Contents

KALLER®

About gas springs

GENERAL

KALLER gas springs are designed to meet customer expectations for reliability, safety and service lifetime. The design, manufacture and testing of KALLER gas springs has been approved according to the new Pressure Equipment Directive (97/23/EC).

The Pressure Equipment Directive (PED) replaces all previous European legislative laws governing the design, manufacture and testing of pressure vessels.

Manufacturing is carried out, using the very latest production methods and equipment, at our modern facilities in Tranås, Sweden.

Strömsholmen AB, the designers and manufacturers of KALLER gas springs, has been ISO 9001 approved since 1994 and ISO 9000:2000 and PED (97/23/EC) approved since 2002 and is the World's first and leading manufacturer of nitrogen gas springs for the metal stamping industry.

Overview of Models

The following is an overview of our Tool & Die family of gas springs:

CU Series:

These Super-Compact gas springs provide a high amount of force while having small outer body diameters.

Forces:	420 daN to 18 300 daN
Strokes:	6 mm to 50 mm
Max. strokes/min.:	~100 (at 20°C)

Power Line - X Series:

The World's shortest and strongest Rod Sealed gas spring with tapped base mounting holes and side charging port for hose system connection.

Forces	350 daN to 4 200 daN
Strokes	10 mm to 125 mm
Max. strokes/min.	~20-100 (at 20°C)

EP Series:

These Ejector Pin gas springs are colour coded and fully adjustable with either an M16 or M24 threaded body.

Forces:	5 daN to 170 daN
Strokes:	10 mm to 100 mm
Max. strokes/min.:	~100 (at 20°C)

R19 Series:

Non-repairable, colour coded and fully adjustable gas springs with a Ø19mm outer body diameter.

Forces:	30 daN to 90 daN
Strokes:	7 mm to 80 mm
Max. strokes/min.:	~100-150 (at 20°C)

Mini Series:

Repairable, colour coded and fully adjustable gas springs with small outer body diameters.

Forces:	50 daN to 200 daN
Strokes:	10 mm to 125 mm
Max. strokes/min.:	~80-100 (at 20°C)

TU Series:

Kaller's standard series and the World's first range of gas spring. Dimensions correspond to the ISO-11 901 standard for gas springs.

Forces:	250 daN to 10 000 daN
Stroke lengths:	10mm to 300mm
Max. strokes/min.:	~15-40 (at 20°C)

TB Series:

Low force increase version of the TU Series, sharing the same total lengths but with larger body diameters. As a result, it has a longer service lifetime and can be run at faster press frequencies.

Forces:	750 daN to 5 000 daN
Stroke lengths:	12.7 mm to 300 mm
Max. strokes/min.:	~40-80 (at 20°C)

SL Series:

Similar to the TU Series, these gas springs have "inch based" total lengths and stroke lengths.

Forces:	750 daN to 5 000 daN
Strokes:	½" to 8"
Max. strokes/min.:	~15-40 (at 20°C)

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K Series:

Short height version of the TU Series with tapped base mounting holes and side charging port for hose system connection.

Forces:	500 daN to 5 000 daN
Strokes	6 mm to 125 mm
Max. strokes/min.	~30 (at 20°C)

KS Series:

Shorter height version of the TU Series with charging port located in the piston rod and without tapped base mounting holes.

Forces:	250 daN to 750 daN
Strokes:	12.7 mm to 125 mm
Max. strokes/min.:	~30 (at 20°C)

HT Series:

High Temperature gas springs for applications with working temperatures up to 180°C.

Forces:	250 daN to 750 daN
Strokes:	10 mm to 300 mm
Max. strokes/min.:	~60 (at 20°C)

HG Series:

These Hollow Gas springs have a hole that goes right through the centre axis of the spring, allowing the gas spring to be mounted onto a pillar or rod.

Forces:	250 daN to 4 180 daN
Strokes:	10 mm to 300 mm
Max. strokes/min.:	~15-40 (at 20°C)

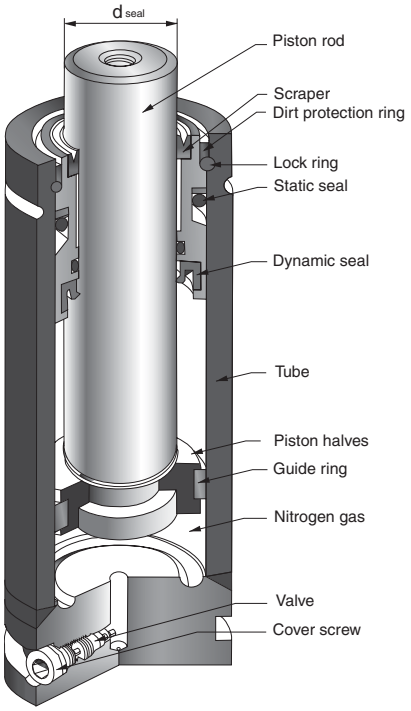
HF Series:

High Frequency gas springs, with a short stroke length and unique sealing method allow these gas springs to run up to 1000 strokes/minute.

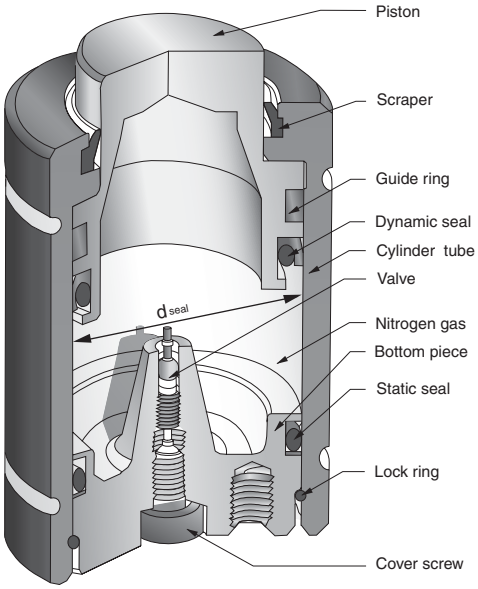
Forces:	150 daN to 1 500 daN
Strokes:	3 mm to 7 mm
Max. strokes/min.:	~400-1000 (at 20°C)

Main groups of gas springs

Kaller gas springs can be split into two main groups, namely Piston Rod Sealed and Bore Sealed. The two basic designs can be seen below:



Piston Rod Sealed gas spring



Bore sealed gas spring

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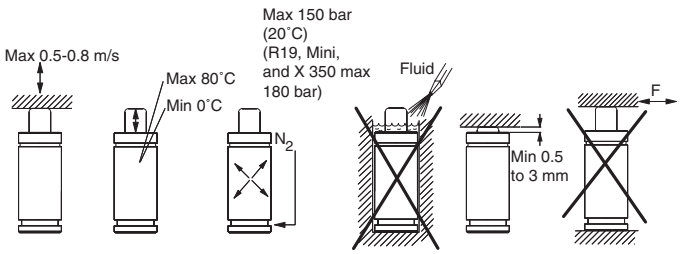
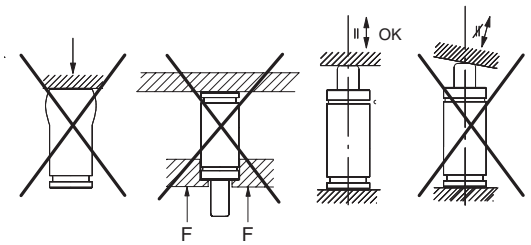
USER INFORMATION

Mounting Instructions

To achieve the best possible service-life and safety from the gas spring, the instructions below must be followed. The gas spring is intended for use in tool and machine applications.

- Secure the gas spring to the tool/machine whenever possible, using the threaded hole(s) in the base of the gas spring or a suitable flange.
- The threaded hole in the piston rod top should not be used for mounting purposes. It is only to be used when servicing the gas spring.
- Do not use the gas spring in such a way that the piston rod is released freely from its compressed position, as this could cause internal damage to the gas spring.
- The maximum allowed stroke speed is from 0.5 to 0.8 m/s, depending on model, see catalogue.
- Make sure the gas spring is mounted parallel to the direction of the compression stroke.
- Ensure the contact surface of the piston rod top is perpendicular to the direction of the compression stroke and is sufficiently hardened.
- The gas spring should not be subjected to side loads.
- Protect the piston rod against mechanical damage and contact with fluids.





Stroke length

The nominal stroke (defined as S in the catalogue tables) may be utilised fully in all KALLER gas springs.

However the recommendation is not to use the full stroke in normal operation. This is to prevent the spring from being “over-stroked” as a result of changes to the tool or mis-happenings in the tool.

We do not recommend the last 5 mm or 10 % of the nominal stroke be utilised.

Maximum charging pressure

The maximum charging pressure (at 20°) stated for the different gas springs may not be exceeded as it may affect the safety of the product.

Operating temperature

Exceeding the gas spring’s recommended operating temperature will shorten the service-life of the gas spring.

Recommended maximum strokes/ minute

The values given for each gas spring in the catalouge are valid for “normal” applications in press tools. The lower limits given are valid for the longer stroke lengths and the higher values for short stroke springs. These values are based on a fully utilised stroke. If only a portion of the stroke is used the number of strokes per minute could be increased.

For further information contact your local distributor.

Maximum piston rod velocity

The maximum piston rod velocity is not to be exceeded because it may infringe on safety, as well as the performance of the gas spring.

Service interval

If correctly installed and used, the following minimum service-interval of the KALLER Gas Springs, except models TB, HT, HG and HF, are recommended.

Stroke lengths up to and including 50 mm after 1 million strokes.

Stroke lengths above 50 mm after 100 000 stroke meters.

The number of stroke meters is calculated as:
Used stroke (in meters) x 2 x number of strokes.

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It is our recommendation that the gas spring is replaced after 2 million strokes or after 10 years of service.

Service information

All KALLER gas springs except the EP16, EP24, EPS24, R19 and CU 420 series can be serviced. For the service, Repair Kits and Tool Kits are available. Service instructions are included in the Repair Kits.

Caution! Only specially trained personnel with good knowledge about the products should carry out the maintenance. Mistakes made during assembly and charging may infrige safety and/or have a detrimental effect on the service-life of the product.

Your local distributor can help you with training. (Service-video in VHS-PAL, CD-ROM and DVD are also available).

CAD-files

To make it easier for tool designers to design in our gas springs, KALLER products are available as both 2D and 3D CAD files/models. These are available for download from our web-site (www.kaller.com) or can be ordered from your local distributor.

BASIC GAS SPRING THEORY 1

Calculating the initial force

The initial force of the gas spring can be calculated as the sealed area of the piston rod or the piston (depending on design) multiplied by the pressure in the gas spring.

The larger the effective cross sectional area of the piston rod or the piston, the more ”powerful” the gas spring will be. This explains why a Bore Sealed spring, like the CU spring is more powerful than a Piston Rod Sealed spring, like the TU spring with the same outer body diameter. Derived from the information above the gas spring force can be written as:

Formula ❶

$$F_{gas\ spring}\ (N) = p \bullet d_{seal}^{\ 2} \bullet \frac{\pi}{40}$$

p (bar)
d_{seal} (mm)

Adjusting the initial force

As seen from formula ❶ the force from any given gas spring can be changed by changing the gas pressure. In cases where a non standard initial force is required the following formula should be applied.

Formula ❷

$$p_{charging} = p_{standard} \bullet \frac{F_{required}}{F_{standard}}$$

$F_{required}$ (N) = The required initial force
$F_{standard}$ (N) = Standard initial force (at $p_{standard}$)
$p_{standard}$ (bar) = Standard charing pressure

About gas springs

KALLER®

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Example I

A TU 1500 spring (see page 2.8/2) should be modified to give an initial force of 12 000 N (at 20°C).

$$P_{charging} = P_{standard} \bullet \frac{F_{required}}{F_{standard}}$$

$$F_{required} = 12\ 000\ N$$

In the table for the TU 1500 the following values can be found:

$P_{standard}$ = 150 bar

$F_{standard}$ = 15 000 N

The charging pressure that should be used will then be:

$$P_{charging} = 150 \bullet \frac{12\ 000}{15\ 000} = 120\ bar$$

A gas pressure of 120 bar will give the desired initial force of 12 000 N.

The standard initial force, $F_{standard}$ and the standard charging pressure at 20°C are given for each model in the catalogue.

Isothermic force increase

As the gas spring is compressed the gas pressure in the spring will rise resulting in an increased gas spring force. The gas pressure increase (and force increase) is determined by the following gas laws.

The ideal gas law

Formula ❸

$$p \bullet V = n \bullet R \bullet T$$

p (bar) = **gas pressure**
V (l) = **gas volume**
n (mole) = **molecular quantity**
R (Nm/°K) = **constant = 8.314**
T (°K) = **temperature**

For a closed system, as the gas spring, where the temperature is kept constant (isothermic process) this formula can be simplified to:

Formula ❹

$$p \bullet V = constant \qquad \text{(Boyles law)}$$

Calculating the gas pressure at a certain point of the stroke (S) can be performed in the following way:

Formula ❺

$$p_o \bullet V_o = p_s \bullet V_s$$

p_o (bar) = **initial pressure**
V_o (l) = **initial volume**
p_s (bar) = **pressure at stroke S**
V_s (l) = **volume at stroke S**

By combining this Formula ❺ with Formula ❶ the following Formula ❻ can be derived to calculate the force at any position of the stroke.

Formula ❻

$$F_s = F_{init,\ actual} \bullet \left(\frac{S_{nom}}{S_{nom} - S_{used} \bullet \left[1 - \frac{F_{init,nom}}{F_{end,\ nom}} \right]} \right)$$

F_s (N) = **force at the used stroke S**
$F_{init,actual}$ (N) = **initial force at current charging pressure**
S_{used} (mm) = **used stroke**
S_{nom} (mm) = **nominal stroke for the spring**
$F_{init,nom}$ (N) = **nominal initial force of the spring**
F_{end} (N) = **force at full nominal stroke**

S_{nom}, $F_{init,nom}$ and $F_{end,nom}$ are given for each model in the catalogue. If the force has not been changed (the charge pressure has not been modified) $F_{init,\ actual}$ will be the same as the $F_{init,\ nom}$ which is the value given in the catalogue.

Note! All end forces, stated in the catalogue are the isothermic end forces.

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Example II

What is the spring force of a TU 1500 – 100 when compressing the spring 80 mm?

$$F_s = F_{init,\ actual} \bullet \frac{S_{nom}}{S_{nom} - S_{used} \bullet \left[1 - \frac{F_{init,\ nom}}{F_{end,\ nom}}\right]}$$

S_{used} = 80 mm

The table for the TU 1500 (see page 2.8/2) will give the following values:

$F_{init,\ actual}$ = 15 000 N
S_{nom} = 100 mm
$F_{init,\ nom}$ = 15 000 N
$F_{end,\ nom}$ = 23 000 N

$$F_s = 15\,000 \bullet \frac{100}{100 - 80 \bullet \left[1 - \frac{15\,000}{23\,000}\right]}$$

F_s (80mm) = 20 800 N

If the temperature of the gas spring is kept constant, (isothermic process), the spring will give a force of 20 800 N when compressed 80 mm.

Polytropic force increase

For most applications the temperature inside the gas spring will not stay constant during the stroke. For these applications the following formula should be used to calculate the ”true” force increase (polytropic process).

Formula ❼

$$F_s = F_{init,\ actual} \bullet \left[\frac{S_{nom}}{S_{nom} - S_{used} \bullet \left[1 - \frac{F_{init,\ nom}}{F_{end,\ nom}}\right]}\right]^n$$

Where **n** is called the polytropic exponent.

Depending on how fast the gas spring is compressed and the initial gas pressure the n-value will be between 1 and 1.55. For a normal application in a press tool and a carging pressure of 150 bar an value of 1.4 can be used.

S_{nom}, $F_{init,nom}$ and **$F_{end,nom}$** are given for each model in the catalogue. If the force has not been changed (the carge pressure has not been modified) **$F_{init,\ actual}$** will be the same as the **$F_{init,\ nom}$** which is the value given in the catalogue.

Note! All end forces, stated in the catalogue are the isothermic end forces.

Example III

What is the “polytropic” end force of a TU 1500-100, when using a stroke of 80 mm in a “normal” press application?

Formula ❼

$$F_{s,\ polytropic} = F_{init,\ actual} \bullet \left[\frac{S_{nom}}{S_{nom} - S_{used} \bullet \left[1 - \frac{F_{init,\ nom}}{F_{end,\ nom}}\right]}\right]^n$$

$F_{init,\ actual}$ = 15 000 N
S_{nom} = 100 mm
S_{used} = 80 mm
$F_{end,nom}$ = 23 000 N
$F_{init,nom}$ = 15 000 N
n = 1.4 (“normal press application”)

$$F_{s,\ polytropic}\ (80\ mm) = 15\,000 \bullet \left[\frac{100}{100 - 80 \bullet \left[1 - \frac{15\,000}{23\,000}\right]}\right]^{1.4}$$

$F_{s,\ polytropic}$ (80 mm) = 23 700 N

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Initial force depending on temperature

The temperature of the nitrogen gas affects the pressure in, and the force, of the gas spring. The forces given in the catalogue are based on a temperature of 20°C. Using the same basic Formula ❸ as before the pressure and force at other temperatures can be calculated as follows:

Formula ❽

$$\frac{p_0}{T_0} = \frac{p_1}{T_1}$$

T_0 (°K) = Reference temperature

T_1 (°K) = Gas spring temperature

Formula ❾

$$p_1 = p_0 \bullet \frac{T_1}{T_0}$$

As the force is proportional to the pressure, it can also be written as:

Formula ❿

$$F_1 = F_0 \bullet \frac{T_1}{T_0}$$

Example IV

A gas spring with a initial force of 15000 N at 20°C is used in such a way that the gas spring temperature is increased to 60°C. What initial force will the spring have at 60°C?

Solution using Formula ❿

$$F_1 = F_0 \bullet \frac{T_1}{T_0}$$

F_0 = 15 000 N

T_1 = 273 + 60°C = 333°K

T_0 = 273 + 20°C = 293°K

$$F_1 = 15\,000 \bullet \frac{333}{293} = 17\,000 \text{ N}$$

LCF (Low Contact Force) Gas Spring Information

The LCF Series is the next generation of nitrogen gas springs. This innovative series is engineered to address the major problems facing metal stampers today: excessive shock loads, high noise levels and extreme pad/blank-holder bounce, all factors that lead to high press maintenance costs and noise pollution.

The LCF Series reduces shock load by as much as 50% compared to traditional gas springs. They deliver a gradual force build-up and smooth acceleration so there's less impact on gear and bearings and less wear on drive components.
The payoff is reduced press maintenance.

The LCF Series lowers noise levels significantly, with a higher reduction in sound pressure level compared to standard gas springs. Its lesser impact force results in these lower noise levels and makes these springs a cost effective alternative to building noise enclosures.
The payoff is a quieter, safer and healthier working environment.

The LCF Series decreases pad/blank-holder bounce, allowing improved part transfer efficiency, increased production rates and reduced scrap. A gradual force increase and return results in smoother pad/blank-holder operation.
The payoff is higher production rates.

Because LCF gas springs mount directly to the die and are independent from the press, all benefits travel with the tool.

Standard features:

- 100% interchangeable with standard, ISO gas springs (i.e. our TU Series)
- Retrofits in existing dies
- Charged and rebuilt like standard gas springs
- Drop in, flange mount, or base plate mounting
- Can be hosed together
- Can be incorporated into press cushions

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F_{INIT} < 250

EP16 05 - 40

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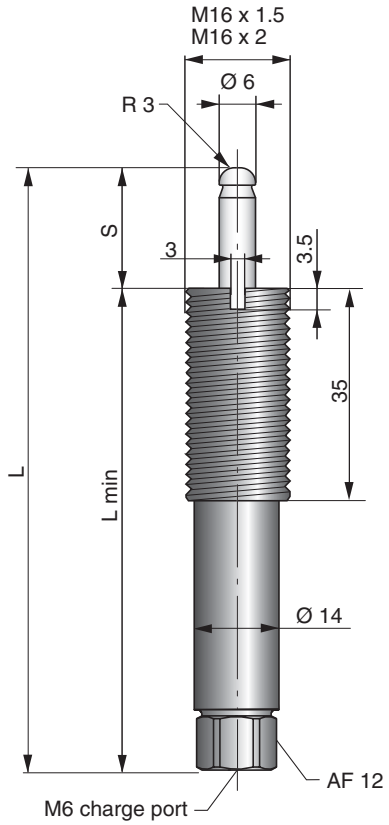
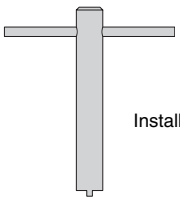


EP16 gas springs (Ejector Pin with an M16 thread) are available in both M16 x 1.5 and M16 x 2 thread sizes.

In each thread size, five models are available. Four preset models (Green, Blue, Red & Yellow) and one adjustable model (Black), whose charging pressure is 5-10 bar, intended for the customer to adjust the gas charge pressure.

They are all colour-coded to help identify the force rating and can be adjusted and recharged to meet individual force requirements.



Installation tool, Order No. 3018432

How to order

EP16x1.5 05-10

Model:

Thread: x1.5 = M16x1.5
x2 = M16x2

Stroke Length (mm)
(10, 20, 30, 40, 50, 60, 70, 80, 100, 125)

Force: 05 = Green
10 = Blue
20 = Red
40 = Yellow
xx = Black, delivered with a pre-charge of 5-10 bar

Model	Charging pressure (bar)	Colour	Force in N at +20°C
			Initial
EP16 05	20	Green	57
EP16 10	40	Blue	110
EP16 20	75	Red	210
EP16 40	150	Yellow	420
EP16 XX*	20-150	Black	57-420

* Force to be set by the customer.
Delivered with a pre-charge of 5-10 bar.

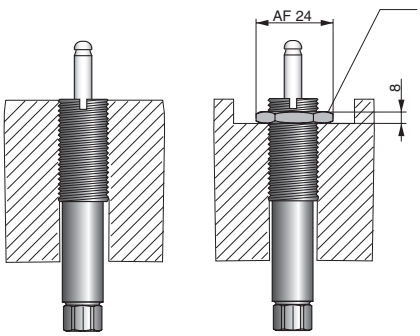
S Stroke	End force in N at + 20°C, at full stroke				L ±0.25	L min	Gas vol. (l)	Weight (kg)
	EP16 05	EP16 10	EP16 20	EP16 40				
10	70	140	250	530	80	70	0.003	0.063
20	70	140	270	540	100	80	0.004	0.070
30	75	150	280	550	120	90	0.005	0.077
40	75	150	280	560	140	100	0.006	0.084
50	75	150	280	570	160	110	0.007	0.091
60	75	150	290	570	180	120	0.008	0.098
70	80	150	290	580	200	130	0.009	0.105
80	80	160	290	580	220	140	0.010	0.111
100	80	160	290	580	260	160	0.012	0.118
125	80	160	290	580	310	185	1.014	0.129

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 20 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ± 0.3%/°C
Recommended max strokes/min ... ~ 100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black Oxide
Repair kit ..... Non-repairable

MOUNTING POSSIBILITIES



Lock nut

Order No.	Thread
503681	M16 x 1.5
503722	M16 x 2

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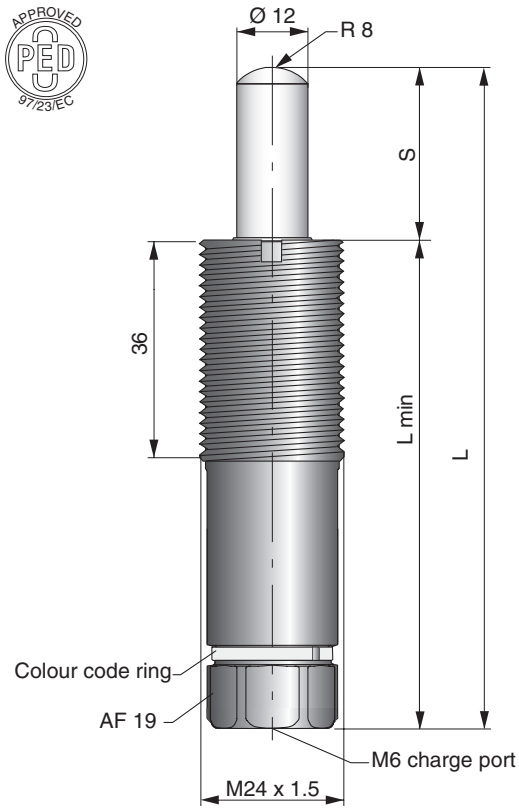
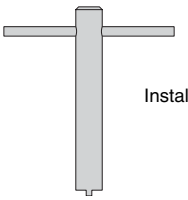


EP24 (Ejector Pin with an M24 thread). It is available with four pre-set models. Each model is colour-coded for easy identification of force rating. If needed, these models can be recharged or adjusted to meet individual force requirements.

Also available is a model (black) which is delivered with a precharge of 5 to 10 bar, intended to be adjusted to the desired force.



Installation tool, Order No. 3018966

How to order

EP24 20-10

Model:

Stroke Length (mm)
(10, 20, 30, 40, 50, 60, 70, 80, 100)

Force: 20 = Green
40 = Blue
80 = Red
170 = Yellow
xx = Black, delivered with a pre-charge of 5-10 bar

Model	Charging pressure (bar)	Colour	Force in N at +20°C Initial
EP24 20	20	Green	230
EP24 40	40	Blue	450
EP24 80	75	Red	850
EP24 170	150	Yellow	1700
EP24 XX*	20-150	Black	230-1700

* Force to be set by the customer.
Delivered with a pre-charge of 5-10 bar.

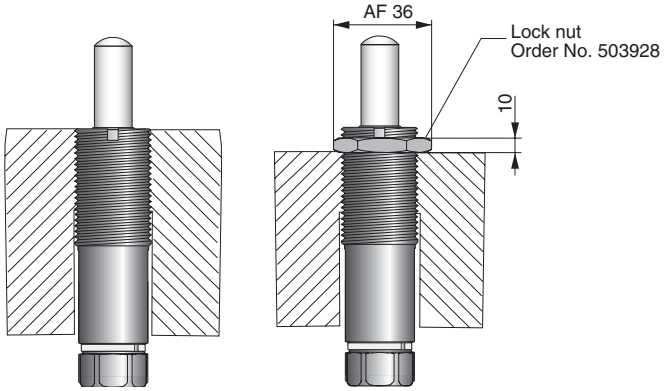
S Stroke	End force in N at + 20°C, at full stroke EP24 20	EP24 40	EP24 80	EP24 170	L ±0.25	L min	Gas vol. (l)	Weight (kg)
10	280	560	1040	2090	80	70	0.006	0.24
20	330	660	1230	2460	100	80	0.010	0.28
30	350	710	1330	2660	120	90	0.016	0.32
40	340	690	1280	2570	140	100	0.008	0.30
50	360	710	1340	2680	160	110	0.011	0.40
60	370	730	1370	2740	180	120	0.014	0.44
70	370	750	1400	2800	200	130	0.019	0.48
80	380	750	1410	2820	220	140	0.022	0.52
100	380	760	1420	2850	260	160	0.030	0.60
125	370	750	1400	2800	310	185	0.037	0.70

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 20 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ± 0.3%/°C
Recommended max strokes/min ... ~ 30-80 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black Oxide
Repair kit ..... Non-repairable

MOUNTING POSSIBILITIES



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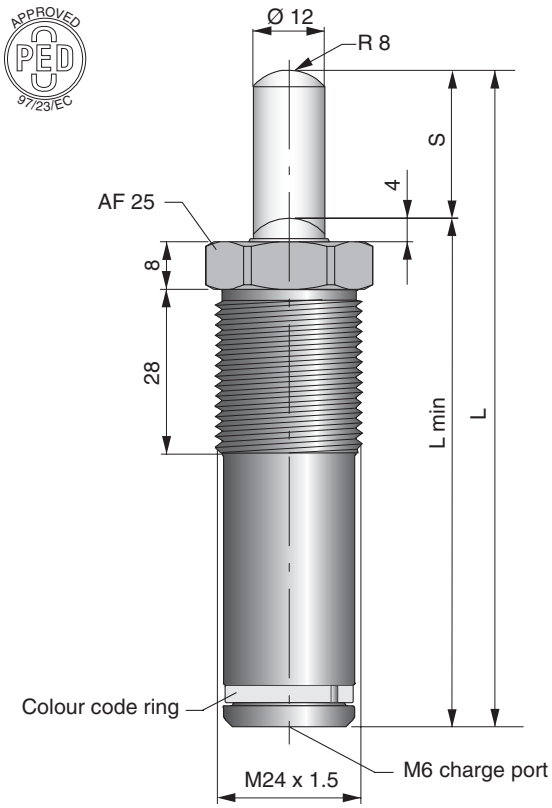


EPS24 (Ejector Pin Special with an M24 thread). It is available with four pre-set models. Each model is colour-coded for easy identification of force rating. If needed, these models can be recharged or adjusted to meet individual force requirements.

Also available is a model (black) which is delivered with a precharge of 5 to 10 bar, intended to be adjusted to the desired force.

The EPS24 is based on FORDS WDX3580-19XX XX XX gas spring standard. Please note that Ford's colour-code scheme may differ from the one shown here.

How to order

EPS24 20-10

Model:

Stroke Length (mm)
(10, 16, 20, 25, 30, 38, 40, 50, 60, 70, 80, 100)

Force: 20 = Green
40 = Blue
80 = Red
170 = Yellow
xx = Black, delivered with a pre-charge of 5-10 bar

Model	Charging pressure (bar)	Colour	Force in N at +20°C
			Initial
EPS24 20	20	Green	230
EPS24 40	40	Blue	450
EPS24 80	75	Red	850
EPS24 170	150	Yellow	1700
EPS24 XX*	20-150	Black	230-1700

* Force to be set by the customer.
Delivered with a pre-charge of 5-10 bar.

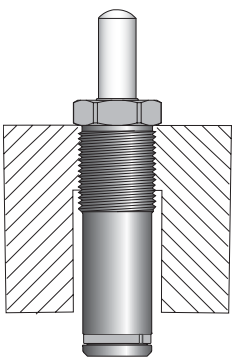
S Stroke	End force in N at + 20°C, at full stroke				L ±0.25	L min	Gas vol. (l)	Weight (kg)
	EPS24 20	EPS24 40	EPS24 80	EPS24 170				
10	280	560	1040	2090	80	70	0.006	0.22
16	300	610	1140	2290	92	76	0.007	0.24
20	330	660	1230	2460	100	80	0.010	0.26
25	350	690	1290	2590	110	85	0.013	0.28
30	350	710	1330	2660	120	90	0.016	0.30
38	380	750	1420	2830	136	98	0.024	0.33
40	340	690	1280	2570	140	100	0.008	0.28
50	360	710	1340	2680	160	110	0.011	0.38
60	370	730	1370	2740	180	120	0.014	0.42
70	370	750	1400	2800	200	130	0.019	0.46
80	380	750	1410	2820	220	140	0.022	0.50
100	380	760	1420	2850	260	160	0.030	0.58
125	370	750	1400	2800	310	185	0.037	0.68

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 180 bar
Min. charging pressure ..... 6 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ± 0.3%/°C
Recommended max strokes/min ... ~ 30-80 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see "About gas springs", 2.1

Rod surface ..... Nitrided
Tube surface ..... Black Oxide
Repair kit ..... Non-repairable

MOUNTING POSSIBILITIES



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R19 30 - 90

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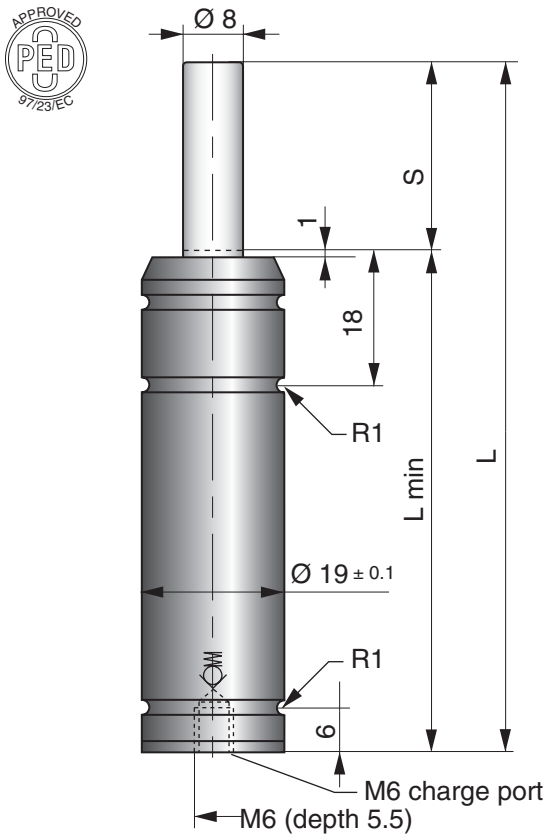


R19 Gas Springs are available in four preset models. Each spring is colour-coded for easy identification of force rating.

We also offer a model with adjustable force (black) that can be customised to meet individual force requirements. The adjustable model can be set to the desired pressure when ordered from us or by customers with charging equipment.

The R19 is rechargeable but cannot be dissassembled as the spring body is roll formed around the internal components.

There are two types of mountings for the R19, the BF 19 used at the lower body groove location and the FCR 19 used at the upper groove. The M6 thread in the base of the spring is used for charging and is also a mounting option.

How to order

R19 30-63.5

Model: R19

Force: 30 = Green
50 = Blue
70 = Red
90 = Yellow
XXX = Black, state desired force in daN

Stroke Length (mm)
(7, 10, 15, 25, 38.1, 50, 63.5, 80)

Model	Charging pressure (bar)	Colour	Force in N at +20°C Initial
R19 30	60	Green	300
R19 50	100	Blue	500
R19 70	140	Red	700
R19 90	180	Yellow	900
R19 XXX*	25-180	Black	225-900

* Adjustable version allowing gas pressure both to be raised and lowered between 45 and 180 bar.

State desired initial force in daN. If the spring should be delivered uncharged, please state zero force.

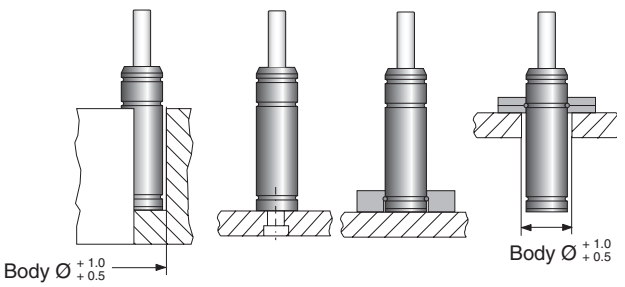
S Stroke	End force in N at + 20°C, at full stroke R19 30	R19 50	R19 70	R19 90	L ±0.25	L min	Gas vol. (l)	Weight (kg)
7	530	880	1200	1600	56	49	0.003	0.07
10	470	780	1100	1400	62	52	0.003	0.08
15	440	730	1000	1300	72	57	0.004	0.08
25	420	700	980	1300	92	67	0.006	0.08
38.1	410	690	970	1200	118.2	80.1	0.009	0.10
50	410	680	960	1200	142	92	0.011	0.12
63.5	410	680	950	1200	169	105.5	0.014	0.13
80	410	680	950	1200	202	122	0.018	0.14
100	410	670	940	1200	242	142	0.022	0.17
125	410	670	940	1200	292	167	0.027	0.20

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 180 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ± 0.3%/°C
Recommended max strokes/min ... ~ 100-150 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit ..... Non-repairable

MOUNTING POSSIBILITIES



Drop - In | **B** Bottom thread | **BF-19** Foot Mount | **FCR-19** Top Mount

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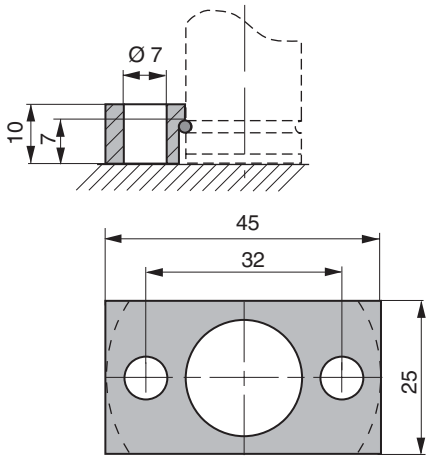
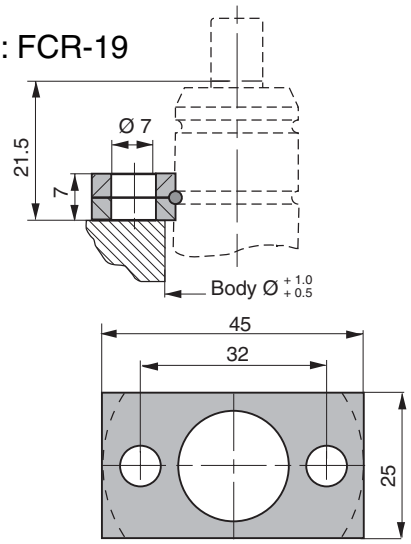
R19 30 - 90 Mounts

BF
Order No: BF-19



FCR
Order No: FCR-19



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M2 50 - 200

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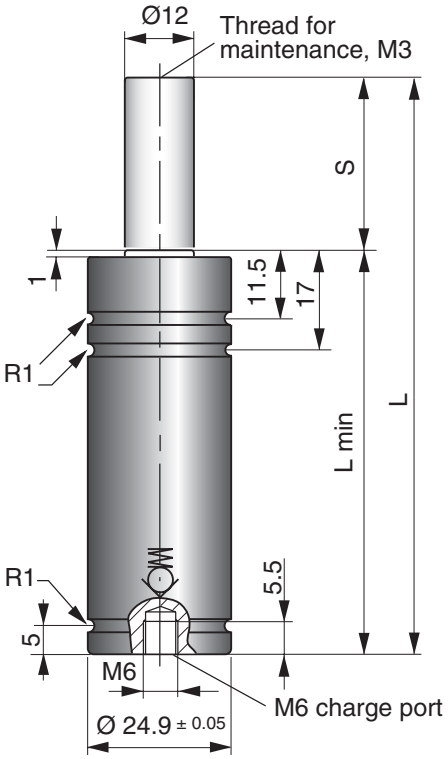


The M2 is available in four preset models, with initial forces from 500 to 2000 N. Each spring is colour-coded for easy identification of force rating.

We also offer a model with adjustable force (black) that can be customised to meet individual force requirements. The adjustable model may be set to desired pressure when ordered from us or by customers with charging equipment.

The M2 spring can in many cases directly replace mechanical die springs of 25 mm (1 inch) diameter.

All M2 springs can be repaired and recharged. The spring can be attached to the tool, using a mount (FCR or SM). The M6 thread in the base of the spring is used for charging and is also a mounting option.

How to order

M2 50-63.5

Model

Stroke Length (mm)

Force: 50 = Green
100 = Blue
150 = Red
200 = Yellow
XXX = Black, state desired force in daN

Model	Charging pressure (bar)	Colour	Force in N at +20°C Initial
M2 50	45	Green	500
M2 100	90	Blue	1000
M2 150	135	Red	1500
M2 200	180	Yellow	2000
M2 XXX*	25-180	Black	280-2000

* Adjustable version allowing gas pressure both to be raised and lowered between 25 and 180 bar. State desired initial force in daN. If the spring should be delivered uncharged, please state zero force.

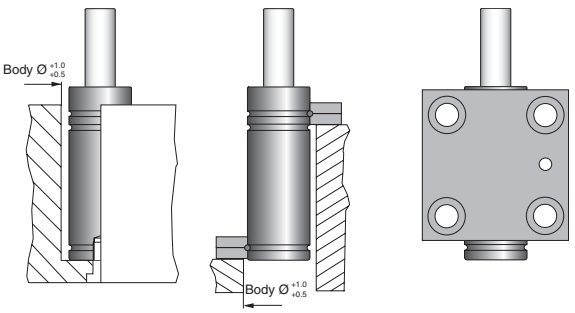
S Stroke	End force in N at + 20°C, at full stroke M2 050	M2 100	M2 150	M2 200	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
10	770	1530	2300	3060	62	52	0.005	0.14
12.7	770	1530	2300	3070	67.4	54.7	0.006	0.15
15	770	1540	2310	3070	72	57	0.007	0.16
16	770	1540	2310	3070	74	58	0.007	0.16
25	770	1540	2310	3080	92	67	0.010	0.18
38.1	770	1540	2320	3090	118.2	80.1	0.015	0.20
50	770	1540	2320	3090	142	92	0.019	0.22
63.5	760	1520	2270	3020	172	108.5	0.024	0.26
80	760	1520	2280	3040	205	125	0.029	0.30
100	760	1520	2290	3050	245	145	0.036	0.33
125	760	1530	2290	3060	295	170	0.044	0.39

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 180 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 80-100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3016385

MOUNTING POSSIBILITIES



Drop - In, B
Bottom threads

FCR
Flange Mount

SM
Side Mount

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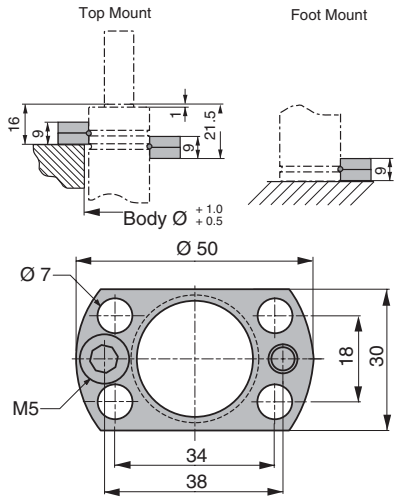
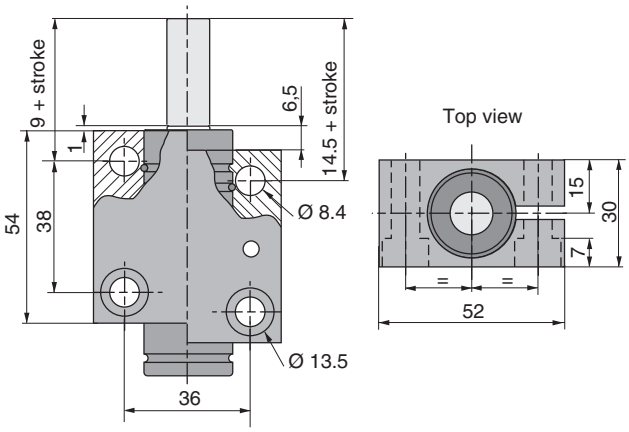
FCR
Order No: FCR-150

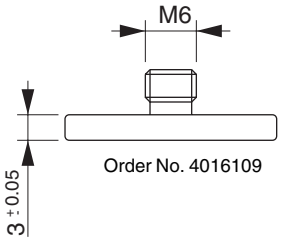


SM
Order No: SM-150



Note! For M2 L and L min are 3 mm shorter for 10 to 50 mm stroke compared to older version of Mini Spring (called M).

To obtain the correct total length when replacing the older version (M) when using Drop in, or FCR as foot mount, a 3 mm distance should be used (Order No. 4016109, see picture below).



Order No. 4016109

MM2 50 - 200

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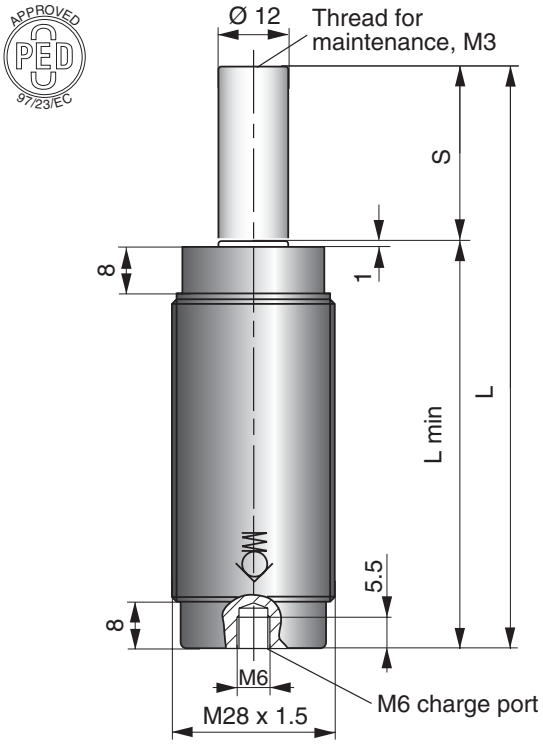


The MM2 is a version of the M2 spring with a threaded body, (M28 x 1.5). All internal parts and technical data are the same as for M2 springs (with the exception of strokes 63.5 to 125 whose total lenghts are 3 mm shorter). Each spring is colour-coded for easy identification of force rating.

We also offer a model with adjustable force (black) that can be customised to meet individual force requirements. The adjustable model may be set to desired pressure when ordered from us or by customers with charging equipment.

All MM2 springs can be repaired and recharged.

For locking the spring in the tool a lock nut is available.

How to order

MM2 50-63.5

Model

Force: 50 = Green
100 = Blue
150 = Red
200 = Yellow
XXX = Black, state desired force in daN

Stroke Length (mm)

Model	Charging pressure (bar)	Colour	Force in N at +20°C Initial
MM2 50	45	Green	500
MM2 100	90	Blue	1000
MM2 150	135	Red	1500
MM2 200	180	Yellow	2000
MM2 XXX*	25-180	Black	280-2000

* Adjustable version allowing gas pressure both to be raised and lowered between 25 and 180 bar. State desired initial force in daN. If the spring should be delivered uncharged, please state zero force.

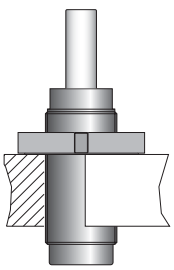
S Stroke	End force in N at + 20°C, at full stroke MM2 50	MM2 100	MM2 150	MM2 200	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
10	770	1530	2300	3060	62	52	0.005	0.14
12.7	770	1530	2300	3070	67.4	54.7	0.006	0.15
15	770	1540	2310	3070	72	57	0.007	0.16
16	770	1540	2310	3070	74	58	0.007	0.16
25	770	1540	2310	3080	92	67	0.010	0.18
38.1	770	1540	2320	3090	118.2	80.1	0.015	0.20
50	770	1540	2320	3090	142	92	0.019	0.22
63.5	760	1520	2270	3020	169	105.5	0.024	0.26
80	760	1520	2280	3040	202	122	0.029	0.30
100	760	1520	2290	3050	242	142	0.036	0.33
125	760	1530	2290	3060	292	167	0.044	0.39

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 180 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 80-100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3016385

MOUNTING POSSIBILITIES



FRM
Lock nut

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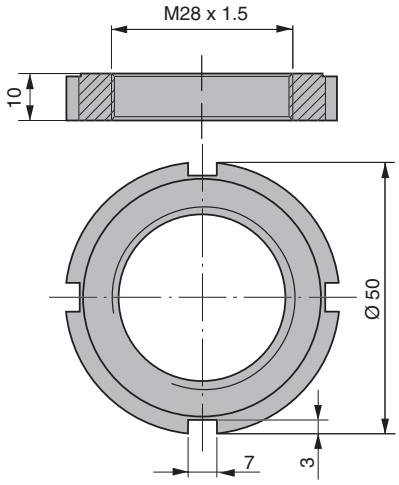
FRM
Order No. FRM-150



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MC2 50 - 200

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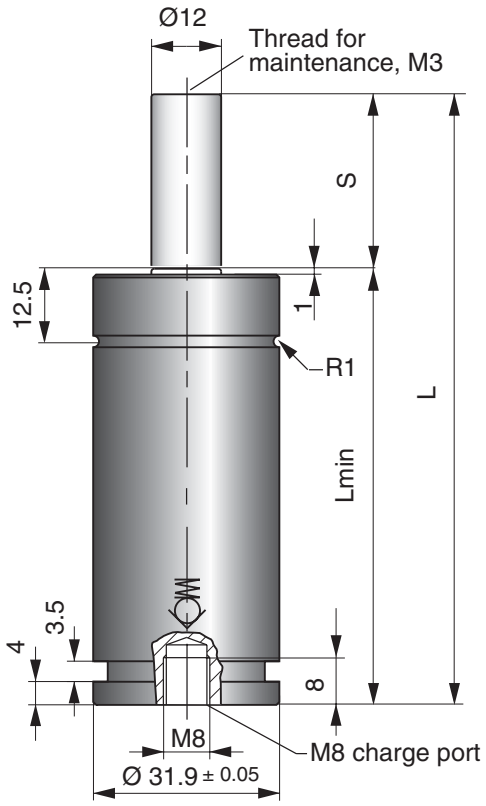


The MC2 spring is based on the M2 spring, using the same piston rod and internal components. The body of the spring and the mount are designed to meet the ISO-dimension found in ISO 11901.

Each spring is colour-coded for easy identification of force rating. We also offer a model with adjustable force (black) that can be customised to meet individual force requirements. The adjustable model may be set to desired pressure at the factory or by customers with charging equipment.

The spring can be attached to the tool, using mounts FC-MC or FFC-MC. The M8 thread in the base of the spring is used for charging and is also a mounting option.

How to order

MC2 50-63.5

Model

Stroke Length (mm)

Force: 50 = Green
100 = Blue
150 = Red
200 = Yellow
XXX = Black, state desired force in daN

Model	Charging pressure (bar)	Colour	Force in N at +20°C Initial
MC2 50	45	Green	500
MC2 100	90	Blue	1000
MC2 150	135	Red	1500
MC2 200	180	Yellow	2000
MC2 XXX*	25-180	Black	280-2000

* Adjustable version allowing gas pressure both to be raised and lowered between 25 and 180 bar. State desired initial force in daN. If the spring should be delivered uncharged, please state zero force.

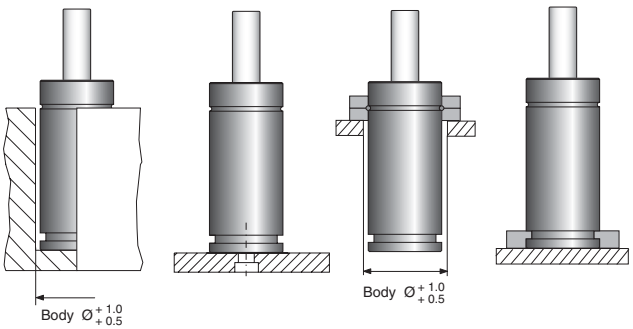
S Stroke	End force in N at + 20°C, at full stroke MC2 50	MC2 100	MC2 150	MC2 200	L ±0.25	L min	Gas vol. (l)	Weight (kg)	ISO
10	770	1530	2300	3060	70	60	0.005	0.30	✔
12.7	770	1530	2300	3070	75.4	62.7	0.006	0.31	
16	770	1540	2310	3070	82	66	0.007	0.33	✔
25	770	1540	2310	3080	100	75	0.010	0.38	✔
38.1	770	1540	2320	3090	126.2	88.1	0.015	0.43	
50	770	1540	2320	3090	150	100	0.019	0.48	✔
63.5	760	1520	2270	3020	177	113.5	0.024	0.54	
80	760	1520	2280	3040	210	130	0.029	0.62	✔
100	760	1520	2290	3050	250	150	0.036	0.71	
125	760	1530	2290	3060	300	175	0.044	0.83	

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 180 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 80-100 (at 20°C)
Max piston rod velocity ..... 0,8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3016385

MOUNTING POSSIBILITIES



Drop - In

B Bottom thread

FC-MC Top Mount

FFC-MC Foot Mount

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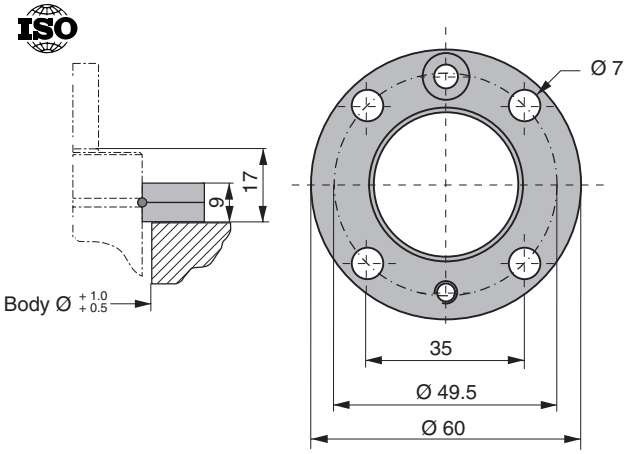
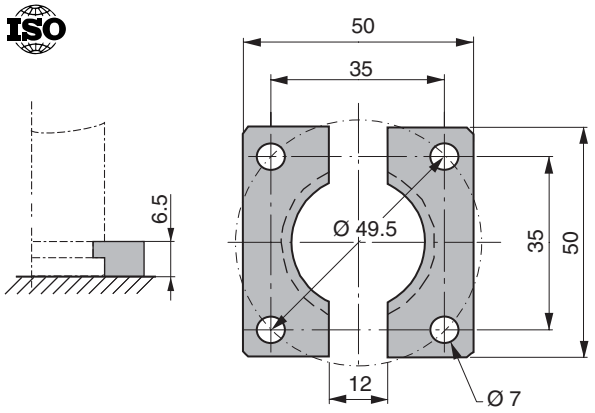
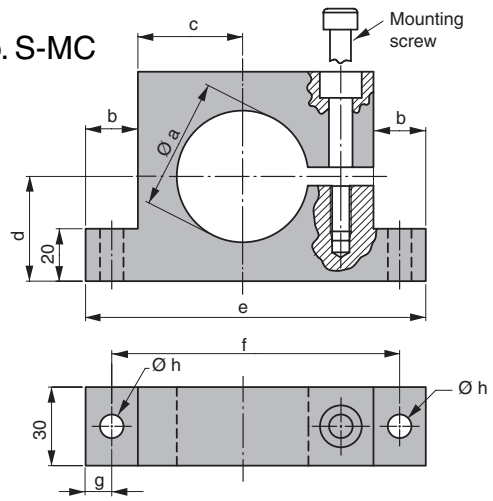
FC
Order No. FC-MC-150



FFC
Order No. FFC-MC-150



S
Order No. S-MC



X 170

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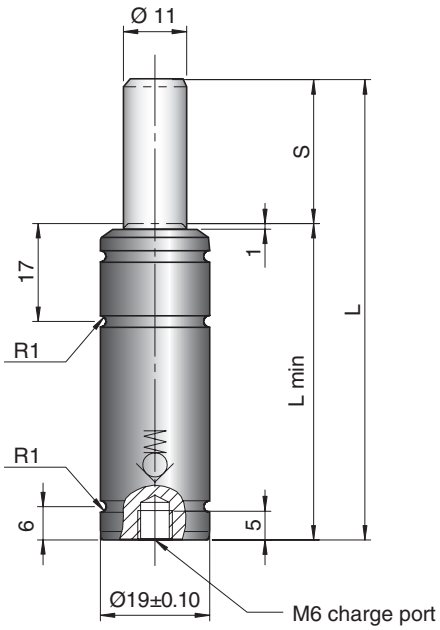


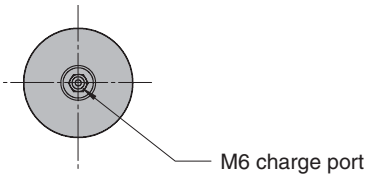
The Power Line series are our shortest and most powerful Piston Rod Sealed gas springs, giving you a great deal of force in a very small amount of space.

The Power Line springs are available with forces from 170 daN up to 9500 daN and stroke lengths between 7 and 125 mm.

The X 170 has a bottom port for gas charging that can also be used to connect to a Micro Hose™ hose system.

The X 170 has an upper ISO-Standard C-groove and a lower C-groove which together with a threaded bottom hole offers various mounting possibilities using our standard mounts.

