

Gas Springs & Standard Mounts

Edition 2.2022
© KALLER

Would you like to order this product?
All available information at www.kaller.com



CONTENT

Chapter 1 - About gas springs	Page
"The Safer Choice"	4
"General information"	5
"User Information"	6
"Gas springs selection guide"	10

Chapter 2 - Gas springs	Page
"Gas Spring - contents"	12
"KALLER Limited Warranty"	13
"Overview - $\text{FINIT} \leq 2500$ "	14
"Overview - $2500 \leq \text{FINIT} < 5000$ "	42
"Overview - $5000 \leq \text{FINIT} < 7500$ "	60
"Overview - $7500 \leq \text{FINIT} < 10000$ "	76
"Overview - $10000 \leq \text{FINIT} < 25000$ "	100
"Overview - $25000 \leq \text{FINIT} < 50000$ "	148
"Overview - $50000 \leq \text{FINIT} < 75000$ "	170

Chapter 3 - Mounts	Page
"Mounting Guidelines"	220
"Mounts"	228

THE SAFER CHOICE

Introduced in 1983, the KALLER gas spring technology quickly led to worldwide demand. The Safer Choice – Training, Safety and Reliability – has always been a KALLER top priority for providing innovative solutions for the safer working environment. We recommend looking through all available KALLER features when selecting gas springs and gas or hose linked systems.



KALLER Safety App

SAFETY. Fake or KALLER original? With the KALLER Safety App you can identify and verify your specific KALLER gas springs.



Overstroke Protection System

SAFETY. When a gas spring is overstroked, this helps reduce the risk of tool damage or injury.



PED approved for a minimum of 2 million strokes

RELIABILITY. Our 2 million stroke PED approval ensures safer component cycle life.



Overload Protection System

SAFETY. Jammed cam or tool part being forced by gas springs? This will help reducing such risks.



Overpressure Protection System

SAFETY. Vents the spring if the internal gas pressure exceeds the maximum allowable limit to prevent accidents.



Flex Guide™ System

RELIABILITY. Prolongs service life, allows more strokes per minute, and offers greater tolerance to lateral tool movements.



Dual Seal™ Link Systems

RELIABILITY. Fewer production interruptions due to leakage caused by vibration. Simplified installation thanks to the non-rotation feature.



KALLER Training Program

TRAINING. Without doubt the KALLER Training Program is the best and most creative way to fully understand and appreciate the importance of the safety and reliability features.

GENERAL INFORMATION

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 European Pressure Equipment Directive (2014/68/EU).



The Pressure Equipment Directive (PED) replaces all previous European legislation governing the design, manufacture and testing of pressure vessels. Manufacturing relies on 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. The company is the world's premiere and leading manufacturer of nitrogen gas springs for the metal stamping industry.

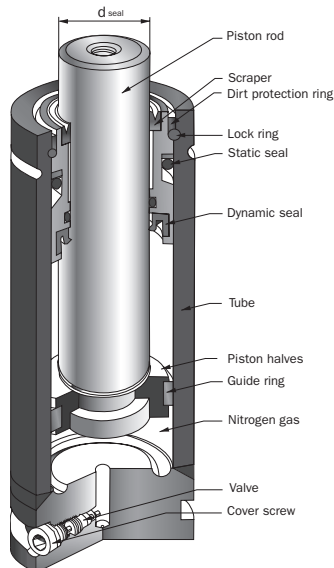
KALLER Worldwide Guarantee

Strömsholmen AB, which develops, manufactures and markets KALLER gas springs, guarantees that each gas spring manufactured by Strömsholmen AB is free of defects in materials and workmanship. The KALLER Worldwide Guarantee applies to gas springs used for 2,000,000 strokes from 0 mm to 80 mm per stroke or 1,000,000 strokes above 80 mm per stroke* or two years from the date of purchase, whichever occurs first. The KALLER Worldwide Guarantee only applies to gas springs used in accordance with the KALLER gas springs installation and usage guidelines. Strömsholmen AB's liability is limited solely to the authorized repair or replacement of any gas spring that is returned to Strömsholmen AB and is reasonably determined by Strömsholmen AB to be found defective. KALLER Limited Warranty details are available upon request.

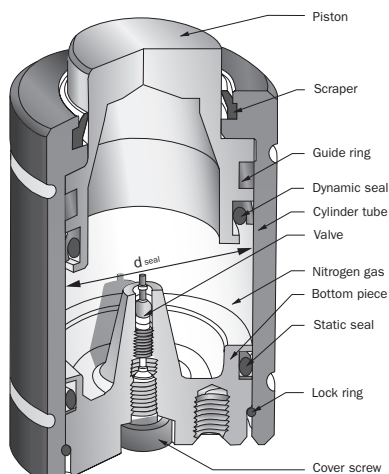
*Exceptions include gas springs with initial force less than 5 kN, MT and Controllable gas springs which are guaranteed for a maximum of 500,000 strokes or 50,000 stroke meters, whichever occurs first.

Main groups of gas springs

KALLER gas springs can be divided into two main groups, namely Piston Rod Sealed and Bore Sealed. The two basic designs are depicted below:



Piston Rod Sealed gas spring



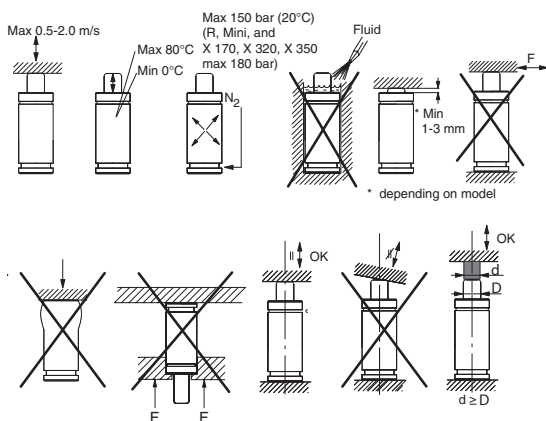
Bore Sealed gas spring

USER INFORMATION

Mounting instructions

To achieve the best possible service life and safety from the gas spring, the following instructions 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.
- Do not use the threaded hole in the piston rod top 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.
- Depending on the model, the maximum allowed stroke speed is from 0.5 to 2.0 m/s (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.
- Do not subject the gas spring to side loads.
- Protect the piston rod against mechanical damage and contact with fluids.
- Ensure the entire contact surface of the piston rod/piston is used.



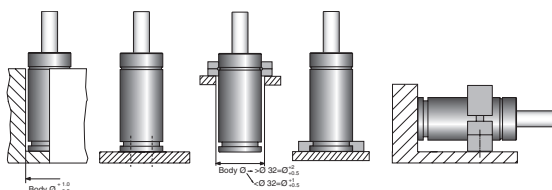
CAUTION!

Do not modify the product in any way. For more information, please contact Strömsholmen (www.kaller.com) or your local KALLER distributor.

Mounting of gas springs

When mounting the gas spring in the tool/machine, certain specifications must be adhered to in order to assure that the mount/flange does not come loose:

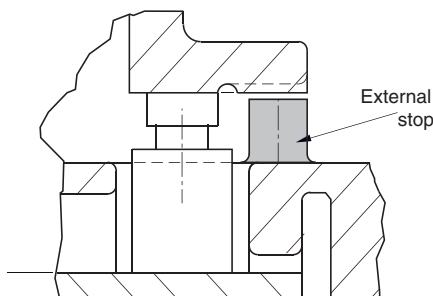
- Screws must have a free length (clamping length) of 2 to 4 × the thread diameter and a thread depth of at least 1 × the thread diameter in steel and 1.5 × the thread diameter in cast iron.
- If the free length cannot be achieved in any other way, the screw holes must be countersunk.
- Always use a torque wrench to tighten to the correct torque.
- Make sure the bottom of the spring is always supported.
- Only use mounts manufactured or approved by KALLER.



Stroke length

The nominal stroke (defined as S in the catalog tables) that may be utilized fully in all KALLER gas springs. However, in * normal operation the recommendation is not to use the full stroke length. This is to prevent the spring from being "over-stroked" as a result of changes to the tool or mishaps in the tool.

An external stop for the tool is recommended. We do not recommend utilizing the last 5 mm or 10 % of the nominal stroke length.



Maximum charging pressure

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

Operating temperature

Exceeding the gas spring's recommended max. operating temperature will shorten the service life of the gas spring.

Recommended maximum strokes/minute

The values given for each gas spring in the catalog apply for "normal" press tool applications. The lower limits given apply to the longer stroke lengths, while the higher values apply to short stroke springs. These values are based on a fully utilized stroke. If only a portion of the stroke is used, the number of strokes per minute can be increased. For further information, please contact your local distributor.

Maximum piston rod velocity

The maximum piston rod velocity is not to be exceeded because it may infringe on safety and can affect gas spring performance.

Service interval

If correctly installed and used, the following minimum service interval of the KALLER gas springs, except model MT, is 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) × 2 × number of strokes.

Service information

All KALLER gas springs can be serviced except the following models: EP3 16, EP2 24, EPS2 24, R12, R15, R19, CU4 420, X 170, X 320, X 2400-16 and MT 16, MT 24 Series. Repair Kits and Tool Kits are available. Service instructions are included in the Repair Kits.

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

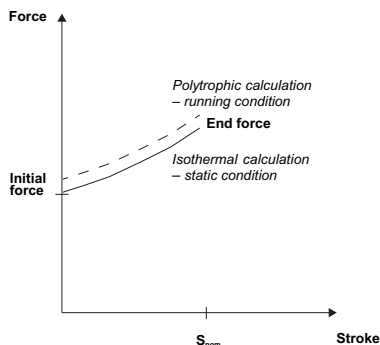
Instructional service videos are also available at www.kaller.com.

Force calculations

All end forces, stated in the catalog are the isothermal end forces.

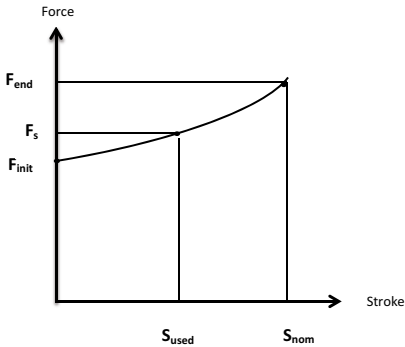
For normal use, the isothermal calculation is sufficient. Only for special requirements should a polytrophic calculation be considered, to be decided case by case.

For more detailed information, please consult our **KALLER Basic Gas spring Theory** brochure.



Isothermal force increase

When calculating the force at any position of the stroke the following equation can be used:



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

F_{init} = Initial force
 F_{end} = End force at nom.stroke
 S_{nom} = Nom. stroke length (mm)
 S_{used} = Used stroke length (mm)

Example:

What is the spring force of a TU 1500-100 when compressing the spring 80 mm at a normal charging pressure of 150 bar?

The table for the TU 1500 (see page 2.6/24) will give the following values:

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

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

$$F_s (80 \text{ mm}) = 20,800 \text{ N}$$

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

Polytrophic force increase

For most applications the temperature inside the gas spring will not stay constant during the stroke. Therefore the real force is different from application to application depending on:

Stroke length and used stroke, gas volume, press velocity and strokes per minute (SPM), operating temperature and environment, internal frictions etc.

GAS SPRINGS SELECTION GUIDE

Series	Description	Gas spring model	Available stroke lengths (mm)	Initial force at max. pressure		Total length (mm)	Cylinder diameter (mm)
				(N)	(lbf)		
EP3 16 EPS3 16 EP2 24 EPS2 24	Color coded gas Ejector-Pins, interchangeable with mechanical spring plungers.	EP3 16	10 - 125	420	95	45 + (2 x Stroke)	M16x1.5/M16x2
		EPS3 16	10 - 125	420	95	45 + (2 x Stroke)	M16x1.5
		EP2 24	10 - 125	1,700	382	45 + (2 x Stroke)	M24x1.5
		EPS2 24	10 - 125	1,700	382	45 + (2 x Stroke)	M24x1.5
R12 R15 R19	Rod sealed and color coded gas springs – compact and fully adjustable.	R12	7 - 125	500	112	56 - 295	Ø 12
		R15	7 - 125	700	160	56 - 295	Ø 15
		R19	7 - 125	900	202	56 - 295	Ø 19
M2 MM2 MC3 MC3-SP	Repairable, color coded and fully adjustable gas springs available with or without threaded cylinders.	M2	10 - 125	2,000	450	62 - 295	Ø 25
		MM2	10 - 125	2,000	450	42 + (2 x Stroke)	M28x1.5
		MC3	10 - 125	2,000	450	50 + (2 x Stroke)	Ø 32
		MC3-SP	10 - 125	2,000	450	50 + (2 x Stroke)	Ø 32
CU4	Super compact gas springs provide extreme forces with minimal cylinder diameters.	CU4 420	6 - 50	4,250	955	56 - 195	Ø 25
		CU4 740	6 - 50	7,400	1,660	63 - 195	Ø 32
		CU4 1000	6 - 50	10,600	2,400	61 - 230	Ø 38
		CU4 1800	6 - 65	18,000	4,050	66 - 271	Ø 50
		CU4 2900	10 - 65	29,500	6,630	85 - 256	Ø 63
		CU4 4700	10 - 65	47,000	10,570	80 - 273	Ø 75
		CU4 7500	10 - 65	75,000	16,860	90 - 279	Ø 95
		CU4 11800	10 - 65	118,000	26,530	100 - 320	Ø 120
		CU4 18300	10 - 65	183,000	41,140	110 - 323	Ø 150
CX	Compact Xtreme CX gas springs provide extreme forces and allow for higher pressures.	CX 500	10 - 80	5,100	1,150	75-145	Ø 32
		CX 1000	10 - 80	9,800	2,200	75-240	Ø 38
		CX 1900	10 - 80	19,200	4,320	80-245	Ø 50
X	The world's shortest, strongest and most advanced rod sealed gas springs.	X 170	7 - 125	1,700	382	44 - 285	Ø 19
		X 320	7 - 125	3,200	720	44 - 285	Ø 25
		X 350	10 - 125	3,600	810	30 + (2 x Stroke)	Ø 32
		X 500	10 - 125	4,700	1,055	30 + (2 x Stroke)	Ø 38
		X 750	10 - 125	7,400	1,665	32 + (2 x Stroke)	Ø 45
		X 1000	13 - 125	9,200	2,068	38 + (2 x Stroke)	Ø 50
		X 1500	13 - 125	15,000	3,375	44 + (2 x Stroke)	Ø 63
		X 2400	16 - 125	24,000	5,396	45 + (2 x Stroke)	Ø 75
		X 4200	16 - 125	42,000	9,440	58 + (2 x Stroke)	Ø 95
		X 6600	16 - 125	66,300	14,905	68 + (2 x Stroke)	Ø 120
		X 9500	19 - 125	95,000	21,400	78 + (2 x Stroke)	Ø 150
		X 20000	19 - 125	200,000	45,000	110+ (2 x Stroke)	Ø 195
XG	The Power Line XG series is based on the X series with the same features but additional total length providing a larger G 1/8" charge port and longer bottom threads.	XG 350	10 - 125	3,600	810	40 + (2 x Stroke)	Ø 32
		XG 500	10 - 125	4,700	1,055	40 + (2 x Stroke)	Ø 38
		XG 750	10 - 125	7,400	1,665	47 + (2 x Stroke)	Ø 45
		XG 1000	13 - 125	9,200	2,068	52 + (2 x Stroke)	Ø 50
		XG 1500	13 - 125	15,000	3,375	52 + (2 x Stroke)	Ø 63
		XG 2400	16 - 125	24,000	5,396	59 + (2 x Stroke)	Ø 75
		XG 4200	16 - 125	42,000	9,440	62 + (2 x Stroke)	Ø 95
XF	The Power Line XF series is based on the X series with the same features but additional 10 mm total length providing a larger G 1/8" charge port.	XF 750	10 - 125	7,400	1,665	42 + (2 x Stroke)	Ø 45
		XF 1000	13 - 125	9,200	2,068	48 + (2 x Stroke)	Ø 50
		XF 1500	13 - 125	15,000	3,375	54 + (2 x Stroke)	Ø 63
		XF 2400	16 - 125	24,000	5,396	55 + (2 x Stroke)	Ø 75

Series	Description	Gas spring model	Available stroke lengths	Initial force at max. pressure		Total length	Cylinder diameter
				(N)	(lbf)		
			(mm)			(mm)	(mm)
TX	The Power Line Heavy Duty series, a crossover between the standard TU series and the Power Line X series. Total length same as TU, force same as X.	TX 750	13 - 200	7,400	1,665	85 + (2 x Stroke)	Ø 45
		TX 1000	13 - 300	9,200	2,068	95 + (2 x Stroke)	Ø 50
		TX 1500	13 - 300	15,000	3,375	95 + (2 x Stroke)	Ø 63
		TX 2400	25 - 300	24,000	5,396	110 + (2 x Stroke)	Ø 75
		TX 4200	25 - 300	42,000	9,440	120 + (2 x Stroke)	Ø 95
		TX 6600	25 - 300	66,300	14,905	140 + (2 x Stroke)	Ø 120
		TX 9500	25 - 300	95,000	21,400	155 + (2 x Stroke)	Ø 150
		TX 20000	25 - 300	200,000	45,000	160 + 2 x Stroke	Ø 195
TL	The TL gas spring is shorter than the corresponding TU by 25 mm, except TL 5000 and TL 7500, which are 37.5 and 50 mm shorter respectively.	TL 750	12.5 - 250	7,400	1,665	70 + (2 x Stroke)	Ø 50
		TL 1500	12.5 - 250	15,000	3,375	85 + (2 x Stroke)	Ø 75
		TL 3000	12.5 - 250	30,000	6,750	95 + (2 x Stroke)	Ø 95
		TL 5000	25 - 250	50,000	11,240	102,5 + (2 x Stroke)	Ø 120
		TL 7500	25 - 250	75,000	16,860	105 + (2 x Stroke)	Ø 150
TU	The TU gas springs' dimensions are the basis of the ISO 11901 standard for gas springs as well as the Ford WDX and GM gas spring standards.	TU 250	10 - 125	2,650	600	50 + (2 x Stroke)	Ø 38
		TU 500	10 - 160	4,700	1,055	85 + (2 x Stroke)	Ø 45
		TU 750	12.7 - 300	7,400	1,665	95 + (2 x Stroke)	Ø 50
		TU 1500	25 - 300	15,000	3,375	110 + (2 x Stroke)	Ø 75
		TU 3000	25 - 300	30,000	6,750	120 + (2 x Stroke)	Ø 95
		TU 5000	25 - 300	50,000	11,240	140 + (2 x Stroke)	Ø 120
		TU 7500	25 - 300	75,000	16,860	155 + (2 x Stroke)	Ø 150
		TU 10000	25 - 300	106,000	23,830	160 + (2 x Stroke)	Ø 195
TUS	The High Speed gas springs (TUS) have been engineered to withstand press stroke speeds to a maximum of 2 m/s.	TUS 750	25 - 300	7,400	1,665	95 + (2 x Stroke)	Ø 50
		TUS 1500	25 - 300	15,000	3,375	110 + (2 x Stroke)	Ø 75
		TUS 3000	25 - 300	30,000	6,750	120 + (2 x Stroke)	Ø 95
		TUS 5000	25 - 300	50,000	11,240	140 + (2 x Stroke)	Ø 120
		TUS 7500	25 - 300	75,000	16,860	155 + (2 x Stroke)	Ø 150
LCF	These innovative Low Contact Force gas spring are 100% interchangeable with ISO gas springs (i.e. TU series) and reduce shock loads, noise levels and pad bounce problems.	LCF 750	12.7 - 300	7,400	1,665	95 + (2 x Stroke)	Ø 50
		LCF 1500	25 - 300	15,000	3,375	110 + (2 x Stroke)	Ø 75
		LCF 3000	25 - 300	30,000	6,750	120 + (2 x Stroke)	Ø 95
		LCF 5000	25 - 300	50,000	11,240	140 + (2 x Stroke)	Ø 120
		LCF 7500	25 - 300	75,000	16,860	155 + (2 x Stroke)	Ø 150
SPC	Speed Control™ reduce or eliminate blank holder bounce; commonly associated with increased return stroke speeds from new generation of presses.	SPC 750	80 - 300	7,400	1,665	110 + (2 x Stroke)	Ø 75
		SPC 1500	125 - 300	15,000	3,375	120 + (2 x Stroke)	Ø 95
		SPC 3000	125 - 300	30,000	6,750	140 + (2 x Stroke)	Ø 120
		SPC 5000	125 - 300	50,000	11,240	155 + (2 x Stroke)	Ø 150
MT	Mould Temp gas springs are compact and powerful piston rod sealed gas springs, which can be used up to 120°C.	MT 16	10 - 80	420	95	48 + (2 x Stroke)	M16x1.5
		MT 24	10 - 80	1,700	382	48 + (2 x Stroke)	M24x1.5
		MT 300	10 - 80	3,000	675	30 + (2 x Stroke)	Ø 32
		MT 500	10 - 80	4,700	1,055	30 + (2 x Stroke)	Ø 38
		MT 750	10 - 80	7,440	1,665	32 + (2 x Stroke)	Ø 45
		MT 1000	13 - 80	9,200	2,068	38 + (2 x Stroke)	Ø 50

Gas Spring - contents

Initial force N 	Cylinder diameter mm 	Models 	Page
$F_{INIT} < 2,500$	Ø 12 Ø 32	EP3 16, EP2 24, EPS2 24 R12, R15, R19 M2, MM2, MC3, MC3-SP X 170 MT 16, MT 24	14
$2,500 \leq F_{INIT} < 5,000$	Ø 25 Ø 38	CU4 420 X 320, X 350, XG 350 TU 250, TM 250, TI 250, TMS 250 MT 300	42
$5,000 \leq F_{INIT} < 7,500$	Ø 38 Ø 45	CU4 740 CX 500, X 500, XG 500 K 500 TU 500 MT 500	60
$7,500 \leq F_{INIT} < 10,000$	Ø 45 Ø 75	X 750, XG 750, TL 750, TX 750 K 750, TU 750, TUS 750, LCF 750, SPC 750 MT 750	76
$10,000 \leq F_{INIT} < 25,000$	Ø 38 Ø 95	CU4 1000, CU4 1800, CX 1000, CX 1900 X 1000, XMS 1000, XG 1000, TX 1000, TL 1500, X 1500, XG 1500, TX 1500 X 2400, XG 2400, TX 2400 K 1500, TU 1500, TUS 1500, LCF 1500, SPC 1500 MT 1000	100
$25,000 \leq F_{INIT} < 50,000$	Ø 75 Ø 120	CU4 2900, CU4 4700 X 4200, XG 4200, TX 4200 TL 3000, TU 3000, TUS 3000, LCF 3000 SPC 3000	148
$50,000 \leq F_{INIT} < 75,000$	Ø 120 Ø 150	X 6600, XG 6600, TX 6600 TL 5000, TU 5000, TUS 5000, LCF 5000 SPC 5000	170
$75,000 \leq F_{INIT} < 100,000$	Ø 95 Ø 150	CU4 7500 X 9500, TX 9500 TL 7500, TU 7500, TUS 7500, LCF 7500	188
$F_{INIT} \geq 100,000$	Ø 120 Ø 195	CU4 11800, CU4 18300 TU 10000, TUR 10000 X 20000, TX 20000	204

KALLER Limited Warranty

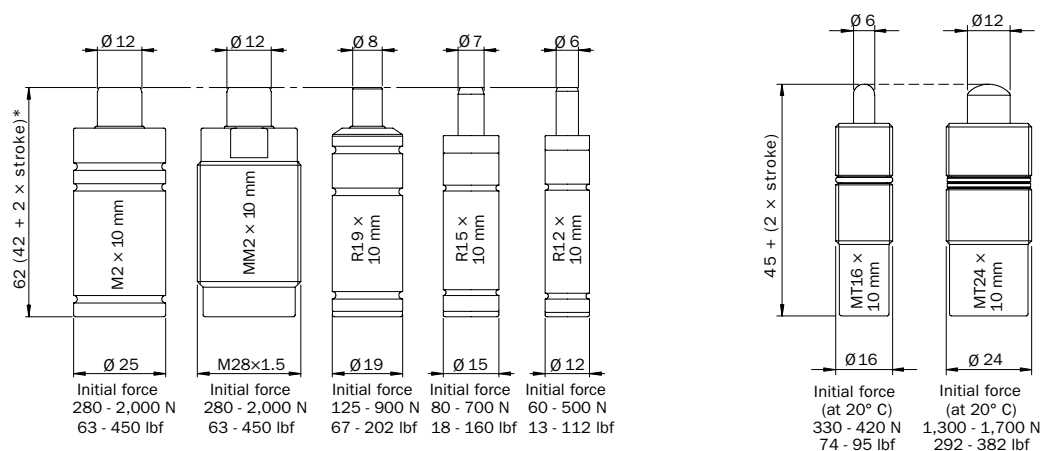
The warranties contained herein supersede all other warranties, expressed or implied, including those concerning the merchantability or suitability for a specific use or performance of the gas spring including its components.

The warranty period for replacement and or repaired gas springs shall not exceed the warranty period of the original defective gas spring. The warranty does not apply to any gas spring which has been damaged or misused or repaired by anyone other than KALLER or its authorized representatives, or to any gas spring that has been altered by anyone other than KALLER or its authorized representatives.

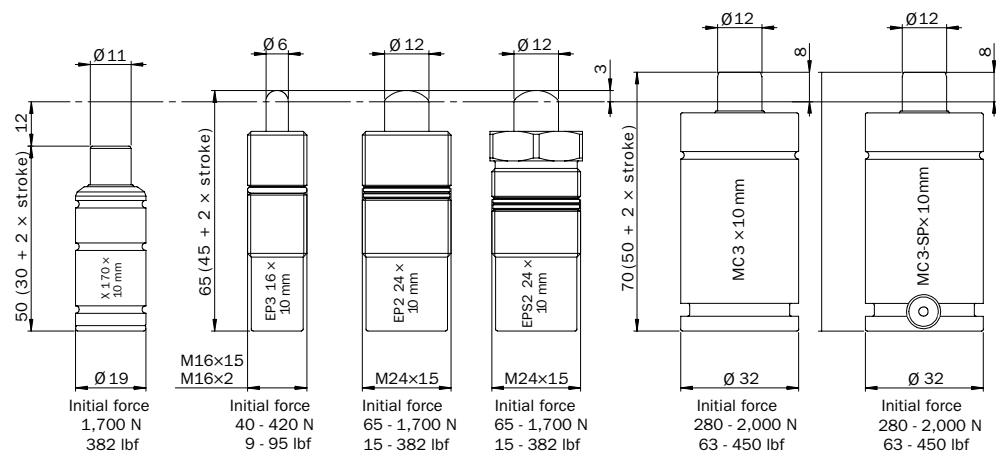
The customer shall notify KALLER of all information pertaining to the defective gas spring including but not limited to serial number and date of installation so that KALLER may determine the number of strokes incurred by the gas spring alleged to be defective. The customer shall be responsible for freight charges incurred in connection with the repair and/or replacement of any gas spring found to be defective.

KALLER is not liable for injury, property damage, or other loss related to the inability to use the gas spring or failure of the gas spring, nor is KALLER liable for any costs incurred relating to the removal and/or replacement of the gas spring. In no event is KALLER's liability to exceed the selling price of the gas spring. This warranty is void with respect to any gas spring damaged as a result of misuse, alteration, accident or neglect; failure to follow operating, maintenance and environmental instructions; repair by anyone other than KALLER, its authorized representatives or trained service technicians acting in accordance with KALLER's service instructions and using components and supplies specified by KALLER.

kaller.com



- * Total length for M2 stroke length 63.5 mm and longer is $45 + (2 \times \text{Stroke})$
- * Total length for R12, R15 and R19 stroke length 63.5 mm and longer is $45 + (2 \times \text{Stroke})$
- * Total length for X 170 stroke length 75 mm and longer is $35 + (2 \times \text{Stroke})$



	Page
EP3 16	16
EP2 24	18
EPS2 24	20
R12	22
R15	24
R19	26
M2	28
MM2	30
MC3	32
MC3-SP	34
X 170	36
MT 16	38
MT 24	40

EP3 16 gas springs (Ejector Pin with an M16 thread) are available in M16x1.5 and M16x2 thread size. For each thread size, six models are available. Four preset models (Green, Blue, Red & Yellow) and one adjustable model (Black), whose pre-charging pressure is 5-10 bar, intended for the customer to adjust the gas charge pressure. They are all color-coded to help identify the force rating and can be adjusted and re-charged to meet individual force requirements.



Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen

Max. charging pressure (at 20°C) 150 bar

Min. charging pressure (at 20°C) 10 bar

Operating temperature 0 to +80°C

Force increase by temperature 0.3%/°C

Recommended max strokes/min (at 20°C)..... ~ 100

Max piston rod velocity 1.6 m/s

Rod surface Nitrided

Tube surface Black Oxide

Repair kit Non-repairable

Automotive standard: VDI 3004, ISO 20928, WDX35-60-3016xxx,
GMGDS 90.25.97, 39-670-005x, GMGDS 90.80.46



How to order

Model:

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

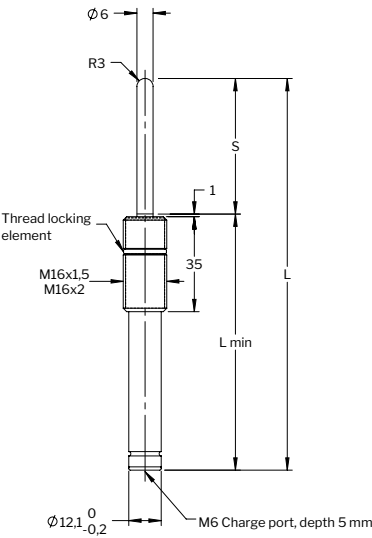
EP3 16x1.5 - 10 - Blue

Force: Purple, Green, Blue,
Red, Yellow, Black

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

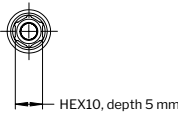
Model	Initial force at +20°C		Color	Charging pressure (bar)	Isothermal end force at + 20°C, at full stroke	
	in N	in lbf			in N	in lbf
EP3 16x1.5/x2	57	13	Green	20	95	21
EP3 16x1.5/x2	110	25	Blue	40	190	43
EP3 16x1.5/x2	210	47	Red	75	360	81
EP3 16x1.5/x2	420	95	Yellow	150	715	160
EP3 16x1.5/x2 XX*	28-420	9-95	Black	10-150	64-715	14-160

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



S stroke	L ±0.25	L min.	Gas vol. (l)	Weight (kg)
10	65	55	0.002	0.06
20	85	65	0.003	0.07
30	105	75	0.003	0.07
40	125	85	0.004	0.08
50	145	95	0.005	0.08
60	165	105	0.005	0.09
70	185	115	0.006	0.10
80	205	125	0.006	0.11
100	245	145	0.008	0.11
125	295	170	0.010	0.13

■ Recommended stroke length for optimal delivery.

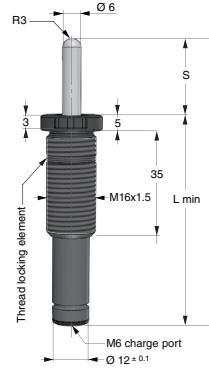


Installation tool

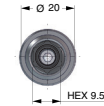


Order No. 3021000

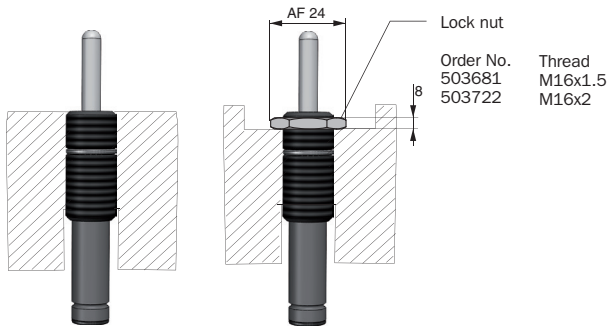
EPS3 16



Also available with shoulder as per GM-Standard 90.80.45. Contact your local distributor or Strömsholmen AB for more information.



Mounting possibilities



EP2 24 (Ejector Pin with an M24 thread). Four preset models are available. Each model is color-coded for easy identification of force rating. If needed, these models can be re-charged or adjusted to meet individual force requirements. A special model (black), which is delivered with a precharge of 5 to 10 bar, is also available and is intended for adjustment to the desired force.



Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen

Max. charging pressure (at 20°C) 150 bar

Min. charging pressure (at 20°C) 6 bar

Operating temperature 0 to +80°C

Force increase by temperature ± 0.3%/°C

Recommended max strokes/min (at 20°C)..... ~ 30-80

Max piston rod velocity 1.6 m/s

Rod surface Nitrided

Tube surface Nitrided

Repair kit Non-repairable

Automotive standard: VDI 3004, ISO 20928, WDX35-60-3024080,
GMGDS 90.25.95, 39-670-005x, 39-67-0061, WDX35-60-3024110,
WDX35-60-3024140



How to order

EP2 24 - 10 - Red

Model:

Force: Green, Blue, Red, Yellow, Black

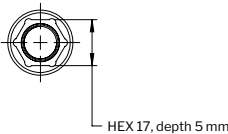
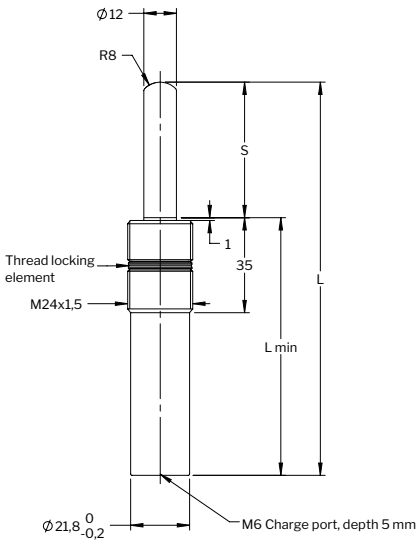
Stroke length: (mm)
(10, 20, 30, 40, 50, 60, 70, 80, 100, 125)

Model	Initial force at +20°C		Color	Charging pressure (bar)	Isothermal end force at + 20°C, at full stroke	
	in N	in lbf			in N	in lbf
EP2 24	2300	52	Green	20	390	90
EP2 24	4500	101	Blue	40	800	180
EP2 24	8500	191	Red	75	1500	340
EP2 24	1700	382	Yellow	150	2900	650
EP2 24 XX*	113-1700	25-382	Black	10-150	110-2900	25-650

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

S stroke	L ±0.25	L min.	Gas vol. (l)	Weight (kg)
10	65	55	0.003	0.13
20	85	65	0.006	0.15
30	105	75	0.008	0.17
40	125	85	0.011	0.19
50	145	95	0.012	0.21
60	165	105	0.014	0.23
70	185	115	0.017	0.25
80	205	125	0.019	0.27
100	245	145	0.024	0.31
125	295	170	0.030	0.35

■ Recommended stroke length for optimal delivery.

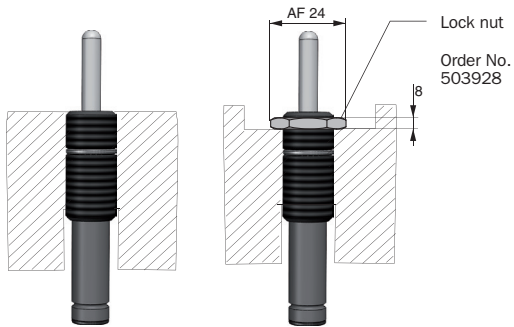


Installation tool



Order No. 3021000

Mounting possibilities



EPS2 24 (Ejector Pin Special with an M24 thread). It is available with four pre-set models. Each model is color-coded for easy identification of force rating. If needed, these models can be re-charged or adjusted to meet individual force requirements. Also available is a model (black) which is delivered with a pre-charge of 5 to 10 bar, intended to be adjusted to the desired force.



Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen

Max. charging pressure (at 20°C) 150 bar

Min. charging pressure (at 20°C)..... 6 bar

Operating temperature 0 to +80°C

Force increase by temperature ± 0.3%/°C

Recommended max strokes/min (at 20°C)..... ~ 30-80

Max piston rod velocity 1.6 m/s

Rod surface Nitrided

Tube surface Nitrided

Repair kit..... Non-repairable

Automotive standard: WDX35-80-19xxxx10, WDX35-80-19xxxx15,
WDX35-80-19xxxx25, WDX35-80-19xxxx38, WDX35-80-19xxxx50,
WDX35-80-19xxxx80



How to order

Model:

EPS2 24 - 10 - Green

Force: Orange, Purple, Green, Blue, Red, Yellow, Black

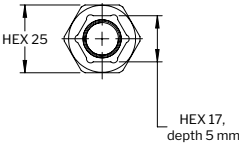
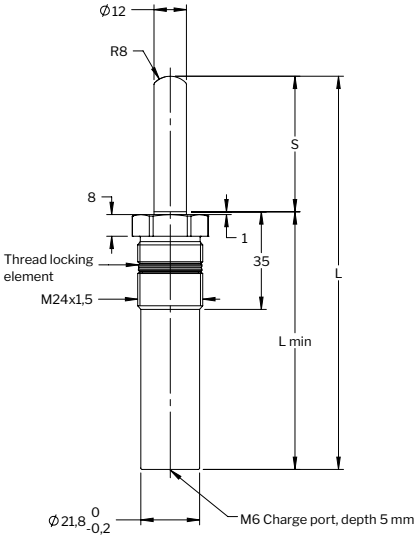
Stroke length: (mm)
(10, 16, 20, 25, 30, 38, 40, 50, 60, 70, 80, 100, 125)

Model	Initial force at +20°C		Color	Charging pressure (bar)	Isothermal end force at + 20°C, at full stroke	
	in N	in lbf			in N	in lbf
EPS2 24	230	52	Green	20	390	90
EPS2 24	450	101	Blue	40	800	180
EPS2 24	850	191	Red	75	1500	340
EPS2 24	1700	382	Yellow	150	2900	650
EPS2 24 XX*	65-1700	15-382	Black	6-150	110-2900	25-650

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

S stroke	L ±0.25	L min.	Gas vol. (l)	Weight (kg)
10	65	55	0.005	0.14
16	77	61	0.006	0.15
20	85	65	0.007	0.16
25	95	70	0.008	0.17
30	105	75	0.010	0.18
38	121	83	0.011	0.19
40	125	85	0.012	0.20
50	145	95	0.014	0.21
60	165	105	0.017	0.23
70	185	115	0.019	0.25
80	205	125	0.022	0.27
100	245	145	0.026	0.31
125	295	170	0.032	0.36

■ Recommended stroke length for optimal delivery.

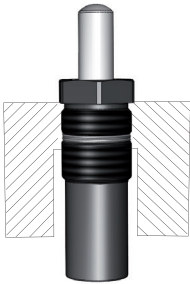


Installation tool



Order No. 3021000

Mounting possibilities



The R series was named because the tube is Rollformed and therefore permanently closed, making these springs non-repairable. R series springs are available with Ø12, Ø15, and Ø19 mm tube diameters and with stroke lengths up to 125 mm. There are 4 color-coded models, all with preset forces. An adjustable model (black) is also available. It can be ordered either set to a specific charge pressure or it can be adjusted by customers with the appropriate charging equipment and training.

Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen

Max. charging pressure (at 20°C) 180 bar

Min. charging pressure (at 20°C) 20 bar

Operating temperature 0 to +80°C

Force increase by temperature ±0.3 %/°C

Recommended max. strokes/min (at 20°C) ~40 – 100

Max. piston rod velocity 1.6 m/s

Rod surface Nitrided

Tube surface Black oxide

Repair Kit Non-repairable



How to order

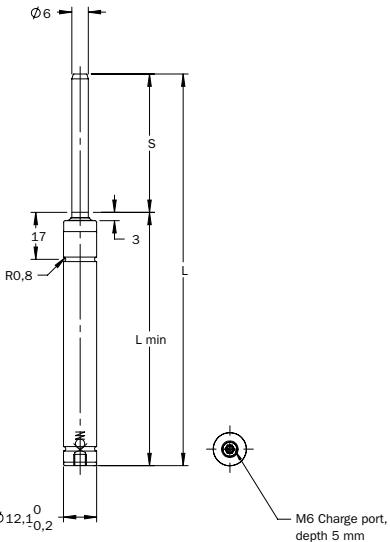
Model: **R12 - 7 - Blue**

Force: Green, Blue, Red, Yellow, Black, state desire force in N

Stroke length: (mm)
(7, 10, 12.7, 15, 19, 25, 38, 50, 63.5, 75, 80, 100, 125)

Model	Force in N at +20°C	Force in lbf at +20°C	Color	Charging pressure (bar)
	in N	in lbf		
R12	130	29	Green	45
R12	250	56	Blue	90
R12	380	85	Red	135
R12	500	112	Yellow	180
R12 XX*	60-500	13-112	Black	20-180

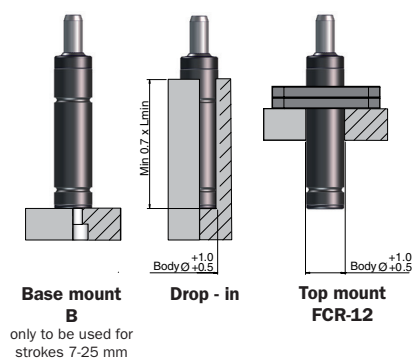
* Force to be set by the customer. Delivered with a pre-charge of 5-10 bar.



S stroke	Isothermal end force in N at +20°C **				Isothermal end force in lbf at +20°C **				L ±0.25	L min.	Gas vol. (l)	Weight (kg)
	R12	R12	R12	R12	R12	R12	R12	R12				
7	149	299	448	597	34	67	101	134	56	49	0.001	0.03
10	158	317	475	634	36	71	107	143	62	52	0.001	0.03
12.7	164	329	493	657	37	74	111	148	67.4	54.7	0.001	0.03
15 ■	168	335	503	670	38	75	113	151	72	57	0.002	0.03
19	172	344	517	689	39	77	116	155	80	61	0.002	0.04
25 ■	177	354	530	707	40	80	119	159	92	67	0.002	0.04
38 ■	183	365	548	730	41	82	123	164	118	80	0.003	0.04
50 ■	185	371	556	742	42	83	125	167	142	92	0.004	0.05
63.5	197	395	592	789	44	89	133	178	172	108.5	0.005	0.06
75	197	394	591	788	44	89	133	178	195	120	0.006	0.06
80	207	414	620	827	47	93	139	186	205	125	0.006	0.07
100	204	409	613	817	46	92	138	184	245	145	0.008	0.07
125	202	405	607	810	45	91	137	182	295	170	0.010	0.09

** at full stroke ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



FCR-12



26

Additional mounts

FC-12



231

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The R series was named because the tube is Roll-formed and therefore permanently closed, making these springs non-repairable. R series springs are available with Ø12, Ø15, and Ø19 mm tube diameters and with stroke lengths up to 125 mm. There are 4 color-coded models, all with preset forces. An adjustable model (black) is also available. It can be ordered either set to a specific charge pressure or it can be adjusted by customers with the appropriate charging equipment and training.

Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen

Max. charging pressure (at 20°C) 180 bar

Min. charging pressure (at 20°C) 20 bar

Operating temperature 0 to +80°C

Force increase by temperature ±0.3 %/°C

Recommended max. strokes/min (at 20°C) ~100 – 150

Max. piston rod velocity 1.6 m/s

Rod surface Nitrided

Tube surface Black oxide

Repair Kit Non-repairable



How to order

R15 - 10 - Green

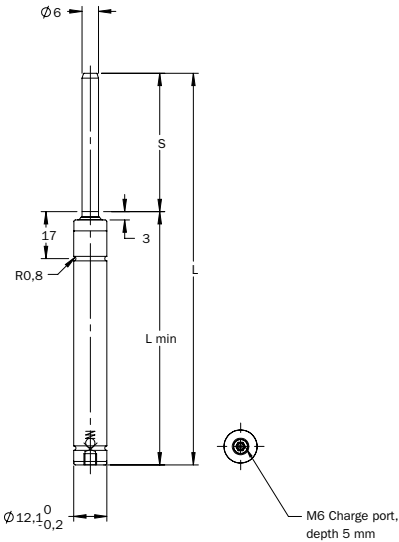
Model: _____

Force: Green, Blue, Red, Yellow, Black, state desire force in N

Stroke length: (mm)
(7, 10, 12.7, 15, 19, 25, 38.1, 50, 63.5, 75, 80, 100, 125)

Model	Force in N at +20°C	Force in lbf at +20°C	Color	Charging pressure (bar)
	in N	in lbf		
R15	180	40	Green	45
R15	350	80	Blue	90
R15	500	115	Red	135
R15	700	160	Yellow	180
R15 XX*	80-700	18-160	Black	20-180

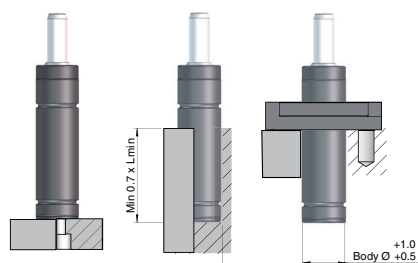
* Force to be set by the customer. Delivered with a pre-charge of 5-10 bar.



S stroke	Isothermal end force in N at +20°C **				Isothermal end force in lbf at +20°C **				L ±0.25	L min.	Gas vol. (l)	Weight (kg)
	R15	R15	R15	R15	R15	R15	R15	R15				
7	216	432	648	865	49	97	146	195	56	49	0.001	0.05
10	224	447	671	895	50	101	151	201	62	52	0.001	0.05
12.7	228	457	685	914	51	103	154	206	67.44	54.7	0.001	0.05
15	232	463	695	927	52	104	156	209	72	57	0.002	0.05
19	236	471	707	943	53	106	159	212	80	61	0.002	0.05
25	240	480	720	961	54	108	162	216	92	67	0.002	0.06
38.1	258	516	774	1032	58	116	174	232	118.2	80.1	0.003	0.07
50	258	516	774	1033	58	116	174	232	142	92	0.004	0.08
63.5	273	546	819	1092	61	123	184	246	172	108.5	0.005	0.09
75	270	541	811	1982	61	122	182	243	195	120	0.006	0.10
80	270	539	809	1079	61	121	182	243	205	125	0.006	0.11
100	267	534	802	1069	60	120	180	240	245	145	0.008	0.12
125	265	531	796	1062	60	119	179	239	295	170	0.010	0.14

** at full stroke

Mounting possibilities



Base mount

B

only to be used for
strokes 7-25 mm

Drop-in

Top mount
FCR-15

Recommended mounts



FCR-15

 26

Additional mounts

FC-15

 231

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The R series get their name from the fact their tube is roll formed and therefore permanently closed, making them non-repairable. R series springs are available with Ø 12, Ø 15, and Ø 19 mm tube diameters and with stroke lengths up to 125 mm. There are 4 color-coded models, whose forces are preset. An adjustable model (black) is also available, that can be ordered to a specific charge pressure or adjusted by customers with the appropriate charging equipment and training.

Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen
Max. charging pressure (at 20°C) 180 bar
Min. charging pressure (at 20°C) 25 bar
Operating temperature 0 to +80°C
Force increase by temperature ± 0.3%/°C
Recommended max strokes/min (at 20°C) ~ 100-150
Max piston rod velocity 1.6 m/s
Rod surface Nitrided
Tube surface Black oxide
Repair kit Non-repairable

Automotive standard: VDI 3003-Blatt 2, ISO 11901-1-900, WDX35-80-3607xxxx, WDX35-80-3615xxxx, WDX35-80-3625xxxx, WDX35-80-3638xxxx, WDX35-80-3650xxxx, 39D878xx, B2 4005 21712xx, B2 4005 21680xx, B2 4005, 21729xx, 03326xx, 0529565, 0332739, 05755xx, 39-670-67xx, WDX35-80-19xxxx



How to order

R19 - 7 - Yellow

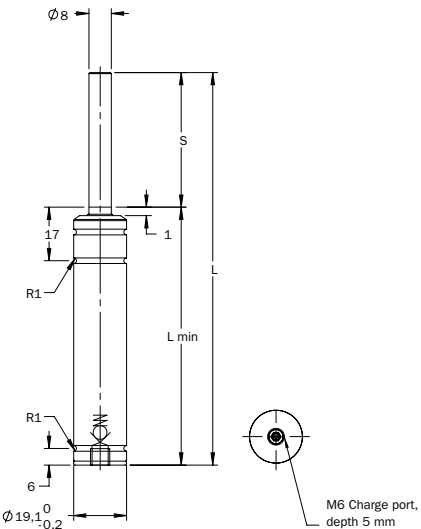
Model: _____

Force: Green, Blue, Red, Yellow, Black, state desire force in N

Stroke length: (mm)
(7, 10, 15, 25, 38.1, 50, 63.5, 80, 100, 125)

Model	Force in N at +20°C	Force in lbf at +20°C	Color	Charging pressure (bar)
	in N	in lbf		
R19	300	67	Green	60
R19	500	112	Blue	100
R19	700	157	Red	140
R19	900	202	Yellow	180
R19 XX *	125-900	67-202	Black	25-180

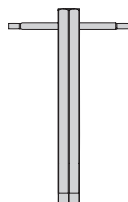
* Force to be set by the customer. Delivered with a pre-charge of 5-10 bar.



S stroke	Isothermal end force in N at +20°C **				Isothermal end force in lbf at +20°C **				L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
	R19	R19	R19	R19	R19	R19	R19	R19					
7	530	880	1,200	1,600	119	199	270	360	56	49	0.003	0.07	
10	470	780	1,100	1,400	105	175	247	315	62	52	0.003	0.08	
12	444	740	1,040	1,330	100	166	233	299	66	54	0.004	0.08	
15 ■	440	730	1,000	1,300	99	164	225	292	72	57	0.004	0.08	✓
25 ■	420	700	980	1,300	94	157	220	292	92	67	0.006	0.08	✓
38.1 ■	410	690	970	1,200	92	155	218	270	118.2	80.1	0.009	0.10	✓
50 ■	410	680	960	1,200	92	152	216	270	142	92	0.011	0.12	✓
63.5	410	680	950	1,200	92	152	214	270	172	108.5	0.014	0.13	✓
80	410	680	950	1,200	92	152	214	270	205	125	0.018	0.14	✓
100	410	670	940	1,200	92	152	214	270	245	145	0.022	0.17	
125	410	670	940	1,200	92	152	214	270	295	170	0.027	0.20	

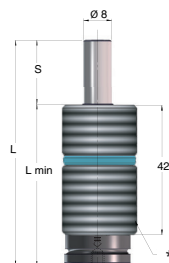
** at full stroke ■ Recommended stroke length for optimal delivery.

Installation tool



Installation Tool
for threaded sleeve
Order No. 3020618

R19



Also available with
threaded sleeve -TM or -TI

Order no. example
R19-Stroke-Color-TM
R19-Stroke-Color-TI

* **TM = M24 x 1,5**
or TI = 1" - 8 UNC

* Please note that when the threaded sleeve is used, the max stroke length is reduced by 3 mm and Lmin is increased by 3 mm.

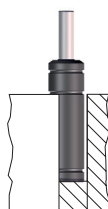
Mounting possibilities



Base mount

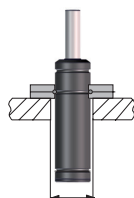
B

only to be used for
strokes 7-25 mm



Drop - in

Body Ø
+ 1.0
+ 0.5



Top mount
FCR

Body Ø
+ 1.0
+ 0.5



Foot mount

BF-19

only to be used for
strokes 7-25 mm

Recommended mounts



BF-19

28



FCR-90

26



FCR-19 VD12

26

Additional mounts

FC-19

231

Note!

For dimensions on all mounting possibilities, refer to "Mounts" in chapter 3.

The M2 is available in four preset models, with initial forces from 500 to 2000 N. The body of the spring and the mount are designed to meet the ISO-dimension found in ISO 11901 as well as in VDI 3003. Each spring is color-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.



Basic information

For general information see "About gas springs".

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	180 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 80-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3016385

Automotive standard: VDI 3003-Blatt 2, ISO 11901-1-2000, 39D878xx, B2 4005 2172962, B2 4005 21680xx, 03326xx, 0529566, 0332740, 05295xx, Z000351514, Z000213263, Z000260312, N000739808, 39-670-18xx, 304502x, 304503x



How to order

M2 - 10 - Green

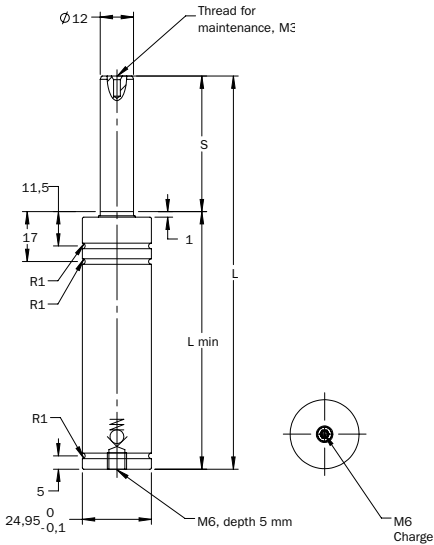
Model:

Force: Green, Blue, Red, Yellow, Black, state desire force in N

Stroke length: (mm)
(10, 12.7, 15, 16, 25, 38.1, 50, 63.5, 80, 100, 125)

Model	Force in N at +20°C	Force in lbf at +20°C	Color	Charging pressure (bar)
	in N	in lbf		
M2	500	110	Green	45
M2	1,000	225	Blue	90
M2	1,500	340	Red	135
M2	2,000	450	Yellow	180
M2 XX*	280-2,000	63-450	Black	25-180

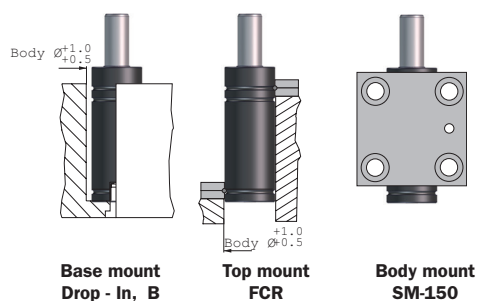
* Force to be set by the customer. Delivered with a pre-charge of 5-10 bar.



S stroke	Isothermal end force in N at +20°C **				Isothermal end force in lbf at +20°C **				L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
	M2	M2	M2	M2	M2	M2	M2	M2					
10	770	1,530	2,300	3,060	173	344	689	689	62	52	0.005	0.14	
12.7	770	1,530	2,300	3,070	173	344	690	690	67.4	54.7	0.006	0.15	
15	770	1,540	2,310	3,070	173	346	690	690	72	57	0.007	0.16	✓
16	770	1,540	2,310	3,070	173	346	690	690	74	58	0.007	0.16	
25	770	1,540	2,310	3,080	173	346	692	692	92	67	0.010	0.18	✓
38.1	770	1,540	2,320	3,090	173	346	695	695	118.2	80.1	0.015	0.20	✓
50	770	1,540	2,320	3,090	173	346	695	695	142	92	0.019	0.22	✓
63.5	760	1,520	2,270	3,020	171	342	679	679	172	108.5	0.024	0.26	✓
80	760	1,520	2,280	3,040	171	342	683	683	205	125	0.029	0.30	✓
100	760	1,520	2,290	3,050	171	342	686	686	245	145	0.036	0.33	✓
125	760	1,530	2,290	3,060	171	344	689	689	295	170	0.044	0.39	✓

** at full stroke

Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

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 lengths are 3 mm shorter). Each spring is color-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.



Basic information

For general information see "About gas springs".

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	180 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 80-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3016385



How to order

MM2 - 10 - Black

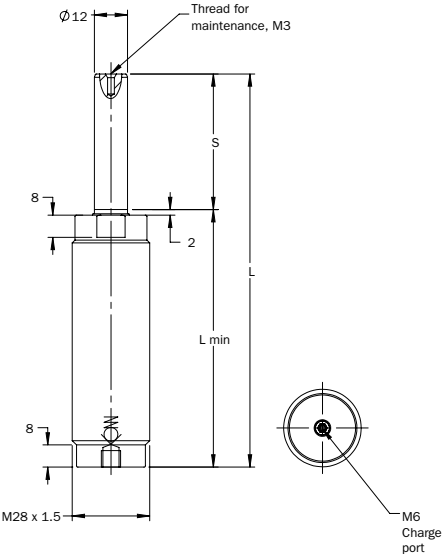
Model: _____

Force: Green, Blue, Red, Yellow, Black, state desire force in N

Stroke length: (mm)
(10, 12.7, 15, 16, 25, 38.1, 50, 63.5, 80, 100, 125)

Model	Force in N at +20°C	Force in lbf at +20°C	Color	Charging pressure (bar)
	in N	in lbf		
MM2	500	110	Green	45
MM2	1,000	225	Blue	90
MM2	1,500	340	Red	135
MM2	2,000	450	Yellow	180
MM2 XX*	280-2,000	63-450	Black	25-180

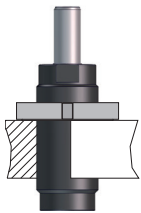
* Force to be set by the customer. Delivered with a pre-charge of 5-10 bar.



S stroke	Isothermal end force in N at +20°C**				Isothermal end force in lbf at +20°C**				L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2					
10	770	1,530	2,300	3,060	173	344	517	689	62	52	0.005	0.14	
12.7	770	1,530	2,300	3,070	173	344	517	690	67.4	54.7	0.006	0.15	
15	770	1,540	2,310	3,070	173	346	519	690	72	57	0.007	0.16	✓
16	770	1,540	2,310	3,070	173	346	519	690	74	58	0.007	0.16	
25	770	1,540	2,310	3,080	173	346	519	692	92	67	0.010	0.18	✓
38.1	770	1,540	2,320	3,090	173	346	522	695	118.2	80.1	0.015	0.20	✓
50	770	1,540	2,320	3,090	173	346	522	695	142	92	0.019	0.22	✓
63.5	760	1,520	2,270	3,020	171	342	510	679	169	105.5	0.024	0.26	✓
80	760	1,520	2,280	3,040	171	342	513	683	202	122	0.029	0.30	✓
100	760	1,520	2,290	3,050	171	342	515	686	242	142	0.036	0.33	✓
125	760	1,530	2,290	3,060	171	344	515	689	292	167	0.044	0.39	✓

** at full stroke

Mounting possibilities



Thread mount
FRM

Recommended mounts



FRM-150

 36

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The MC3 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 as well as in VDI 3003.

Each spring is color-coded for easy identification of force rating. We also offer a model with adjustable force (black) that can be customized to meet individual force requirements. The adjustable model may be set to the desired pressure when ordered from us or by customers with charging equipment. The spring can be attached to the tool, using an FCS or FFC mount. The M6 thread in the base of the spring is used for charging and is also a mounting option.



