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CT21024K

신원에스앤티

2021

질소 가스 스프링



(주)신원에스앤티
SHINWEON S&T CO.,LTD.



SERIES

- TSP SERIES
- TSX SERIES
- TST SERIES
- TSM SERIES
- TSS SERIES
- TSL SERIES



XTRA HIGH POWER

STABLE XTRA HIGH POWER

STABLE XTRA HIGH POWER

COMPACT TYPE

TOSS STANDARD

ISO STANDARD

ETC.

Model	Stroke	Cylinder Dia.	Rod Dia.	Force (N)		Page
				Initial	End	
TSP0170	7~125	19	11	1,700	2,800	12
TSP0320	7~125	25	15	3,200	5,500	14
TSP0350	10~125	32	16	3,600	5,400	16
TSP0500	10~125	38	20	4,700	7,200	18
TSP0750	10~125	45	25	7,400	11,700	20
TSP1000	13~125	50	28	9,200	14,900	22
TSP1500	13~125	63	36	15,200	24,100	24
TSP2400	16~125	75	45	23,800	38,400	26
TSP4200	16~125	95	60	42,200	70,900	28
TSP6600	16~125	120	75	66,000	108,700	30
TSP9500	20~125	150	90	95,000	149,100	32
TSX0350	10~125	32	16	3,600	5,400	36
TSX0500	10~125	38	20	4,700	7,200	38
TSX0750	10~125	45	25	7,400	11,700	40
TSX1000	13~125	50	28	9,200	14,600	42
TSX1500	13~125	63	36	15,200	23,900	44
TSX2400	16~125	75	45	23,800	38,100	46
TSX4200	16~125	95	60	42,200	69,200	48
TSX6600	16~125	120	75	66,000	105,600	50
TST1000	13~125	50	28	9,200	14,600	54
TST2400	16~125	75	45	23,800	38,100	56
TST4200	16~125	95	60	42,200	69,200	58
TST6600	16~125	120	75	66,000	105,600	60
TST9500	20~125	150	90	95,000	149,100	62
TSM50	7~125	12	6	130~500	200~800	66
TSM70	7~125	15	7	180~700	200~1,100	67
TSM90	7~125	19	8	300~900	400~1,200	68
TSM0150	10~125	25	12	500~2,000	700~2,900	70
TSM0300	10~125	38	16	3,000	4,200	72
TTM0300		M38				73
TSM0500	10~125	45	20	4,650	6,500	74
TSM0750	10~125	50	25	7,350	12,000	76
TSM1500	10~200	75	36	15,150	22,100	78
TSM3000	10~200	95	50	29,400	47,600	80
TSM5000	10~200	120	65	49,650	84,100	82
TSS0750	10~200	50	25	7,350	11,800	86
TSS1500	10~300	75	36	15,150	22,000	88
TSS3000	10~300	95	50	29,400	47,000	90
TSS5000	10~300	120	65	49,650	84,300	92
TSL0500	10~160	45	20	4,650	6,200	96
TSL0750	10~300	50	25	7,350	11,500	98
TSL1500	10~300	75	36	15,150	22,100	100
TSL3000	10~300	95	50	29,400	47,300	102
TSL5000	10~300	120	65	49,650	83,900	104
TSL7500	15~300	150	80	75,300	123,900	106
TSL10000	20~300	195	95	106,200	156,600	108
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GAS SPRING



CONTROL PANEL



DISTRIBUTION BLOCK



CF FITTING



GF FITTING



ACCESSORIES



VF FITTING



ACCUMULATOR



REPAIR TOOL



■ TOSS 질소 GAS SPRING

TOSS는 국내 최초로 개발된 질소(N₂) GAS SPRING 입니다. TOSS의 모든 부품은 CNC & M/C 등의 고정도 장비로 정밀하게 제작되었으며 시험 TEST에서 SPM80의 가혹한 조건에서도 100만회를 상회하는 시험효과를 거두었으며 국내 업계 생산 현장 적용 시험에서도 품질의 우수성을 인정 받았습니다.

