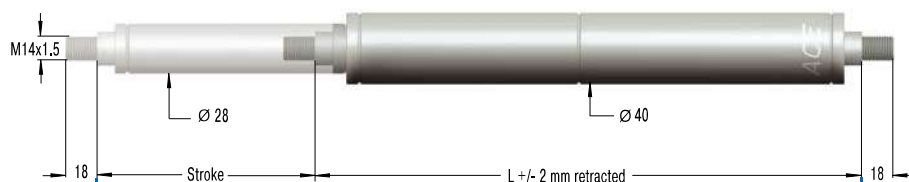
End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.

End Fitting

Standard Dimensions

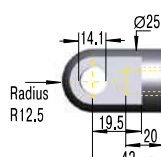
End Fitting

B14



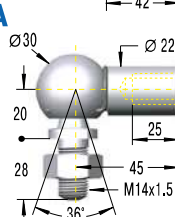
Stud Thread B14

A14-VA



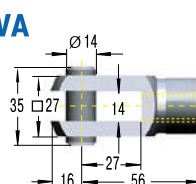
Eye A14-VA max. force 7,000 N

C14-VA



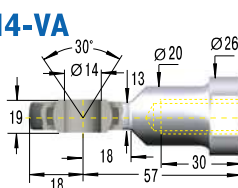
Angle Ball Joint C14-VA max. force 3,200 N

D14-VA



Clevis Fork D14-VA max. force 7,000 N

E14-VA



Swivel Eye E14-VA max. force 7,000 N

Performance and Dimensions

TYPES	Stroke mm	L retracted mm	Traction force max. N
GZ-40-100-VA	100	250	5,000
GZ-40-150-VA	150	325	5,000
GZ-40-200-VA	200	400	5,000
GZ-40-250-VA	250	475	5,000
GZ-40-300-VA	300	550	5,000
GZ-40-400-VA	400	700	5,000
GZ-40-500-VA	500	850	5,000
GZ-40-600-VA	600	1,000	5,000

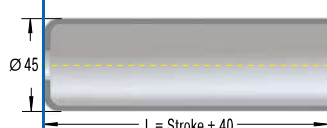
Ordering Example

Type (Pull Type) _____
 Body Ø (40 mm) _____
 Stroke (150 mm) _____
 Piston Rod End Fitting E14-VA _____
 Body End Fitting E14-VA _____
 Traction Force F_1 800 N _____
 Material (1.4301/1.4305, AISI 304/303, VA) _____

GZ-40-150-EE-800-VA

Mounting accessories see from page 208.

Rod Shroud W14-40-VA



Adjuster Knob DE-GAS-14

See page 175.

GZ-40-VA

Technical Data

Traction force: 500 N to 5,000 N (extended up to 7,250 N)

Progression: Approx. 43 % to 45 %

Lifetime: Approx. 2,000 m

Operating temperature range: -20 °C to +80 °C

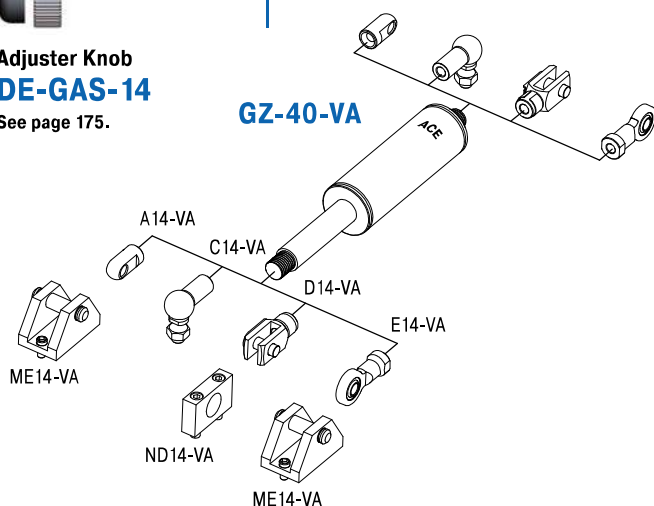
Material: Outer body, Piston rod, End fittings: stainless steel (1.4301/1.4305, AISI 304/303)

Mounting: with piston rod upwards

End position damping length: Without damping. For end position damping use damping material (e.g. TUBUS or SLAB).

Positive stop: External positive stop in the pulling direction provided by the customer.

End fittings: They are interchangeable and if necessary must be positively secured by the customer to prevent unscrewing.