Basic information

For general information see "About gas springs".

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	180 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 80-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3016385

Automotive standard: VDI 3003, ISO 11901-1-1500, GMGDS 90.25.00-1.5, 39D878xx, B2 4005 21712xx, 03322xx, Z000332028, Z000299476, Z000332029, N000382204, Z000347117, Z000174638, Z000295927, R100036114, X346590726, X346590651, R100036118, 39-673-563x, 39-673-564x

How to order

MC3 - 10 - Green

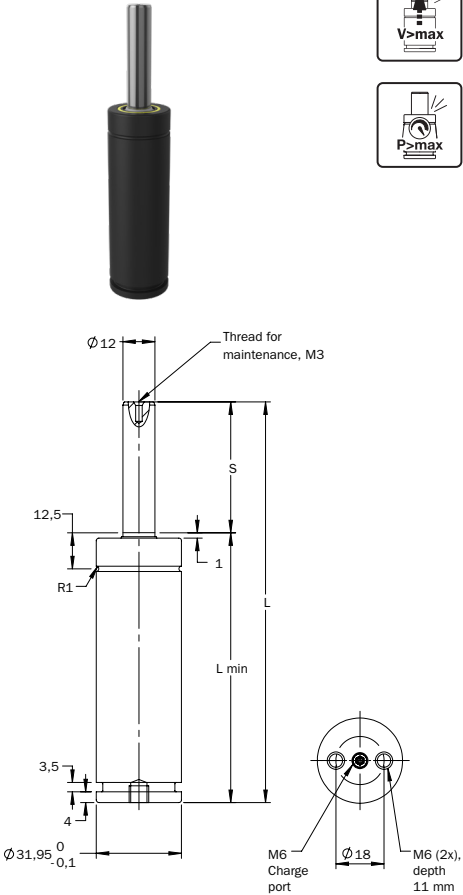
Model: _____

Force: Green, Blue, Red, Yellow, Black, state desire force in N

Stroke length: (mm)
(10, 12.7, 16, 25, 38.1, 50, 63.5, 80, 100, 125)

Model	Force in N at +20°C	Force in lbf at +20°C	Color	Charging pressure (bar)
	in N	in lbf		
M2	500	110	Green	45
M2	1,000	225	Blue	90
M2	1,500	340	Red	135
M2	2,000	450	Yellow	180
M2 XX*	280-2,000	63-450	Black	25-180

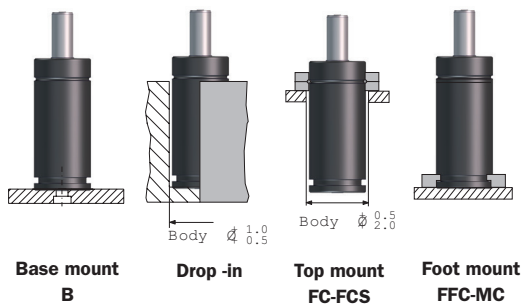
* Force to be set by the customer. Delivered with a pre-charge of 5-10 bar.



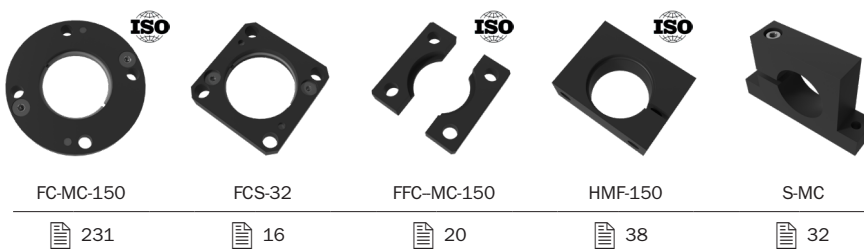
S stroke	Isothermal end force in N at +20°C**				Isothermal end force in lbf at +20°C**				L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
	MC3	MC3	MC3	MC3	MC3	MC3	MC3	MC3					
10	770	1,530	2,300	3,060	173	344	517	688	70	60	0.005	0.30	✓
12.7	770	1,530	2,300	3,070	173	344	517	690	75.4	62.7	0.006	0.31	
16	770	1,540	2,310	3,070	173	340	519	690	82	66	0.007	0.33	✓
25	770	1,540	2,310	3,080	173	340	519	692	100	75	0.010	0.38	✓
38.1	770	1,540	2,320	3,090	173	340	522	695	126.2	88.1	0.015	0.43	
50	770	1,540	2,320	3,090	173	340	522	695	150	100	0.019	0.48	✓
63.5	760	1,520	2,270	3,020	171	342	510	679	177	113.5	0.024	0.54	
80	760	1,520	2,280	3,040	171	342	513	683	210	130	0.029	0.62	✓
100	760	1,520	2,290	3,050	171	342	515	686	250	150	0.036	0.71	
125	760	1,530	2,290	3,060	171	342	515	688	300	175	0.044	0.83	

** at full stroke

Mounting possibilities



Recommended mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The MC3-SP spring s equipped with a M6 side charge port compared to the M6 bottom charge port on the MC3. The body of the spring and the mount are designed to meet the ISO dimension found in ISO 11901 as well as in VDI 3003 and the current GM standard, GMGDS 90.25.00-1.5-XXX.

Each spring is color-coded in red and black for easy identification of force rating. The adjustable force (black) that can be customized to meet individual force requirements. The adjustable model may be set to the desired pressure when ordered from us or by customers with charging equipment. The spring can be attached to the tool, using an FC-MC or FFC-MC mount. The M6 thread in the base of the spring is used for charging and is also a mounting option.

Basic information

For general information see "About gas springs".

Pressure medium Nitrogen

Max. charging pressure (at 20°C) 180 bar

Min. charging pressure (at 20°C) 25 bar

Operating temperature 0 to +80°C

Force increase by temperature ±0.3%/°C

Recommended max strokes/min (at 20°C) ~ 80-100

Max piston rod velocity 1.6 m/s

Rod surface Nitrided

Tube surface Black oxide

Repair kit 3016385



How to order

MC3-SP - 10 - Red

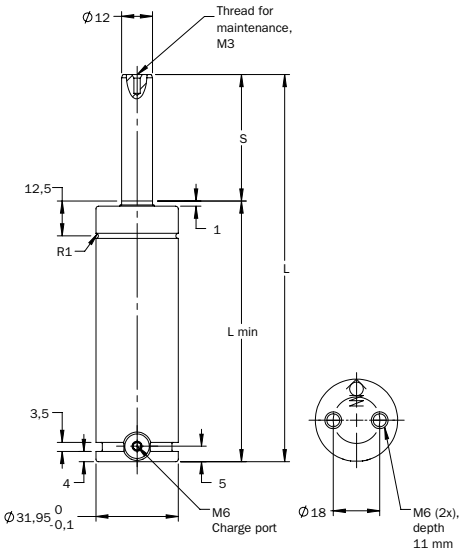
Model: _____

Force: Green, Blue, Red, Yellow, Black, state desire force in N

Stroke length: (mm)
(10, 12.7, 16, 25, 38.1, 50, 63.5, 80, 100, 125)

Model	Force in N at +20°C		Color	Charging pressure (bar)
	in N	in lbf		
MC3-SP	1,500	340	Red	135
MC3-SP*	280-2,000	63-450	Black	25-180

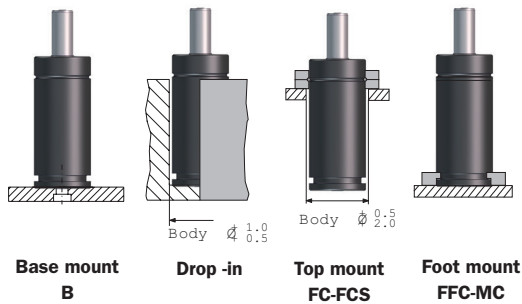
* Force to be set by the customer. Delivered with a pre-charge of 5-10 bar.



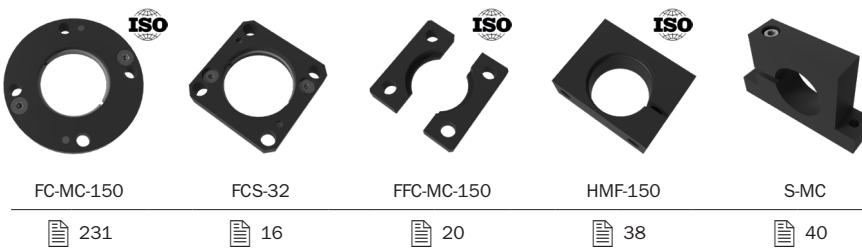
S stroke	Isothermal end force in N at +20°C **		Isothermal end force in lbf at +20°C **		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	
	MC3-SP		MC3-SP						
10	2300		517		70	60	0.005	0.30	√
12.7	2300		517		75.4	62.7	0.006	0.31	
16	2310		519		82	66	0.007	0.33	√
25	2310		519		100	75	0.010	0.38	√
38.1	2320		522		126.2	88.1	0.015	0.43	
50	2320		522		150	100	0.019	0.48	√
63.5	2270		510		177	113.5	0.024	0.54	
80	2280		513		210	130	0.029	0.62	√
100	2290		515		250	150	0.036	0.71	
125	2290		515		300	175	0.044	0.83	

** at full stroke

Mounting possibilities



Recommended mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

The Power Line springs are available with forces from 1,700 N up to 200,000 N 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 gas link system. The X 170 has an upper ISO Standard C-groove and a lower C-groove, which together with a threaded bottom hole offer various mounting possibilities using our standard mounts.



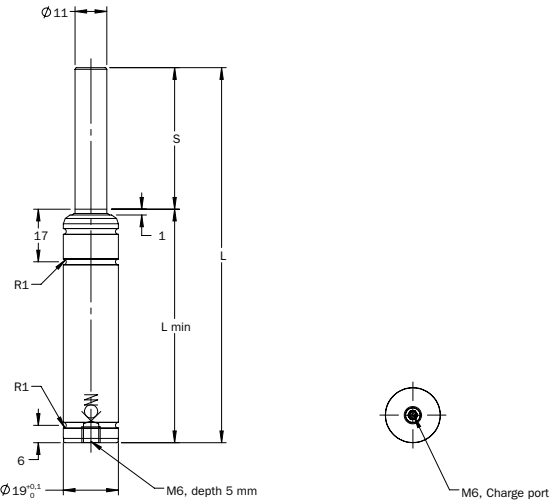
Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 180 bar
- Min. charging pressure (at 20°C) 25 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 40-100
- Max piston rod velocity 1.6 m/s
- Rod surface Nitrided
- Tube surface Black oxide
- Repair kit Non-repairable



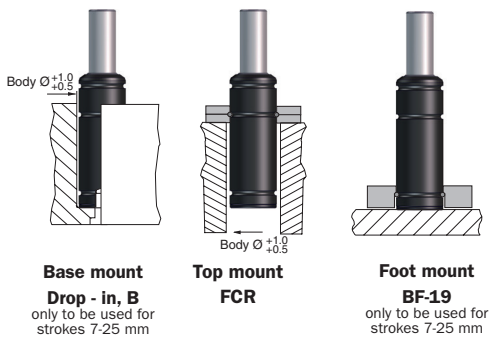
Automotive standard: VDI 3003-Blatt 3, ISO 11901-3-1700, 39D997x,
B2 4005 21723xx, 04584xx, 39-673-020x, 90201401941,



Order No.	S stroke	Force in N at 180 bar/+20°C		Force in lbf at 180 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X 170-007	7	1,700	2,800	382	630	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	0.14	
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	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

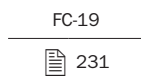
Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Mould Temp gas springs have been engineered to withstand higher working temperatures, like those commonly associated with plastic molding tools. Mould Temp gas springs are compact and powerful piston rod sealed gas springs, which can be used at working temperatures up to 120°C.

Features

- For applications up to 120°C
- Fully adjustable charge pressure
- Various mounting possibilities using our standard mounts as well as bottom threaded holes
- MT 16 and MT 24 have threaded upper cylinders for easy and adjustable mounting
- M6 gas ports that can be connected to the special high temp version of our Micro EO24™ Hose and Tube system for remote pressure control

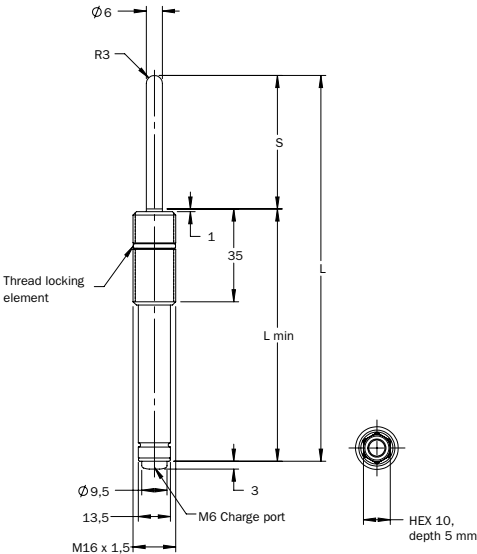


Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen
Max. charging pressure (at 20°C) See table below
Min. charging pressure (at 20°C) 25 bar
Operating temperature 0 to +120°C
Force increase by temperature ±0.3%/°C
Recommended max strokes/min (at 20°C) See table below
Max piston rod velocity 1.0 m/s
Service life (0 to 80°C) 1,000,000 strokes
or 100,000 stroke meters
Service life (80 to 120°C) 500,000 strokes
or 50,000 stroke meters
Rod surface Nitrided
Tube surface Black oxide
Repair kit Non-repairable

Max. working temp. interval	Max. strokes per minute (spm)	Max. charge pressure at 20°C (bar)	Force per temperature		
			Spring temp.	Initial force (N)	End force* (N)
0 - 80°C	20	150	80°C (20°C)	510 (420)	810 (670)
80 - 100°C	15	125	100°C (20°C)	450 (355)	720 (570)
100 - 120°C	10	115	120°C (20°C)	435 (325)	700 (520)



Order No.	S stroke	Initial force in N at 150 bar/+20°C	Initial force in lbf at 150 bar/+20°C	L ±0.25	L min.	Gas vol. (l)	Weight (kg)
MT 16-010	10	420	95	65	55	0.002	0.06
MT 16-020	20			85	65	0.003	0.07
MT 16-030	30			105	75	0.003	0.07
MT 16-040	40			125	85	0.004	0.08
MT 16-050	50			145	95	0.005	0.09
MT 16-060	60			165	105	0.006	0.10
MT 16-070	70			185	115	0.007	0.11
MT 16-080	80			205	125	0.008	0.11

* Isothermal end force at full stroke.

Installation tool



Order No. 3021000

Mounting possibilities



Thread mount

Lock nut available
M16x1.5 503681

Additional mounts

FRM-16

 36

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Mould Temp gas springs have been engineered to withstand higher working temperatures, like those commonly associated with plastic molding tools. Mould Temp gas springs are compact and powerful piston rod sealed gas springs, which can be used at working temperatures up to 120°C.



Features

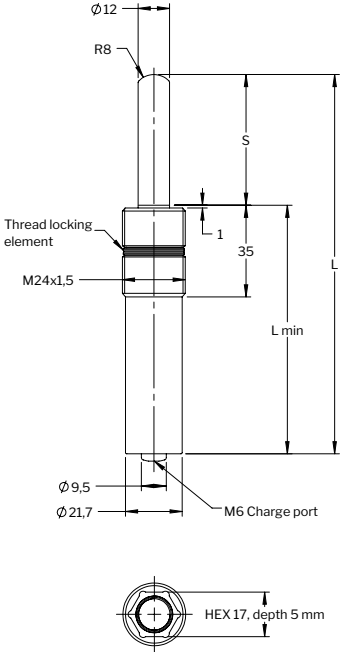
- For applications up to 120°C
- Fully adjustable charge pressure
- Various mounting possibilities using our standard mounts as well as bottom threaded holes
- MT 16 and MT 24 have threaded upper cylinders for easy and adjustable mounting
- M6 gas ports can be connected to the special high temp version of our Micro EO24™ Hose and Tube system for remote pressure control



Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	See table below
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +120°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	See table below
Max piston rod velocity	1.0 m/s
Service life (0 to 80°C)	1,000,000 strokes
or	100,000 stroke meters
Service life (80 to 120°C)	500,000 strokes
or	50,000 stroke meters
Rod & tube surface	Nitrided
Repair kit	Non-repairable



Max. working temp. interval	Max. strokes per minute (spm)	Max. charge pressure at 20°C (bar)	Force per temperature		
			Spring temp.	Initial force (N)	End force* (N)
0 - 80°C	20	150	80°C (20°C)	2040 -1700	3250 -2700
80 - 100°C	15	125	100°C (20°C)	1800 -1415	2880 -2250
100 - 120°C	10	115	120°C (20°C)	1750 -1300	2800 -2080

Order No.	S stroke	Initial force in N at 150 bar/+20°C	Initial force in lbf at 150 bar/+20°C	L ±0.25	L min.	Gas vol. (l)	Weight (kg)
MT 24-010	10	1,700	382	65	55	0.003	0.13
MT 24-020	20			85	65	0.006	0.15
MT 24-030	30			105	75	0.008	0.17
MT 24-040	40			125	85	0.011	0.19
MT 24-050	50			145	95	0.012	0.21
MT 24-060	60			165	105	0.014	0.23
MT 24-070	70			185	115	0.017	0.25
MT 24-080	80			205	125	0.019	0.27

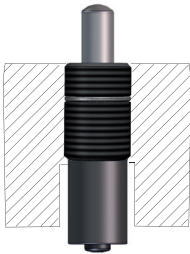
* Isothermal end force at full stroke.

Installation tool



Order No. 3021000

Mounting possibilities



Thread mount

Lock nut available
M24x1.5 503928

Additional mounts

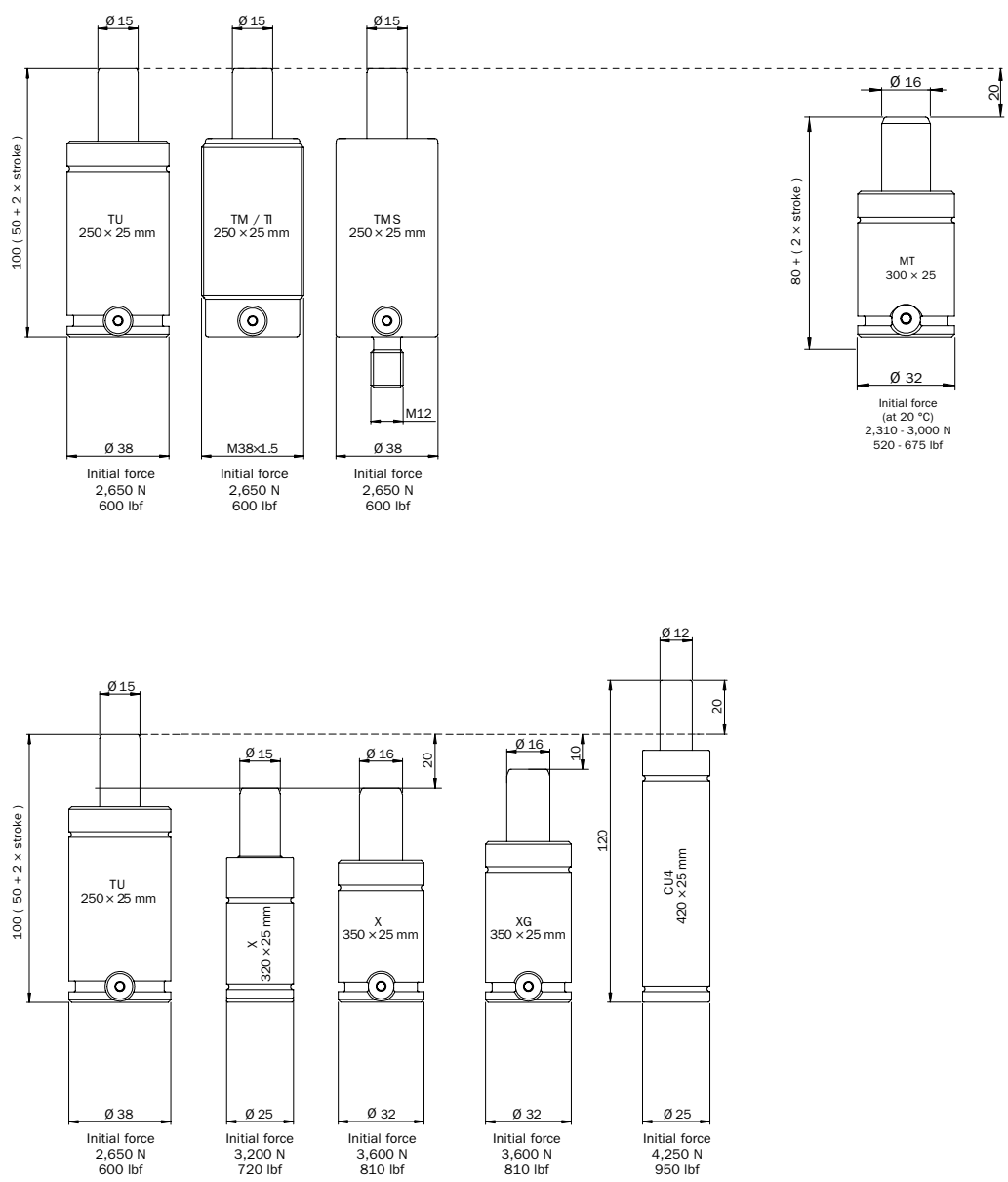
FRM-19

 36

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

2 | Overview - $2500 \leq F_{INIT} < 5000$



	Page
CU4 420	44
X 320	46
X 350	48
XG 350	50
TU 250	52
TM/TI 250	54
TMS 250	56
MT 300	58

This is the smallest member of the CU4 family. As with the rest of the CU4 springs it has a very high force compared to its outer diameter.

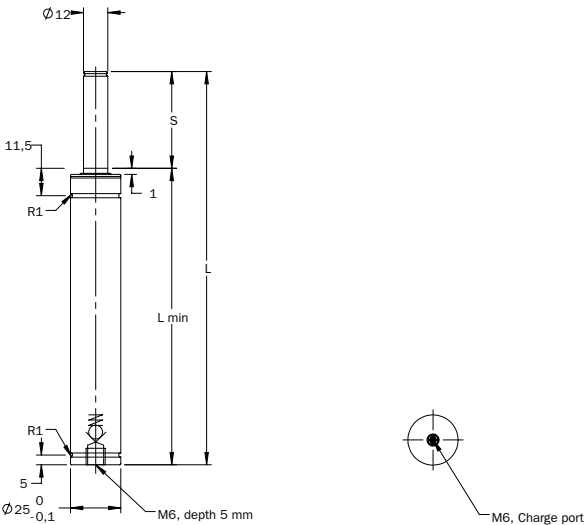


Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 150 bar
- Min. charging pressure (at 20°C) 25 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 50-100
- Max piston rod velocity 0.8 m/s
- Rod surface Nitrided
- Tube surface Nitrided
- Repair kit Non-repairable

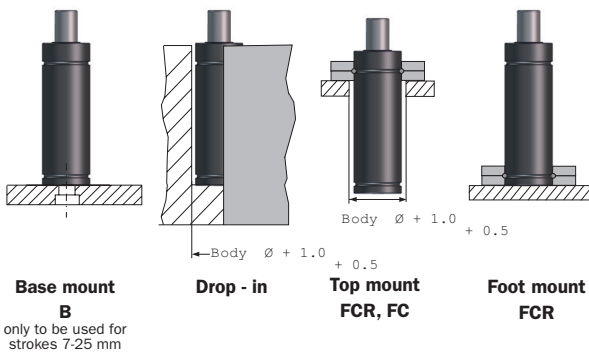
Automotive standard: 5937643, 5937644, 5937645, 5937646, 5937647, 5937648



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
CU4 420-006	6	4,250	7,300	955	1,641	56	50	0.003	0.13
CU4 420-010	10		7,300		1,416	70	60	0.005	0.15
CU4 420-016	16		7,300		1,416	91	75	0.008	0.18
CU4 420-025	25		7,400		1,439	120	95	0.011	0.22
CU4 420-032	32		7,900		1,776	140	108	0.021	0.24
CU4 420-040	40		8,000		1,800	165	125	0.026	0.27
CU4 420-050	50		8,000		1,800	195	145	0.032	0.31

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

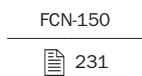
Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

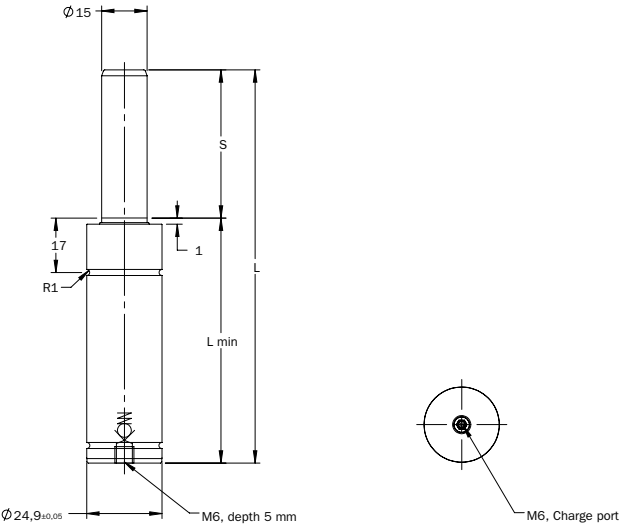
The Power Line springs are available with forces from 1,700 N up to 200,000 N and stroke lengths between 7 and 125 mm. The X 320 has a bottom port for gas charging that can also be used to connect to a gas link system. The X 320 has an upper ISO Standard C-groove that together with a threaded bottom hole offers various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 180 bar
- Min. charging pressure (at 20°C) 25 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 50-100
- Max piston rod velocity 1.6 m/s
- Rod surface Nitrided
- Tube surface Black oxide
- Repair kit Non-repairable

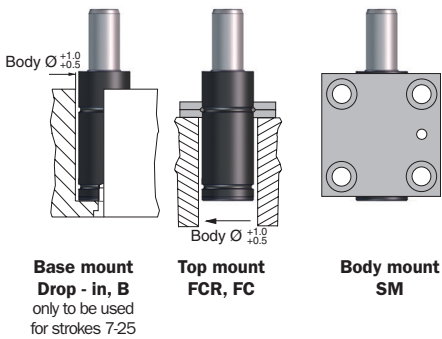
Automotive standard: 39D99710x, 90201407353



Order No.	S Stroke	Force in N at 180 bar/+20°C		Force in lbf at 180 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X 320-007	7	3,200	4,800	720	1,080	44	37	0.004	0.10	✓
X 320-010	10		4,900		1,100	50	40	0.005	0.11	
X 320-015	15		5,100		1,150	60	45	0.007	0.12	✓
X 320-019	19		5,100		1,150	68	49	0.009	0.13	
X 320-025	25 ■		5,200		1,170	80	55	0.011	0.14	✓
X 320-038	38 ■		5,300		1,190	106	68	0.017	0.16	✓
X 320-050	50 ■		5,300		1,190	130	80	0.022	0.19	✓
X 320-063	63 ■		5,300		1,190	156	93	0.028	0.21	✓
X 320-075	75		5,300		1,190	185	110	0.034	0.24	
X 320-080	80		5,300		1,190	195	115	0.036	0.25	✓
X 320-100	100		5,300		1,190	235	135	0.044	0.29	✓
X 320-125	125		5,300		1,190	285	160	0.055	0.33	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



Additional mounts

FCN-150	SM-150
231	32

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

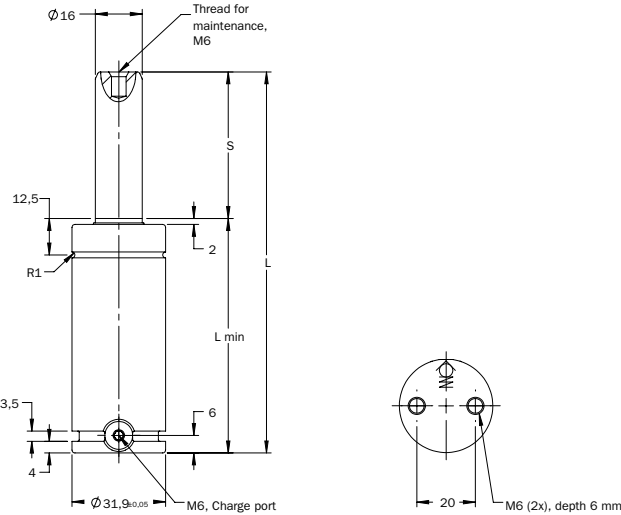
These gas springs are available with forces from 1,700 N up to 200,000 N and stroke lengths between 7 and 125 mm. There is a side port for gas charging that can also be used to connect to a gas link system. An upper C-groove, lower U-groove together with two M6 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 180 bar
- Min. charging pressure (at 20°C) 25 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 50-100
- Max piston rod velocity 1.6 m/s
- Rod surface Nitrided
- Tube surface Black oxide
- Repair kit 3018845

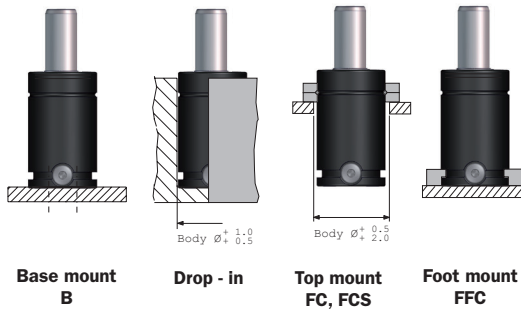
Automotive standard: VDI 3003-Blatt 3, ISO 11901-3-3500, WDX356204-03xxDMS, GMGDS 90.25.08-3.5, 39D99xx, B2 4005 21723xx, 04584xx, 39-673-021x, 39-673-0220, 304503x, 305074x



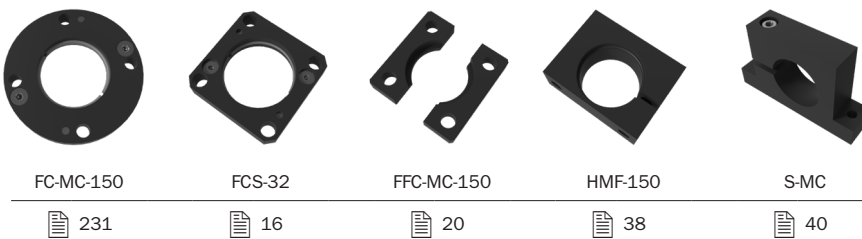
Order No.	S stroke	Force in N at 180 bar/+20°C		Force in lbf at 180 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X 350-010	10	3,600	5,900	810	1,330	50	40	0.01	0.17	✓
X 350-013	13		5,200		1,190	56	43	0.01	0.18	✓
X 350-016	16		5,300		1,210	62	46	0.01	0.19	✓
X 350-019	19		5,600		1,260	68	49	0.01	0.20	
X 350-025	25 ■		5,500		1,260	80	55	0.02	0.22	✓
X 350-032	32		5,500		1,260	94	62	0.02	0.24	
X 350-038	38 ■		5,500		1,240	106	68	0.03	0.26	✓
X 350-050	50 ■		5,600		1,260	130	80	0.03	0.29	✓
X 350-063	63 ■		5,500		1,260	156	93	0.04	0.33	✓
X 350-075	75		5,500		1,260	180	105	0.05	0.37	
X 350-080	80		5,500		1,240	190	110	0.05	0.39	✓
X 350-100	100		5,500		1,240	230	130	0.06	0.45	✓
X 350-125	125		5,500		1,240	280	155	0.08	0.53	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

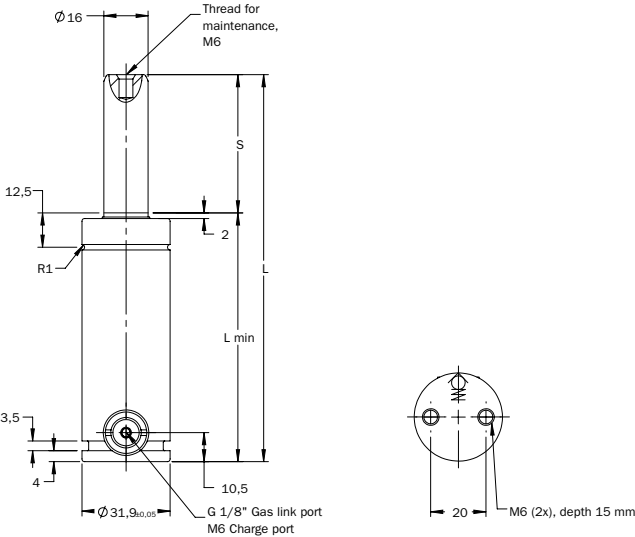
These gas springs are available with forces from 3,500 N up to 66,000 N and stroke lengths between 10 and 125 mm. There is a side and a bottom port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with two M6 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	180 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 50-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3018845

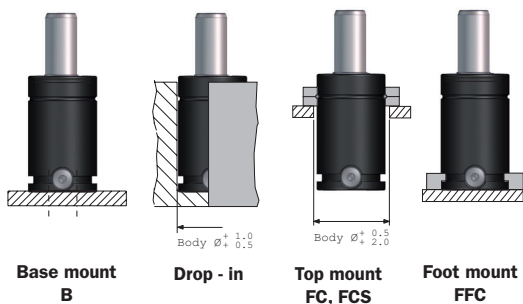
Automotive standard: MES E7231 PG230-PG24D-03, M-2404-TD-1-350



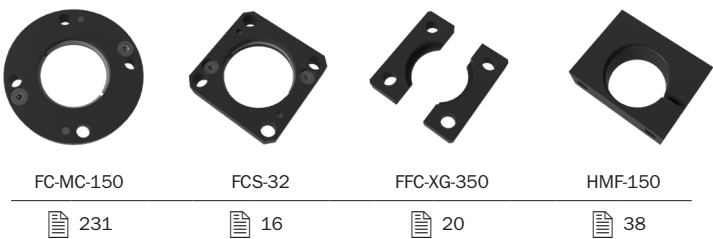
Order No.	S stroke	Force in N at 180 bar/+20°C		Force in lbf at 180 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XG 350-010	10	3,600	5,900	810	1,330	60	50	0.01	0.23
XG 350-013	13		5,200		1,190	66	53	0.01	0.23
XG 350-016	16		5,300		1,210	72	56	0.01	0.24
XG 350-019	19		5,600		1,260	78	59	0.01	0.25
XG 350-025	25		5,500		1,260	90	65	0.02	0.27
XG 350-032	32		5,500		1,260	104	72	0.02	0.29
XG 350-038	38 ■		5,500		1,240	116	78	0.03	0.31
XG 350-050	50 ■		5,600		1,260	140	90	0.03	0.35
XG 350-063	63 ■		5,500		1,260	166	103	0.04	0.39
XG 350-075	75		5,500		1,260	190	115	0.05	0.43
XG 350-080	80		5,500		1,240	200	120	0.05	0.44
XG 350-100	100		5,500		1,240	240	140	0.06	0.50
XG 350-125	125		5,500		1,240	290	165	0.08	0.58

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

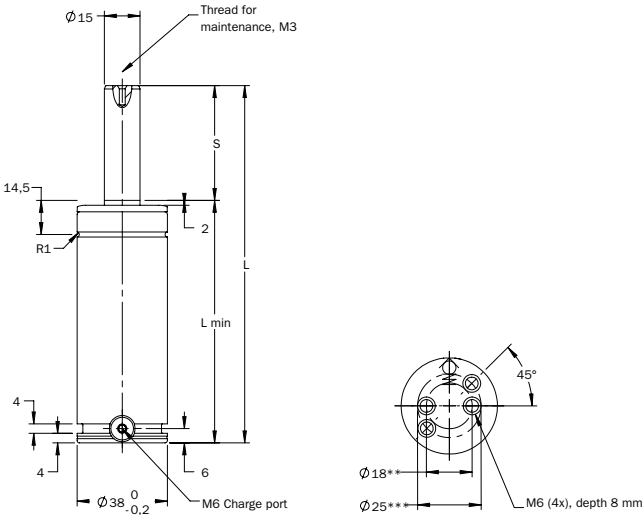
The TU line constitutes our standard line of gas springs. Sizes 250 to 10000 conform to the ISO 11901 gas spring standard as well as VDI 3003. The total length L is 50 mm + (2 × stroke).

Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 150 bar
- Min. charging pressure (at 20°C) 50 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 80-100
- Max piston rod velocity 1.6 m/s
- Rod surface Nitrided
- Tube surface Black oxide
- Repair kit 3026638

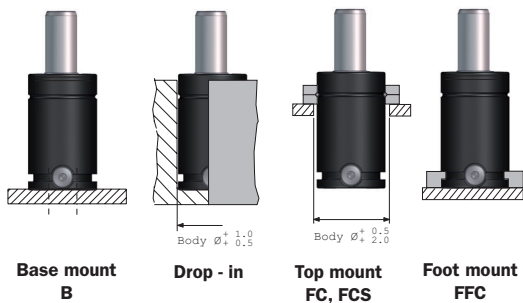
Automotive standard: VDI 3003, ISO 11901-1-5000 WDX356203-0202DMS
GMGDS 90.25.00-2.5 39D878xx, B2 4005 21680xx, B2 4006 33834xx, B2 4006 21710xx, B2 4006 33834xx, 03322xx, N00135992x, N001374093, X346590500, R100287063, X346590823, 39-673-564x, 39-673-565x, N03020x, K32S0-0250-25, 304417x, M-2401-TD-01-250



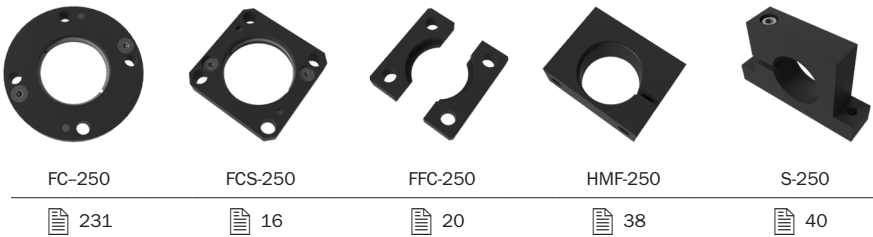
Order No.	S stroke	Force in N at 180 bar/+20°C		Force in lbf at 180 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TU 250-010	10	2,650	3,500	600	790	70	60	0.011	0.40	✓
TU 250-013	12.7		3,500			75.4	62.7	0.013	0.42	
TU 250-016	16		3,500			82	66	0.016	0.43	✓
TU 250-025	25 ■		3,500			100	75	0.023	0.48	✓
TU 250-038	38.1		3,500			126.2	88.1	0.032	0.54	
TU 250-050	50 ■		3,500			150	100	0.041	0.60	✓
TU 250-064	63.5		3,500			177	113.5	0.051	0.67	
TU 250-080	80 ■		3,500			210	130	0.062	0.75	✓
TU 250-100	100		3,500			250	150	0.077	0.85	
TU 250-125	125		3,500			300	175	0.096	0.97	

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

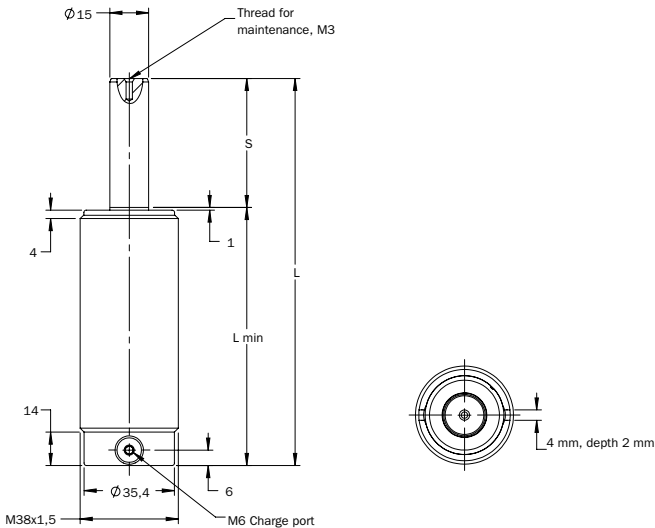
The TM and TI are threaded body 250 springs with the same length as the TU 250. The TM spring has an M38 × 1.5 metric thread. The TI spring has a UNF 1½-12 inch thread.



Basic information

For general information see “About gas springs”.

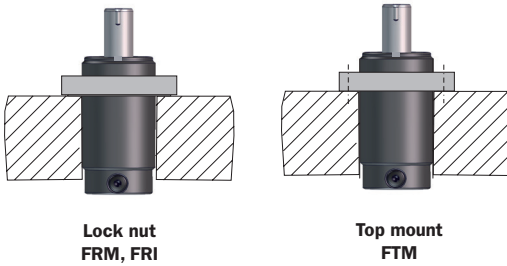
Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	50 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 80-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3016873



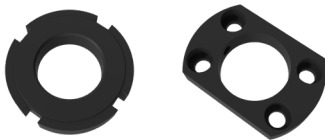
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force *	Initial	End force *				
TM/TI 250-013	12.7	2,650	3,400	600	765	75.4	62.7	0.015	0.37
TM/TI 250-025	25		3,400		765	100	75	0.024	0.42
TM/TI 250-038	38.1		3,400		765	126.2	88.1	0.033	0.47
TM/TI 250-050	50		3,400		765	150	100	0.042	0.52
TM/TI 250-064	63.5		3,500		790	177	113.5	0.052	0.57
TM/TI 250-080	80		3,500		790	210	130	0.063	0.64
TM/TI 250-100	100		3,500		790	250	150	0.078	0.72
TM/TI 250-125	125		3,500		790	300	175	0.096	0.085

* Isothermal end force at full stroke.

Mounting possibilities



Recommended mounts



FRM-250

231

FTM-250

16

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

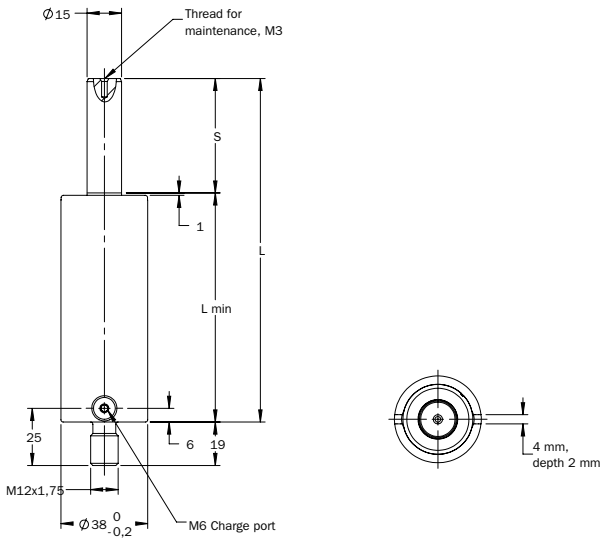
The TMS are 250 springs equipped with a threaded stud for mounting. The TMS (Tube Metric Stud) has a M12 thread. It has the same basic length as the TU 250 spring.



Basic information

For general information see “About gas springs”.

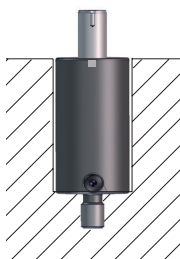
Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	50 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 80-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3016873



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TM/TI 250-013	12.7	2,650	3,400	600	765	75.4	62.7	0015	0.45
TM/TI 250-025	25		3,400		765	100	75	0.024	0.50
TM/TI 250-038	38.1		3,400		765	126.2	88.1	0.033	0.55
TM/TI 250-050	50		3,400		765	150	100	0.042	0.60
TM/TI 250-064	63.5		3,500		790	177	113.5	0.052	0.65
TM/TI 250-080	80		3,500		790	210	130	0.063	0.70
TM/TI 250-100	100		3,500		790	250	150	0.078	0.80

* Isothermal end force at full stroke.

Mounting possibilities



Thread mount
M12x1.75

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Mould Temp gas springs have been engineered to withstand higher working temperatures, like those commonly associated with plastic molding tools. Mould Temp gas springs are compact and powerful piston rod sealed gas springs, which can be used at working temperatures up to 120°C.

Features

- For applications up to 120°C
- Fully adjustable charge pressure
- Various mounting possibilities using our standard mounts as well as bottom threaded holes
- M6 gas ports can be connected to the special high temp version of our Micro EO24™ Hose and Tube system for remote pressure control

Basic information

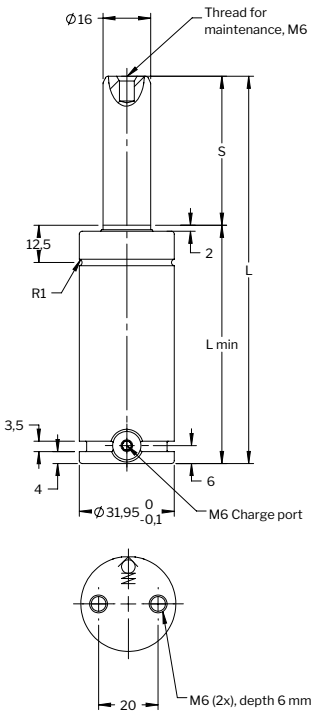
For general information see “About gas springs”.

Pressure medium	Nitrogen	
Max. charging pressure (at 20°C)	Se table below	
Min. charging pressure (at 20°C)	25 bar	
Operating temperature	0 to +120°C	
Force increase by temperature	±0.3%/°C	
Recommended max strokes/min (at 20°C)	See table below	
Max piston rod velocity	1.0 m/s	
Service life (0 to 80°C)	1,000,000 strokes	
or	100,000 stroke meters	
Service life (80 to 120°C)	500,000 strokes	
or	50,000 stroke meters	
Rod & tube surface	Nitrided	
Repair kit	3022687	

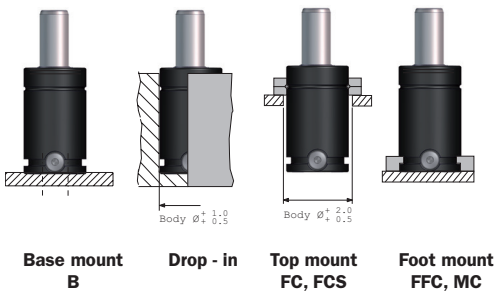
Max. working temp. interval	Max. strokes per minute (spm)	Max. charge pressure at 20°C (bar)	Force per temperature		
			Spring temp.	Initial force (N)	End force* (N)
0 - 80°C	20	150	80°C (20°C)	3,630 (3,000)	5,550 (4,600)
80 - 100°C	15	125	100°C (20°C)	3,200 (2,510)	4,900 (3,850)
100 - 120°C	10	115	120°C (20°C)	3,100 (2,310)	4,750 (3,540)

Order No.	S stroke	Initial force in N at 150 bar/+20°C	Initial force in lbf at 150 bar/+20°C	L ±0.25	L min.	Gas vol. (l)	Weight (kg)
MT 300-010	10	1,700	382	50	40	0.01	0.17
MT 300-013	13			56	43	0.01	0.17
MT 300-016	16			62	46	0.01	0.19
MT 300-019	19			68	49	0.01	0.20
MT 300-025	25			80	55	0.02	0.21
MT 300-032	32			94	62	0.02	0.23
MT 300-038	38			106	68	0.03	0.25
MT 300-050	50			130	80	0.03	0.29
MT 300-063	63			156	93	0.04	0.33
MT 300-075	75			180	105	0.05	0.36
MT 300-080	80			190	110	0.05	0.38

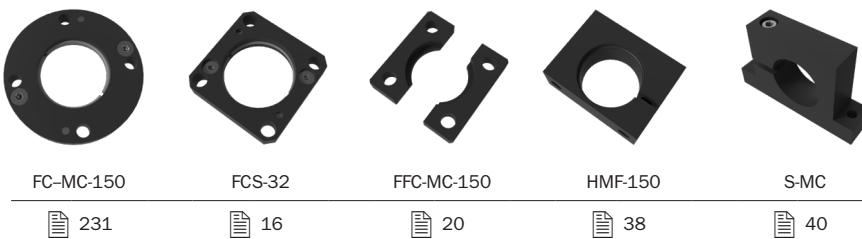
* Isothermal end force at full stroke.



Mounting possibilities

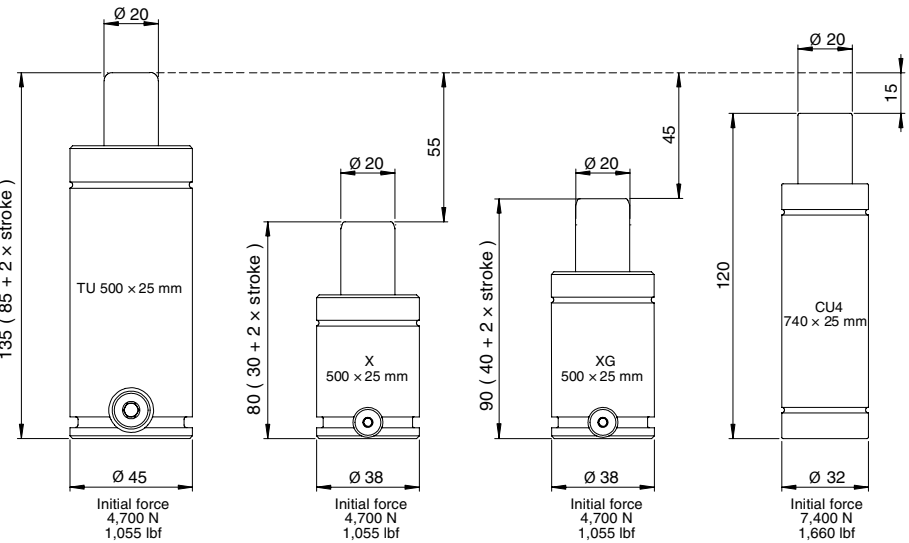
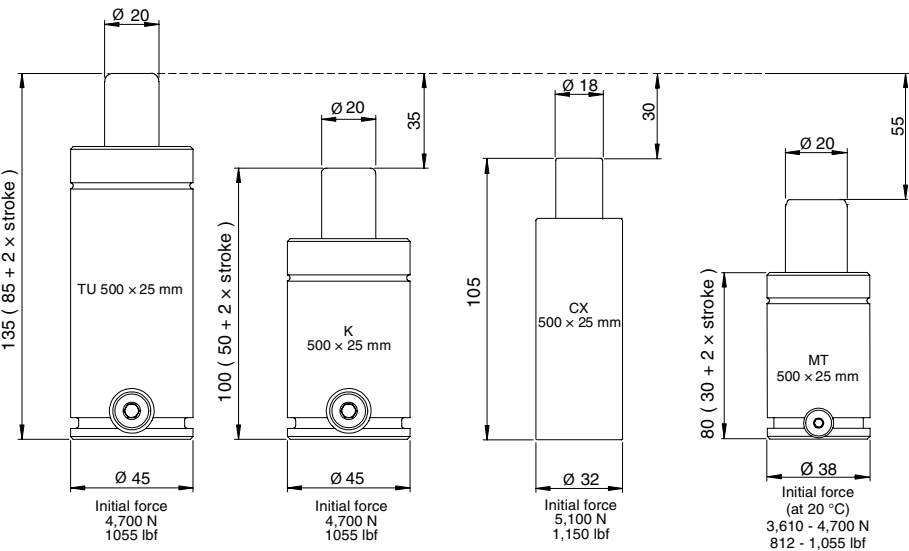


Recommended mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.



	Page
CU4 740	62
CX 500	64
X 500	66
XG 500	68
K 500	70
TU 500	72
MT 500	74

The CU4 gas springs are a very compact Bore Sealed gas springs, offering impressive force in a compact body. 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 fixing of shorter stroke springs for optimal service life.

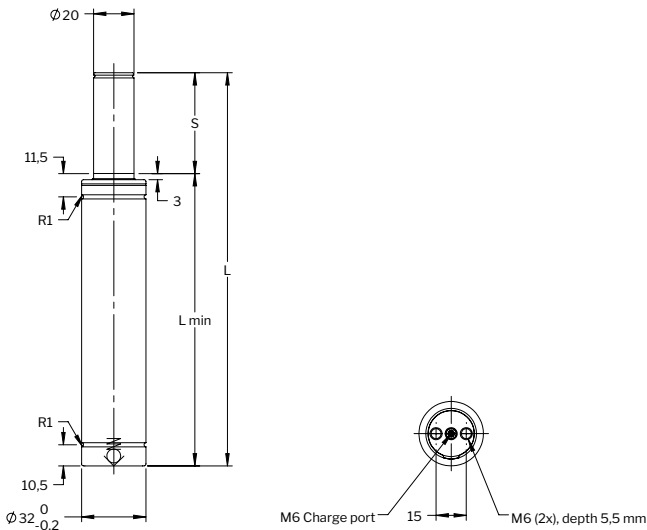


Basic information

For general information see "About gas springs".

Pressure medium.....	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 50-100
Max piston rod velocity	0.8 m/s
Rod surface	Nitrided
Tube surface	Nitrided
Repair kit	3025048

Automotive standard: WDX35-62-06007xxDM, 5937649. 5937650. 5937651.
5937652. 5937653.5937654. 5937655

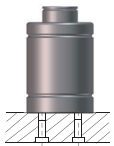


Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CU4 740-006	6	7,400	10,000	1,660	2,200	63	57	0.012	0.20
CU4 740-010	10 ■		10,000		2,250	75	65	0.017	0.24
CU4 740-016	16 ■		11,000		2,475	93	77	0.024	0.28
CU4 740-025	25 ■		12,000		2,700	120	95	0.034	0.33
CU4 740-032	32*		12,000		2,700	140	108	0.042	0.37
CU4 740-040	40*		12,000		2,700	165	125	0.052	0.42
CU4 740-050	50*		12,000		2,700	195	145	0.063	0.48

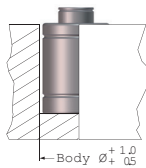
* Should always be attached to the tool using the tapped holes in the bottom or a flange. ** Isothermal end force at full stroke.

■ Recommended stroke length for optimal delivery.

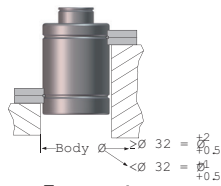
Mounting possibilities



**Base mount
B**



Drop-in



**Top mount
FC, FCS**

Recommended mounts



FC-MC-150

 231



FCS-32

 16

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

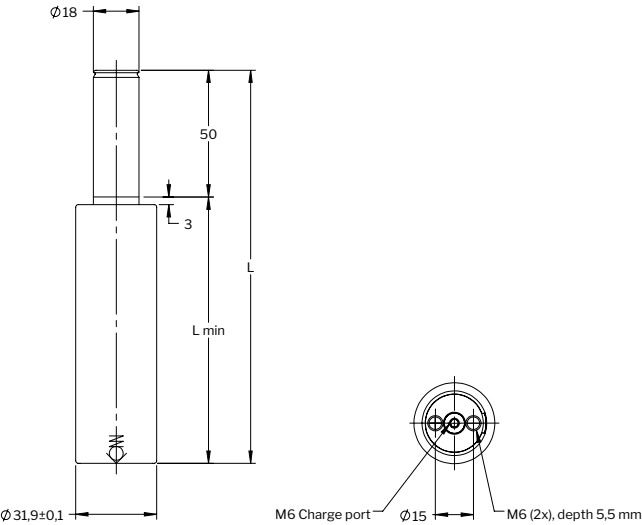
With its unique safety and reliability features, KALLER Compact Xtreme CX is a extremely compact and powerful piston rod sealed gas spring series. Using the CX gas spring is an excellent way to achieve more cost efficient dies due to lower die height.

With its extremely compact build height and cylinder diameters, the CX gas spring can reach extreme initial forces, ranging from 5,100 N to 19,200 N with stroke lengths up to 80 mm. The CX gas spring series is similar to the KALLER Power Line X series and provide extreme forces comparable to the bore sealed KALLER Super Compact CU4 series. In addition, the CX gas spring can handle higher running frequencies (SPM) compared to similar gas springs on the market, which leads to a higher production rate. Additional high force in a small area when baseplate mounted.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	200 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 70-200
Max piston rod velocity	1.6 m/s

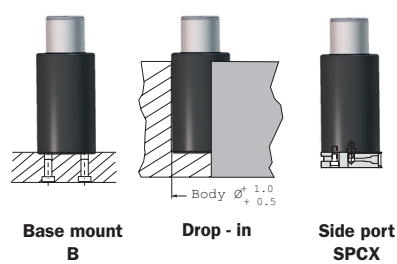


Order No.	S stroke	Force in N at 200 bar/+20°C		Force in lbf at 200 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CX 500-010	10 ■	5,100	6,600	1,150	1,490	75	65	0.01	0.27
CX 500-015	15 ■		7,100		1,610	85	70	0.02	0.29
CX 500-025	25 ■		7,900		1,780	105	80	0.02	0.33
CX 500-038	38* ■		8,700		1,960	130	92	0.03	0.37
CX 500-050	50* ■		9,100		2,040	155	105	0.04	0.42
CX 500-063	63* ■		8,800		1,990	190	127	0.05	0.50
CX 500-080	80* ■		9,200		2,060	225	145	0.06	0.56

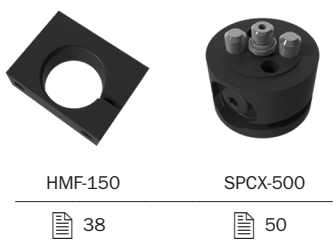
* For stroke lengths over 25 mm, the spring should be attached to the tool using the threaded holes in the bottom.

** Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

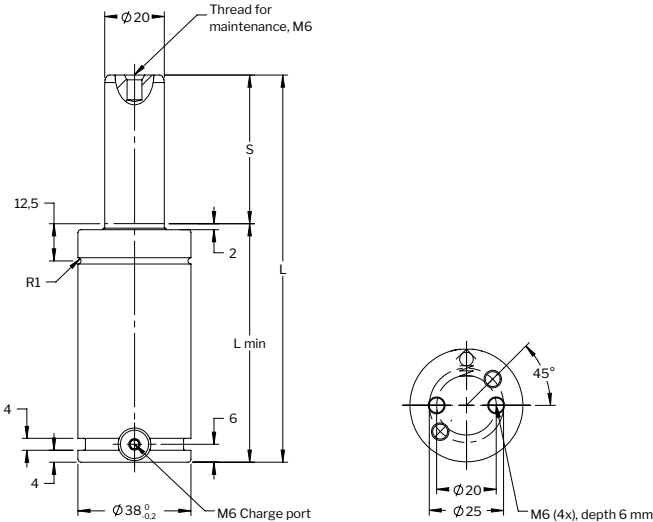
These gas springs are available with forces from 1,700 N up to 200,000 N and stroke lengths between 7 and 125 mm. There is a side port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with two M6 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 150 bar
- Min. charging pressure (at 20°C) 25 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 50-100
- Max piston rod velocity 1.6 m/s
- Rod surface Nitrided
- Tube surface Black oxide
- Repair kit 3018846

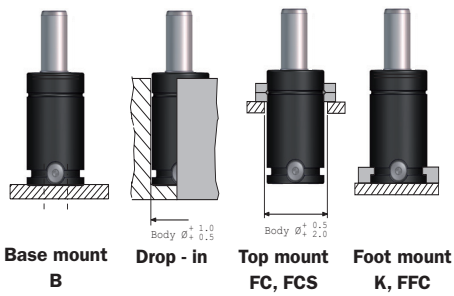
Automotive standard: VDI 3003-Blatt 3 ISO 11901-3-5000 WDX356204-05xxDMS
GMGDS 90.25.08-5 39D997xx B2 4005 21723xx 04584xx, Z0004590xx,
N000491555 , Z000504472, Z000416026, 39-673-022x, 39-673-023x, 305074x



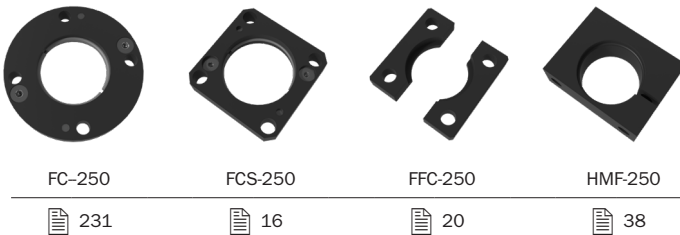
Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X 500-010	10	4,700	7,200	1,055	1,620	50	40	0.01	0.25	✓
X 500-013	13		7,100		1,600	56	43	0.01	0.26	✓
X 500-016	16		7,200		1,620	62	46	0.02	0.27	✓
X 500-019	19		7,400		1,660	68	49	0.02	0.29	
X 500-025	25 ■		7,300		1,640	80	55	0.03	0.31	✓
X 500-032	32		7,200		1,620	94	62	0.03	0.34	
X 500-038	38 ■		7,200		1,620	106	68	0.04	0.36	✓
X 500-050	50 ■		7,200		1,620	130	80	0.05	0.41	✓
X 500-063	63 ■		7,200		1,620	156	93	0.06	0.46	✓
X 500-075	75		7,100		1,600	180	105	0.07	0.50	
X 500-080	80		7,100		1,600	190	110	0.08	0.52	✓
X 500-100	100		7,100		1,600	230	130	0.10	0.60	✓
X 500-125	125		7,100		1,600	280	155	0.12	0.69	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



Additional mounts

FCN-250	K-250	L-250
231	247	58

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

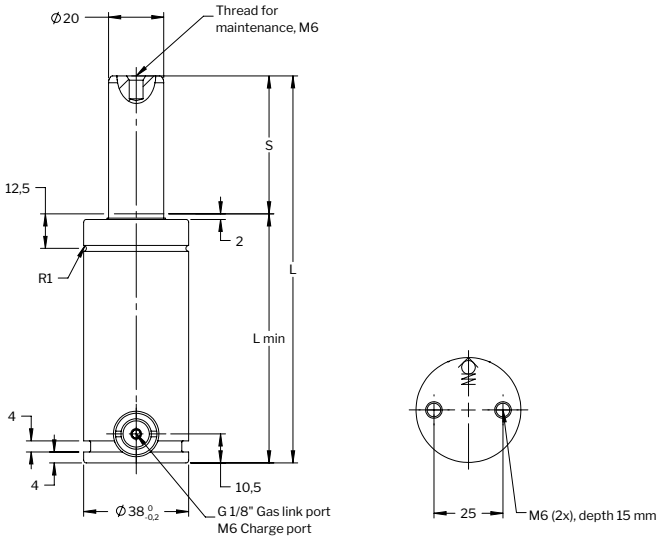
These gas springs are available with forces from 3500 N up to 66000 N and stroke lengths between 10 and 125 mm. There is a side port for gas charging that also can be used to connect to a hose system. An upper C-groove, lower U-groove together with two M6 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see "About gas springs".

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 50-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3018846

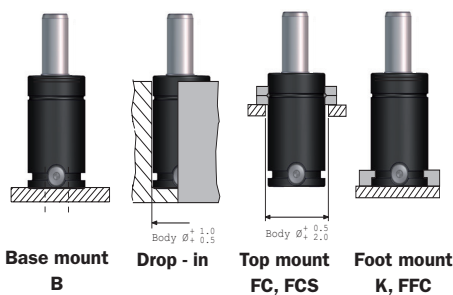
Automotive standard: MES E7231 PG230-PG24D-05, M-2404-TD-8-500



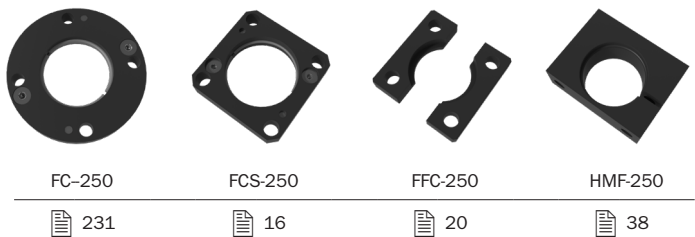
Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
XG 500-010	10	4,700	7,200	1,055	1,620	60	50	0.01	0.33	✓
XG 500-013	13		7,100		1,600	66	53	0.01	0.34	✓
XG 500-016	16		7,200		1,620	72	56	0.02	0.36	✓
XG 500-019	19		7,400		1,660	78	59	0.02	0.37	
XG 500-025	25		7,300		1,640	90	65	0.03	0.39	✓
XG 500-032	32		7,200		1,620	104	72	0.03	0.42	
XG 500-038	38 ■		7,200		1,620	116	78	0.04	0.44	✓
XG 500-050	50 ■		7,200		1,620	140	90	0.05	0.49	✓
XG 500-063	63 ■		7,200		1,620	166	103	0.06	0.54	✓
XG 500-075	75		7,100		1,600	190	115	0.07	0.58	
XG 500-080	80		7,100		1,600	200	120	0.08	0.60	✓
XG 500-100	100		7,100		1,600	240	140	0.10	0.68	✓
XG 500-125	125		7,100		1,600	290	165	0.12	0.77	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

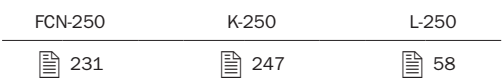
Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

This is a short height hoseable spring with an initial force of 4,700 N. The K 500 has a total length of 50 mm + (2 × stroke). This spring is 35 mm shorter than the TU 500. Mounting options are the same as for the TU 500.

Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen

Max. charging pressure (at 20°C) 150 bar

Min. charging pressure (at 20°C) 25 bar

Operating temperature 0 to +80°C

Force increase by temperature ±0.3%/°C

Recommended max strokes/min (at 20°C) ~ 40-80

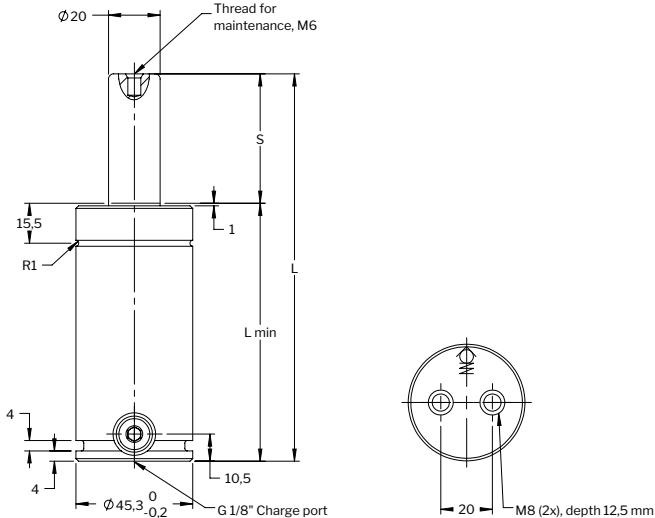
Max piston rod velocity 1.6 m/s

Rod surface Nitrided

Tube surface Black oxide

Repair kit 3017230-0500

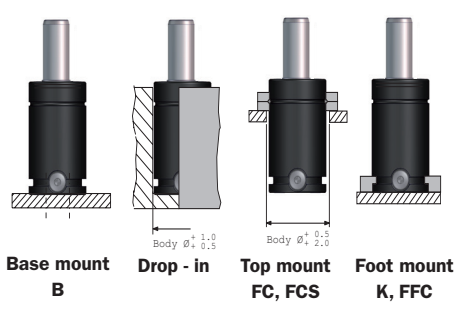
Automotive standard: R100278271, X346590506, R100288377, R100288378



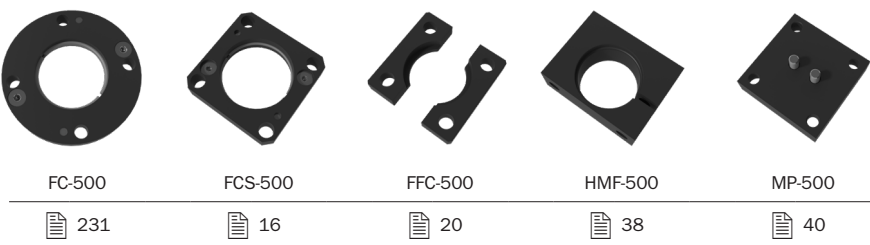
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
K 500-006	6	4,700	5,600	1,055	1,260	62	56	0.02	0.50
K 500-013	12.7		5,900		1,330	75.4	62.7	0.03	0.54
K 500-019	19		6,100		1,370	88.1	69.05	0.04	0.59
K 500-025	25		6,100		1,370	100	75	0.04	0.62
K 500-038	38.1		6,200		1,390	126.2	88.1	0.06	0.71
K 500-050	50		6,300		1,420	150	100	0.07	0.78
K 500-064	63.5		6,300		1,420	177	113.5	0.09	0.88
K 500-080	80		6,600		1,480	210	130	0.11	0.98
K 500-100	100		6,600		1,480	250	150	0.12	1.12
K 500-125	125		6,600		1,480	300	175	0.15	1.28

* Isothermal end force at full stroke.

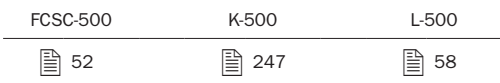
Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

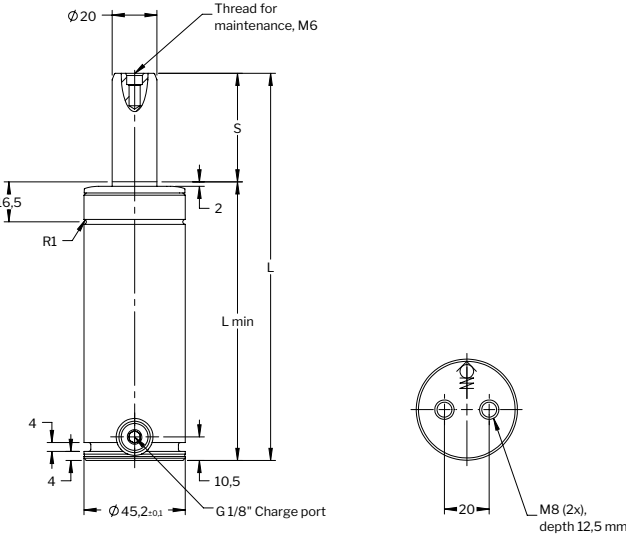
The TU line constitutes our standard line of gas springs. Sizes 250 to 10000 conform to the ISO 11901 gas spring standard.
The TU 500 has a total length of 85 mm + (2 × stroke).

Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen
Max. charging pressure (at 20°C) 150 bar
Min. charging pressure (at 20°C) 25 bar
Operating temperature 0 to +80°C
Force increase by temperature ±0.3%/°C
Recommended max strokes/min (at 20°C) ~ 40-80
Max piston rod velocity 1.6 m/s
Rod surface Nitrided
Tube surface Black oxide
Repair kit 2026637-0500

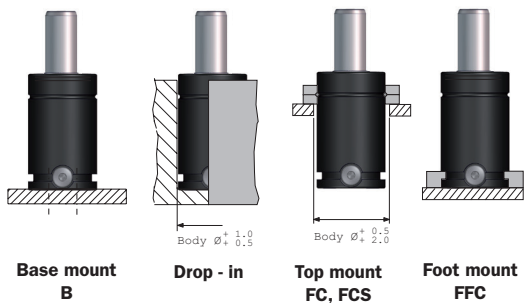
Automotive standard: VDI 3003, ISO 11901-1-5000, GMGDS 90.25.00-5, 39D878xx, B2 4006 21710xx, B2 4005 21680xx, B2 4006 2171243, 03322xx, X34659033x, Z000307844, X34659033x, Z000234960, X34659033x, Z000287855, N000539337, X346590829, R10003612x, 39-673-500x, 39-673-501x, MES E7231 PG230- PG23D-05, K32S0-0500, 304417x, 304418x, SD116322-500, M-2401-TD-06-500



Order No.	S stroke	Force in N at 180 bar / +20°C		Force in lbf at 180 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TU 500-010	10	4,700	6,000	1,055	1,350	105	95	0.023	0.93	√
TU 500-013	12.7		6,100		1,370	110.4	97.7	0.025	0.95	
TU 500-025	25		6,400		1,440	135	110	0.038	1.04	
TU 500-038	38.1		6,500		1,460	161.2	123.1	0.051	1.13	
TU 500-050	50		6,600		1,480	185	135	0.063	1.21	
TU 500-064	63.5		6,600		1,480	212	148.5	0.077	1.31	
TU 500-080	80		6,700		1,510	245	165	0.093	1.43	
TU 500-100	100		6,700		1,510	285	185	0.114	1.57	
TU 500-125	125		6,700		1,510	335	210	0.139	1.74	
TU 500-160	160		6,700		1,510	405	245	0.175	1.99	

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts

FC-500	FCS-500	FFC-500	HMF-500	MP-500	S-500
231	16	20	38	54	40

Additional mounts

FCSC-500	K-500	L-500	NMP-750
231	247	58	102

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Mould Temp gas springs have been engineered to withstand higher working temperatures, like those commonly associated with plastic moulding tools. Mould Temp gas springs are compact and powerful piston rod sealed gas springs, which can be used at working temperatures up to 120°C.

Features

- For applications up to 120°C
- Fully adjustable charge pressure
- Various mounting possibilities using our standard mounts as well as bottom threaded holes
- M6 gas ports can be connected to the special high temp version of our Micro EO24™ Hose and Tube system for remote pressure control.

Basic information

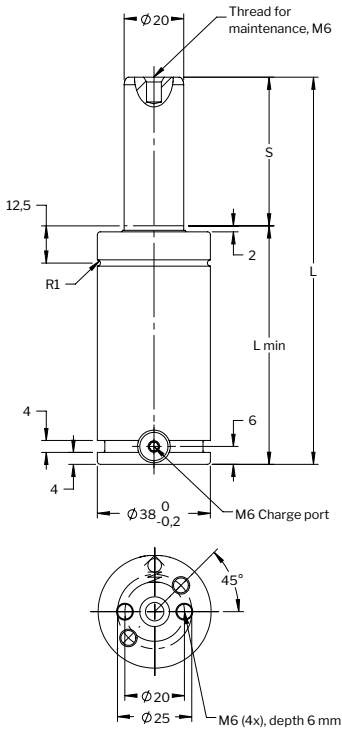
For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	See table below
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +120°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	See table below
Max piston rod velocity	1.0 m/s
Service life (0 to 80°C)	1,000,000 strokes
or	100,000 stroke meters
Service life (80 to 120°C)	500,000 strokes
or	50,000 stroke meters
Rod & tube surface	Nitrided
Repair kit	3022687

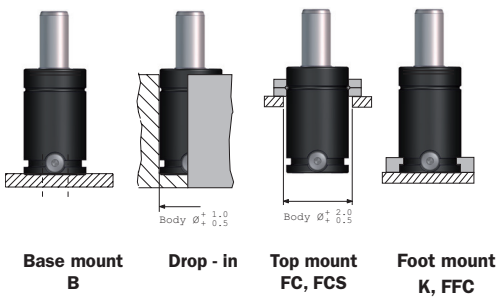
Max. working temp. interval	Max. strokes per minute (spm)	Max. charge pressure at 20°C (bar)	Force per temperature		
			Spring temp.	Initial force (N)	End force* (N)
0 - 80°C	20	150	80°C (20°C)	5,680 (4,700)	8,690 (7,200)
80 - 100°C	15	125	100°C (20°C)	5,000 (3,930)	7,650 (6,010)
100 - 120°C	10	115	120°C (20°C)	4,850 (3,610)	7,420 (5,520)

Order No.	S stroke	Initial force in N at 150 bar/+20°C	Initial force in lbf at 150 bar/+20°C	L ±0.25	L min.	Gas vol. (l)	Weight (kg)
MT 500-010	10	4,700	1,055	50	40	0.01	0.25
MT 500-013	13			56	43	0.01	0.26
MT 500-016	16			62	46	0.02	0.27
MT 500-019	19			68	49	0.02	0.28
MT 500-025	25			80	55	0.03	0.31
MT 500-032	32			94	62	0.03	0.34
MT 500-038	38			106	68	0.04	0.36
MT 500-050	50			130	80	0.05	0.40
MT 500-063	63			156	93	0.06	0.45
MT 500-075	75			180	105	0.07	0.50
MT 500-080	80			190	110	0.08	0.52

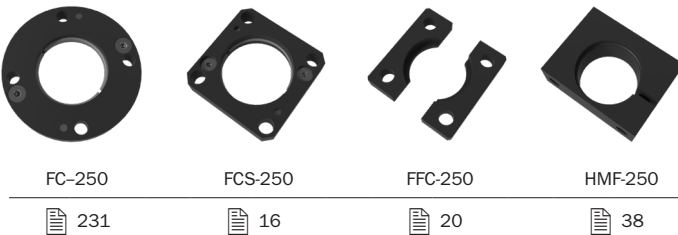
* Isothermal end force at full stroke.



Mounting possibilities



Recommended mounts

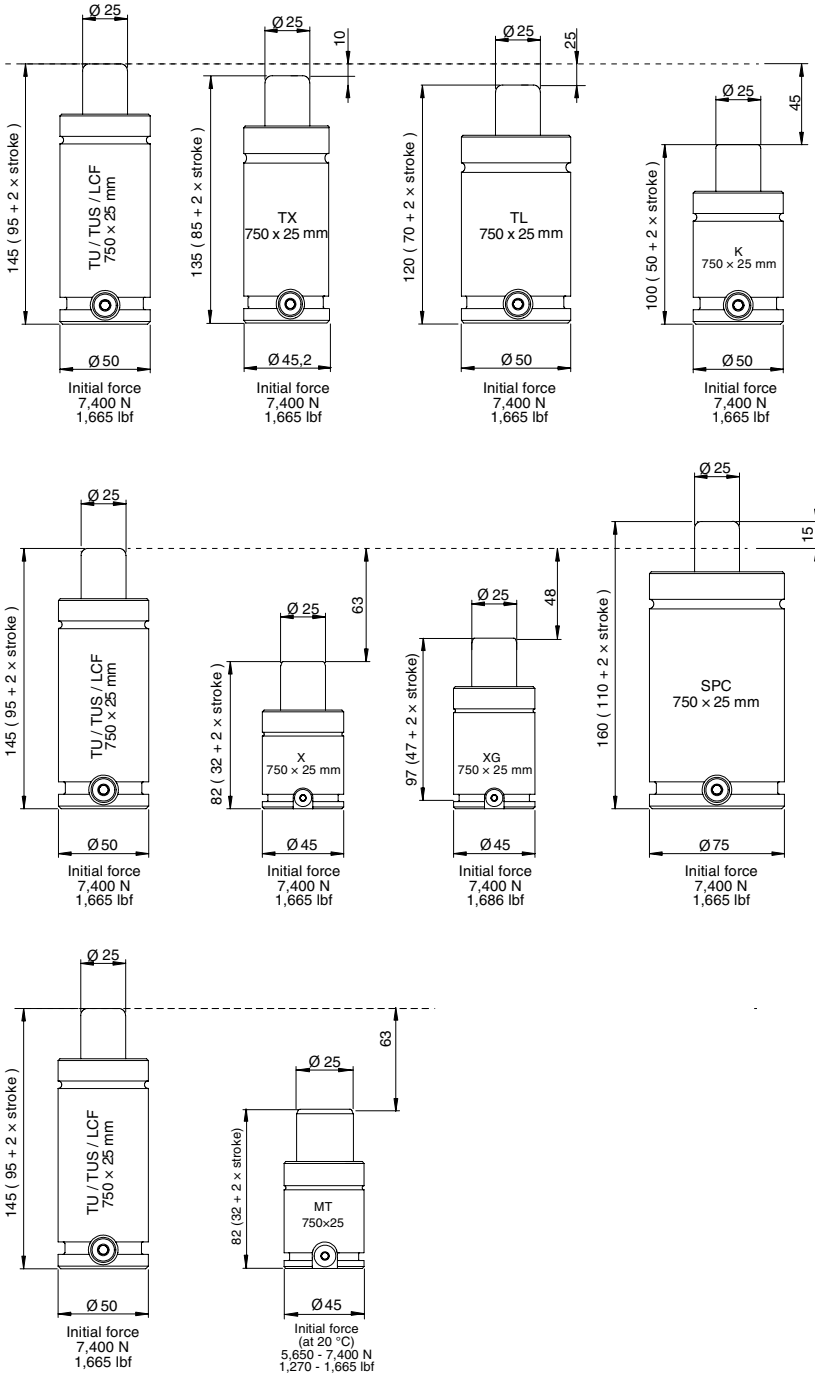


Additional mounts

FCN-250	K-250	L-250
231	247	58

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.



	Page
X 750	78
XF 750	80
XG 750	82
TX 750	84
TL 750	86
K 750	88
TU 750	90
TUS 750	92
LCF 750	94
SPC 750	96
MT 750	98

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

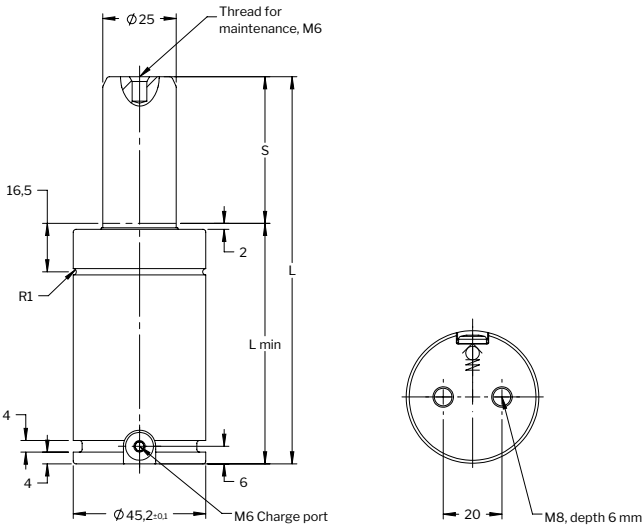
These gas springs are available with forces from 1,700 N up to 200,000 N and stroke lengths between 7 and 125 mm. There is a side port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see "About gas springs".

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 150 bar
- Min. charging pressure (at 20°C) 25 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 50-100
- Max piston rod velocity 1.6 m/s
- Rod surface Nitrided
- Tube surface Black oxide
- Repair kit 3019903

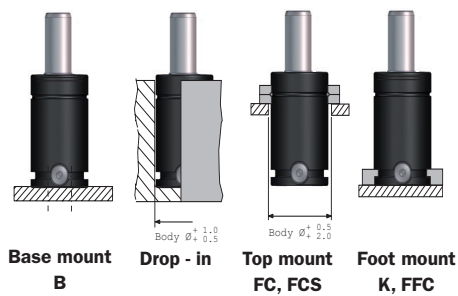
Automotive standard: VDI 3003-Blatt 3, ISO 11901-3-7500, WDX356204-07xxDMS, GMGDS 90.25.08-7.5, 39D997xx, B2 4005 21749xx, 04585xx, N000491556, Z0004590xx



Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X 750-010	10	7,400	12,100	1,665	2,720	52	42	0.02	0.37	✓
X 750-013	13		12,100		2,720	58	45	0.02	0.39	
X 750-016	16		12,100		2,720	64	48	0.03	0.41	
X 750-019	19		11,700		2,630	70	51	0.03	0.41	✓
X 750-025	25 ■		11,800		2,650	82	57	0.04	0.45	
X 750-032	32		11,800		2,650	96	64	0.05	0.50	
X 750-038	38 ■		11,800		2,650	108	70	0.05	0.53	✓
X 750-050	50 ■		11,800		2,650	132	82	0.07	0.61	
X 750-063	63 ■		11,800		2,650	158	95	0.09	0.69	
X 750-075	75		11,900		2,675	182	107	0.10	0.77	✓
X 750-080	80		11,900		2,675	192	112	0.11	0.80	
X 750-100	100		11,900		2,675	232	132	0.13	0.93	
X 750-125	125		11,900		2,675	282	157	0.17	1.09	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts

FC-500	FCS-500	FFC-500	HMF-500
231	16	20	38

Additional mounts

FCSC-500	K-500	L-500	NMP-750
52	247	58	62

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

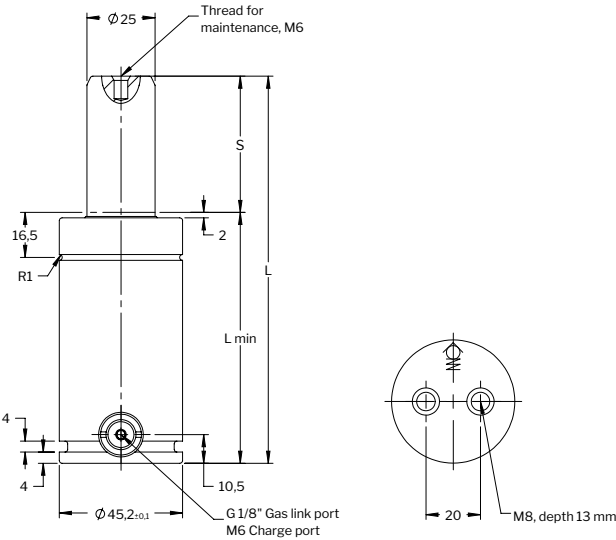
The Power Line XF series fulfills our gas spring range for FCA Fiat-Chrysler standard 075.90.60. There is a G 1/8" side port for charging or to connect to a gas link system. The upper ISO Standard C-groove and the threaded bottom hole offer various mounting possibilities using our standard mounts.

Basic information

For general information see "About gas springs".

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 50-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019903

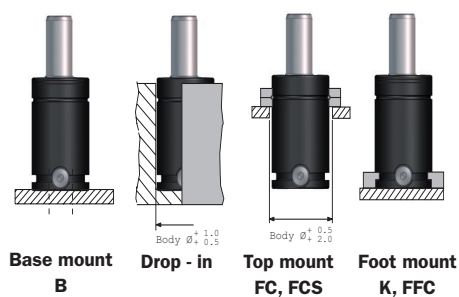
Automotive standard: GMGDS 90.25.08-7.5G, 39-673-023x, 39-673-024x



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XF 750-010	10	7,400	12,100	1,665	2,720	62	52	0.02	0.47
XF 750-013	13		12,100		2,720	68	55	0.02	0.49
XF 750-016	16		12,100		2,720	74	52	0.03	0.51
XF 750-019	19		11,700		2,630	80	61	0.03	0.51
XF 750-025	25		11,800		2,650	92	67	0.04	0.55
XF 750-032	32		11,800		2,650	106	74	0.05	0.60
XF 750-038	38		11,800		2,650	118	80	0.05	0.64
XF 750-050	50		11,800		2,650	142	92	0.07	0.71
XF 750-063	63		11,800		2,650	168	105	0.09	0.79
XF 750-075	75		11,900		2,675	192	117	0.10	0.87
XF 750-080	80		11,900		2,675	202	122	0.11	0.90
XF 750-100	100		11,900		2,675	242	142	0.13	1.03
XF 750-125	125		11,900		2,675	292	167	0.17	1.19

* Isothermal end force at full stroke.

Mounting possibilities



Recommended mounts

FC-500	FCS-500	FFC-500	HMF-500
231	16	20	38

Additional mounts

FCSC-500	K-500	L-500	NMP-750
52	247	58	62

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

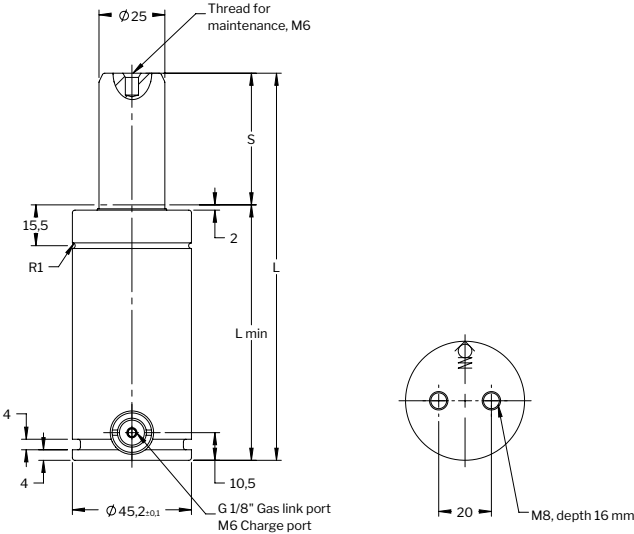
These gas springs are available with forces from 3,500 N up to 66,000 N and stroke lengths between 10 and 125 mm. There is a side and a bottom port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 50-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019903

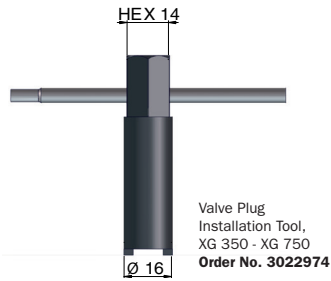
Automotive standard: R90344047x, MES E7231 PG230-PG24D-07, K32R0-0750-050, M-2404-TD-15-750



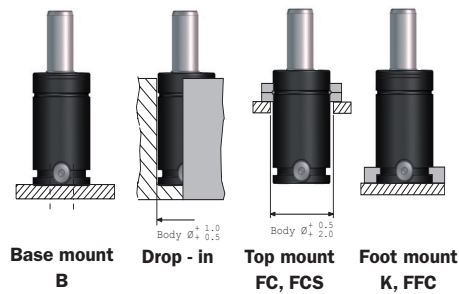
Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XG 750-010	10	7,400	12,100	1,665	2,720	67	57	0.02	0.55
XG 750-013	13		12,100		2,720	73	60	0.02	0.55
XG 750-016	16		12,100		2,720	79	63	0.03	0.57
XG 750-019	19		11,700		2,630	85	66	0.03	0.58
XG 750-025	25		11,800		2,650	97	72	0.04	0.62
XG 750-032	32		11,800		2,650	111	79	0.05	0.66
XG 750-038	38 ■		11,800		2,650	123	85	0.05	0.70
XG 750-050	50 ■		11,800		2,650	147	97	0.07	0.78
XG 750-063	63 ■		11,800		2,650	173	110	0.09	0.86
XG 750-075	75		11,900		2,675	197	122	0.10	0.93
XG 750-080	80		11,900		2,675	207	127	0.11	0.97
XG 750-100	100		11,900		2,675	247	147	0.13	1.09
XG 750-125	125		11,900		2,675	297	172	0.17	1.25

* Isothermal end force at full stroke.

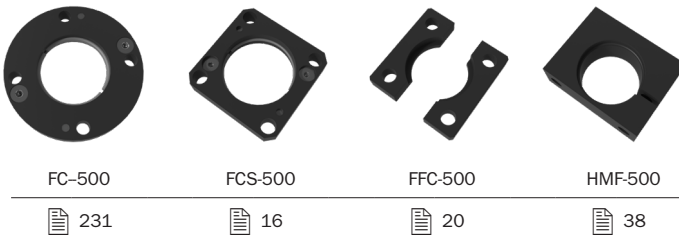
Installation tool



Mounting possibilities



Recommended mounts



Additional mounts

FCSC-500	K-500	L-500	NMP-750	RMX-750
52	247	58	62	74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line – Heavy Duty Series is a crossover between the standard TU Series and the Power Line X Series.

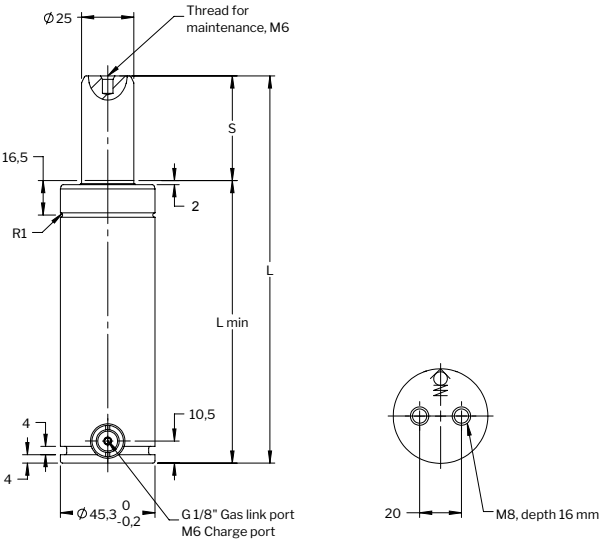
These gas springs are available with forces from 7,400 N up to 200,000 N and stroke lengths between 13 and 300 mm. There is an optional bottom port for hose/base plate connection. An upper C-groove, lower U-groove and bottom threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3026200

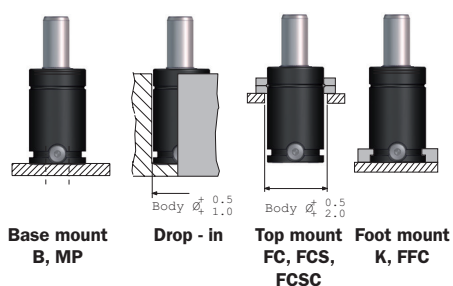
Automotive standard: GMGDS 90.25.05-05



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TX 750-013	13	7,400	12,000	1,665	2,700	111	98	0.04	0.85
TX 750-025	25		12,000		2,700	135	110	0.06	0.93
TX 750-038	38		12,000		2,700	161	123	0.07	1.01
TX 750-050	50		12,000		2,700	185	135	0.09	1.09
TX 750-063	63		12,000		2,700	211	148	0.11	1.17
TX 750-075	75		12,000		2,700	235	160	0.12	1.25
TX 750-080	80		12,000		2,700	245	165	0.13	1.28
TX 750-100	100		12,000		2,700	285	185	0.15	1.41
TX 750-125	125		12,100		2,720	335	210	0.19	1.56
TX 750-150	150 ■		12,100		2,720	385	235	0.22	1.72
TX 750-160	160 ■		12,100		2,720	405	245	0.23	1.79
TX 750-175	175 ■		12,000		2,720	435	260	0.25	1.88
TX 750-200	200 ■		12,100		2,720	485	285	0.28	2.04

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts

FC-500	FCS-500	FFC-500	HMF-500	MP-500	S-500
231	16	20	38	54	40

Additional mounts

FCSC-500	K-500	L-500	NMP-750
52	247	58	62

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

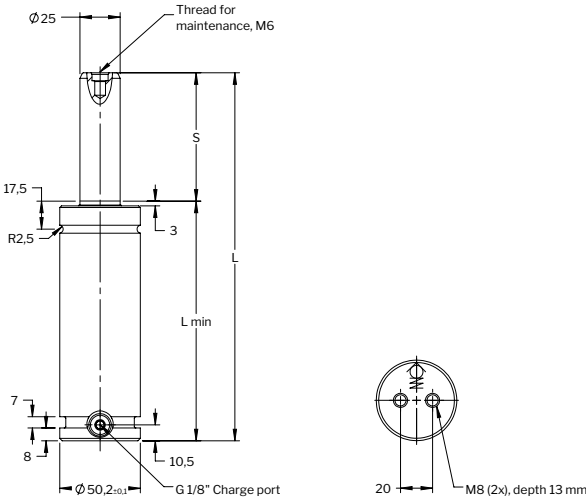
The TL series ranges from model sizes 750 to 7,500, with the same features and technology as the TU series.

At the same time, the TL gas spring is shorter than the corresponding TU gas spring by 25 mm, except TL 5000 and TL 7500, which are 37.5 mm and 50 mm shorter respectively. TL springs share the same TU mounting possibilities and stroke lengths, with exception of strokes 12.5, 37.5 and 62.5.

Basic information

For general information see “About gas springs”.

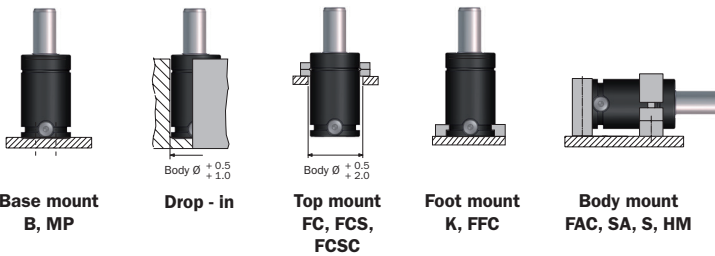
Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3024118



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TL 750-013	12.5	7,400	11,400	1,660	2,560	95	82.5	0.03	0.97
TL 750-025	25		11,700		2,630	120	95	0.04	1.08
TL 750-038	37.5		11,800		2,650	145	107.5	0.06	1.20
TL 750-050	50		11,900		2,670	170	120	0.08	1.32
TL 750-063	62.5		11,900		2,670	195	132.5	0.09	1.42
TL 750-075	75		11,900		2,675	220	145	0.11	1.53
TL 750-080	80		11,900		2,670	230	150	0.11	1.58
TL 750-088	87.5		11,900		2,670	245	157.5	0.11	1.65
TL 750-100	100		11,900		2,670	270	170	0.14	1.77
TL 750-113	112.5		12,000		2,700	295	182.5	0.15	1.89
TL 750-125	125		12,000		2,700	320	195	0.15	2.01
TL 750-138	137.5		12,000		2,700	345	207.5	0.17	2.13
TL 750-150	150		12,000		2,700	370	220	0.19	2.25
TL 750-160	160		12,000		2,700	390	230	0.20	2.34
TL 750-175	175		12,000		2,700	420	245	0.23	2.48
TL 750-200	200		12,000		2,700	470	270	0.26	2.72
TL 750-225	225		12,000		2,700	520	295	0.30	2.96
TL 750-250	250		12,000		2,700	570	320	0.33	3.19

* Isothermal end force at full stroke.

Mounting possibilities



Recommended mounts

FC-750	FCS-750	FFC-750	HMF-750	MP-750	S-750
231	16	20	38	54	40

Additional mounts

FAC-750	FCSC-750	FFL-750	FSL-750	FSS-750	HM-750
230	52	66	241	72	46
K-750	L-750	NMP-1000	RM-750	SA-750	
247	58	62	74	70	

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

This is a short height hoseable spring with an initial force of 7,400 N.

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

Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen

Max. charging pressure (at 20°C) 150 bar

Min. charging pressure (at 20°C) 25 bar

Operating temperature 0 to +80°C

Force increase by temperature ±0.3%/°C

Recommended max strokes/min (at 20°C) ~ 15-40

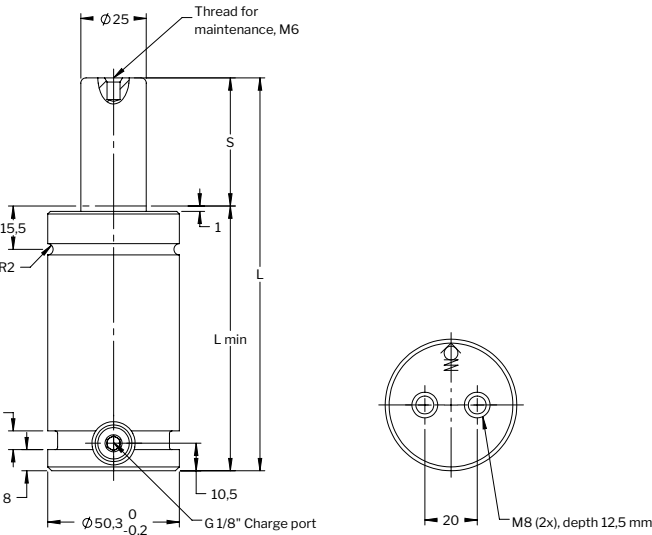
Max piston rod velocity 1.6 m/s

Rod surface Nitrided

Tube surface Black oxide

Repair kit 3017230-0750

Automotive standard: R100278277, R100288380. R100288377. R100288378



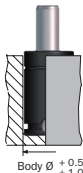
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
K 750-006	6	7,400	15,000	1,665	3,370	62	56	0.01	0.68
K 750-013	12.7		13,000		2,920	75.4	62.7	0.02	0.73
K 750-019	19		12,000		2,700	88.1	69.05	0.03	0.80
K 750-025	25		11,000		2,470	100	75	0.04	0.82
K 750-038	38.1		11,000		2,470	126.2	88.1	0.06	0.92
K 750-050	50		11,000		2,470	150	100	0.08	1.06
K 750-064	63.5		11,000		2,470	177	113.5	0.10	1.12
K 750-080	80		11,000		2,470	210	130	0.12	1.26
K 750-100	100		11,000		2,470	250	150	0.15	1.39
K 750-125	125		11,000		2,470	300	175	0.19	1.57

* Isothermal end force at full stroke.

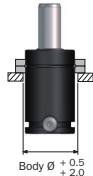
Mounting possibilities



Base mount
B, MP



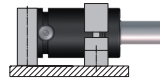
Drop - in



Top mount
FC, FCS,
FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S

Recommended mounts



FC-750

 231



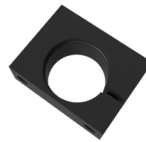
FCS-750

 16



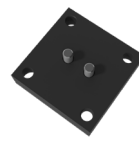
FFC-750

 20



HMF-750

 38



MP-750

 54



S-750

 40

Additional mounts

FCSC-750

 52

FFL-750

 66

FSS-750

 72

K-750

 247

L-750

 58

RM-750

 74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

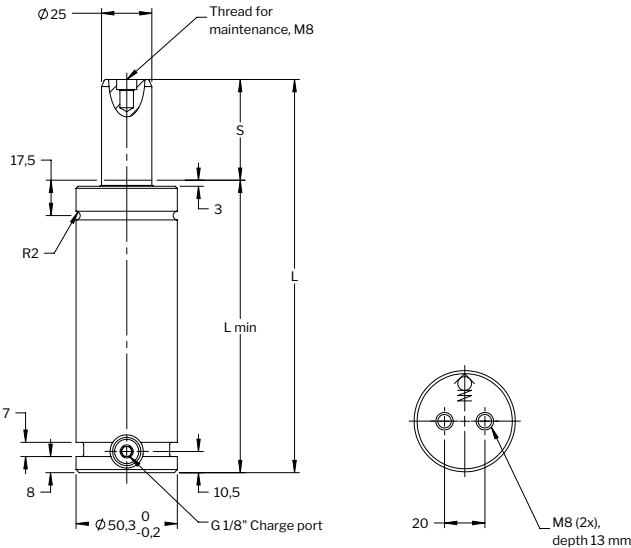
The standard line of gas springs is the TU line. Sizes 250 to 10 000 correspond to the ISO 11901 standard for gas springs.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019817

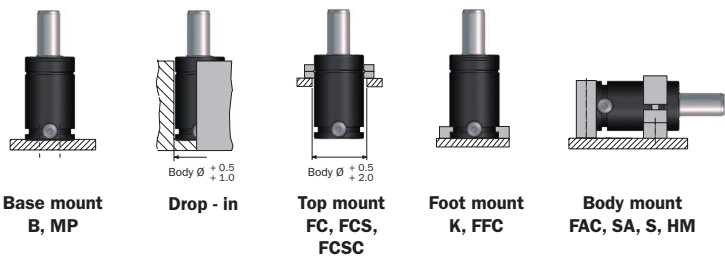
Automotive standard: ISO 11901-1-7500, WDX356203-07xxDMS, GMGDS 90.25.00-7.5, 39D878xx, B2 4006 21710xx, B2 4006 32521xx, B2 4006 32841xx, B2 4006 0996826, B2 4006 3273512, B2 4006 3344894, 03322xx, X34659033x, Z000304414, X346590260, X346590253, R10003620x, X3465906xx, R100036210, 39-673-510x, 39-673-511x, 39-673-512x, 39-673-5130, N03070x, N03071x, N030720, MES E7231 PG230-PG23D-07, K32S0-0750, 304418x, 997594x, 997595x, SD116322-750, M-2401-TD-1-750



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TU 750-013	12.7	7,400	12,000	1,665	2,700	120.4	107.7	0.03	1.33	✓
TU 750-025	25		12,000		2,700	145	120	0.04	1.44	
TU 750-038	38.1		12,000		2,700	171.2	133.1	0.06	1.57	
TU 750-050	50		12,000		2,700	195	145	0.07	1.68	✓
TU 750-064	63.5		12,000		2,700	222	158.5	0.09	1.78	
TU 750-080	80		12,000		2,700	255	175	0.11	1.94	✓
TU 750-100	100		12,000		2,700	295	195	0.14	2.13	
TU 750-125	125		12,100		2,720	345	220	0.17	2.37	✓
TU 750-160	160		12,100		2,720	415	255	0.21	2.70	
TU 750-175	175		12,100		2,720	445	270	0.23	2.84	
TU 750-200	200		12,100		2,720	495	295	0.26	3.08	
TU 750-225	225		12,100		2,720	545	320	0.29	3.32	
TU 750-250	250		12,100		2,720	595	345	0.33	3.55	
TU 750-300	300		12,100		2,720	695	395	0.39	4.03	

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts

FC-750	FCS-750	FFC-750	HMF-750	MP-750	S-750
231	16	20	38	54	40

Additional mounts

FAC-750	FCSC-750	FFL-750	FSL-750	FSS-750	HM-750
230	52	66	241	72	46
K-750	L-750	NMP-1000	RM-750	SA-750	
247	58	62	74	70	

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The TUS High Speed gas springs have been engineered to withstand press stroke speeds to a maximum of 2 m/s, which meets the safety requirements from the French automotive manufacturer Renault.

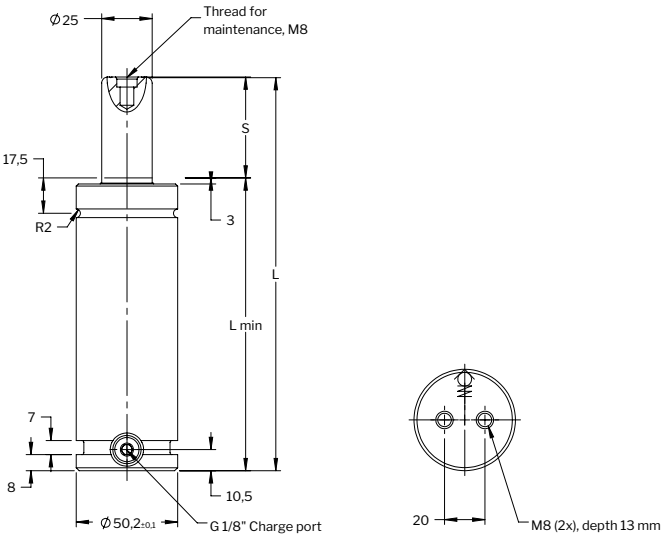
These gas springs are available in sizes from 750 to 7,500 and dimensions that conform to the ISO 11901 gas spring standard. The TUS gas spring replaces TUR spring that has been phased out.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	2.0 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019277

Automotive standard: R903636001, R903636002, R903636003, R903636004, R903636005, R903636006



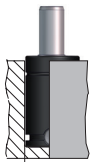
Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TUS 750-025	25	7,400	12,000	1,665	2,700	145	120	0.04	1.44
TUS 750-038	38.1		12,000		2,700	171.2	133.1	0.06	1.57
TUS 750-050	50		12,000		2,700	195	145	0.07	1.68
TUS 750-064	63.5		12,000		2,700	222	158.5	0.09	1.78
TUS 750-080	80		12,000		2,700	255	175	0.11	1.94
TUS 750-100	100		12,000		2,700	295	195	0.14	2.13
TUS 750-125	125		12,100		2,720	345	220	0.17	2.37
TUS 750-160	160		12,100		2,720	415	255	0.21	2.70
TUS 750-200	200		12,100		2,720	495	295	0.26	3.08
TUS 750-250	250		12,100		2,720	595	345	0.33	3.55
TUS 750-300	300		12,100		2,720	695	395	0.39	4.03

* Isothermal end force at full stroke.

Mounting possibilities



Base mount
B, MP



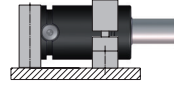
Drop - in



Top mount
FC, FCS,
FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-750

 231



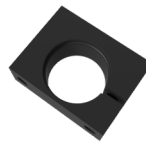
FCS-750

 16



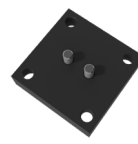
FFC-750

 20



HMF-750

 38



MP-750

 54



S-750

 40

Additional mounts

FAC-750

 230

FFL-750

 66

FSL-750

 241

FSS-750

 72

HM-750

 46

K-750

 247

L-750

 58

NMP-1000

 62

RM-750

 74

SA-750

 70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Low Contact Force (LCF) gas springs are designed to reduce excessive 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”.

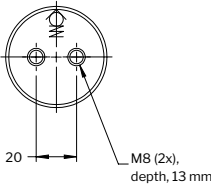
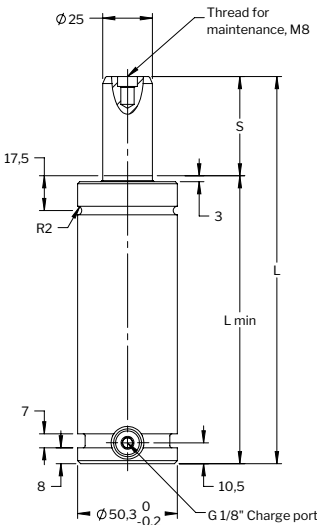
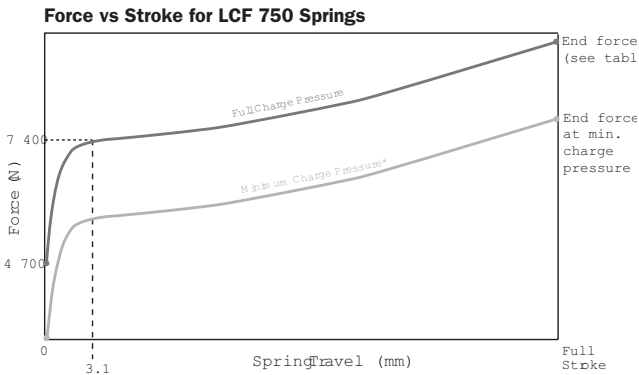


Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 150 bar
- Min. charging pressure (at 20°C) 70 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recom max strokes/min (at 20°C) ~ 15-40
- Max piston rod velocity 1.6 m/s
- Rod surface Nitrided
- Tube surface Black oxide
- *Repair kit..... 3019377

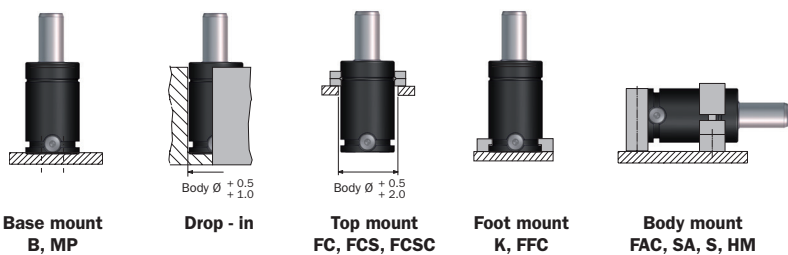
*Identified by circular rings on the top of tube, guide and rod.



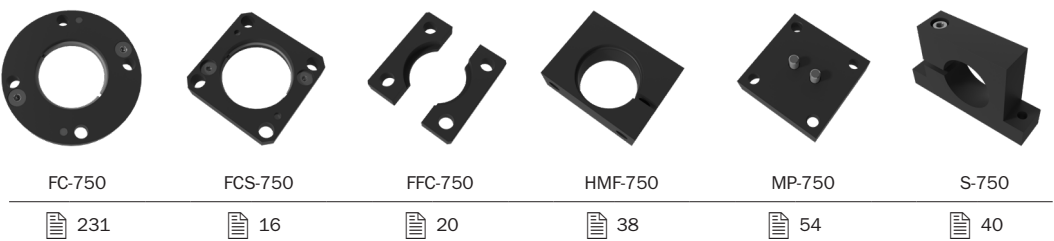
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
LCF 750-013	12.7	7,400	12,000	1,665	2,700	120.4	107.7	0.03	1.30
LCF 750-025	25		12,000			145	120	0.04	1.45
LCF 750-038	38.1		12,000			171.2	133.1	0.06	1.50
LCF 750-050	50		12,000			195	145	0.07	1.70
LCF 750-064	63.5		12,000			222	158.5	0.09	1.75
LCF 750-080	80		12,000			255	175	0.11	1.95
LCF 750-100	100		12,000			295	195	0.14	2.15
LCF 750-125	125		12,100			345	220	0.17	2.40
LCF 750-160	160	2,725	12,100	2,725	2,725	415	255	0.21	2.70
LCF 750-200	200		12,100			495	295	0.26	3.10
LCF 750-250	250		12,100			595	345	0.33	3.60
LCF 750-300	300		12,100			695	395	0.39	4.10

* Isothermal end force at full stroke.

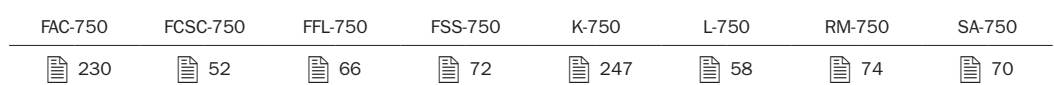
Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Speed Control™ – SPC gas springs have been engineered to eliminate blank holder bounce, commonly associated with increased return stroke speeds from link drive presses.

SPC gas springs have inbuilt return stroke speed dampening, which decelerates the last 30 mm of the piston rod stroke to 0.4 m/s, helping to bring the blank holder to a smooth stop.

Features

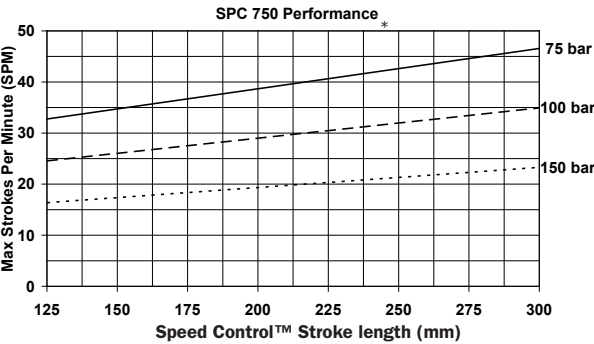
- Eliminates blank holder bounce
- Increases productivity by increasing part transfer efficiency
- Easily retrofitted to existing dies
- Stroke lengths from 125 to 300 mm
- Linkable using a hose system

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	See chart below
Max piston rod velocity	1.6 m/s
Dampening length	≈30 mm
Dampening speed	0.4 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit.....	3421490

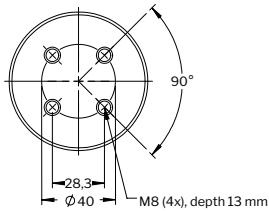
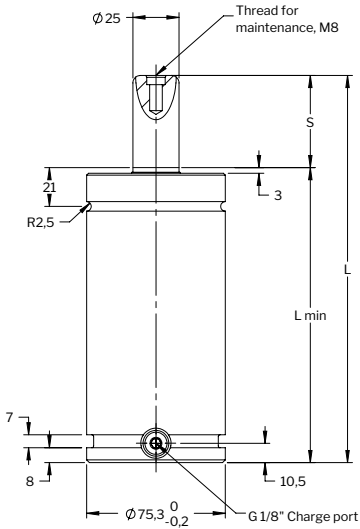
Automotive standard: 5934868, 5937351, 5937387, 5937821, 5937824



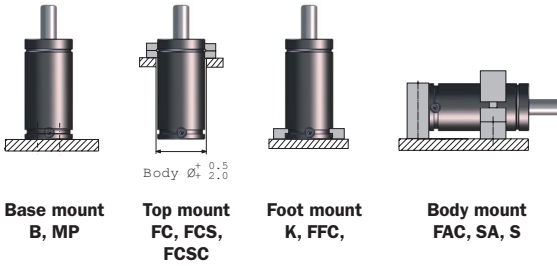
*At ambient room temperatures with free air flow

Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
SPC 750-080	80	7,400	8,700	1,665	2,700	270	190	0.30	5.50
SPC 750-100	100					310	210	0.36	5.80
SPC 750-125	125					360	235	0.44	6.10
SPC 750-160	160					430	270	0.55	6.60
SPC 750-200	200					510	310	0.67	7.15
SPC 750-250	250					610	360	0.83	7.85
SPC 750-300	300					710	410	0.98	8.60

* Isothermal end force at full stroke.



Mounting possibilities



Recommended mounts

FC-1500	FCS-1500	FFC-1500	HMF-1500	MP-1500	S-1500
231	16	20	38	54	40

Additional mounts

FAC-1500	FCSC-1500	FFL-1500	FSS-1500	HM-1500	K-1500
230	52	66	72	46	247
L-1500	NMP-2400	RM-1500	SA-1500		
58	102	74	70		

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Mould Temp gas springs have been engineered to withstand higher working temperatures, like those commonly associated with plastic molding tools. Mould Temp gas springs are compact and powerful piston rod sealed gas springs, which can be used at working temperatures up to 120°C.

Features

- For applications up to 120°C
- Fully adjustable charge pressure
- Various mounting possibilities using our standard mounts as well as bottom threaded holes
- M6 gas ports can be connected to the special high temp version of our Micro EO24™ Hose and Tube system for remote pressure control.