또한 기존 제품보다 더욱 COMPACT한 TSP시리즈를 개발하여 국내 금형산업의 발전에 크게 기여할 수 있으리라 기대합니다.

■ 품질보증

TOSS의 보증 기간은 당사 출하 후 1년이며 기간 중 모든 A/S 및 부품 교환은 무상이며 제품의 중대한 결함시에는 일대일의 교환을 원칙으로 하고 보증 기간 이후라도 제품의 결함 및 간단한 부품 교환은 무상으로 즉시 대응합니다.

■ 보수유지

TOSS GAS SPRING은 보증된 수명까지 보수가 필요치 않으나 작업 중의 훼손이나 수명이 다한 제품이라도 간단한 부품교환으로 보수 및 재생이 가능하며 이에 필요한 시간은 5분 이내면 충분합니다.

또한 TOSS GAS SPRING은 GAS의 배기 및 재충전이 간단하므로 현장에서 직접압력을 조정하여 적절한 하중을 선택할 수 있습니다.

■ 신속한 납기

TOSS의 신속한 납기 및 신속한 A/S를 위한 부품 공급을 원활하게 하기 위해 이들의 부품은 물론 GAS 충전 시설, 하중 TEST설비 등을 확보하고 최단납기를 위하여 모든 준비를 완료하고 있습니다.

또한 충분한 재고를 확보하여 주문 즉시 공급을 하여 납기 지연으로 인한 생산계획의 차질을 단축함은 물론 재고가 없는 제품이라도 수량에 따라 7일 이내에 제품인도가 가능합니다.

■ 주의 사항

* PISTON ROD의 상단부에 조립 및 분해를 위한 M6 또는 M8용 TAP이 있으나 이에 어떠한 연결 장치나 GAS SPRING의 고정용으로 사용되어서는 안됩니다.

* TOSS의 설치시 PISTON ROD 상부와 접촉면과의 사이에 1mm정도의 여유를 두어야 합니다.
특히 초기압력이 강력하므로 예압이 전혀 필요하지 않으며 예압을 적용할 경우에 금형이 손상 되므로 주의 바랍니다.

* TOSS GAS SPRING은 어떠한 경우라도 원형 그대로 사용하여야 합니다.
PISTON ROD 상부를 연마, 절단 또는 GAS SPRING 하부면을 연마하는 등의 훼손을 금하여 주십시오.
원형훼손시 수명감소 및 고장의 원인이 됩니다.

* TOSS 설치시 TOSS의 바닥면이 금형에 닿아 GAS SPRING의 하중을 흡수하도록 설치하여 주십시오.
MOUNT만의 조립으로 바닥면에 공간을 두면 경우에 따라 고하중이 MOUNT에 전달 되어 이의 파손 및 금형이 훼손될 수도 있습니다.

■ 설치 및 사용

TOSS의 설치시 GAS SPRING이 PISTON ROD의 작동 방향으로 평행하게 설치되어야합니다.

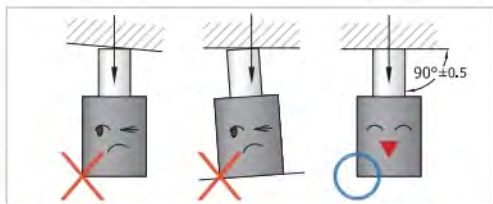
설치 바닥 면과 수직이 되지 않으면 편하중이 발생하기 때문에 PISTON ROD, BEARING, SEAL 등의 마모로 GAS SPRING의 수명을 감소시킬 수 있습니다.

TOSS의 내구성 및 수명을 최대화하고 손상을 방지하기 위하여 실적용 STROKE를 규격보다 약 10% 정도의 여유를 확보하여야 합니다.

