GAS SPRINGS
—GUIDE—

■Gas spring selection

Compact High load type

GSZ

Page	P.1013
Delivery	Quotation

Features Featuring high allowable eccentricity of 1° and high speed

Specification table

Outer diameter D (mm)	Stroke S (mm) 10	15	20	25	32	38	45	50	56	63	80	Initial load N {kgf}
19	—	●	●	●	●	●	●	●	●	●	●	1500 { 153}
25	—	●	●	●	●	●	●	●	●	●	●	3000 { 306}
32	●	●	●	●	●	●	●	●	●	●	●	5000 { 510}
38	●	●	●	●	●	●	●	●	●	●	●	10000 {1020}
50	●	●	●	●	●	●	●	●	●	●	●	20000 {2039}
63	●	●	●	●	●	●	●	●	—	●	●	30000 {3059}

GSX

Page	P.1015
Delivery	Quotation

Features Allowable eccentricity of 0.5° (up to 50mm stroke)

Specification table

Outer diameter D (mm)	Stroke S (mm) 10	15	20	25	32	38	45	50	56	63	80	Initial load N {kgf}
32	●	●	●	●	●	●	●	●	●	●	●	4750 { 484}
38	●	●	●	●	●	●	●	●	●	●	●	9030 { 921}
50	—	●	●	●	●	●	●	●	●	●	●	19000 {1937}
63	—	—	●	●	●	●	●	●	—	●	●	31000 {3161}

GSC/MGSC

Page	P.1017・1018
Delivery	Quotation

Features Super compact type with a shorter overall length than Standard

Specification table

Outer diameter D (mm)	Stroke S (mm) 10	15	20	25	32	38	45	50	56	63	80	Initial load N {kgf}
16	●	●	—	●	—	●	—	—	—	—	—	1000 { 102}
19	●	●	—	●	—	●	—	—	—	—	—	1700 { 173}
25	●	●	—	●	—	●	—	—	—	—	—	3600 { 367}
32	●	●	●	●	●	●	●	●	●	●	●	3750 { 382}
38	●	●	●	●	●	●	●	●	●	●	●	7500 { 765}
50	●	●	—	●	—	●	—	●	—	—	●	15000 {1530}

MGSA

Page	P.1019
Delivery	Quotation

Features Wide variety of stroke variations in a compact body (10-80mm)

Specification table

Outer diameter D (mm)	Stroke S (mm) 10	15	25	38	50	80	Initial load N {kgf}
19	●	●	●	●	●	●	800 { 82}
25	●	●	●	●	●	●	1600 {163}

MGSB

Page	P.1020
Delivery	Quotation

Features Small diameter screw-in type

Specification table

Outer diameter M (fine thread)	Stroke S (mm) 10	15	25	Initial load N {kgf}
12	●	●	—	400 {41}
16	●	●	●	800 {82}

GSSR

Page	P.1023
Delivery	Quotation

Features Piston rod return speed is adjustable

Specification table

Outer diameter D (mm)	Stroke S (mm) 25	38	50	80	Initial load N {kgf}
50	●	●	●	●	5000 {510}

Global Standard type

GSK

Page	P.1021
Delivery	Quotation

Features Equivalent to ISO. Product lineup featuring stroke length up to 300mm

Specification table

Outer diameter D (mm)	Stroke S (mm) 25	50	80	100	125	160	200	Initial load N {kgf}
38	●	●	●	—	—	—	—	2600 { 265}
45	●	●	●	●	●	●	—	4700 { 479}
50	●	●	●	●	●	●	●	7400 { 755}
75	●	●	●	●	●	●	—	15300 {1560}
95	●	●	●	●	●	●	—	29450 {3003}

PRECAUTIONS FOR THE USE OF GAS SPRINGS

—GUIDE—

■Precautions for the use of gas springs

If a gas spring is used under any of the conditions listed below, explosion of the spring or other malfunction may result in a major accident or in product trouble.
Be sure to read the following precautions before using gas springs.

■Danger prevention

①Never disassemble, weld, fuse, heat, or modify gas springs.
Gas springs contain high-pressure gas. Failure to observe this precaution may cause the internal parts to burst out.

②Gas recharge and pressure adjustment are not possible.
Attempting to do so may cause the spring to explode or result in other major accidents.

③The operating environment temperature range (temperature around the die) is 0 ～ 40℃. Use gas springs only within this range.
If gas springs are heated to 70℃ or higher, the spring may explode or other major accidents may occur.
Even if a major accident does not occur, the heat will deteriorate the gas seal, possibly resulting in gas leakage.
A clearance of approximately 1mm on each side of the spring is recommended in order to dissipate heat and prevent contact with the mounting holes.

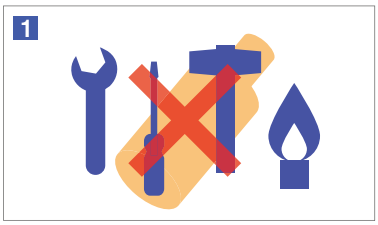
■Disposal method

④Wear protective goggles and discharge the gas from the cylinder before disposing of the spring.
Cut the mounting bolt hole all the way through and verify that the nitrogen gas is discharged completely before disposing.

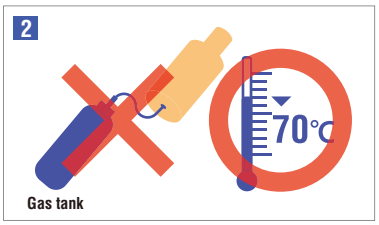
■Preventing gas leakage

⑤Do not use gas springs under any of the conditions listed below.
Failure to observe these precautions may result in gas leakage and other problems.
Moreover, a spring explosion or other major accident may occur.

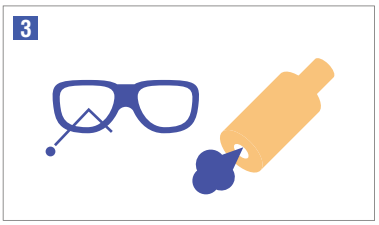
	Conditions of use that may cause problems	Resulting problem	Consequence
a	An oblique load or transverse load is applied.	Eccentric load and/or Spring damage	Gas leakage
b	Gas spring is not fixed with bolts.		
c	Sub-guides are not used or the number is insufficient.		
d	The load distribution is not even in all four directions inside the die.		
e	There is an obstruction which contacts the gas spring inside the die.		
f	The gas spring is fixed in place using the tap hole on the end of the piston rod.		
g	An extension pin is mounted on the end of the piston rod.		
h	The pressure on the piston rod is not applied to the entire surface.		
i	The piston rod contact face is deformed.		
j	The piston rod is cut.		
k	Welding spatter has adhered to the piston rod.	Seal damage	
l	Cutting particles or metal particles have adhered to the piston rod.		
m	The piston rod is dented.		
n	The shot limit is exceeded.		
o	A large amount of lubricant (especially chlorine-based lubricant) is applied.		
p	The gas spring is exposed to moisture, steam or chemicals.		
q	The gas has been recharged or the pressure has been adjusted.	Loss of durability	Gas leakage and/or explosion or other accidents
r	The gas spring is used at high temperatures (above 40℃) or low temperatures (below 0℃).		
s	Overstroking		
t	The cylinder has been ground.		
u	Conditions in which the piston rod is released abruptly.		
v	The gas spring is used or stored outdoors, or in a humid location.		
w	The gas spring is disassembled, welded, fused, heated, or modified.	Unexpected problems	
x	The gas spring is incorporated in a building or a vehicle.		
y	Other unintended uses (uses other than in a die)		



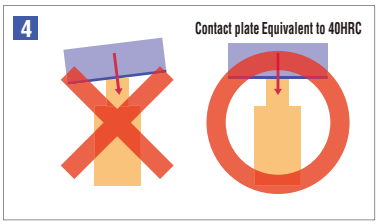
Do not attempt to disassemble, weld, fuse, heat, or modify the product.



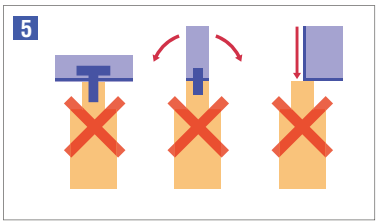
Do not recharge or adjust the gas pressure. Operating environment temperature range 0～40℃, gas spring surface temperature 70℃ or less.