Basic information

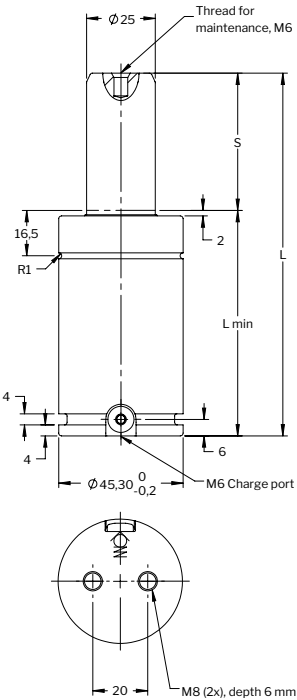
For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	See table below
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +120°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	See table below
Max piston rod velocity	1.0 m/s
Service life (0 to 80°C)	1,000,000 strokes
	or 100,000 stroke meters
Service life (80 to 120°C)	500,000 strokes
	or 50,000 stroke meters
Rod & tube surface	Nitrided
Repair kit	3022686

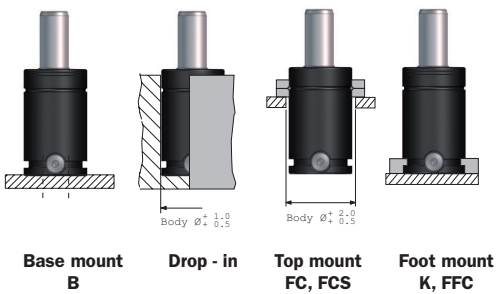
Max. working temp. interval	Max. strokes per minute (spm)	Max. charge pressure at 20°C (bar)	Force per temperature		
			Spring temp.	Initial force (N)	End force* (N)
0 – 80°C	20	150	80°C (20°C)	8,870 (7,400)	14,100 (11,760)
80 – 100°C	15	125	100°C (20°C)	7,810 (6,140)	12,420 (9,750)
100 – 120°C	10	115	120°C (20°C)	7,570 (5,650)	12,050 (9,000)

Order No.	S stroke	Initial force in N at 150 bar/+20°C	Initial force in lbf at 150 bar/+20°C	L ±0.25	L min.	Gas vol. (l)	Weight (kg)
MT 750-010	10	7,400	1,665	52	42	0.02	0.37
MT 750-013	13			58	45	0.02	0.39
MT 750-016	16			64	48	0.03	0.41
MT 750-019	19			70	51	0.03	0.41
MT 750-025	25			82	57	0.04	0.45
MT 750-032	32			96	64	0.05	0.50
MT 750-038	38			108	70	0.05	0.53
MT 750-050	50			132	82	0.07	0.61
MT 750-063	63			158	95	0.09	0.69
MT 750-075	75			182	107	0.10	0.77
MT 750-080	80			192	112	0.11	0.80

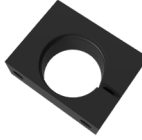
* Isothermal end force at full stroke.



Mounting possibilities



Recommended mounts

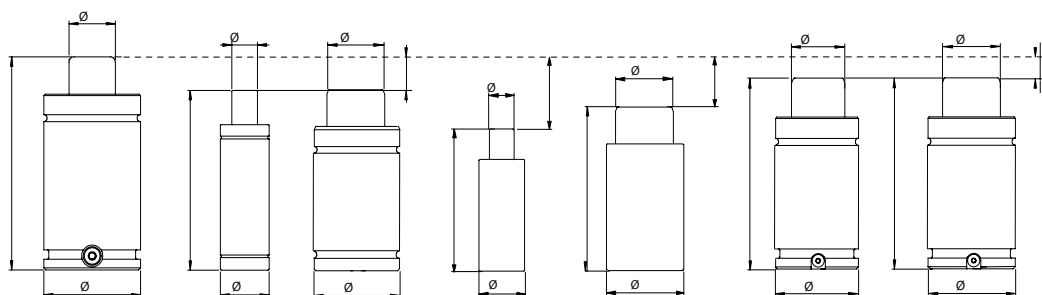
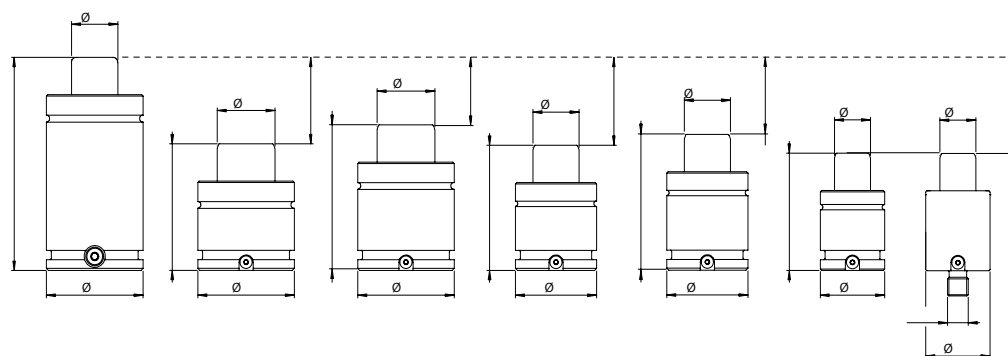
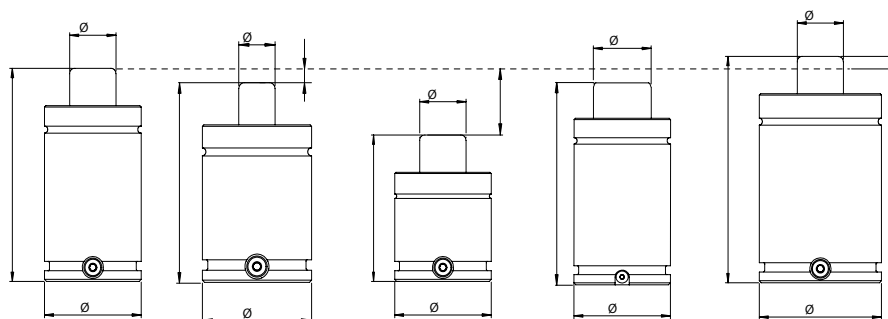
			
FC-500	FCS-500	FFC-500	HMF-500
 231	 16	 20	 38

Additional mounts

FCSC-500	K-500	L-500	RMX-750
 52	 247	 58	 74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.



	Page
CU4 1000	102
CU4 1800	104
CX 1000	106
CX 1900	108
X 1000 and XMS 1000	110
XF 1000	112
XG 1000	114
TX 1000	116
X 1500	118
XF 1500	120
XG 1500	122
TX 1500	124
X 2400	126
XF 2400	128
XG 2400	130
TX 2400	132
TL 1500	134
K 1500	136
TU 1500	138
TUS 1500	140
LCF 1500	142
SPC 1500	144
MT 1000	146

The CU4 gas spring is a very compact Bore Sealed gas spring with impressive force in a compact body. The maximum frequency for the spring is 100 strokes/minute.

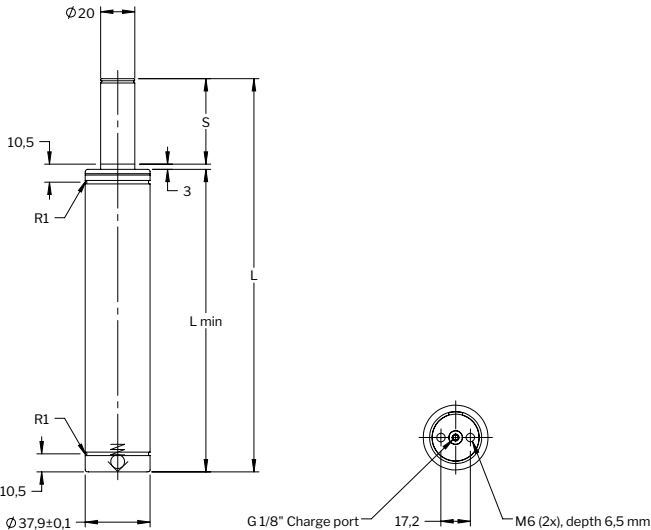
Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend fixing of shorter stroke springs for optimal service life. As an option, the CU4 springs can be delivered with a Side Port plate (SP) for applications where a sideport is needed (e.g., for use in hose systems).

Basic information

For general information see "About gas springs".

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 100
Max piston rod velocity	0.8 m/s
Rod surface	Nitrided
Tube surface	Nitrided
Repair kit	3024835

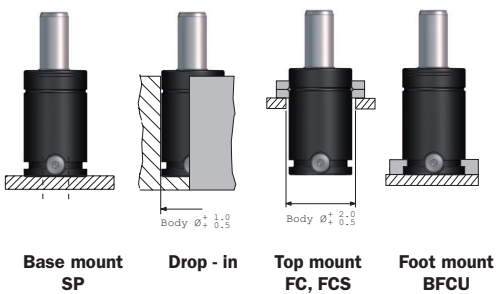
Automotive standard: WDX35-62-06010xxDM, Z000336576, Z000235618, Z000346352, Z000459185, 5937656, 5937657, 5937658, 5937659, 5937660



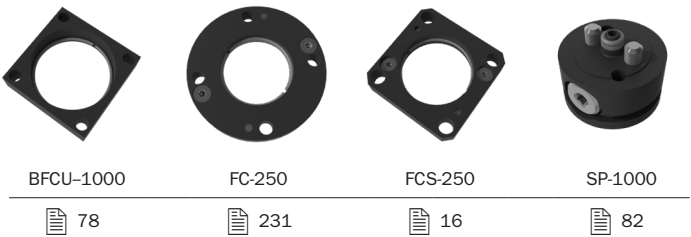
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CU4 1000-006	6	10,600	16,000	2,400	3,595	61	55	0.014	0.33
CU4 1000-010	10 ■		16,000			78	68	0.024	0.38
CU4 1000-016	16 ■		16,000			100	84	0.036	0.44
CU4 1000-025	25 ■		16,000			135	110	0.056	0.54
CU4 1000-032	32*		16,000			167	135	0.074	0.65
CU4 1000-040	40*	50*	16,000	50*	50*	195	155	0.092	0.73
CU4 1000-050	50*		16,000			230	180	0.110	0.83

* Should always be attached to the tool using the tapped holes in the bottom or a flange. ** Isothermal end force at full stroke.
■ Recommended stroke length for optimal delivery.

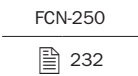
Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The CU4 gas spring is a very compact Bore Sealed gas spring with impressive force in a compact body. The maximum frequency for the spring is 100 strokes/minute.

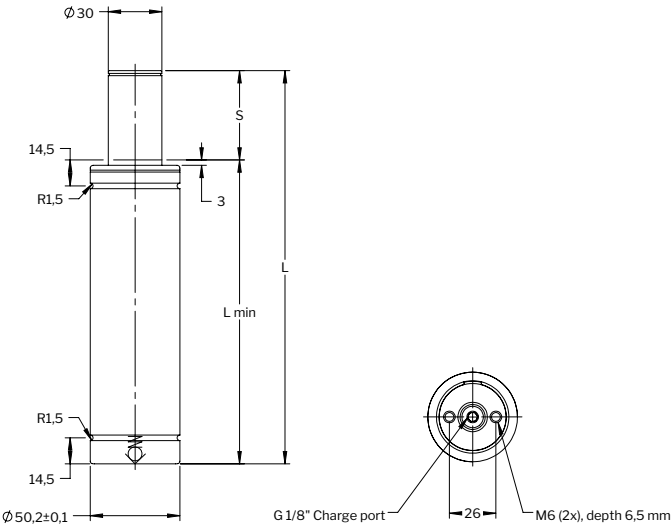
Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend fixing of shorter stroke springs for optimal service life. As an option, the CU4 springs can be delivered with a Side Port plate (SP) for applications where a sideport is needed (e.g., for use in hose systems).

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 100
Max piston rod velocity	0.8 m/s
Rod surface	Nitrided
Tube surface	Nitrided
Repair kit	3024836

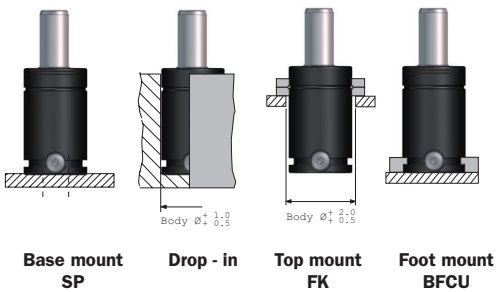
Automotive standard: WDX35-62-07018xxDM, Z000283147, Z000236719, Z000367232, 5937661, 5937662, 5937663, 5937664, 5937665, 5937666, 5937702



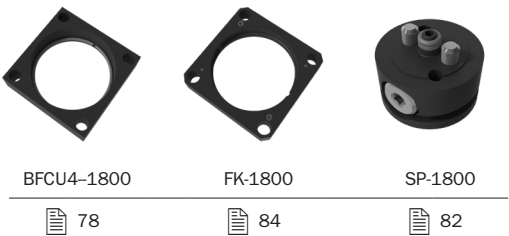
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CU4 1800-006	6	18,000	24,000	4,050	5,395	66	60	0.030	0.60
CU4 1800-010	10 ■		25,000		5,620	80	70	0.044	0.66
CU4 1800-016	16 ■		25,000		5,620	106	90	0.072	0.79
CU4 1800-025	25 ■		26,000		5,845	135	110	0.100	0.93
CU4 1800-032	32*		26,000		5,845	162	130	0.126	1.06
CU4 1800-040	40*		26,000		5,845	190	150	0.150	1.19
CU4 1800-050	50*		27,000		6,070	220	170	0.179	1.32
CU4 1800-065	65*		28,000		6,294	271	206	0.240	1.52

* Should always be attached to the tool using the tapped holes in the bottom or a flange. ** Isothermal end force at full stroke.
■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



Note!

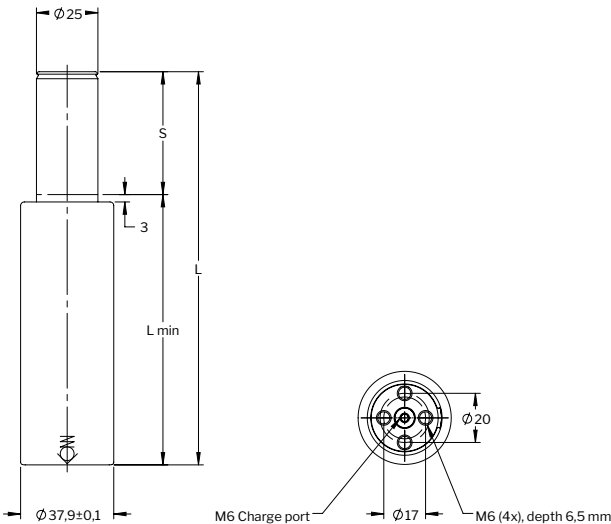
For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

With its unique safety and reliability features, KALLER Compact Xtreme CX is a extremely compact and powerful piston rod sealed gas spring series. Using the CX gas spring is an excellent way to achieve more cost efficient dies due to lower die height.

With its extremely compact build height and cylinder diameters, the CX gas spring can reach extreme initial forces, ranging from 5,100 N to 19,200 N with stroke lengths up to 80 mm. The CX gas spring series is similar to the KALLER Power Line X series and provide extreme forces comparable to the bore sealed KALLER Super Compact CU4 series. In addition, the CX gas spring can handle higher running frequencies (SPM) compared to similar gas springs on the market, which leads to a higher production rate. Additional high force in a small area when baseplate mounted.

Basic information

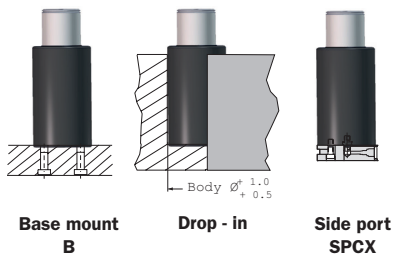
- For general information see “About gas springs”.
- Pressure medium Nitrogen
 - Max. charging pressure (at 20°C) 200 bar
 - Min. charging pressure (at 20°C) 25 bar
 - Operating temperature 0 to +80°C
 - Force increase by temperature ±0.3%/°C
 - Recommended max strokes/min (at 20°C) ~ 70-200
 - Max piston rod velocity 1.6 m/s
 - Repair kit 3022836



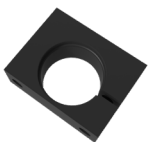
Order No.	S stroke	Force in N at 200 bar/+20°C		Force in lbf at 200 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CX 1000-010	10 ■	9,800	13,300	2,200	2,980	75	65	0.03	0.36
CX 1000-015	15 ■		14,400		3,240	85	70	0.03	0.39
CX 1000-025	25 ■		16,100		3,620	105	80	0.04	0.43
CX 1000-038	38* ■		16,900		3,800	135	97	0.06	0.50
CX 1000-050	50* ■		17,700		3,990	160	110	0.07	0.56
CX 1000-063	63* ■		16,500		3,710	205	142	0.10	0.67
CX 1000-080	80* ■		17,300		3,880	240	160	0.12	0.75

* For stroke lengths over 25 mm, the spring should be attached to the tool using the threaded holes in the bottom.
** Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



HMF-250



38



SPCX-1000



50

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

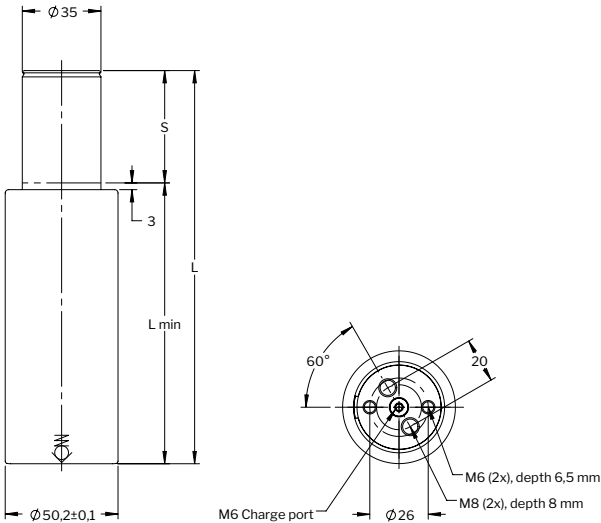
With its unique safety and reliability features, KALLER Compact Xtreme CX is a extremely compact and powerful piston rod sealed gas spring series. Using the CX gas spring is an excellent way to achieve more cost efficient dies due to lower die height.

With its extremely compact build height and cylinder diameters, the CX gas spring can reach extreme initial forces, ranging from 5,100 N to 19,200 N with stroke lengths up to 80 mm. The CX gas spring series is similar to the KALLER Power Line X series and provide extreme forces comparable to the bore sealed KALLER Super Compact CU4 series. In addition, the CX gas spring can handle higher running frequencies (SPM) compared to similar gas springs on the market, which leads to a higher production rate. Additional high force in a small area when baseplate mounted.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	200 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 50-130
Max piston rod velocity	1.6 m/s
Repair kit	3022844

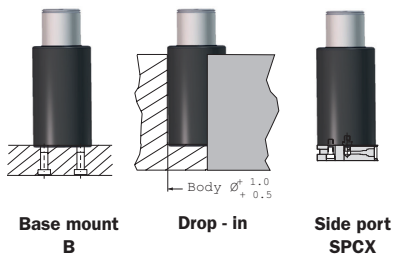


Order No.	S stroke	Force in N at 200 bar/+20°C		Force in lbf at 200 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CX 1900-010	10 ■	19,200	26,300	4,320	5,920	80	70	0.05	0.69
CX 1900-015	15 ■		31,800		7,140	95	80	0.05	0.76
CX 1900-025	25 ■		30,900		6,950	115	90	0.08	0.84
CX 1900-038	38* ■		31,900		7,160	150	112	0.12	0.98
CX 1900-050	50* ■		33,800		7,600	175	125	0.14	1.08
CX 1900-063	63* ■		34,800		7,820	205	142	0.17	1.21
CX 1900-080	80* ■		35,600		8,000	245	165	0.21	1.37

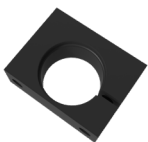
* For stroke lengths over 25 mm, the spring should be attached to the tool using the threaded holes in the bottom.

** Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



HMF-500



SPCX-1900



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

These gas springs are available with forces from 1,700 N up to 200,000 N 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 an M16 threaded tap for mounting. When ordering this version XMS 1000-xxx must be stated on the order.

Basic information

For general information see "About gas springs".

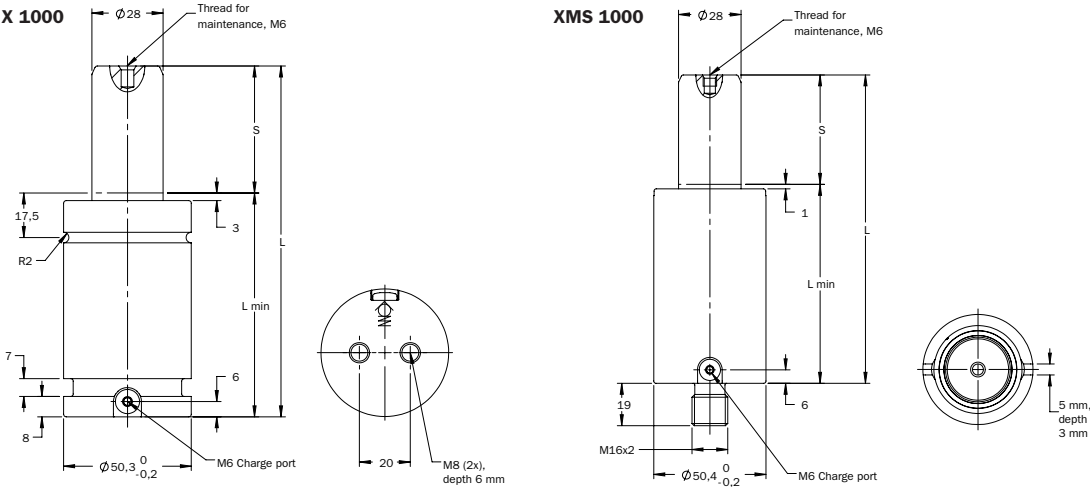
Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3018847

Automotive standard: VDI 3003-Blatt 3, ISO 11901-3-10000, WDX356204-10xxDMS, GMGDS 90.25.08-10, 39D997xx, B2 4005 21749xx, 04585xx, Z0004591xx, Z000438717, Z000376302, 305075x, 305076x, 90201405890, 90201407787



X 1000 XMS 1000

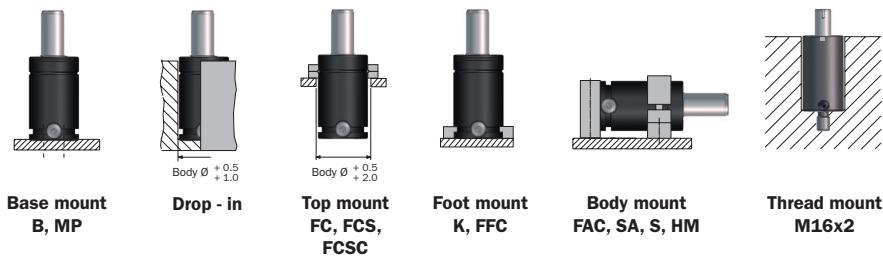




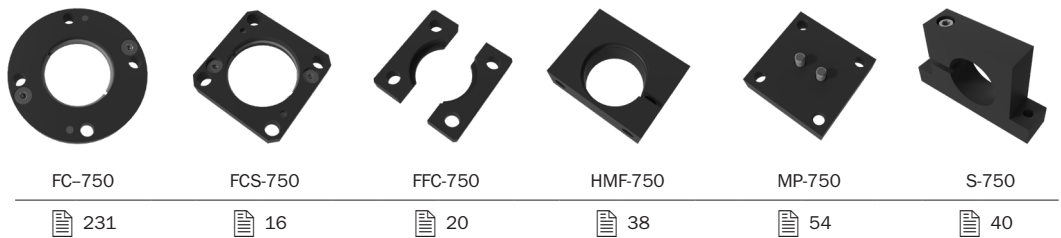
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X/XMS 1000-013	13	9,200	13,800	2,068	3,103	64	51	0.03	0.50	✓
X/XMS 1000-016	16		13,800		3,103	70	54	0.04	0.52	
X/XMS 1000-019	19		14,000		3,147	76	57	0.04	0.54	
X/XMS 1000-025	25		14,200		3,192	88	63	0.05	0.59	✓
X/XMS 1000-032	32		14,300		3,215	102	70	0.06	0.64	
X/XMS 1000-038	38		14,500		3,26	114	76	0.07	0.70	✓
X/XMS 1000-050	50		14,600		3,282	138	88	0.09	0.79	✓
X/XMS 1000-063	63		14,700		3,305	164	101	0.11	0.89	✓
X/XMS 1000-075	75		14,700		3,305	188	113	0.13	0.99	
X/XMS 1000-080	80		14,800		3,327	198	118	0.14	1.03	✓
X/XMS 1000-100	100		14,800		3,327	238	138	0.17	1.19	✓
X/XMS 1000-125	125		14,8		3,327	288	163	0.21	1.39	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts



Additional mounts

FCSC-750	FFL-750	FSL-750	FSS-750	HM-750	K-750
52	66	241	72	46	247
L-750	RMX-1000				
58	74				

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

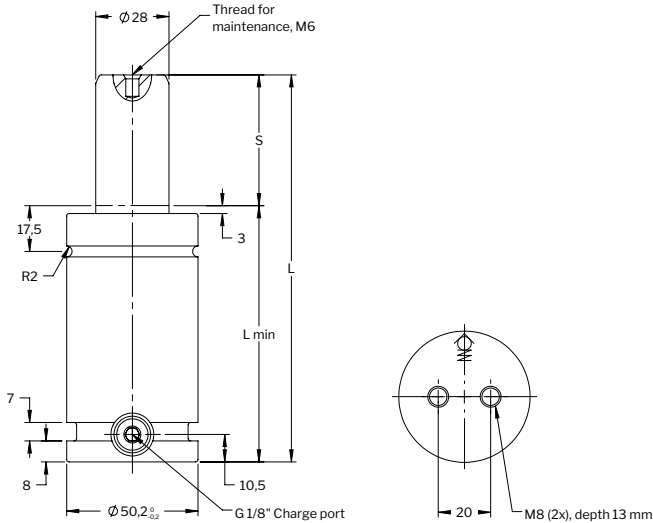
The Power Line XF series fulfills our gas spring range for FCA Fiat-Chrysler standard 075.90.60. There is a G 1/8" side port for charging or to connect to a gas link system. The upper ISO Standard C-groove and the threaded bottom hole offer various mounting possibilities using our standard mounts.

Basic information

For general information see "About gas springs".

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 150 bar
- Min. charging pressure (at 20°C) 25 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 50-100
- Max piston rod velocity 1.6 m/s
- Rod surface Nitrided
- Tube surface Black oxide
- Repair kit 3018847

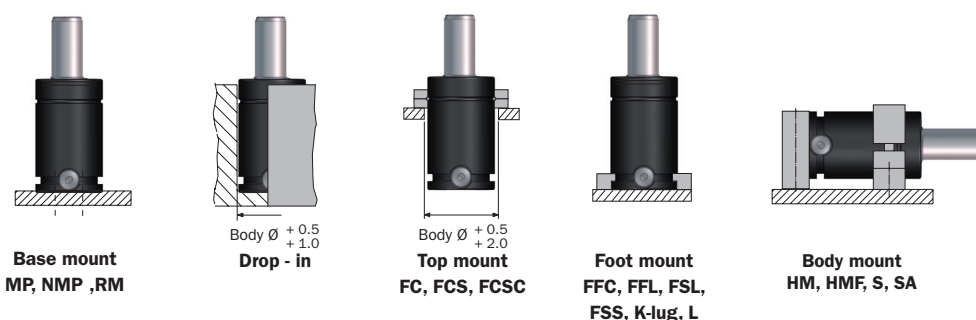
Automotive standard: GMGDS 90.25.08-10G, 39-673-0242, 39-673-0243, 39-673-0244, 39-673-0245, 39-673-0246, 39-673-0247, 39-673-0248, 39-673-0249



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XF 1000-013	13	9,200	13,800	2,068	3,103	74	61	0.03	0.70
XF 1000-016	16		13,800		3,103	80	64	0.04	0.72
XF 1000-019	19		14,000		3,147	86	67	0.04	0.74
XF 1000-025	25		14,200		3,192	98	73	0.05	0.79
XF 1000-032	32		14,300		3,215	112	80	0.06	0.84
XF 1000-038	38		14,500		3,26	124	86	0.07	0.89
XF 1000-050	50		14,600		3,282	148	98	0.09	0.98
XF 1000-063	63		14,700		3,305	174	111	0.11	1.09
XF 1000-075	75		14,700		3,305	198	123	0.13	1.18
XF 1000-080	80		14,800		3,327	208	128	0.14	1.22
XF 1000-100	100		14,800		3,327	248	148	0.17	1.41
XF 1000-125	125		14,800		3,327	298	173	0.21	1.60

* Isothermal end force at full stroke.

Mounting possibilities



Recommended mounts

FC-750	FCS-750	FFC-750	HMF-750	MP-750	S-750
231	16	20	38	54	40

Additional mounts

FCSC-750	FFL-750	FSL-750	FSS-750	HM-750	K-750
52	66	241	72	46	247
L-750	NMP-1000	RM-750	SA-750		
58	62	74	70		

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

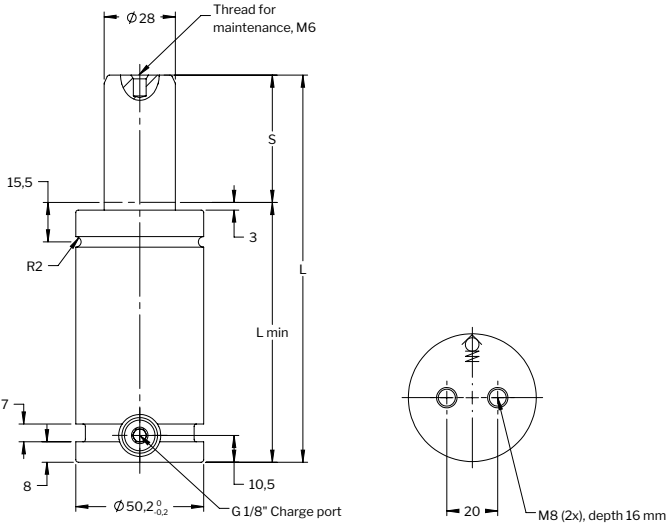
These gas springs are available with forces from 3500 N up to 66000 N and stroke lengths between 13 and 125 mm. There is a side port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 50-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3018847

Automotive standard: R9034405xx, MES E7231 PG230-PG24D-10, K32R0-1000, SD116391-1000, M-2404-TD-22-1000



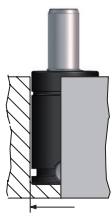
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XG 1000-013	13	9,200	13,800	2,068	3,103	78	65	0.03	0.70
XG 1000-016	16		13,800		3,103	84	68	0.04	0.72
XG 1000-019	19		14,000		3,147	90	71	0.04	0.74
XG 1000-025	25		14,200		3,192	102	77	0.05	0.79
XG 1000-032	32		14,300		3,215	116	84	0.06	0.84
XG 1000-038	38 ■		14,500		3,26	128	90	0.07	0.89
XG 1000-050	50 ■		14,600		3,282	152	102	0.09	0.98
XG 1000-063	63 ■		14,700		3,305	178	115	0.11	1.09
XG 1000-075	75		14,700		3,305	202	127	0.13	1.18
XG 1000-080	80		14,800		3,327	212	132	0.14	1.22
XG 1000-100	100		14,800		3,327	252	152	0.17	1.41
XG 1000-125	125		14,800		3,327	302	177	0.21	1.60

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

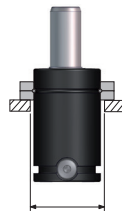
Mounting possibilities



**Base mount
B**



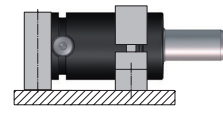
Body Ø $+0.5$
 $+1.0$
Drop-in



Body Ø $+0.5$
 $+2.0$
**Top mount
FC, FCS**



**Foot mount
K, FFC**



**Body mount
FAC, SA, S, HM**

Recommended mounts



FC-750

231



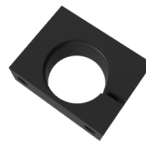
FCS-750

16



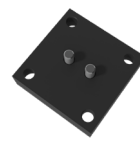
FFC-750

20



HMF-750

38



MP-750

54



S-750

40

Additional mounts

FCSC-750

52

FFL-750

66

FSL-750

241

FSS-750

72

HM-750

46

K-750

247

L-750

58

NMP-1000

62

RM-750

74

SA-750

70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line – Heavy Duty Series is a crossover between the standard TU Series and the Power Line X Series.

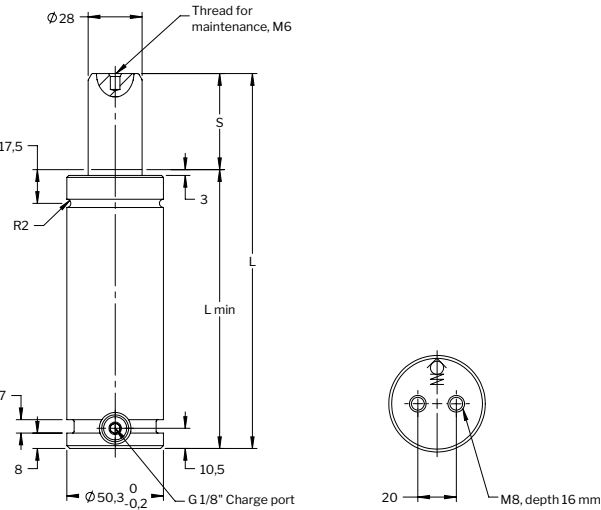
These gas springs are available with forces from 7,400 N up to 200,000 N and stroke lengths between 13 and 300 mm. There is an optional bottom port for hose/base plate connection. An upper C-groove, lower U-groove and bottom threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium Nitrogen
Max. charging pressure (at 20°C) 150 bar
Min. charging pressure (at 20°C) 25 bar
Operating temperature 0 to +80°C
Force increase by temperature ±0.3%/°C
Recommended max strokes/min (at 20°C) ~ 15-100
Max piston rod velocity 1.6 m/s
Rod surface Nitrided
Tube surface Black oxide
Repair kit 3023788

Automotive standard: VDI 3003-Blatt 4, ISO 11901-4-10000, GMGDS 90.25.05-7.5, 39D838xx, B2 4008 21750xx, 39-673-82xx, 305468x, 305469x



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	
		Initial	End force*	Initial	End force*					
TX 1000-013	13	9,200	11,200	2,075	2,525	121	108	0.06	1.17	✓
TX 1000-025	25		12,100		2,725	145	120	0.07	1.27	
TX 1000-038	38		12,800		2,875	171	133	0.09	1.32	
TX 1000-050	50		13,200		2,975	195	145	0.11	1.37	✓
TX 1000-063	63		13,500		3,050	221	158	0.13	1.58	
TX 1000-075	75		13,700		3,075	245	170	0.15	1.71	
TX 1000-080	80		13,800		3,100	255	175	0.16	1.73	✓
TX 1000-100	100		14,100		3,175	295	195	0.19	1.90	
TX 1000-125	125		14,300		3,225	345	220	0.23	2.11	
TX 1000-150	150 ■		14,500		3,250	395	245	0.27	2.32	✓
TX 1000-160	160 ■		14,500		3,250	415	255	0.28	2.40	
TX 1000-175	175 ■		14,600		3,275	445	270	0.30	2.53	
TX 1000-200	200 ■		14,700		3,300	495	295	0.34	2.74	✓
TX 1000-250	250		14,800		3,325	595	345	0.42	3.16	
TX 1000-300	300		14,900		3,350	695	395	0.49	3.58	

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

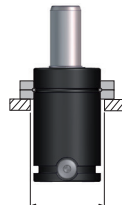
Mounting possibilities



Base mount
B



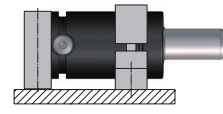
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-750

231



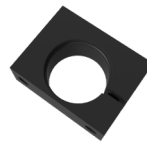
FCS-750

16



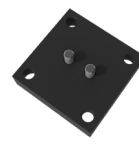
FFC-750

20



HMF-750

38



MP-750

54



S-750

40

Additional mounts

FAC-750

230

FCSC-750

52

FFL-750

66

FSL-750

241

FSS-750

72

HM-750

46

K-750

247

L-750

58

NMP-1000

62

RM-750

74

SA-750

70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

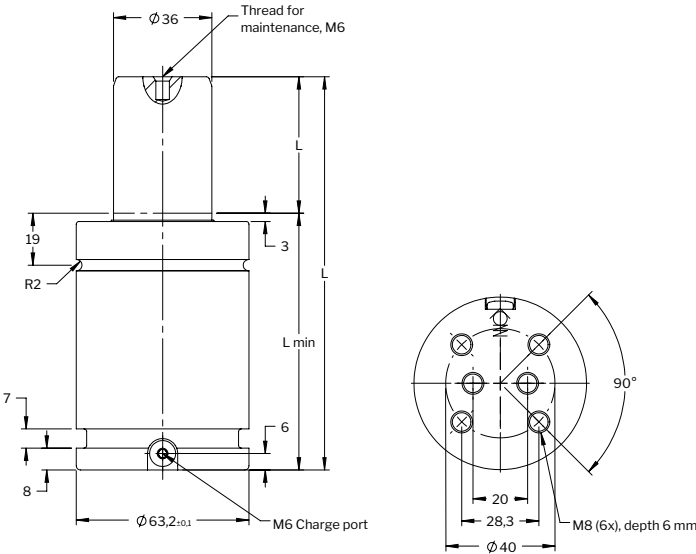
These gas springs are available with forces from 1,700 N up to 200,000 N and stroke lengths between 7 and 125 mm. There is a side port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see "About gas springs".

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3020434

Automotive standard: VDI 3003-Blatt 3, ISO 11901-3-15000,
WDX356204-15xxDMS, 39D997xx, B2 4005 21723xx, 04585xx, 1028888



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X 1500-013	13	15,000	24,000	3,375	5,395	70	57	0.05	0.89	✓
X 1500-016	16		24,100		5,420	76	60	0.06	0.93	
X 1500-019	19		24,200		5,440	82	63	0.07	0.96	
X 1500-025	25 ■		24,300		5,365	94	69	0.08	1.03	✓
X 1500-032	32		23,800		5,355	108	76	0.11	1.08	
X 1500-038	38 ■		23,900		5,375	120	82	0.12	1.15	✓
X 1500-050	50 ■		24,000		5,395	144	94	0.15	1.28	✓
X 1500-063	63 ■		24,100		5,420	170	107	0.19	1.43	✓
X 1500-075	75		24,200		5,440	194	119	0.22	1.57	
X 1500-080	80		24,200		5,440	204	124	0.24	1.63	✓
X 1500-100	100		24,300		5,465	244	144	0.29	1.86	✓
X 1500-125	125		24,300		5,465	294	169	0.36	2.15	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Base mount
B, MPX



Drop - in
Body Ø + 0.5
+ 1.0



Top mount
FCX, FCSX
Body Ø + 0.5
+ 2.0



Foot mount
KX, FFC

Recommended mounts



FCSX-1500

20



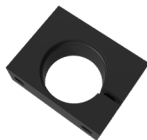
XFC-1500

16



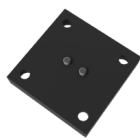
FFX-1500

20



HMF-X1500

38



MPX-1500

54



FFCX-1500

231

Additional mounts

FCX-1500

16

FCSCX-1500

52

FSLT-1500

241

KX-1500

247

LX-1500

58

RMX-1500

74

XFCJ-1500

231

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

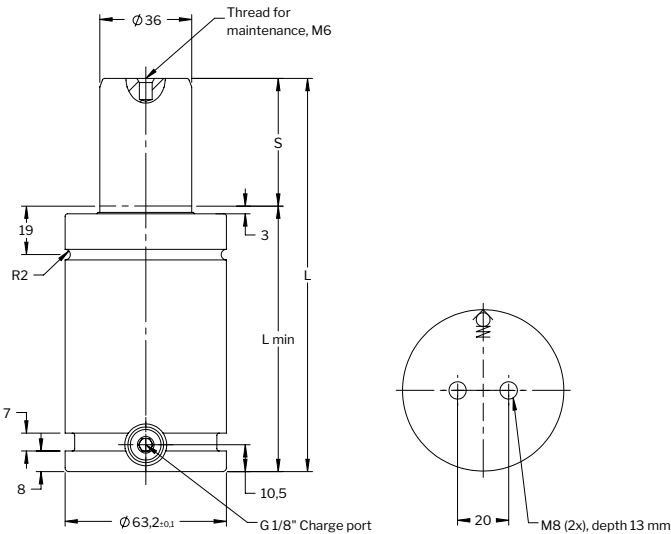
The Power Line XF series fulfills our gas spring range for FCA Fiat-Chrysler standard 075.90.60. There is a G 1/8" side port for charging or to connect to a gas link system. The upper ISO Standard C-groove and the threaded bottom hole offer various mounting possibilities using our standard mounts.

Basic information

For general information see "About gas springs".

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3020434

Automotive standard: 39-673-0251, 39-673-0252, 39-673-0253, 39-673-0254, 39-673-0255, 39-673-0256, 39-673-0257, 39-673-0258



Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XF 1500-013	13	15,000	24,000	3,375	5,395	80	67	0.05	1.14
XF 1500-016	16		24,100		5,420	86	70	0.06	1.27
XF 1500-019	19		24,200		5,440	92	73	0.07	1.28
XF 1500-025	25		24,300		5,365	104	79	0.08	1.28
XF 1500-032	32		23,800		5,355	118	86	0.11	1.33
XF 1500-038	38		23,900		5,375	130	92	0.12	1.35
XF 1500-050	50		24,000		5,395	154	104	0.15	1.39
XF 1500-063	63		24,100		5,420	180	117	0.19	1.43
XF 1500-075	75		24,200		5,440	204	129	0.22	1.48
XF 1500-080	80		24,200		5,440	214	134	0.24	1.49
XF 1500-100	100		24,300		5,465	254	154	0.29	2.12
XF 1500-125	125		24,300		5,465	304	179	0.36	2.39

* Isothermal end force at full stroke.

Mounting possibilities



Base mount
RM, MP



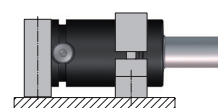
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FCSC, FCS,
FC



Foot mount
FFC, FSL,
K-lug, L



Body mount
HMF

Recommended mounts



FFCX-1500

 20



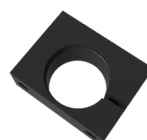
FCSCX-1500

 16



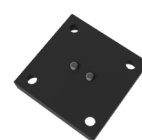
FFX-1500

 20



HMF-X1500

 38



MPX-1500

 54



XFC-1500

 231

Additional mounts

FCX-1500

 16

FCSCX-1500

 52

FSLT-1500

 241

KX-1500

 247

LX-1500

 58

RMX-750

 74

XFCJ-1500

 231

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

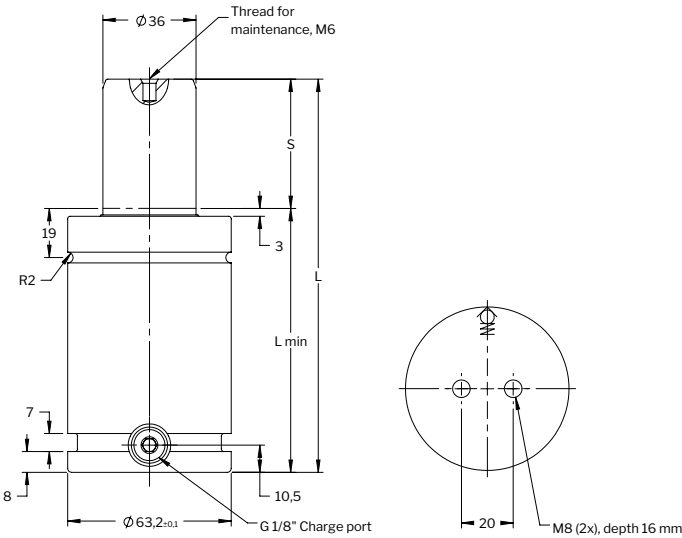
These gas springs are available with forces from 3,500 N up to 66,000 N and stroke lengths between 13 and 125 mm. There is a side and a bottom port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 50-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3020434

Automotive standard: MES E7231 PG230-PG24D-15, M-2404-TD-29-2400



Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XG 1500-013	13	15,000	24,000	3,375	5,395	78	65	0.05	0.9
XG 1500-016	16		24,100		5,420	84	68	0.06	0.9
XG 1500-019	19		24,200		5,440	90	71	0.07	1.0
XG 1500-025	25		24,300		5,365	102	77	0.08	1.0
XG 1500-032	32		23,800		5,355	116	84	0.11	1.1
XG 1500-038	38 ■		23,900		5,375	128	90	0.12	1.2
XG 1500-050	50 ■		24,000		5,395	152	102	0.15	1.3
XG 1500-063	63 ■		24,100		5,420	178	115	0.19	1.4
XG 1500-075	75		24,200		5,440	202	127	0.22	1.4
XG 1500-080	80		24,200		5,440	212	132	0.24	1.4
XG 1500-100	100		24,300		5,465	252	152	0.29	1.9
XG 1500-125	125		24,300		5,465	302	177	0.36	2.2

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

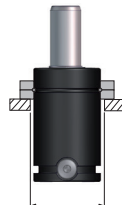
Mounting possibilities



**Base mount
B, MPX**



Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
**Top mount
FCX, FCSX**



**Foot mount
KX, FFC**

Recommended mounts



FCSX-1500

 16



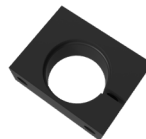
XFC-1500

 231



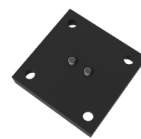
FFX-1500

 20



HMF-X1500

 38



MPX-1500

 54



FFCX-1500

 20

Additional mounts

FCSCX-1500

 52

FSLT-1500

 241

KX-1500

 247

LX-1500

 58

RMX-750

 74

FCX-1500

 16

XFCJ-1500

 231

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

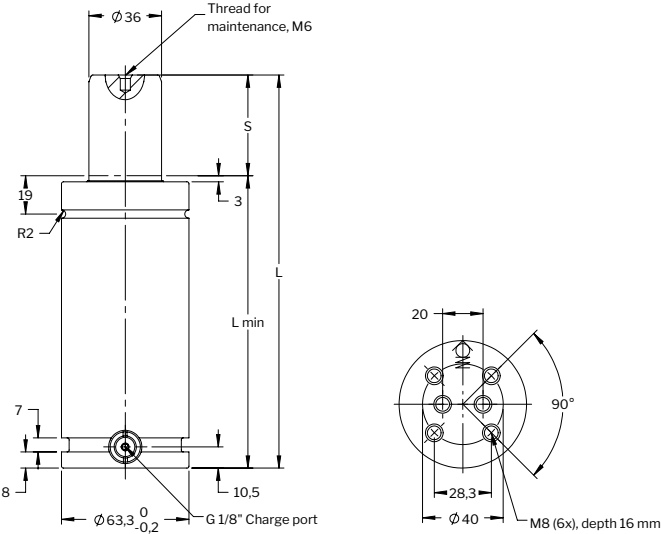
The Power Line – Heavy Duty Series is a crossover between the standard TU Series and the Power Line X Series.

These gas springs are available with forces from 7,400 N up to 200,000 N and stroke lengths between 13 and 300 mm. There is an optional bottom port for hose/base plate connection. An upper C-groove, lower U-groove and bottom threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3026202



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TX 1500-013	13	15,000	17,700	3,372	3,979	121	108	0.10	1.76
TX 1500-025	25		19,100		4,294	145	120	0.13	1.89
TX 1500-038	38		20,000		4,496	171	133	0.17	2.04
TX 1500-050	50		20,600		4,631	195	145	0.20	2.18
TX 1500-063	63		21,100		4,743	221	158	0.23	2.33
TX 1500-075	75		21,500		4,833	245	170	0.27	2.47
TX 1500-080	80		21,600		4,856	255	175	0.28	2.52
TX 1500-100	100		21,700		4,878	295	195	0.33	2.76
TX 1500-125	125		22,400		4,968	345	220	0.40	3.04
TX 1500-150	150 ■		22,500		5,036	395	245	0.47	3.33
TX 1500-160	160 ■		22,600		5,058	415	255	0.50	3.44
TX 1500-175	175 ■		22,600		5,081	445	270	0.54	3.61
TX 1500-200	200 ■		22,800		5,126	495	295	0.60	3.90
TX 1500-250	250		23,000		5,171	595	345	0.74	4.47
TX 1500-300	300		23,200		5,216	695	395	0.87	5.05

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

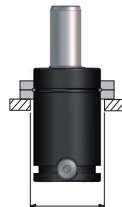
Mounting possibilities



**Base mount
B, MPX**



Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
**Top mount
FCX, FCSX**



**Foot mount
KX, FFC**

Recommended mounts



FCSX-1500

16



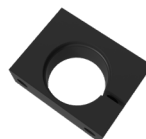
XFC-1500

231



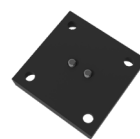
FFX-1500

20



HMF-X1500

38



MPX-1500

54



FFCX-1500

20

Additional mounts

FCSCX-1500

52

FSLT-1500

241

KX-1500

247

LX-1500

58

RMX-1500

74

FCX-1500

16

XFCJ-1500

231

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

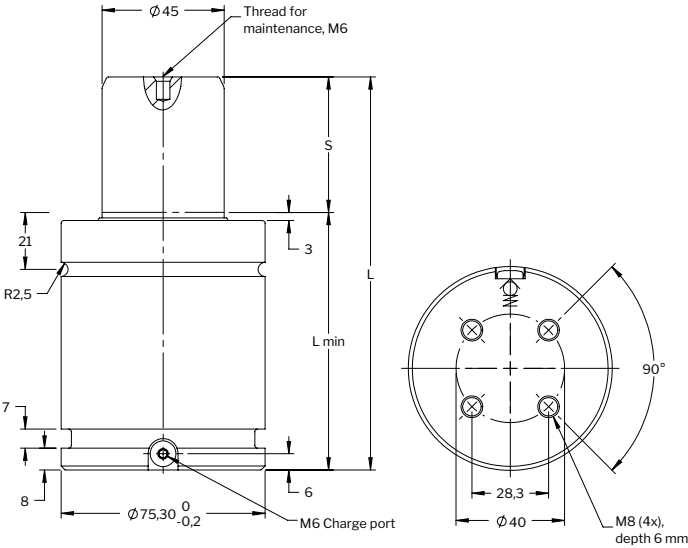
These gas springs are available with forces from 1,700 N up to 200,000 N and stroke lengths between 7 and 125 mm. There is a side port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
 - Max. charging pressure (at 20°C) 150 bar
 - Min. charging pressure (at 20°C) 25 bar
 - Operating temperature 0 to +80°C
 - Force increase by temperature ±0.3%/°C
 - Recommended max strokes/min (at 20°C) ~ 40-100
 - Max piston rod velocity 1.6 m/s
 - Rod surface Nitrided
 - Tube surface Black oxide
 - Repair kit 3018848
- The X 2400-016 and X 2400-019 are not possible to repair.

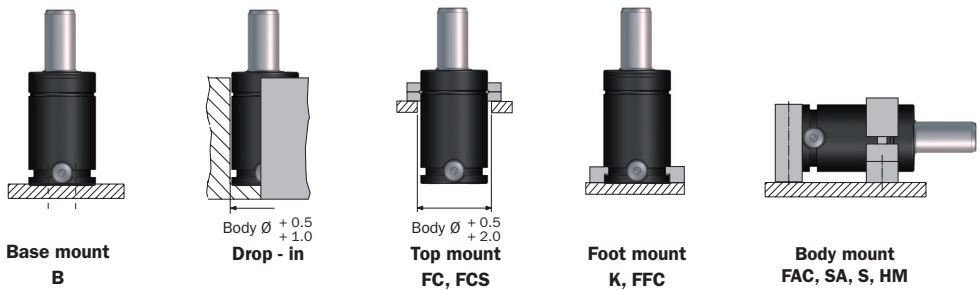
Automotive standard: VDI 3003-Blatt 3, ISO 11901-3-24000, WDX356204-24xxDMS, GMGDS 90.25.08-24, 39D997xx, B2 4005 21723xx, 04585xx, Z000410552, Z000479498, Z0004591xx, Z000365402



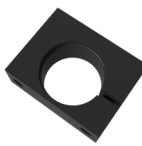
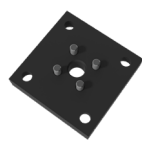
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X 2400-016	16	24,000	38,300	5,396	8,611	77	61,000	0.09	1.34	
X 2400-019	19		38,500		8,656	83	64	0.10	1.38	
X 2400-025	25 ■		38,700		8,701	95	70	0.13	1.45	✓
X 2400-032	32		38,600		8,678	109	77	0.16	1.56	
X 2400-038	38 ■		38,400		8,633	121	83	0.18	1.65	✓
X 2400-050	50 ■		39,200		8,813	145	95	0.23	1.84	✓
X 2400-063	63 ■		39,200		8,813	171	108	0.28	2.20	✓
X 2400-075	75		39,200		8,813	195	120	0.33	2.26	
X 2400-080	80		39,200		8,813	205	125	0.35	2.32	✓
X 2400-100	100		39,300		8,835	245	145	0.43	2.66	✓
X 2400-125	125		39,300		8,835	295	170	0.54	3.05	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Recommended mounts

					
FC-1500	FCS-1500	FFC-1500	HMF-1500	MP-1500	S-1500
 231	 16	 20	 38	 54	 40

Additional mounts

FCSC-1500	FFL-1500	FSL-1500	FSS-1500	HM-1500	K-1500
 52	 66	 241	 72	 46	 247
L-1500	RMX-2400				
 58	 74				

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

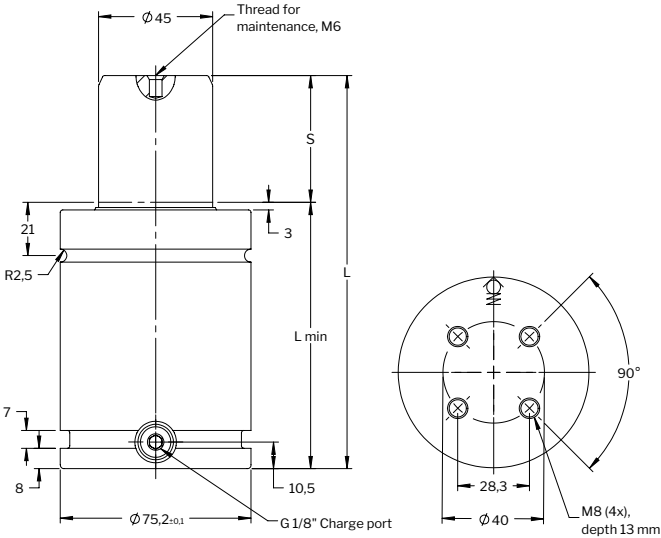
The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

The Power Line XF series fulfills our gas spring range for FCA Fiat-Chrysler standard 075.90.60. There is a G 1/8" side port for charging or to connect to a gas link system. The upper ISO Standard C-groove and the threaded bottom hole offer various mounting possibilities using our standard mounts.

Basic information

For general information see "About gas springs".

Pressure medium Nitrogen
Max. charging pressure (at 20°C) 150 bar
Min. charging pressure (at 20°C) 25 bar
Operating temperature 0 to +80°C
Force increase by temperature ±0.3%/°C
Recommended max strokes/min (at 20°C) ~ 40-100
Max piston rod velocity 1.6 m/s
Rod surface Nitrided
Tube surface Black oxide
Repair kit 3018848
Automotive standard: GMGDS 90.25.08-24G, 39-673-0260, 39-673-0261,
39-673-0262, 39-673-0263, 39-673-0264, 39-673-0265, 39-673-0266



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XF 2400-016	16	24,000	38,300	5,396	8,611	87	71	0.09	1.66
XF 2400-019	19		38,500		8,656	93	74	0.10	1.71
XF 2400-025	25		38,700		8,701	105	80	0.13	1.81
XF 2400-032	32		38,600		8,678	119	87	0.16	1.93
XF 2400-038	38		38,400		8,633	131	93	0.18	2.03
XF 2400-050	50		39,200		8,813	155	105	0.23	2.23
XF 2400-063	63		39,200		8,813	181	118	0.28	2.44
XF 2400-075	75		39,200		8,813	205	130	0.33	2.64
XF 2400-080	80		39,200		8,813	215	135	0.35	2.72
XF 2400-100	100		39,300		8,835	255	155	0.43	3.05
XF 2400-125	125		39,300		8,835	305	180	0.54	3.47

* Isothermal end force at full stroke.

Mounting possibilities



Base mount
B



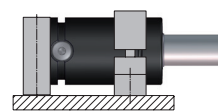
Body $\varnothing$ $+0.5$
 $+1.0$
Drop - in



Body $\varnothing$ $+0.5$
 $+2.0$
Top mount
FC, FCS



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-1500

 231



FCS-1500

 16



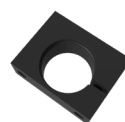
FFC-1500

 20



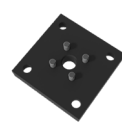
FFC-3000

 20



HMF-1500

 38



MP-1500

 54



S-1500

 40

Additional mounts

FCSC-1500

 52

FFL-1500

 66

FSL-1500

 241

FSS-1500

 72

HM-1500

 46

K-1500

 247

L-1500

 58

NMP-2400

 62

RM-1500

 74

SA-1500

 70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

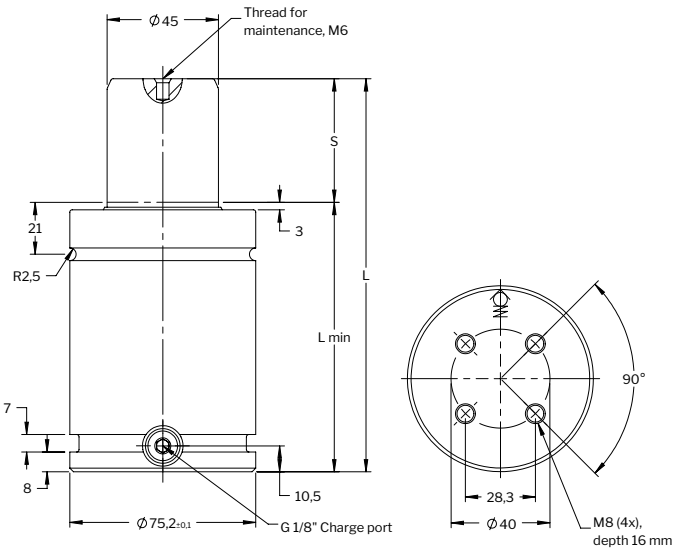
These gas springs are available with forces from 3,500 N up to 66,000 N and stroke lengths between 10 and 125 mm. There is a side and bottom port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with four M8 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
 - Max. charging pressure (at 20°C) 150 bar
 - Min. charging pressure (at 20°C) 25 bar
 - Operating temperature 0 to +80°C
 - Force increase by temperature ±0.3%/°C
 - Recommended max strokes/min (at 20°C) ~ 40-100
 - Max piston rod velocity 1.6 m/s
 - Rod surface Nitrided
 - Tube surface Black oxide
 - Repair kit 3018848
- The X 2400-016 and X 2400-019 are not possible to repair.