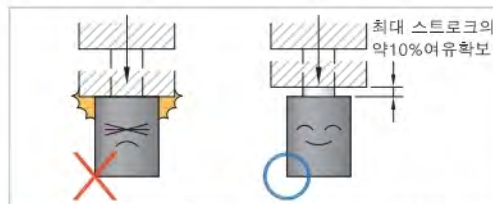
이는 경우에 따라서 PISTON ROD가 바닥에 닿아 손상되는 경우를 예방하고 GAS의 최대 압축 충격으로 인한 GAS SPRING의 수명감소를 방지합니다.

■ 사용상 주의사항

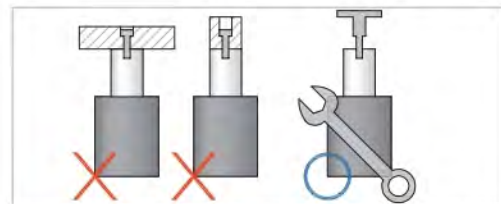
가스 스프링 내부에는 고압 가스가 충전되어 있으므로, 사용상 주의사항을 지키지 않을 경우 안전사고나 제품파손, 오작동 등을 유발할 수 있습니다. 따라서 본 제품의 사용 전에 반드시 아래의 사항을 숙지하고 지켜서 사용 하시기 바랍니다.



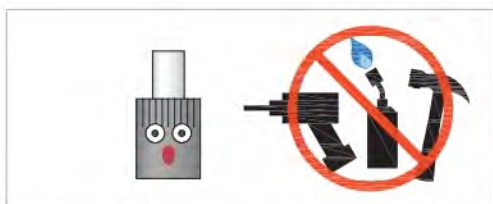
1. 가스 스프링을 작동 방향에 평행하게 설치하고, 경사하중이나 횡하중을 가하면 안 됩니다.



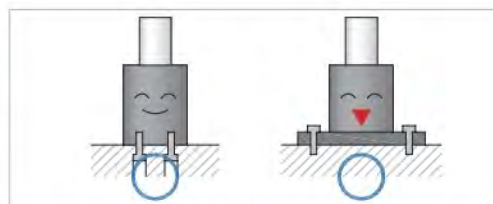
2. 최대 스트로크에서 10%정도의 여유를 확보하고 최대 스트로크를 초과하지 않도록 합니다.



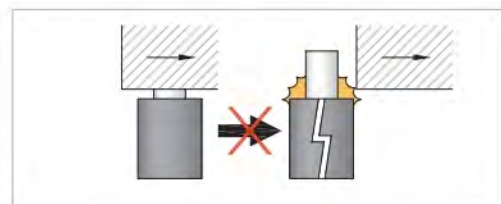
3. 로드 상단의 탭홀은 정비, 수리를 위한 것 이외의 용도로 사용하면 안됩니다.



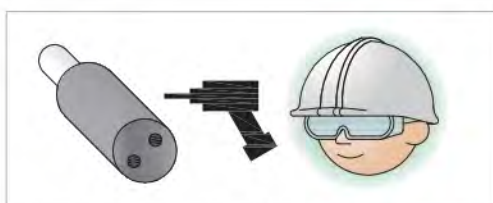
4. 분해, 용접, 용단, 가열, 개조 등 원형을 훼손하는 행위는 절대로 금지하여 주시기 바랍니다.



5. 가스 스프링 장착시에는 바닥면에 금형에 닿도록 하여 마운트나 볼트로 고정해야 합니다.



6. 돌출핀이나 압출핀 등 피스톤 로드가 급격하게 개방될 수 있는 용도로 사용하면 안됩니다.



7. 폐기시에는 안전한 장소에서 가스를 제거하고, 가스가 전부 방출되었는지를 확인한 후 폐기 바랍니다.



8. 가스스프링은 무급유 제품이므로 윤활유가 묻지 않게 해야 합니다.



9. 금형 사상이나 가공시엔 용접스파크, 절단편, 금속이물질 등의 부착에 주의하시기 바랍니다.

TOSS의 규격

TOSS의 규격은 초기하중에 따라 130N에서부터 100,000N까지가 있고 최소 7mm에서부터 최대 300mm까지의 STROKE (작동거리)가 가능하며 전체길이별 규격 TSP, TSM, TSS, TSL, TSX, TST 등의 모델이 있어 선택의 폭이 다양하고 소형금형에도 적용이 용이합니다.

