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 to 70 mm and forces from 10 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

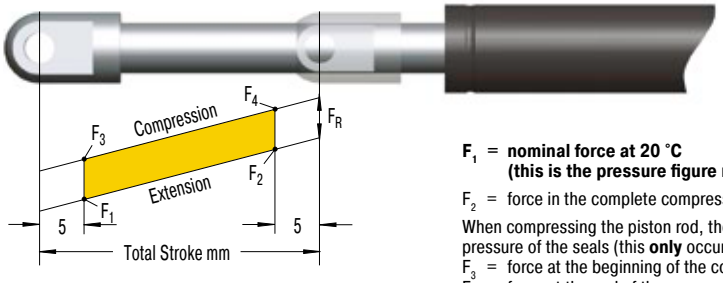
ACE gas springs are individually filled to a predetermined pressure to suit a customer's requirement (extension Force F_1). The cross-sectional area of the piston rod and filling pressure determines the extension force.

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

Free calculation service see page 168!

Force-Stroke Characteristics of Gas Spring (Push 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 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)

Type	Progression approx. %	[1] Friction F_R approx. in N
GS-8	28	10
GS-10	20	10
GS-12	25	20
GS-15	27	20
GS-19	26 - 39 [2]	30
GS-22	30 - 40 [2]	30
GS-28	58 - 67 [2]	40
GS-40	37 - 49 [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 termperature: 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

Page 130

Valve Technology
Individual stroke length and extension forces
Hoods, Shutters, Machine housing, Conveyor systems

GS-8-V4A to GS-40-VA

Page 140

Valve Technology, Stainless Steel
With food grade oil according to FDA approval
Hoods, Shutters, Machine housing, Conveyor systems

GST-40 Tandem

Page 150

Valve Technology
Optimised dual force for heavy flaps and wide angle applications
Hoods, Shutters, Machine housing, Conveyor systems

Issue 08.2016 – Specifications subject to change

GS-8 to GS-70

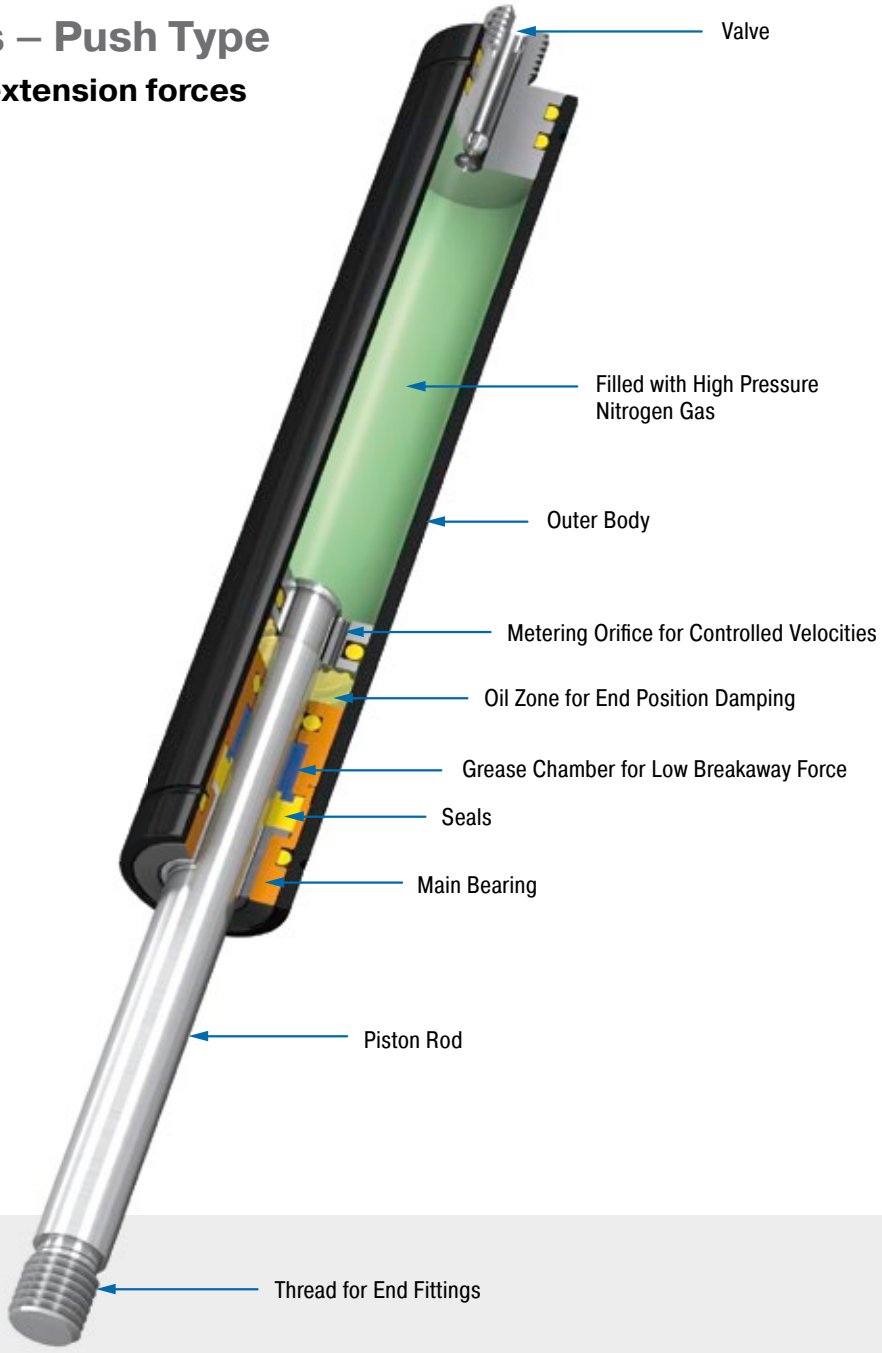
Industrial Gas Springs – Push Type

Individual stroke length and extension forces

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

Force range: 10 N to 13,000 N

Piston rod diameter: Ø 3 mm to Ø 30 mm

Progression: Approx. 20 % to 67 % (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

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

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

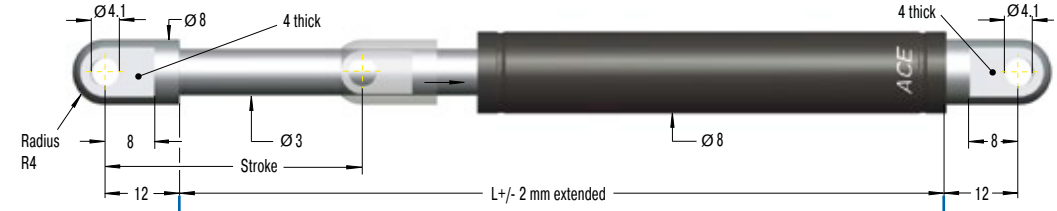
Safety instructions: Gas springs (push type) should not be installed under pre-tension.

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

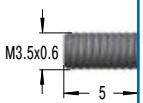
Issue 08.2016 – Specifications subject to change

End Fitting

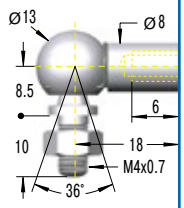
A3,5



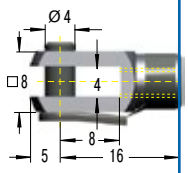
B3,5



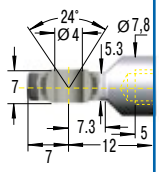
C3,5



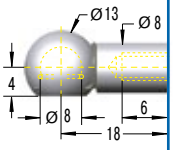
D3,5



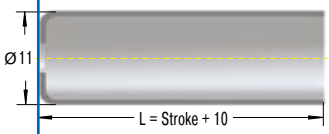
E3,5



G3,5



Rod Shroud W3,5-8



Standard Dimensions

Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range 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

Ordering Example

GS-8-30-AC-30

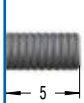
- Type (Push Type)
- Body Ø (8 mm)
- Stroke (30 mm)
- Piston Rod End Fitting A3,5
- Body End Fitting C3,5
- Nominal Force F_1 30 N

Mounting accessories see from page 194.

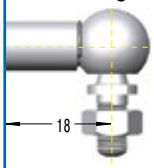
End Fitting

Eye A3,5
max. force 370 N

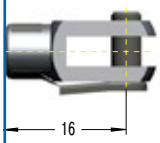
Stud Thread B3,5



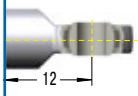
Angle Ball Joint C3,5
max. force 370 N



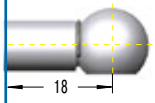
Clevis Fork D3,5
max. force 370 N

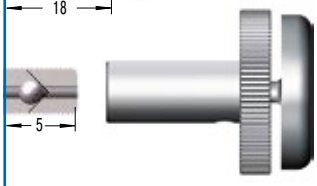


Swivel Eye E3,5
max. force 370 N

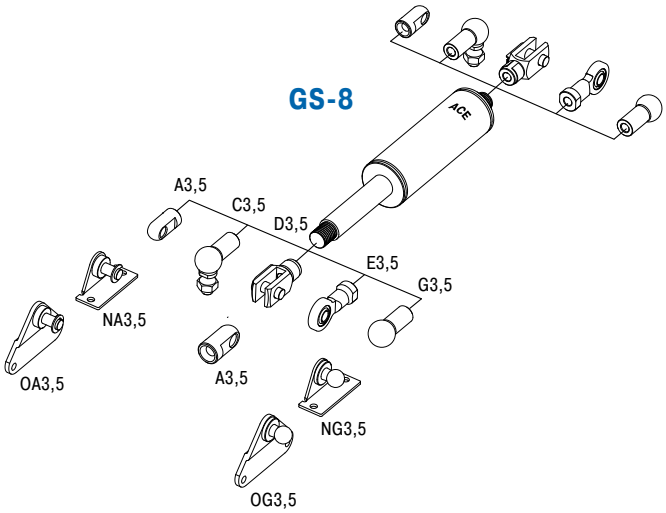


Ball Socket G3,5
max. force 370 N





Adjuster Knob
DE-GAS-3,5
See page 171.



Technical Data

Force range: 10 N to 100 N (compressed up to 130 N)

Progression: Approx. 28 %

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 must be positively secured by the customer to prevent unscrewing.

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

Issue 08.2016 – Specifications subject to change

Industrial Gas Springs – Push Type GS-10

Valve Technology, Force range 10 N to 100 N (compressed up to 120 N)