Automotive standard: R9034405xx, MES E7231 PG230-PG24D-2A, K32R0-2400, SD116391-2400, M-2404-TD-36-4200



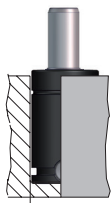
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XG 2400-016	16	24,000	38,300	5,396	8,611	91	75,000	0.09	1.77
XG 2400-019	19		38,500		8,656	97	78	0.10	1.82
XG 2400-025	25		38,700		8,701	109	84	0.13	1.89
XG 2400-032	32		38,600		8,678	123	91	0.16	2.00
XG 2400-038	38 ■		38,400		8,633	135	97	0.18	2.10
XG 2400-050	50 ■		39,200		8,813	159	109	0.23	2.28
XG 2400-063	63 ■		39,200		8,813	185	122	0.28	2.56
XG 2400-075	75		39,200		8,813	209	134	0.33	2.75
XG 2400-080	80		39,200		8,813	219	139	0.35	2.83
XG 2400-100	100		39,300		8,835	259	159	0.43	3.15
XG 2400-125	125		39,300		8,835	309	184	0.54	3.54

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Base mount
B



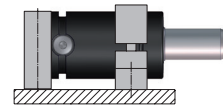
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-1500

231



FCS-1500

16



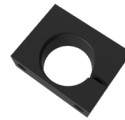
FFC-1500

20



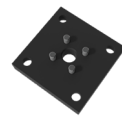
FFC-3000

20



HMF-1500

38



MP-1500

54



S-1500

40

Additional mounts

FCSC-1500

52

FFL-1500

66

FSL-1500

241

FSS-1500

72

HM-1500

46

K-1500

247

L-1500

58

NMP-2400

62

RM-1500

74

SA-1500

70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line – Heavy Duty series is a crossover between the standard TU Series and the Power Line X Series.

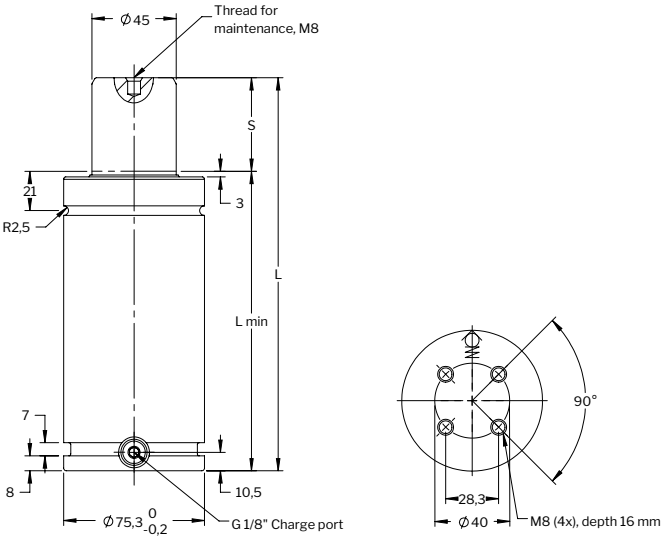
These gas springs are available with forces from 9,200 N up to 95,000 N and stroke lengths between 13 and 300 mm. There is an optional bottom port for hose/base plate connection. An upper C-groove, lower U-groove and bottom threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 40-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3022952

Automotive standard: VDI 3003-Blatt 4, ISO 11901-4-24000, GMGDS 90.25.05-15, 39D838xx, B2 4008 21750xx, 39-673-829x, 39-673-830x, 305469x



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TX 2400-025	25	24,000	37,100	5,400	8,350	160	135,000	0.23	3.1	✓
TX 2400-038	38		37,600		8,450	186	148	0.28	3.31	
TX 2400-050	50		37,900		8,525	210	160	0.33	3.5	✓
TX 2400-063	63		38,100		8,575	236	173	0.38	3.7	
TX 2400-075	75		38,300		8,625	260	185	0.43	3.89	
TX 2400-080	80		38,300		8,625	270	190	0.45	3.97	✓
TX 2400-100	100		38,500		8,650	310	210	0.53	4.29	✓
TX 2400-125	125		38,700		8,700	360	235	0.63	4.68	✓
TX 2400-150	150 ■		38,800		8,725	410	260	0.73	5.07	
TX 2400-160	160 ■		38,800		8,725	430	270	0.77	5.23	✓
TX 2400-175	175 ■		38,900		8,750	460	285	0.83	5.47	
TX 2400-200	200 ■		38,900		8,750	510	310	0.93	5.86	✓
TX 2400-250	250		39,000		8,775	610	360	1.17	6.65	✓
TX 2400-300	300		39,100		8,800	710	410	1.33	7.44	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Base mount
B



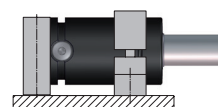
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-1500

231



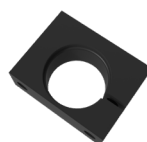
FCS-1500

16



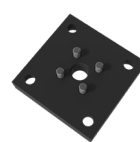
FFC-1500

20



HMF-1500

38



MP-1500

54



S-1500

40

Additional mounts

FAC-1500

230

FCSC-1500

52

FFL-1500

66

FSL-1500

241

FSS-1500

72

HM-1500

46

K-1500

247

L-1500

58

NMP-2400

62

RM-1500

74

SA-1500

70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

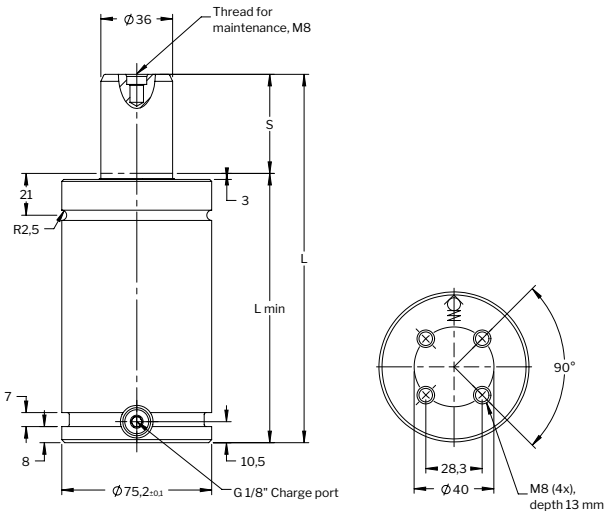
The TL Series ranges from model sizes 750 to 7,500, with the same features and technology as the TU series.

At the same time, the TL gas spring is shorter than the corresponding TU gas spring by 25 mm, except TL 5000 and TL 7500, which are 37.5 mm and 50 mm shorter respectively. TL springs share the same TU mounting possibilities and stroke lengths, with exception of strokes 12.5, 37.5 and 62.5.

Basic information

For general information see “About gas springs”.

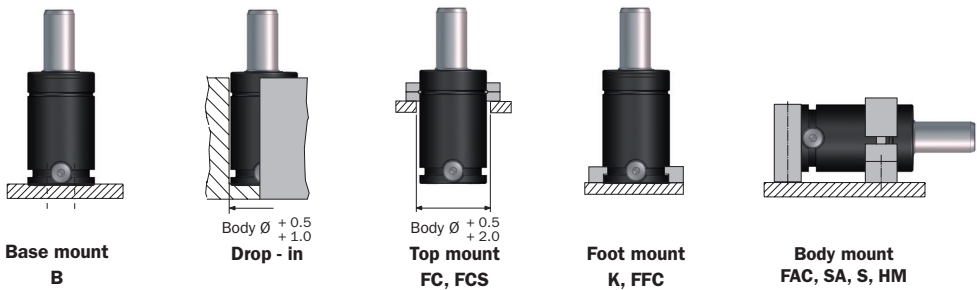
- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 150 bar
- Min. charging pressure (at 20°C) 25 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 15-40
- Max piston rod velocity 1.6 m/s
- Rod surface Nitrided
- Tube surface Black oxide
- Repair kit 3024144



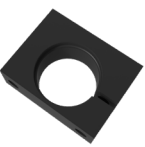
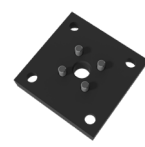
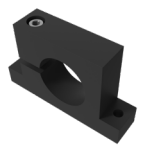
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TL 1500-013	12.5	15,000	18,000	3,370	4,050	110	97.5	0.11	2.65
TL 1500-025	25		19,200		4,320	135	110	0.15	2.88
TL 1500-038	37.5		20,000		4,500	160	122.5	0.19	3.11
TL 1500-050	50		20,400		4,590	185	135	0.23	3.34
TL 1500-063	62.5		20,700		4,650	210	147.5	0.27	3.57
TL 1500-075	75		20,900		4,700	235	160	0.31	3.88
TL 1500-080	80		21,000		4,720	245	165	0.33	3.89
TL 1500-088	87.5		21,100		4,740	260	172.5	0.35	4.03
TL 1500-100	100		21,200		4,770	285	185	0.39	4.26
TL 1500-113	112.5		21,400		4,810	310	197.5	0.43	4.49
TL 1500-125	125		21,500		4,830	335	210	0.47	4.71
TL 1500-138	137.5		22,000		4,950	360	222.5	0.49	4.94
TL 1500-150	150		22,000		4,950	385	235	0.52	5.17
TL 1500-160	160		22,100		4,970	405	245	0.56	5.36
TL 1500-175	175		22,100		4,970	435	260	0.60	5.63
TL 1500-200	200		22,100		4,970	485	285	0.68	6.09
TL 1500-225	225		22,200		4,990	535	310	0.76	6.55
TL 1500-250	250		22,200		4,990	585	335	0.84	7.01

* Isothermal end force at full stroke.

Mounting possibilities



Recommended mounts

					
FC-1500	FCS-1500	FFC-1500	HMF-1500	MP-1500	S-1500
 231	 16	 20	 38	 54	 40

Additional mounts

FAC-1500	FCSC-1500	FFL-1500	FSL-1500	FSS-1500	HM-1500
 230	 52	 66	 241	 72	 46
K-1500	L-1500	NMP-2400	RM-1500	SA-1500	
 247	 58	 62	 74	 70	

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

This is a short height hoseable spring with an initial force of 15,000 N.

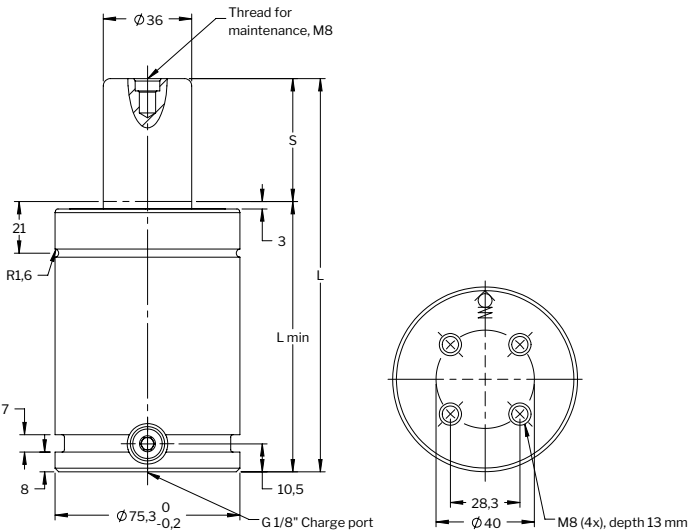
The K 1500 has a total length of 60 mm + (2 × stroke). This spring is 50 mm shorter than the TU 1500.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3017230-1500

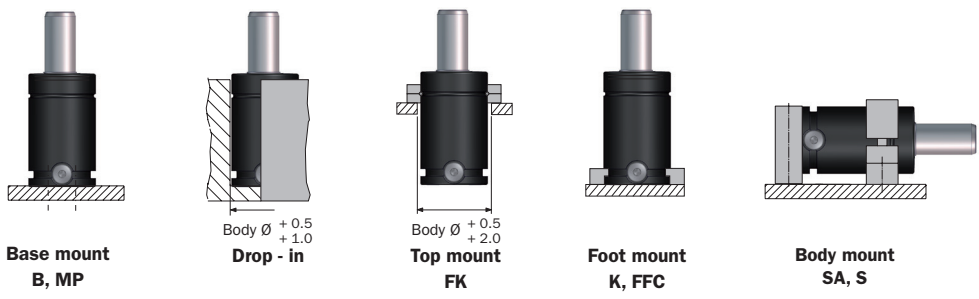
Automotive standard: R100288379. R100288383. R100288384. R100288385



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
K 1500-025	25	15,000	24,000	3,375	5,400	110	85	0.10	2.05
K 1500-038	38.1		23,000		5,170	136.2	98.1	0.14	2.35
K 1500-050	50		23,000		5,170	160	110	0.18	2.50
K 1500-064	63.5		23,000		5,170	187	123.5	0.22	2.75
K 1500-080	80		23,000		5,170	220	140	0.27	3.05
K 1500-100	100		23,000		5,170	260	160	0.34	3.40

* Isothermal end force at full stroke.

Mounting possibilities



Recommended mounts

FFL-1500	FK-1500	HMF-1500	MP-1500	S-1500
20	84	38	54	40

Additional mounts

FFL-1500	FSS-1500	K-1500	L-1500	RM-1500
66	72	247	58	74

Note!

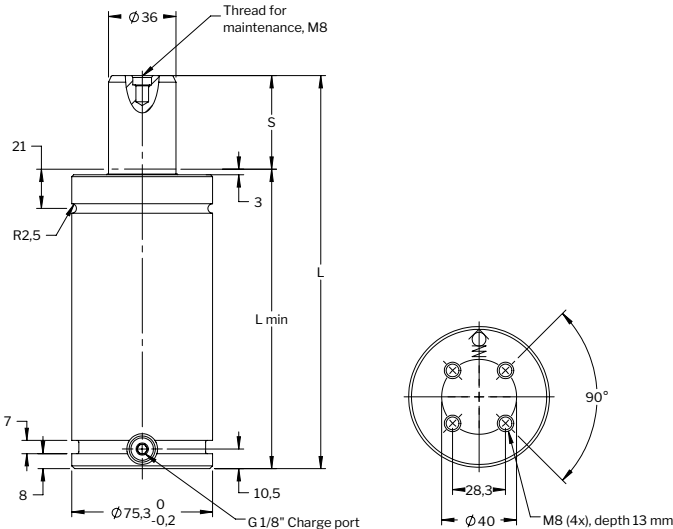
For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The TU line constitutes our standard line of gas springs. Sizes 250 to 10,000 conform to the ISO 11901 gas spring standard.

Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
 - Max. charging pressure (at 20°C) 150 bar
 - Min. charging pressure (at 20°C) 25 bar
 - Operating temperature 0 to +80°C
 - Force increase by temperature ±0.3%/°C
 - Recommended max strokes/min (at 20°C) ~ 15-40
 - Max piston rod velocity 1.6 m/s
 - Rod surface Nitrided
 - Tube surface Black oxide
 - Repair kit 2014068-02
- Automotive standard: VDI 3003, ISO 11901-1-15000, WDX356203-15xxDMS, GMGDS 90.25.00-15, 39D878xx, B2 4006 0998614, B2 4006 21710xx, B2 4006 3273508, B2 4006 3860208, B2 4006 3352603, B2 4006 09677xx, 03323xx, X3465902xx, X3465900xx, Z000296562, X346590618, X346590004, R1000362xx, R1002297xx, 39-673-52xx, N0315xx, MES E7231 PG230-PG23D-15, K32S0-1500, 997595x, 304418x, 997595x, 997596x, SD116322-1500, M-2401-TD-7-1500, 90201402297



Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TU 1500-025	25 ■	15,000	23,000	3,375	5,170	160	135	0.10	3.65	✓
TU 1500-038	38.1					186.2	148.1	0.15	3.89	
TU 1500-050	50 ■					210	160	0.18	4.11	✓
TU 1500-064	63.5					237	173.5	0.22	4.35	
TU 1500-080	80 ■					270	190	0.28	4.66	✓
TU 1500-100	100					310	210	0.34	5.02	✓
TU 1500-125	125					360	235	0.42	5.48	✓
TU 1500-160	160 ■					430	270	0.53	6.12	✓
TU 1500-175	175					460	285	0.60	6.34	
TU 1500-200	200					510	310	0.68	6.86	
TU 1500-225	225					560	335	0.76	7.26	
TU 1500-250	250					610	360	0.81	7.77	
TU 1500-300	300					710	410	0.96	8.69	

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

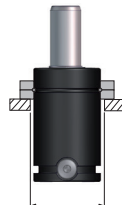
Mounting possibilities



Base mount
B, MP



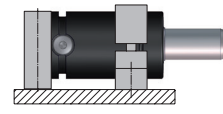
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-1500

 231



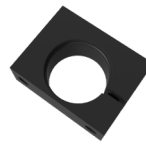
FCS-1500

 16



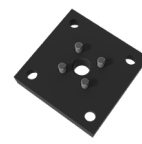
FFC-1500

 20



HMF-1500

 38



MP-1500

 54



S-1500

 40

Additional mounts

FAC-1500

 230

FCSC-1500

 52

FFL-1500

 66

FSL-1500

 241

FSS-1500

 72

HM-1500

 46

K-1500

 247

L-1500

 58

NMP-2400

 102

RM-1500

 74

SA-1500

 70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The High Speed gas springs (TUS) have been engineered to withstand press stroke speeds to a maximum of 2 m/s, which meet the safety requirements from the French automotive manufacturer Renault.

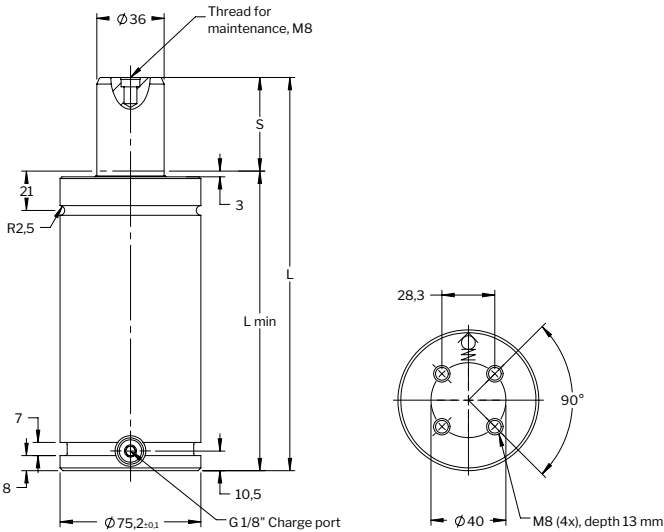
These gas springs are available in sizes from 750 to 7,500 and dimensions that conform to the ISO 11901 gas spring standard. The TUS gas spring replaces the TUR spring that has been phased out.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	2.0 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019278

Automotive standard: R903636007, R903636008, R903636009, R903636010, R903636011, R903636012, R903636013, R903636014, R903636015



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TUS 1500-025	25	15,000	23,000	3,375	5,170	160	135	0.10	3.75
TUS 1500-038	38.1		23,000			186.2	148.1	0.15	3.95
TUS 1500-050	50		23,000			210	160	0.18	4.15
TUS 1500-064	63.5		23,000			237	173.5	0.22	4.40
TUS 1500-080	80		23,000			270	190	0.28	4.70
TUS 1500-100	100		23,000			310	210	0.34	5.10
TUS 1500-125	125		23,000			360	235	0.42	5.55
TUS 1500-160	160		23,000			430	270	0.53	6.25
TUS 1500-200	200		23,000			510	310	0.68	6.90
TUS 1500-250	250		23,000			610	360	0.81	7.80
TUS 1500-300	300		23,000			710	410	0.96	8.90

* Isothermal end force at full stroke.

Mounting possibilities



Base mount
B, MP



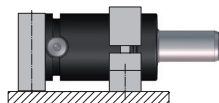
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-1500

231



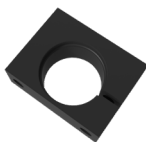
FCS-1500

16



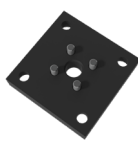
FFC-1500

20



HMF-1500

38



MP-1500

54



S-1500

40

Additional mounts

FAC-1500	FCSC-1500	FFL-1500	FSL-1500	FSS-1500	HM-1500
230	52	66	241	72	46
K-1500	L-1500	NMP-2400	RM-1500	SA-1500	
247	58	102	74	70	

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

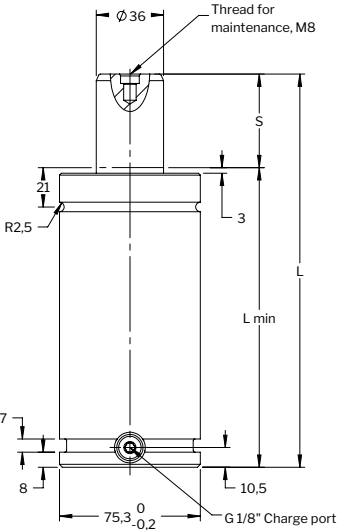
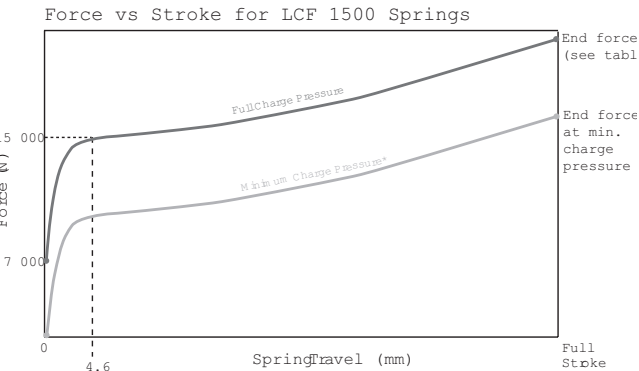
Low Contact Force (LCF) gas springs are designed to reduce excessive shock loads, high noise levels and extreme pad bounce, all factors that lead to high press maintenance costs and noise pollution. For more information, see “About Gas Springs”.



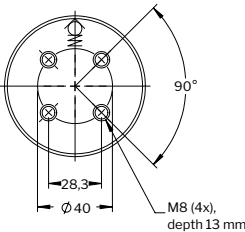
Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	105 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recom max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit.....	3019378



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
LCF 1500-025	25	15,000	23,000	3,375	5,170	160	135	0.10	3.75
LCF 1500-038	38.1		23,000			186.2	148.1	0.15	3.95
LCF 1500-050	50		23,000			210	160	0.18	4.15
LCF 1500-064	63.5		23,000			237	173.5	0.22	4.40
LCF 1500-080	80		23,000			270	190	0.28	4.70
LCF 1500-100	100		23,000			310	210	0.34	5.10
LCF 1500-125	125		23,000			360	235	0.42	5.55
LCF 1500-160	160		23,000			430	270	0.53	6.25
LCF 1500-200	200		23,000			510	310	0.68	6.90
LCF 1500-250	250		23,000			610	360	0.81	7.80
LCF 1500-300	300		23,000			710	410	0.96	8.90

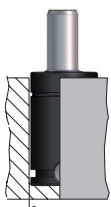


* Isothermal end force at full stroke.

Mounting possibilities



Base mount
B, MP



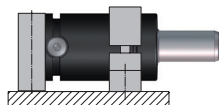
Body Ø + 0.5
+ 1.0
Drop - in



Body Ø + 0.5
+ 2.0
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-1500

231



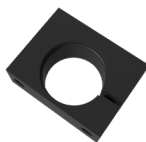
FCS-1500

16



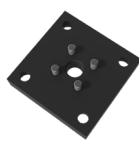
FFC-1500

20



HMF-1500

38



MP-1500

54



S-1500

40

Additional mounts

FAC-1500	FCSC-1500	FFL-1500	FSS-1500	HM-1500	K-1500
230	52	66	72	46	247
L-1500	RM-1500	SA-1500			
58	74	70			

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Speed Control™ – SPC gas springs have been engineered to eliminate blank holder bounce, commonly associated with increased return stroke speeds from link drive presses.

SPC gas springs have inbuilt return stroke speed dampening, which decelerates the last 30 mm of the piston rod stroke to 0.4 m/s, helping to bring the blank holder to a smooth stop.

Features

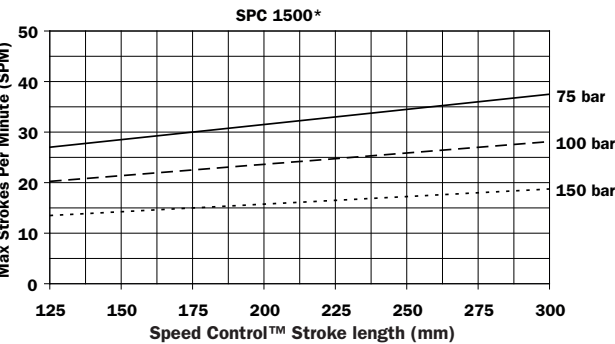
- Eliminates blank holder bounce
- Increases productivity by increasing part transfer efficiency
- Easily retrofitted to existing dies
- Stroke lengths from 125 to 300 mm
- Linkable using a hose system

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	See chart
Max piston rod velocity	1.6 m/s
Dampening length	≈ 30 mm
Dampening speed	0.4 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit.....	3421494

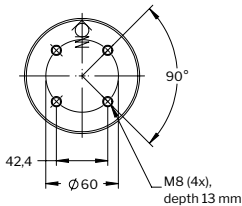
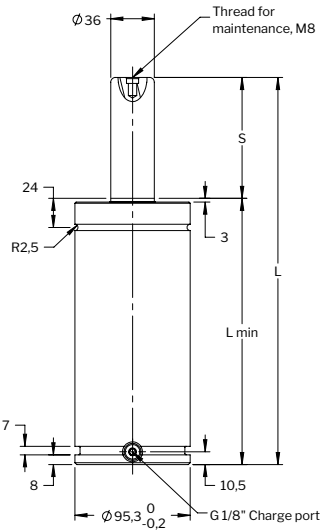
Automotive standard: 5937839, 5937840, 5937841, 5937842, 5937843



*At ambient room temperatures with free air flow

Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
SPC 1500-125	125					370	245	0.73	7.60
SPC 1500-160	160					440	280	0.91	8.45
SPC 1500-200	200	15,000	19,000	3,375	4,275	520	320	1.11	9.43
SPC 1500-250	250					620	370	1.36	10.64
SPC 1500-300	300					720	420	1.62	11.86

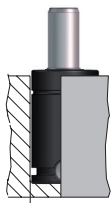
* Isothermal end force at full stroke.



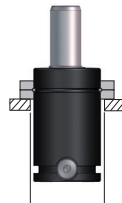
Mounting possibilities



Base mount
B, MP



Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC

Recommended mounts



FC-3000

 231



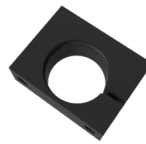
FCS-3000

 16



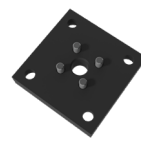
FFC-3000

 20



HMF-3000

 38



MP-3000

 54



S-3000

 40

Additional mounts

FAC-3000

 230

FCSC-3000

 52

FFL-3000

 66

FSS-3000

 72

HM-3000

 46

K-3000

 247

L-3000

 58

NMP-4200

 102

RM-3000

 74

SA-3000

 70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Mould Temp gas springs have been engineered to withstand higher working temperatures, like those commonly associated with plastic molding tools. Mould Temp gas springs are compact and powerful piston rod sealed gas springs, which can be used at working temperatures up to 120°C.

Features

- For applications up to 120°C
- Fully adjustable charge pressure
- Various mounting possibilities using our standard mounts as well as bottom threaded holes
- M6 gas ports can be connected to the special high temp version of our Micro EO24™ Hose and Tube system for remote pressure control.

Basic information

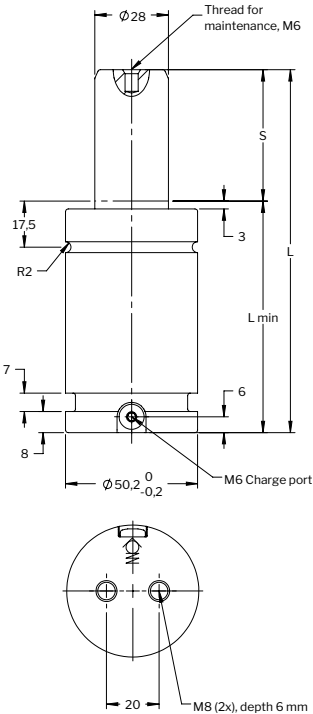
For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	See table below
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +120°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	See table below
Max piston rod velocity	1.0 m/s
Service life (0 to 80°C)	1,000,000 strokes
or	100,000 stroke meters
Service life (80 to 120°C)	500,000 strokes
or	50,000 stroke meters
Rod & tube surface	Nitrided
Repair kit	3022690

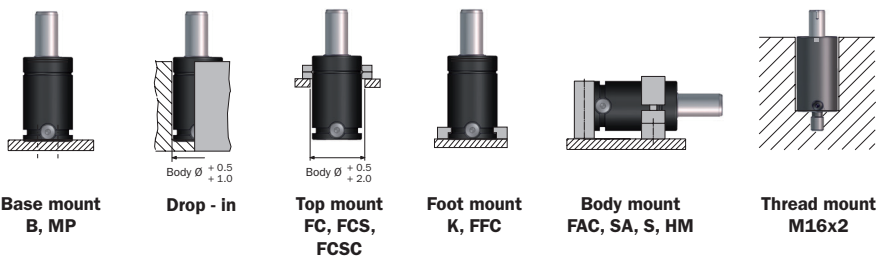
Max. working temp. interval	Max. strokes per minute (spm)	Max. charge pressure at 20°C (bar)	Force per temperature		
			Spring temp.	Initial force (N)	End force* (N)
0 – 80°C	20	150	80°C (20°C)	11,130 (9,200)	17,500 (14,500)
80 – 100°C	15	125	100°C (20°C)	9,800 (7,700)	15,400 (12,100)
100 – 120°C	10	115	120°C (20°C)	9,500 (7,080)	14,900 (11,100)

Order No.	S stroke	Initial force in N at 150 bar/+20°C	Initial force in lbf at 150 bar/+20°C	L ±0.25	L min.	Gas vol. (l)	Weight (kg)
MT 1000-013	13	9,200	2,068	64	51	0.03	0.52
MT 1000-016	16			70	54	0.04	0.54
MT 1000-019	19			76	57	0.04	0.56
MT 1000-025	25			88	63	0.05	0.61
MT 1000-032	32			102	70	0.06	0.66
MT 1000-038	38			114	76	0.07	0.71
MT 1000-050	50			138	88	0.09	0.81
MT 1000-063	63			164	101	0.11	0.91
MT 1000-075	75			188	113	0.13	1.02
MT 1000-080	80			198	118	0.14	1.05

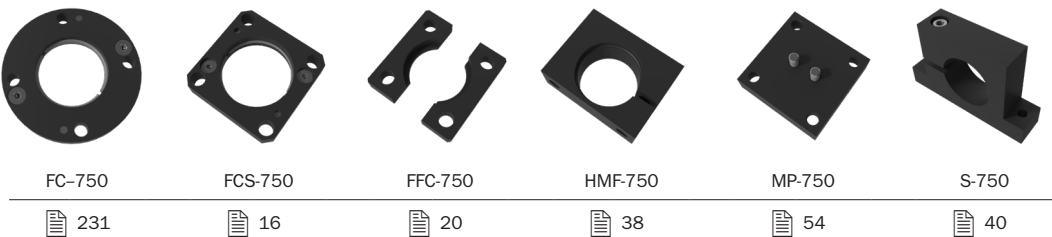
* Isothermal end force at full stroke.



Mounting possibilities



Recommended mounts

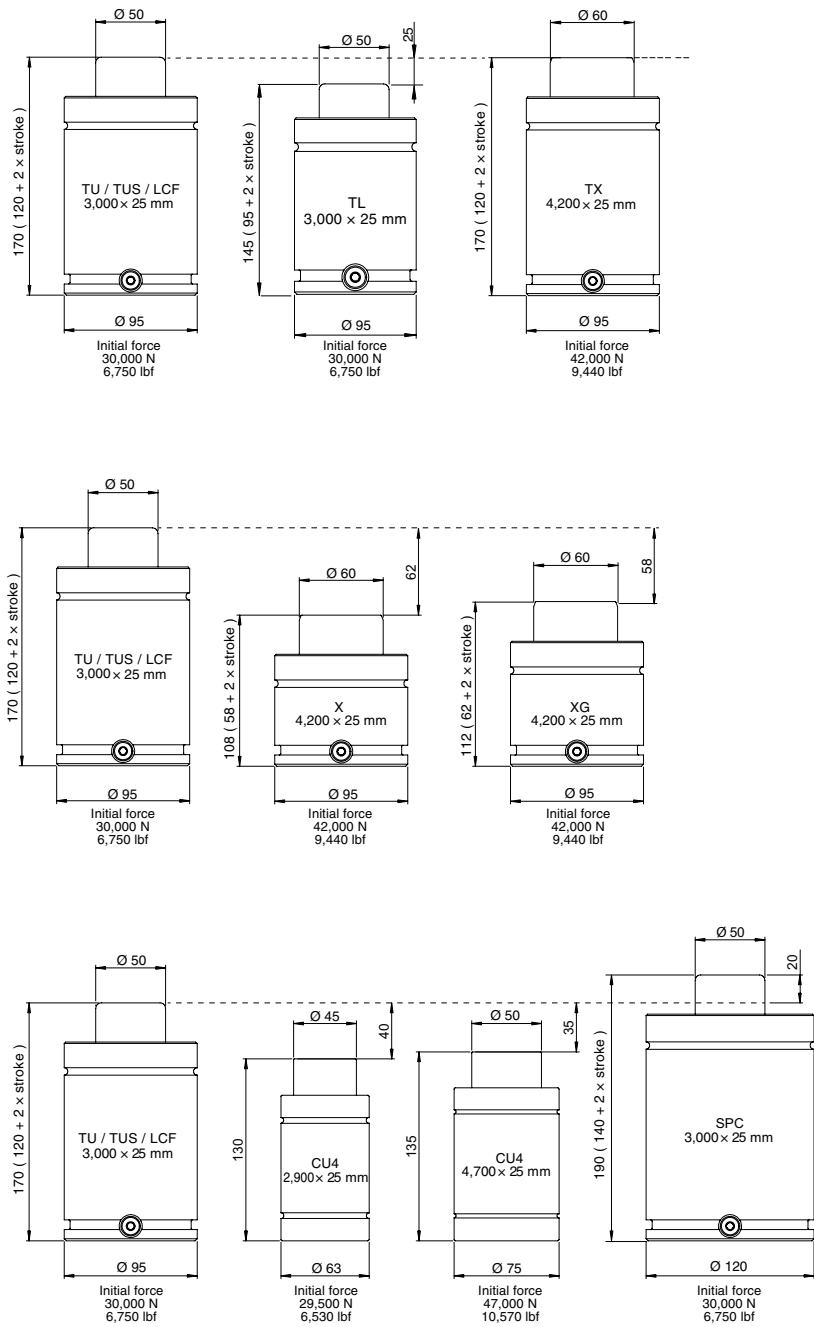


Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.



	Page
CU4 2900	150
CU4 4700	152
X 4200	154
XG 4200	156
TX 4200	158
TL 3000	160
TU 3000	162
TUS 3000	164
LCF 3000	166
SPC 3000	168

The CU4 gas spring is a very compact Bore Sealed gas spring with impressive force in a compact body.

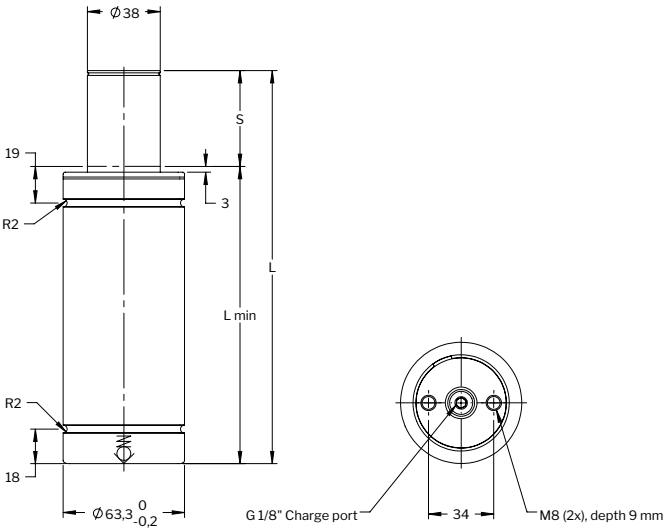
Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend fixing of shorter stroke springs for optimal service life. As an option, this CU4 spring can be delivered with a Side Port plate (SP) for applications where a sideport is needed (e.g., for use in hose systems).

Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 150 bar
- Min. charging pressure (at 20°C) 25 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 80-100
- Max piston rod velocity 0.8 m/s
- Rod surface Nitrided
- Tube surface Nitrided
- Repair kit 3024837

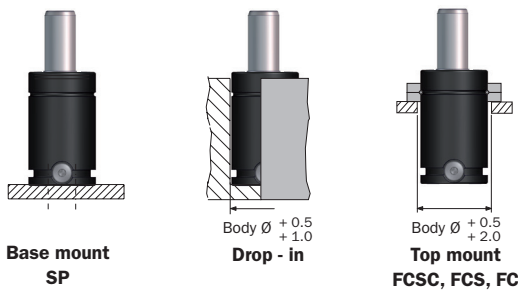
Automotive standard: WDX35-62-07029xxDM, 5937667, 5937668, 5937669, 5937670, 5937671, 5937672, 5937401



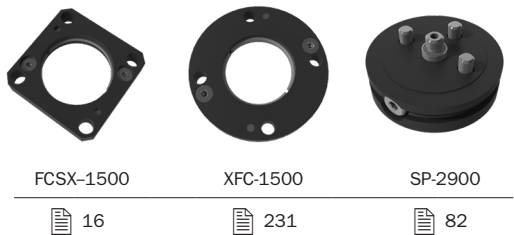
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CU4 2900-010	10 ■	29,500	40,000	6,630	8,990	85	75	0.08	1.14
CU4 2900-016	16 ■		42,000		8,440	103	87	0.12	1.28
CU4 2900-025	25 ■		45,000		10,120	130	105	0.16	1.49
CU4 2900-032	32*		46,200		10,340	150	118	0.20	1.64
CU4 2900-040	40*		47,200		10,570	175	135	0.24	1.83
CU4 2900-050	50*		45,000		10,120	205	155	0.29	2.06
CU4 2900-065	65*		47,000		10,570	256	191	0.35	2.39

* Should always be attached to the tool using the tapped holes in the bottom or a flange. ** Isothermal end force at full stroke.
■ Recommended stroke length for optimal delivery.

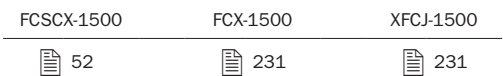
Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The CU4 gas spring is a very compact Bore Sealed gas spring with impressive force in a compact body.

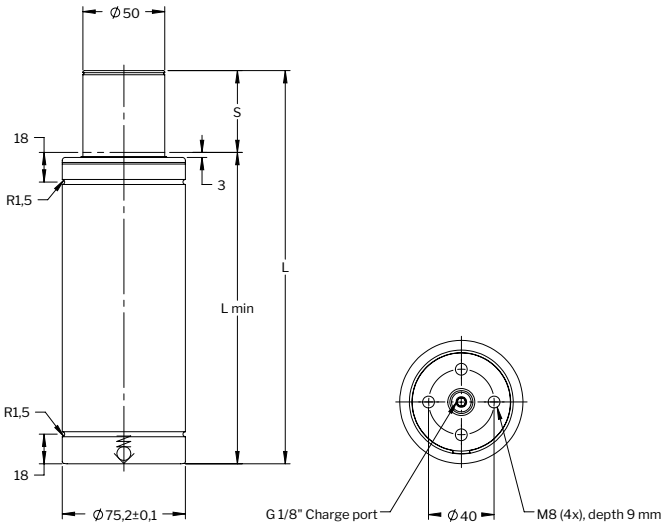
Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend fixing of shorter stroke springs for optimal service life. As an option, this CU4 spring can be delivered with a Side Port plate (SP) for applications where a sideport is needed (e.g., for use in hose systems).

Basic information

For general information see "About gas springs".

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 80-100
Max piston rod velocity	0.8 m/s
Rod surface	Nitrided
Tube surface	Nitrided
Repair kit	3024838

Automotive standard: WDX35-62-08047xxDM, Z000332033, Z000283148, Z000294883, Z000459186, 5937673, 5937674, 5937675, 5937676, 5937677, 5937678, 5937700



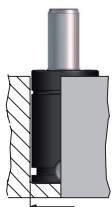
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CU4 4700-010	10 ■	47,000	67,000	10,570	15,100	80	70	0.10	1.55
CU4 4700-016	16 ■		66,000		14,800	106	90	0.17	1.79
CU4 4700-025	25 ■		68,000		15,300	135	110	0.24	2.05
CU4 4700-032	32*		67,000		15,100	167	135	0.32	2.34
CU4 4700-040	40*		67,000		15,100	200	160	0.41	2.65
CU4 4700-050	50*		67,000		15,100	240	190	0.52	3.01
CU4 4700-065	65*		71,000		15,200	273	208	0.62	3.12

* Should always be attached to the tool using the tapped holes in the bottom or a flange. ** Isothermal end force at full stroke.
■ Recommended stroke length for optimal delivery.

Mounting possibilities



Base mount
SP, SPRM



Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FK



Foot mount
BFCU

Recommended mounts



BFP-4700

 78



FK-1500

 84



SP-4700

 82

Additional mounts

SPRM-75

 86

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

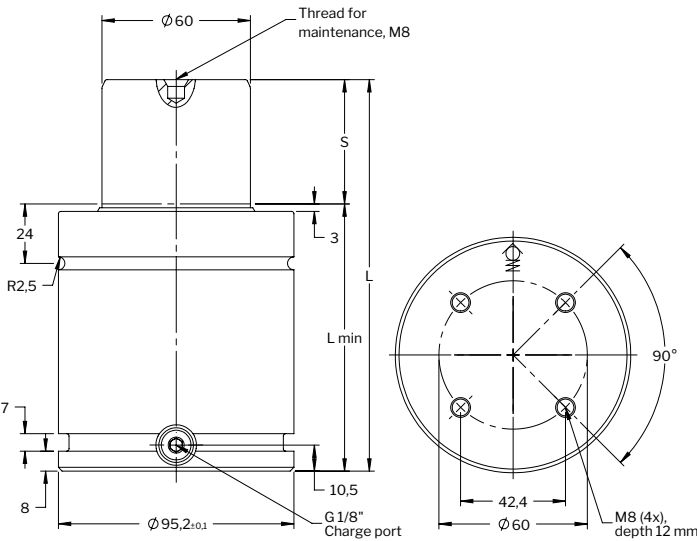
These gas springs are available with forces from 1,700 N up to 200,000 N and stroke lengths between 7 and 125 mm. There is a side port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 30-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3018849

Automotive standard: VDI 3003-Blatt 3, ISO 11901-3-42000, WDX356204-42xxDMS,
GMGDS 90.25.08-42, 39D997xx, B2 4005 21723xx, 04585xx, Z000414099,
Z0004591xx, Z00044337x, 39-673-026x, 39-673-027x, 305077x, 305078x,
90201404397, 90201404443, 90201405563



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X 4200-016	16	42,000	61,700	9,440	13,870	90	74	0.15	2.81	
X 4200-019	19		63,700		14,320	96	77	0.18	2.88	
X 4200-025	25		64,800		13,670	108	83	0.26	2.96	✓
X 4200-032	32		65,300		14,455	122	90	0.30	3.13	
X 4200-038	38		65,800		14,790	134	96	0.32	3.28	✓
X 4200-050	50 ■		67,000		15,060	158	108	0.40	3.57	✓
X 4200-063	63 ■		67,800		15,240	184	121	0.49	4.10	✓
X 4200-075	75		68,000		15,285	208	133	0.58	4.20	
X 4200-080	80 ■		68,600		15,420	218	138	0.61	4.32	✓
X 4200-100	100 ■		69,100		15,535	258	158	0.74	4.81	✓
X 4200-125	125		69,600		15,645	308	183	0.91	5.42	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Base mount
B, MP



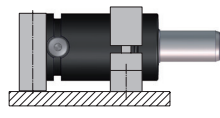
Body Ø +0.5
+1.0
Drop - in



Body Ø +0.5
+2.0
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-3000

📄 231



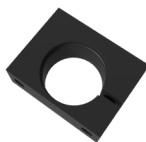
FCS-3000

📄 16



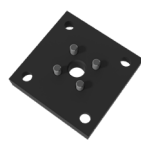
FFC-3000

📄 20



HMF-3000

📄 38



MP-3000

📄 54



S-3000

📄 40

Additional mounts

FCSC-3000

📄 52

FFL-3000

📄 66

FSL-3000

📄 241

FSS-3000

📄 72

HM-3000

📄 46

K-3000

📄 247

L-3000

📄 58

RM-3000

📄 74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

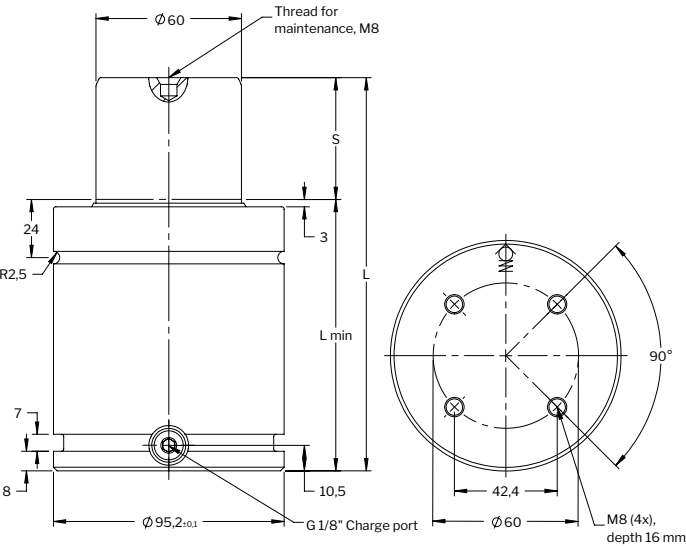
These gas springs are available with forces from 3,500 N up to 66,000 N and stroke lengths between 10 and 125 mm. There is a side and bottom port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with four M8 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 30-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3018849

Automotive standard: R90344053x, MES E7231 PG230-PG24D-4A, K32R0-4200, SD116391-4200



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XG 4200-016	16	42,000	61,700	9,440	13,870	94	78	0.15	2.81
XG 4200-019	19		63,700		14,320	100	81	0.18	2.88
XG 4200-025	25		64,800		13,670	112	87	0.26	2.96
XG 4200-032	32		65,300		14,455	126	94	0.30	3.13
XG 4200-038	38		65,800		14,790	138	100	0.32	3.28
XG 4200-050	50		67,000		15,060	162	112	0.40	3.57
XG 4200-063	63		67,800		15,240	188	125	0.49	4.10
XG 4200-075	75		68,000		15,285	212	137	0.58	4.20
XG 4200-080	80		68,600		15,420	222	142	0.61	4.32
XG 4200-100	100		69,100		15,535	262	162	0.74	4.81
XG 4200-125	125		69,600		15,645	312	187	0.91	5.42

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

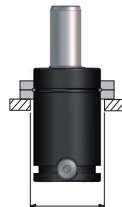
Mounting possibilities



Base mount
B



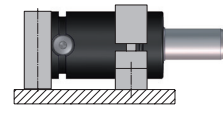
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



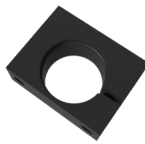
FC-3000

231



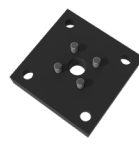
FCS-3000

16



HMF-3000

38



MP-3000

54



S-3000

40

Additional mounts

FCSC-3000	FFL-3000	FSL-3000	FSS-3000	HM-3000	K-3000
52	66	241	72	46	247
L-3000	NMP-4200	RM-3000	SA-3000		
58	62	74	70		

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line – Heavy Duty series is a crossover between the standard TU Series and the Power Line X Series.

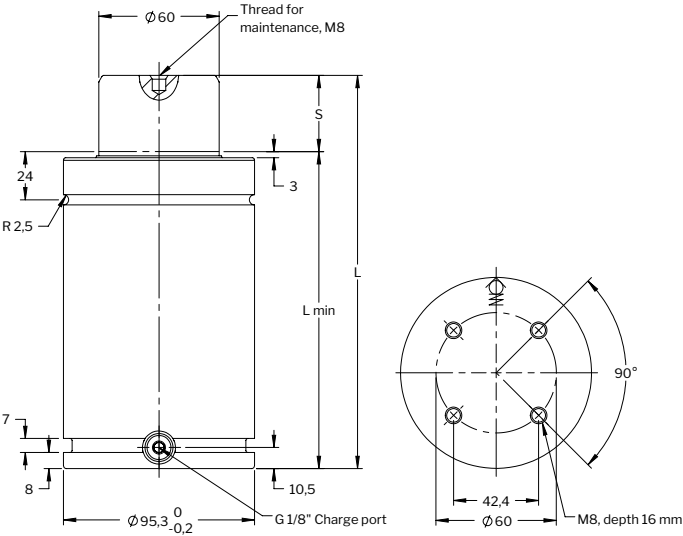
These gas springs are available with forces from 9,200 N up to 95,000 N and stroke lengths between 13 and 300 mm. There is an optional bottom port for hose/base plate connection. An upper C-groove, lower U-groove and bottom threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 40-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3022953

Automotive standard: VDI 3003-Blatt 4, ISO 11901-4-42000,
GMGDS 90.25.05-30, 39D838xx, B2 4008 21750xx, 39-673-84xx, 305470x



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TX 4200-025	25	42,000	52,100	9,440	11,725	170	145	0.43	5.08	✓
TX4200-038	38		55,100		12,400	196	158	0.52	5.41	
TX 4200-050	50		57,200		12,875	220	170	0.60	5.71	✓
TX 4200-063	63		59,000		13,275	246	183	0.68	6.05	
TX 4200-075	75		60,300		13,575	270	195	0.76	6.35	
TX 4200-080	80		60,800		13,700	280	200	0.80	6.48	✓
TX 4200-100	100		62,500		14,050	320	220	0.93	6.99	✓
TX 4200-125	125		64,000		14,400	370	245	1.10	7.63	✓
TX 4200-150	150 ■		65,100		14,650	420	270	1.27	8.27	
TX 4200-160	160 ■		65,500		14,750	440	280	1.33	8.53	✓
TX 4200-175	175 ■		66,000		14,850	470	295	1.43	8.91	
TX 4200-200	200 ■		66,800		15,025	520	320	1.60	9.55	✓
TX 4200-250	250		67,900		15,275	620	370	1.93	11.08	✓
TX 4200-300	300		68,700		15,450	720	420	2.27	12.11	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

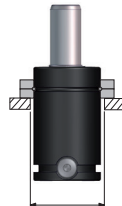
Mounting possibilities



Base mount
B, MP



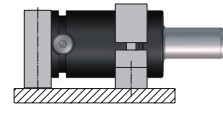
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-3000

 231



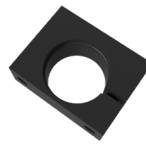
FCS-3000

 16



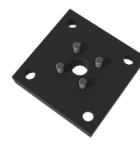
FFC-3000

 20



HMF-3000

 38



MP-3000

 54



S-3000

 40

Additional mounts

FAC-3000

 230

FCSC-3000

 52

FFL-3000

 66

FSL-3000

 241

FSS-3000

 72

HM-3000

 46

K-3000

 247

L-3000

 58

NMP-4200

 62

RM-3000

 74

SA-3000

 70

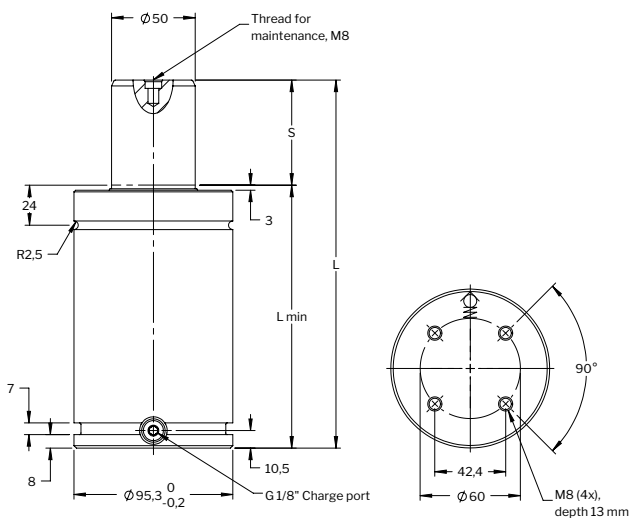
Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

At the same time, the TL gas spring is shorter than the corresponding TU gas spring by 25 mm, except TL 5000 and TL 7500, which are 37.5 mm and 50 mm shorter respectively. TL springs share the same TU mounting possibilities and stroke lengths, with exception of strokes 12.5, 37.5 and 62.5.

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	+0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3024171



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TL 3000-013	12.5	30,000	38,700	6,750	8,710	120	107.5	0.14	4.84
TL 3000-025	25		41,800		9,400	145	120	0.21	5.24
TL 3000-038	37.5		43,500		9,770	170	132.5	0.27	5.64
TL 3000-050	50		44,400		9,980	195	145	0.33	6.03
TL 3000-063	62.5		45,100		10,130	220	157.5	0.40	6.44
TL 3000-075	75		45,500		10,230	245	170	0.46	6.83
TL 3000-080	80		45,600		10,260	255	175	0.48	7.12
TL 3000-088	87.5		45,800		10,300	270	182.5	0.52	7.24
TL 3000-100	100		46,100		10,360	295	195	0.58	7.62
TL 3000-113	112.5		46,300		10,410	320	207.5	0.65	8.02
TL 3000-125	125		46,500		10,450	345	220	0.71	8.41
TL 3000-138	137.5		46,600		10,490	370	232.5	0.77	8.84
TL 3000-150	150		46,800		10,510	395	245	0.84	9.21
TL 3000-160	160		46,900		10,530	415	255	0.89	9.53
TL 3000-175	175		47,000		10,560	445	270	0.96	10.00
TL 3000-200	200		47,100		10,590	495	295	1.09	10.79
TL 3000-225	225	47,200	10,620	545	320	1.21	11.59		
TL 3000-250	250	47,300	10,640	595	345	1.34	12.38		

* Isothermal end force at full stroke.

Mounting possibilities



Base mount
B, MP



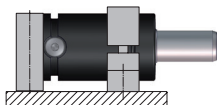
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-3000

📄 231



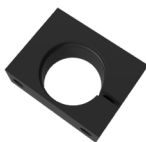
FCS-3000

📄 16



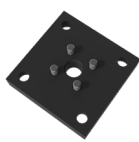
FFC-3000

📄 20



HMF-3000

📄 38



MP-3000

📄 54



S-3000

📄 40

Additional mounts

FAC-3000	FCSC-3000	FFL-3000	FSL-3000	FSS-3000	HM-3000
📄 230	📄 52	📄 66	📄 241	📄 72	📄 46
K-3000	L-3000	NMP-4200	RM-3000	SA-3000	
📄 247	📄 58	📄 62	📄 74	📄 70	

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

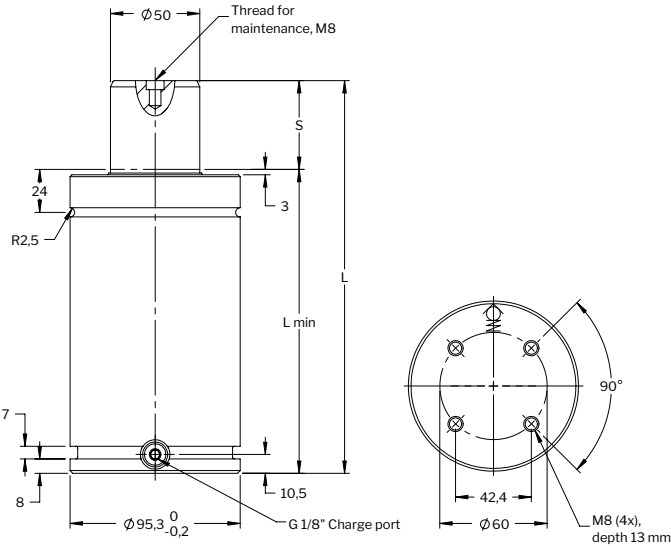
The TU line constitutes our standard line of gas springs. Sizes 250 to 10,000 conform to the ISO 11901 gas spring standard.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019025

Automotive standard: VDI 3003, ISO 11901-1-30000, WDX356203-30xxDMS, GMGDS 90.25.00-30, 39D878xx, B2 4006 3881189, B2 4006 21710xx, B2 4006 33834xx, B2 4006 3286139, B2 4006 3373105, X3465900xx, X3465902xx, Z0004590xx, X3465903xx, R1000362xx, R100229769, R100229773, 39-673-53xx, N03300x, N03301x, N033020, MES E7231 PG230-PG23D-30, K32S0-3000, 99759xx, 3044189, 99759xx, 304419x, SD116322-3000, M-2401-TD-13-3000



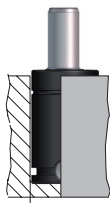
Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TU 3000-025	25 ■	30,000	42,000	6,750	9,440	170	145	0.20	6.45	✓
TU 3000-038	38.1		43,000		9,670	196.2	158.1	0.26	6.87	
TU 3000-050	50 ■		44,000		9,890	220	170	0.32	7.25	✓
TU 3000-064	63.5		45,000		10,100	247	183.5	0.38	7.67	
TU 3000-080	80 ■		46,000		10,340	280	200	0.46	8.20	✓
TU 3000-100	100		47,000		10,570	320	220	0.56	8.83	✓
TU 3000-125	125		47,000		10,570	370	245	0.69	9.63	✓
TU 3000-160	160 ■		47,000		10,570	440	280	0.87	10.74	✓
TU 3000-175	175		48,000		10,790	470	295	0.95	11.20	
TU 3000-200	200		48,000		10,790	520	320	1.07	12.00	
TU 3000-225	225		48,000		10,790	570	345	1.20	12.80	
TU 3000-250	250		48,000		10,790	620	370	1.32	13.59	
TU 3000-300	300		48,000		10,790	720	420	1.57	15.18	

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

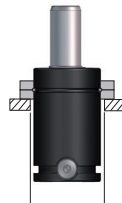
Mounting possibilities



Base mount
B, MP



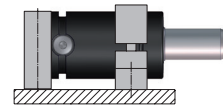
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-3000

 231



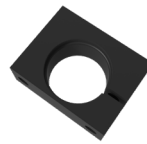
FCS-3000

 16



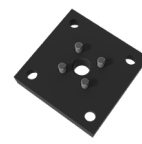
FFC-3000

 20



HMF-3000

 38



MP-3000

 54



S-3000

 40

Additional mounts

FAC-3000

 230

FCSC-3000

 52

FFL-3000

 66

FSL-3000

 241

FSS-3000

 72

HM-3000

 46

K-3000

 247

L-3000

 58

NMP-4200

 62

RM-3000

 74

SA-3000

 70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The High Speed gas springs (TUS) have been engineered to withstand press stroke speeds to a maximum of 2 m/s, which meet the safety requirements from the French automotive manufacturer Renault.