또한 각각의 GAS SPRING으로 적용하는 단독형과 다수의 GAS SPRING을 배관으로 연결하여 동시에 압력 조절이 가능한 연결형이 있으며 상호 간단하게 전환할 수 있습니다.

TOSS의 전규격은 배기, 재충전이 간단하여 필요한 압력으로 쉽게 조정할 수 있습니다.

TOSS GAS SPRING의 최대 충전압력은 모델에 따라 150~180bar입니다.

단독형·연결형 가능

단독형

단독형은 출고시 지정된 압력으로 미리 충전되어 있어 다른 부품의 설치를 위한 공간이 필요하지 않아 빠르고 쉽게 설치할 수 있습니다.

배기 및 재충전이 가능하며 최대 충전압력은 150~180bar입니다.



연결형

연결형은 각각의 GAS SPRING을 상호 연결하여 동시에 배기 및 충전하는 SYSTEM으로 CONTROL PANEL을 통해 항상 압력을 확인할 수 있어 관리가 용이하고 압력조정이 간단합니다.

최대 충전압력은 150~180bar입니다.





◆ 인증 현황



1. SYSTEM

TOSS GAS SPRING은 국제 규격에 의한 SYSTEM으로 생산 유지 관리 되고있습니다. 압력용기 Module A1 유럽 인증인 PED 를 비롯한 품질경영·환경경영 SYSTEM ISO, 제품인증 CE 등의 인증 관리를 통해 품질 최우선 정책을 펼쳐나가고 있습니다.

2. 제품 구성

TSP, TSX, TST, TSM, TSS, TSL 6개의 규격과 2000여종 이상의 Model로 구성되어 고객이 원하는 다양하고 폭넓은 선택의 기회를 제공하고 있습니다.

3. 제품 평가

TOSS GAS SPRING은 30여개국 이상의 국가에 출고 되어 안정된 품질과 가격, 납기, 철저한 서비스로 시장을 더욱더 확대해 나가고 있습니다.

4. 보증 기간

TOSS GAS SPRING은 제조년 기준 1년 이하의 제품이나 규격에 따라 30 ~ 100만 Stroke 를 보장합니다.

5. DATA Download(Cad & Catalogue Data)

(www.shinweon.com) 접속 Data download

CD요청

TEL: 82-2-2675-6744

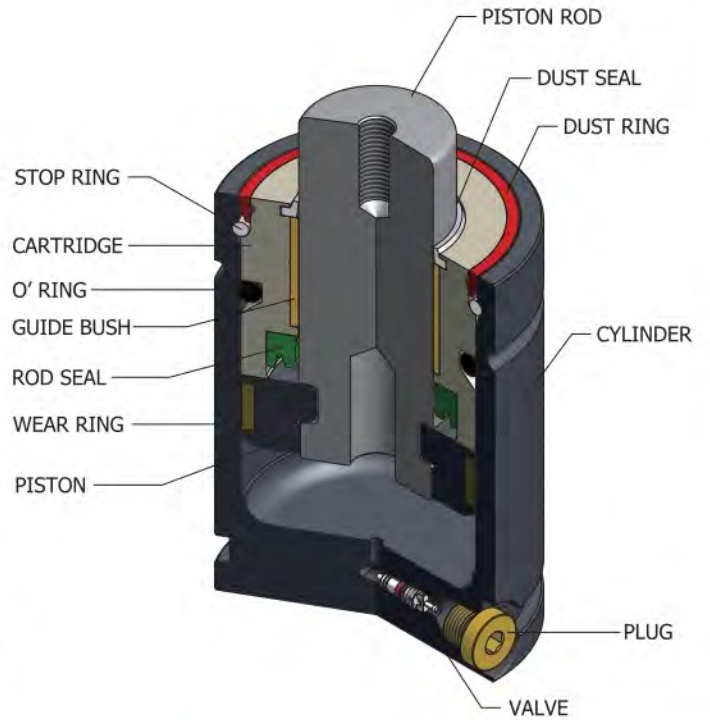
e-mail : shinweon@shinweon.com으로 연락 주시기 바랍니다.

