PED 97/23/EC CE ISO 9001 JAS-ANZ

NITROGEN GAS SPRING

SRP

บริษัท ซันไรส์ พรอพเพอร์ตี้ จำกัด

SUN RISE PROPERTY Co.,LTD.

www.sunrisegr.com

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GAS SPRING

* MODEL
* NAME
* PAGE

* TSP SERIES
* GAS SPRING
* P8~31

* TSM SERIES
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* P32~51

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NEW TSX SERIES
(Slim + Long Stroke)

TECHNICAL DATA

* TECHNICAL DATA
* GAS SPRING
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■ TOSS NITROGEN GAS SPRING

TOSS is the first developed nitrogen gas spring domestically. All TOSS products are accurately manufactured with equipments of high precision such as CNC, M/C, etc., and have passed several trial tests of over one million strokes under SPM 80 condition. Shinweon has received acknowledgement for their superior quality through the application test on the spot from domestic industries. Also, Shinweon looks forward to big contribution to die pressing industries by developing TSP series which is more compact than existing gas spring.

■ Quality Assurance

TOSS gas springs come with two-year warranty from date of loading from the warehouse or one million strokes. Every troubleshooting service and (or) exchange of parts during this term is free. Also, should there arise any critical defects after the two-year guarantee period, the products shall be replaced free of charge.

■ Maintenance

TOSS gas springs are manufactured based on a simple structure, which requires no repair throughout their useful life. TOSS gas springs, which are damaged during operations after their useful life may be easily repaired and revived by simply replacing the damaged parts. In addition, adequate load can be specified by directly adjusting the pressure at site.

■ Fast Delivery

In order to ensure fast delivery and support parts for A/S, Shinweon is equipped with requirements such as procurements of load testing facilities, gas charging facilities and a comprehensive inventory for all spare parts. We also carry sufficient stock for certain models to minimize lead-time and to reduce deadlock in production. Models that are without stock can be delivered within 7 days from day of order. However, this lead-time varies according to quantity and location.

■ Notice

* Although there is a tap of M6 or M8 on top of the piston rod for an assembly and a disassembly, this should not be used to fix the gas springs or for any connecting devices.

* During the installation, please ensure that there is about 1mm of margin space between the contact surface and the upper part of the piston rods. Also, there is no need for pre-pressure because the initial pressure is strong enough. Any increase of pre-pressure can damage the molds.

* TOSS gas springs must be used just as it is. Do not cut or grind the upper part of the piston rods or grind the lower part of the gas springs, as it is dangerous. Any change on the gas spring can shorten a life and cause a breakdown.

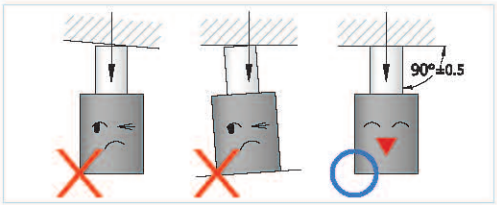
* When installing the TOSS, please ensure that the bottom surface of the TOSS touches the mold to absorb the load of gas spring. However, when assembling with mounts, there should be space between the mount and the bottom surface of the mold. This is to prevent the mold from breaking should heaby load breaks the mount.

Installation and Operation

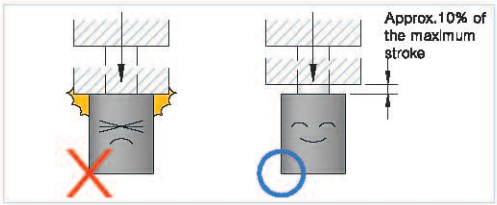
When installing the TOSS gas spring, the piston rods of the gas springs must be installed parallel to the operation direction and vertical to the installation ground. Failure to do so will result in the generation of odd load and abrasion of piston rods, bearings, and seals etc., which will reduce the life span of the gas spring.
To prevent damage to the gas spring and to maximize its life span, please allow 10% margin to the standard stroke to reduce shock that is caused by the compression of gas. The margin can prevent damage on the gas spring when the piston rod touches the bottom surface and shortening a life span due to the impact by maximum gas pressure.

Warning

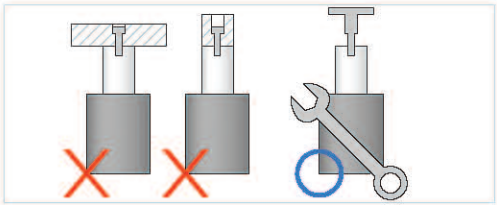
With gas spring fully charged with high pressure gas, non-compliance with this warning may lead to accidents, product damages, malfunctions, etc. Before using the spring, make sure to fully understand and observe the warning below.



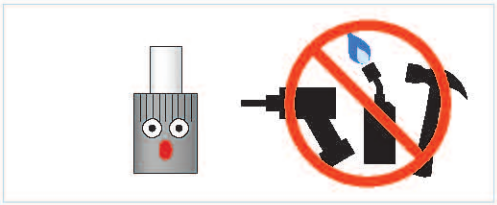
1. Install the gas spring parallel to the working direction and void of inclined or lateral load.



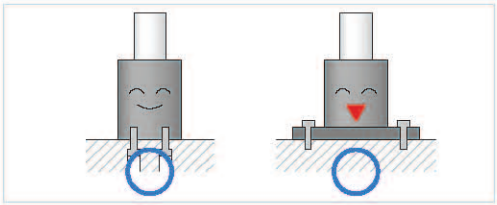
2. It may cause gas leakage or the piston rod not to return if gas spring is used exceeding the range of stroke length.



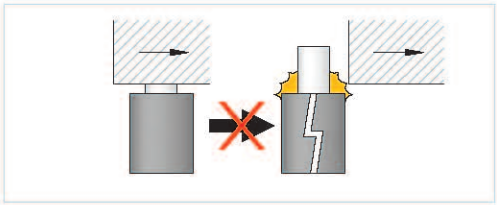
3. Do not use the Tap hole at the top of the rod for purpose other than repair and maintenance.



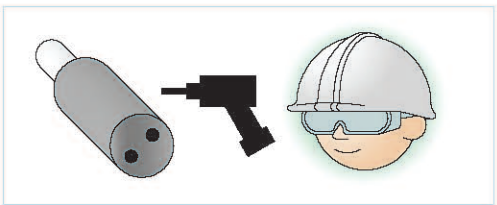
4. Do not cut, weld, heat to the main body.



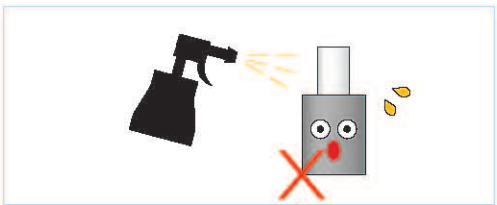
5. Unless, gas spring is secured by bolts, bottom base will be loosened.



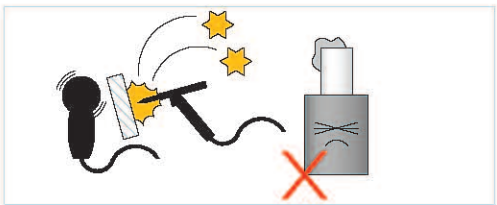
6. Avoid using the spring in a setting that it is released of the piston rod.



7. In disposing of gas spring, Be sure that N_2 Gas spring has completely escaped. Please keep disposition procedure.



8. Keep gas spring from fluid.



9. For mold lapping and polishing, exercise caution against the adhesion of welding sparks, scraps, metallic contaminants, etc.

TOSS MODEL

TOSS is available from 500N to 100,000N of initial force and from 10mm to 300mm of stroke. Depends on total length, TOSS provides a wide range to choose from TSP, TSM, TSS and TSL series, and they are easy to use in small molds.
Also, TOSS is available for self contained type, individually used as an independent gas spring, and fitting system type, multiple gas springs that is connected by pipes to adjust gas pressure simultaneously for each gas spring. Conversion between those two types is possible.
Recharging and discharging are simple and pressure can be adjusted easily.
The maximum gas pressure for each model can be 150~180 bar.

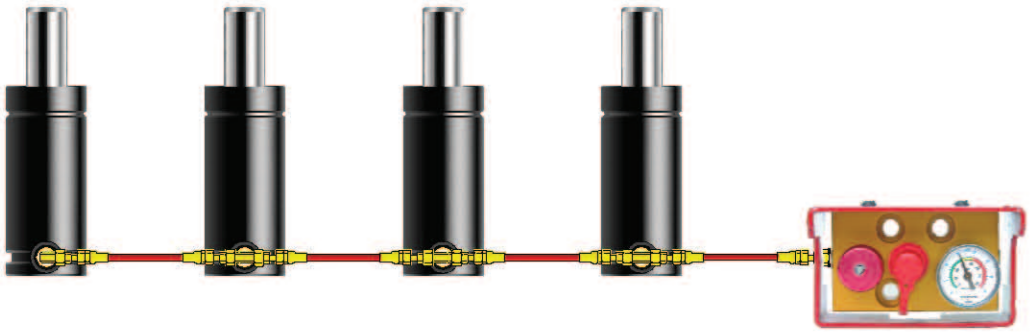
Self-contained type and fitting system type

Self-contained type

Already charged when shipped, it can be easily used, as it does not need extra space for installation of other parts. It may be discharged and recharged with a maximum charging pressure of 150~180 bar.

Fitting System type

Hoses connect with a few gas springs together and each gas spring can be simultaneously charged and discharged. They are easily handled during operations as the control panel controls pressure for each gas spring. The maximum charging pressure is 150 bar.



◈ Certificate Status

PED 97/23/EC

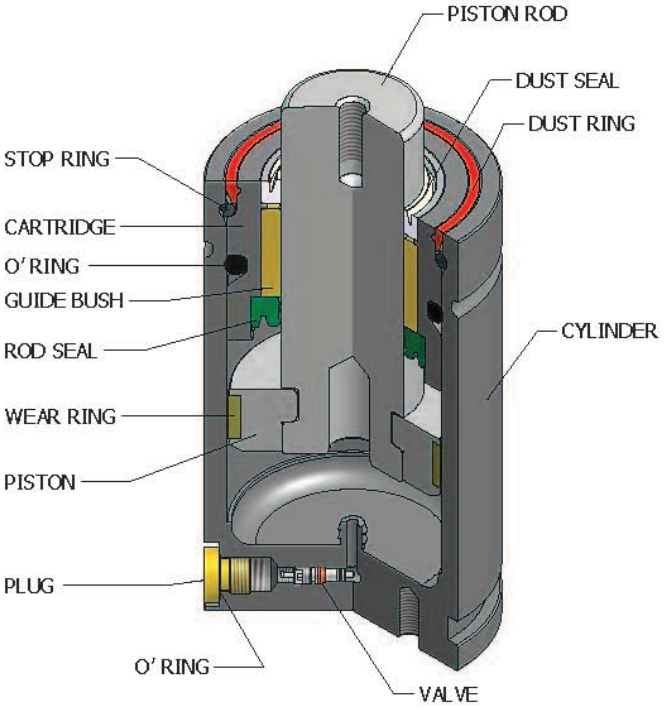
ISO 9001 JAS-ANZ CE

1. SYSTEM

As TOSS GAS SPRING is produced and controlled by a system of international standard. Quality places as PED, (European pressurized Module A1), ISO (Quality control system) and CE (Product Certificate).

2. Product Line-up

TOSS provides a wide range to choose from 4 kinds of standards (TSP, TSM, TSS and TSL series), and more than 1,700 models are available.



TSM, TSS, TSL

3. Product Assessment

TOSS Gas spring is exported more than 30 countries and plans to expand our market abroad with a solid quality, fast delivery and good service.

4. Warranty

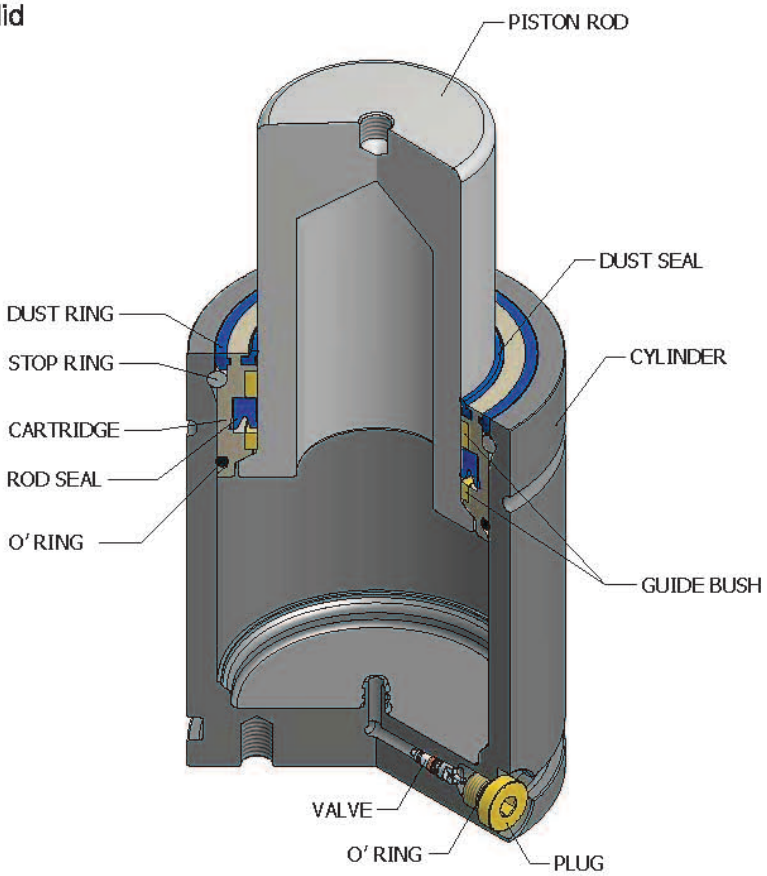
All TOSS gas springs come with a two-year warranty from date of loading from the ware-house or 0.3 ~ 1 million strokes, depend on model.

5. DATA Download(Cad & Catalogue Data)

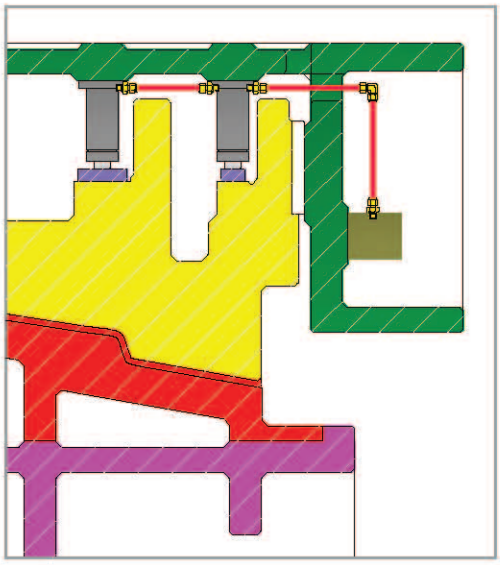
Visit (www.shinweon.com) for Data download

Requesting for Data CD
TEL: 82-2-2675-6744
e-mail : shinweon@shinweon.com

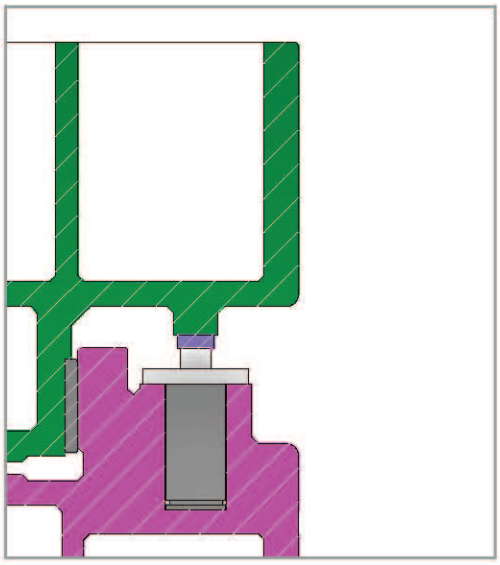
DATA format
2d_ Auto cad.dwg
3d_igs
Catalogue_pdf



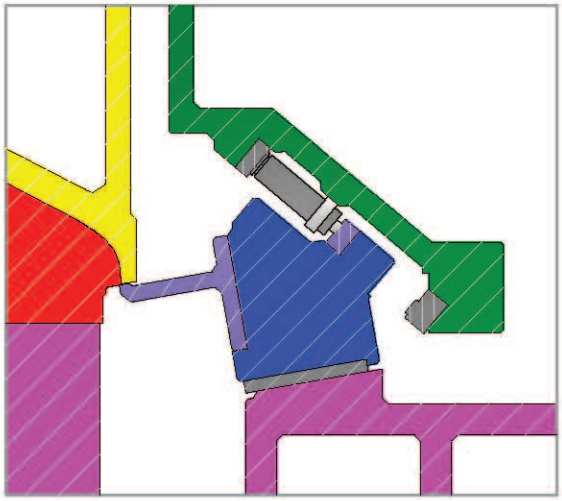
TSP



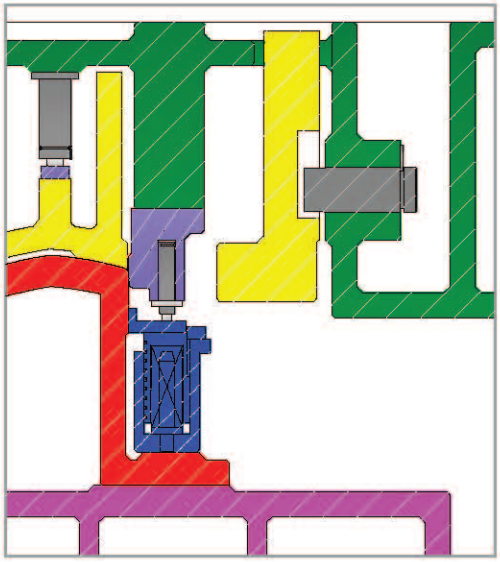
UPPER PAD FITTING TYPE



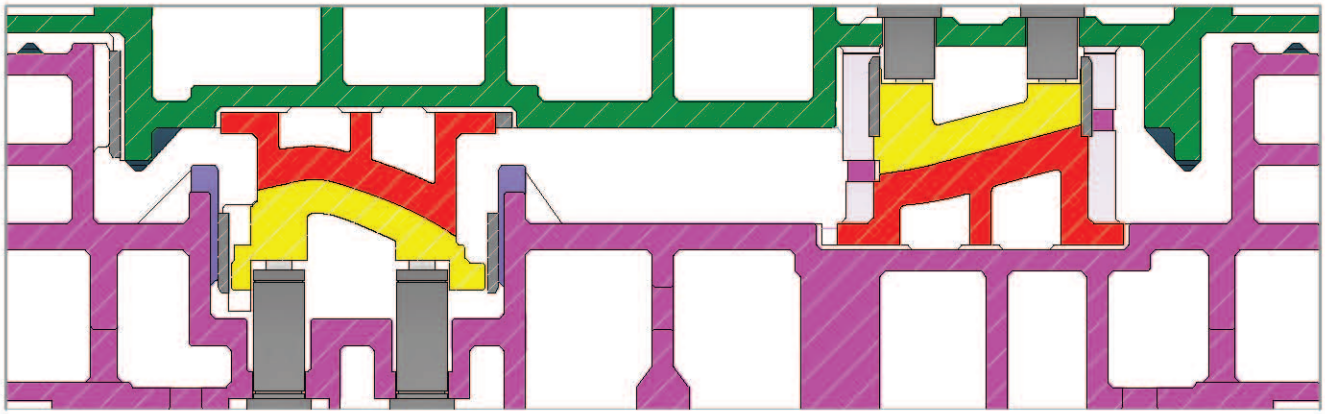
UPPER · LOWER MOLD
LOADING TYPE



CAM RETURN TYPE



UPPER PAD TYPE
FL LIFTER PRECEDENCE
PRESSING TYPE



DRAW S/A TYPE

CT02052E

NITROGEN GAS SPRING

PED 97/23/EC

CE

ISO 9001

JAS-ANZ

TSP SERIES!!

SHINWEON S&T CO.,LTD.

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TSP6600 28
TSP9500 30

XTRA HIGH POWER

MODEL

TSP TSM TSS TSL

■ General Specification

- ● Filling Materials: Nitrogen Gas (N_2)
- ● Maximum Stroke Rate Per Minute (Recommended): ~50 to 100 (at 20℃)
- ● Maximum Filling Pressure: 150~180 bar (at 20℃)
- ● Piston Rod Speed: 0.03~0.8 m/s
- ● Minimum Filling Pressure: 25 bar (at 20℃)
- ● Rod Surface Treatment: Nitrate Coating
- ● Operation Temperature: -5 to 80℃
- ● Cylinder Surface Treatment: Oxidized Black Coating
- ● Pressure Increase as per Temperature: ±0.3% / ℃

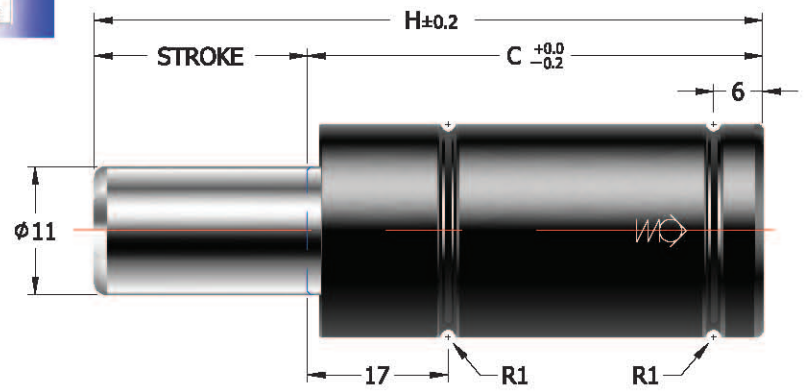
■ Specification

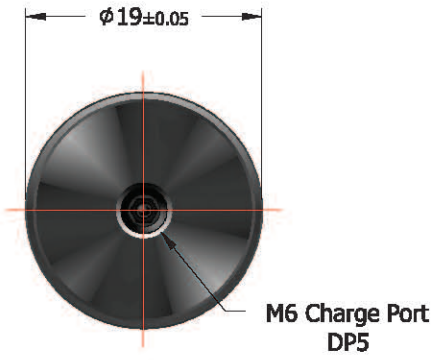
TYPE	Stroke (mm)	Cylinder Diameter Φ(mm)	Rod Φ(mm)	Initial Force (N)	End Force (N)	MAX. Charging Pressure
TSP0170	7~125	19	11	1,700	2,800	180Bar
TSP0320	7~125	25	15	3,200	5,500	180Bar
TSP0350	10~125	32	16	3,600	5,400	180Bar
TSP0500	10~125	38	20	4,700	7,200	150Bar
TSP0750	10~125	45	25	7,400	11,700	150Bar
TSP1000	13~125	50	28	9,200	14,900	150Bar
TSP1500	13~125	63	36	15,200	24,100	150Bar
TSP2400	16~125	75	45	23,800	38,400	150Bar
TSP4200	16~125	95	60	42,200	70,900	150Bar
TSP6600	16~125	120	75	66,000	108,700	150Bar
TSP9500	20~125	150	90	95,000	149,100	150Bar

※ The above specification is subject to change without notice for performance improvement.

TSP0170 NITROGEN GAS SPRING

PED 97/23/2C





HOW TO SPECIFY

GAS SPRING	TSP0170 (MODEL)	×	050 (STROKE)	−	180 (CHARGING PRESSURE (Bar))
MOUNT	XP0170				
REPAIR KIT	Non-repairable				

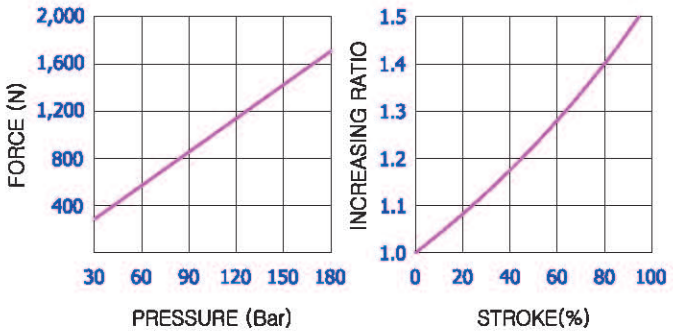
[Caution!] Charging pressure has to be specified. Otherwise, 180Bar will be charged.

TSP0170

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (180 bar / +20 ℃) Initial	Force (N) (180 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
7	0.28	44	37	1,700	2,500	2.2	0.06
10	0.39	50	40		2,500	2.9	0.06
13	0.51	56	43		2,600	3.6	0.07
16	0.63	62	46		2,600	4.4	0.07
20	0.79	70	50		2,700	5.3	0.08
25	0.98	80	55		2,700	6.5	0.08
30	1.18	90	60		2,700	7.7	0.09
35	1.38	100	65		2,700	8.9	0.10
38	1.50	106	68		2,700	9.6	0.11
40	1.57	110	70		2,700	10.1	0.11
45	1.77	120	75		2,800	11.3	0.12
50	1.97	130	80		2,800	12.5	0.12
60	2.36	150	90		2,800	14.9	0.14
63	2.48	156	93		2,800	15.6	0.14
70	2.76	175	105		2,800	17.3	0.15
75	2.95	185	110		2,800	18.5	0.15
80	3.15	195	115		2,800	19.7	0.16
90	3.54	215	125		2,800	22.1	0.18
100	3.94	235	135		2,800	24.5	0.20
125	4.92	285	160		2,800	30.4	0.22

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP0170

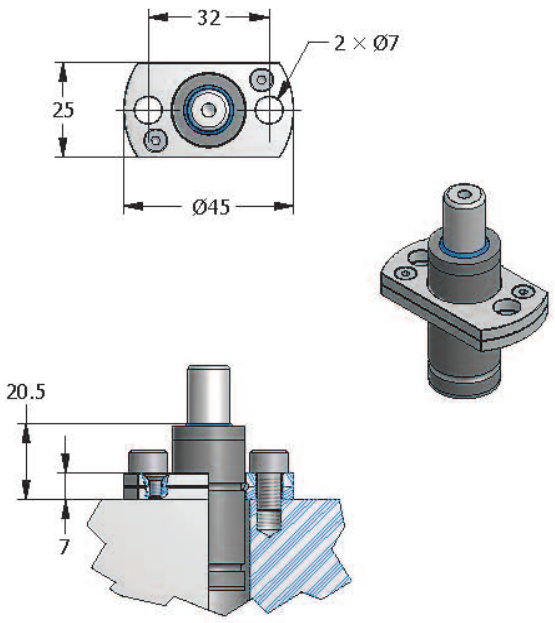
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{9.5}$$

ex) What comes to the charging pressure of gas spring which demands force 1,000N?

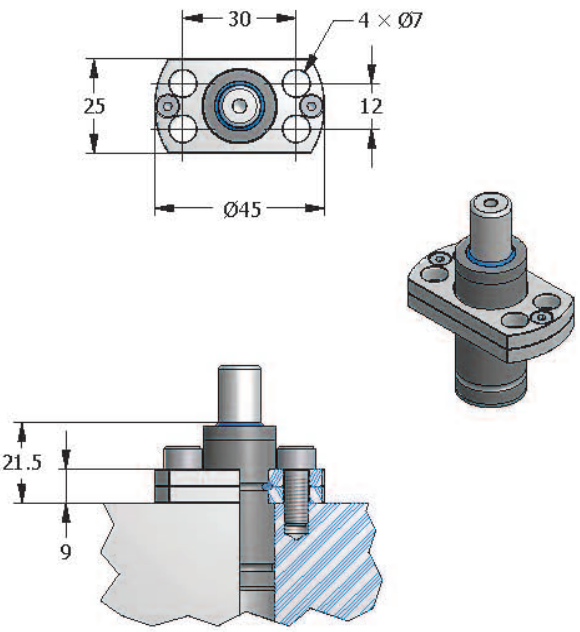
$$105\text{(Bar)} = \frac{1{,}000\text{(N)}}{9.5}$$

TSP0170 Mounts

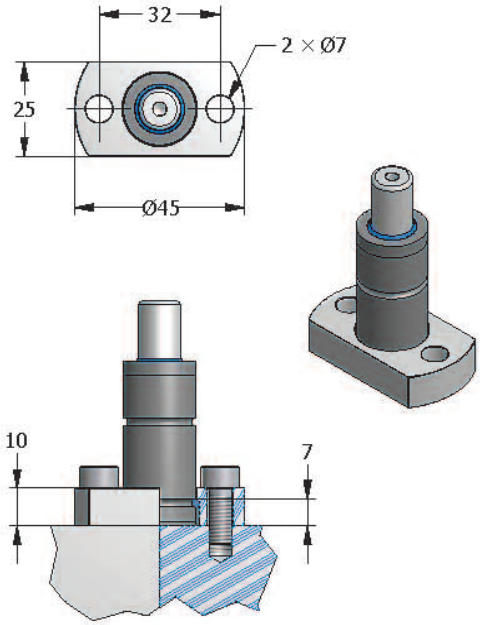
XG0170 MOUNT



XC0170 MOUNT

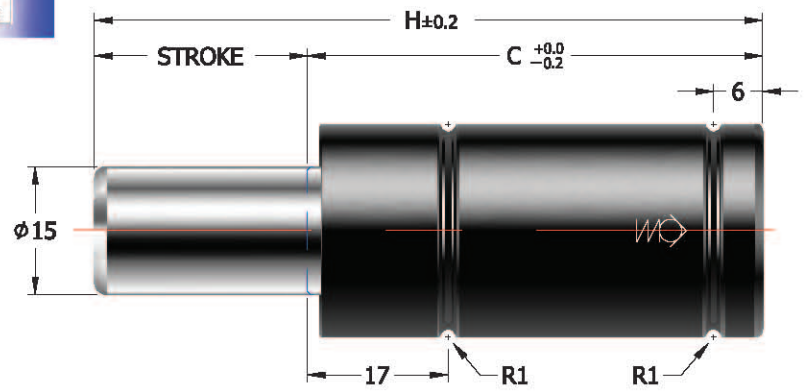


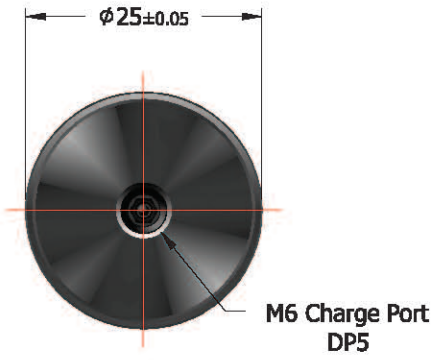
XP0170 MOUNT



TSP0320 NITROGEN GAS SPRING

PED 97/23/2C





HOW TO SPECIFY

GAS SPRING	TSP0320 (MODEL)	×	050 (STROKE)	−	180 (CHARGING PRESSURE (Bar))
MOUNT	XR0320				
REPAIR KIT	Non-repairable				

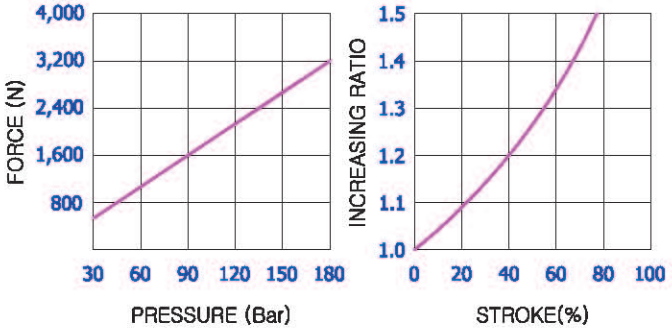
[Caution!] Charging pressure has to be specified. Otherwise, 180Bar will be charged.

TSP0320

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (180 bar / +20 ℃) Initial	Force(N) (180 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
7	0.28	44	37	3,200	5,000	3.7	0.09
10	0.39	50	40		5,000	4.9	0.11
13	0.51	56	43		5,100	6.2	0.11
16	0.63	62	46		5,200	7.4	0.12
20	0.79	70	50		5,200	9.0	0.14
25	0.98	80	55		5,300	11.1.	0.15
30	1.18	90	60		5,300	13.1	0.16
35	1.38	100	65		5,400	15.2	0.18
38	1.50	106	68		5,400	16.4	0.18
40	1.57	110	70		5,400	17.2	0.19
45	1.77	120	75		5,400	19.3	0.21
50	1.97	130	80		5,400	21.3	0.22
60	2.36	150	90		5,500	25.4	0.25
63	2.48	156	93		5,500	26.6	0.26
70	2.76	175	105		5,500	29.5	0.28
75	2.95	185	110		5,500	31.6	0.28
80	3.15	195	115		5,500	33.6	0.32
90	3.54	215	125		5,500	37.7	0.33
100	3.94	235	135		5,500	41.8	0.36
125	4.92	285	160		5,500	52.0	0.43

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP0320

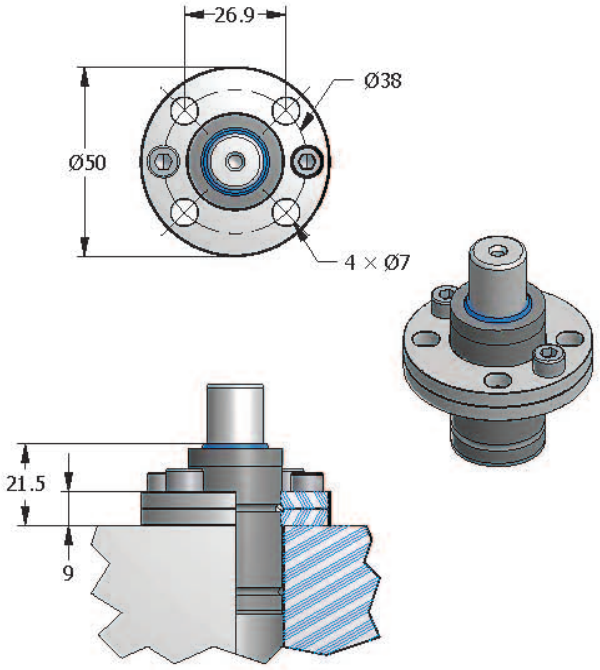
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{17.7}$$

ex) What comes to the charging pressure of gas spring which demands force 2,500N?

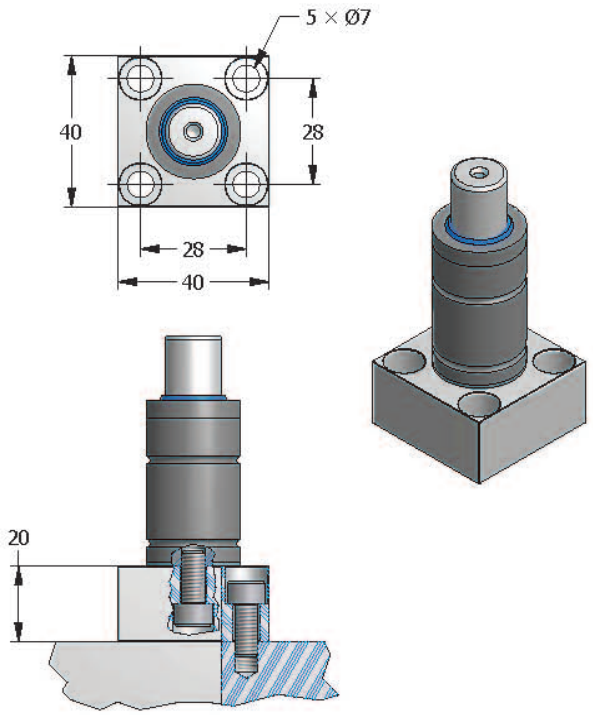
$$141\text{(Bar)} = \frac{2{,}500\text{(N)}}{17.7}$$

TSP0320 Mounts

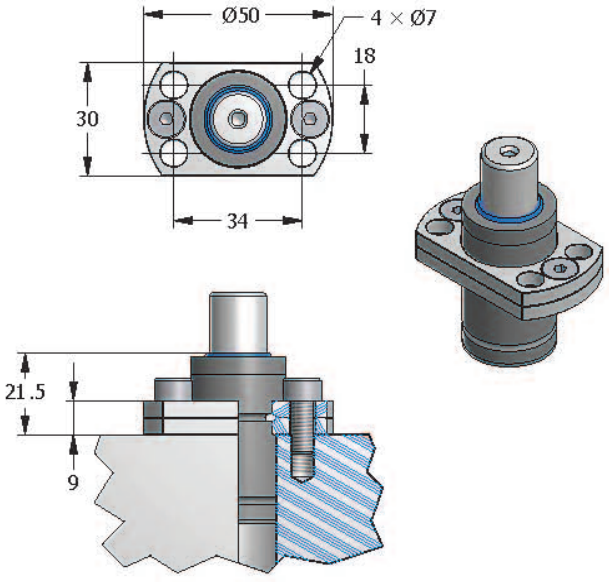
XR0320(SR0150) MOUNT



XB0320(SB0150) MOUNT

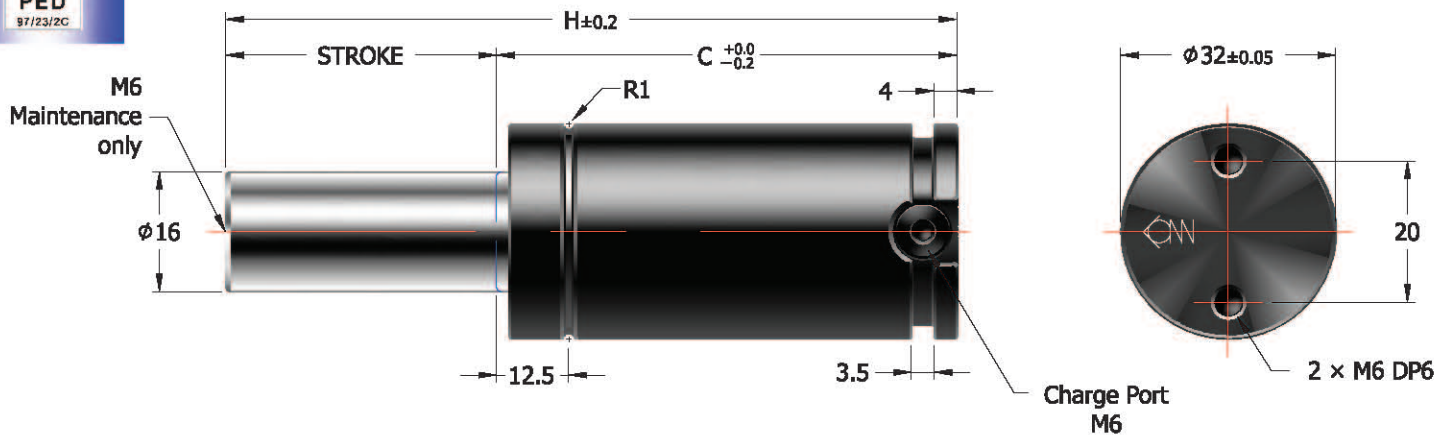


XG0320(SG0150) MOUNT



TSP0350 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING	TSP0350 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	—	180 (CHARGING PRESSURE (Bar))
MOUNT	XP0350					
REPAIR KIT	RCX0350					

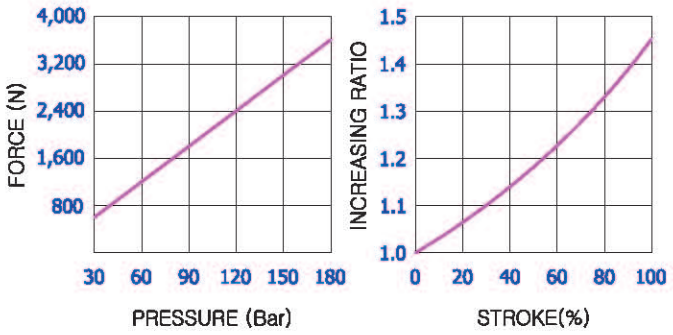
[Caution!] Charging pressure has to be specified. Otherwise, 180Bar will be charged.

TSP0350

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (180 bar / +20 ℃) Initial	Force (N) (180 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	50	40		5,000	7.2	0.20
13	0.51	56	43		5,100	9.0	0.21
16	0.63	62	46		5,200	10.8	0.21
20	0.79	70	50		5,200	13.3	0.23
25	0.98	80	55		5,200	16.3	0.25
30	1.18	90	60		5,300	19.4	0.26
35	1.38	100	65		5,300	22.4	0.28
38	1.50	106	68		5,300	24.2	0.29
40	1.57	110	70		5,300	25.4	0.29
45	1.77	120	75	3,600	5,300	28.5	0.32
50	1.97	130	80		5,300	31.5	0.33
60	2.36	150	90		5,300	37.6	0.37
63	2.48	156	93		5,300	39.5	0.37
70	2.76	170	100		5,300	43.7	0.40
75	2.95	180	105		5,300	46.8	0.41
80	3.15	190	110		5,300	49.8	0.43
90	3.54	210	120		5,300	55.9	0.46
100	3.94	230	130		5,400	62.5	0.49
125	4.92	280	155		5,400	77.2	0.58

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP0350

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{20.1}$$

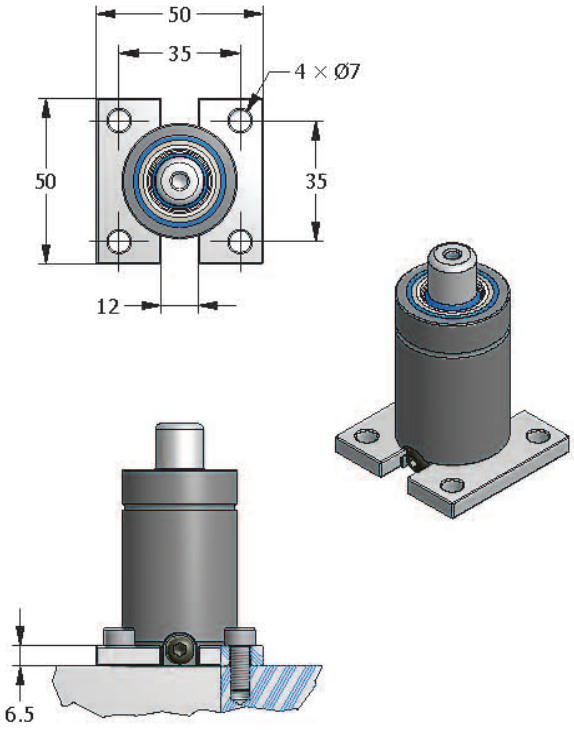
ex) What comes to the charging pressure of gas spring which demands force 2,500N?

$$164\text{(Bar)} = \frac{3{,}300\text{(N)}}{20.1}$$

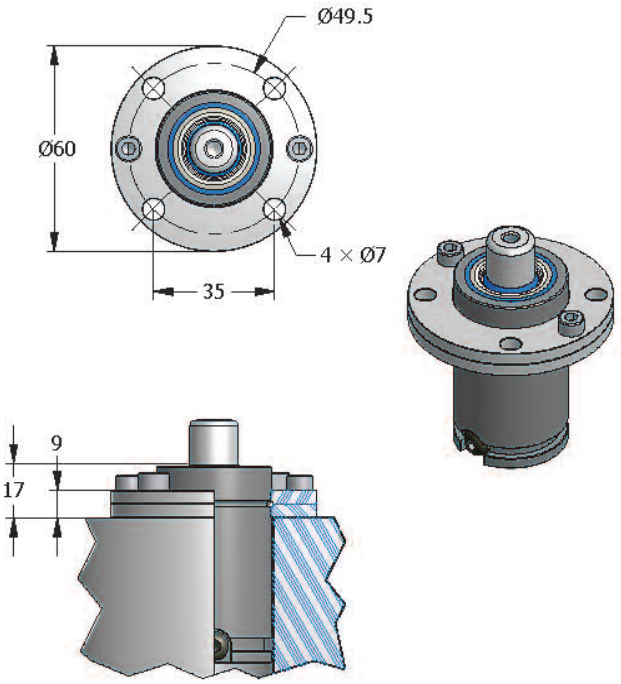
SHINWEON S&T CO.,LTD.

TSP0350 Mounts

XP0350 MOUNT

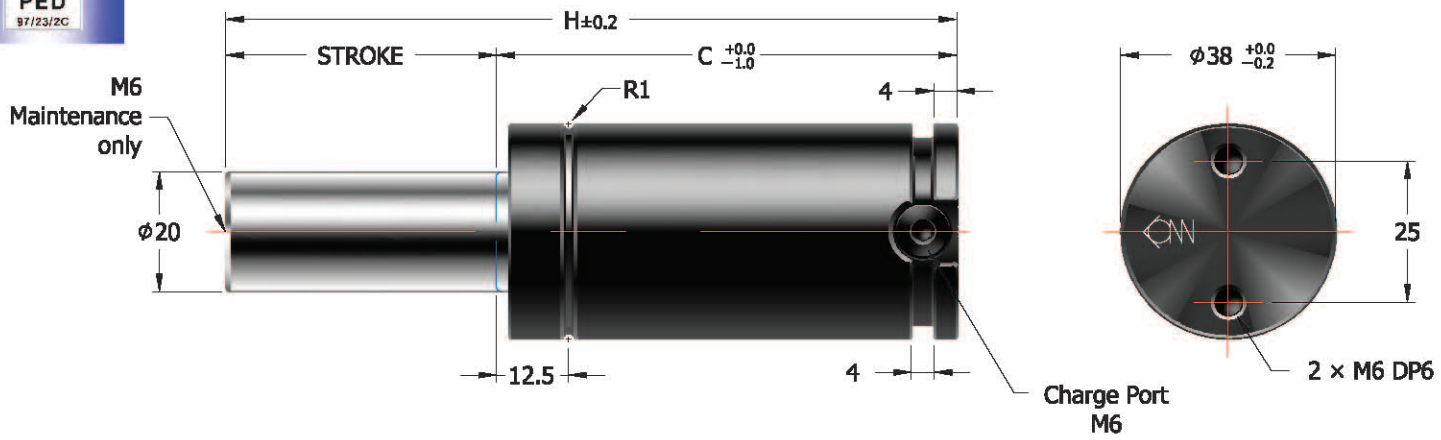


XR0350 MOUNT



TSP0500 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING	TSP0500 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	XP0500					
REPAIR KIT	RCX0500					

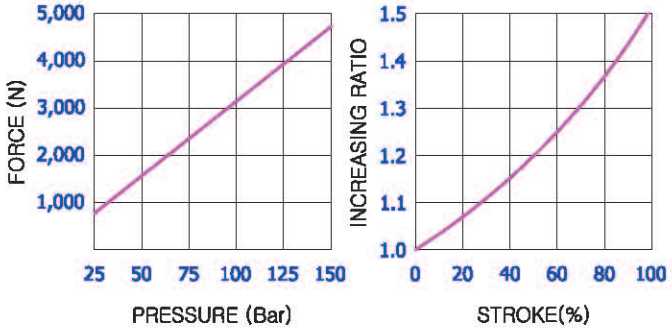
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSP0500

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	50	40		6,700	10.4	0.26
13	0.51	56	43		6,800	13.1	0.28
16	0.63	62	46		6,900	15.7	0.29
20	0.79	70	50		7,000	19.3	0.31
25	0.98	80	55		7,000	23.7	0.33
30	1.18	90	60		7,100	28.2	0.36
35	1.38	100	65		7,100	32.6	0.38
38	1.50	106	68		7,100	35.3	0.39
40	1.57	110	70		7,100	37.0	0.41
45	1.77	120	75	4,700	7,100	41.5	0.43
50	1.97	130	80		7,200	45.9	0.46
60	2.36	150	90		7,200	54.8	0.51
63	2.48	156	93		7,200	57.4	0.52
70	2.76	170	100		7,200	63.6	0.55
75	2.95	180	105		7,200	68.1	0.57
80	3.15	190	110		7,200	72.5	0.60
90	3.54	210	120		7,200	81.4	0.65
100	3.94	230	130		7,200	90.3	0.70
125	4.92	280	155		7,200	112.4	0.82

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP0500

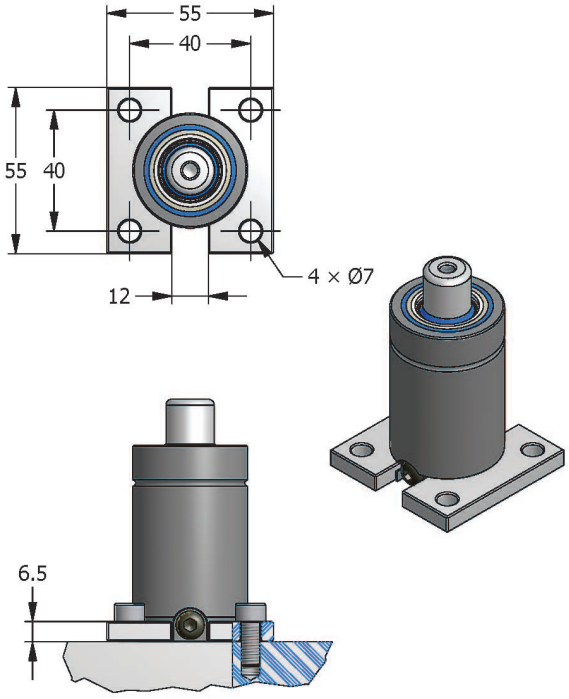
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{31.4}$$

ex) What comes to the charging pressure of gas spring which demands force 4,000N?

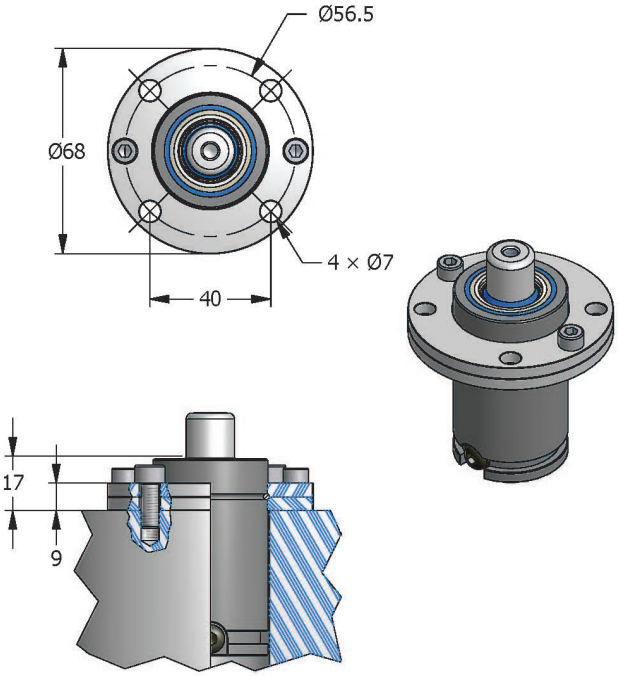
$$127\text{(Bar)} = \frac{4{,}000\text{(N)}}{31.4}$$

TSP0500 Mounts

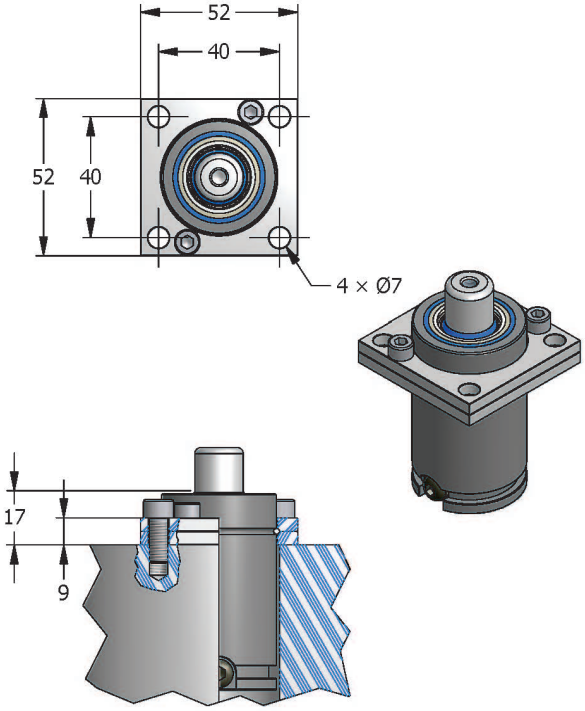
XP0500(SP0300) MOUNT



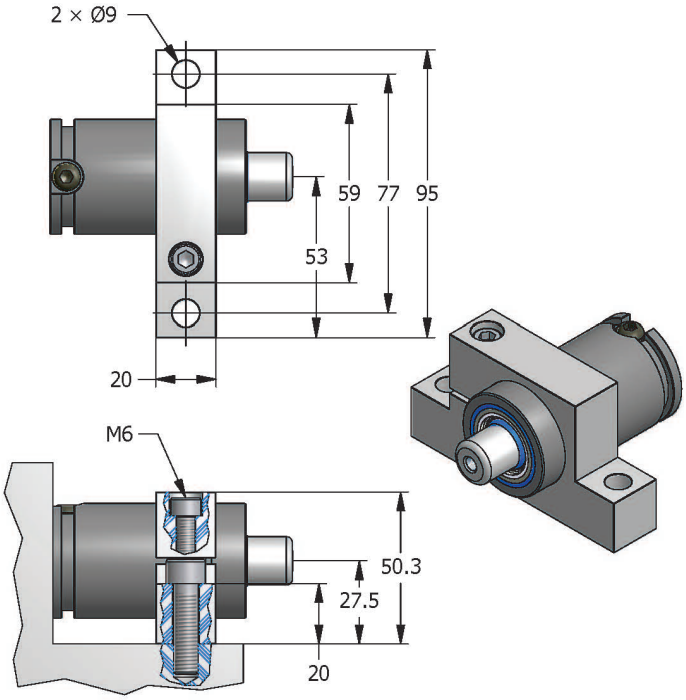
XR0500(SR0300) MOUNT



XT0500(ST0300) MOUNT

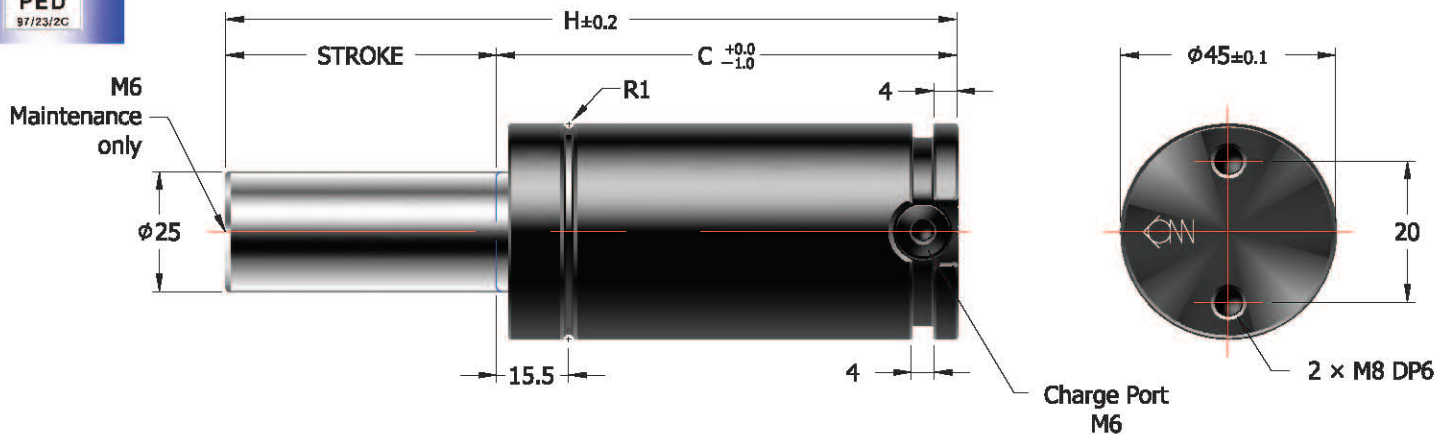


XC0500(SC0300) MOUNT



TSP0750 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING	TSP0750 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	XP0750					
REPAIR KIT	RCX0750					

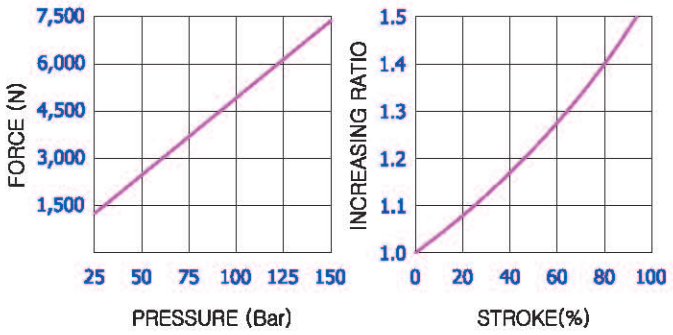
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSP0750

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	52	42		10,600	15.9	0.40
13	0.51	58	45		10,900	19.8	0.42
16	0.63	64	48		11,000	23.7	0.44
20	0.79	72	52		11,100	28.9	0.47
25	0.98	82	57		11,300	35.4	0.50
30	1.18	92	62		11,300	41.9	0.53
35	1.38	102	67		11,400	48.4	0.56
38	1.50	108	70		11,400	52.3	0.58
40	1.57	112	72		11,400	55.0	0.59
45	1.77	122	77	7,400	11,500	61.5	0.63
50	1.97	132	82		11,500	68.0	0.66
60	2.36	152	92		11,600	81.0	0.72
63	2.48	158	95		11,600	84.9	0.74
70	2.76	172	102		11,600	94.0	0.79
75	2.95	182	107		11,600	100.5	0.82
80	3.15	192	112		11,600	107.0	0.85
90	3.54	212	122		11,600	120.0	0.92
100	3.94	232	132		11,700	133.0	0.98
125	4.92	282	157		11,700	165.6	1.14

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP0750

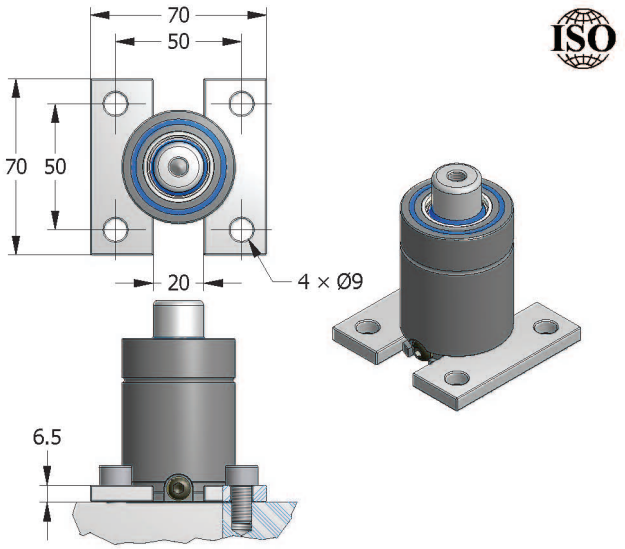
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{49.1}$$

ex) What comes to the charging pressure of gas spring which demands force 6,000N?