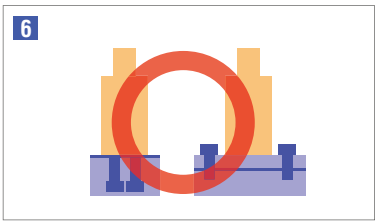
Wear safety goggles and discharge gas before disposal.



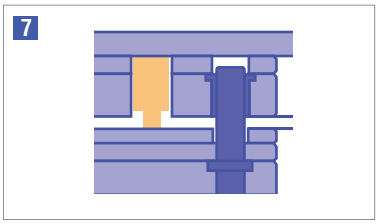
Do not apply oblique or transverse loads.



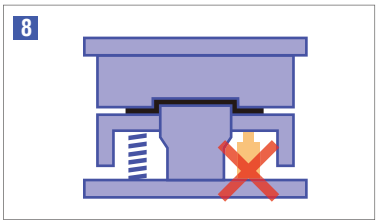
Do not use threaded hole at hole for fastening the spring. Do not use extension pin. Always apply pressure to the entire end surface.



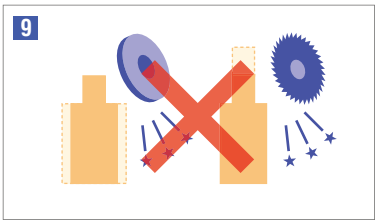
Fasten with bolts and flange.



Use sub guide pins to prevent eccentric loads.



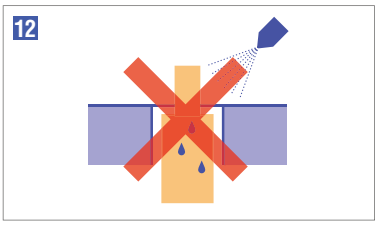
Equalize the load.



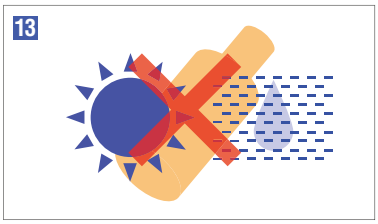
Do not grind the cylinder or cut the piston rod.

Be careful of weld spatters, cut particles, and metal particles.

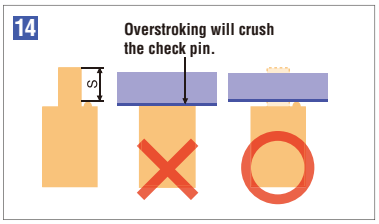
Do not exceed the shot limit.



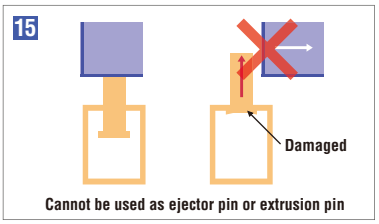
Do not apply excessive lubricant.



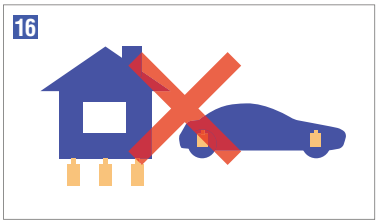
Do not use or store outdoors or at high humidity place.



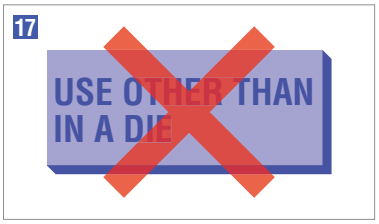
Do not overstroke.



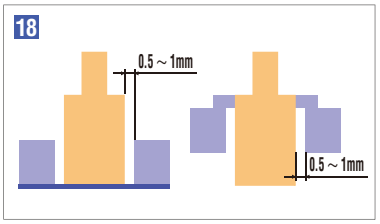
Do not allow the piston rod to be released abruptly.



Do not incorporate in a building or vehicle.



Do not use for applications other than dies.



Keep clearance 0.5～1mm per side

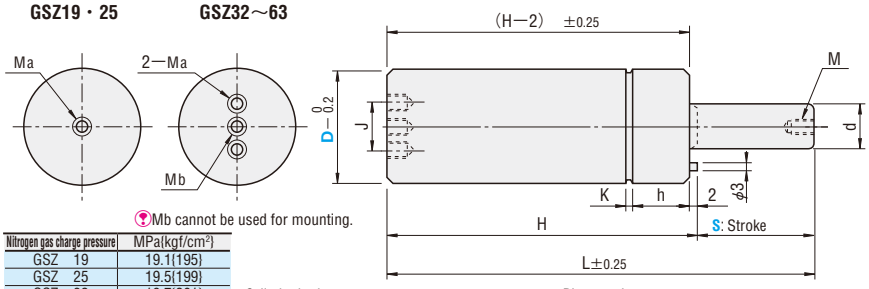
GAS SPRINGS

—HIGH ALLOWABLE ECCENTRICITY AND HIGH SPEED TYPE—

GSZ (Main body)
GSZH (HM plate set)
GSZF (FM plate set)

- If a gas spring is used in excess of the specified stroke range S, gas leakage will occur and the piston rod will not return. Make sure to use the gas spring within the specified stroke range so that it does not contact the overstroke check pin.
- ※For the specifications of plates, refer to the page at right.
- Do not fix the gas spring using the screw hole at the front end or install an extension pin. P.1012

GSZ19・25 **GSZ32～63**



- Mb cannot be used for mounting.

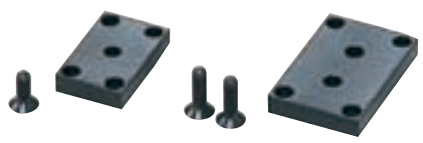
Nitrogen gas charge pressure	MPa{kgf/cm²}
GSZ 19	19.1{195}
GSZ 25	19.5{199}
GSZ 32	19.7{201}
GSZ 38	20.5{209}
GSZ 50	20.9{213}
GSZ 63	18.9{193}

Cylinder body
M Equivalent to SCM440
S Black oxide (Fe_3O_4)

Piston rod
M SACM645
H 1000HV ～(Surface)
S Nitriding+Barrel finishing

Weight (kg)	D	d	M	L	H	h	K	Ma Tap hole for mounting	Mb	J	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. D—S	Base unit price 1～9 pieces GSZ	GSZH	GSZF
0.10	19	10	M5× 7	85	70	23	2 (R1)	M6× 8	—	—	1500 {153}	2200{ 224}	GSZ (Main body)	19—15			
0.11				95	75							2400{ 245}		19—20			
0.11				105	80							2600{ 265}		19—25			
0.13				120	88							2700{ 275}		19—32			
0.14				135	97							2650{ 270}		19—38			
0.15				150	105							2650{ 270}		19—45			
0.16				160	110							2700{ 275}		19—50			
0.17				175	119							2700{ 275}		19—56			
0.19				190	127							2750{ 280}		19—63			
0.21				220	140							2800{ 286}		19—80			
0.21	25	14	M6× 8	85	70	23	2 (R1)	M6× 8	—	—	3000 {306}	5200{ 530}		25—15			
0.21				95	75							5300{ 540}		25—20			
0.23				105	80							5850{ 597}		25—25			
0.24				120	88							5900{ 602}		25—32			
0.26				135	97							5950{ 607}		25—38			
0.28				150	105							6000{ 612}		25—45			
0.29				160	110							6050{ 617}		25—50			
0.32				175	119							6050{ 617}		25—56			
0.35				190	127							6100{ 622}		25—63			
0.38				225	145							6150{ 627}		25—80			
0.32	32	18	M8×12	75	65	26	2 (R1)	M6× 8	M4× 8	15	5000 {510}	8000{ 816}		32—10			
0.32				85	70							8700{ 887}		32—15			
0.35				95	75							9400{ 959}		32—20			
0.36				105	80							9400{ 959}		32—25			
0.40				120	88							9500{ 969}		32—32			
0.43				135	97							9500{ 969}		32—38			
0.46				150	105							9600{ 979}		32—45			
0.48				160	110							9600{ 979}		32—50			
0.52				175	119							9700{ 989}		32—56			
0.58				195	132							9700{ 989}		32—63			
0.64				230	150							9800{ 999}		32—80			
0.44	38	25	M8×12	75	65	12	2 (R1)	M6× 8	M8× 8	20	10000 {1020}	17700{1805}	GSZH (HM plate set)	38—10	Quotation		
0.47				85	70							19000{1937}		38—15			
0.49				95	75							21000{2141}		38—20			
0.52				105	80							22000{2243}		38—25			
0.57				120	88							22500{2294}		38—32			
0.61				135	97							22500{2294}	GSZF (FM plate set)	38—38			
0.66				150	105							22800{2325}		38—45			
0.68				160	110							23000{2345}		38—50			
0.72				175	119							23100{2356}		38—56			
0.83				205	142							23100{2356}		38—63			
0.98				240	160							23100{2356}		38—80			
1.05	50	35	M8×12	90	80	13	4 (R2)	M8×12	M8×12	20	20000 {2039}	34000{3467}		50—10			
1.15				115	100							32000{3263}		50—15			
1.18				125	105							33500{3416}		50—20			
1.19				135	110							36000{3671}		50—25			
1.27				150	118							37000{3773}		50—32			
1.28				165	127							39000{3977}		50—38			
1.38				180	135							39500{4028}		50—45			
1.40				190	140							42000{4283}		50—50			
1.59				205	149							43500{4436}		50—56			
1.66				220	157							44000{4487}		50—63			
1.90				255	175							47000{4793}		50—80			
1.66	63	45	M8×12	95	85	12	5 (R2.5)	M8×12	M8×12	20	30000 {3059}	44000{4487}		63—10			
1.80				115	100							45000{4589}		63—15			
1.85				125	105							48000{4895}		63—20			
1.94				135	110							50000{5099}		63—25			
2.05				150	118							52000{5303}		63—32			
2.18				165	127							53000{5405}		63—38			
2.28				180	135							54000{5506}		63—45			
2.34				190	140							55000{5608}		63—50			
2.65				220	157							61000{6220}		63—63			
2.95				255	175							64000{6526}		63—80			