Bottom view



Order No.	S Stroke	Force in N at 180 bar/+20°C Initial	Force in N at 180 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X 170-007	7	1700	2800	44	37	0.002	0.06
X 170-010	10			50	40	0.002	0.06
X 170-015	15			60	45	0.004	0.07
X 170-019	19			68	49	0.005	0.07
X 170-025	25			80	55	0.006	0.08
X 170-038	38			106	68	0.009	0.09
X 170-050	50			130	80	0.012	0.10
X 170-063	63			156	93	0.015	0.12
X 170-075	75			185	110	0.018	0.13
X 170-080	80			195	115	0.019	0.14
X 170-100	100			235	135	0.024	0.16
X 170-125	125			285	160	0.030	0.19

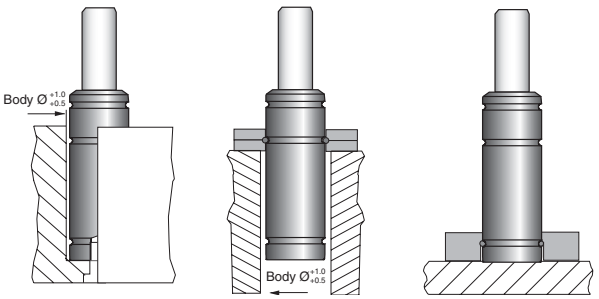
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 180 bar (at 20° C)
Min. charging pressure ..... 25 bar (at 20° C)
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 40-100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit ..... Non-repairable

MOUNTING POSSIBILITIES



Drop - In
B
Bottom thread

FCR-19
Flange
Mount

BF-19
Bottom
Mount

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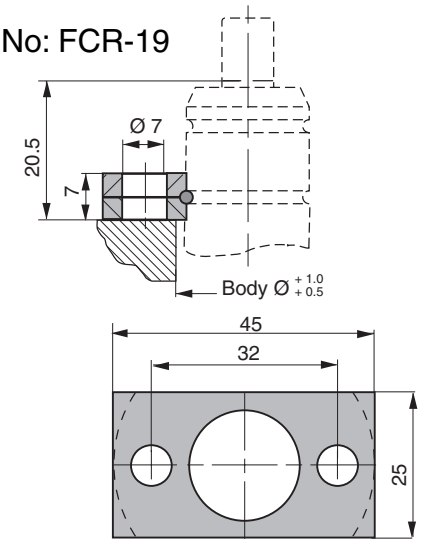
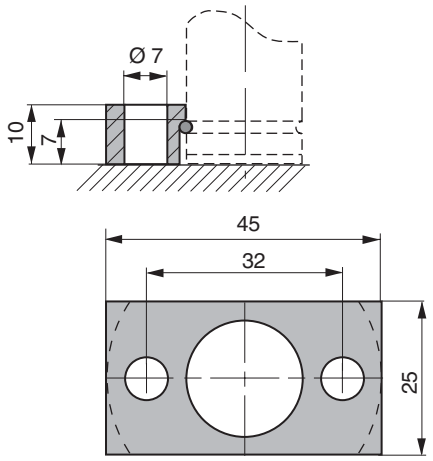
X 170 Mounts

FCR
Order No: FCR-19



BF
Order No: BF-19



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$250 \leq F_{INIT} < 500$

CU 420

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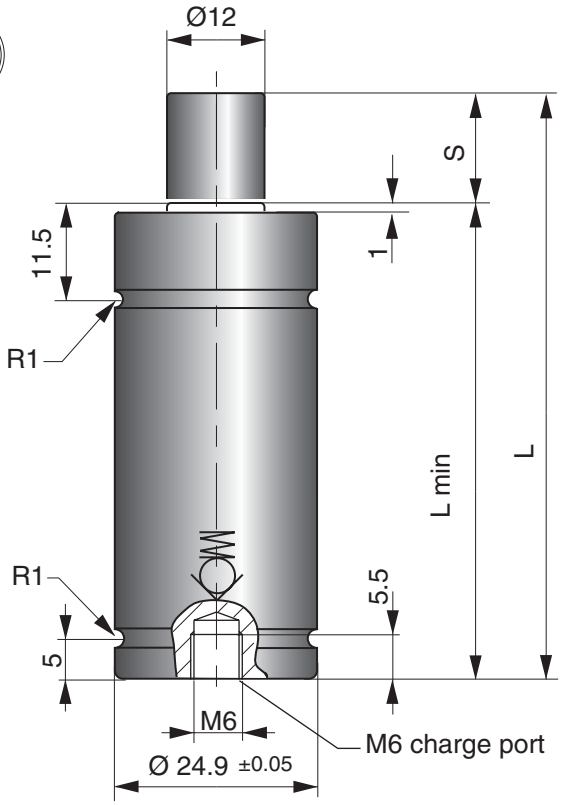


This is the smallest member of the CU family. As with the rest of the CU springs it has a very high force compared to it's outer diameter.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
CU 420-006	6	4250	7000	56	50	0.003	0.13
CU 420-010	10		6900	70	60	0.005	0.15
CU 420-016	16		6900	91	75	0.008	0.18
CU 420-025	25		6900	120	95	0.011	0.22
CU 420-032	32		7600	140	108	0.021	0.24
CU 420-040	40		7600	165	125	0.026	0.27
CU 420-050	50		7600	195	145	0.032	0.31

* = at full stroke

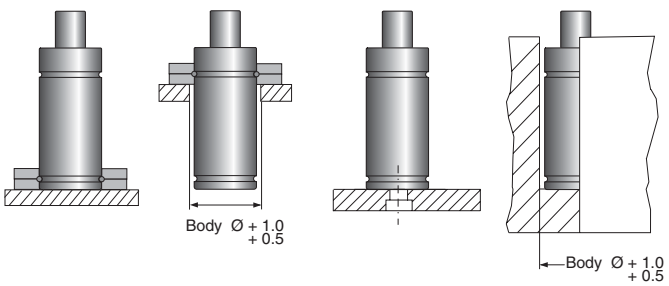
BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... 50~100 (at 20° C)
Max piston rod velocity ..... 0.5 m/s
Note! For more information see "About gas springs", 2.1

Rod surface ..... Nitrided
Tube surface ..... Nitrided

Repair kit ..... Non-repairable

MOUNTING POSSIBILITIES



FCR-150 Foot Mount

FCR-150 Top Mount

B Bottom thread

Drop - In

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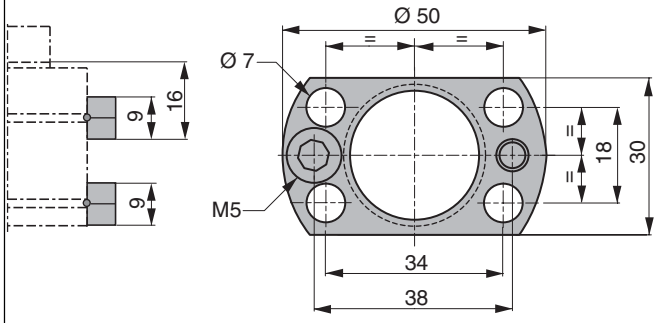
3

FCR

Order No: FCR-150



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X 320

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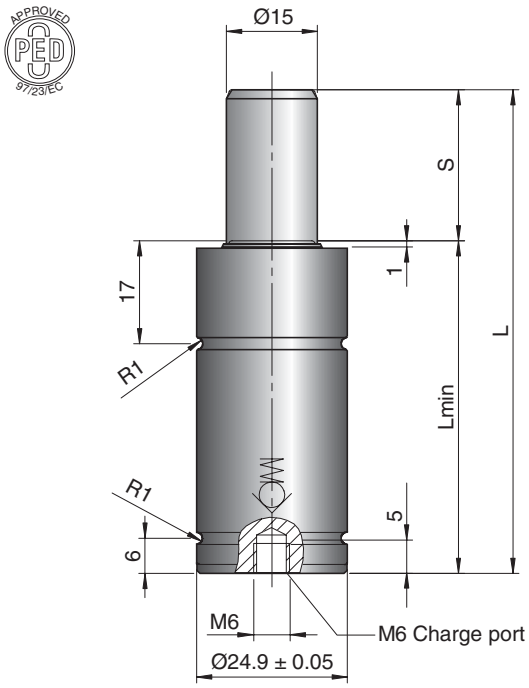


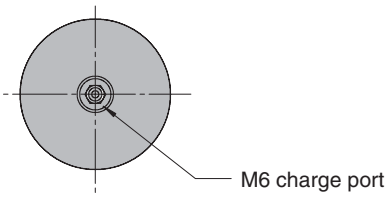
The Power Line series are our shortest and most powerful Piston Rod Sealed gas springs, giving you a great deal of force in a very small amount of space.

The Power Line springs are available with forces from 170 daN up to 9500 daN and stroke lengths between 7 and 125 mm.

The X 320 has a bottom port for gas charging that can also be used to connect to a Micro Hose™ hose system.

The X 320 has an upper ISO-Standard C-groove that together with a threaded bottom hole offers various mounting possibilities using our standard mounts.

Bottom view



Order No.	S Stroke	Force in N at 180 bar/+20°C Initial	Force in N at 180 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X 320-007	7	3200	4800	44	37	0.004	0.10
X 320-010	10		4900	50	40	0.005	0.11
X 320-015	15		5100	60	45	0.007	0.12
X 320-019	19		5100	68	49	0.009	0.13
X 320-025	25		5200	80	55	0.011	0.14
X 320-038	38		5300	106	68	0.017	0.16
X 320-050	50		5300	130	80	0.022	0.18
X 320-063	63		5300	156	93	0.028	0.21
X 320-075	75		5300	185	110	0.034	0.24
X 320-080	80		5300	195	115	0.036	0.25
X 320-100	100		5300	235	135	0.044	0.28
X 320-125	125		5300	285	160	0.055	0.33

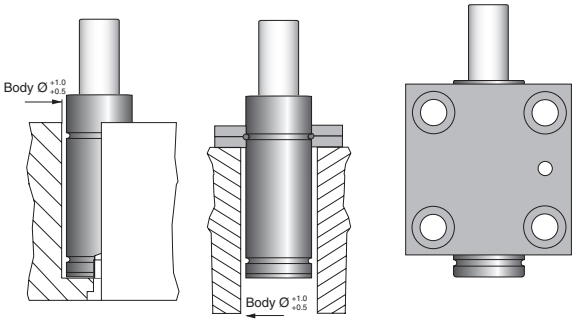
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 180 bar (at 20° C)
Min. charging pressure ..... 25 bar (at 20° C)
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 40-100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit ..... Non-repairable

MOUNTING POSSIBILITIES



Drop - In B
Bottom thread

FCR-150
Flange Mount

SM -150
Side Mount

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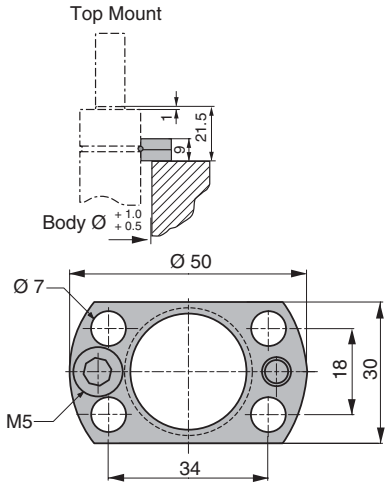
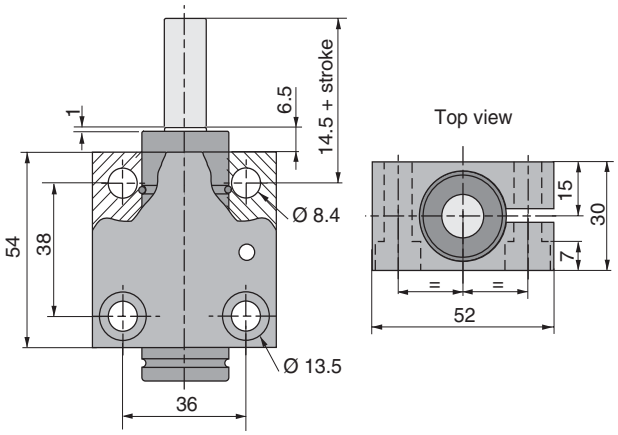
FCR
Order No: FCR-150



SM
Order No: SM-150



X 350

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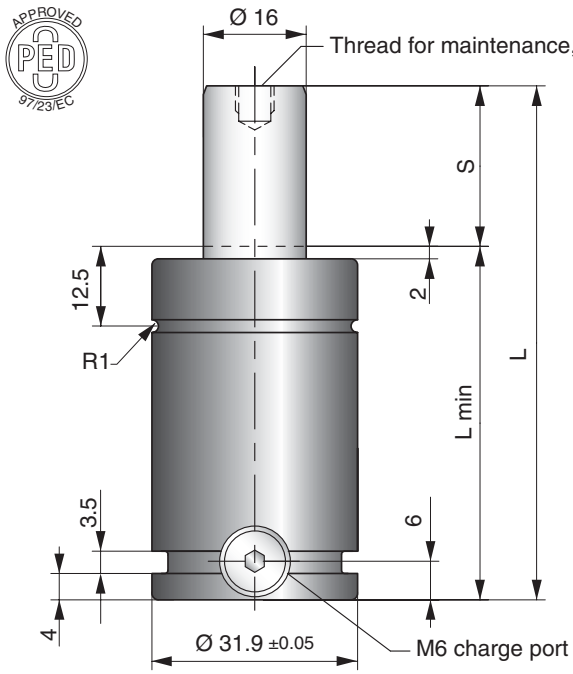


The Power Line series are our shortest and most powerful Piston Rod Sealed gas springs, giving you a great deal of force in a very small amount of space.

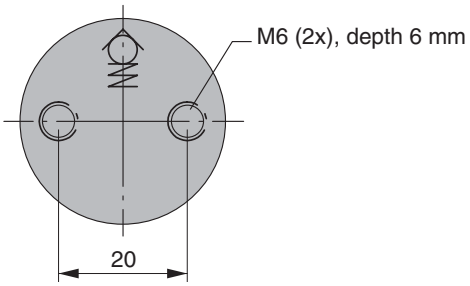
These gas springs are available with forces from 170 daN up to 9500 daN and stroke lengths between 7 and 125 mm.

There is a side port for gas charging that can also be used to connect to a hose system.

An upper C-groove, lower U-groove together with two M6 threaded holes allow various mounting possibilities using our standard mounts.

Order No.	S Stroke	Force in N at 180 bar/+20°C Initial	Force in N at 180 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X 350-010	10	3600	5900	50	40	0.01	0.17
X 350-013	13		5200	56	43	0.01	0.17
X 350-016	16		5300	62	46	0.01	0.19
X 350-019	19		5600	68	49	0.01	0.20
X 350-025	25		5500	80	55	0.02	0.21
X 350-032	32		5500	94	62	0.02	0.23
X 350-038	38		5500	106	68	0.03	0.25
X 350-050	50		5600	130	80	0.03	0.29
X 350-063	63		5500	156	93	0.04	0.33
X 350-075	75		5500	180	105	0.05	0.36
X 350-080	80		5500	190	110	0.05	0.38
X 350-100	100		5500	230	130	0.06	0.45
X 350-125	125		5500	280	155	0.08	0.52

Bottom view



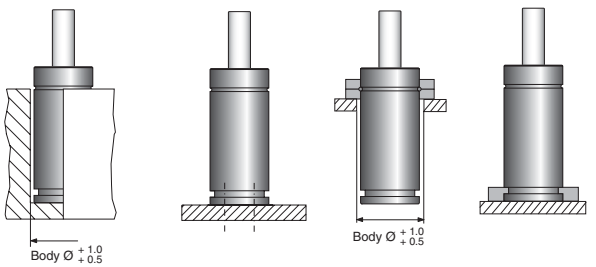
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 180 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 50 to 100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3018845

MOUNTING POSSIBILITIES



Drop - In

B Bottom threads

FC-MC Top Mount

FFC-MC Foot Mount

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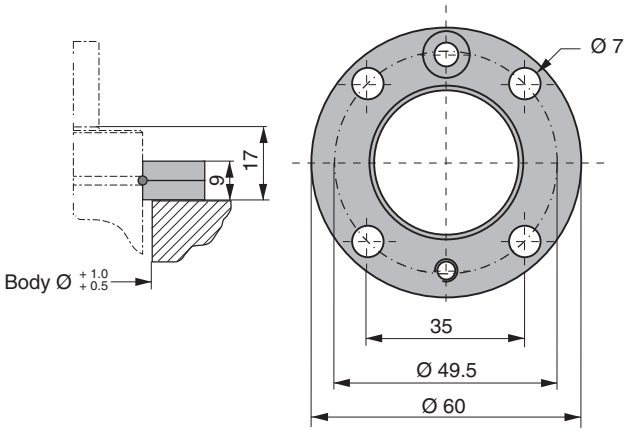
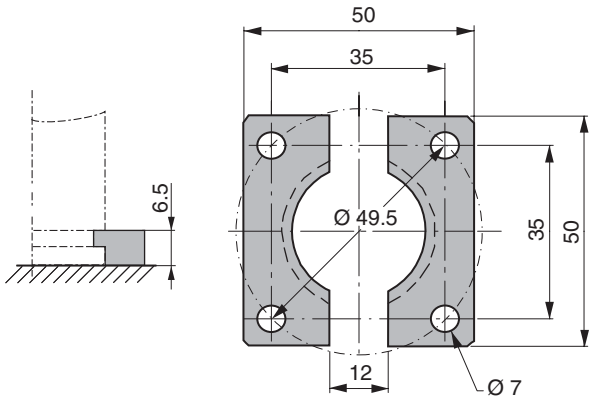
FC
Order No. FC-MC-150



FFC
Order No. FFC-MC-150



KS 250

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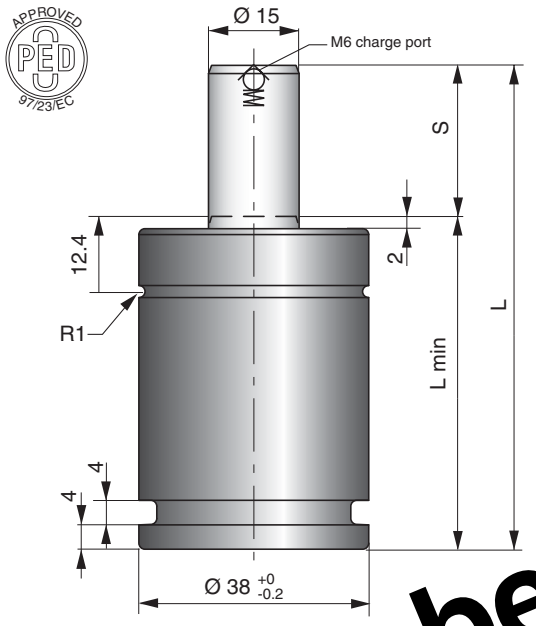


The KS 250 is a short height gas spring with an initial force of 2650 N. The KS 250 is 20 mm shorter than the TU 250.

The total length L is 30 mm + (2 x stroke).

To be phased out - Possible alternative: X 500

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
KS 250-013	12.7	2650	3800	55.4	42.7	0.012	0.27
KS 250-015	15		3700	60	45	0.013	0.28
KS 250-025	25		3600	80	55	0.021	0.33
KS 250-038	38.1		3600	106.2	68.1	0.030	0.37
KS 250-050	50		3500	130	80	0.039	0.41
KS 250-064	63.5		3500	157	93.5	0.049	0.50
KS 250-080	80		3500	190	110	0.061	0.55
KS 250-100	100		3500	230	130	0.076	0.66

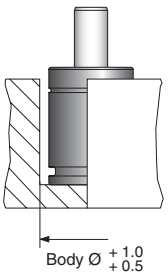
* = at full stroke

BASIC INFORMATION

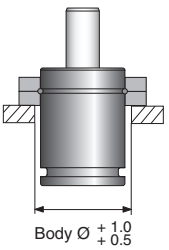
Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 80-100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxided
Repair kit 3017230-0250

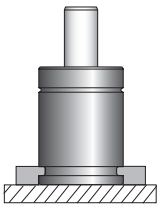
MOUNTING POSSIBILITIES



Drop - In



FC, FCS
Top Mount



FFC
Foot Mount

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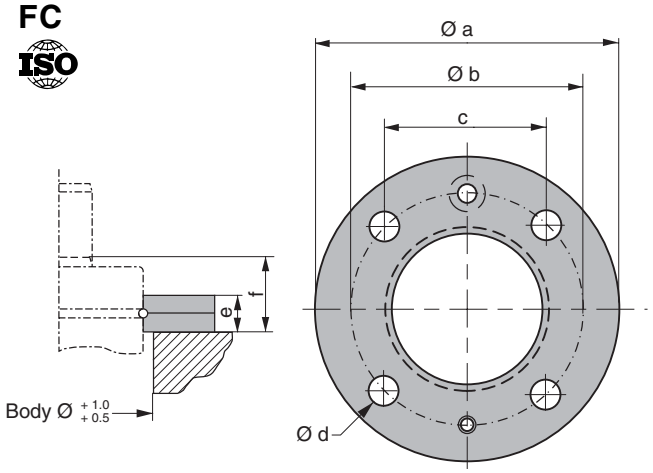
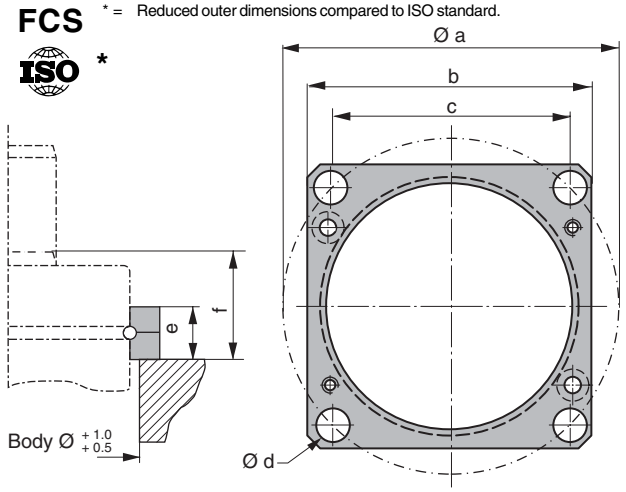
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-250	68	56.5	40	7	9	17

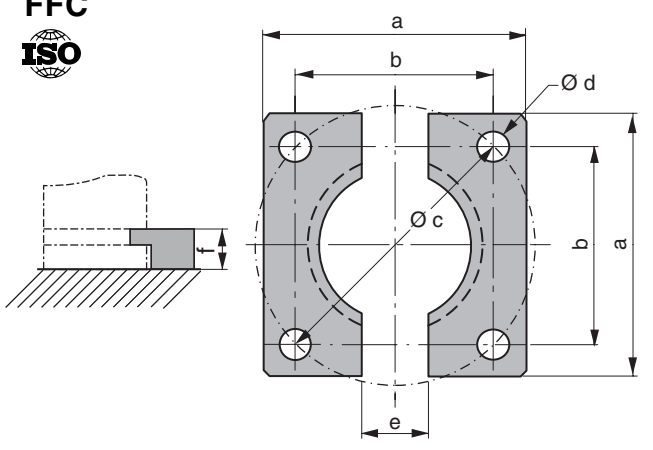
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-250	56.5	52	40	7	9	17

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-250	55	40	56.6	7	12	6.5

KSM 250

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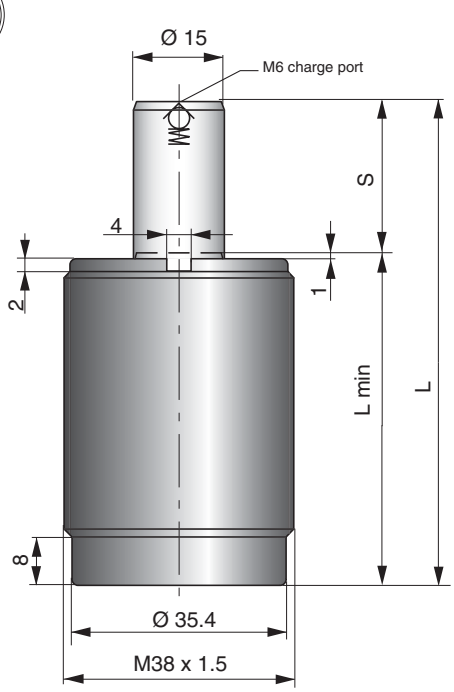


The KSM 250 is a version of the KS 250 with threaded body. All internal components and technical data are the same as for the KS 250.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
KSM 250-013	12.7	2650	3800	55.4	42.7	0.012	0.27
KSM 250-015	15		3700	60	45	0.013	0.28
KSM 250-025	25		3600	80	55	0.021	0.33
KSM 250-038	38.1		3600	106.2	68.1	0.030	0.37
KSM 250-050	50		3500	130	80	0.039	0.41
KSM 250-064	63.5		3500	157	93.5	0.049	0.50
KSM 250-080	80		3500	190	110	0.061	0.55
KSM 250-100	100		3500	230	130	0.076	0.66

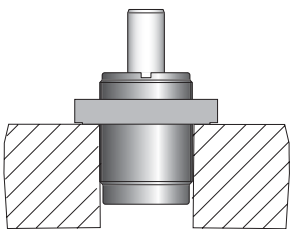
* = at full stroke

BASIC INFORMATION

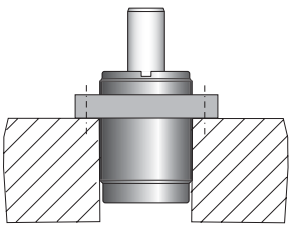
Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 80-100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3017230-0250

MOUNTING POSSIBILITIES



FRM
FHM
Lock nut



FTM
Flange mount

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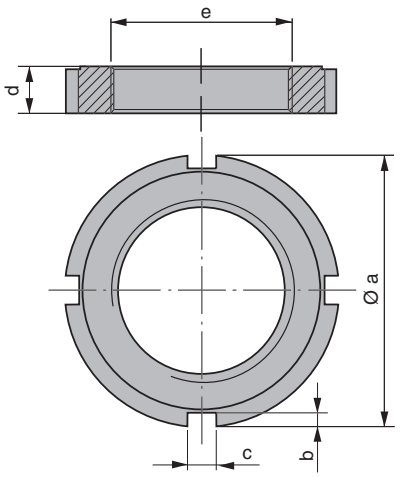
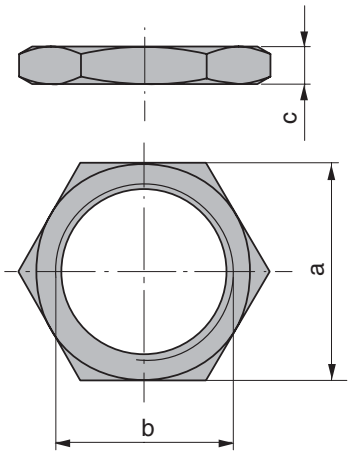
FRM



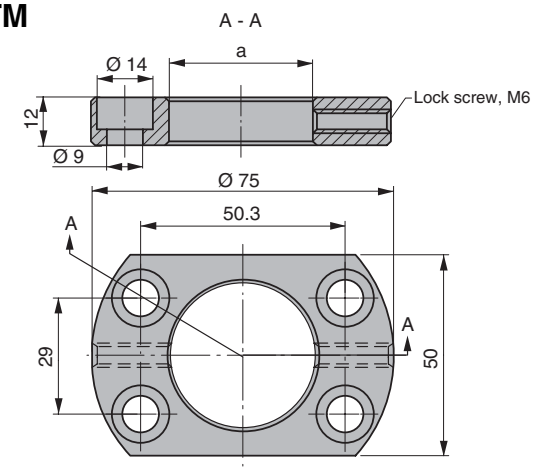
Order No.	Ø a	b	c	d	e
FRM-250	58	3.5	8	11	M38 x 1.5

FHM



Order No.	a	b	c
FHM-250	47	M38 x 1.5	8

FTM

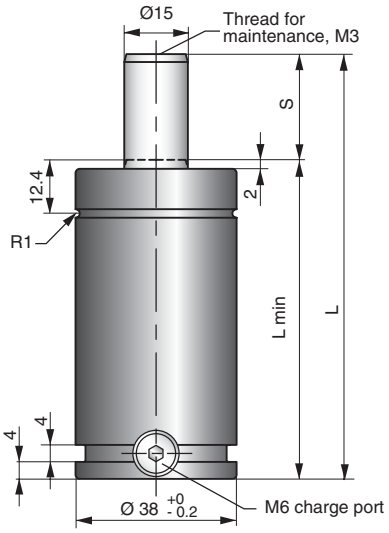


Order No.	a
FTM-250	M38 x 1.5

TU 250

KALLER®

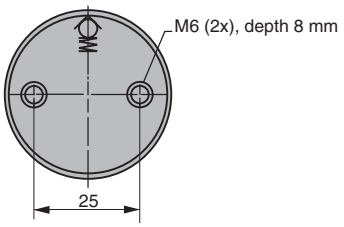
3



Standard line of gas springs is the TU- line. Sizes 250 to 10 000 correspond to the ISO 11901 standard for gas springs.

The total length L is 50 mm + (2 x stroke).

Bottom view



Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)	ISO
TU 250-010	**10**	**2650**	**3500**	**70**	**60**	**0.011**	**0.43**	✔
TU 250-013	12.7		3500	75.4	62.7	0.013	0.44	
TU 250-016	16		3500	82	66	0.016	0.46	✔
TU 250-025	25		3500	100	75	0.023	0.50	✔
TU 250-038	38.1		3500	126.2	88.1	0.032	0.54	
TU 250-050	50		3500	150	100	0.041	0.58	✔
TU 250-064	63.5		3500	177	113.5	0.051	0.67	
TU 250-080	80		3500	210	130	0.062	0.72	✔
TU 250-100	100		3500	250	150	0.077	0.83	
TU 250-125	125		3500	300	175	0.096	0.97	

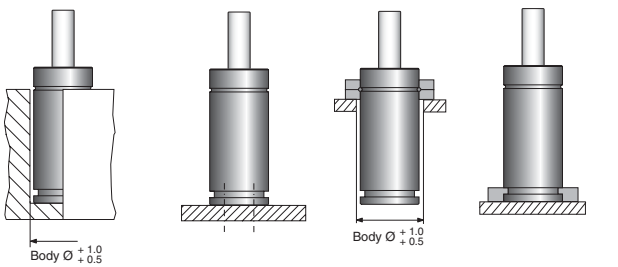
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 80-100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3016873

MOUNTING POSSIBILITIES



Drop - In | **B** Bottom threads | **FC, FCS** Top Mount | **K, FFC** Foot Mount

Note! For dimensions on mounting possibilities K refer to chapter 3.

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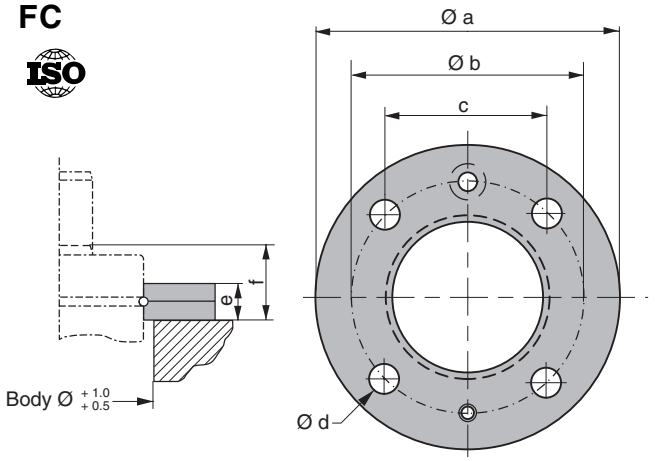
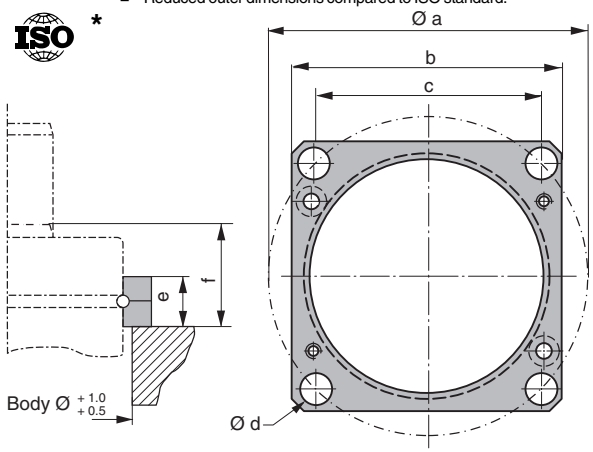
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-250	68	56.5	40	7	9	17

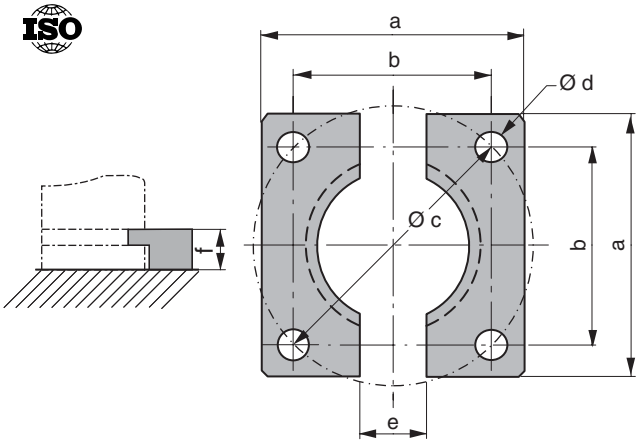
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-250	56.5	52	40	7	9	17

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-250	55	40	56.6	7	12	6.5

TM/TI 250

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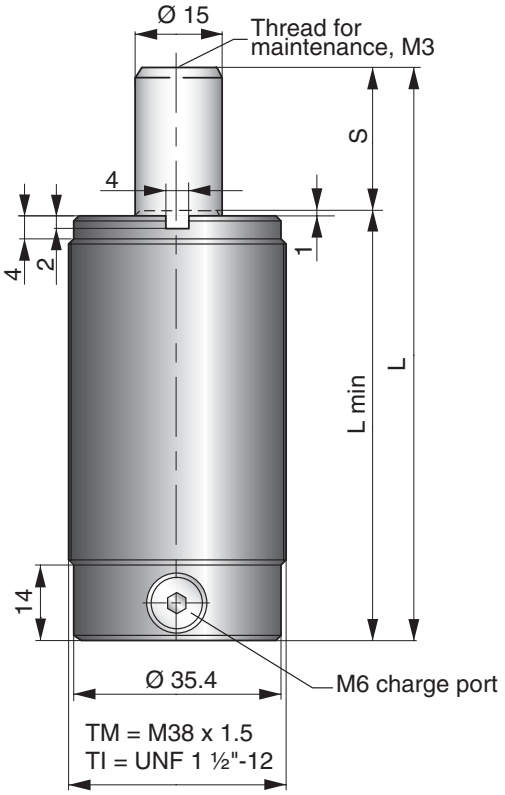


The TM and TI are threaded body 250 springs with the same length as the TU 250.

The TM spring has a metric thread M38 x 1.5.

The TI spring has an Inch thread 1½ UNF.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
TM/TI 250-013	12.7	2650	3400	75.4	62.7	0.015	0.37
TM/TI 250-025	25		3400	100	75	0.024	0.42
TM/TI 250-038	38.1		3400	126.2	88.1	0.033	0.47
TM/TI 250-050	50		3400	150	100	0.042	0.52
TM/TI 250-064	63.5		3500	177	113.5	0.052	0.57
TM/TI 250-080	80		3500	210	130	0.063	0.64
TM/TI 250-100	100		3500	250	150	0.078	0.72

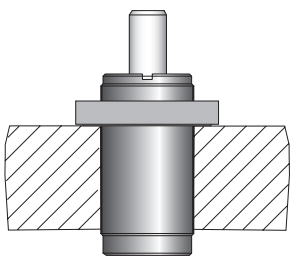
* = at full stroke

BASIC INFORMATION

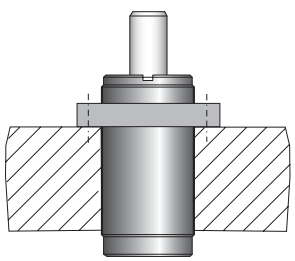
Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 80-100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 2013691-0250

MOUNTING POSSIBILITIES



FRM, FRI, FHM, FHI
Lock nut



FTM, FTI
Flange mount

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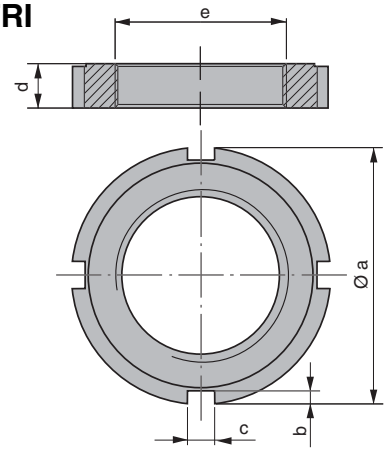
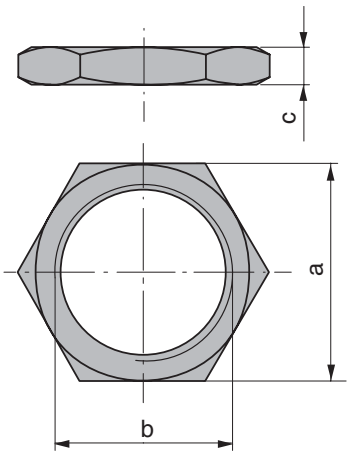
FRM/FRI



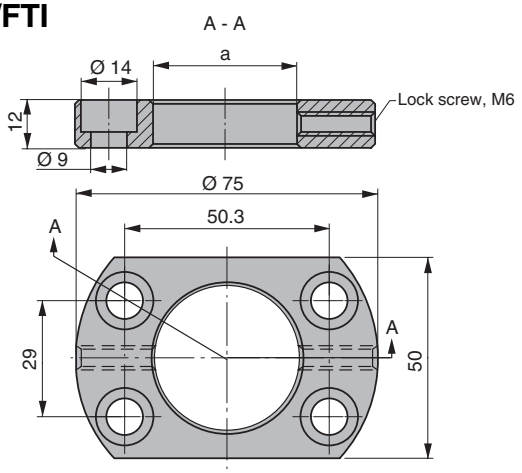
Order No.	Ø a	b	c	d	e
FRM-250	58	3.5	8	11	M38 x 1.5
FRI-250	58	3.5	8	11	UNF 1 ½-12

FHM/FHI



Order No.	a	b	c
FHM-250	47	M38 x 1.5	8
FHI-250	50.8	UNF 1½-12	8

FTM/FTI



Order No.	a
FTM-250	M38 x 1.5
FTI-250	UNF 1 ½-12

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TMS 250

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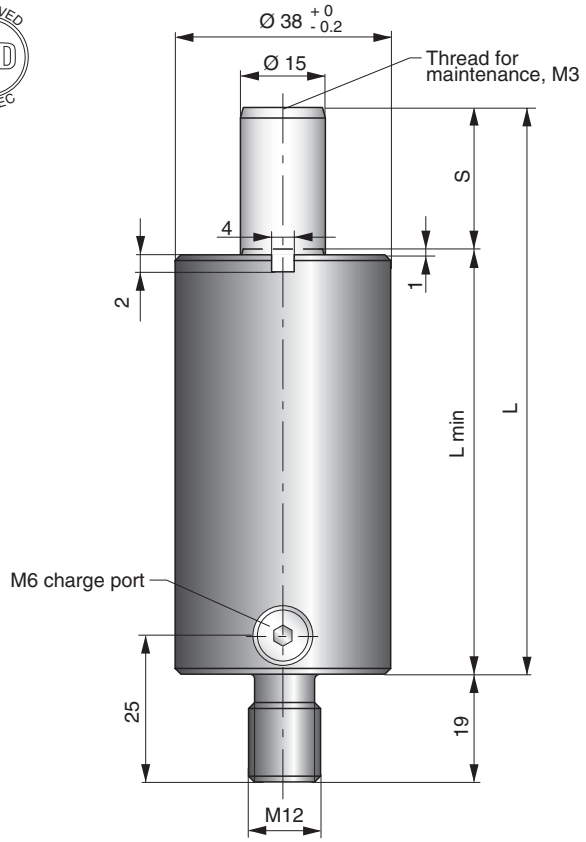


The TMS are 250 springs equipped with a threaded stud for mounting.

The TMS (Tube Metric Stud) has a M12 thread.

It has the same basic length as the TU 250 spring.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
TMS 250-013	12.7	2650	3400	75.4	62.7	0015	0.45
TMS 250-025	25		3400	100	75	0.024	0.50
TMS 250-038	38.1		3400	126.2	88.1	0.033	0.55
TMS 250-050	50		3400	150	100	0.042	0.60
TMS 250-064	63.5		3500	177	113.5	0.052	0.65
TMS 250-080	80		3500	210	130	0.063	0.70
TMS 250-100	100		3500	250	150	0.078	0.80

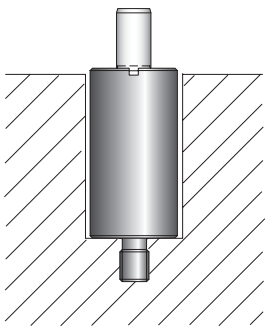
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 80-100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 2013691-0250

MOUNTING POSSIBILITIES



Thread

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$500 \leq F_{INIT} < 750$

CU 740

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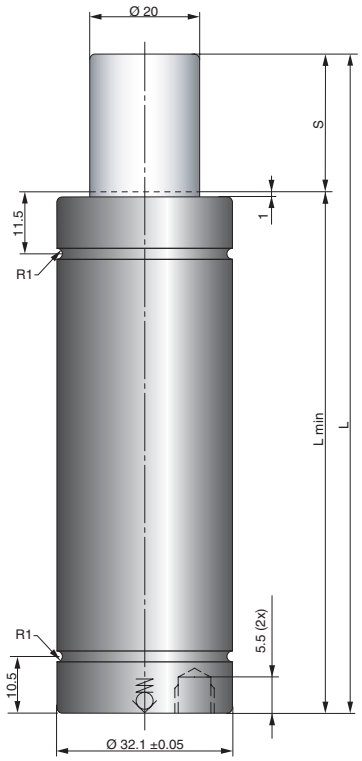


The CU gas springs is a very compact Bore Sealied gas spring, that gives a high force in a limited space.

Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend shorter stroke springs to be fastened for optimal service-life.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force**	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
CU 740-006	6	7400	9800	63	57	0.012	0.20
CU 740-010	10		10000	75	65	0.017	0.24
CU 740-016	16		11000	93	77	0.024	0.28
CU 740-025	25		12000	120	95	0.034	0.33
CU 740-032	32*		12000	140	108	0.042	0.37
CU 740-040	40*		12000	165	125	0.052	0.42
CU 740-050	50*		12000	195	145	0.063	0.48

* = Should always be attached to the tool using the tapped holes in the bottom or a flange

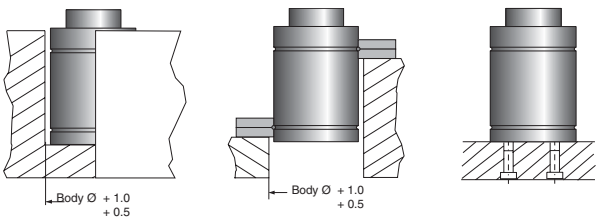
** = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20° C)
Min. charging pressure ..... 25 bar (at 20° C)
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 50-100 (at 20°C)
Max piston rod velocity ..... 0.5 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Nitrided
Repair kit ..... Non-repairable

MOUNTING POSSIBILITIES



Drop - In

FC-MC Top Mount

B Bottom thread

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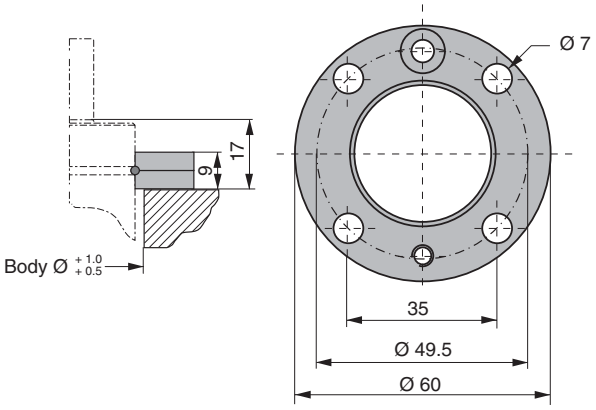
FC-MC
Order No. FC-MC-150



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X 500

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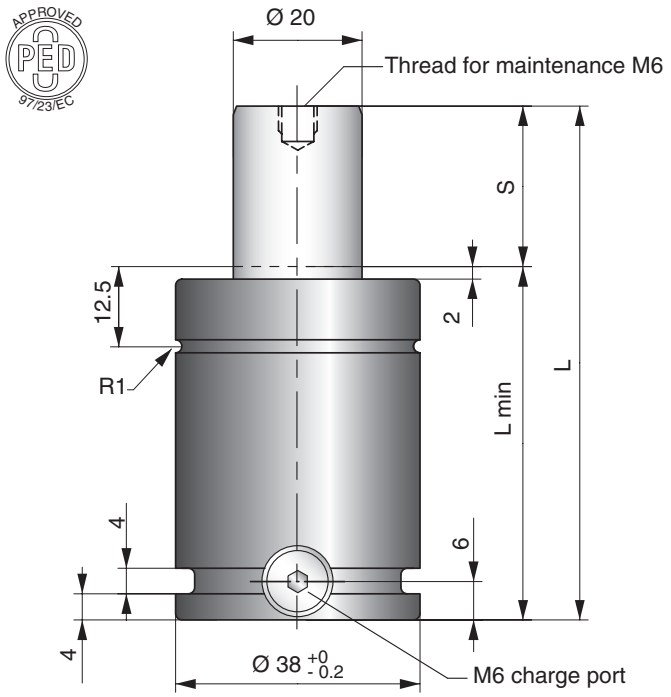


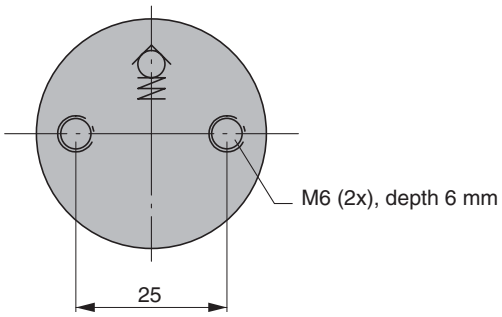
The Power Line series are our shortest and most powerful Piston Rod Sealed gas springs, giving you a great deal of force in a very small amount of space.

These gas springs are available with forces from 170 daN up to 9500 daN and stroke lengths between 7 and 125 mm.

There is a side port for gas charging that can also be used to connect to a hose system.

An upper C-groove, lower U-groove together with two M6 threaded holes allow various mounting possibilities using our standard mounts.

Bottom view



Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X 500-010	10	4700	7200	50	40	0.01	0.25
X 500-013	13		7100	56	43	0.01	0.26
X 500-016	16		7200	62	46	0.02	0.27
X 500-019	19		7400	68	49	0.02	0.28
X 500-025	25		7300	80	55	0.03	0.31
X 500-032	32		7200	94	62	0.03	0.34
X 500-038	38		7200	106	68	0.04	0.36
X 500-050	50		7200	130	80	0.05	0.40
X 500-063	63		7200	156	93	0.06	0.45
X 500-075	75		7100	180	105	0.07	0.50
X 500-080	80		7100	190	110	0.08	0.52
X 500-100	100		7100	230	130	0.10	0.60
X 500-125	125		7100	280	155	0.12	0.70

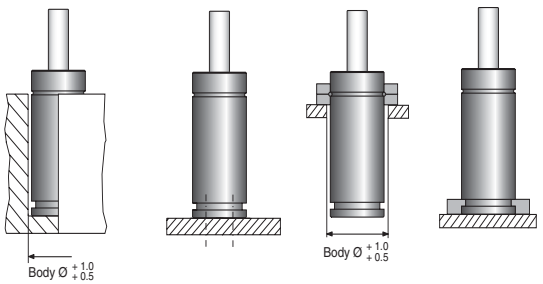
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 50 to 100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3018846

MOUNTING POSSIBILITIES



Drop - In | **B** Bottom threads | **FC, FCS** Top Mount | **K, FFC** Foot Mount

Note! For dimensions on mounting possibility K refer to chapter 3.

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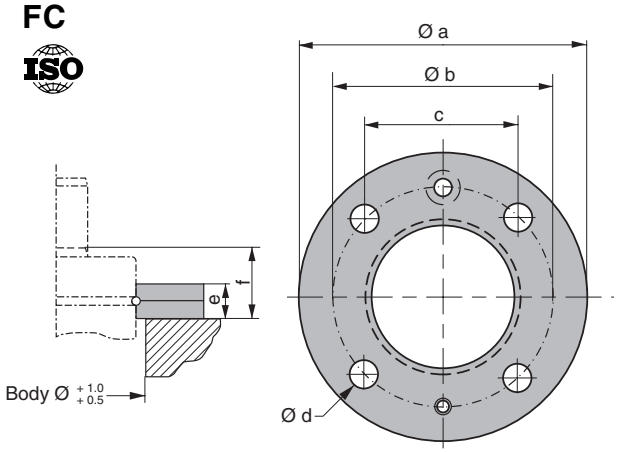
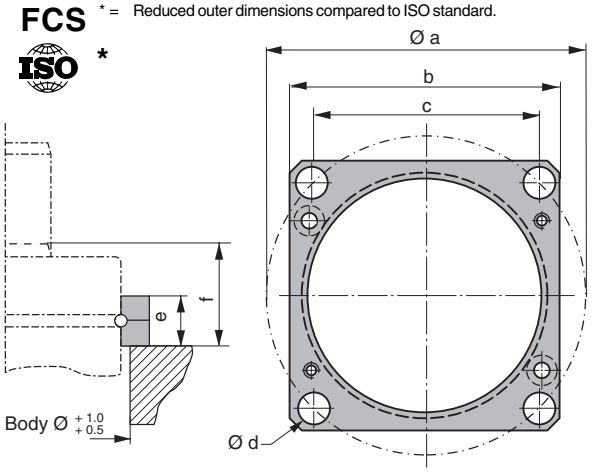
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-250	68	56.5	40	7	9	17

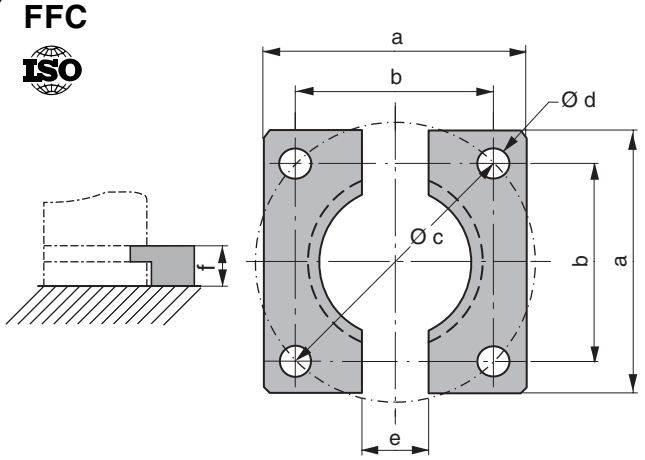
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-250	56.5	52	40	7	9	17

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-250	55	40	56.6	7	12	6.5

Note! For dimensions on mounting possibility K refer to chapter 3.

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K 500

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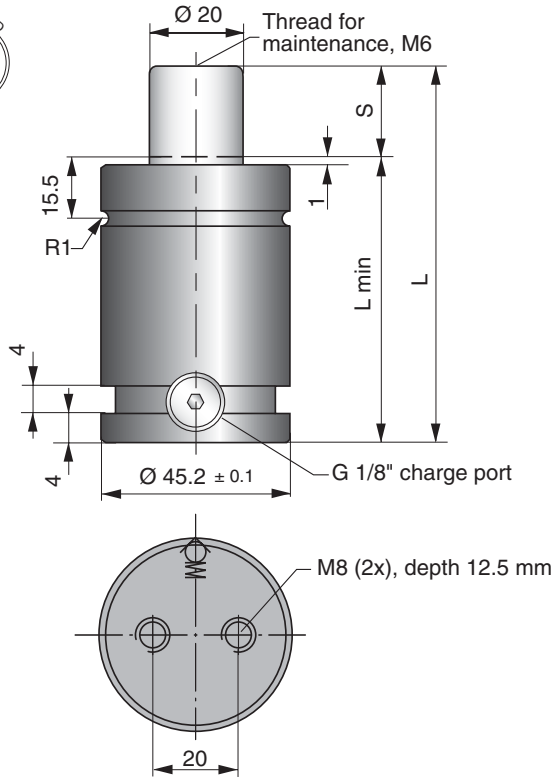


This is a short height hoseable spring with an initial force of 4700 N.

The K 500 has a total length of 50 mm + (2 x stroke). This spring is 35 mm shorter than the TU 500. Mounting options are the same as for the TU 500.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
K 500-006	6	4700	5600	62	56	0.02	0.50
K 500-013	12.7		5900	75.4	62.7	0.03	0.54
K 500-019	19		6100	88.1	69.05	0.04	0.59
K 500-025	25		6100	100	75	0.04	0.62
K 500-038	38.1		6200	126.2	88.1	0.06	0.71
K 500-050	50		6300	150	100	0.07	0.78
K 500-064	63.5		6300	177	113.5	0.09	0.88
K 500-080	80		6600	210	130	0.11	0.98
K 500-100	100		6600	250	150	0.12	1.12
K 500-125	125		6600	300	175	0.15	1.28

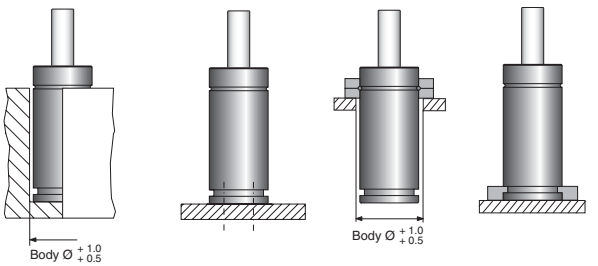
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 40-80 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3017230-0500

MOUNTING POSSIBILITIES



Drop - In | **B, MP** Bottom Mount | **FC, FCS** Top Mount | **K, FFC, FU** Foot Mount

Note! For dimensions on mounting possibilities K and FU refer to chapter 3.

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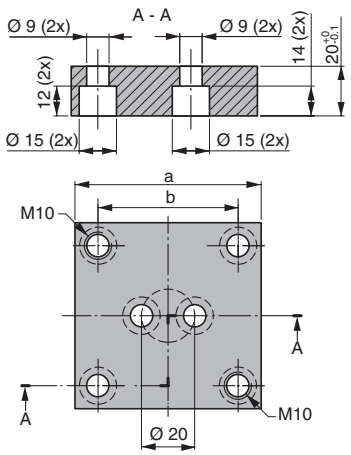
MP

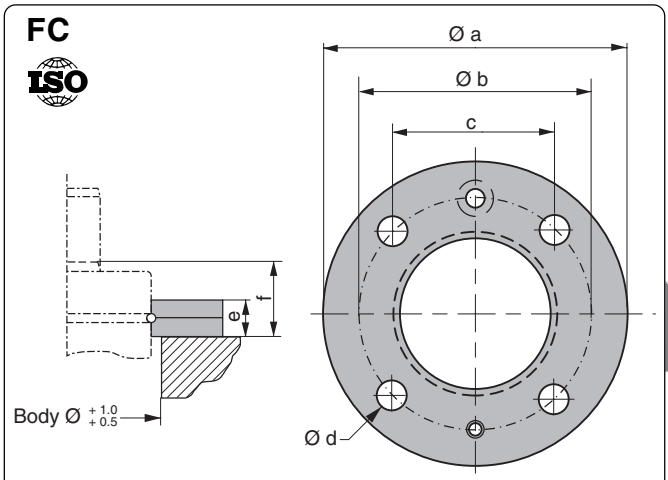
* = According to updated ISO 11901 standard



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-500	70	50

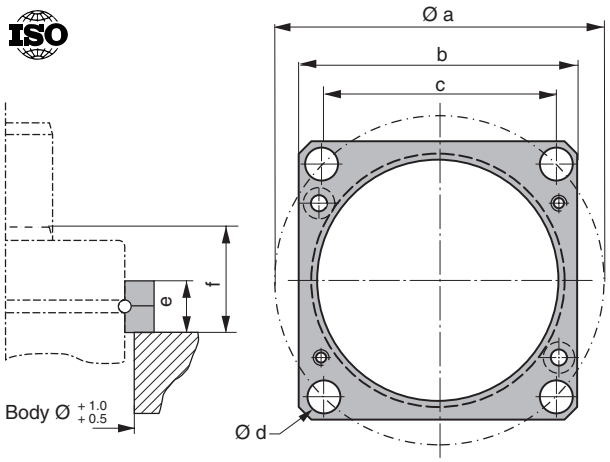
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-500	86	70.7	50	9	13	22

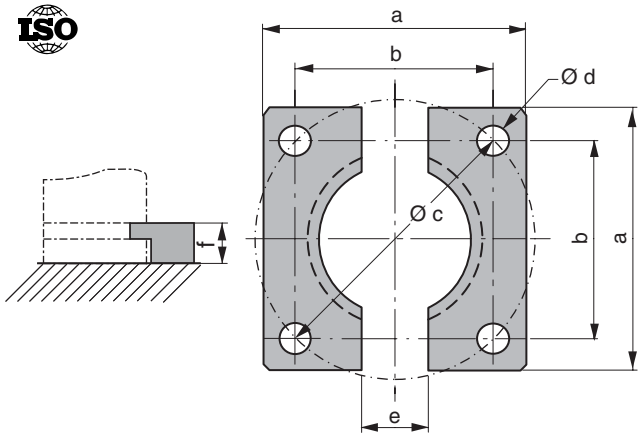
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-500	70.7	64	50	9	13	22

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-500	70	50	70.7	9	20	6.5

Note! For dimensions on mounting possibilities K and FU refer to chapter 3.

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KS 500

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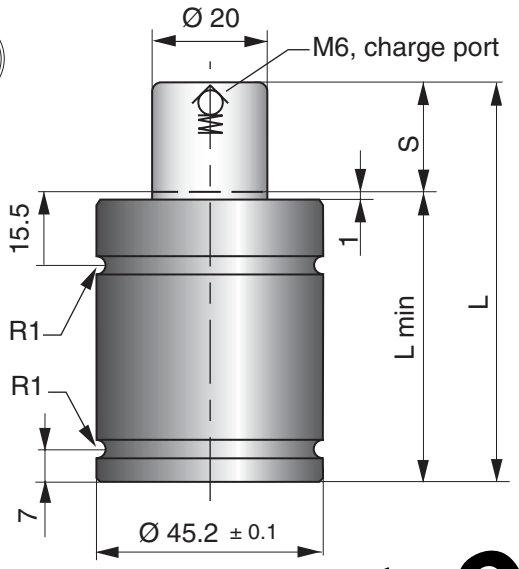


The KS 500 is a short height gas spring with an initial force of 4700 N.

The KS 500 has a total length of 32 mm + (2 x stroke), this is 53 mm shorter than the TU 500.

To be phased out - Possible alternative: X 750

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
KS 500-013	12.7	4700	6900	57.4	44.7	0.02	0.42
KS 500-019	19.05		6700	70.1	51.05	0.03	0.46
KS 500-025	25		6600	82	57	0.03	0.51
KS 500-038	38.1		6600	108.2	70.1	0.05	0.59
KS 500-050	50		6700	132	82	0.06	0.66
KS 500-064	63.5		6600	159	95.5	0.08	0.72
KS 500-080	80		6600	192	112	0.09	0.82
KS 500-100	100		6700	232	132	0.11	0.98
KS 500-125	125		6700	282	157	0.14	1.14

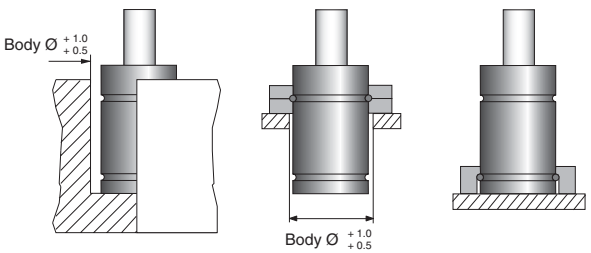
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 40-80 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3017230-0500

MOUNTING POSSIBILITIES



Drop-In

FC, FCS
Top Mount

BF
Foot Mount

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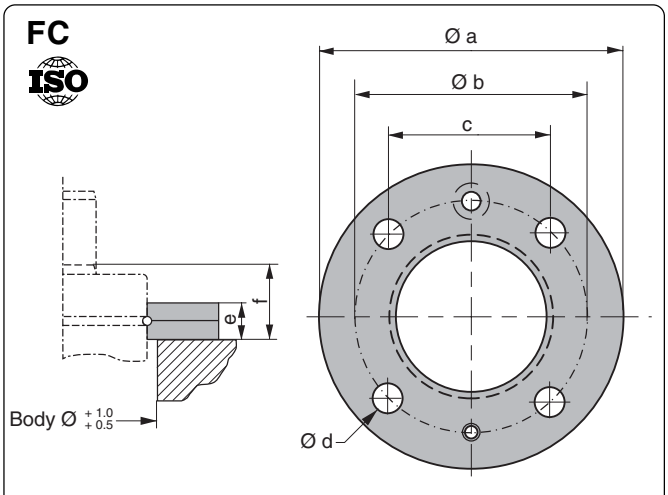
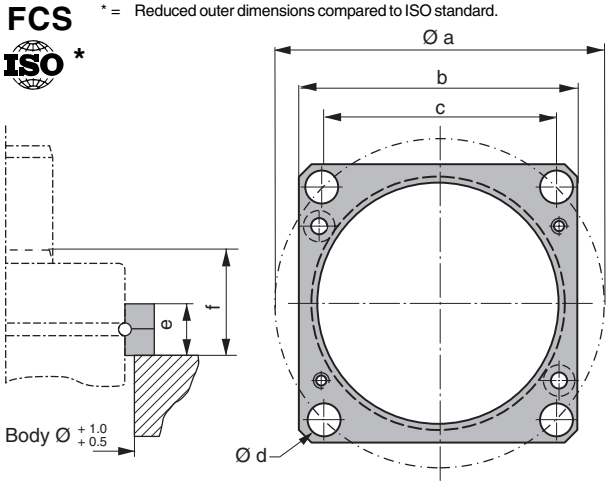
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-500	86	70.7	50	9	13	22

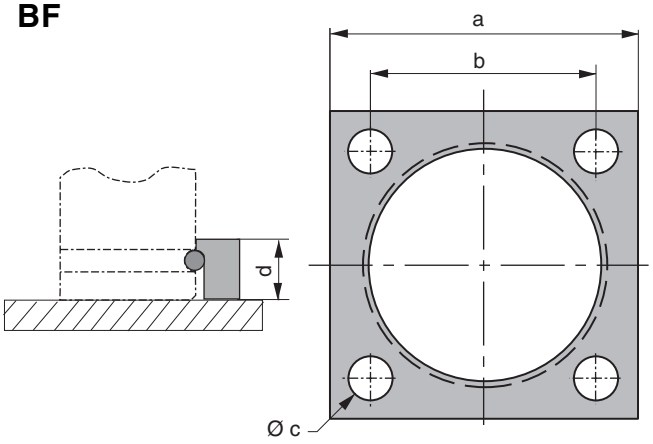
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-500	70.7	64	50	9	13	22

BF



Order No.	a	b	Ø c	d
BF-500	60	44	9	9.5

4

KSM 500

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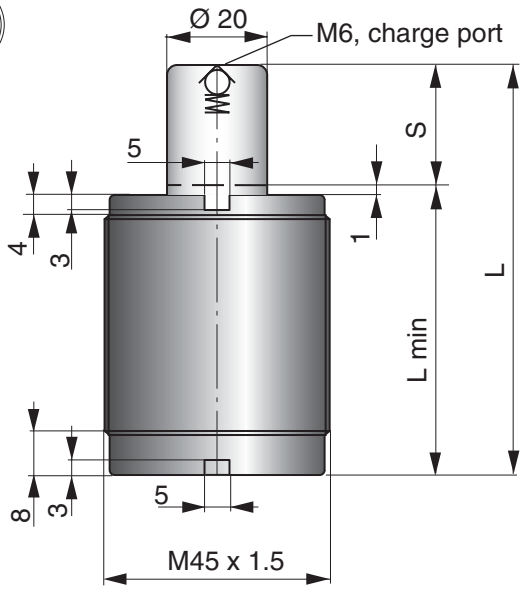


The KSM 500 is a threaded body version of the KS 500.