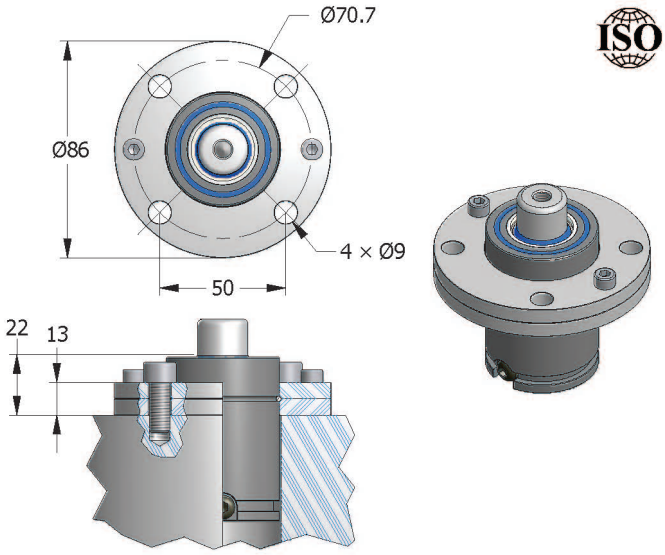
$$122\text{(Bar)} = \frac{6{,}000\text{(N)}}{49.1}$$

TSP0750 Mounts

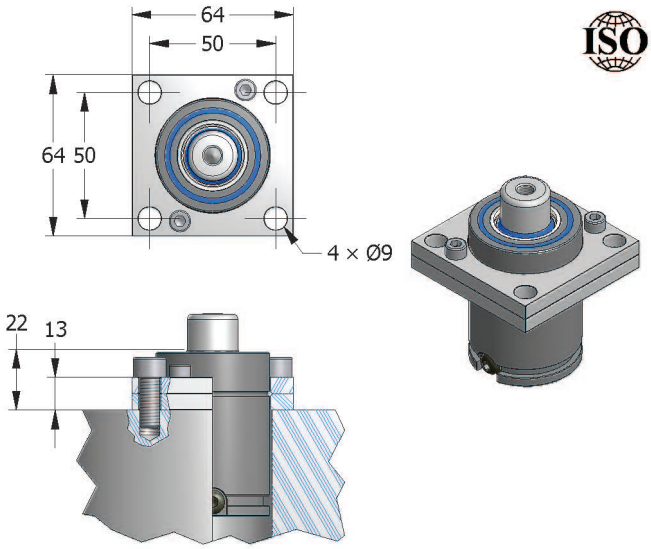
XP0750(SP0500) MOUNT



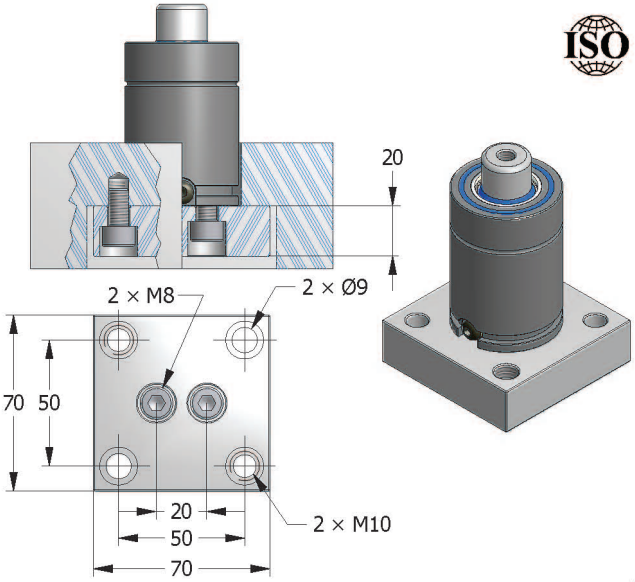
XR0750(SR0500) MOUNT



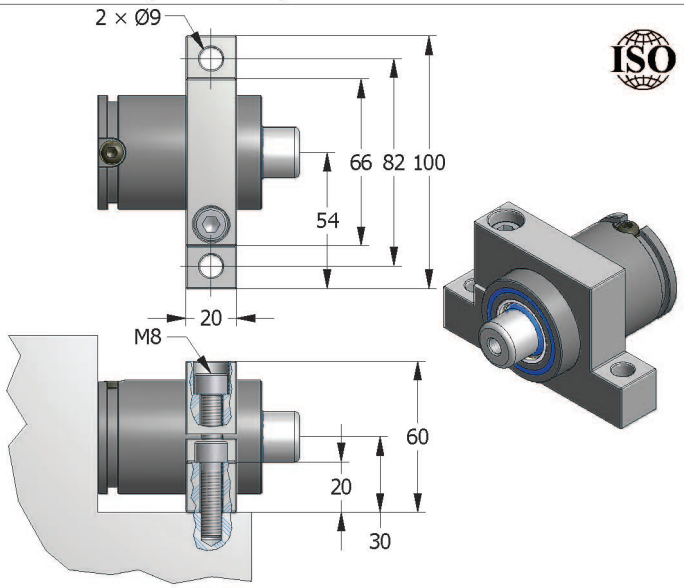
XT0750(ST0500) MOUNT



XB0750(SB0500) MOUNT

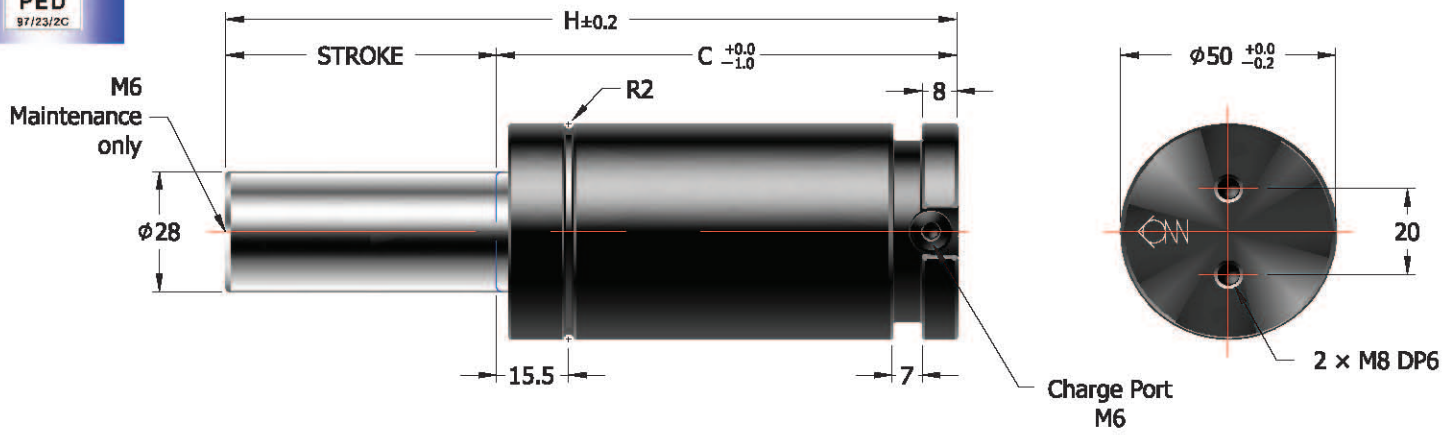


XC0750(SC0500) MOUNT



TSP1000 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING	TSP1000 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	XP1000							
REPAIR KIT	RCX1000							

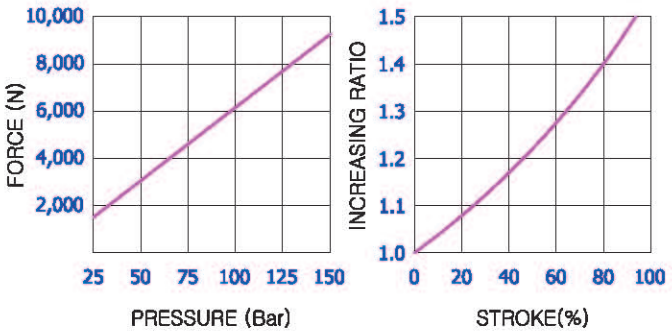
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSP1000

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
13	0.51	64	51	9,200	13,300	27.3	0.58
16	0.63	70	54		13,600	32.0	0.61
20	0.79	78	58		13,800	38.3	0.64
25	0.98	88	63		14,000	46.2	0.68
30	1.18	98	68		14,200	54.0	0.72
35	1.38	108	73		14,300	61.9	0.76
38	1.50	114	76		14,400	66.6	0.78
40	1.57	118	78		14,400	69.7	0.80
45	1.77	128	83		14,500	77.6	0.84
50	1.97	138	88		14,600	85.4	0.89
60	2.36	158	98		14,600	101.1	0.96
63	2.48	164	101		14,700	105.8	0.98
70	2.76	178	108		14,700	116.8	1.04
75	2.95	188	113		14,700	124.7	1.09
80	3.15	198	118		14,800	132.5	1.12
90	3.54	218	128		14,800	148.2	1.21
100	3.94	238	138		14,900	163.8	1.29
125	4.92	288	163		14,900	203.2	1.49

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP1000

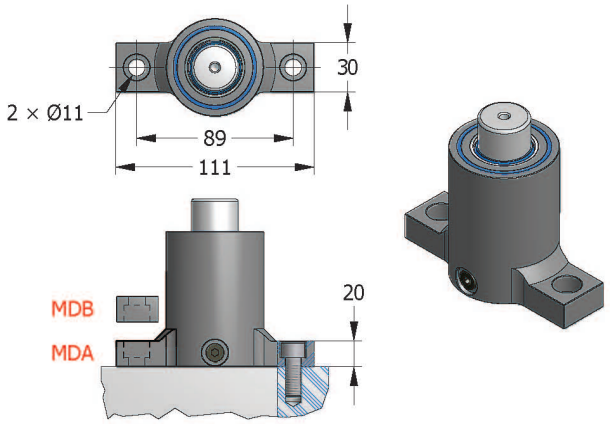
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{61.5}$$

ex) What comes to the charging pressure of gas spring which demands force 8,500N?

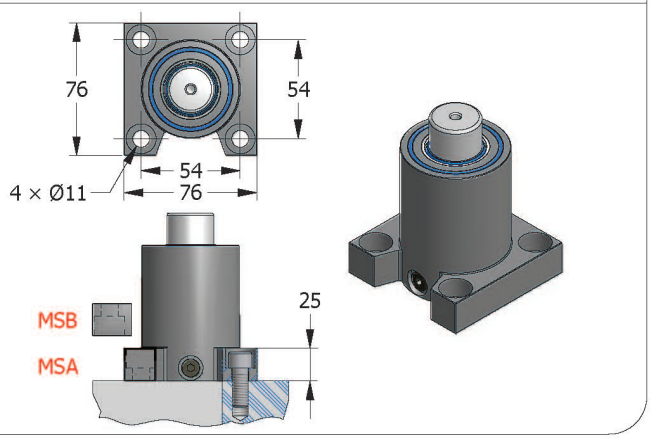
$$138(\text{Bar}) = \frac{8{,}500(\text{N})}{61.5}$$

TSP1000 Mounts

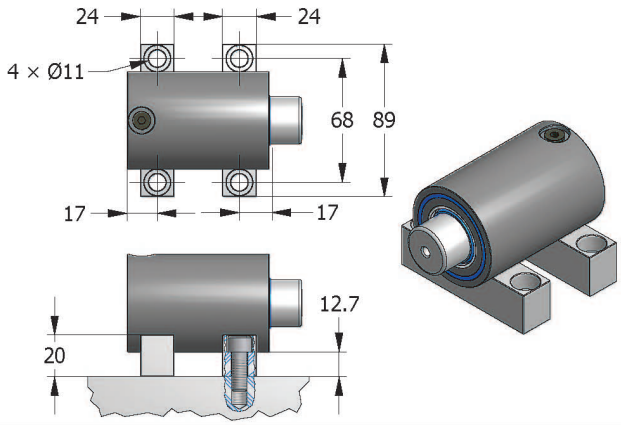
MD MOUNT WELDED



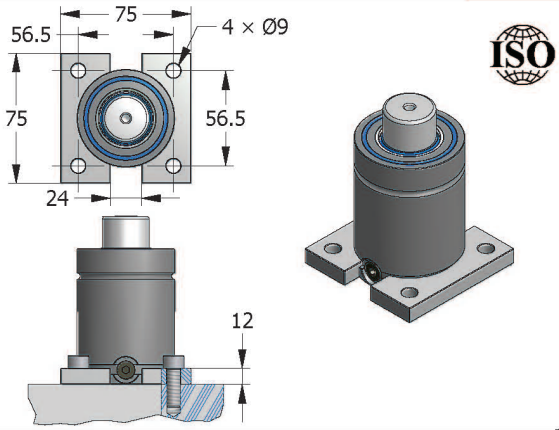
MS MOUNT WELDED



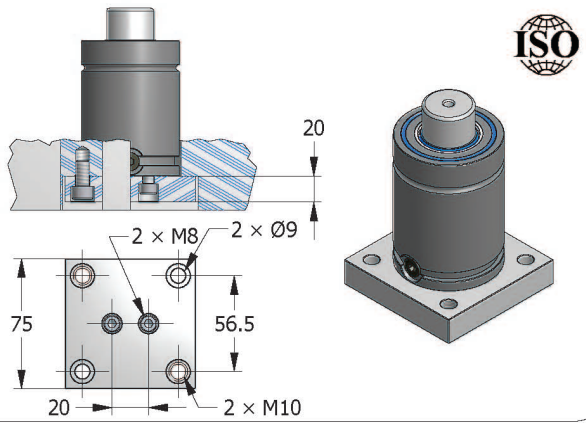
MK MOUNT WELDED



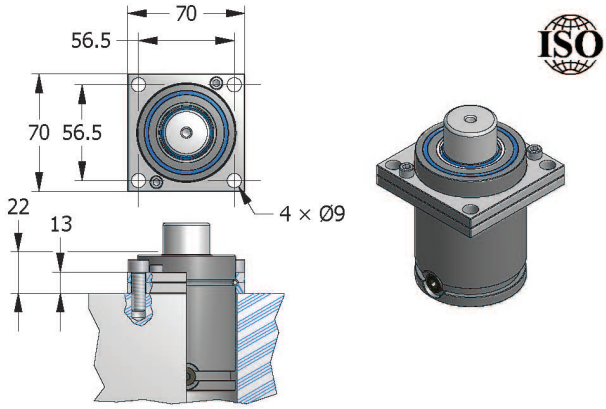
XP1000(SP0750) MOUNT



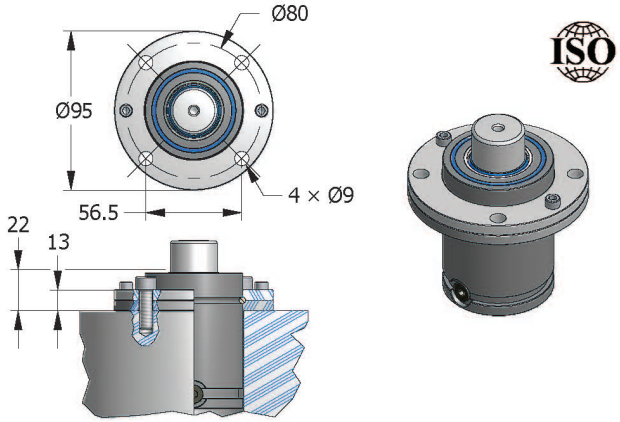
XB1000(SB0750) MOUNT



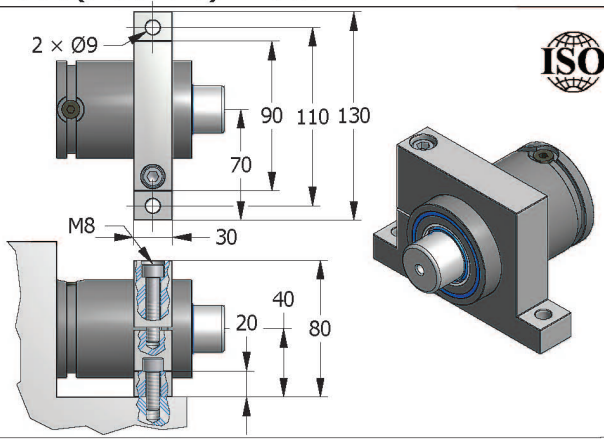
XT1000(ST0750) MOUNT



XR1000(SR0750) MOUNT

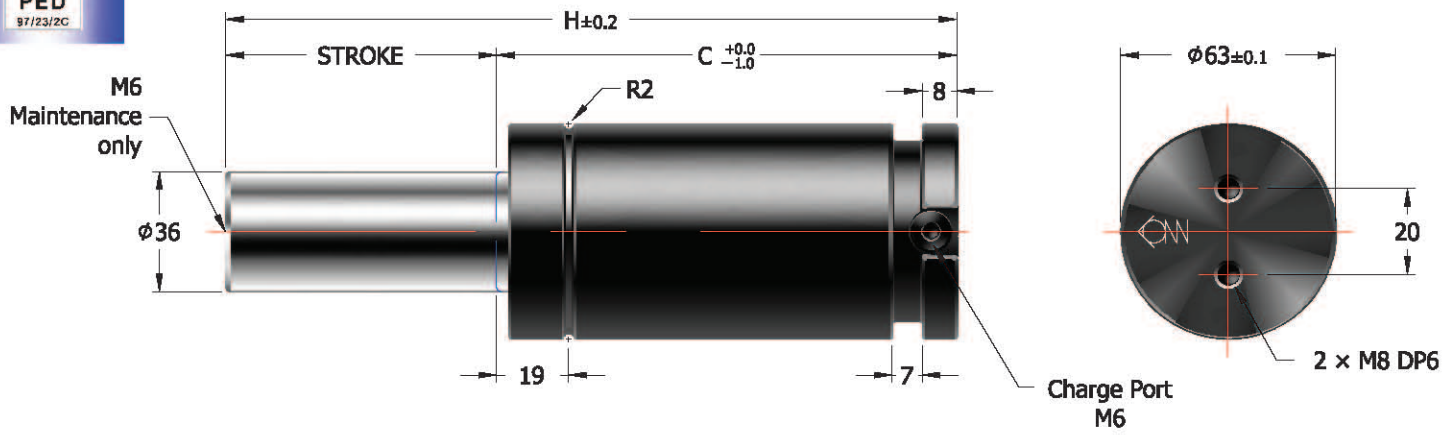


XC1000(SC0750) MOUNT



TSP1500 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING	TSP1500 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	XP1500							
REPAIR KIT	RCX1500							

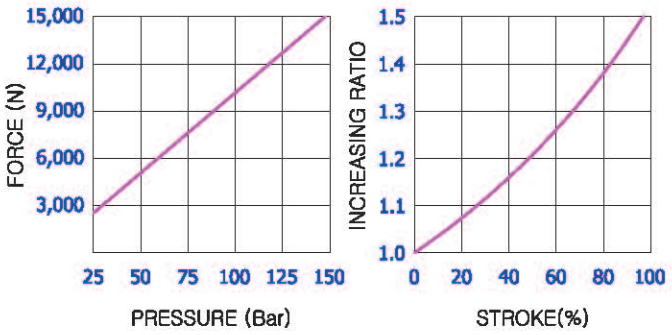
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSP1500

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force *	Gas vol. (㎤)	Weight (kg)
13	0.51	70	57	15,200	20,900	48.8	1.04
16	0.63	76	60		21,400	56.8	1.08
20	0.79	84	64		21,900	67.4	1.13
25	0.98	94	69		22,300	80.7	1.20
30	1.18	104	74		22,600	93.9	1.27
35	1.38	114	79		22,900	107.2	1.34
38	1.50	120	82		23,000	115.2	1.37
40	1.57	124	84		23,000	120.5	1.40
45	1.77	134	89		23,200	133.7	1.47
50	1.97	144	94		23,300	147.0	1.58
60	2.36	164	104		23,500	173.5	1.66
63	2.48	170	107		23,600	181.5	1.71
70	2.76	184	114		23,700	200.1	1.80
75	2.95	194	119		23,800	213.3	1.87
80	3.15	204	124		23,800	226.3	1.93
90	3.54	224	134		23,900	252.9	2.07
100	3.94	244	144		24,000	279.5	2.19
125	4.92	294	169		24,100	346.0	2.53

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP1500

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{101.7}$$

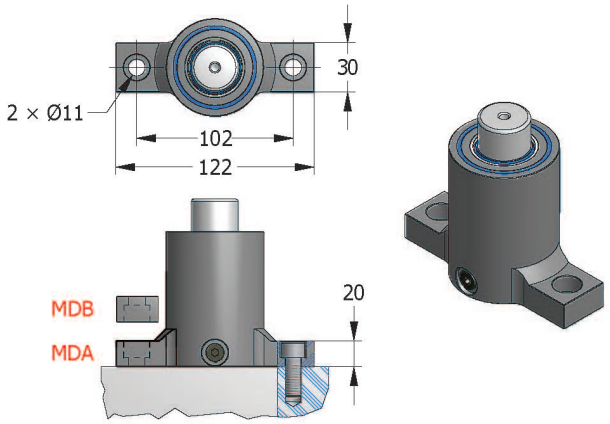
ex) What comes to the charging pressure of gas spring which demands force 12,000N?

$$118(\text{Bar}) = \frac{12{,}000(\text{N})}{101.7}$$

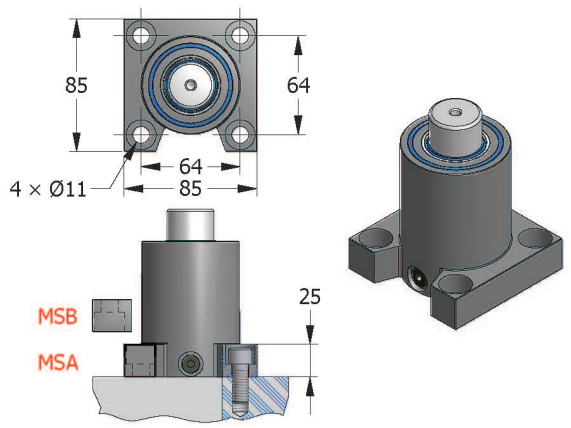
SHINWEON S&T CO.,LTD.

TSP1500 Mounts

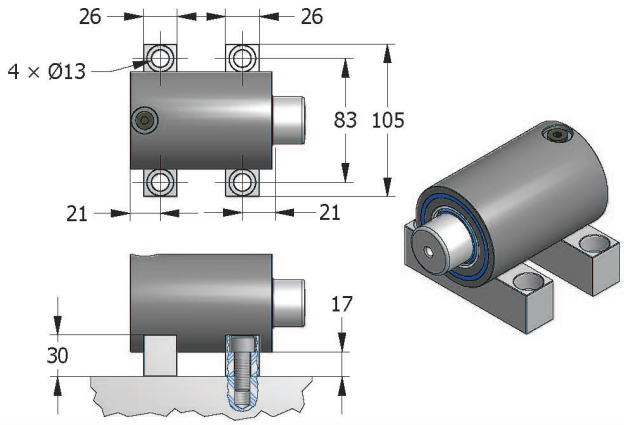
MD MOUNT — WELDED



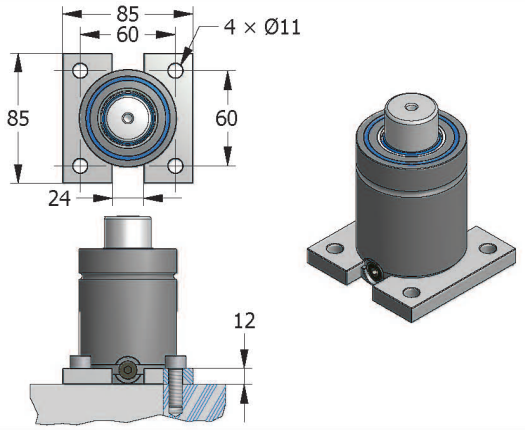
MS MOUNT — WELDED



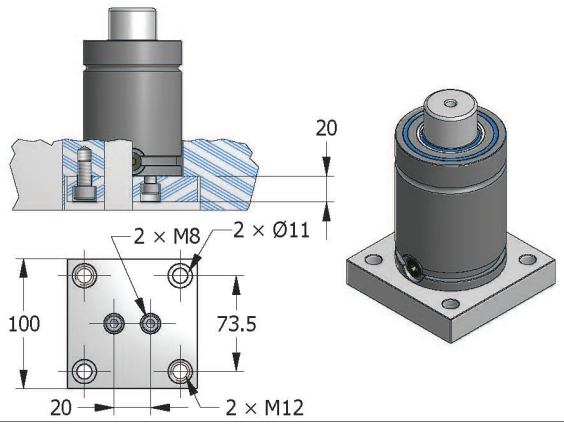
MK MOUNT — WELDED



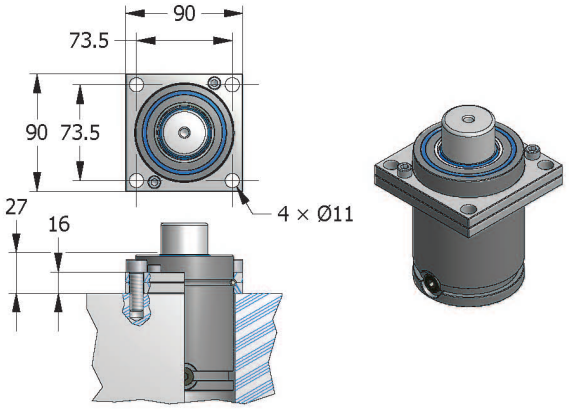
XP1500 MOUNT



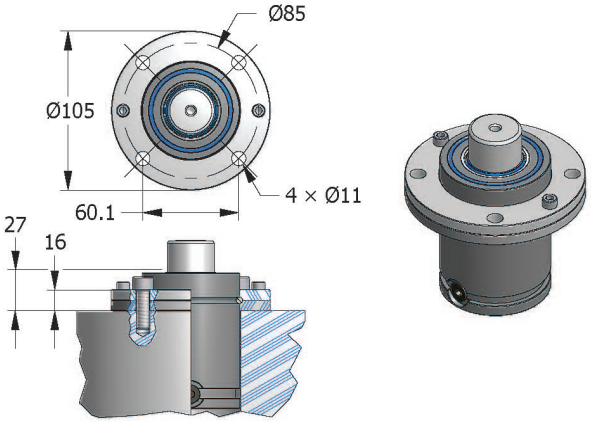
XB1500 MOUNT



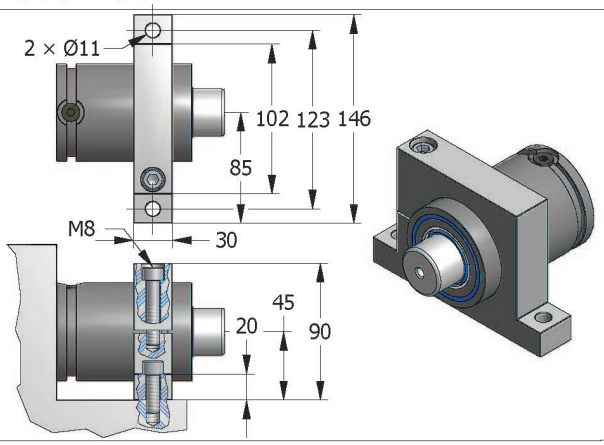
XT1500 MOUNT



XR1500 MOUNT

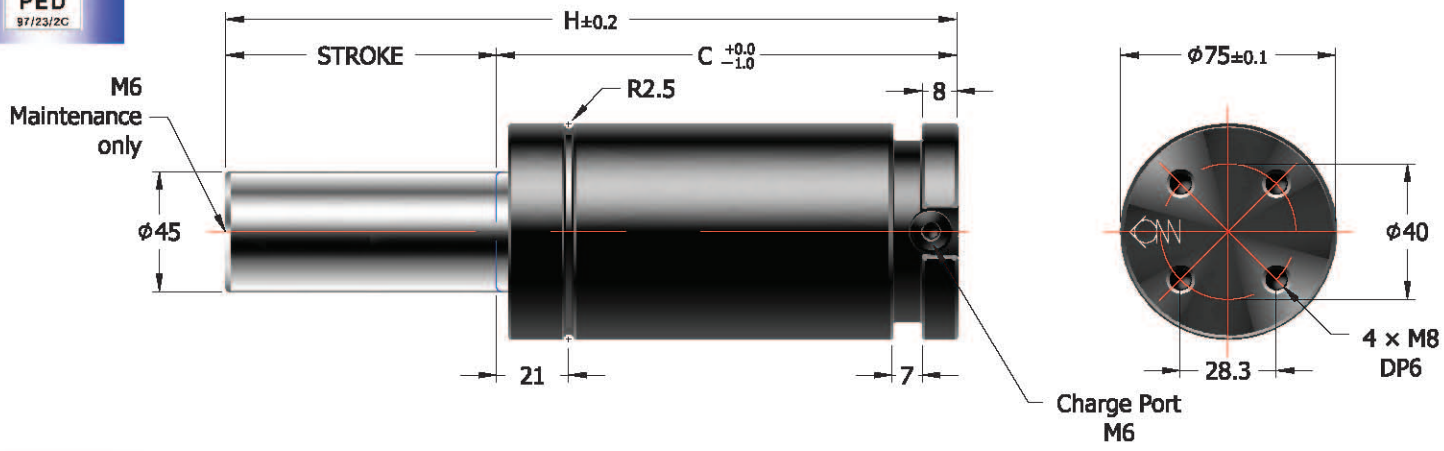


XC1500 MOUNT



TSP2400 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING	TSP2400 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	XP2400							
REPAIR KIT	RCX2400							

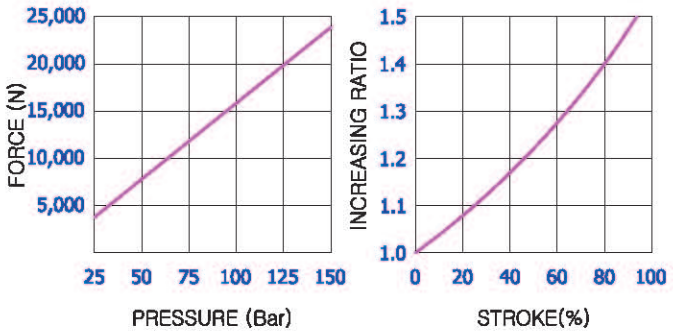
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSP2400

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
16	0.63	77	61		33,800	86.3	1.58
20	0.79	85	65		34,600	102.4	1.65
25	0.98	95	70		35,300	122.5	1.73
30	1.18	105	75		35,800	142.6	1.81
35	1.38	115	80		36,200	162.7	1.89
38	1.50	121	83		36,400	174.8	1.94
40	1.57	125	85		36,600	182.8	1.97
45	1.77	135	90		36,800	203.0	2.05
50	1.97	145	95	23,800	37,000	223.1	2.13
60	2.36	165	105		37,400	263.3	2.30
63	2.48	171	108		37,500	275.4	2.34
70	2.76	185	115		37,600	303.5	2.47
75	2.95	195	120		37,700	323.6	2.55
80	3.15	205	125		37,800	343.8	2.63
90	3.54	225	135		38,000	384.0	2.79
100	3.94	245	145		38,100	424.2	2.95
125	4.92	295	170		38,400	524.8	3.37

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP2400

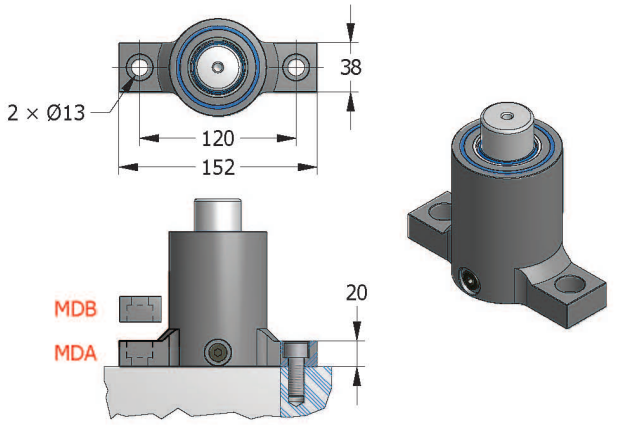
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{159.0}$$

ex) What comes to the charging pressure of gas spring which demands force 20,000N?

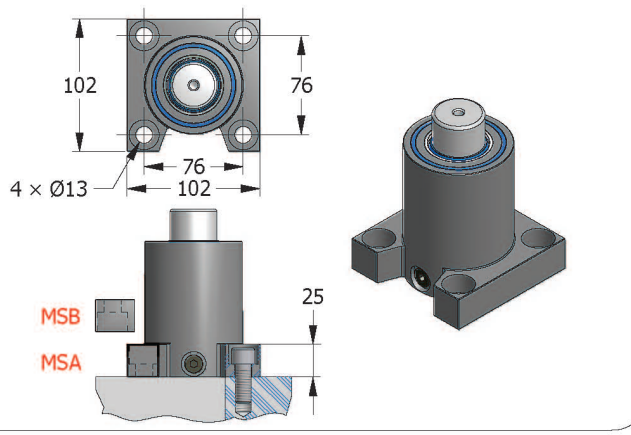
$$126\text{(Bar)} = \frac{20{,}000\text{(N)}}{159.0}$$

TSP2400 Mounts

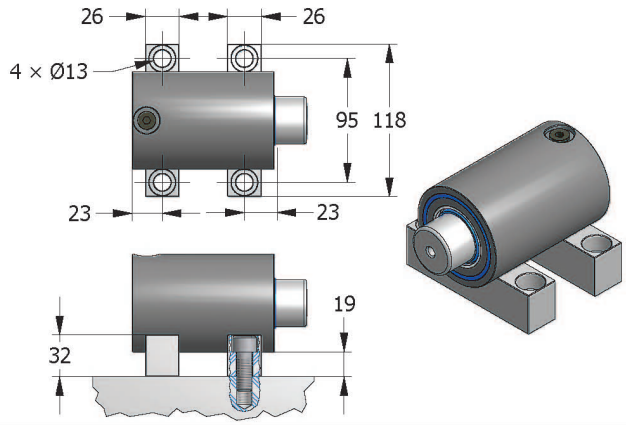
MD MOUNT WELDED



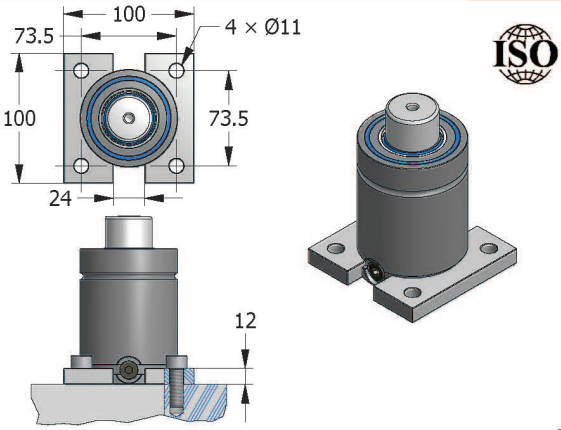
MS MOUNT WELDED



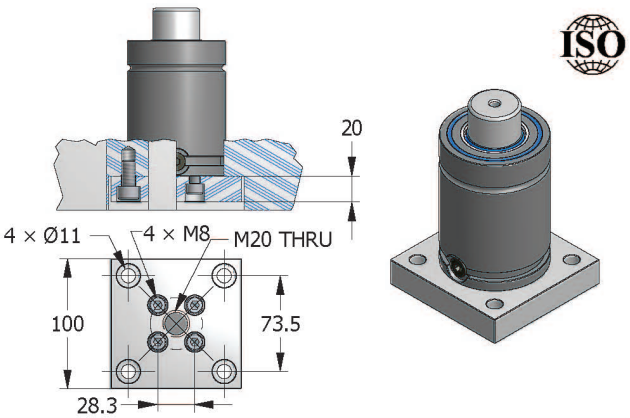
MK MOUNT WELDED



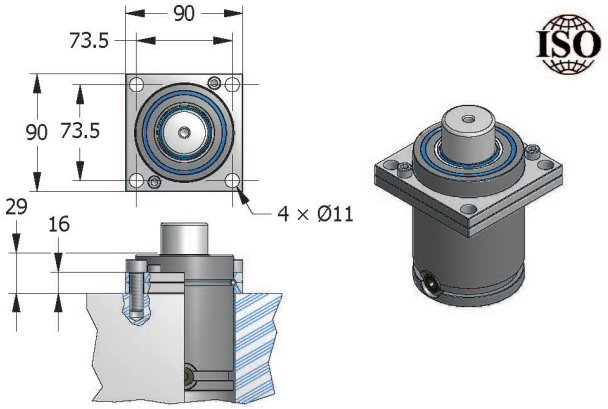
XP2400(SP1500) MOUNT



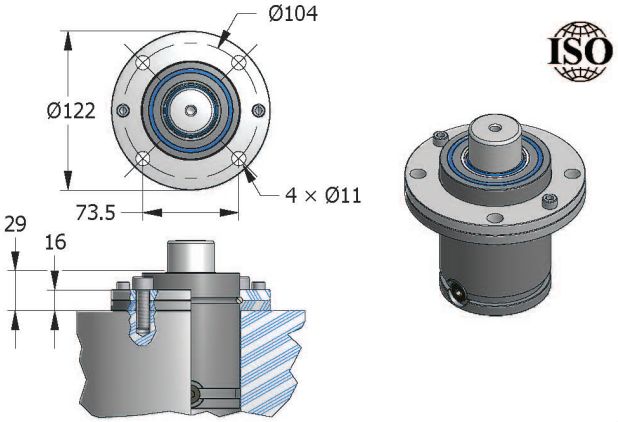
XB2400(SB1500) MOUNT



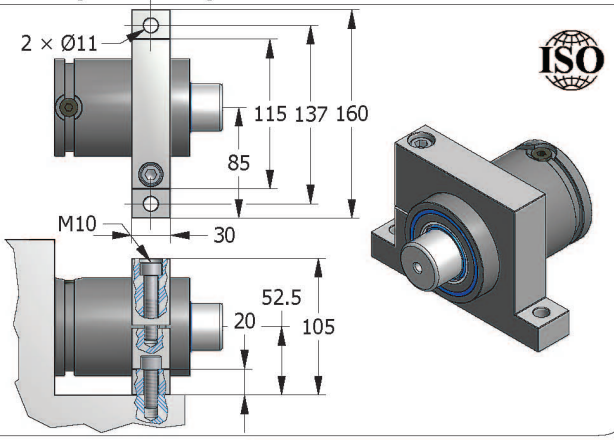
XT2400(ST1500) MOUNT



XR2400(SR1500) MOUNT

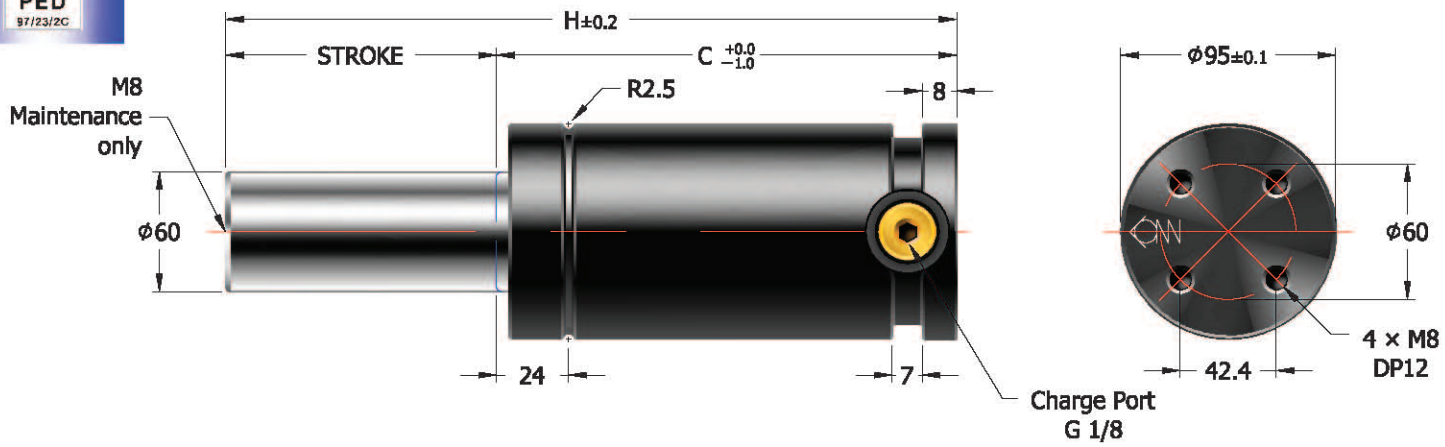


XC2400(SC1500) MOUNT



TSP4200 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSP4200 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	XP4200							
REPAIR KIT	RCX4200							

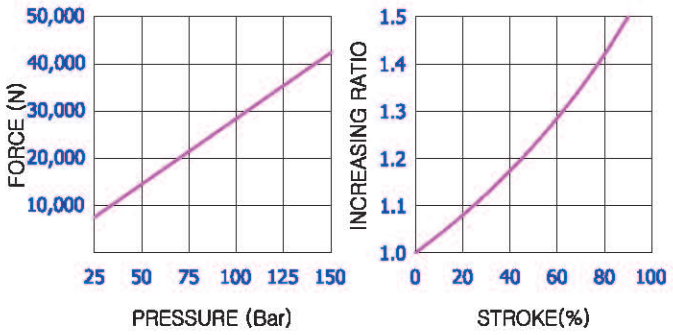
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSP4200

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
16	0.63	90	74		60,600	150.5	3.21
20	0.79	98	78		62,300	177.8	3.32
25	0.98	108	83		63,800	212.0	3.46
30	1.18	118	88		65,000	246.2	3.60
35	1.38	128	93		65,900	280.3	3.75
38	1.50	134	96		66,400	300.8	3.82
40	1.57	138	98		66,600	314.5	3.88
45	1.77	148	103		67,200	348.7	4.02
50	1.97	158	108	42,200	67,700	382.8	4.16
60	2.36	178	118		68,500	451.2	4.44
63	2.48	184	121		68,700	471.7	4.52
70	2.76	198	128		69,100	519.5	4.72
75	2.95	208	133		69,400	553.6	4.86
80	3.15	218	138		69,600	587.8	5.00
90	3.54	238	148		70,000	656.1	5.27
100	3.94	258	158		70,300	724.5	5.56
125	4.92	308	183		70,900	895.3	6.25

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP4200

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{282.6}$$

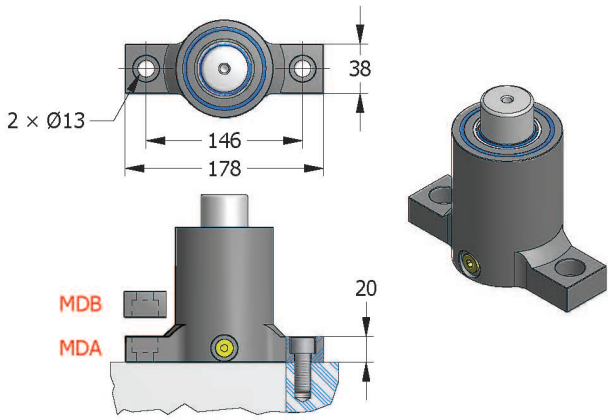
ex) What comes to the charging pressure of gas spring which demands force 35,000N?

$$124\text{(Bar)} = \frac{35{,}000\text{(N)}}{282.6}$$

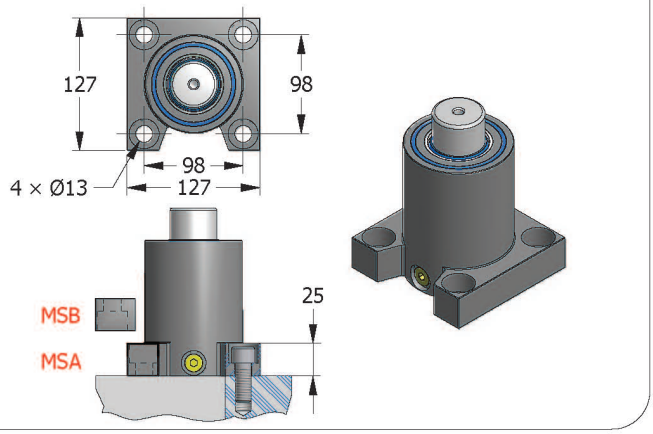
SHINWEON S&T CO.,LTD.

TSP4200 Mounts

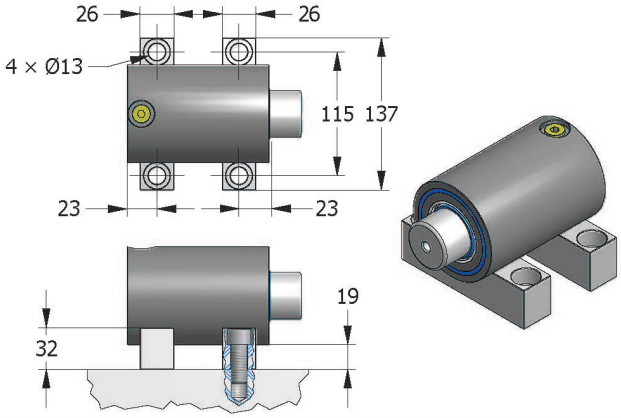
MD MOUNT — WELDED



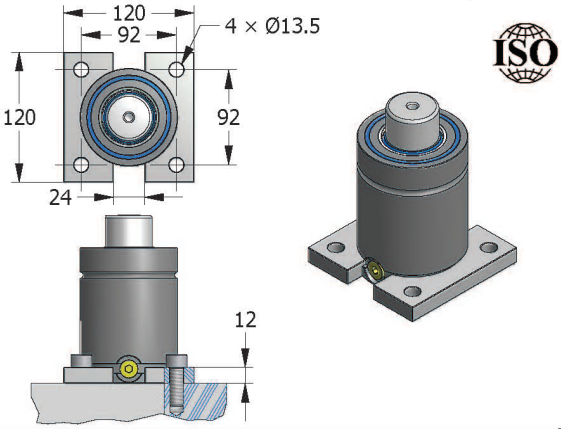
MS MOUNT — WELDED



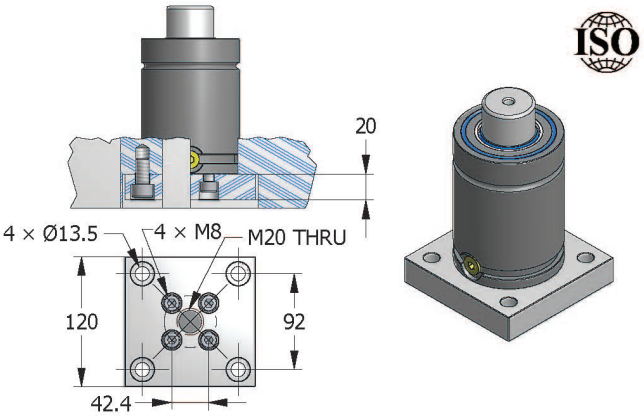
MK MOUNT — WELDED



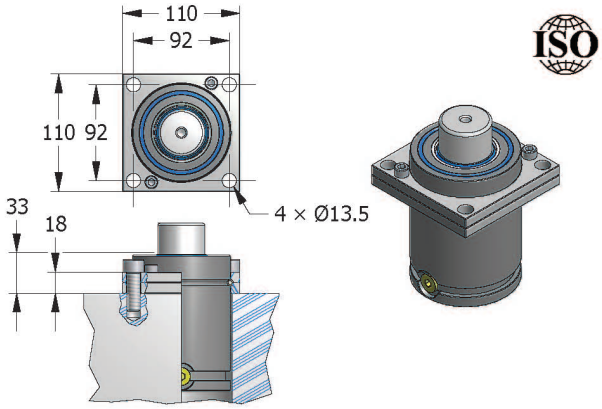
XP4200(SP3000) MOUNT



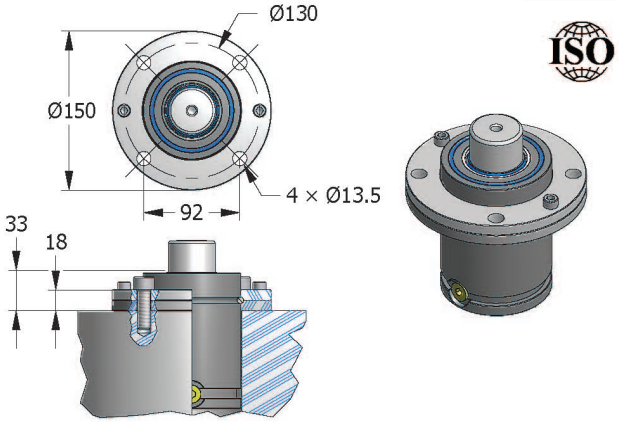
XB4200(SB3000) MOUNT



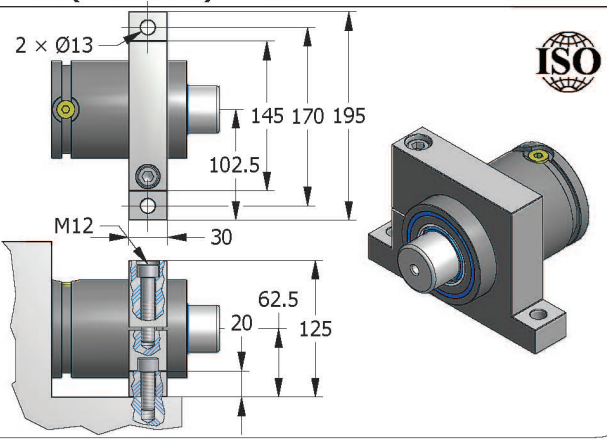
XT4200(ST3000) MOUNT



XR4200(SR3000) MOUNT

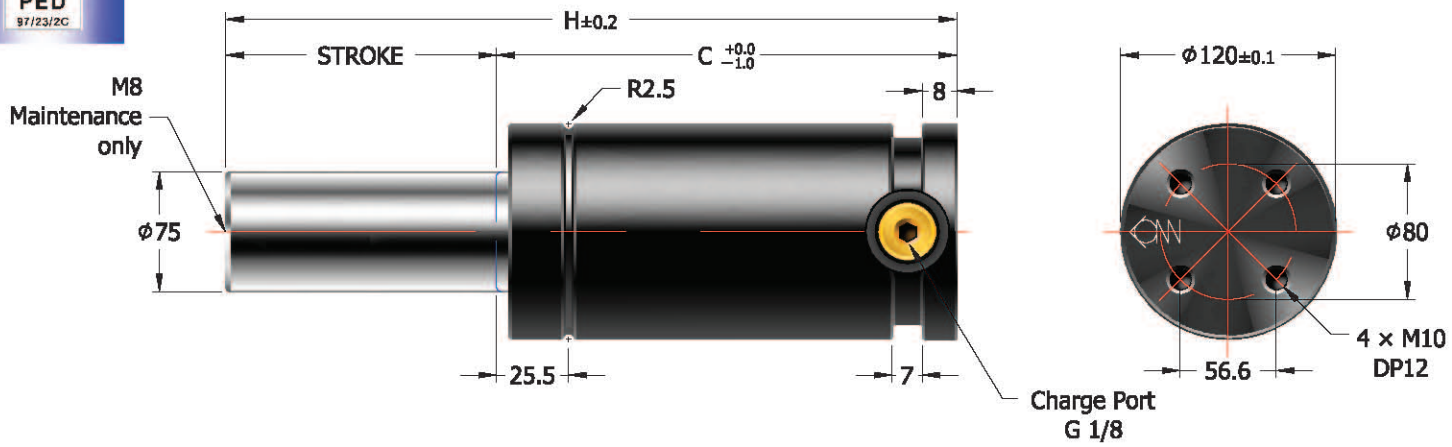


XC4200(SC3000) MOUNT



TSP6600 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING	TSP6600 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	XP6600							
REPAIR KIT	RCX6600							

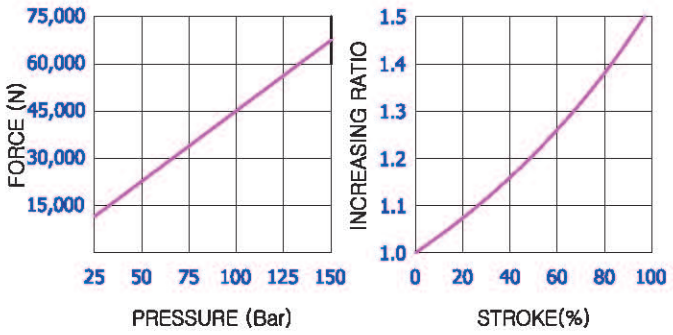
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSP6600

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
16	0.63	100	84		91,900	272.3	6.01
20	0.79	108	88		93,700	315.7	6.19
25	0.98	118	93		96,200	370.1	6.42
30	1.18	128	98		98,200	424.4	6.65
35	1.38	138	103		99,700	478.7	6.87
38	1.50	144	106		100,500	511.3	7.01
40	1.57	148	108		101,000	533.1	7.11
45	1.77	158	113		102,100	587.4	7.33
50	1.97	168	118	66,000	103,000	641.8	7.56
60	2.36	188	128		104,400	750.4	8.01
63	2.48	194	131		104,800	783.0	8.15
70	2.76	208	138		105,500	859.1	8.47
75	2.95	218	143		105,900	913.4	8.70
80	3.15	228	148		106,400	967.8	8.93
90	3.54	248	158		107,100	1076.5	9.38
100	3.94	268	168		107,600	1185.1	9.84
125	4.92	318	193		108,700	1456.8	10.98

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP6600

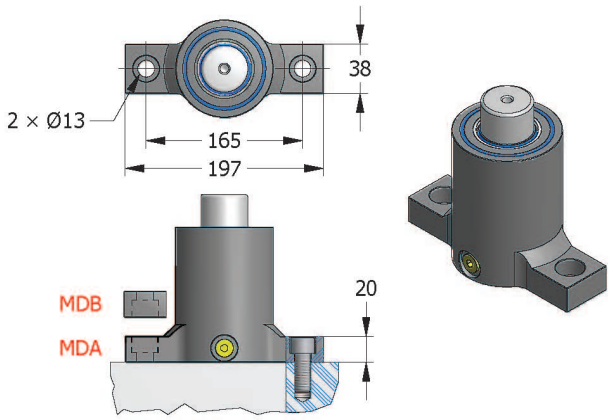
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{441.6}$$

ex) What comes to the charging pressure of gas spring which demands force 60,000N?