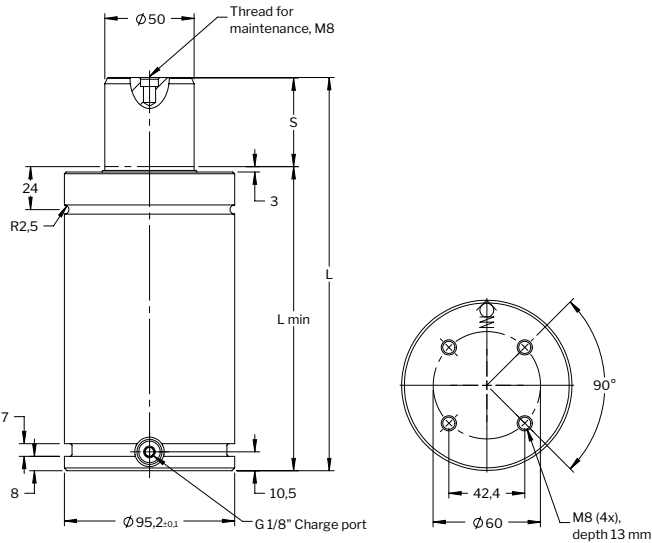
These gas springs are available in sizes from 750 to 7,500 and dimensions that conform to the ISO 11901 gas spring standard. The TUS gas spring replaces the TUR spring that has been phased out.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	2.0 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019279

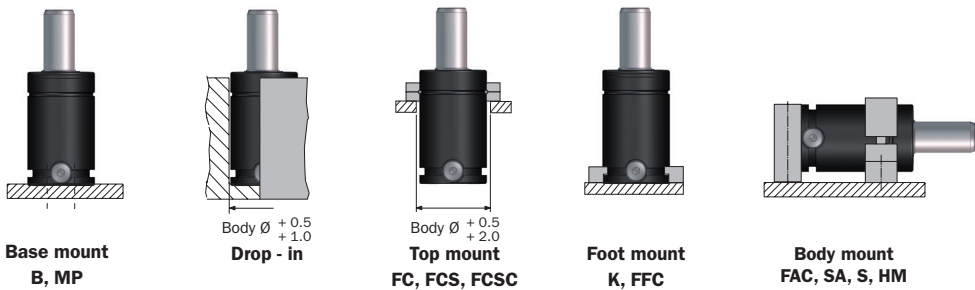
Automotive standard: R903636016, R903636017, R903636018, R903636019, R903636020, R903636021, R903636022, R903636023, R903636024



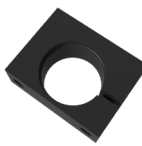
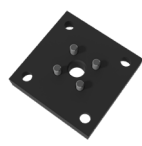
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TUS 3000-025	25	30,000	42,000	6,750	9,440	170	145	0.20	6.35
TUS 3000-038	38.1		43,000		9,670	196.2	158.1	0.26	6.75
TUS 3000-050	50		44,000		9,890	220	170	0.32	7.50
TUS 3000-064	63.5		45,000		10,100	247	183.5	0.38	7.70
TUS 3000-080	80		46,000		10,340	280	200	0.46	8.10
TUS 3000-100	100		47,000		10,570	320	220	0.56	8.85
TUS 3000-125	125		47,000		10,570	370	245	0.69	9.90
TUS 3000-160	160		47,000		10,570	440	280	0.87	10.80
TUS 3000-200	200		48,000		10,790	520	320	1.07	12.20
TUS 3000-250	250		48,000		10,790	620	370	1.32	13.70
TUS 3000-300	300		48,000		10,790	720	420	1.57	15.30

* Isothermal end force at full stroke.

Mounting possibilities



Recommended mounts

					
FC-3000	FCS-3000	FFC-3000	HMF-3000	MP-3000	S-3000
 231	 16	 20	 38	 54	 40

Additional mounts

FAC-3000	FCSC-3000	FFL-3000	FSL-3000	FSS-3000	HM-3000
 230	 52	 66	 241	 72	 46
K-3000	L-3000	NMP-4200	RM-3000	SA-3000	
 247	 58	 102	 74	 70	

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Low Contact Force (LCF) gas springs are designed to reduce excessive 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”.

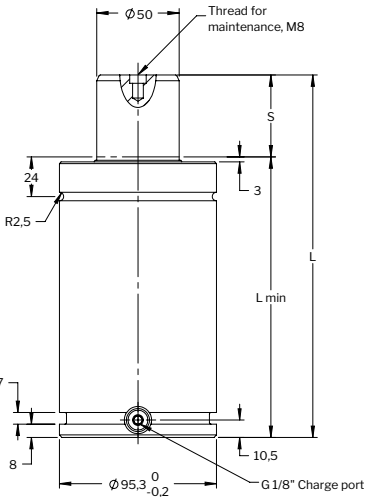
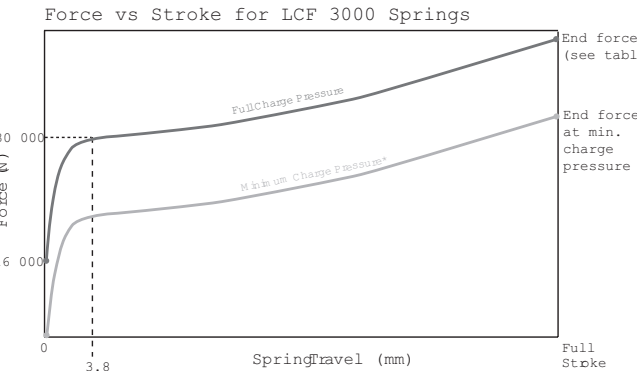


Basic information

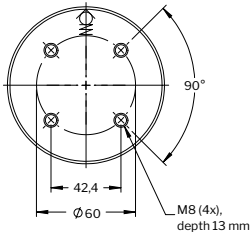
For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	70 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recom max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit.....	3019379

Automotive standard: WDX358037-30xxDMS



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
LCF 3000-025	25		42,000		9,440	170	145	0.20	6.35
LCF 3000-038	38.1		43,000		9,670	196.2	158.1	0.26	6.75
LCF 3000-050	50		44,000		9,890	220	170	0.32	7.50
LCF 3000-064	63.5		45,000		10,100	247	183.5	0.38	7.70
LCF 3000-080	80		46,000		10,340	280	200	0.46	8.10
LCF 3000-100	100	30,000	47,000	6,740	10,570	320	220	0.56	8.85
LCF 3000-125	125		47,000		10,570	370	245	0.69	9.90
LCF 3000-160	160		47,000		10,570	440	280	0.87	10.80
LCF 3000-200	200		48,000		10,790	520	320	1.07	12.20
LCF 3000-250	250		48,000		10,790	620	370	1.32	13.70
LCF 3000-300	300		48,000		10,790	720	420	1.57	15.30



* Isothermal end force at full stroke.

Mounting possibilities



Base mount
B, MP



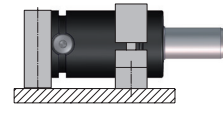
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-3000

231



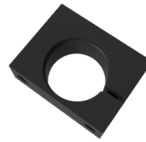
FCS-3000

16



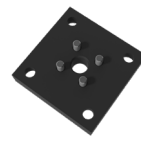
FFC-3000

20



HMF-3000

38



MP-3000

54



S-3000

40

Additional mounts

FAC-3000

230

FCSC-3000

52

FFL-3000

66

FSS-3000

72

HM-3000

46

K-3000

247

L-3000

58

RM-3000

74

SA-3000

70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Speed Control™ – SPC gas springs have been engineered to eliminate blank holder bounce, commonly associated with increased return stroke speeds from link drive presses.

SPC gas springs have inbuilt return stroke speed dampening, which decelerates the last 30 mm of the piston rod stroke to 0.4 m/s, helping to bring the blank holder to a smooth stop.

Features

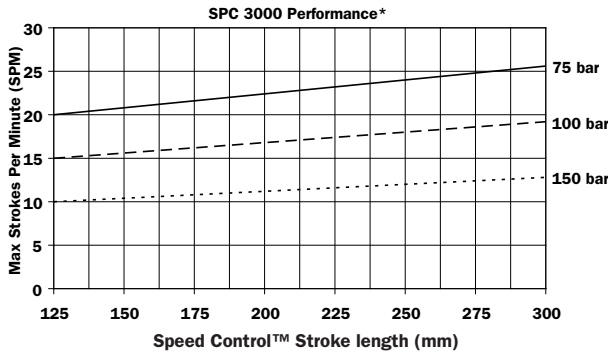
- Eliminates blank holder bounce
- Increases productivity by increasing part transfer efficiency
- Easily retrofitted to existing dies
- Stroke lengths from 125 to 300 mm
- Linkable using a hose system

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recom max strokes/min (at 20°C)	See chart
Max piston rod velocity	1.6 m/s
Dampening length	≈ 30 mm
Dampening speed	0.4 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit.....	3421496

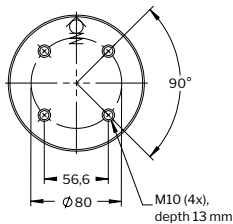
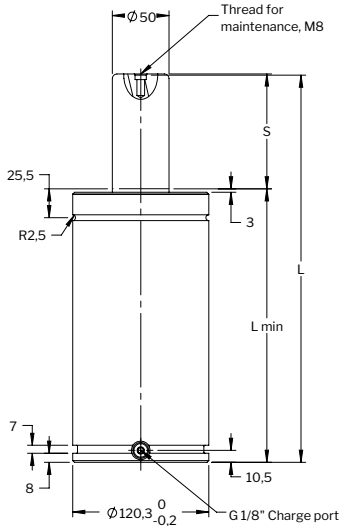
Automotive standard: 5937844, 5937845, 5937846, 5937847, 5937848



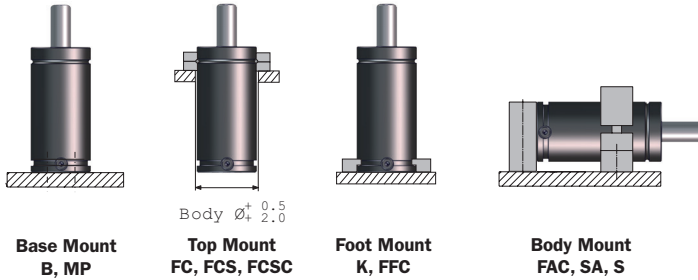
*At ambient room temperatures with free air flow

Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
SPC 3000-125	125		38,000		8,550	390	265	1.15	10.64
SPC 3000-160	160		38,000		8,550	460	300	1.43	11.30
SPC 3000-200	200	30,000	38,000	6,750	8,550	540	340	1.74	12.06
SPC 3000-250	250		39,000		8,775	640	390	2.14	13.00
SPC 3000-300	300		39,000		8,775	740	440	2.53	13.95

* Isothermal end force at full stroke.



Mounting possibilities



Recommended mounts

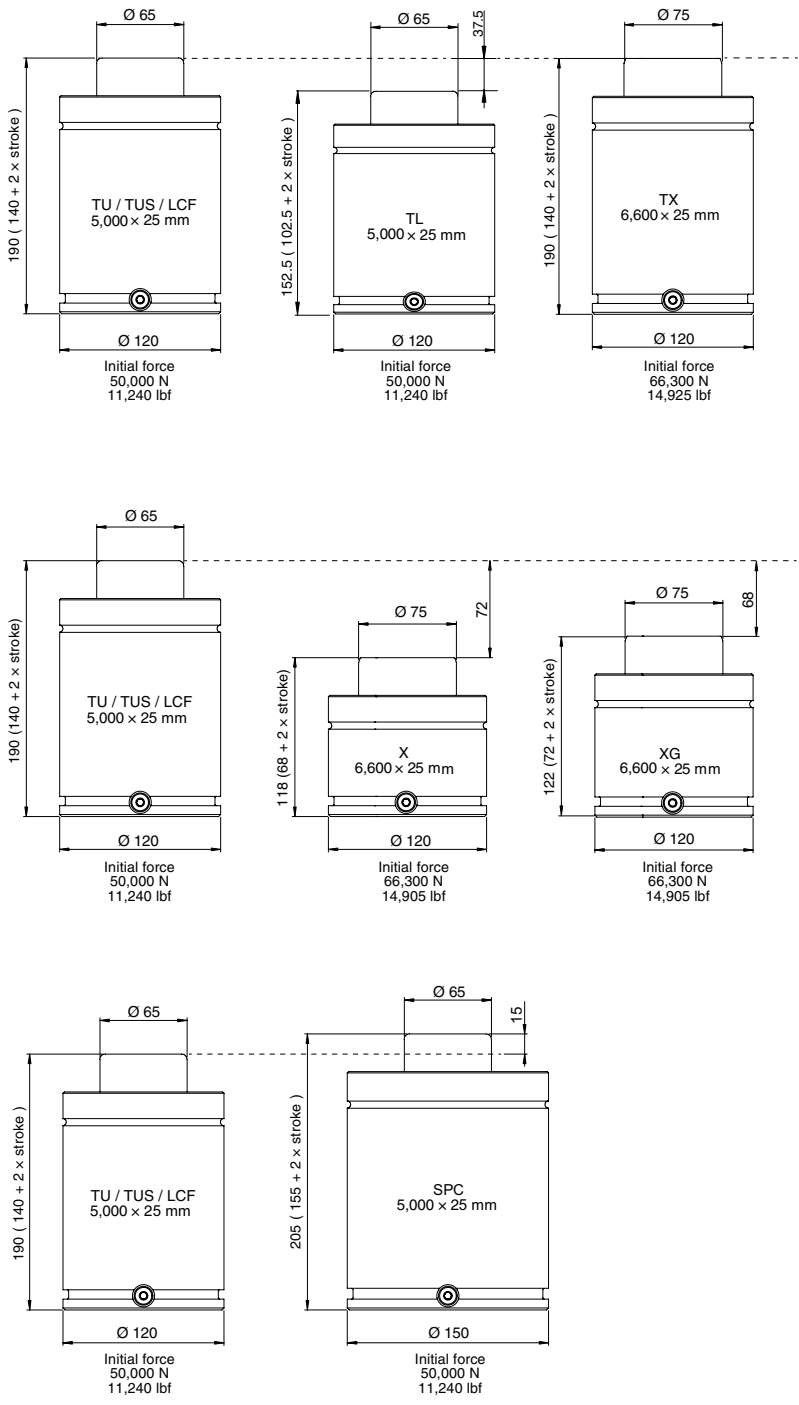
FC-5000	FCS-5000	FFC-5000	HMF-5000	MP-5000	S-5000
231	16	20	38	54	40

Additional mounts

FAC-5000	FCSC-5000	FFL-5000	FSS-5000	HM-5000	K-5000
230	52	66	72	46	247
L-5000	RM-5000	SA-5000			
58	74	70			

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.



	Page
X 6600	172
XG 6600	174
TX 6600	176
TL 5000	178
TU 5000	180
TUS 5000	182
LCF 5000	184
SPC 5000	186

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

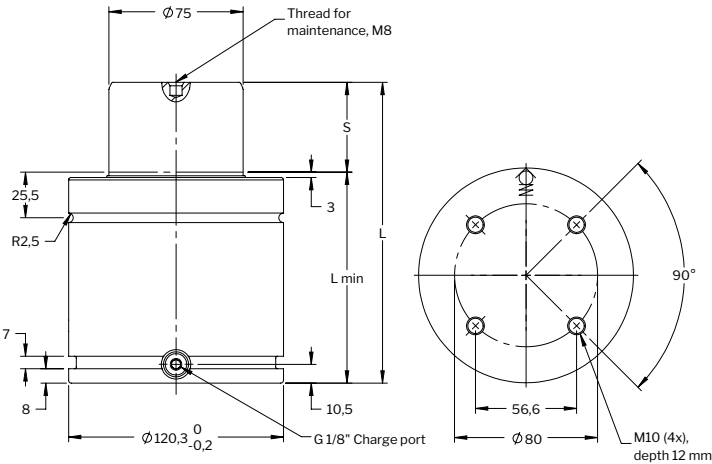
These gas springs are available with forces from 1,700 N up to 200,000 N and stroke lengths between 7 and 125 mm. There is a side port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with two M8 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 30-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019912

Automotive standard: VDI 3003-Blatt 3, ISO 11901-3-66000, WDX356204-66xxDMS, GMGDS 90.25.08-66, 39D9977x, B2 4005 21723xx, B2 4005 21724xx, 04585xx, 39-673-027x, 39-673-028x, 305397x, 305398x, 90201404320, 90201405687, 90201405211, 90201406012



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X 6600-016	16	66,300	89,000	14,905	20,010	100	84	0.32	5.00	
X 6600-019	19		91,000		20,460	106	87	0.35	5.11	
X 6600-025	25		93,900		21,110	118	93	0.42	5.34	✓
X 6600-032	32		96,100		21,605	132	100	0.49	5.61	
X 6600-038	38		98,200		22,075	144	106	0.56	5.84	✓
X 6600-050	50 ■		10,0600		22,615	168	118	0.69	6.31	✓
X 6600-063	63 ■		10,2400		23,020	194	131	0.83	6.81	✓
X 6600-075	75		10,3400		23,245	218	143	0.90	7.27	
X 6600-080	80 ■		10,4100		23,400	228	148	1.01	7.46	✓
X 6600-100	100 ■		10,5400		23,700	268	168	1.23	8.23	✓
X 6600-125	125		10,6500		23,940	318	193	1.50	9.19	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Base mount
B, MP



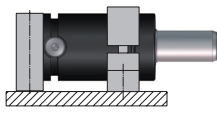
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S

Recommended mounts



FC-5000

231



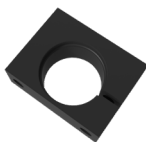
FCS-5000

16



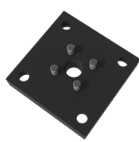
FFC-5000

20



HMF-5000

38



MP-5000

54



S-5000

40

Additional mounts

FCSC-5000

52

FFL-5000

66

FSL-5000

241

FSS-5000

72

K-5000

247

L-5000

58

RM-5000

74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

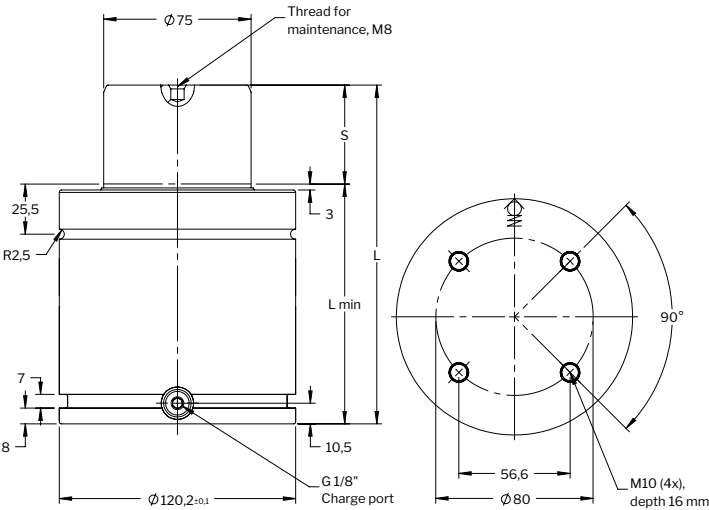
These gas springs are available with forces from 3,500 N up to 66,000 N and stroke lengths between 10 and 125 mm. There is a side and a bottom port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with four M10 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 30-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019912

Automotive standard: R9034405xx, R100679839, R100674470,
MES E7231 PG230-PG24D-6A, K32E1-6600, SD116391-6600



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
XG 6600-016	16	66,300	89,000	14,905	20,010	104	88	0.32	5.00
XG 6600-019	19		91,000		20,460	110	91	0.35	5.11
XG 6600-025	25		93,900		21,110	122	97	0.42	5.34
XG 6600-032	32		96,100		21,605	136	104	0.49	5.61
XG 6600-038	38		98,200		22,075	148	110	0.56	5.84
XG 6600-050	50		100,600		22,615	172	122	0.69	6.31
XG 6600-063	63		102,400		23,020	198	135	0.83	6.81
XG 6600-075	75		103,400		23,245	222	147	0.90	7.27
XG 6600-080	80		104,100		23,400	232	152	1.01	7.46
XG 6600-100	100		105,400		23,700	272	172	1.23	8.23
XG 6600-125	125		106,500		23,940	322	197	1.50	9.19

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

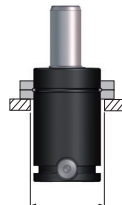
Mounting possibilities



Base mount
B.MP



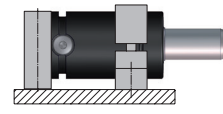
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S

Recommended mounts



FC-5000

 231



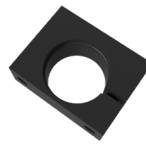
FCS-5000

 16



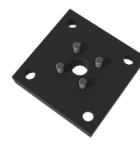
FFC-5000

 20



HMF-5000

 38



MP-5000

 54



S-5000

 40

Additional mounts

FCSC-5000

 52

FFL-5000

 66

FSL-5000

 241

FSS-5000

 72

K-5000

 247

L-5000

 58

RM-5000

 74

SA-5000

 70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line – Heavy Duty series is a crossover between the standard TU Series and the Power Line X Series.

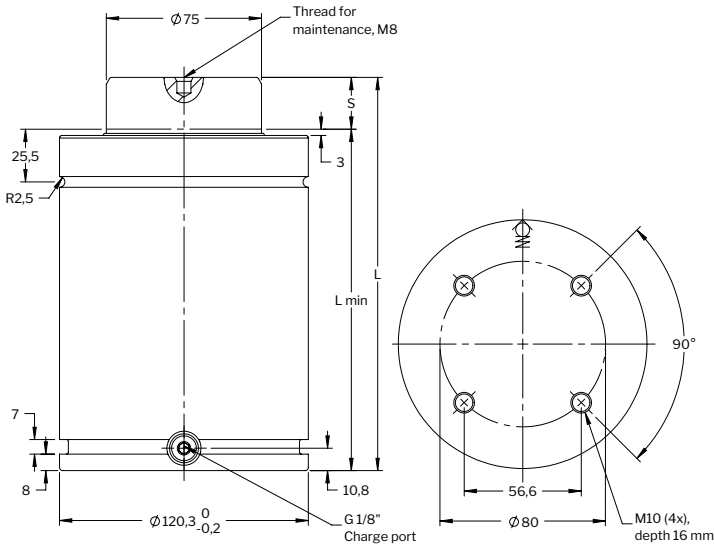
These gas springs are available with forces from 9,200 N up to 95,000 N and stroke lengths between 13 and 300 mm. There is an optional bottom port for hose/base plate connection. An upper C-groove, lower U-groove and bottom threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 30-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3022954

Automotive standard: VDI 3003-Blatt 4, ISO 11901-4-66000, GMGDS 90.25.05-50, 39D838xx, B2 4008 21750xx, 39-673-85xx, 305470x, 305471x,



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TX 6600-025	25	66,300	79,500	14,925	17,900	190	165	0.73	9.28	✓
TX 6600-038	38		83,900		18,875	216	178	0.87	9.81	
TX 6600-050	50		87,000		19,600	240	190	1.00	10.30	✓
TX 6600-063	63		89,700		20,200	266	203	1.13	10.83	
TX 6600-075	75		91,800		20,650	290	215	1.26	11.32	
TX 6600-080	80		92,600		20,825	300	220	1.31	11.52	✓
TX 6600-100	100		95,100		21,500	340	240	1.53	12.33	✓
TX 6600-125	125		97,600		21,950	390	265	1.79	13.35	✓
TX 6600-150	150 ■		99,500		22,400	440	290	2.05	14.36	
TX 6600-160	160 ■		100,100		22,525	460	300	2.16	14.77	✓
TX 6600-175	175 ■		101,000		22,725	490	315	2.32	15.38	
TX 6600-200	200 ■		102,200		23,000	540	340	2.58	16.40	✓
TX 6600-250	250		104,000		23,400	640	390	3.11	18.43	✓
TX 6600-300	300		105,300		23,700	740	440	3.64	20.46	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

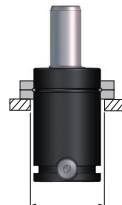
Mounting possibilities



Base mount
B, MP



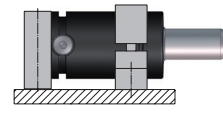
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S

Recommended mounts



FC-5000

231



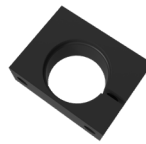
FCS-5000

16



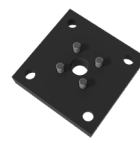
FFC-5000

20



HMF-5000

38



MP-5000

54



S-5000

40

Additional mounts

FAC-5000

230

FCSC-5000

52

FFL-5000

66

FSL-5000

241

FSS-5000

72

K-5000

247

L-5000

58

RM-5000

74

SA-5000

70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

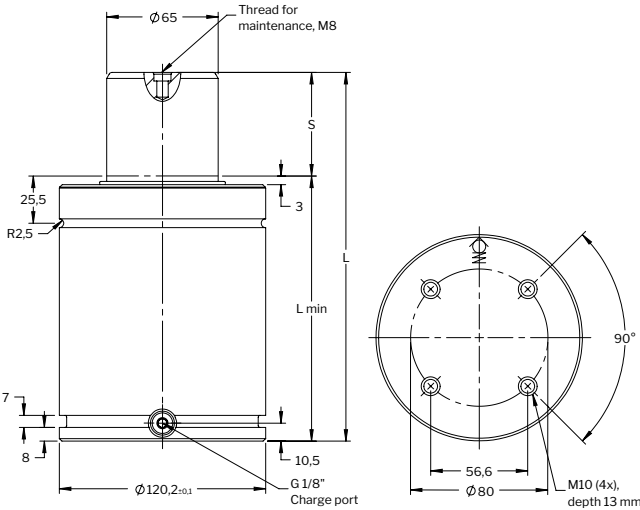
The TL Series ranges from model sizes 750 to 7,500, with the same features and technology as the TU series.

At the same time, the TL gas spring is shorter than the corresponding TU gas spring by 25 mm, except TL 5000 and TL 7500, which are 37.5 mm and 50 mm shorter respectively. TL springs share the same TU mounting possibilities and stroke lengths, with exception of strokes 12.5, 37.5 and 62.5.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3024178



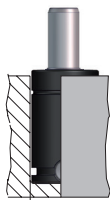
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TL 5000-025	25	50,000	80,100	11,200	18,000	152.5	127.5	0.2	9.04
TL 5000-038	37.5		81,900		18,410	177.5	140	0.3	9.70
TL 5000-050	50		82,800		18,620	202.5	152.5	0.4	10.35
TL 5000-063	62.5		83,500		18,760	227.5	165	0.5	11.01
TL 5000-075	75		83,800		18,850	252.5	177.5	0.6	11.67
TL 5000-080	80		84,000		18,870	262.5	182.5	0.7	11.93
TL 5000-088	87.5		84,100		18,920	277.5	190	0.7	12.32
TL 5000-100	100		84,400		18,970	302.5	202.5	0.8	12.98
TL 5000-113	112.5		84,500		19,000	327.5	215	0.9	13.64
TL 5000-125	125		84,700		19,040	352.5	227.5	1.0	14.30
TL 5000-138	137.5		84,800		19,070	377.5	240	1.1	14.96
TL 5000-150	150		84,900		19,090	402.5	252.5	1.2	15.62
TL 5000-160	160		85,000		19,100	422.5	262.5	1.3	16.14
TL 5000-175	175		85,100		19,130	452.5	277.5	1.4	16.94
TL 5000-200	200		85,200		19,160	502.5	302.5	1.6	18.25
TL 5000-225	225		85,300		19,180	552.5	327.5	1.8	19.57
TL 5000-250	250		85,400		19,190	602.5	352.5	2.0	20.89

* Isothermal end force at full stroke.

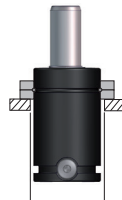
Mounting possibilities



Base mount
B, MP



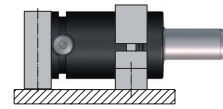
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-5000

 231



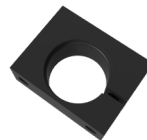
FCS-5000

 16



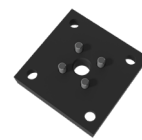
FFC-5000

 20



HMF-5000

 38



MP-5000

 54



S-5000

 40

Additional mounts

FAC-5000

 230

FCSC-5000

 52

FFL-5000

 66

FSL-5000

 241

FSS-5000

 72

K-5000

 247

L-5000

 58

RM-5000

 74

SA-5000

 70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

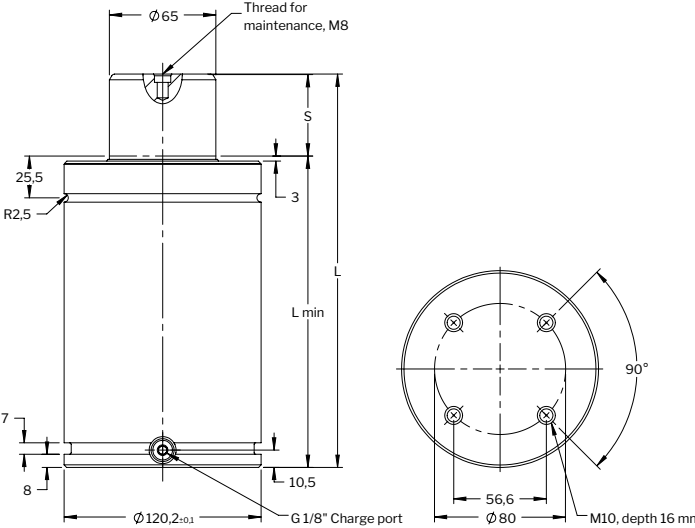
The TU line constitutes our standard line of gas springs. Sizes 250 to 10,000 conform to the ISO 11901 gas spring standard.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3018876

Automotive standard: VDI 3003, ISO 11901-1-50000, WDX356203-50xxDMS, GMGDS 90.25.00-50, 39D878xx, B2 4005 21680xx, B2 4006 21710xx, 03323xx, Z000410553, X346590027, Z00049215x, Z000301877, Z000239128, Z000134786, R1000362xx, X346590834, R100229774, R100228812, 39-673-54xx, N03500x, N03501x, N03501x, N03501x, N035020, MES E7231 PG230-PG23D-5A, K32S0-5000, 304419x, 997597x, 9975980, SD116322-5000, M-2401-TD-19-5000



Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TU 5000-025	25	50,000	71,000	11,240	15,960	190	165	0.32	12.40	✓
TU 5000-038	38.1		75,000		16,860	216.2	178.1	0.42	13.10	
TU 5000-050	50		77,000		17,310	240	190	0.51	13.70	✓
TU 5000-064	63.5		80,000		17,990	267	203.5	0.60	14.40	
TU 5000-080	80 ■		81,000		18,210	300	220	0.73	15.30	✓
TU 5000-100	100 ■		82,000		18,430	340	240	0.89	16.40	✓
TU 5000-125	125 ■		82,000		18,430	390	265	1.09	17.70	✓
TU 5000-160	160 ■		83,000		18,660	460	300	1.36	19.60	✓
TU 5000-175	175		84,000		18,880	490	315	1.49	20.40	
TU 5000-200	200 ■		84,000		18,880	540	340	1.68	21.70	
TU 5000-225	225		84,000		18,880	590	365	1.88	22.10	
TU 5000-250	250		84,000		18,880	640	390	2.07	22.40	
TU 5000-300	300		84,000		18,880	740	440	2.46	27.10	

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

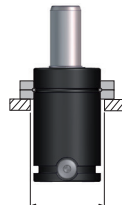
Mounting possibilities



Base mount
B, MP



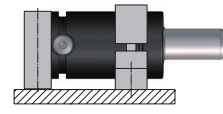
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-5000

 231



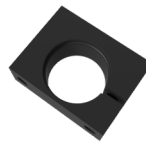
FCS-5000

 16



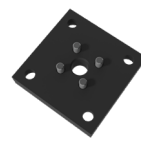
FFC-5000

 20



HMF-5000

 38



MP-5000

 54



S-5000

 40

Additional mounts

FAC-5000

 230

FCSC-5000

 52

FFL-5000

 66

FSL-5000

 241

FSS-5000

 72

K-5000

 247

L-5000

 58

RM-5000

 74

SA-5000

 70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The High Speed gas springs (TUS) have been engineered to withstand press stroke speeds to a maximum of 2 m/s, which meet the safety requirements from the French automotive manufacturer Renault.

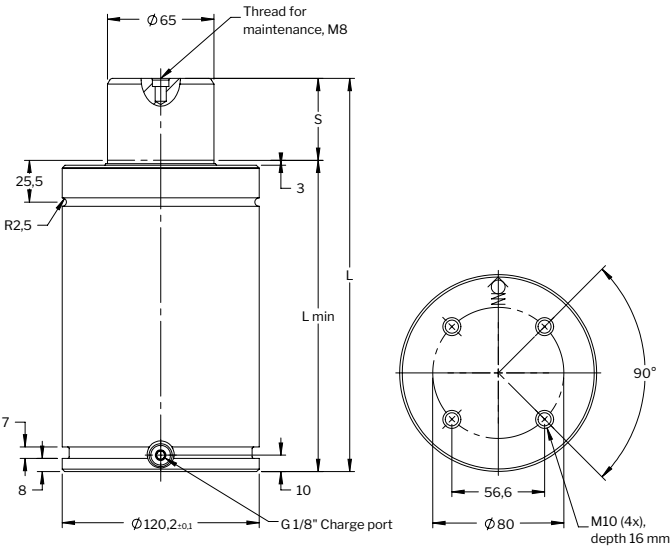
These gas springs are available in sizes from 750 to 7,500 and dimensions that conform to the ISO 11901 gas spring standard. The TUS gas spring replaces the TUR spring that has been phased out.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	2.0 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019280

Automotive standard: R903636025, R903636026, R903636027, R903636028, R903636029, R903636030, R903636031, R903636032, R903636033



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ± 0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TUS 5000-025	25	50,000	71,000	11,240	15,960	190	165	0.32	12.00
TUS 5000-038	38.1		75,000		16,860	216.2	178.1	0.42	12.65
TUS 5000-050	50		77,000		17,310	240	190	0.51	13.30
TUS 5000-064	63.5		80,000		17,990	267	203.5	0.60	14.46
TUS 5000-080	80		81,000		18,210	300	220	0.73	15.05
TUS 5000-100	100		82,000		18,430	340	240	0.89	16.15
TUS 5000-125	125		82,000		18,430	390	265	1.09	16.96
TUS 5000-160	160		83,000		18,660	460	300	1.36	19.40
TUS 5000-200	200		84,000		18,880	540	340	1.68	20.70
TUS 5000-250	250		84,000		18,880	640	390	2.07	22.40
TUS 5000-300	300		84,000		18,880	740	440	2.46	24.66

* Isothermal end force at full stroke.

Mounting possibilities



Base mount
B, MP



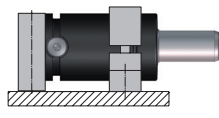
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-5000

231



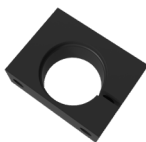
FCS-5000

16



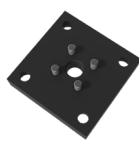
FFC-5000

20



HMF-5000

38



MP-5000

54



S-5000

40

Additional mounts

FAC-5000

230

FCSC-5000

52

FFL-5000

66

FSL-5000

241

FSS-5000

72

K-5000

247

L-5000

58

RM-5000

74

SA-5000

70

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Low Contact Force (LCF) gas springs are designed to reduce excessive 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”.

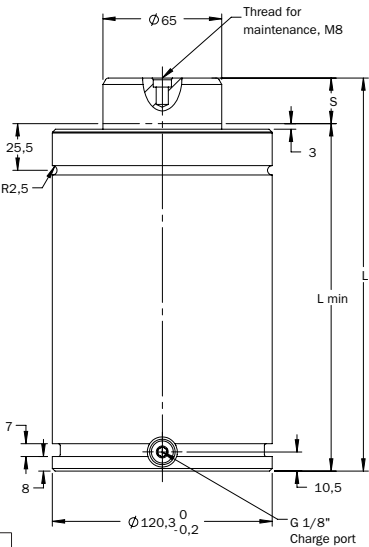
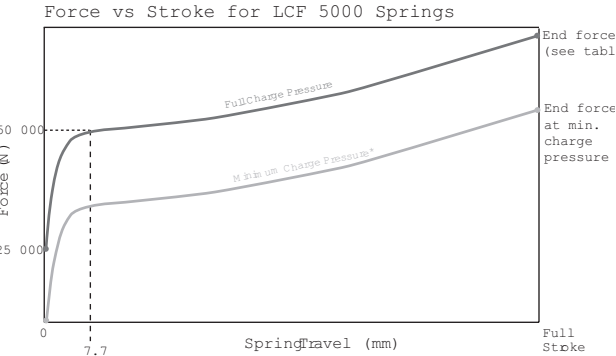


Basic information

For general information see “About gas springs”.

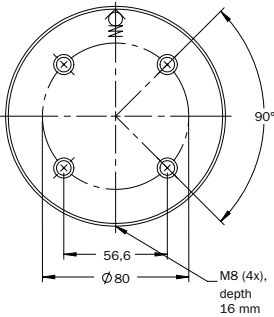
Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	75 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recom max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit.....	3019380

Automotive standard: WDX358037-50xxDMS

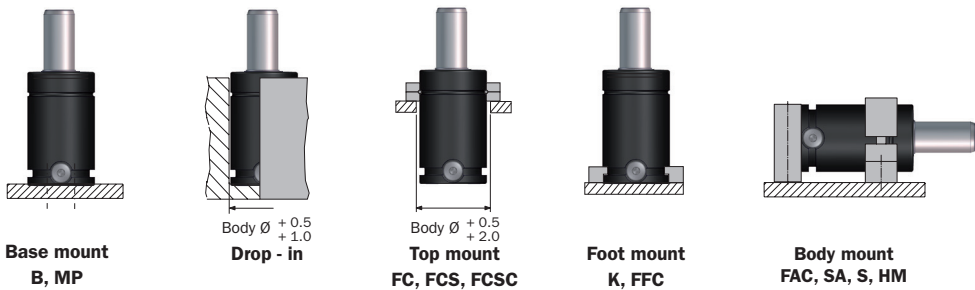


Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
LCF 5000-025	25	50,000	71,000	11,240	15,960	190	165	0.32	12.00
LCF 5000-038	38.1		75,000		16,860	216.2	178.1	0.42	12.65
LCF 5000-050	50		77,000		17,310	240	190	0.51	13.30
LCF 5000-064	63.5		80,000		17,990	267	203.5	0.60	14.46
LCF 5000-080	80		81,000		18,210	300	220	0.73	15.05
LCF 5000-100	100		82,000		18,430	340	240	0.89	16.15
LCF 5000-125	125		82,000		18,430	390	265	1.09	16.96
LCF 5000-160	160		83,000		18,660	460	300	1.36	19.40
LCF 5000-200	200		84,000		18,880	540	340	1.68	20.70
LCF 5000-250	250		84,000		18,880	640	390	2.07	22.40
LCF 5000-300	300		84,000		18,880	740	440	2.46	24.66

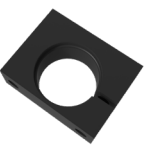
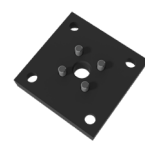
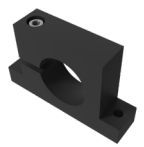
* Isothermal end force at full stroke.



Mounting possibilities



Recommended mounts

					
FC-5000	FCS-5000	FFC-5000	HMF-5000	MP-5000	S-5000
 231	 16	 20	 38	 54	 40

Additional mounts

FAC-5000	FCSC-5000	FFL-5000	FSL-5000	FSS-5000	HM-750
 230	 52	 66	 241	 72	 46
K-5000	L-5000	RM-5000	SA-5000		
 247	 58	 74	 70		

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Speed Control™ – SPC gas springs have been engineered to eliminate blank holder bounce, commonly associated with increased return stroke speeds from link drive presses.

SPC gas springs have inbuilt return stroke speed dampening, which decelerates the last 30 mm of the piston rod stroke to 0.4 m/s, helping to bring the blank holder to a smooth stop.

Features

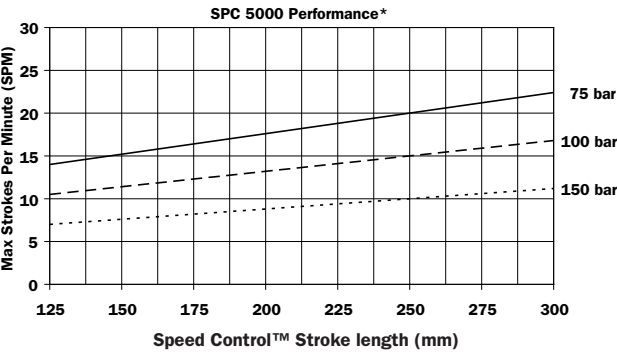
- Eliminates blank holder bounce
- Increases productivity by increasing part transfer efficiency
- Easily retrofitted to existing dies
- Stroke lengths from 125 to 300 mm
- Linkable using a hose system

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recom max strokes/min (at 20°C)	See chart
Max piston rod velocity	1.6 m/s
Dampening length	≈ 30 mm
Dampening speed	0.4 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit.....	3421497

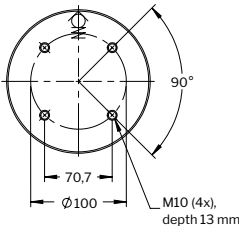
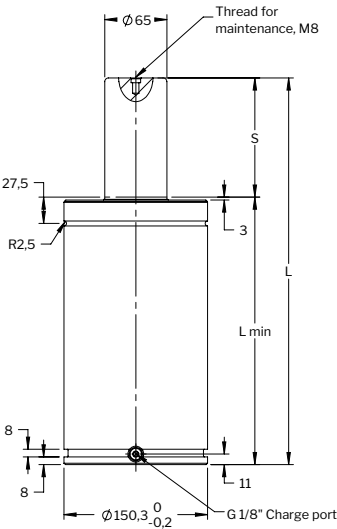
Automotive standard: 5937849, 5937850, 5937851, 5937852, 5937853



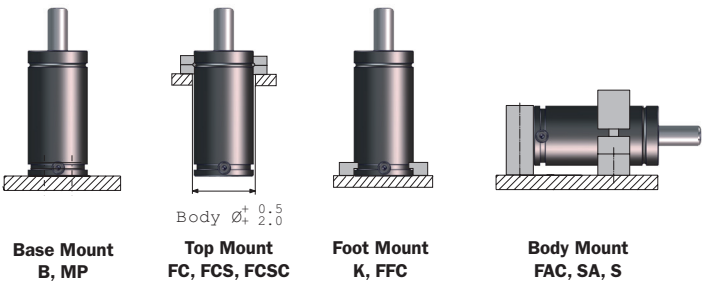
*At ambient room temperatures with free air flow

Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
SPC 5000-125	125	50,000	64,000	11,250	14,400	405	280	1.90	26.35
SPC 5000-160	160		65,000		14,625	475	315	2.33	28.75
SPC 5000-200	200		66,000		14,850	555	355	2.82	31.50
SPC 5000-250	250		66,000		14,850	655	405	3.43	34.93
SPC 5000-300	300		66,000		14,850	755	455	4.05	38.37

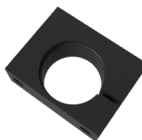
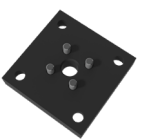
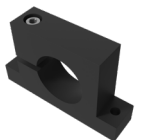
* Isothermal end force at full stroke.



Mounting possibilities



Recommended mounts

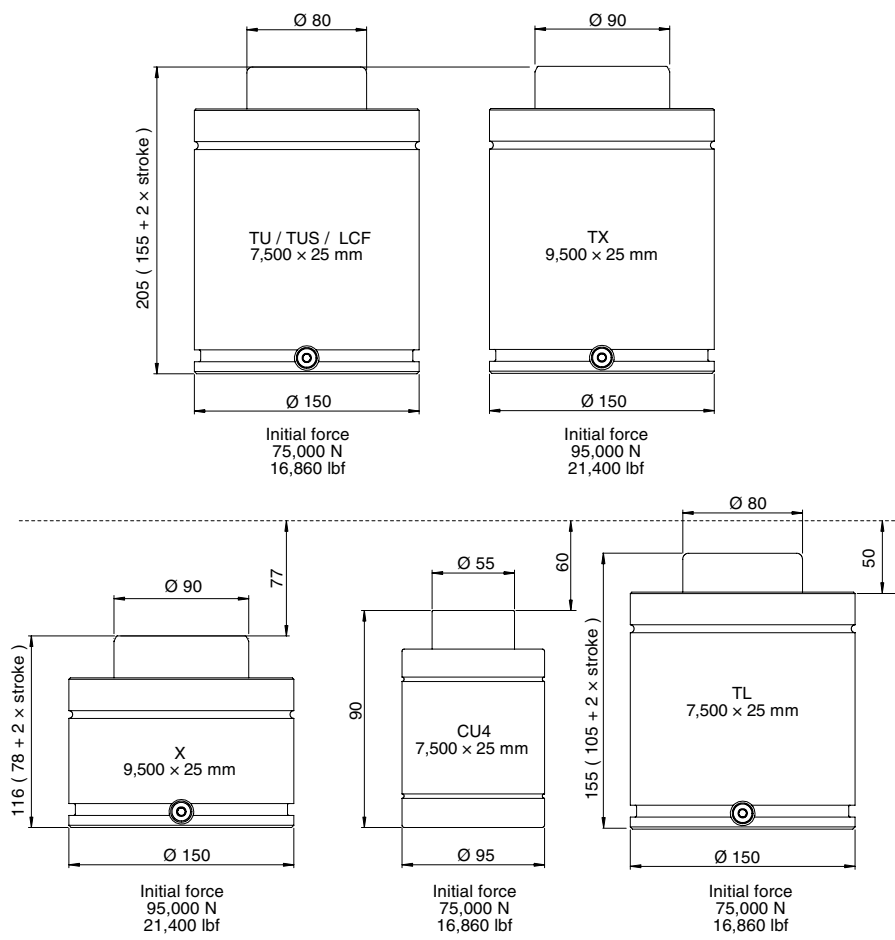
					
FC-7500	FCS-75000	FFC-7500	HMF-7500	MP-7500	S-7500
 231	 16	 20	 38	 54	 40

Additional mounts

FFL-7500	FSS-7500	K-7500	L-7500	RM-7500
 66	 72	 247	 58	 74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.



	Page
CU4 7500	190
X 9500	192
TX 9500	194
TL 7500	196
TU 7500	198
TUS 7500	200
LCF 7500	202

The CU4 gas spring is a very compact Bore Sealed gas spring with impressive force in a compact body. The maximum 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 fixing of shorter stroke springs for optimal service life. As an option, the CU4 spring can be delivered with a Side Port plate (SP) for applications where a sideport is needed (e.g., for use in hose systems).

Basic information

For general information see "About gas springs".

Pressure medium Nitrogen

Max. charging pressure (at 20°C) 150 bar

Min. charging pressure (at 20°C) 25 bar

Operating temperature 0 to +80°C

Force increase by temperature ±0.3%/°C

Recommended max strokes/min (at 20°C) ~ 80-100

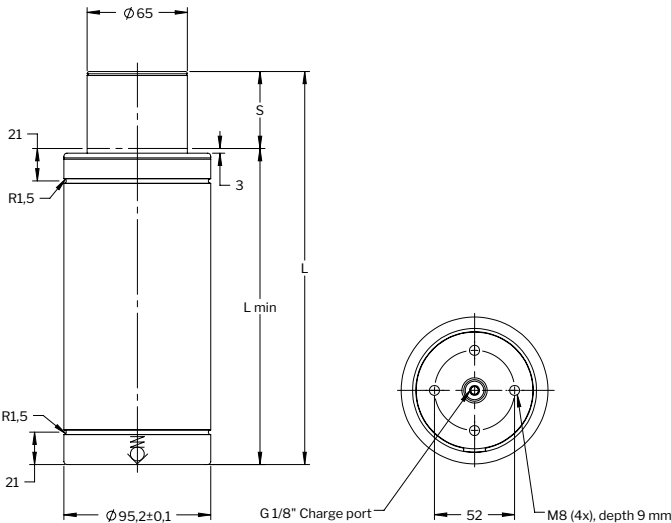
Max piston rod velocity 0.8 m/s

Rod surface Nitrided

Tube surface Nitrided

Repair kit 3024839

Automotive standard: WDX35-62-08075xxDM, Z000459187, 5937679, 5937680, 5937681, 5937682, 5937683, 5937684, 5937685



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CU4 7500-010	10 ■	75,000	98,500	16,860	22,143	90	80	0.18	2.86
CU4 7500-016	16 ■		100,000		22,480	116	100	0.30	3.22
CU4 7500-025	25 ■		104,000		23,380	145	120	0.41	3.61
CU4 7500-032	32*		102,000		22,930	182	150	0.57	4.14
CU4 7500-040	40*		104,000		23,380	210	170	0.68	4.52
CU4 7500-050	50*		103,000		23,155	255	205	0.87	5.15
CU4 7500-065	65*		111,000		24,953	279	214	1.00	5.23

* Should always be attached to the tool using the tapped holes in the bottom or a flange. ** Isothermal end force at full stroke.

■ Recommended stroke length for optimal delivery.

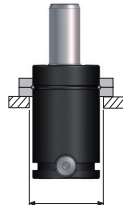
Mounting possibilities



Base mount
SP, SPRM



Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FK



Foot mount
BFCU

Recommended mounts



BFP-7500



80



FK-3000



84



SP-7500



82

Additional mounts

SPRM-95



86

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

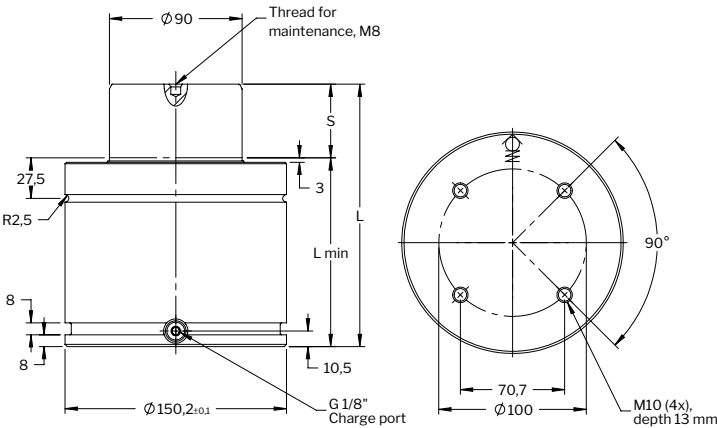
These gas springs are available with forces from 1,700 N up to 200,000 N and stroke lengths between 7 and 125 mm. There is a side port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with four M10 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 30-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3020614

Automotive standard: VDI 3003-Blatt 3, ISO 11901-3-95000, WDX356204-95xxDMS, GMGDS 90.25.08-95, 39D997xx, B2 4005 21724xx, 04585xx, 39-673-028x, 39-673-0290, MES E7231 PG230-PG24D-9A, 305398x, 305399x, SD116391-9500



Order No.	S stroke	Force in N at 150 bar / +20°C		Force in lbf at 150 bar / +20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
X 9500-019	19	95,000	135,000	21,400	30,370	116	97	0.49	9.86	✓
X 9500-025	25		139,000		31,270	128	103	0.58	10.23	
X 9500-032	32		142,000		31,945	142	110	0.70	10.67	
X 9500-038	38		143,000		32,170	154	116	0.80	11.04	✓
X 9500-050	50 ■		146,000		32,845	178	128	0.99	11.79	✓
X 9500-063	63 ■		148,000		33,295	204	141	1.20	12.60	✓
X 9500-075	75		149,000		33,520	228	153	1.39	13.35	✓
X 9500-080	80 ■		150,000		33,745	238	158	1.47	13.66	
X 9500-100	100 ■		151,000		33,970	278	178	1.79	14.91	
X 9500-125	125		152,000		34,195	328	203	2.20	16.47	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Base mount
B, MP



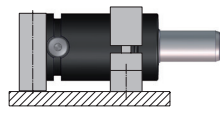
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
S

Recommended mounts



FC-7500

📄 231



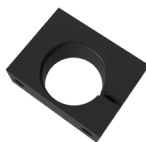
FCS-7500

📄 16



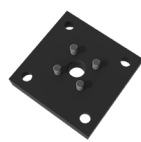
FFC-7500

📄 20



HMF-7500

📄 38



MP-7500

📄 54



S-7500

📄 40

Additional mounts

FCSC-7500

📄 52

FFL-7500

📄 66

FSL-7500

📄 241

FSS-7500

📄 72

K-7500

📄 247

L-7500

📄 58

RM-7500

📄 74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line – Heavy Duty series is a crossover between the standard TU Series and the Power Line X Series.

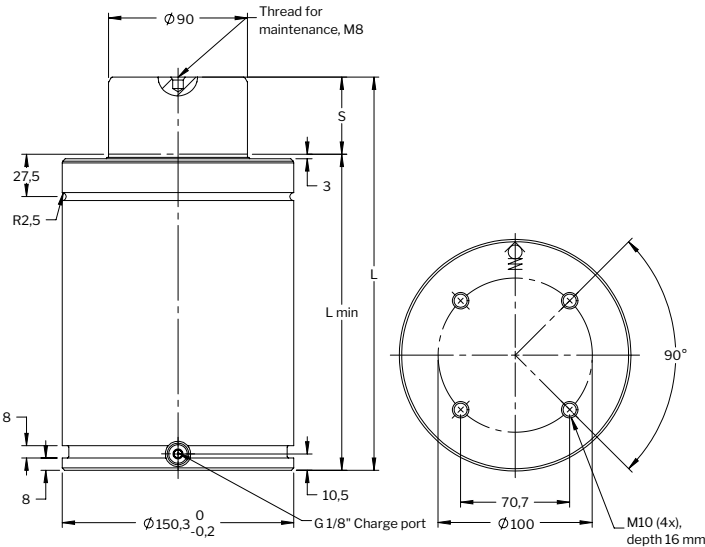
These gas springs are available with forces from 7,400 N up to 200,000 N and stroke lengths between 13 and 300 mm. There is an optional bottom port for hose/base plate connection. An upper C-groove, lower U-groove and bottom threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 30-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3022901

Automotive standard: VDI 3003-Blatt 4, ISO 11901-4-95000, GMGDS 90.25.05-75, 39D838xx, B2 4008 21750xx, 39-673-86xx, 305471x, 305472x



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TX 9500-025	25 ■	95,000	113,200	21,400	25,500	205	180	1.09	16.86	✓
TX 9500-038	38 ■		119,000		26,800	231	193	1.30	17.70	
TX 9500-050	50 ■		123,300		27,730	255	205	1.49	18.48	✓
TX 9500-063	63 ■		127,000		28,550	281	218	1.69	19.32	
TX 9500-075	75 ■		129,700		29,200	305	230	1.88	20.10	
TX 9500-080	80 ■		130,800		29,430	315	235	1.96	20.42	✓
TX 9500-100	100 ■		134,300		30,200	355	255	2.28	31.72	✓
TX 9500-125	125 ■		137,600		31,000	405	280	2.67	23.35	✓
TX 9500-150	150 ■		140,200		31,530	455	305	3.07	24.97	
TX 9500-160	160 ■		141,000		31,730	475	315	3.23	25.62	✓
TX 9500-175	175 ■		142,200		31,990	505	330	3.47	26.59	
TX 9500-200	200 ■		143,800		32,360	555	355	3.86	28.21	✓
TX 9500-250	250 ■		146,300		32,930	655	405	4.65	31.46	✓
TX 9500-300	300 ■		148,200		33,340	755	455	5.44	34.70	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

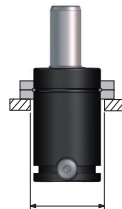
Mounting possibilities



Base mount
B, MP



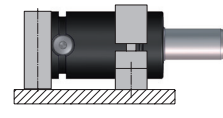
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
S

Recommended mounts



FC-7500

231



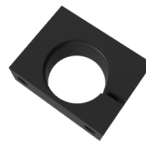
FCS-7500

16



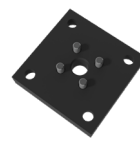
FFC-7500

20



HMF-7500

38



MP-7500

54



S-7500

40

Additional mounts

FCSC-7500

52

FFL-7500

66

FSL-7500

241

FSS-7500

72

K-7500

247

L-7500

58

RM-7500

74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

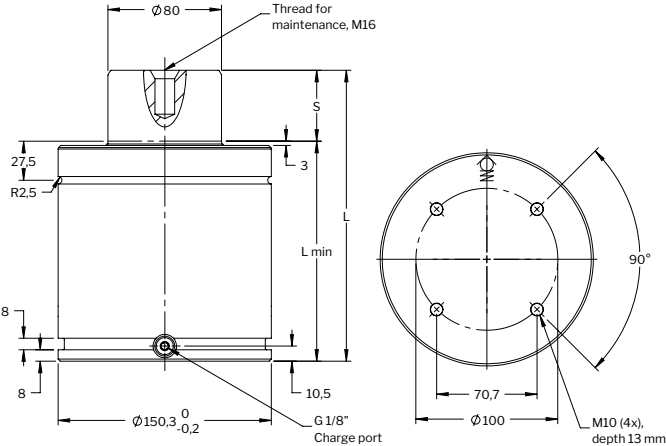
The TL Series ranges from model sizes 750 to 7,500, with the same features and technology as the TU series.

At the same time, the TL gas spring is shorter than the corresponding TU gas spring by 25 mm, except TL 5000 and TL 7500, which are 37.5 mm and 50 mm shorter respectively. TL springs share the same TU mounting possibilities and stroke lengths, with exception of strokes 12.5, 37.5 and 62.5.

Basic information

For general information see “About gas springs”.