All internal components and technical data are the same as for the KS 500.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
KSM 500-013	12.7	4700	6900	57.4	44.7	0.02	0.40
KSM 500-019	19.05		6700	70.1	51.05	0.03	0.44
KSM 500-025	25		6600	82	57	0.03	0.49
KSM 500-038	38.1		6600	108.2	70.1	0.05	0.57
KSM 500-050	50		6700	132	82	0.06	0.64
KSM 500-064	63.5		6600	159	95.5	0.08	0.70
KSM 500-080	80		6600	192	112	0.09	0.80
KSM 500-100	100		6700	232	132	0.11	0.96
KSM 500-125	125		6700	282	157	0.14	1.12

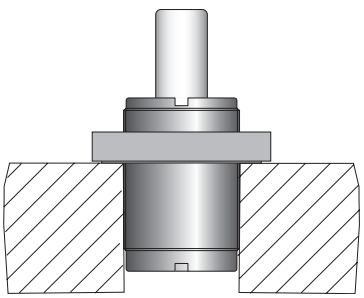
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 40-80 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3017230-0500

MOUNTING POSSIBILITIES



FRM
Lock nut

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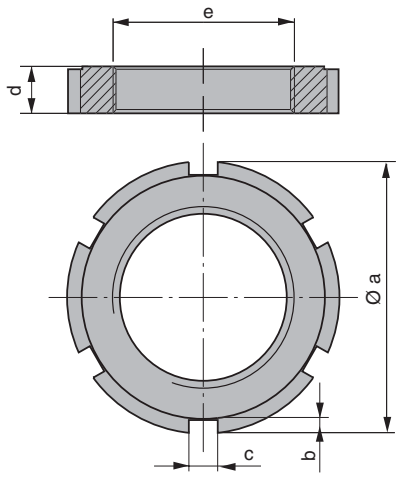
FRM



Order No.	Ø a	b	c	d	e
FRM-500	68	3.5	8	12	M45 x 1.5

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TU 500

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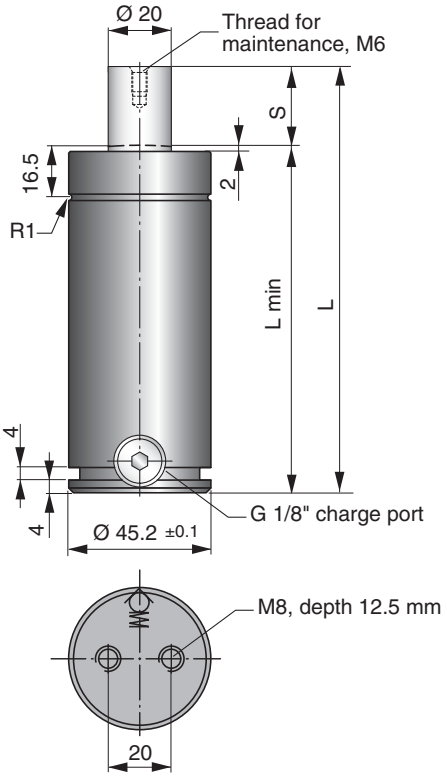


The standard line of gas springs is the TU- line. Sizes 250 to 10 000 correspond to the ISO 11901 standard for gas springs.

The TU 500 has a total length of 85 mm + (2 x stroke).

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)	ISO
TU 500-010	**10**	**4700**	**6000**	**105**	**95**	**0.023**	**0.96**	
TU 500-013	**12.7**		**6100**	**110.4**	**97.7**	**0.025**	**1.04**	
TU 500-025	**25**		**6400**	**135**	**110**	**0.038**	**1.13**	✔
TU 500-038	38.1		6500	161.2	123.1	0.051	1.22	
TU 500-050	50		6600	185	135	0.063	1.30	✔
TU 500-064	63.5		6600	212	148.5	0.077	1.41	
TU 500-080	80		6700	245	165	0.093	1.55	✔
TU 500-100	100		6700	285	185	0.114	1.72	
TU 500-125	125		6700	335	210	0.139	1.89	
TU 500-160	160		6700	405	245	0.175	2.14	

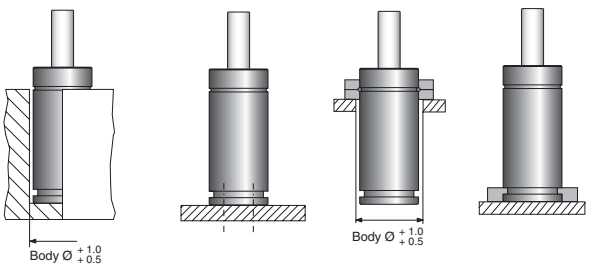
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 40-80 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 2013691-0500

MOUNTING POSSIBILITIES



Drop - In | **B, MP** Bottom Mount | **FC, FCS** Top Mount | **K, FFC, FU** Foot Mount

Note! For dimensions on mounting possibilities K and FU refer to chapter 3.

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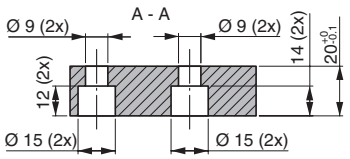
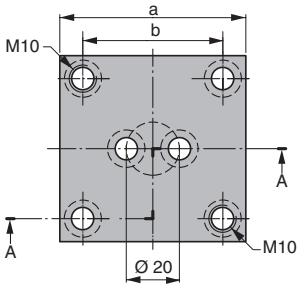
MP

* = According to updated ISO 11901 standard

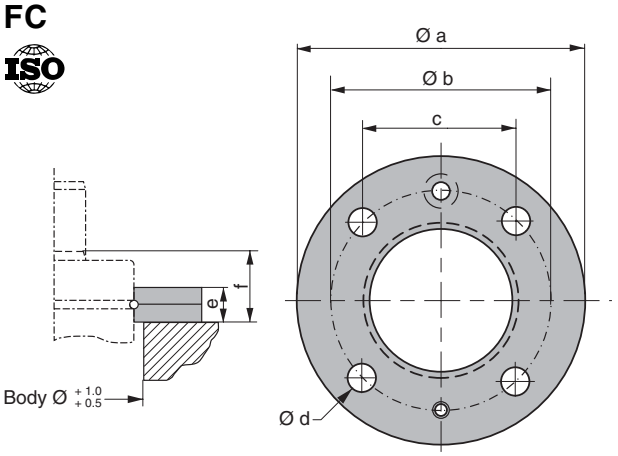


Note! Comes complete with screws to mount gas spring.



Order No.	a	b
MP-500	70	50

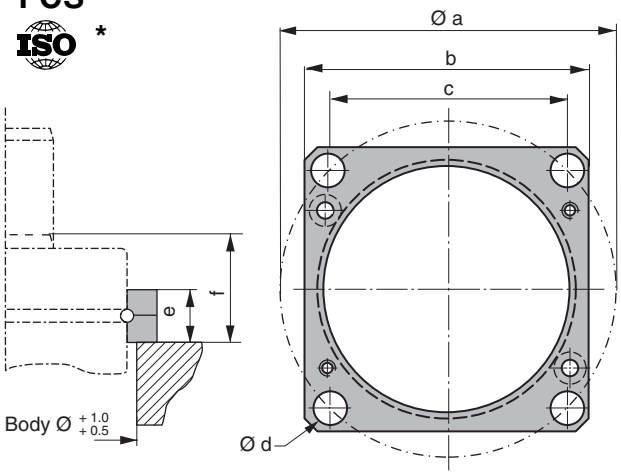
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-500	86	70.7	50	9	13	23

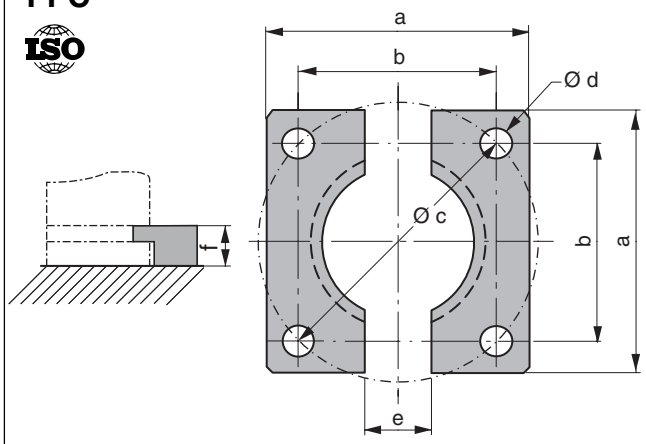
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-500	70.7	64	50	9	13	23

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-500	70	50	70.7	9	20	6.5

Note! For dimensions on mounting possibilities K and FU refer to chapter 3.

$750 \leq F_{INIT} < 1000$

X 750

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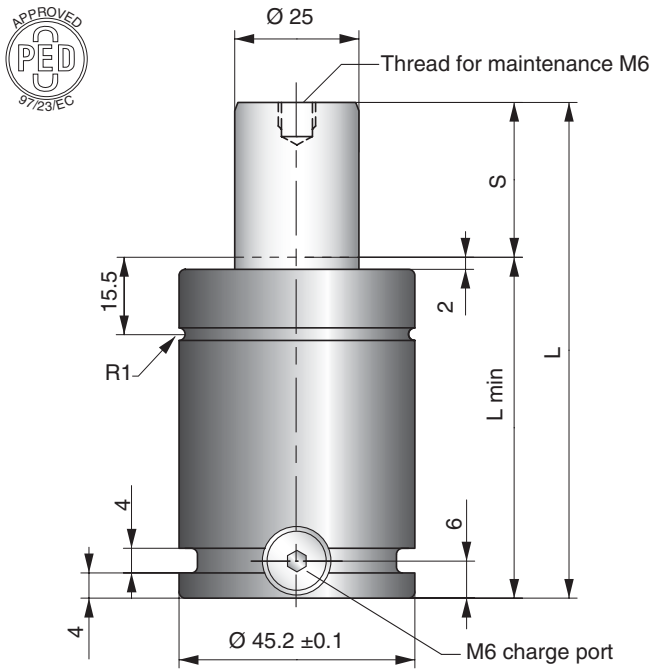


The Power Line series are our shortest and most powerful Piston Rod Sealed gas springs, giving you a great deal of force in a very small amount of space.

These gas springs are available with forces from 170 daN up to 9500 daN and stroke lengths between 7 and 125 mm.

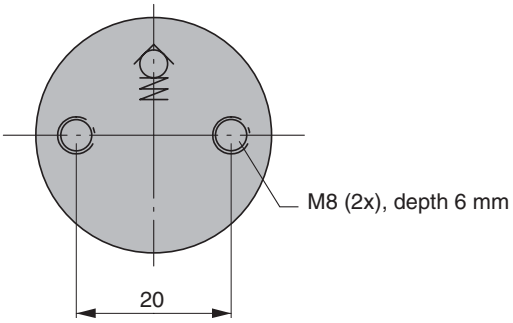
There is a side port for gas charging that can also be used to connect to a hose system.

An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X 750-010	10	7400	12100	52	42	0.02	0.37
X 750-013	13		12100	58	45	0.02	0.39
X 750-016	16		12100	64	48	0.03	0.41
X 750-019	19		11700	70	51	0.03	0.41
X 750-025	25		11800	82	57	0.04	0.45
X 750-032	32		11800	96	64	0.05	0.50
X 750-038	38		11800	108	70	0.05	0.53
X 750-050	50		11800	132	82	0.07	0.61
X 750-063	63		11800	158	95	0.09	0.69
X 750-075	75		11900	182	107	0.10	0.77
X 750-080	80		11900	192	112	0.11	0.80
X 750-100	100		11900	232	132	0.13	0.93
X 750-125	125		11900	282	157	0.17	1.09

* = at full stroke

Bottom view

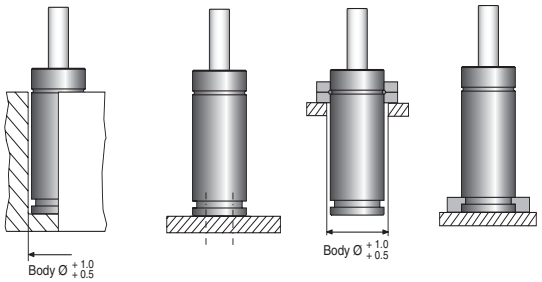


BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min .... ~ 50 to 100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3019903

MOUNTING POSSIBILITIES



Drop - In | **B** Bottom threads | **FC, FCS** Top Mount | **K, FFC** Foot Mount

Note! For dimensions on mounting possibility K refer to chapter 3.

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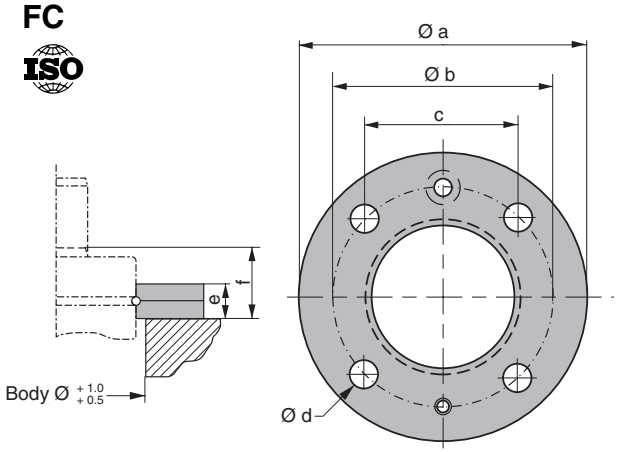
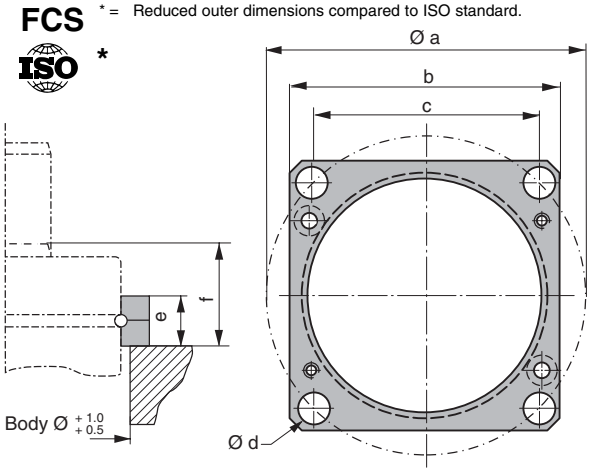
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-500	86	70.7	50	9	13	22

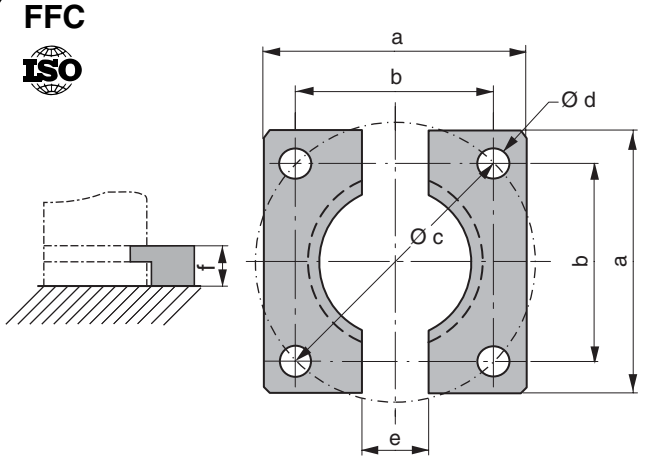
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-500	70.7	64	50	9	13	22

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-500	70	50	70.7	9	20	6.5

Note! For dimensions on mounting possibility K refer to chapter 3.

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K 750

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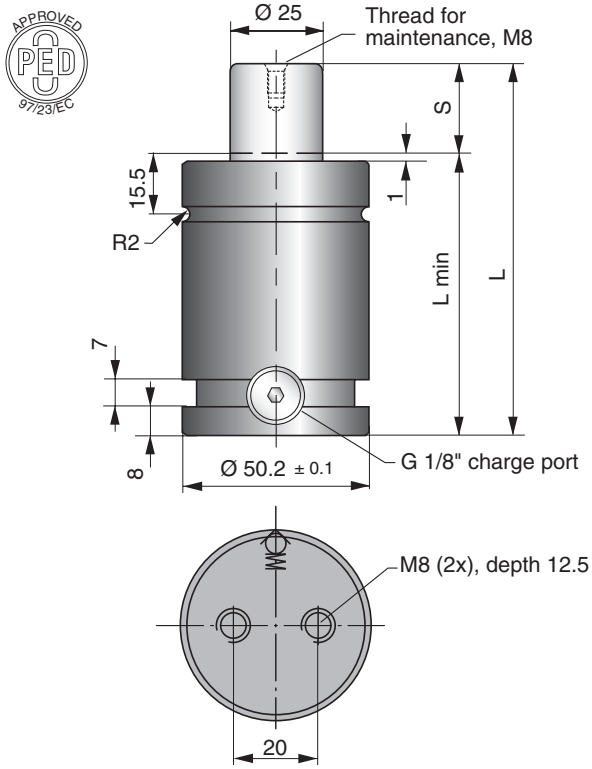
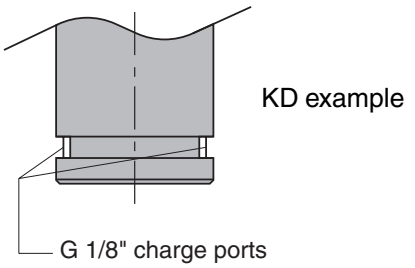


This is a short height hoseable spring with an initial force of 7400 N.

The K 750 has a total length of 50 mm + (2 x stroke). This spring is 45 mm shorter than the TU 750. Mounting options are the same as for the TU 750.

K 750 is also available with double gas charging ports in the tube. When ordering this type add a **D** to the Order No. Example: KD 750-xxx.

Note! The KD 750 has no valve and can only be pressurised through a hose system and is therefore always delivered uncharged.



Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
K 750-006	6	7400	15000	62	56	0.01	0.68
K 750-013	12.7		13000	75.4	62.7	0.02	0.73
K 750-019	19		12000	88.1	69.05	0.03	0.80
K 750-025	25		11000	100	75	0.04	0.82
K 750-038	38.1		11000	126.2	88.1	0.06	0.92
K 750-050	50		11000	150	100	0.08	1.06
K 750-064	63.5		11000	177	113.5	0.10	1.12
K 750-080	80		11000	210	130	0.12	1.26
K 750-100	100		11000	250	150	0.15	1.39
K 750-125	125		11000	300	175	0.19	1.57

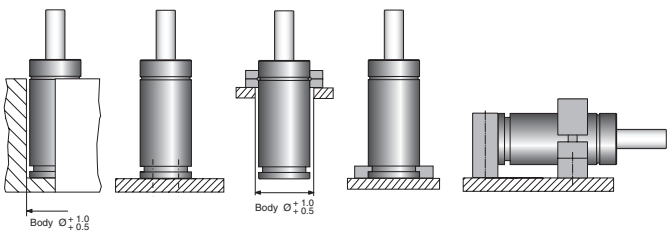
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min .... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3017230-0750

MOUNTING POSSIBILITIES



Drop - In	B, MP Bottom Mount	FC, FCS Top Mount	K, KU, FFC, FU Foot Mount	FAC, SA, S Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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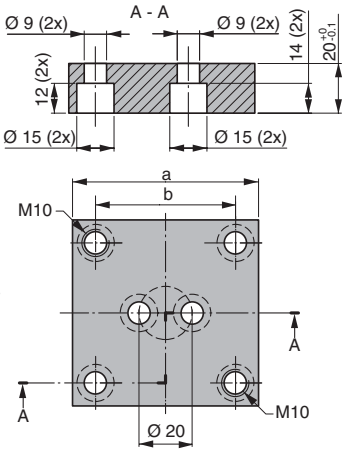
MP

* = According to updated ISO 11901 standard

ISO *

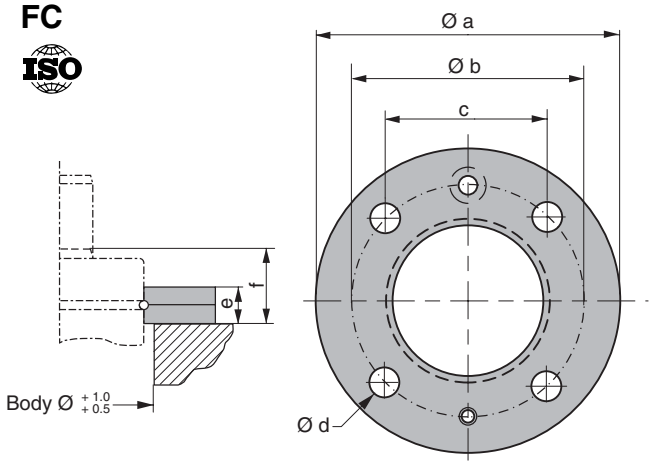


Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-750	75	56.5

FC

ISO

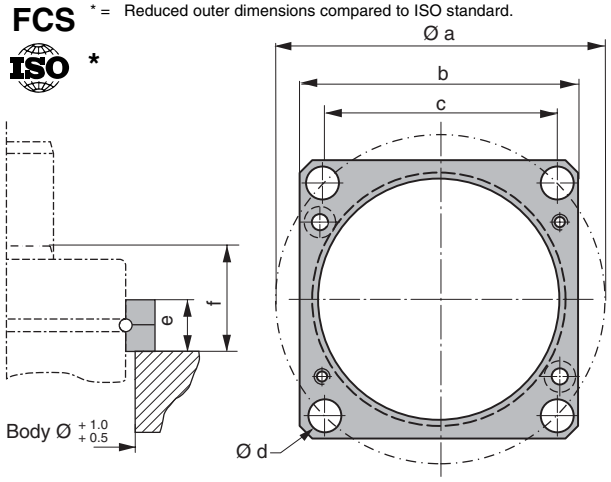


Order No.	Ø a	Ø b	c	Ø d	e	f
FC-750	95	80	56.5	9	13	22

FCS

* = Reduced outer dimensions compared to ISO standard.

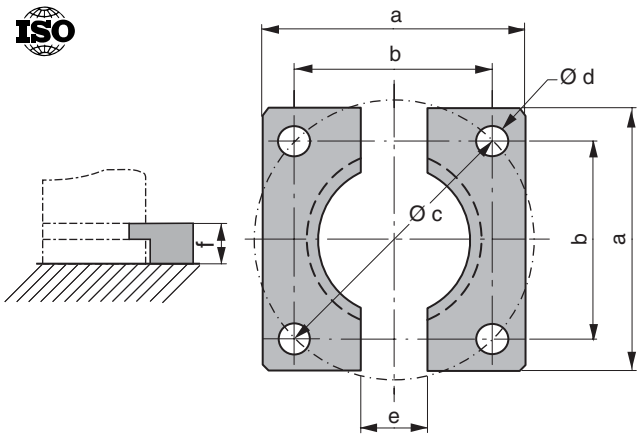
ISO *



Order No.	Ø a	b	c	Ø d	e	f
FCS-750	80	70	56.5	9	13	22

FFC

ISO



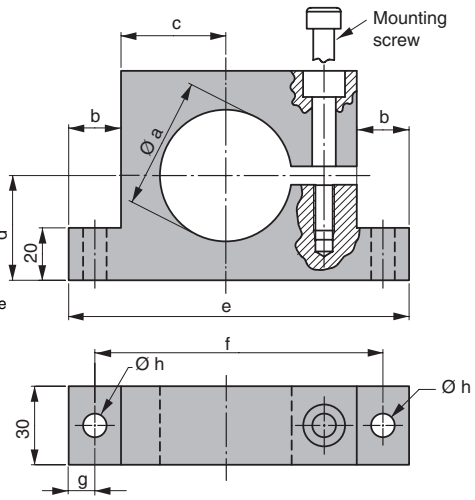
Order No.	a	b	Ø c	Ø d	e	f
FFC-750	75	56.5	80	9	24	12

S

ISO

Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mount option B.

The mounting screw (M8) should be tightened with torque 25 Nm.



Order No.	Ø a	b	c	d	e	f	g	Ø h
S-750	50.4	20	40	40	130	110	10	9

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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KM 750

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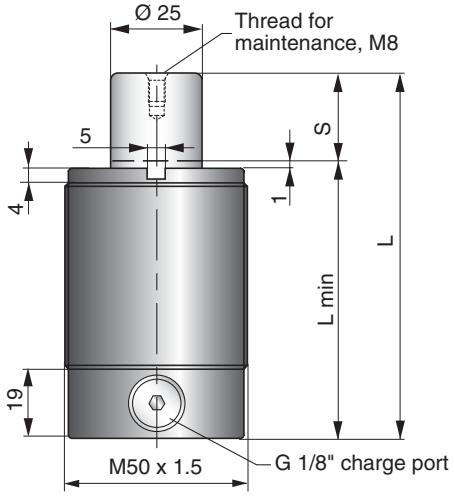
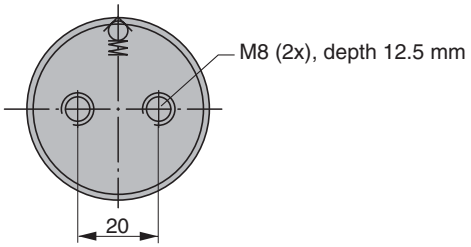




The KM 750 is a threaded body version of the K 750.

All internal components and technical data are the same as for the K 750.

Dimensions according to the FORD standard.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
KM 750-006	6	7400	15000	62	56	0.01	0.68
KM 750-013	12.7		13000	75.4	62.7	0.02	0.73
KM 750-019	19		12000	88.1	69.05	0.03	0.80
KM 750-025	25		11000	100	75	0.04	0.82
KM 750-038	38.1		11000	126.2	88.1	0.06	0.92
KM 750-050	50		11000	150	100	0.08	1.06
KM 750-064	63.5		11000	177	113.5	0.10	1.12
KM 750-080	80		11000	210	130	0.12	1.26
KM 750-100	100		11000	250	150	0.15	1.39
KM 750-125	125		11000	300	175	0.19	1.57

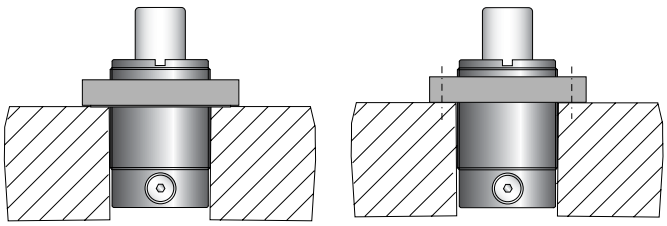
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min .... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3017230-0750

MOUNTING POSSIBILITIES



FRM
Lock nut

FTM
Flange mount

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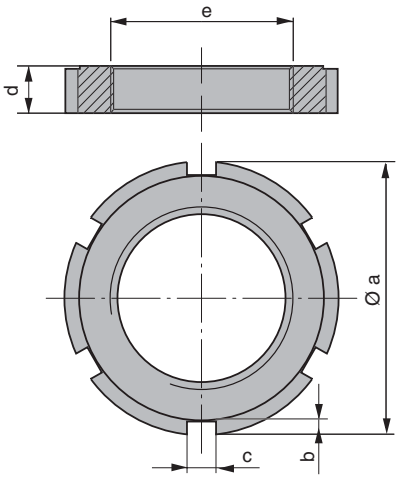
KALLER®

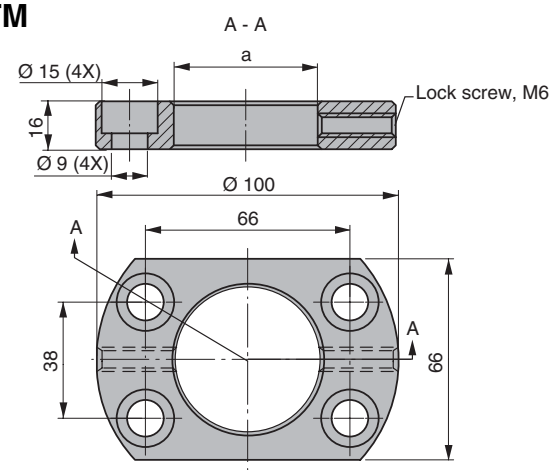
KM 750 Mounts

FRM



Order No.	Ø a	b	c	d	e
FRM-750	75	3.5	8	13	M50 x 1.5

FTM



Order No.	a
FTM-750	M50 x 1.5

5

KS 750

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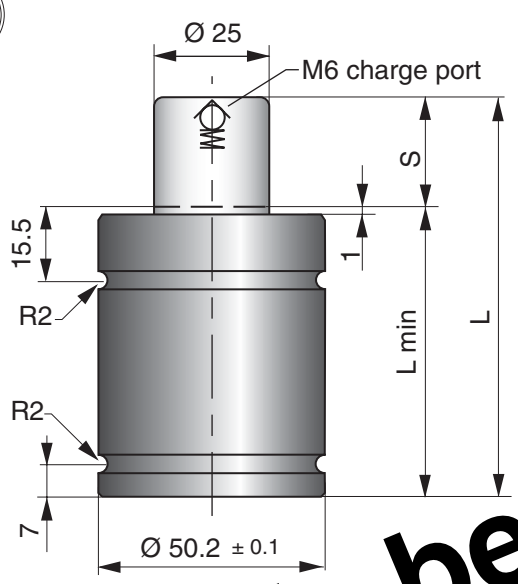


This is an ultra short height gas spring with an initial force of 7400 N. The internal components are the same as in the K 750.

The KS 750 has a total length of 38 mm +(2 x stroke), this is 57 mm shorter than the TU 750.

To be phased out - Possible alternative: X 1000

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
KS 750-013	12.7	7400	13000	63.4	50.7	0.02	0.60
KS 750-019	19,05		12000	76.1	57.05	0.03	0.64
KS 750-025	25		11000	88	63	0.04	0.68
KS 750-038	38.1		11000	114.2	76.1	0.06	0.78
KS 750-050	50		11000	138	88	0.08	0.88
KS 750-064	63.5		11000	165	101.5	0.10	0.98
KS 750-080	80		11000	198	118	0.12	1.10
KS 750-100	100		11000	238	138	0.15	1.26
KS 750-125	125		11000	288	163	0.19	1.45

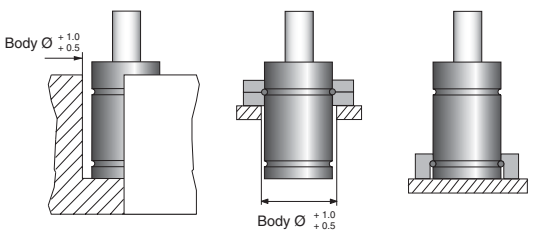
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min .... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3017230-0750

MOUNTING POSSIBILITIES



Drop-In

FC, FCS
Top Mount

BF
Foot Mount

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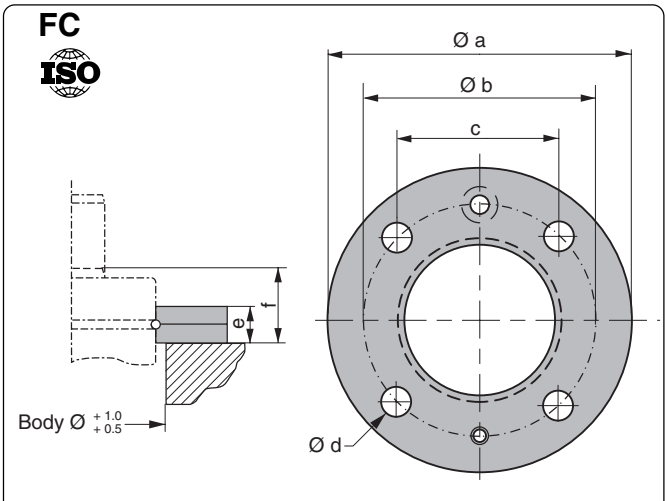
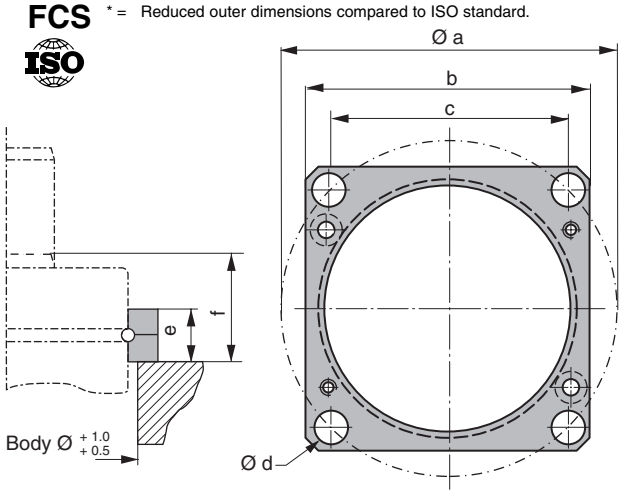
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-750	95	80	56.5	9	13	22

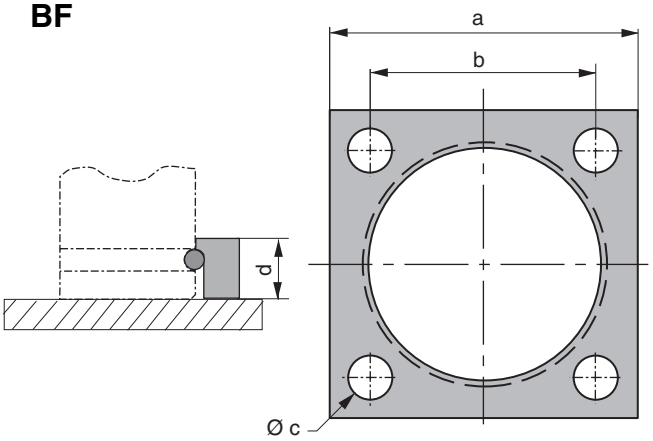
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-750	80	70	56.5	9	13	22

BF



Order No.	a	b	Ø c	d
BF-750	65	48	9	11.5

5

KSM 750

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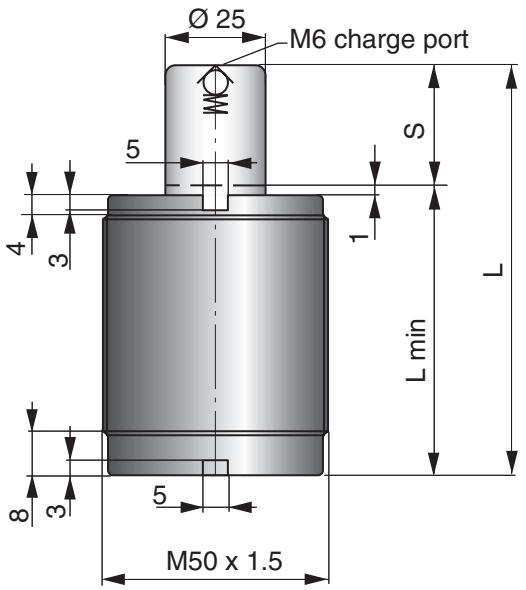


The KSM 750 is a threaded body version of the KS 750.

All internal components and technical data are the same as for the KS 750.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
KSM 750-013	12.7	7400	13000	63.4	50.7	0.02	0.57
KSM 750-019	19.05		12000	76.1	57.05	0.03	0.61
KSM 750-025	25		12000	88	63	0.04	0.65
KSM 750-038	38.1		12000	114.2	76.1	0.06	0.75
KSM 750-050	50		12000	138	88	0.07	0.85
KSM 750-064	63.5		12000	165	101.5	0.09	0.95
KSM 750-080	80		12000	198	118	0.11	1.08
KSM 750-100	100		12000	238	138	0.14	1.23
KSM 750-125	125		12000	288	163	0.17	1.42

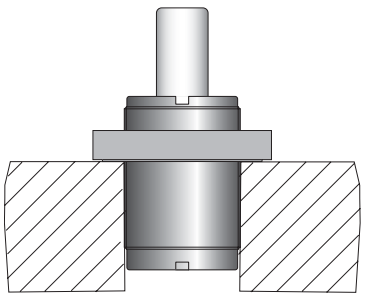
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min .... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3017230-0750

MOUNTING POSSIBILITIES



FRM
Lock nut

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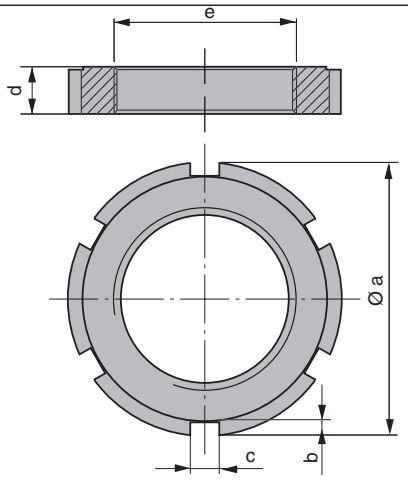
FRM



Order No.	Ø a	b	c	d	e
FRM-750	75	3.5	8	13	M50 x 1.5

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TU and LCF 750

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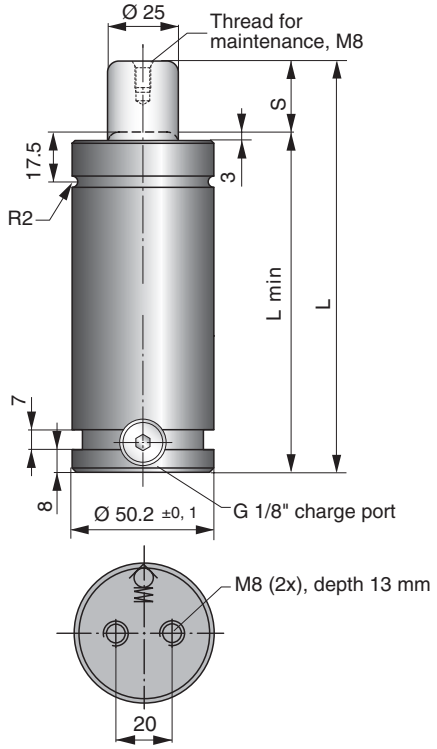
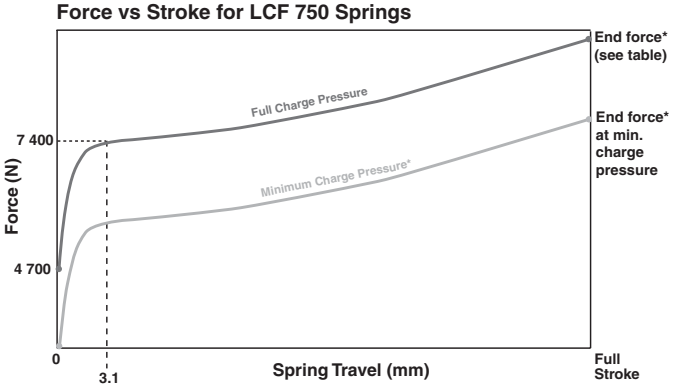


TU series
The standard line of gas springs is the TU line.
Sizes 250 to 10 000 correspond to the ISO 11901 standard for gas springs.
Sizes 750 to 7500 correspond to FORD's WDX3560, GM's M-1500 and Renault's automotive gas spring standards. When ordering a Renault standard gas spring add an R to the Order No. (for example: TUR 1500-xxx). For more information, see "Automotive Standards" 2.17/2

LCF series
Low Contact Force (LCF) gas springs are designed to reduce exessive shock loads, high noise levels and extreme pad bounce, all factors that lead to high press maintenance costs and noise pollution. For more information see "About Gas Springs" 2.1/2.

Force vs Stroke for LCF 750 Springs



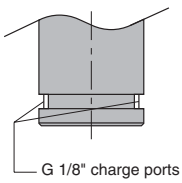
Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)	ISO
TU/LCF 750-013	**12.7**	**7400**	**12000**	**120.4**	**107.7**	**0.03**	**1.30**	
TU/LCF 750-025	**25**		**12000**	**145**	**120**	**0.04**	**1.45**	✔
TU/LCF 750-038	38.1		12000	171.2	133.1	0.06	1.50	
TU/LCF 750-050	50		12000	195	145	0.07	1.70	✔
TU/LCF 750-064	63.5		12000	222	158.5	0.09	1.75	
TU/LCF 750-080	80		12000	255	175	0.11	1.95	✔
TU/LCF 750-100	100		12000	295	195	0.14	2.15	✔
TU/LCF 750-125	125		12100	345	220	0.17	2.40	✔
TU/LCF 750-160	160		12100	415	255	0.21	2.70	✔
TU/LCF 750-200	200		12100	495	295	0.26	3.10	
TU/LCF 750-250	250		12100	595	345	0.33	3.60	
TU/LCF 750-300	300		12100	695	395	0.39	4.10	

* = at full stroke

TU, TUR and LCF 750 gas springs are also available with double charging ports. When ordering this type, add a D to the Order No. For example: TUD 750-xxx

Note! TUD, TURD and LCFD 750 gas springs contain no valve and can only be pressurised through connection to a hose system and therefore are always delivered uncharged.

TUD 750 example

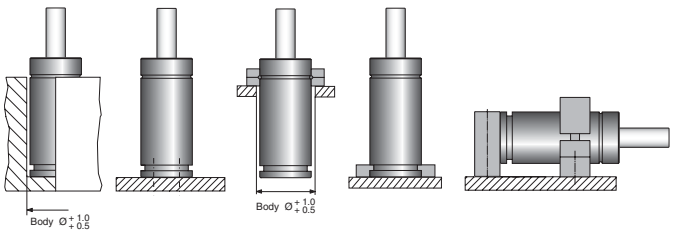


BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure (TU 750) ..... 25 bar
Min. charging pressure (LCF 750) ..... 70 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see "About gas springs", 2.1
Rod surface ..... Nitrided
Tube surface ..... Black oxide
*Repair kit (TU 750 PED) 3019817
*Repair kit (TU 750) 2014068-01
*Repair kit (LCF 750) 3019377

*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In | **B, MP** | **FC, FCS** | **K, KU, FFC, FU** | **FAC, SA, S, HM**

Bottom Mount | Top Mount | Foot Mount | Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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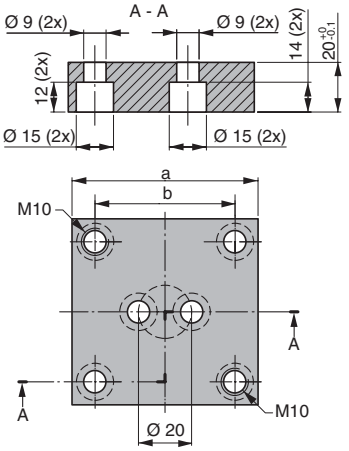
MP

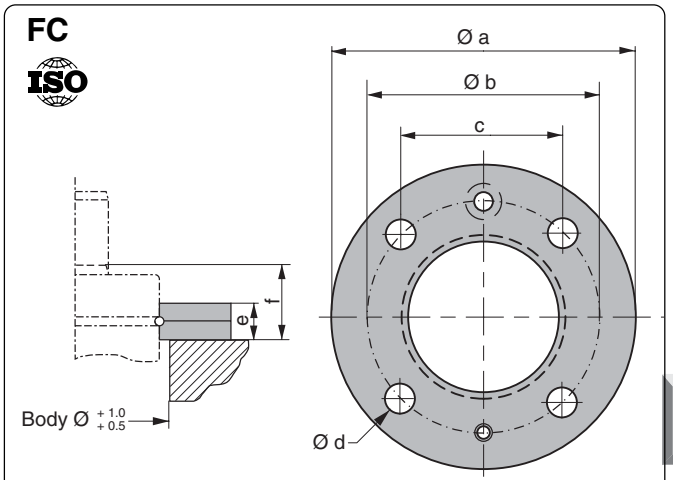
* = According to updated ISO 11901 standard



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-750	75	56.5

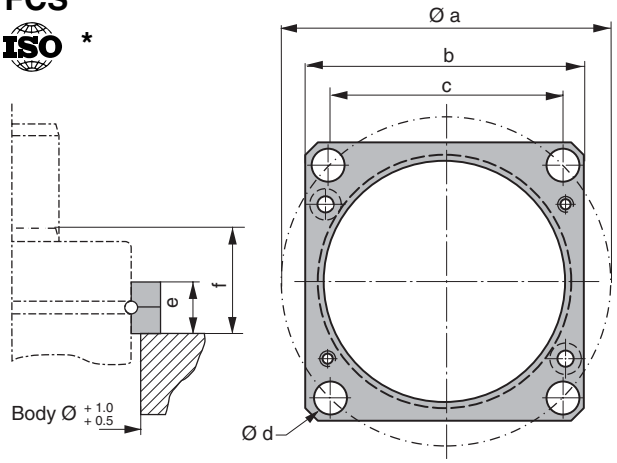
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-750	95	80	56.5	9	13	24

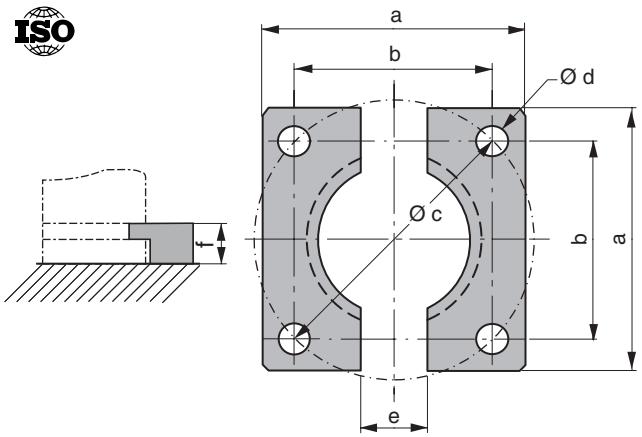
FCS

* = Reduced outer dimensions compared to ISO standard.



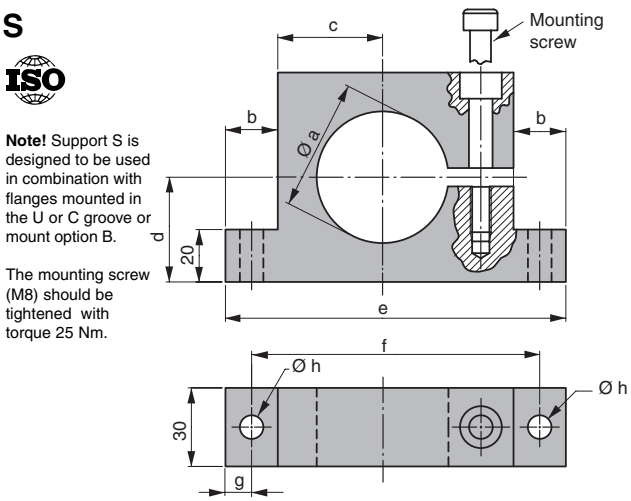
Order No.	Ø a	b	c	Ø d	e	f
FCS-750	80	70	56.5	9	13	24

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-750	75	56.5	80	9	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mount option B.

The mounting screw (M8) should be tightened with torque 25 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-750	50.4	20	40	40	130	110	10	9

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

TB 750

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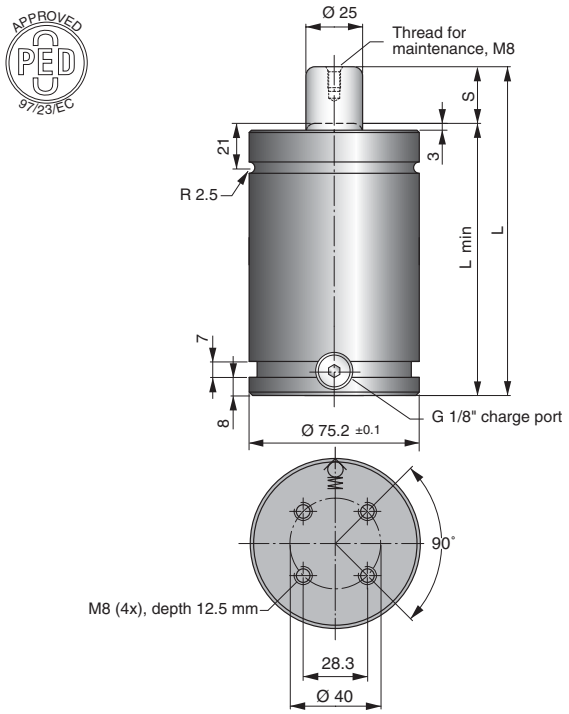


TB springs have a larger gas volume than our standard TU series.This reduces the pressure increase as the piston rod is stroked. It also increases the service life of the spring.

TB springs are recommended for applications where a low force increase is desirable. TB springs are also a good choice for higher cycle rates and high volume production.

Note! When ordering mounts for TB 750 springs, a mount of a larger size than the spring must be used.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
TB 750-013	12.7	7400	9500	120.4	107.7	0.06	3.05
TB 750-025	25		9000	145	120	0.10	3.15
TB 750-038	38.1		9000	171.2	133.1	0.14	3.35
TB 750-050	50		8900	195	145	0.17	3.50
TB 750-064	63.5		8800	222	158.5	0.22	3.75
TB 750-080	80		8800	255	175	0.27	3.95
TB 750-100	100		8800	295	195	0.33	4.25
TB 750-125	125		8800	345	220	0.41	4.65
TB 750-160	160		8800	415	255	0.52	5.15
TB 750- 200	200		8800	495	295	0.64	5.65
TB 750- 250	250		8800	595	345	0.80	6.45
TB 750- 300	300		8800	695	395	0.95	7.25

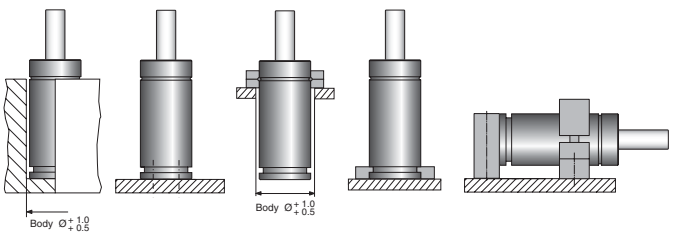
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 40-80 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
*Repair kit (TB 750 PED) 3019235
*Repair kit (TB 750) 2014068-05
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In | **B, MP** | **FC, FCS** | **K, KU, FFC, FU** | **FAC, SA, S**

Bottom Mount | Top Mount | Foot Mount | Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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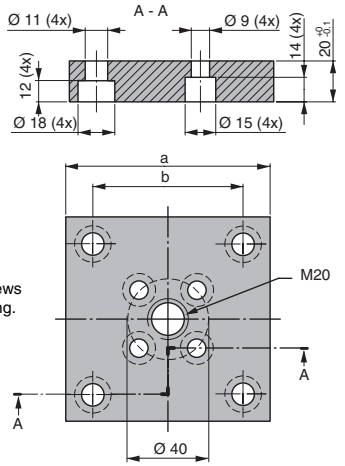
MP

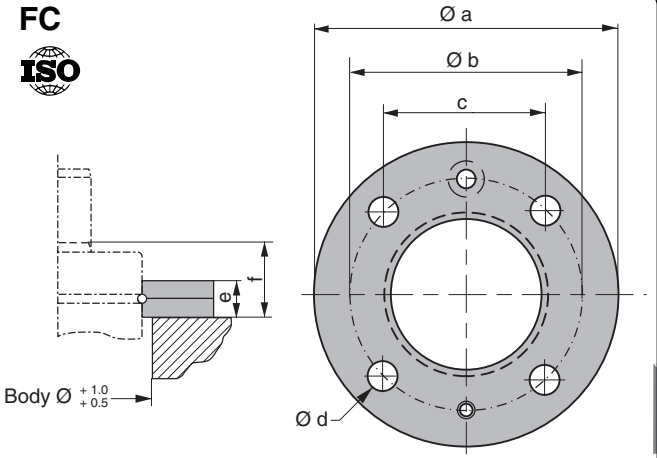
* = According to updated ISO 11901 standard



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-1500	100	73.5

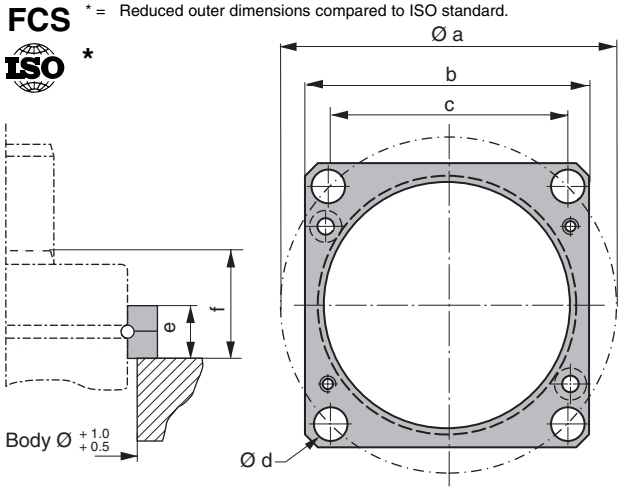
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-1500	122	104	73.5	11	16	29

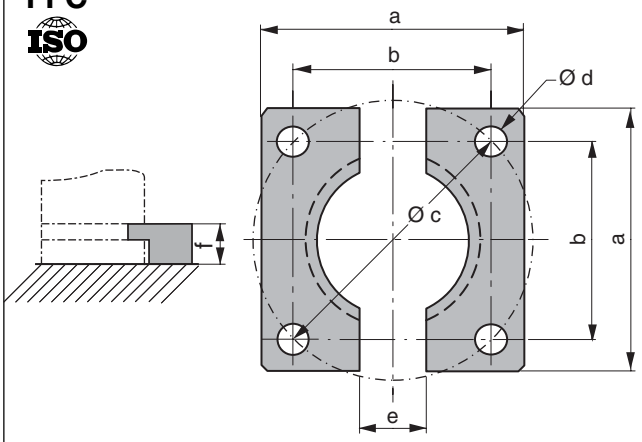
FCS

* = Reduced outer dimensions compared to ISO standard.



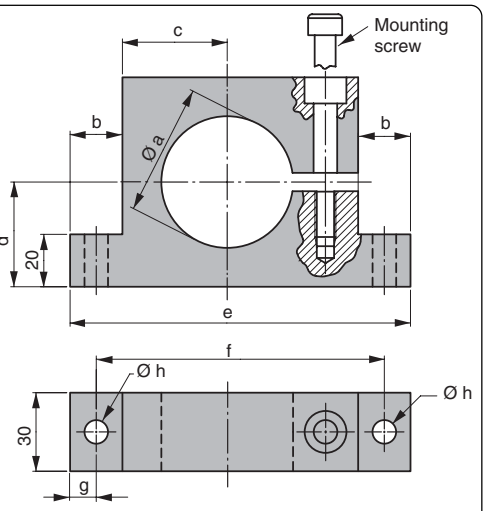
Order No.	Ø a	b	c	Ø d	e	f
FCS-1500	104	90	73.5	11	16	29

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-1500	100	73.5	104	11	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or attachment B.

The mounting screw (M10) should be tightened with torque 52 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-1500	75.4	22.5	52.5	52.5	160	137	11.5	11

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA, refer to chapter 3.

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SL 750

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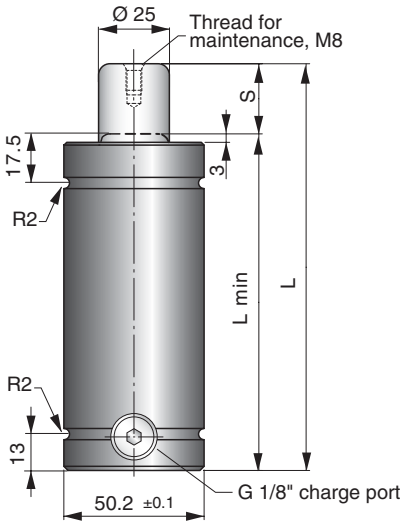
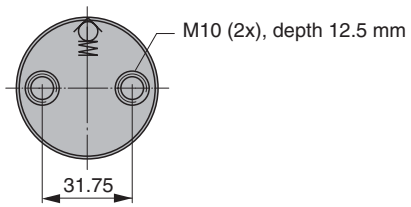




This 750 spring has “inch-based” total length and stroke length.