DATA 형식

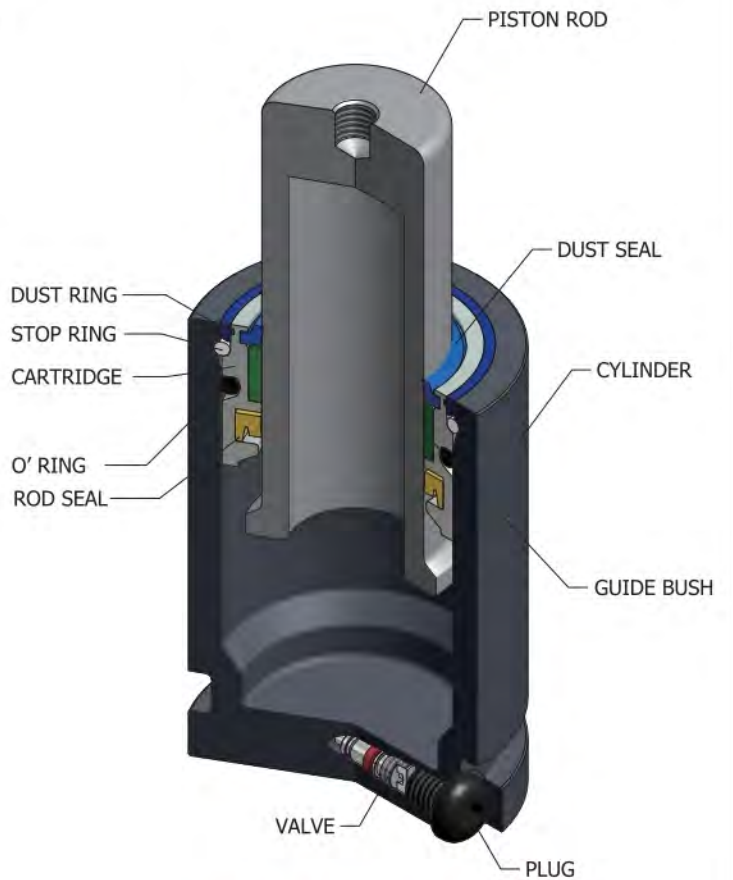
2d_ Auto cad.dwg

3d_igs

Catalogue_pdf

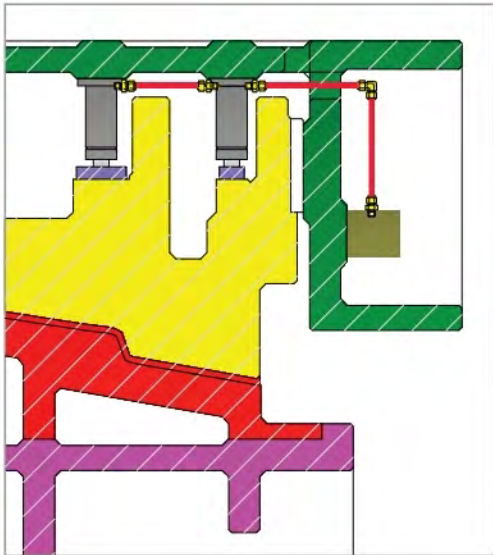


TSM, TSS, TSL 단면도

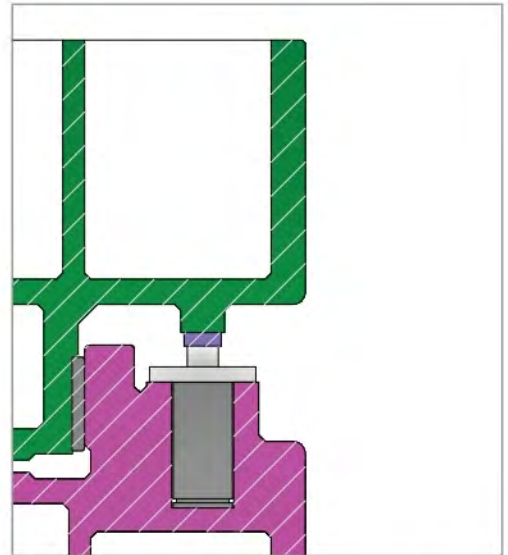


TSP, TSX, TST 단면도

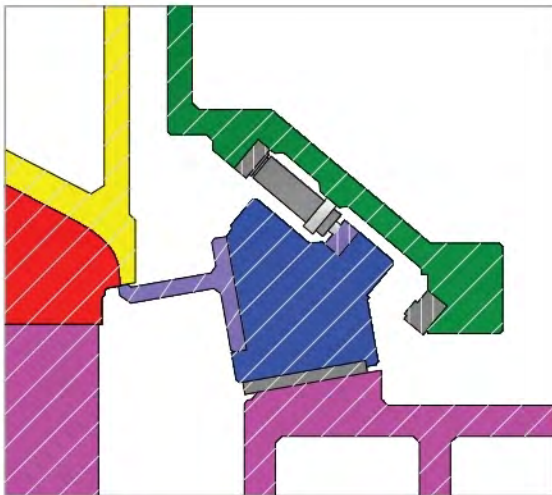




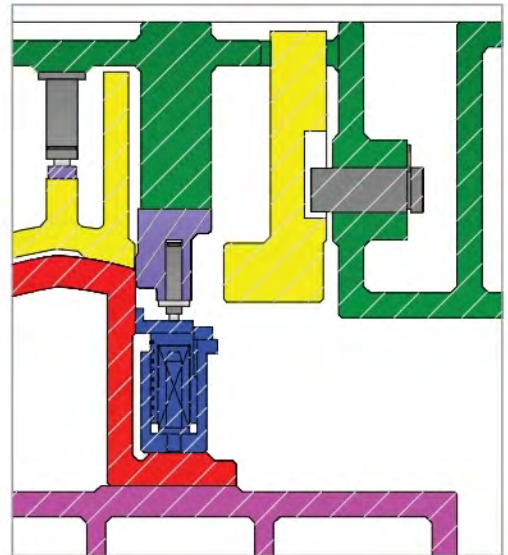
상형 PAD 배관 TYPE



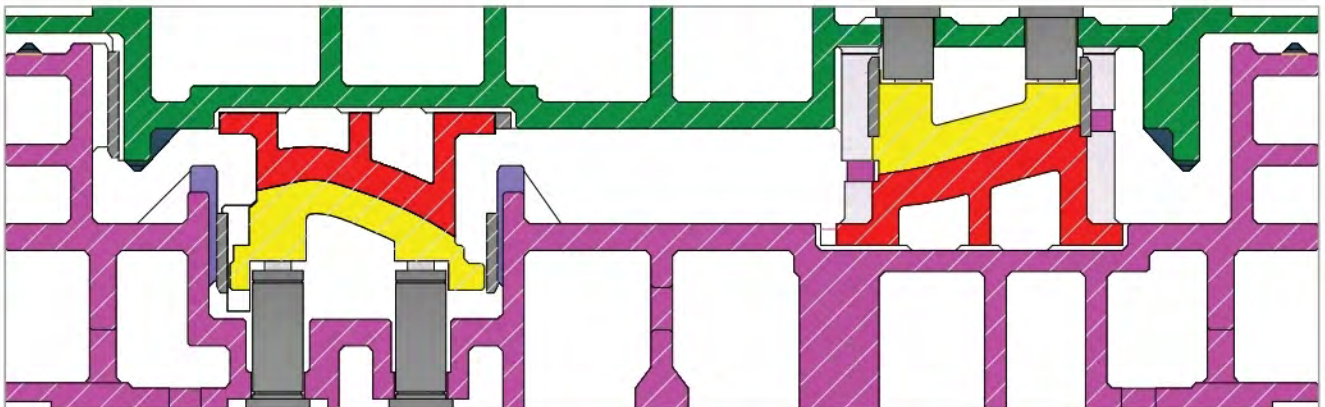
상.하형 금형 적재 TYPE



CAM RETURN TYPE



상형 PAD TYPE
FL LIFTER 선행누름 TYPE