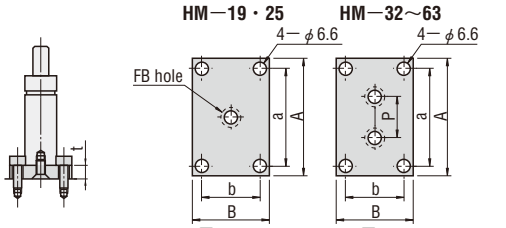
- The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%.
- ●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665
- ●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665
- When mounting GSZ32, 38, 50, or 63, be sure to use the Ma mounting holes and two bolts.



RoHS

GSZH (Set product)

HM (Plate only)

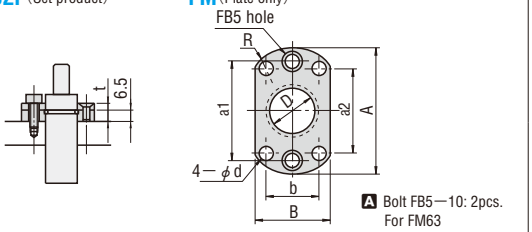


M SS400 S Black oxide (Fe_3O_4)

RoHS

GSZF (Set product)

FM (Plate only)



M S45C
S Black oxide (Fe_3O_4)

A Bolt FB5—10: 2pcs.
For FM63
FB5—12: 2pcs
Semicircle ring: 2pcs.

A Provided bolts	A	B	a	b	P	t	Catalog No.		Base unit price 1～9 pieces
FB6—16×1 piece	38	28	28	18	—	9	HM	19	Quotation
	44	28	34	18	—			25	
FB6—16×2 pcs.	51	32	41	22	15			32	
	57	38	47	28				38	
FB8—20×2 pcs.	69	50	59	40	20			50	
	84	65	70	50				63	

A	B	a_1	a_2	b	d	D	t	R	Catalog No.		Base unit price 1～9 pieces
44	28	33	28	18	6.6	19	11	22.0	FM	19	Quotation
50	30	38	34	18		25		25.0		25	
57	39	46	40	22		32		28.5		32	
63	46	53	45	26		38		31.5		38	
75	58	64	54	34		50		37.5		50	
98	76	86	74	40	9.0	63	13	49.0		63	

Order

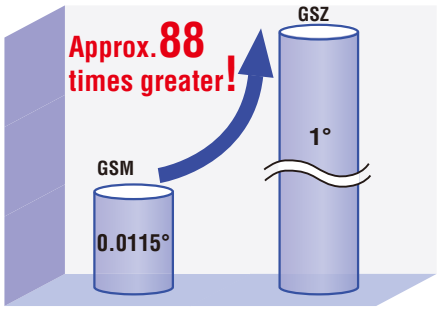
Catalog No.	
GSZ	32—25
GSZH	38—38
HM —	32

Days to Ship: Quotation

Price: Quotation

■Allowable eccentricity

Allowable eccentricity has been improved.



■Shot limit

	Stroke (mm)	10	15	20	25	32	38	45	50	56	63	80
GSZ	Shot limit (spm)	500	330	250	200	156	130	110	100	90	80	60

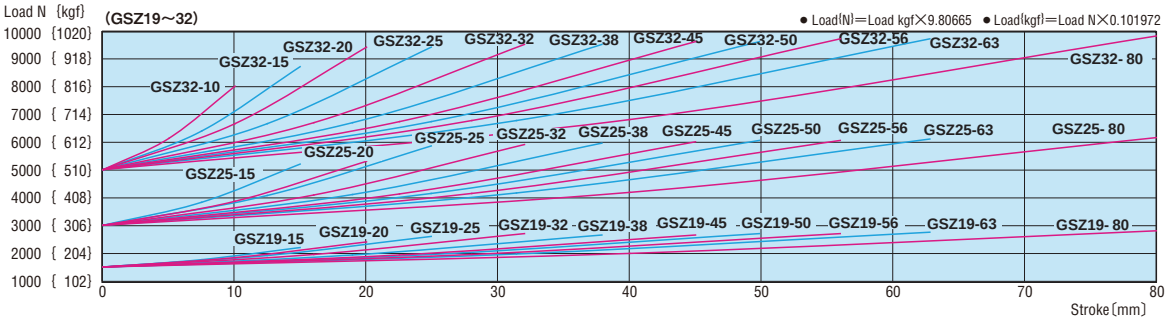
Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

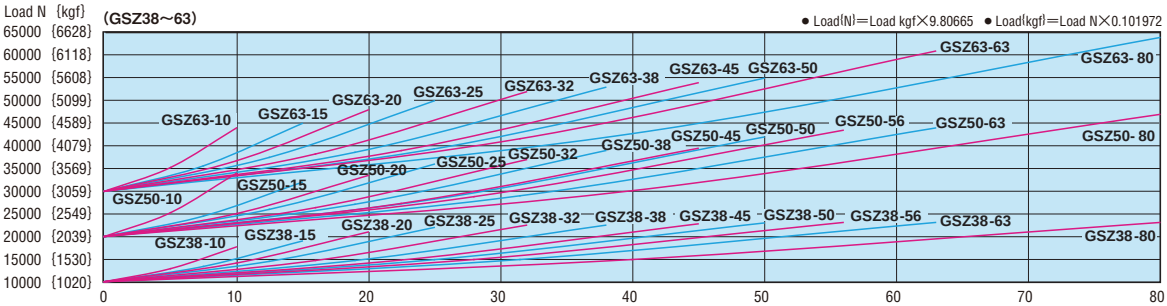
■Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

■GSZ load characteristic graph

This graph shows the quasi-static characteristics. Actual characteristics vary depending on temperature and operation speed.

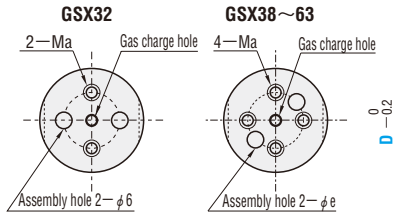




RoHS

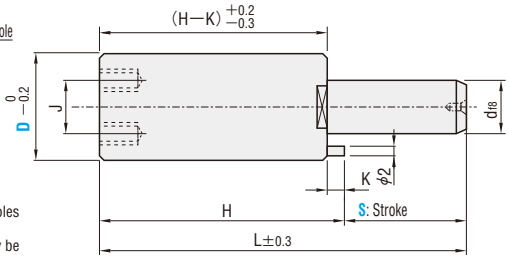
GSX

If a gas spring is used in excess of the specified stroke range S, gas leakage will occur and the piston rod will not return. Make sure to use the gas spring within the specified stroke range so that it does not contact the overstroke check pin.
※For the specifications of plates, refer to the page at right.