The SL 750 has a total length of 95 mm +(2 x stroke). The same length as for the TU 750.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
SL 750-013	12.7	7400	12000	120.4	107.7	0.03	1.30
SL 750-025	25.4		12000	145.8	120.4	0.04	1.40
SL 750-038	38.1		12000	171.2	133.1	0.06	1.60
SL 750-051	50.8		12000	196.6	145.8	0.07	1.70
SL 750-064	63.5		12000	222	158.5	0.09	1.80
SL 750-076	76.2		12000	247.4	171.2	0.11	1.90
SL 750-089	88.9		12000	272.8	183.9	0.12	2.10
SL 750-102	101.6		12000	298.2	196.6	0.14	2.20
SL 750-114	114.3		12000	323.6	209.3	0.15	2.30
SL 750-127	127		12000	349	222	0.17	2.40

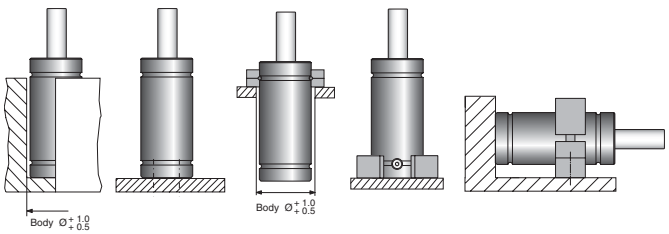
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min .... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 2014068-01

MOUNTING POSSIBILITIES



Drop - In | **B** Bottom thread | **FC, FCS** Top Mount | **FSL** Foot Mount | **S** Body Mount

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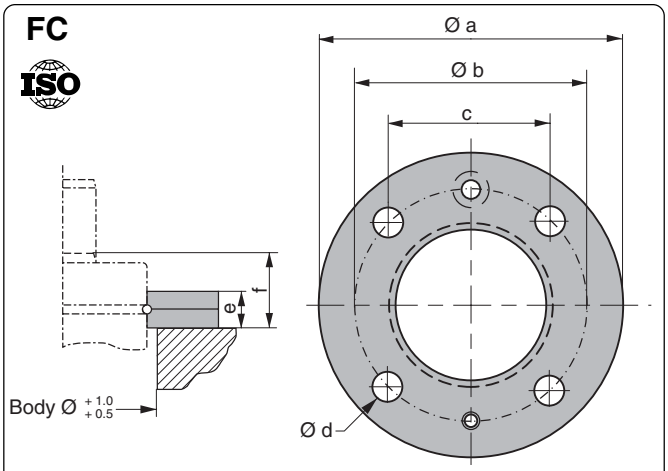
SL 750 Mounts

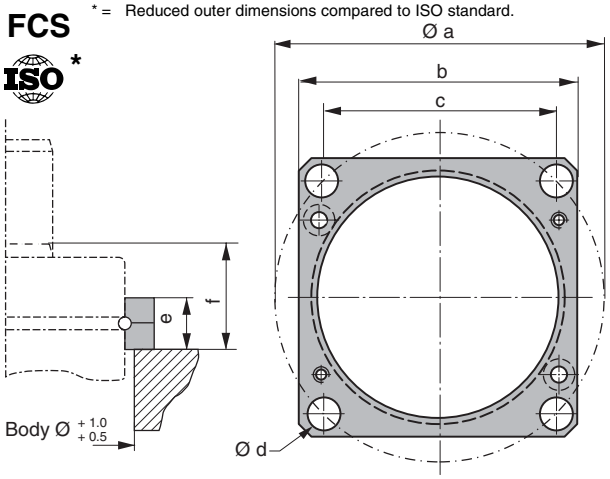
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-750	95	80	56.5	9	13	24

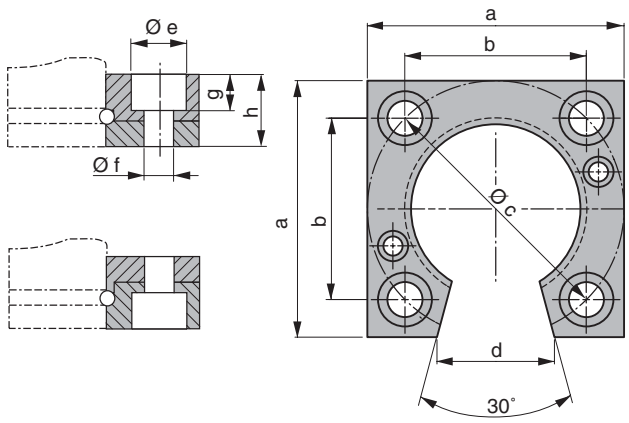
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-750	80	70	56.5	9	13	24

FSL

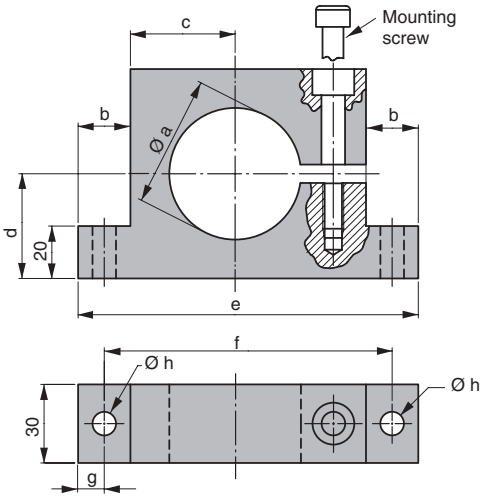


Order No.	a	b	Ø c	d	Ø e	Ø f	g	h
FSL-750	76.2	53.9	76.2	35	16	11	11	25

S

Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M8) should be tightened with torque 25 Nm.



Order No.	Ø a	b	c	d	e	f	g	Ø h
S-750	50.4	20	40	40	130	110	10	9

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$1000 \leq F_{INIT} < 2500$

CU 1000 - 1800

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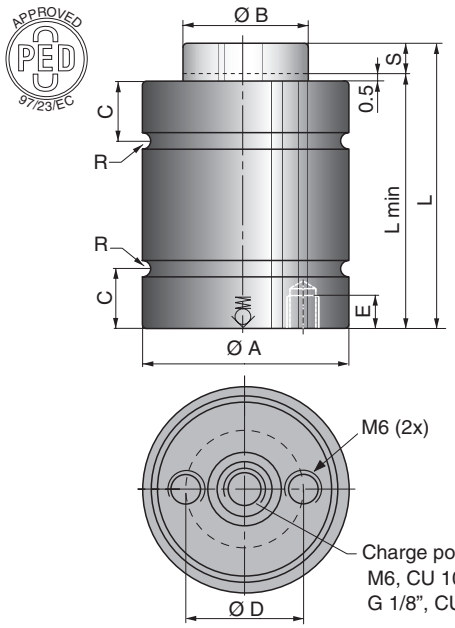


The CU gas spring is a very compact Bore Sealed gas spring, that gives a high force in a limited space.
The max. frequency for the spring is 100 strokes/minute.

Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend shorter stroke springs to be fastened for optimal service-life.

As an option, the CU springs can be delivered with a Side-Port plate (SP) for applications where a side-port is needed (i.e. for use in hose systems).

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force**	L ± 0.25	L min	Ø A ± 0.1	Ø B	C	Ø D	E	R	Gas vol. (l)	Weight (kg)
CU 1000-006	6	10600	16000	61	55	37.9	20	10.5	17	6.5	1	0.014	0.3
CU 1000-010	10		16000	78	68							0.024	0.4
CU 1000-016	16		16000	100	84							0.036	0.5
CU 1000-025	25		16000	135	110							0.056	0.6
CU 1000-032	32*		16000	167	135							0.074	0.7
CU 1000-040	40*		16000	195	155							0.092	0.8
CU 1000-050	50*		16000	230	180							0.110	0.9
CU 1800-006	6	18000	25000	66	60	50.2	30	14.5	26	6.5	2	0.030	0.6
CU 1800-010	10		26000	80	70							0.044	0.7
CU 1800-016	16		26000	106	90							0.072	0.8
CU 1800-025	25		27000	135	110							0.100	1.0
CU 1800-032	32*		27000	162	130							0.126	1.2
CU 1800-040	40*		28000	190	150							0.150	1.4
CU 1800-050	50*		29000	220	170							0.179	1.6

* = Should always be attached to the tool using the tapped holes in the bottom or a flange
** = at full stroke

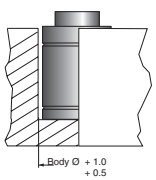
BASIC INFORMATION

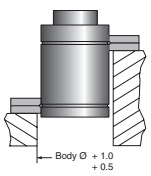
Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~100 (at 20° C)
Max piston rod velocity ..... 0.5 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Nitrided
Repair kit CU 1000 2014493-0100
Repair kit CU 1800 2014493-0180

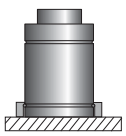
MOUNTING POSSIBILITIES

Drop-In

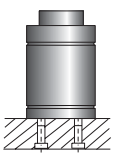




FC/FCS
Flange mount



BFCU
Flange mount



B
Bottom thread

SP
Side port

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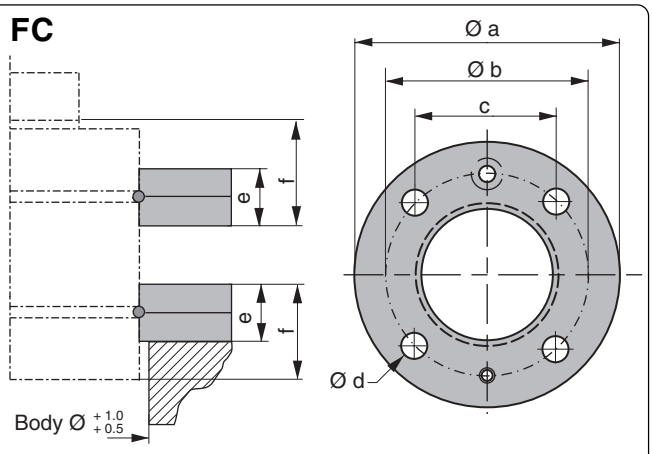
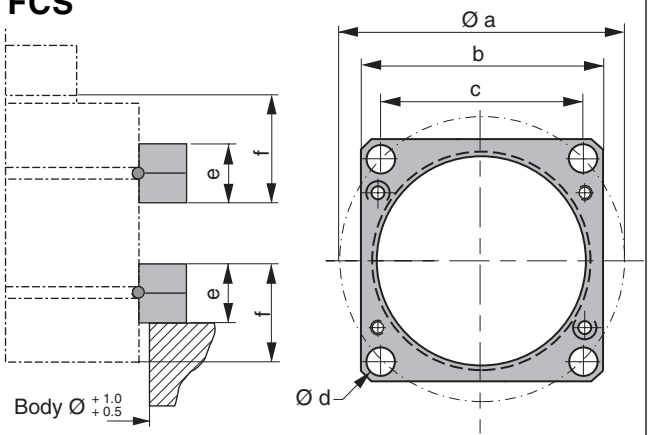
CU 1000 - 1800 Mounts

FC



For model	Order No.	Ø a	Ø b	c	Ø d	e	f
CU 1000	FC-250	68	56.5	40	7	9	15
CU 1800	FC-750	95	80	56.5	9	13	21

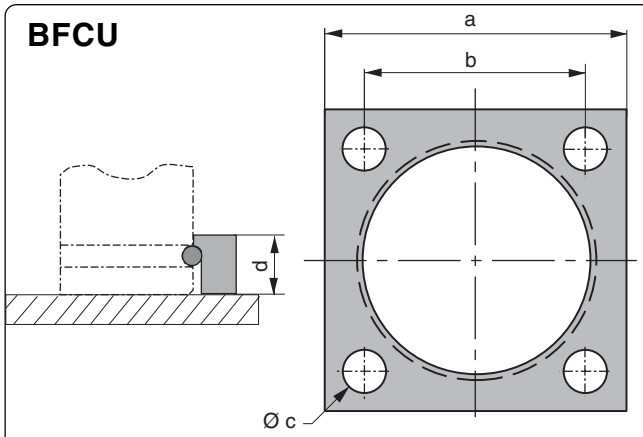
FCS



For model	Order No.	Ø a	b	c	Ø d	e	f
CU 1000	FCS-250	56.5	52	40	7	9	15
CU 1800	FCS-750	80	70	56.5	9	13	21

6

BFCU



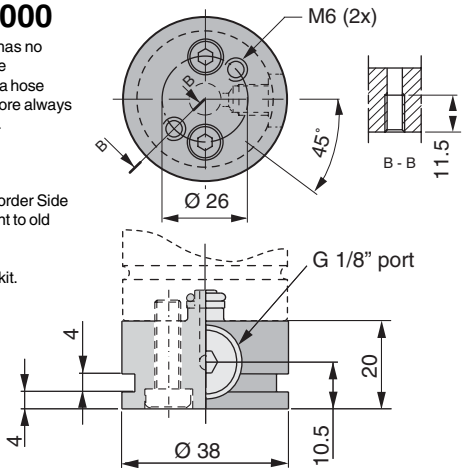
For model	Order N0.	a	b	Ø c	d
CU 1000	BFCU-1000	52	40	7	14.5
CU 1800	BFCU-1800	70	56.5	9	19.5

CU-SP 1000

Note! CU SP-1000 has no valve and can only be pressurised through a hose system and is therefore always delivered uncharged.

It is also possible to order Side Port kit for attachment to old springs.

Order No. SP 1000 kit.



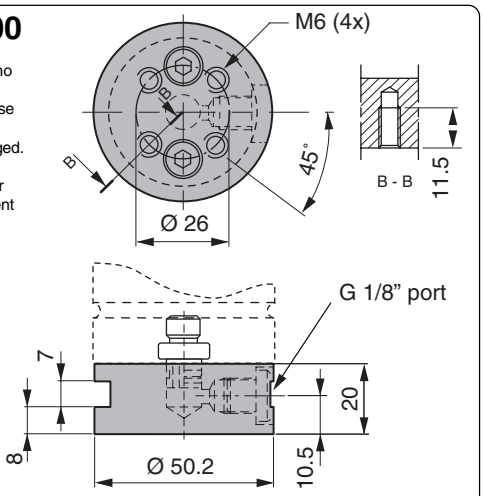
For model	Order No.	For U-groove mounts on CU-SP
CU 1000	CU SP-1000	Refer to TU 250

CU-SP 1800

Note! CU SP-1800 has no valve and can only be pressurised through a hose system and is therefore always delivered uncharged.

It is also possible to order Side Port kit for attachment to old springs.

Order No. SP 1800 kit.



For model	Order No.	For U-groove mounts on CU-SP
CU 1800	CU SP-1800	Refer to TU 750

X 1000 and XMS 1000

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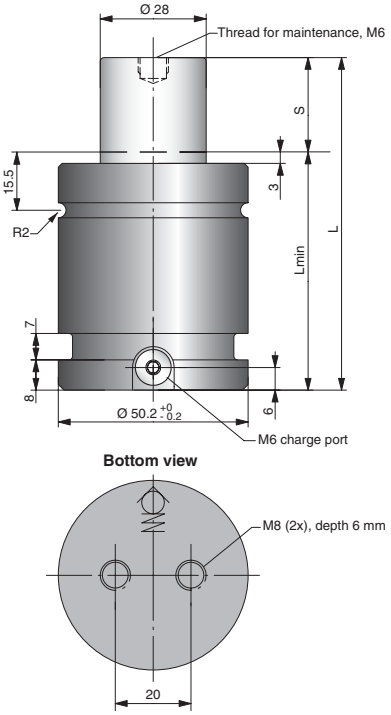


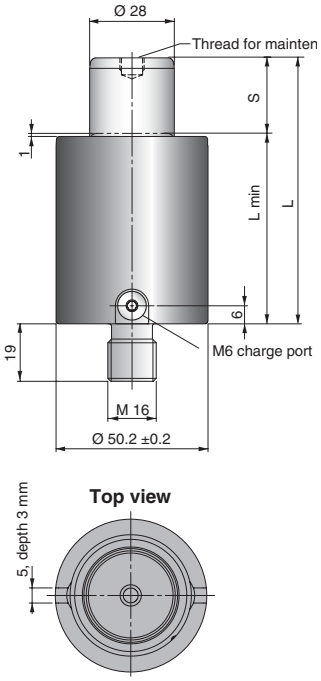
The Power Line series are our shortest and most powerful Piston Rod Sealed gas springs, giving you a great deal of force in a very small amount of space.

These gas springs are available with forces from 170 daN up to 9500 daN and stroke lengths between 7 and 125 mm.

There is a side port for gas charging that can also be used to connect to a hose system.

An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

The X 1000 model is also available equipped with a M16 threaded tap for mounting. When ordering this version XMS 1000-xxx must be stated on the order



Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X/XMS 1000-013	13	9200	13800	64	51	0.03	0.52
X/XMS 1000-016	16		13800	70	54	0.04	0.54
X/XMS 1000-019	19		14000	76	57	0.04	0.56
X/XMS 1000-025	25		14200	88	63	0.05	0.61
X/XMS 1000-032	32		14300	102	70	0.06	0.66
X/XMS 1000-038	38		14500	114	76	0.07	0.71
X/XMS 1000-050	50		14600	138	88	0.09	0.81
X/XMS 1000-063	63		14700	164	101	0.11	0.91
X/XMS 1000-075	75		14700	188	113	0.13	1.02
X/XMS 1000-080	80		14800	198	118	0.14	1.05
X/XMS 1000-100	100		14800	238	138	0.17	1.20
X/XMS 1000-125	125		14800	288	163	0.21	1.40

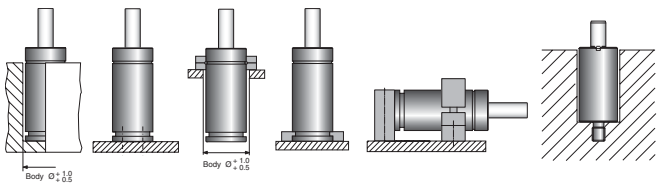
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 50 to 100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3018847

MOUNTING POSSIBILITIES



Drop - In | **B, MP** Bottom Mount | **FC, FCS** Top Mount | **K, KU, FFC, FU** Foot Mount | **FAC, SA, S, HM** Body Mount | **Threaded Stud**

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

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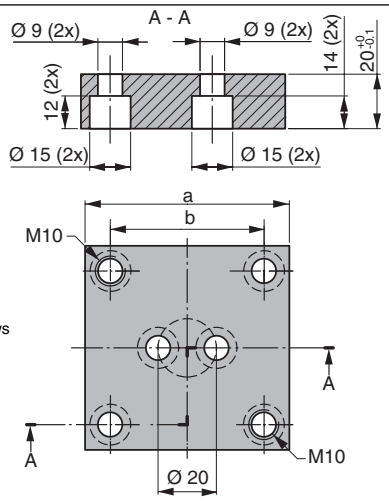
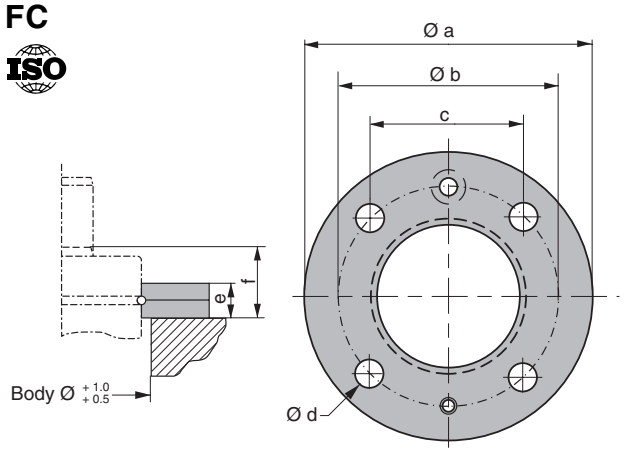
MP



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-750	75	56.5

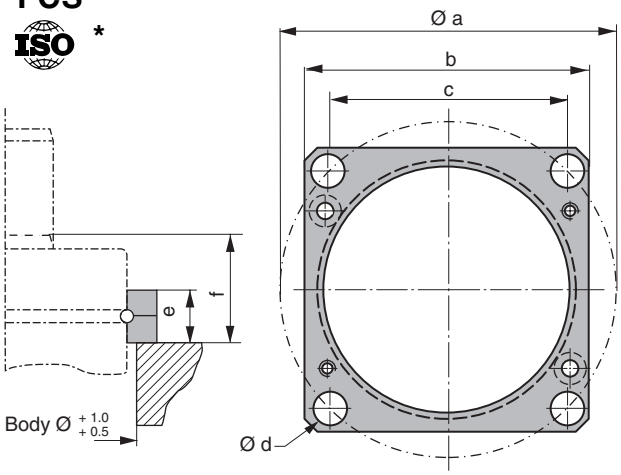
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-750	95	80	56.5	9	13	22

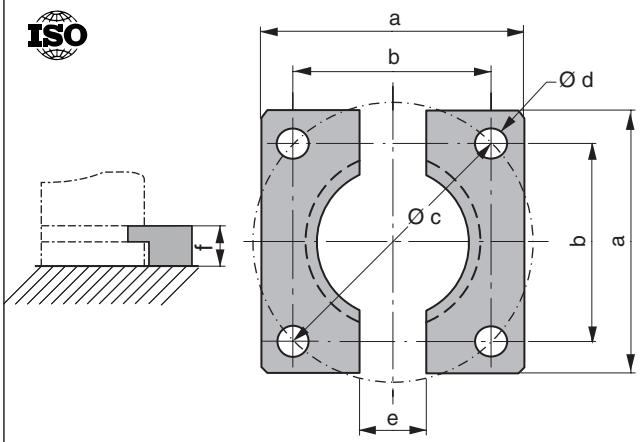
FCS

* = Reduced outer dimensions compared to ISO standard.



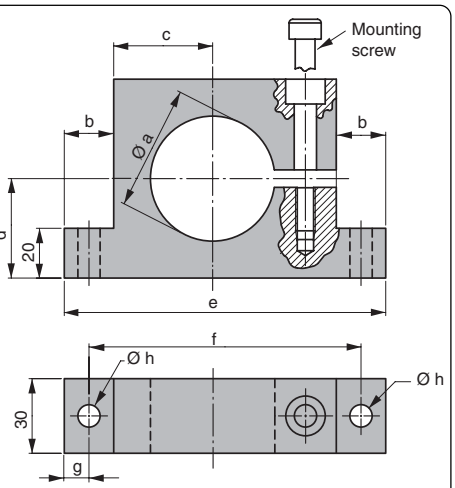
Order No.	Ø a	b	c	Ø d	e	f
FCS-750	80	70	56.5	9	13	22

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-750	75	56.5	80	9	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or attachment B.

The mounting screw (M8) should be tightened with torque 25 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-750	50.4	20	40	40	130	110	10	9

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

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X 1500

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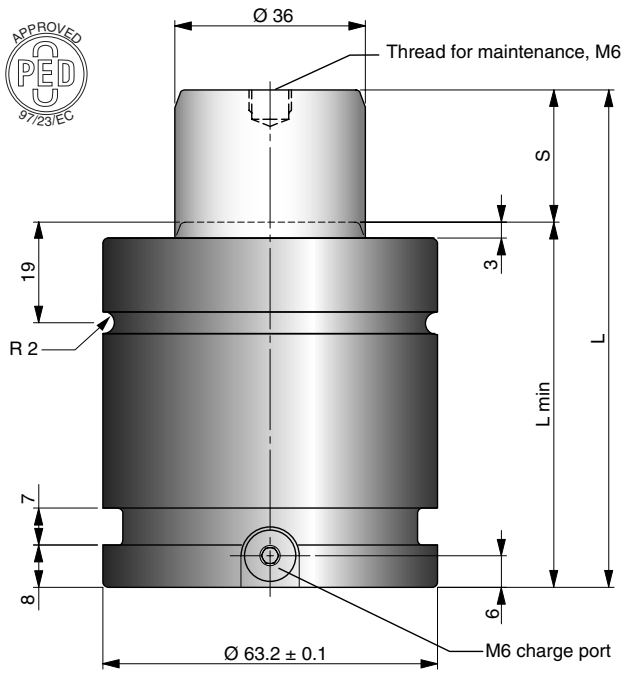


The Power Line series are our shortest and most powerful Piston Rod Sealed gas springs, giving you a great deal of force in a very small amount of space.

These gas springs are available with forces from 170 daN up to 9500 daN and stroke lengths between 7 and 125 mm.

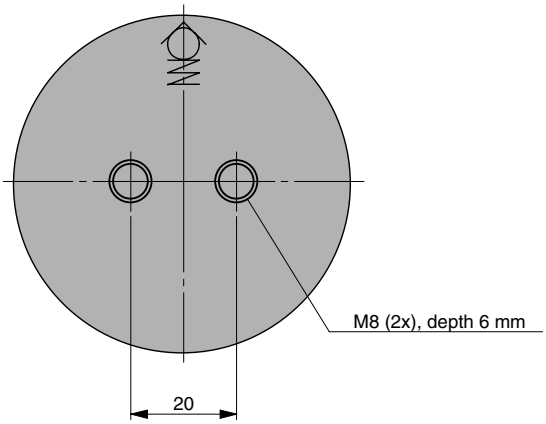
There is a side port for gas charging that can also be used to connect to a hose system.

An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X 1500-013	13	15000	24000	70	57	0.05	0.9
X 1500-016	16		24100	76	60	0.06	0.9
X 1500-019	19		24200	82	63	0.07	1.0
X 1500-025	25		24300	94	69	0.08	1.0
X 1500-032	32		23800	108	76	0.11	1.1
X 1500-038	38		23900	120	82	0.12	1.2
X 1500-050	50		24000	144	94	0.15	1.3
X 1500-063	63		24100	170	107	0.19	1.4
X 1500-075	75		24200	194	119	0.22	1.4
X 1500-080	80		24200	204	124	0.24	1.4
X 1500-100	100		24300	244	144	0.29	1.9
X 1500-125	125		24300	294	169	0.36	2.2

* = at full stroke

Bottom view

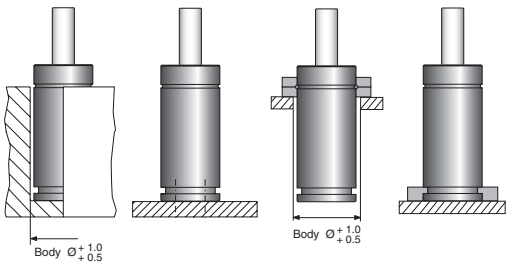


BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 50 to 100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3020434

MOUNTING POSSIBILITIES



Drop - In | **B, MPX** Bottom Mount | **FCX** Top Mount | **K, FFX** Foot Mount

Note! For dimensions on mounting possibility K refer to chapter 3.

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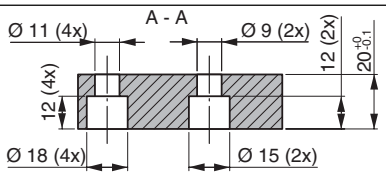
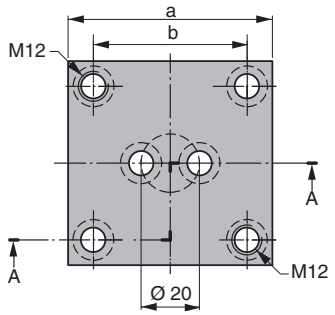
MPX

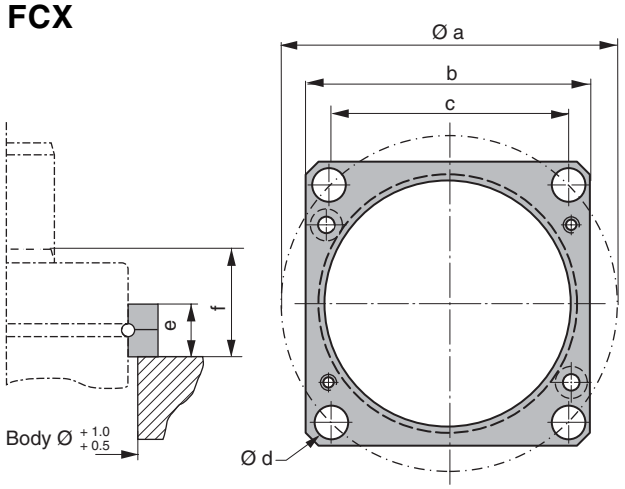




Note! Comes complete with screws to mount gas spring.

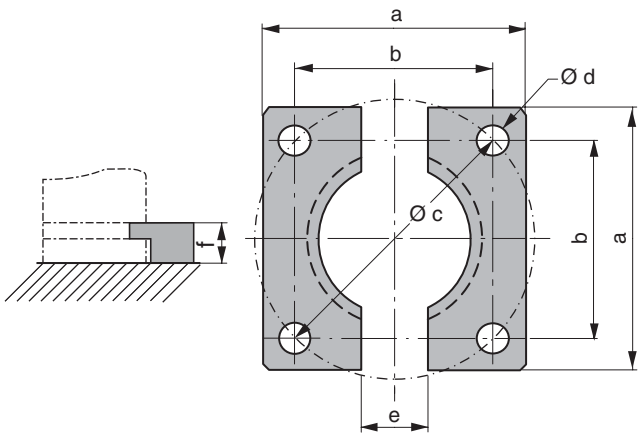
Order No.	a	b
MPX-1500	100	73.5

FCX



Order No.	Ø a	b	c	Ø d	e	f
FCX-1500	104	90	73.5	11	16	27

FFX



Order No.	a	b	Ø c	Ø d	e	f
FFX-1500	100	73.5	104	11	24	12

Note! For dimensions on mounting possibility K refer to chapter 3.

X 2400

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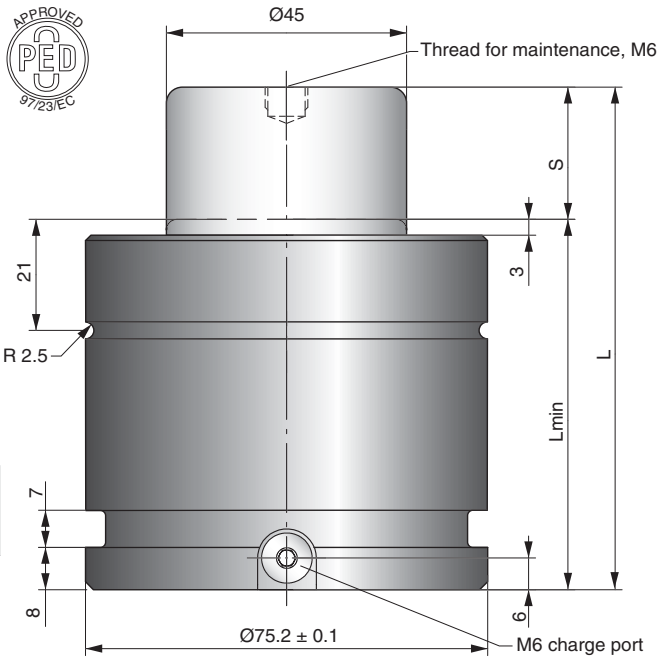

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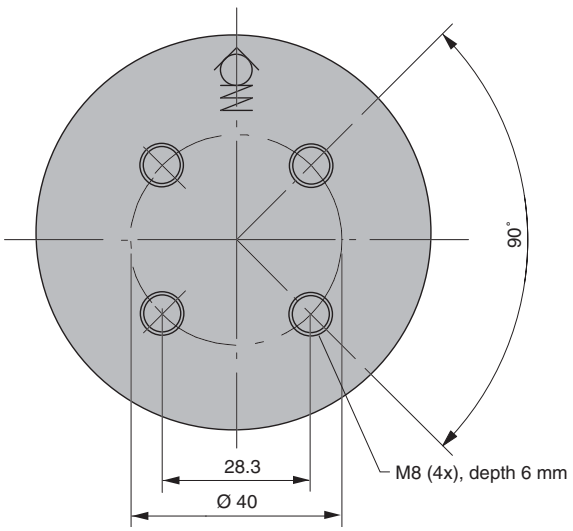
There is a side port for gas charging that can also be used to connect to a hose system.

An upper C-groove, lower U-groove together with four M8 threaded holes allow various mounting possibilities using our standard mounts.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X 2400-016	16	24000	38300	77	61	0.09	1.4
X 2400-019	19		38500	83	64	0.10	1.44
X 2400-025	25		38700	95	70	0.13	1.54
X 2400-032	32		38600	109	77	0.16	1.63
X 2400-038	38		38400	121	83	0.18	1.71
X 2400-050	50		39200	145	95	0.23	1.89
X 2400-063	63		39200	171	108	0.28	2.09
X 2400-075	75		39200	195	120	0.33	2.30
X 2400-080	80		39200	205	125	0.35	2.35
X 2400-100	100		39300	245	145	0.43	2.66
X 2400-125	125		39300	295	170	0.54	3.04

* = at full stroke

Bottom view

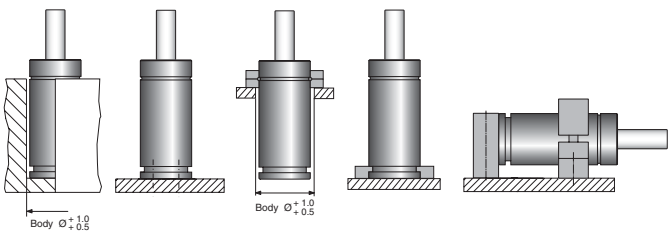


BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 40 to 100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3018848

MOUNTING POSSIBILITIES



Drop - In | **B, MP** | **FC, FCS** | **K, KU, FFC,FU** | **FAC, SA, S, HM**

Bottom Mount | Top Mount | Foot Mount | Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

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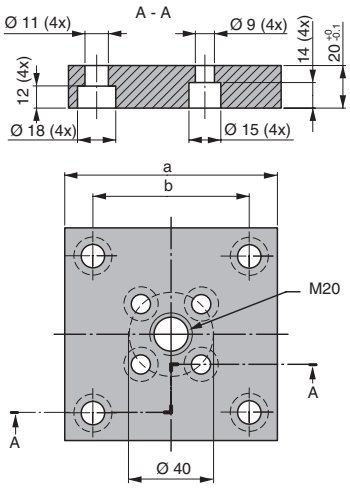
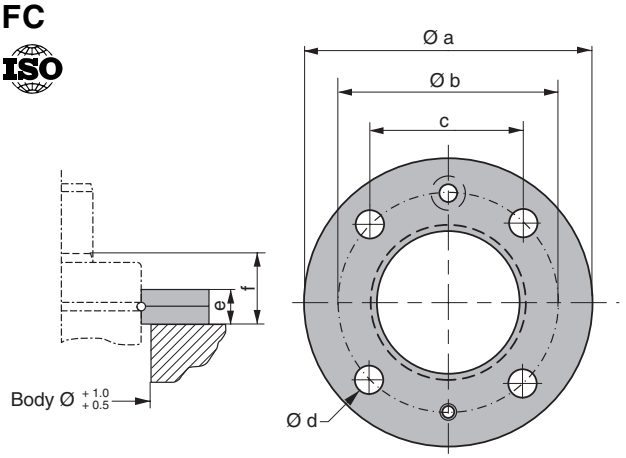
MP



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-1500	100	73.5

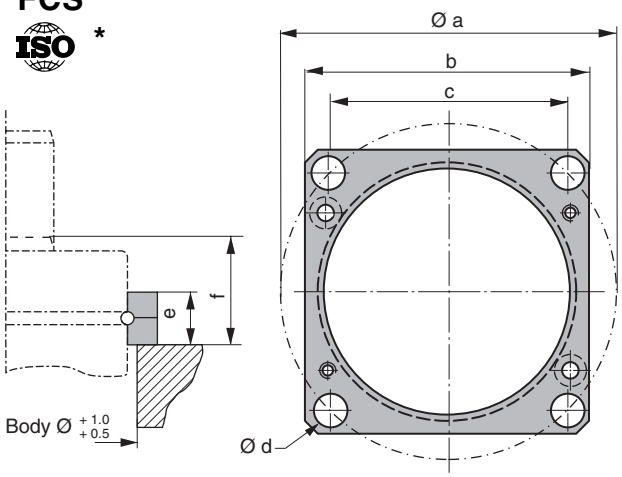
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-1500	122	104	73.5	11	16	29

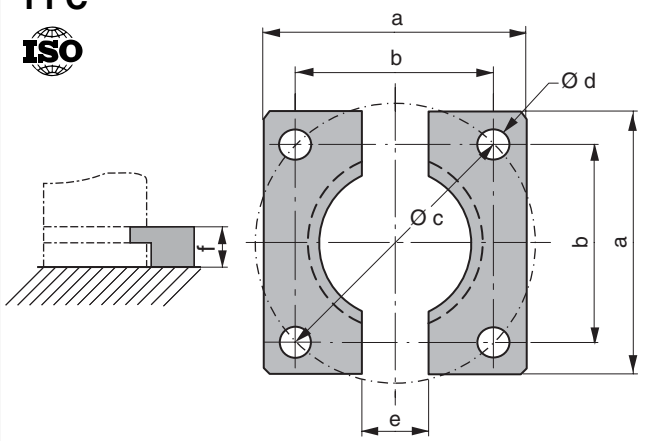
FCS

* = Reduced outer dimensions compared to ISO standard.



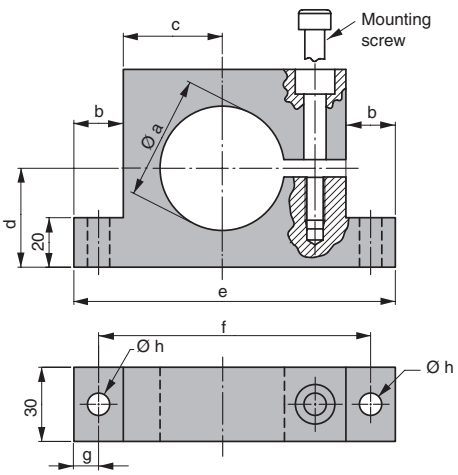
Order No.	Ø a	b	c	Ø d	e	f
FCS-1500	104	90	73.5	11	16	29

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-1500	100	73.5	104	11	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or attachment B.

The mounting screw (M10) should be tightened with torque 52 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-1500	75.4	22.5	52.5	52.5	160	137	11.5	11

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

K 1500

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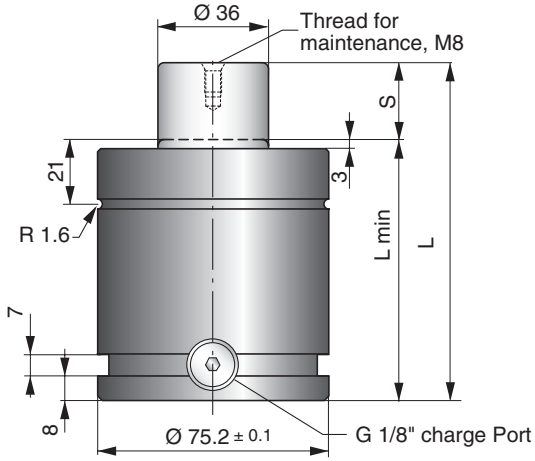
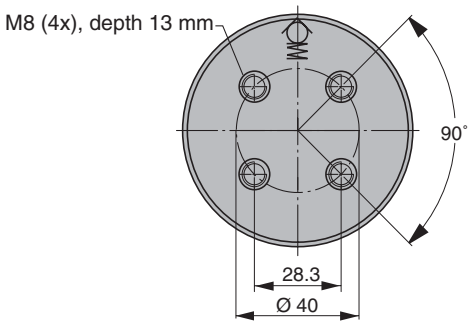




This is a short height hoseable spring with an initial force of 15000 N.

The K 1500 has a total length of 60 mm + (2 x stroke). This spring is 50 mm shorter than the TU 1500.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
K 1500-025	25	15000	24000	110	85	0.10	2.05
K 1500-038	38.1		23000	136.2	98.1	0.14	2.35
K 1500-050	50		23000	160	110	0.18	2.50
K 1500-064	63.5		23000	187	123.5	0.22	2.75
K 1500-080	80		23000	220	140	0.27	3.05
K 1500-100	100		23000	260	160	0.34	3.40

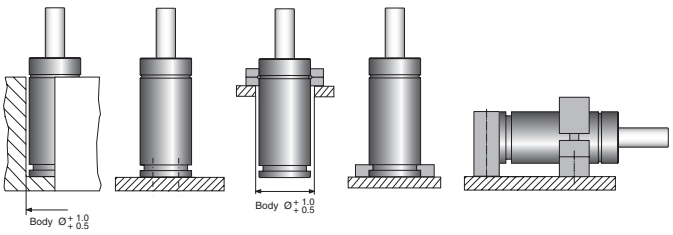
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3017230-1500

MOUNTING POSSIBILITIES



Drop - In | **B, MP** Bottom Mount | **FK** Top Mount | **K, KU, FFC, FU** Foot Mount | **FAC, SA, S** Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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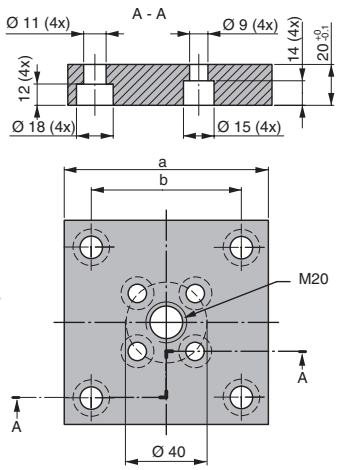
MP

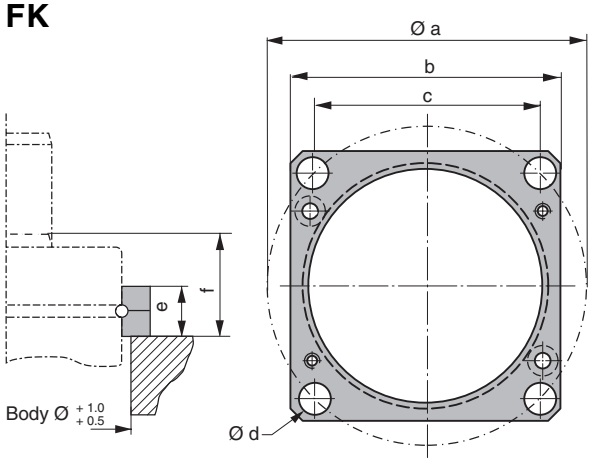
* = According to updated ISO 11901 standard



Note! Comes complete with screws to mount gas spring.

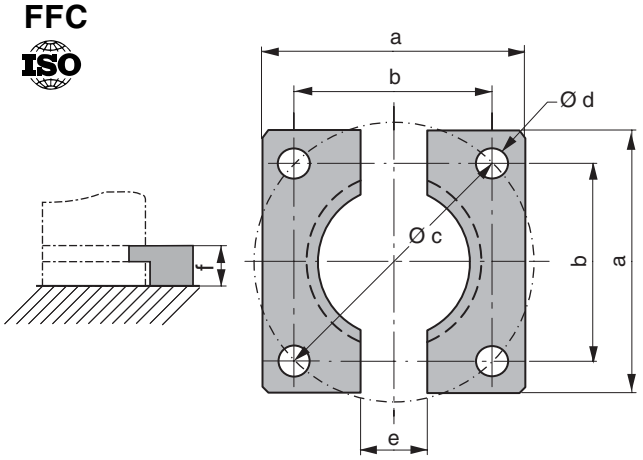
Order No.	a	b
MP-1500	100	73.5

FK



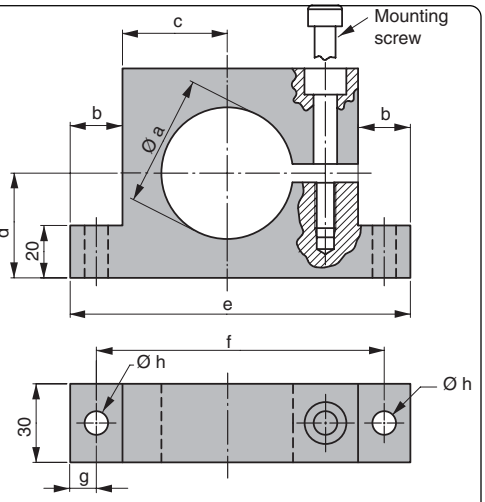
Order No.	Ø a	b	c	Ø d	e	f
FK-1500	104	90	73.5	11	16	29

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-1500	100	73.5	104	11	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M10) should be tightened with torque 52 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-1500	75.4	22.5	52.5	52.5	160	137	11.5	11

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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TU and LCF 1500

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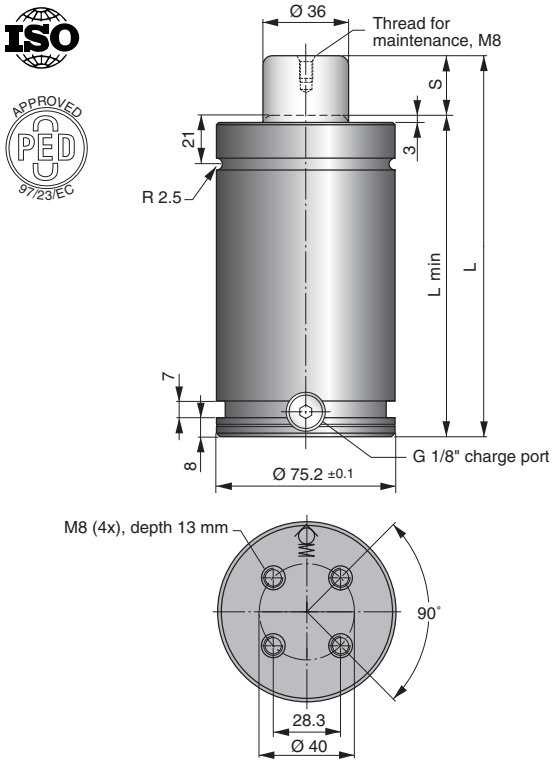
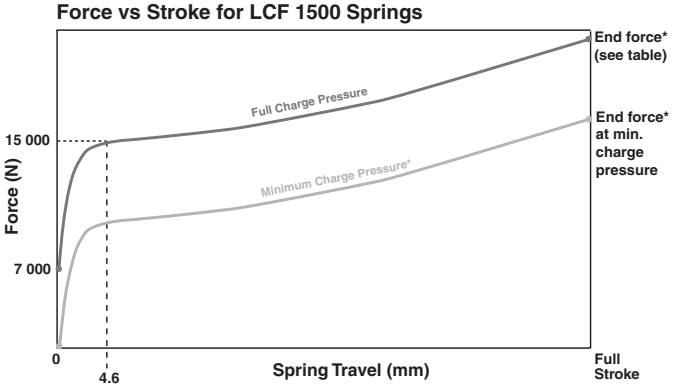


TU series
The standard line of gas springs is the TU line.
Sizes 250 to 10 000 correspond to the ISO 11901 standard for gas springs. Sizes 750 to 7500 correspond to FORD's WDX3560, GM's M-1500 and Renault's automotive gas spring standards. When ordering a Renault standard gas spring add an R to the Order No. (for example: TUR 1500-xxx).

For more information, see "Automotive Standards" 2.17/2

LCF series
Low Contact Force (LCF) gas springs are designed to reduce exessive shock loads, high noise levels and extreme pad bounce, all factors that lead to high press maintenance costs and noise pollution. For more information see "About Gas Springs" 2.1/2.

Force vs Stroke for LCF 1500 Springs



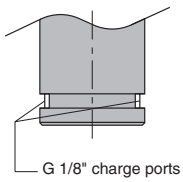
Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)	ISO
TU/LCF 1500-025	**25**		**23000**	**160**	**135**	**0.10**	**3.75**	✔
TU/LCF 1500-038	38.1		23000	186.2	148.1	0.15	3.95	
TU/LCF 1500-050	50		23000	210	160	0.18	4.15	✔
TU/LCF 1500-064	63.5		23000	237	173.5	0.22	4.40	
TU/LCF 1500-080	80		23000	270	190	0.28	4.70	✔
TU/LCF 1500-100	100	**15000**	23000	310	210	0.34	5.10	✔
TU/LCF 1500-125	125		23000	360	235	0.42	5.55	✔
TU/LCF 1500-160	160		23000	430	270	0.53	6.25	✔
TU/LCF 1500-200	200		23000	510	310	0.68	6.90	
TU/LCF 1500-250	250		23000	610	360	0.81	7.80	
TU/LCF 1500-300	300		23000	710	410	0.96	8.90	

* = at full stroke

TU, TUR och LCF 1500 gas springs are also available with double charging ports. When ordering this type, add a D to the Order No. For example: TUD 1500-xxx

Note! TUD, TURD and LCFD 1500 gas springs contain no valve and can only be pressurised through connection to a hose system and therefore are always delivered uncharged.

TUD 1500 example

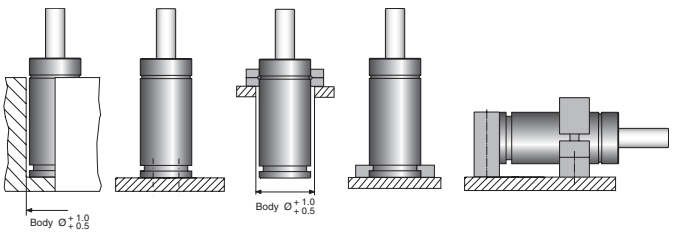


BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure (TU 1500) ..... 25 bar
Min. charging pressure (LCF 1500) ..... 105 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see "About gas springs", 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
* Repair kit (TU 1500) 2014068-02
* Repair kit (LCF 1500 PED) 3019378
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair
Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In	B, MP	FC, FCS	K, KU, FFC, FU	FAC, SA, S, HM
	Bottom Mount	Top Mount	Foot Mount	Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

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TU and LCF 1500 Mounts

MP

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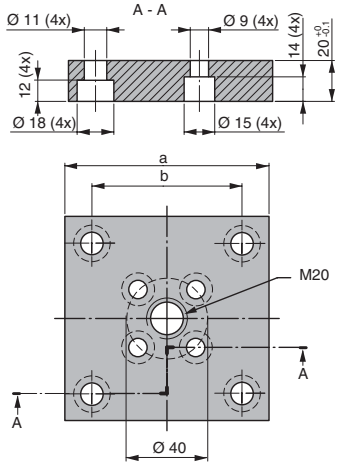
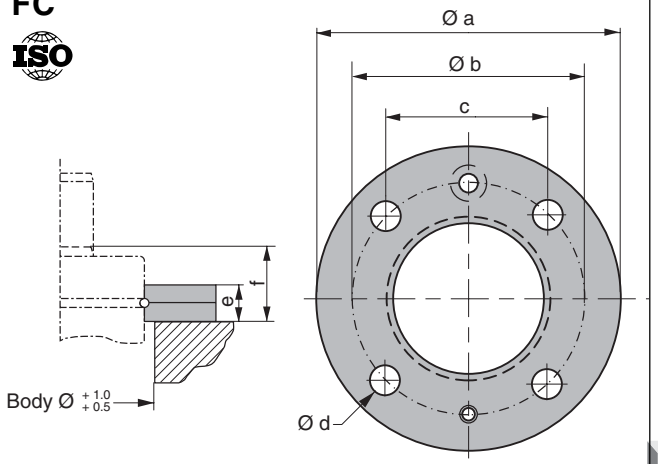


Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-1500	100	73.5

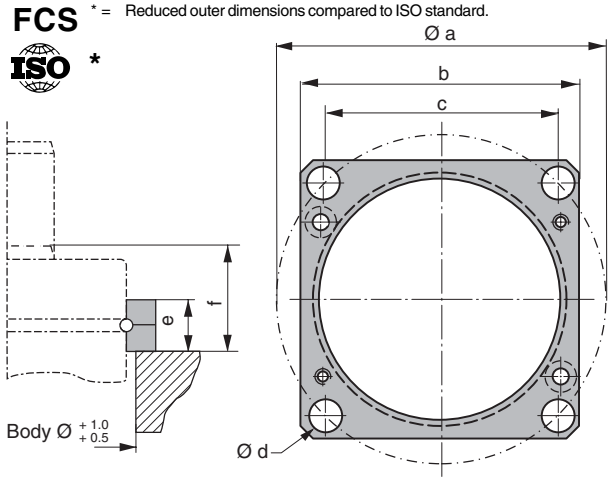
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-1500	122	104	73.5	11	16	29

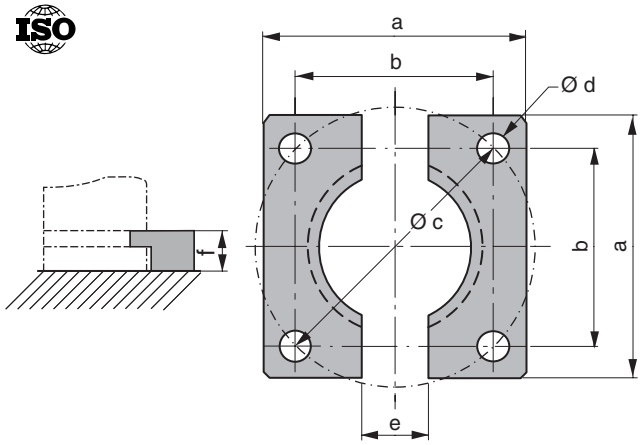
FCS

* = Reduced outer dimensions compared to ISO standard.



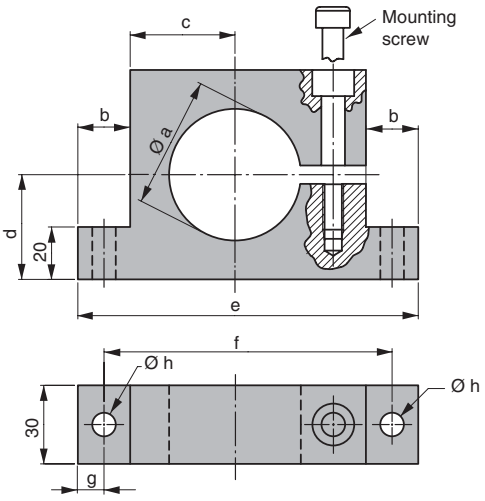
Order No.	Ø a	b	c	Ø d	e	f
FCS-1500	104	90	73.5	11	16	29

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-1500	100	73.5	104	11	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M10) should be tightened with torque 52 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-1500	75.4	22.5	52.5	52.5	160	137	11.5	11

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

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TB 1500

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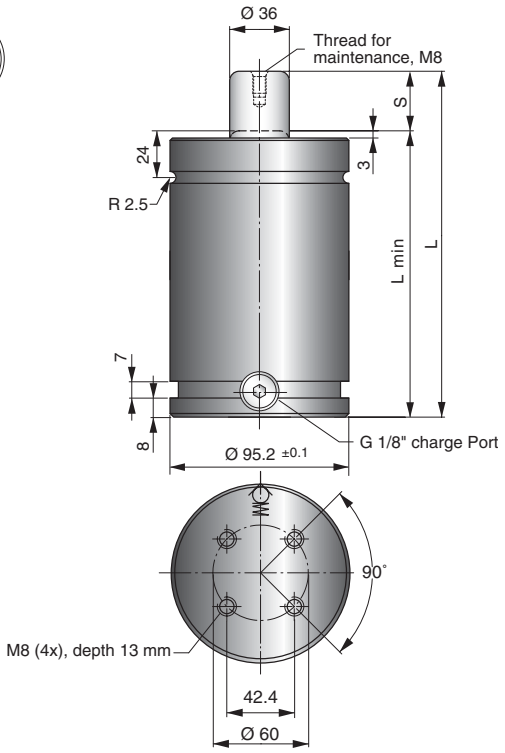


TB springs have a larger gas volume than our standard TU series.This reduces the pressure increase as the piston rod is stroked. It also increases the service life of the spring.

TB springs are recommended for applications where a low force increase is desirable. TB springs are also a good choice for higher cycle rates and high volume production.

Note! When ordering mounts for TB 1500 springs, a mount of a larger size than the spring must be used.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
TB 1500-025	25	15000	19000	160	135	0.17	6.05
TB 1500-038	38.1		19000	186.2	148.1	0.23	6.25
TB 1500-050	50		19000	210	160	0.29	6.65
TB 1500-064	63.5		19000	237	173.5	0.36	6.95
TB 1500-080	80		19000	270	190	0.44	7.35
TB 1500-100	100		19000	310	210	0.54	7.90
TB 1500-125	125		19000	360	235	0.67	8.45
TB 1500-160	160		19000	430	270	0.85	9.35
TB 1500-200	200		19000	510	310	1.05	10.25
TB 1500-250	250		19000	610	360	1.30	11.45
TB 1500-300	300		19000	710	410	1.55	12.65

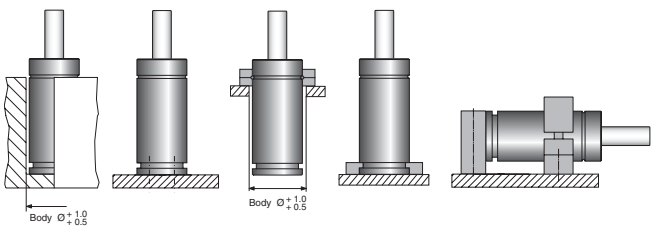
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 40-80 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
* Repair kit (TB 1500 PED) 3019236
* Repair kit (TB 1500) 2014068-06
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In	B, MP	FC, FCS	K, KU, FFC, FU	FAC, SA, S
	Bottom Mount	Top Mount	Foot Mount	Body Mount

Note! For dimension on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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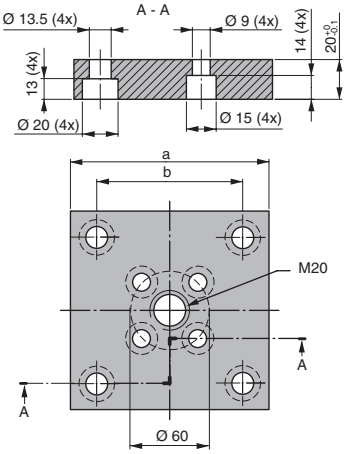
MP

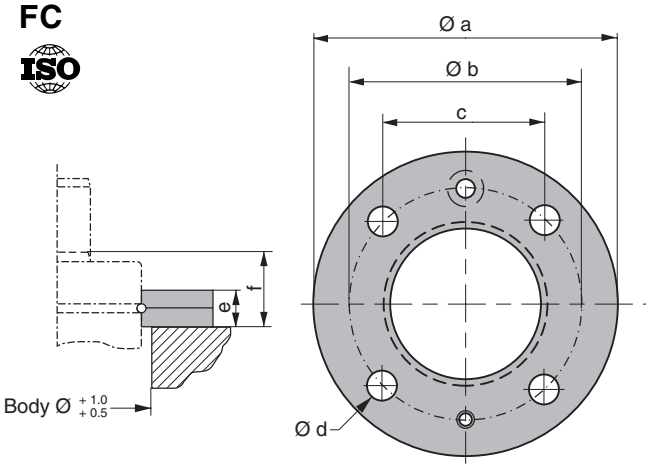
* = According to updated ISO 11901 standard



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-3000	120	92

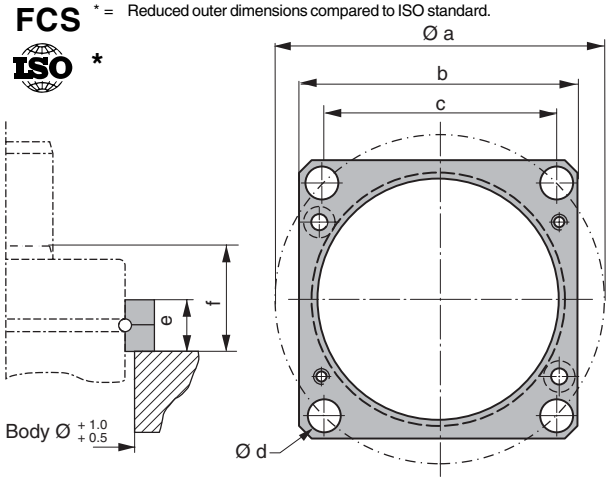
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-3000	150	130	92	13.5	18	33

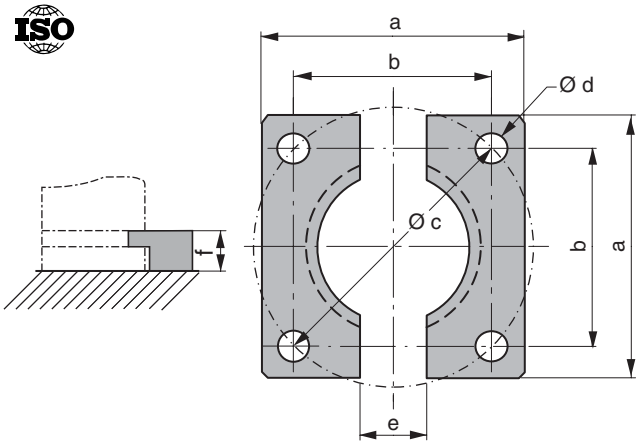
FCS

* = Reduced outer dimensions compared to ISO standard.