DRAW S/A TYPE



TSP SERIES



CONTENTS

NITROGEN GAS SPRING



TSP0170	12
TSP0320	14
TSP0350	16
TSP0500	18
TSP0750	20
TSP1000	22
TSP1500	24
TSP2400	26
TSP4200	28
TSP6600	30
TSP9500	32

XTRA HIGH POWER

■ 일반 제원

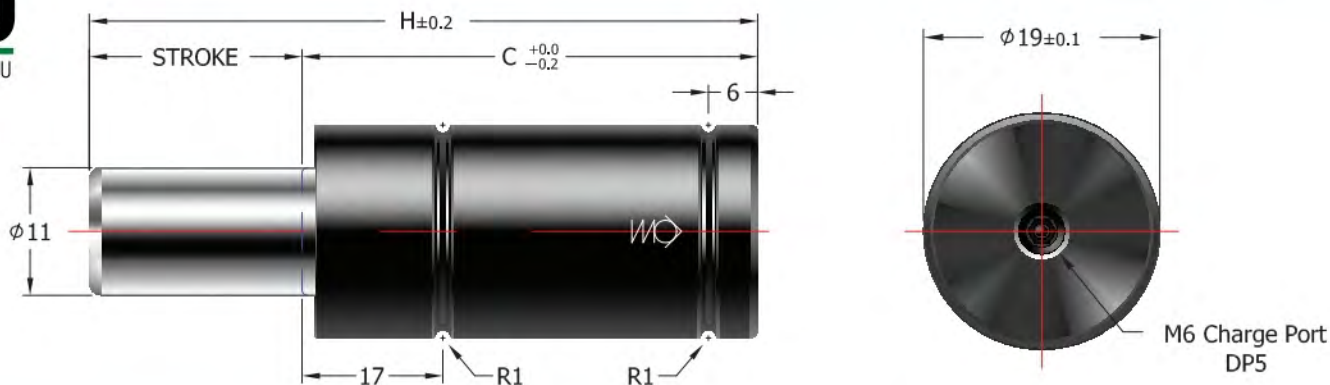
- 충전재
질소가스 (N₂)
- 최대 충전 압력
150 ~ 180 bar (at 20℃)
- 최소 충전 압력
25 bar (at 20℃)
- 작동 온도
0 to 80℃
- 온도에 따른 압력 증가량
±0.3% / ℃
- 분당 최대 스트로크 용복
~50 to 100 (at 20℃)
- 피스톤 로드 속도
0 ~ 0.8 m/s
- 로드 표면처리
