

Gas Springs

Overview

Gas Springs

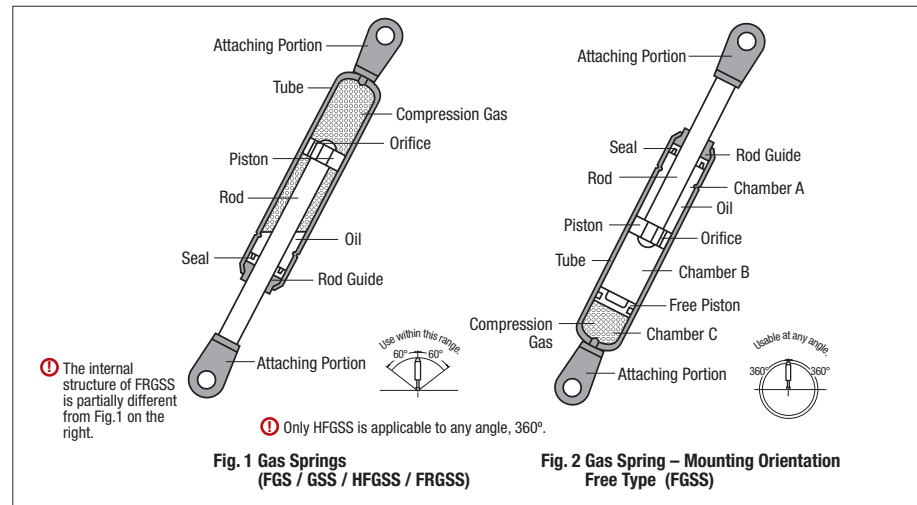
High pressure gas (Nitrogen gas: non-combustible) is sealed in a cylinder, and the gas reaction force is used as spring. Because this small gas spring receive small spring constant from large initial load despite its size, it can be used for wide range of applications including machines, furniture, cars, office automation equipments, etc.

Features

In spite of its size and weight, large spring (reaction) force can be obtained.

Spring (reaction) force is almost constant throughout its stroke.

Can be designed as required for wide applications.

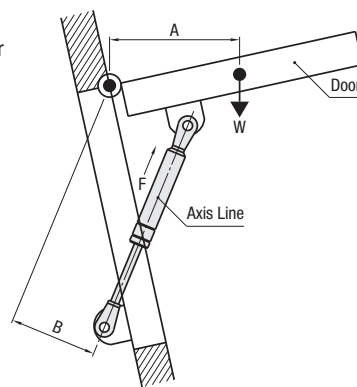


About Initial Selection

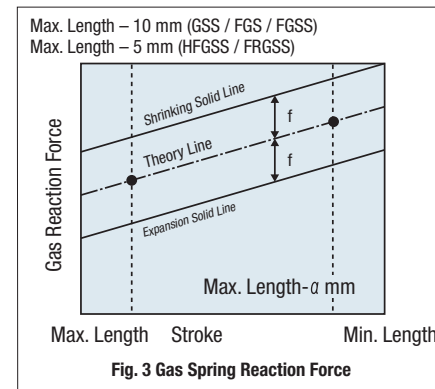
1. Calculate the necessary reaction force (F) through the following formula, then identify possible model types.

- $F = \frac{W \times A}{B}$
- F : Necessary reaction force (at max. length)
 - W : Weight of doors, etc.
 - A : Horizontal distance between fulcrum (door hinge, etc.) and the center of gravity
 - B : Vertical distance between fulcrum (door hinge, etc.) and the axis of gas spring

- Select Fx1.1 or more for the gas spring reaction force. Gas reaction forces may vary within about ±10%.
- If required reaction force (Fx1.1) is larger than the reaction force at the max. length of gas spring () mm, use two or more springs.
- Reaction forces are designed at 20°C. Reaction forces increase or decrease as the temperature changes.



Gas reaction force at the max. length (10 (5) mm and the max. length) mm are listed in this catalog. Since gas reaction force generally changes proportionately, if the gas reaction force on a certain stroke is required, connect the two points as shown in Fig. 3 with a straight line and read and conjecture the value on the stroke.



About Final Selection

Load may vary depending on door angles or gas spring mounting positions. Calculate the reaction force moment based on the subject design drawing.

Precautions for Use (for FGS, GSS, FGSS, HFGSS and FRGSS)

- Pay attention to temperature of gas springs during use. Do not store for prolonged duration. It will cause premature seal deterioration and reaction force decline. (Product temperature range: GSS, FGSS: -20-60°C, HFGSS: -20-80°C, FRGSS: -30-80°C)
- Gas reaction forces are slightly different among individual products and may change depending on the temperature.
- Reaction force may decrease depending on the operating condition and times of use. Please replace it when it cannot reach the necessary reaction force.
- Do not store or use in the environments where the rod rusts or in chemical atmosphere. Furthermore, do not paint the gas spring.
- Do not damage the cylinders and rods. Furthermore, do not apply forces like bending load and torsion etc.
- Do not extend gas springs beyond its max. length. Even in the max. stroke (during compression), it must remain about 10 mm away from the stroke end. Moreover, do not extend and compress at high speed (with 1 m/s or more).
- Use FGS and GSS with the cylinder side up and the rod side down, so that internal oil protects the rubber seal. For FGS, GSS and FRGSS, do not tilt more than 60 degrees. When storing temporarily, also do not tilt more than 60°.
- Although there is no restriction in the use angle for the FGSS and HFGSS, rod downward is recommended.