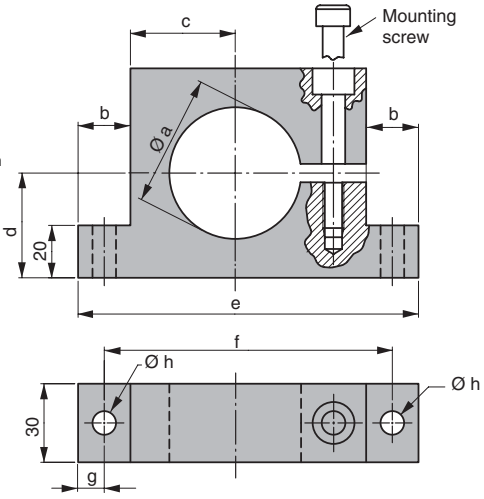
Order No.	Ø a	b	c	Ø d	e	f
FCS-3000	130	110	92	13.5	18	33

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-3000	120	92	130	13.5	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-3000	95.4	25	67.5	62.5	195	170	1.5	13

Note! For dimension on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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SL 1500

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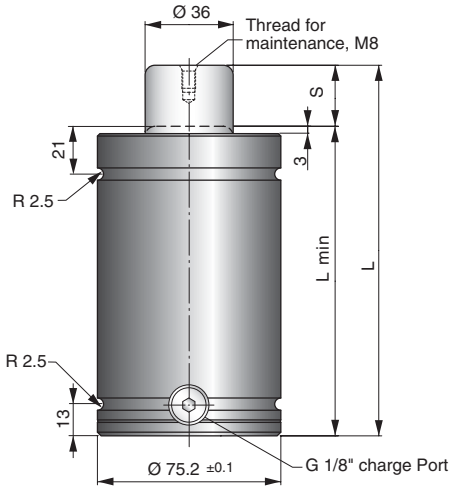
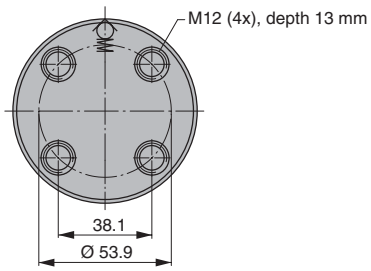




This 1500 spring has “inch-based” total length and stroke length.

The SL 1500 has a total length of 101.6 mm + (2 x stroke).

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
SL 1500-013	12.7	15000	25000	127	114.3	0.06	3.3
SL 1500-025	25.4		22000	152.4	127	0.10	3.5
SL 1500-038	38.1		22000	177.8	139.7	0.14	3.8
SL 1500-051	50.8		22000	203.2	152.4	0.18	4.0
SL 1500-064	63.5		22000	228.6	165.1	0.22	4.3
SL 1500-076	76.2		22000	254	177.8	0.26	4.5
SL 1500-089	88.9		22000	279.4	190.5	0.30	4.7
SL 1500-102	101.6		23000	304.8	203.2	0.34	5.0
SL 1500-114	114.3		23000	330.2	215.9	0.38	5.2
SL 1500-127	127		23000	355.6	228.6	0.42	5.5
SL 1500-140	139.7		23000	381	241.3	0.46	5.7
SL 1500-152	152.4		23000	406.4	254	0.50	6.0

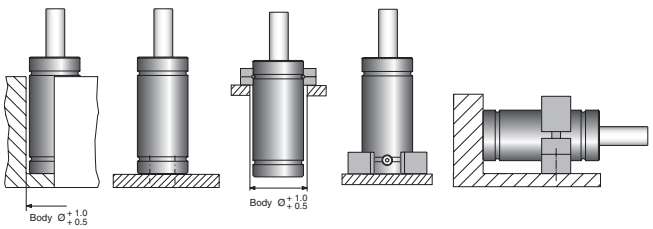
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Yellow chromed
* Repair kit (SL 1500) 2014979-1500
* Repair kit (SL 1500 PED) 2014979-1500
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In | **B** Bottom thread | **FC, FCS** Top Mount | **FSL** Foot Mount | **S** Body Mount

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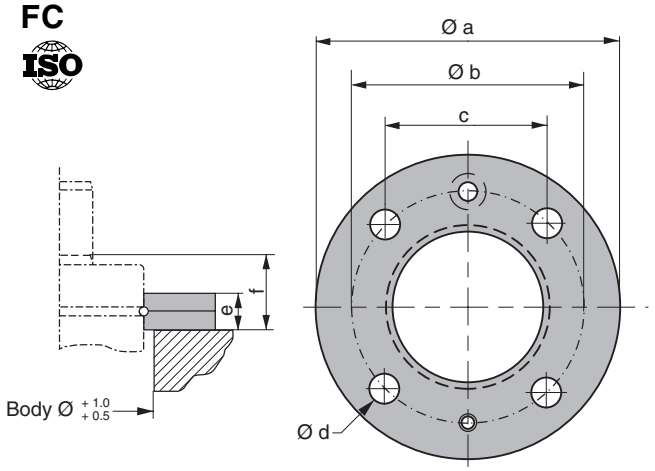
KALLER®

SL 1500 Mounts

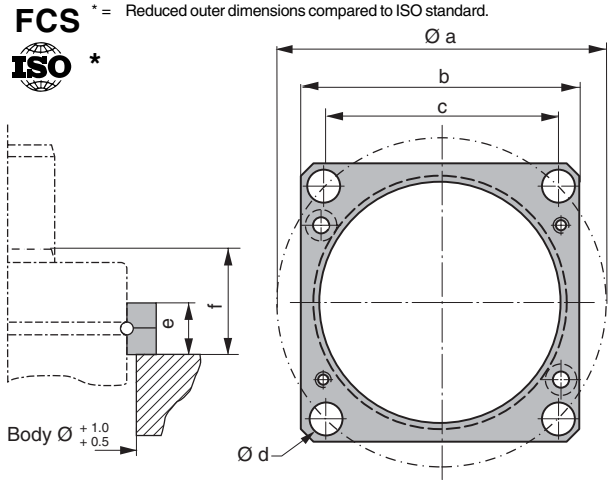
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-1500	122	104	73.5	11	16	29

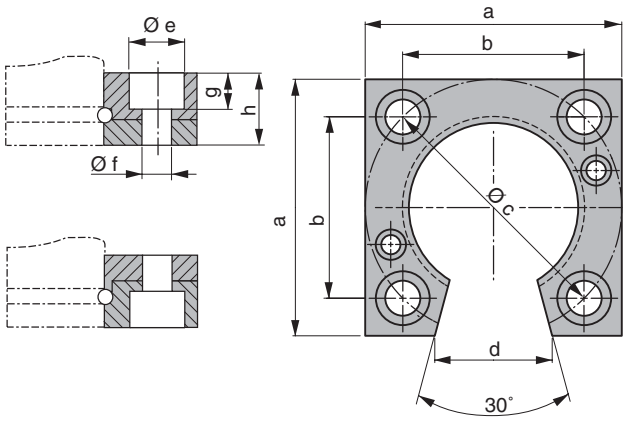
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-1500	104	90	73.5	11	16	29

FSL

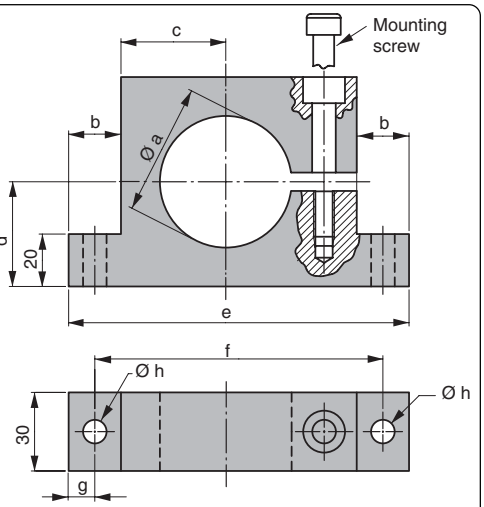


Order No.	a	b	Ø c	d	Ø e	Ø f	g	h
FSL-1500	101.6	76.2	107.8	49	20	13.5	13	25

S

Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting optionv B.

The mounting screw (M10) should be tightened with torque 52 Nm.



Order No.	Ø a	b	c	d	e	f	g	Ø h
S-1500	75.4	22.5	52.5	52.5	160	137	11.5	11

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$2500 \leq F_{INIT} < 5000$

CU 2900

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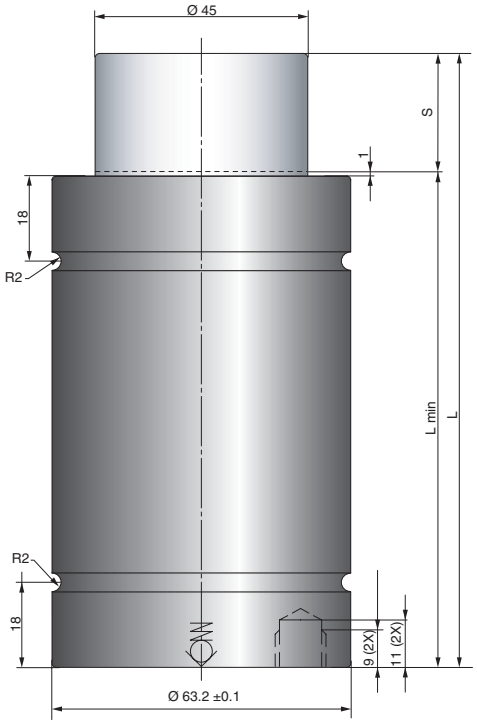


The CU gas spring is a very compact Bore Sealed gas spring, that gives a high force in a limited space.

Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend shorter stroke springs to be fastened for optimal service-life.

As an option, this CU spring can be delivered with a Side-Port plate (SP) for applications where a side-port is needed (i.e. for use in hose systems).

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force**	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
CU 2900-010	10	29500	38500	85	75	0.08	1.1
CU 2900-016	16		41000	103	87	0.12	1.3
CU 2900-025	25		43000	130	105	0.16	1.5
CU 2900-032	32*		44200	150	118	0.20	1.6
CU 2900-040	40*		45200	175	135	0.24	1.8
CU 2900-050	50*		45800	205	155	0.29	2.1

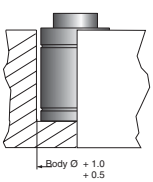
* = Should always be attached to the tool using the tapped holes in the bottom or a flange
** = at full stroke

BASIC INFORMATION

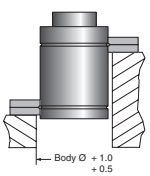
Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20° C)
Min. charging pressure ..... 25 bar (at 20° C)
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 80-100 (at 20°C)
Max piston rod velocity ..... 0.5 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Nitrided
Repair kit 2014493-0290

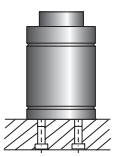
MOUNTING POSSIBILITIES



Drop-In



FCX
Flange mount



B
Bottom thread

SP
Side port

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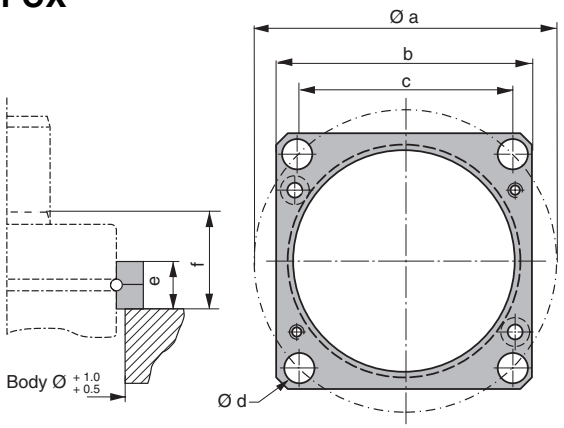
KALLER®

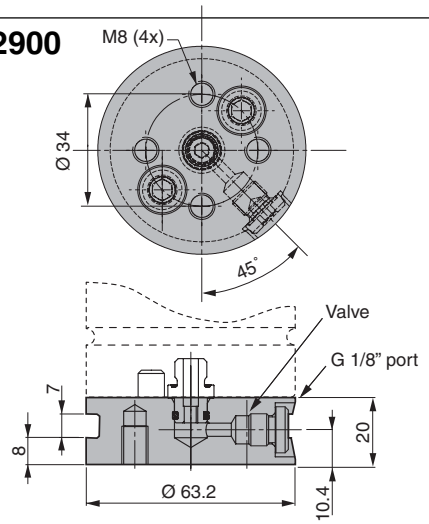
CU 2900 Mounts

FCX



Order No.	Ø a	b	c	Ø d	e	f
FCX-1500	104	90	73.5	11	16	27

CU-SP 2900



For model	Order No.	For U-groove mounts on CU-SP
CU 2900	CU SP-2900	Refer to X 1500

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CU 4700

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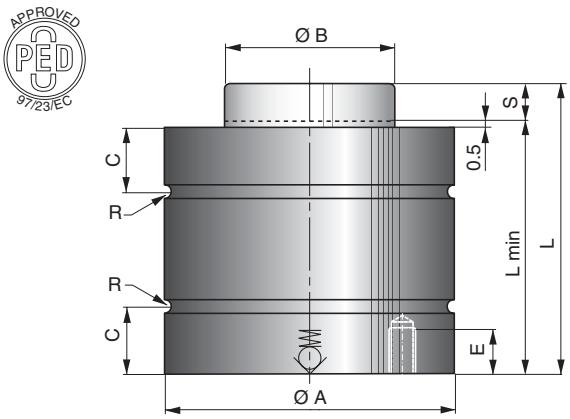
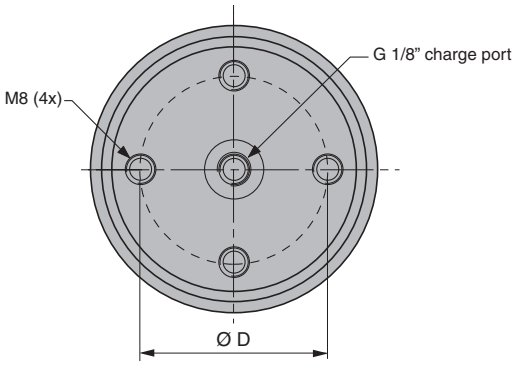


The CU gas spring is a very compact Bore Sealed gas spring, that gives a high force in a limited space.
The max. frequency for the spring is 100 strokes/minute.

Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend shorter stroke springs to be fastened for optimal service-life.

As an option, the CU springs can be delivered with a Side-Port plate (SP) for applications where a side-port is needed (i.e. for use in hose systems).



Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force**	L ± 0.25	L min	Ø A ± 0.1	Ø B	C	Ø D	E	R	Gas vol. (l)	Weight (kg)
CU 4700-010	10	47000	67000	80	70	75.2	50	18	40	9	1.5	0.10	1.4
CU 4700-016	16		66000	106	90							0.17	1.7
CU 4700-025	25		68000	135	110							0.24	2.0
CU 4700-032	32*		67000	167	135							0.32	2.4
CU 4700-040	40*		67000	200	160							0.41	2.8
CU 4700-050	50*		67000	240	190							0.52	3.3

* = Should always be attached to the tool using the tapped holes in the bottom or a flange
** = at full stroke

BASIC INFORMATION

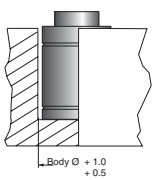
Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~80 to 100 (at 20° C)
Max piston rod velocity ..... 0.5 m/s

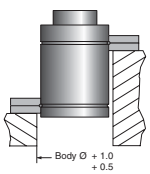
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Nitrided
Repair kit CU 4700 2014493-0470

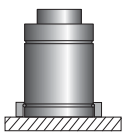
MOUNTING POSSIBILITIES

Drop-In

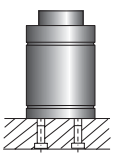




FK
Flange mount



BFP
Flange mount



B
Bottom thread

SP
Side port

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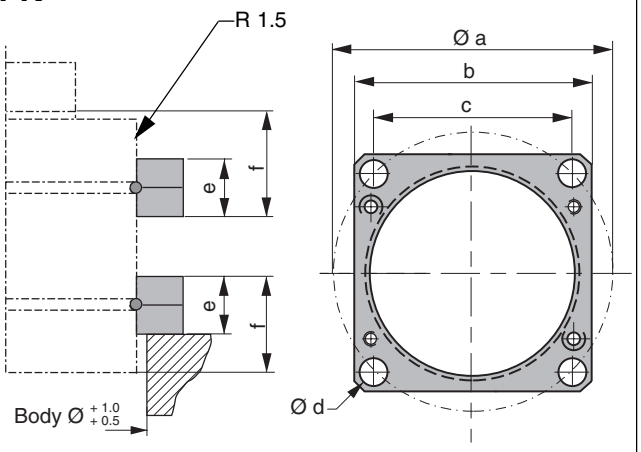
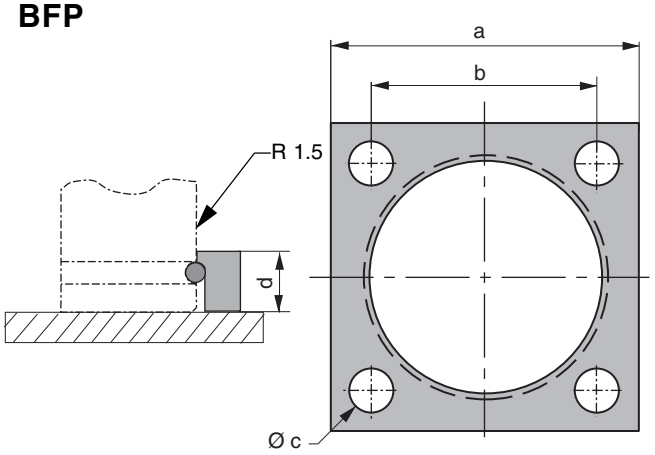
FK



For model	Order No.	Ø a	Ø b	c	Ø d	e	f
CU 4700	FK-1500	104	90	73.5	11	16	26

Note! For spring of earlier version with R=2.5 FCS 1500 respective FCS 3000 should be used.
Please contact your local distributor for more information.

BFP



For model	Order No.	a	b	Ø c	d
CU 4700	BFP-4700	90	73.5	11	24.5

Note! BF flange for earlier version with R=2.5 is obsolete.
Please contact your local distributor for more information.

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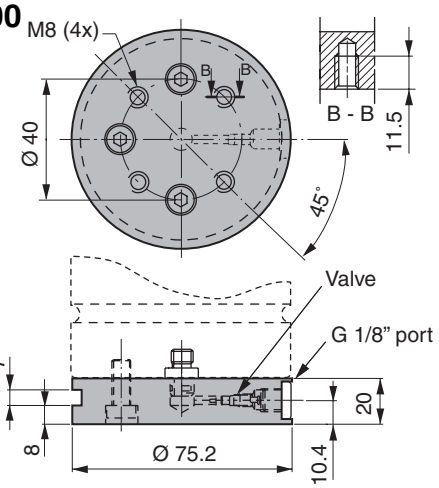
CU-SP 4700

It is also possible to order Side Port kit for attachment to old springs.

Order No. SP 4700 kit.



For model	Order No.	For U-groove mounts on CU-SP
CU 4700	CU SP-4700	Refer to TU 1500

X 4200

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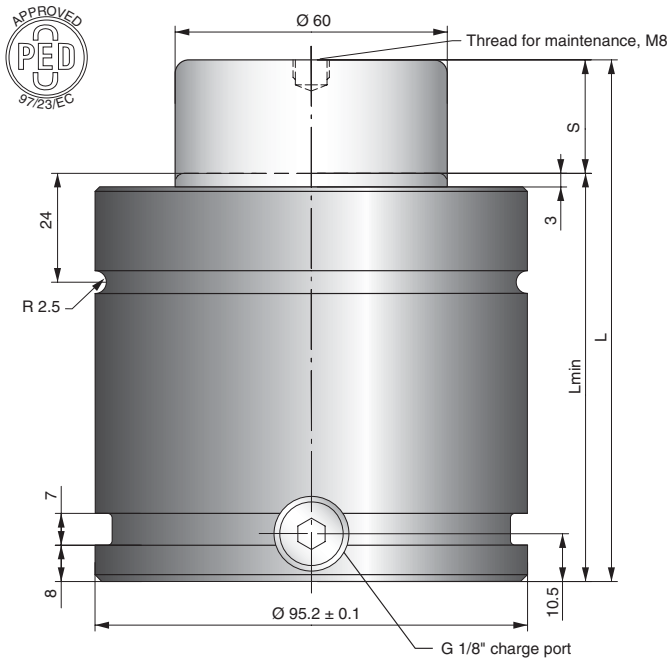


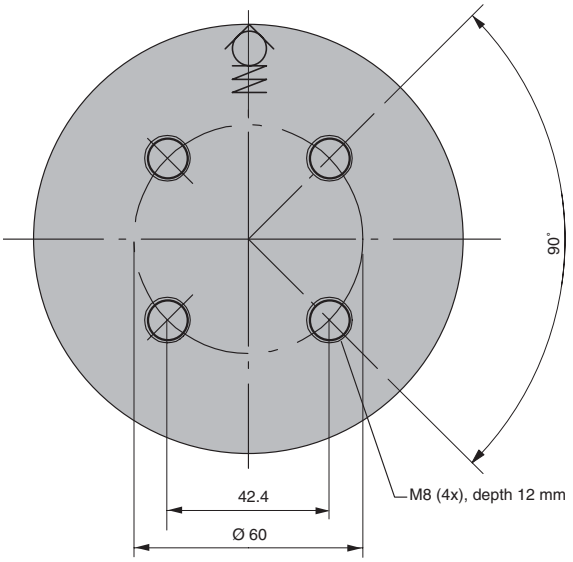
The Power Line series are our shortest and most powerful Piston Rod Sealed gas springs, giving you a great deal of force in a very small amount of space.

These gas springs are available with forces from 170 daN up to 9500 daN and stroke lengths between 7 and 125 mm.

There is a side port for gas charging that can also be used to connect to a hose system.

An upper C-groove, lower U-groove together with four M8 threaded holes allow various mounting possibilities using our standard mounts.

Bottom view



Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X 4200-016	16	42000	61700	90	74	0.15	2.60
X 4200-019	19		63700	96	77	0.18	2.70
X 4200-025	25		60800	108	83	0.26	2.90
X 4200-032	32		64300	122	90	0.30	3.05
X 4200-038	38		65800	134	96	0.32	3.20
X 4200-050	50		67000	158	108	0.40	3.50
X 4200-063	63		67800	184	121	0.49	3.80
X 4200-075	75		68000	208	133	0.58	4.20
X 4200-080	80		68600	218	138	0.61	4.40
X 4200-100	100		69100	258	158	0.74	4.90
X 4200-125	125		69600	308	183	0.91	5.40

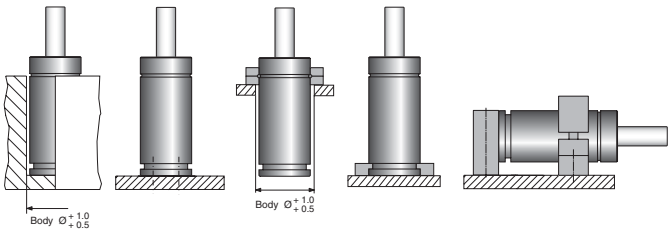
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 30 to 100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3018849

MOUNTING POSSIBILITIES



Drop - In	B, MP	FC, FCS	K, KU, FFC, FU	FAC, SA, S, HM
	Bottom Mount	Top Mount	Foot Mount	Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

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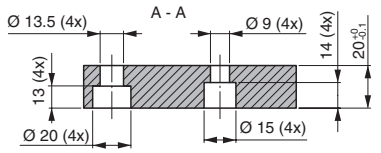
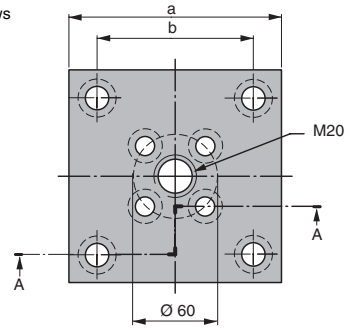
MP

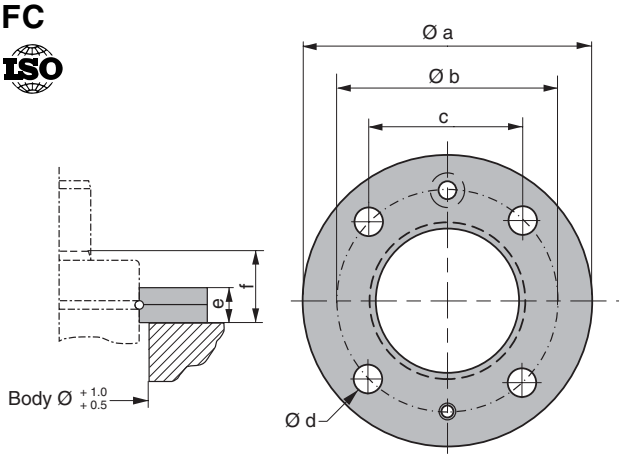


Note! Comes complete with screws to mount gas spring.



Order No.	a	b
MP-3000	120	92

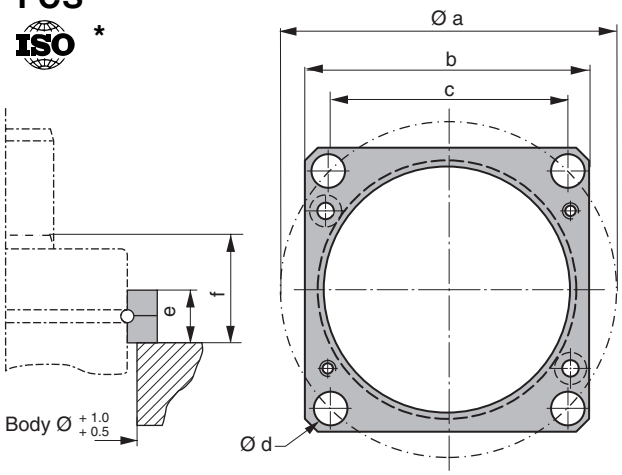
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-3000	150	130	92	13.5	18	33

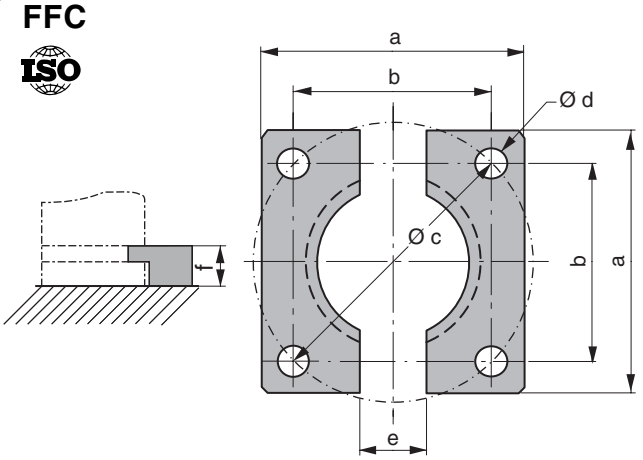
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-3000	130	110	92	13.5	18	33

FFC

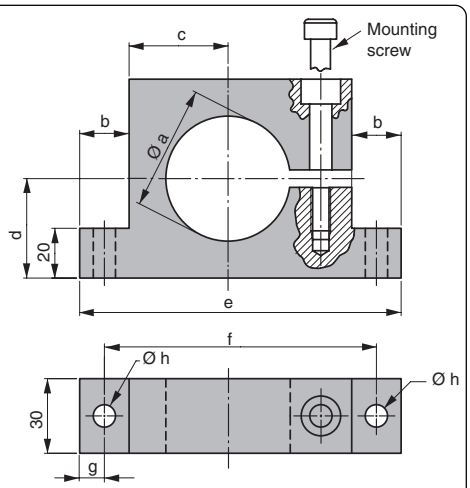


Order No.	a	b	Ø c	Ø d	e	f
FFC-3000	120	92	130	13.5	24	12

S

Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or attachment B.

The mounting screw (M12) should be tightened with torque 91 Nm.



Order No.	Ø a	b	c	d	e	f	g	Ø h
S-3000	95.4	25	67.5	62.5	195	170	12.5	13

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

K 3000

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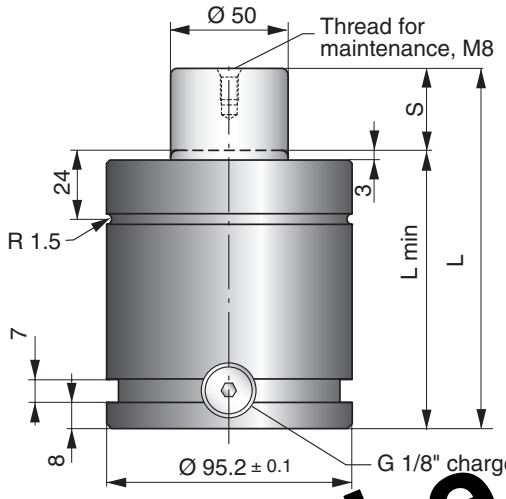
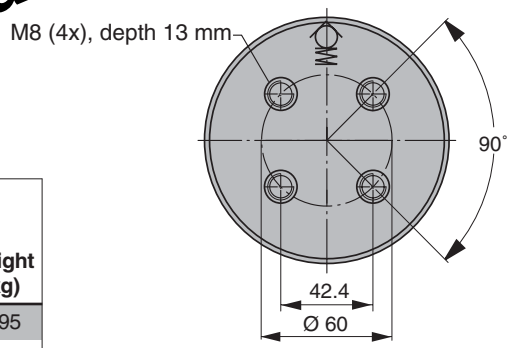
This is a short height hoseable spring with an initial force of 30 000 N.

The K 3000 has a total length of 70 mm + (2 x stroke). This spring is 50 mm shorter than the TU 3000.



To be phased out - Possible alternative: X 4200

Bottom view



Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
K 3000-025	25	30000	47000	120	95	0.16	3.95
K 3000-038	38.1		48000	146.2	108.1	0.23	4.37
K 3000-050	50		48000	170	120	0.29	4.75
K 3000-064	63.5		48000	197	133.5	0.35	5.20
K 3000-080	80		48000	230	150	0.44	5.70
K 3000-100	100		48000	270	170	0.54	6.40

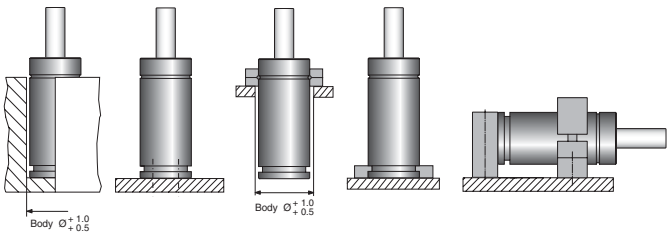
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min .... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3017230-3000

MOUNTING POSSIBILITIES



Drop - In | **B, MP** Bottom Mount | **FK** Top Mount | **K, KU, FFC, FU** Foot Mount | **FAC, SA, S** Body Mount

Note! For dimensions on mounting possibilities K, KU, FU FAC and SA refer to chapter 3.

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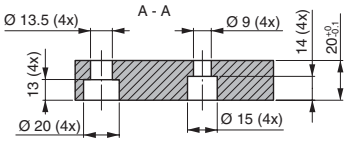
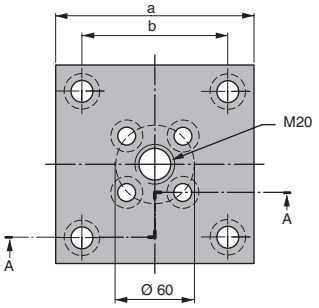
MP

* = According to updated ISO 11901 standard

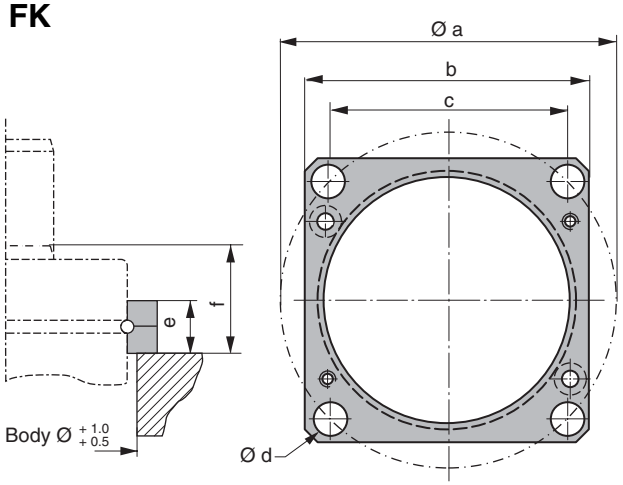




Note! Comes complete with screws to mount gas spring.

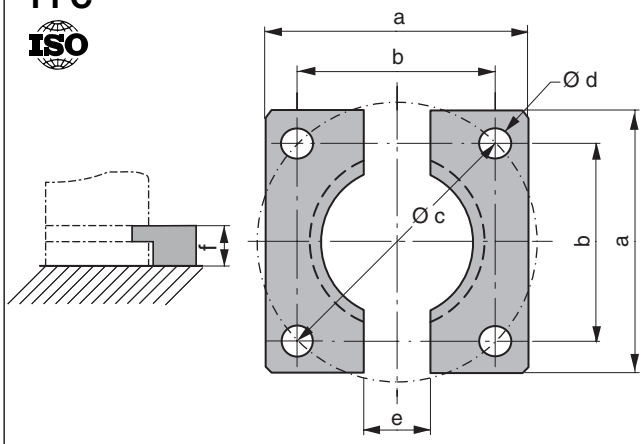
Order No.	a	b
MP-3000	120	92

FK



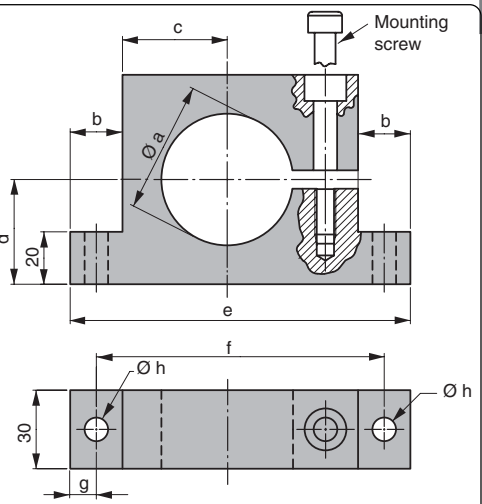
Order No.	Ø a	b	c	Ø d	e	f
FK-3000	130	110	92	13.5	18	33

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-3000	120	92	130	13.5	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-3000	95.4	25	67.5	62.5	195	170	12.5	13

Note! For dimensions on mounting possibilities K, KU, FU FAC and SA refer to chapter 3.

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TU and LCF 3000

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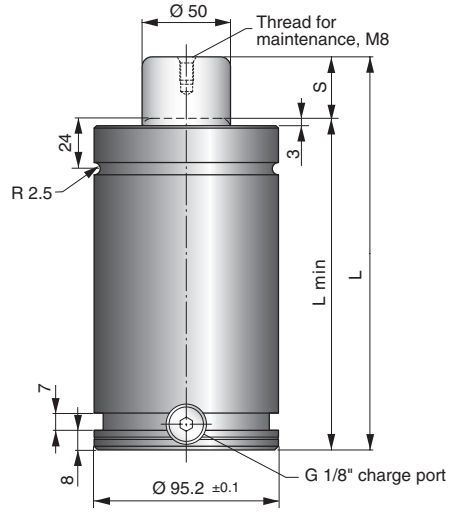
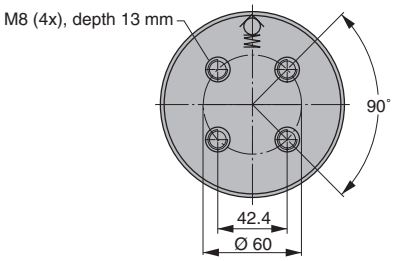
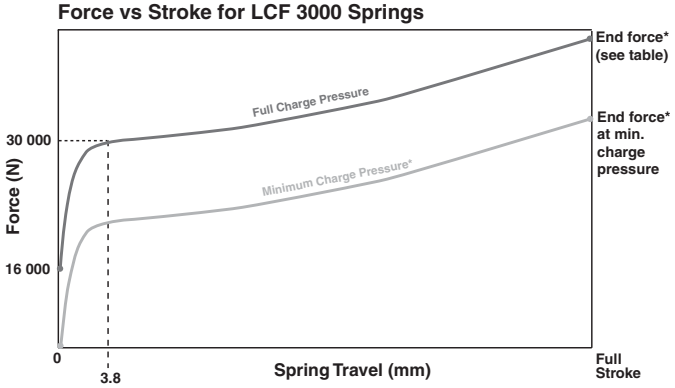




TU series
The standard line of gas springs is the TU line.
Sizes 250 to 10 000 correspond to the ISO 11901 standard for gas springs. Sizes 750 to 7500 correspond to FORD's WDX3560, GM's M-1500 and Renault's automotive gas spring standards. When ordering a Renault standard gas spring add an R to the Order No. (for example: TUR 3000-xxx). For more information, see "Automotive Standards" 2.17/2

LCF series
Low Contact Force (LCF) gas springs are designed to reduce exessive shock loads, high noise levels and extreme pad bounce, all factors that lead to high press maintenance costs and noise pollution. For more information see "About Gas Springs" 2.1/2.

Force vs Stroke for LCF 3000 Springs



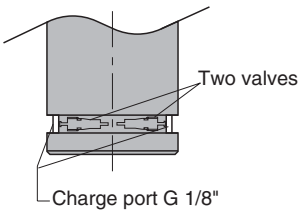
Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)	ISO
TU/LCF 3000-025	25		42000	170	145	0.20	6.35	✔
TU/LCF 3000-038	38.1		43000	196.2	158.1	0.26	6.75	
TU/LCF 3000-050	50		44000	220	170	0.32	7.50	✔
TU/LCF 3000-064	63.5		45000	247	183.5	0.38	7.70	
TU/LCF 3000-080	80		46000	280	200	0.46	8.10	✔
TU/LCF 3000-100	100	30000	47000	320	220	0.56	8.85	✔
TU/LCF 3000-125	125		47000	370	245	0.69	9.90	✔
TU/LCF 3000-160	160		47000	440	280	0.87	10.80	✔
TU/LCF 3000-200	200		48000	520	320	1.07	12.20	
TU/LCF 3000-250	250		48000	620	370	1.32	13.70	
TU/LCF 3000-300	300		48000	720	420	1.57	15.30	

* = at full stroke

TU, TUR och LCF 3000 gas springs are also available with double charging ports. When ordering this type, add a D to the Order No. For example: TUD 3000-xxx

Note! TUD, TURD and LCFD 3000 gas springs have two valves and are delivered charged.

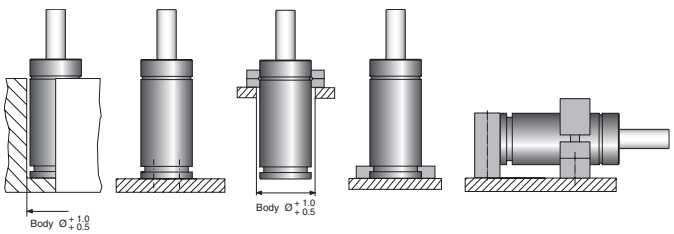
TUD 3000 example



BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure (TU 3000) ..... 25 bar
Min. charging pressure (LCF 3000) ..... 70 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see "About gas springs", 2.1
Rod surface ..... Nitrided
Tube surface ..... Black oxide
* Repair kit (TU 3000 PED) 3019025
* Repair kit (TU 3000) 2014068-03
* Repair kit (LCF 3000 PED) 3019379
* Repair kit (LCF 3000) 3019132
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In	B, MP	FC, FCS	K, KU, FFC, FU, FX	FAC, SA, S, HM
	Bottom Mount	Top Mount	Foot Mount	Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

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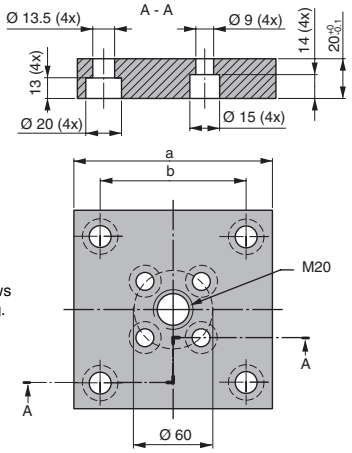
MP

* = According to updated ISO 11901 standard

ISO *

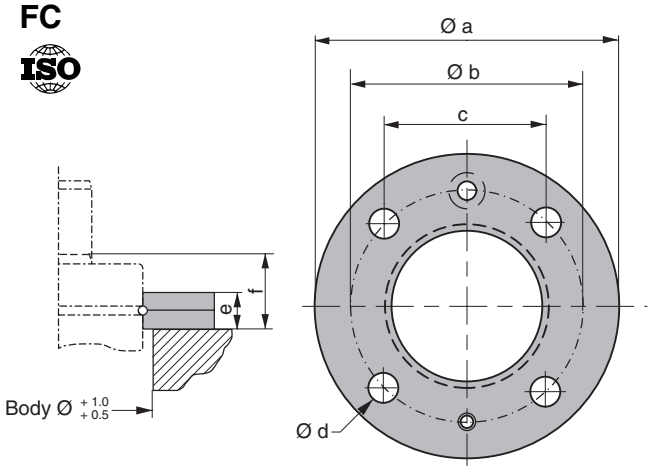


Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-3000	120	92

FC

ISO



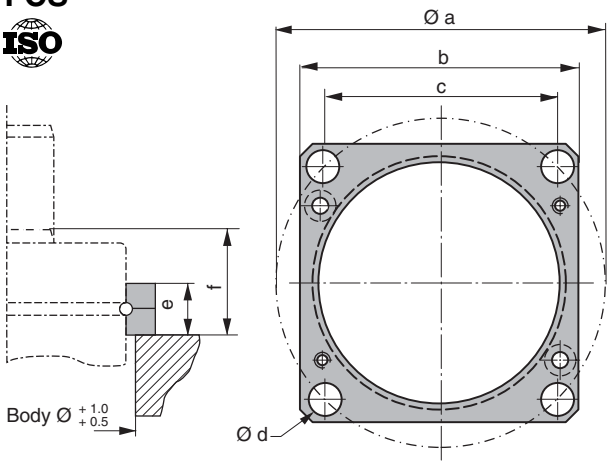
Order No.	Ø a	Ø b	c	Ø d	e	f
FC-3000	150	130	92	13.5	18	33

7

FCS

* = Reduced outer dimensions compared to ISO standard.

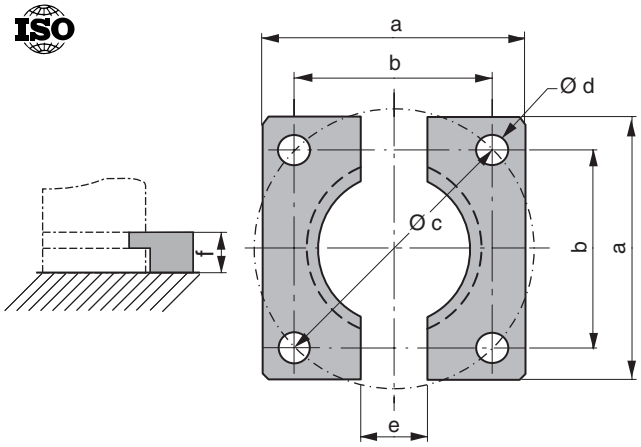
ISO



Order No.	Ø a	b	c	Ø d	e	f
FCS-3000	130	110	92	13.5	18	33

FFC

ISO



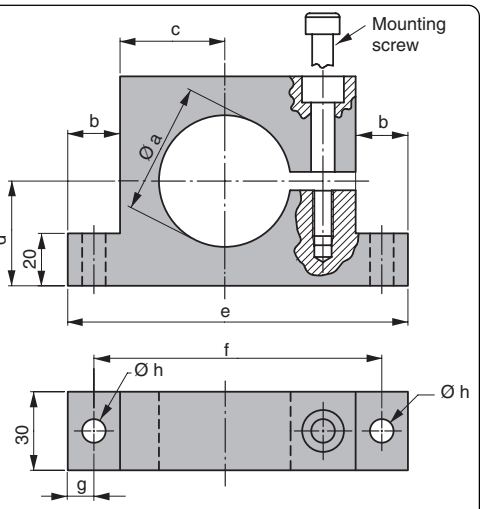
Order No.	a	b	Ø c	Ø d	e	f
FFC-3000	120	92	130	13.5	24	12

S

ISO

Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.



Order No.	Ø a	b	c	d	e	f	g	Ø h
S-3000	95.4	25	67.5	62.5	195	170	12.5	13

Note! For dimensions on mounting possibilities K, KU, FU, FAC, SA and HM refer to chapter 3.

TB 3000

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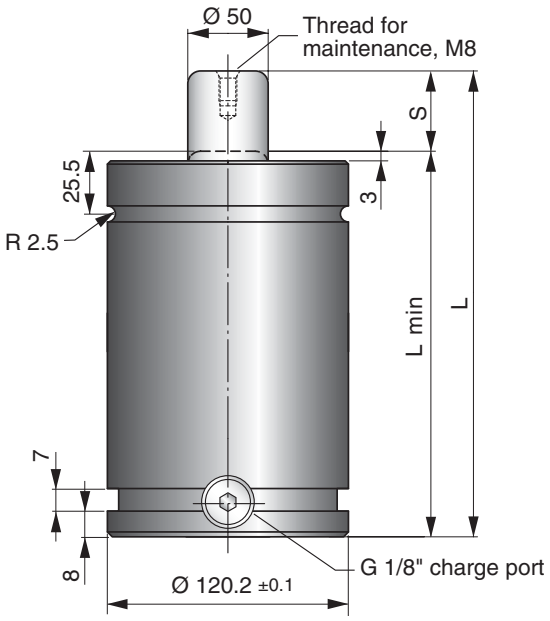


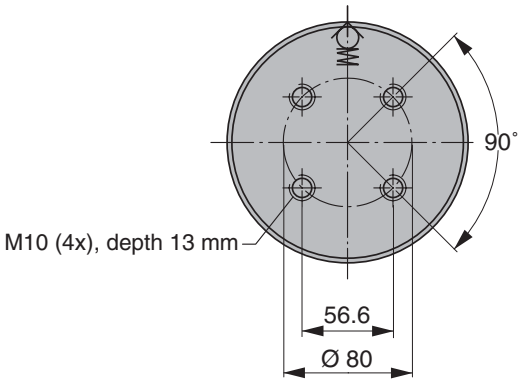
TB springs have a larger gas volume than our standard TU series.This reduces the pressure increase as the piston rod is stroked. It also increases the service life of the spring.

TB springs are recommended for applications where a low force increase is desirable. TB springs are also a good choice for higher cycle rates and high volume production.

Note! When ordering mounts for TB 3000 springs, a mount of a larger size than the spring must be used.

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
TB 3000-025	25	30000	39000	170	145	0.25	10.65
TB 3000-038	38.1		39000	196.2	158.1	0.36	11.25
TB 3000-050	50		39000	220	170	0.45	11.65
TB 3000-064	63.5		40000	247	183.5	0.55	12.30
TB 3000-080	80		40000	280	200	0.68	13.00
TB 3000-100	100		39000	320	220	0.83	13.70
TB 3000-125	125		39000	370	245	1.03	14.75
TB 3000-160	160		39000	440	280	1.30	16.05
TB 3000-200	200		39000	520	320	1.62	17.75
TB 3000-250	250		39000	620	370	2.01	19.80
TB 3000-300	300		39000	720	420	2.41	21.85

Bottom view



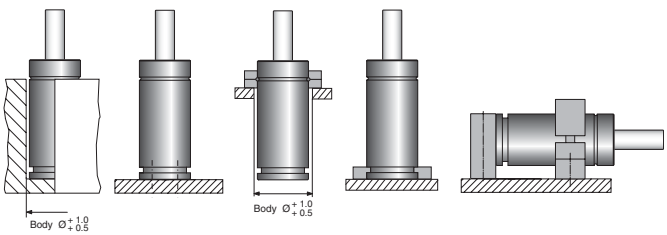
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 40-80 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
*Repair kit (TB 3000 PED) 3019237
*Repair kit (TB 3000) 2014068-07
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In | **B, MP** | **FC, FCS** | **K, KU, FFC, FU** | **FAC, SA, S**

Bottom Mount | Top Mount | Foot Mount | Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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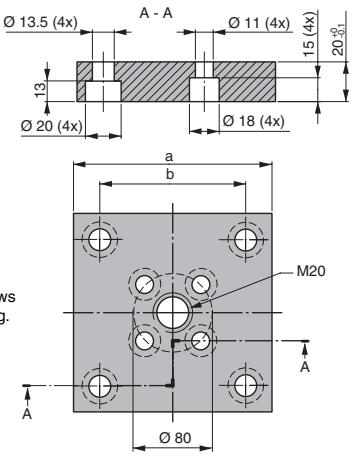
MP

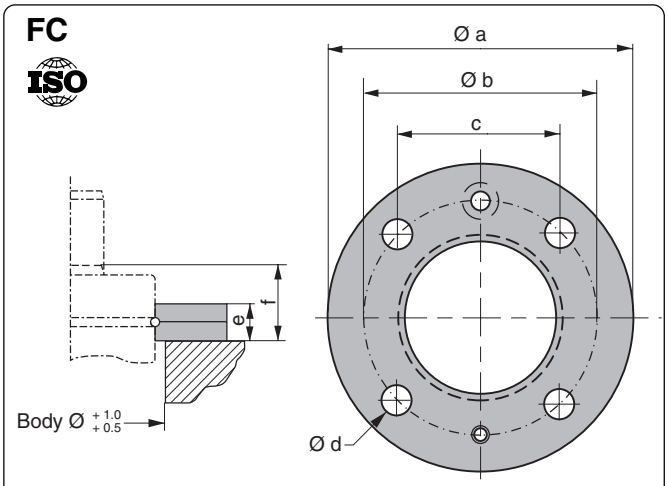
* = According to updated ISO 11901 standard



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-5000	140	109.5

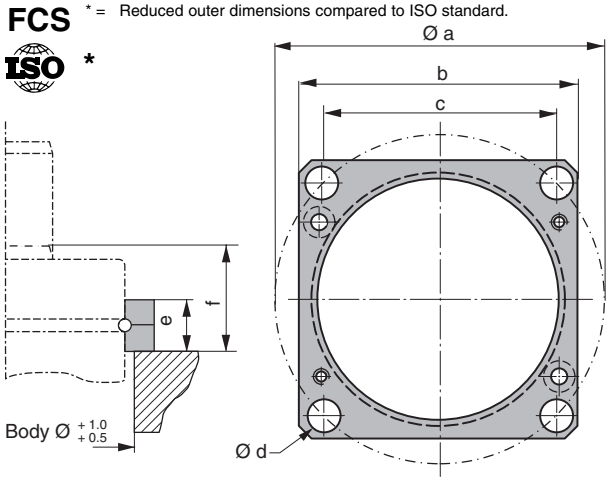
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-5000	175	155	109.5	13.5	21	36

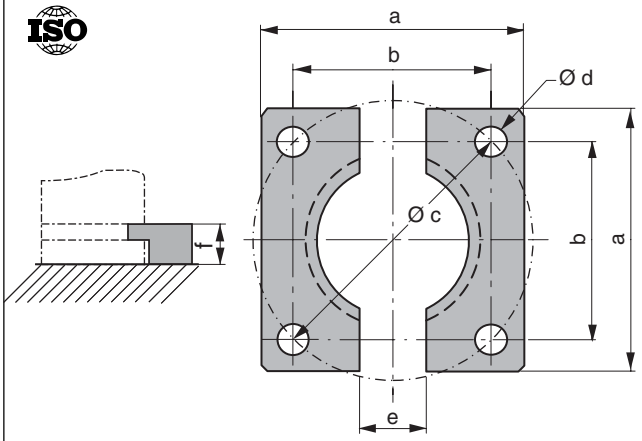
FCS

* = Reduced outer dimensions compared to ISO standard.



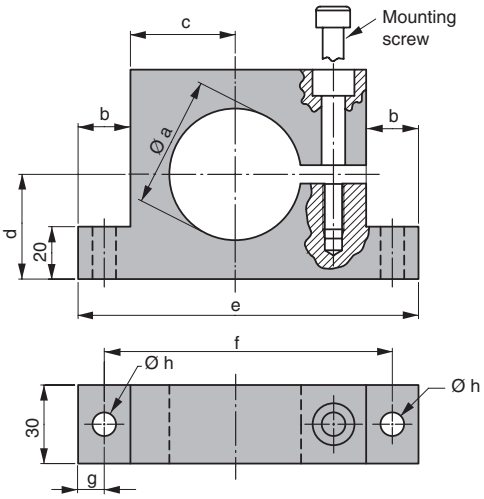
Order No.	Ø a	b	c	Ø d	e	f
FCS-5000	155	130	109.5	13.5	21	36

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-5000	140	109.5	155	13.5	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-5000	120.4	27.5	77.5	74	220	195	12.5	13

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

SL 3000

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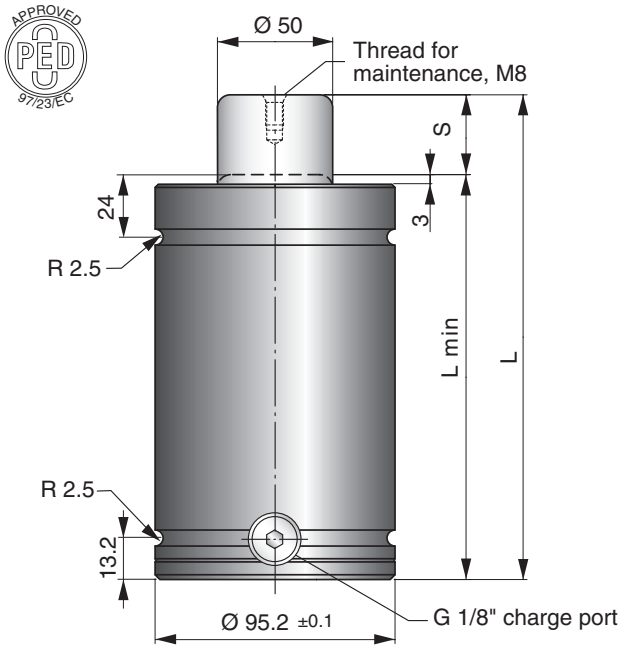


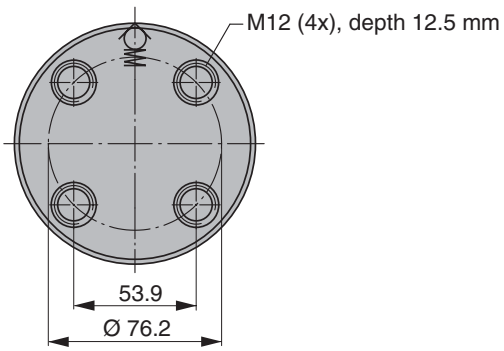
The SL 3000 spring has an “inch-based” total length and stroke length.

The SL 3000 has a total length of 101.6 mm + (2 x stroke).