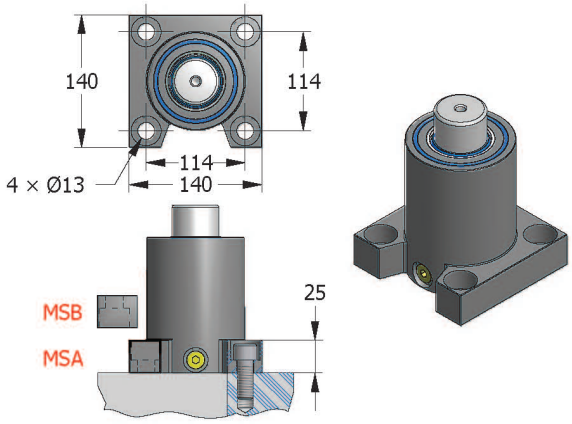
$$136\text{(Bar)} = \frac{60{,}000\text{(N)}}{441.6}$$

TSP6600 Mounts

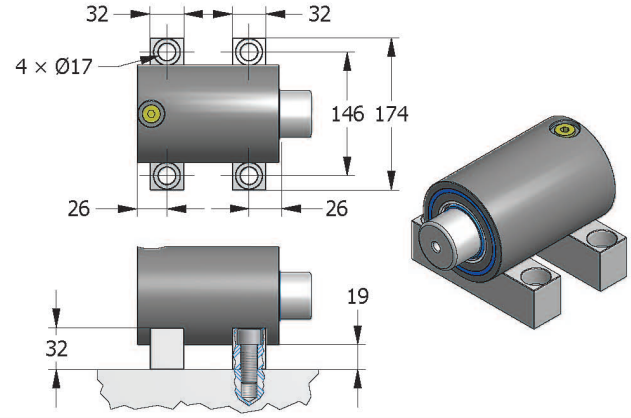
MD MOUNT — WELDED



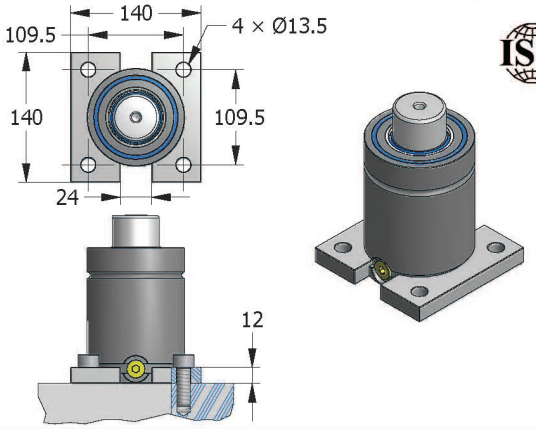
MS MOUNT — WELDED



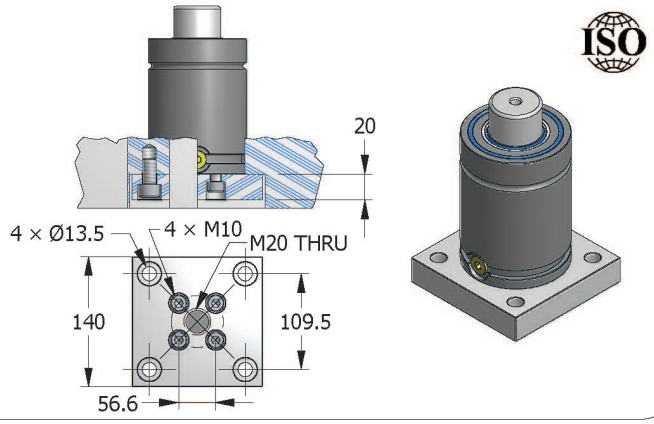
MK MOUNT — WELDED



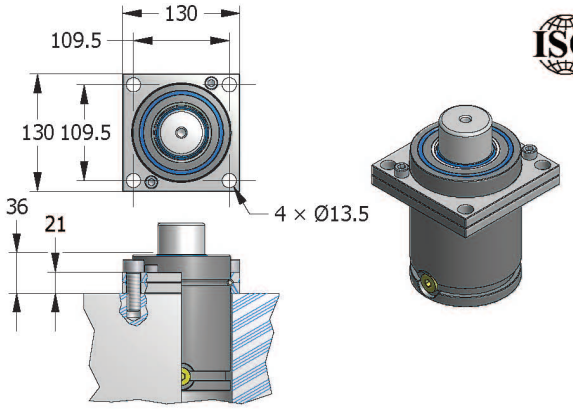
XP6600(SP5000) MOUNT



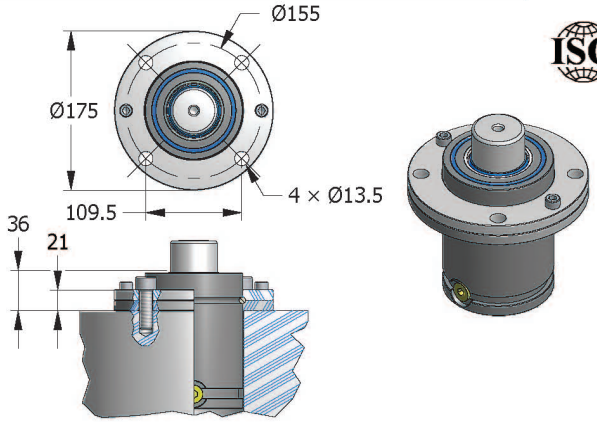
XB6600(SB5000) MOUNT



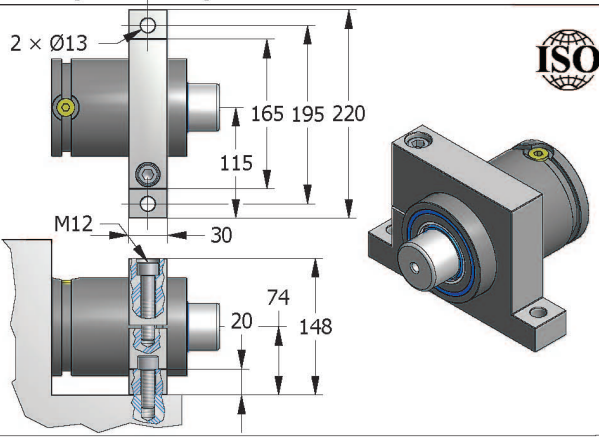
XT6600(ST5000) MOUNT



XR6600(SR5000) MOUNT

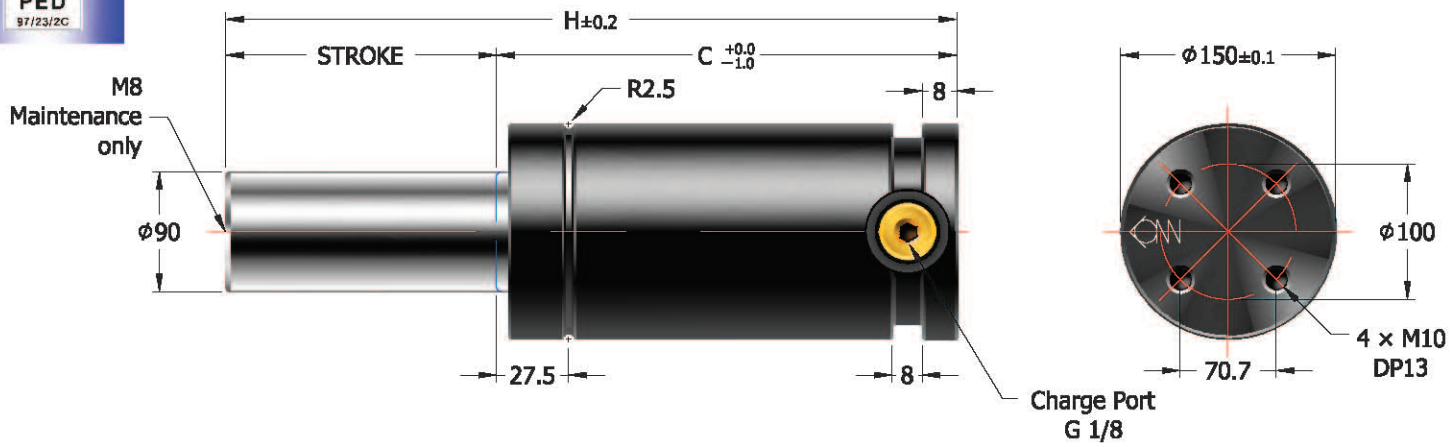


XC6600(SC5000) MOUNT



TSP9500 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING	TSP9500 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	XP9500							
REPAIR KIT	RCX9500							

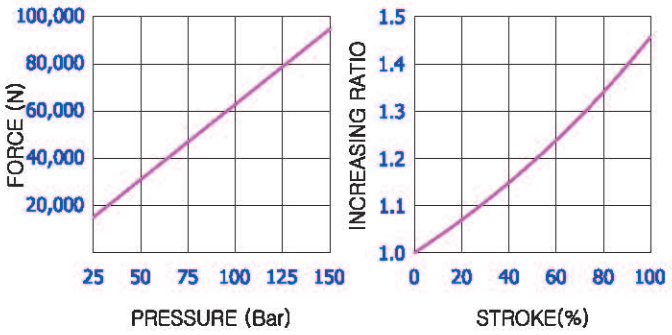
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSP9500

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
20	0.79	118	98	95,000	127,600	509.9	10.78
25	0.98	128	103		131,000	591.6	11.10
30	1.18	138	108		133,700	673.3	11.60
35	1.38	148	113		135,900	755.0	12.84
38	1.50	154	116		137,000	804.0	13.18
40	1.57	158	118		137,700	836.6	13.24
45	1.77	168	123		139,200	918.3	14.48
50	1.97	178	128		140,500	1000.0	14.70
60	2.36	198	138		142,600	1163.3	15.50
63	2.48	204	141		143,100	1212.3	15.64
70	2.76	218	148		144,200	1326.7	16.20
75	2.95	228	153		144,900	1408.4	17.30
80	3.15	238	158		145,500	1490.0	18.10
90	3.54	258	168		146,500	1653.4	19.60
100	3.94	278	178		147,400	1816.7	20.44
125	4.92	328	203		149,100	2225.1	21.20

* = at full stroke

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSP9500

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{635.9}$$

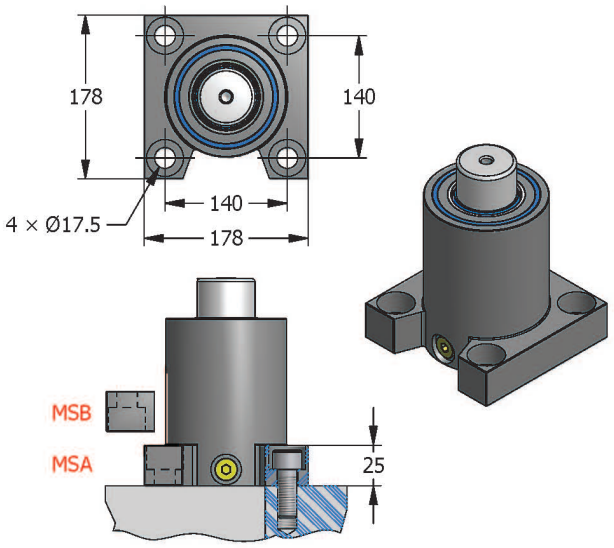
ex) What comes to the charging pressure of gas spring which demands force 85,000N?

$$134\text{(Bar)} = \frac{85{,}000\text{(N)}}{635.9}$$

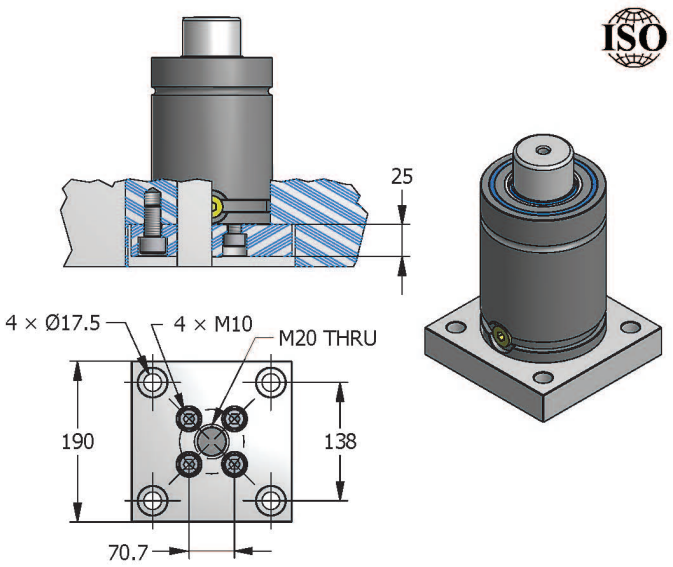
TSP9500 Mounts

MS MOUNT

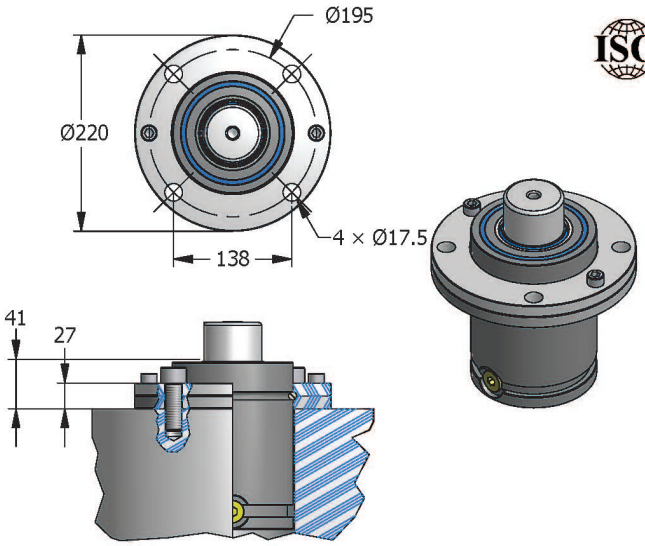
WELDED



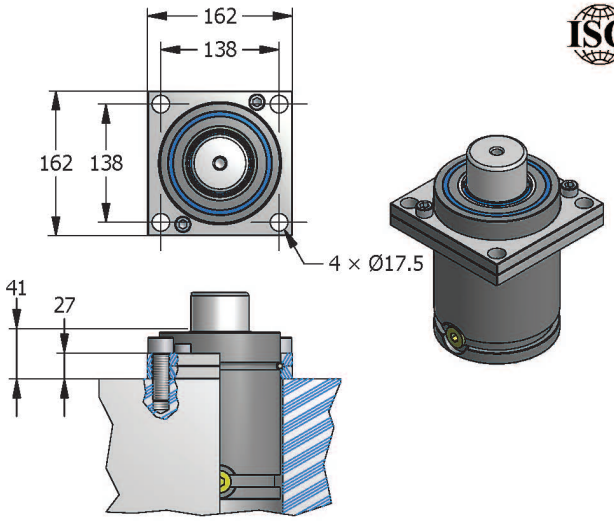
XB9500(SB7500) MOUNT



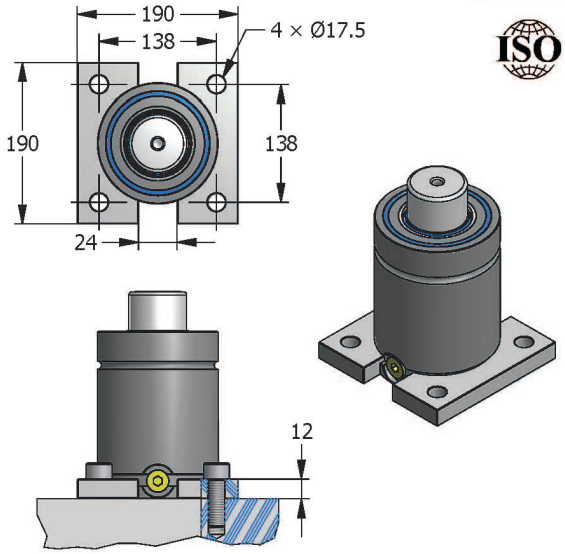
XR9500(SR7500) MOUNT



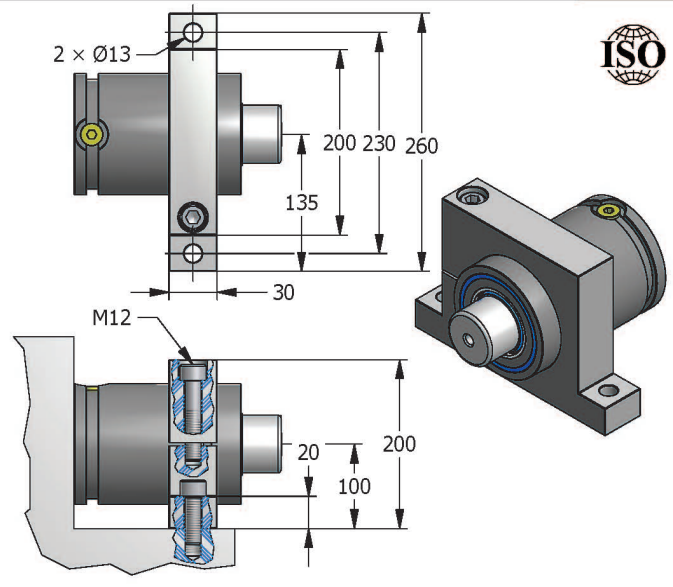
XT9500(ST7500) MOUNT



XP9500(SP7500) MOUNT



XC9500(SC7500) MOUNT



CT02052E

NITROGEN GAS SPRING

PED 97/23/EC

CE

ISO 9001

JAS-ANZ

TSM SERIES!!

SHINWEON S&T CO.,LTD.

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TSM-SERIES

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COMPACT TYPE

MODEL

■ General Specification

- ● Filling Materials: Nitrogen Gas (N_2)
- ● Maximum Stroke Rate Per Minute (Recommended): ~50 to 100 (at 20℃)
- ● Maximum Filling Pressure: 150~175 bar (at 20℃)
- ● Piston Rod Speed: 0.03~0.8 m/s
- ● Minimum Filling Pressure: 25 bar (at 20℃)
- ● Rod Surface Treatment: Nitrate Coating
- ● Operation Temperature: -5 to 80℃
- ● Cylinder Surface Treatment: Oxidized Black Coating
- ● Pressure Increase as per Temperature: ±0.3% / ℃

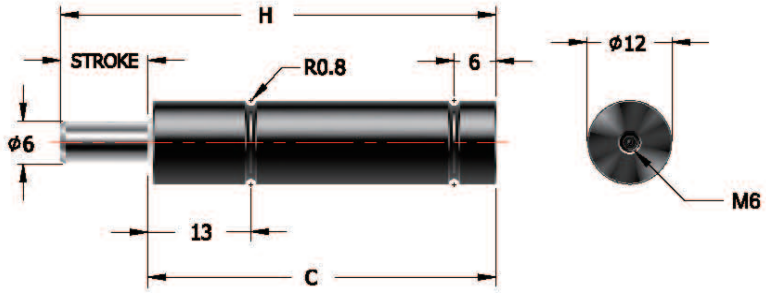
■ Specification

TYPE	Stroke (mm)	Cylinder Diameter Φ(mm)	Rod Φ(mm)	Initial Force (N)	End Force (N)	MAX. Charging Pressure
TSM50	7~125	12	6	P34 Reference	P34 Reference	P34 Reference
TSM70	7~125	15	7	P35 Reference	P35 Reference	P35 Reference
TSM90	7~125	19	8	P36 Reference	P36 Reference	P36 Reference
TSM0150	10~125	25	12	P38 Reference	P38 Reference	P38 Reference
TSM0300	10~125	38	16	3,000	4,200	150Bar
TTM0300		M38				
TSM0500	10~125	45	20	4,650	6,500	150Bar
TSM0750	10~125	50	25	7,350	12,000	150Bar
TSM1500	10~200	75	36	15,150	22,100	150Bar
TSM3000	10~200	95	50	29,400	47,600	150Bar
TSM5000	10~200	120	65	49,650	84,100	150Bar

※ The above specification is subject to change without notice for performance improvement.

TSM50 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING — TSM50 (MODEL) × 050 (STROKE) – 180(YELLOW) (CHARGING PRESSURE (Bar))

MOUNT — SG50

REPAIR KIT — Non-repairable

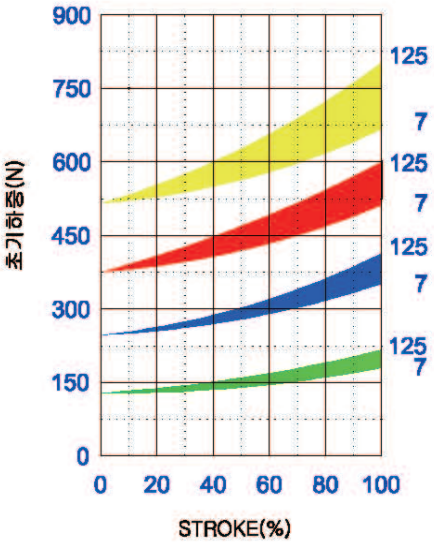
TSM50

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (180·135·90·45 bar / +20℃) End force*	End force*	End force*	End force*	Gas vol. (㎤)	weight (kg)
7	0.28	56	49	700	500	400	200	0.8	0.03
10	0.39	62	52	700	600	400	200	1.1	0.03
12.7	0.50	67.4	54.7	800	600	400	200	1.3	0.03
15	0.59	72	57	800	600	400	200	1.5	0.03
19	0.75	80	61	800	600	400	200	1.8	0.04
25	0.98	92	67	800	600	400	200	2.2	0.04
38	1.50	118	80	800	600	400	200	3.3	0.04
50	1.97	142	92	800	600	400	200	4.2	0.05
63.5	2.50	172	108.5	800	600	400	200	5.5	0.06
75	2.95	195	120	800	600	400	200	6.4	0.06
80	3.15	205	125	800	600	400	200	6.8	0.07
100	3.94	245	145	800	600	400	200	8.4	0.07
125	4.92	295	170	800	600	400	200	10.3	0.09

* = at full stroke

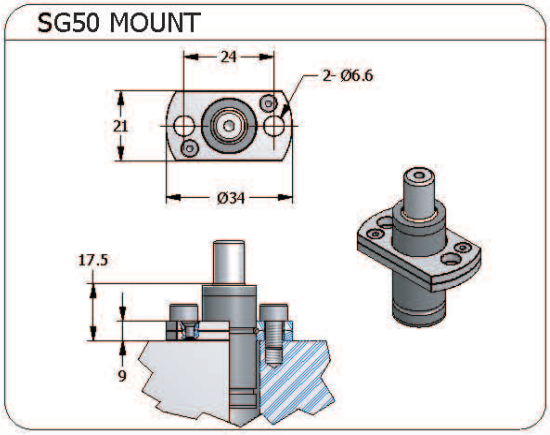
※ Special type is available upon requested.

FORCE CHART



TSM50 is pre-charged when shipped and comes in four types, depending on the force. Pressure regulator and nitrogen gas recharging is not possible.

SG50 MOUNT



Note:

All of TOSS gas spring must be secured with a stroke reserved at least 10% of the length of the stroke.
Not allowed disassembled in any case without manufacture's instructions.

Bottom thread

only to be used for strokes 7-25mm

Color	Force (N)	Bar
YELLOW	500	180
RED	380	135
BLUE	250	90
GREEN	130	45

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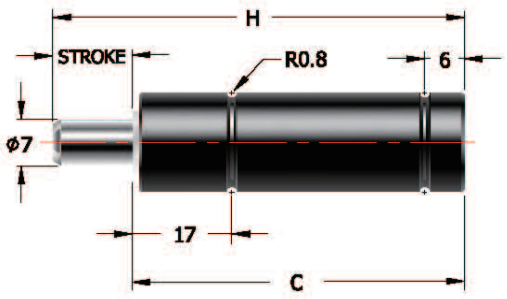
TSM70 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING	TSM70 (MODEL)	×	050 (STROKE)	–	180(YELLOW) (CHARGING PRESSURE (Bar))
MOUNT	SG70				
REPAIR KIT	Non-repairable				

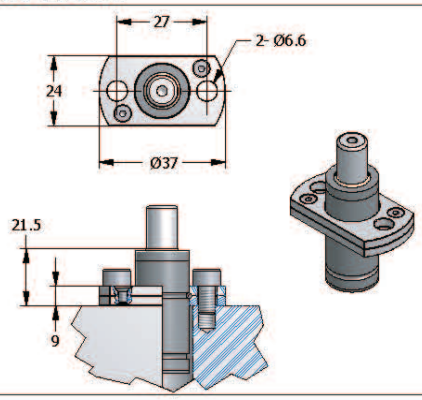
TSM70

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (180·135·90·45 bar / +20℃) End force*	End force*	End force*	End force*	Gas vol. (㎤)	weight (kg)
7	0.28	56	49	900	700	500	200	1.2	0.05
10	0.39	62	52	1,000	700	500	200	1.5	0.05
12.7	0.50	68	55	1,000	700	500	200	1.9	0.05
15	0.59	72	57	1,000	800	500	300	2.1	0.05
19	0.75	80	61	1,000	800	500	300	2.5	0.05
25	0.98	92	67	1,000	800	500	300	3.2	0.06
38	1.50	118	80	1,100	800	500	300	4.7	0.07
50	1.97	142	92	1,100	800	500	300	6.0	0.08
63.5	2.50	172	108.5	1,100	800	500	300	7.9	0.09
75	2.95	195	120	1,100	800	500	300	9.2	0.10
80	3.15	205	125	1,100	800	500	300	9.8	0.11
100	3.94	245	145	1,100	800	500	300	12.0	0.12
125	4.92	295	170	1,100	800	500	300	14.9	0.14

* = at full stroke

※ Special type is available upon requested.

SG70 MOUNT



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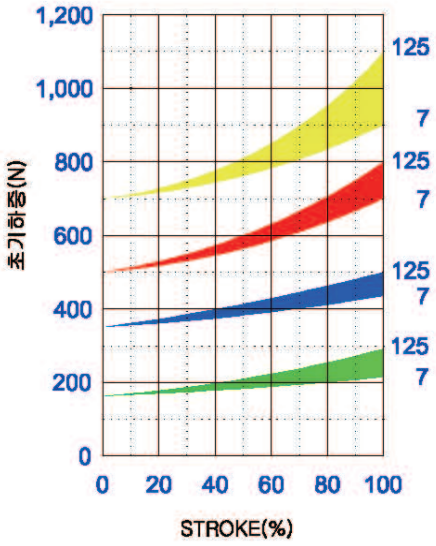


TSM70 is pre-charged when shipped and comes in four types, depending on the force. Pressure regulator and nitrogen gas recharging is not possible.

Note:

All of TOSS gas spring must be secured with a stroke reserved at least 10% of the length of the stroke.
Not allowed disassembled in any case without manufacture's instructions.

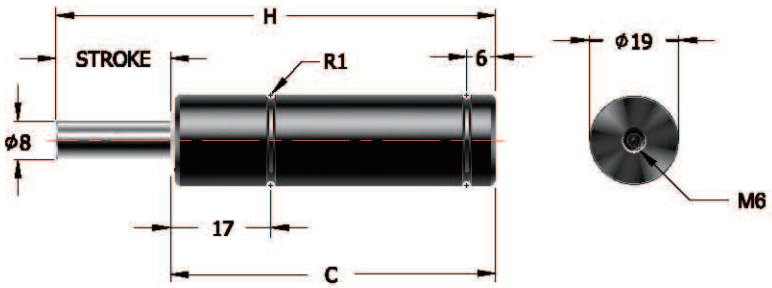
Bottom thread

only to be used for strokes 7-25mm

Color	Force (N)	Bar
YELLOW	700	180
RED	500	135
BLUE	350	90
GREEN	180	45

TSM90 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING — TSM90 (MODEL) × 050 (STROKE) – 180(YELLOW) (CHARGING PRESSURE (Bar))

MOUNT — SG90

REPAIR KIT — Non-repairable

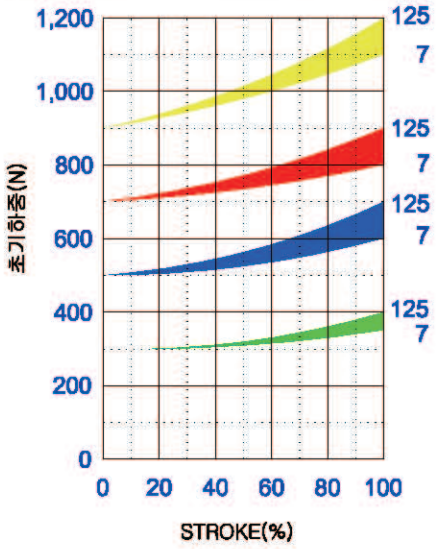
TSM90

Stroke (mm)	Stroke (inch)	H	C	Force(N) (180·140·100·60 bar / +20℃) End force*	End force*	End force*	End force*	Gas vol. (cm³)	weight (kg)
7	0.28	56	49	1,100	800	600	400	2.3	0.07
10	0.39	62	52	1,100	800	600	400	2.9	0.08
12.7	0.50	67.4	54.7	1,100	900	600	400	3.5	0.08
15	0.59	72	57	1,100	900	600	400	3.9	0.08
19	0.75	80	61	1,100	900	600	400	4.7	0.08
25	0.98	92	67	1,100	900	600	400	5.9	0.10
38	1.50	118	80	1,200	900	600	400	8.5	0.10
50	1.97	142	92	1,200	900	600	400	11.0	0.12
63.5	2.50	172	108.5	1,200	900	600	400	14.3	0.13
75	2.95	195	120	1,200	900	600	400	16.6	0.14
80	3.15	205	125	1,200	900	600	400	17.6	0.14
100	3.94	245	145	1,200	900	700	400	21.6	0.17
125	4.92	295	170	1,200	900	700	400	26.6	0.20

* = at full stroke

※ Special type is available upon requested.

FORCE CHART



TSM90 is pre-charged when shipped and comes in four types, depending on the force. Pressure regulator and nitrogen gas recharging is not possible.

Color	Force (N)	Bar
YELLOW	900	180
RED	700	140
BLUE	500	100
GREEN	300	60

Note:

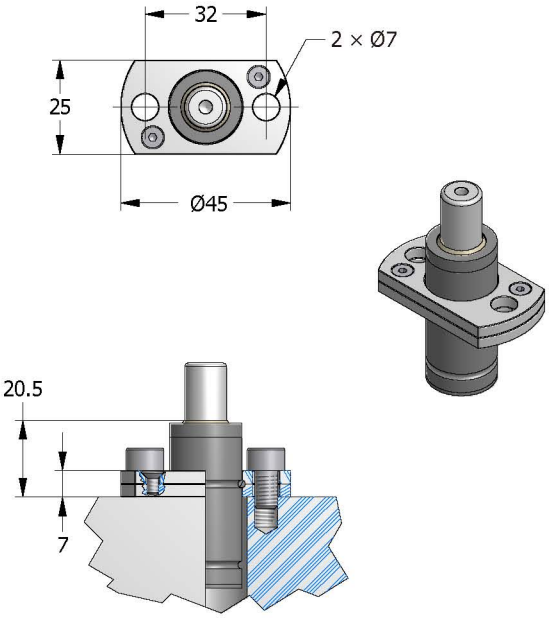
All of TOSS gas spring must be secured with a stroke reserved at least 10% of the length of the stroke.
Not allowed disassembled in any case without manufacture's instructions.

Bottom thread

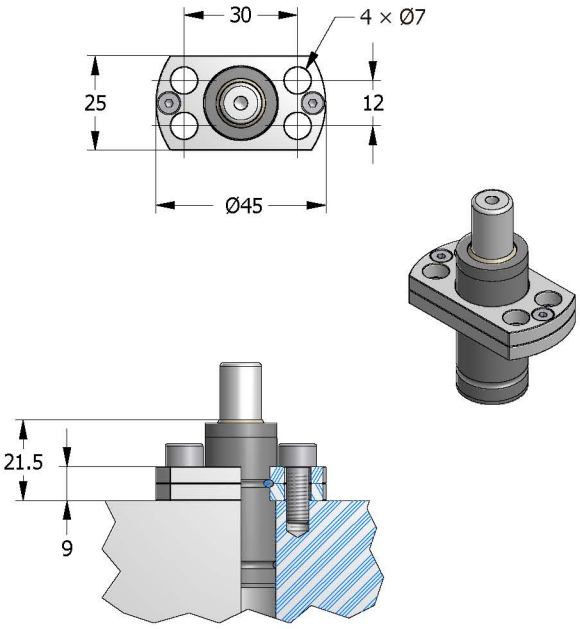
only to be used for strokes 7-25mm

SHINWEON S&T CO.,LTD.

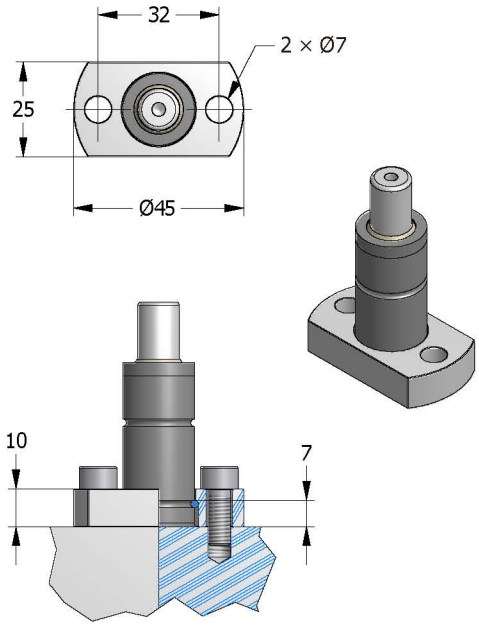
SG90 MOUNT



SC90 MOUNT

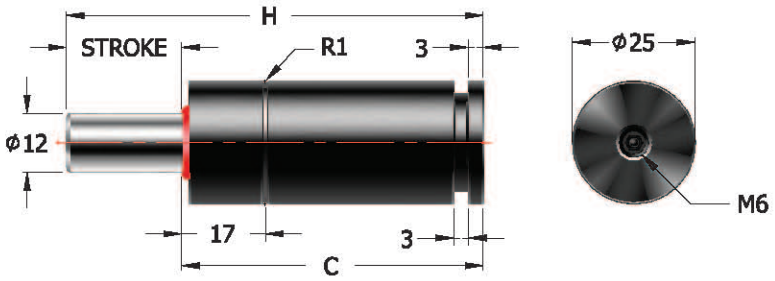


SP90 MOUNT



TSM0150 NITROGEN GAS SPRING

PED 97/23/EC



HOW TO SPECIFY

GAS SPRING — TSM0150 (MODEL) × 050 (STROKE) – 175(YELLOW) (CHARGING PRESSURE (Bar))

MOUNT — SP0150

REPAIR KIT — Non-repairable

TSM0150

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (175·135·90·45 bar / +20 ℃) End force*	End force*	End force*	End force*	Gas vol. (㎤)	weight (kg)
10	0.39	62	52	2,600	2,000	1,300	700	4.7	0.14
13	0.51	68	55	2,700	2,000	1,300	700	5.7	0.15
15	0.59	72	57	2,700	2,000	1,300	700	6.4	0.16
16	0.63	74	58	2,700	2,000	1,400	700	6.8	0.16
20	0.79	82	62	2,700	2,100	1,400	700	8.1	0.17
25	0.98	92	67	2,800	2,100	1,400	700	9.9	0.18
30	1.18	102	72	2,800	2,100	1,400	700	11.6	0.19
35	1.38	112	77	2,800	2,100	1,400	700	13.3	0.20
38	1.50	118	80	2,800	2,100	1,400	700	14.4	0.21
40	1.57	122	82	2,800	2,100	1,400	700	15.1	0.22
45	1.77	132	87	2,800	2,100	1,400	700	16.8	0.23
50	1.97	142	92	2,800	2,100	1,400	700	18.5	0.24
60	2.36	165	105	2,900	2,100	1,400	700	22.0	0.27
63	2.48	172	109	2,800	2,100	1,400	700	23.4	0.27
70	2.76	185	115	2,900	2,200	1,400	700	25.4	0.29
80	3.15	205	125	2,900	2,200	1,400	700	28.9	0.32
100	3.94	245	145	2,900	2,200	1,400	700	35.8	0.36
125	4.92	295	170	2,900	2,200	1,400	700	44.5	0.40

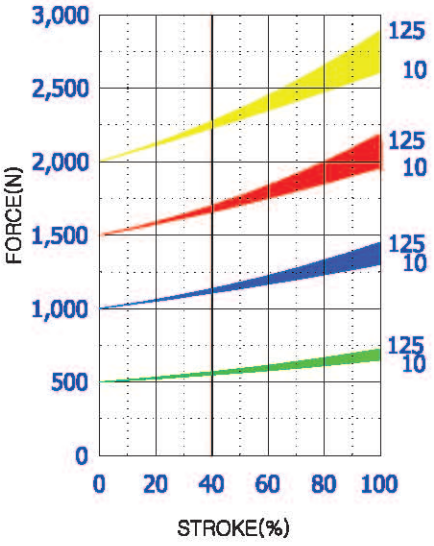
* = at full stroke

※ Special type is available upon requested.

Note:

All of TOSS gas spring must be secured with a stroke reserved at least 10% of the length of the stroke.
Not allowed disassembled in any case without manufacture's instructions.

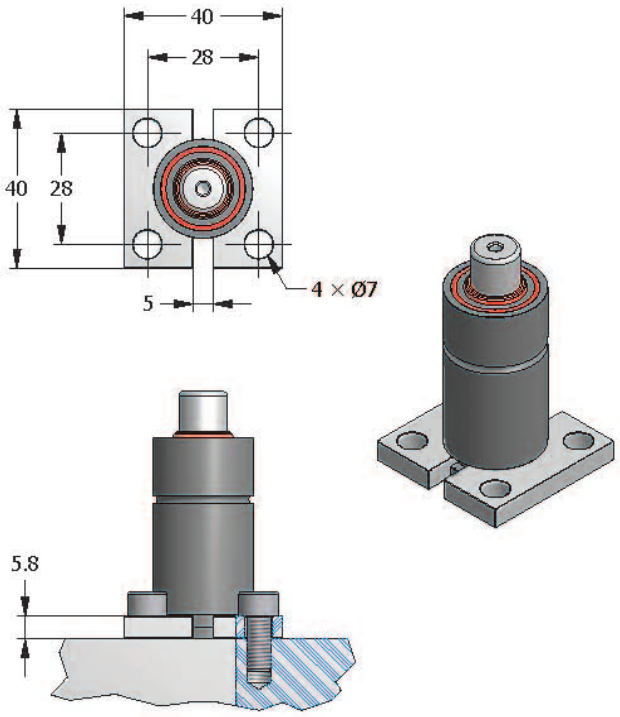
FORCE CHART



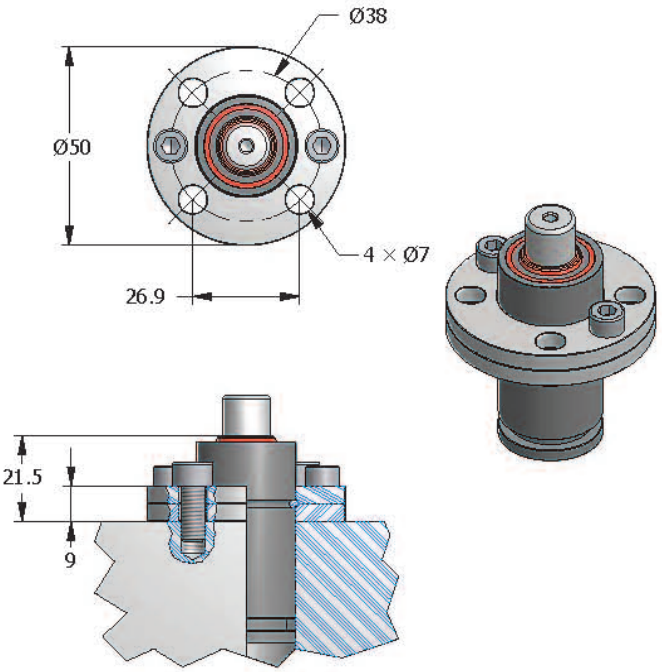
TSM0150 is pre-charged when shipped and comes in four types, depending on the force. The pressure cannot be adjusted but Nitrogen is rechargeable.

Color	Force (N)	bar
YELLOW	2,000	175
RED	1,500	135
BLUE	1,000	90
GREEN	500	45

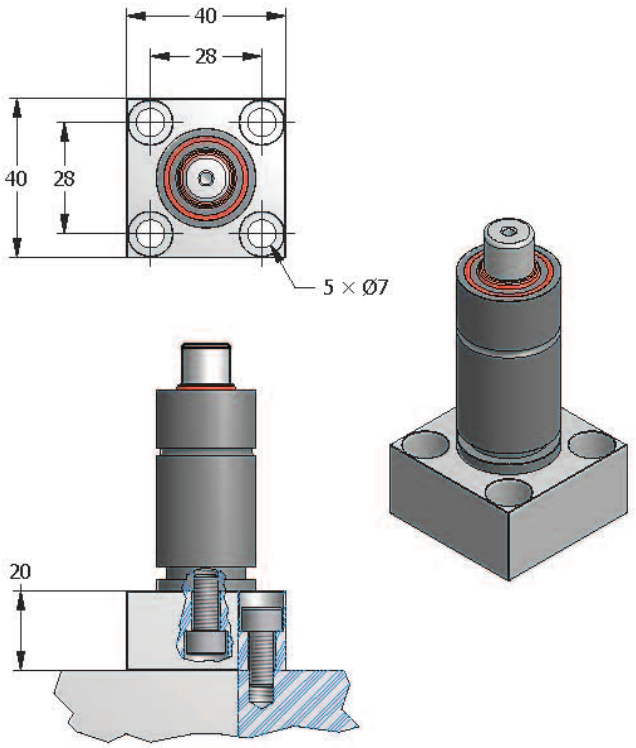
SP0150 MOUNT



SR0150 MOUNT

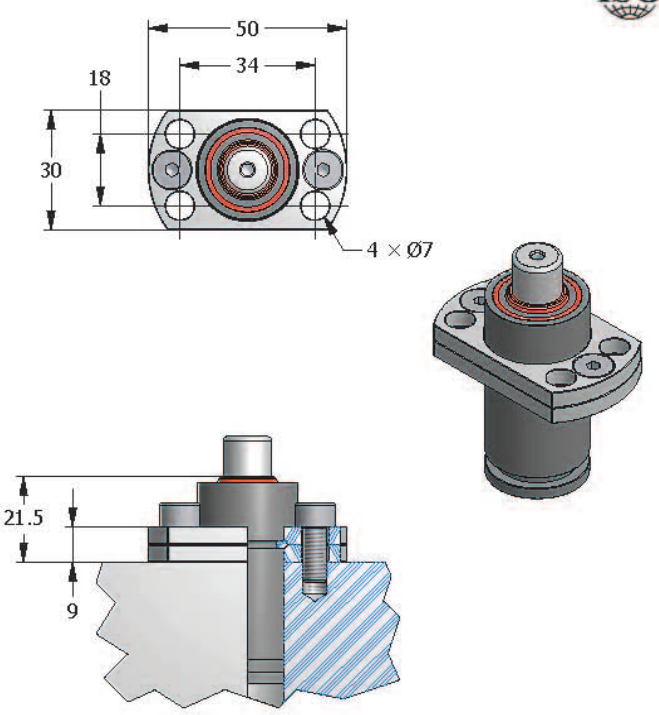


SB0150 MOUNT



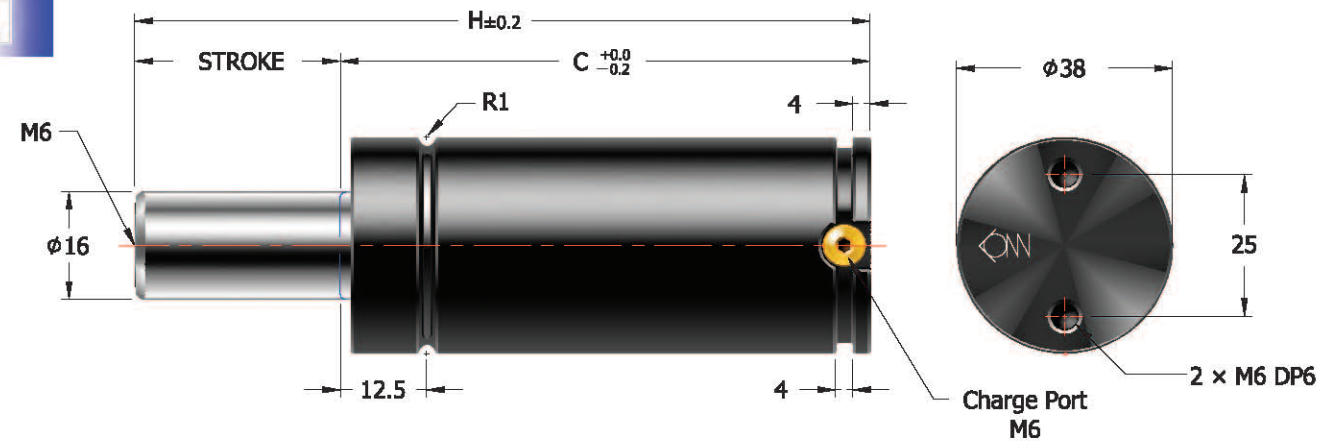
SG0150 MOUNT

ISO



TSM0300 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSM0300 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP0300					
REPAIR KIT	RCM0300					

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

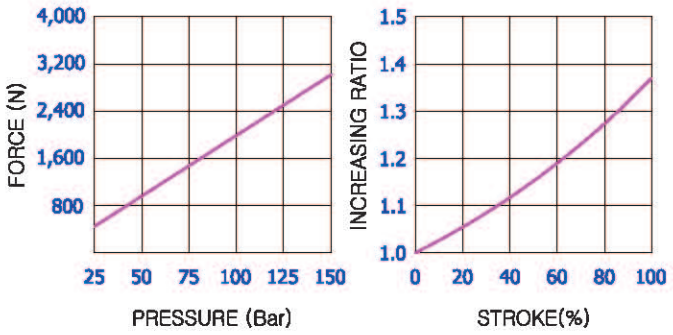
TSM0300

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	70	60		3,900	8.5	0.44
15	0.59	80	65		4,000	12.0	0.46
20	0.79	90	70		4,000	15.5	0.50
25	0.98	100	75		4,100	19.1	0.52
30	1.18	110	80		4,100	22.6	0.56
35	1.38	120	85		4,100	26.1	0.58
38	1.50	126	88		4,100	28.3	0.58
40	1.57	130	90		4,100	29.7	0.60
45	1.77	140	95		4,100	33.2	0.62
50	1.97	150	100	3,000	4,100	36.7	0.66
60	2.36	170	110		4,100	43.8	0.70
63	2.48	176	113		4,100	45.9	0.72
70	2.76	190	120		4,100	50.9	0.76
80	3.15	210	130		4,100	57.9	0.80
90	3.54	230	140		4,100	65.0	0.84
100	3.94	250	150		4,200	72.1	0.90
110	4.33	270	160		4,200	79.1	0.96
120	4.72	290	170		4,200	86.2	1.00
125	4.92	300	175		4,200	89.7	1.04

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSM0300

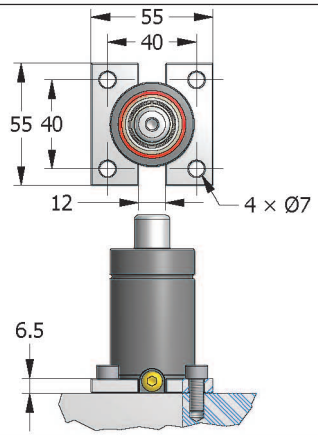
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{20.1}$$

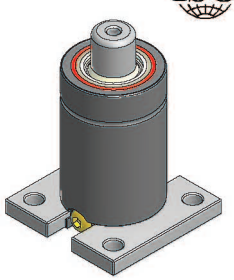
ex) What comes to the charging pressure of gas spring which demands force 2,500N?

$$124\text{(Bar)} = \frac{2{,}500\text{(N)}}{20.1}$$

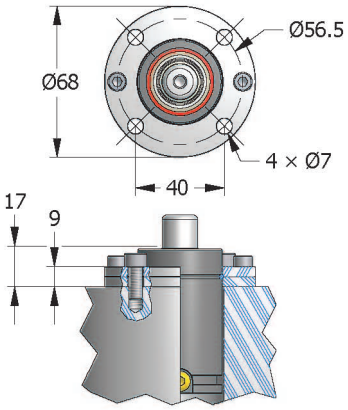
TSM0300 Mounts

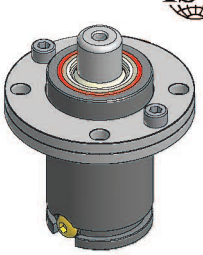
SP0300 MOUNT



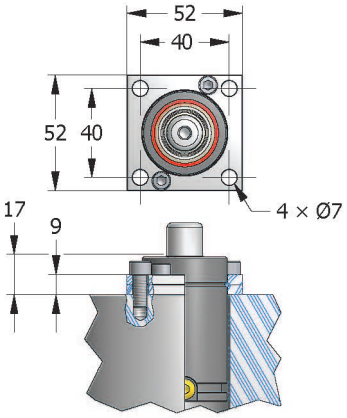


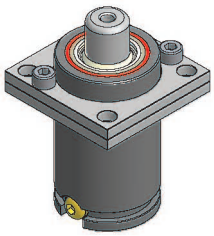
SR0300 MOUNT



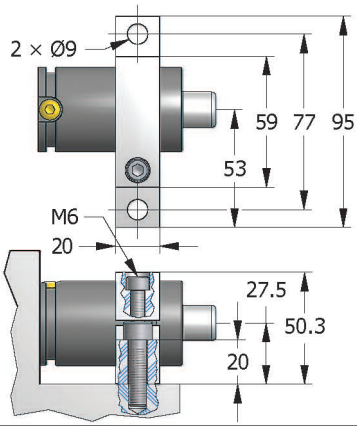


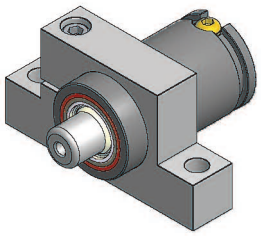
ST0300 MOUNT



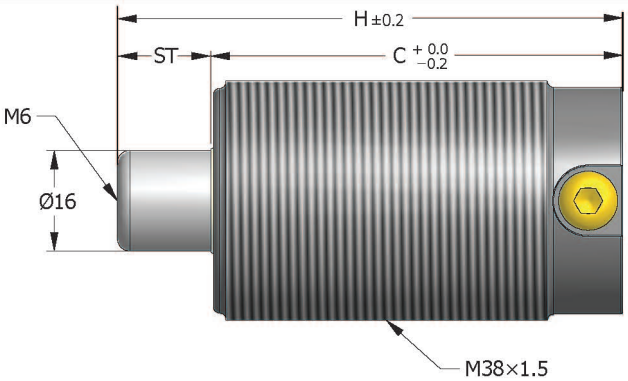


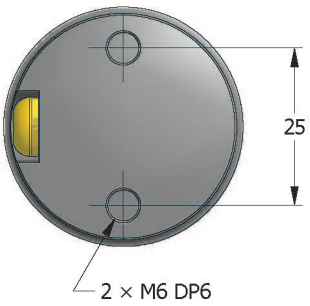
SC0300 MOUNT



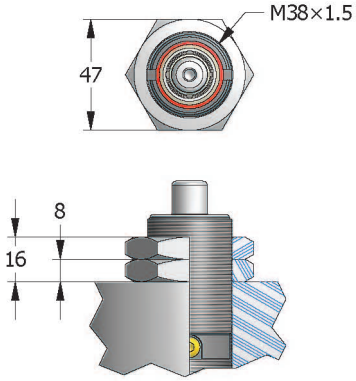


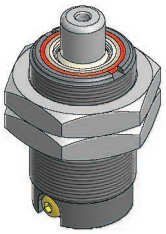
TTM0300 (Threaded Option)



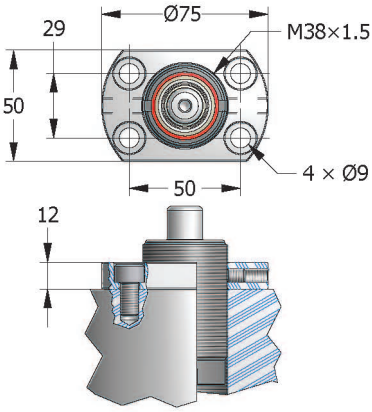


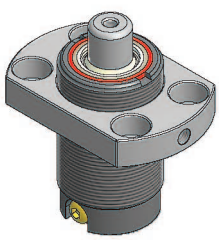
SN0300 MOUNT For TTM0300





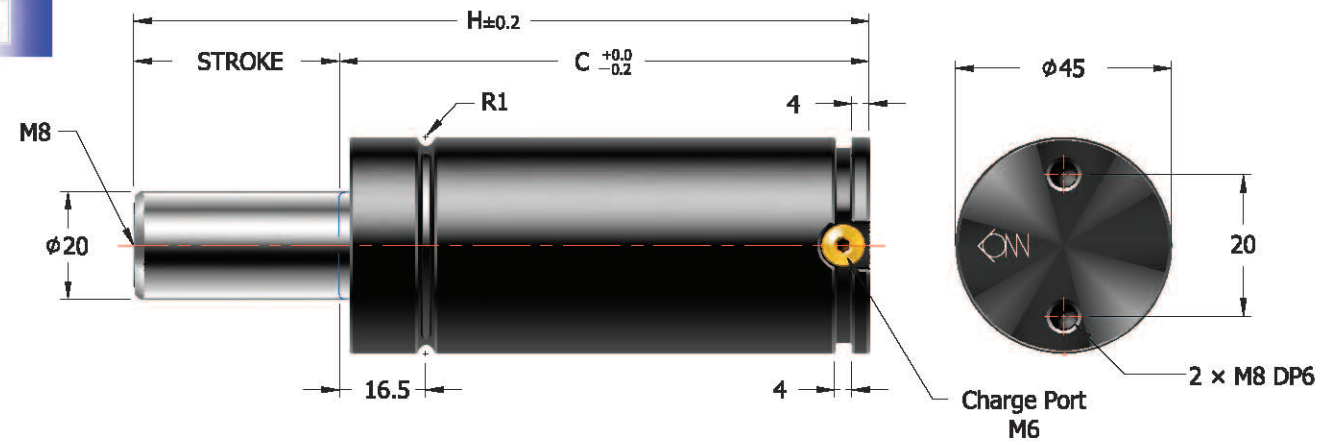
SG0300 MOUNT For TTM0300





TSM0500 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSM0500 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP0500					
REPAIR KIT	RCM0500					

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

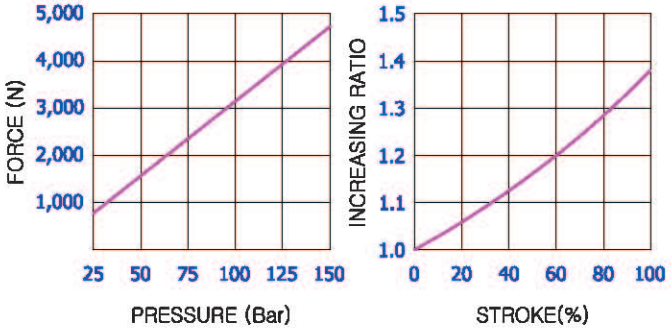
TSM0500

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	70	60		6,100	12.9	0.60
15	0.59	80	65		6,200	18.3	0.64
20	0.79	90	70		6,300	23.6	0.68
25	0.98	100	75		6,300	29.0	0.72
30	1.18	110	80		6,400	34.4	0.76
35	1.38	120	85		6,400	39.8	0.80
38	1.50	126	88		6,400	43.0	0.81
40	1.57	130	90		6,400	45.1	0.82
45	1.77	140	95		6,400	50.5	0.86
50	1.97	150	100	4,650	6,400	55.9	0.89
60	2.36	170	110		6,500	66.6	0.96
63	2.48	176	113		6,500	69.9	0.98
70	2.76	190	120		6,500	77.4	1.01
80	3.15	210	130		6,500	88.1	1.09
90	3.54	230	140		6,500	98.9	1.16
100	3.94	250	150		6,500	109.6	1.23
110	4.33	270	160		6,500	120.4	1.30
120	4.72	290	170		6,500	131.1	1.35
125	4.92	300	175		6,500	136.5	1.39

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSM0500

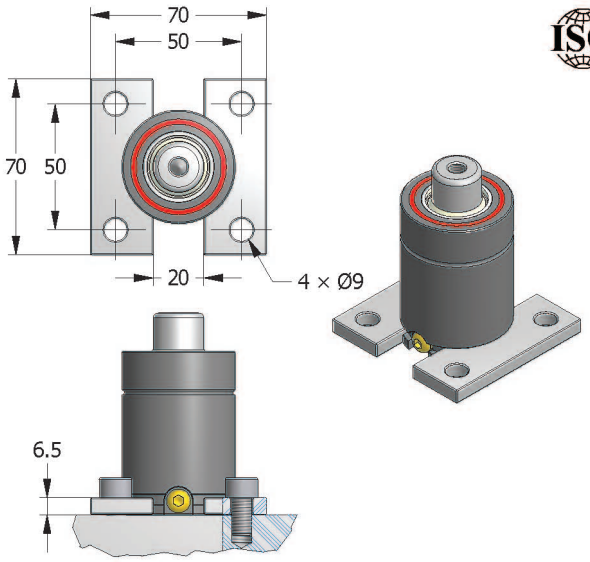
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{31.4}$$

ex) What comes to the charging pressure of gas spring which demands force 4,000N?