D	e
38	6
50	7
63	8

The gas charging hole and assembly holes cannot be used for product mounting. The assembly holes will not necessarily be aligned with the spanner grooves.



Nitrogen gas charge pressure	MPa{kgf/cm²}
GSX32	18.7{191}
GSX38	18.4{188}
GSX50	19.2{196}
GSX63	19.2{196}

Components	Cylinder body	Piston rod
M	Equivalent to S45C	SCM435
H	—	750HV～(Surface)
S	Black oxide (Fe_3O_4)	Hardening＋Polishing finish

Weight (kg)	D	d	L	H	Ma Tap hole for mounting	J	K	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. D—S	Base unit price 1～9 pieces
0.30	32	18	75	65	M6×9	15	2	4750 {484}	7200{ 734}	GSX	32–10	
0.32			85	70					8000{ 816}		32–15	
0.34			95	75					8300{ 846}		32–20	
0.35			105	80					8600{ 877}		32–25	
0.39			120	88					8700{ 887}		32–32	
0.42			135	97					8850{ 902}		32–38	
0.43			145	100					9000{ 918}		32–45	
0.45			155	105					9250{ 943}		32–50	
0.49			170	114					9300{ 948}		32–56	
0.51			185	122					9300{ 948}		32–63	
0.57			220	140					9350{ 953}		32–80	
0.41	38	25	75	65	M6×9	20	2	9030 {921}	15000{1530}		38–10	
0.44			85	70					17200{1754}		38–15	
0.47			95	75					17800{1815}		38–20	
0.49			105	80					18400{1876}		38–25	
0.55			120	88					18800{1917}		38–32	
0.59			135	97					19100{1948}		38–38	
0.60			145	100					19500{1988}		38–45	
0.62			155	105					19700{2009}		38–50	
0.67			170	114					19700{2009}		38–56	
0.70			185	122					19800{2019}		38–63	
0.80			220	140					19900{2029}		38–80	
0.90	50	35	110	95	M8×12	25	3	19000 {1937}	24000{2447}		50–15	
0.93			120	100					25000{2549}		50–20	
0.98			130	105					26000{2651}		50–25	
1.05			145	113					27000{2753}		50–32	
1.09			155	117					28000{2855}		50–38	
1.14			170	125					28500{2906}		50–45	
1.19			180	130					29000{2957}		50–50	
1.29			195	139					30000{3059}		50–56	
1.30			205	142					30500{3110}		50–63	
1.45			240	160					31500{3212}		50–80	
1.61	63	45	120	100	M8×12	35	3	31000 {3161}	42500{4334}		63–20	
1.64			130	105					43500{4436}		63–25	
1.75			145	113					45500{4640}		63–32	
1.80			155	117					47000{4793}		63–38	
1.91			170	125					48000{4895}		63–45	
1.93			180	130					49000{4997}		63–50	
2.12			205	142					51000{5201}		63–63	
2.34			240	160					52500{5354}		63–80	

Quotation

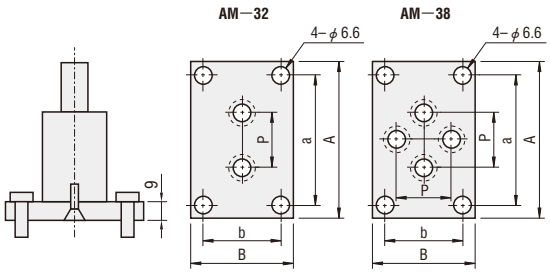
The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%.
●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665 ●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

Order — Catalog No. GSX 32—38 AM—32

Days to Ship — Quotation

Price — Quotation

AM (Plate only)



A Provided bolts	A	B	a	b	P	Catalog No.		Base unit price 1～9 pieces
FB6—16×2 pcs.	51	32	41	22	15	AM	32	Quotation
FB6—16×4 pcs.	57	38	47	28	20		38	

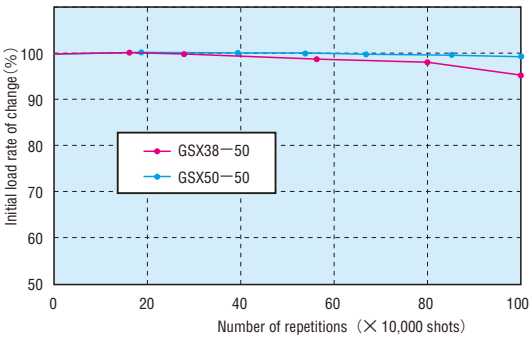
It is recommended that thread locking compound be applied to the bolts before they are used.

■Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

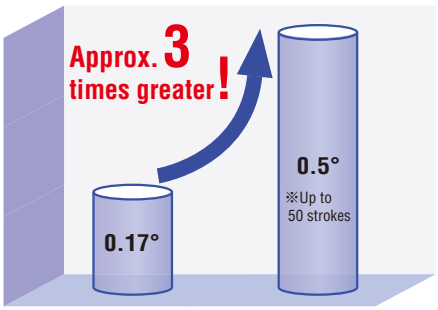
■Endurance test results

Catalog No.	GSX38—50	GSX50—50
Amplitude	48mm	48mm
Excitation speed	50spm	50spm
Mounting direction	Tilt 0.5°	Tilt 0.5°
Cooling method	Forced air cooling	Forced air cooling



■Allowable eccentricity

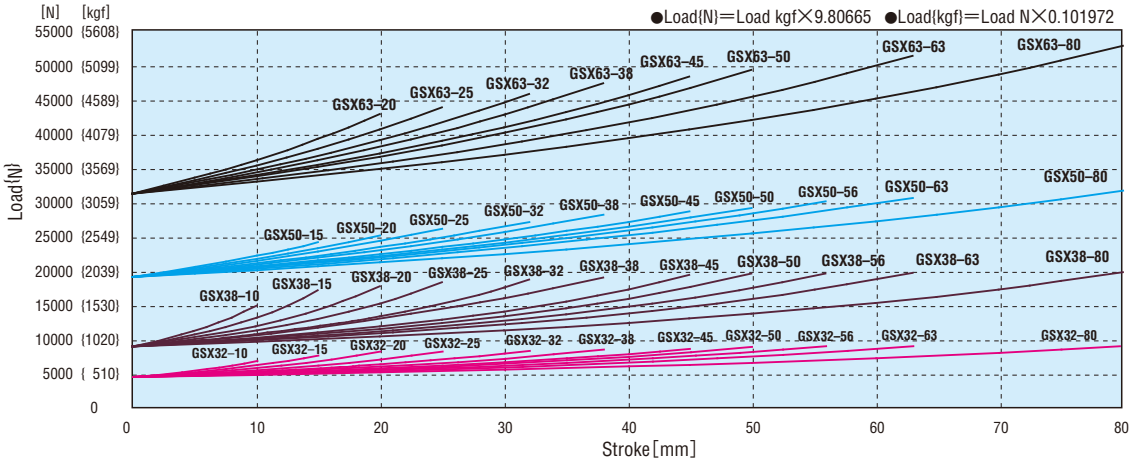
Allowable eccentricity has been improved.



※Strokes 56, 63 and 80 are 0.3°.

■GSX load characteristic graph

This graph shows the quasi-static characteristics. Actual characteristics vary depending on temperature and operation speed.



■Shot limit

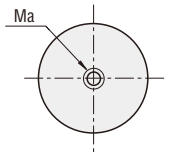
	Stroke (mm)	10	15	20	25	32	38	45	50	56	63	80
GSX	Shot limit (spm)	220	165	125	100	75	65	55	50	45	40	35

Shot limit: Number of shots per minute

The shot limit may be affected by the operating environment. The figures shown here are for reference only.