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
SL 3000-013	12.7	30000	43000	127	114.3	0.11	5.50
SL 3000-025	25.4		45000	152.4	127	0.17	5.90
SL 3000-038	38.1		46000	177.8	139.7	0.23	6.30
SL 3000-051	50.8		48000	203.2	152.4	0.29	6.60
SL 3000-064	63.5		49000	228.6	165.1	0.35	7.00
SL 3000-076	76.2		49000	254	177.8	0.41	7.40
SL 3000-089	88.9		49000	279.4	190.5	0.48	7.70
SL 3000-102	101.6		49000	304.8	203.2	0.54	8.10
SL 3000-114	114.3		49000	330.2	215.9	0.61	8.50
SL 3000-127	127		49000	355.6	228.6	0.67	8.90
SL 3000-140	139.7		49000	381	241.3	0.73	9.20
SL 3000-152	152.4		49000	406.4	254	0.80	9.60
SL 3000-165	165.1		49000	431.8	266.7	0.86	10.00
SL 3000-178	177.8		49000	457.2	279.4	0.93	10.40

* = at full stroke

Bottom view

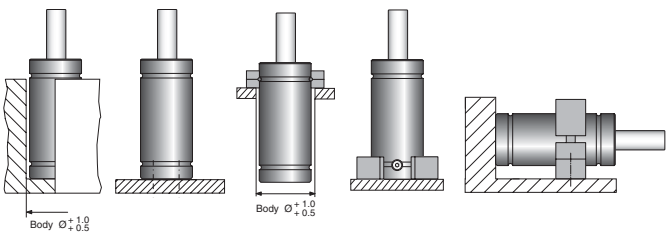


BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Yellow chromed
* Repair kit (SL 3000 PED) 4019339
* Repair kit (SL 3000) 2014979-3000
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In	B Bottom thread	FC, FCS Top Mount	FSL Foot Mount	S Body Mount

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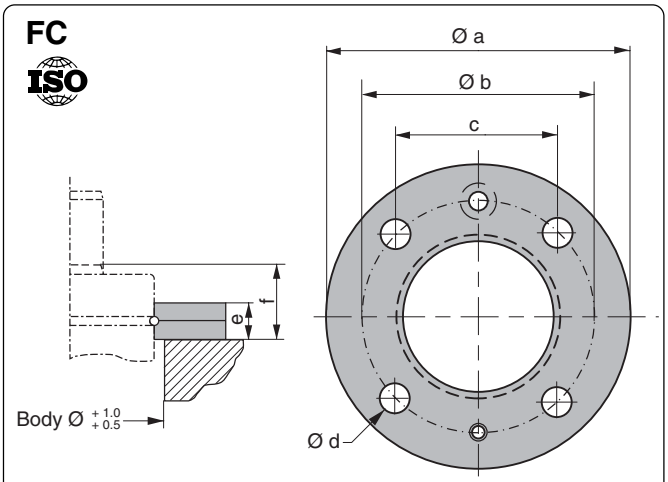
SL 3000 Mounts

FC

ISO

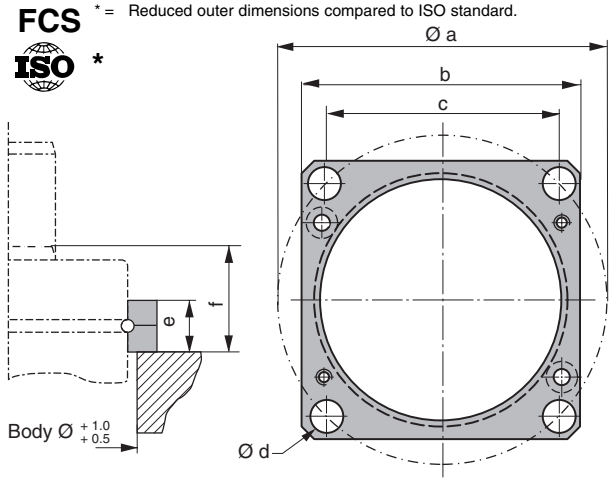


Order No.	Ø a	Ø b	c	Ø d	e	f
FC-3000	150	130	92	13.5	18	33

FCS

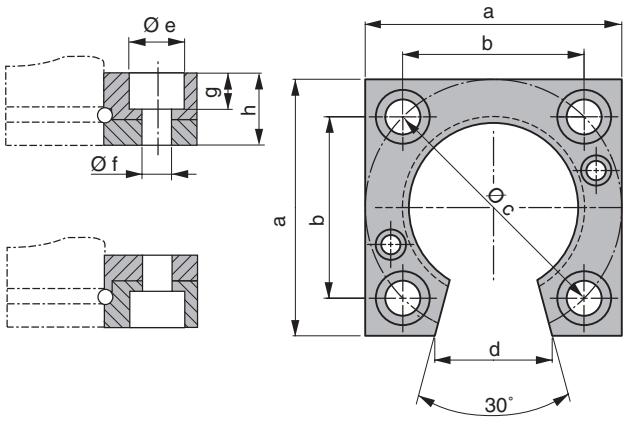
ISO *

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-3000	130	110	92	13,5	18	33

FSL



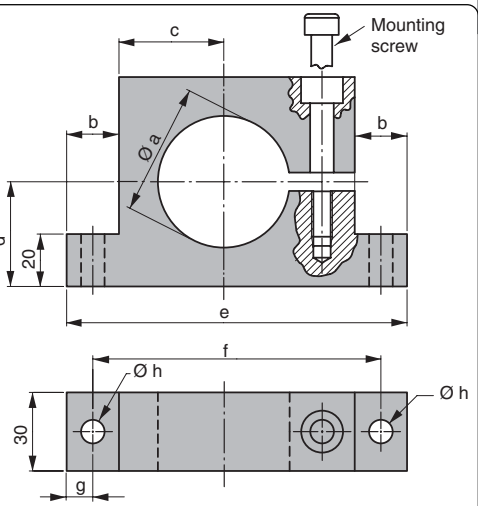
Order No.	a	b	Ø c	d	Ø e	Ø f	g	h
FSL-3000	127	98.3	139	61	20	13.5	13	25

S

ISO

Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.



Order No.	Ø a	b	c	d	e	f	g	Ø h
S-3000	95.4	25	67.5	62.5	195	170	12.5	13

7

$5000 \leq F_{INIT} < 7500$

X 6600

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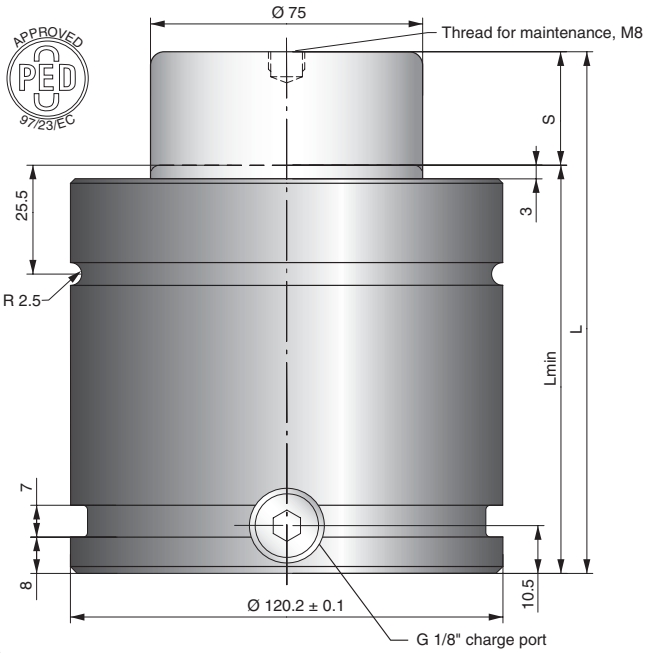


The Power Line series are our shortest and most powerful Piston Rod Sealed gas springs, giving you a great deal of force in a very small amount of space.

These gas springs are available with forces from 170 daN up to 9500 daN and stroke lengths between 7 and 125 mm.

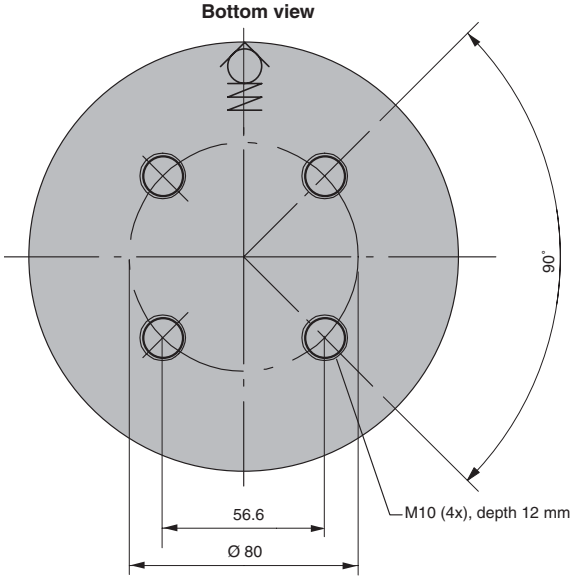
There is a side port for gas charging that can also be used to connect to a hose system.

An upper C-groove, lower U-groove together with four M10 threaded holes allow various mounting possibilities using our standard mounts.

8

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X 6600-016	16	66300	89000	100	84	0.32	4.97
X 6600-019	19		91000	106	87	0.35	5.09
X 6600-025	25		93900	118	93	0.42	5.31
X 6600-032	32		96100	132	100	0.49	5.58
X 6600-038	38		98200	144	106	0.56	5.81
X 6600-050	50		100600	168	118	0.69	6.22
X 6600-063	63		102400	194	131	0.83	6.78
X 6600-075	75		103400	218	143	0.90	7.05
X 6600-080	80		104100	228	148	1.01	7.43
X 6600-100	100		105400	268	168	1.23	8.20
X 6600-125	125		106500	318	193	1.50	9.16

Bottom view



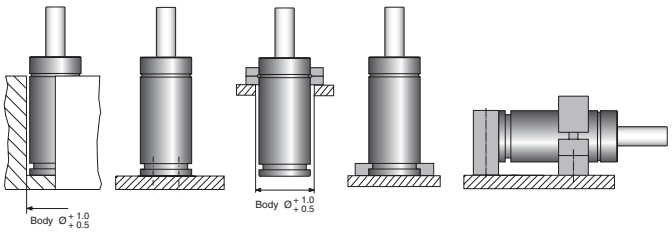
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min .... ~ 30 to 100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3019912

MOUNTING POSSIBILITIES



Drop - In	B, MP	FC, FCS	K, KU, FFC, FU	FAC, SA, S
	Bottom Mount	Top Mount	Foot Mount	Body Mount

Note! For dimensions on mounting possibilities K, KU, and FU, refer to chapter 3.

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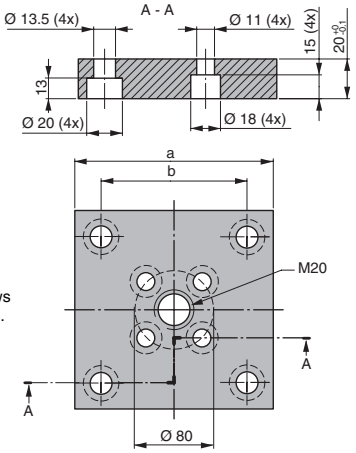
MP

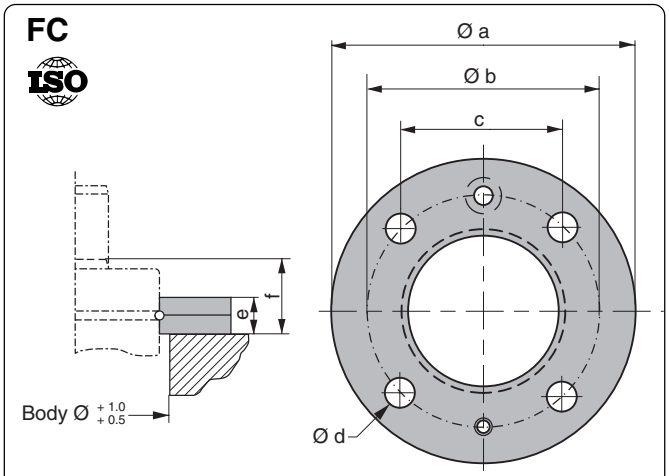
* = According to updated ISO 11901 standard



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-5000	140	109.5

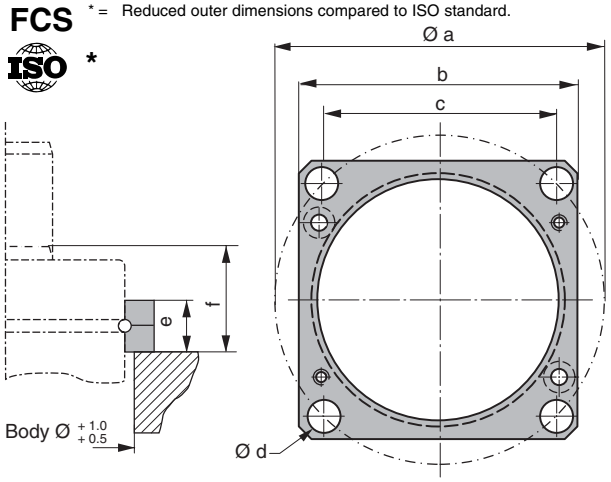
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-5000	175	155	109.5	13.5	21	36

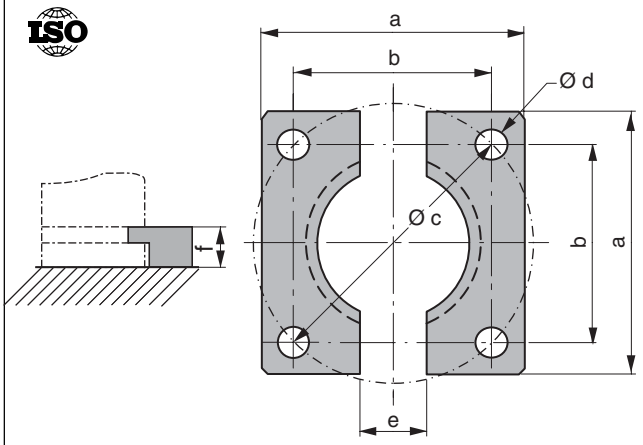
FCS

* = Reduced outer dimensions compared to ISO standard.



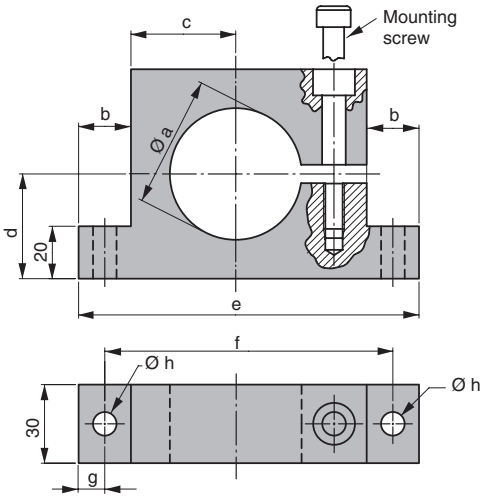
Order No.	Ø a	b	c	Ø d	e	f
FCS-5000	155	130	109.5	13.5	21	36

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-5000	140	109.5	155	13.5	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-5000	120.4	27.5	77.5	74	220	195	12.5	13

Note! For dimensions on mounting possibilities K, KU, and FU, refer to chapter 3.

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TU and LCF 5000

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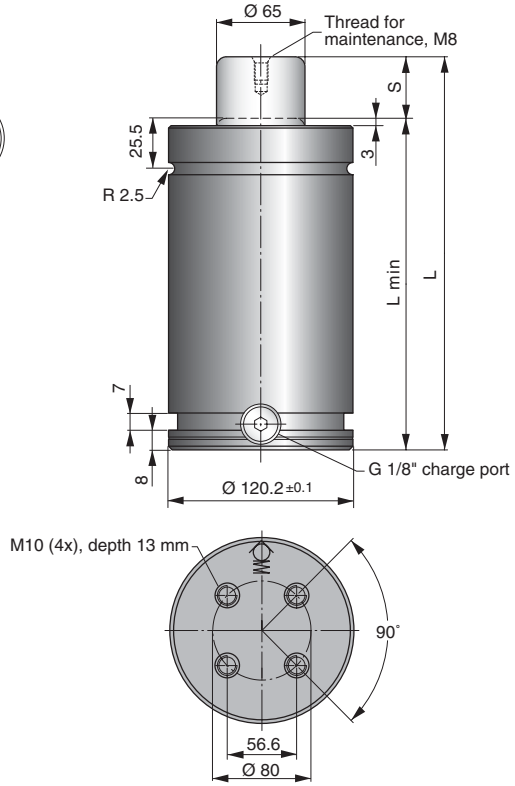
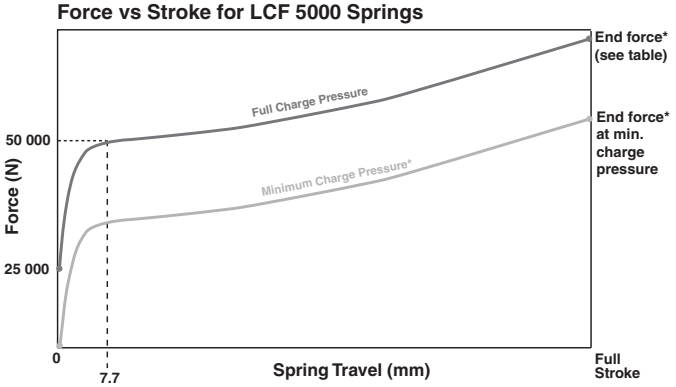


TU series
The standard line of gas springs is the TU line.
Sizes 250 to 10 000 correspond to the ISO 11901 standard for gas springs. Sizes 750 to 7500 correspond to FORD's WDX3560, GM's M-1500 and Renault's automotive gas spring standards. When ordering a Renault standard gas spring add an R to the Order No. (for example: TUR 5000-xxx). For more information, see "Automotive Standards" 2.17/2

LCF series
Low Contact Force (LCF) gas springs are designed to reduce exessive shock loads, high noise levels and extreme pad bounce, all factors that lead to high press maintenance costs and noise pollution. For more information see "About Gas Springs" 2.1/2.

Force vs Stroke for LCF 5000 Springs



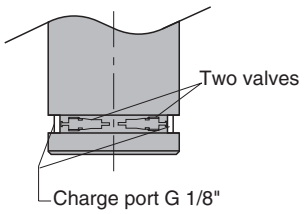
Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)	ISO
TU 5000-025	25		71000	190	165	0.32	12.00	✔
TU 5000-038	38.1		75000	216.2	178.1	0.42	12.65	
TU 5000-050	50		77000	240	190	0.51	13.30	✔
TU 5000-064	63.5		80000	267	203.5	0.60	14.46	
TU 5000-080	80		81000	300	220	0.73	15.05	✔
TU 5000-100	100	50000	82000	340	240	0.89	16.15	✔
TU 5000-125	125		82000	390	265	1.09	16.96	✔
TU 5000-160	160		83000	460	300	1.36	19.40	✔
TU 5000-200	200		84000	540	340	1.68	20.70	
TU 5000-250	250		84000	640	390	2.07	22.40	
TU 5000-300	300		84000	740	440	2.46	24.66	

* = at full stroke

TU, TUR och LCF 5000 gas springs are also available with double charging ports. When ordering this type, add a D to the Order No. For example: TUD 5000-xxx

Note! TUD, TURD and LCFD 5000 gas springs have two valves and are delivered charged.

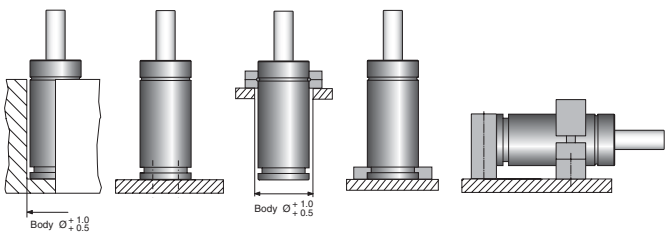
TUD 5000 example



BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure (TU 5000) ..... 25 bar
Min. charging pressure (LCF 5000) ..... 75 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see "About gas springs", 2.1
Rod surface ..... Nitrided
Tube surface ..... Black oxide
* Repair kit (TU 5000 PED) 3018876
* Repair kit (TU 5000) 2014068-04
* Repair kit (LCF 5000 PED) 3019380
* Repair kit (LCF 5000) 3019133
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In	B, MP	FC, FCS	K, KU, FFC, FU	FAC, SA, S
	Bottom Mount	Top Mount	Foot Mount	Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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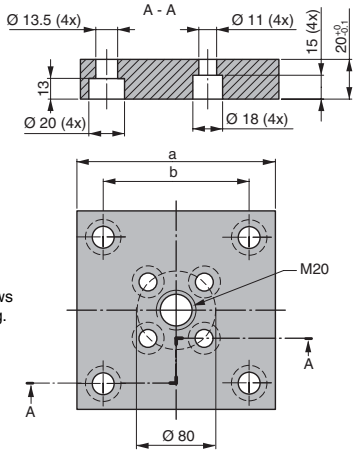
MP

* = According to updated ISO 11901 standard

ISO *

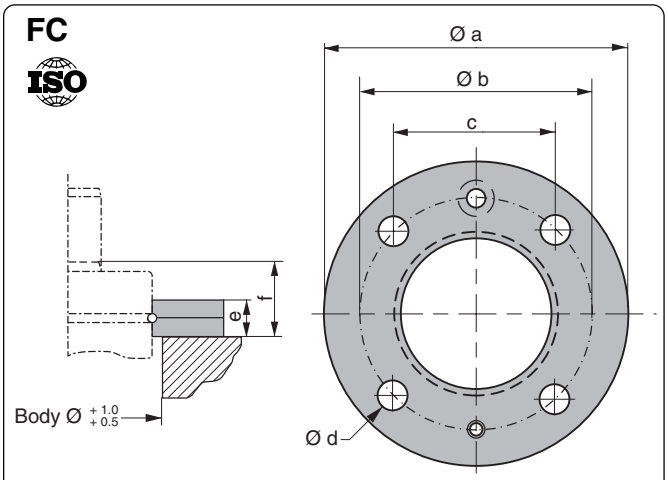


Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-5000	140	109.5

FC

ISO

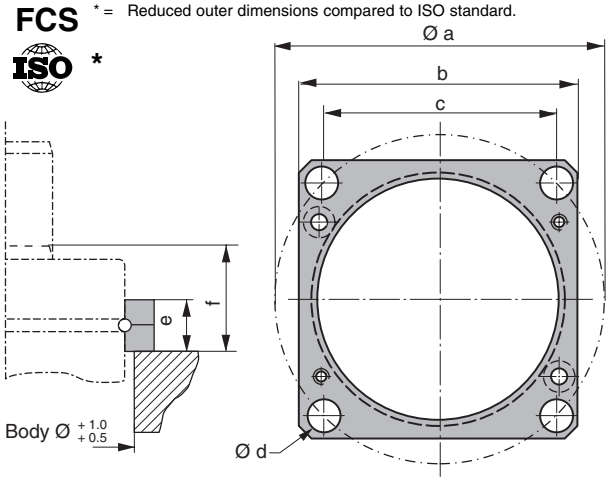


Order No.	Ø a	Ø b	c	Ø d	e	f
FC-5000	175	155	109.5	13.5	21	36

FCS

* = Reduced outer dimensions compared to ISO standard.

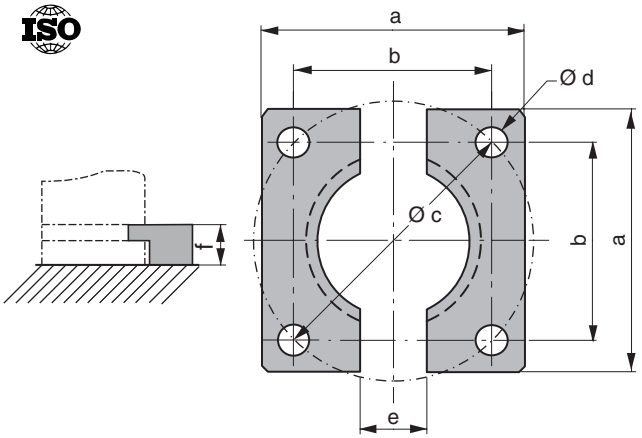
ISO *



Order No.	Ø a	b	c	Ø d	e	f
FCS-5000	155	130	109.5	13.5	21	36

FFC

ISO



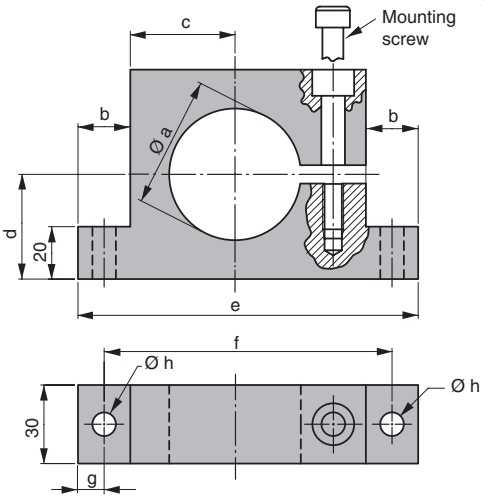
Order No.	a	b	Ø c	Ø d	e	f
FFC-5000	140	109.5	155	13.5	24	12

S

ISO

Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.



Order No.	Ø a	b	c	d	e	f	g	Ø h
S-5000	120.4	27.5	77.5	74	220	195	12.5	13

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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TB 5000

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TB springs have a larger gas volume than our standard TU series.This reduces the pressure increase as the piston rod is stroked. It also increases the service life of the spring.

TB springs are recommended for applications where a low force increase is desirable. TB springs are also a good choice for higher cycle rates and high volume production.

Note! When ordering mounts for TB 5000 springs, a mount of a larger size than the spring must be used.

8

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
TB 5000-025	25	50000	70000	190	165	0.41	19.5
TB 5000-038	38.1		69000	216.2	178.1	0.57	20.5
TB 5000-050	50		69000	240	190	0.72	21.4
TB 5000-064	63.5		69000	267	203.5	0.86	22.4
TB 5000-080	80		69000	300	220	1.07	23.7
TB 5000-100	100		69000	340	240	1.31	25.2
TB 5000-125	125		69000	390	265	1.62	27.1
TB 5000-160	160		69000	460	300	2.05	29.8
TB 5000-200	200		69000	540	340	2.54	32.8
TB 5000-250	250		68000	640	390	3.16	36.6
TB 5000-300	300		68000	740	440	3.77	40.4

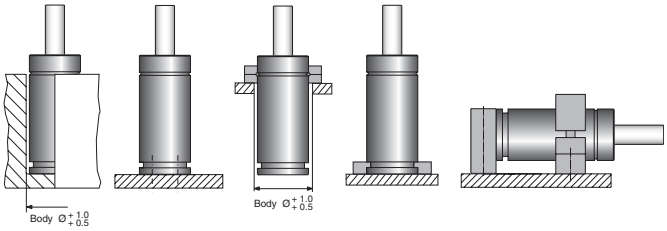
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 40-80 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
* Repair kit (TB 5000 PED) 3019238
* Repair kit (TB 5000) 2014068-08
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In | **B, MP** | **FC, FCS** | **K, KU, FFC, FU** | **FAC, SA, S**

Bottom Mount | Top Mount | Foot Mount | Body Mount

Note! For dimension on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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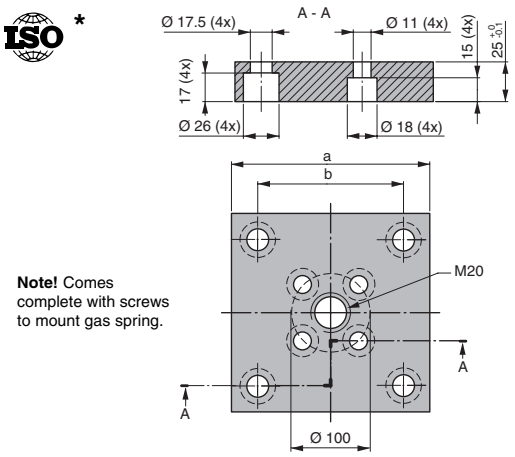
MP

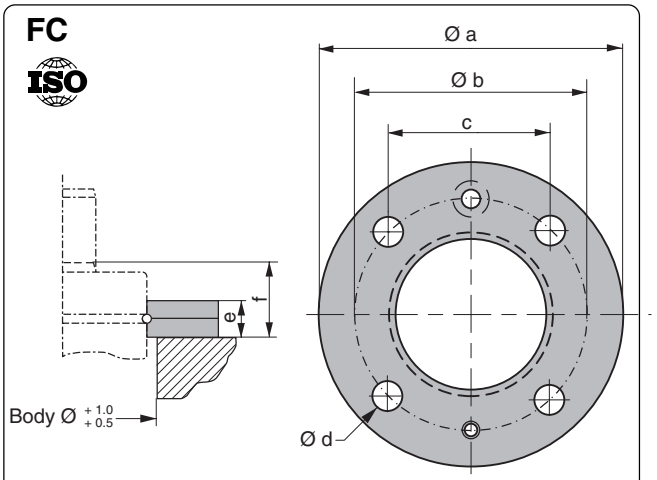
* = According to updated ISO 11901 standard



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-7500	190	138

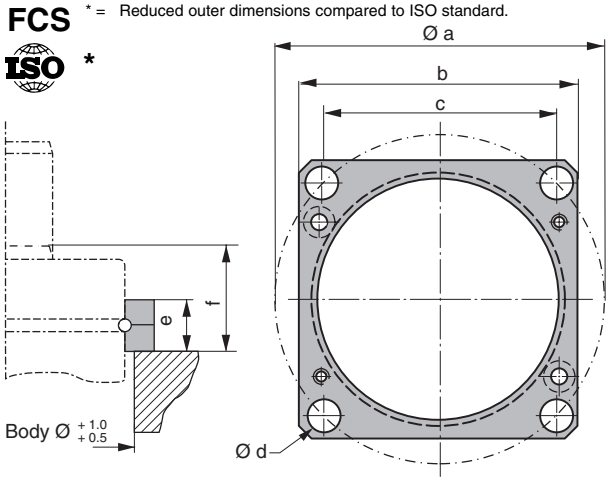
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-7500	220	195	138	17.5	27	41

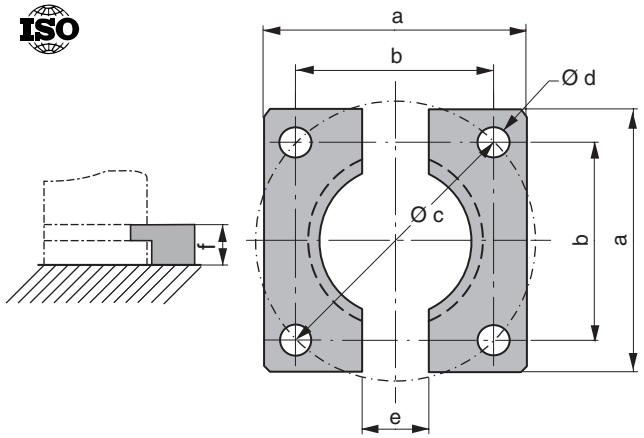
FCS

* = Reduced outer dimensions compared to ISO standard.



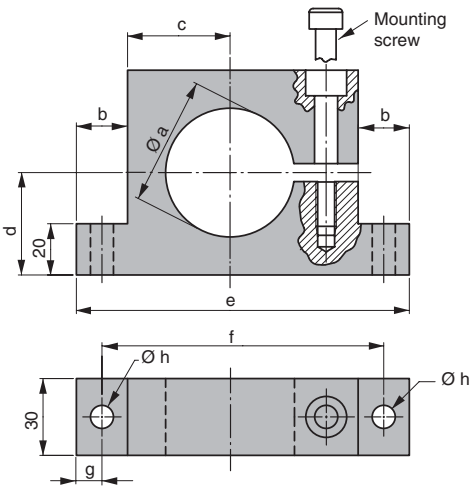
Order No.	Ø a	b	c	Ø d	e	f
FCS-7500	195	162	138	17.5	27	41

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-7500	190	138	195.2	17.5	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-7500	150.4	30	95	100	260	230	15	13

Note! For dimension on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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SL 5000

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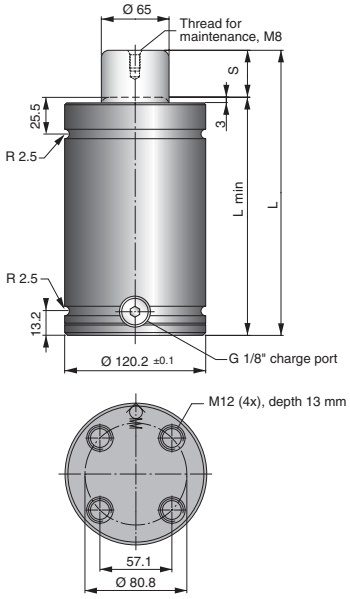


The SL 5000 spring has an “inch-based” total length and stroke length.

The SL 5000 has a total length of 101.6 mm + (2 x stroke).

8

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
SL 5000-013	12.7	50000	79000	127	114.3	0.18	7.9
SL 5000-025	25.4		82000	152.4	127	0.28	8.5
SL 5000-038	38.1		87000	177.8	139.7	0.37	9.1
SL 5000-051	50.8		87000	203.2	152.4	0.46	9.7
SL 5000-064	63.5		86000	228.6	165.1	0.56	11.1
SL 5000-076	76.2		86000	254	177.8	0.66	11.7
SL 5000-089	88.9		86000	279.4	190.5	0.76	12.3
SL 5000-102	101.6		86000	304.8	203.2	0.86	12.9
SL 5000-114	114.3		86000	330.2	215.9	0.96	13.5
SL 5000-127	127		86000	355.6	228.6	1.06	14.1
SL 5000-140	139.7		86000	381	241.3	1.16	14.7
SL 5000-152	152.4		86000	406.4	254	1.26	15.3
SL 5000-165	165.1		86000	431.8	266.7	1.36	15.9
SL 5000-178	177.8		86000	457.2	279.4	1.46	16.5
SL 5000-191	190.5		86000	482.6	292.1	1.56	17.1
SL 5000-203	203.2		86000	508	304.8	1.66	17.8

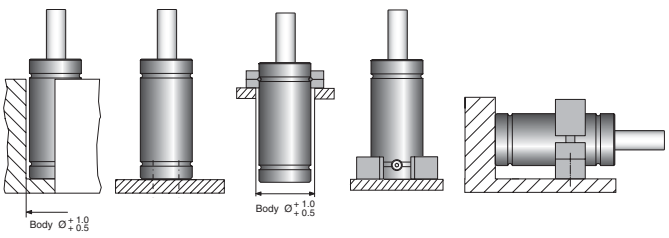
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Yellow chromed
* Repair kit (SL 5000 PED) 4019340
* Repair kit (SL 5000) 2014979-5000
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used. .....

MOUNTING POSSIBILITIES



Drop - In	B	FC, FCS	FSL	S
	Bottom thread	Top Mount	Foot Mount	Body Mount

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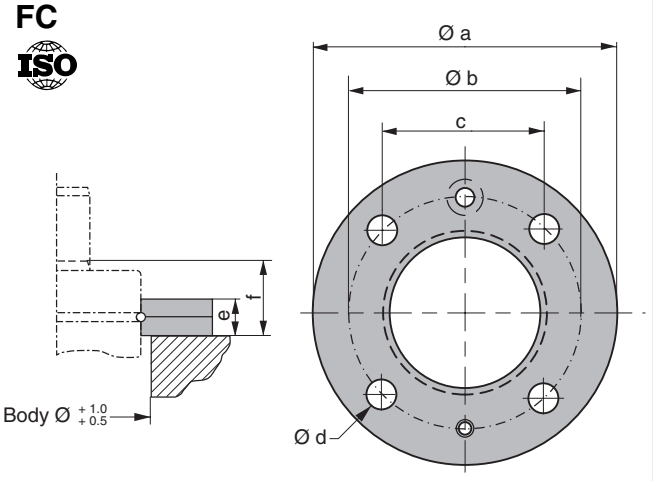
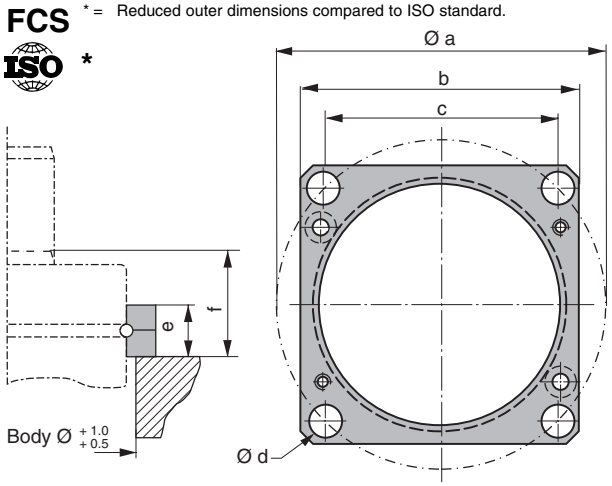
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-5000	175	155	109.5	13.5	21	36

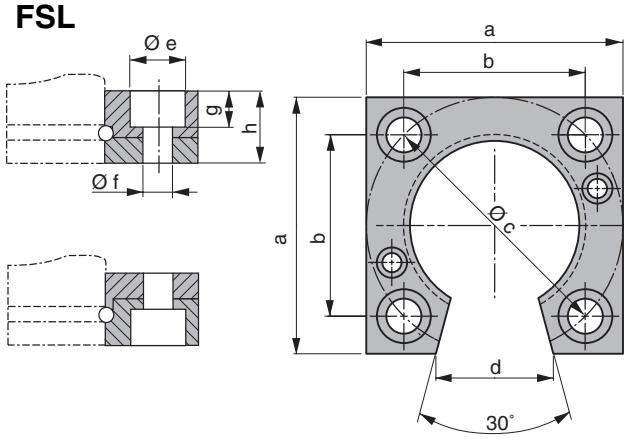
FCS

* = Reduced outer dimensions compared to ISO standard.



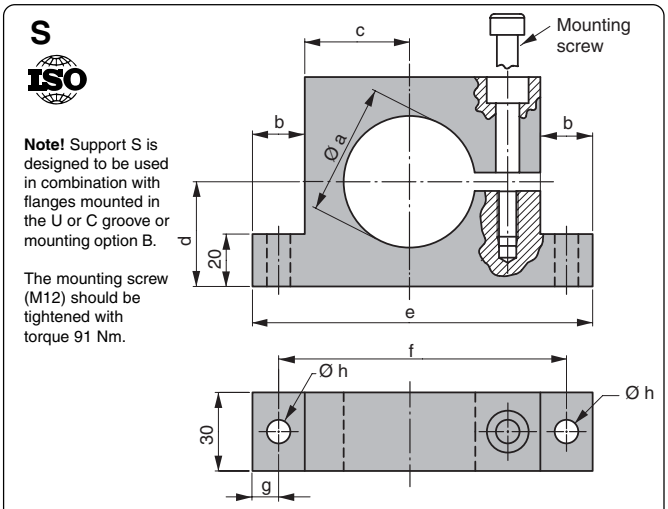
Order No.	Ø a	b	c	Ø d	e	f
FCS-5000	155	130	109.5	13.5	21	36

FSL



Order No.	a	b	Ø c	d	Ø e	Ø f	g	h
FSL-5000	139.7	114.3	161.8	71	20	13.5	13	25

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.

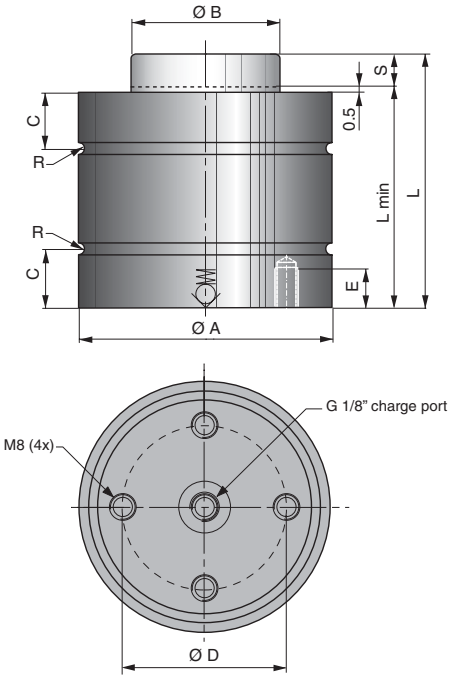
Order No.	Ø a	b	c	d	e	f	g	Ø h
S-5000	120.4	27.5	77.5	74	220	195	12.5	13

8

$7500 \leq F_{INIT} < 10000$

CU 7500

KALLER®



The CU gas spring is a very compact Bore Sealed gas spring, that gives a high force in a limited space.
The max. frequency for the spring is 100 strokes/minute.

Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend shorter stroke springs to be fastened for optimal service-life.

As an option, the CU springs can be delivered with a Side-Port plate (SP) for applications where a side-port is needed (i.e. for use in hose systems).

9

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force**	L ± 0.25	L min	Ø A ± 0.1	Ø B	C	Ø D	E	R	Gas vol. (l)	Weight (kg)
CU 7500-010	10	75000	104000	90	80	95.2	55	21	52	9	1.5	0.18	2.8
CU 7500-016	16		104000	116	100							0.30	3.2
CU 7500-025	25		109000	145	120							0.41	3.7
CU 7500-032	32*		105000	182	150							0.57	4.4
CU 7500-040	40*		107000	210	170							0.68	4.8
CU 7500-050	50*		106000	255	205							0.87	5.6

* = Should always be attached to the tool using the tapped holes in the bottom or a flange
** = at full stroke

BASIC INFORMATION

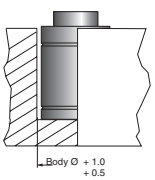
Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~80 to 100 (at 20° C)
Max piston rod velocity ..... 0.5 m/s

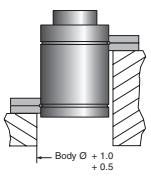
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Nitrided
Repair kit CU 7500 2014493-0750

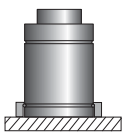
MOUNTING POSSIBILITIES

Drop-In

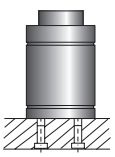




FK
Flange mount



BFP
Flange mount



B
Bottom thread

SP
Side port

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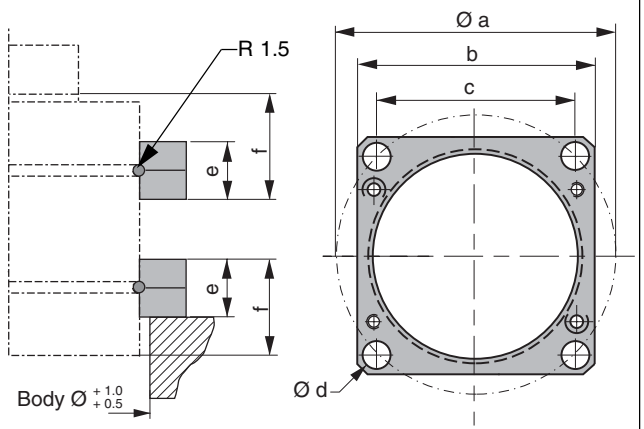
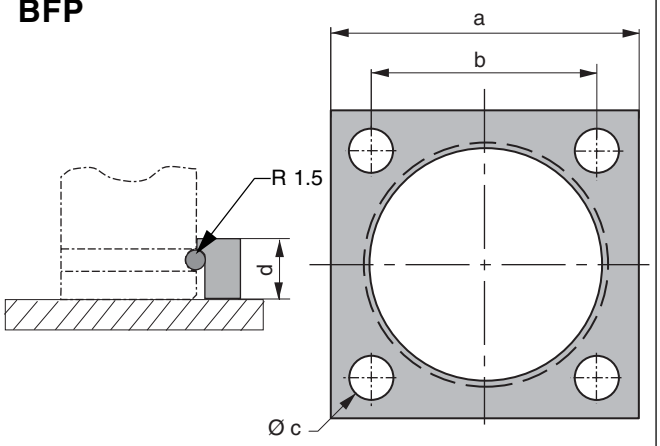
FK



For model	Order No.	Ø a	Ø b	c	Ø d	e	f
CU 7500	FK-3000	130	110	92	13.5	18	30

Note! For spring of earlier version with R=2.5 FCS 1500 respective FCS 3000 should be used.
Please contact your local distributor for more information.

BFP



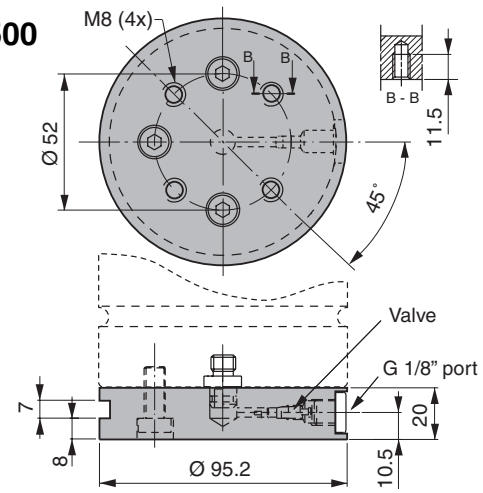
For model	Order No.	a	b	Ø c	d
CU 7500	BFP-7500	110	92	13	27.5

Note! BF flange for earlier version with R=2.5 is obsolete.
Please contact your local distributor for more information.

CU-SP 7500

It is also possible to order Side Port kit for attachment to old springs.

Order No. SP 7500 kit.



For model	Order No.	For U-groove mounts on CU-SP
CU 7500	CU SP-7500	Refer to TU 3000

9

X 9500

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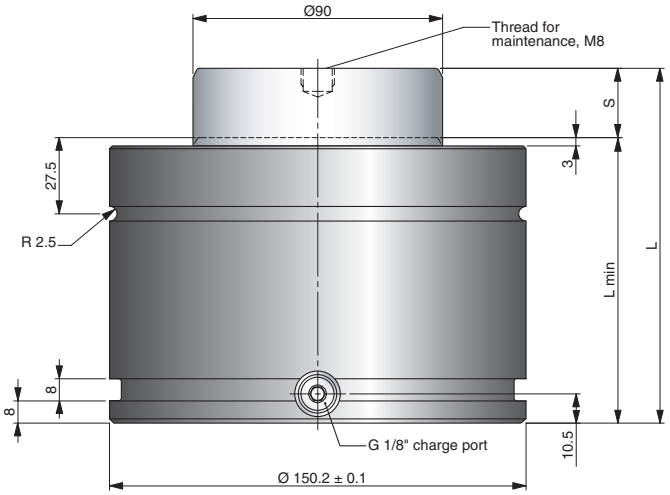


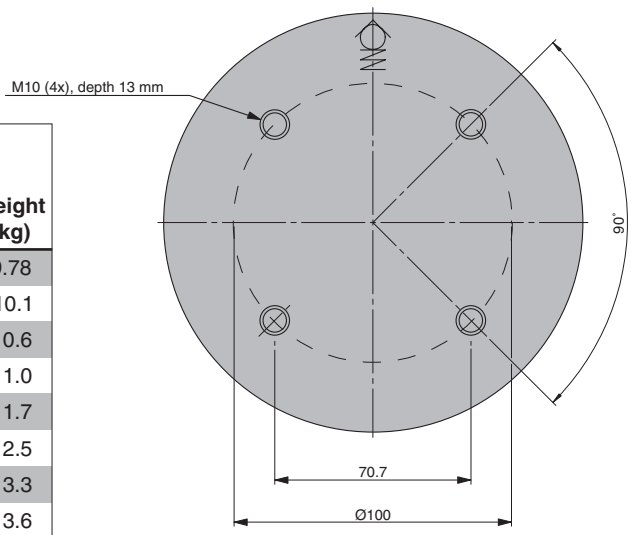
The Power Line series are our shortest and most powerful Piston Rod Sealed gas springs, giving you a great deal of force in a very small amount of space.

These gas springs are available with forces from 170 daN up to 9500 daN and stroke lengths between 7 and 125 mm.

There is a side port for gas charging that can also be used to connect to a hose system.

An upper C-groove, lower U-groove together with four M10 threaded holes allow various mounting possibilities using our standard mounts.

Bottom view



9

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
X 9500-019	19	95000	135000	116	97	0.49	9.78
X 9500-025	25		139000	128	103	0.58	10.1
X 9500-032	32		142000	142	110	0.70	10.6
X 9500-038	38		143000	154	116	0.80	11.0
X 9500-050	50		146000	178	128	0.99	11.7
X 9500-063	63		148000	204	141	1.20	12.5
X 9500-075	75		149000	228	153	1.39	13.3
X 9500-080	80		150000	238	158	1.47	13.6
X 9500-100	100		151000	278	178	1.79	14.8
X 9500-125	125		152000	328	203	2.20	16.4

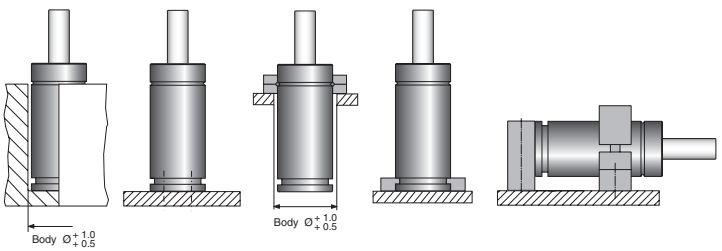
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 30 to 100 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
Repair kit 3020614

MOUNTING POSSIBILITIES



Drop - In | **B, MP** | **FC, FCS** | **K, KU, FFC, FU** | **FAC, SA, S**

Bottom Mount | Top Mount | Foot Mount | Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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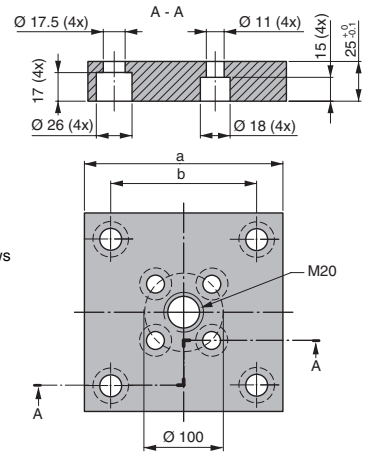
MP

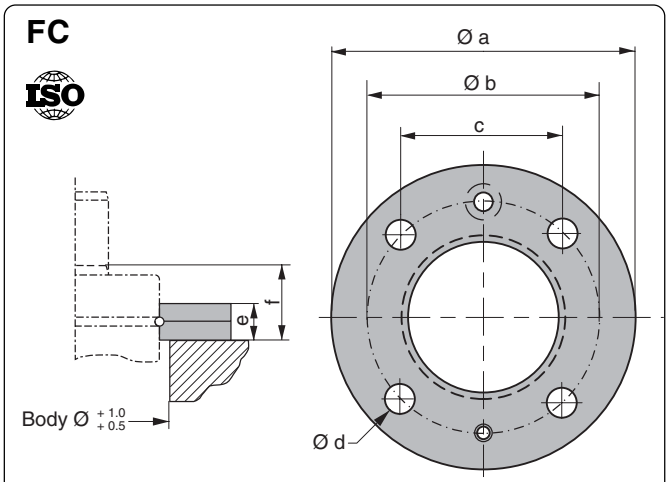
* = According to updated ISO 11901 standard



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-7500	190	138

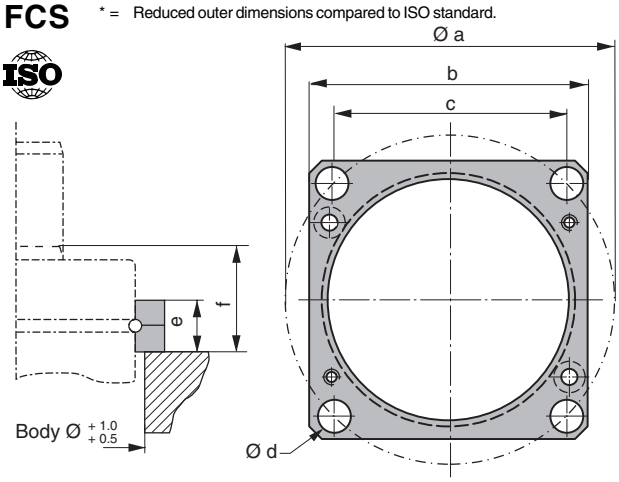
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-7500	220	195	138	17.5	27	41

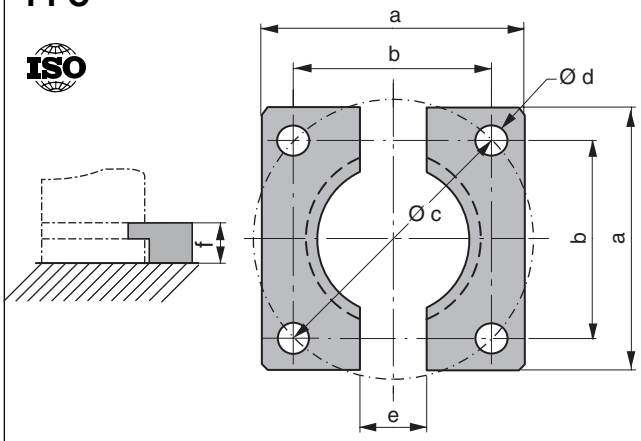
FCS

* = Reduced outer dimensions compared to ISO standard.



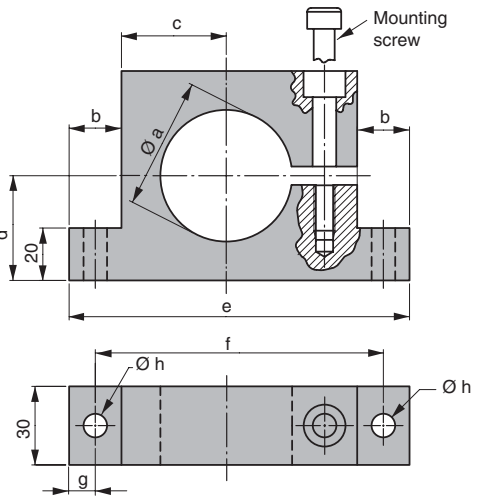
Order No.	Ø a	b	c	Ø d	e	f
FCS-7500	195	162	138	17.5	27	41

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-7500	190	138	195.2	17.5	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-7500	150.4	30	95	100	260	230	15	13

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

TU and LCF 7500

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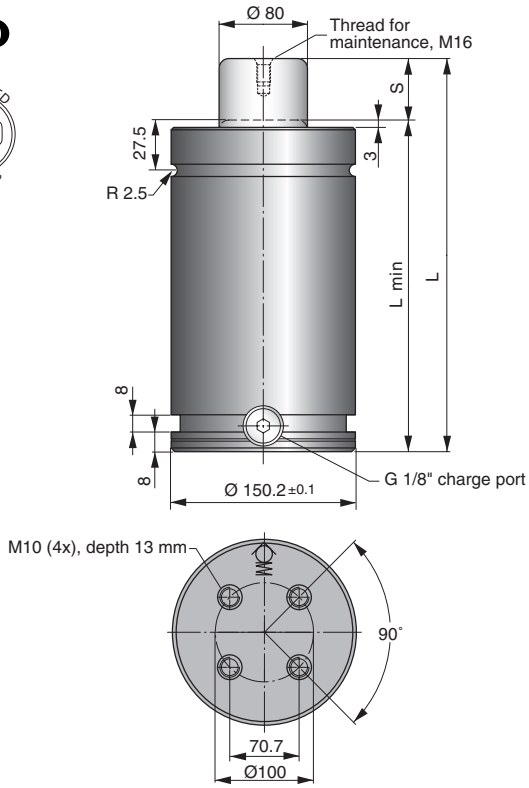
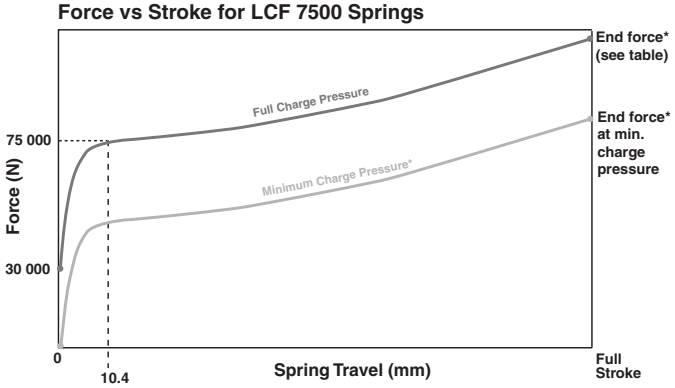


TU series
The standard line of gas springs is the TU line.
Sizes 250 to 10 000 correspond to the ISO 11901 standard for gas springs. Sizes 750 to 7500 correspond to FORD's WDX3560, GM's M-1500 and Renault's automotive gas spring standards. When ordering a Renault standard gas spring add an R to the Order No. (for example: TUR 7500-xxx). For more information, see "Automotive Standards" 2.17/2

LCF series
Low Contact Force (LCF) gas springs are designed to reduce exessive shock loads, high noise levels and extreme pad bounce, all factors that lead to high press maintenance costs and noise pollution. For more information see "About Gas Springs" 2.1/2.

Force vs Stroke for LCF 7500 Springs



9

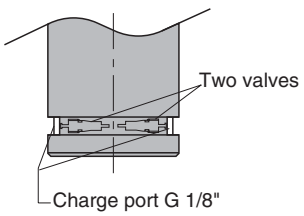
Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End Force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)	ISO
TU/LCF 7500-025	**25**		**105000**	**205**	**180**	**0.51**	**19.2**	✔
TU/LCF 7500-038	38.1		110000	231.2	193.1	0.67	20.0	
TU/LCF 7500-050	50		113000	255	205	0.81	20.9	✔
TU/LCF 7500-064	63.5		115000	282	218.5	0.98	21.8	
TU/LCF 7500-080	80		117000	315	235	1.18	22.9	✔
TU/LCF 7500-100	100	**75000**	119000	355	255	1.43	24.3	✔
TU/LCF 7500-125	125		121000	405	280	1.74	26.0	✔
TU/LCF 7500-160	160		122000	475	315	2.17	28.4	✔
TU/LCF 7500-200	200		123000	555	355	2.66	31.1	
TU/LCF 7500-250	250		124000	655	405	3.27	34.5	
TU/LCF 7500-300	300		124000	755	455	3.88	37.9	

* = at full stroke

TU, TUR och LCF 7500 gas springs are also available with double charging ports. When ordering this type, add a D to the Order No. For example: TUD 7500-xxx

Note! TUD, TURD and LCFD 7500 gas springs have two valves and are delivered charged.

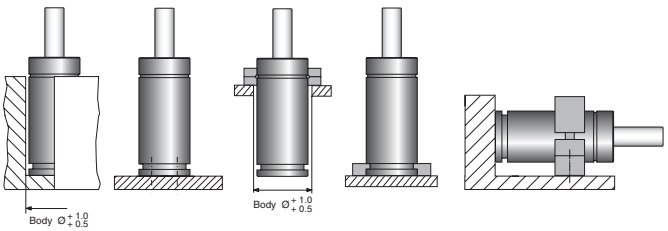
TUD 7500 example



BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure (TU 7500) ..... 25 bar
Min. charging pressure (LCF 7500) ..... 89 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see "About gas springs", 2.1
Tube surface ..... Black oxide
Rod surface ..... Nitrided
* Repair kit (TU 7500 PED) 3018877
* Repair kit (TU 7500) 2014068-09
* Repair kit (LC 7500 PED) 3019381
* Repair kit (LCF 7500) 3019134
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In | **B, MP** | **FC, FCS** | **K, KU, FFC, FU** | **S**

Bottom Mount | Top Mount | Foot Mount | Body Mount

Note! For dimensions on mounting possibilities K, KU, and FU, refer to chapter 3.