End Fitting

A3,5

B3,5

C3,5

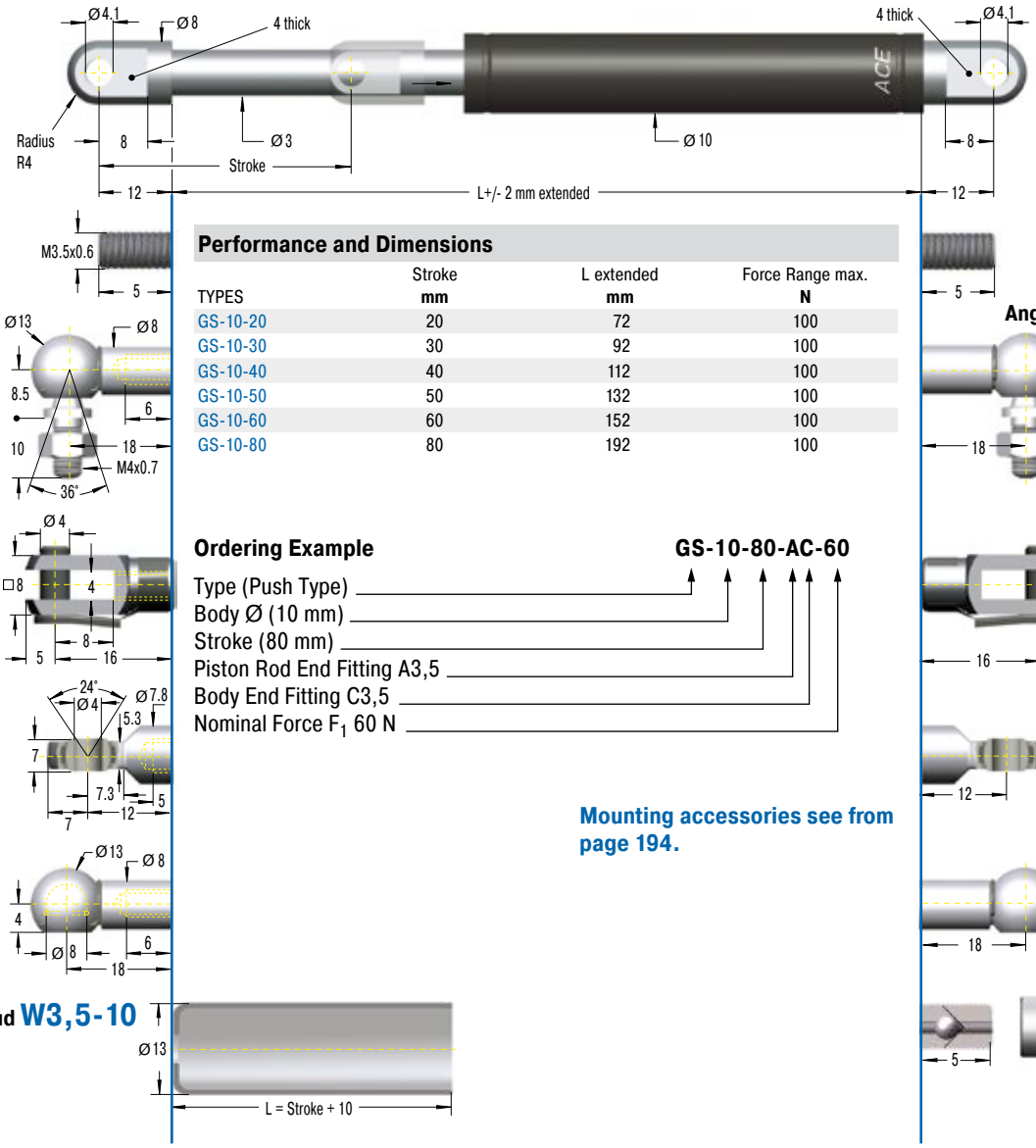
D3,5

E3,5

G3,5

Rod Shroud W3,5-10

Standard Dimensions



Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range 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 **GS-10-80-AC-60**

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

Mounting accessories see from page 194.

End Fitting

Eye A3,5
max. force 370 N

Stud Thread B3,5

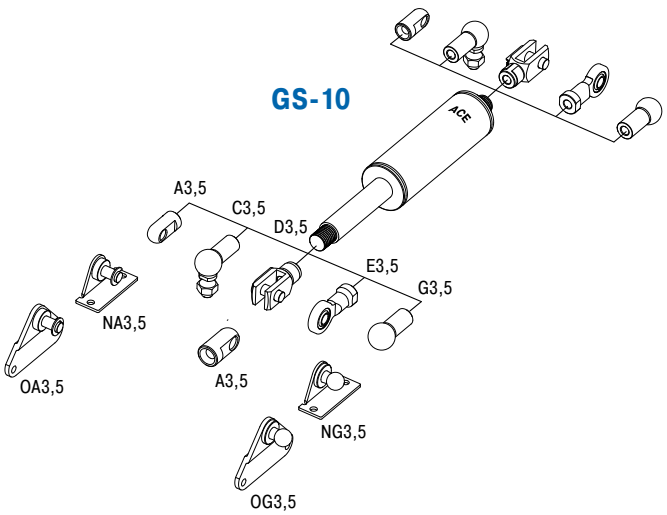
Angle Ball Joint C3,5
max. force 370 N

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 171.



Technical Data

Force range: 10 N to 100 N (compressed up to 120 N)

Progression: Approx. 28 %

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 must be positively secured by the customer to prevent unscrewing.

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

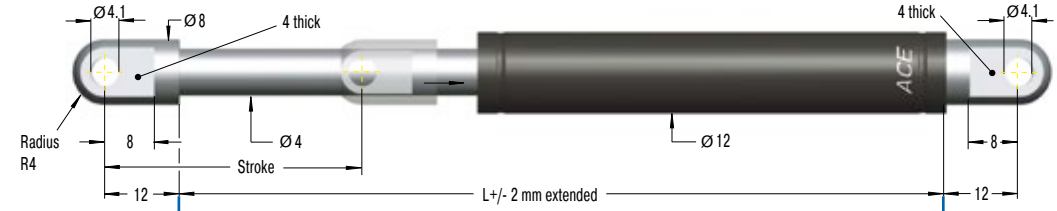
Issue 08.2016 – Specifications subject to change

End Fitting

Standard Dimensions

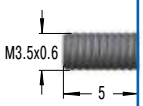
End Fitting

A3,5



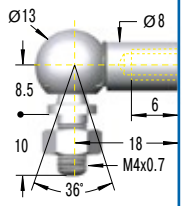
Eye A3,5
max. force 370 N

B3,5

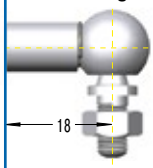


Stud Thread B3,5

C3,5



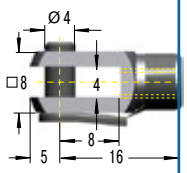
Angle Ball Joint C3,5
max. force 370 N



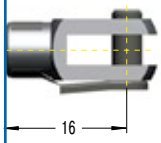
Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range 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

D3,5



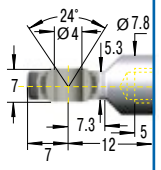
Clevis Fork D3,5
max. force 370 N



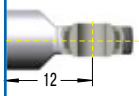
Ordering Example **GS-12-100-AA-30**

Type (Push Type)
Body Ø (12 mm)
Stroke (100 mm)
Piston Rod End Fitting A3,5
Body End Fitting A3,5
Nominal Force F_1 30 N

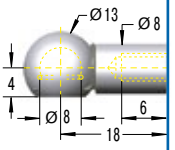
E3,5



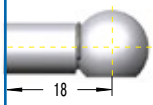
Swivel Eye E3,5
max. force 370 N



G3,5

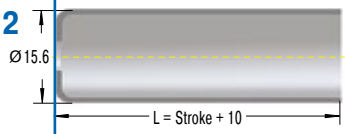


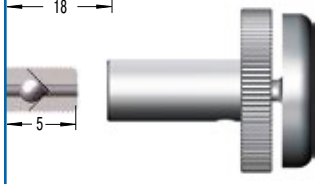
Ball Socket G3,5
max. force 370 N



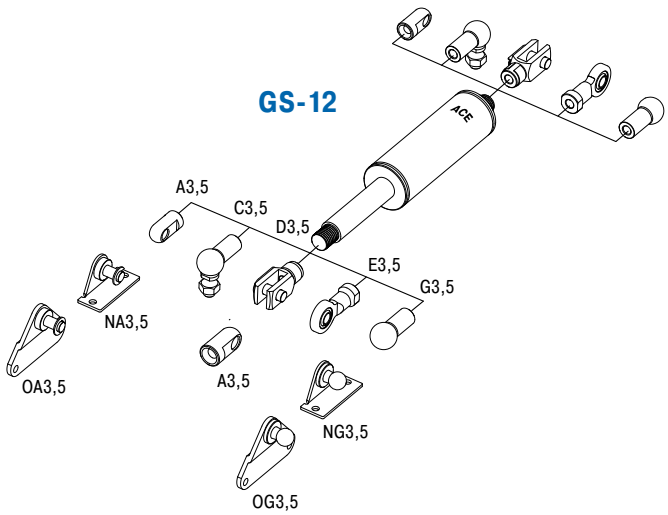
Mounting accessories see from page 194.

Rod Shroud W3,5-12





Adjuster Knob
DE-GAS-3,5
See page 171.



Technical Data

Force range: 15 N to 180 N (compressed up to 225 N)

Progression: Approx. 25 %

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 must be positively secured by the customer to prevent unscrewing.

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

Issue 08.2016 – Specifications subject to change

Industrial Gas Springs – Push Type GS-15

Valve Technology, Force range 40 N to 400 N (compressed up to 500 N)

End Fitting

A5

B5

C5

D5

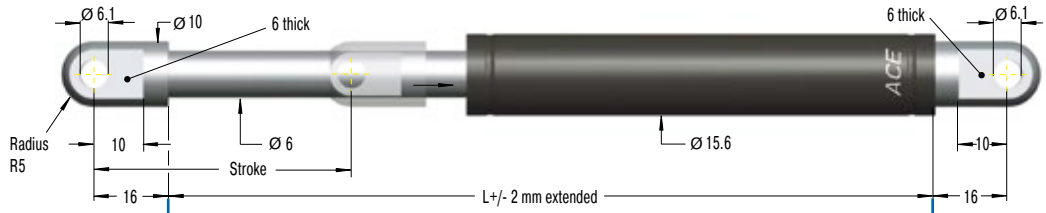
E5

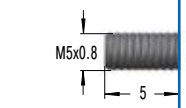
F5

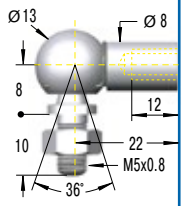
G5

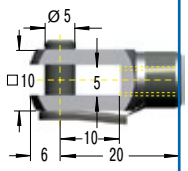
Rod Shroud W5-15

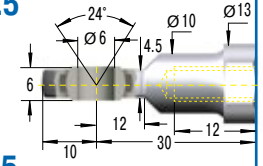
Standard Dimensions

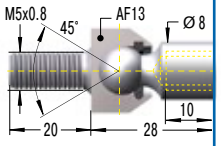


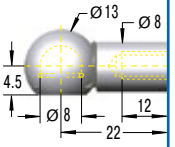


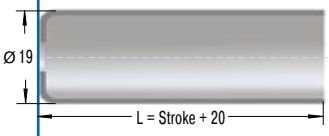












Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range 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	400

Ordering Example **GS-15-150-AC-150**

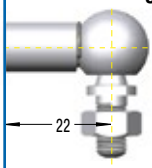
- Type (Push Type)
- Body Ø (15.6 mm)
- Stroke (150 mm)
- Piston Rod End Fitting A5
- Body End Fitting C5
- Nominal Force F_1 150 N

Mounting accessories see from page 194.

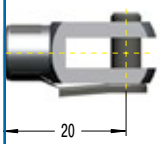
End Fitting

Eye A5
max. force 800 N

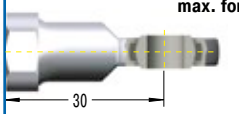
Stud Thread B5



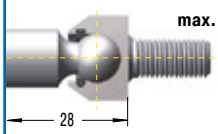
Angle Ball Joint C5
max. force 500 N



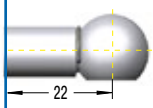
Clevis Fork D5
max. force 800 N



Swivel Eye E5
max. force 800 N

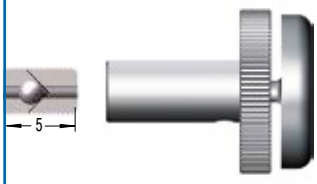


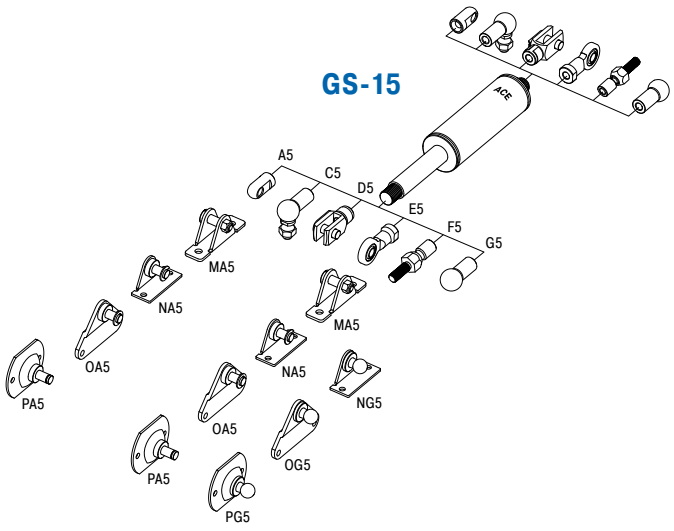
Inline Ball Joint F5
max. force 500 N



Ball Socket G5
max. force 500 N

Adjuster Knob
DE-GAS-5
See page 171.





Technical Data

Force range: 40 N to 400 N (compressed up to 500 N)

Progression: Approx. 27 %

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 must be positively secured by the customer to prevent unscrewing.