RoHS

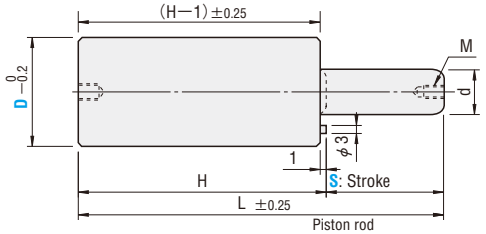
GSC (Main body)
GSCB (BM plate set)



Nitrogen gas charge pressure	MPa{kgf/cm²}
GSC 32	14.7{150}
GSC 38	19.7{201}
GSC 50	21.2{216}

If a gas spring is used in excess of the specified stroke range S, gas leakage will occur and the piston rod will not return. Make sure to use the gas spring within the specified stroke range so that it does not contact the overstroke check pin.

Do not fix the gas spring using the screw hole at the front end or install an extension pin. P.1012



Cylinder body
M Equivalent to SCM440
S Black oxide (Fe_3O_4)

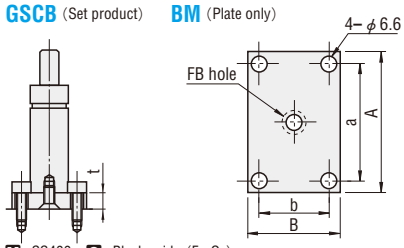
Piston rod
M SACM645
H 1000HV～(Surface)
S Nitriding＋Barrel finishing

Weight (kg)	D	d	M	L	H	Ma Tap hole for mounting	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. D—S	Base unit price 1～9 pieces GSC	Base unit price 1～9 pieces GSCB
0.21	32	18	—	55	45	M6×8	3750 {382}	6710{ 684}	GSC (Main body)	32–10	Quotation	
0.23			M6×8	65	50			6750{ 688}		32–15		
0.24				75	55			6800{ 693}		32–20		
0.26				85	60			6860{ 700}		32–25		
0.28				100	68			6900{ 704}		32–32		
0.30				111	73			6940{ 708}		32–38		
0.32				125	80			6950{ 709}		32–45		
0.33				135	85			6980{ 712}		32–50		
0.36				150	94			7000{ 714}		32–56		
0.38				165	102			7000{ 714}		32–63		
0.43				195	115			7000{ 714}		32–80		
0.29	38	22	—	55	45	M8×12	7500 {765}	13500{1377}	GSCB (BM plate set)	38–10		
0.32			M6×8	65	50			13880{1415}		38–15		
0.34				75	55			14000{1428}		38–20		
0.36				85	60			14030{1431}		38–25		
0.39				100	68			14100{1438}		38–32		
0.42				111	73			14100{1438}		38–38		
0.45				125	80			14200{1448}		38–45		
0.47				135	85			14250{1453}		38–50		
0.49				150	94			14300{1458}		38–56		
0.53				165	102			14300{1458}		38–63		
0.60				195	115			14320{1460}		38–80		
0.61	50	30	M8×12	60	50	M10×12	15000 {1530}	27750{2830}		50–10		
0.64				70	55			28500{2906}		50–15		
0.72				90	65			28950{2952}		50–25		
0.81				116	78			29400{2998}		50–38		
0.91				140	90			29500{3008}		50–50		
1.13				200	120			29700{3029}		50–80		

The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%. ●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665
●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

RoHS

GSCB (Set product) **BM** (Plate only)



M SS400 S Black oxide (Fe_3O_4)

A Provided bolts	A	B	a	b	t	Catalog No.		Base unit price 1～9 pieces
FB 6—16×1 piece	51	32	41	22	9	BM	32	Quotation
FB 8—20×1 piece	57	38	47	28			38	
FB10—20×1 piece	69	50	59	40			50	

Order

Catalog No.
GSC 32—25
GSCB 38—38
BM — 32

Days to Ship **Quotation**

Price **Quotation**

■Shot limit

	Stroke (mm)	10	15	20	25	32	38	45	50	56	63	80
GSC	Shot limit (spm)	250	165	125	100	78	65	55	50	45	40	30

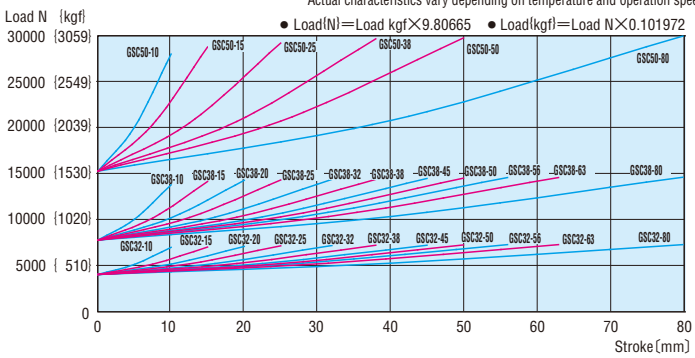
Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

■Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

■GSC load characteristic graph

This graph shows the quasi-static characteristics.
Actual characteristics vary depending on temperature and operation speed.

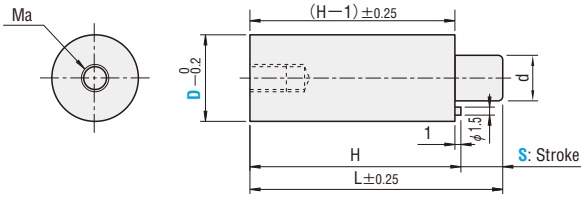


GAS SPRINGS
—HEAVY LOAD MINI TYPE—

RoHS

MGSC

If a gas spring is used in excess of the specified stroke range S, gas leakage will occur and the piston rod will not return. Make sure to use the gas spring within the specified stroke range so that it does not contact the overstroke check pin.



Nitrogen gas charge pressure	MPa{kgf/cm²}
MGSC 16	20.0{204}
MGSC 19	21.6{220}
MGSC 25	20.4{208}

Cylinder body
- M Equivalent to SCM440
- S Black oxide (Fe3O4)

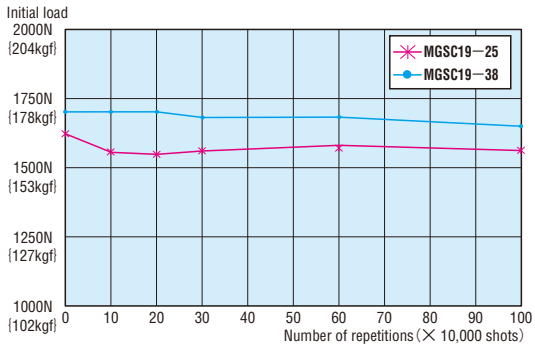
Piston rod
- M SACM645
- H 900HV～(Surface)
- S Nitriding+Polishing finish

Weight (kg)	D	d	L	H	Ma (Tap hole for mounting)	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. D—S	Base unit price 1～9 pieces
0.06	16	8	55	45	M5×7	1000 {102}	1550{158}	MGSC	16—10	Quotation
0.06			65	50			1650{168}		16—15	
0.07			85	60			1750{178}		16—25	
0.07			111	73			1800{184}		16—38	
0.08	19	10	55	45	M5×7	1700 {173}	2750{280}		19—10	
0.09			65	50			2850{291}		19—15	
0.10			85	60			2950{301}		19—25	
0.11			111	73			3100{316}		19—38	
0.14	25	15	55	45	M6×8	3600 {367}	6000{612}		25—10	
0.15			65	50			6550{668}		25—15	
0.16			85	60			6800{693}		25—25	
0.18			111	73			6950{709}		25—38	

The initial load and maximum load vary depending on the temperature and operation speed.The load error is ±10%. ●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665
●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

■Endurance test results

Catalog No.	MGSC19—25	MGSC19—38
Amplitude	23mm	35mm
Excitation speed	120spm	65spm
Mounting direction	Upright	Upright

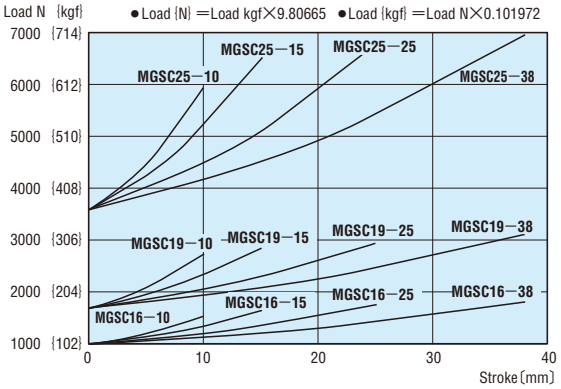


Order — Catalog No. MGSC 19—25

Days to Ship — Quotation

Price — Quotation

■MGSC load characteristics graph



This graph shows the quasi-static characteristics. Actual characteristics vary depending on temperature and operation speed.