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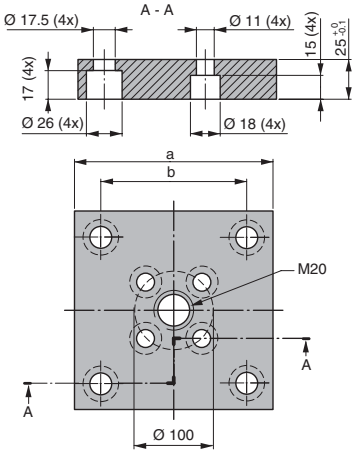
MP

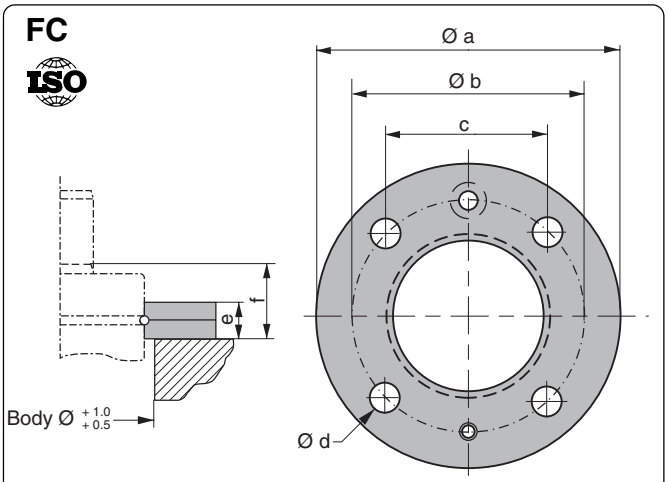
* = According to updated ISO 11901 standard



Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-7500	190	138

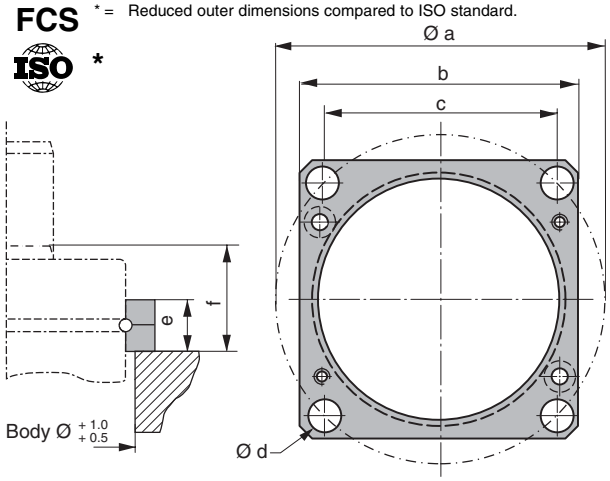
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-7500	220	195	138	17.5	27	41

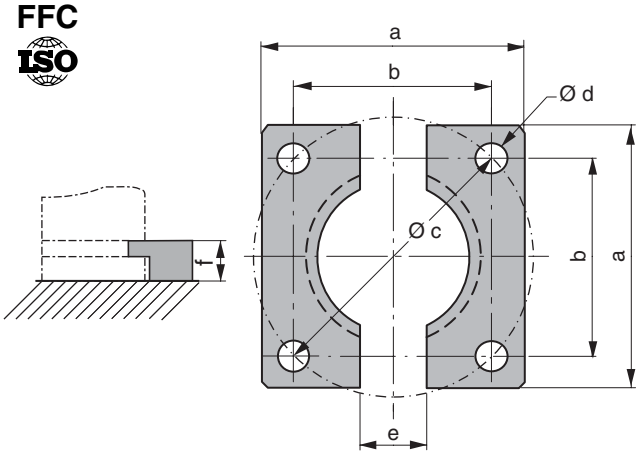
FCS

* = Reduced outer dimensions compared to ISO standard.



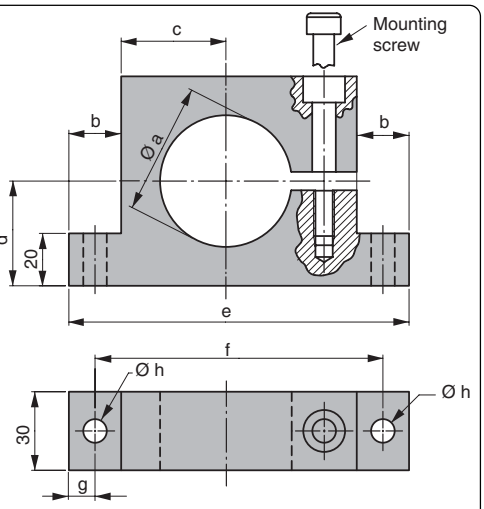
Order No.	Ø a	b	c	Ø d	e	f
FCS-7500	195	162	138	17.5	27	41

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-7500	190	138	195.2	17.5	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M12) should be tightened with torque 91 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-7500	150.4	30	95	100	260	230	15	13

Note! For dimensions on mounting possibilities K, KU, and FU, refer to chapter 3.

$F_{INIT} \geq 10000$

CU 11800 - 18300

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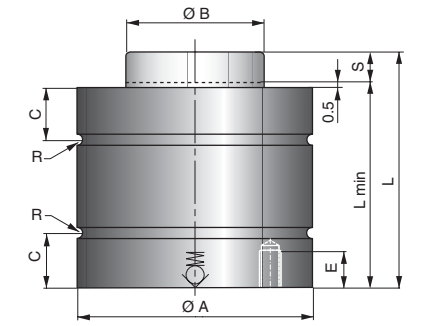
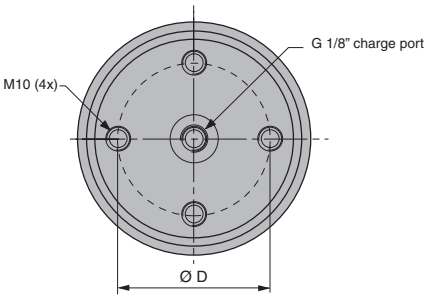




The CU gas spring is a very compact Bore Sealed gas spring, that gives a high force in a limited space.
The max. frequency for the spring is 100 strokes/minute.

Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend shorter stroke springs to be fastened for optimal service-life.

As an option, the CU springs can be delivered with a Side-Port plate (SP) for applications where a side-port is needed (i.e. for use in hose systems).

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force**	L ± 0.25	L min	Ø A ± 0.1	Ø B	C	Ø D	E	R	Gas vol. (l)	Weight (kg)
CU 11800-010	10	118000	155000	100	90	120.2	70	22.5	68	11	2.5	0.33	5.4
CU 11800-016	16		158000	126	110							0.50	6.0
CU 11800-025	25		170000	155	130							0.68	6.9
CU 11800-032	32*		164000	187	155							0.88	7.8
CU 11800-040	40*		165000	220	180							1.00	8.7
CU 11800-050	50*		166000	260	210							1.35	9.9
CU 18300-010	10	183000	235000	110	100	150.2	90	24.5	90	11	2.5	0.56	9.5
CU 18300-016	16		252000	136	120							0.84	10.4
CU 18300-025	25		254000	165	140							1.13	11.8
CU 18300-032	32*		251000	197	165							1.45	13.3
CU 18300-040	40*		250000	235	195							1.86	15.0
CU 18300-050	50*		255000	270	220							2.19	16.5

* = Should always be attached to the tool using the tapped holes in the bottom or a flange
** = at full stroke

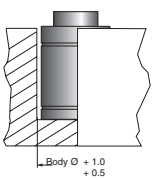
BASIC INFORMATION

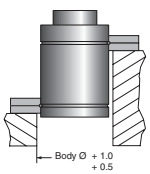
Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar (at 20°C)
Min. charging pressure ..... 25 bar (at 20°C)
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min .... ~80 to 100 (at 20° C)
Max piston rod velocity ..... 0.5 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Nitrided
Repair kit CU 11800 2014493-1180
Repair kit CU 18300 2014493-1830

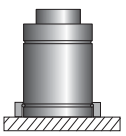
MOUNTING POSSIBILITIES

Drop-In

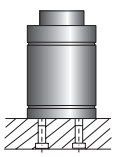




FC/FCS
Flange mount



BFCU
Flange mount



B
Bottom thread

SP
Side port

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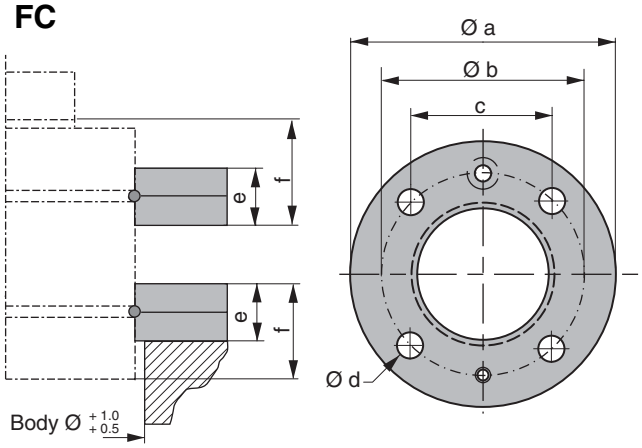
KALLER®

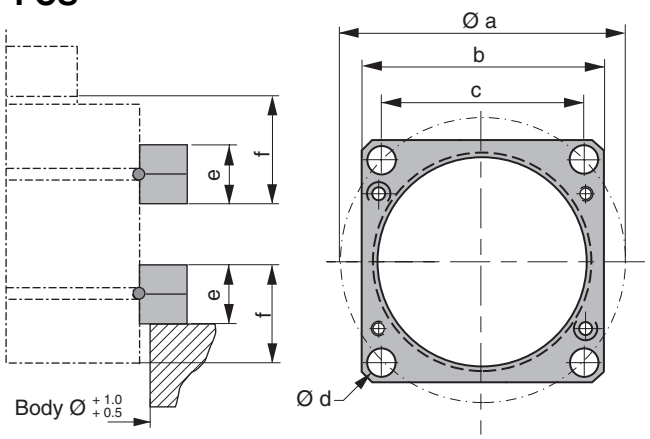
CU 11800 - 18300 Mounts

FC



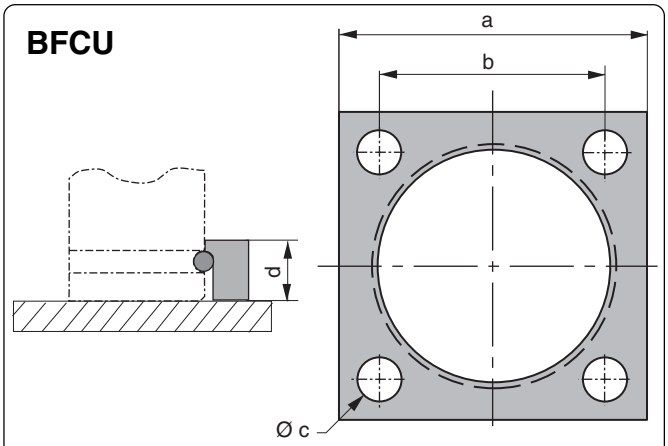
For model	Order No.	Ø a	Ø b	c	Ø d	e	f
CU 11800	FC-5000	175	155	109.5	13.5	21	33
CU 18300	FC-7500	220	195	138	17.5	27	38

FCS



For model	Order No.	Ø a	b	c	Ø d	e	f
CU 11800	FCS-5000	155	130	109.5	13.5	21	33
CU 18300	FCS-7500	195	162	138	17.5	27	38

BFCU

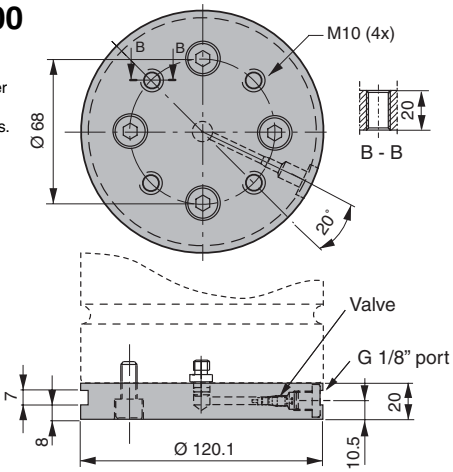


For model	Order No.	a	b	Ø c	d
CU 11800	BFCU-11800	130	109.5	13	29.5
CU 18300	BFCU-18300	162	138	17.5	34.5

CU-SP 11800

It is also possible to order Side Port kit for attachment to old springs.

Order No. SP 11800 kit.

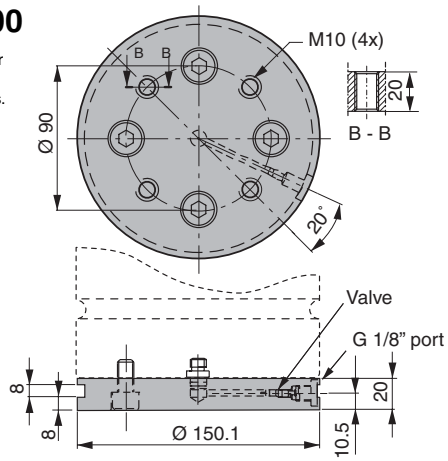


For model	Order No.	For U-groove mounts on CU-SP
CU 11800	CU SP-11800	Refer to TU 5000

CU-SP 18300

It is also possible to order Side Port kit for attachment to old springs.

Order No. SP 18300 kit.



For model	Order No.	For U-groove mounts on CU-SP
CU 18300	CU SP-18300	Refer to TU 7500

10

TU 10 000

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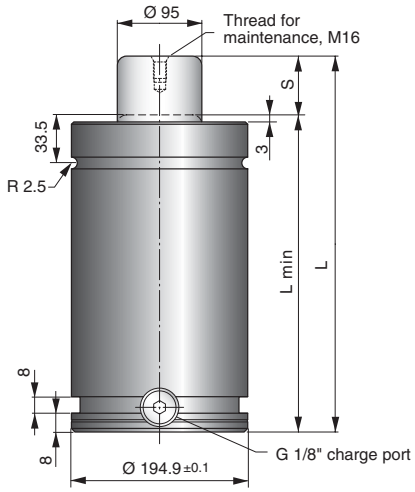
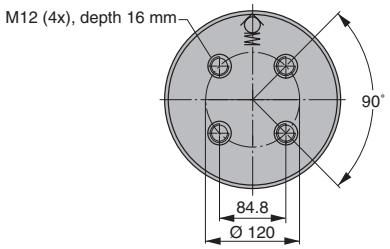


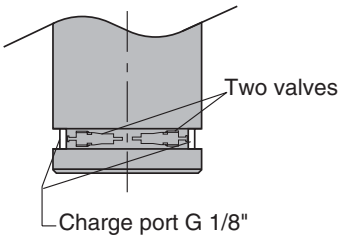


The standard line of gas springs is the TU line. Sizes 250 to 10 000 correspond to the ISO 11901 standard for gas springs.

TU 10 000 is also available with double ports. When ordering this type add a **D** to the Order No. Example: TUD 10000-xxx.

Note! The TUD 10 000 has two valves and is normally delivered charged.

TUD 10000 example



Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force**	L ± 0.25	L min	Gas vol. (l)	Weight (kg)	ISO
TU 10000-025	25		138000	210	185	0.87	36.5	
TU 10000-038	38.1		143000	236.2	198.1	1.13	38.5	
TU 10000-050	50		147000	260	210	1.37	40.0	✳
TU 10000-064	63.5		150000	287	223.5	1.64	42.0	
TU 10000-080	80		152000	320	240	1.98	44.0	✳
TU 10000-100	100	106000	156000	360	260	2.38	46.5	✳
TU 10000-125	125		157000	410	285	2.88	50.0	✳
TU 10000-160	160		158000	480	320	3.59	54.5	✳
TU 10000-200	200		160000	560	360	4.39	60.0	✳
TU 10000-250	250		160000	660	410	5.40	66.5	✳
TU 10000-300	300		160000	760	460	6.40	73.0	✳

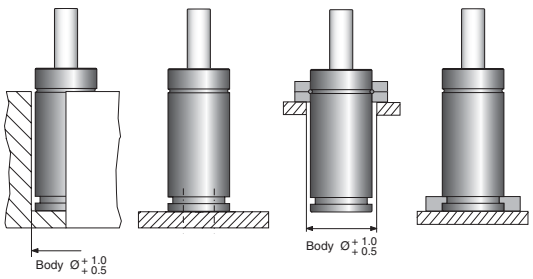
** = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... 0 - +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
* Repair kit (TU 10 000 PED) 3019037
* Repair kit (TU 10 000) 2014068-10
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

MOUNTING POSSIBILITIES



Drop - In | **B, MP** Bottom Mount | **FCS** Top Mount | **K, FFC** Foot Mount

Note! For dimensions on mounting possibilities K refer to chapter 3.

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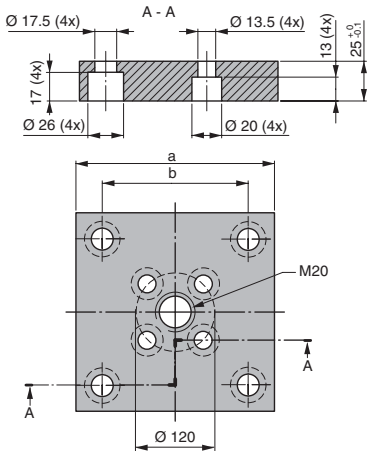
MP

* = According to updated ISO 11901 standard

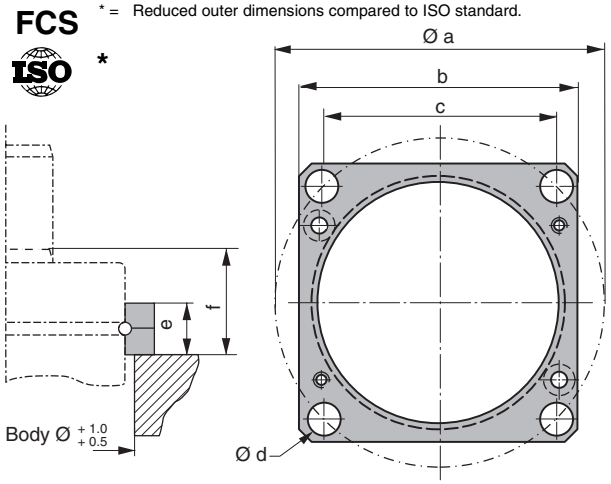


Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-10000	210	170

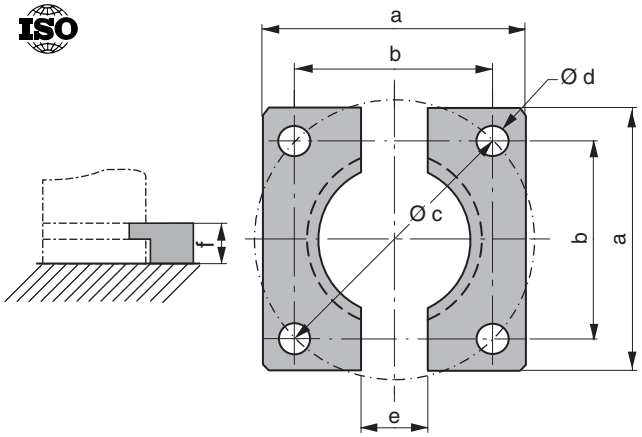
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-10000	240.4	210	170	17.5	27	47

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-10000	210	170	240.4	17.5	24	13

Note! For dimensions on mounting possibilities K refer to chapter 3.

10

HT - High Temperature gas springs (180 °C)

HT 250	APPROVED PED 97/23/EC	**2.10/2**
HTM 250	APPROVED PED 97/23/EC	**2.10/4**
HT 750	APPROVED PED 97/23/EC	**2.10/6**

HT 250

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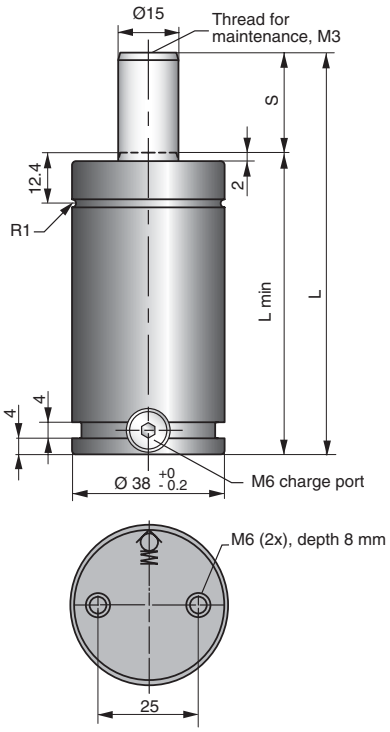


High Temp is a series of gas springs especially developed for the plastic and rubber industry where the surrounding temperature often reaches values above 100°C.

HT 250 dimensions and available mounts correspond to those of our standard TU 250.

The HT 250 model is also available in a threaded body version HTM 250.

Order No.	S Stroke	Force in N at 120 bar/+20°C Initial	Force in N at 120 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
HT 250-010	10	2100	3300	70	60	0.01	0.43
HT 250-013	12.7		3100	75.4	62.7	0.01	0.44
HT 250-016	16		3000	82	66	0.01	0.46
HT 250-025	25		2900	100	75	0.02	0.50
HT 250-038	38.1		2900	126.2	88.1	0.03	0.54
HT 250-050	50		2800	150	100	0.04	0.58
HT 250-064	63.5		2800	177	113.5	0.05	0.67
HT 250-080	80		2800	210	130	0.06	0.72
HT 250-100	100		2800	250	150	0.08	0.83

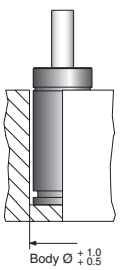
* = at full stroke

BASIC INFORMATION

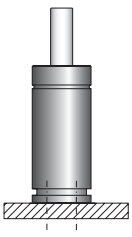
Pressure medium ..... Nitrogen
Max. charging pressure ..... 120 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... + 20 to +180°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 60 (at 20°C)
Max piston rod velocity ..... 0.5 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Nickel plated
Repair kit 3015091

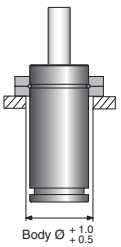
MOUNTING POSSIBILITIES



Drop - In



B
Bottom threads



FC, FCS
Top Mount

K, FFC
Foot Mount

Note! For dimensions on mounting possibilities K refer to chapter 3.

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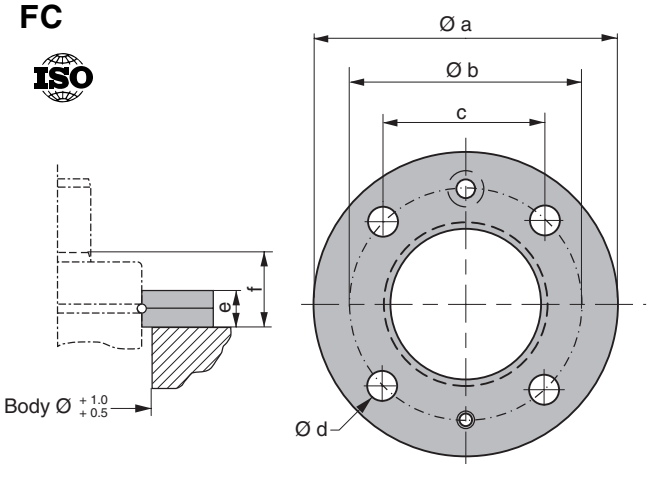
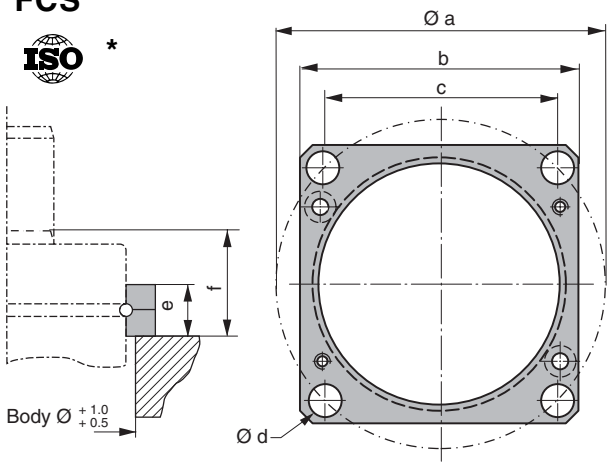
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-250	68	56.5	40	7	9	17

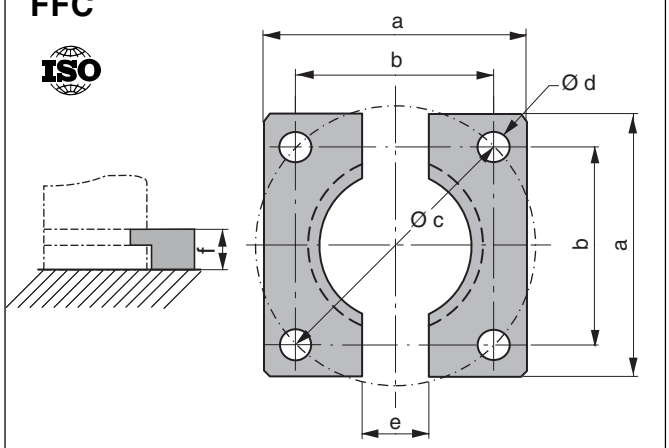
FCS

* = Reduced outer dimensions compared to ISO standard.



Order No.	Ø a	b	c	Ø d	e	f
FCS-250	56.5	52	40	7	9	17

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-250	55	40	56.6	7	5	6.5

Note! For dimensions on mounting possibilities K refer to chapter 3.

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HTM 250

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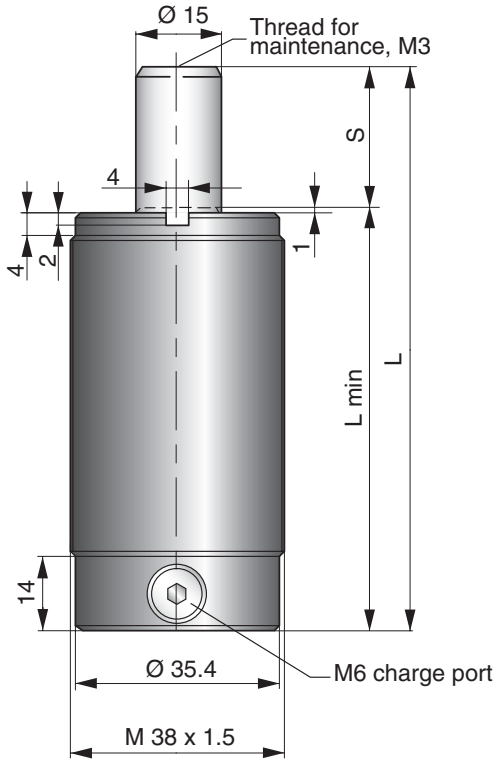


The HTM is a threaded body 250 spring with the same total length as the HT 250.

The HTM spring has a metric thread M38 x 1.5.

Order No.	S Stroke	Force in N at 120 bar/+20°C Initial	Force in N at 120 bar/+20°C End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
HTM/HTI 250-010	10	2100	3300	70	60	0.009	0.43
HTM/HTI 250-013	12.7		3100	75.4	62.7	0.011	0.44
HTM/HTI 250-016	16		3000	82	66	0.014	0.46
HTM/HTI 250-025	25		2900	100	75	0.020	0.50
HTM/HTI 250-038	38.1		2900	126.2	88.1	0.030	0.54
HTM/HTI 250-050	50		2800	150	100	0.039	0.58
HTM/HTI 250-064	63.5		2800	177	113.5	0.049	0.67
HTM/HTI 250-080	80		2800	210	130	0.061	0.72
HTM/HTI 250-100	100		2800	250	150	0.076	0.83

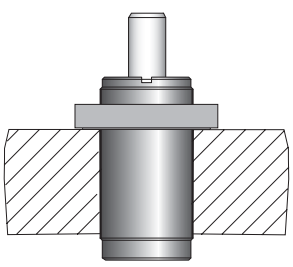
* = at full stroke

BASIC INFORMATION

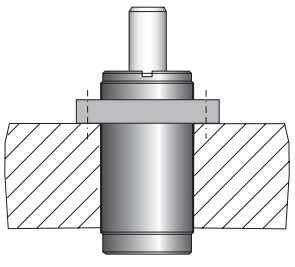
Pressure medium ..... Nitrogen
Max. charging pressure ..... 120 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... + 20 to +180°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 60 (at 20°C)
Max piston rod velocity ..... 0.5 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Nickel plated
Repair kit 3015091

MOUNTING POSSIBILITIES



FRM, FHM
Lock nut



FTM
Flange mount

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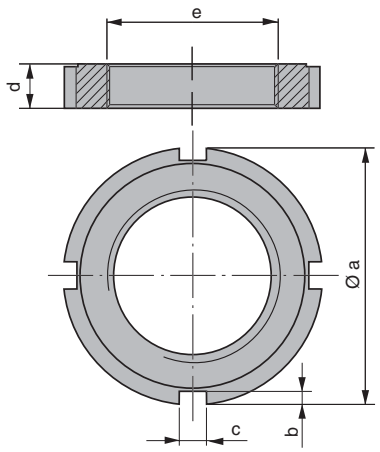
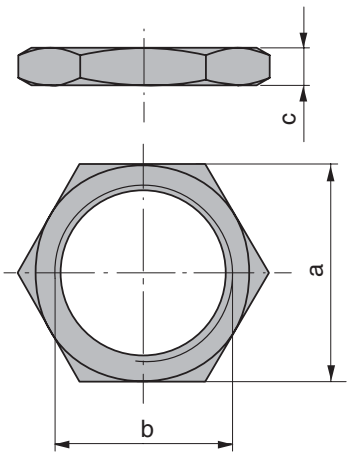
HTM/HTI 250 Mounts

FRM



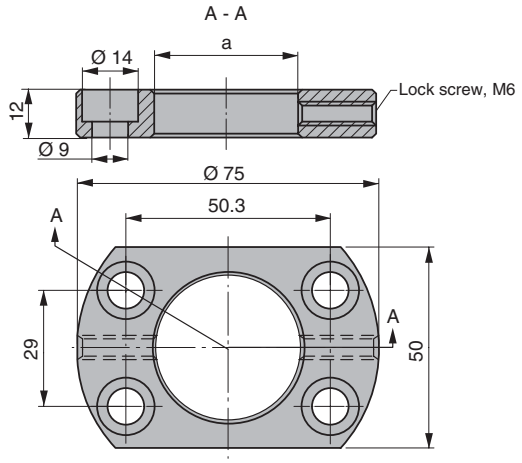
Order No.	Ø a	b	c	d	e
FRM-250	58	3.5	8	11	M38 x 1.5

FHM



Order No.	a	b	c
FHM-250	47	M38 x 1.5	8

FTM



Order No.	a
FTM-250	M38 x 1.5

11

HT 750

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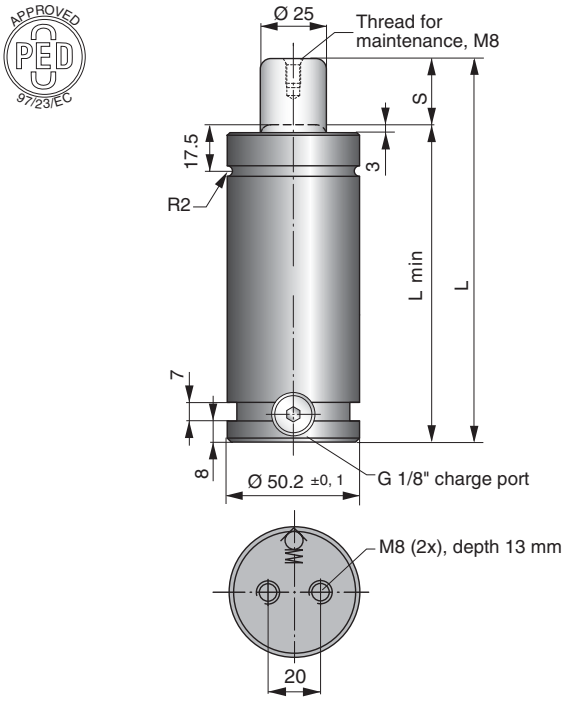


High Temp is a series of gas springs especially developed for the plastic and rubber industry where the surrounding temperature often reaches values above 100°C.

Dimensions and available mounts correspond to those of our standard TU 750.

Order No.	S Stroke	Force in N at 120 bar/+20°C Initial	End force*	L ± 0.25	L min	Gas vol. (l)	Weight (kg)
HT 750-013	12.7	5900	11000	120.4	107.7	0.03	1.2
HT 750-025	25		10300	145	120	0.04	1.4
HT 750-038	38.1		10000	171.2	133.1	0.06	1.6
HT 750-050	50		9900	195	145	0.07	1.7
HT 750-064	63.5		9800	222	158.5	0.09	1.8
HT 750-080	80		9800	255	175	0.11	1.9
HT 750-100	100		9800	295	195	0.14	2.1
HT 750-125	125		9700	345	220	0.17	2.4
HT 750-160	160		9700	415	255	0.21	2.7
HT 750-200	200		9700	495	295	0.26	2.76
HT 750-250	250		9700	595	345	0.33	2.82
HT 750-300	300		9700	695	395	0.39	2.87

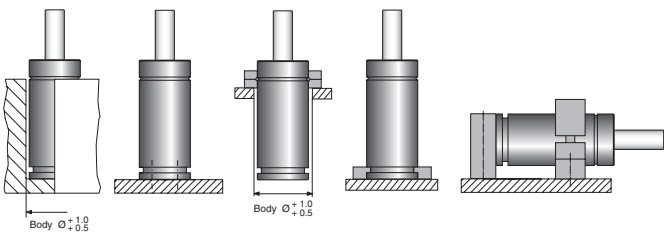
* = at full stroke

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 120 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... + 20 to +180°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.5 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Nickel plated
Repair kit 2015092-0750

MOUNTING POSSIBILITIES



Drop - In | **B, MP** | **FC, FCS** | **K, KU, FFC, FU** | **FAC, SA, S**

Bottom Mount | Top Mount | Foot Mount | Body Mount

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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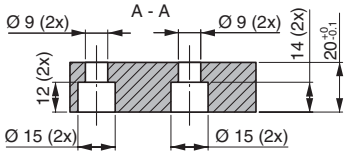
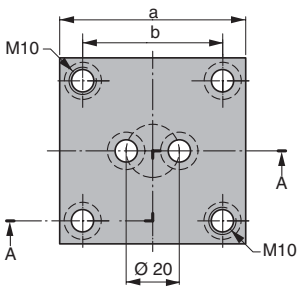
KALLER® HT 750 Mounts

MP

* = According to updated ISO 11901 standard

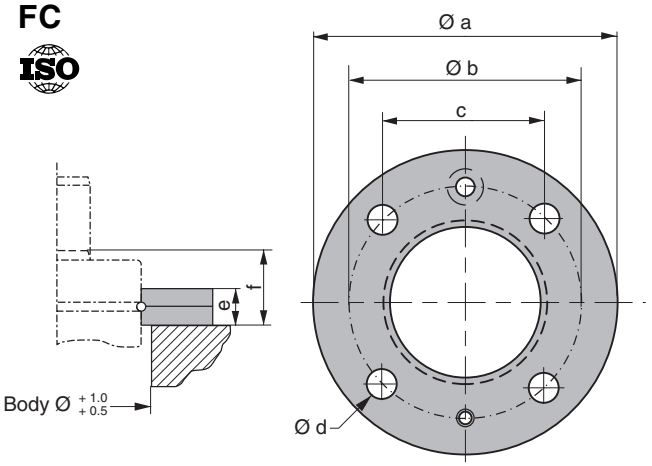




Note! Comes complete with screws to mount gas spring.

Order No.	a	b
MP-750	75	56.5

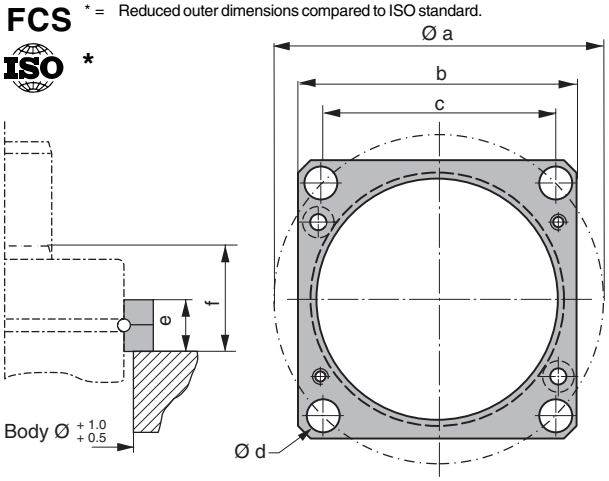
FC



Order No.	Ø a	Ø b	c	Ø d	e	f
FC-750	95	80	56.5	9	13	24

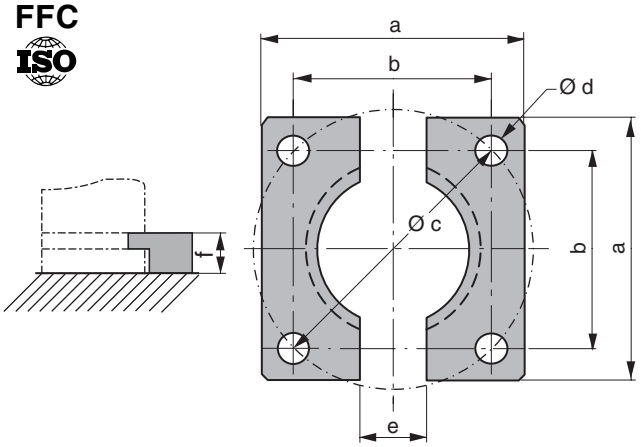
FCS

* = Reduced outer dimensions compared to ISO standard.



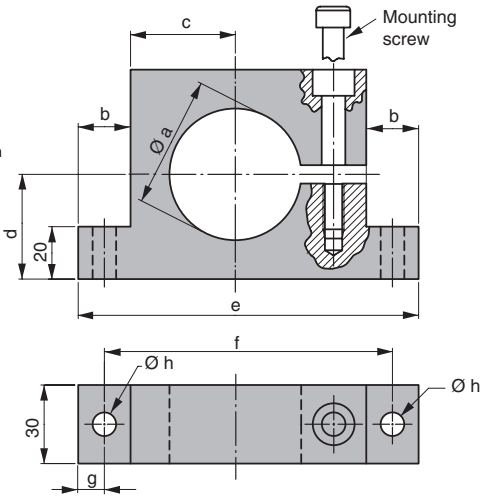
Order No.	Ø a	b	c	Ø d	e	f
FCS-750	80	70	56.5	9	13	24

FFC



Order No.	a	b	Ø c	Ø d	e	f
FFC-750	75	56.5	80	9	24	12

S



Note! Support S is designed to be used in combination with flanges mounted in the U or C groove or mounting option B.

The mounting screw (M8) should be tightened with torque 25 Nm.

Order No.	Ø a	b	c	d	e	f	g	Ø h
S-750	50.4	20	40	40	130	110	10	9

Note! For dimensions on mounting possibilities K, KU, FU, FAC and SA refer to chapter 3.

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HG 270-1060

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2.12/2

HG 270-1060

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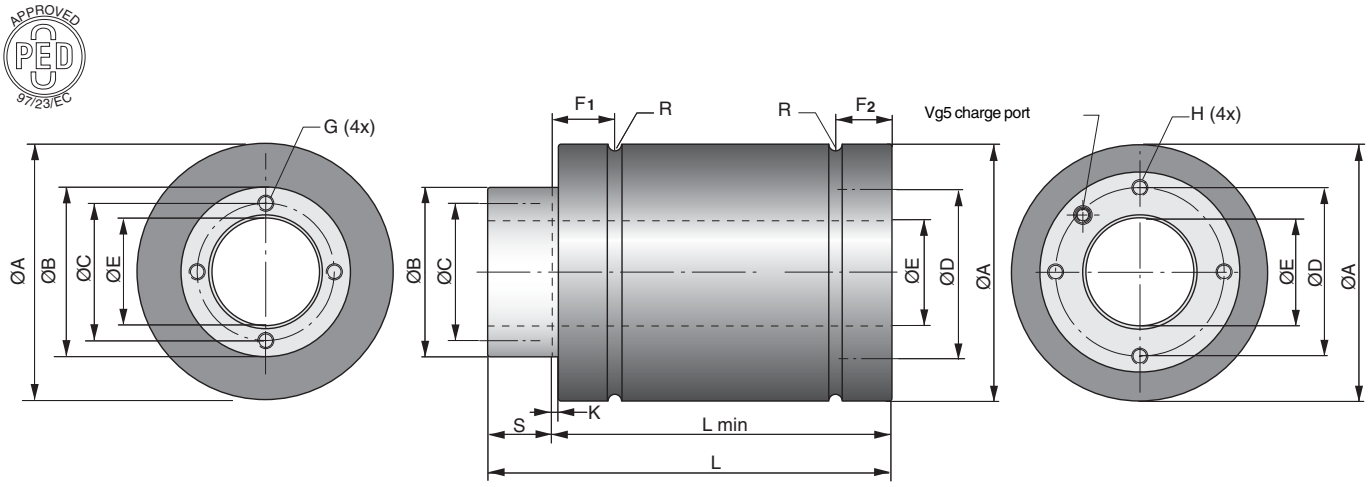


Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L +0 -1	L min	Gas vol. (l)	Weight (kg)
HG 270-016	16	2500	3902	108	92	0.01	0.57
HG 270-025	25		3860	126	101	0.02	0.62
HG 270-050	50		3826	176	126	0.04	0.75
HG 270-080	80		3813	236	156	0.06	0.94
HG 490-016	16	4700	7548	112	96	0.02	1.01
HG 490-025	25		7916	130	105	0.03	1.09
HG 490-050	50		8332	180	130	0.05	1.32
HG 490-080	80		8518	240	160	0.08	1.64
HG 1060-016	16	10300	16076	122	106	0.05	2.56
HG 1060-025	25		17006	140	115	0.06	2.80
HG 1060-050	50		18124	190	140	0.11	3.35
HG 1060-080	80		18644	250	170	0.16	3.98
HG 1060-100	100		18833	290	190	0.20	4.37

* = at full stroke

Model	Ø A ± 0.1	Ø B	Ø C	Ø D	Ø E	F_1	F_2	G	H	R	K
HG 270	37.9	22	--	--	10.4	11.5	10.5	--	--	1	2
HG 490	50.2	30	23	28	16.4	15.5	14.5	M4 (depth 8)	M4 (depth 8)	2	3
HG 1060	75.2	50	36	48	25.4	19	18	M6 (depth 11)	M6 (depth 12)	2.5	3

The Hollow Gas spring is a gas spring with a hole through the centre of the spring. The spring is not hoseable as it has no charge port on the side of the spring body.

Repair kit	Order No.
HG 270	3018340-0270
HG 490	3018340-0490
HG 1060	3018340-1060

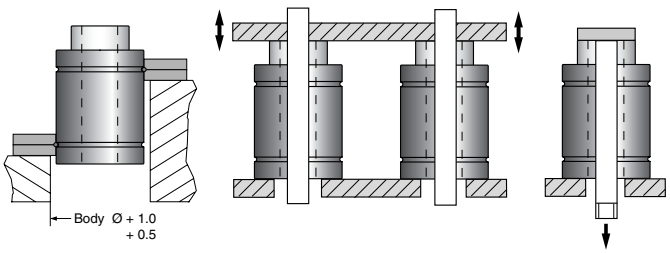
12

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 50 bar
Operating temperature ..... 0 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.5 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Nitrided

MOUNTING POSSIBILITIES



FC, FCS
Top Mount
Foot Mount

Bolster return,
Pillar mounted

Pulling

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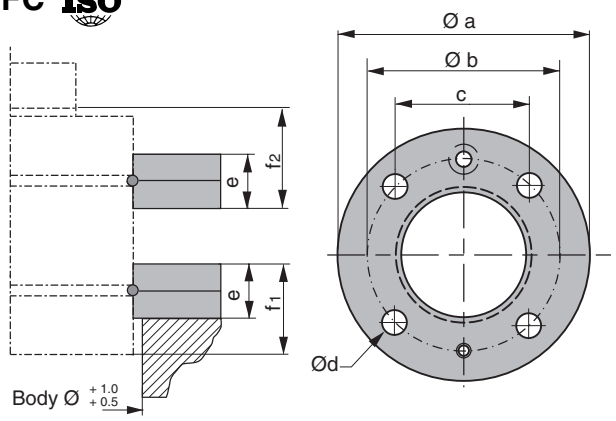
HG 270-1060 Mounts

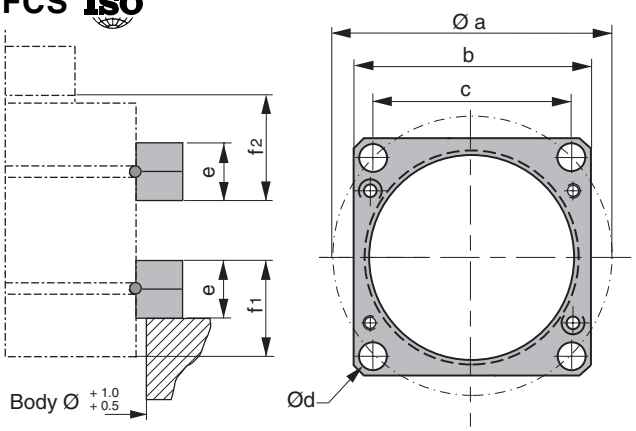
FC ISO



For model	Order No.	Ø a	Ø b	c	Ø d	e	f_1	f_2
HG 270	FC-250	68	56.5	40	7	9	15	16
HG 490	FC-750	95	80	56.5	9	13	21	22
HG 1060	FC-1500	122	104	73.5	11	16	26	27

FCS ISO *

* = Reduced outer dimensions compared to ISO standard.



For model	Order No.	Ø a	b	c	Ø d	e	f_1	f_2
HG 270	FCS-250	56.5	52	40	7	9	15	16
HG 490	FCS-750	80	70	56.5	9	13	21	22
HG 1060	FCS-1500	104	90	73.5	11	16	26	27

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Counter balance gas springs

TET and TEE 750-3000

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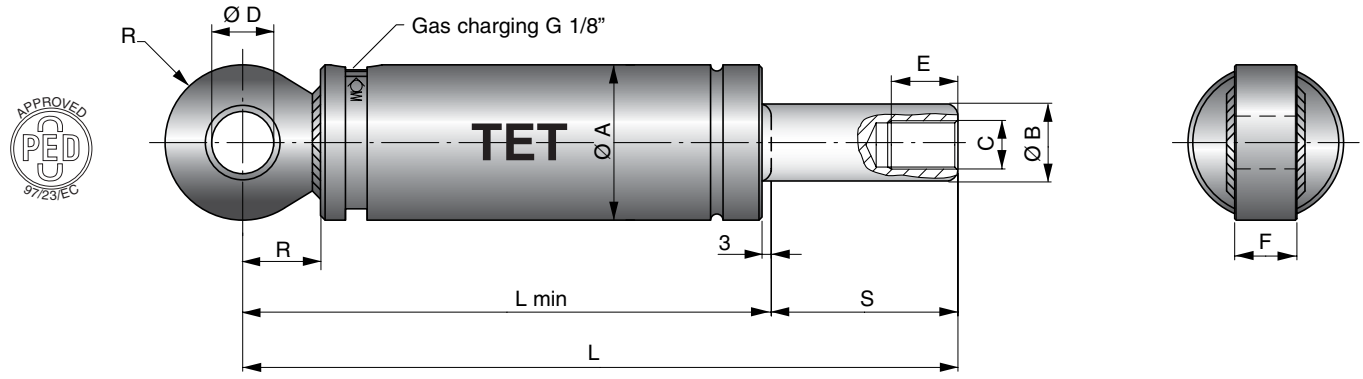
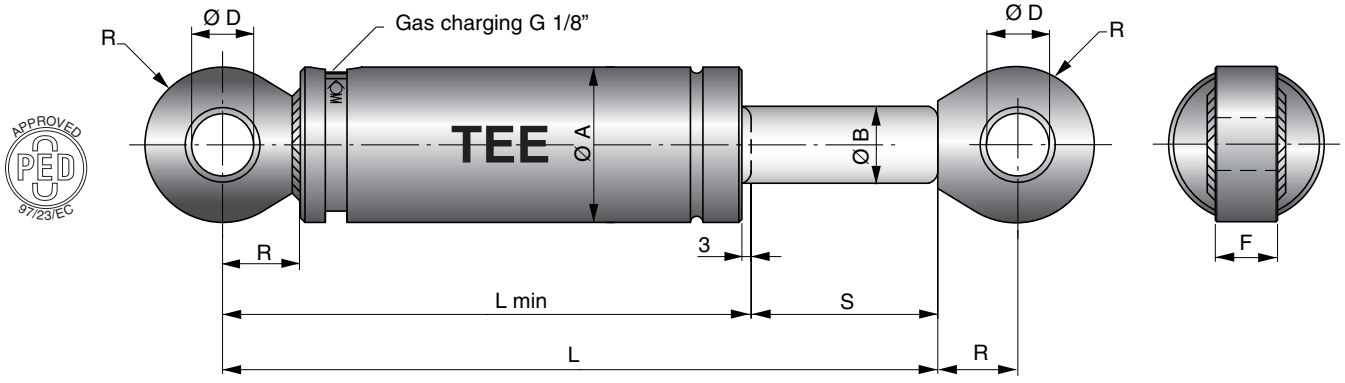




The TET and TEE are gas springs with ears for attachment. The TET has an ear at the bottom of the tube and an attachment thread in the top of the piston rod. The TEE has ears at both ends of the spring.

If the axels will rotate in the ears we recommend using the TEBT/TEBEB instead.

As standard the springs are only for in-door use. If the springs are to be used outdoors, please contact your distributor for further information.

Note! The gas springs are not to be exposed to any pulling forces. If needed a mechanical stop must be installed to prevent this from happening.

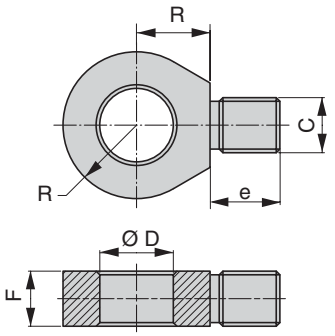
13

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... + 20 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1

Rod surface ..... Nitrided
Tube surface ..... Black oxide
* Repair kit 750 PED 3019817
* Repair kit 750 2014068-01
* Repair kit 1500 PED 3019816
* Repair kit 1500 2014068-02
* Repair kit 3000 PED 3019025
* Repair kit 3000 2014068-03
*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

DIMENSION ATTACHMENT E



For size	Order No.	C	Ø D	e	F	R
750	E-750	M16 x 1.5	20	20	20	25
1500	E-1500	M24 x 2	35	30	25	35
3000	E-3000	M30 x 2	40	38	30	40

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TET and TEE 750-3000

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.5	L min	Ø A ± 0.1	Ø B	C	Ø D	E	F	R	Gas vol. (l)	TET Weight (kg)	TEE Weight (kg)
TET/TEE 750-013	12.7	7400	12000	145.4	132.7	50.2	25	M16x1.5	20	22	20	25	0.03	1.57	1.87
TET/TEE 750-025	25		12000	170	145								0.04	1.72	2.02
TET/TEE 750-038	38.1		12000	196.2	158.1								0.06	1.77	2.07
TET/TEE 750-050	50		12000	220	170								0.07	1.97	2.27
TET/TEE 750-064	63.5		12000	247	183.5								0.09	2.02	2.32
TET/TEE 750-080	80		12000	280	200								0.11	2.22	2.52
TET/TEE 750-100	100		12000	320	220								0.14	2.42	2.72
TET/TEE 750-125	125		12100	370	245								0.17	2.67	2.97
TET/TEE 750-160	160		12100	440	280								0.21	2.97	3.27
TET/TEE 750-200	200		12100	520	320								0.26	3.37	3.67
TET/TEE 750-250	250		12100	620	370								0.33	3.87	4.17
TET/TEE 750-300	300		12100	720	420								0.39	4.37	4.67
TET/TEE 1500-025	25	15000	23000	195	170	75.2	36	M24x2	35	32	25	35	0.10	3.97	4.61
TET/TEE 1500-038	38.1		23000	221.1	183.1								0.15	4.21	4.85
TET/TEE 1500-050	50		23000	245	195								0.18	4.44	5.08
TET/TEE 1500-064	63.5		23000	272	208.5								0.22	4.70	5.34
TET/TEE 1500-080	80		23000	305	225								0.28	5.01	5.65
TET/TEE 1500-100	100		23000	345	245								0.34	5.39	6.03
TET/TEE 1500-125	125		23000	395	270								0.42	5.87	6.51
TET/TEE 1500-160	160		23000	465	305								0.53	6.58	7.22
TET/TEE 1500-200	200		23000	545	345								0.68	7.34	7.98
TET/TEE 1500-250	250		23000	645	395								0.81	8.29	8.93
TET/TEE 1500-300	300		23000	745	445								0.96	9.24	9.88
TET/TEE 3000-025	25	30000	42000	210	185	95.2	50	M30x2	40	40	30	40	0.20	7.18	8.28
TET/TEE 3000-038	38.1		43000	236.2	198.1								0.26	7.69	8.79
TET/TEE 3000-050	50		44000	260	210								0.32	8.15	9.25
TET/TEE 3000-064	63.5		45000	287	223.5								0.38	8.68	9.78
TET/TEE 3000-080	80		46000	320	240								0.46	9.32	10.42
TET/TEE 3000-100	100		47000	360	260								0.56	10.10	11.20
TET/TEE 3000-125	125		47000	410	285								0.69	11.07	12.17
TET/TEE 3000-160	160		47000	480	320								0.87	12.42	13.52
TET/TEE 3000-200	200		48000	560	360								1.07	13.98	15.08
TET/TEE 3000-250	250		48000	660	410								1.32	15.92	17.02
TET/TEE 3000-300	300		48000	760	460								1.57	17.86	18.96

* = at full stroke

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TEBT and TEBEB 750-5000

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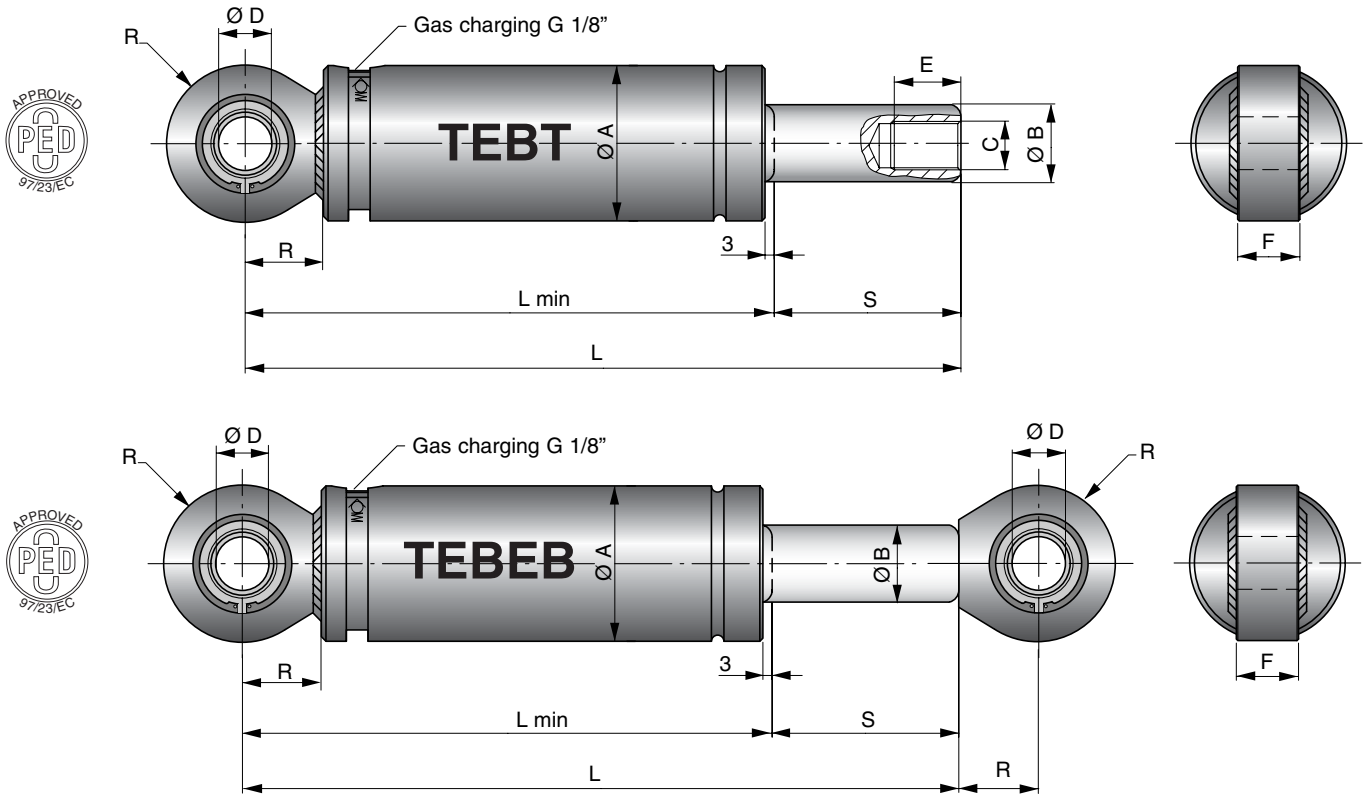


The TEBT and TEBEB are gas springs with ears, containing bearings, for attachment.The TEBT has an ear (with bearing) at the bottom of the tube, an attachment thread in the top of the piston rod. The TEBEB has ears (with bearings) at both ends of the spring.

As standard the springs are only for in-door use. If the springs are to be used outdoors, please contact your distributor for further information.

Note! The gas springs are not to be exposed to any pulling forces. If needed a mechanical stop must be installed to prevent this from happening.

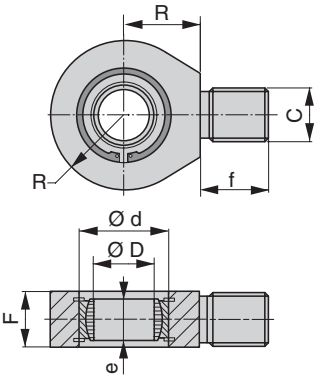
13

BASIC INFORMATION

Pressure medium ..... Nitrogen
Max. charging pressure ..... 150 bar
Min. charging pressure ..... 25 bar
Operating temperature ..... + 20 to +80°C
Force increase by temperature ..... ±0.3%/°C
Recommended max strokes/min ..... ~ 15-40 (at 20°C)
Max piston rod velocity ..... 0.8 m/s
Note! For more information see “About gas springs”, 2.1
Rod surface ..... Nitrided
Tube surface ..... Black oxide
* Repair kit 750 PED 3019817
* Repair kit 750 2014068-01
* Repair kit 1500 PED 3019816
* Repair kit 1500 2014068-02
* Repair kit 3000 PED 3019025
* Repair kit 3000 2014068-03
* Repair kit 5000 PED 3018876
* Repair kit 5000 2014068-04

*** Please note!** For those gas springs whose tube, guide and piston rod top are marked with circular rings, it is the PED Repair Kit version that must be used.