Stainless Steel Gas Springs (Pull Type), V4A

TYPES	Stroke mm	L retracted mm	Dimensions see Page
GZ-19-30-V4A	30	130	168
GZ-19-50-V4A	50	150	168
GZ-19-100-V4A	100	200	168
GZ-19-150-V4A	150	250	168
GZ-19-200-V4A	200	300	168
GZ-19-250-V4A	250	350	168
GZ-28-50-V4A	50	165	169
GZ-28-100-V4A	100	215	169
GZ-28-150-V4A	150	265	169
GZ-28-200-V4A	200	315	169
GZ-28-250-V4A	250	365	169
GZ-28-300-V4A	300	415	169
GZ-28-350-V4A	350	465	169
GZ-28-400-V4A	400	515	169
GZ-28-450-V4A	450	565	169
GZ-28-500-V4A	500	615	169
GZ-28-550-V4A	550	665	169
GZ-28-600-V4A	600	715	169
GZ-40-100-V4A	100	250	170
GZ-40-150-V4A	150	325	170
GZ-40-200-V4A	200	400	170
GZ-40-250-V4A	250	475	170
GZ-40-300-V4A	300	550	170
GZ-40-400-V4A	400	700	170
GZ-40-500-V4A	500	850	170
GZ-40-600-V4A	600	1,000	170

Stainless Steel Accessories, V4A

TYPES	Dimensions see Page
A5-V4A	210
C5-V4A	210
D5-V4A	210
E5-V4A	210
G5-V4A	210
A8-V4A	211
C8-V4A	211
D8-V4A	211
E8-V4A	211
G8-V4A	212
A10-V4A	212
C10-V4A	212
D10-V4A	212
E10-V4A	212
A14-V4A	213
C14-V4A	213
D14-V4A	213
E14-V4A	213

Free Calculation Offer for Industrial Gas Springs

With all necessary information for installation

To obtain the optimum operation with minimal hand force, the gas spring must be properly sized and the mounting points have to be optimally placed.

It is important to identify the following points:

- gas spring size
- required gas spring stroke
- mounting points on flap and frame
- extended length of the gas spring
- required extension force
- hand forces throughout the complete movement on the flap

With our free calculation service you can eliminate the time-consuming calculation and send us your details by fax or e-mail. Just complete the information shown on the following page. Please attach a sketch of your application (a simple hand sketch is sufficient) in side view. Our application engineers will determine the optimum gas springs and mounting points and calculate the ideal situation to satisfy your requirements.

You will receive a quotation showing the opening and closing forces and our recommended mounting points to suit your application.

NEW!
Also try our
Online Calculation Service:
www.ace-ace.com

Example of a Calculation Offer

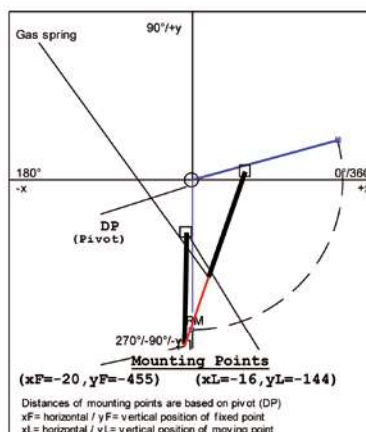
Input data		Identification data	
Start angle	αM : 270 °	Temperature	: 20 °C
Open angle	α : 105 °	Progression	: 42 %
Rd. ctr.grvty.	RM: 410 mm	Friction	: 30 N
Mass	m: 12 kg	Ext. length	: 504 mm
No. gas springs	n: 2		
Radius handfor	RR: 820 mm		

Required user hand-forces

F1-F2/F3-F4=Hand forces for opening/closing

Angle [°]	F1-F2 [N]	F3-F4 [N]	Length [mm]
270	-13	-14	311
293	37	42	323
317	59	68	363
340	53	63	418
363	34	44	477
375	25	34	504

F1-F4 positive requires clockwise hand force
F1-F4 negative requires counter-clockwise hand force



Input Data

Gas Spring Push type ☐ Gas Spring Pull type ☐

Gas spring fixing points

The fixed point of the frame and the moving point of the flap are critical for the optimum operation.

Therefore please attach a sketch of your application!

(A few lines with their dimensions are sufficient)

Moving mass* m _____ kg
 Number of gas springs in parallel* n _____ pcs
 Number of movements* _____ /day
 Ambient temperature T _____ °C

If not shown by the sketch:

Radius of centre of gravity R_M _____ mm
 Radius of hand force R_H _____ mm
 Starting angle α_M _____ °
 Opening angle α _____ °