■Shot limit

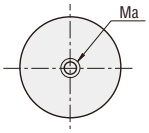
	Stroke (mm)	10	15	25	38
MGSC	Shot limit (spm)	170	150	90	50

Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

■Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

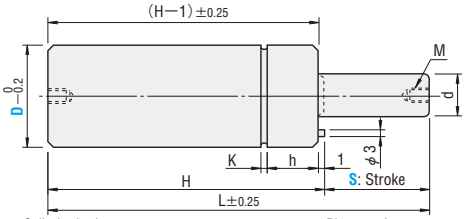
MGSA (Main body: Regular type)
MGSAH (H plate set)
MGSAF (F plate Set)



Nitrogen gas charge pressure	MPa{kgf/cm²}
MGSA 19	10.2{104}
MGSA 25	

If a gas spring is used in excess of the specified stroke range S, gas leakage will occur and the piston rod will not return. Make sure to use the gas spring within the specified stroke range so that it does not contact the overstroke check pin.

Do not fix the gas spring using the screw hole at the front end or install an extension pin. P.1012



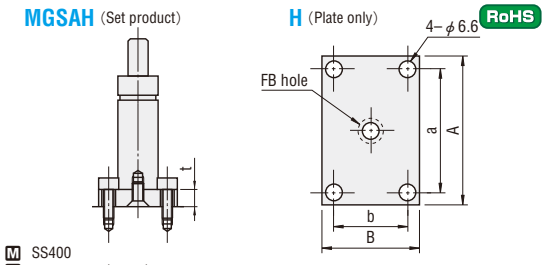
Cylinder body
M S45C
S Black oxide (Fe_3O_4)

Piston rod
M SACM645
H 1000HV～(Surface)
S Nitriding+Barrel finishing

Weight (kg)	D	d	M	L	H	h	K	Ma Tap hole for mounting	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. D—S
0.08	19	10	M5×7	65	55	18	2 (R1)	M6×6	800 {82}	1200{122}	MGSA (Main body)	19—10
0.08				75	60					1260{128}		19—15
0.11				95	70					1270{130}		19—25
0.11				121	83					1280{131}		19—38
0.13				145	95					1290{132}		19—50
0.17				205	125					1300{133}	MGSAH (H plate set)	19—80
0.15	25	14	M6×8	65	55	18	2 (R1)	M6×6	1600 {163}	2520{257}		25—10
0.16				75	60					2560{261}		25—15
0.19				95	70					2600{265}	MGSAF (F plate set)	25—25
0.22				121	83					2620{267}		25—38
0.25				145	95					2640{269}		25—50
0.33				205	125					2660{271}		25—80

The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%.
●Load (kgf)=Load N×0.101972 ●Load (N)=Load kgf×9.80665
●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

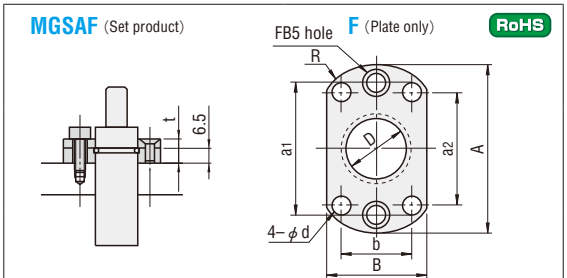
MGSAH (Set product) **H** (Plate only)



M SS400
S Black oxide (Fe_3O_4)

A Provided bolt	A	B	a	b	t	Catalog No.		Base unit price 1～9 pieces
FB6—16×1 piece	38	28	28	18	9	H	19	Quotation
FB6—16×1 piece	44		34				25	

MGSAF (Set product) **F** (Plate only)



M SS400
S Black oxide (Fe_3O_4)

A Bolt FB5—10: 2 pcs.
Semicircle ring: 2 pcs.

A	B	a_1	a_2	b	d	D	t	R	Catalog No.		Base unit price 1～9 pieces
44	28	33	28	18	6.6	19	11	22	F	19	Quotation
50	30	38	34			25		25		25	

Order — Catalog No.
MGSA 19—80
MGSAH 25—10
F—25

Days to Ship — Quotation

Price — Quotation

D—S	Base unit price 1～9 pieces Body only MGSA	H plate set MGSAH	F plate set MGSAF
19—10	Quotation		
19—15			
19—25			
19—38			
19—50			
19—80			
25—10			
25—15			
25—25			
25—38			
25—50			
25—80			

■Shot limit

	Stroke (mm)	10	15	25	38	50	80
MGSA	Shot limit (spm)	250	165	100	65	50	30

Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

■Gas spring temperature range

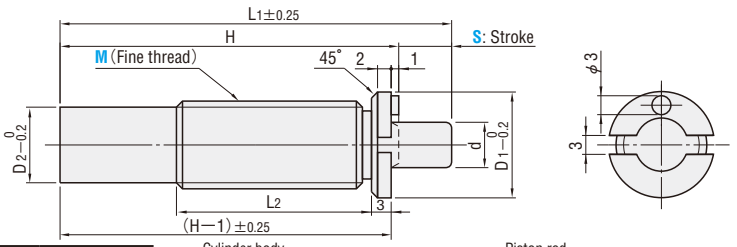
The service environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

GAS SPRINGS
—THREADED TYPE—

RoHS

MGSB

If a gas spring is used in excess of the specified stroke range S, gas leakage will occur and the piston rod will not return. Make sure to use the gas spring within the specified stroke range so that it does not contact the overstroke check pin.



Nitrogen gas charge pressure	MPa{kgf/cm²}
MGSB 12	12.0{122}
MGSB 16	10.1{103}

Cylinder body
M SACM645
S Nitriding+Black oxide (Fe_3O_4)

Piston rod
M SACM645
H 1000HV～(Surface)
S Nitriding+Barrel finishing

Weight (kg)	D_1	D_2	d	L_1	H	M×P (fine thread)	L_2	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. M—S	Base unit price 1～9 pieces
0.03	14	10.2	5	75	65	M12×P1.25	27	400{41}	640{ 65}	MGSB	12—10	Quotation
0.04				90	75						12—15	
0.05	18	14.2	8	75	65	M16×P1.5	37	800{82}	1280{131}		16—10	
0.06				90	75						16—15	
0.07				120	95						16—25	

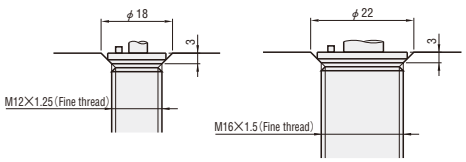
The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%. ●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665
●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

Order — Catalog No. MGSB 12— 15

Days to Ship — Quotation

Price — Quotation

■Mounting



Prepare a tap hole for MGSB as shown above, so that the MGSB flange will be in close contact with the mounting surface.
MGSB is provided with a flange to prevent overtightening and loosening.

Applicable wrench: Use a **PJG** wrench (P.733).

■Shot limit

	Stroke (mm)	10	15	25
MGSB	Shot limit (spm)	200	130	80

Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

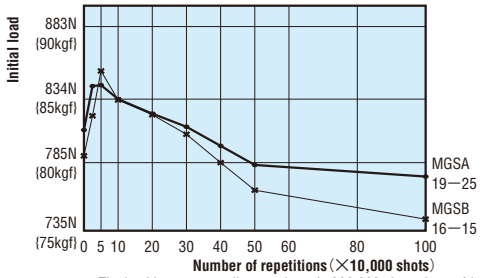
■Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

MGSB is not an oil-free product.
After applying initial break-in grease, grease the piston rod at intervals of 50,000 shots. The use of molybdenum disulfide (MoS_2) grease is recommended.