도금 열처리
- 실린더 표면처리
흑산화 피막

■ Model별 제원

종류 TYPE	Stroke (mm)	실린더 외경 Φ(mm)	Rod 외경 Φ(mm)	초기하중 (N)	최대하중 (N)	최대충전압력
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

※ 상기 사양은 성능개선을 위해 예고없이 변경될 수 있습니다.





규격 표기법

GAS SPRING TSP0170 × 050 - 180
 MODEL STROKE 충전압력 (Bar)

MOUNT XP0170

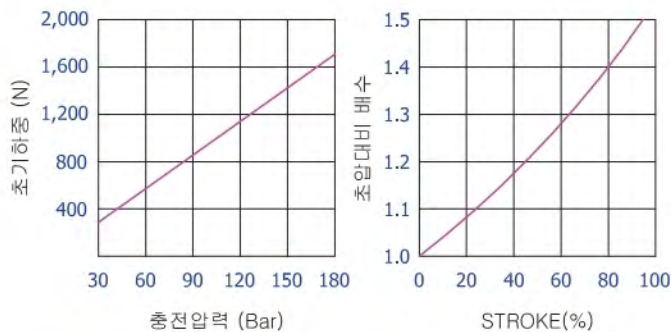
REPAIR KIT Non-repairable

[주의!] TSP0170은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(180Bar)으로 출고됩니다.