- Pressure medium Nitrogen
- Max. charging pressure (at 20°C) 150 bar
- Min. charging pressure (at 20°C) 25 bar
- Operating temperature 0 to +80°C
- Force increase by temperature ±0.3%/°C
- Recommended max strokes/min (at 20°C) ~ 15-40
- Max piston rod velocity 1.6 m/s
- Rod surface Nitrided
- Tube surface Black oxide
- Repair kit 3025027



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TL 7500-025	25	75,000	99,900	16,900	22,450	155	130	0.6	13.6
TL 7500-038	37.5		104,100		23,400	180	142.5	0.7	14.5
TL 7500-050	50		106,800		24,010	205	155	0.9	15.4
TL 7500-063	62.5		108,700		24,440	230	167.5	1.0	16.3
TL 7500-075	75		110,100		24,750	255	180	1.3	17.2
TL 7500-080	80		115,600		25,990	265	185	1.4	17.5
TL 7500-088	87.5		111,200		25,000	280	192.5	1.6	18.0
TL 7500-100	100		112,000		25,180	305	205	1.8	18.9
TL 7500-113	112.5		112,700		25,340	330	217.5	1.9	19.8
TL 7500-125	125		113,300		25,470	355	230	2.1	20.7
TL 7500-138	137.5		113,700		25,560	380	242.5	2.3	21.6
TL 7500-150	150		114,100		25,650	405	255	2.4	22.5
TL 7500-160	160		114,400		25,720	425	265	2.6	23.2
TL 7500-175	175		114,800		25,810	453	280	3.0	24.3
TL 7500-200	200		115,300		25,920	505	305	3.3	26.1
TL 7500-225	225		115,700		26,010	555	330	3.3	27.8
TL 7500-250	250		116,000		26,080	605	355	3.6	29.6

* Isothermal end force at full stroke.

Mounting possibilities



Base mount
B, MP



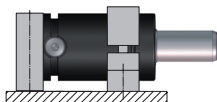
Body Ø + 0.5
+ 1.0
Drop - in



Body Ø + 0.5
+ 2.0
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
FAC, SA, S, HM

Recommended mounts



FC-7500

231



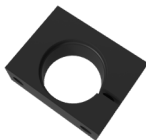
FCS-7500

16



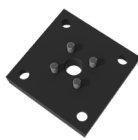
FFC-7500

20



HMF-7500

38



MP-7500

54



S-7500

40

Additional mounts

FFL-7500

66

FSL-7500

241

FSS-7500

72

K-7500

247

L-7500

58

RM-750

74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The TU line constitutes our standard line of gas springs. Sizes 250 to 10,000 conform to the ISO 11901 gas spring standard.

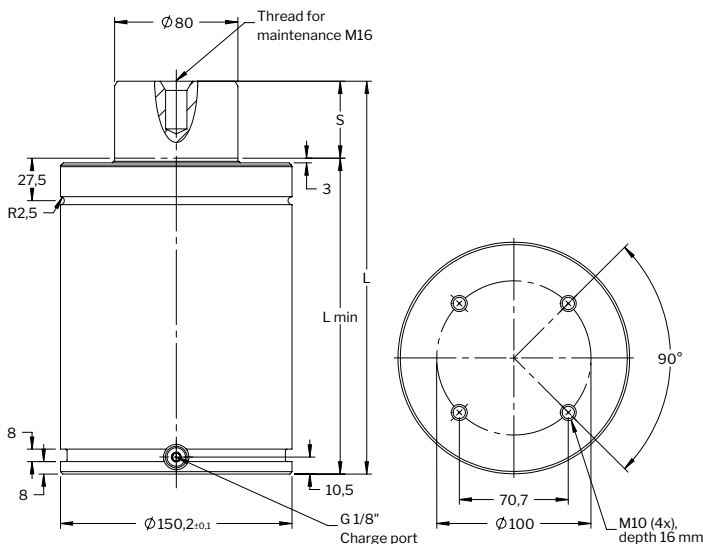


Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	301887

Automotive standard: VDI 3003, ISO 11901-1-75000, WDX356203-75xxDMS, GMGDS 90.25.00-75, 39D878xx, B2 4005 21680xx, B2 4006 21710xx, 03323xx, Z00049238xx, Z000487363, N0007014822, N000701263, R1001753xx, R1001607xx, R10022977x, 30643-55xx, N03750xx, N03751x, R037520, M62 E731 PG230-PG23D-7A. 304419x, 3044200. SD1116322-7500



Order No.	S stroke	Force in N at 150 bar /+20°C		Force in lbf at 150 bar /+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	
		Initial	End force*	Initial	End force*					
TU 7500-025	25	75,000	105,000	16,860	23,600	205	180	0.51	20.30	✓
TU 7500-038	38.1		110,000		24,730	231.2	193.1	0.67	21.40	
TU 7500-050	50		113,000		25,400	255	205	0.81	22.40	✓
TU 7500-064	63.5		115,000		25,850	282	218.5	0.98	23.50	
TU 7500-080	80 ■		117,000		26,300	315	235	1.18	24.80	✓
TU 7500-100	100 ■		119,000		26,750	355	255	1.43	26.50	✓
TU 7500-125	125 ■		121,000		27,200	405	280	1.74	28.50	✓
TU 7500-160	160 ■		122,000		27,430	475	315	2.17	31.40	✓
TU 7500-175	175		123,000		27,650	505	330	2.06	32.60	
TU 7500-200	200 ■		123,000		27,650	555	355	2.66	34.70	
TU 7500-225	225		124,000		27,880	605	380	2.96	36.80	
TU 7500-250	250		124,000		27,880	655	405	3.27	38.80	
TU 7500-300	300	124,000	27,880	755	455	3.88	42.90			

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

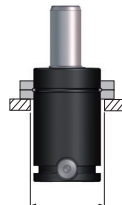
Mounting possibilities



Base mount
B, MP



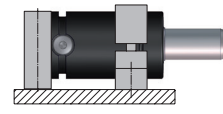
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
S

Recommended mounts



FC-7500

231



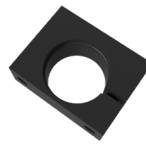
FCS-7500

16



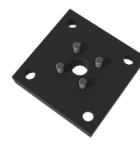
FFC-7500

20



HMF-7500

38



MP-7500

54



S-7500

40

Additional mounts

FCSC-7500

52

FFL-7500

66

FSL-7500

241

FSS-7500

72

K-7500

247

L-7500

58

RM-7500

74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The High Speed gas springs (TUS) have been engineered to withstand press stroke speeds to a maximum of 2 m/s, which meet the safety requirements from the French automotive manufacturer Renault.

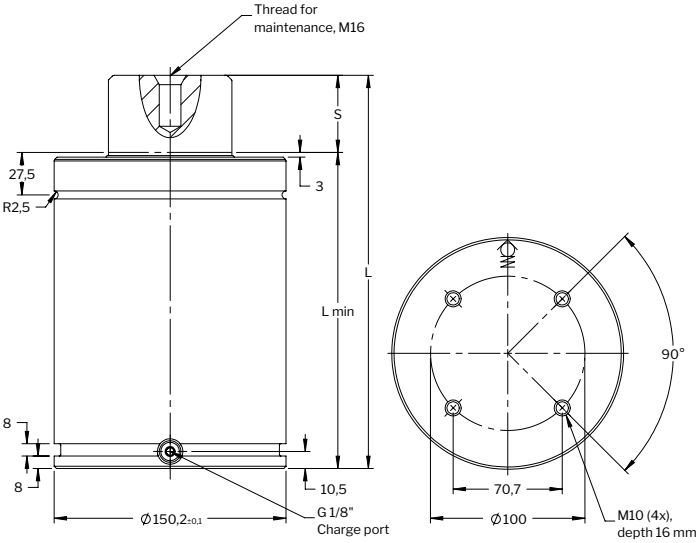
These gas springs are available in sizes from 750 to 7,500 and dimensions that conform to the ISO 11901 gas spring standard. The TUS gas spring replaces the TUR spring that has been phased out.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	2.0 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019281

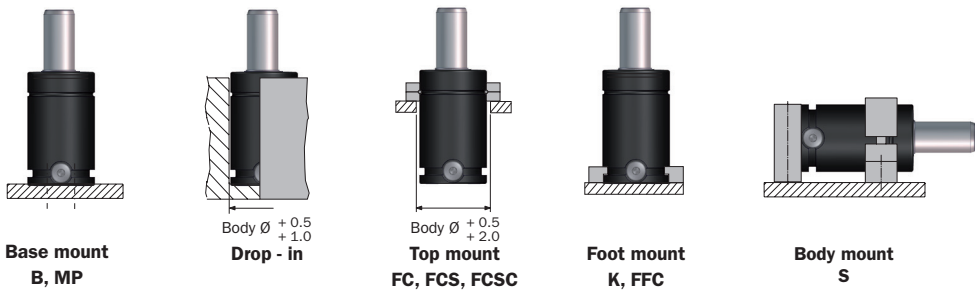
Automotive standard: R903636034, R903636035, R903636036, R903636037, R903636038, R903636039, R903636040, R903636041, R903636042



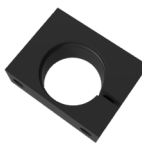
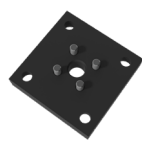
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TUS 7500-025	25	75,000	105,000	16,860	23,600	205	180	0.51	19.40
TUS 7500-038	38.1		110,000		24,730	231.2	193.1	0.67	20.47
TUS 7500-050	50		113,000		25,400	255	205	0.81	21.25
TUS 7500-064	63.5		115,000		25,850	282	218.5	0.98	22.56
TUS 7500-080	80		117,000		26,300	315	235	1.18	23.91
TUS 7500-100	100		119,000		26,750	355	255	1.43	25.56
TUS 7500-125	125		121,000		27,200	405	280	1.74	27.61
TUS 7500-160	160		122,000		27,430	475	315	2.17	30.48
TUS 7500-200	200		123,000		27,650	555	355	2.66	33.76
TUS 7500-250	250		124,000		27,880	655	405	3.27	37.87
TUS 7500-300	300		124,000		27,880	755	455	3.88	41.97

* Isothermal end force at full stroke.

Mounting possibilities



Recommended mounts

					
FC-7500	FCS-7500	FFC-7500	HMF-7500	MP-7500	S-7500
 231	 16	 20	 38	 54	 40

Additional mounts

FCSC-7500	FFL-7500	FSL-7500	FSS-7500	K-7500	L-7500
 52	 66	 241	 72	 247	 58
RM-7500					
 74					

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Low Contact Force (LCF) gas springs are designed to reduce excessive 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”.

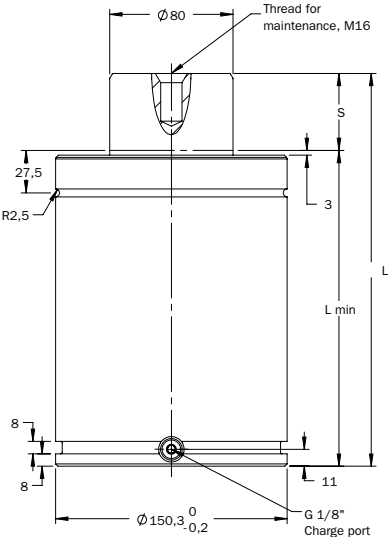
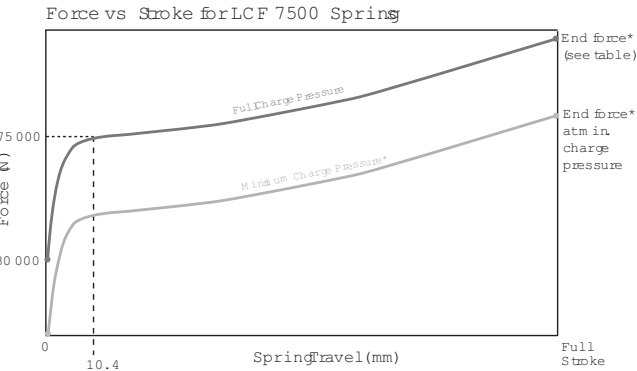


Basic information

For general information see “About gas springs”.

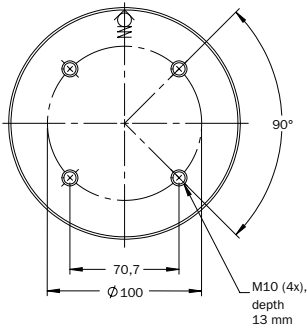
Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	85 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recom max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit.....	3019381

Automotive standard: WDX358037-75xxDMS



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
LCF 7500-025	25	75,000	105,000	16,860	23,600	205	180	0.51	19.40
LCF 7500-038	38.1		110,000		24,730	231.2	193.1	0.67	20.47
LCF 7500-050	50		113,000		25,400	255	205	0.81	21.25
LCF 7500-064	63.5		115,000		25,850	282	218.5	0.98	22.56
LCF 7500-080	80		117,000		26,300	315	235	1.18	23.91
LCF 7500-100	100		119,000		26,750	355	255	1.43	25.56
LCF 7500-125	125		121,000		27,200	405	280	1.74	27.61
LCF 7500-160	160		122,000		27,430	475	315	2.17	30.48
LCF 7500-200	200		123,000		27,650	555	355	2.66	33.76
LCF 7500-250	250		124,000		27,880	655	405	3.27	37.87
LCF 7500-300	300		124,000		27,880	755	455	3.88	41.97

* Isothermal end force at full stroke.



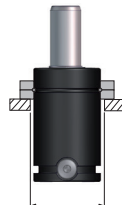
Mounting possibilities



Base mount
B, MP



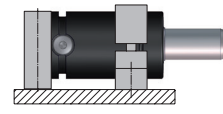
Body Ø $+0.5$
 $+1.0$
Drop - in



Body Ø $+0.5$
 $+2.0$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
S

Recommended mounts



FC-7500

231



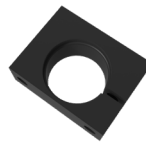
FCS-7500

16



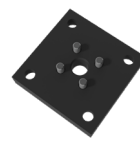
FFC-7500

20



HMF-7500

38



MP-7500

54



S-7500

40

Additional mounts

FCSC-7500

52

FFL-7500

66

FSL-7500

241

FSS-7500

72

K-7500

247

L-7500

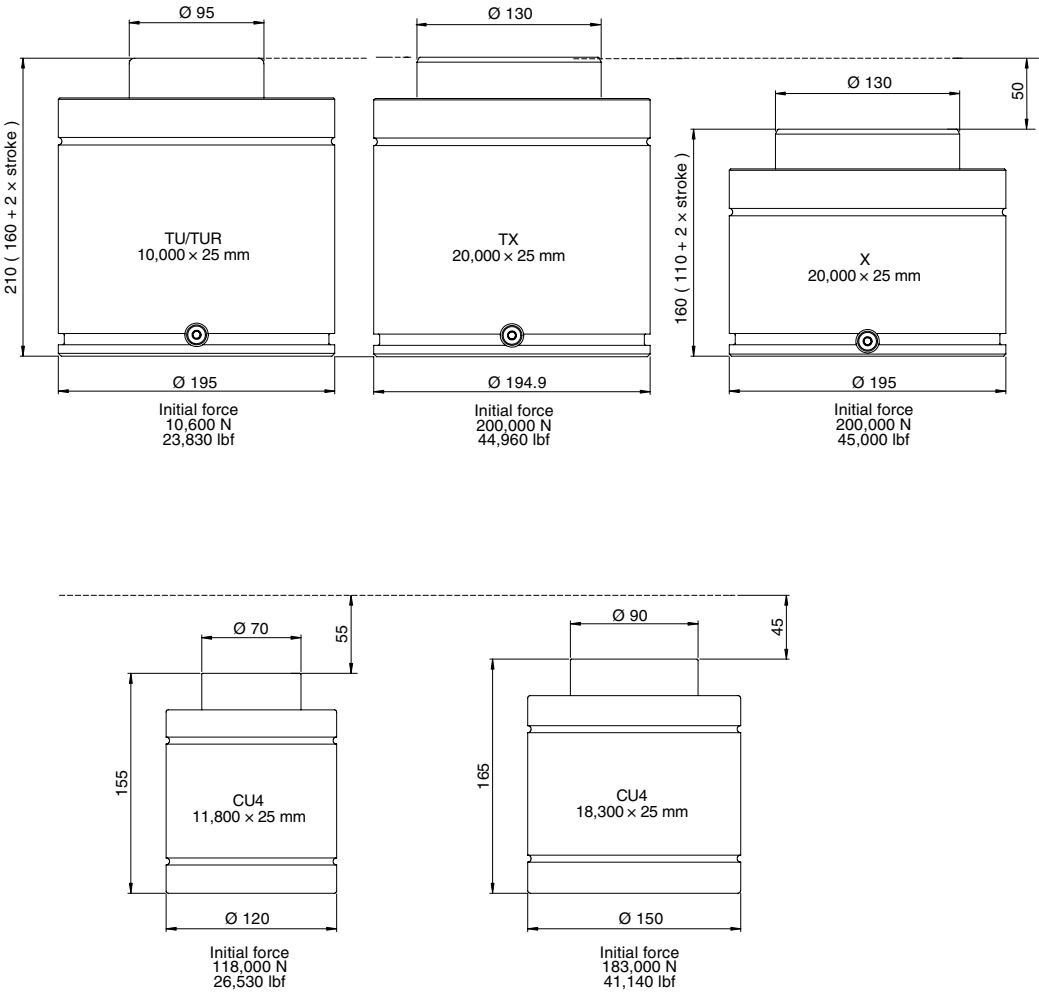
58

RM-5000

74

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.



	Page
CU4 11800	206
CU4 18300	208
TU 10000	210
TUR 10000	212
X 20000	214
TX 20000	216

The CU4 gas spring is a very compact Bore Sealed gas spring with impressive force in a compact body. The maximum frequency for the spring is 100 strokes/minute.

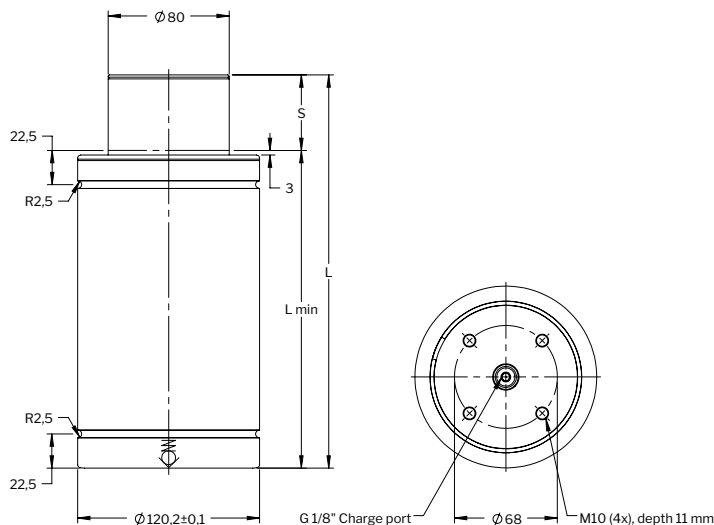
Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend fixing of shorter stroke springs for optimal service life. As an option, the CU4 spring can be delivered with a Side Port plate (SP) for applications where a sideport is needed (e.g., for use in hose systems).

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 80-100
Max piston rod velocity	0.8 m/s
Rod surface	Nitrided
Tube surface	Nitrided
Repair kit	3024840

Automotive standard: WDX35-62-09118xxDM, 5937686, 5937687, 5937688, 5937689, 5937690, 5937691, 5937692



Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CU4 11800-010	10 ■	118,000	150,000	26,530	33,700	100	90	0.33	4.95
CU4 11800-016	16 ■		153,000		34,400	126	110	0.50	5.55
CU4 11800-025	25 ■		160,000		36,000	155	130	0.68	6.17
CU4 11800-032	32*		165,000		37,100	187	155	0.88	6.90
CU4 11800-040	40*		160,000		36,000	220	180	1.00	7.65
CU4 11800-050	50*		161,000		36,200	260	210	1.35	8.55
CU4 11800-065	65*		163,000		36,600	320	255	1.90	9.56

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

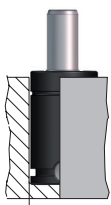
■ Recommended stroke length for optimal delivery.

** Isothermal end force at full stroke.

Mounting possibilities



Base mount
SP, SPRM



Body Ø +0.5
+1.0
Drop - in



Body Ø +0.5
+2.0
Top mount
FC, FCS, FCSC



Foot mount
BFCU

Recommended mounts



BFCU-11800

80



FC-5000

231



FCS-5000

16



SP-11800

82

Additional mounts

FCSC-5000

52

SPRM-120

86

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The CU4 gas spring is a very compact Bore Sealed gas spring with impressive force in a compact body. The maximum frequency for the spring is 100 strokes/minute.

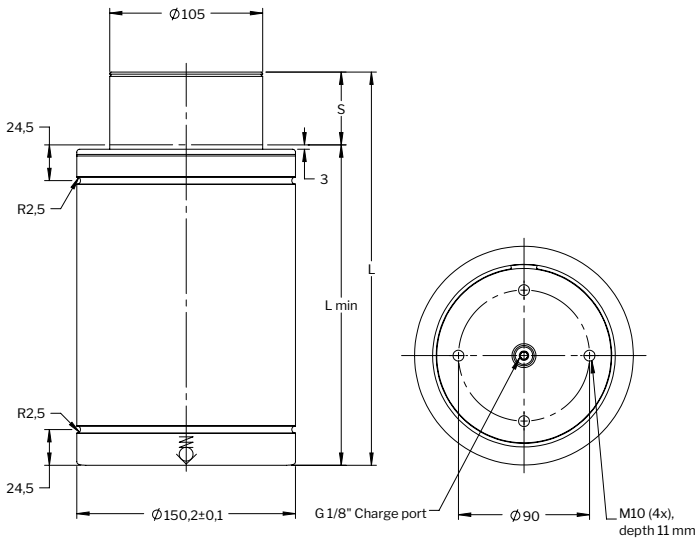
Springs with stroke lengths over 25 mm should always be attached to the tool, using a flange or the tapped holes in the bottom of the spring. We also recommend fixing of shorter stroke springs for optimal service life. As an option, the CU4 spring can be delivered with a Side Port plate (SP) for applications where a sideport is needed (e.g., for use in hose systems).

Basic information

For general information see "About gas springs".

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 80-100
Max piston rod velocity	0.8 m/s
Rod surface	Nitrided
Tube surface	Nitrided
Repair kit	3024841

Automotive standard: WDX35-62-09183xxDM, 5937693, 5937694, 5937695, 5937696, 5937697, 5937698, 5937699

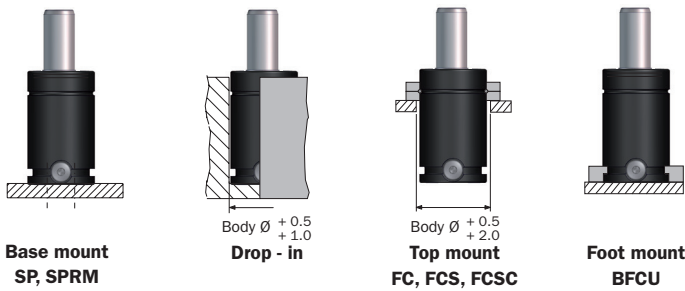


Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ± 0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force**	Initial	End force**				
CU4 18300-010	10 ■	183,000	227,000	41,140	51,000	110	100	0.56	8.78
CU4 18300-016	16 ■		233,000		52,400	136	120	0.84	9.72
CU4 18300-025	25 ■		244,000		54,900	165	140	1.13	10.71
CU4 18300-032	32*		244,000		54,900	197	165	1.45	11.88
CU4 18300-040	40*		244,000		54,900	235	195	1.86	13.28
CU4 18300-050	50*		248,000		55,800	270	220	2.19	14.50
CU4 18300-065	65*		253,000		56,900	323	258	2.90	16.30

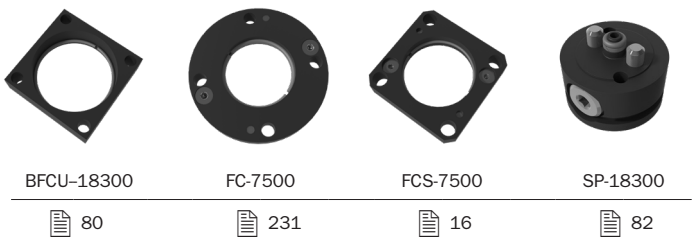
* Should always be attached to the tool using the tapped holes in the bottom or a flange. ** at full stroke.

■ Recommended stroke length for optimal delivery.

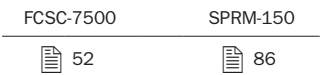
Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The TU line constitutes our standard line of gas springs. Sizes 250 to 10,000 conform to the ISO 11901 gas spring standard.

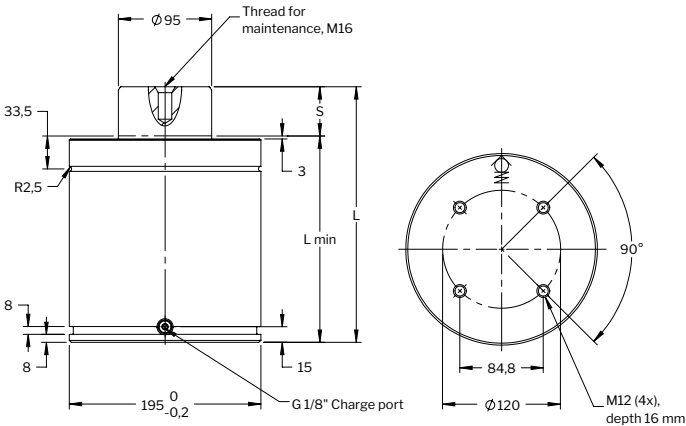


Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019037

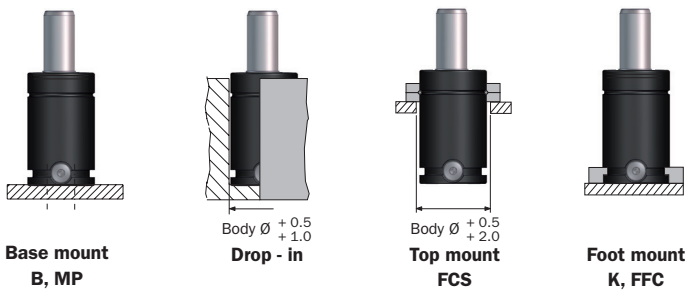
Automotive standard: VDI 3003, ISO 11901-1-100000, GMGDS 90.25.00-100, 39D878xx, 03441xx, R1001607xx, R10022977x, 39-673-56xx, N03990x, N03991x, N039920, 305396x, 305397x



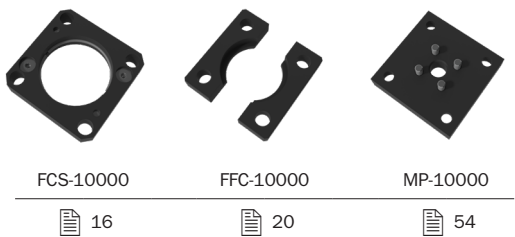
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	ISO
		Initial	End force*	Initial	End force*					
TU 10000-025	25	106,000	138,000	23,830	31,020	210	185	0.87	35.90	
TU 10000-038	38.1		143,000		32,150	236.2	198.1	1.13	37.60	
TU 10000-050	50		147,000		33,050	260	210	1.37	39.20	✓
TU 10000-064	63.5		150,000		33,720	287	223.5	1.64	41.00	
TU 10000-080	80		152,000		34,170	320	240	1.98	43.20	✓
TU 10000-100	100		156,000		35,070	360	260	2.38	45.80	✓
TU 10000-125	125		157,000		35,300	410	285	2.88	49.10	✓
TU 10000-160	160		158,000		35,520	480	320	3.59	53.70	✓
TU 10000-200	200		160,000		35,970	560	360	4.39	59.00	✓
TU 10000-250	250		160,000		35,970	660	410	5.40	65.60	✓
TU 10000-300	300		160,000		35,970	760	460	6.40	72.20	✓

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

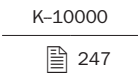
Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The TUR 10000 gas spring conforms to the ISO 11901-1 and the Renault automotive gas spring standards. In full compliance with the Renault requirements, it features an over-stroke protection system.

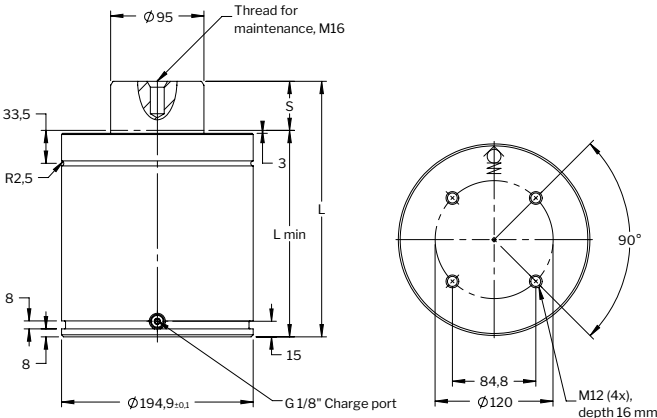
For sizes 750 up to 7,500, please refer to the TUS High Speed gas springs.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	2.0 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3019282

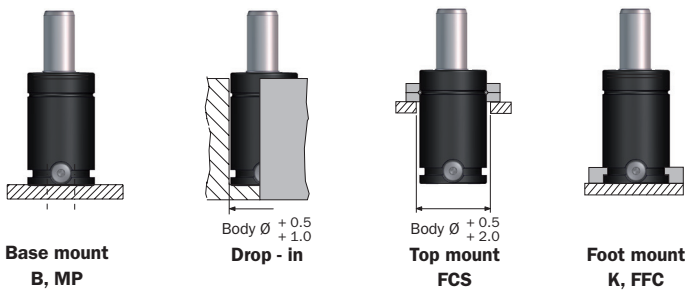
Automotive standard: GMGDS 90.50.11, R100160733, R100160734, R100160735, R100160736, R100160738, R100160739, R100160741, R100229777, R100229778



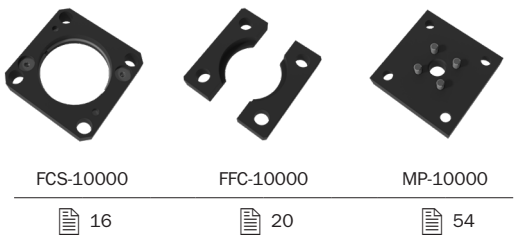
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TUR 10000-025	25	106,000	138,000	23,830	31,020	210	185	1.0	34.7
TUR 10000-038	38.1		143,000		32,150	236.2	198.1	1.2	36.4
TUR 10000-050	50		147,000		33,050	260	210	1.5	39.2
TUR 10000-064	63.5		150,000		33,720	287	223.5	1.8	39.8
TUR 10000-080	80		152,000		34,170	320	240	2.1	41.9
TUR 10000-100	100		156,000		35,070	360	260	2.5	44.6
TUR 10000-125	125		157,000		35,300	410	285	3.0	47.9
TUR 10000-160	160		158,000		35,520	480	320	3.7	53.4
TUR 10000-200	200		160,000		35,970	560	360	4.5	59.0
TUR 10000-250	250		160,000		35,970	660	410	5.5	65.5
TUR 10000-300	300		160,000		35,970	760	460	6.5	72.1

* Isothermal end force at full stroke.

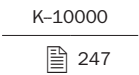
Mounting possibilities



Recommended mounts



Additional mounts



Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line Series includes our shortest and most powerful Piston Rod Sealed gas springs, offering impressive force in a very compact format.

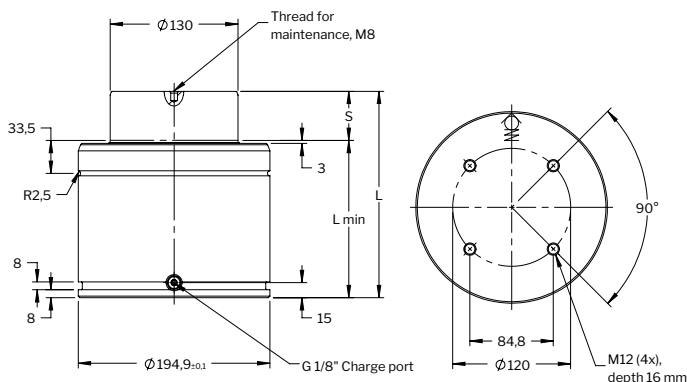
These gas springs are available with forces from 1,700 N up to 200,000 N and stroke lengths between 7 and 125 mm. There is a side port for gas charging that can also be used to connect to a hose system. An upper C-groove, lower U-groove together with four M12 threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-40
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3022902

Automotive standard: ISO 11901-3-200000, GMGDS 90.25.08-199,
39-673-029x, 305467x, 305468x



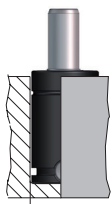
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)	
		Initial	End force*	Initial	End force*					
X 20000-019	19	200,000	259,000	45,000	58,200	148	129	1.21	21.50	
X 20000-025	25		270,000		60,750	160	135	1.38	22.16	√
X 20000-032	32		280,000		63,000	174	142	1.59	22.92	
X 20000-038	38		287,000		64,600	186	148	1.77	23.57	√
X 20000-050	50 ■		298,000		67,000	210	160	2.12	24.87	√
X 20000-063	63 ■		307,000		69,100	236	173	2.50	26.28	√
X 20000-075	75		313,000		70,500	260	185	2.85	27.59	
X 20000-080	80 ■		315,000		70,900	270	190	3.00	28.13	√
X 20000-100	100 ■		323,000		72,700	310	210	3.58	30.30	√
X 20000-125	125		330,000		74,250	360	235	4.31	33.02	√

* Isothermal end force at full stroke. ■ Recommended stroke length for optimal delivery.

Mounting possibilities



Base mount
B, MP



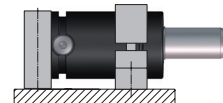
Body Ø $\begin{smallmatrix} +0.5 \\ +1.0 \end{smallmatrix}$
Drop - In



Body Ø $\begin{smallmatrix} +0.5 \\ +2.0 \end{smallmatrix}$
Top mount
FC, FCS, FCSC



Foot mount
K, FFC



Body mount
S

Recommended mounts



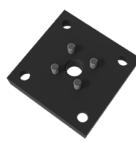
FCS-10000

16



FFC-10000

20



MP-10000

54

Additional mounts

K-10000

247

Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

The Power Line – Heavy Duty series is a crossover between the standard TU Series and the Power Line X Series.

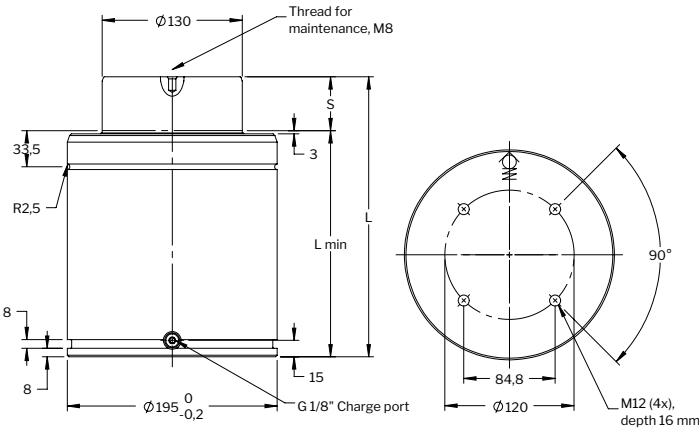
These gas springs are available with forces from 7,400 N up to 200,000 N and stroke lengths between 13 and 300 mm. There is an optional bottom port for hose/base plate connection. An upper C-groove, lower U-groove and bottom threaded holes allow various mounting possibilities using our standard mounts.

Basic information

For general information see “About gas springs”.

Pressure medium	Nitrogen
Max. charging pressure (at 20°C)	150 bar
Min. charging pressure (at 20°C)	25 bar
Operating temperature	0 to +80°C
Force increase by temperature	±0.3%/°C
Recommended max strokes/min (at 20°C)	~ 15-100
Max piston rod velocity	1.6 m/s
Rod surface	Nitrided
Tube surface	Black oxide
Repair kit	3026204

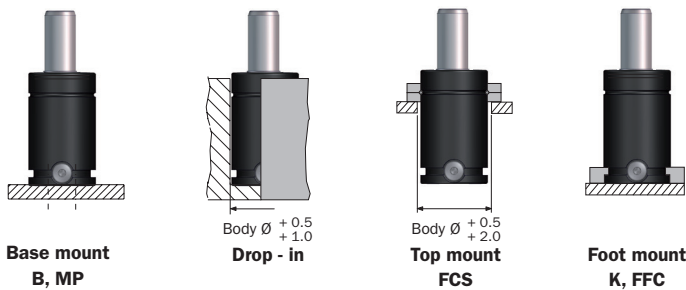
Automotive standard: GMGDS 90.25.05-100, 39-673-87xx



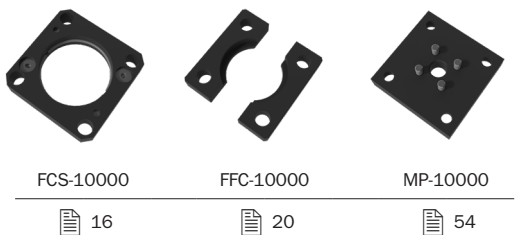
Order No.	S stroke	Force in N at 150 bar/+20°C		Force in lbf at 150 bar/+20°C		L ±0.25	L min.	Gas vol. (l)	Weight (kg)
		Initial	End force*	Initial	End force*				
TX 20000-025	25	200,000	242,000	44,960	54,404	210	185	2.03	28.20
TX 20000-038	38		256,400		57,640	236	198	2.41	29.57
TX 20000-050	50		266,800		59,980	260	210	2.77	30.83
TX 20000-063	63		276,000		62,048	286	223	3.15	32.20
TX 20000-075	75		283,100		63,644	310	235	3.51	33.46
TX 20000-080	80		285,700		64,228	320	240	3.66	33.98
TX 20000-100	100		294,600		66,229	360	260	4.25	36.09
TX 20000-125	125		303,100		68,140	410	285	5.00	38.71
TX 20000-150	150		309,700		69,624	460	310	5.74	41.34
TX 20000-160	160		312,000		70,140	480	320	6.04	42.39
TX 20000-175	175		315,000		70,815	510	335	6.48	43.97
TX 20000-200	200		319,000		71,714	560	360	7.23	46.60
TX 20000-250	250		325,600		73,198	660	410	8.71	51.85
TX 20000-300	300		330,600		72,322	760	460	10.20	57.11

* Isothermal end force at full stroke.

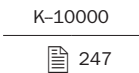
Mounting possibilities



Recommended mounts



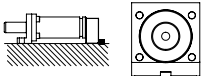
Additional mounts

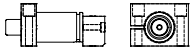
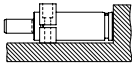
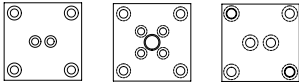
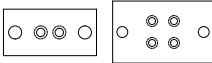
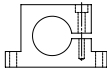
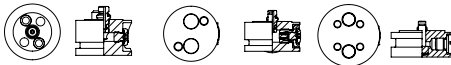


Note!

For dimensions on all mounting possibilities, refer to “Mounts” in chapter 3.

Page

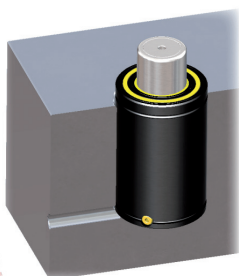
Mounting Guidelines		220
BF		228
BFCU		229
FAC		230
FC		231
FC (R)		232
FCR		233
FCR ISO		234
FCS		235
FCSC		236
FFC		237
FFL		238
FK		239
FRM		240
FSL		241

		Page
FSS		243
FTM		244
HM		245
HMF		246
K-LUG		247
L		248
MP		249
NMP		250
RM		251
S		252
SA		253
SM		254
SP		255
SPCX		256
SPRM		257

KALLER gas springs are engineered for use in modern day, metal stamping dies and plastic moulding tools. Over the years, KALLER has developed a wide range of mounting methods for the gas springs. The following is intended as a reminder of the correct procedure when using these various mounting methods.

Mounting method overview

Generally speaking, KALLER gas spring cylinders are machined with two external grooves. The C-groove being located towards the cylinder opening and a U-groove or second C-groove located just above its base. These grooves allow various flange mounts to be attached. It is then the flange mount that is clamped to the tool using mounting screws of a suitable length, property class and torque setting (see next page for more details). Only use mounts manufactured or approved by KALLER.



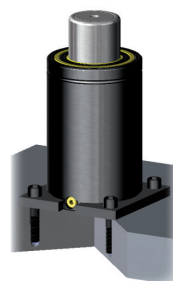
Drop-In

The gas spring is dropped into a flat bottomed pocket within the die.



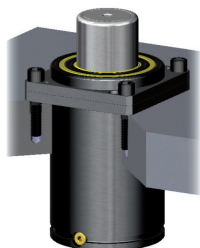
Base mount

The gas spring's base threaded holes are used to mount the gas spring directly to the tool or indirectly via a base mounting plate.



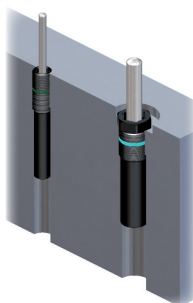
Foot mount

A flange mount is used to clamp the base of the gas spring to the tool using the gas spring's lower U or C groove.



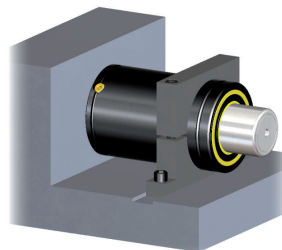
Top mount

A flange mount is first attached to the gas spring's upper C-groove before being mounted into a hole in the die.



Thread mount

A section of the gas spring's cylinder, which has an external thread (either cylinder body or base stud), is used to install the gas spring in the die. In some cases with an additional lock nut or flange mount.



Body mount

The body mounts are attached to the gas spring to allow it to be installed in any orientation within the die, from vertically upright through to vertically upside down.

Mounting screws

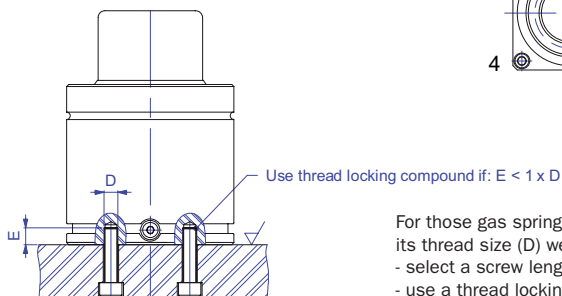
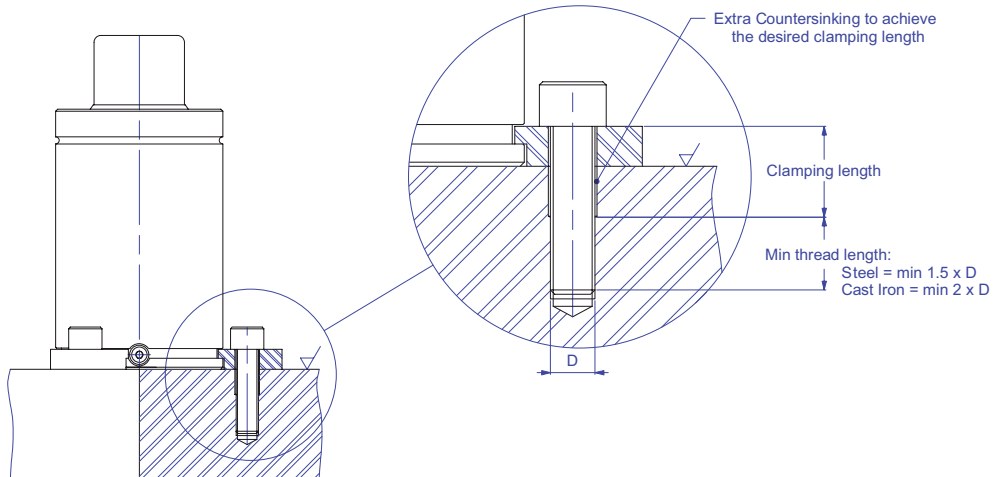
When mounting the gas spring directly to the tool or via a flange mount, it is important to observe the following recommendations in order to prevent the gas spring or its mounting accessories from working loose into the tool.

Recommendations:

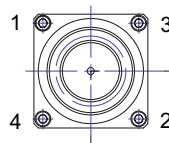
Screws should have a free length (clamping length) of 2 to 4 times their thread diameter and a thread depth of at least 1.5 times their thread diameter in steel and 2 times their thread diameter in cast iron. If the free length cannot be achieved in any other way, the screw holes should be countersunk (see below). Please note that the specifications in automotive standards may differ. Always use a torque wrench to apply the appropriate torque for the class of screws used.

Thread	Torque (for screw class 8.8 according to ISO 898-1)
M6	10 Nm
M8	24 Nm
M10	45 Nm
M12	80 Nm
M16	160-200 Nm

For all types of flange mounting using mounting screws:



For example: X 2400



When tightening the mounting screws in the tool, apply an evenly cross like pattern according to the picture (1-2-3-4). Otherwise there is a risk for the mount to tilt.

For those gas springs whose thread depth (E) is less than 1 times its thread size (D) we recommend the following:

- select a screw length to engage all available thread depth
- use a thread locking compound (middle strength or higher)
- ensure the correct screw torque setting is applied

Mounting method: Drop-In

For stroke lengths < 25 mm: base threaded holes are optional for stroke lengths up to and including 25 mm.

For stroke lengths > 25 mm: base threaded holes should always be used for longer stroke lengths to prevent possible side loads and/or gas spring movement within the pocket.

Gas spring orientations: only vertically upright installations are recommended (see **Warning!**).

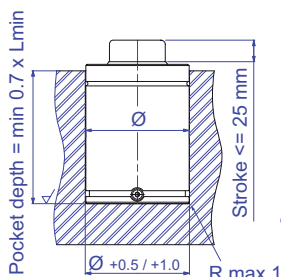
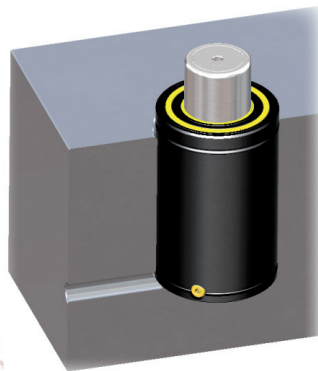
Hole depth: min 70% of the spring's Lmin length to ensure sufficient support and reduce the risk of side loading.

Hole diameter: +0.5 to +1.0 mm greater than the gas spring's cylinder diameter.

Hole drainage: recommended wherever drawing fluids and/or liquid coolants are used in the die.

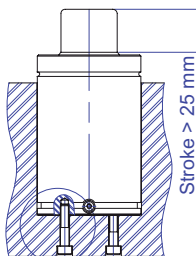
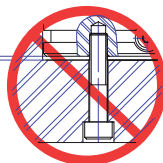
Link systems: Not recommended for stroke lengths < 25 mm.

Warning! Never drop a gas spring into a pocket upside down as this may lead to excessive wear on the outside of the tube.



Always observe pocket dimension recommendations

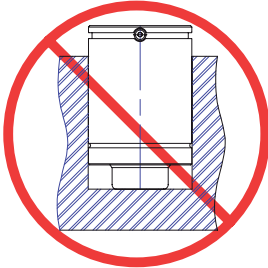
Use correct screw length



Use Drop-In and Base Thread: B together for longer stroke lengths

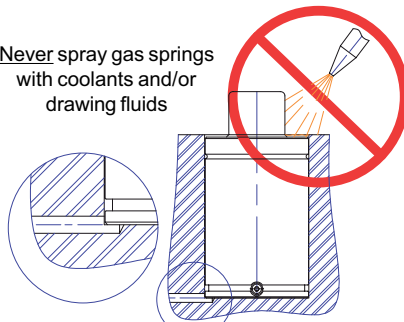


Never mount a gas spring in a pocket that does not fully support its base



Never mount a gas spring in a pocket upside down

Never spray gas springs with coolants and/or drawing fluids



Always provide pocket drainage if coolants are used in the die

Mounting method: Base Mount (B, MP, MPX)

Stroke length suitability:

For cylinder diameters $< \varnothing 25$ = Max stroke 25 mm

For cylinder diameters $> \varnothing 25$ = OK for all stroke lengths

Gas spring orientations: Vertically upright - OK for all stroke lengths

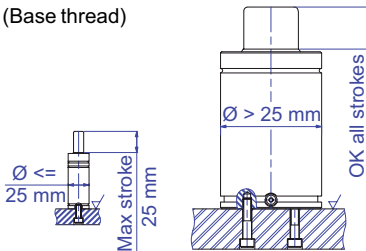
Vertically upside down - OK up to stroke 125 mm*

Link systems: this mounting method is very suitable for gas link systems

*For thread depths less than 1 times its thread size use a screw length that engages all thread depth, use a thread locking compound (middle strength or higher) and apply correct screw torque setting.

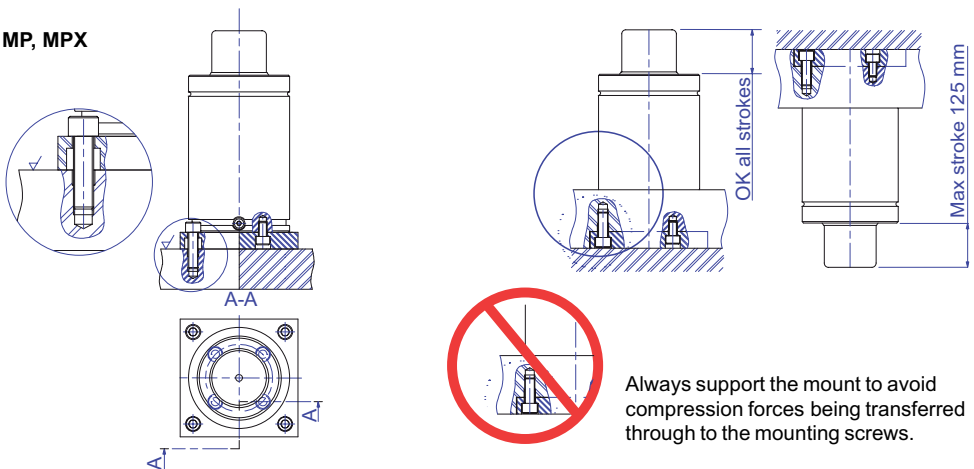


For: B (Base thread)



If the gas spring has only a single base threaded hole, then the max stroke length for this mounting method should not exceed 25 mm

For: MP, MPX



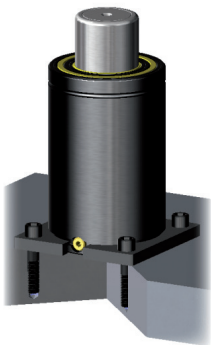
Mounting method: Foot mount (BF, FCR, FFC, FFX, FSL, RM)

Gas spring orientations: Vertically upright = OK for all stroke lengths
Vertically upside down = OK up to 125 mm stroke (see **Warning!** below)

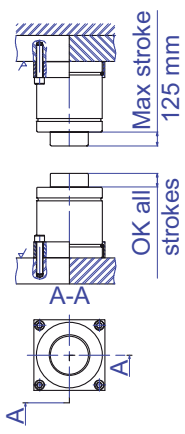
Link systems: this mounting method is generally suitable for gas link systems, with the exception of the BF, FCR and FSL flange mounts that do not fully prevent rotation of the gas spring.

Note! A small gap between Foot Mount and mounting surface is normal before the gas spring is clamped to the die using the mounting screws.

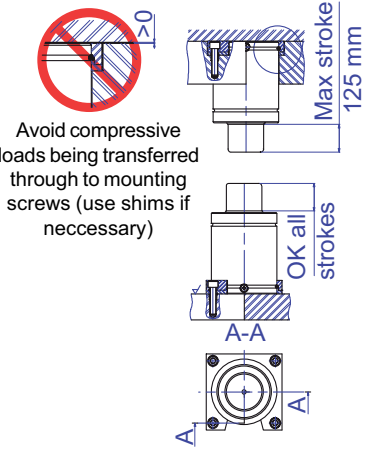
Warning! K Foot Mounts are not recommended for vertically upside down installations. Wherever possible, vertically upside down installations using Foot Mounts should be used in combination with base threaded holes to prevent gas spring rotation within the flange and to provide additional security.



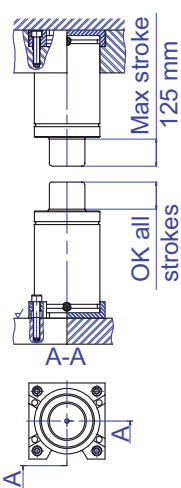
For: BF, FCR



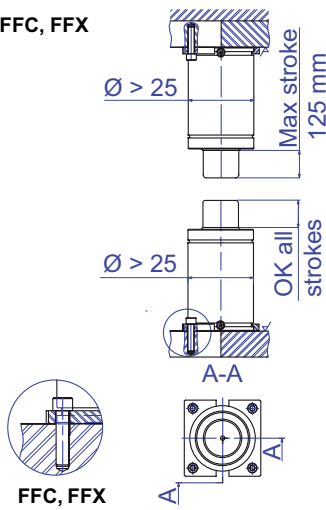
For: FSL



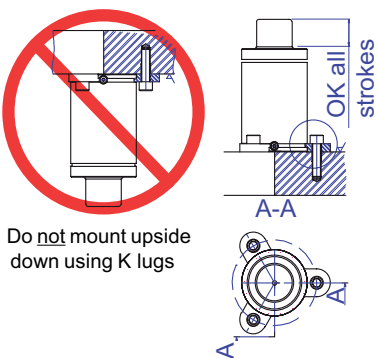
For: RM



For: FFC, FFX



For: K



Mounting method:

Top mount (FC, FCS, FCX, FK, FCSC, FCR, FCSX)

Gas spring orientations: Vertically upright = OK for all stroke lengths

Vertically upside down = OK up to 125 mm stroke (see **Warning!** below)

Cylinder hole clearance for cylinder diameters < Ø32

hole $\varnothing$ = cylinder $\varnothing$ + 0.5 to 1.0 mm

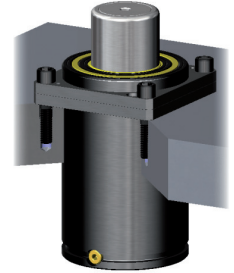
Cylinder hole clearance for cylinder diameters > Ø32

hole $\varnothing$ = cylinder $\varnothing$ + 0.5 to 2.0 mm

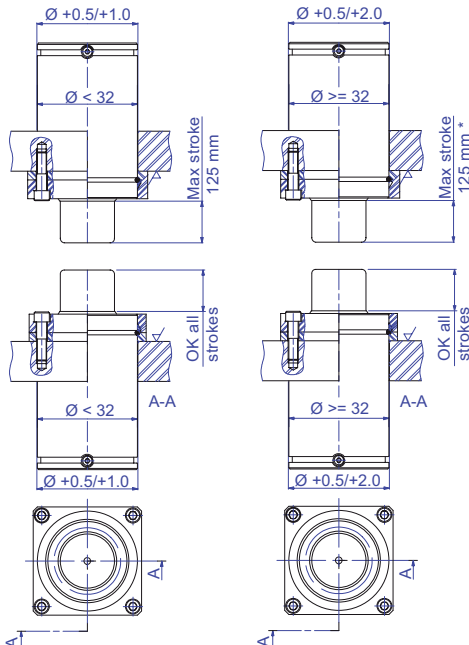
Link systems: FCSC is the preferred flange mount for linked systems as the gas spring is unable to rotate in the flange (see Note below).

Note! A small gap between flange halves is normal before the gas spring is clamped to the die using the mounting screws. Recent tolerance improvements between gas spring C-grooves and Top Mounts has, in some cases, eliminated the tendency for the gas spring to rotate within the flange. This now makes them more suitable for Link systems.

Warning! Depending on the stroke speed of the press, longer stroke gas springs are not generally recommended for upside down installations unless the FCSC flange mount is used. Top Mounts must never be installed in the die, whereby the mounting screws are required to support the full compression force of the gas spring when stroked (see below).

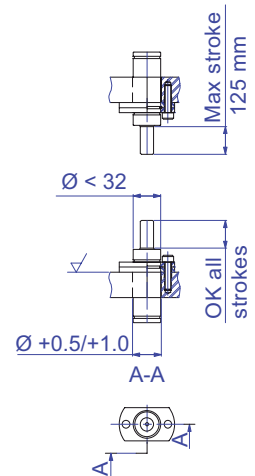


For: FC, FCS, FCX, FK, FCSC, FCSX

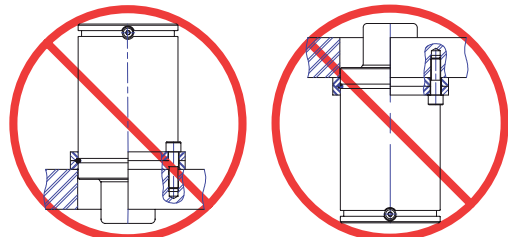


* **Note:** for the FCSC flange, upside down installation is OK for all stroke lengths

For: FCR



For: all Top mounts



Never let the mounting screws support gas spring compression forces

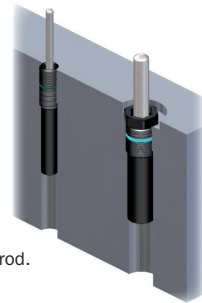
Mounting method:
Thread mount (including FRM, FTM)

Gas spring orientations: Vertically upright = OK for all stroke lengths
Vertically upside down = OK for all stroke lengths

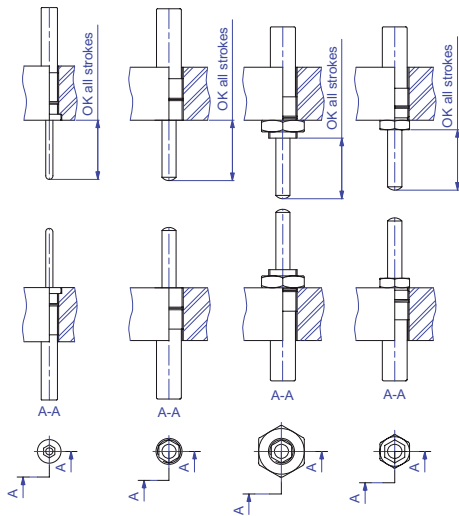
Link systems: it is possible to link thread mounted gas springs if there is sufficient access to the spring's charge port.

Note! It is important to always use the appropriate torque setting for the springs thread size when mounting the spring to the tool in order to prevent tool vibrations working the spring loose.