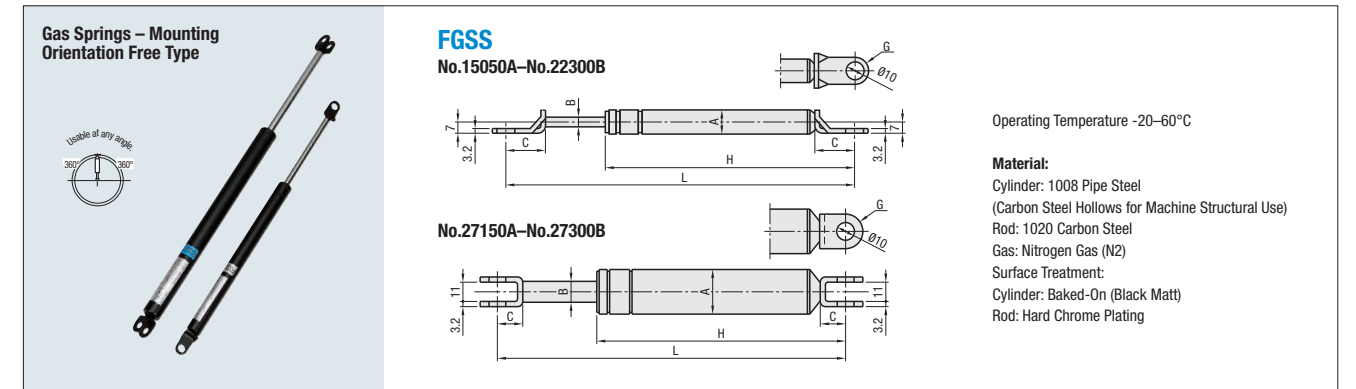
Features: Mounting Orientation Free Gas Springs (FGSS)

Gas Springs of Free Attachable

- Nitrogen gas (non-combustible) is sealed in the gas chamber C with a free moving piston intervening, and gas reaction force is used as a spring.
- Gas chamber C has a constant reaction force in extending direction since it pressurizes oil chamber AB. Therefore the size of reaction force depends on the inner pressure of gas chamber C.
- When rod moves from the predetermined position, oil in chamber AB moves through orifice hole of the piston.
- The rod volume change in the cylinder is adjusted by the change of gas chamber C.

Gas Springs

Free Mounting Orientation



Operating Temperature -20-60°C

Material:
Cylinder: 1008 Pipe Steel
(Carbon Steel Hollows for Machine Structural Use)
Rod: 1020 Carbon Steel
Gas: Nitrogen Gas (N2)
Surface Treatment:
Cylinder: Baked-On (Black Matt)
Rod: Hard Chrome Plating

Part Number	Max. Length (Lmax)	Min. Length (Lmin)	Stroke	Gas Reaction Force (20°C)				A	B	H	Applicable Mounting Bracket	Weight (g)	
				Lmax. -10mm Stroke		Lmax. -(S)mm Stroke							
				N	Fa	N	Fb						(S)
15050A	246	196	50	49	5	69	7	15	7	164	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	125	
15050K				70	7.1	90	9.1						40
15050B				98	10	127	13						70
15080A	330	250	80	49	5	69	7	18	8	253	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	150	
15080B				98	10	127	13						70
15090A				49	5	69	7						80
15090B	360	270	90	98	10	127	13	22	10	343	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	155	
15100A				49	5	69	7						90
15100B				98	10	127	13						90
18100A	386	286	100	196	20	255	26	18	8	253	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	170	
18100B				294	30	382	39						90
18150A				196	20	265	27						140
18150B	526	376	150	294	30	392	40	22	10	163	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	210	
22050A				196	20	265	27						40
22050B				294	30	402	41						40
22050C	246	196	50	392	40	529	54	22	10	217	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	215	
22050D				490	50	655	66						70
22080A				196	20	274	28						70
22080B	330	250	80	294	30	412	42	22	10	237	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	270	
22080C				392	40	539	55						70
22080D				490	50	675	68						70
22090A	360	270	90	196	20	265	27	22	10	253	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	280	
22090B				294	30	402	41						80
22090C				392	40	529	54						80
22090D	386	286	100	490	50	659	67	22	10	287	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	305	
22100A				196	20	274	28						90
22100B				294	30	412	42						90
22100C	440	320	120	392	40	549	56	22	10	287	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	320	
22120A				196	20	274	28						110
22120B				294	30	402	41						110
22120C	470	340	130	392	40	539	55	22	10	307	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	330	
22120D				490	50	672	68						120
22130A				196	20	274	28						120
22130B	526	376	150	294	30	402	41	22	10	343	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	400	
22130C				392	40	539	55						140
22150A				196	20	274	28						140
22150B	610	430	180	294	30	402	41	22	10	397	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	420	
22150C				392	40	539	55						170
22200A				196	20	265	27						170
22200B	666	466	200	294	30	402	41	22	10	433	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	480	
22200C				392	40	529	54						190
22250A				196	20	304	31						190
22250B	750	500	250	294	30	451	46	22	10	467	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	540	
22250C				392	40	598	61						240
22300A				196	20	323	33						240
22300B	850	550	300	294	30	490	50	22	10	517	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	600	
22300C				490	50	657	67						290
27150A				588	60	784	80						290
27150B	526	376	150	686	70	921	94	22	10	351	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	610	
27150C				490	50	657	67						140
27200A				490	50	657	67						140
27200B	666	466	200	588	60	784	80	22	10	441	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	760	
27200C				686	70	921	94						190
27250A				490	50	725	74						190
27250B	750	500	250	588	60	872	89	22	10	475	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	900	
27250C				686	70	1019	104						240
27300A				490	50	774	79						240
27300B	850	550	300	588	60	931	95	22	10	525	GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P2561)	1000	
27300C				588	60	931	95						290

For Mounting Brackets, refer to P2561-2562