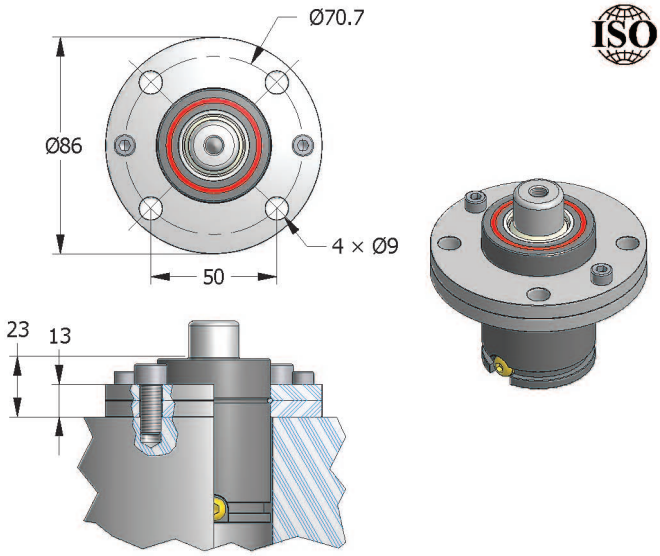
$$127\text{(Bar)} = \frac{4{,}000\text{(N)}}{31.4}$$

TSM0500 Mounts

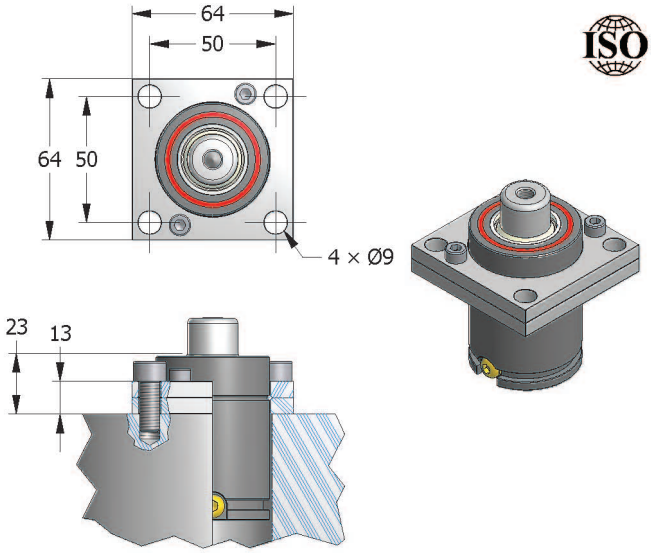
SP0500 MOUNT



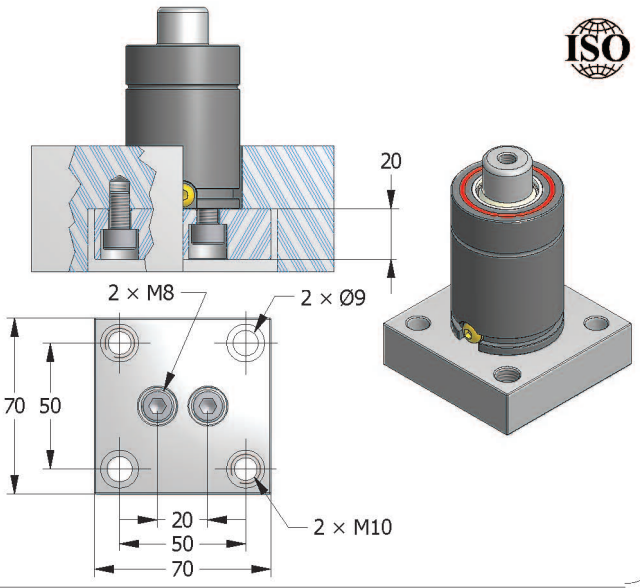
SR0500 MOUNT



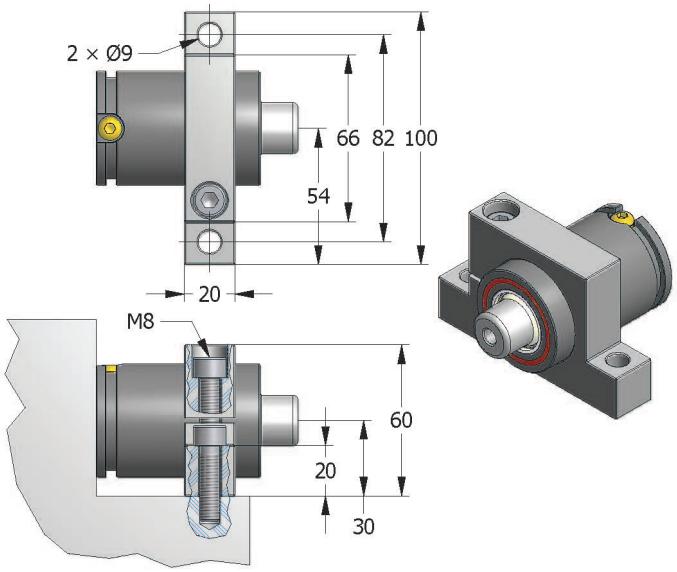
ST0500 MOUNT



SB0500 MOUNT

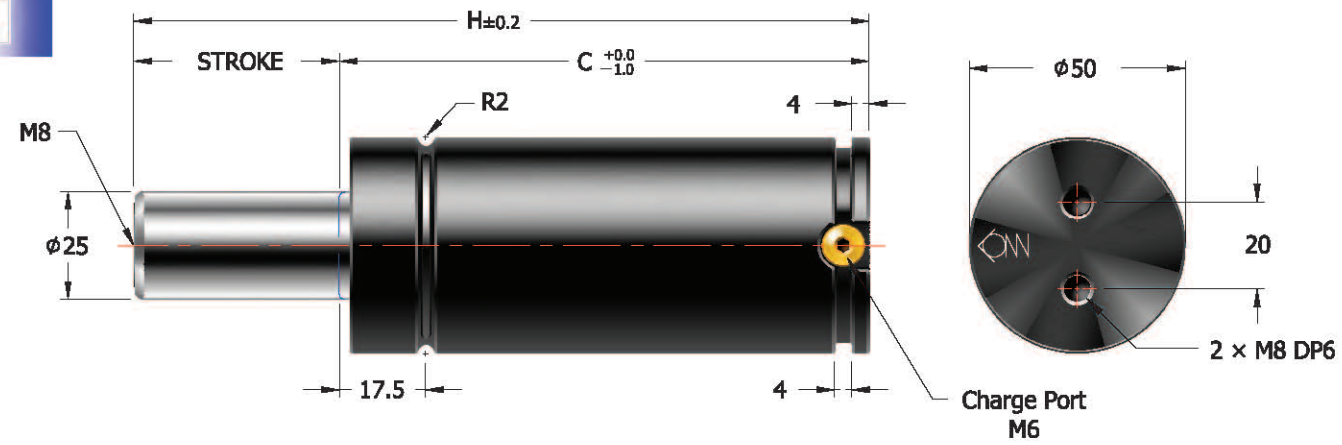


SC0500 MOUNT



TSM0750 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSM0750 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP0750							
REPAIR KIT	RCM0750							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

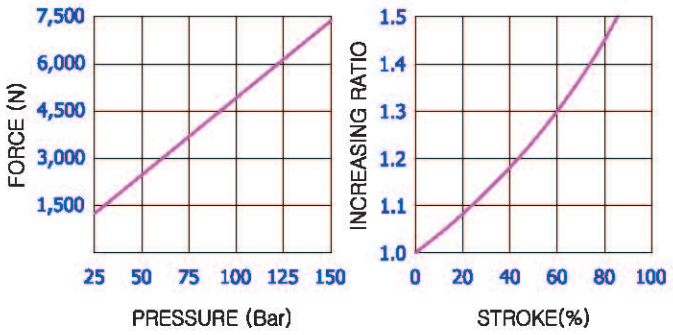
TSM0750

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	70	60		11,700	13.2	0.75
12.7	0.50	75.4	62.7		11,800	16.6	0.78
15	0.59	80	65		11,800	19.5	0.80
20	0.79	90	70		11,900	25.7	0.86
25	0.98	100	75		11,900	32.0	0.92
30	1.18	110	80		11,900	38.3	0.94
35	1.38	120	85		11,900	44.6	1.02
38	1.50	126	88		12,000	48.4	1.04
40	1.57	130	90		12,000	50.9	1.06
45	1.77	140	95	7,350	12,000	57.1	1.10
50	1.97	150	100		12,000	63.4	1.14
60	2.36	170	110		12,000	76.0	1.24
63	2.48	176	113		12,000	79.8	1.26
70	2.76	190	120		12,000	88.5	1.34
75	2.95	200	125		12,000	94.8	1.38
80	3.15	210	130		12,000	101.1	1.43
90	3.54	230	140		12,000	113.7	1.53
100	3.94	250	150		12,000	126.2	1.62
125	4.92	300	175		12,000	157.6	1.84

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSM0750

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{49.1}$$

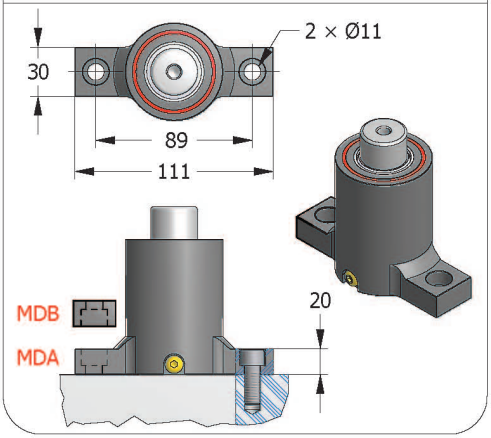
ex) What comes to the charging pressure of gas spring which demands force 6,000N?

$$122\text{(Bar)} = \frac{6{,}000\text{(N)}}{49.1}$$

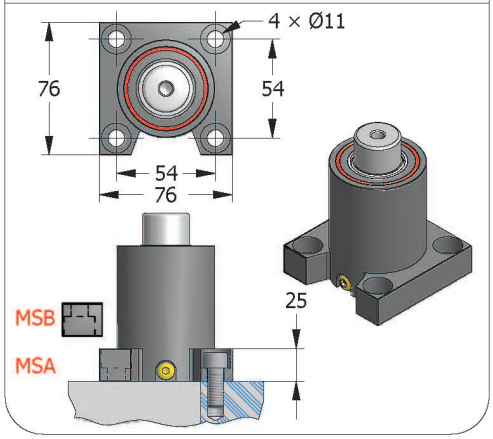
SHINWEON S&T CO.,LTD.

TSM0750 Mounts

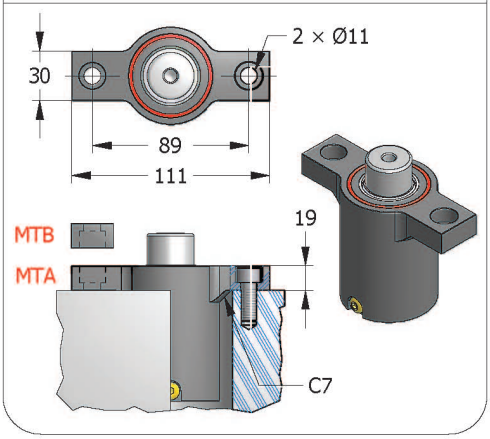
MD MOUNT WELDED



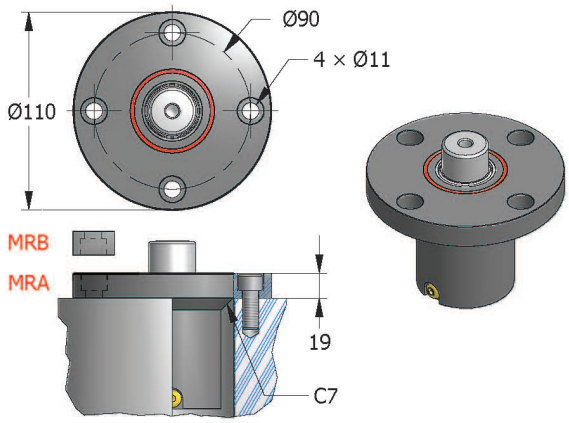
MS MOUNT WELDED



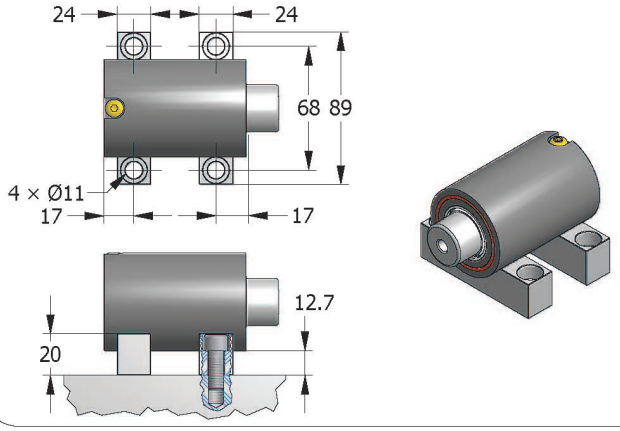
MT MOUNT WELDED



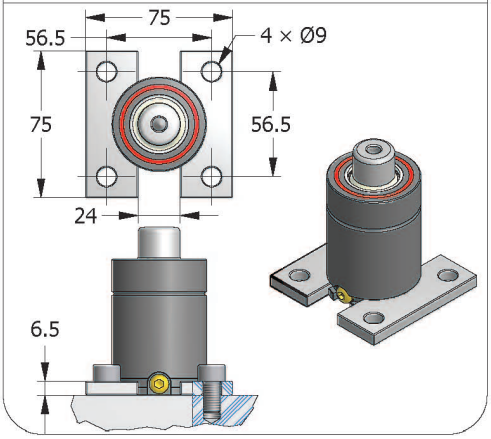
MR MOUNT WELDED



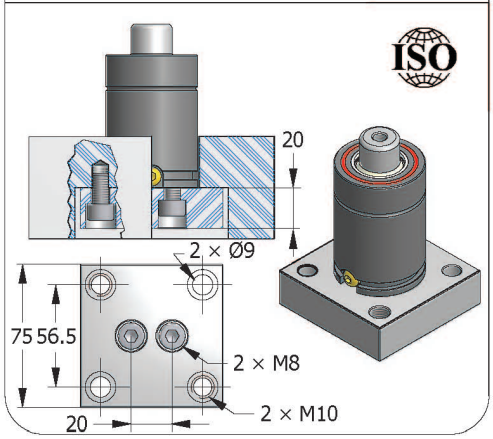
MK MOUNT WELDED



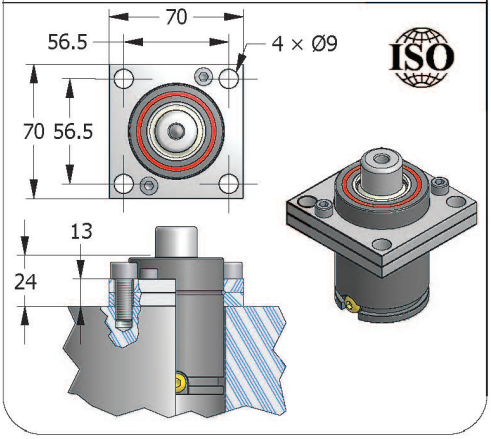
SP0750M MOUNT



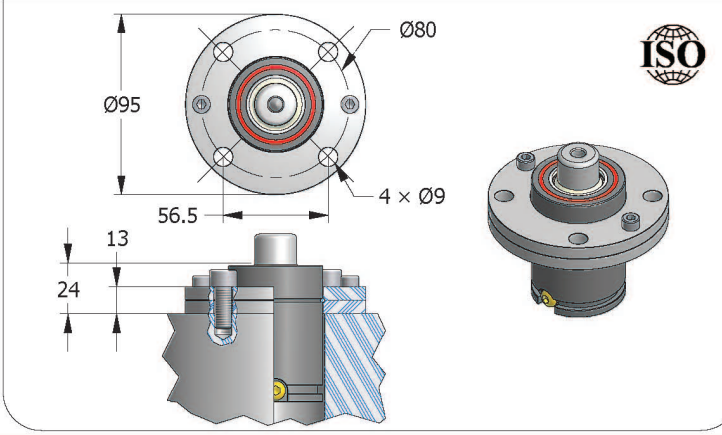
SB0750 MOUNT



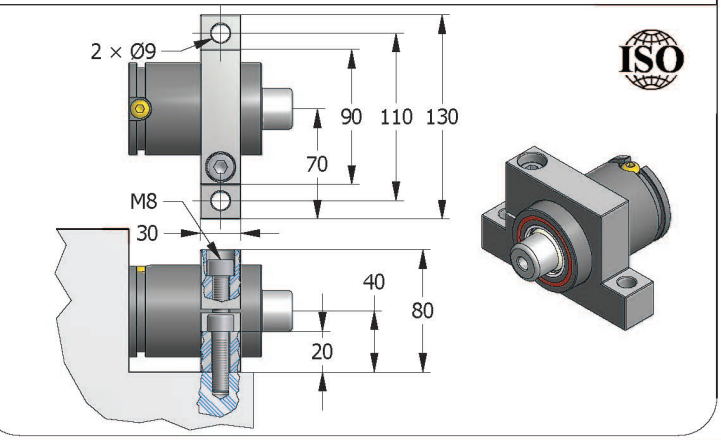
ST0750 MOUNT



SR0750 MOUNT

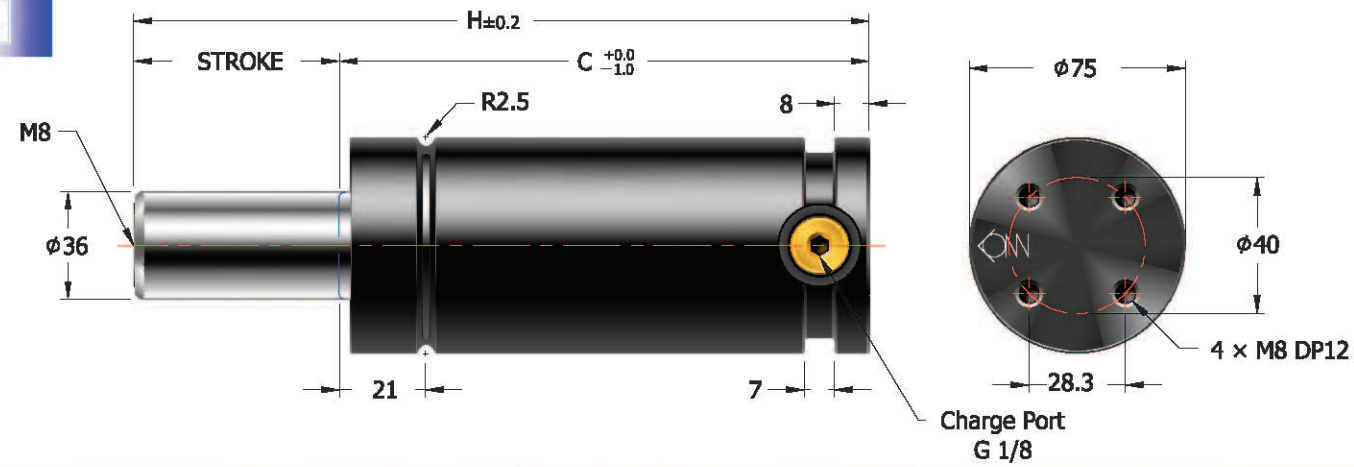


SC0750 MOUNT



TSM1500 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSM1500 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP1500							
REPAIR KIT	RCM1500							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

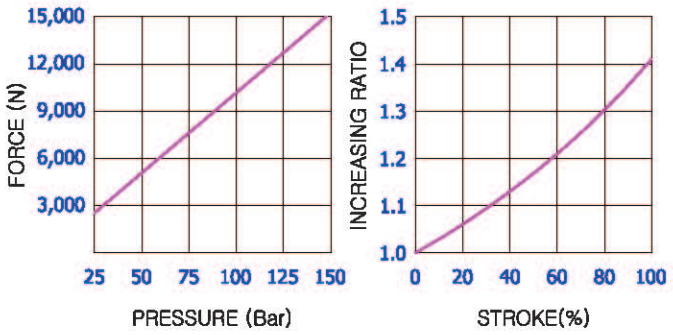
TSM1500

Stroke (mm)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	114	104		19,000	49.9	2.00
13	0.51	120	107		19,500	59.2	2.95
15	0.59	124	109		19,700	65.4	3.02
20	0.79	134	114		20,200	81.0	3.13
25	0.98	144	119		20,500	96.6	3.20
30	1.18	154	124		20,800	112.2	3.32
35	1.38	164	129		20,900	127.7	3.38
38	1.50	170	132		21,000	137.1	3.47
40	1.57	174	134		21,100	143.3	3.49
45	1.77	184	139		21,200	158.9	3.58
50	1.97	194	144		21,300	174.5	3.65
60	2.36	214	154	15,150	21,500	205.6	3.83
63	2.48	220	157		21,500	215.0	3.88
70	2.76	234	164		21,600	236.8	4.05
75	2.95	244	169		21,600	252.4	4.17
80	3.15	254	174		21,700	267.9	4.24
90	3.54	274	184		21,800	299.1	4.34
100	3.94	294	194		21,800	330.3	4.60
125	4.92	344	219		21,900	408.2	5.06
150	5.91	394	244		22,000	486.0	5.54
160	6.30	414	254		22,000	517.2	5.83
175	6.89	444	269		22,100	563.9	6.11
200	7.87	494	294		22,100	641.8	6.46

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSM1500

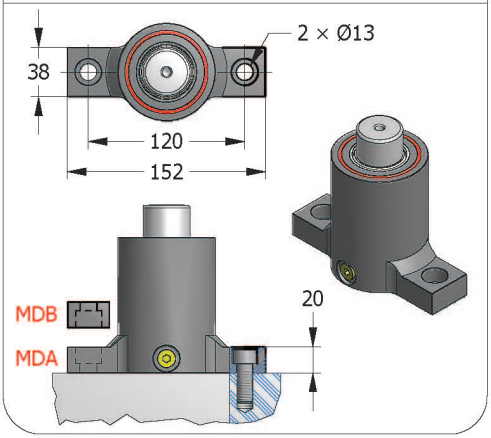
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{101.7}$$

ex) What comes to the charging pressure of gas spring which demands force 12,000N?

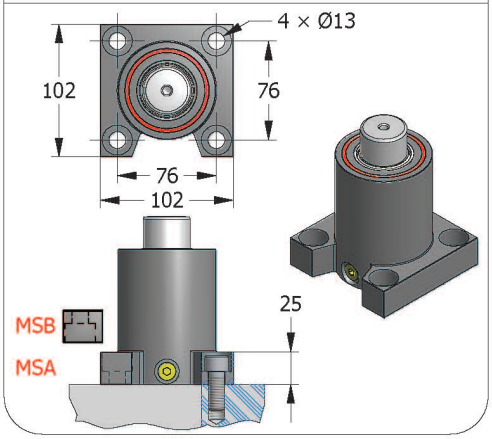
$$118(\text{Bar}) = \frac{12{,}000(\text{N})}{101.7}$$

TSM1500 Mounts

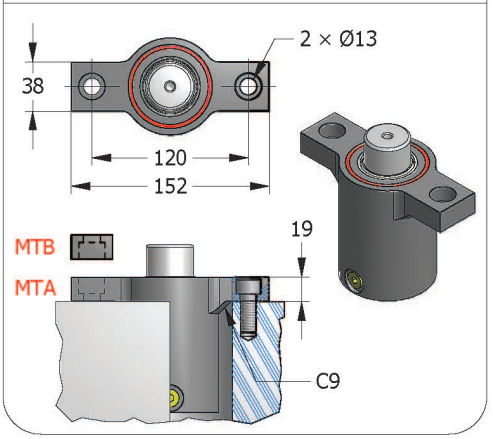
MD MOUNT WELDED



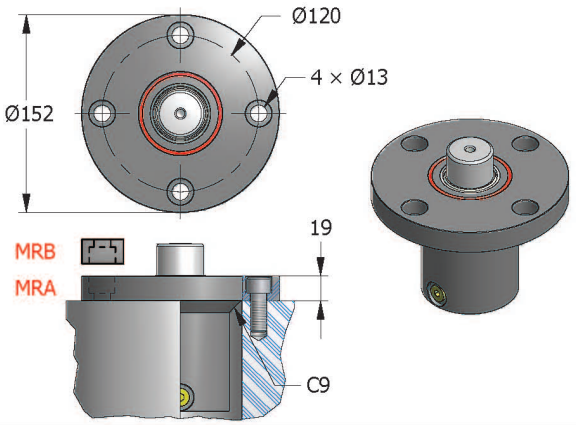
MS MOUNT WELDED



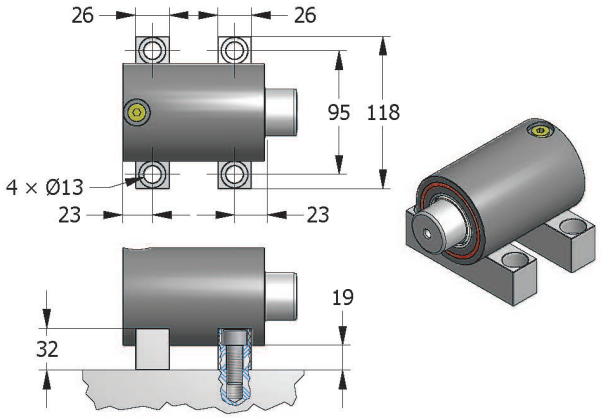
MT MOUNT WELDED



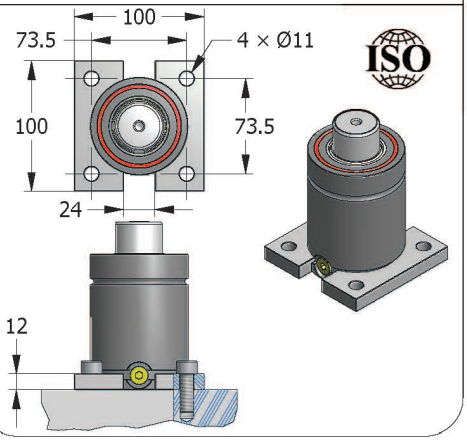
MR MOUNT WELDED



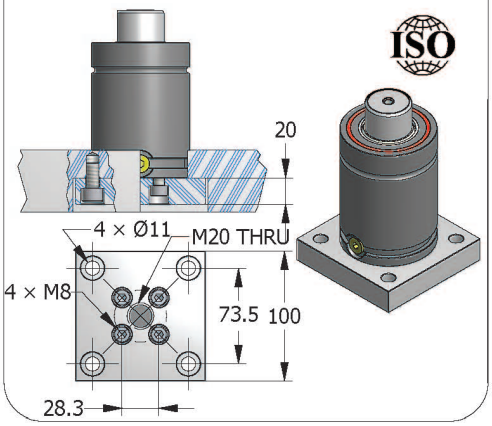
MK MOUNT WELDED



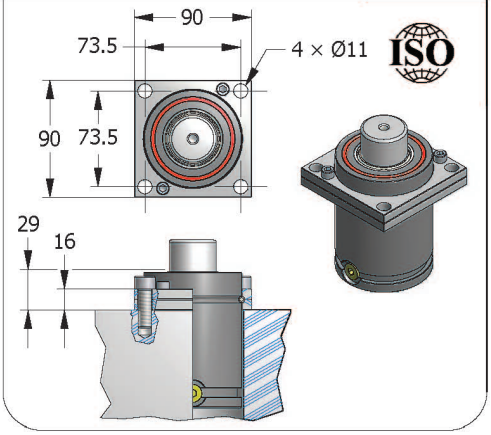
SP1500 MOUNT



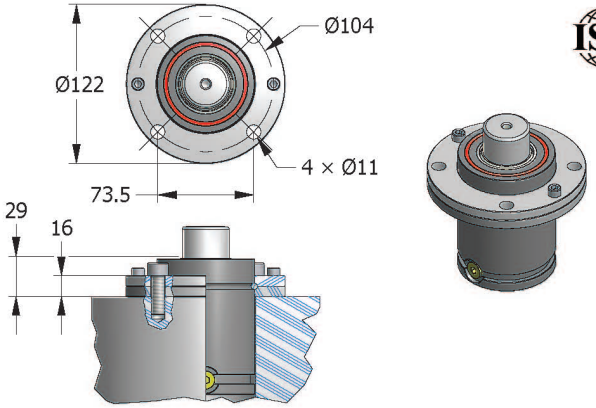
SB1500 MOUNT



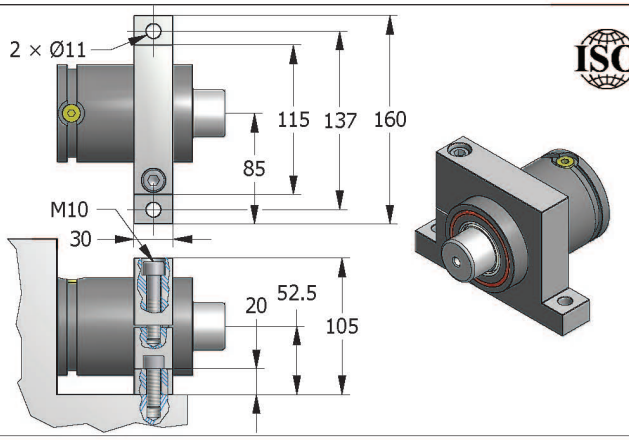
ST1500 MOUNT



SR1500 MOUNT

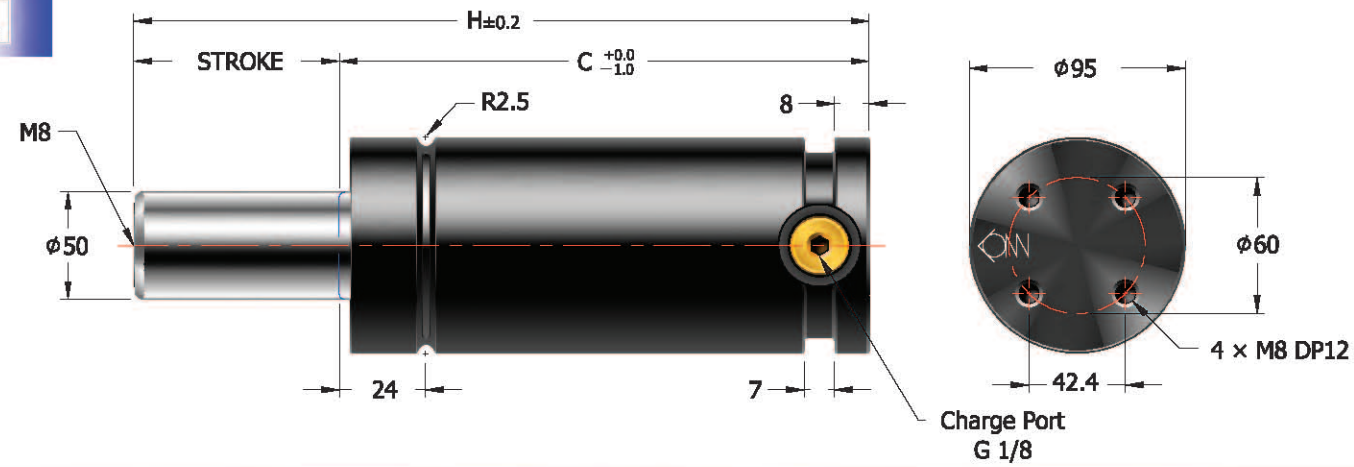


SC1500 MOUNT



TSM3000 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSM3000 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP3000							
REPAIR KIT	RCM3000							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

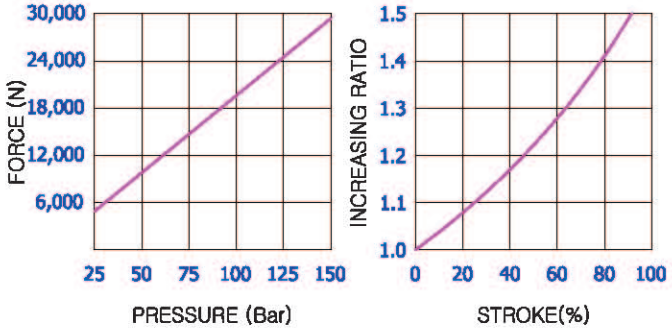
TSM3000

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	114	104		40,800	70.3	4.79
13	0.51	120	107		41,900	85.4	4.96
15	0.59	124	109		42,500	95.5	4.96
20	0.79	134	114		43,600	120.6	5.09
25	0.98	144	119		44,300	145.7	5.29
30	1.18	154	124		44,800	170.8	5.38
35	1.38	164	129		45,200	195.9	5.53
38	1.50	170	132		45,400	211.0	5.62
40	1.57	174	134		45,600	221.1	5.68
45	1.77	184	139		45,800	246.2	5.83
50	1.97	194	144		46,000	271.3	5.98
60	2.36	214	154	29,400	46,400	321.5	6.27
63	2.48	220	157		46,400	336.6	6.36
70	2.76	234	164		46,600	371.8	6.57
75	2.95	244	169		46,700	396.9	6.72
80	3.15	254	174		46,800	422.0	7.07
90	3.54	274	184		46,900	472.3	7.40
100	3.94	294	194		47,000	522.5	7.76
125	4.92	344	219		47,300	648.1	8.48
150	5.91	394	244		47,400	773.7	8.93
160	6.30	414	254		47,500	823.9	9.23
175	6.89	444	269		47,500	899.3	10.11
200	7.87	494	294		47,600	1024.9	10.41

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSM3000

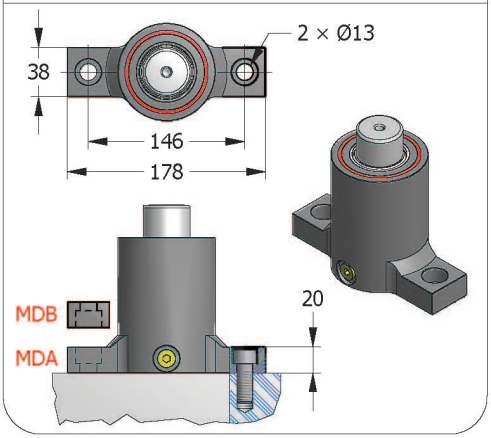
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{196.2}$$

ex) What comes to the charging pressure of gas spring which demands force 25,000N?

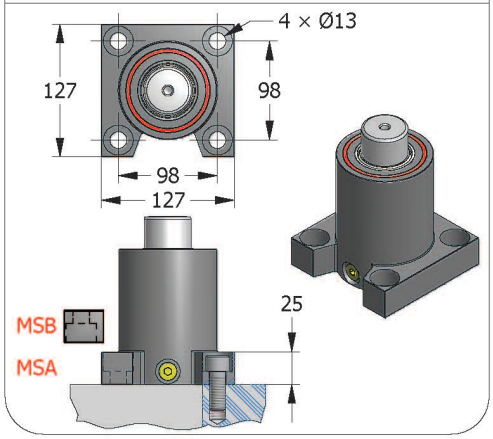
$$127\text{(Bar)} = \frac{25{,}000\text{(N)}}{196.2}$$

TSM3000 Mounts

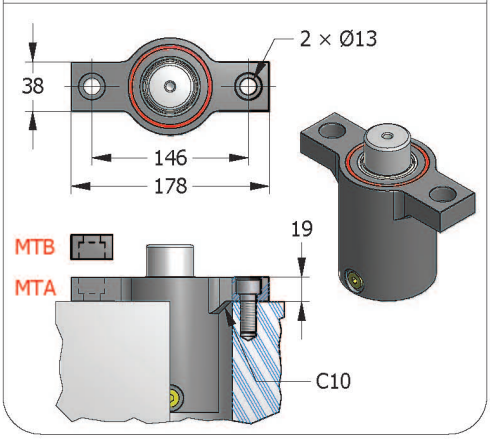
MD MOUNT WELDED



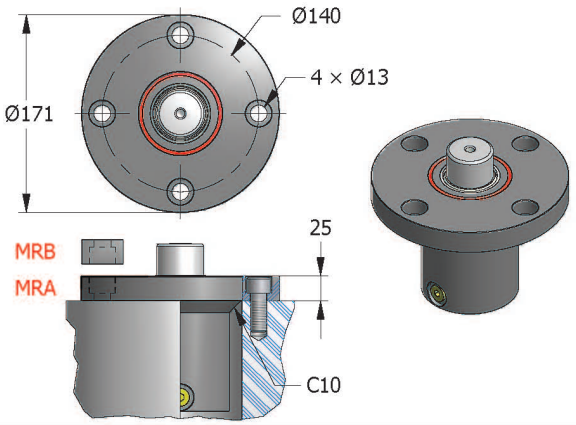
MS MOUNT WELDED



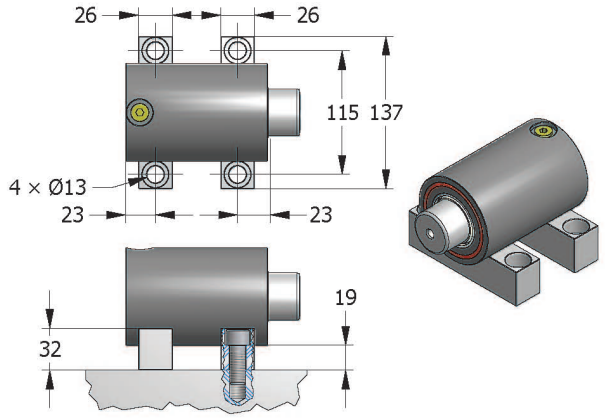
MT MOUNT WELDED



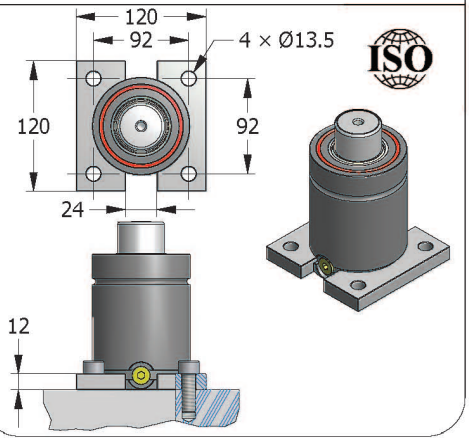
MR MOUNT WELDED



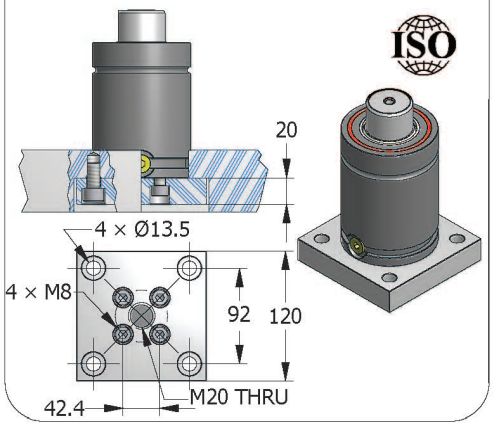
MK MOUNT WELDED



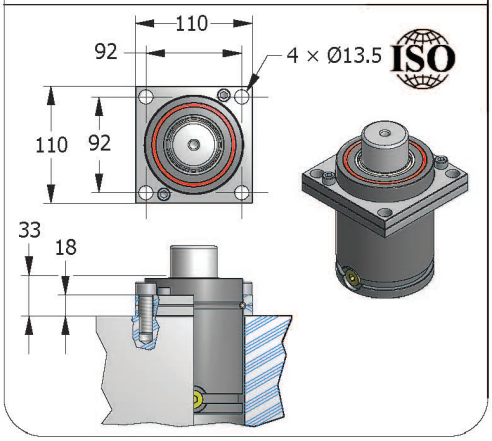
SP3000 MOUNT



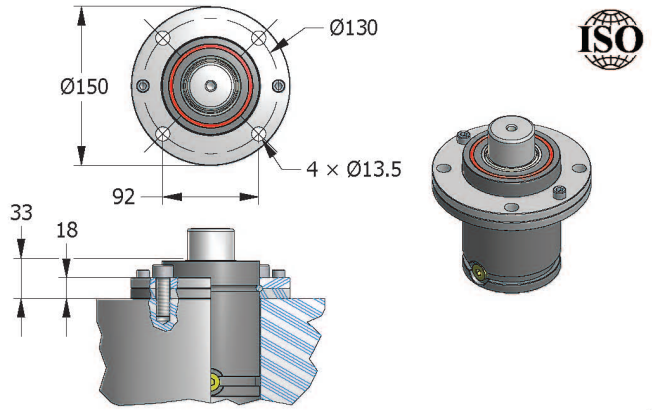
SB3000 MOUNT



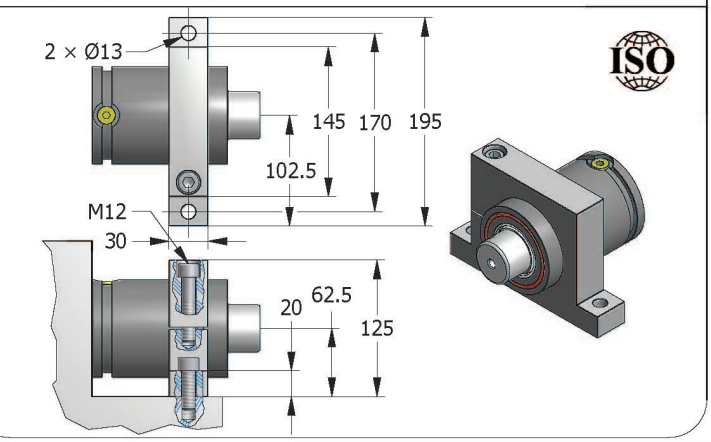
ST3000 MOUNT



SR3000 MOUNT

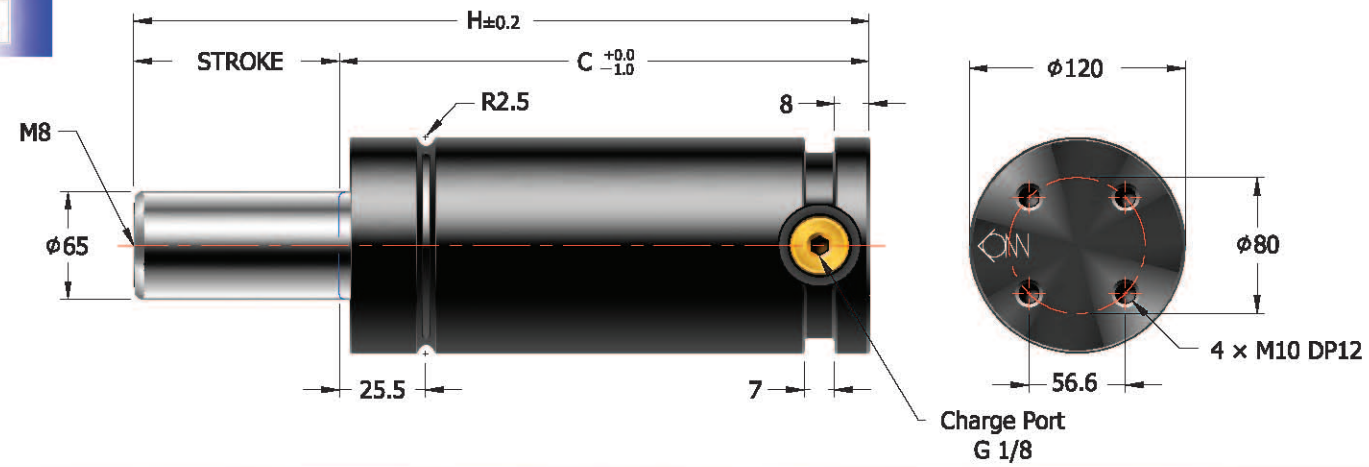


SC3000 MOUNT



TSM5000 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSM5000 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP5000							
REPAIR KIT	RCM5000							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

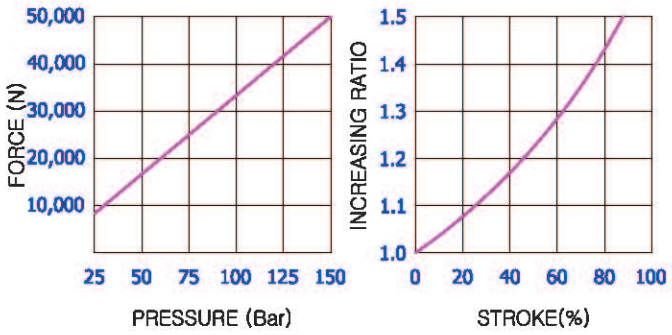
TSM5000

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	117	107		67,400	125.6	7.78
13	0.51	123	110		69,800	149.2	7.92
15	0.59	127	112		71,000	164.9	8.01
20	0.79	137	117		73,500	204.1	8.24
25	0.98	147	122		75,200	243.4	8.48
30	1.18	157	127		76,500	282.6	8.71
35	1.38	167	132		77,600	321.9	8.95
38	1.50	173	135		78,100	345.4	9.09
40	1.57	177	137		78,400	361.1	9.18
45	1.77	187	142		79,100	400.4	9.41
50	1.97	197	147		79,600	439.6	9.65
60	2.36	217	157	49,650	80,500	518.1	10.11
63	2.48	223	160		80,700	541.7	10.25
70	2.76	237	167		81,200	596.6	10.58
75	2.95	247	172		81,400	635.9	10.81
80	3.15	257	177		81,700	675.1	11.05
90	3.54	277	187		82,100	753.6	11.51
100	3.94	297	197		82,400	832.1	11.98
125	4.92	347	222		83,100	1028.4	13.15
150	5.91	397	247		83,500	1224.6	14.32
160	6.30	417	257		83,600	1303.1	14.79
175	6.89	447	272		83,800	1420.9	15.49
200	7.87	497	297		84,100	1617.1	16.65

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSM5000

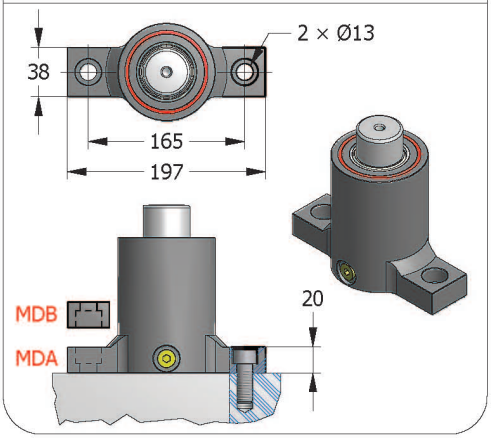
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{331.7}$$

ex) What comes to the charging pressure of gas spring which demands force 38,000N?

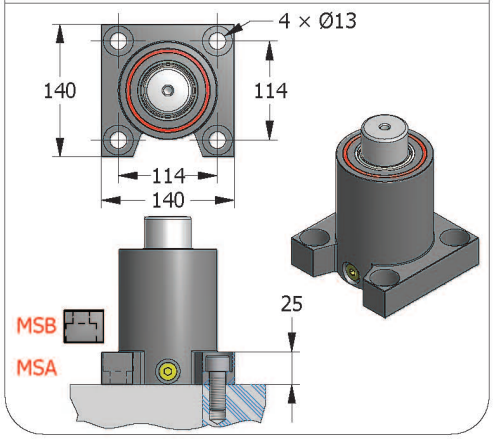
$$115(\text{Bar}) = \frac{38{,}000(\text{N})}{331.7}$$

TSM5000 Mounts

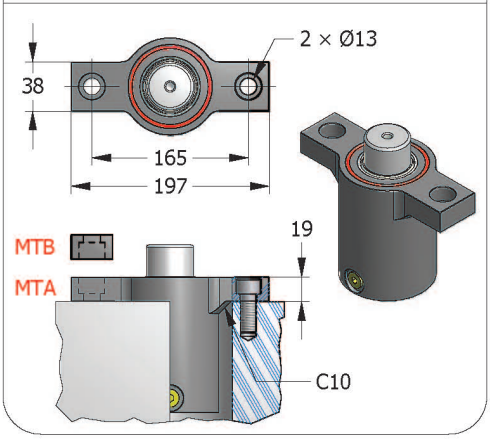
MD MOUNT WELDED



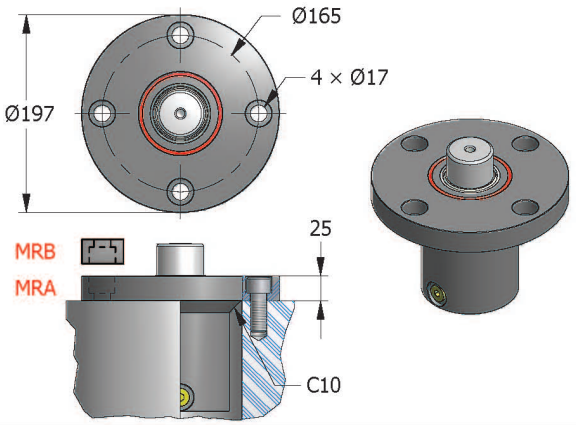
MS MOUNT WELDED



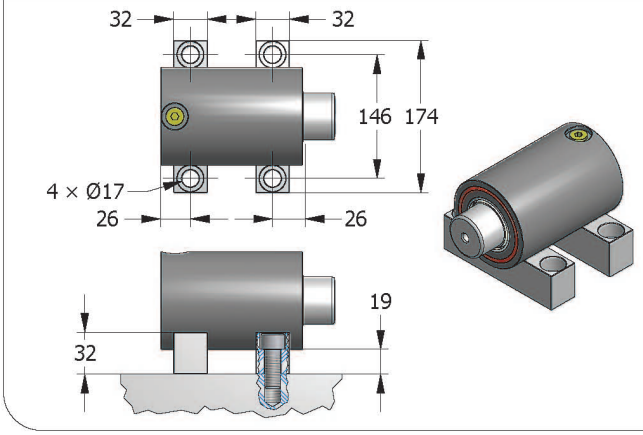
MT MOUNT WELDED



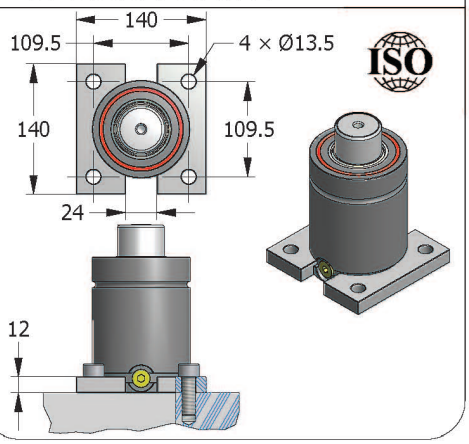
MR MOUNT WELDED



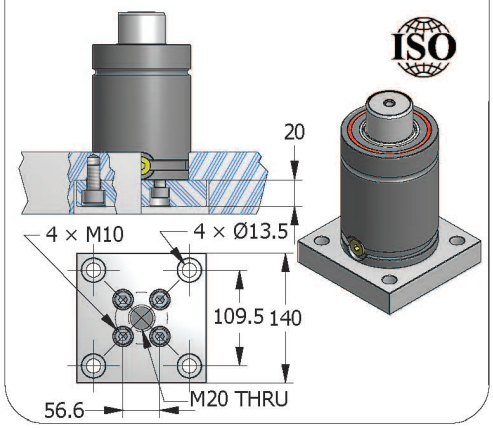
MK MOUNT WELDED



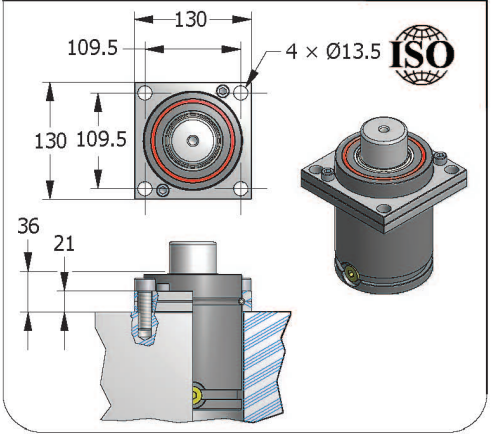
SP5000 MOUNT



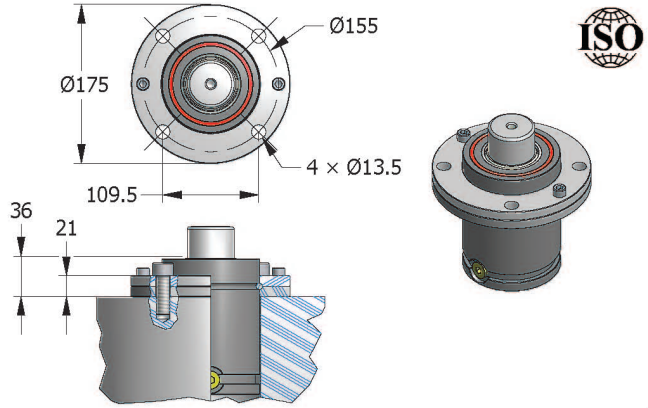
SB5000 MOUNT



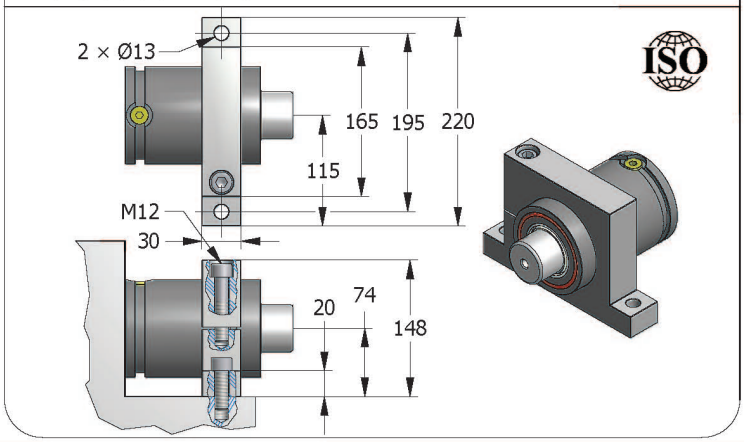
ST5000 MOUNT



SR5000 MOUNT



SC5000 MOUNT



CT02052E

NITROGEN GAS SPRING

PED 97/23/EC

CE

ISO 9001

JAS-ANZ

TSS SERIES!!

SHINWEON S&T CO.,LTD.