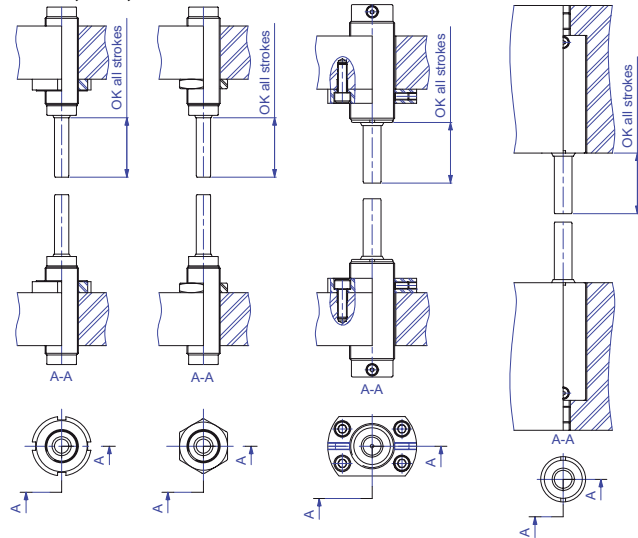
Use a dismountable thread locking compound and ensure that the compound do not touch the piston rod.



For: EP, EPS



For: FRM, FTM, TMS/XMS



Mounting method:

Body mount (S, SM, HM, FAC, SA, HMF)

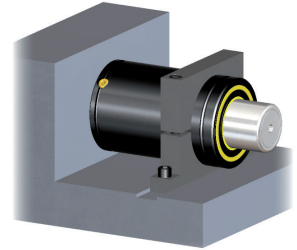
Gas spring orientations: suitable for all stroke lengths and all gas spring orientations from vertically upright through to upside down (see **Warning!** below).

Key grooves: Key-grooves should be used to either recess the Body Mount or to back up the Body Mount with an additional key, thus preventing gas spring compression forces exerting a shear stress on the mounting screws.

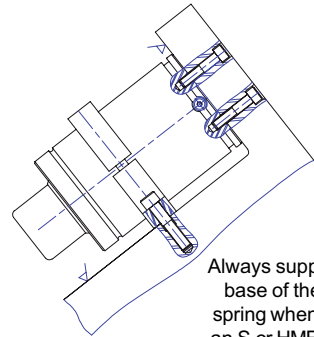
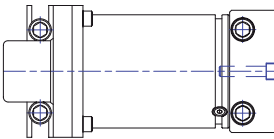
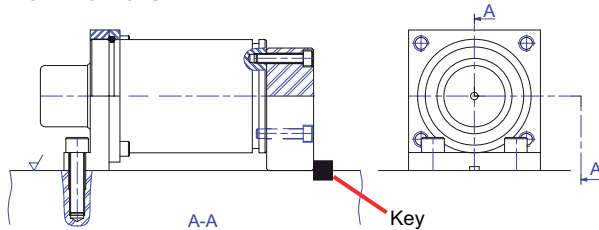
Link systems: this mounting method is very suitable for gas link systems, since the gas spring is unable to rotate.

Warning!

Always ensure the gas spring sits parallel with its mounting surface to minimise the risk of side loading.

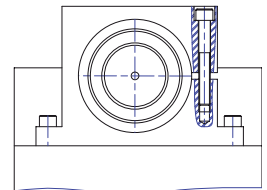
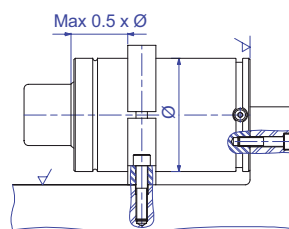


For: FAC with SA

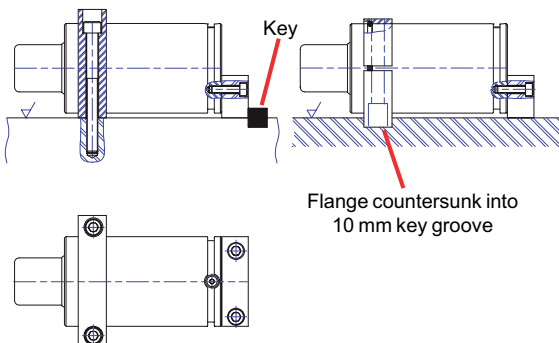


Always support the base of the gas spring when using an S or HMF mount

For: S, SM, HMF



For: HM, HMF



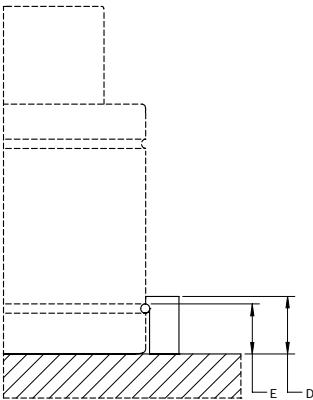
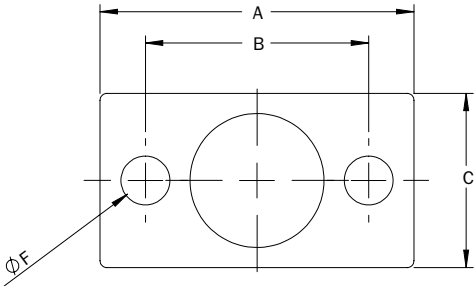
Flange countersunk into 10 mm key groove

BF

BF is a flange mount used to clamp the base of the gas spring to the tool by using the lower C-groove of the gas spring.



Order No.	A	B	C	D	E	F
BF-19	45	32	25	10	7	7

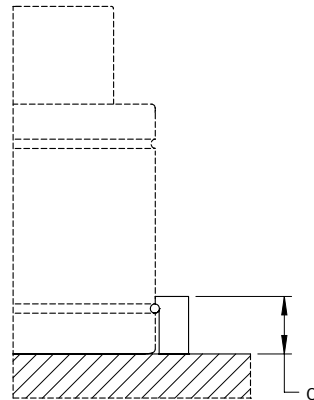
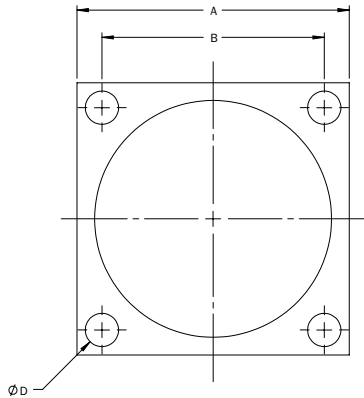


BFCU

BFCU is a flange mount used to clamp the base of the gas spring to the tool by using the lower C-groove of the gas spring.

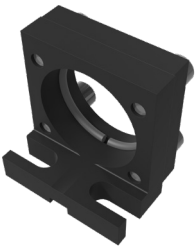


Order No.	A	B	C	D
BFCU-1000	52	40	14.5	7
BFCU4-1800	70	56.5	19.5	9
BFP-4700	90	73.5	24.5	11
BFP-7500	110	92	27.5	13
BFCU-11800	130	109.5	29.5	13
BFCU-18300	162	138	34.5	17.5

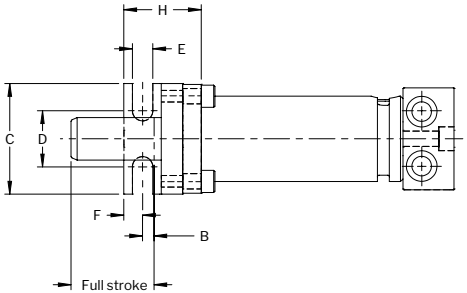
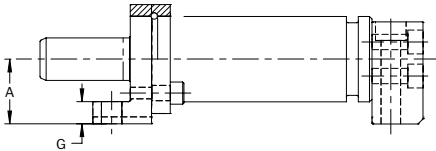
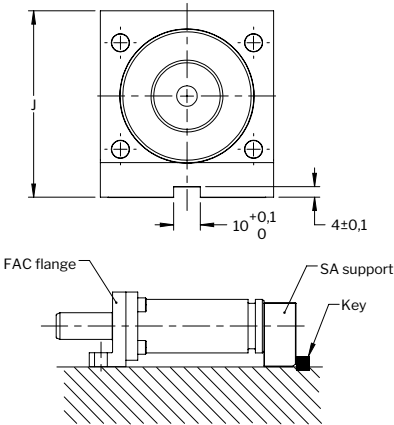


FAC

The FAC is a 90° angled, 2-piece flange for TU 750 – 5000. The flange is only to be used together with the SA support or any other support that supports the bottom of the spring. It is recommended to back the SA mount with a key.



Order No.	A	B	C	D	E	F	G	H	J
FAC-750	38	8	65	33	12	11	13	45.5	70
FAC-1500	57	11	90	37	15	14	19	53.5	101
FAC-3000	66.5	11	110	63	15	14	19	57.5	121
FAC-5000	79	11	140	88	18	14	19	59.5	149



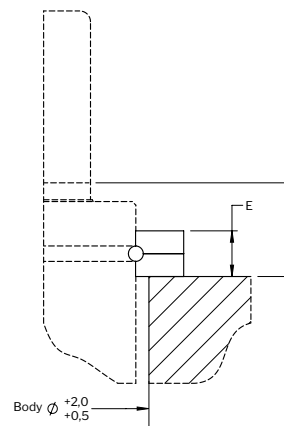
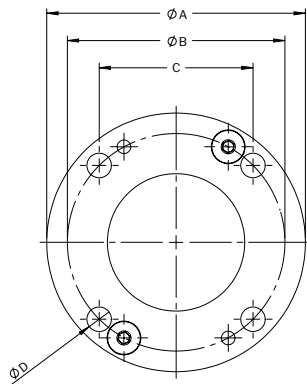
FC

FC is a round flange mount used to mount the gas spring in the upper C-groove.



Order No.	Spring size	A	B	C	D	E	F
FC-150		50	38	26.9	7	9	16 (CU4 420)* 21.5 (M2, X 320)*
FCN-150	M2, X 320	56	42	29.7	9	9	16 (CU4 420)* 21.5 (M2, X 320)*
FC-MC-150		60	49.5	35	7	9	16 (CU4 740)* 17 (MC3, MC3-SP, MT 300, X350, XG 350)*
FC-250		68	56.5	40	7	9	15 (CU4 1000)* 17 (MT 500, TU 250, X500, XG 500)*
FCN-250	TU 250, X/XG 50,0	70	56.6	40	9	9	15 (CU4 1000)* 17 (MT 500, TU 250, X500, XG 500)*
FC-500		86	70.7	50	9	13	22 (K 500)* 23 (MT 750, TU 500, TX 750, X750, XG 750, XF 750)*
FC-750		95	80	56.5	9	13	22 (K 750)* 24 (MT 1000, X 1000, XG 1000, XF 1000, LCF 750, TL 750, TU 750, TUS 750, TX 1000)*
XFC-1500	X/XG 1500	105	85	60	11	16	27
XFCJ-1500	X /XG 1500	122	104	73.5	11	16	27
FC-1500		122	104	73.5	11	16	29
FC-3000		150	130	92	13.5	18	33
FC-5000		175	155	109.5	13.5	21	33 (CU4 11800)* 36 (X 6600, XG 6600, LCF 5000, SPC 3000, TL 5000, TU 5000, TUS 5000, TX 6600)*
FC-7500		220	195	138	17.5	27	38 (CU4 18300)* 41 (LCF 7500, SPC 5000, TL 7500, TU 7500, TUS 7500, TX 9500, X 9500)*

*Mounts to this model/models

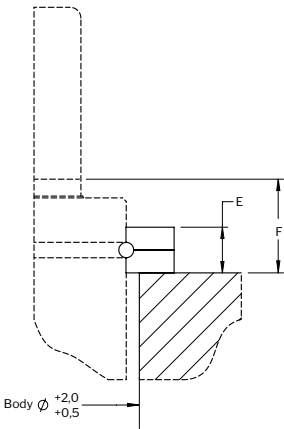
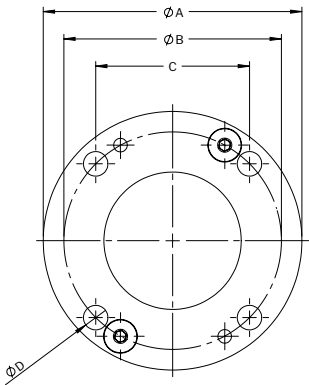


FC (R)

FC is a round flange mount used to mount the gas spring in the upper C-groove.



Order No.	A	B	C	E	F
FC-12	25	36	6.6	9	21.5
FC-15	27	37	6.6	9	21.5
FC-19	32	44	6.6	9	21.5



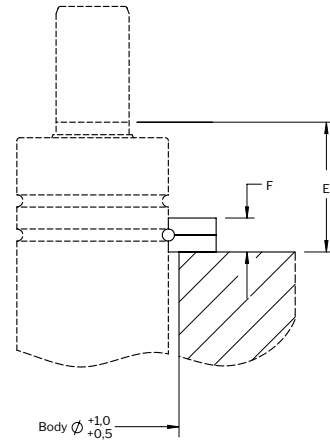
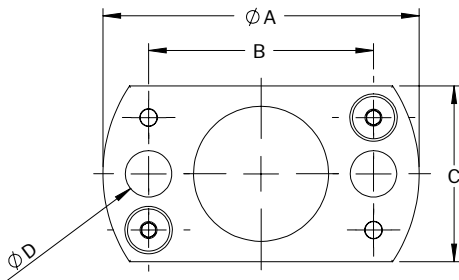
FCR

FCR is a rectangular flange mount used to mount the gas spring in the upper C-groove. FCR meets ISO 11901-2, VDI 3003, GM 90.25 and other standards



Order No.	A	B	C	D	E	F
FCR-12	34	24	21	6.6	21.5	9
FCR-15	37	27	24	6.6	21.5	9
FCR-19 VDI2	45	32	25	7	21.5	9
FCR-25	50	38	30	7	16/21.5*	9

*depending on gas spring model



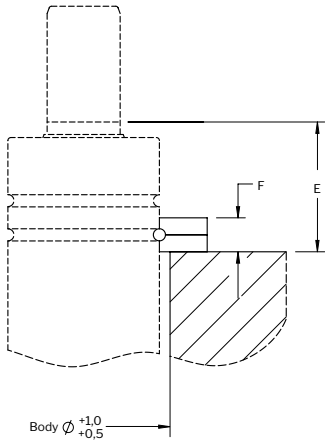
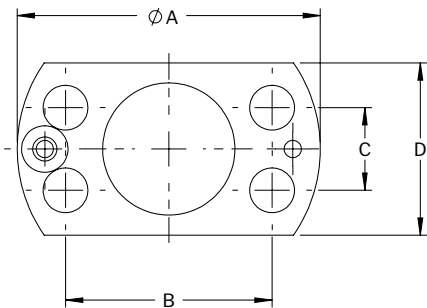
FCR ISO

FCR is a rectangular flange mount used to mount the gas spring in the upper C-groove. FCR meets ISO 11901-2, VDI 3003, GM 90.25 and other standards



Order No.	A	B	C	D	E	F	G
FCR-90	45	30	12	25	21.5	9	7
FCR-150	50	34	18	30	16 (CU4 420)* 21,5 (M2, X 320)*	9	7

*Mounts to this model/models



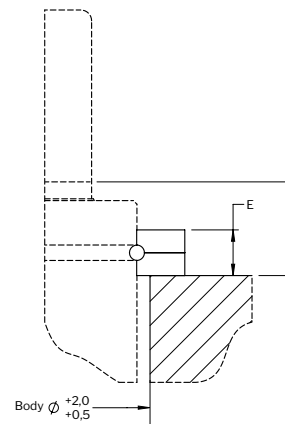
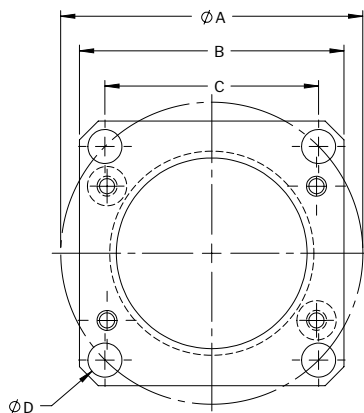
FCS

FCS is a square flange mount used to mount the gas spring in the upper C-groove. FCS meets the ISO 11901-2, VDI 3003, Ford WDX35-62, GM 90.25 and other standards.



Order No.	A	B	C	D	E	F
FCS-32	49.5	45	35	7	9	16 (CU4 740)* 17 (MC3, MC3-SP, MT 300, X 350, XG 350)*
FCS-250	56.5	52	40	7	9	15 (CU4 1000)* 17 (MT 500, TU 250, X 500, XG 500)*
FCS-500	70.7	64	50	9	13	22 (K 500)* 23 (MT 750, TU 500, TX 750, X 750, XG 750, XF 750)*
FCS-750	80	70	56.5	9	13	22 (K 750)* 24 (MT 1000, X1000, XG 1000, XF 1000, LCF 750, TL 750, TU 750, TUS 750, TX 1000)*
FCSX-1500	90.5	80	64	11	16	27
FCS-1500	104	90	73.5	11	16	29
FCS-3000	130	110	92	13.5	18	33
FCS-5000	155	130	109.5	13.5	21	33 (CU4 11800)* 36 (X 6600, XG 6600, LCF 5000, SPC 3000, TL 5000, TU 5000, TUS 5000, TX 6600)*
FCS-7500	195	162	138	17.5	27	38 (CU4 18300)* 41 (LCF 7500, SPC 5000, TL 7500, TU 7500, TUS 7500, TX 9500, X 9500)*
FCS-10000	240.4	210	170	17.5	27	47

*Mounts to this model/models



FCSC

Patent No. SE 521 352, EP 1 565 670, US 7,544,008

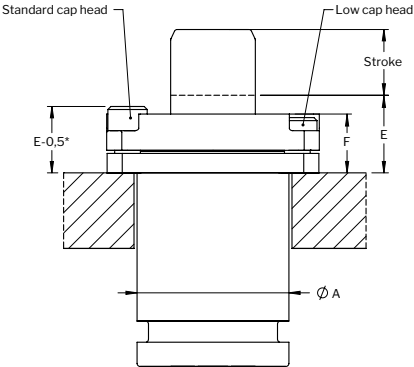
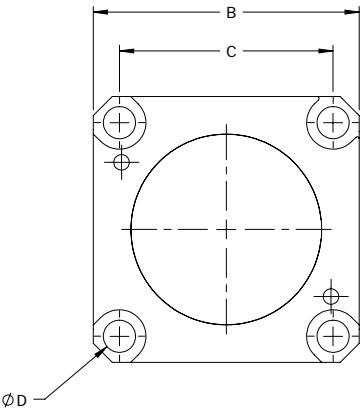
The FCSC Clamp Flange has a unique patented design that offers a very robust play-free connection between the gas spring and the mount. This play-free connection also prevents rotation of the gas spring. The FCSC Clamp Flange is especially suitable for gas springs that will be hoses together and/or are used in high-speed, long-stroke upside-down installations. The FCSC Clamp Flange is available for gas springs sizes from 500 up to 7,500.



Order No.	Spring size	A	B	C	D	E	F
FCSC-500	X 750, TU 500, TX 750, K 500	45	64	50	9	22 (K 500)* 23 (X 750, TU 500, TX 750)*	18.4
FCSC-750	X 1000, TU 750, TX 1000, K 750	50	70	56.5	9	22 (K750)* 24 (X 1000, TU 750, TX 1000)*	19.4
FCSCX-1500	CU4 2900, X 1500, TX 1500	63	80	64	10.5	27	23.9
FCSC-1500	X 2400, TU 1500, TX 2400	75	90	73.5	10.5	29	26
FCSC-3000	X 4200, TU 3000, TX 4200	95	110	92	12.5	33	30
FCSC-5000	CU4 11800, X 6600, TU 5000, TX 6600	120	130	109.5	12.5	33 (CU4 11800)* 36 (X 6600, XG 6600, LCF 5000, SPC 3000, TL 5000, TU 5000, TUS 5000, TX 6600)*	32.4
FCSC-7500	CU4 18300, X 9500, TU 7500, TX 9500	150	162	138	16.5	38 (CU4 18300)* 41 (LCF 7500, SPC 5000, TL 7500, TU 7500, TUS 7500, TX 9500, X 9500)*	38

*Mounts to this model/models

Note: The FCSC and FCS flanges are fully interchangeable if low head cap mounting screws (4x) are used. Using low head cap screws ensures the top of the screw is flush with the top of the flange. If normal head cap screws are used, the top of the screw will protrude from the top of the flange by 3 mm.



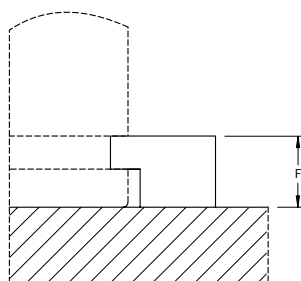
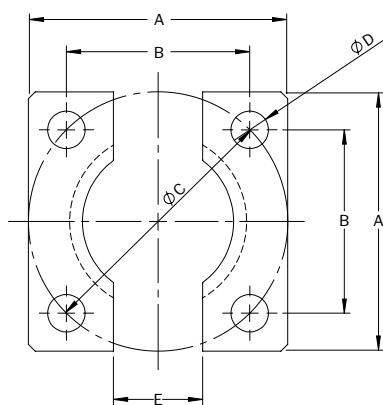
Low cap head screws are recommended
* If standard screws are used

FFC

FFC is a foot mount used to clamp the base of the gas spring to the tool by using U-groove of the gas spring. FFC meets the ISO 11901-2, VDI 3003, Ford WDX35-62, GM 90.25 and other standards.



Order No.	A	B	C	D	E	F
FFC-MC-150	50	35	49.5	7	12	6.5
FFC-250	55	40	56.6	7	12	6.5
FFC-500	70	50	70.7	9	20	6.5
FFC-750	75	56.5	80	9	24	12
FFX-1500	100	73.5	104	11	24	12
FFCX-1500	85	60	84.85	11	23	12
FFC-1500	100	73.5	104	11	24	12
FFC-3000	120	92	130	13.5	24	12
FFC-5000	140	109.5	155	13.5	24	12
FFC-7500	190	138	195.2	17.5	24	12
FFC-10000	210	170	240.4	17.5	24	13
FFC-XG-350	50	35	49.5	7	18	6.5
FFC-XG-500	55	40	56.6	7	18	6.5

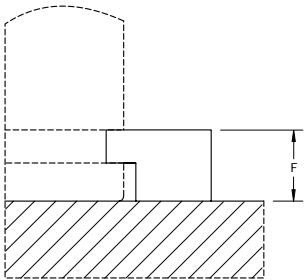
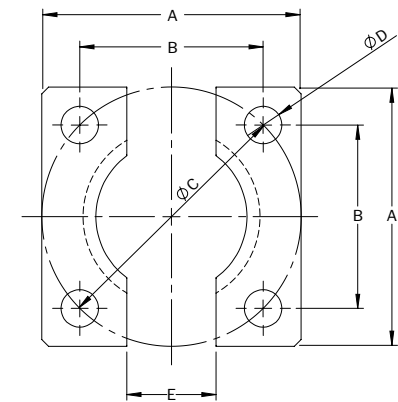


FFL

The FFL mount is of the same type as the FFC mount, but with external dimensions and hole pattern as the FSL mount.



Order No.	A	B	C	D	E	F
FFL-750	76.2	53.9	76.2	11	26	12
FFL-1500	101.6	76.2	107.8	13.5	26	12
FFL-3000	127	98.3	139	13.5	24	12
FFL-5000	139.7	114	161.7	13.5	24	12
FFL-7500	177.8	139.7	197.6	18	24	12



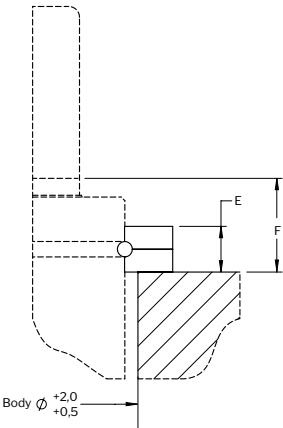
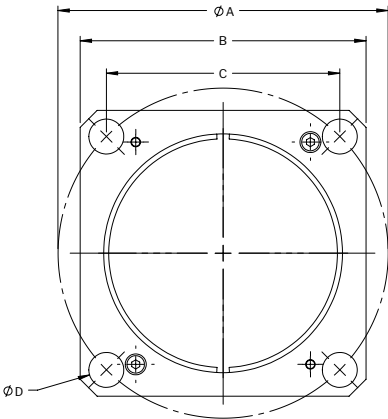
FK

FK is a square flange mount used to mount the gas spring in the upper C-groove.



Order No.	A	B	C	D	E	F
FK-1500	104	90	73.5	11	16	26 (CU4 4700)* 29 (K 1500)*
FK-1800	80	70	56.5	9	13	21
FK-3000	130	110	92	13.5	18	30

*Mounts to this model/models

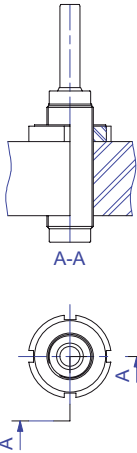
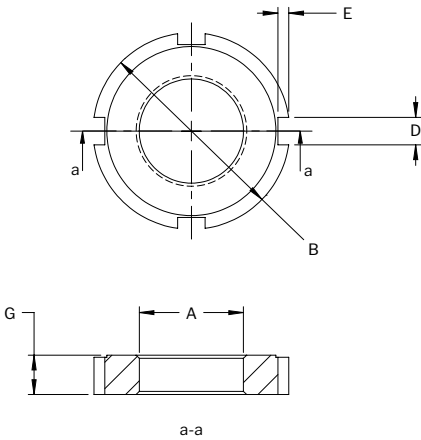


FRM

FRM is a slotted round lock nut, which meets the GM standard 90.25.99. The FRM lock nut is to be used on gas springs with an outer metric thread on the tube.



Order No.	A	B	D	E	G
FRM-16	M16x1.5	32	5	2	7
FRM-19	M24x1.5	42	6	2.5	9
FRM-150	M28x1.5	50	7	3	10
FRM-250	M38x1.5	58	8	3.5	11
FFL-7500	177.8	139.7	197.6	18	24



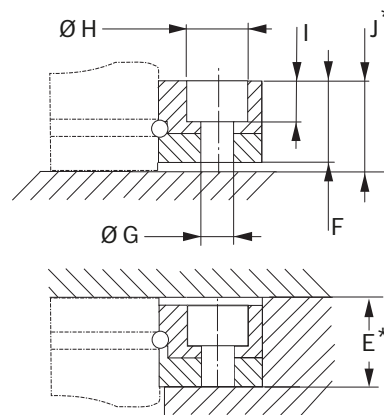
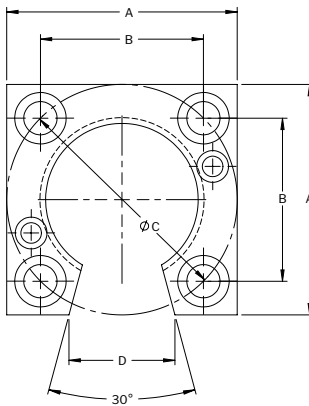
FSL

- The FSL flange type originally was developed to fit gas springs with a lower C-groove and consists of two halves with a lock ring between
- The FSL flange can be used for both upright and upside-down installations.
- The FSL flange can also be used on gas springs with a lower U-groove by using the additional FSL adapter ring.
- The FSL adapter ring is ordered separately and is to replace the standard lock ring included in the FSL flange.
- For “FSL Adapter Ring” see page 242.



Order No.	Spring size	A	B	C	D	E	F	G	H	I	J
FSL-750	TU 750, X 1000	76.2	53.9	76.2	35	25.7*	25	11	17	11	25.7*
FSLT-1500	X 1500	100	73.5	103.9	49	25.5*	24	11	18	10	25*
FSL-1500	TU 1500, X 2400	101.6	76.2	107.6	49	25.7*	25	13	20	13	25.7*
FSL-3000	TU 3000, X 4200	127	98.3	139	61	25.7*	25	13.5	20	13	25.7*
FSL-5000	TU 5000, X 6600	139.7	114.3	161.8	71	25.7*	25	13.5	20	13	25.7*
FSL-7500	TU 7500, X 9500	177.8	139.7	197.8	88	25.7*	25	18	26	17	25.7*

*approximate value



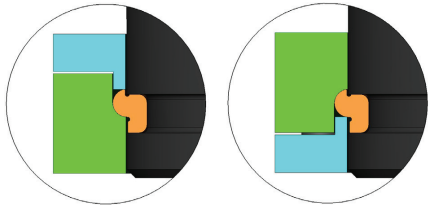
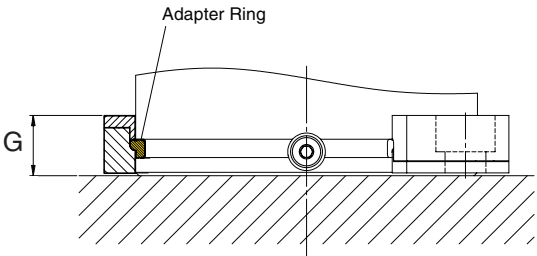
FSL Adapter ring

The FSL flange can also be used on gas springs with a lower U-groove by using the additional FSL adapter ring.
The FSL adapter ring is to replace the standard lock ring included in the FSL flange.

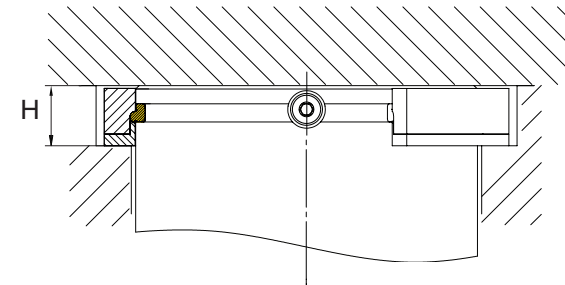


Order No.	FSL Adapter Ring size	Spring size	G*	H*
3020946	750	TU 750, X 1000	26	26
3027144	X 1500	X 1500	25.8	25.4
3020947	1500	TU 1500, X 2400	26	25.9
3020948	3000	TU 3000, X 4200	26	25.9
3020949	5000	TU 5000, X 6600	26	25.9
3020950	7500	TU 7500, X 9500	26.6	26.4

* approximate value



Important! FSL-Adapter Ring location
The location of the FSL-Adapter Ring should always be the same regardless of the orientation of the installed gas spring (standing upright or upside-down). Only the flange halves change position.



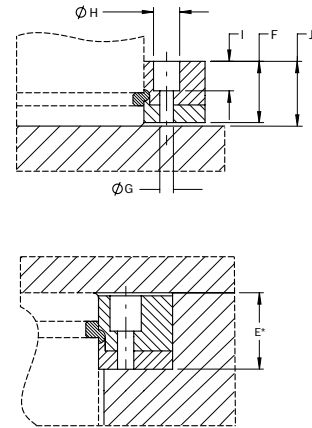
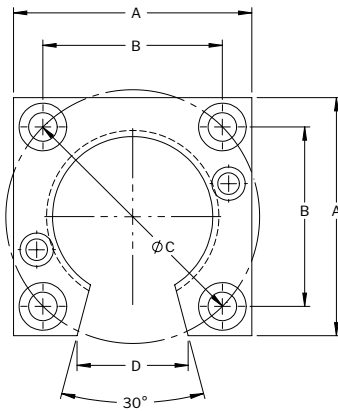
FSS

The FSS mount is of the same type as the FSL mount, but with external dimensions and hole pattern as the FFC mount. The FSS mount fits on gas springs with a lower U-groove. The FSL adapter ring is included in the FSS mount and does not need to be ordered separately. The FSS mount can be used for both upright and upside down installation. The FSS mount meets the Subaru standard SD116401.



Order No.	Spring size	A	B	C	D	E	F	G	H	I	J
FSS-750	TU 750, X/XG 1000	75	56.5	80	35	26*	25.5	9	15	10.5	26*
FSS-1500	TU 1500, X/XG 2400	100	73.5	104	49	26*	25.9	11	18	13	26*
FSS-3000	TU 3000, X/XG 4200	120	92	130	61	26*	25.9	13.5	20	13	26*
FSS-5000	TU 5000, X/XG 6600	140	109.5	155	71	26*	25.9	13.5	20	13	26*
FSS-7500	TU 7500, X 9500	190	138	195.2	88	26.4*	26.2	18	26	16	26.6*

*approximate value

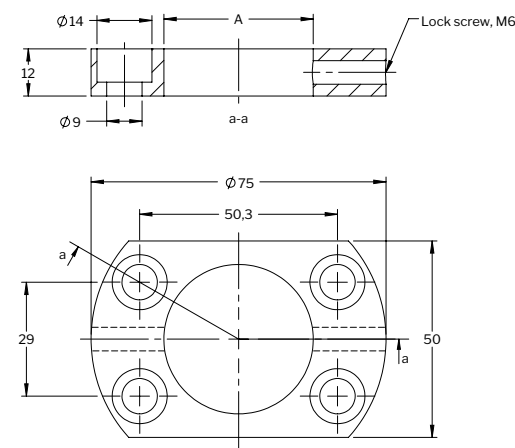


FTM

FTM is rectangular lock nut with lock screw. The FTM lock nut is to be used on gas springs with an outer metric thread on the tube.

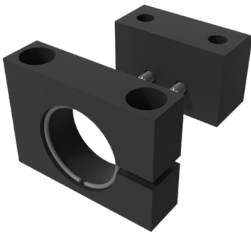


Order No.	A
FTM-250	M38x1.5



HM

HM (Horizontal Mount) is a mount for TU 750-3000 springs. This mount meets FORD WDX35-62-standard. 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 B). The support is supplied complete with screws for attaching the mount to the spring.



Order No.	A	B	C	D	E	F	G	H	J	K	L	M	P	Q	R
HM-250	74	54	29.5	12	40	60	54	23.9	16	15	9	9	20	10	38
HM-750	90	68	43	13	44	65	70	30	25	18	11	11	30	15	45
HM-1500	125	100	45	12	57	80	94	42	32	20	13.5	13.5	30	15	45
HM-3000	140	115	48	15	70	95	115	52.5	33	20	13.5	13.5	30	15	45

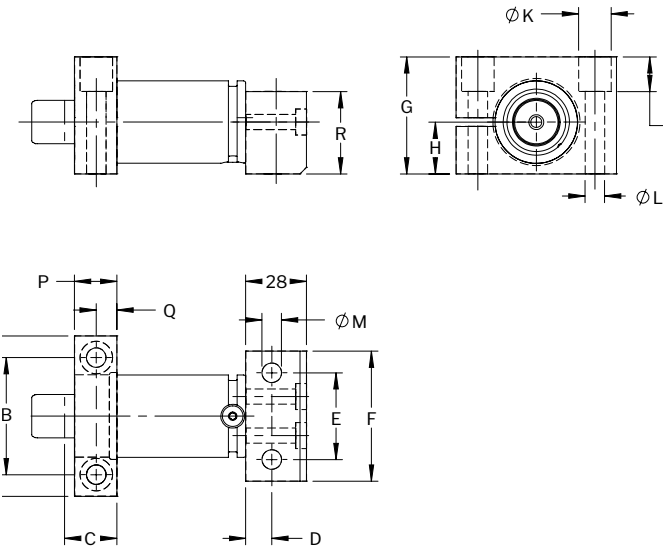


Fig. A

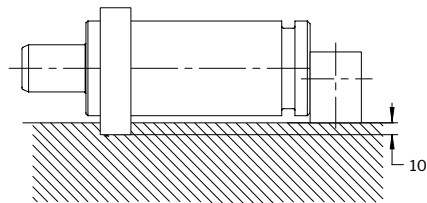
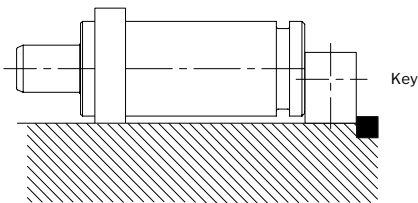
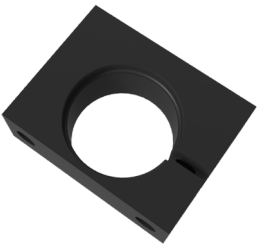


Fig. B



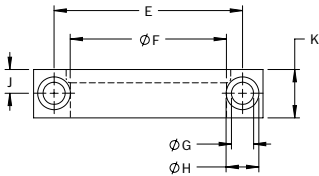
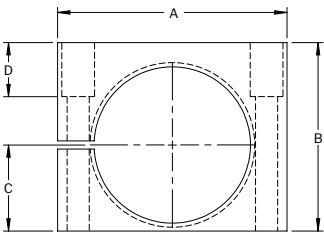
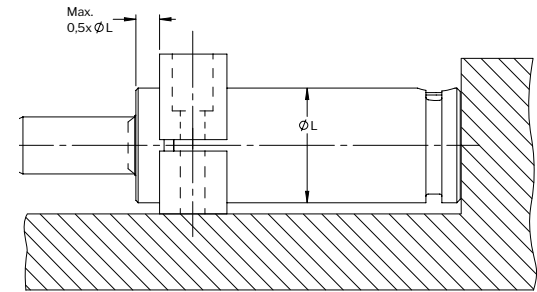
HMF

The HMF mount is a symmetric horizontal body mount similar to the S mount. The HMF mount meets the VDI 3003, Ford WD-X35-62 and GMDS 90.25.455 standard.



Order No.	A	B	C	D	E	F	G	H	J	K	L
HMF-150	68	48	20.9	10	50	32.1	9	15	10	20	31.9
HMF-250	74	54	23.9	16	54	38.1	9	15	10	20	38
HMF-500	80	60	27.5	22	60	45.4	9	15	10	20	45.2
HMF-750	90	70	30	25	68	50.4	11	18	15	30	50.2
HMF-X1500	108	82	36.5	27	84	63.4	11	18	15	30	63.2
HMF-1500	125	94	42	32	100	75.4	13.5	20	15	30	75.2
HMF-3000	140	115	52.5	33	115	95.4	13.5	20	15	30	95.2
HMF-5000	170	140	65	58	145	120.4	13.5	20	15	30	120.2
HMF-7500	200	170	80	68	175	150.4	13.5	20	15	30	150.2

Note! The base of the gas spring must always be supported when using the HMF mount.



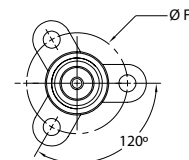
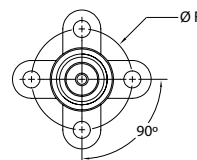
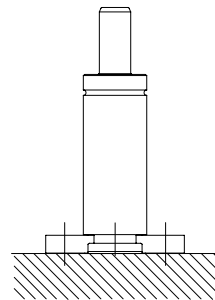
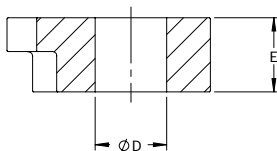
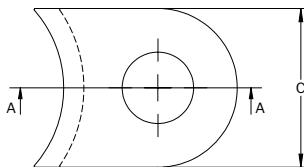
K-LUG

The K-lug is used to clamp the gas spring vertically upright to the tool. The gas spring can be clamped down using 2, 3 or 4 K-lugs. If only 2 lugs are used, then locking plate L must also be used to fix the gas spring. Note: When using locking plate L together with K-lugs, the spring cannot be hoses together as the L-plate will cover the gas charge port of the gas spring. Important! The K-lugs are only to be used to mount the spring vertically upright.



Order No.	Spring size	C	D	E	F
K-250	250 (X 500)	20	7	7	56.6
K-500	500 (X, TX 750)	25	9	7	70.7
K-750	750 (X, TX 1000)	30	13.5	14	80
KX-1500	X, TX 1500	30	13.5	14	92
K-1500	1,500 (X,TX 2400)	30	13.5	14	104
K-3000	3,000 (X, TX 4200)	40	17.5	14	130
K-5000	5,000 (X, TX 6600)	50	17.5	14	155
K-7500	7,500 (X, TX 9500)	50	21.5	14	195
K-10000	10,000 (X, TX 20 000)	58	21.5	15	240

Note: When ordering K-lugs for X/TX springs, a lug of smaller size than the spring must be used. For example, an X/TX 2400 spring requires lug K-1500.

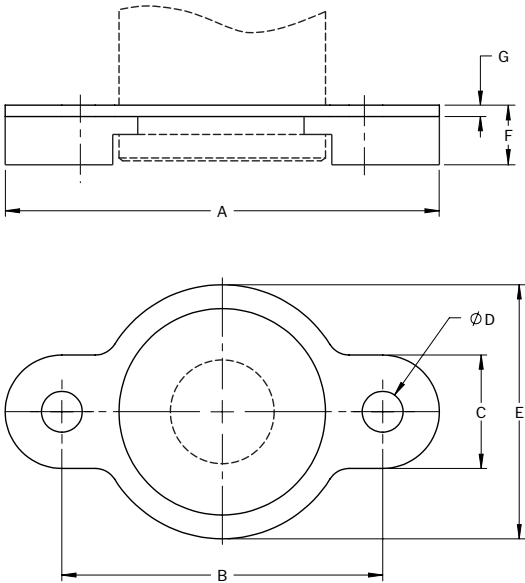


L

When fixing gas springs vertically using 2 K-lugs, locking plate L must be used at the same time to ensure that the spring will be fixed radially.

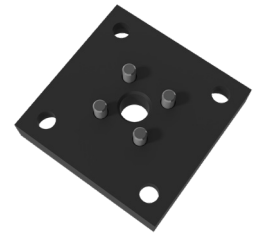


Order No.	A	B	C	D	E	F	G
L-250	76.6	56.6	20	7	48	9.5	2.5
L-500	95.8	70.7	25	9	56	9.5	2.5
L-750	110	80	30	13	61	16.5	2.5
LX-1500	122	92	30	13.5	74	16.5	2.5
L-1500	134	104	30	13	86	16.5	2.5
L-3000	170	130	40	17	106	16.5	2.5
L-5000	205	155	50	17	131	16.5	2.5
L-7500	245	195	50	21	170	16.5	2.5



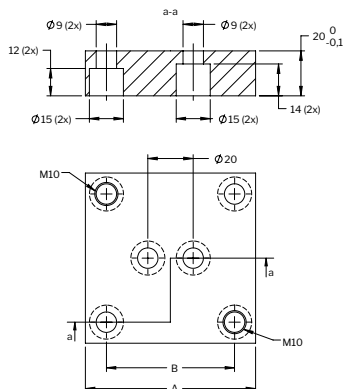
MP

MP is a square base mount to mount the gas spring to the tool by using the bottom threads of the gas spring into the tool. **MP** meets the ISO 11901-2, GM 90.25 and other standards.

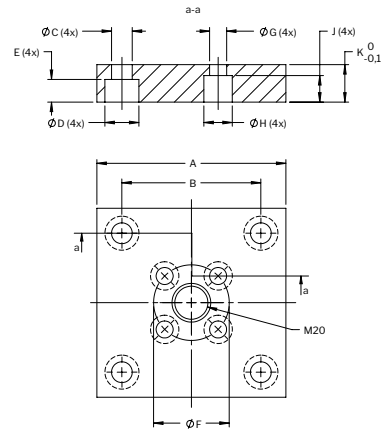


Order No.	A	B	C	D	E	F	G	H	J	K
MP-500	70	50	9	15	12	20	9	15	14	20
MP-750	75	56.5	9	15	12	20	9	15	14	20
MPX-1500	100	73.5	10.5	18	13	20	9	15	12	20
MP-1500	100	73.5	11	18	12	40	9	15	14	20
MP-3000	120	92	13.5	20	13	60	9	15	14	20
MP-5000	140	109.5	13.5	20	13	80	11	18	15	20
MP-7500	190	138	17.5	26	17	100	11	18	20	25
MP-10000	210	170	17.5	26	17	120	13.5	20	13	25

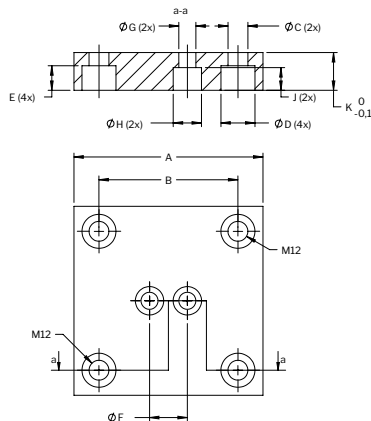
MP-500 MP-750



MP-1500 MP-3000 MP-5000 MP-7500 MP-10000



MPX-1500



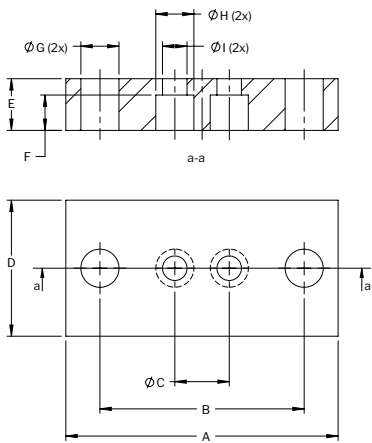
NMP

The NMP is a rectangular base mount, which meets the Nissan standard K32P0.

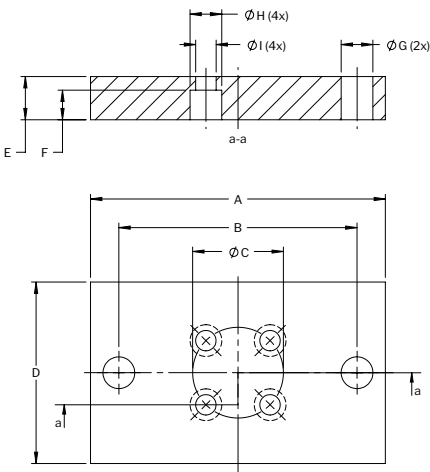


Order No.	Spring size	A	B	C	D	E	F	G	H	I
NMP-750	XG 750	90	70	20	45	16	10	9	14	9
NMP-1000	XG 1000	100	75	20	50	19	13	14	14	9
NMP-2400	XG 2400	130	105	40	80	19	13	14	14	9
NMP-4200	XG 4200	150	125	60	100	19	13	14	14	9

NMP-750 NMP-1000



NMP-2400 NMP-4200

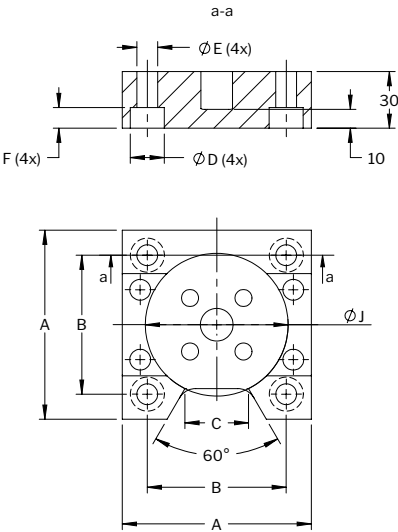


RM

The RM mount is a removable square mount for mounting the gas spring in the base. The RM mount is an alternative to an SW (Square Welded) mount, making it possible to keep a more flexible inventory. The RM mount meets the Ford W-DX35-80 North America standard.



Order No.	A	B	C	D	E	F	J
RM-750	80	56.5	21.1	18	11	11	50.2
RM-1500	100	73.5	33.7	18	11	11	75.2
RM-3000	120	92	43.2	20	13.5	13	95.2
RM-5000	140	109.5	55.7	20	13.5	13	120.2
RM-7500	190	138	70.7	26	18	17	150.2
RMX-750	70	50	21.2	15	9	11	45.2
RMX-1000	80	56.5	21.1	18	11	11	50.2
RMX-1500	100	73.5	33.7	18	11	11	63.2
RMX-2400	100	73.5	33.7	18	11	11	75.2



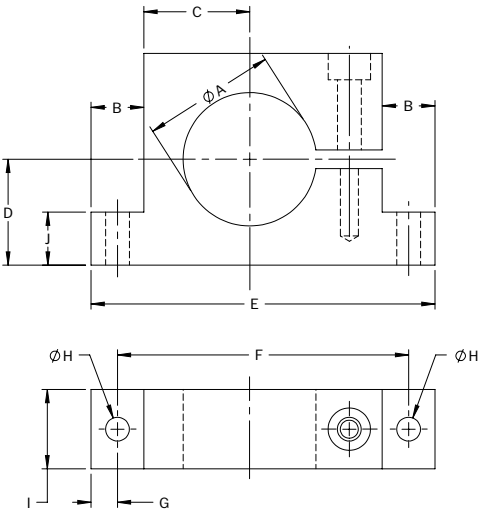
S

The S mount is a horizontal body mount allowing the gas spring to be installed in any orientation within the die.



Order No.	A	B	C	D	E	F	G	H	I	J
S-MC	32.1	18	22	22.5	90	72	9	8.5	20	15
S-250	38.1	18	24	27.5	95	77	8	9	20	15
S-500	45.4	17	29	30	100	82	9	9	20	15
S-750	50.4	20	40	40	130	110	10	9	30	20
S-1500	75.4	22.5	52.5	52.5	160	137	11.5	11	30	20
S-3000	95.4	25	67.5	62.5	195	170	12.5	13	30	20
S-5000	120.4	27.5	77.5	74	220	195	12.5	13	30	20
S-7500	150.4	30	95	100	260	230	15	13	30	20

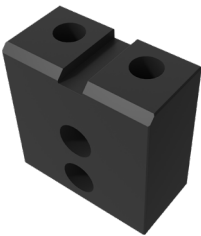
Note! The base of the gas spring must always be supported when using the S mount.



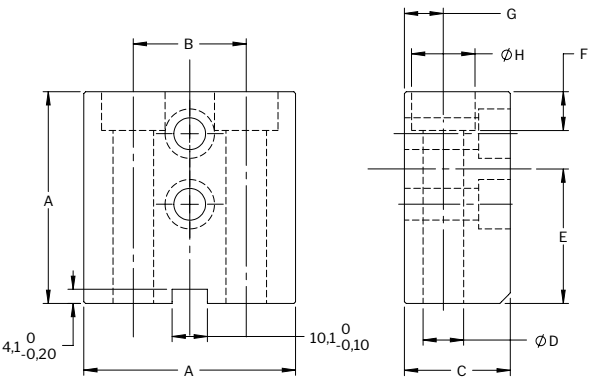
SA

The SA support can be fitted using the B mount option on TU springs and is normally used together with the FAC flange. The SA support is supplied complete with screws needed to mount the support to the spring.

It is recommended to back the SA mount with a key.

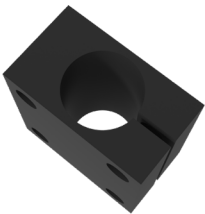


Order No.	A	B	C	D	E	F	G	H
SA-750	60	32	30	11.5	38	11	11	18
SA-1500	90	38	35	14.5	57	13	14	20.5
SA-3000	110	63.5	40	14.5	66.5	13	14	20.5
SA-5000	130	88.9	50	17.5	79	16	14	25

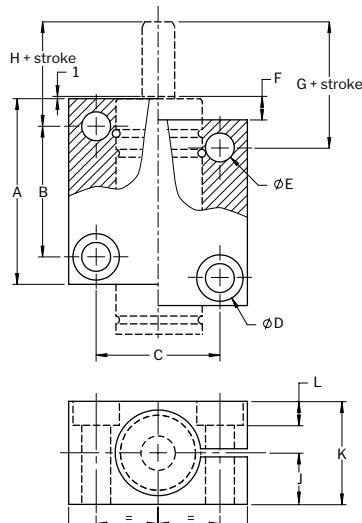


SM

SM is a body mount for the M2 gas spring.



Order No.	A	B	C	D	E	F	G	H	I	J	K	L
SM-150	54	38	37	13.5	9	6.5	14.5	9	52	15	30	7



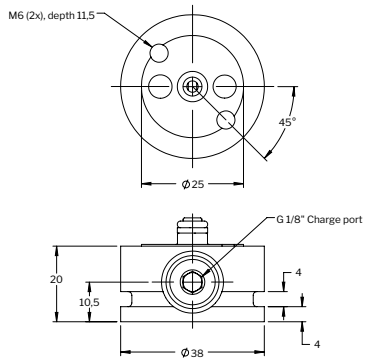
SP

SP is a Side Port plate for the CU4 spring used for connecting into a hoses or linked system.

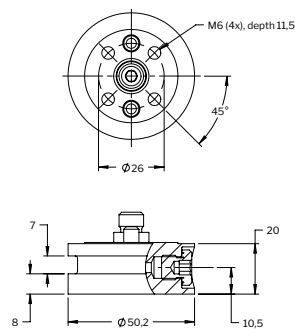


Order No.	B	C
SP-1000	25	38
SP-1800	26	50.2
SP-2900	34	63.2
SP-4700	40	75.2
SP-7500	52	95.2
SP-11800	68	120.2
SP-18300	90	150.2

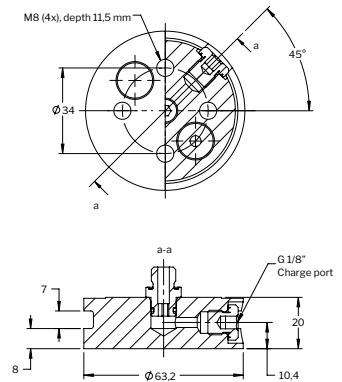
SP-1000



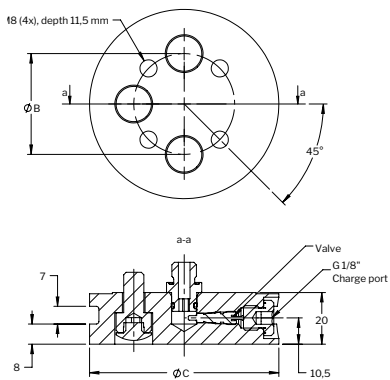
SP-1800



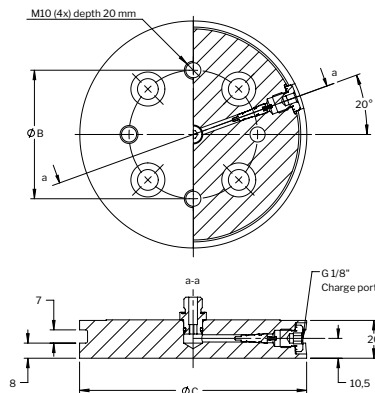
SP-2900



SP-4700, SP-7500



SP-1180, SP-18300



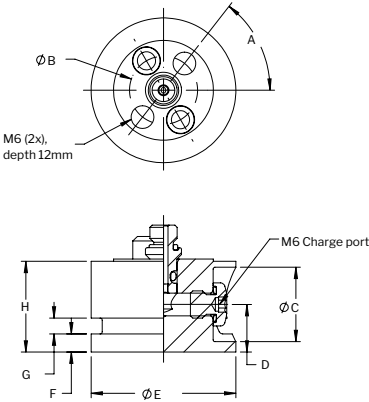
SPCX

SPCX is a Side Port plate for the CX spring used for connecting into a hoses or linked system

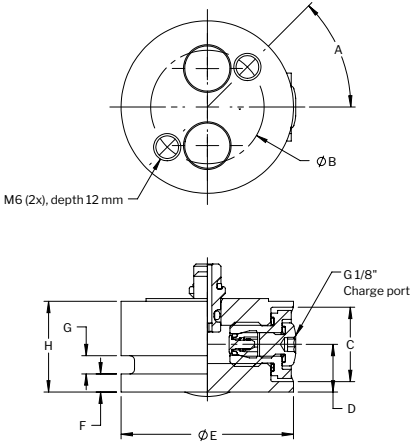


Order No.	A	B	C	D	E	F	G	H
SPCX-500	52	15	16.4	10.5	31.9	4	3.5	20
SPCX-1000	45	25	16.4	10.5	38	4	4	20
SPCX-1900	45	26	16.4	10.5	50.2	8	7	20

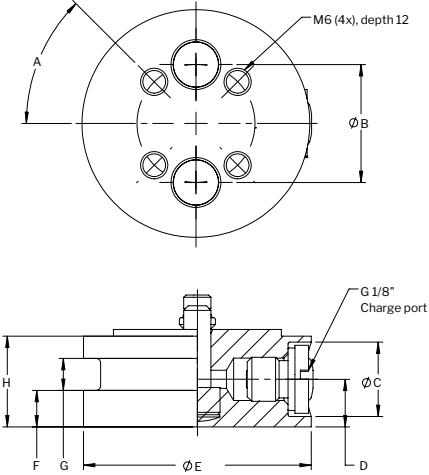
SPCX-500



SP-1000

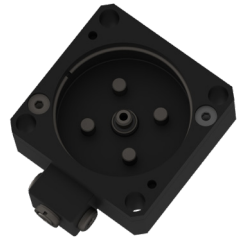


SPCX-1900

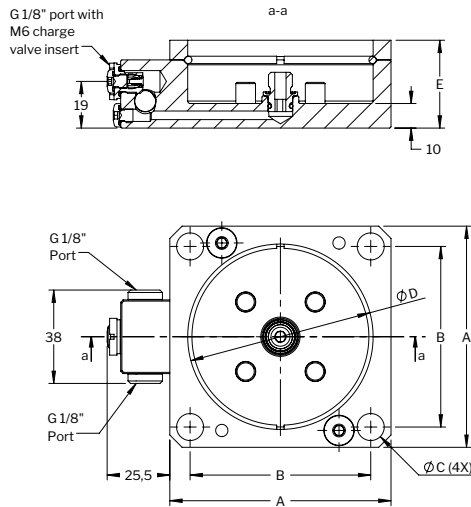


SPRM

SPRM is a Side Port Rear Mount for the CU4 spring (CU4 4700 - 18300) used for connecting into a hosod or linked system. The SPRM mount is included the Ford W-DX35-62 global standard.



Order No.	A	B	C	D	E
SPRM-75	90	73.5	11	75.2	36
SPRM-95	110	92	13.5	95.2	40
SPRM-120	130	109.5	13.5	120.2	43
SPRM-150	162	138	17.5	150.2	48



THE SAFER CHOICE

Introduced in 1983, the KALLER gas spring technology quickly led to worldwide demand. The Safer Choice – Training, Safety and Reliability – has always been a KALLER top priority for providing innovative solutions for the safer working environment. We recommend looking through all available KALLER features when selecting gas springs and gas or hose linked systems.



KALLER Safety App

SAFETY. Fake or KALLER original? With the KALLER Safety App you can identify and verify your specific KALLER gas springs.



Overstroke Protection System

SAFETY. When a gas spring is overstroked, this helps reduce the risk of tool damage or injury.



PED approved for a minimum of 2 million strokes

RELIABILITY. Our 2 million stroke PED approval ensures safer component cycle life.



Overload Protection System

SAFETY. Jammed cam or tool part being forced by gas springs? This will help reducing such risks.



Overpressure Protection System

SAFETY. Vents the spring if the internal gas pressure exceeds the maximum allowable limit to prevent accidents.



Flex Guide™ System

RELIABILITY. Prolongs service life, allows more strokes per minute, and offers greater tolerance to lateral tool movements.



Dual Seal™ Link Systems

RELIABILITY. Fewer production interruptions due to leakage caused by vibration. Simplified installation thanks to the non-rotation feature.



KALLER Training Program

TRAINING. Without doubt the KALLER Training Program is the best and most creative way to fully understand and appreciate the importance of the safety and reliability features.