DIMENSION ATTACHMENT EB



For size	Order No.	c	Ø D	Ø d	e	F	f	R
750	EB-750	M16 x 1.5	17	30	14	20	20	25
1500	EB-1500	M24 x 2	25	42	20	25	30	35
3000	EB-3000	M30 x 2	30	47	22	30	38	40
5000	EB-5000	M36 x 2	45	68	32	40	40	55

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TEBT and TEBEB 750-5000

Order No.	S Stroke	Force in N at 150 bar/+20°C Initial	Force in N at 150 bar/+20°C End force*	L ± 0.5	L min	Ø A ± 0.1	Ø B	C	Ø D	E	F	R	Gas vol. (l)	TEBT Weight (kg)	TEBEB Weight (kg)
TEBT/TEBEB 750-013	12.7	7400	12000	145.4	132.7	50.2	25	M16x1.5	17	22	20	25	0.03	1.54	1.80
TEBT/TEBEB 750-025	25		12000	170	145								0.04	1.69	1.95
TEBT/TEBEB 750-038	38.1		12000	196.2	158.1								0.06	1.74	2.00
TEBT/TEBEB 750-050	50		12000	220	170								0.07	1.94	2.20
TEBT/TEBEB 750-064	63.5		12000	247	183.5								0.09	1.99	2.25
TEBT/TEBEB 750-080	80		12000	280	200								0.11	2.19	2.45
TEBT/TEBEB 750-100	100		12000	320	220								0.14	2.39	2.65
TEBT/TEBEB 750-125	125		12100	370	245								0.17	2.64	2.90
TEBT/TEBEB750-160	160		12100	440	280								0.21	2.94	3.20
TEBT/TEBEB 750-200	200		12100	520	320								0.26	3.34	3.60
TEBT/TEBEB 750-250	250		12100	620	370								0.33	3.84	4.10
TEBT/TEBEB 750-300	300		12100	720	420								0.39	4.34	4.60
TEBT/TEBEB 1500-025	25	15000	23000	195	170	75.2	36	M24x2	25	32	25	35	0.10	3.98	4.64
TEBT/TEBEB 1500-038	38.1		23000	221.1	183.1								0.15	4.22	4.88
TEBT/TEBEB 1500-050	50		23000	245	195								0.18	4.45	5.11
TEBT/TEBEB 1500-064	63.5		23000	272	208.5								0.22	4.71	5.37
TEBT/TEBEB 1500-080	80		23000	305	225								0.28	5.02	5.68
TEBT/TEBEB 1500-100	100		23000	345	245								0.34	5.40	6.06
TEBT/TEBEB 1500-125	125		23000	395	270								0.42	5.88	6.54
TEBT/TEBEB 1500-160	160		23000	465	305								0.53	6.59	7.25
TEBT/TEBEB 1500-200	200		23000	545	345								0.68	7.35	8.01
TEBT/TEBEB 1500-250	250		23000	645	395								0.81	8.30	8.96
TEBT/TEBEB 1500-300	300		23000	745	445								0.96	9.25	9.91
TEBT/TEBEB 3000-025	25	30000	42000	210	185	95.2	50	M30x2	30	40	30	40	0.20	7.37	8.63
TEBT/TEBEB 3000-038	38.1		43000	236.2	198.1								0.26	7.88	9.14
TEBT/TEBEB 3000-050	50		44000	260	210								0.32	8.34	9.60
TEBT/TEBEB 3000-064	63.5		45000	287	223.5								0.38	8.87	10.13
TEBT/TEBEB 3000-080	80		46000	320	240								0.46	9.51	10.77
TEBT/TEBEB 3000-100	100		47000	360	260								0.56	10.29	11.55
TEBT/TEBEB 3000-125	125		47000	410	285								0.69	11.26	12.52
TEBT/TEBEB 3000-160	160		47000	480	320								0.87	12.61	13.87
TEBT/TEBEB 3000-200	200		48000	560	360								1.07	14.17	15.43
TEBT/TEBEB 3000-250	250		48000	660	410								1.32	16.11	17.37
TEBT/TEBEB 3000-300	300		48000	760	460								1.57	18.05	19.31
TEBT/TEBEB 5000-025	25	50000	71000	245	220	120.1	65	M36x2	45	43	40	55	0.32	14.81	17.51
TEBT/TEBEB 5000-038	38.1		75000	271.2	233.1								0.42	15.51	18.21
TEBT/TEBEB 5000-050	50		77000	295	245								0.51	16.14	18.84
TEBT/TEBEB 5000-064	63.5		80000	322	258.5								0.60	16.86	19.56
TEBT/TEBEB 5000-080	80		81000	355	275								0.73	17.73	20.43
TEBT/TEBEB 5000-100	100		82000	395	295								0.89	18.80	21.50
TEBT/TEBEB 5000-125	125		82000	445	320								1.09	20.13	22.83
TEBT/TEBEB 5000-160	160		83000	515	355								1.36	21.99	24.69
TEBT/TEBEB 5000-200	200		84000	595	395								1.68	24.11	26.81
TEBT/TEBEB 5000-250	250		84000	695	445								2.07	26.77	29.47
TEBT/TEBEB 5000-300	300		84000	795	495								2.46	29.43	32.13

* = at full stroke

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Automotive standards - Ford W-DX, GM M-1500

FORD WDX356015-XX-XX-DMS
FORD WDX356025-XX-XX-DMS

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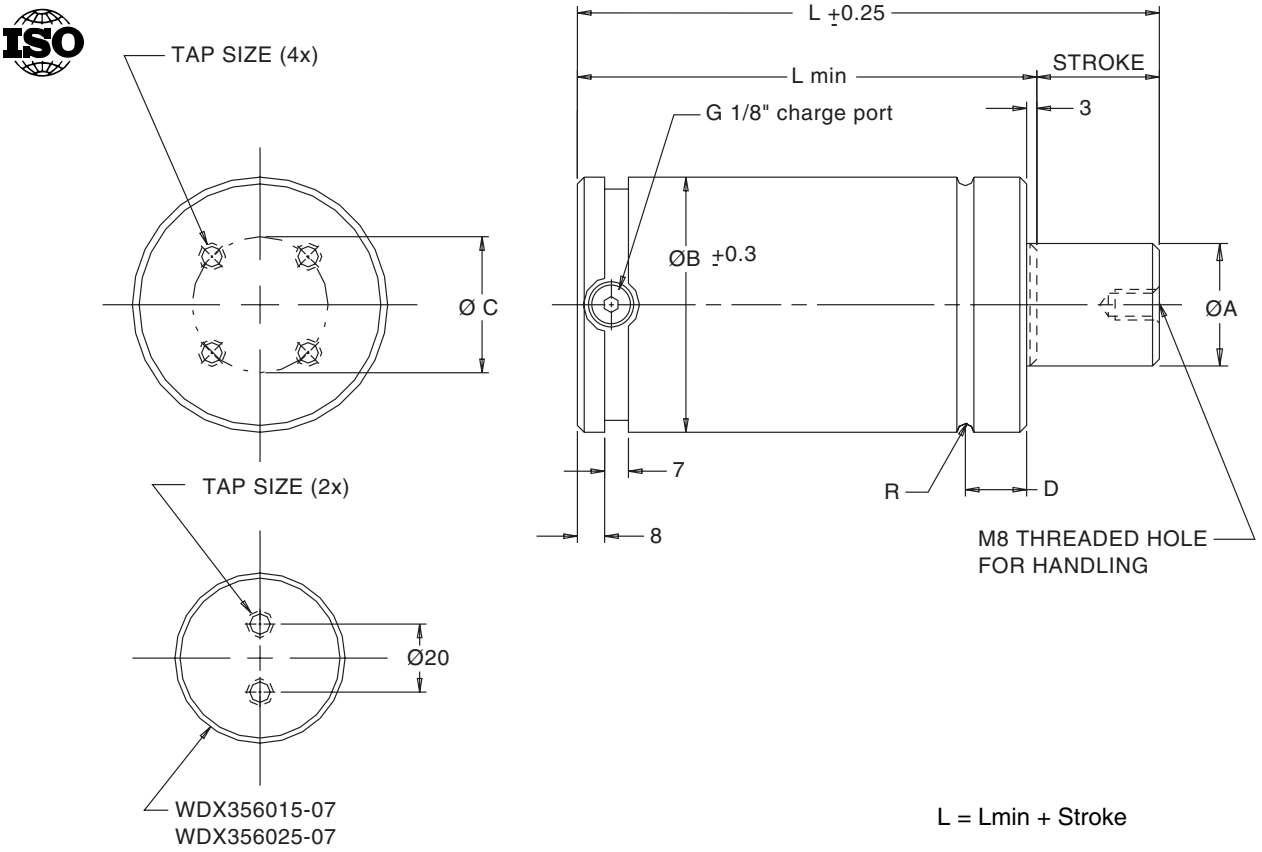

L = Lmin + Stroke

FORD Part No. = Order No.	Gas spring	L min	ØA	ØB	C	D	R	Tap size
WDX356015-07-XX-DMS	TU 750	95 + stroke	25	50	20	14.5	2.0	M8 x 13 deep
WDX356015-15-XX-DMS	TU 1500	110 + stroke	36	75	40	18.0	2.5	M8 x 13 deep
WDX356015-30-XX-DMS	TU 3000	120 + stroke	50	95	60	21.0	2.5	M8 x 13 deep
WDX356015-50-XX-DMS	TU 5000	140 + stroke	65	120	80	22.5	2.5	M10 x 16 deep
WDX356015-75-XX-DMS	TU 7500	155 + stroke	80	150	100	24.5	2.5	M10 x 16 deep

FORD Part No. = Order No.	Gas spring	L min	ØA	ØB	C	D	R	Tap size
WDX356025-07-XX-DMS	LCF 750	95 + stroke	25	50	20	14.5	2.0	M8 x 13 deep
WDX356025-15-XX-DMS	LCF 1500	110 + stroke	36	75	40	18.0	2.5	M8 x 13 deep
WDX356025-30-XX-DMS	LCF 3000	120 + stroke	50	95	60	21.0	2.5	M8 x 13 deep
WDX356025-50-XX-DMS	LCF 5000	140 + stroke	65	120	80	22.5	2.5	M10 x 16 deep
WDX356025-75-XX-DMS	LCF 7500	155 + stroke	80	150	100	24.5	2.5	M10 x 16 deep

• Label 8100-3845 is to be filled out and placed directley above the G1/8" charging port, covering the original KALLER marking. (See page 2.17/9)

ORDERING EXAMPLE

WDX356015 07 05 DM S

- S — SELF CONTAINED CODE (S)
- DM — TYPE OF MOUNTING CODE
- 05 — CYLINDER STROKE CODE
- 07 — CYLINDER SIZE CODE
- WDX356015 — FORD BASIC PART NUMBER

XX = Stroke	FORD Code
25	02
38.1	03
50	05
63.5	06
80	08
100	10
125	12
160	16
200	20

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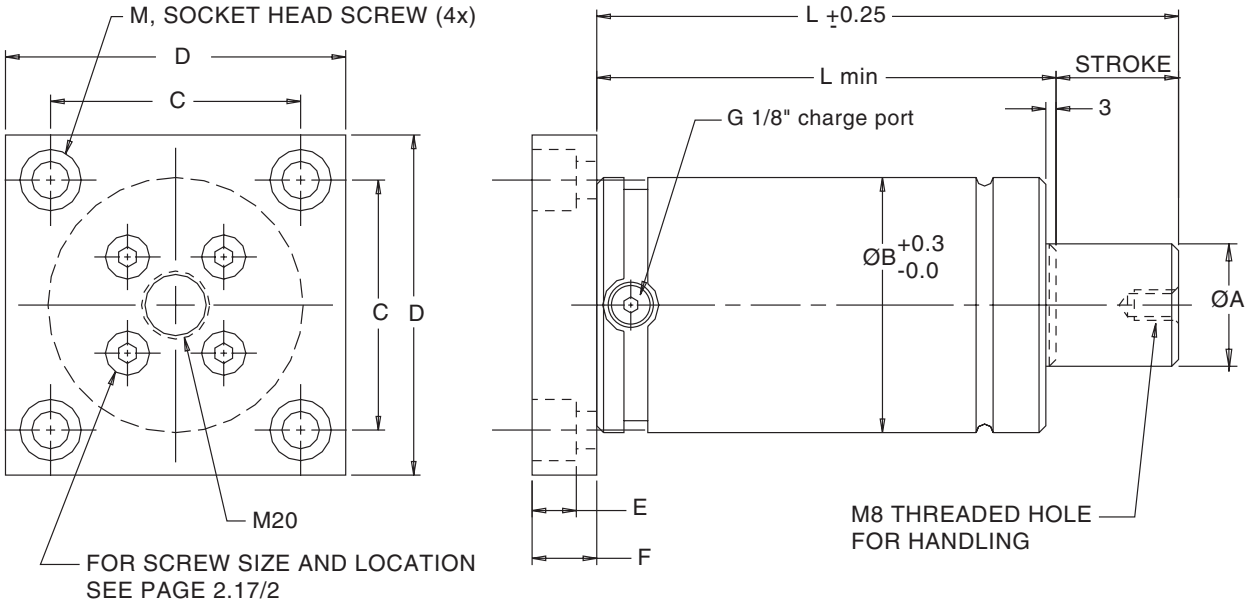
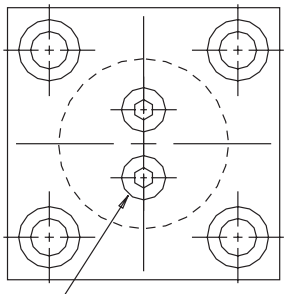
KALLER® FORD WDX356016-XX-XX-PM(1)





NOTE! FOR PIPED SYSTEM (P) ADAPTER 4017764
IS SUPPLIED WITH GAS SPRING, SEE PAGE 2.17/9

WDX356016-07-XX-PM ONLY
TWO SCREWS, SEE PAGE 2.17/2

L = Lmin + Stroke

FORD Part No. = Order No.	Gas spring	Spring mount	L min	ØA	ØB	C	D	E	F	M
WDX356016-07-XX-PM(1)	TU 750	MP-750	95 + stroke	25	50	56.5	80	12	20	M10
WDX356016-15-XX-PM(1)	TU 1500	MP-1500	110 + stroke	36	75	73.5	100	12	20	M10
WDX356016-30-XX-PM(1)	TU 3000	MP-3000	120 + stroke	50	95	92.0	120	13	20	M12
WDX356016-50-XX-PM(1)	TU 5000	MP-5000	140 + stroke	65	120	109.5	140	13	20	M12
WDX356016-75-XX-PM(1)	TU 7500	MP-7500	155 + stroke	80	150	138.0	190	17	25	M16

14

• 1 = S = Self contained
P = Piped system supplied with adapter 4017764 mounted in the G 1/8" charge port before delivery.
Note! Remember to remove the valve from the spring when using an adapter.
• Label 8100-3845 is to be filled out and placed directley above the G1/8" charging port, covering the original KALLER marking. (See page 2.17/9).

ORDERING EXAMPLE

WDX356016 07 05 PM S

- PIPED SYSTEM CODE (P) / SELF CONTAINED CODE (S)
- TYPE OF MOUNTING CODE
- CYLINDER STROKE CODE
- CYLINDER SIZE CODE
- FORD BASIC PART NUMBER

XX= Stroke	FORD Code
25	02
38.1	03
50	05
63.5	06
80	08
100	10
125	12
160	16
200	20

FORD WDX356017-XX-XX-SW(1)
FORD WDX356026-XX-XX-SW(1)

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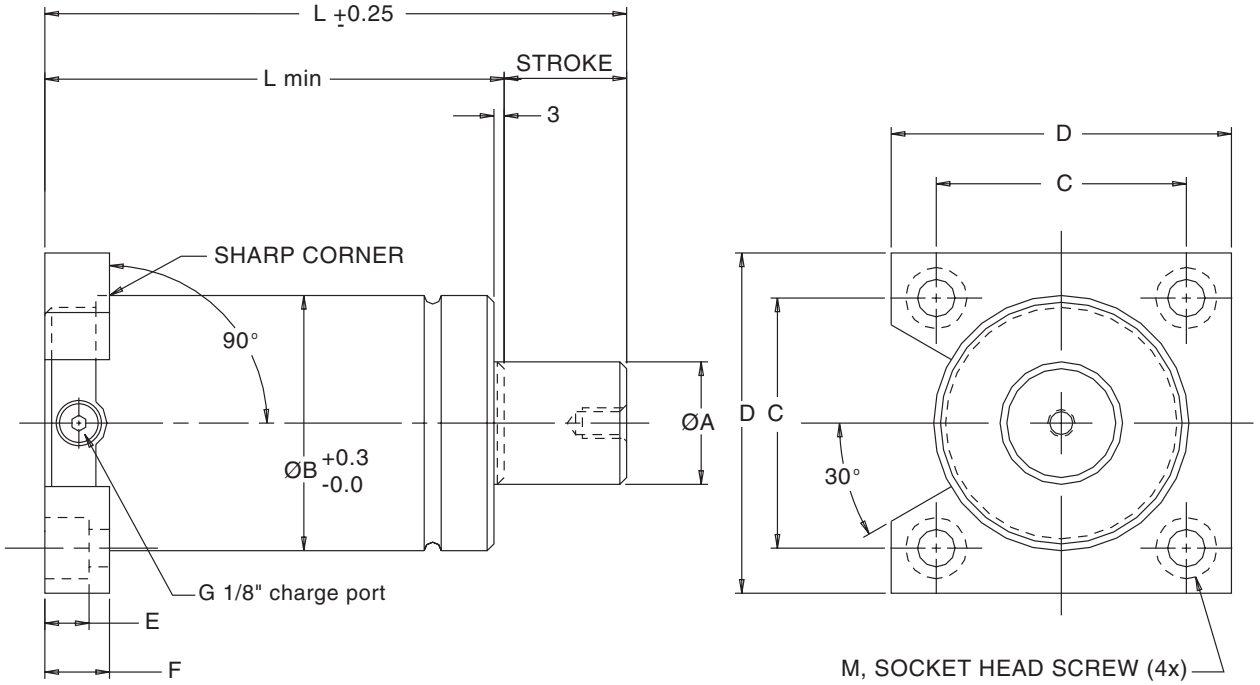

NOTE! FOR PIPED SYSTEM (P) ADAPTER 4017764
IS SUPPLIED WITH GAS SPRING, SEE PAGE 2.17/9

L = Lmin + Stroke

FORD Part No. = Order No.	Gas spring	Spring mount	L min	ØA	ØB	C	D	E	F	M
WDX356017-07-XX-SW(1)	TU 750	SW-750	95 + stroke	25	50	56.5	80	11	19	M10
WDX356017-15-XX-SW(1)	TU 1500	SW-1500	110 + stroke	36	75	73.5	100	11	19	M10
WDX356017-30-XX-SW(1)	TU 3000	SW-3000	120 + stroke	50	95	92.0	120	13	25	M12
WDX356017-50-XX-SW(1)	TU 5000	SW-5000	140 + stroke	65	120	109.5	140	13	25	M12
WDX356017-75-XX-SW(1)	TU 7500	SW-7500	155 + stroke	80	150	138.0	190	17	25	M16

FORD Part No. = Order No.	Gas spring	Spring mount	L min	ØA	ØB	C	D	E	F	M
WDX356026-07-XX-SW(1)	LCF 750	SW-750	95 + stroke	25	50	56.5	80	11	19	M10
WDX356026-15-XX-SW(1)	LCF 1500	SW-1500	110 + stroke	36	75	73.5	100	11	19	M10
WDX356026-30-XX-SW(1)	LCF 3000	SW-3000	120 + stroke	50	95	92.0	120	13	25	M12
WDX356026-50-XX-SW(1)	LCF 5000	SW-5000	140 + stroke	65	120	109.5	140	13	25	M12
WDX356026-75-XX-SW(1)	LCF 7500	SW-7500	155 + stroke	80	150	138.0	190	17	25	M16

14

• [1]= S = Self contained
P = Piped system supplied with adapter 40 177 64 mounted in the G 1/8" port before delivery.
Note! Remember to remove the valve from the spring when using an adapter.

ORDERING EXAMPLE

WDX356017 07 05 SW S

- S: PIPED SYSTEM CODE (P) / SELF CONTAINED CODE (S)
- SW: TYPE OF MOUNTING CODE
- 05: CYLINDER STROKE CODE
- 07: CYLINDER SIZE CODE
- WDX356017: FORD BASIC PART NUMBER

XX= Stroke	FORD Code
25	02
38.1	03
50	05
63.5	06
80	08
100	10
125	12
160	16
200	20

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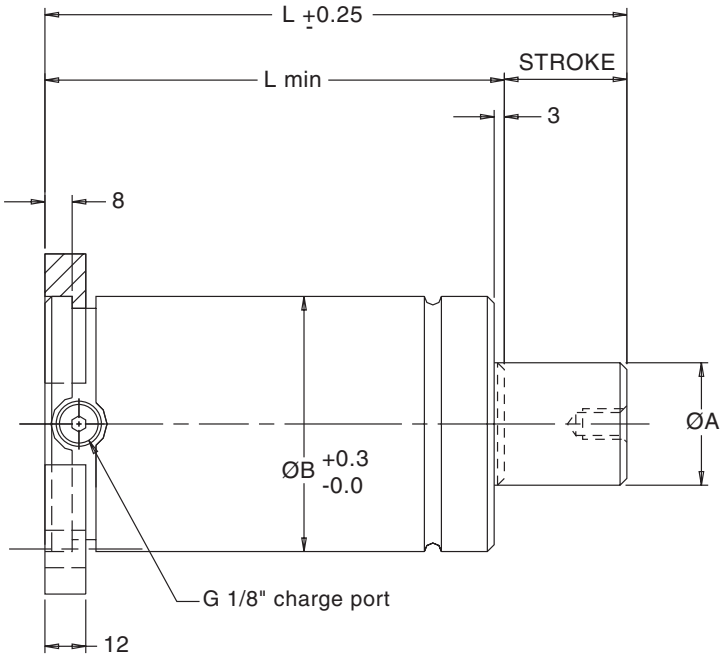
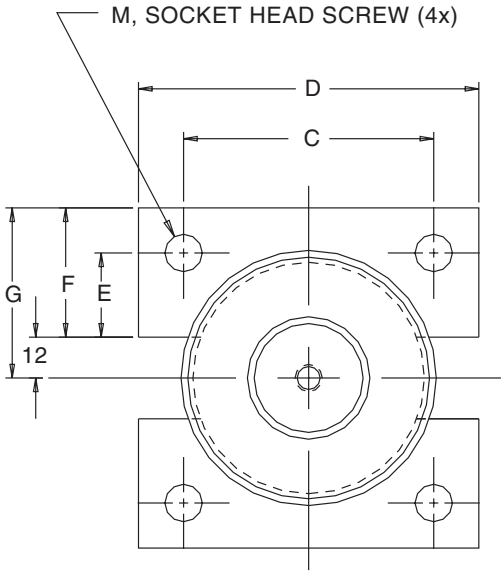
KALLER® FORD WDX356018-XX-XX-SLS





L = Lmin + Stroke

FORD Part No. = Order No.	Gas spring	Spring mount	L min	ØA	ØB	C	D	E	F	G	M
WDX356018-07-XX-SLS	TU 750	FORD FFC-750(1)	95 + stroke	25	50	56.5	80	16.25	28	40	M10
WDX356018-15-XX-SLS	TU 1500	FFC-1500	110 + stroke	36	75	73.5	100	24.75	38	50	M10
WDX356018-30-XX-SLS	TU 3000	FFC-3000	120 + stroke	50	95	92.0	120	34.00	48	60	M12
WDX356018-50-XX-SLS	TU 5000	FFC-5000	140 + stroke	65	120	109.5	140	42.75	58	70	M12
WDX356018-75-XX-SLS	TU 7500	FFC-7500	155 + stroke	80	150	138.0	190	57.00	83	95	M16

• [1]= FFC flange does not comply with KALLER standard. Mounting bolt size M10 instead of M8 (see page 3.1/6).
• Label 8100-3845 is to be filled out and placed directley above the G1/8" charging port, covering the original KALLER marking. (See page 2.17/9).

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ORDERING EXAMPLE

WDX356018 07 05 SL S

- SELF CONTAINED CODE (S)
- TYPE OF MOUNTING CODE
- CYLINDER STROKE CODE
- CYLINDER SIZE CODE
- FORD BASIC PART NUMBER

XX= Stroke	FORD Code
25	02
38.1	03
50	05
63.5	06
80	08
100	10
125	12
160	16
200	20

FORD WDX356019-XX-XX-TMS

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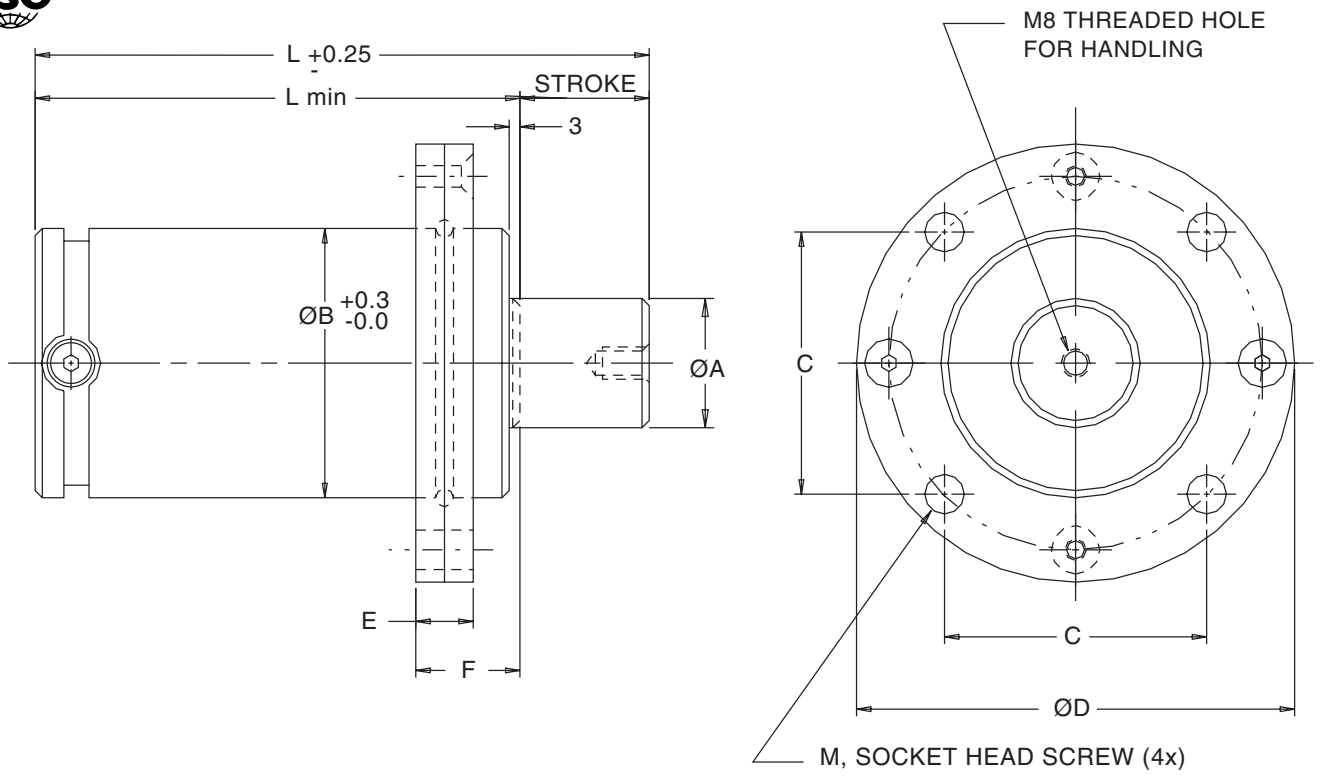

L = Lmin + Stroke

FORD Part No. = Order No.	Gas spring	Spring mount	L min	ØA	ØB	C	D	E	F	M
WDX356019-07-XX-TMS	TU 750	FORD FC-750(1)	95 + stroke	25	50	56.5	95	13	24	M10
WDX356019-15-XX-TMS	TU 1500	FC-1500	110 + stroke	36	75	73.5	122	16	29	M10
WDX356019-30-XX-TMS	TU 3000	FC-3000	120 + stroke	50	95	92.0	150	18	33	M12
WDX356019-50-XX-TMS	TU 5000	FC-5000	140 + stroke	65	120	109.5	175	21	36	M12
WDX356019-75-XX-TMS	TU 7500	FC-7500	155 + stroke	80	150	138.0	220	26	41	M16

• [1]= FC flange does not comply with KALLER standard. Mounting bolt size M10 instead of M8 (see page 3.1/6).

• Label 8100-3845 is to be filled out and placed directley above the G1/8" charging port, covering the original KALLER marking. (See page 2.17/9).

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ORDERING EXAMPLE

WDX356019 07 05 TM S

- S — SELF CONTAINED CODE (S)
- TM — TYPE OF MOUNTING CODE
- 05 — CYLINDER STROKE CODE
- 07 — CYLINDER SIZE CODE
- WDX356019 — FORD BASIC PART NUMBER

XX= Stroke	FORD Code
25	02
38.1	03
50	05
63.5	06
80	08
100	10
125	12
160	16
200	20

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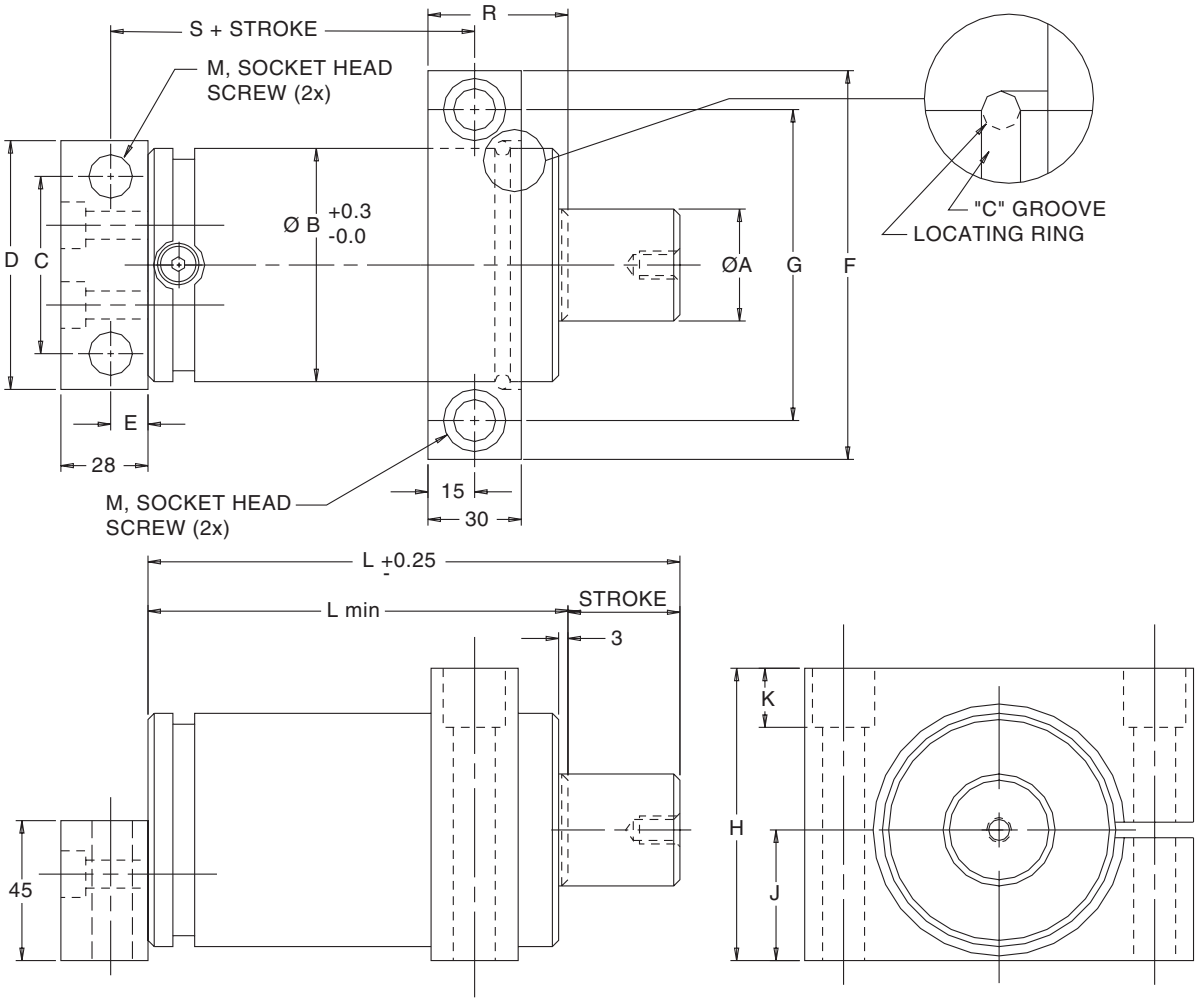
KALLER® FORD WDX356020-XX-XX-HM(1)



NOTE! FOR PIPED SYSTEM (P) ADAPTER 4017764 IS SUPPLIED WITH GAS SPRING, SEE PAGE 2.17/9

L = Lmin + Stroke

FORD Part No. = Order No.	Gas spring	Spring mount	L min	ØA	ØB	C	D	E	F	G	H	J	K	M	R	S
WDX356020-07-XX-HM(1)	TU 750	HM-750	95 + stroke	25	50	44	65	13	90	68	70	30	25	M10	43	80
WDX356020-15-XX-HM(1)	TU 1500	HM-1500	110 + stroke	36	75	57	80	12	125	100	94	42	19	M12	45	92
WDX356020-30-XX-HM(1)	TU 3000	HM-3000	120 + stroke	50	95	70	95	15	140	115	115	52.5	40	M12	48	102

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• [1]= S = Self contained
P = Piped system supplied with adapter 40 177 64 mounted in the G 1/8" port before delivery.
Note! Remember to remove the valve from the spring.
• Label 8100-3845 is to be filled out and placed directley above the G1/8" charging port, covering the original KALLER marking. (See page 2.17/9).

ORDERING EXAMPLE

WDX356020 07 05 HM S

- S: PIPED SYSTEM CODE (P) / SELF CONTAINED CODE (S)
- HM: TYPE OF MOUNTING CODE
- 05: CYLINDER STROKE CODE
- 07: CYLINDER SIZE CODE
- WDX356020: FORD BASIC PART NUMBER

XX= Stroke	FORD Code
25	02
38.1	03
50	05
63.5	06
80	08
100	10
125	12
160	16
200	20

FORD WDX356021-07-XX-TB

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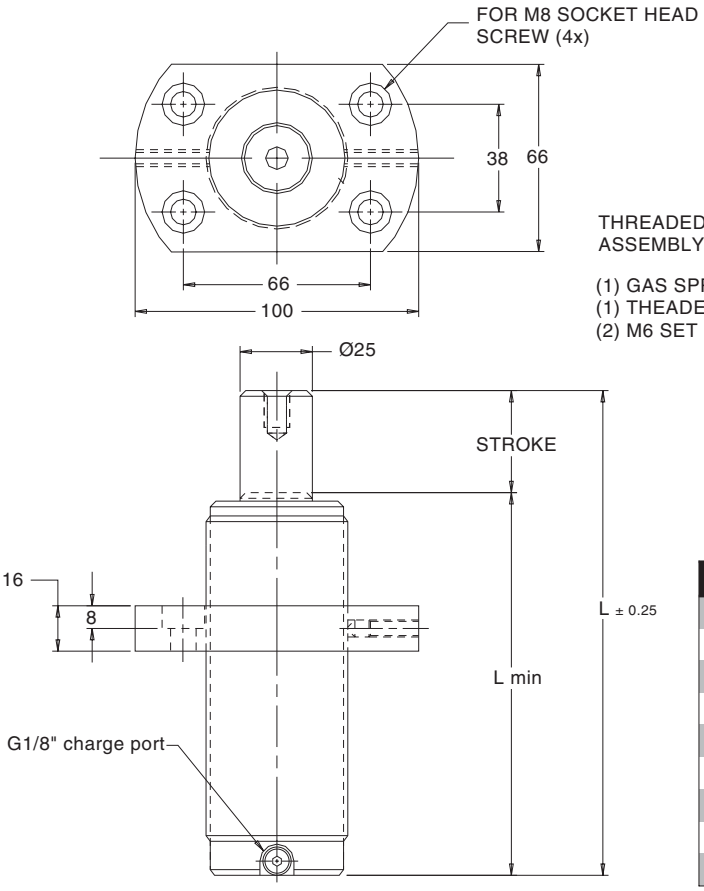


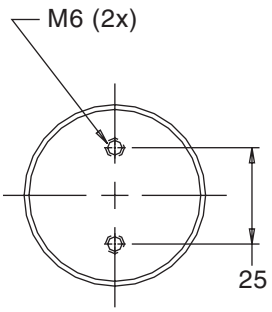
THREADED GAS SPRING ASSEMBLY CONSISTS OF

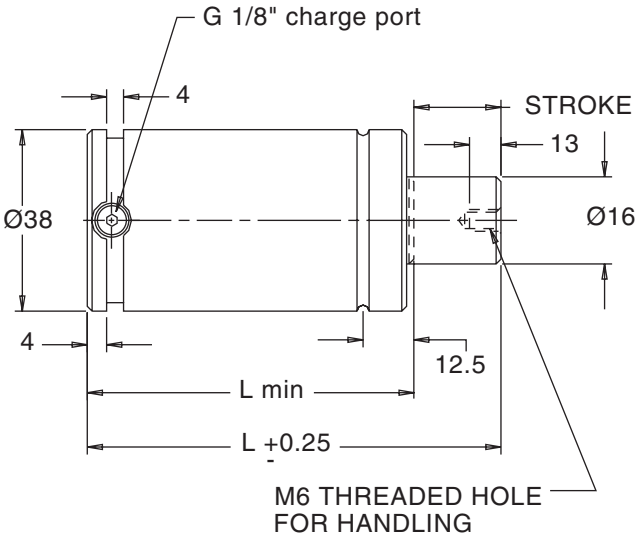
(1) GAS SPRING
(1) THEADED FLANGE MOUNT
(2) M6 SET SCREWS

L = Lmin + Stroke

Ford Part No.	Stroke	FORD Code	L min
WDX356021-07-02-TB	25	02	75
WDX356021-07-03-TB	38.1	03	88
WDX356021-07-05-TB	50	05	100
WDX356021-07-06-TB	63.5	06	113
WDX356021-07-08-TB	80	08	130
WDX356021-07-10-TB	100	10	150
WDX356021-07-12-TB	125	12	175
WDX356021-07-16-TB	160	16	210
WDX356021-07-20-TB	200	20	250

FORD WDX356022-03-XX-DMS





ORDERING EXAMPLE

WDX356022 03 05 D M S

- S — SELF CONTAINED CODE (S)
- M — TYPE OF MOUNTING CODE
- D — CYLINDER STROKE CODE
- 05 — CYLINDER SIZE CODE
- 03 — FORD BASIC PART NUMBER
- WDX356022 — FORD BASIC PART NUMBER

Ford Part No.	Stroke	L min
WDX356022-03-05-DMS	50	100
WDX356022-03-06-DMS	63.5	113.5

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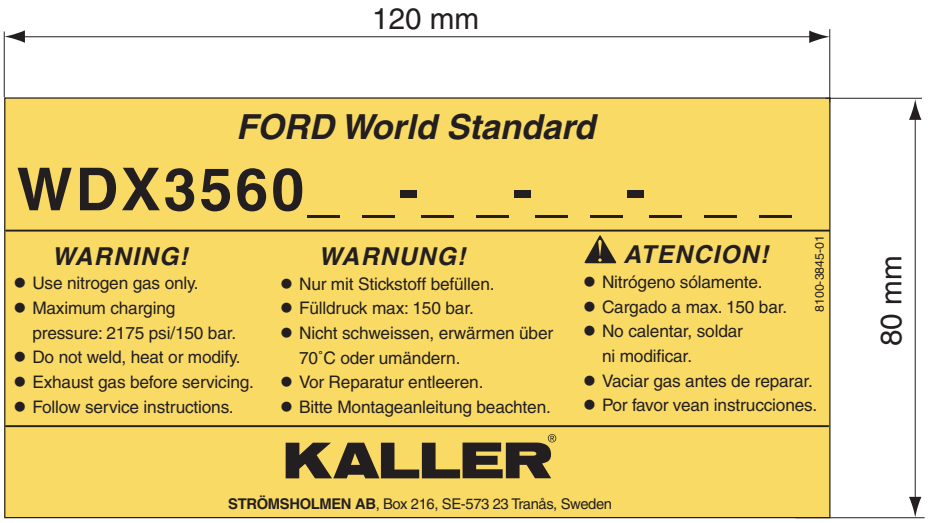
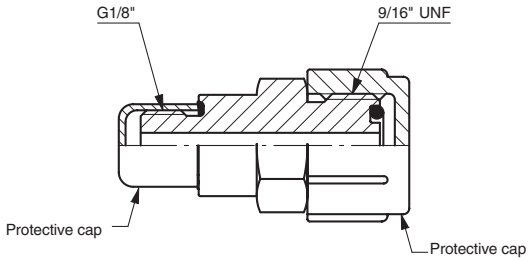
KALLER® FORD Label 8100-3845



• Label to be filled out with FORD part no. and placed directley above the G1/8" charging port, covering the original KALLER marking.
• NOTE! Please observe that the text to fill out on the lable does not always comply with the marking on the tube. All springs with a mount or flange that is dismountable are marked on the tube as a 'DM' spring, but the lable should be filled out with the original FORD part no.

FORD O-ring face seal adapter 40 177 64



• Adapter for hose connection G1/8" - 9/16" UNF, to be delivered mounted on springs with piped system code (P).

GM M-1500-XX-XX (North America)
GM 90.25.00-XX-XX (Global)

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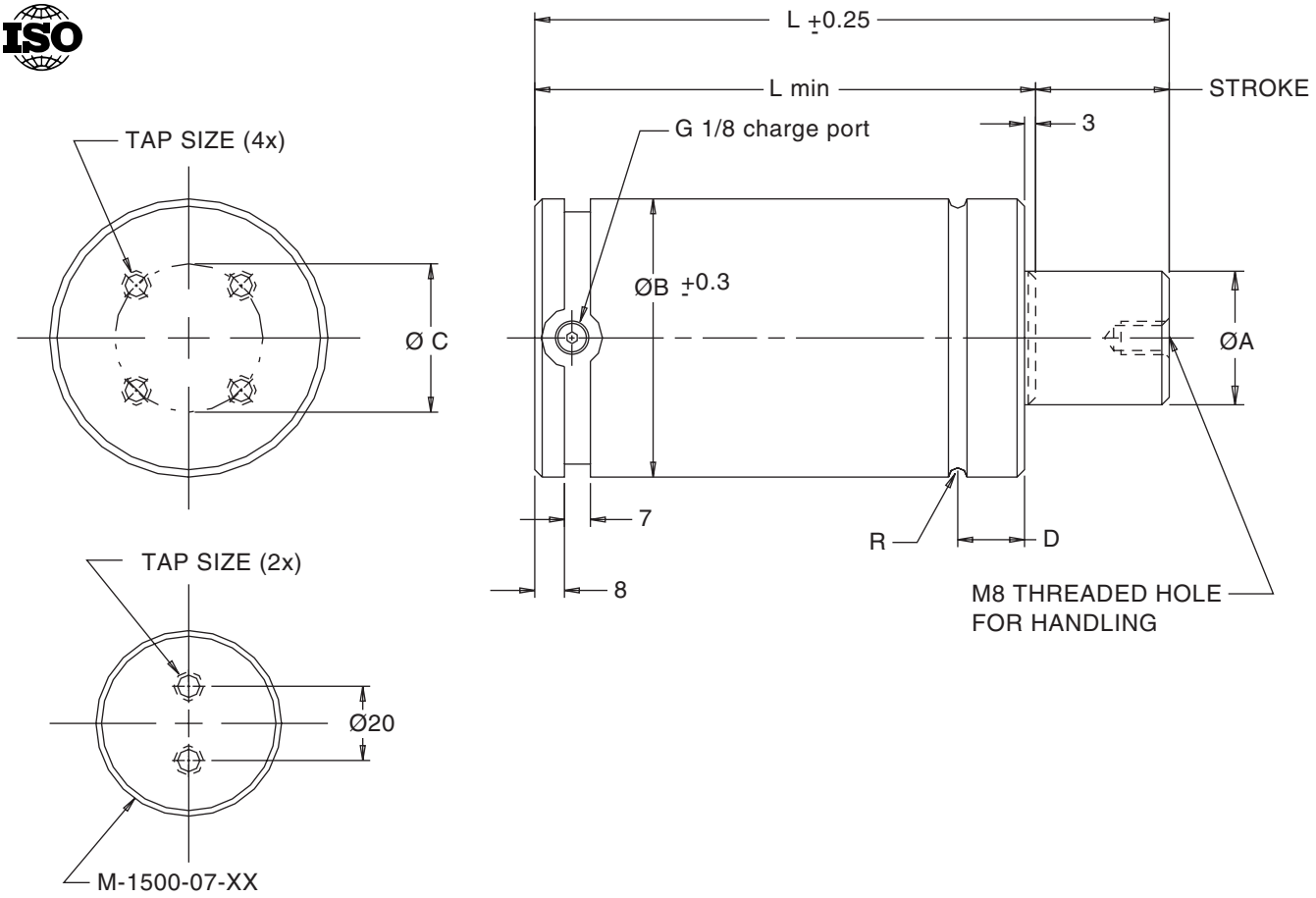

GM Part No. (N. America/Global)	Gas spring	L min	ØA	ØB	C	D	R	Tap size
M-1500-07-XX/90.25.00-07-XX	TU 750	95 + stroke	25	50	20	14.5	2.0	M8 x 13 deep
M-1500-15-XX/90.25.00-15-XX	TU 1500	110 + stroke	36	75	40	18.0	2.5	M8 x 13 deep
M-1500-30-XX/90.25.00-30-XX	TU 3000	120 + stroke	50	95	60	21.0	2.5	M8 x 13 deep
M-1500-50-XX/90.25.00-50-XX	TU 5000	140 + stroke	65	120	80	22.5	2.5	M10 x 16 deep
M-1500-75-XX/90.25.00-75-XX	TU 7500	155 + stroke	80	150	100	24.5	2.5	M10 x 16 deep

14

- ISO specification 11901-1
- Label 503511 is to be placed on the opposite side of the G1/8" charging port, without covering the original KALLER marking. (See page 2.17/15).

XX = Stroke	GM Code
25	02
50	05
80	08
100	10
125	12
160	16
200	20

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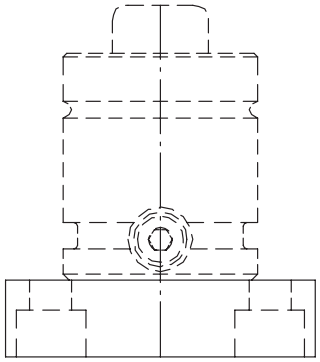
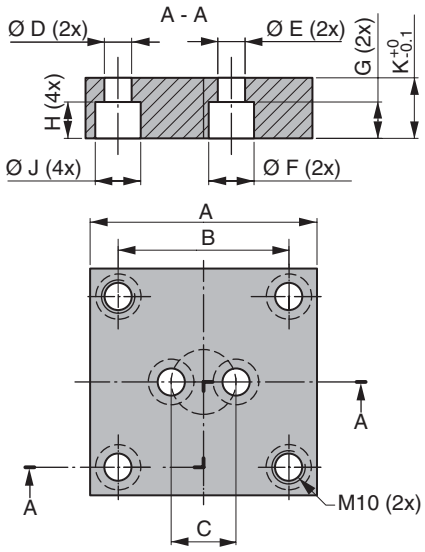
GM M-1501-XX-01(North America)
GM 90.25.04-XX (Global)

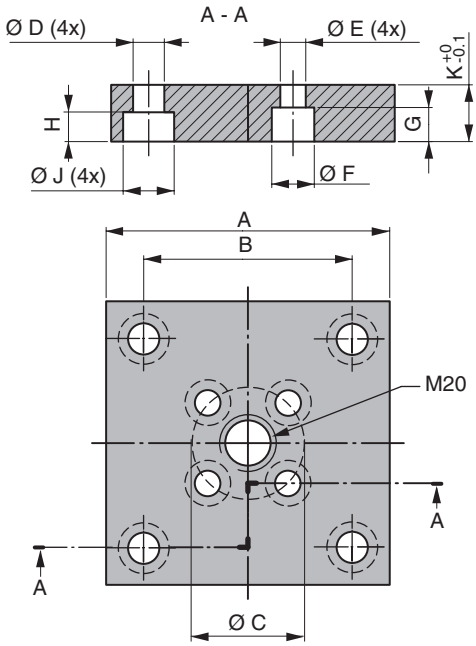
* = According to updated ISO 11901 standard



750 mount only



1500 to 7500 mounts



GM Part No. (N.America/Global)	Spring Mount = Order No.	A	B	C	D	E	F	G	H	J	K
M-1501-07-01/90.25.04-7.5	MP 750	75	56.5	20	9	9	15	14	12	15	20
M-1501-15-01/90.25.04-15	MP 1500	100	73.5	40	11	9	15	14	12	18	20
M-1501-30-01/90.25.04-30	MP 3000	120	92	60	13.5	9	15	14	13	20	20
M-1501-50-01/90.25.04-50	MP 5000	140	109.5	80	13.5	11	18	15	13	20	20
M-1501-75-01/90.25.04-75	MP 7500	190	138	100	17.5	11	18	15	17	26	25

- ISO specification 11901-2
- The above stated GM part no. does not include gas spring

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GM M-1501-XX-02 (North America)
GM 90.25.01-XX (Global)

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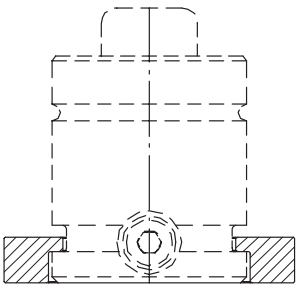

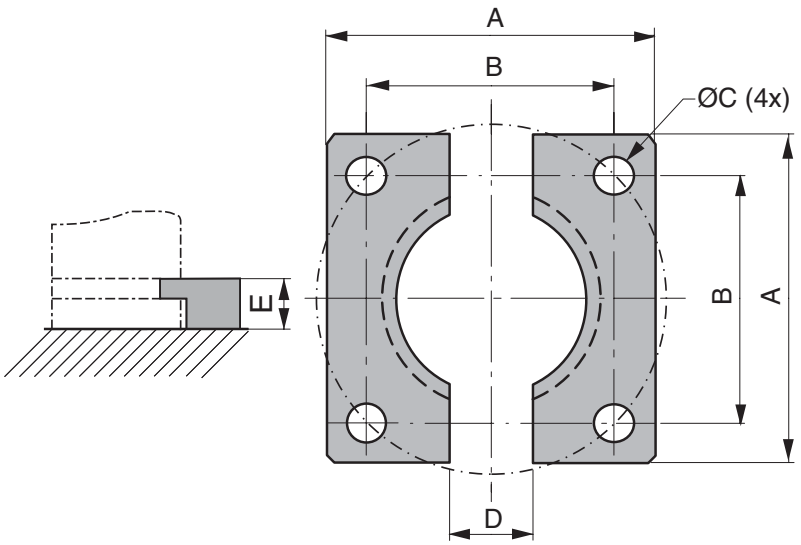

GM Part No. (N.America/Global)	Spring Mount = Order No.	A	B	Ø C	D	E
M-1501-07-02/90.25.01-7.5	FFC 750	75	56.5	9	24	12
M-1501-15-02/90.25.01-15	FFC 1500	100	73.5	11	24	12
M-1501-30-02/90.25.01-30	FFC 3000	120	92	13.5	24	12
M-1501-50-02/90.25.01-50	FFC 5000	140	109.5	13.5	24	12
M-1501-75-02/90.25.01-75	FFC 7500	190	138	17.5	24	12

- ISO specification 11901-2
- The above stated GM part no. does not include gas spring

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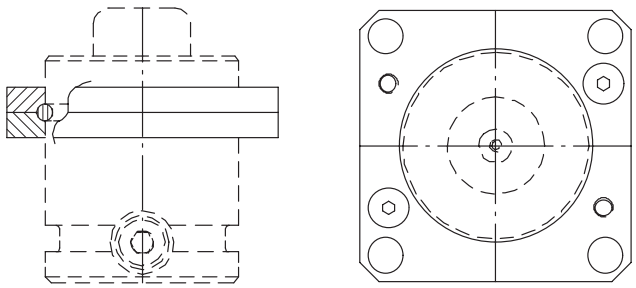
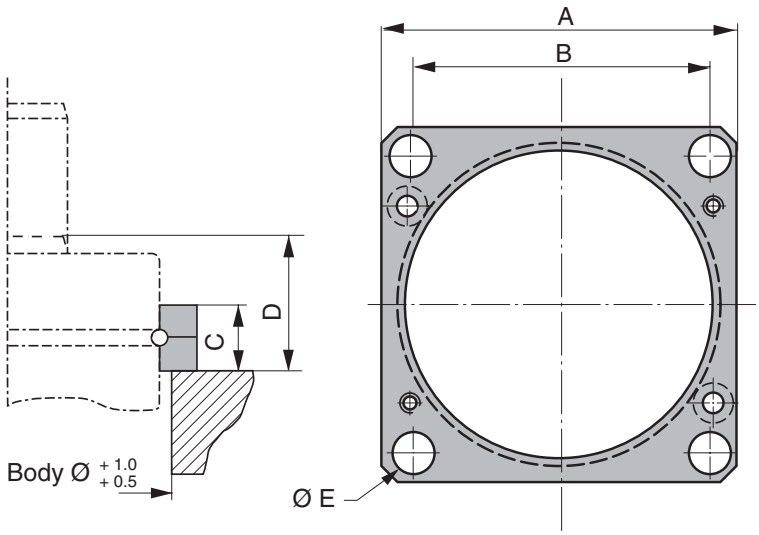
GM M-1501-XX-03 (North America)
GM 90.25.02-XX (Global)





GM Part No. (N.America/Global)	Spring Mount = Order No.	A	B	C	D	Ø E
M-1501-07-03/90.25.02-7.5	FCS 750	70	56.5	13	24	9
M-1501-15-03/90.25.02-15	FCS 1500	90	73.5	16	29	11
M-1501-30-03/90.25.02-30	FCS 3000	110	92	18	33	13.5
M-1501-50-03/90.25.02-50	FCS 5000	130	109.5	21	36	13.5
M-1501-75-03/90.25.02-75	FCS 7500	162	138	27	41	17.5

• The above stated GM part no. does not include gas spring

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GM M-1501-XX-04 (North America)
GM 90.25.06-XX (Global)

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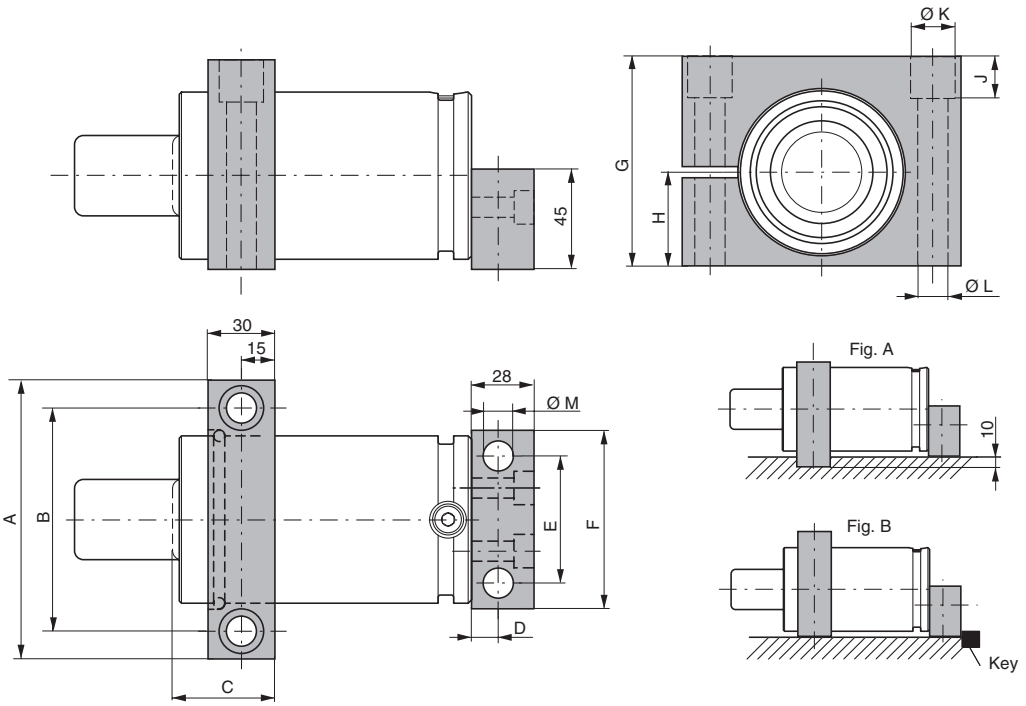

GM Part No. (N. America/Global)	Spring Mount = Order No	A	B	C	D	E	F	G	H	J	Ø K	Ø L	Ø M
M-1501-07-04/90.25.06-7.5	HM-750	90	68	43	13	44	65	70	30	25	18	11	11
M-1501-15-04/90.25.06-15	HM-1500	125	100	45	12	57	80	94	42	19	20	13.5	13.5
M-1501-30-04/90.25.06-75	HM-3000	140	115	48	15	70	95	115	52.5	40	20	13.5	13.5

• The above stated GM part no. does not include gas spring.
• The above stated GM part no.corresponds to the complete horizontal foot mount which includes front and rear mount, locking ring and mounting screws for gas spring.
• The front support can be rotated 180° allowing it to be mounted in a 10 mm key-groove. If the front support is not mounted in a key-groove, we recommend that the rear mount is backed up using a key (see Fig. A and Fig. B).

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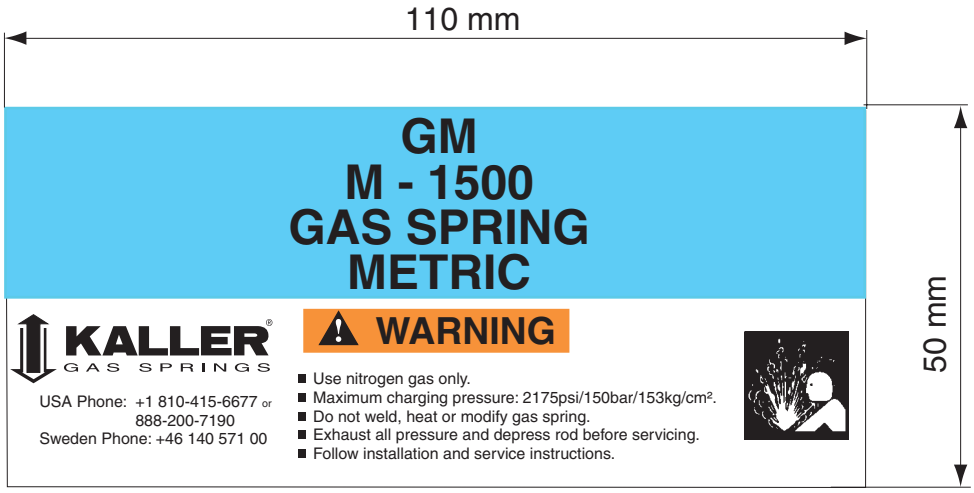
All dimensions are stated in mm.
All dimensions are nominal unless tolerance is stated.

KALLER® GM Label 503511



• Label 503511 is to be placed on the opposite side of the G1/8" charging port, without covering the original KALLER marking.

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