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TSS-SERIES

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TSS1500 56
TSS3000 58
TSS5000 60

TOSS STANDARD

MODEL

General Specification

- Filling Materials: Nitrogen Gas (N_2)
- Maximum Stroke Rate Per Minute (Recommended): ~50 to 100 (at 20℃)
- Maximum Filling Pressure: 150~180 bar (at 20℃)
- Piston Rod Speed: 0.03~0.8 m/s
- Minimum Filling Pressure: 25 bar (at 20℃)
- Rod Surface Treatment: Nitrate Coating
- Operation Temperature: -5 to 80℃
- Cylinder Surface Treatment: Oxidized Black Coating
- Pressure Increase as per Temperature: ±0.3% / ℃

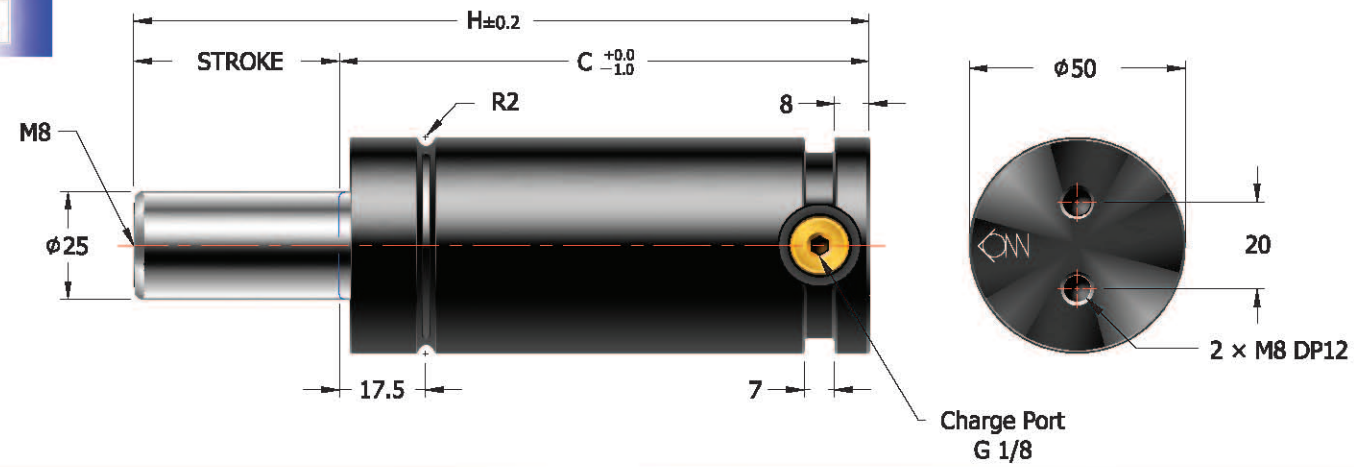
Specification

TYPE	Stroke (mm)	Cylinder Diameter Φ(mm)	Rod Φ(mm)	Initial Force (N)	End Force (N)	MAX. Charging Pressure
TSS0750	10~200	50	25	7,350	11,800	150Bar
TSS1500	10~300	75	36	15,150	22,000	150Bar
TSS3000	10~300	95	50	29,400	47,000	150Bar
TSS5000	10~300	120	65	49,650	84,300	150Bar

※ The above specification is subject to change without notice for performance improvement.

TSS0750 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSS0750 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP0750							
REPAIR KIT	RCS0750							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

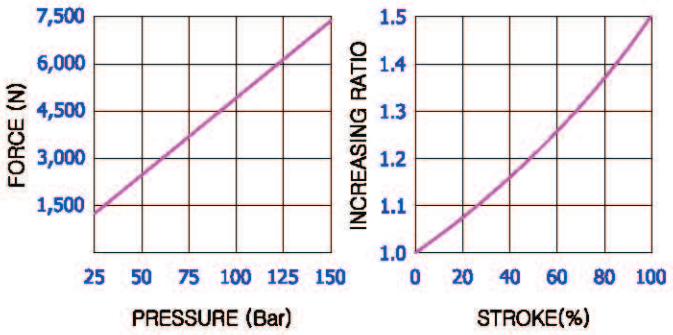
TSS0750

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	90	80		9,500	21.4	1.00
12.7	0.50	95.4	82.7		9,800	24.7	1.00
15	0.59	100	85		10,000	27.6	1.02
20	0.79	110	90		10,300	33.9	1.06
25	0.98	120	95		10,600	40.2	1.12
30	1.18	130	100		10,800	46.5	1.16
35	1.38	140	105		10,900	52.8	1.20
38	1.50	146	108		11,000	56.5	1.24
40	1.57	150	110		11,000	59.0	1.26
45	1.77	160	115		11,100	65.3	1.30
50	1.97	170	120		11,200	71.6	1.36
60	2.36	190	130	7,350	11,300	84.2	1.45
63	2.48	196	133		11,300	87.9	1.48
70	2.76	210	140		11,400	96.7	1.52
75	2.95	220	145		11,400	103.0	1.60
80	3.15	230	150		11,500	109.3	1.64
90	3.54	250	160		11,500	121.8	1.74
100	3.94	270	170		11,600	134.4	1.82
125	4.92	320	195		11,700	165.8	2.04
150	5.91	370	220		11,700	197.2	2.30
160	6.30	390	230		11,700	209.8	2.37
175	6.89	420	245		11,800	228.6	2.52
200	7.87	470	270		11,800	260.0	2.76

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSS0750

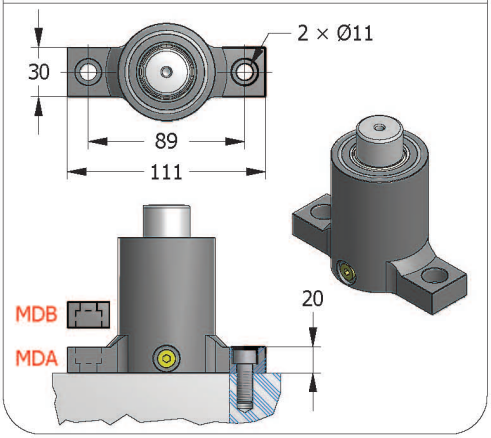
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{49.1}$$

ex) What comes to the charging pressure of gas spring which demands force 6,000N?

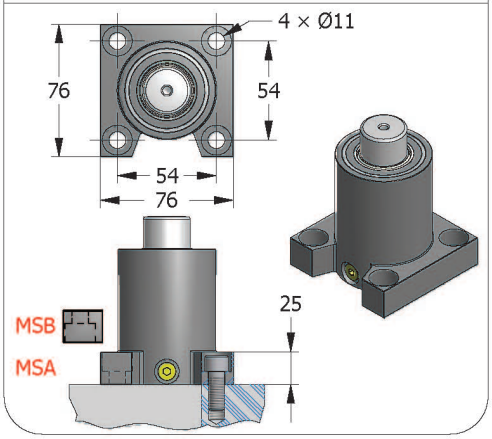
$$122\text{(Bar)} = \frac{6{,}000\text{(N)}}{49.1}$$

TSS0750 Mounts

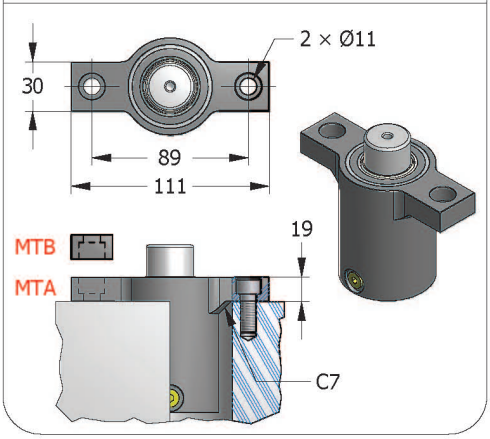
MD MOUNT WELDED



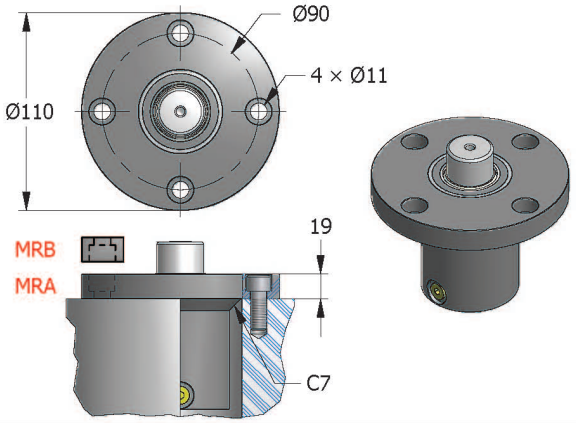
MS MOUNT WELDED



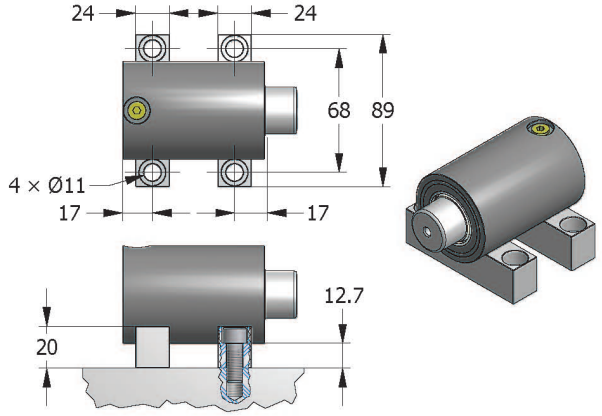
MT MOUNT WELDED



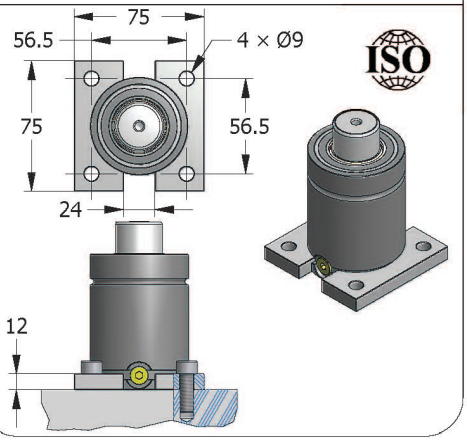
MR MOUNT WELDED



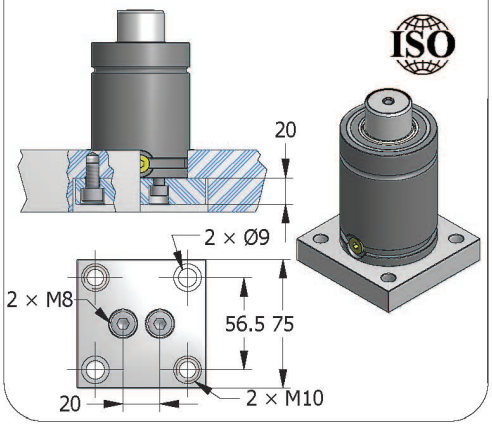
MK MOUNT WELDED



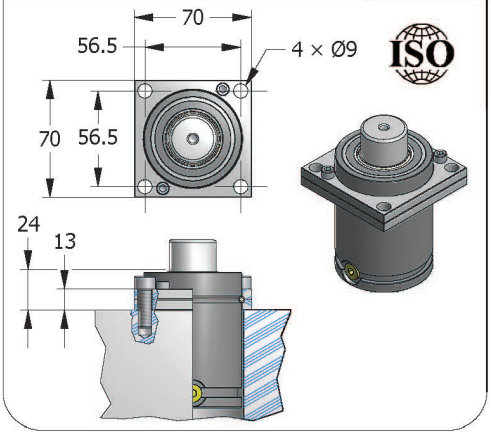
SP0750 MOUNT



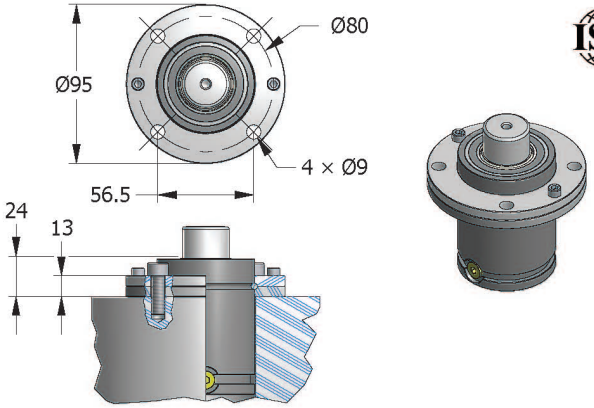
SB0750 MOUNT



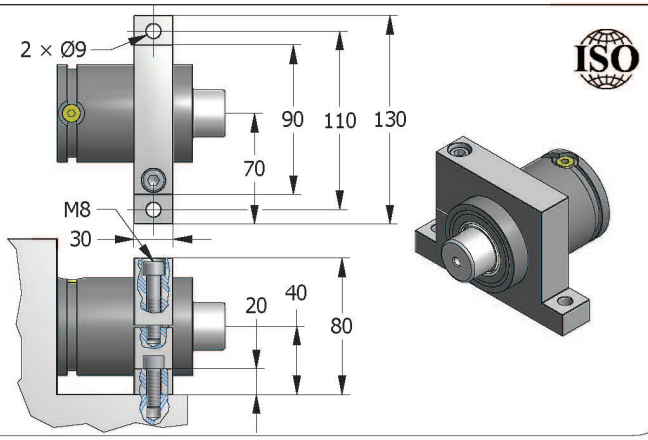
ST0750 MOUNT



SR0750 MOUNT

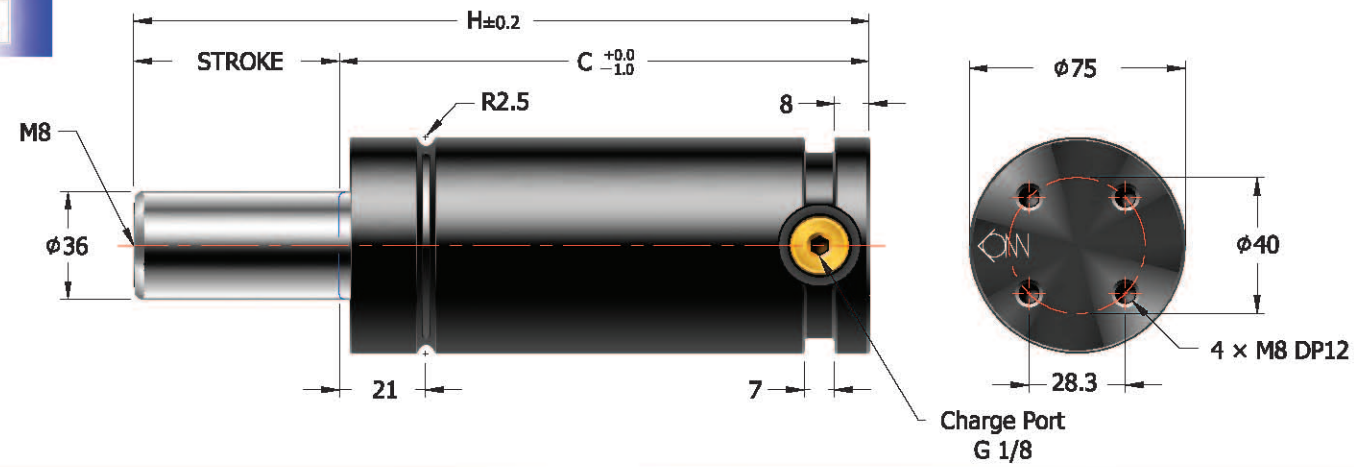


SC0750 MOUNT



TSS1500 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSS1500 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP1500							
REPAIR KIT	RCS1500							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

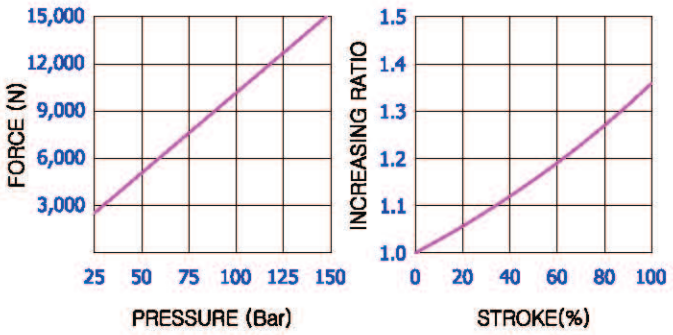
TSS1500

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	122	112		17,800	68.5	3.06
13	0.51	127.4	114.4		18,300	76.0	3.09
15	0.59	132	117		18,500	84.1	3.13
20	0.79	142	122		19,000	99.7	3.24
25	0.98	152	127		19,400	115.3	3.33
30	1.18	162	132		19,700	130.9	3.42
35	1.38	172	137		20,000	146.4	3.50
38	1.50	178	140		20,100	155.8	3.59
40	1.57	182	142		20,200	162.0	3.62
45	1.77	192	147		20,400	177.6	3.70
50	1.97	202	152		20,500	193.2	3.80
60	2.36	222	162		20,800	224.3	3.99
63	2.48	228	165	15,150	20,800	233.7	4.06
70	2.76	242	172		20,900	255.5	4.16
75	2.95	252	177		21,000	271.1	4.28
80	3.15	262	182		21,100	286.6	4.34
90	3.54	282	192		21,200	317.8	4.56
100	3.94	302	202		21,300	349.0	4.73
125	4.92	352	227		21,500	426.8	5.20
150	5.91	402	252		21,600	504.7	5.62
160	6.30	422	262		21,700	535.9	5.80
175	6.89	452	277		21,700	582.6	6.16
200	7.87	502	302		21,800	660.5	6.50
250	9.84	602	352		21,900	816.3	7.39
300	11.8	702	402		22,000	972.1	8.27

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSS1500

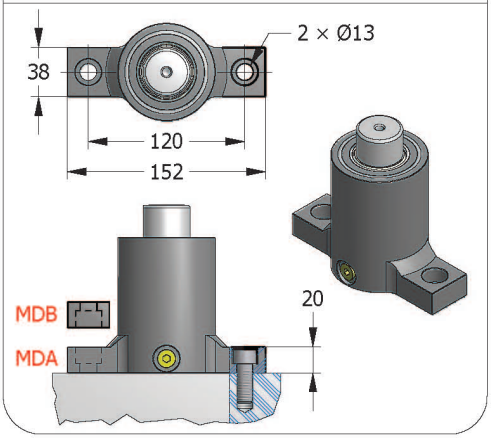
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{101.7}$$

ex) What comes to the charging pressure of gas spring which demands force 12,000N?

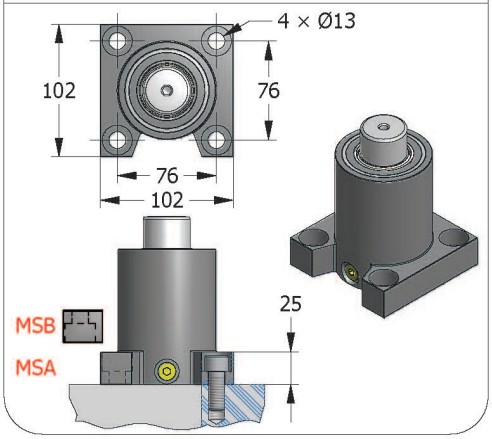
$$118(\text{Bar}) = \frac{12{,}000(\text{N})}{101.7}$$

TSS1500 Mounts

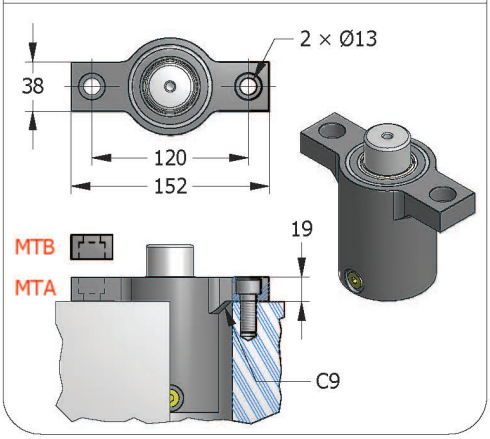
MD MOUNT WELDED



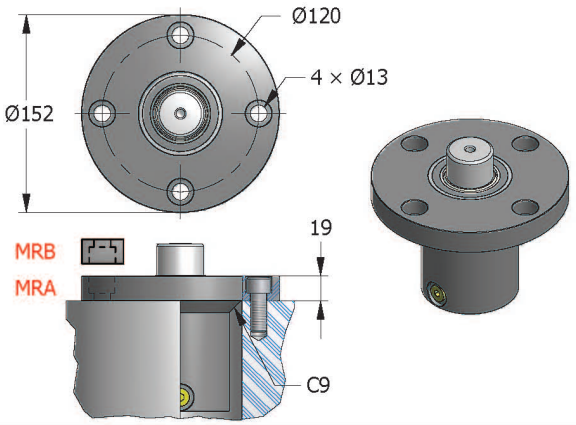
MS MOUNT WELDED



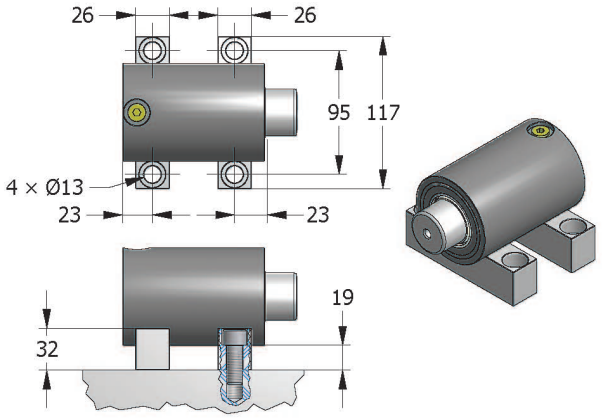
MT MOUNT WELDED



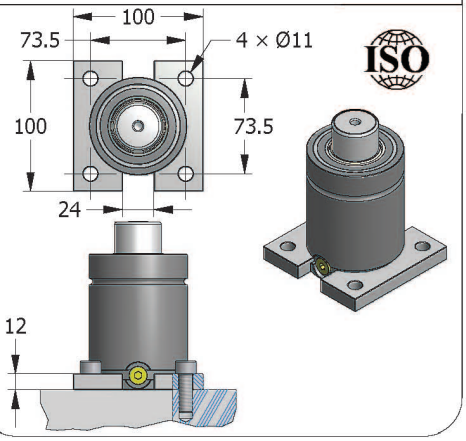
MR MOUNT WELDED



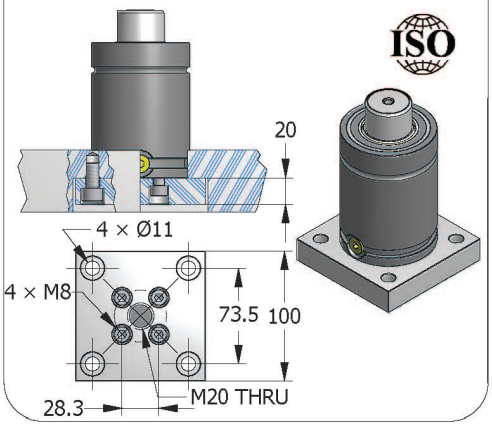
MK MOUNT WELDED



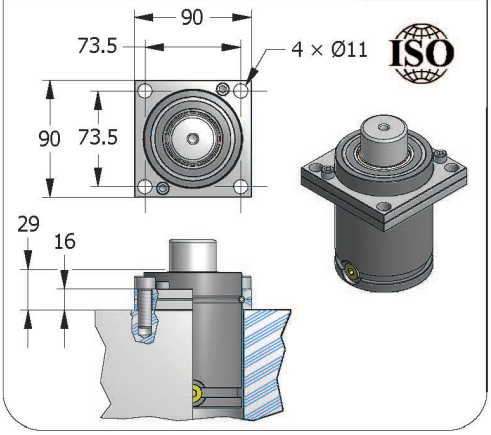
SP1500 MOUNT



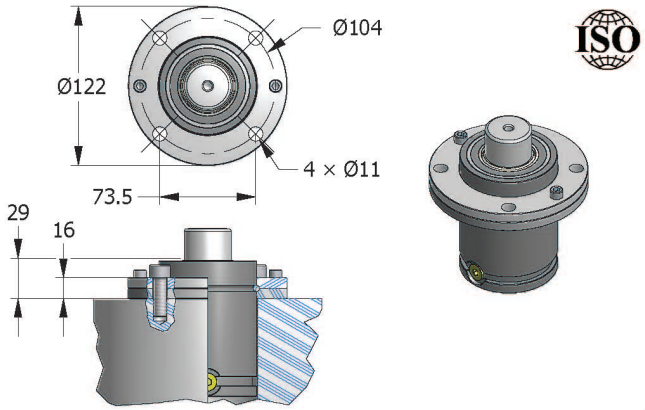
SB1500 MOUNT



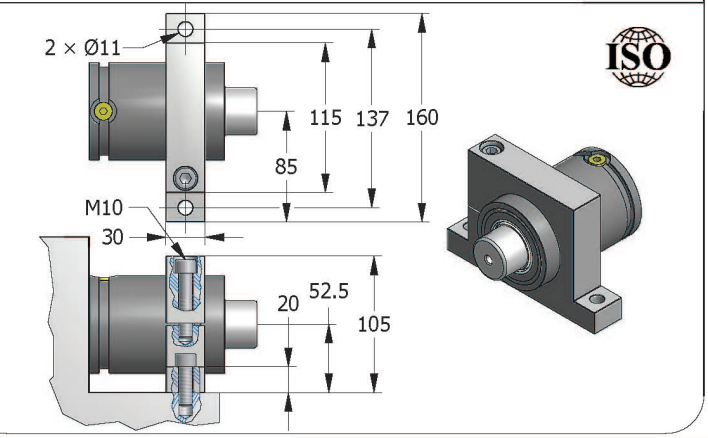
ST1500 MOUNT



SR1500 MOUNT

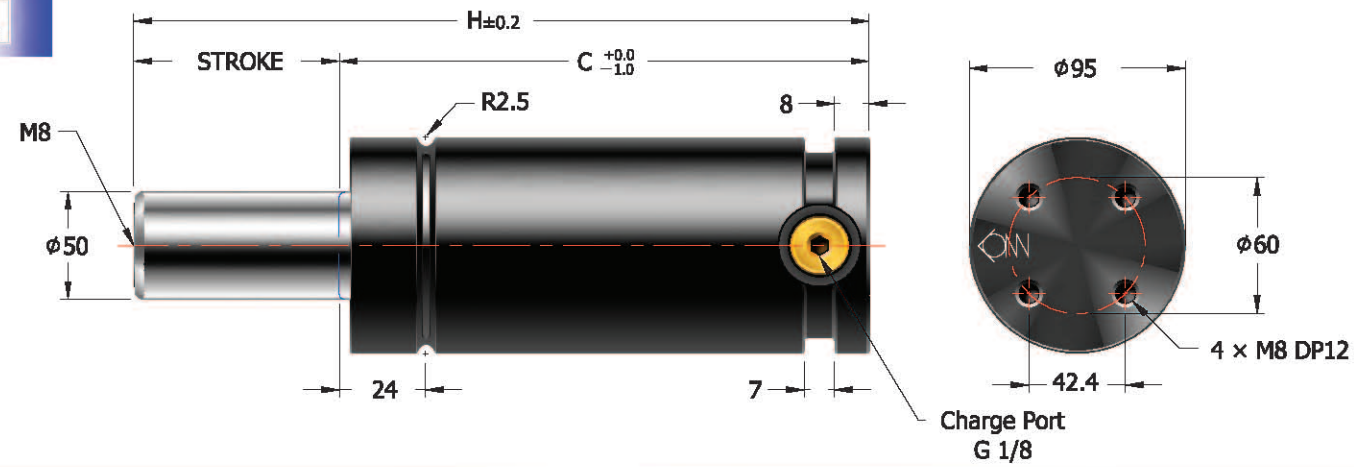


SC1500 MOUNT



TSS3000 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSS3000 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP3000							
REPAIR KIT	RCS3000							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

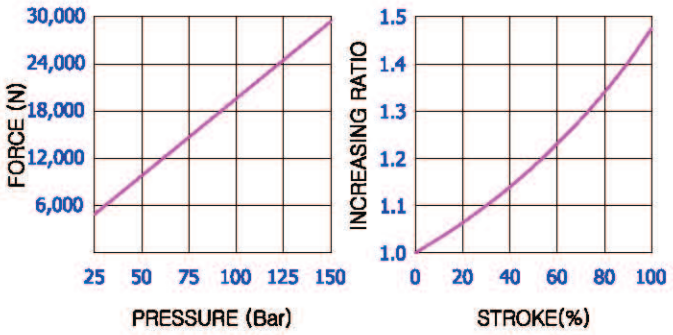
TSS3000

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	122	112		35,700	110.5	5.07
13	0.51	127.5	114.5		37,100	123.1	5.08
15	0.59	132	117		37,500	135.6	5.18
20	0.79	142	122		38,900	160.8	5.38
25	0.98	152	127		39,900	185.9	5.54
30	1.18	162	132		40,800	211.0	5.69
35	1.38	172	137		41,400	236.1	5.85
38	1.50	178	140		41,800	251.2	5.90
40	1.57	182	142		42,000	261.2	5.93
45	1.77	192	147		42,500	286.4	6.16
50	1.97	202	152		42,900	311.5	6.22
60	2.36	222	162		43,600	361.7	6.52
63	2.48	228	165	29,400	43,700	376.8	6.70
70	2.76	242	172		44,100	412.0	6.94
75	2.95	252	177		44,300	437.1	7.10
80	3.15	262	182		44,500	462.2	7.26
90	3.54	282	192		44,800	512.4	7.51
100	3.94	302	202		45,100	562.7	7.86
125	4.92	352	227		45,600	688.3	8.66
150	5.91	402	252		46,000	813.9	9.45
160	6.30	422	262		46,100	864.1	9.76
175	6.89	452	277		46,300	939.5	10.23
200	7.87	502	302		46,500	1065.1	11.01
250	9.84	602	352		46,800	1316.3	12.53
300	11.8	702	402		47,000	1567.5	14.14

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSS3000

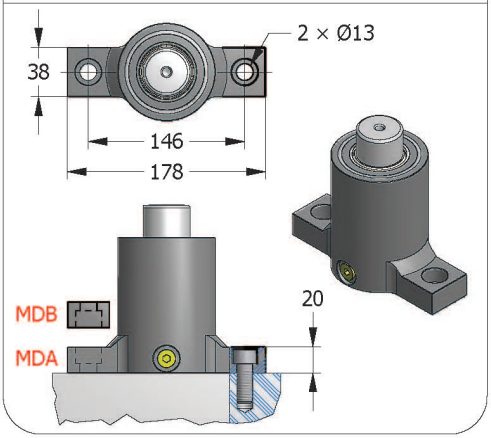
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{196.2}$$

ex) What comes to the charging pressure of gas spring which demands force 25,000N?

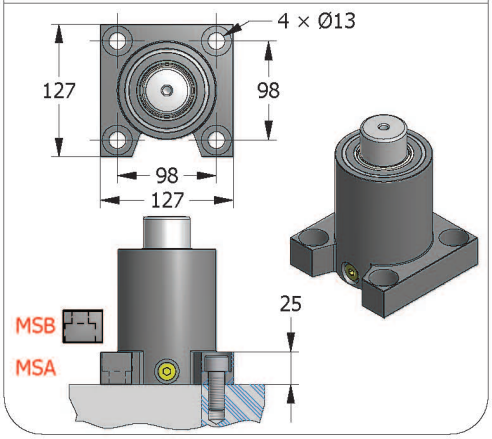
$$127\text{(Bar)} = \frac{25{,}000\text{(N)}}{196.2}$$

TSS3000 Mounts

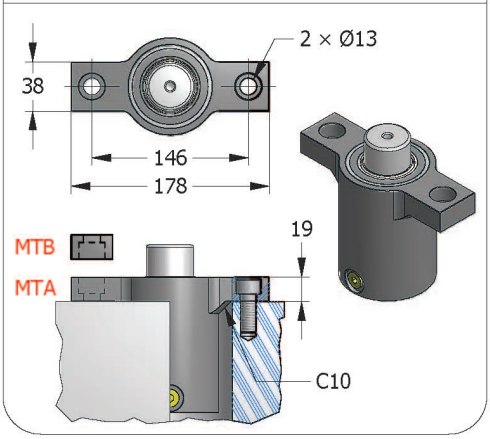
MD MOUNT WELDED



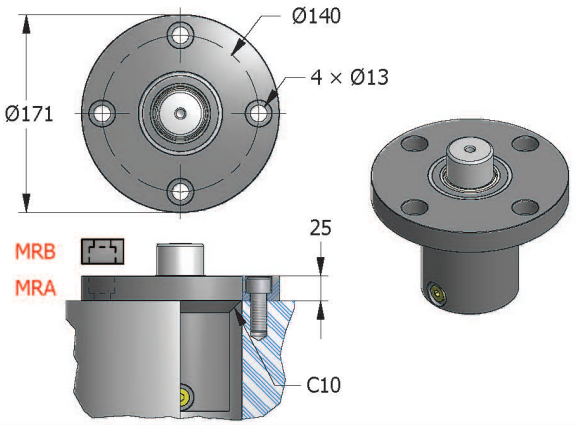
MS MOUNT WELDED



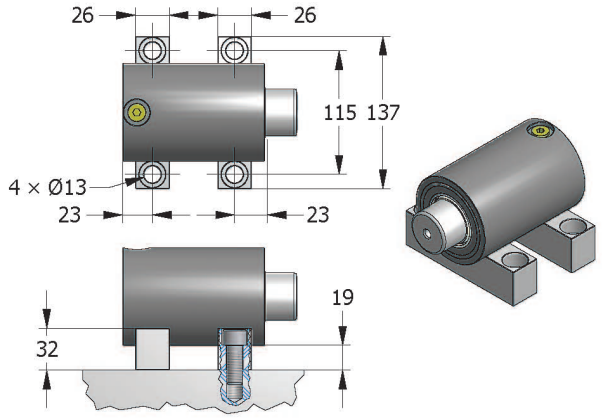
MT MOUNT WELDED



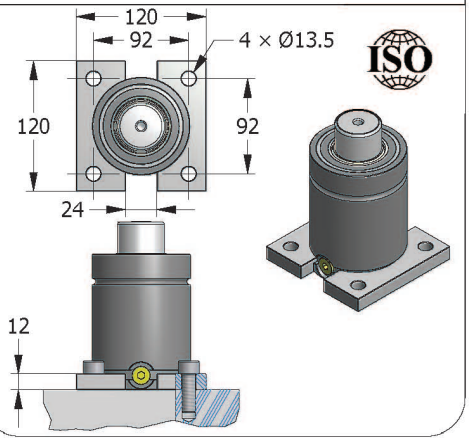
MR MOUNT WELDED



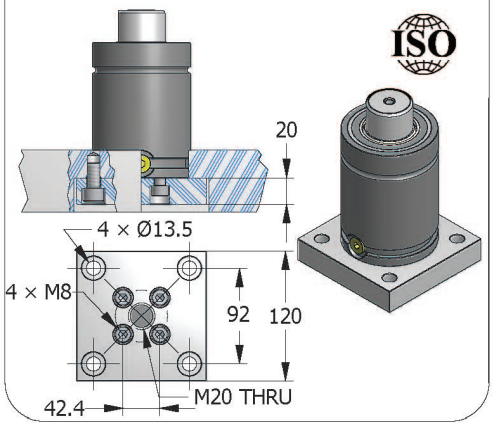
MK MOUNT WELDED



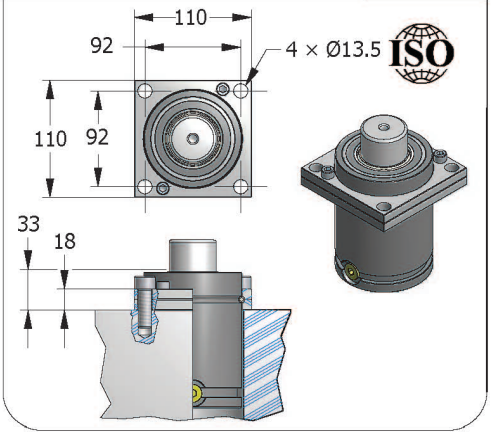
SP3000 MOUNT



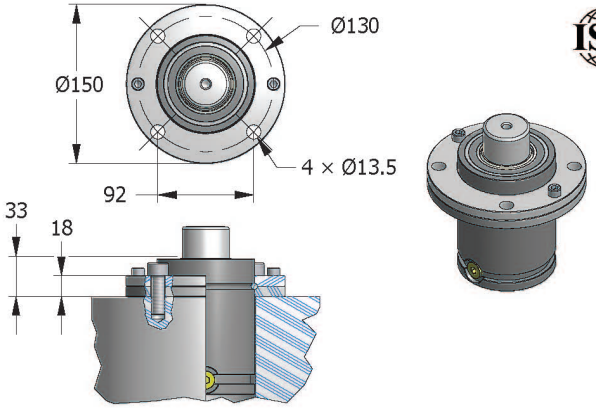
SB3000 MOUNT



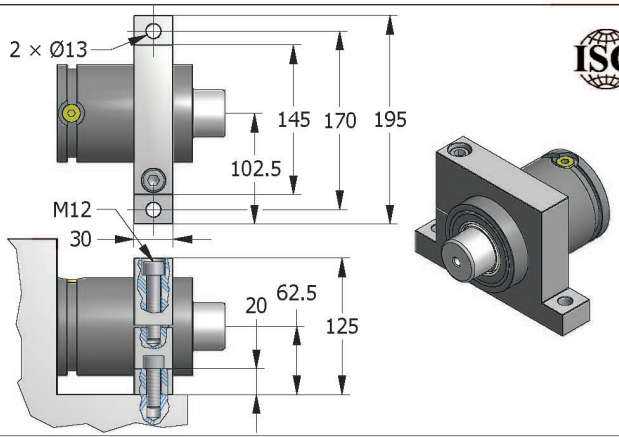
ST3000 MOUNT



SR3000 MOUNT

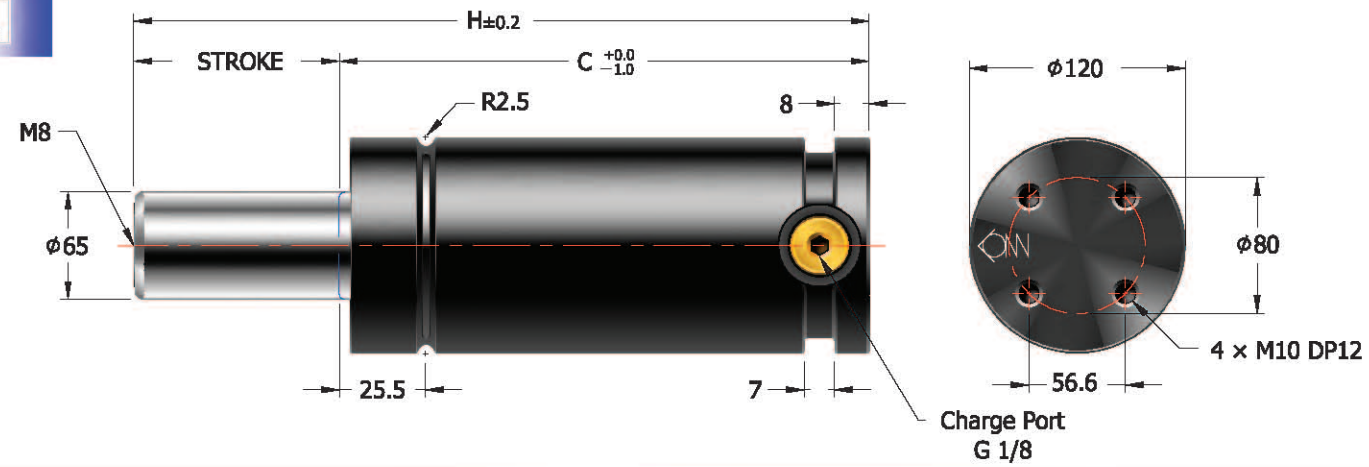


SC3000 MOUNT



TSS5000 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSS5000 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP5000							
REPAIR KIT	RCS5000							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

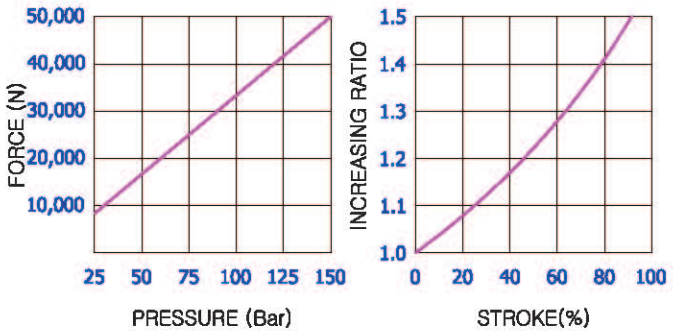
TSS5000

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	121.5	111.5		65,400	137.4	8.22
13	0.51	127.5	114.5		67,800	160.9	8.37
15	0.59	132	117		68,500	180.6	8.47
20	0.79	142	122		71,000	219.8	8.72
25	0.98	152	127		73,000	259.1	9.00
30	1.18	162	132		74,400	298.3	9.21
35	1.38	172	137		75,600	337.6	9.68
38	1.50	178	140		76,200	361.1	9.71
40	1.57	182	142		76,500	376.8	9.71
45	1.77	192	147		77,300	416.1	9.95
50	1.97	202	152		78,000	455.3	1034
60	2.36	222	162		79,100	533.8	10.69
63	2.48	228	165	49,650	79,300	557.4	10.84
70	2.76	242	172		79,900	612.3	11.19
75	2.95	252	177		80,200	651.6	11.44
80	3.15	262	182		80,500	690.8	11.97
90	3.54	282	192		81,000	769.3	12.18
100	3.94	302	202		81,400	847.8	12.67
125	4.92	352	227		82,200	1044.1	13.91
150	5.91	402	252		82,800	1240.3	15.14
160	6.30	422	262		83,000	1318.8	15.63
175	6.89	452	277		83,200	1436.6	16.38
200	7.87	502	302		83,500	1632.8	17.61
250	9.84	602	352		84,000	2025.3	20.08
300	11.81	702	402		84,300	2417.8	22.55

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSS5000

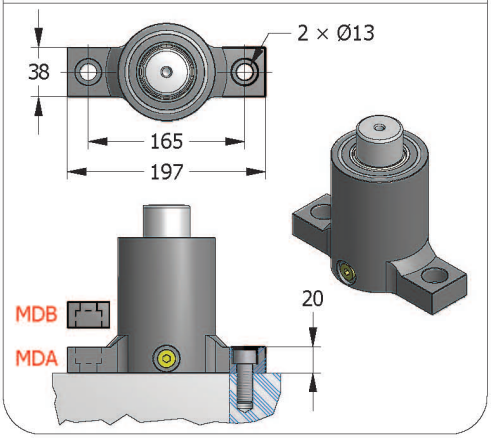
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{331.7}$$

ex) What comes to the charging pressure of gas spring which demands force 38,000N?

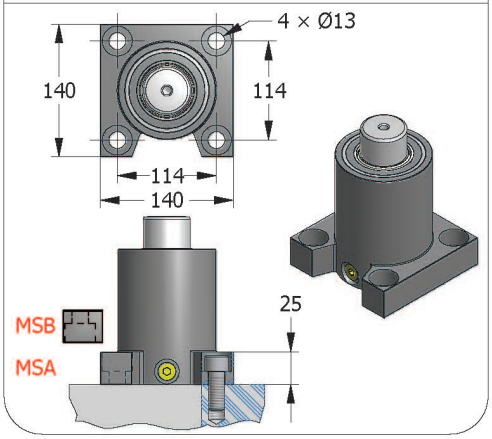
$$115\text{(Bar)} = \frac{38{,}000\text{(N)}}{331.7}$$

TSS5000 Mounts

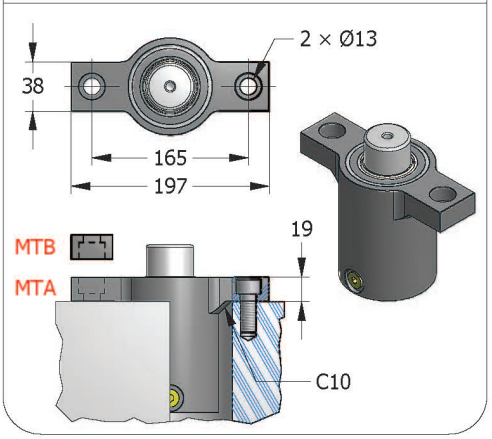
MD MOUNT WELDED



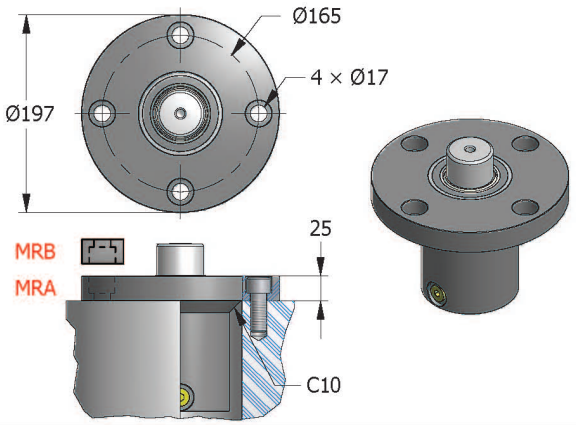
MS MOUNT WELDED



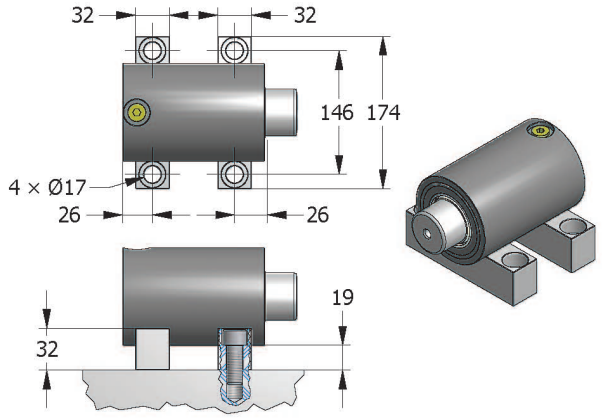
MT MOUNT WELDED



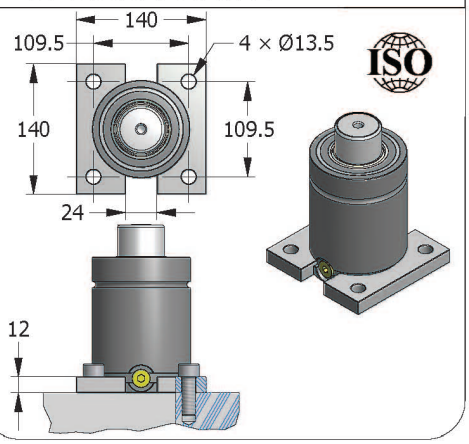
MR MOUNT WELDED



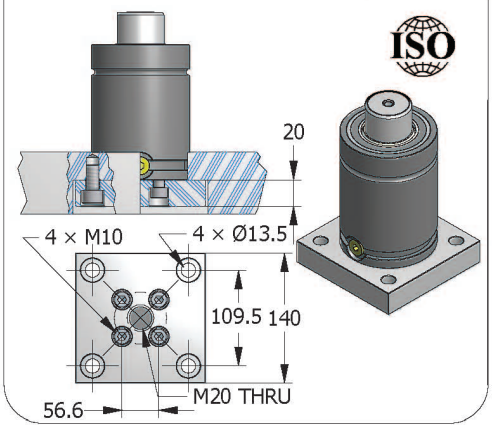
MK MOUNT WELDED



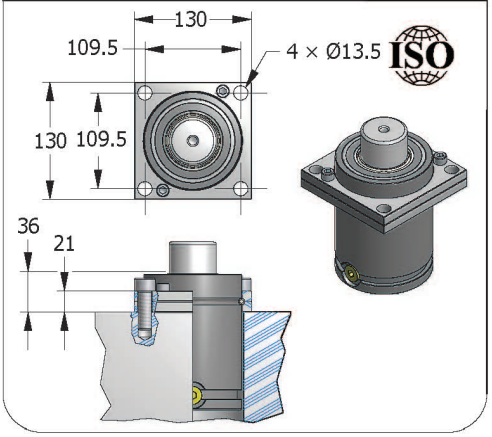
SP5000 MOUNT



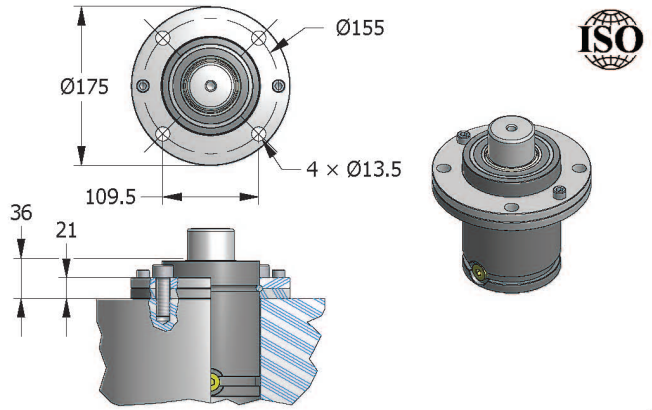
SB5000 MOUNT



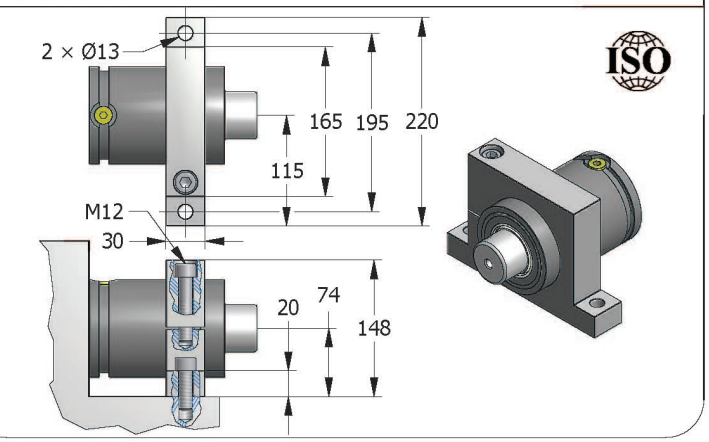
ST5000 MOUNT



SR5000 MOUNT



SC5000 MOUNT



CT02052E

NITROGEN GAS SPRING

PED 97/23/EC

CE

ISO 9001

JAS-ANZ

TSL SERIES!!

SHINWEON S&T CO.,LTD.

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ISO STANDARD

MODEL

■ General Specification

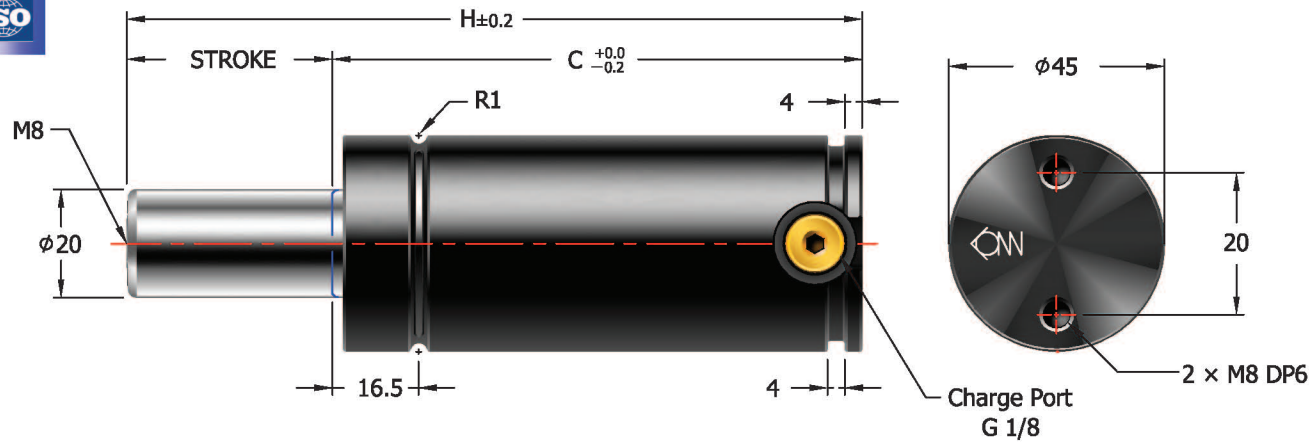
- Filling Materials: Nitrogen Gas (N_2)
- Maximum Stroke Rate Per Minute (Recommended): ~50 to 100 (at 20℃)
- Maximum Filling Pressure: 150~180 bar (at 20℃)
- Piston Rod Speed: 0.03~0.8 m/s
- Minimum Filling Pressure: 25 bar (at 20℃)
- Rod Surface Treatment: Nitrate Coating
- Operation Temperature: -5 to 80℃
- Cylinder Surface Treatment: Oxidized Black Coating
- Pressure Increase as per Temperature: ±0.3% / ℃

■ Specification

TYPE	Stroke (mm)	Cylinder Diameter Φ(mm)	Rod Φ(mm)	Initial Force (N)	End Force (N)	MAX. Charging Pressure
TSL0500	10~125	45	20	4,650	6,200	150Bar
TSL0750	10~300	50	25	7,350	11,500	150Bar
TSL1500	10~300	75	36	15,150	22,100	150Bar
TSL3000	10~300	95	50	29,400	47,300	150Bar
TSL5000	10~300	120	65	49,650	83,900	150Bar
TSL7500	15~300	150	80	75,300	123,900	150Bar
TSL10000	20~300	195	95	106,200	156,600	150Bar

※ The above specification is subject to change without notice for performance improvement.

TSL0500 NITROGEN GAS SPRING



HOW TO SPECIFY

GAS SPRING	TSL0500 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	—	150 (CHARGING PRESSURE (Bar))
MOUNT	SP0500					
REPAIR KIT	RCL0500					

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

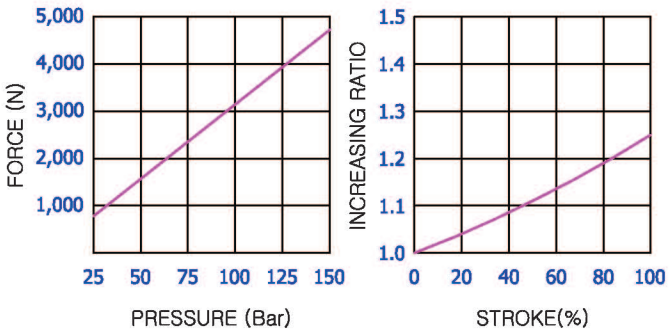
TSL0500

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)	ISO
10	0.39	105	95	4,650	5,100	33.9	0.89	
15	0.59	115	100		5,300	39.2	0.94	
20	0.79	125	105		5,400	44.6	0.98	
25	0.98	135	110		5,500	50.0	0.98	√
30	1.18	145	115		5,600	55.3	1.10	
35	1.38	155	120		5,700	60.7	1.13	
38	1.50	161	123		5,700	63.9	1.16	
40	1.57	165	125		5,700	66.1	1.16	
45	1.77	175	130		5,800	71.5	1.19	
50	1.97	185	135		5,800	76.8	1.21	√
60	2.36	205	145		5,900	87.6	1.23	
63	2.48	211	148		5,900	90.8	1.25	
70	2.76	225	155		6,000	98.3	1.31	
80	3.15	245	165		6,000	109.1	1.38	√
90	3.54	265	175		6,100	119.8	1.45	
100	3.94	285	185		6,100	130.6	1.51	
110	4.33	305	195		6,100	141.3	1.58	
120	4.72	325	205		6,200	152.1	1.64	
125	4.92	335	210		6,200	157.4	1.67	
160	6.30	405	245		6,200	195.1	1.89	

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSL0500

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{31.4}$$

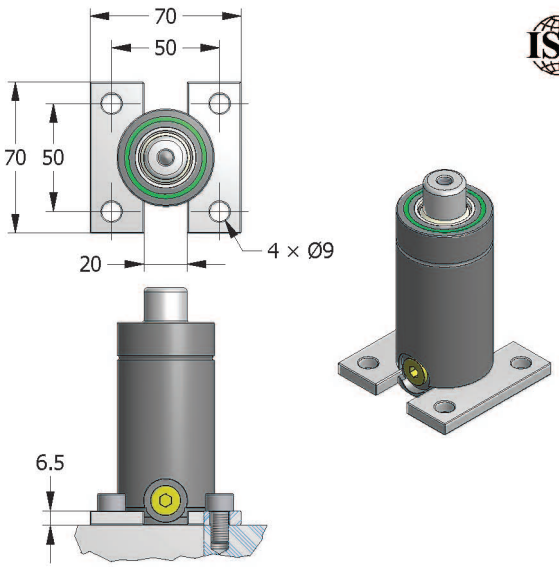
ex) What comes to the charging pressure of gas spring which demands force 4,000N?

$$127(\text{Bar}) = \frac{4{,}000(\text{N})}{31.4}$$

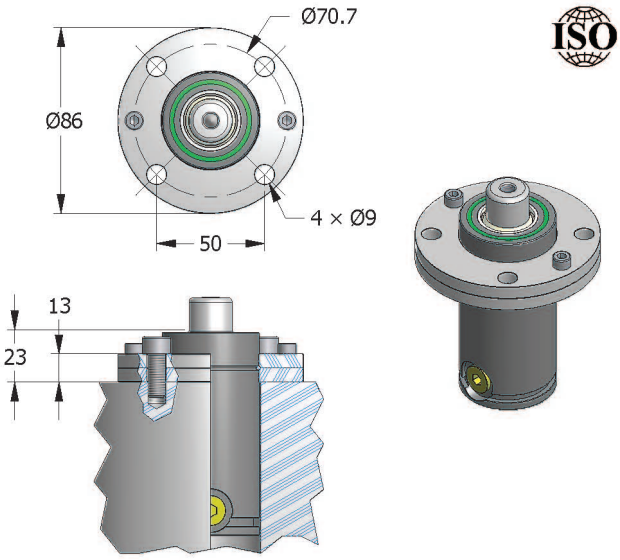
SHINWEON S&T CO.,LTD.