■Endurance test results

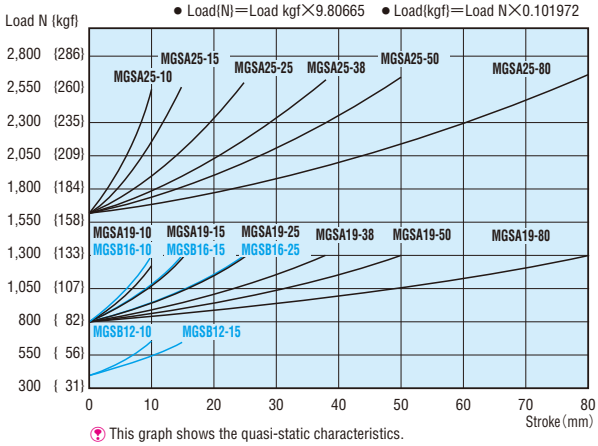
Catalog No.	MGSA 19—25	MGSB 16—15
Amplitude	25mm	15mm
Excitation speed	120spm	135spm
Mounting direction	Upright	Upright



The load increases until approximately 300,000 shots due to friction between the rod and special urethane seal.

■Load characteristic graph for MGSA and MGSB

● Load{N}=Load kgf×9.80665 ● Load{kgf}=Load N×0.101972



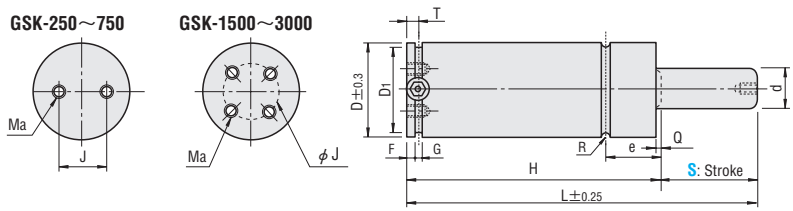
This graph shows the quasi-static characteristics.
Actual characteristics vary depending on temperature and operation speed.

GAS SPRINGS
—ISO/CNOMO STANDARD TYPE—

RoHS

GSK

- If used outside the stroke range S, gas release occurs and piston rod becomes unable to return. Be sure to use within the stroke range.
- Mb cannot be used for installation.



Nitrogen gas charge pressure	MPa{kgf/cm²}
GSK250 ～ 3000	15.0{153}

Cylinder body
- M Equivalent to 42CrMo4
- S Black oxide (Fe_3O_4)

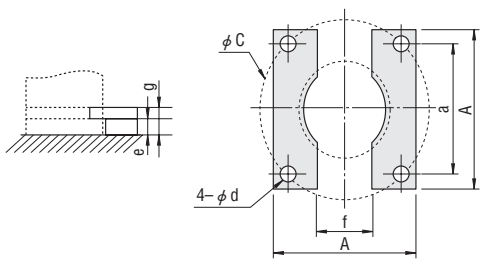
Piston rod
- M 42CrMo4
- H 600HV～
- S Nitriding+Barrel finishing

Weight (kg)	D	D1	d	L	H	e	R	T	F	G	Tap for mounting Ma	J	Q	Load N {kgf} Initial load	Load N {kgf} Max load	Part Number Type	Part Number Initial load—S	Compatible GSE	Mounting hole depth diff.
0.48	38	33	15	100	75	12.5	1	6	4	3.5	2—M6×8	25	2	2600 {265}	3750{383}	GSK	250— 25	GSE38—25	−2
0.60				150	100										3970{405}		250— 50	GSE38—50	−2
0.74				210	130										4080{416}		250— 80	GSE38—80	−2
0.81				250	150										4120{420}		250—100	GSE38—100	−2
1.00	45	40	20	135	110	16.5	1	10.5	4	3.5	2—M8×13	20	2	4700 {479}	7090{723}		500— 25	GSE45—25	+3
1.20				185	135										7710{786}		500— 50	GSE45—50	+3
1.40				245	165										8050{821}		500— 80	GSE45—80	+3
1.60				285	185										8180{834}		500—100	GSE45—100	+3
1.80				335	210										8290{845}		500—125	GSE45—125	+3
2.10				405	245										8400{857}		500—160	GSE45—160	+3
1.38	50	43	25	145	120	17.5	2	10.5	8	5	2—M8×13	20	3	7400 {755}	11560{1179}		750— 25	GSE50—25	+3
1.65				195	145										13140{1340}		750— 50	GSE50—50	+3
1.96				255	175										14130{1441}		750— 80	GSE50—80	+3
2.09				295	195										14530{1482}		750—100	GSE50—100	+3
2.33				345	220										14900{1519}		750—125	GSE50—125	+3
2.68				415	255										15260{1556}		750—160	GSE50—160	+3
3.10				495	295										14940{1523}		750—200	GSE50—200	+3
3.64	75	67	36	160	135	21	2.5	10.5	8	5	4—M8×13	40	3	15300 {1560}	23170{2363}		1500— 25	GSE75—25	−2
4.15				210	160										25990{2650}		1500— 50	GSE75—50	−2
4.81				270	190										27700{2825}		1500— 80	GSE75—80	−2
5.22				310	210										28410{2897}		1500—100	GSE75—100	−2
5.75				360	235										29040{2961}		1500—125	GSE75—125	−2
6.33				430	270										29650{3023}		1500—160	GSE75—160	−2
6.36	95	87	50	170	145	24	2.5	10.5	8	5	4—M8×13	60	3	29450 {3003}	47830{4877}		3000— 25	GSE95—25	−2
7.35				220	170										55530{5663}		3000— 50	GSE95—50	−2
8.44				280	200										60550{6174}		3000— 80	GSE95—80	−2
9.03				320	220										62700{6394}		3000—100	GSE95—100	−2
10.10				370	245										64650{6592}		3000—125	GSE95—125	−2
11.30				440	280										66560{6787}		3000—160	GSE95—160	−2

Negative "Mounting hole depth diff." means that the GSK mounting hole is shallower than that of GSE.

RoHS

FFC

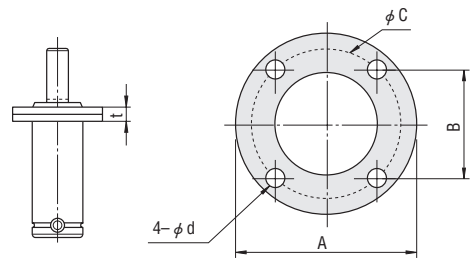


M FE37 or C45 (depends on size)
S Black oxide (Fe_3O_4)

A Hexagon hole bolt (CB): 4 pcs.
Spring washer : 4 pcs.

RoHS

FC



M FE37 or C45 (depends on size)
S Black oxide (Fe_3O_4)

A Hexagon hole bolt (CB): 4 pcs.
Spring washer : 4 pcs.
Semicircle ring : 2 pcs.

■FFC

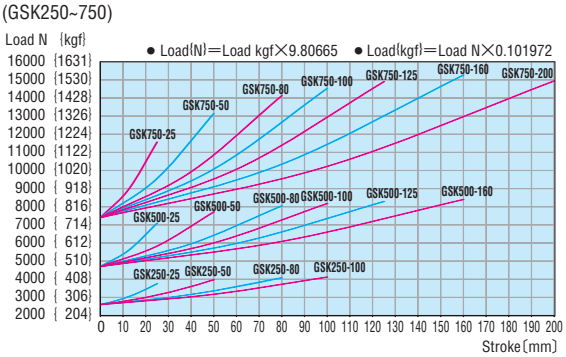
A Accessories bolt	A	a	C	d	f	g	e	Part number		Adaptable Gas Spring
CB 6-18	55	40	56.6	6.6	5	7	4	FFC	38S	GSK250
CB 8-20	70	50	70.7	9	20	7	4		45S	GSK500
CB 8-25	75	56.5	79.9	9	24	12	8		50S	GSK750
CB 10-30	100	73.5	103.9	11	24	12	8		75S	GSK1500
CB 12-30	120	92	130	13.5	24	12	8		95S	GSK3000