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

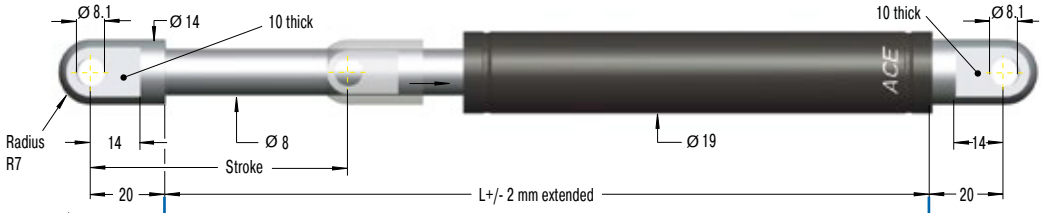
Issue 08.2016 – Specifications subject to change

End Fitting

Standard Dimensions

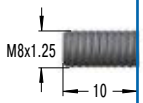
End Fitting

A8



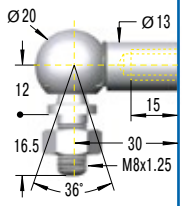
Eye A8
max. force 3.000 N

B8

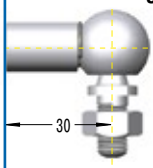


Stud Thread B8

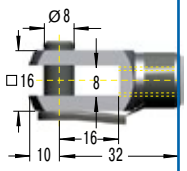
C8



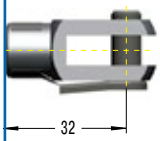
Angle Ball Joint C8
max. force 1,200 N



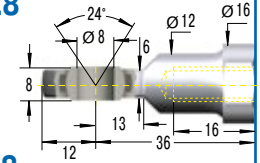
D8



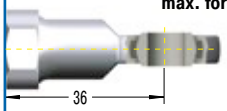
Clevis Fork D8
max. force 3,000 N



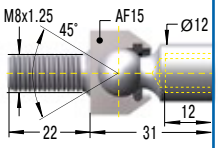
E8



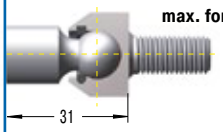
Swivel Eye E8
max. force 3,000 N



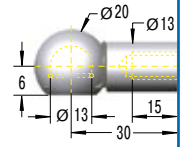
F8



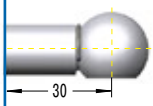
Inline Ball Joint F8
max. force 1,200 N



G8



Ball Socket G8
max. force 1,200 N



Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range 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	700
GS-19-300	300	664	700

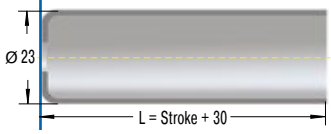
Ordering Example

GS-19-150-AC-600

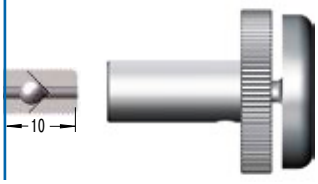
- Type (Push Type)
- Body Ø (19 mm)
- Stroke (150 mm)
- Piston Rod End Fitting A8
- Body End Fitting C8
- Nominal Force F_1 600 N

Mounting accessories see from page 194.

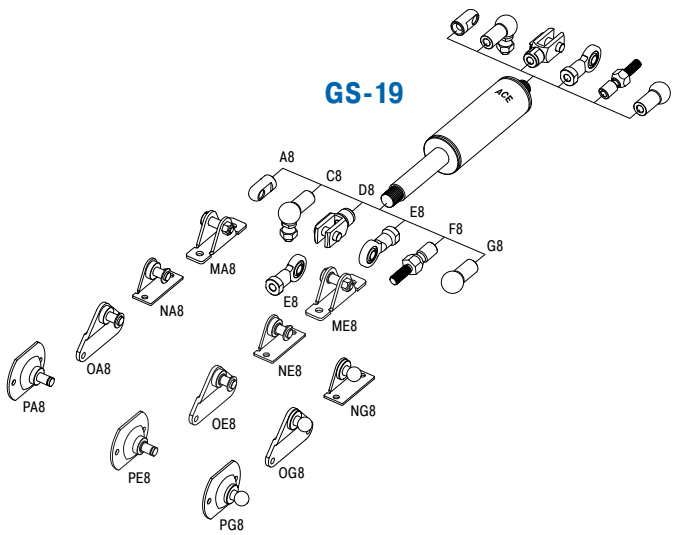
Rod Shroud W8-19



Adjuster Knob DE-GAS-8
See page 171.



Technical Data



Force range: 50 N to 700 N (compressed up to 970 N)

Progression: Approx. 26 % to 39 %

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 must be positively secured by the customer to prevent unscrewing.

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

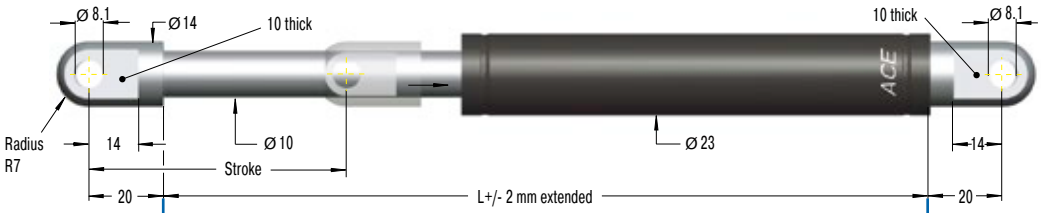
Issue 08.2016 – Specifications subject to change

Industrial Gas Springs – Push Type GS-22

Valve Technology, Force range 80 N to 1,300 N (compressed up to 1,820 N)

End Fitting

A8

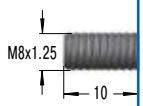


Standard Dimensions

End Fitting

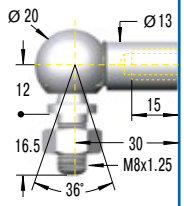
Eye A8
max. force 3.000 N

B8

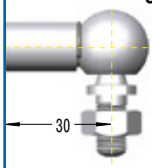


Stud Thread B8

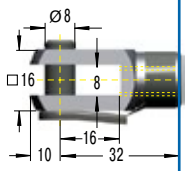
C8



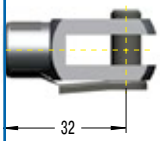
Angle Ball Joint C8
max. force 1,200 N



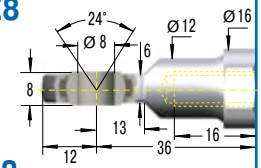
D8



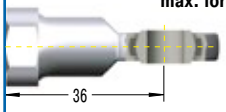
Clevis Fork D8
max. force 3,000 N



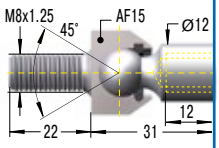
E8



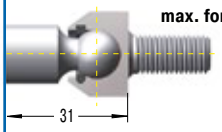
Swivel Eye E8
max. force 3,000 N



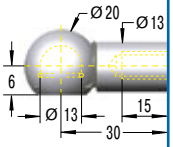
F8



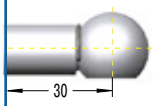
Inline Ball Joint F8
max. force 1,200 N



G8



Ball Socket G8
max. force 1,200 N



Performance and Dimensions

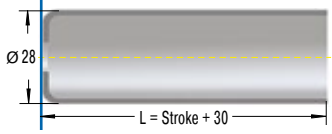
TYPES	Stroke mm	L extended mm	Force Range max. N
GS-22-50	50	164	1,300
GS-22-100	100	264	1,300
GS-22-150	150	364	1,300
GS-22-200	200	464	1,300
GS-22-250	250	564	1,300
GS-22-300	300	664	1,300
GS-22-350	350	764	1,300
GS-22-400	400	864	1,300
GS-22-450	450	964	1,300
GS-22-500	500	1,064	1,300
GS-22-550	550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

Ordering Example **GS-22-150-AE-800**

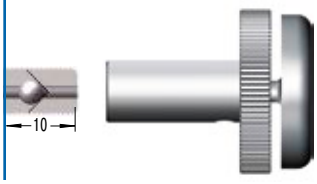
- Type (Push Type)
- Body Ø (23 mm)
- Stroke (150 mm)
- Piston Rod End Fitting A8
- Body End Fitting E8
- Nominal Force F_1 800 N

Mounting accessories see from page 194.

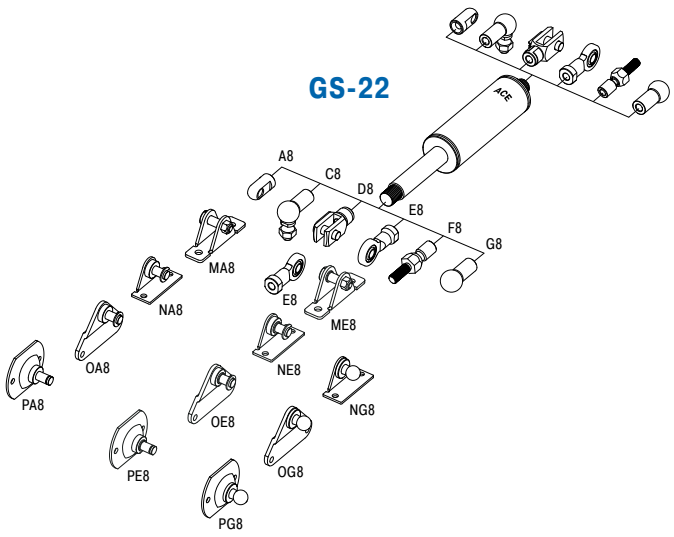
Rod Shroud W8-22



Adjuster Knob DE-GAS-8
See page 171.



GS-22



Technical Data

Force range: 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 must be positively secured by the customer to prevent unscrewing.

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

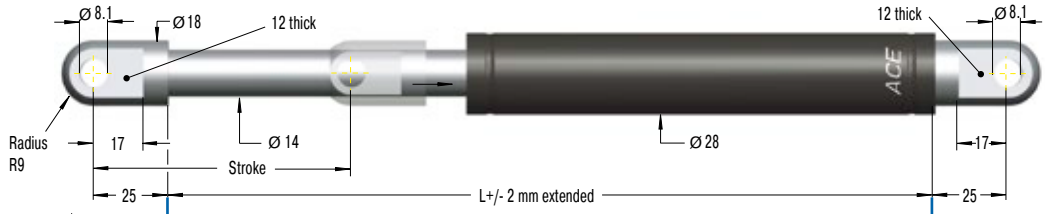
Issue 08.2016 – Specifications subject to change

End Fitting

Standard Dimensions

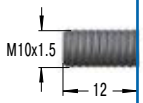
End Fitting

A10



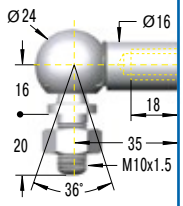
Eye A10
max. force 10,000 N

B10

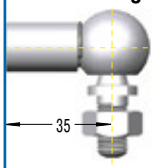


Stud Thread B10

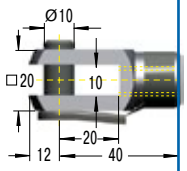
C10



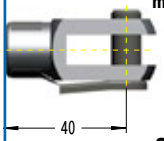
Angle Ball Joint C10
max. force 1,800 N



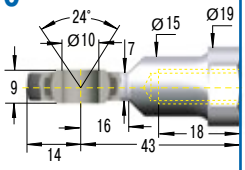
D10



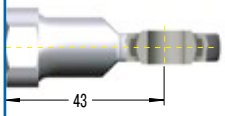
Clevis Fork D10
max. force 10,000 N



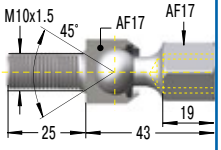
E10



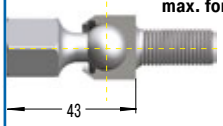
Swivel Eye E10
max. force 10,000 N



F10



Inline Ball Joint F10
max. force 1,800 N



Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range 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	2,500
GS-28-450	450	962	2,500
GS-28-500	500	1,062	2,500
GS-28-550	550	1,162	2,500
GS-28-600	600	1,262	2,500
GS-28-650	650	1,362	2,500
GS-28-700	700	1,462	2,500
GS-28-750	750	1,562	2,500

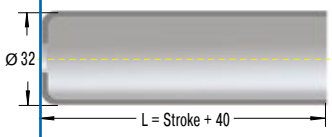
Ordering Example

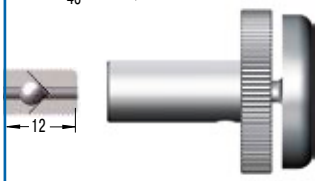
GS-28-150-EE-1200

- Type (Push Type)
- Body Ø (28 mm)
- Stroke (150 mm)
- Piston Rod End Fitting E10
- Body End Fitting E10
- Nominal Force F_1 1200 N

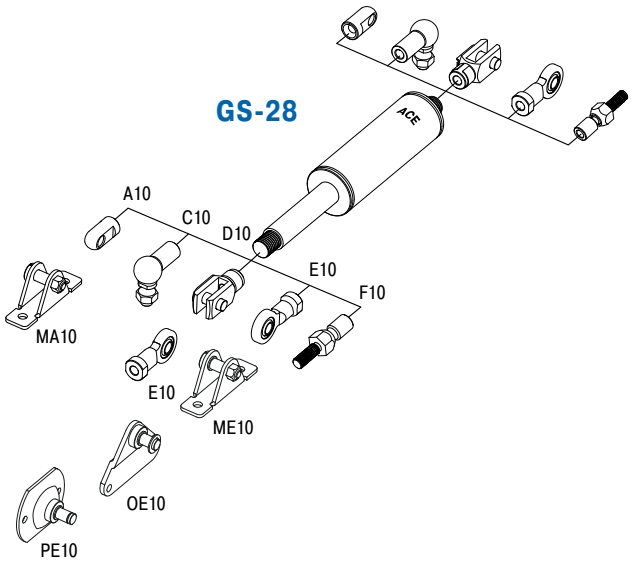
Mounting accessories see from page 194.