TSL0500 Mounts

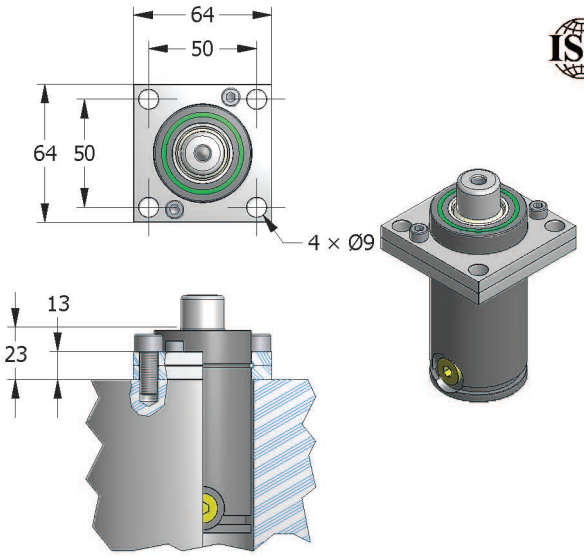
SP0500 MOUNT



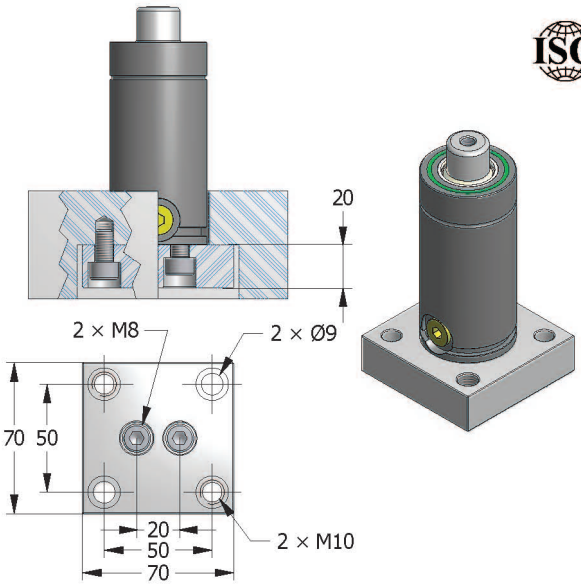
SR0500 MOUNT



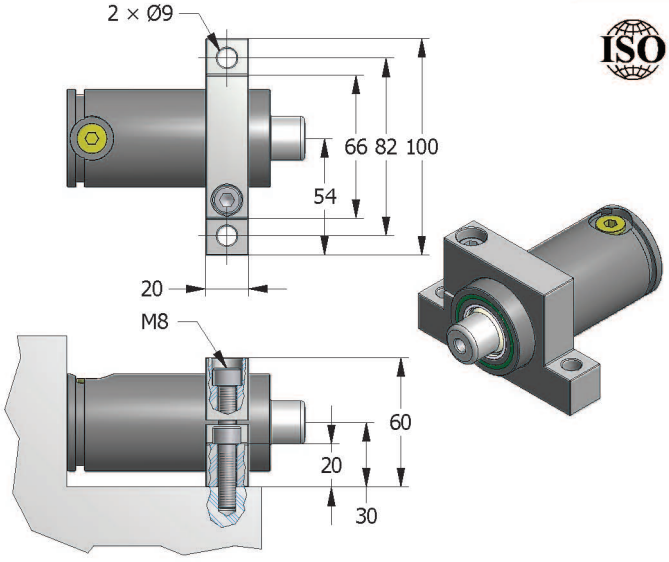
ST0500 MOUNT



SB0500 MOUNT

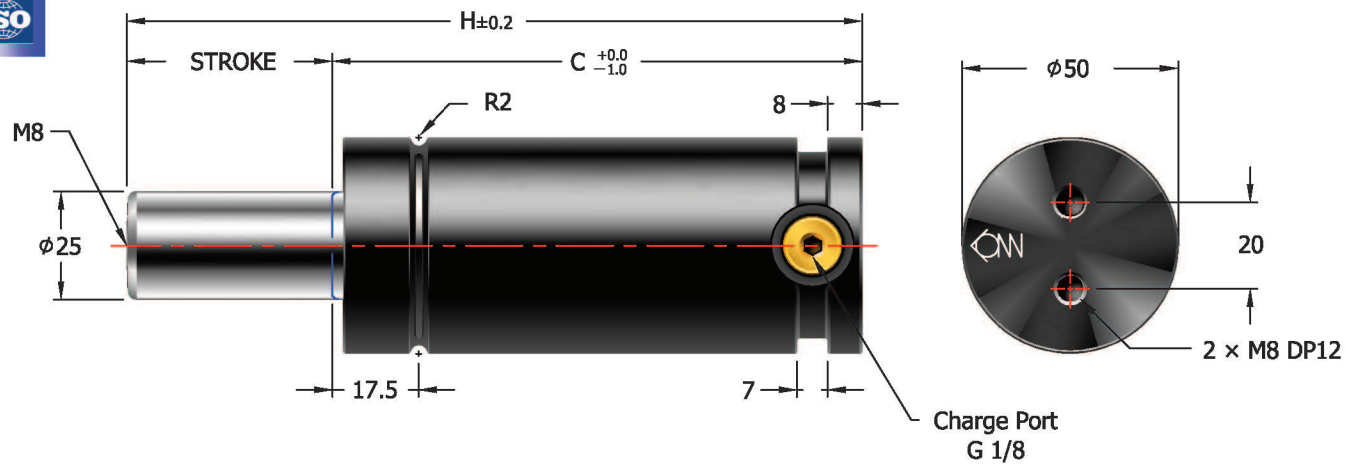


SC0500 MOUNT



TSL0750 NITROGEN GAS SPRING

PED 97/23/2C ISO



HOW TO SPECIFY

GAS SPRING	TSL0750 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP0750							
REPAIR KIT	RCL0750							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

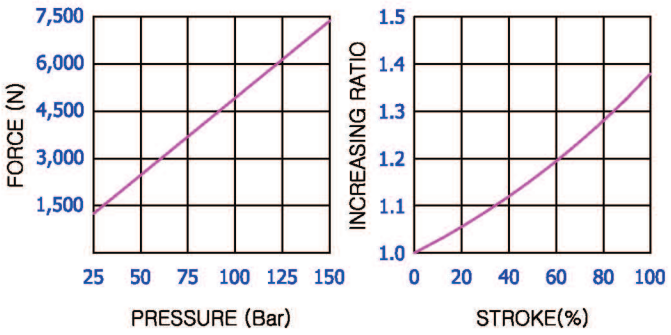
TSL0750

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)	ISO
10	0.39	115	105		8,400	40.2	1.32	
12.7	0.50	120.4	107.7		8,600	43.6	1.34	
15	0.59	125	110		8,700	46.5	1.35	
20	0.79	135	115		9,000	52.8	1.40	
25	0.98	145	120		9,300	59.0	1.44	√
30	1.18	155	125		9,500	65.3	1.50	
35	1.38	165	130		9,700	71.6	1.54	
38	1.50	171	133		9,800	75.4	1.58	
40	1.57	175	135		9,800	77.9	1.59	
45	1.77	185	140		10,000	84.2	1.64	
50	1.97	195	145		10,100	90.4	1.68	√
60	2.36	215	155		10,300	103.0	1.78	
63	2.48	222	158	7,350	10,300	106.8	1.82	
70	2.76	235	165		10,500	115.6	1.87	
75	2.95	245	170		10,500	121.8	1.91	
80	3.15	255	175		10,600	128.1	1.98	√
90	3.54	275	185		10,700	140.7	2.06	
100	3.94	295	195		10,800	153.2	2.14	√
125	4.92	345	220		11,000	184.6	2.30	√
150	5.91	395	245		11,100	216.0	2.61	
160	6.30	415	255		11,200	228.6	2.72	√
175	6.89	445	270		11,200	247.4	2.84	
200	7.87	495	295		11,300	278.8	3.08	
250	9.84	595	345		11,500	341.6	3.60	
300	11.81	695	395		11,500	404.4	4.07	

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSL0750

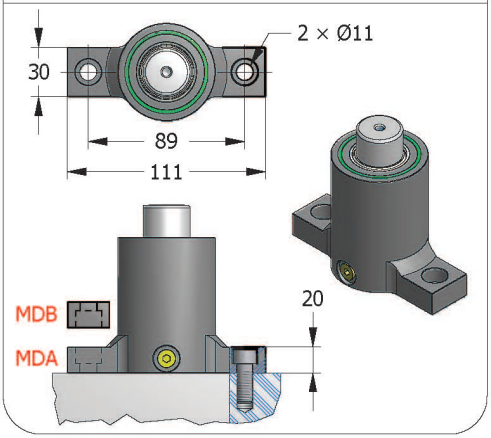
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{49.1}$$

ex) What comes to the charging pressure of gas spring which demands force 6,000N?

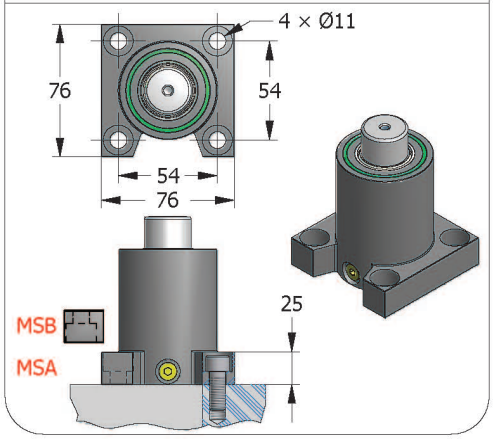
$$122(\text{Bar}) = \frac{6{,}000(\text{N})}{49.1}$$

TSL0750 Mounts

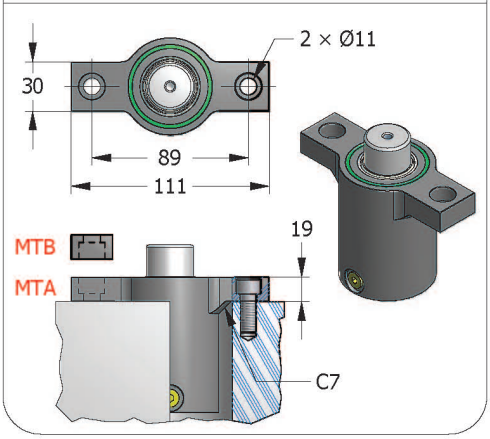
MD MOUNT WELDED



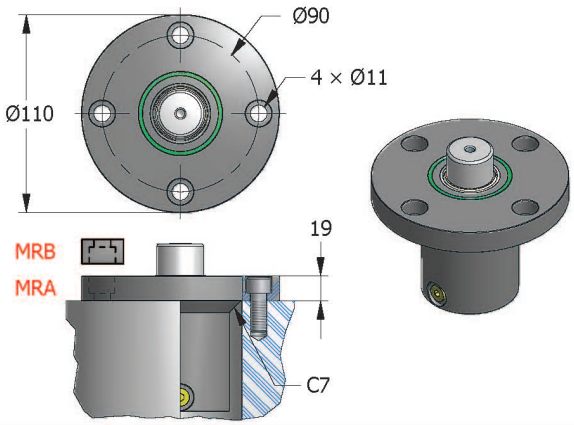
MS MOUNT WELDED



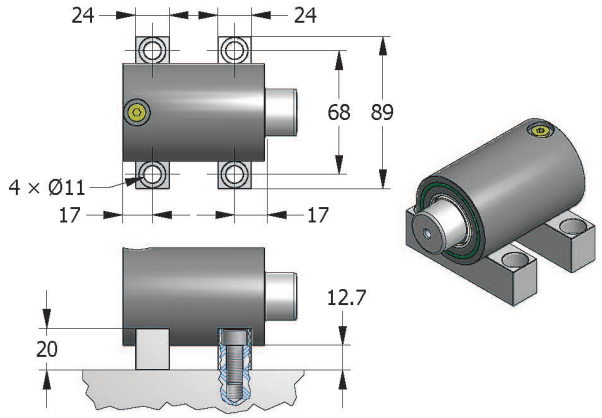
MT MOUNT WELDED



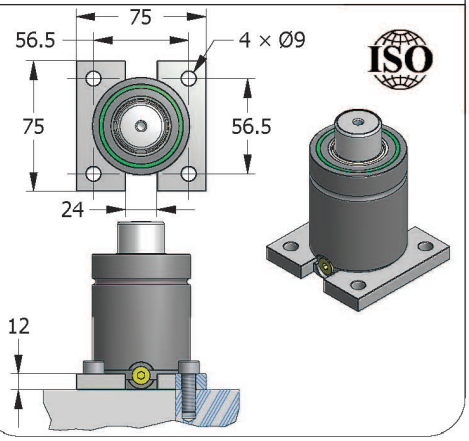
MR MOUNT WELDED



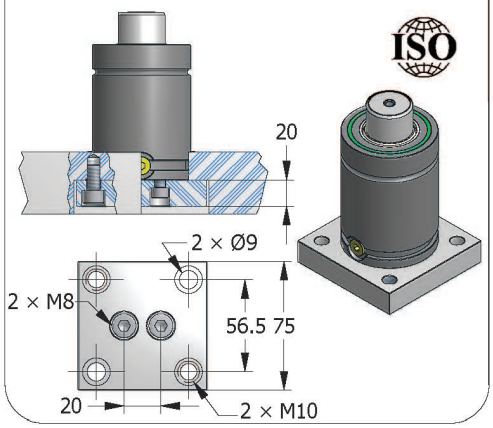
MK MOUNT WELDED



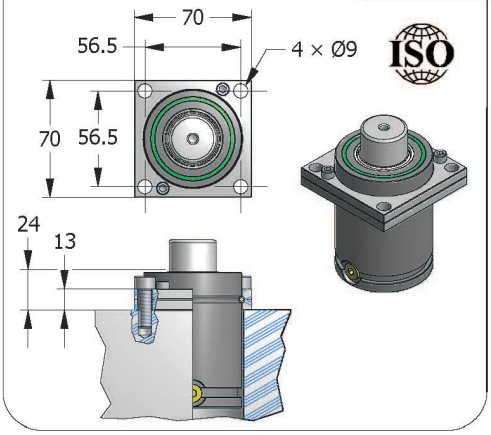
SP0750 MOUNT



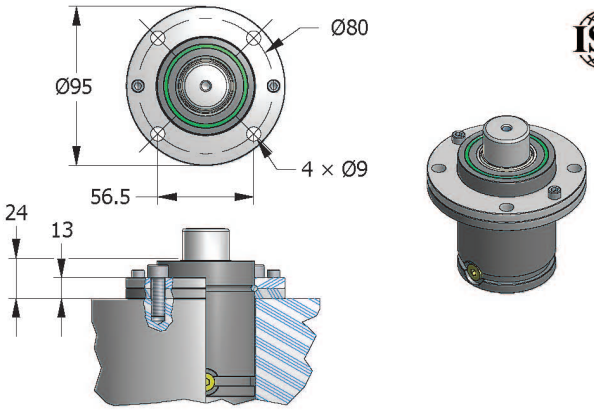
SB0750 MOUNT



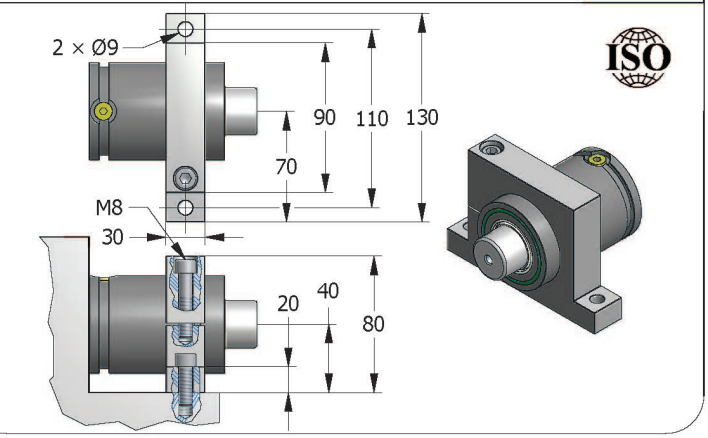
ST0750 MOUNT



SR0750 MOUNT

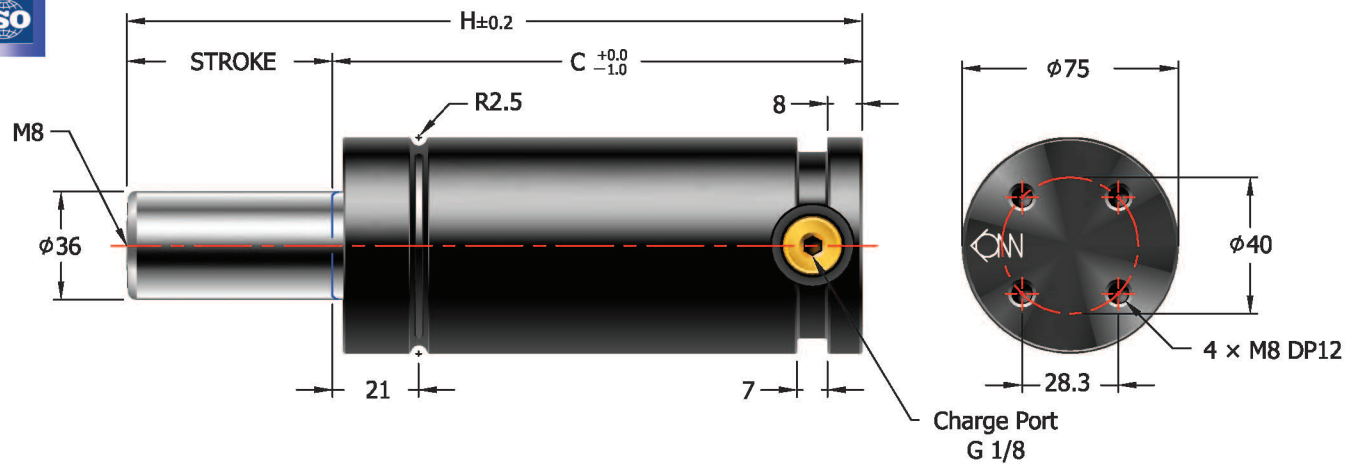


SC0750 MOUNT



TSL1500 NITROGEN GAS SPRING

PED 97/23/2C ISO



HOW TO SPECIFY

GAS SPRING	TSL1500	×	050	S(F)	–	(MSA)	–	150
	MODEL		STROKE	SELF CONTAINED-S FITTING-SYSTEM-F		MOUNT		CHARGING PRESSURE (Bar)
MOUNT	SP1500							
REPAIR KIT	RCL1500							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

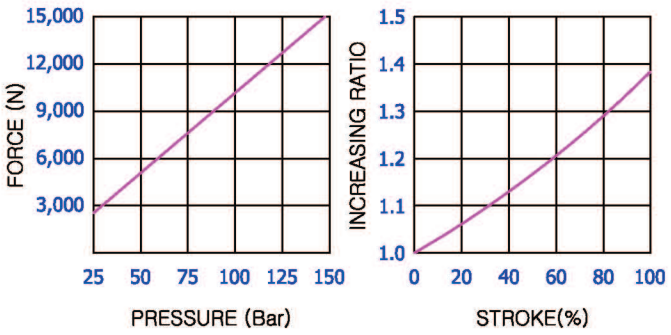
TSL1500

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)	ISO
10	0.39	130	120		18,500	56.1	3.40	
13	0.51	135.4	122.4		19,100	63.6	3.45	
15	0.59	140	125		19,200	71.7	3.48	
20	0.79	150	130		19,700	87.2	3.58	
25	0.98	160	135		20,100	102.8	3.66	√
30	1.18	170	140		20,400	118.4	3.78	
35	1.38	180	145		20,600	134.0	3.86	
38	1.50	186	148		20,700	143.3	3.92	
40	1.57	190	150		20,800	149.6	4.00	
45	1.77	200	155		20,900	165.1	4.04	
50	1.97	210	160		21,000	180.7	4.16	√
60	2.36	230	170		21,200	211.9	4.36	
63	2.48	237	174	15,150	21,100	224.3	4.40	
70	2.76	250	180		21,400	243.0	4.47	
75	2.95	260	185		21,400	258.6	4.60	
80	3.15	270	190		21,500	274.2	4.67	√
90	3.54	290	200		21,600	305.3	4.85	
100	3.94	310	210		21,600	336.5	5.03	√
125	4.92	360	235		21,800	414.4	5.47	√
150	5.91	410	260		21,900	492.3	5.92	
160	6.30	430	270		21,900	523.4	6.22	√
175	6.89	460	285		22,000	570.2	6.37	
200	7.87	510	310		22,000	648.1	6.82	
250	9.84	610	360		22,100	803.8	7.90	
300	11.81	710	410		22,100	959.6	8.68	

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSL1500

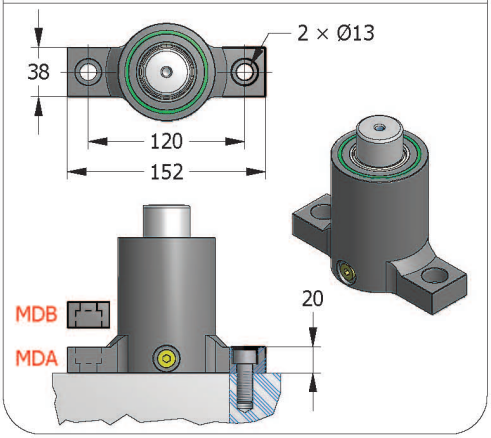
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{101.7}$$

ex) What comes to the charging pressure of gas spring which demands force 12,000N?

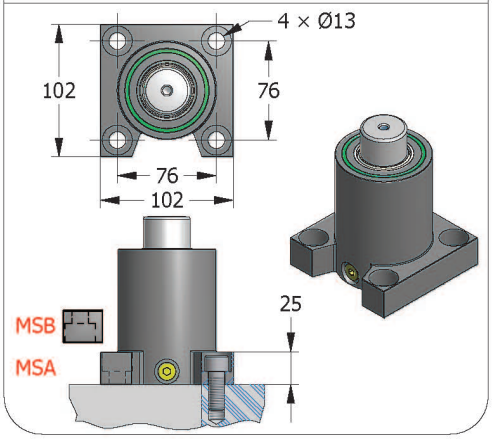
$$118(\text{Bar}) = \frac{12{,}000(\text{N})}{101.7}$$

TSL1500 Mounts

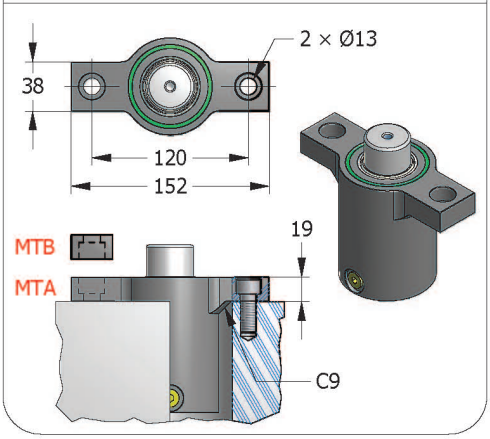
MD MOUNT WELDED



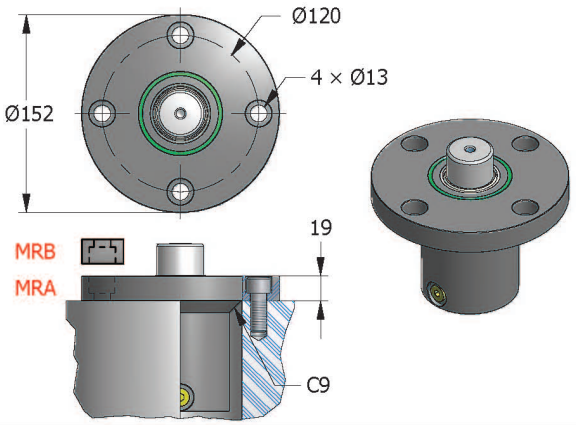
MS MOUNT WELDED



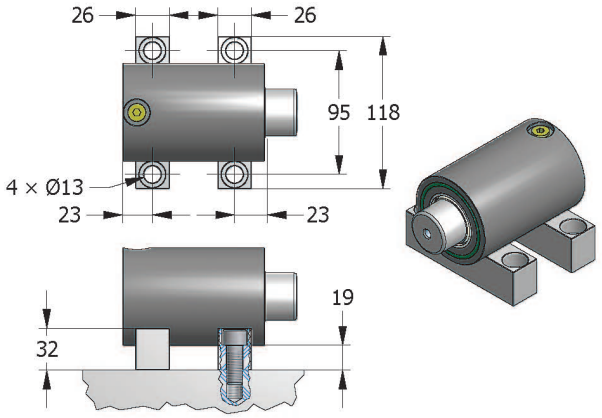
MT MOUNT WELDED



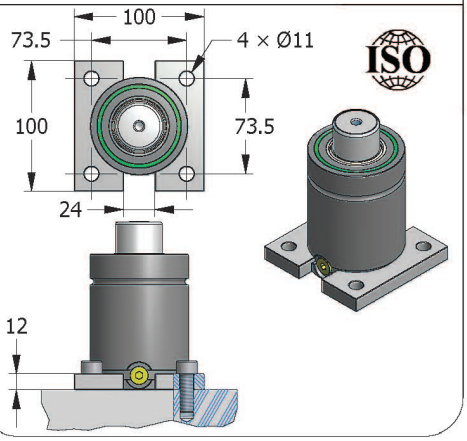
MR MOUNT WELDED



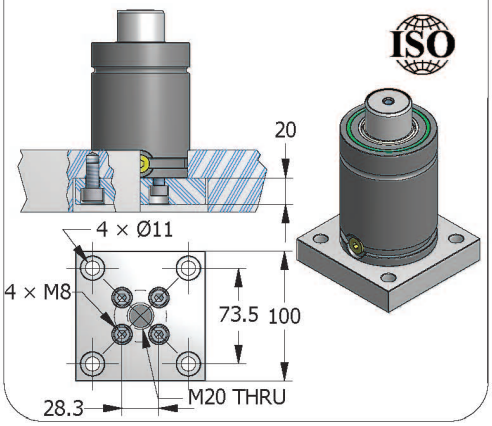
MK MOUNT WELDED



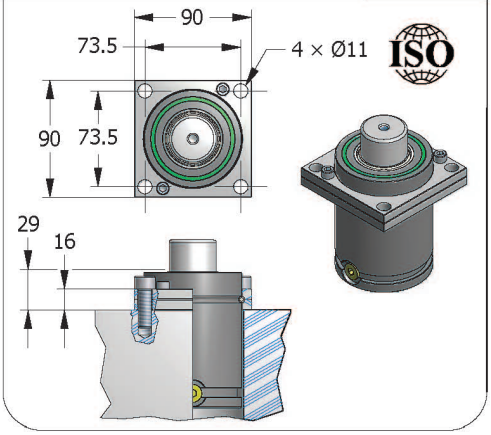
SP1500 MOUNT



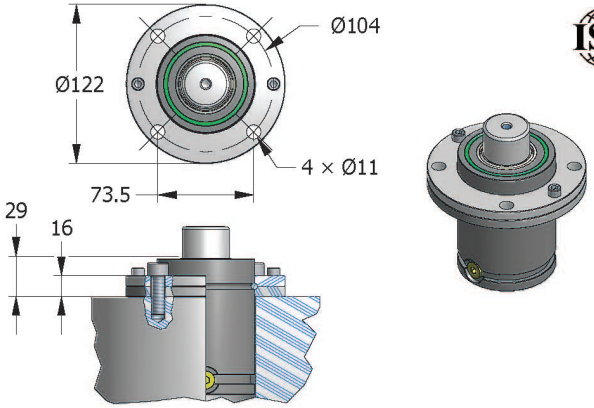
SB1500 MOUNT



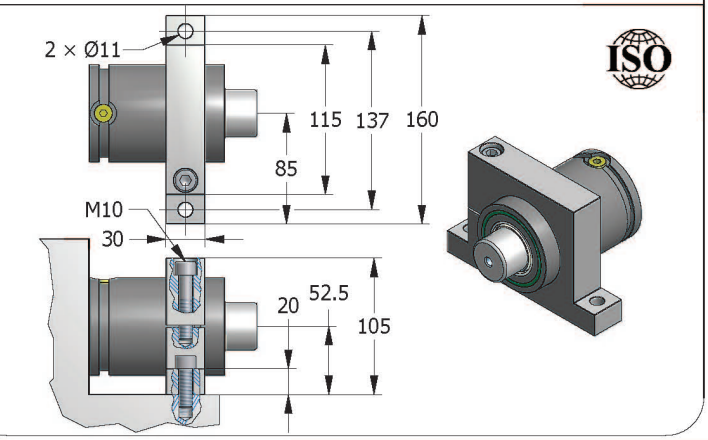
ST1500 MOUNT



SR1500 MOUNT

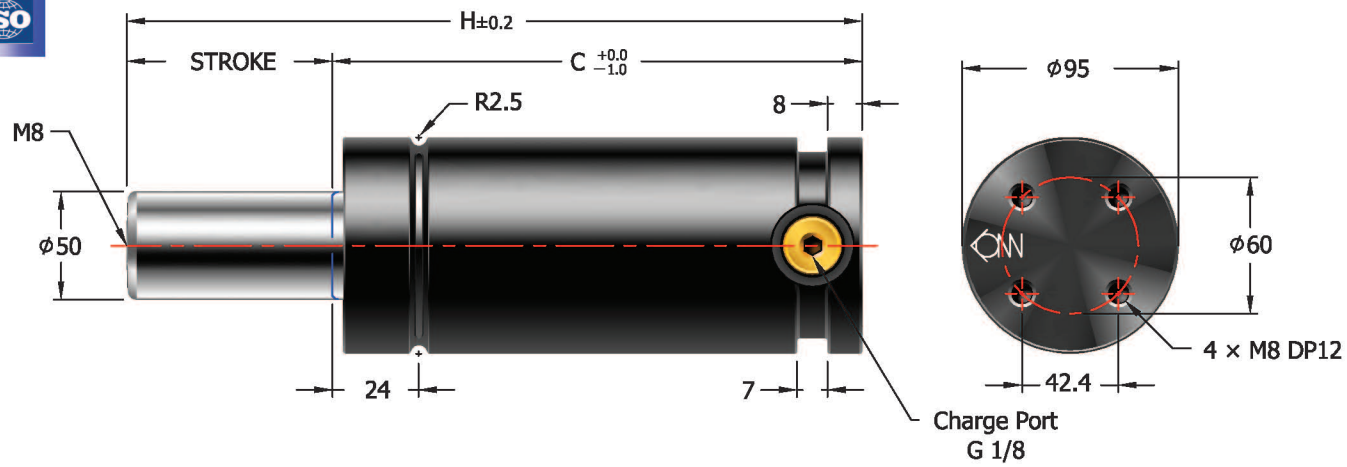


SC1500 MOUNT



TSL3000 NITROGEN GAS SPRING

PED 97/23/2C ISO



HOW TO SPECIFY

GAS SPRING	TSL3000	×	050	S(F)	–	(MSA)	–	150
	MODEL		STROKE	SELF CONTAINED-S FITTING-SYSTEM-F		MOUNT		CHARGING PRESSURE (Bar)
MOUNT	SP3000							
REPAIR KIT	RCL3000							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

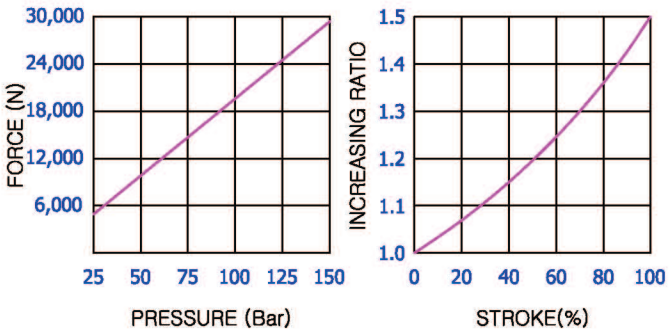
TSL3000

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)	ISO
10	0.39	140	130		37,000	95.5	5.74	
13	0.51	145.5	132.5		38,500	108.0	5.84	
15	0.59	150	135		38,900	120.6	5.92	
20	0.79	160	140		40,200	145.7	6.09	
25	0.98	170	145		41,200	170.8	6.48	√
30	1.18	180	150		42,000	195.9	6.55	
35	1.38	190	155		42,600	221.1	6.62	
38	1.50	196	158		42,900	236.1	6.73	
40	1.57	200	160		43,100	246.2	6.80	
45	1.77	210	165		43,600	271.3	6.98	
50	1.97	220	170		43,900	296.4	7.15	√
60	2.36	240	180		44,500	346.7	7.51	
63	2.48	247	184	29,400	44,300	366.8	7.68	
70	2.76	260	190		44,900	396.9	7.86	
75	2.95	270	195		45,100	422.0	8.04	
80	3.15	280	200		45,300	447.1	8.27	√
90	3.54	300	210		45,600	497.4	8.58	
100	3.94	320	220		45,800	547.6	8.85	√
125	4.92	370	245		46,200	673.2	9.65	√
150	5.91	420	270		46,500	798.8	10.69	
160	6.30	440	280		46,600	849.1	11.05	√
175	6.89	470	295		46,700	924.4	11.58	
200	7.87	520	320		46,900	1050.0	12.46	
250	9.84	620	370		47,200	1301.2	14.23	
300	11.81	720	420		47,300	1552.4	16.00	

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSL3000

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{196.2}$$

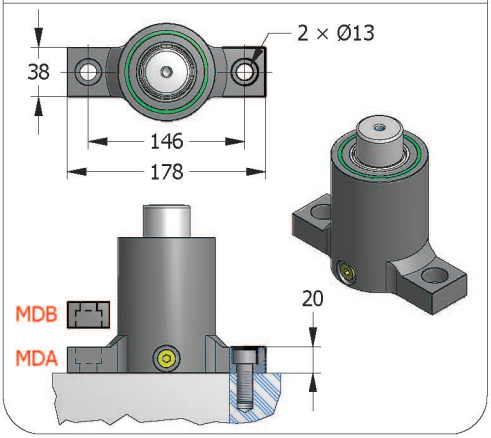
ex) What comes to the charging pressure of gas spring which demands force 25,000N?

$$127(\text{Bar}) = \frac{25{,}000(\text{N})}{196.2}$$

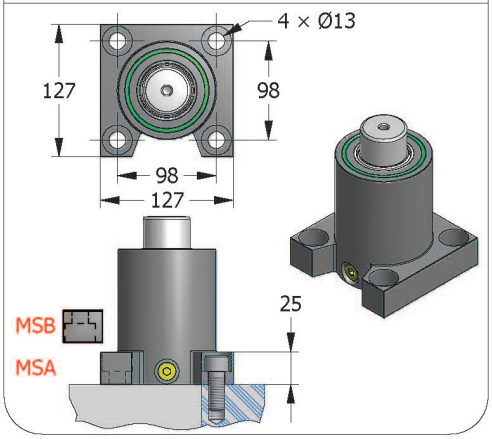
SHINWEON S&T CO.,LTD.

TSL3000 Mounts

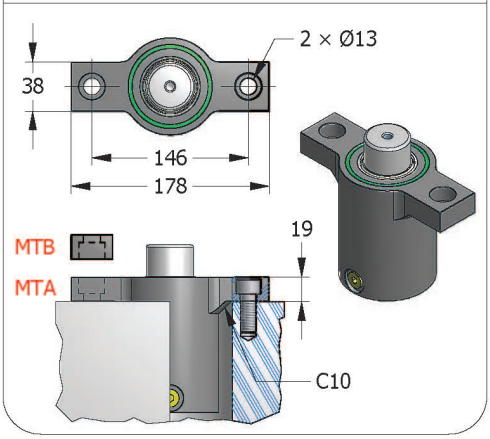
MD MOUNT WELDED



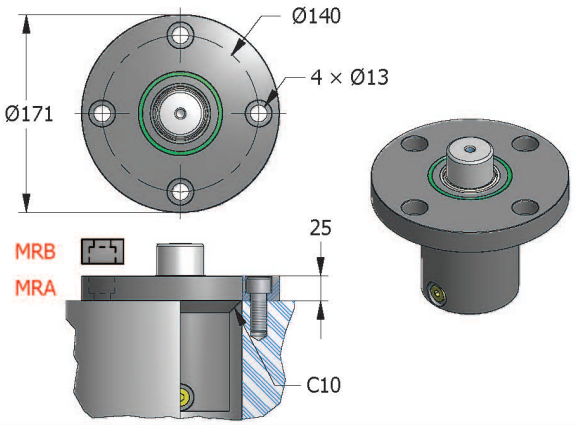
MS MOUNT WELDED



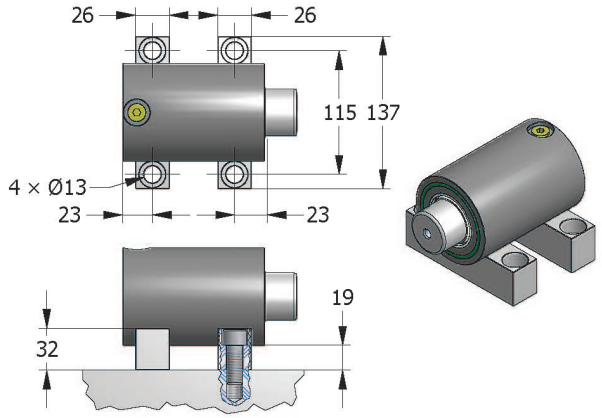
MT MOUNT WELDED



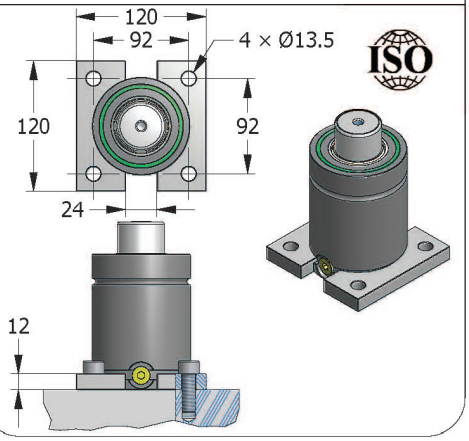
MR MOUNT WELDED



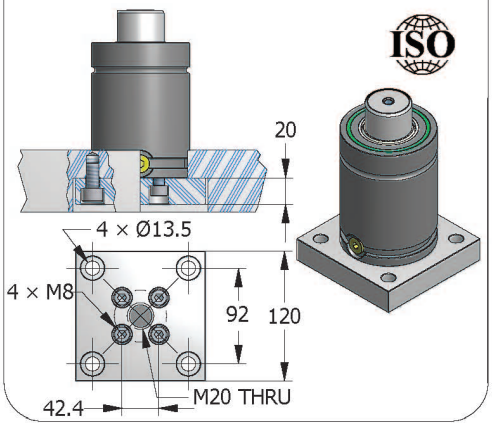
MK MOUNT WELDED



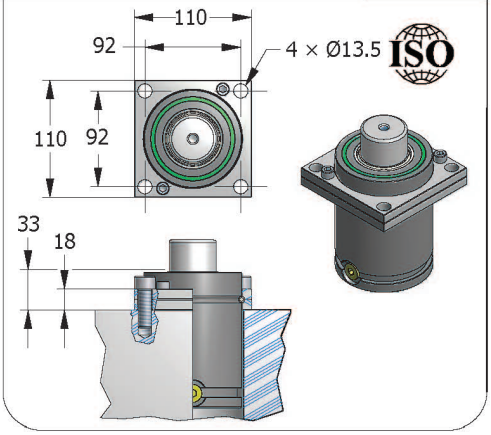
SP3000 MOUNT



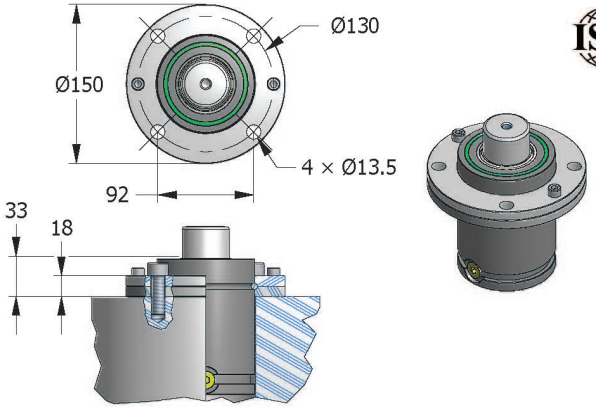
SB3000 MOUNT



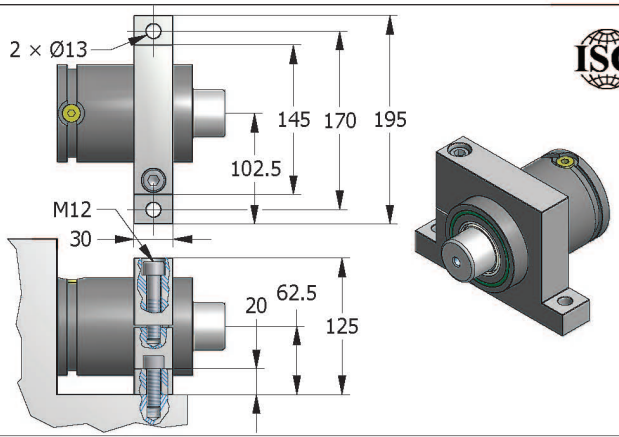
ST3000 MOUNT



SR3000 MOUNT

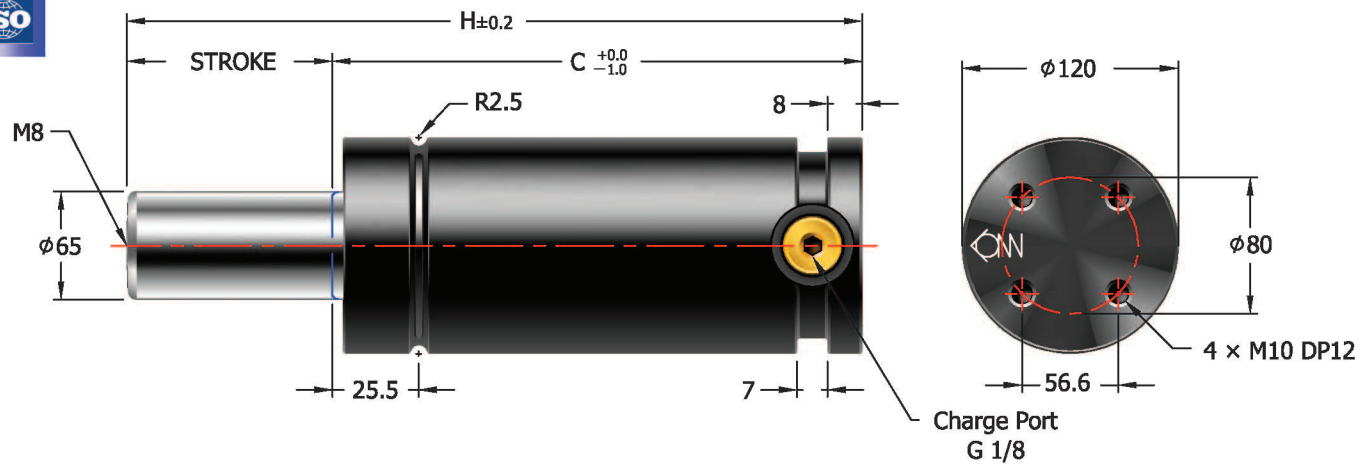


SC3000 MOUNT



TSL5000 NITROGEN GAS SPRING

PED 97/23/2C ISO



HOW TO SPECIFY

GAS SPRING	TSL5000 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP5000							
REPAIR KIT	RCL5000							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

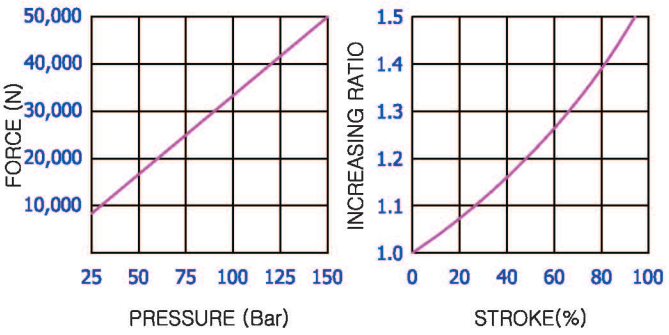
TSL5000

Stroke (㎜)	Stroke (inch)	H	C	Force (N) (150 bar / +20 ℃) Initial	Force (N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)	ISO
10	0.39	159.5	149.5		63,300	153.1	10.32	
13	0.51	165.5	152.5		65,600	176.6	10.71	
15	0.59	170	155		66,500	196.3	11.10	
20	0.79	180	160		69,100	235.5	11.49	
25	0.98	190	165		71,000	274.8	11.88	√
30	1.18	200	170		72,600	314.0	12.27	
35	1.38	210	175		73,900	353.3	12.66	
38	1.50	216	178		74,500	376.8	13.00	
40	1.57	220	180		74,900	392.5	13.44	
45	1.77	230	185		75,800	431.8	13.83	
50	1.97	240	190		76,500	471.0	14.22	√
60	2.36	260	200		77,800	549.5	14.68	
63	2.48	266	203	49,650	78,100	573.1	15.07	
70	2.76	280	210		78,700	628.0	15.46	
75	2.95	290	215		79,100	667.3	15.85	
80	3.15	300	220		79,400	706.5	16.24	√
90	3.54	320	230		80,000	785.0	16.94	
100	3.94	340	240		80,500	863.5	17.66	√
125	4.92	390	265		81,400	1059.8	18.05	√
150	5.91	440	290		82,100	1256.0	18.44	
160	6.30	460	300		82,300	1334.5	18.83	√
175	6.89	490	315		82,600	1452.3	19.22	
200	7.87	540	340		83,000	1648.5	19.61	
250	9.84	640	390		83,500	2041.0	20.31	
300	11.81	740	440		83,900	2433.5	21.01	

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSL5000

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{331.7}$$

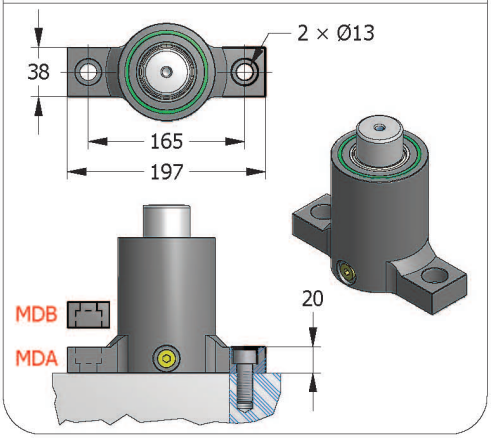
ex) What comes to the charging pressure of gas spring which demands force 38,000N?

$$115\text{(Bar)} = \frac{38{,}000\text{(N)}}{331.7}$$

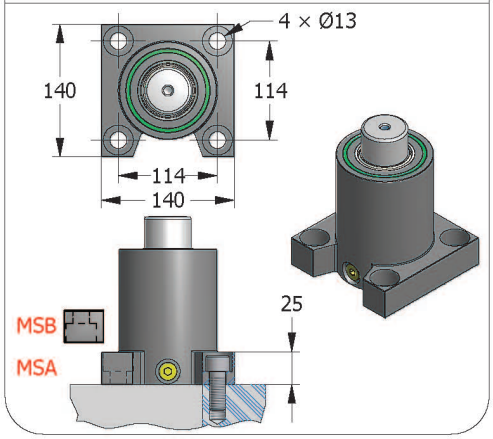
SHINWEON S&T CO.,LTD.

TSL5000 Mounts

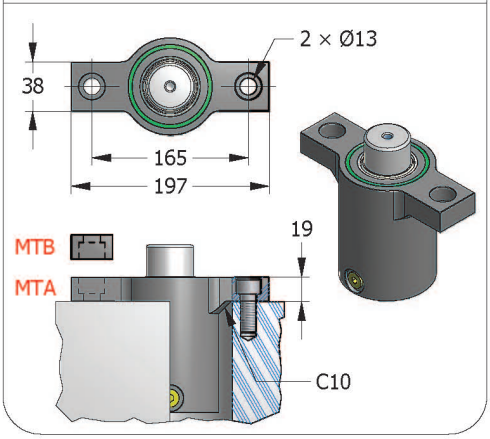
MD MOUNT WELDED



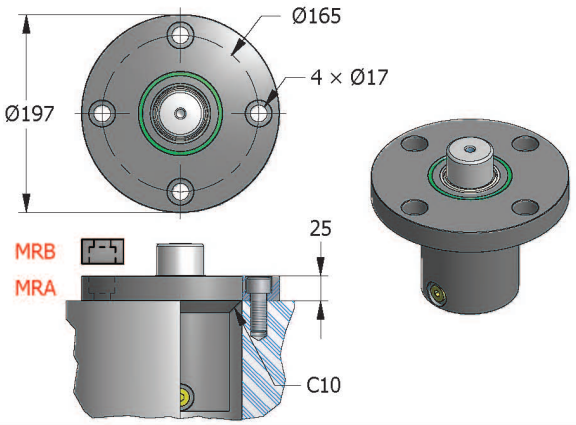
MS MOUNT WELDED



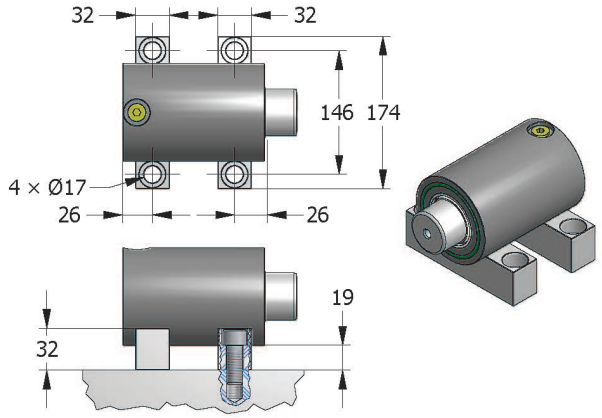
MT MOUNT WELDED



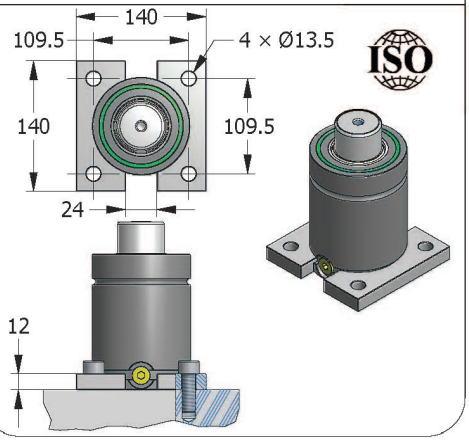
MR MOUNT WELDED



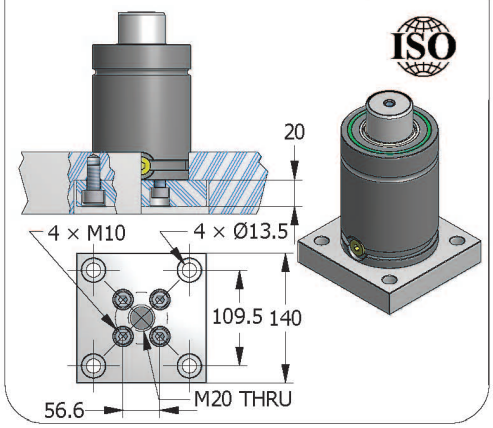
MK MOUNT WELDED



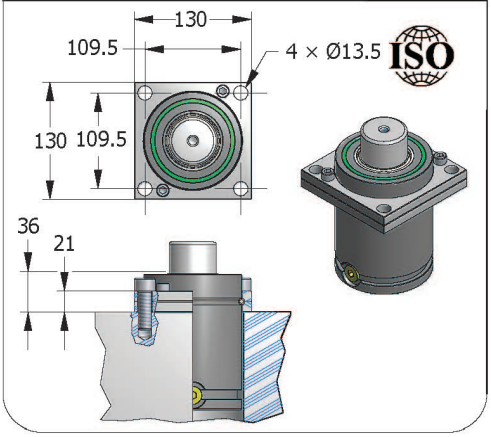
SP5000 MOUNT



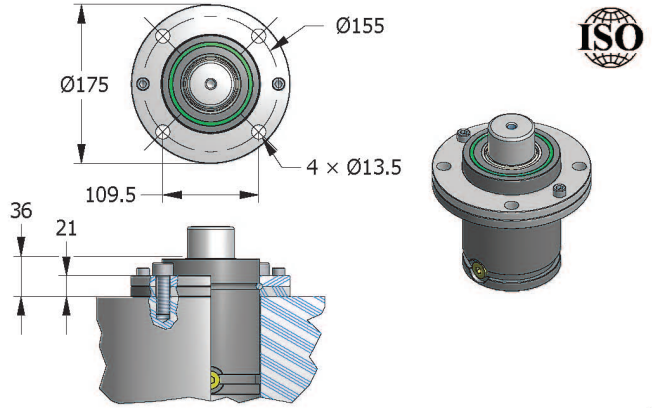
SB5000 MOUNT



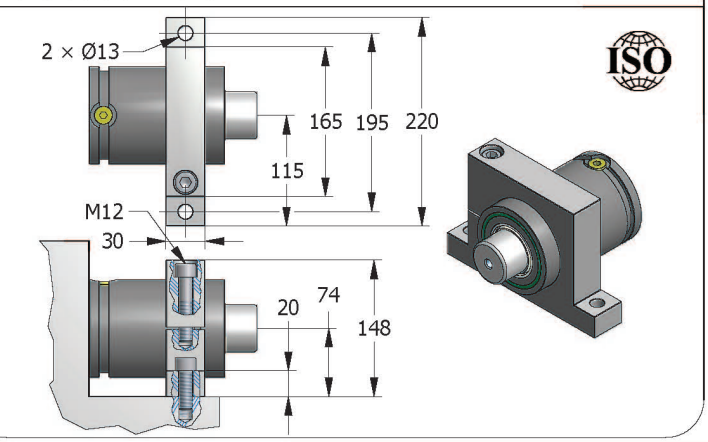
ST5000 MOUNT



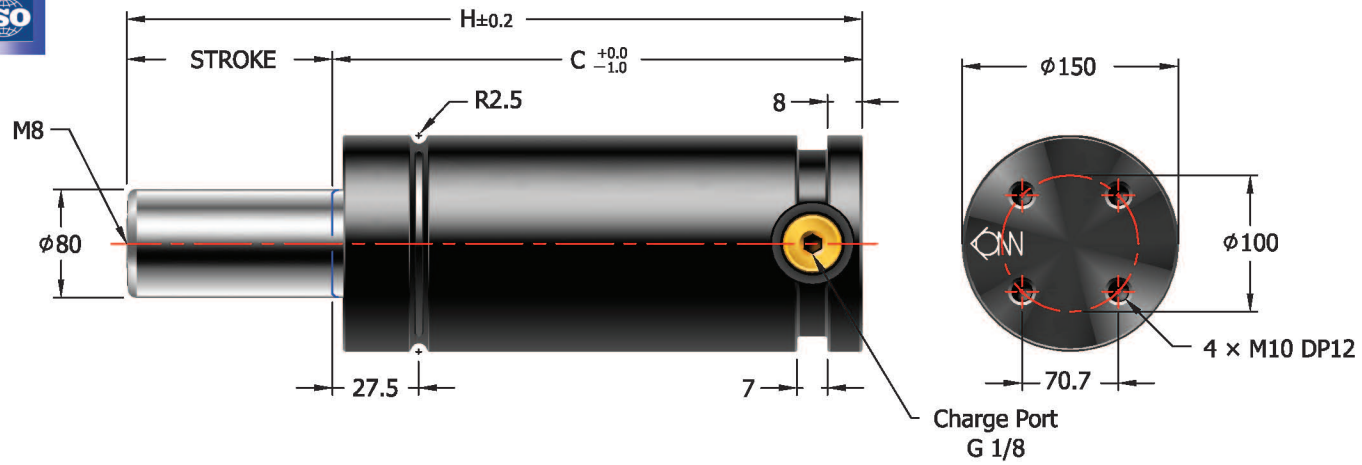
SR5000 MOUNT



SC5000 MOUNT



TSL7500 NITROGEN GAS SPRING



HOW TO SPECIFY

GAS SPRING	TSL7500 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP7500							
REPAIR KIT	RCL7500							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

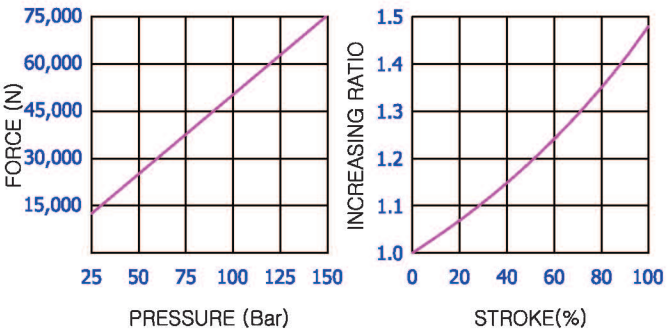
TSL7500

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)	ISO
15	0.59	185	170		96,400	343.4	16.80	
20	0.79	195	175		100,100	404.8	18.40	
25	0.98	205	180		103,000	466.1	21.20	√
30	1.18	215	185		105,400	527.4	22.45	
35	1.38	225	190		107,300	588.8	23.20	
38	1.50	231	193		108,300	625.5	24.20	
40	1.57	235	195		109,000	650.1	25.20	
45	1.77	245	200		110,300	711.4	26.90	
50	1.97	255	205		111,500	772.7	27.90	√
60	2.36	275	215		113,500	895.4	29.50	
63	2.48	282	219		113,200	944.5	30.50	
70	2.76	295	225	75,300	115,000	1018.0	31.80	
75	2.95	305	230		115,600	1079.4	33.20	
80	3.15	315	235		116,200	1140.7	34.40	√
90	3.54	335	245		117,200	1263.4	35.40	
100	3.94	355	255		118,100	1386.0	36.50	√
125	4.92	405	280		119,700	1692.7	37.40	√
150	5.91	455	305		120,800	1999.3	38.50	
160	6.30	475	315		121,200	2122.0	39.40	√
175	6.89	505	330		121,600	2305.9	40.40	
200	7.87	555	355		122,300	2612.6	41.70	
250	9.84	655	405		123,200	3225.9	42.60	
300	11.81	755	455		123,900	3839.1	43.70	

* = at full stroke

※ Special type is available requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSL7500

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{502.4}$$

ex) What comes to the charging pressure of gas spring which demands force 65,000N?