■FC

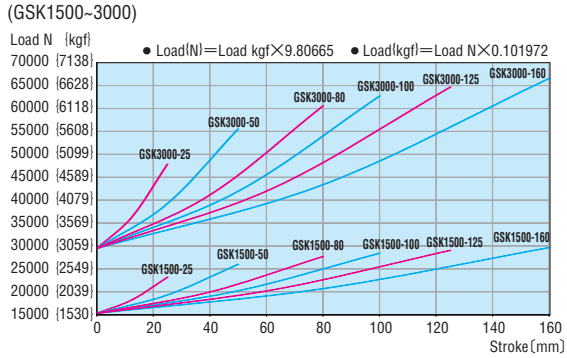
A Accessories bolt	A	B	C	d	t	Part number		Adaptable Gas Spring
CB 6-18	68	40	56.6	6.6	9	FC	38S	GSK250
CB 8-25	86	50	70.7	9	13		45S	GSK500
CB 8-25	95	56.5	79.9	9	13		50S	GSK750
CB 10-35	122	73.5	103.9	11	16		75S	GSK1500
CB 12-40	150	92	130	13.5	18		95S	GSK3000

■Load characteristic graph

(GSK250~750)



(GSK1500~3000)



■Shot limit

	Stroke (mm)	25	50	80	100	125	160	200
GSK	250	110	70	40	35	—	—	—
	500	100	50	30	25	20	16	12
	750							
	1500	70	45				15	—
	3000							

Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

■Gas spring temperature range

The operating environment temperature range is 0~40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

Order — Catalog No.
GSK 250—80
FC38S

Days to Ship — Quotation

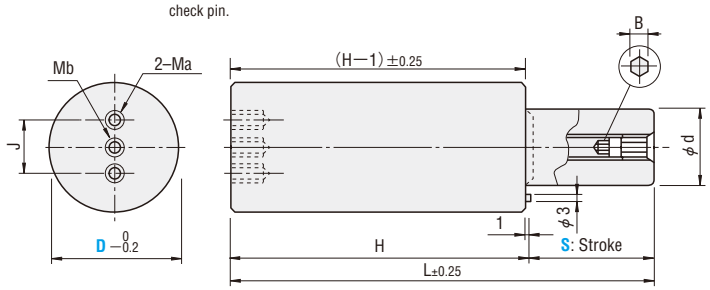
Price — Quotation

GAS SPRINGS
—SLOW RETURN TYPE—

RoHS

GSSR

If a gas spring is used in excess of the specified stroke range S, gas leakage will occur and the piston rod will not return.
Make sure to use the gas spring within the specified stroke range so that it does not contact the overstroke check pin.



Mb cannot be used for mounting.

Nitrogen gas charge pressure	MPa{kgf/cm²}
GSSR50	7.0 {72}

Cylinder body
M SACM645
S Nitriding+Black oxide (Fe_3O_4)

Piston rod
M SACM645
H 1000HV ～(Surface)
S Nitriding+Barrel finishing

Weight (kg)	D	d	B	L	H	Ma Tap hole for mounting	J	Mb	Load N{kgf}		Catalog No.		Base unit price
									Initial load	Maximum load	Type	D—S	1 ～ 9 pieces
1.22	50	30	4	135	110	M8×12	20	M8×12	5000 {510}	9750 {994}	GSSR	50—25	Quotation
1.33				161	123							50—38	
1.45				185	135							50—50	
1.57				245	165							50—80	

Order — Catalog No. GSSR 50—50

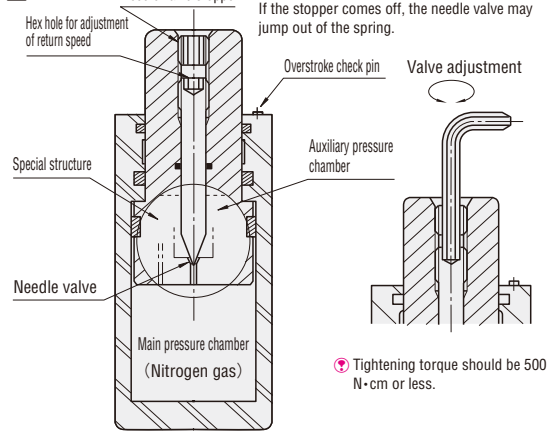
Days to Ship — Quotation

Price — Quotation

■Features

- The return time (speed) of the piston rod can be adjusted using the needle valve. (To adjust the needle valve, insert a hex wrench into the hexagon socket hole for return speed adjustment.)
  Turn clockwise: The valve closes and the piston rod returns slower.
  Turn counterclockwise: The valve clearance increases and the piston rod returns faster as the nitrogen gas can quickly move from the auxiliary pressure chamber to the main pressure chamber.
- Because the piston rod can be adjusted to return slowly, the workpiece will not be damaged when the piston rod extends during the drawing process.
- For the mounting plate, HM-50 on P.1014 can be used.

■Structure



For safety, never touch the needle valve stopper! If the stopper comes off, the needle valve may jump out of the spring.

Tightening torque should be 500 N·cm or less.

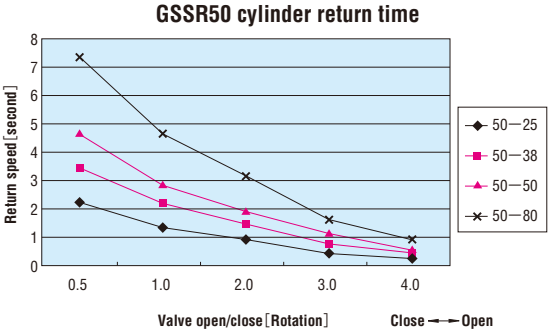
When the piston rod descends, nitrogen gas flows into the auxiliary pressure chamber.

Because the nitrogen gas in the auxiliary pressure chamber reduces the pressure in the main pressure chamber, the return speed of the piston rod slows down.

■Precautions

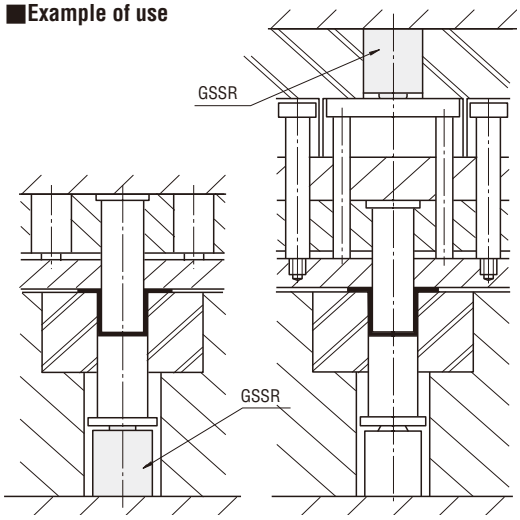
- Do not use two or more gas springs on either the die side or punch side. Because it is difficult to synchronize the return timing of multiple gas springs, the die guide may seize or the die may be damaged.
- If the needle valve is tightened too much, the valve may be deformed, resulting in malfunction of the gas spring.
- Do not turn the needle valve stopper. Although it is bonded in place, turning it forcefully may cause gas leakage.
- The operating environment temperature range is 0 ～ 40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.
- GSSR can be used without lubrication.
- For the precautions for use, refer to P.1011.

■Relationship between piston rod return time and needle valve position for GSSR

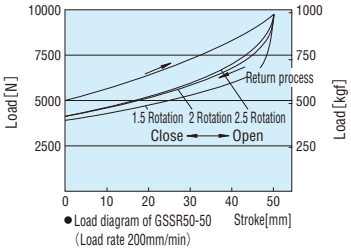


This graph shows the mean value from 10 piston rods. Use it only as a reference.

■Example of use

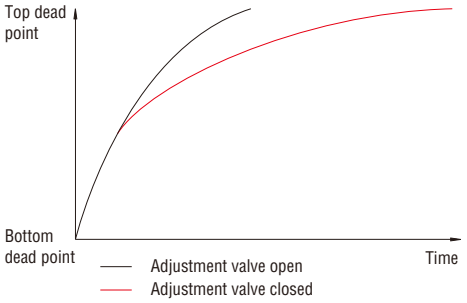


■Load curve



● Load diagram of GSSR50-50 (Load rate 200mm/min)

■Stroke returned curve



This graph is a relationship image of stroke returned and time. Please use as a reference.

Even though the valve is closed, the return speed is the same as when it is open at first. After for a given length of time, the return speed becomes slower gradually.

■Shot limit

	Stroke (mm)	25	38	50	80
GSSR	Shot limit (spm)	14	10	8	5

Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

■Limit stroke speed

The stroke speed shall not exceed 80mm/sec.