Rod Shroud W10-28





Adjuster Knob DE-GAS-10
See page 171.



Technical Data

Force range: 150 N to 2,500 N (compressed up to 4,175 N)

Progression: Approx. 58 % to 67 %

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 must be positively secured by the customer to prevent unscrewing.

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

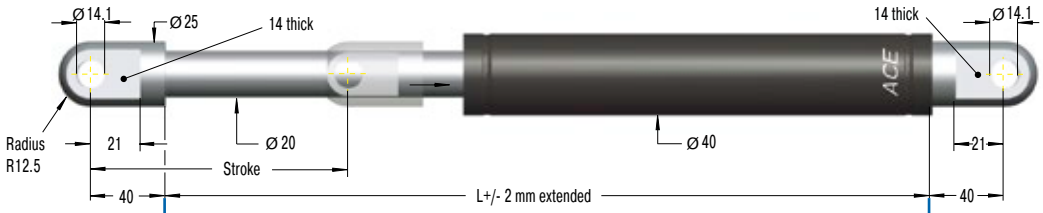
Issue 08.2016 – Specifications subject to change

Industrial Gas Springs – Push Type GS-40

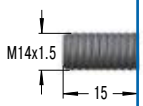
Valve Technology, Force range 500 N to 5,000 N (compressed up to 7,450 N)

End Fitting

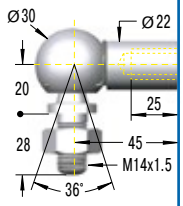
A14



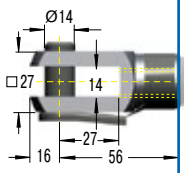
B14



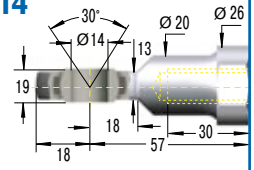
C14



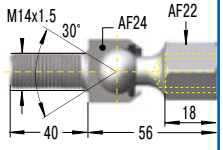
D14



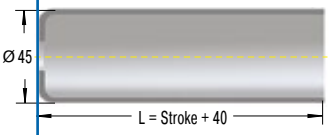
E14



F14



Rod Shroud W14-40



Standard Dimensions

Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range 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	5,000
GS-40-800	800	1,717	5,000
GS-40-1000	1,000	2,117	5,000

Ordering Example **GS-40-150-DD-3500**

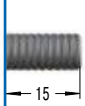
- Type (Push Type)
- Body Ø (40 mm)
- Stroke (150 mm)
- Piston Rod End Fitting D14
- Body End Fitting D14
- Nominal Force F_1 3500 N

Mounting accessories see from page 194.

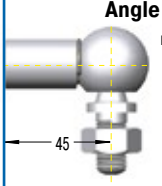
End Fitting

Eye A14
max. force 10,000 N

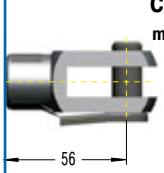
Stud Thread B14



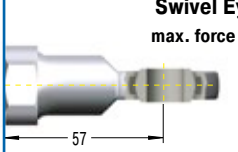
Angle Ball Joint C14
max. force 3,200 N



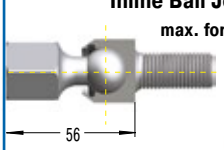
Clevis Fork D14
max. force 10,000 N

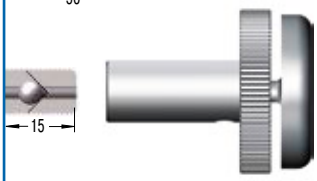


Swivel Eye E14
max. force 10,000 N

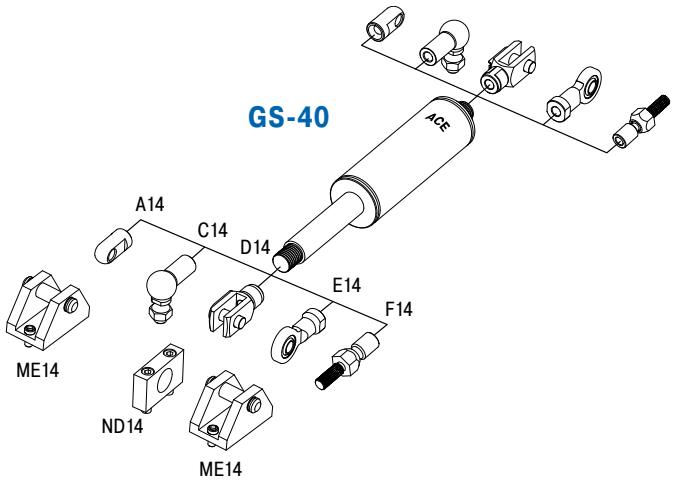


Inline Ball Joint F14
max. force 3,200 N





Adjuster Knob DE-GAS-14
See page 171.



Technical Data

Force range: 500 N to 5,000 N (compressed up to 7,450 N)

Progression: Approx. 37 % to 49 %

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.

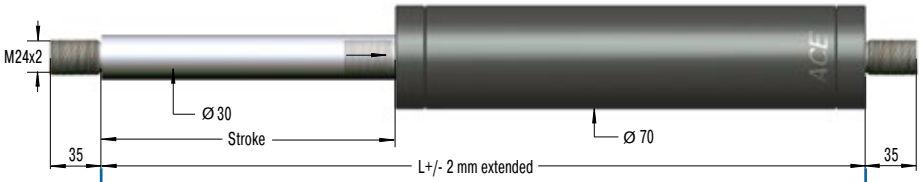
End fittings: They are interchangeable and must be positively secured by the customer to prevent unscrewing.

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

Issue 08.2016 – Specifications subject to change

End Fitting — Standard Dimensions — End Fitting

B24

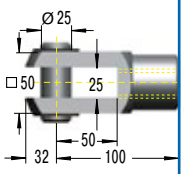


Stud Thread B24

Performance and Dimensions

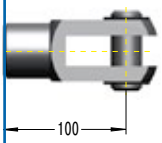
TYPES	Stroke mm	L extended mm	Force Range max. N
GS-70-100	100	320	13,000
GS-70-200	200	520	13,000
GS-70-300	300	720	13,000
GS-70-400	400	920	13,000
GS-70-500	500	1,120	13,000
GS-70-600	600	1,320	13,000
GS-70-700	700	1,520	13,000
GS-70-800	800	1,720	13,000

D24



Clevis Fork D24

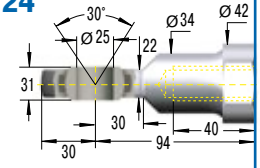
max. force 50,000 N



Ordering Example **GS-70-200-EE-8000**

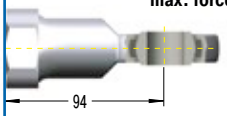
- Type (Push Type)
- Body Ø (70 mm)
- Stroke (200 mm)
- Piston Rod End Fitting E24
- Body End Fitting E24
- Nominal Force F_1 8000 N

E24



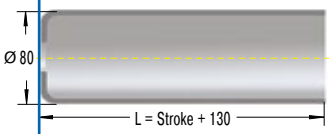
Swivel Eye E24

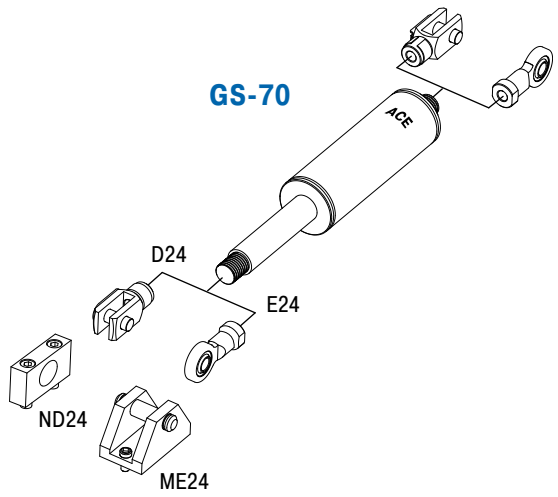
max. force 50,000 N



Mounting accessories see from page 194.

Rod Shroud W24-70





Technical Data

Force range: 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 must be positively secured by the customer to prevent unscrewing.

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

Issue 08.2016 – Specifications subject to change

GS-8-V4A to GS-40-VA

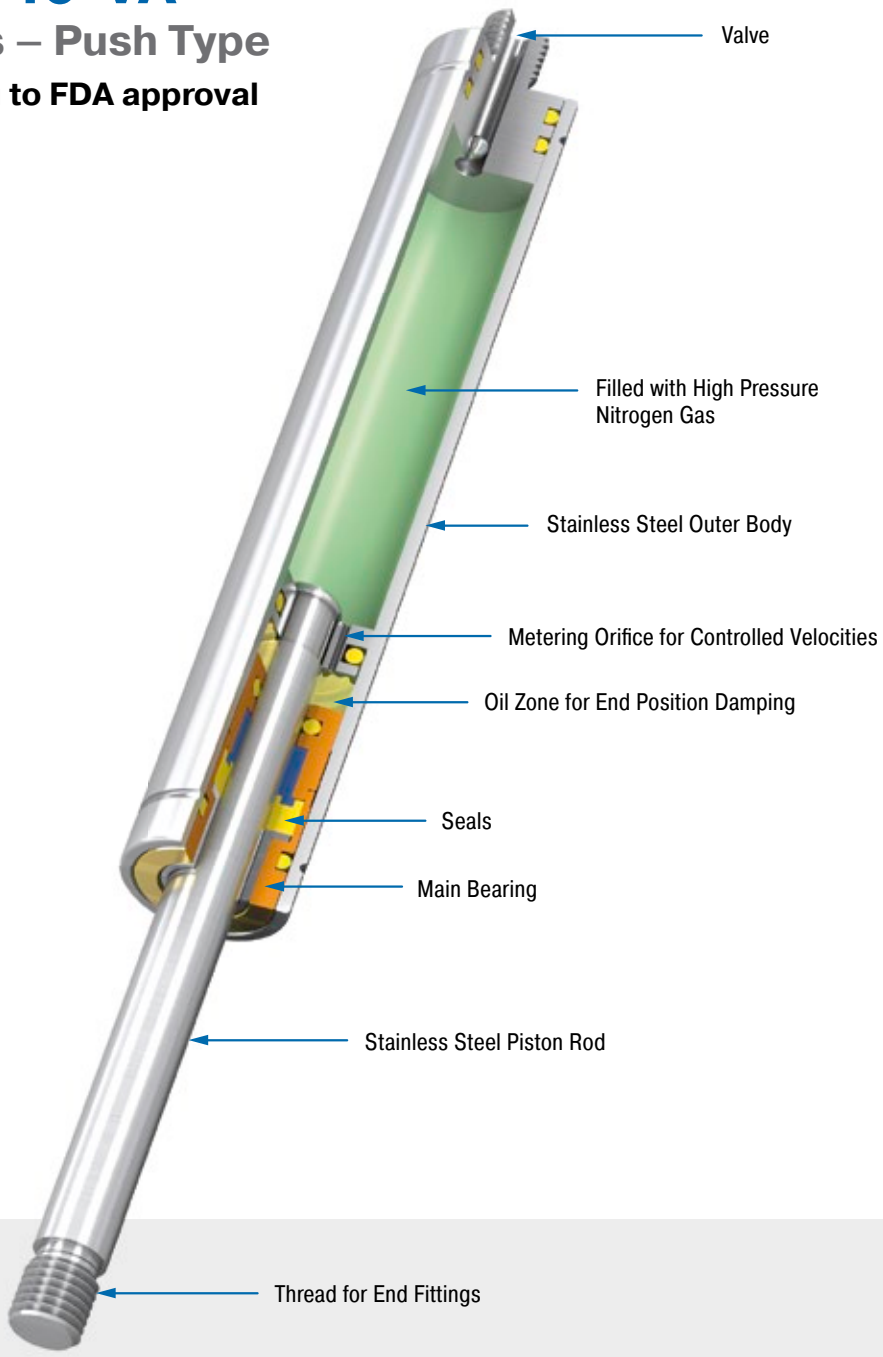
Industrial Gas Springs – Push Type

With food grade oil according to FDA approval

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

Force range: 10 N to 5,000 N

Piston rod diameter: Ø 3 mm to Ø 20 mm

Progression: Approx. 12 % to 40 % (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