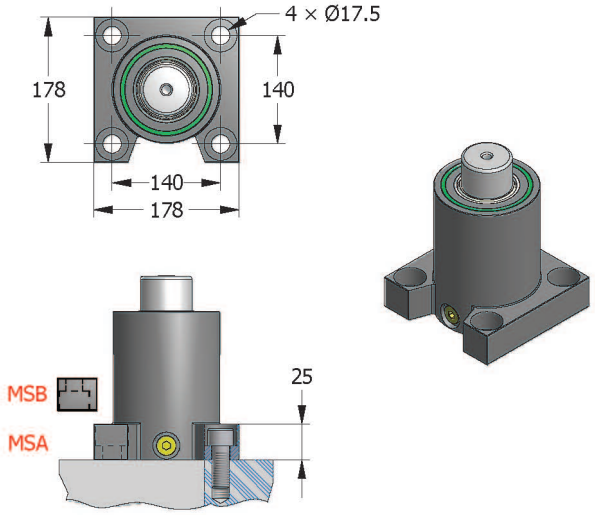
$$129(\text{Bar}) = \frac{65{,}000(\text{N})}{502.4}$$

SHINWEON S&T CO.,LTD.

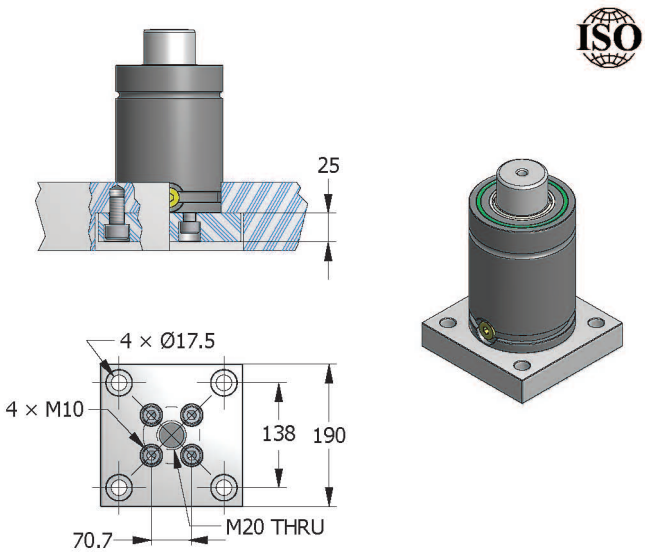
TSL7500 Mounts

MS MOUNT

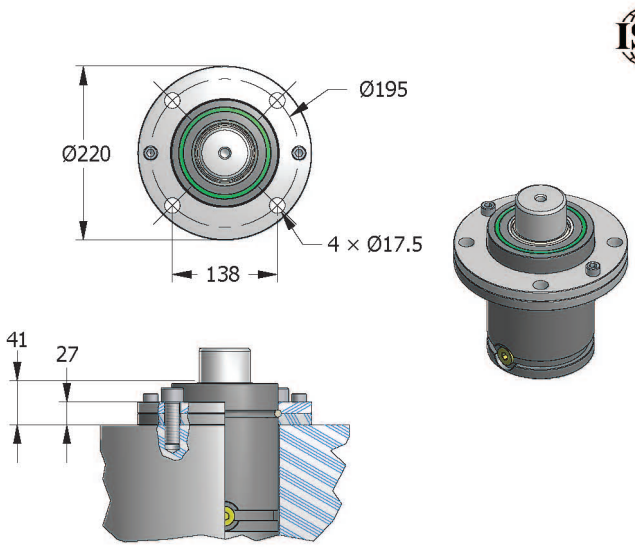
WELDED



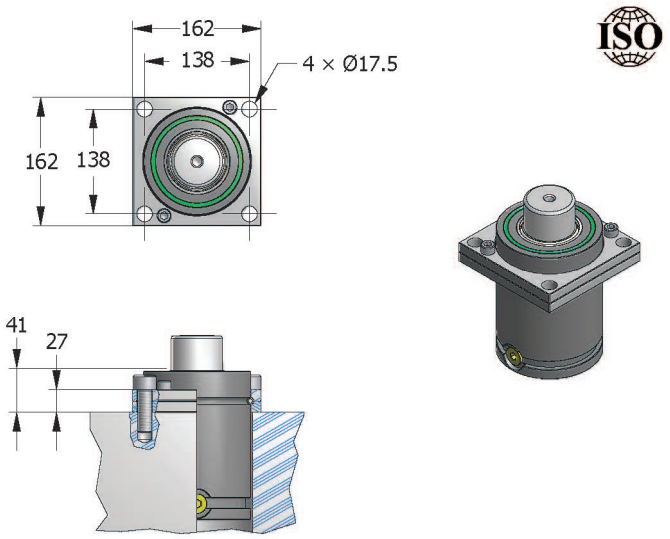
SB7500 MOUNT



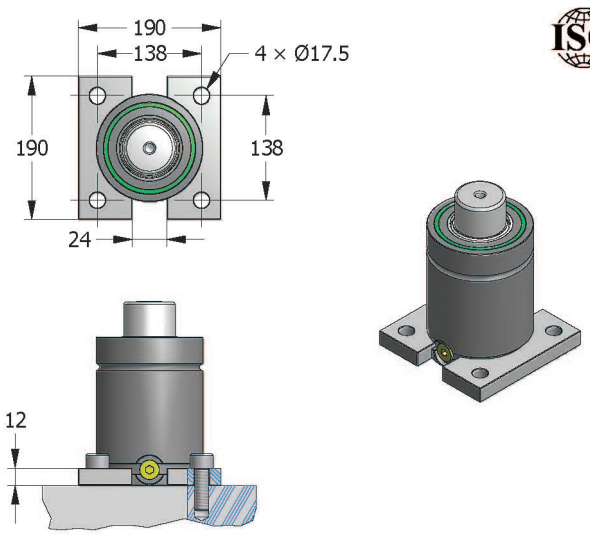
SR7500 MOUNT



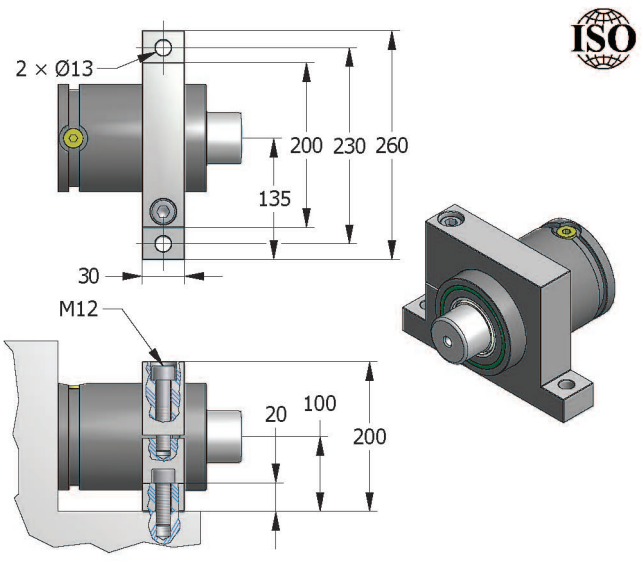
ST7500 MOUNT



SP7500 MOUNT

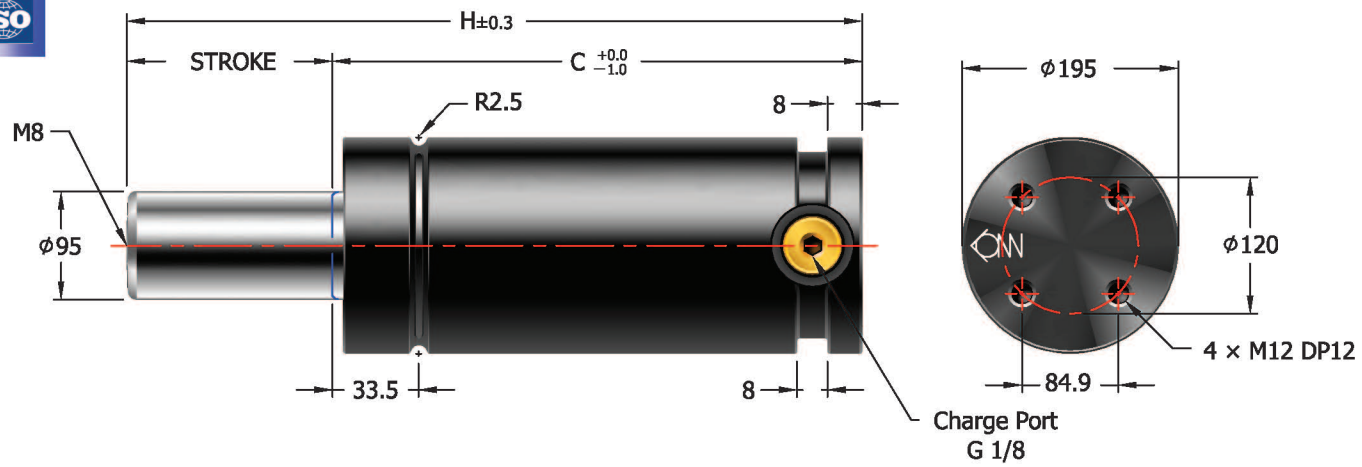


SC7500 MOUNT



TSL10000 NITROGEN GAS SPRING

PED 97/23/2C ISO



HOW TO SPECIFY

GAS SPRING	TSL10000 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	–	(MSA) (MOUNT)	–	150 (CHARGING PRESSURE (Bar))
MOUNT	SP10000							
REPAIR KIT	RCL10000							

[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

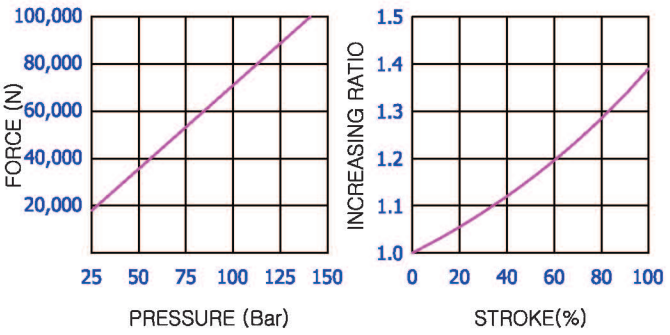
TSL10000

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)	ISO
20	0.79	200	180	106,200	137,600	619.8	36.20	
25	0.98	210	185		140,400	726.6	38.50	
30	1.18	220	190		142,500	833.5	40.20	
35	1.38	230	195		144,200	940.4	42.50	
38	1.50	236	198		145,100	1004.5	44.10	
40	1.57	240	200		145,600	1047.2	45.60	
45	1.77	250	205		146,700	1154.1	47.90	
50	1.97	260	210		147,700	1260.9	48.80	√
60	2.36	280	220		149,200	1474.6	50.90	
63	2.48	287	223		149,600	1538.8	51.70	
70	2.76	300	230		150,300	1688.4	53.20	
75	2.95	310	235		150,800	1795.2	55.45	
80	3.15	320	240		151,200	1902.1	57.00	√
90	3.54	340	250		152,000	2115.8	59.50	
100	3.94	360	260		152,600	2329.5	61.80	√
125	4.92	410	285		153,700	2863.8	64.50	√
150	5.91	460	310		154,500	3398.1	67.20	
160	6.30	480	320		154,700	3611.8	69.00	√
175	6.89	510	335		155,100	3932.4	72.30	
200	7.87	560	360		155,500	4466.7	74.50	√
250	9.84	660	410		156,100	5535.3	80.50	√
300	11.81	760	460		156,600	6603.8	86.50	√

* = at full stroke

※ Special type is available upon requested.

■ CHARGING PRESSURE/FORCE INCREASE FACTOR



■ Calculation of charging pressure for TSL10000

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{708.5}$$

ex) What comes to the charging pressure of gas spring which demands force 85,000N?

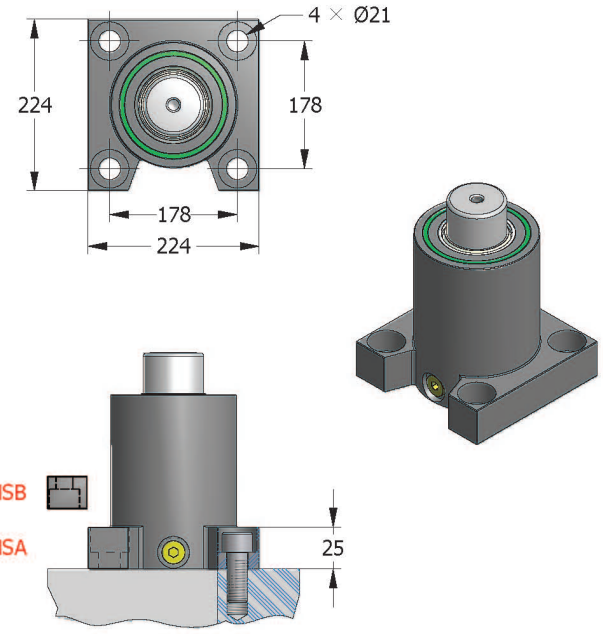
$$120\text{(Bar)} = \frac{85{,}000\text{(N)}}{708.5}$$

SHINWEON S&T CO.,LTD.

TSL10000 Mounts

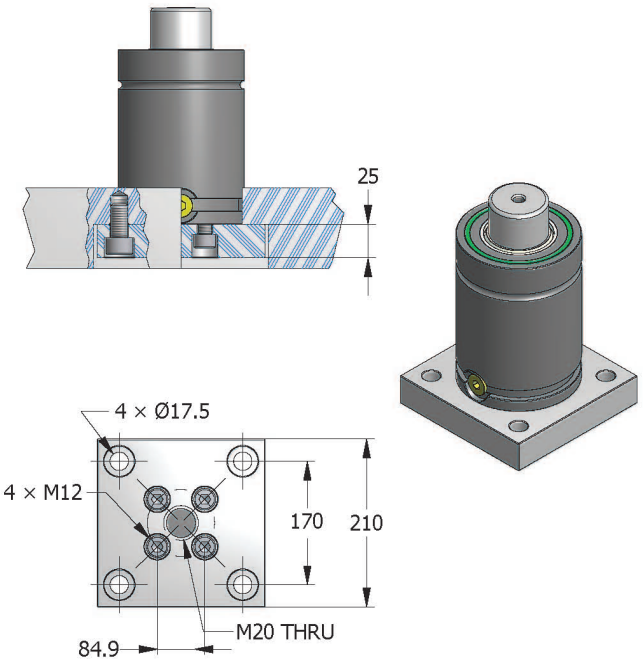
MS MOUNT

WELDED



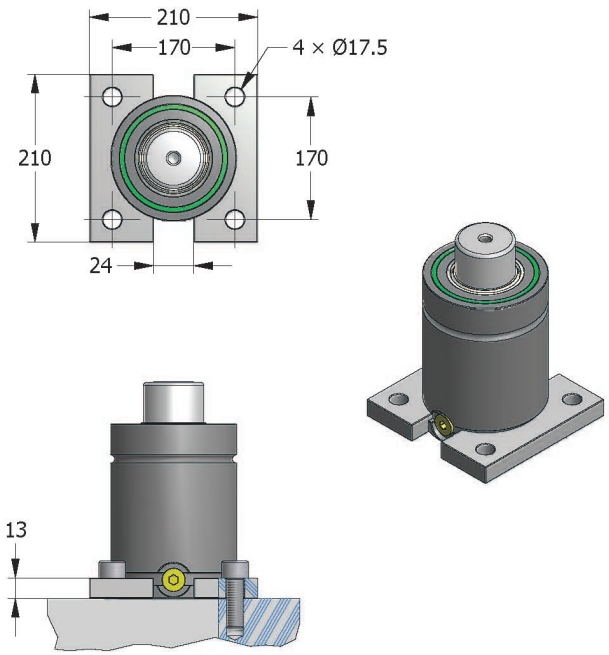
SB10000 MOUNT

ISO



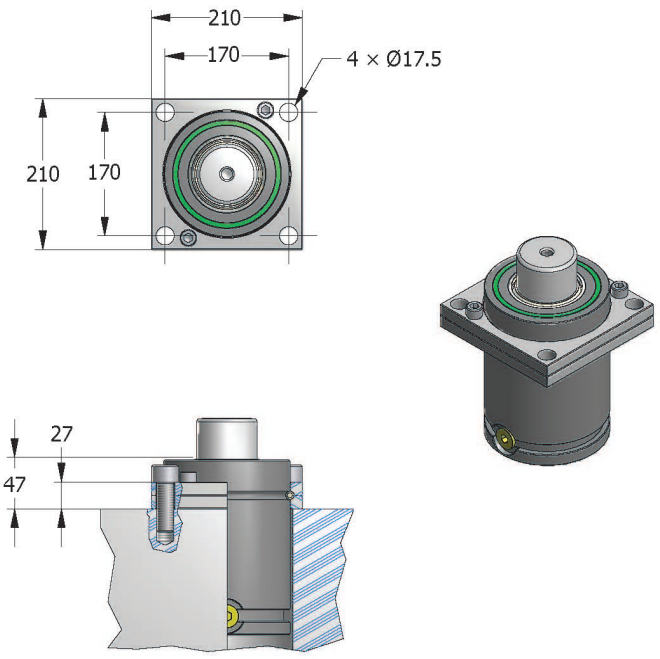
SP10000 MOUNT

ISO

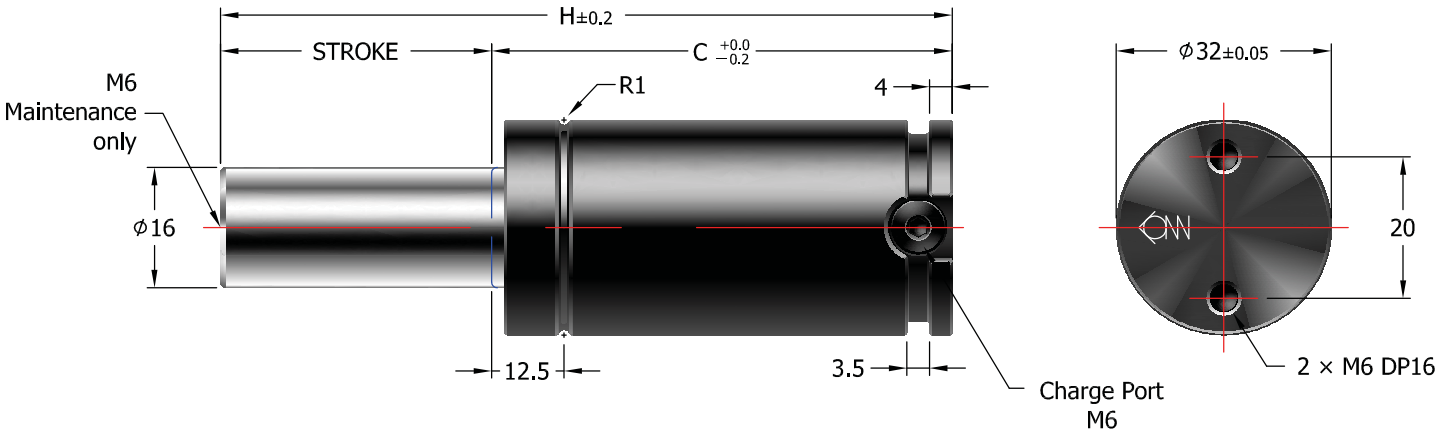


ST10000 MOUNT

ISO



TSX0350 NITROGEN GAS SPRING



HOW TO SPECIFY

GAS SPRING	TSX0350 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	—	180 (CHARGING PRESSURE (Bar))
MOUNT	XP0350					
REPAIR KIT	RCX0350					

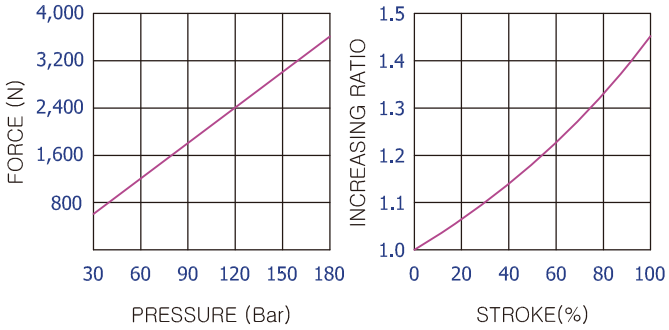
[Caution!] Charging pressure has to be specified. Otherwise, 180Bar will be charged.

TSX0350

Stroke		H	C	Force(N) (180 bar / +20 ℃)		Gas vol. (㎤)	Weight (kg)
(㎜)	(inch)			Initial	End force*		
10	0.39	60	50		5,000	7.2	0.26
13	0.51	66	53		5,100	9.0	0.27
16	0.63	72	56		5,200	10.8	0.27
20	0.79	80	60		5,200	13.3	0.29
25	0.98	90	65		5,200	16.3	0.31
30	1.18	100	70		5,300	19.4	0.32
35	1.38	110	75		5,300	22.4	0.34
38	1.50	116	78		5,300	24.2	0.35
40	1.57	120	80		5,300	25.4	0.35
45	1.77	130	85	3,600	5,300	28.5	0.38
50	1.97	140	90		5,300	31.5	0.39
60	2.36	160	100		5,300	37.6	0.43
63	2.48	166	103		5,300	39.5	0.43
70	2.76	180	110		5,300	43.7	0.46
75	2.95	190	115		5,300	46.8	0.47
80	3.15	200	120		5,300	49.8	0.49
90	3.54	220	130		5,300	55.9	0.52
100	3.94	240	140		5,400	62.5	0.55
125	4.92	290	165		5,400	77.2	0.64

* = at full stroke

CHARGING PRESSURE/FORCE INCREASE FACTOR



Calculation of charging pressure for TSX0350

$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{20.1}$$

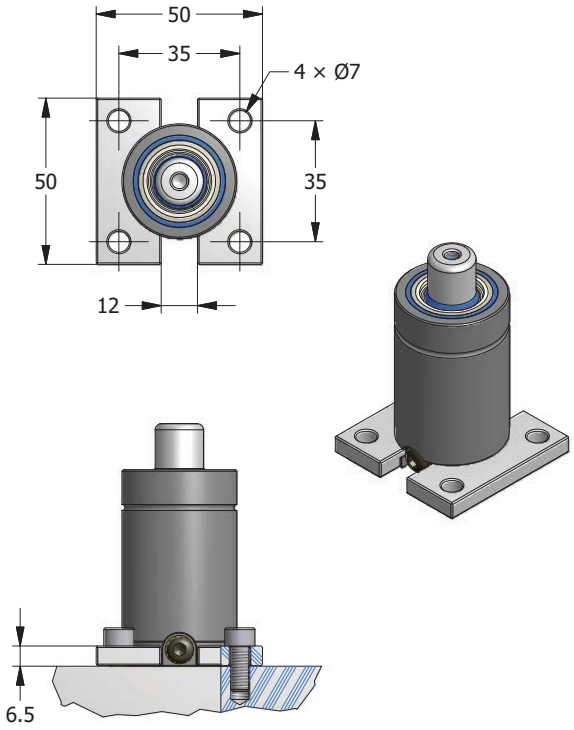
ex) What comes to the charging pressure of gas spring which demands force 3,300N?

$$164\text{(Bar)} = \frac{3{,}300\text{(N)}}{20.1}$$

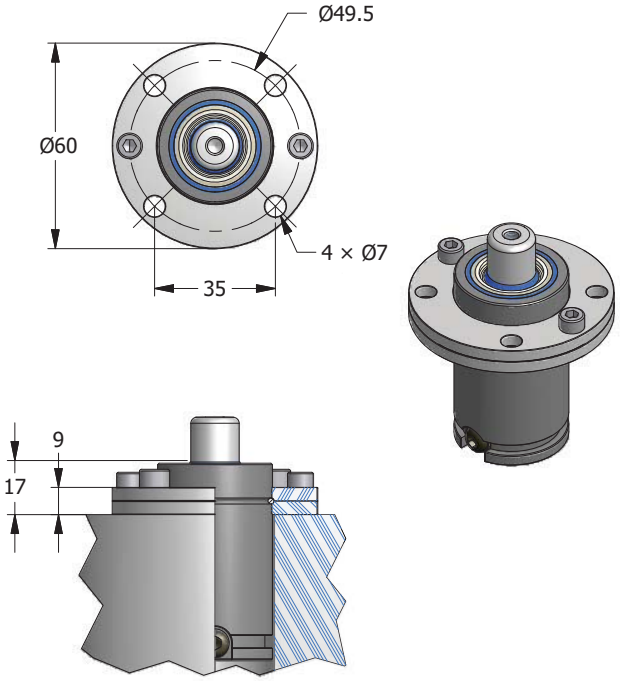
SHINWEON S&T CO.,LTD.

TSX0350 Mounts

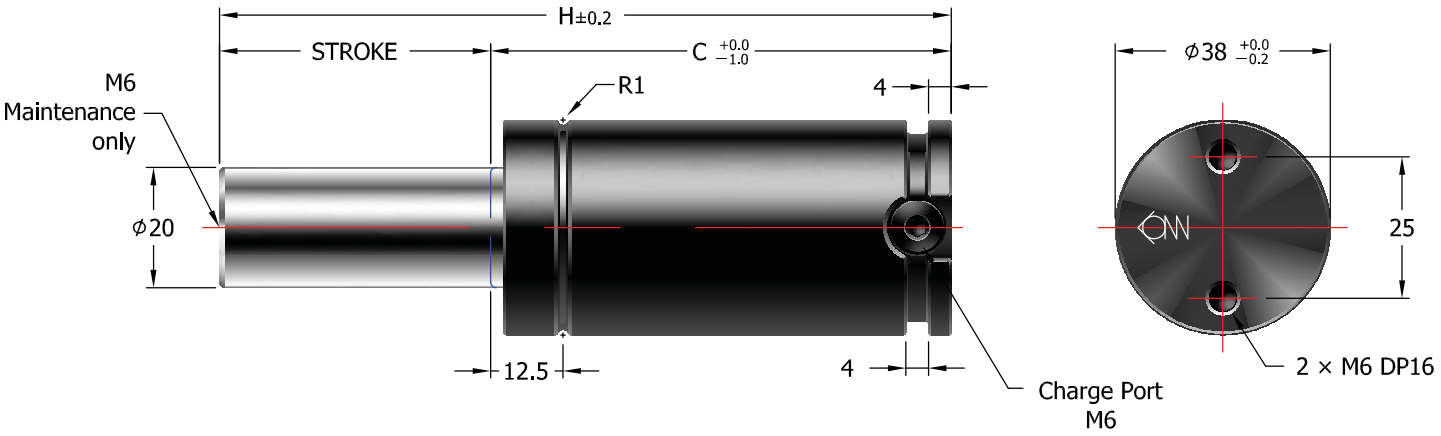
XP0350 MOUNT



XR0350 MOUNT



TSX0500 NITROGEN GAS SPRING



HOW TO SPECIFY

GAS SPRING	TSX0500 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	—	150 (CHARGING PRESSURE (Bar))
MOUNT	XP0500					
REPAIR KIT	RCX0500					

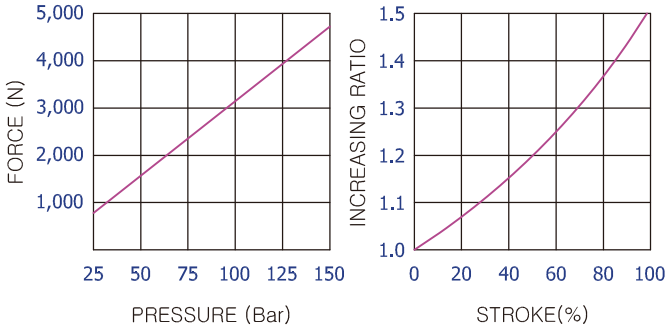
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSX0500

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
10	0.39	60	50		6,700	10.4	0.35
13	0.51	66	53		6,800	13.1	0.37
16	0.63	72	56		6,900	15.7	0.38
20	0.79	80	60		7,000	19.3	0.40
25	0.98	90	65		7,000	23.7	0.42
30	1.18	100	70		7,100	28.2	0.45
35	1.38	110	75		7,100	32.6	0.47
38	1.50	116	78		7,100	35.3	0.48
40	1.57	120	80		7,100	37.0	0.50
45	1.77	130	85	4,700	7,100	41.5	0.52
50	1.97	140	90		7,200	45.9	0.55
60	2.36	160	100		7,200	54.8	0.60
63	2.48	166	103		7,200	57.4	0.61
70	2.76	180	110		7,200	63.6	0.64
75	2.95	190	115		7,200	68.1	0.66
80	3.15	200	120		7,200	72.5	0.69
90	3.54	220	130		7,200	81.4	0.74
100	3.94	240	140		7,200	90.3	0.79
125	4.92	290	165		7,200	112.4	0.91

* = at full stroke

CHARGING PRESSURE/FORCE INCREASE FACTOR



Calculation of charging pressure for TSX0500

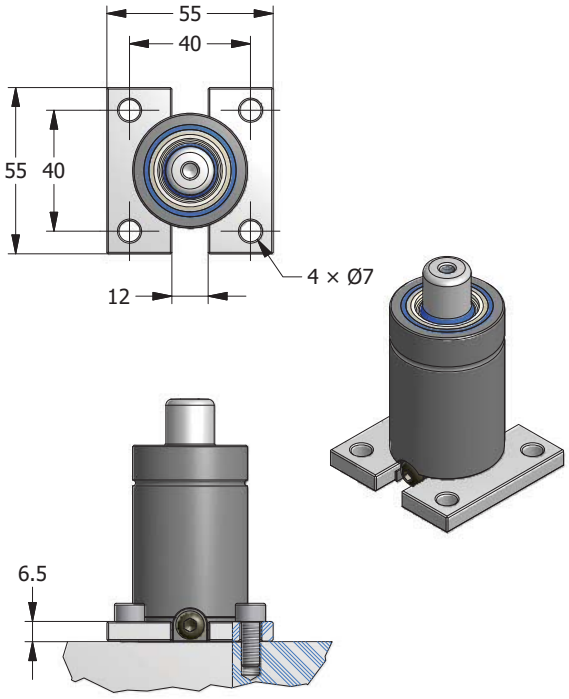
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{31.4}$$

ex) What comes to the charging pressure of gas spring which demands force 4,000N?

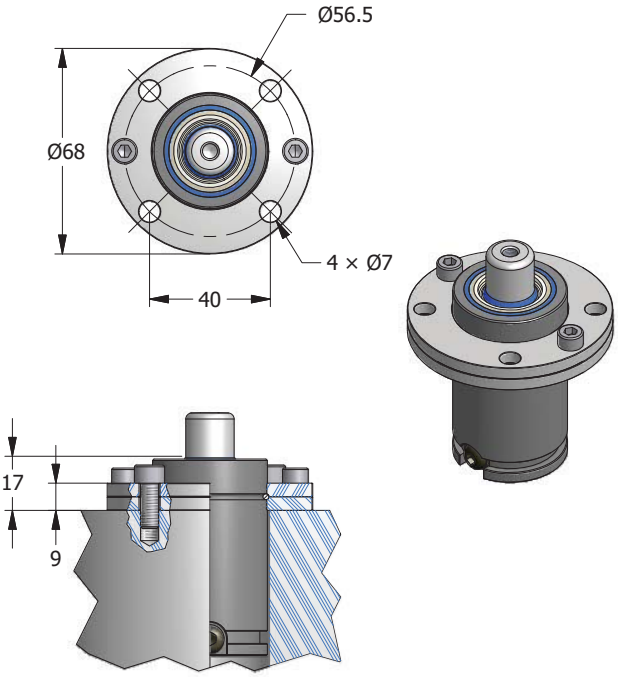
$$127\text{(Bar)} = \frac{4{,}000\text{(N)}}{31.4}$$

TSX0500 Mounts

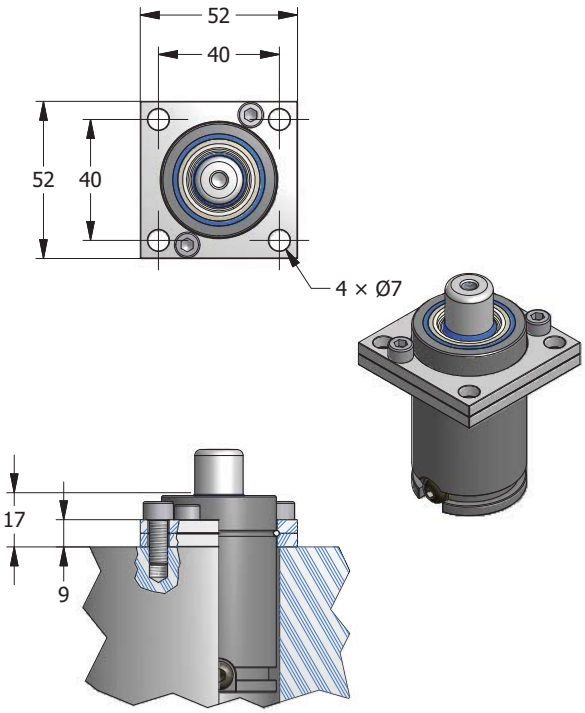
XP0500(SP0300) MOUNT



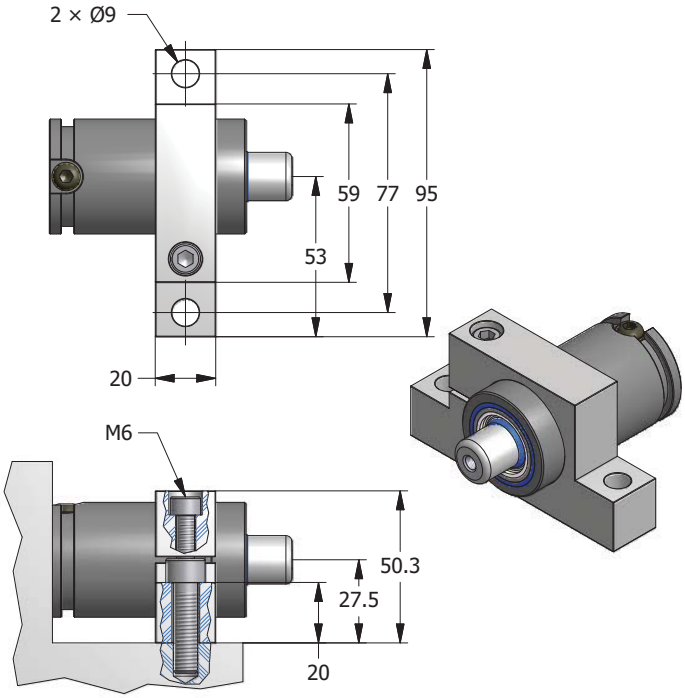
XR0500(SR0300) MOUNT



XT0500(ST0300) MOUNT

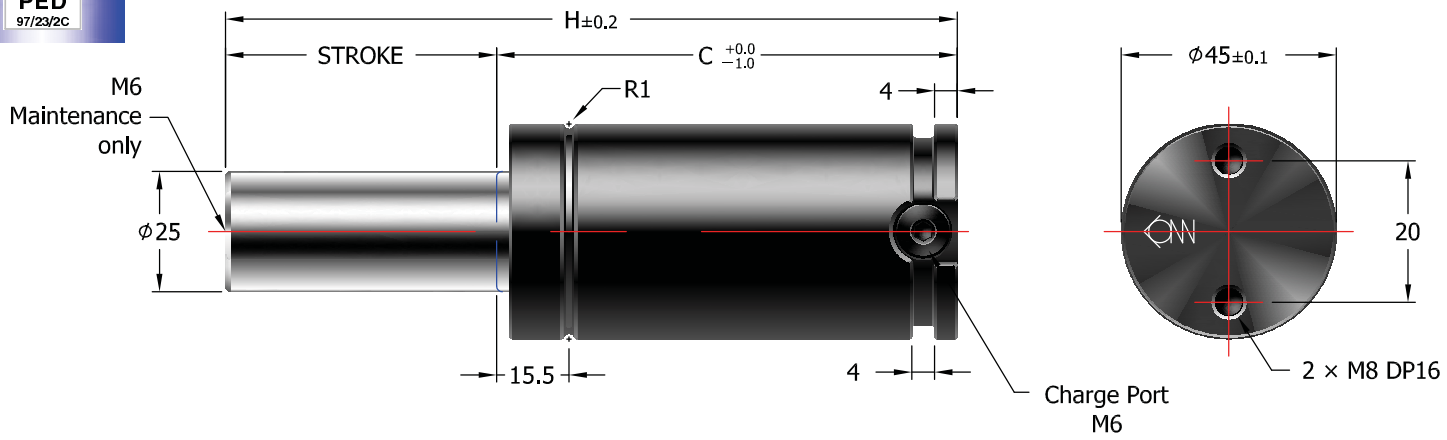


XC0500(SC0300) MOUNT



TSX0750 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSX0750	×	050	S(F)	—	150
	MODEL		STROKE	SELF CONTAINED-S FITTING-SYSTEM-F		CHARGING PRESSURE (Bar)
MOUNT	XP0750					
REPAIR KIT	RCX0750					

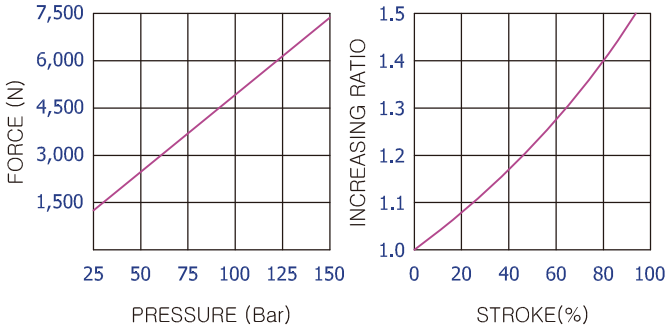
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSX0750

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (㎤)	Weight (kg)
(㎜)	(inch)			Initial	End force*		
10	0.39	67	57		10,200	17.9	0.55
13	0.51	73	60		10,500	21.8	0.57
16	0.63	79	63		10,600	25.7	0.59
20	0.79	87	67		10,800	30.9	0.62
25	0.98	97	72		11,000	37.4	0.65
30	1.18	107	77		11,100	43.9	0.68
35	1.38	117	82		11,200	50.4	0.71
38	1.50	123	85		11,300	54.3	0.73
40	1.57	127	87		11,300	57.0	0.74
45	1.77	137	92	7,400	11,300	63.5	0.78
50	1.97	147	97		11,400	70.0	0.81
60	2.36	167	107		11,500	83.0	0.87
63	2.48	173	110		11,500	86.9	0.89
70	2.76	187	117		11,500	96.0	0.94
75	2.95	197	122		11,500	102.5	0.97
80	3.15	207	127		11,600	109.0	1.00
90	3.54	227	137		11,600	122.0	1.07
100	3.94	247	147		11,600	135.0	1.13
125	4.92	297	172		11,700	167.6	1.29

* = at full stroke

CHARGING PRESSURE/FORCE INCREASE FACTOR



Calculation of charging pressure for TSX0750

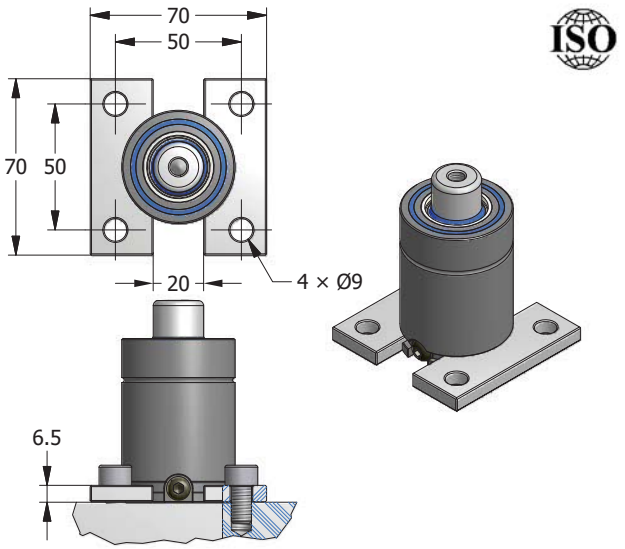
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{49.1}$$

ex) What comes to the charging pressure of gas spring which demands force 6,000N?

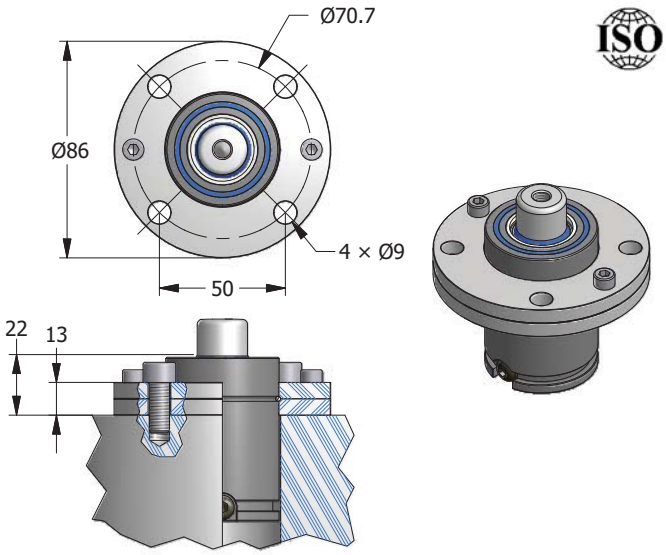
$$122\text{(Bar)} = \frac{6{,}000\text{(N)}}{49.1}$$

TSX0750 Mounts

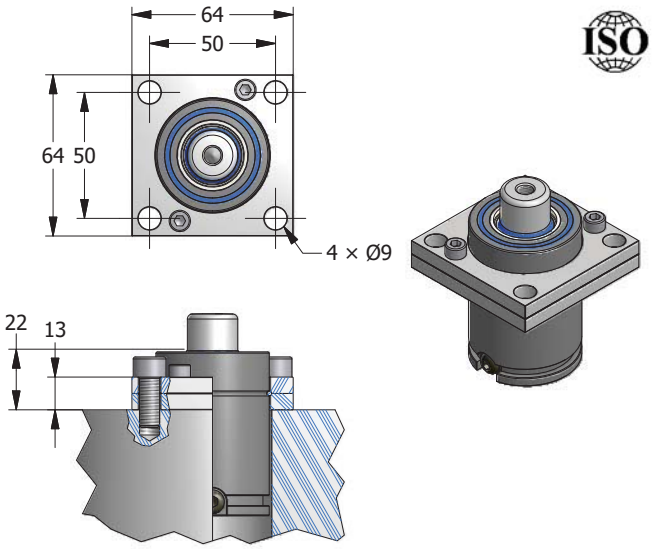
XP0750(SP0500) MOUNT



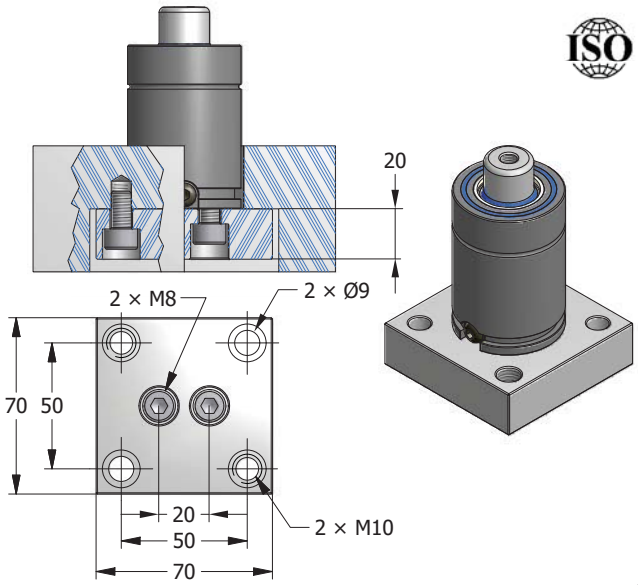
XR0750(SR0500) MOUNT



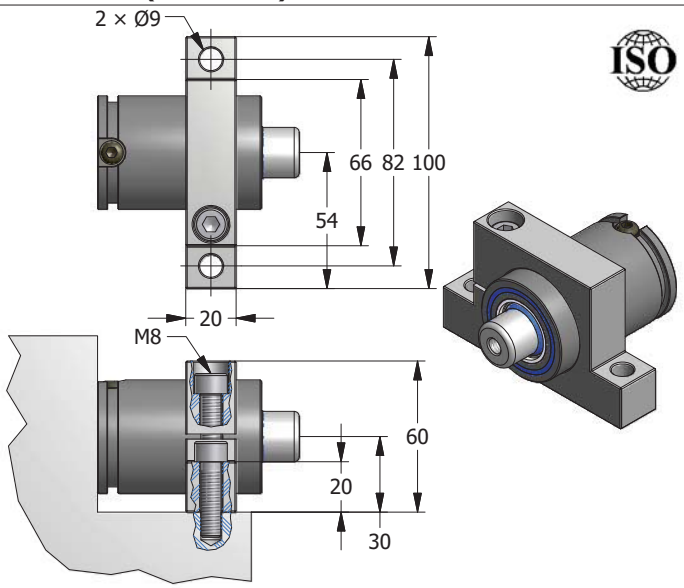
XT0750(ST0500) MOUNT



XB0750(SB0500) MOUNT

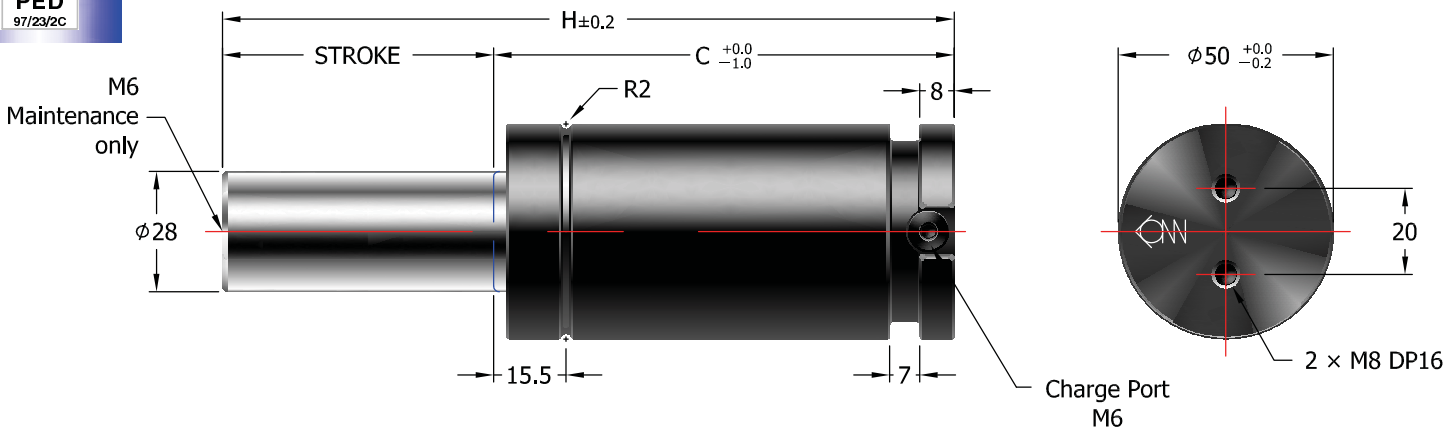


XC0750(SC0500) MOUNT



TSX1000 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSX1000	×	050	S(F)	—	(MSA)	—	150
	MODEL		STROKE	SELF CONTAINED-S FITTING-SYSTEM-F		MOUNT		CHARGING PRESSURE (Bar)
MOUNT	XP1000							
REPAIR KIT	RCX1000							

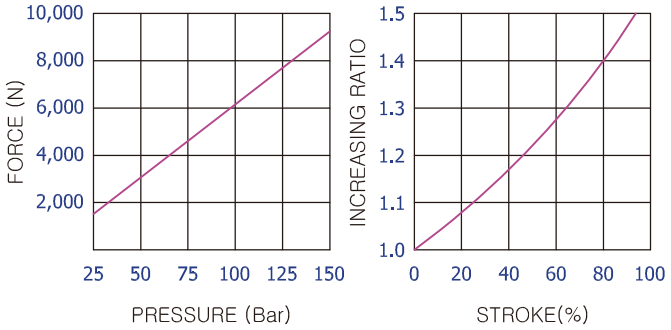
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSX1000

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (㎤)	Weight (kg)
(㎜)	(inch)			Initial	End force*		
13	0.51	78	65	9,200	12,200	32.7	0.71
16	0.63	84	68		12,500	37.4	0.74
20	0.79	92	72		12,800	43.7	0.77
25	0.98	102	77		13,200	51.6	0.81
30	1.18	112	82		13,400	59.4	0.65
35	1.38	122	87		13,600	67.3	0.89
38	1.50	128	90		13,700	72.0	0.91
40	1.57	132	92		13,700	75.1	0.93
45	1.77	142	97		13,900	83.0	0.97
50	1.97	152	102		14,000	90.8	1.02
60	2.36	172	112		14,100	106.5	1.09
63	2.48	178	115		14,200	111.2	1.11
70	2.76	192	122		14,300	122.2	1.17
75	2.95	202	127		14,300	130.1	1.22
80	3.15	212	132		14,400	137.9	1.25
90	3.54	232	142		14,400	153.6	1.34
100	3.94	252	152		14,500	169.2	1.42
125	4.92	302	177		14,600	208.6	1.62

* = at full stroke

CHARGING PRESSURE/FORCE INCREASE FACTOR



Calculation of charging pressure for TSX1000

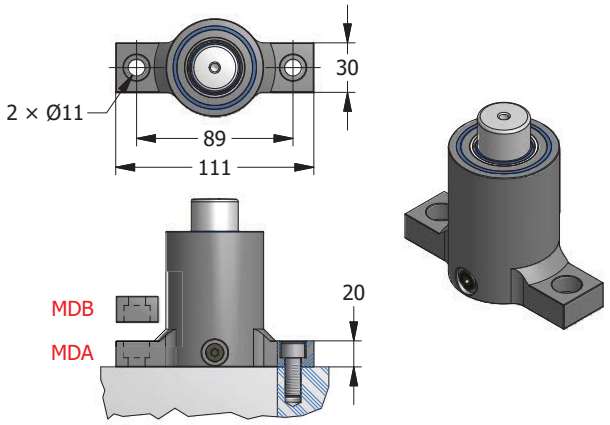
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{61.5}$$

ex) What comes to the charging pressure of gas spring which demands force 8,500N?