* Compulsory information

Desired Mounting Fittings

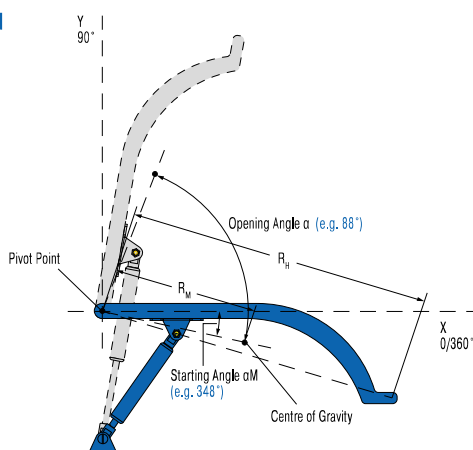
End Fitting

☐ A		☐ A
☐ B	B Stud Thread	☐ B
☐ C		☐ C
☐ D		☐ D
☐ E		☐ E
☐ F		☐ F
☐ G		☐ G

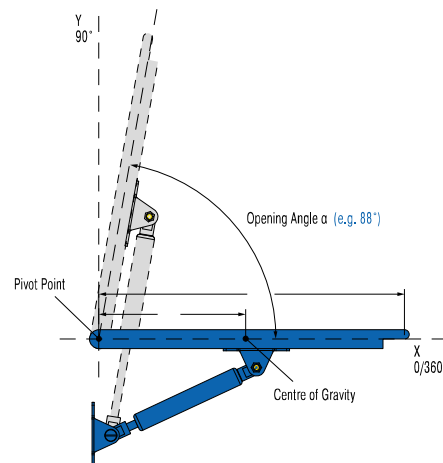
The end fittings are interchangeable

e.g. -CE: C = Angle Ball Joint, E = Swivel Eye

Hood



Flap



Please send us a sketch with dimensions of your application!

Without this sketch we won't be able to calculate.

Comments

Requirement per year

Machine type / reference

Sender

Company

Address

ZIP / City

Internet

Dept.

Name

Telephone

E-Mail

Please copy, complete and fax with attached sketch to: +49 (0)2173 - 9226-89

Mounting and Safety Instructions

Filling

Gas springs are filled with pure nitrogen gas. Nitrogen is an inert gas that does not burn or explode and is not poisonous. The internal pressure of gas springs can be up to 300 bar. Do not attempt to open or modify them!

Gas springs are maintenance-free!

ACE gas springs will operate in surrounding temperatures from -20 °C to +80 °C.

We can equip our springs with special seals to withstand temperatures as low as -45 °C or as high as +200 °C.

Gas springs should not be placed over heat or in open fire!

ACE gas springs can be stored in any position. Pressure lost through long storage is not to be expected. There are no known negative values, but there may be a sticking effect the first time you compress a spring. This may require a higher initial force to operate the gas spring for the first time (initial breakaway force).

Mounting

Gas springs should be installed with the piston rod downwards. This position ensures best damping quality. ACE gas springs include an integrated grease chamber which allows for alternative mounting opportunities.

The tolerance for the installation length is generally deemed to be ± 2 mm. If very high demands are placed on durability and stability, please avoid the combination of small diameter + long stroke + high force.

The filling tolerance is -20 N to 40 N or 5 % to 7 %. Depending on size and extension force the tolerances can differ.

Life Time

Generally, ACE gas springs are tested to 70,000 to 100,000 complete strokes. This is equivalent to the seal lifetime (depending on model size) to a distance travelled of 10 km (lifetime of traction gas springs approx. 2 km). During these tests the gas spring must not lose more than 5 % of its pressure. Depending upon the application and operating environment, the service life of these gas springs may be much longer. In practise 500,000 strokes or more have been achieved on some applications.

Disposal/Recycling

Please ask for our disposal recommendations.

Warnings and Liability

All gas springs are marked with the part number, the production date and a warning sign "Do not open high pressure".

We are not responsible for any damages of any kind that arises due to goods that are not marked accordingly.

Valve Actuation with ACE DE-GAS

Simple, safe and reliable

De-gassing for controlled force reduction on valve gas springs

The reduction is made by screwing the DE-Gas on the male screwed end of the gas spring. The drain process is possible through light actuation of the push button. If too much nitrogen is discharged, the gas spring can be refilled by ACE.

Adjustment

1. Hold gas spring valve up.
2. Insert DE-GAS adjuster knob on thread of the valve.
3. Press the DE-GAS adjuster knob with light hand force until you can hear the nitrogen escaping. Press only briefly to avoid too much nitrogen being discharged.
4. After adjustment, remove the DE-GAS adjuster knob, mount the end fittings and test the gas spring in your application. If necessary repeat the procedure.

If you use 2 gas springs in parallel, both gas springs should have the same force to avoid bending forces or side load on the application. If necessary return to ACE to refill both gas springs to the same (average) force.

If too much nitrogen is discharged, the units can be returned to ACE for re-gassing.



DE-GAS

You can also visit our Youtube channel at www.youtube.com/user/acecontrolsglobal

Here, among other things you will find an ACETips-Video on the topic of DE-GAS!

Gas Spring Refilling Kit

Flexible and easy to use

The ACE gas spring refilling kit offers you the opportunity to fill gas springs on location or adapt them individually. The refilling kit is equipped with all the parts you need to fill gas springs. Very precise filling of the gas springs is possible using the digital manometer. The table for determining the filling pressure of the gas springs is included with the case. The only thing missing from the delivery is the nitrogen.



The refilling kit contains all filling bells and adjuster knobs for the current ACE gas spring range.

Gas springs filled with the refilling kit must be measured on a calibrated measurement system by ACE for repeat production.

The refilling kit suits 200 bar nitrogen bottles with a thread of W24,32x1/14" (German standard). Other connections are available upon request.

Part number: **GS-FK-C**