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

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

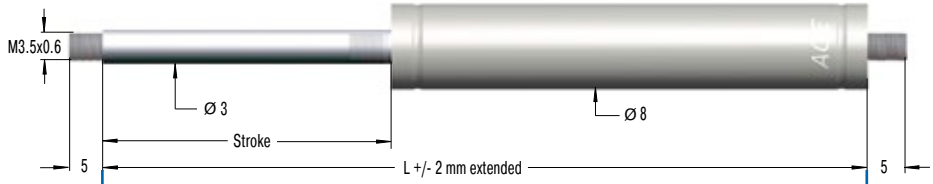
Safety instructions: Gas pressure springs should not be installed under pre-tension.

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.

Issue 08.2016 – Specifications subject to change

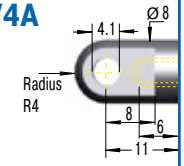
End Fitting — Standard Dimensions — End Fitting

B3,5



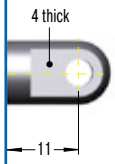
Stud Thread B3,5

A3,5-V4A



Eye A3,5-V4A

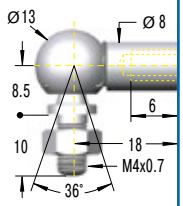
max. force 370 N



Performance and Dimensions

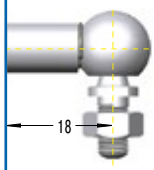
TYPES	Stroke mm	L extended mm	Force Range max. N
GS-8-20-V4A	20	72	100
GS-8-30-V4A	30	92	100
GS-8-40-V4A	40	112	100
GS-8-50-V4A	50	132	100
GS-8-60-V4A	60	152	100
GS-8-80-V4A	80	192	100

C3,5-V4A



Angle Ball Joint C3,5-V4A

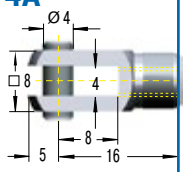
max. force 370 N



Ordering Example **GS-8-30-AC-30-V4A**

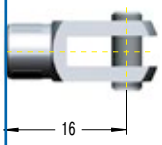
Type (Push Type)
Body Ø (8 mm)
Stroke (30 mm)
Piston Rod End Fitting A3,5-V4A
Body End Fitting C3,5-V4A
Nominal Force F_1 30 N
Material (1.4404/1.4571, AISI 316L/316Ti, V4A)

D3,5-V4A



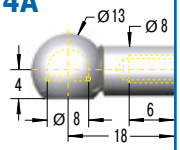
Clevis Fork D3,5-V4A

max. force 370 N



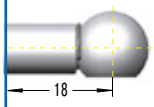
Mounting accessories see from page 202.

G3,5-V4A



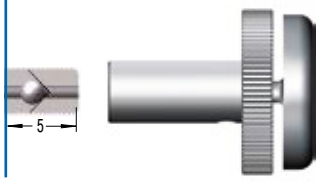
Ball Socket G3,5-V4A

max. force 370 N

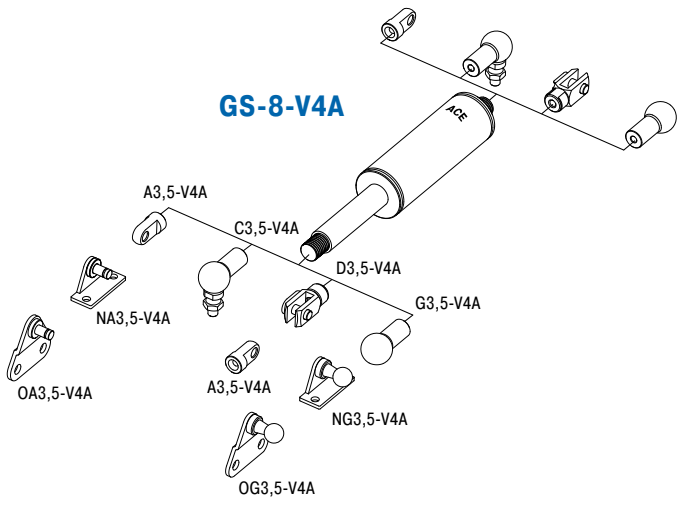


Adjuster Knob DE-GAS-3,5

See page 171.



Technical Data



Force range: 10 N to 100 N (compressed up to 130 N)

Progression: Approx. 27 %

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 must be positively secured by the customer to prevent unscrewing.

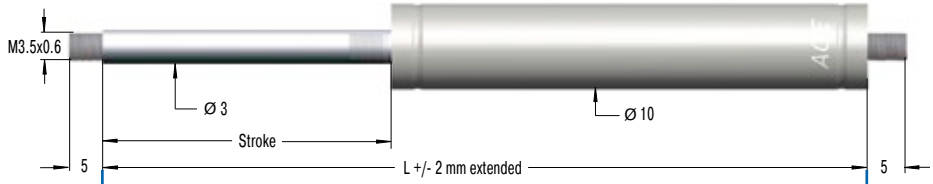
Safety instructions: Gas pressure springs should not be installed under pre-tension.

Industrial Gas Springs – Push Type GS-10-V4A

Valve Technology, Stainless Steel, Force range 10 N to 100 N (compressed up to 115 N)

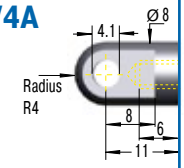
End Fitting | **Standard Dimensions** | **End Fitting**

B3,5



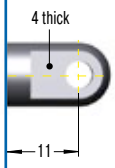
Stud Thread **B3,5**

A3,5-V4A



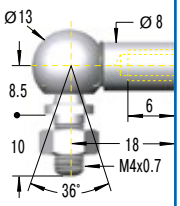
Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range max. N
GS-10-20-V4A	20	72	100
GS-10-30-V4A	30	92	100
GS-10-40-V4A	40	112	100
GS-10-50-V4A	50	132	100
GS-10-60-V4A	60	152	100
GS-10-80-V4A	80	192	100

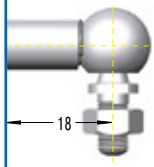


Eye **A3,5-V4A**
max. force 370 N

C3,5-V4A



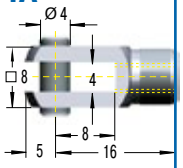
Angle Ball Joint **C3,5-V4A**
max. force 370 N



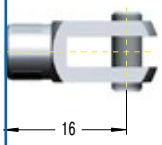
Ordering Example **GS-10-30-AC-30-V4A**

Type (Push Type)
Body Ø (10 mm)
Stroke (30 mm)
Piston Rod End Fitting A3,5-V4A
Body End Fitting C3,5-V4A
Nominal Force F_1 30 N
Material (1.4404/1.4571, AISI 316L/316Ti, V4A)

D3,5-V4A

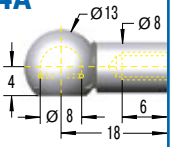


Clevis Fork **D3,5-V4A**
max. force 370 N

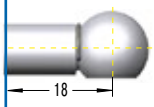


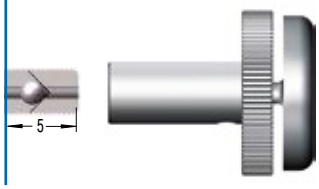
Mounting accessories see from page 202.

G3,5-V4A

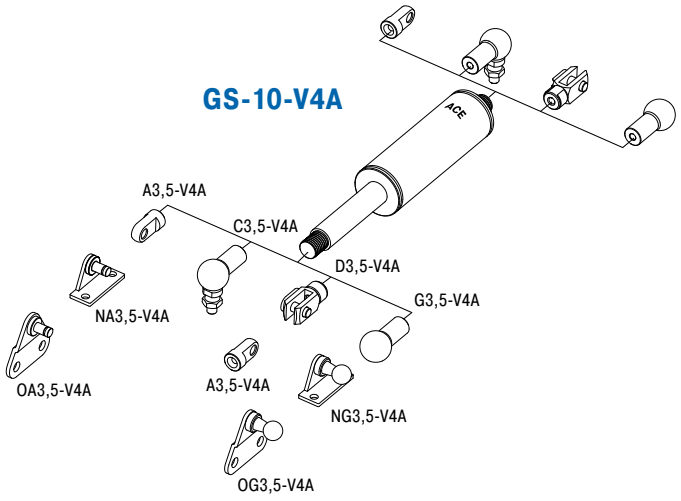


Ball Socket **G3,5-V4A**
max. force 370 N





Adjuster Knob
DE-GAS-3,5
See page 171.



Technical Data

Force range: 10 N to 100 N (compressed up to 115 N)

Progression: Approx. 12 %

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 must be positively secured by the customer to prevent unscrewing.

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

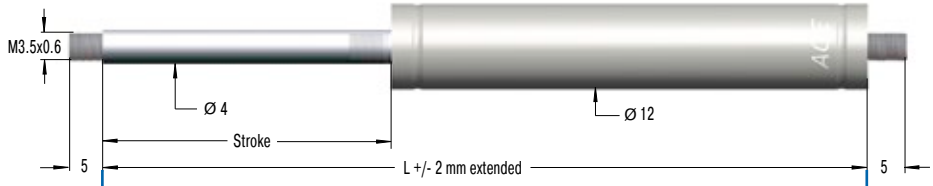
Issue 08.2016 – Specifications subject to change

End Fitting

Standard Dimensions

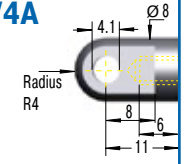
End Fitting

B3,5



Stud Thread B3,5

A3,5-V4A

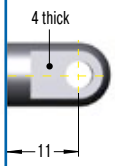


Performance and Dimensions

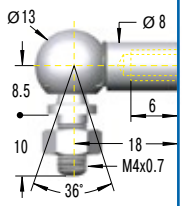
TYPES	Stroke mm	L extended mm	Force Range max. N
GS-12-20-V4A	20	72	180
GS-12-30-V4A	30	92	180
GS-12-40-V4A	40	112	180
GS-12-50-V4A	50	132	180
GS-12-60-V4A	60	152	180
GS-12-80-V4A	80	192	150
GS-12-100-V4A	100	232	150
GS-12-120-V4A	120	272	120
GS-12-150-V4A	150	332	100

Eye A3,5-V4A

max. force 370 N

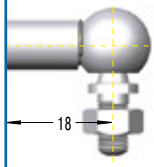


C3,5-V4A

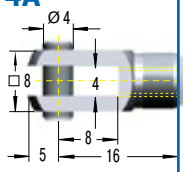


Angle Ball Joint C3,5-V4A

max. force 370 N



D3,5-V4A

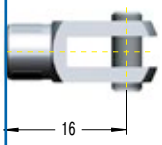


Ordering Example **GS-12-100-AA-30-V4A**

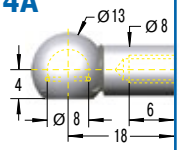
- Type (Push Type)
- Body Ø (12 mm)
- Stroke (100 mm)
- Piston Rod End Fitting A3,5-V4A
- Body End Fitting A3,5-V4A
- Nominal Force F_1 30 N
- Material (1.4404/1.4571, AISI 316L/316Ti, V4A)

Clevis Fork D3,5-V4A

max. force 370 N



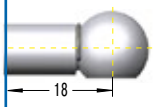
G3,5-V4A

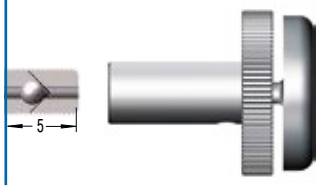


Mounting accessories see from page 202.