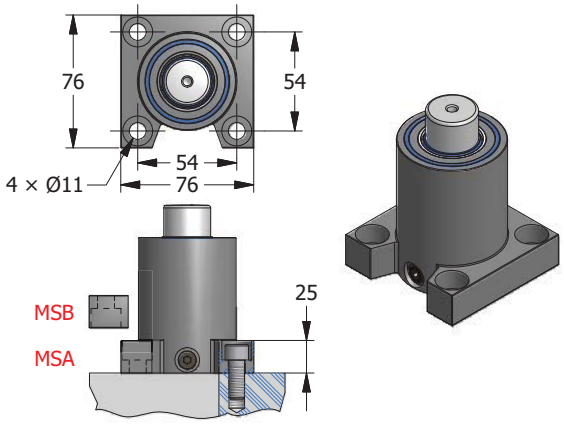
$$138(\text{Bar}) = \frac{8{,}500(\text{N})}{61.5}$$

TSX1000 Mounts

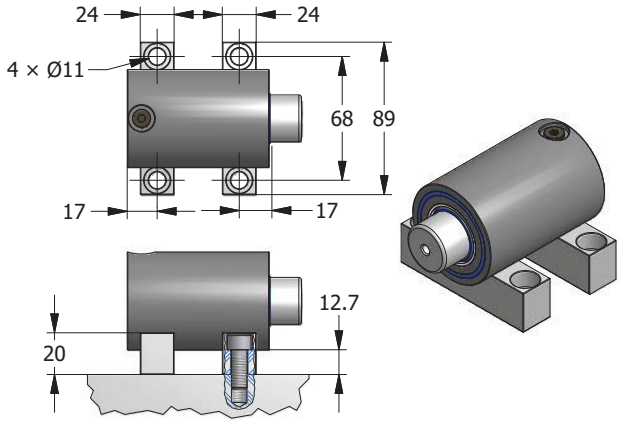
MD MOUNT WELDED



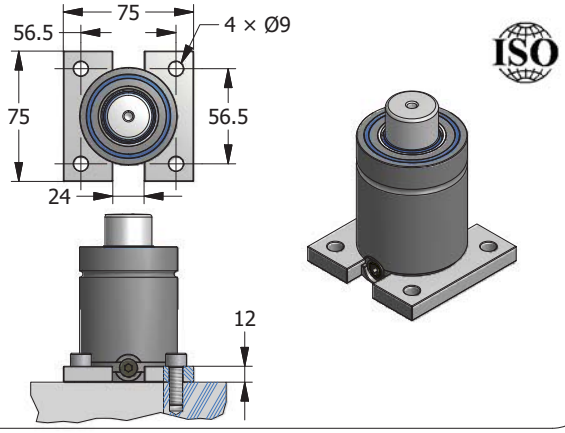
MS MOUNT WELDED



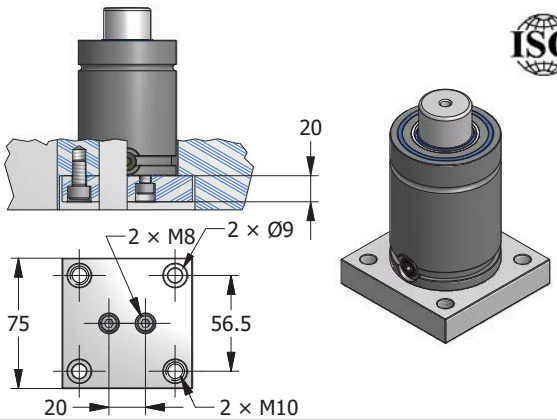
MK MOUNT WELDED



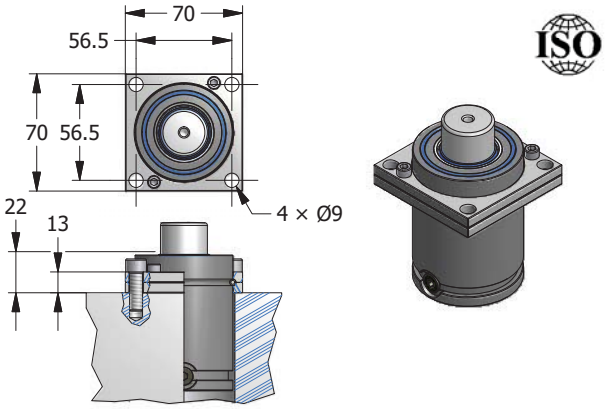
XP1000(SP0750) MOUNT



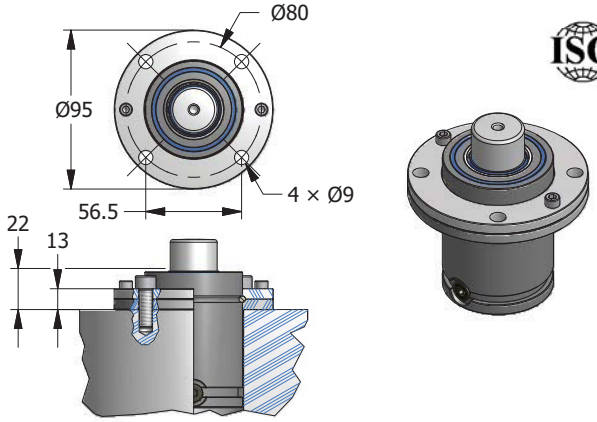
XB1000(SB0750) MOUNT



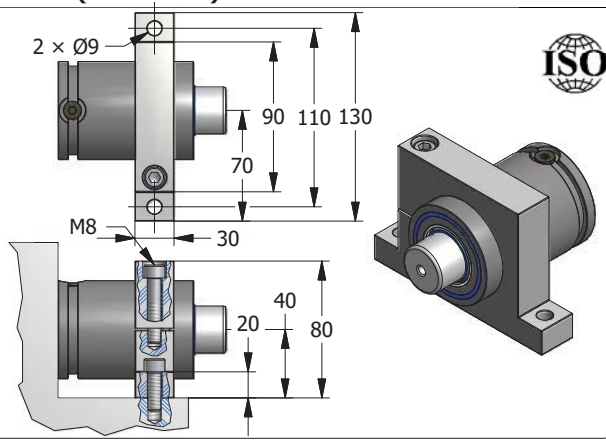
XT1000(ST0750) MOUNT



XR1000(SR0750) MOUNT

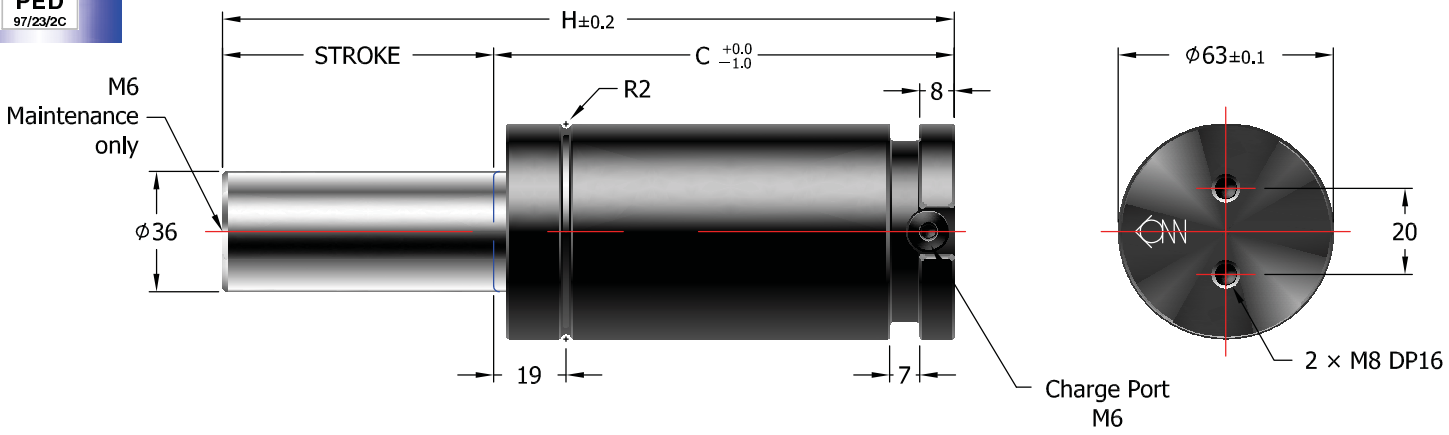


XC1000(SC0750) MOUNT



TSX1500 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSX1500 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	—	(MSA) (MOUNT)	—	150 (CHARGING PRESSURE (Bar))
MOUNT	XP1500							
REPAIR KIT	RCX1500							

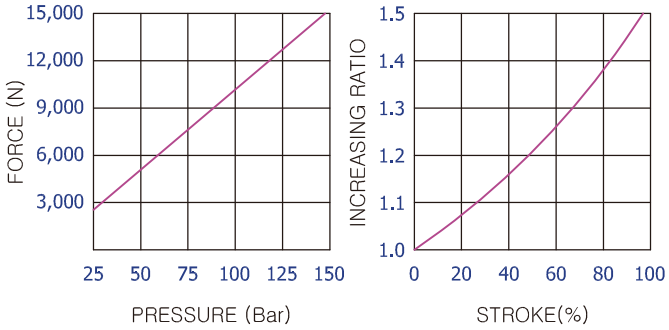
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSX1500

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
13	0.51	78	65	15,200	20,500	50.7	1.20
16	0.63	84	68		21,000	58.7	1.24
20	0.79	92	72		21,500	69.3	1.29
25	0.98	102	77		21,900	82.6	1.36
30	1.18	112	82		22,200	95.8	1.43
35	1.38	122	87		22,500	109.1	1.50
38	1.50	128	90		22,600	117.1	1.53
40	1.57	132	92		22,700	122.4	1.56
45	1.77	142	97		22,900	135.6	1.63
50	1.97	152	102		23,000	148.9	1.74
60	2.36	172	112		23,200	175.4	1.82
63	2.48	178	115		23,300	183.4	1.87
70	2.76	192	122		23,400	202.0	1.96
75	2.95	202	127		23,500	215.2	2.03
80	3.15	212	132		23,500	228.2	2.09
90	3.54	232	142		23,600	254.8	2.23
100	3.94	252	152		23,700	281.4	2.35
125	4.92	302	177		23,900	347.9	2.69

* = at full stroke

CHARGING PRESSURE/FORCE INCREASE FACTOR



Calculation of charging pressure for TSX1500

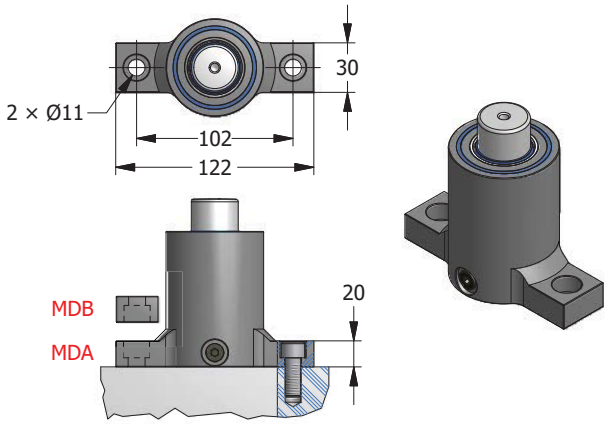
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{101.7}$$

ex) What comes to the charging pressure of gas spring which demands force 12,000N?

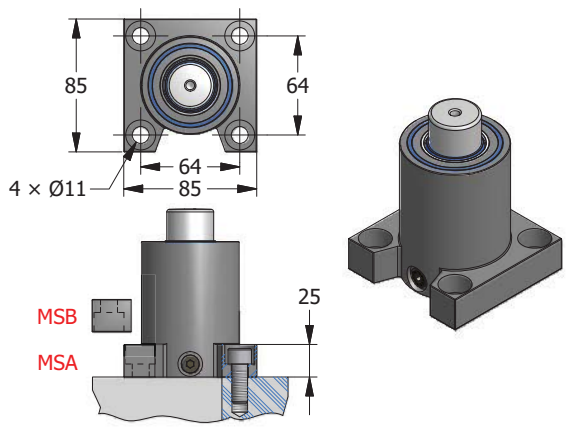
$$118(\text{Bar}) = \frac{12{,}000(\text{N})}{101.7}$$

TSX1500 Mounts

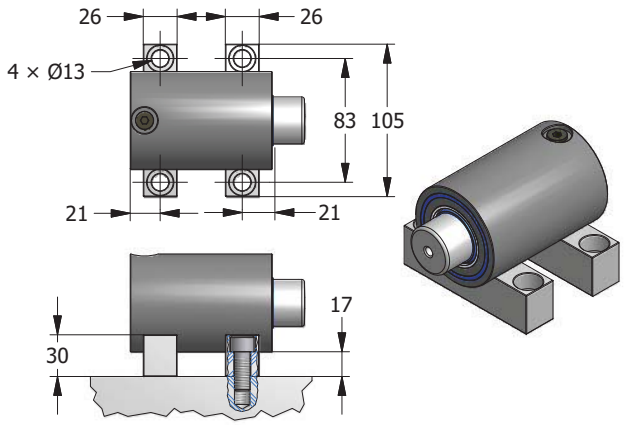
MD MOUNT WELDED



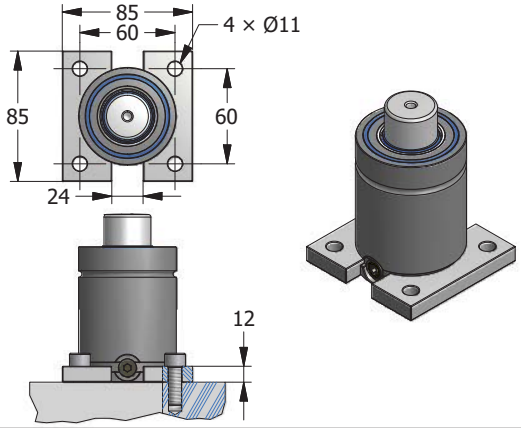
MS MOUNT WELDED



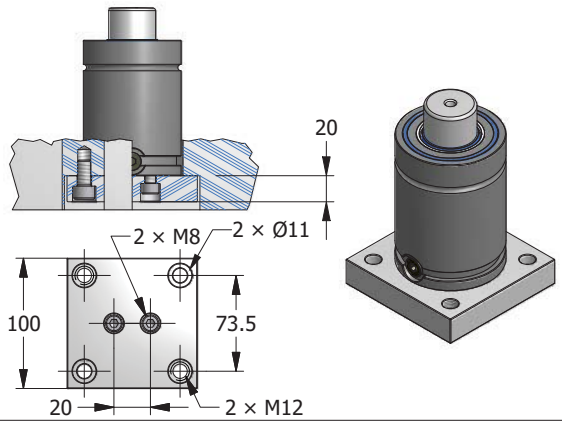
MK MOUNT WELDED



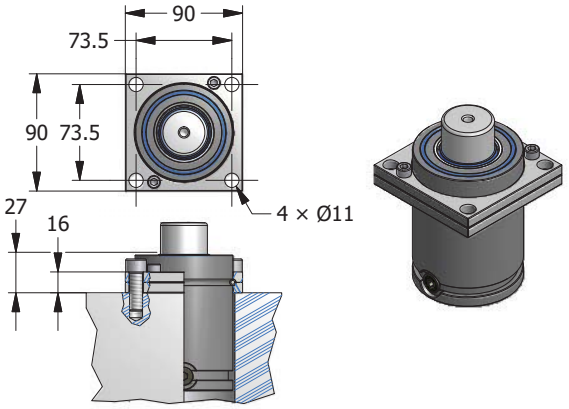
XP1500 MOUNT



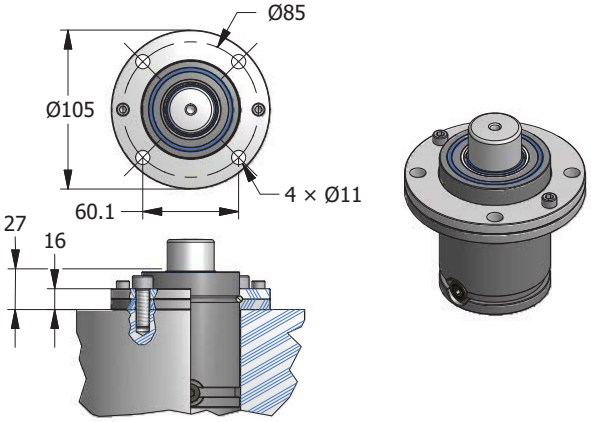
XB1500 MOUNT



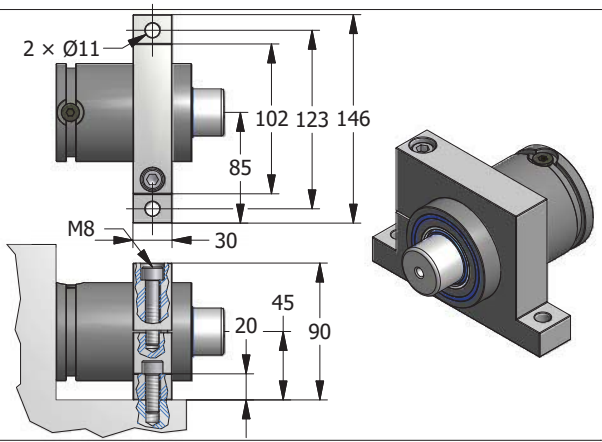
XT1500 MOUNT



XR1500 MOUNT

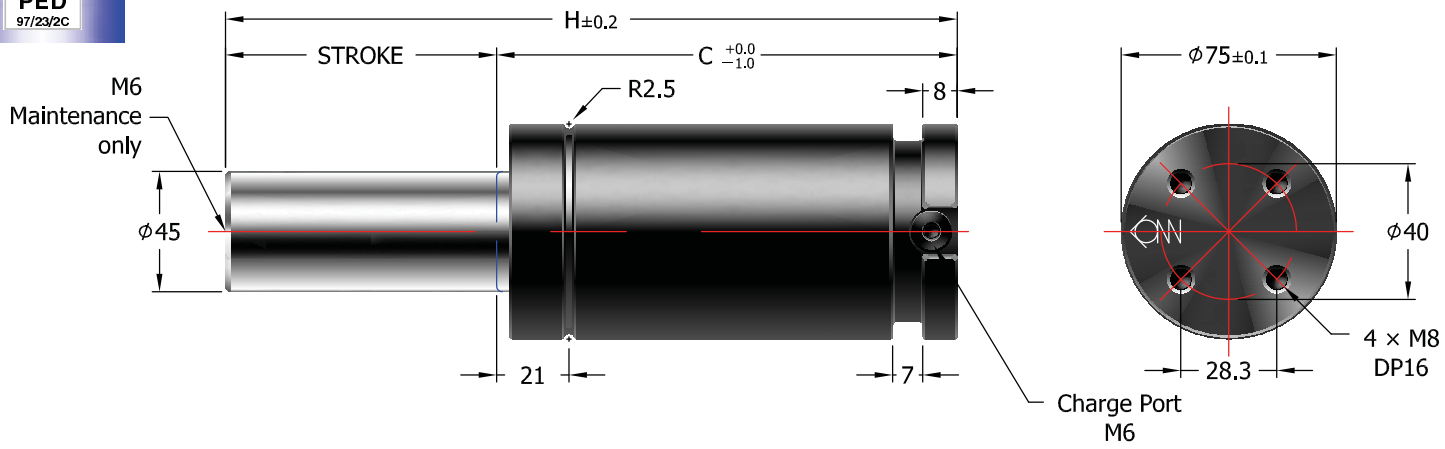


XC1500 MOUNT



TSX2400 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSX2400	×	050	S(F)	—	(MSA)	—	150
	MODEL		STROKE	SELF CONTAINED-S FITTING-SYSTEM-F		MOUNT		CHARGING PRESSURE (Bar)
MOUNT	XP2400							
REPAIR KIT	RCX2400							

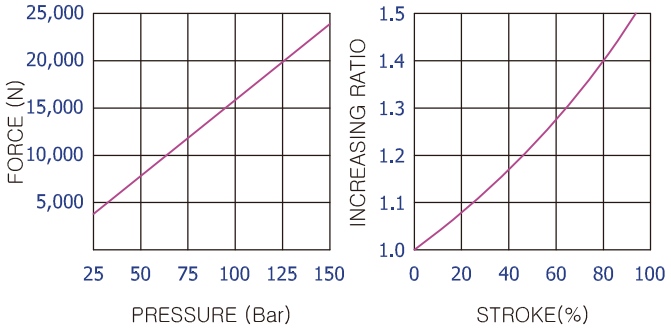
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSX2400

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (㎤)	Weight (kg)
(㎜)	(inch)			Initial	End force*		
16	0.63	91	75		33,000	91.5	1.96
20	0.79	99	79		33,800	107.6	2.03
25	0.98	109	84		34,600	127.7	2.11
30	1.18	119	89		35,100	147.8	2.19
35	1.38	129	94		35,600	167.9	2.27
38	1.50	135	97		35,800	180.0	2.32
40	1.57	139	99		36,000	188.0	2.35
45	1.77	149	104		36,300	208.2	2.43
50	1.97	159	109	23,800	36,500	228.3	2.51
60	2.36	179	119		36,900	268.5	2.68
63	2.48	185	122		37,000	280.6	2.72
70	2.76	199	129		37,200	308.7	2.85
75	2.95	209	134		37,300	328.8	2.93
80	3.15	219	139		37,400	349.0	3.01
90	3.54	239	149		37,600	389.2	3.17
100	3.94	259	159		37,800	429.4	3.33
125	4.92	309	184		38,100	530.0	3.75

* = at full stroke

CHARGING PRESSURE/FORCE INCREASE FACTOR



Calculation of charging pressure for TSX2400

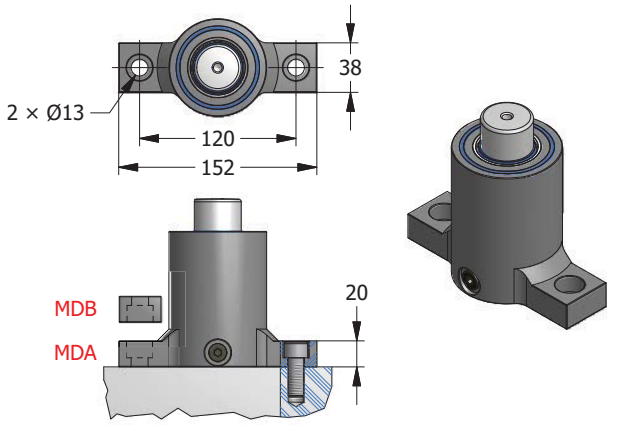
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{159.0}$$

ex) What comes to the charging pressure of gas spring which demands force 20,000N?

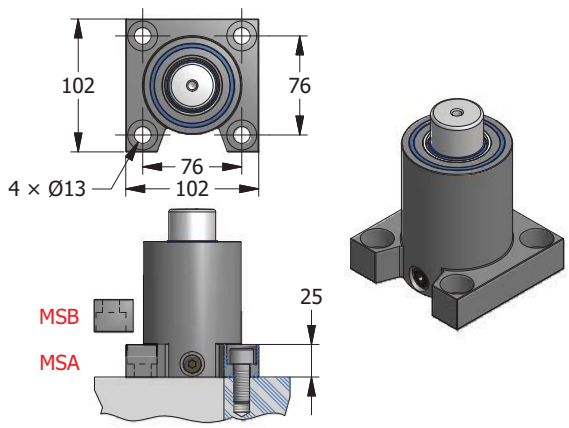
$$126\text{(Bar)} = \frac{20{,}000\text{(N)}}{159.0}$$

TSX2400 Mounts

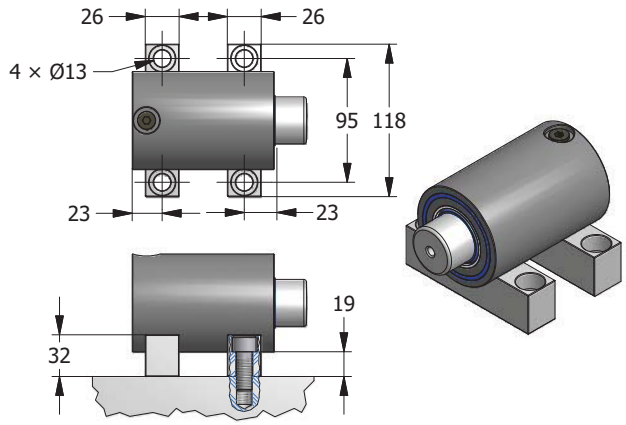
MD MOUNT WELDED



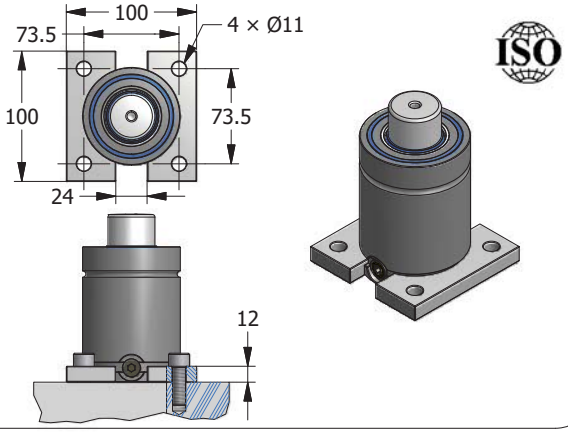
MS MOUNT WELDED



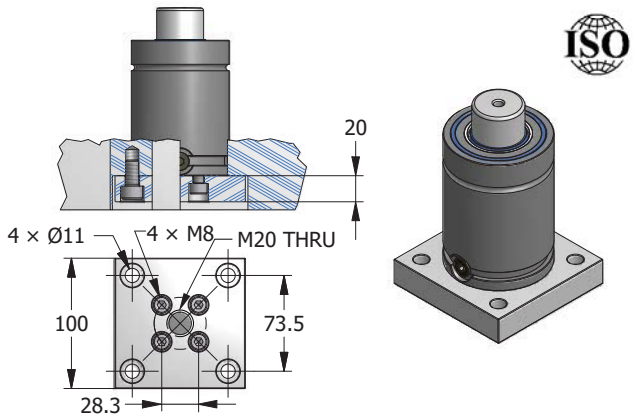
MK MOUNT WELDED



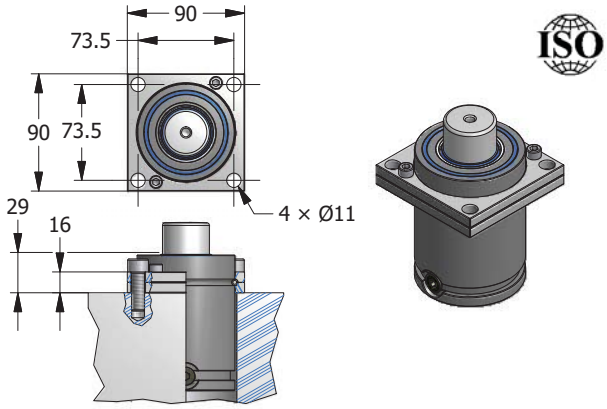
XP2400(SP1500) MOUNT



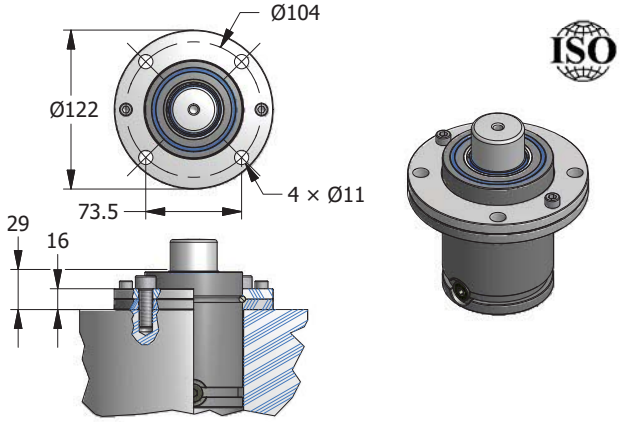
XB2400(SB1500) MOUNT



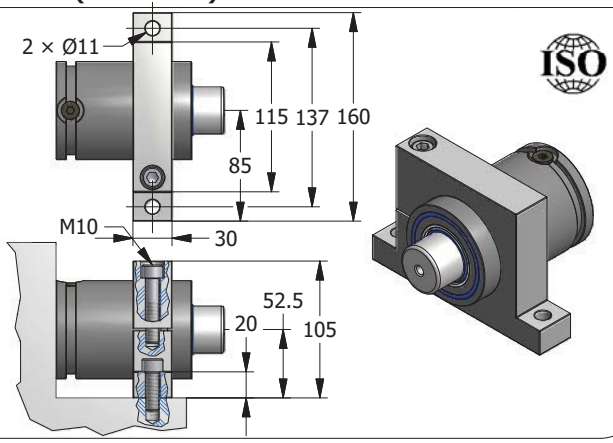
XT2400(ST1500) MOUNT



XR2400(SR1500) MOUNT

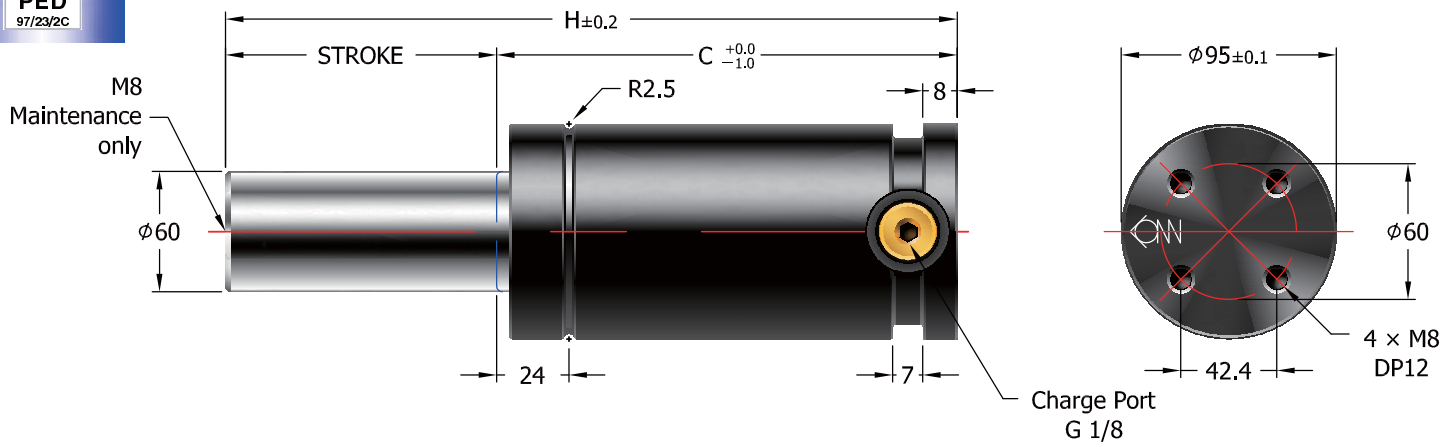


XC2400(SC1500) MOUNT



TSX4200 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSX4200 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	—	(MSA) (MOUNT)	—	150 (CHARGING PRESSURE (Bar))
MOUNT	XP4200							
REPAIR KIT	RCX4200							

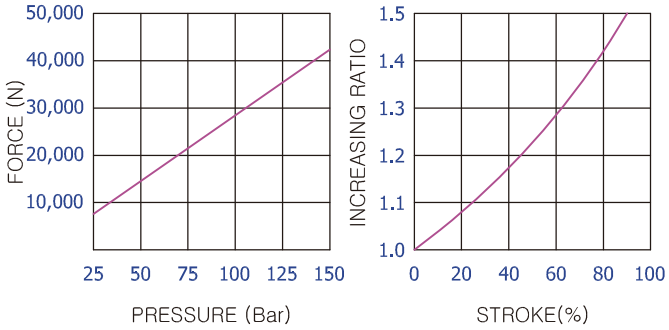
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSX4200

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
16	0.63	94	78	42,200	59,000	158.4	3.27
20	0.79	102	82		60,600	185.7	3.38
25	0.98	112	87		62,100	219.9	3.52
30	1.18	122	92		63,300	254.1	3.66
35	1.38	132	97		64,200	288.2	3.81
38	1.50	138	100		64,600	308.7	3.88
40	1.57	142	102		64,900	322.4	3.94
45	1.77	152	107		65,500	356.6	4.08
50	1.97	162	112		66,000	390.7	4.22
60	2.36	182	122		66,800	459.1	4.50
63	2.48	188	125		67,000	479.6	4.58
70	2.76	202	132		67,400	527.4	4.78
75	2.95	212	137		67,700	561.5	4.92
80	3.15	222	142		67,900	595.7	5.06
90	3.54	242	152		68,300	664.0	5.33
100	3.94	262	162		68,600	732.4	5.62
125	4.92	312	187		69,200	903.2	6.31

* = at full stroke

CHARGING PRESSURE/FORCE INCREASE FACTOR



Calculation of charging pressure for TSX4200

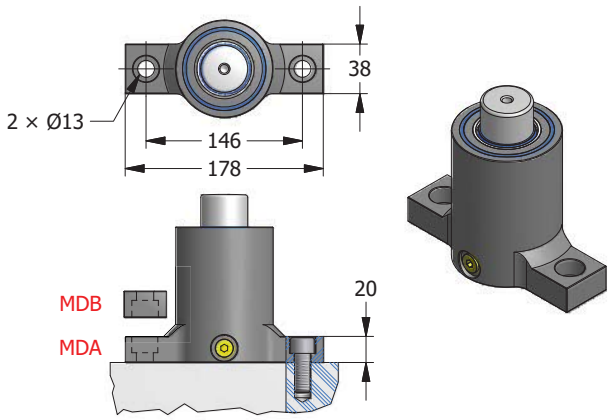
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{282.6}$$

ex) What comes to the charging pressure of gas spring which demands force 35,000N?

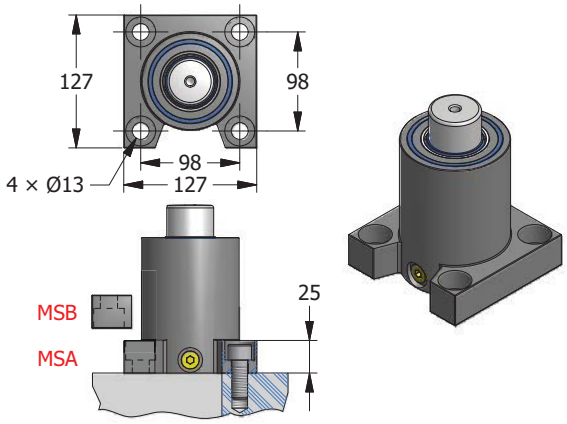
$$124(\text{Bar}) = \frac{35{,}000(\text{N})}{282.6}$$

TSX4200 Mounts

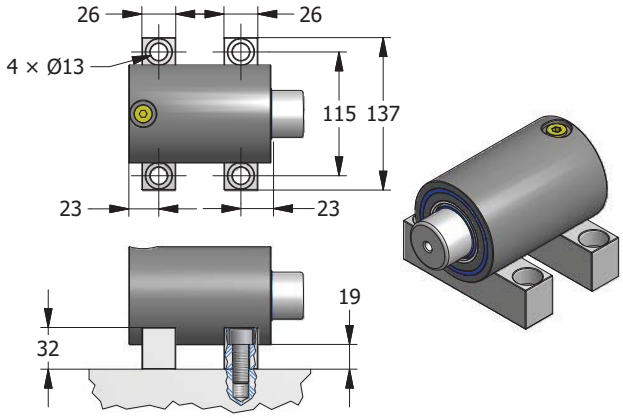
MD MOUNT WELDED



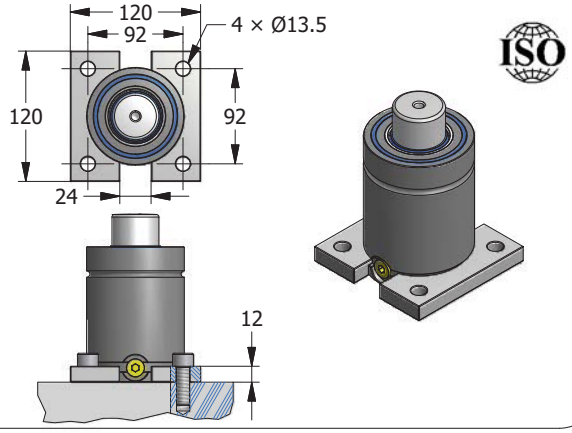
MS MOUNT WELDED



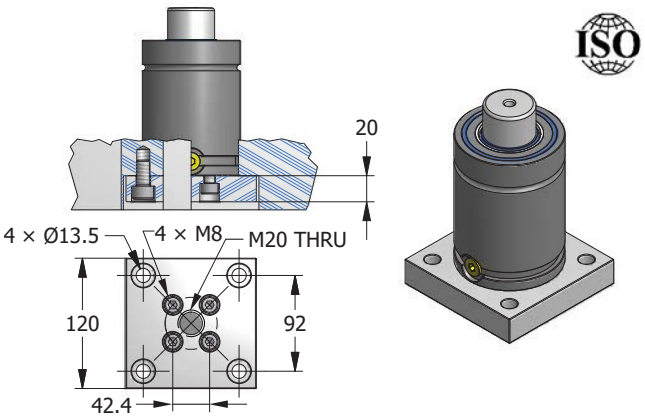
MK MOUNT WELDED



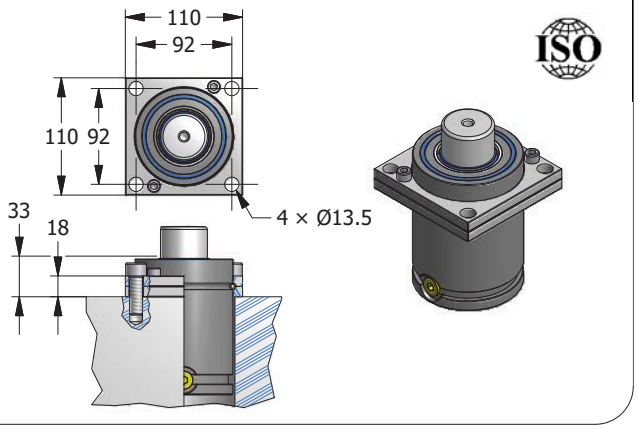
XP4200(SP3000) MOUNT



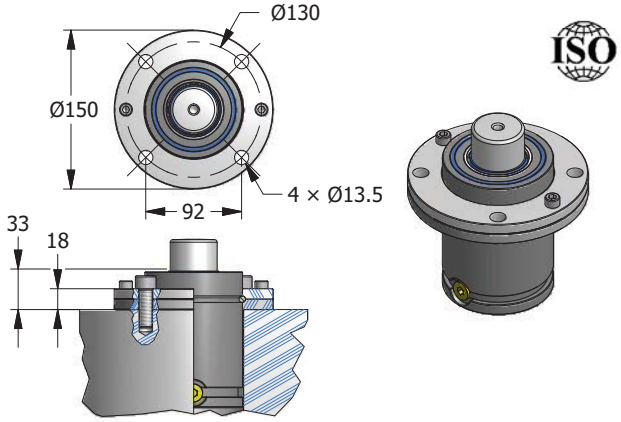
XB4200(SB3000) MOUNT



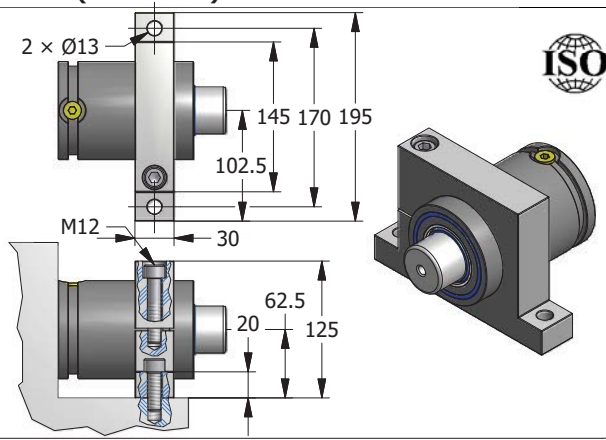
XT4200(ST3000) MOUNT



XR4200(SR3000) MOUNT

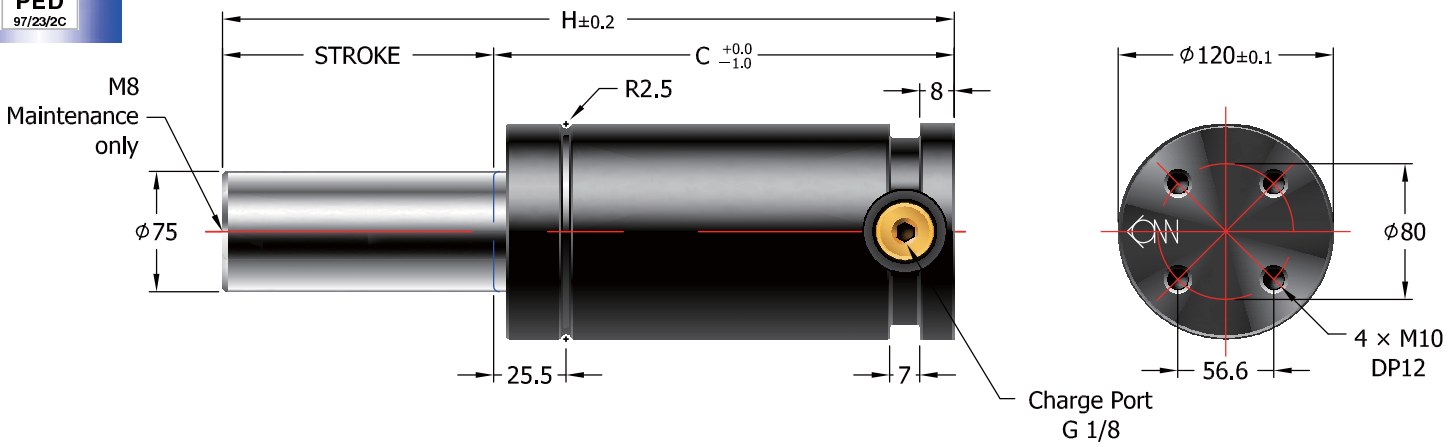


XC4200(SC3000) MOUNT



TSX6600 NITROGEN GAS SPRING

PED 97/23/2C



HOW TO SPECIFY

GAS SPRING	TSX6600 (MODEL)	×	050 (STROKE)	S(F) (SELF CONTAINED-S FITTING-SYSTEM-F)	—	(MSA) (MOUNT)	—	150 (CHARGING PRESSURE (Bar))
MOUNT	XP6600							
REPAIR KIT	RCX6600							

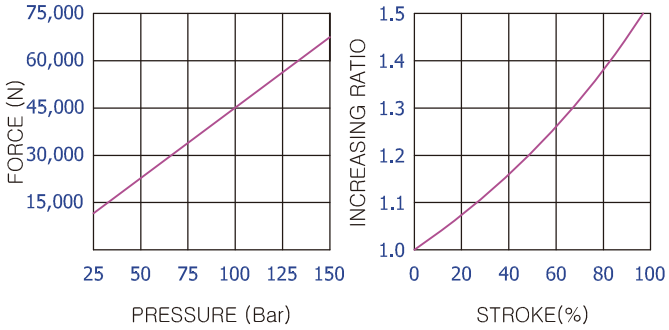
[Caution!] Charging pressure has to be specified. Otherwise, 150Bar will be charged.

TSX6600

Stroke (㎜)	Stroke (inch)	H	C	Force(N) (150 bar / +20 ℃) Initial	Force(N) (150 bar / +20 ℃) End force*	Gas vol. (㎤)	Weight (kg)
16	0.63	104	88		87,600	285.7	6.11
20	0.79	112	92		90,200	329.1	6.29
25	0.98	122	97		92,600	383.5	6.52
30	1.18	132	102		94,600	437.8	6.75
35	1.38	142	107		96,200	492.1	6.97
38	1.50	148	110		97,000	524.7	7.11
40	1.57	152	112		97,500	546.5	7.21
45	1.77	162	117		98,600	600.8	7.43
50	1.97	172	122	66,000	99,500	655.2	7.66
60	2.36	192	132		101,000	763.8	8.11
63	2.48	198	135		101,400	796.4	8.25
70	2.76	212	142		102,100	872.5	8.57
75	2.95	222	147		102,600	926.8	8.80
80	3.15	232	152		103,100	981.2	9.03
90	3.54	252	162		103,800	1089.9	9.48
100	3.94	272	172		104,400	1198.5	9.94
125	4.92	322	197		105,600	1470.2	11.08

* = at full stroke

CHARGING PRESSURE/FORCE INCREASE FACTOR



Calculation of charging pressure for TSX6600

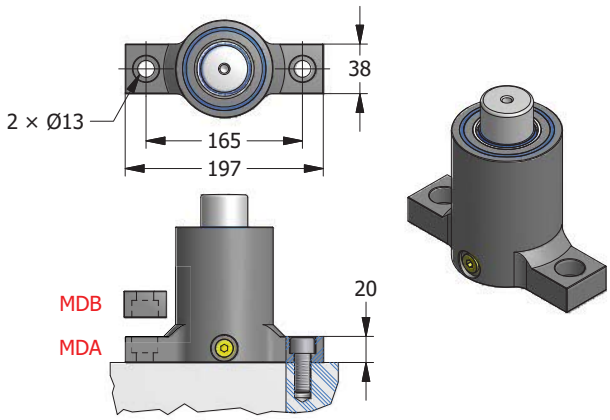
$$\text{Charging pressure(Bar)} = \frac{\text{Initial Force(N)}}{441.6}$$

ex) What comes to the charging pressure of gas spring which demands force 60,000N?

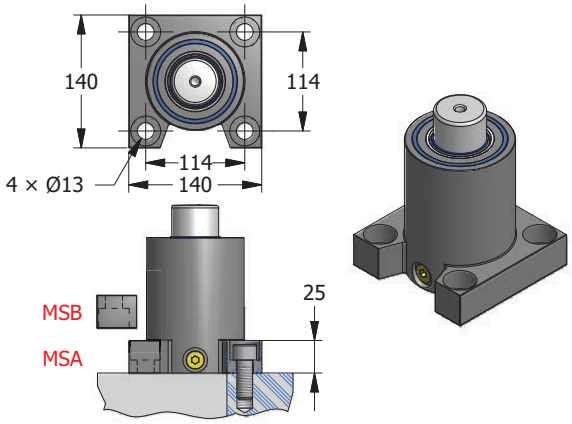
$$136(\text{Bar}) = \frac{60{,}000(\text{N})}{441.6}$$

TSX6600 Mounts

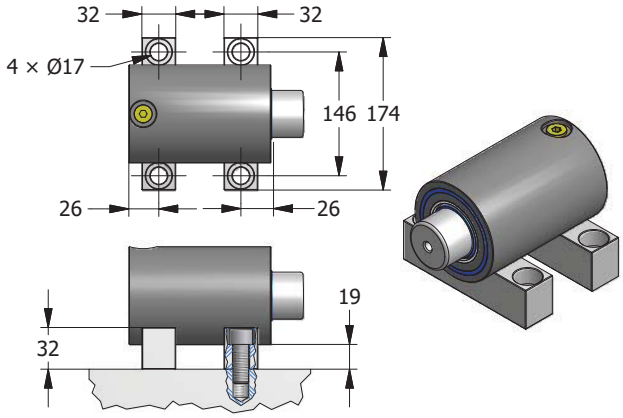
MD MOUNT WELDED



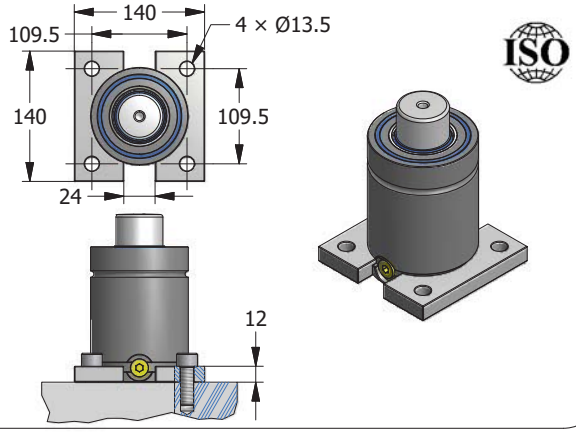
MS MOUNT WELDED



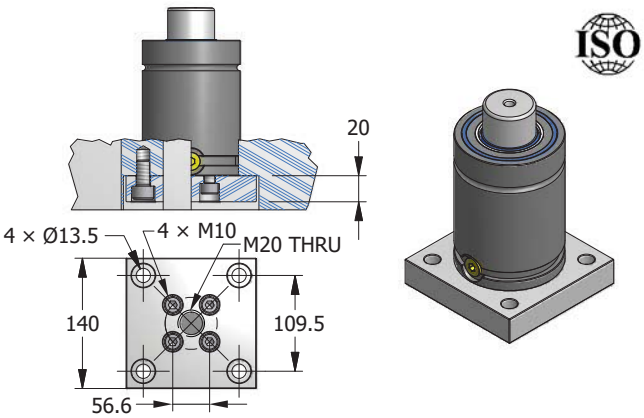
MK MOUNT WELDED



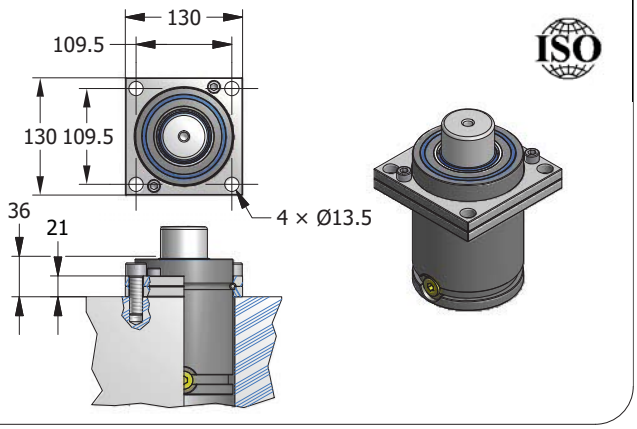
XP6600(SP5000) MOUNT



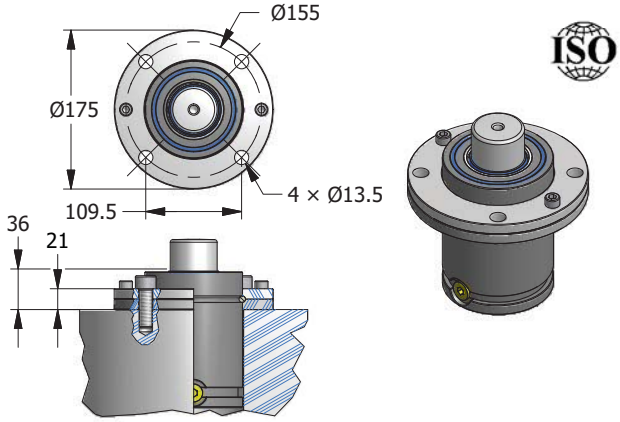
XB6600(SB5000) MOUNT



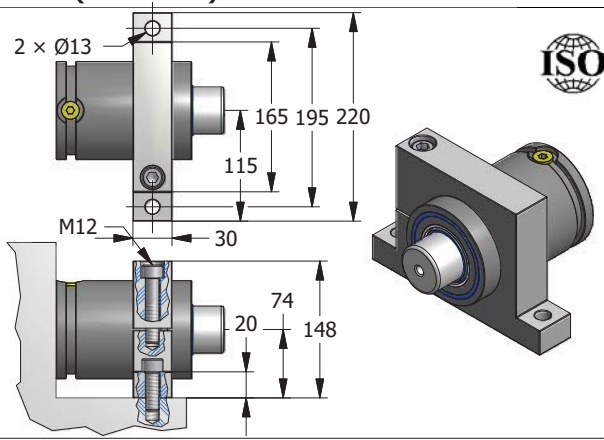
XT6600(ST5000) MOUNT



XR6600(SR5000) MOUNT



XC6600(SC5000) MOUNT



■ Calculation of Pressure Ratio

$$F = \frac{Vg}{Vg - S \times R}$$

EX) What is the pressure ratio when 50mm of stroke is applied with TOSS GAS SPRING TSS5000 x 60?

$$1.45 = \frac{533.8}{533.8 - 5 \times 33.1}$$

F = Pressure Ratio
Va = Volume of Accumulator(㎤)
Vg = Volume of Gas Spring(㎤)
n = Numbers of Gas Spring
S = Real Used Stroke(㎝)
R = Cross Section of Piston Rod(㎠)

■ Calculation of Accumulator applied

$$F = \frac{Va + Vg \times n}{Va + (Vg - S \times R) \times n}$$

EX) What is pressure ratio when 50mm of stroke is applied with 12 of TOSS GAS SPRING TSS 5000 x 60 and 2 of Accumulators TAN080-75?

$$1.12 = \frac{(5{,}880 \times 2) + 533.8 \times 12}{(5{,}880 \times 2) + (533.8 - 5 \times 33.1) \times 12}$$

■ Initial force gradient due to temperature

Volume increases as temperature increases, and volume decreases as temperature decreases. (PV = RT)
With constant pressure volume of any gas increases 1/273 by increment of 1℃ from 0℃ of temperature (Charles's Law).

P = Pressure
V = Volume
R = Gas Constant
T = Temperature

$\frac{V_1}{T_1} = \frac{V_2}{T_2} = K$, $\frac{P_1}{T_1} = \frac{P_2}{T_2}$ T_1 = Initial temperature T_2 = Final temperature

Pressure is proportional to the force $\frac{F_1}{T_1} = \frac{F_2}{T_2} \Rightarrow F_2 = F_1 \times \frac{T_2}{T_1}$

EX) At 20℃, what is force of gas spring if temperature of gas spring (initial force of 7,350N) is increased by 50℃ during operation?

absolute (K) = C° + 273

F_1 = 7,350N, T_1 = 273 + 20℃ = 293°K, T_2 = 273 + 50℃ = 323°K

$F_2 = 7{,}350 \times \frac{323}{293} = 8{,}100N$

■ Charging amount of Nitrogen gas

※ Weight conversion of Nitrogen gas

$P \times V = nRT$ (Ideal gas equation)

$n = \frac{PV}{RT}$

P = Pressure
V = Volume
n = Number of mol
R = Ideal gas constant
T = Absolute temperature

※ Molecular weight of Nitrogen M = 28.0134
Volume of Nitrogen gas 1mol = 22.4 Liter

Ex) When you apply fitting system with 6 of TOSS GAS SPRING TSM 3000×150 and 8 of TSL1500 × 80, what is amount of nitrogen gas to be charged?

Specifications : Nitrogen gas charging pressure 120bar (35℃)
Cyilnder Volume (40.1 Liter)

Sol.1) $\frac{\{(115-40) \times 10^5 N/m^2\} \times (40.1 \times 10^{-3} m^3)}{(8.314\ J \cdot mol^{-1} \cdot K^{-1}) \times (20 + 273.15\ K)} = 123.4$ mol

= 123.4 (Number of mol) × 28.0134 (Molecular Weight of Nitrogen) ÷ 1000 = 3.5 kg

Sol.2) The volume of the gas spring : TSL1500 × 80 = 274.2 cm³,
TSM3000 ×150 = 773.7 cm³
Charging pressure : 150 bar (20℃)

$\frac{(150 \times 10^5 N/m^2) \times [\{(274.2 \times 8) + (773.7 \times 6)\} \times 10^{-6} m^3]}{(8.314\ J \cdot mol^{-1} \cdot K^{-1}) \times (20 + 273.15\ K)} = 42.1$ mol

= 42.1 (Number of mol) × 28.0134 (Molecular Weight of Nitrogen) ÷ 1000 = 1.2 kg

Sol.3) 40.1 Liter of the container divides the amount of gas available into the amount required to charge.

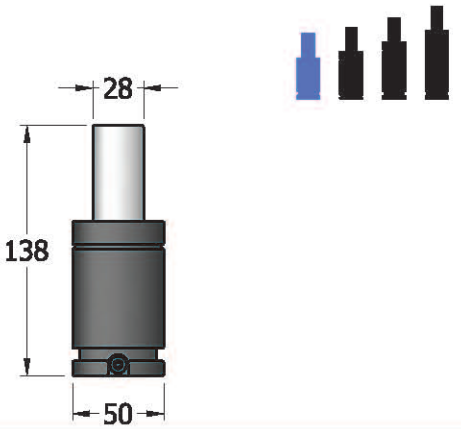
2.45kg ÷ 1.2kg ≒ 2 times

∴ If amount of charge in fitting line and Panel and actual using gas are considered as 30%, 40.1Liter bomb conuse 2 times.

TSP Series

XTRA HIGH POWER

Ex. MODEL TSP1000 × 050

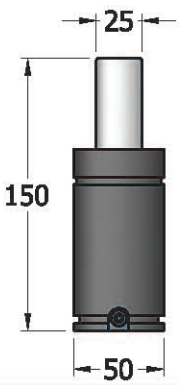


Model	Stroke (mm)	Rod Φ (mm)	Cylinder Φ (mm)	Initial Force (N)
TSP0170	7~125	11	19	1700
TSP0320	7~125	15	25	3200
TSP0350	10~125	16	32	3600
TSP0500	10~125	20	38	4700
TSP0750	10~125	25	45	7400
TSP1000	13~125	28	50	9200
TSP1500	13~125	36	63	15000
TSP2400	15~125	45	75	24000
TSP4200	15~125	60	95	42000
TSP6600	15~125	75	120	66000
TSP9500	20~125	90	150	95000

TSM Series

COMPACT TYPE

Ex. MODEL TSM0750 × 050

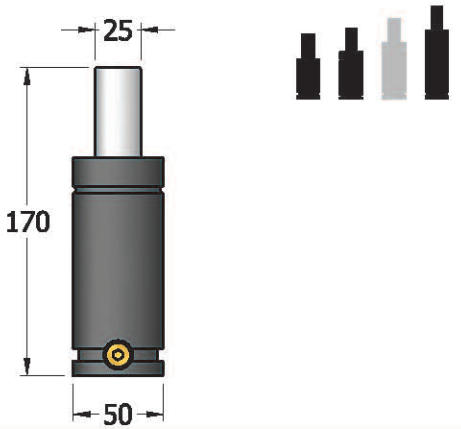


Model	Stroke (mm)	Rod Φ (mm)	Cylinder Φ (mm)	Initial Force (N)
TSM50	7~125	6	12	130~500
TSM70	7~125	7	15	180~700
TSM90	7~125	8	19	300~900
TSM0150	10~125	12	25	500~2000
TSM0300	10~125	16	38	3000
TSM0500	10~125	20	45	4700
TSM0750	10~125	25	50	7350
TSM1500	10~200	36	75	15000
TSM3000	13~200	50	95	29300
TSM5000	13~200	65	120	49700

TSS Series

TOSS STANDARD

Ex. MODEL TSS0750 × 050

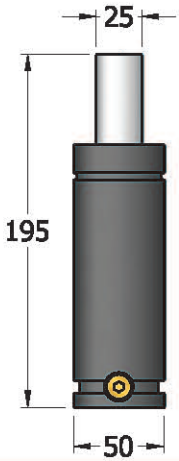


Model	Stroke (mm)	Rod Φ (mm)	Cylinder Φ (mm)	Initial Force (N)
TSS0750	10~200	25	50	7350
TSS1500	10~300	36	75	15000
TSS3000	10~300	50	95	29300
TSS5000	10~300	65	120	49700

TSL Series

ISO STANDARD

Ex. MODEL TSL0750 × 050



Model	Stroke (mm)	Rod Φ (mm)	Cylinder Φ (mm)	Initial Force (N)
TSL0500	10~125	20	45	4700
TSL0750	10~300	25	50	7350
TSL1500	10~300	36	75	15000
TSL3000	10~300	50	95	29300
TSL5000	10~300	65	120	49700
TSL7500	10~300	80	150	75300
TSL10000	10~300	95	195	106200

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