Ball Socket G3,5-V4A

max. force 370 N





Adjuster Knob
DE-GAS-3,5
See page 171.

Technical Data

Force range: 15 N to 180 N (compressed up to 212 N)

Progression: Approx. 18 %

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.

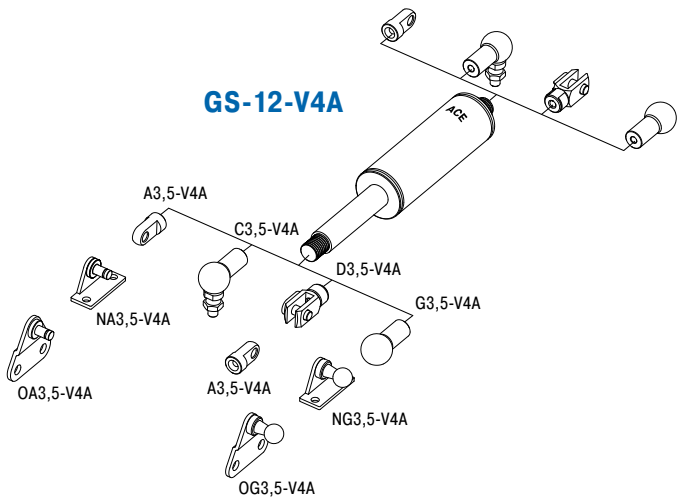
End position damping length: Approx. 10 mm (depending on the stroke)

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 must be positively secured by the customer to prevent unscrewing.

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



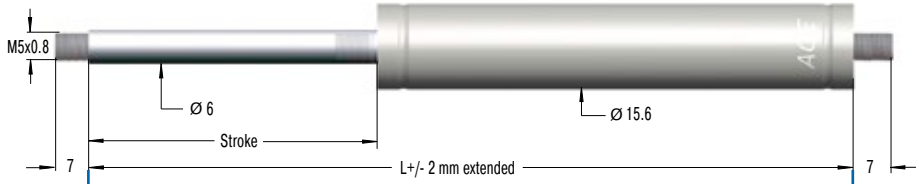
Issue 08.2016 – Specifications subject to change

Industrial Gas Springs – Push Type GS-15-VA

Valve Technology, Stainless Steel, Force range 40 N to 400 N (compressed up to 535 N)

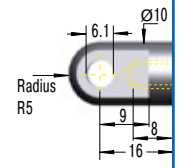
End Fitting | **Standard Dimensions** | **End Fitting**

B5



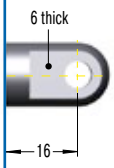
Stud Thread B5

A5-VA

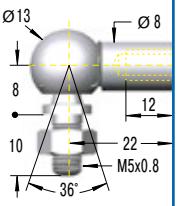


Eye A5-VA

max. force 490 N

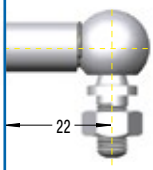


C5-VA

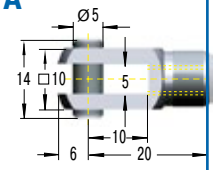


Angle Ball Joint C5-VA

max. force 430 N

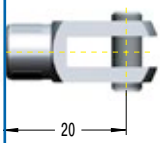


D5-VA

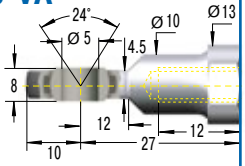


Clevis Fork D5-VA

max. force 490 N

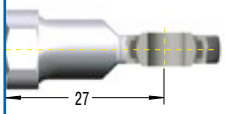


E5-VA



Swivel Eye E5-VA

max. force 490 N



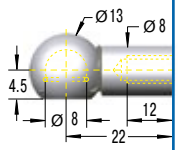
Ordering Example

GS-15-150-AC-150-VA

- Type (Push Type)
- Body Ø (15.6 mm)
- Stroke (150 mm)
- Piston Rod End Fitting A5-VA
- Body End Fitting C5-VA
- Nominal Force F_1 150 N
- Material (1.4301/1.4305, AISI 304/303, VA)

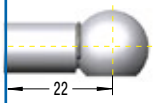
Mounting accessories see from page 202.

G5-VA

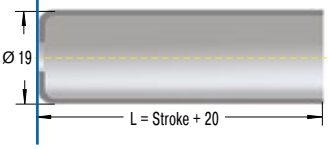


Ball Socket G5-VA

max. force 430 N

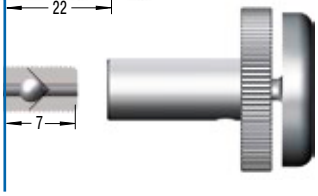


Rod Shroud W5-15-VA



Adjuster Knob DE-GAS-5

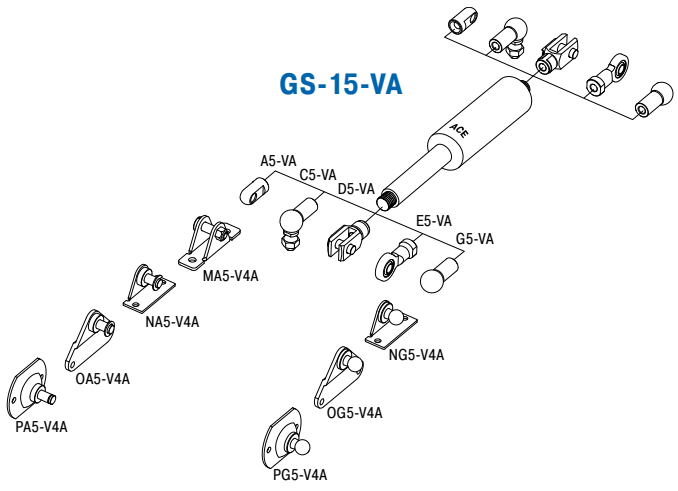
See page 171.



Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range max. N
GS-15-20-VA	20	74	400
GS-15-40-VA	40	114	400
GS-15-50-VA	50	134	400
GS-15-60-VA	60	154	400
GS-15-80-VA	80	194	400
GS-15-100-VA	100	234	400
GS-15-120-VA	120	274	400
GS-15-150-VA	150	334	400

Technical Data



Force range: 40 N to 400 N (compressed up to 535 N)

Progression: Approx. 34 %

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 must be positively secured by the customer to prevent unscrewing.

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

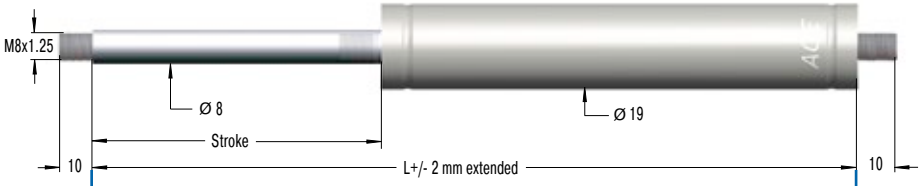
Issue 08.2016 – Specifications subject to change

End Fitting

Standard Dimensions

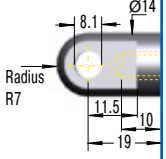
End Fitting

B8



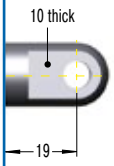
Stud Thread B8

A8-VA

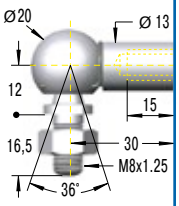


Eye A8-VA

max. force 1,560 N

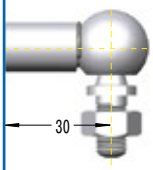


C8-VA



Angle Ball Joint C8-VA

max. force 1,140 N



Performance and Dimensions

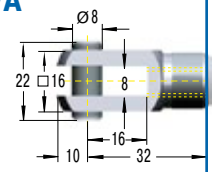
TYPES	Stroke mm	L extended mm	Force Range max. N
GS-19-50-VA	50	164	700
GS-19-100-VA	100	264	700
GS-19-150-VA	150	364	700
GS-19-200-VA	200	464	700
GS-19-250-VA	250	564	700
GS-19-300-VA	300	664	700

Ordering Example

GS-19-150-AC-600-VA

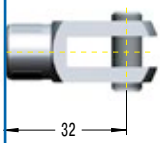
- Type (Push Type)
- Body Ø (19 mm)
- Stroke (150 mm)
- Piston Rod End Fitting A8-VA
- Body End Fitting C8-VA
- Nominal Force F_1 600 N
- Material (1.4301/1.4305, AISI 304/303, VA)

D8-VA

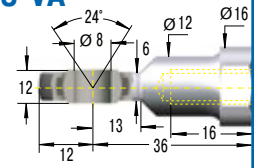


Clevis Fork D8-VA

max. force 1,560 N

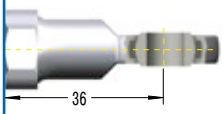


E8-VA



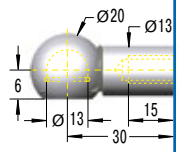
Swivel Eye E8-VA

max. force 1,560 N



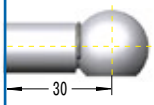
Mounting accessories see from page 202.

G8-VA

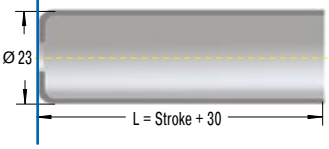


Ball Socket G8-VA

max. force 1,140 N

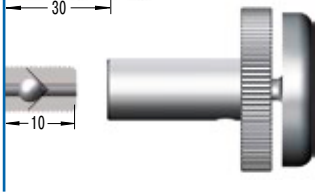


Rod Shroud W8-19-VA

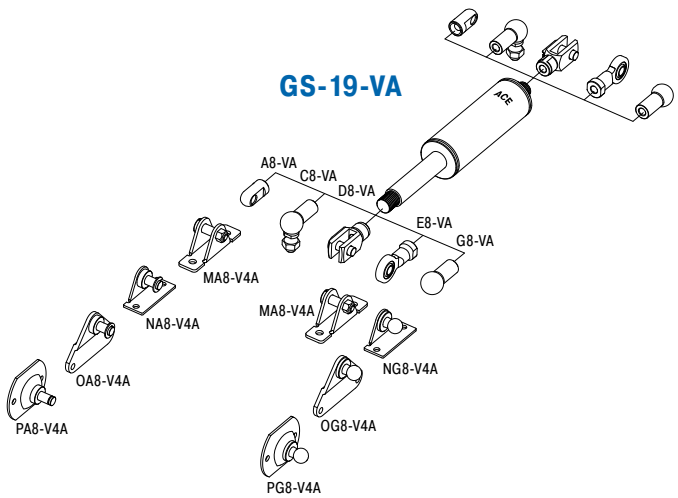


Adjuster Knob DE-GAS-8

See page 171.



Technical Data



Force range: 50 N to 700 N (compressed up to 930 N)

Progression: Approx. 33 %

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 must be positively secured by the customer to prevent unscrewing.

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

Issue 08.2016 – Specifications subject to change

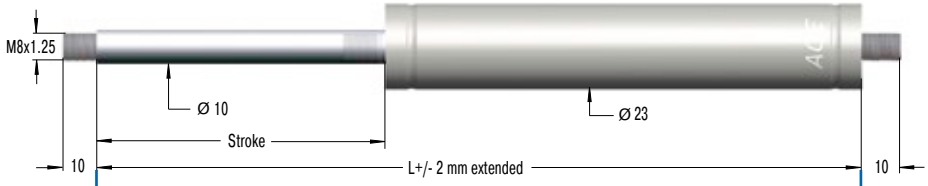
Valve Technology, Stainless Steel, Force range 100 N to 1,200 N (compressed up to 1,585 N)

End Fitting

Standard Dimensions

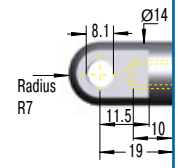
End Fitting

B8

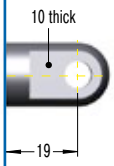


Stud Thread B8

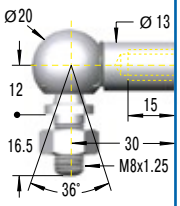
A8-VA



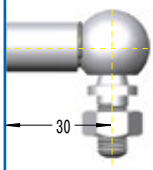
Eye A8-VA
max. force 1,560 N



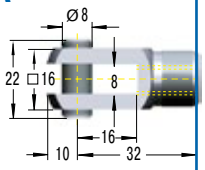
C8-VA



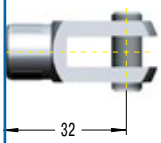
Angle Ball Joint C8-VA
max. force 1,140 N



D8-VA



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



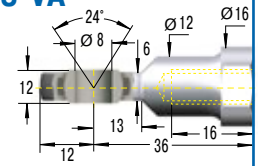
Performance and Dimensions

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

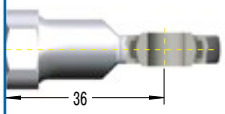
Ordering Example **GS-22-150-AE-800-VA**

- Type (Push Type)
- Body Ø (23 mm)
- Stroke (150 mm)
- Piston Rod End Fitting A8-VA
- Body End Fitting E8-VA
- Nominal Force F_1 800 N
- Material (1.4301/1.4305, AISI 304/303, VA)

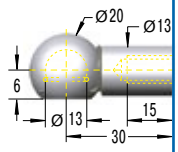
E8-VA



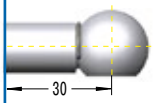
Swivel Eye E8-VA
max. force 1,560 N



G8-VA

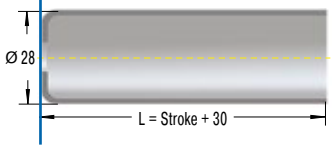


Ball Socket G8-VA
max. force 1,140 N

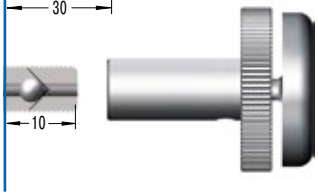


Mounting accessories see from page 202.

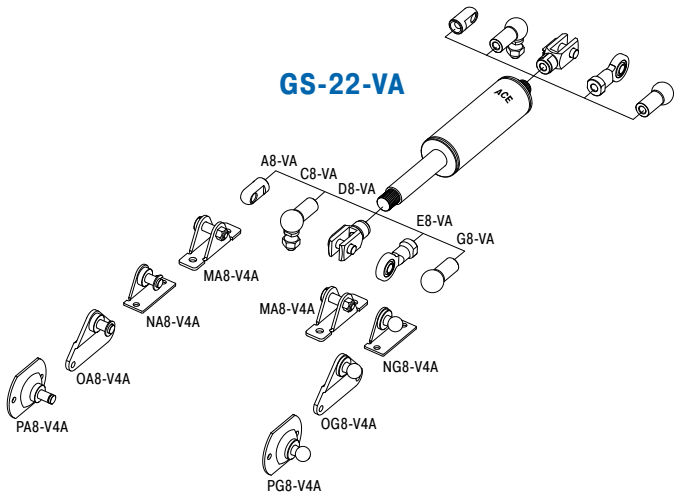
Rod Shroud
W8-22-VA



Adjuster Knob
DE-GAS-8
See page 171.



Technical Data



Force range: 100 N to 1,200 N (compressed up to 1,585 N)

Progression: Approx. 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

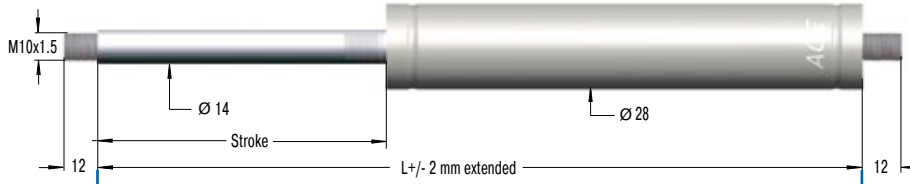
End fittings: They are interchangeable and must be positively secured by the customer to prevent unscrewing.

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

Issue 08.2016 – Specifications subject to change

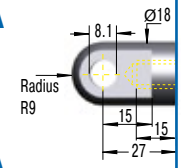
End Fitting — Standard Dimensions — End Fitting

B10



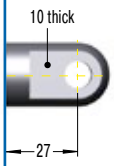
Stud Thread B10

A10-VA

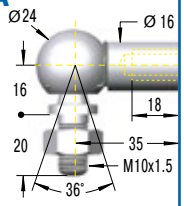


Eye A10-VA

max. force 3,800 N

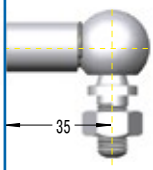


C10-VA

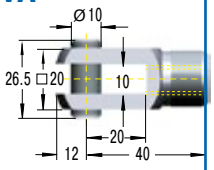


Angle Ball Joint C10-VA

max. force 1,750 N

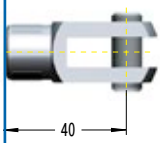


D10-VA

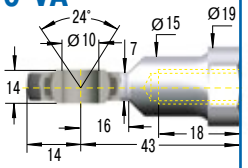


Clevis Fork D10-VA

max. force 3,800 N

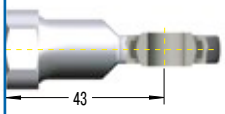


E10-VA



Swivel Eye E10-VA

max. force 3,800 N



Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range max. N
GS-28-100-VA	100	262	2,500
GS-28-150-VA	150	362	2,500
GS-28-200-VA	200	462	2,500
GS-28-250-VA	250	562	2,500
GS-28-300-VA	300	662	2,500
GS-28-350-VA	350	762	2,500
GS-28-400-VA	400	862	2,500
GS-28-450-VA	450	962	2,500
GS-28-500-VA	500	1,062	2,500
GS-28-550-VA	550	1,162	2,500
GS-28-600-VA	600	1,262	2,500
GS-28-650-VA	650	1,362	2,500

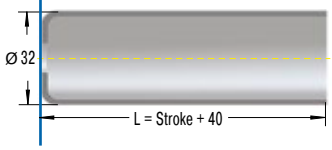
Ordering Example

GS-28-150-EE-1200-VA

- Type (Push Type)
- Body Ø (28 mm)
- Stroke (150 mm)
- Piston Rod End Fitting E10-VA
- Body End Fitting E10-VA
- Nominal Force F_1 1200 N
- Material (1.4301/1.4305, AISI 304/303, VA)

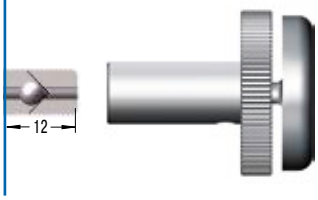
Mounting accessories see from page 202.

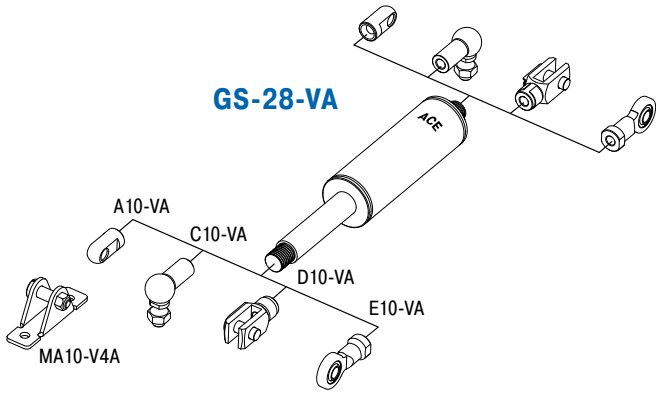
Rod Shroud W10-28-VA



Adjuster Knob DE-GAS-10

See page 171.





Technical Data

Force range: 150 N to 2,500 N (compressed up to 3,800 N)

Progression: Approx. 52 %

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 must be positively secured by the customer to prevent unscrewing.

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

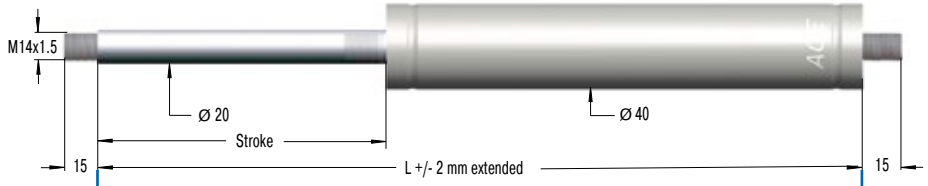
Issue 08.2016 – Specifications subject to change

Industrial Gas Springs – Push Type GS-40-VA

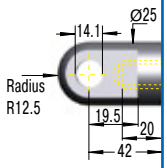
Valve Technology, Stainless Steel, Force range 500 N to 5,000 N (compressed up to 7,000 N)

End Fitting

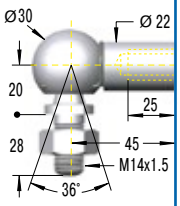
B14



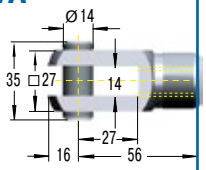
A14-VA



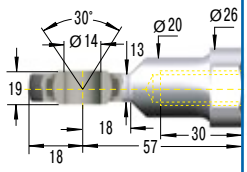
C14-VA



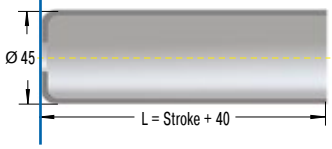
D14-VA



E14-VA



Rod Shroud W14-40-VA



Standard Dimensions

Performance and Dimensions

TYPES	Stroke mm	L extended mm	Force Range 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	5,000

Ordering Example

GS-40-150-DD-3500-VA

- Type (Push Type)
- Body Ø (40 mm)
- Stroke (150 mm)
- Piston Rod End Fitting D14-VA
- Body End Fitting D14-VA
- Nominal Force F_1 3500 N
- Material (1.4301/1.4305, AISI 304/303, VA)

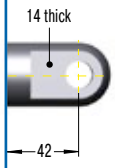
Mounting accessories see from page 202.

End Fitting

Stud Thread B14

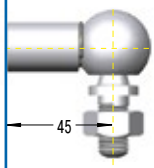
Eye A14-VA

max. force 7,000 N



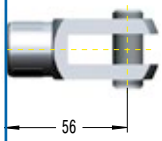
Angle Ball Joint C14-VA

max. force 3,200 N



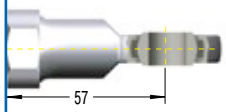
Clevis Fork D14-VA

max. force 7,000 N



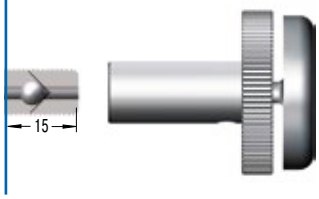
Swivel Eye E14-VA

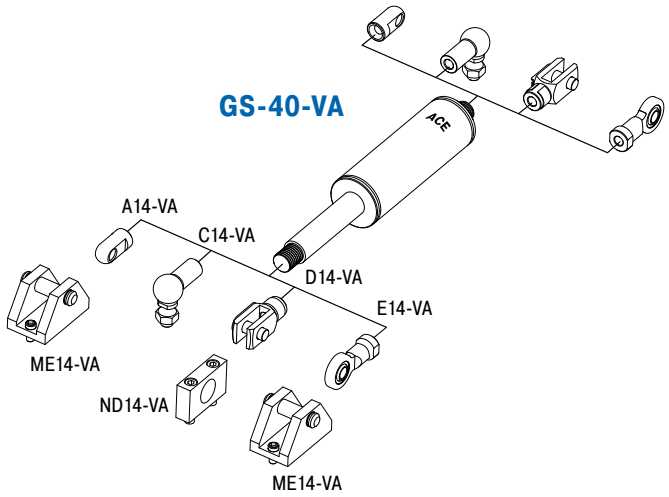
max. force 7,000 N



Adjuster Knob DE-GAS-14

See page 171.





Technical Data

Force range: 500 N to 5,000 N (compressed up to 7,000 N)

Progression: Approx. 40 %

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 must be positively secured by the customer to prevent unscrewing.

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

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Further Stainless Steel Gas Springs (Push Type), V4A

Performance

TYPES	Stroke **mm**	L extended **mm**	Dimensions see Page
GS-15-20-V4A	20	74	144
GS-15-40-V4A	40	114	144
GS-15-50-V4A	50	134	144
GS-15-60-V4A	60	154	144
GS-15-80-V4A	80	194	144
GS-15-100-V4A	100	234	144
GS-15-120-V4A	120	274	144
GS-15-150-V4A	150	334	144
GS-19-50-V4A	50	164	145
GS-19-100-V4A	100	264	145
GS-19-150-V4A	150	364	145
GS-19-200-V4A	200	464	145
GS-19-250-V4A	250	564	145
GS-19-300-V4A	300	664	145
GS-22-50-V4A	50	164	146
GS-22-100-V4A	100	264	146
GS-22-150-V4A	150	364	146
GS-22-200-V4A	200	464	146
GS-22-250-V4A	250	564	146
GS-22-300-V4A	300	664	146
GS-22-350-V4A	350	764	146
GS-22-400-V4A	400	864	146
GS-22-450-V4A	450	964	146
GS-22-500-V4A	500	1,064	146
GS-22-550-V4A	550	1,164	146
GS-22-600-V4A	600	1,264	146
GS-22-650-V4A	650	1,364	146
GS-22-700-V4A	700	1,464	146
GS-28-100-V4A	100	262	147
GS-28-150-V4A	150	362	147
GS-28-200-V4A	200	462	147
GS-28-250-V4A	250	562	147
GS-28-300-V4A	300	662	147
GS-28-350-V4A	350	762	147
GS-28-400-V4A	400	862	147
GS-28-450-V4A	450	962	147
GS-28-500-V4A	500	1,062	147
GS-28-550-V4A	550	1,162	147
GS-28-600-V4A	600	1,262	147
GS-28-650-V4A	650	1,362	147
GS-40-100-V4A	100	317	148
GS-40-150-V4A	150	417	148
GS-40-200-V4A	200	517	148
GS-40-300-V4A	300	717	148
GS-40-400-V4A	400	917	148
GS-40-500-V4A	500	1,117	148
GS-40-600-V4A	600	1,317	148

Further Stainless Steel Accessories, V4A

End Fittings

TYPES	Dimensions see Page
A5-V4A	204
C5-V4A	204
D5-V4A	204
E5-V4A	204
G5-V4A	204
A8-V4A	205
C8-V4A	205
D8-V4A	205
E8-V4A	205
G8-V4A	206

End Fittings

TYPES	Dimensions see Page
A10-V4A	206
C10-V4A	206
D10-V4A	206
E10-V4A	206
A14-V4A	206
C14-V4A	206
D14-V4A	206
E14-V4A	206

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GST-40 Tandem

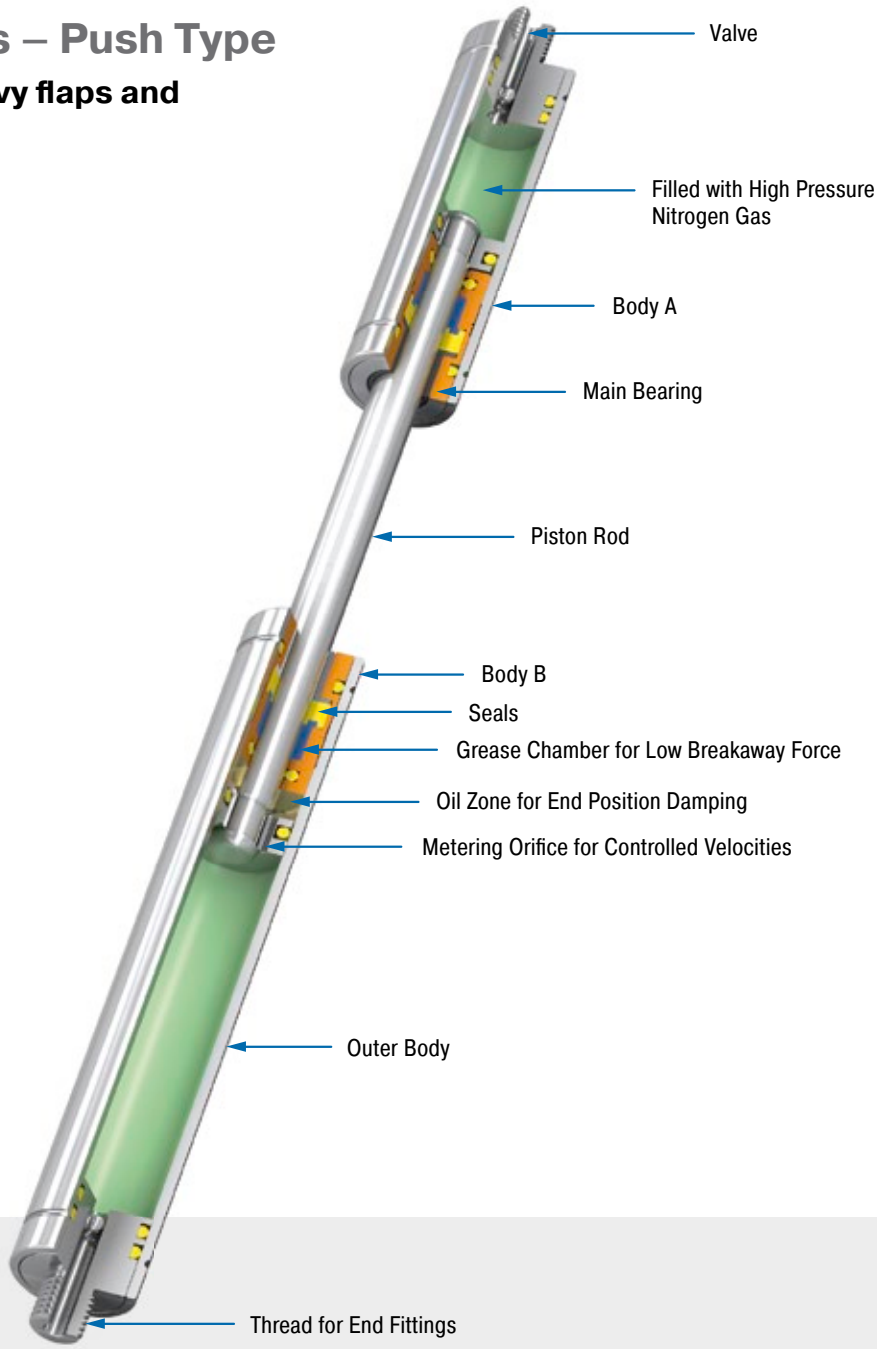
Industrial Gas Springs – Push Type

Optimised dual force for heavy flaps and wide angle applications

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 compliment 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

Force range: 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

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

End fittings: They are interchangeable and 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).

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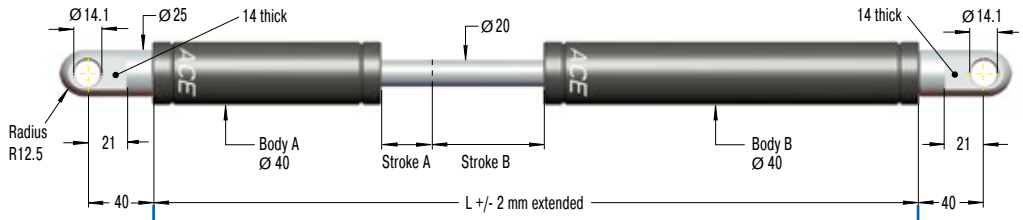
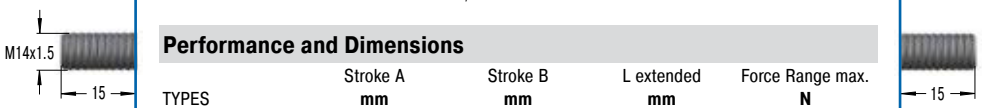
End Fitting

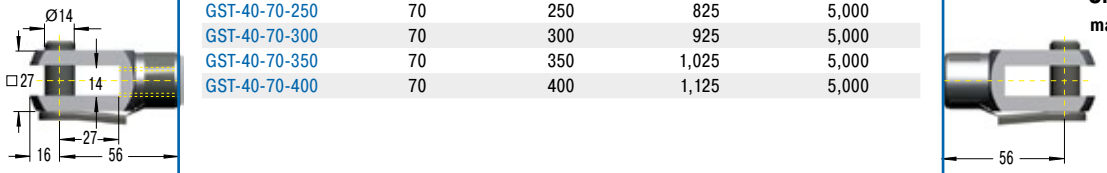
A14



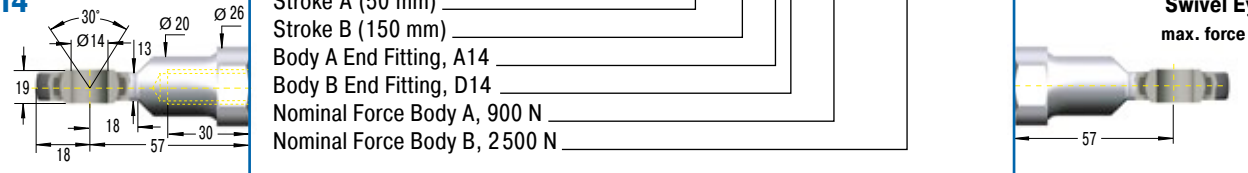
B14



D14



E14



Standard Dimensions

Performance and Dimensions

TYPES	Stroke A mm	Stroke B mm	L extended mm	Force Range 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 194.

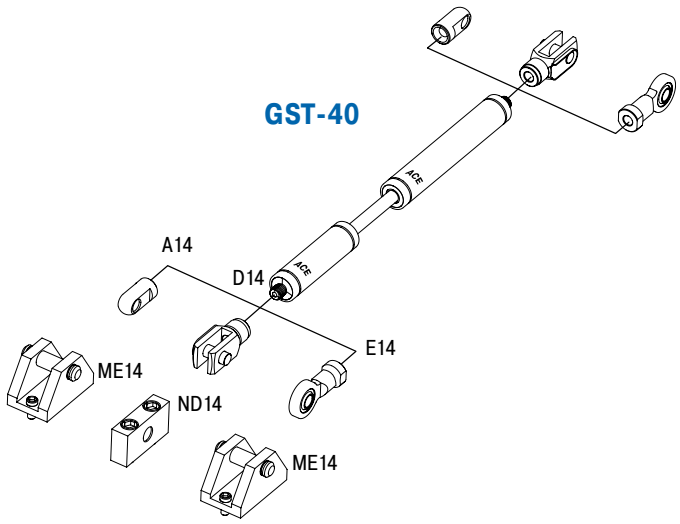
End Fitting

Eye A14
max. force 10,000 N

Stud Thread B14

Clevis Fork D14
max. force 10,000 N

Swivel Eye E14
max. force 10,000 N



Technical Data

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 must be positively secured by the customer to prevent unscrewing.

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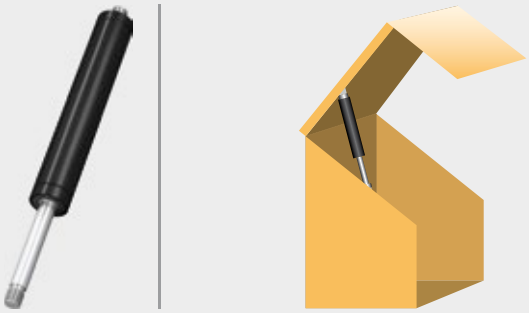
Application Examples

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.

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

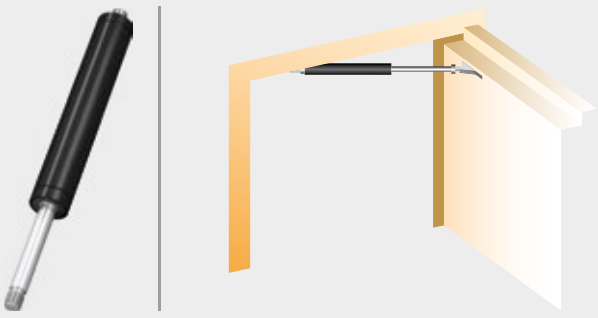


GS-19

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.

Industrial gas springs: For safe entry and exit



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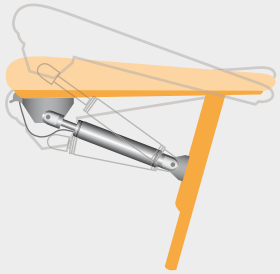
GS-22-VA

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

Tandemly-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

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