TSP0170							
Stroke		H	C	Force (N) (180 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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

■ 충전압력/압축량 대비 하중변화도표



■ TSP0170의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{9.5}$$

ex) 필요한 초기하중 1,000N인 GAS SPRING의 충전압력은?

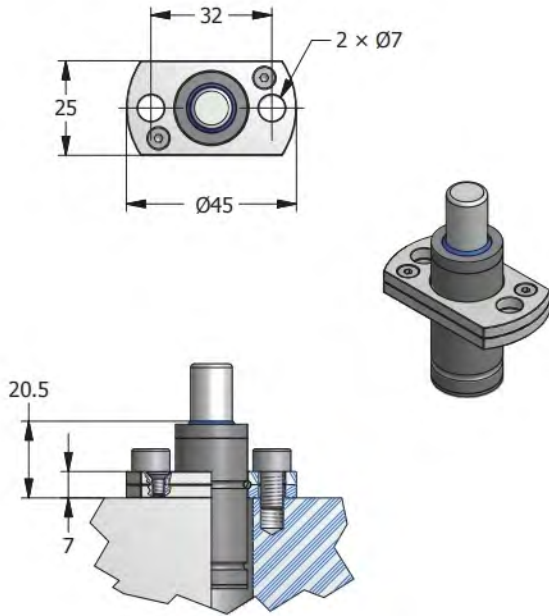
$$105(\text{Bar}) = \frac{1,000(\text{N})}{9.5}$$



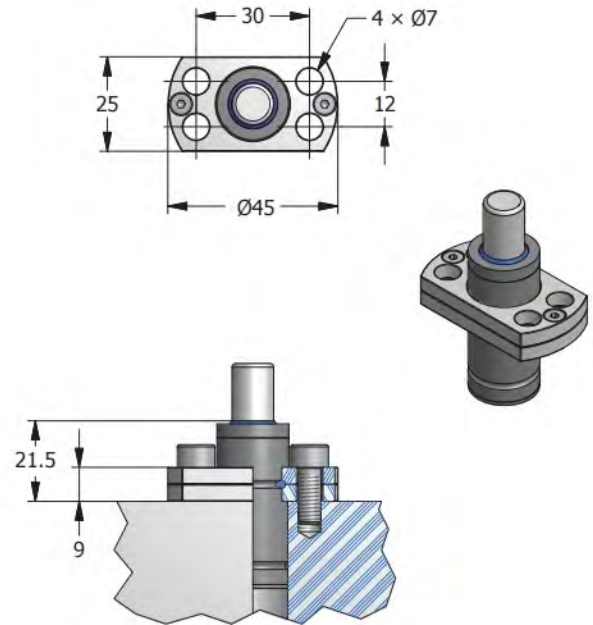
★ Bottom thread

only to be used for strokes 7-25mm

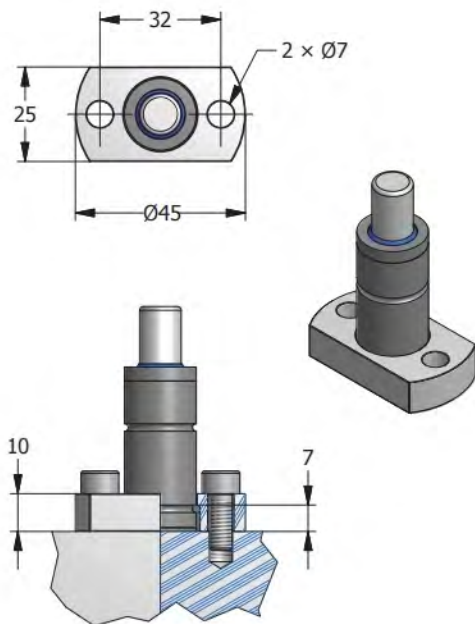
XG0170 MOUNT



XC0170 MOUNT



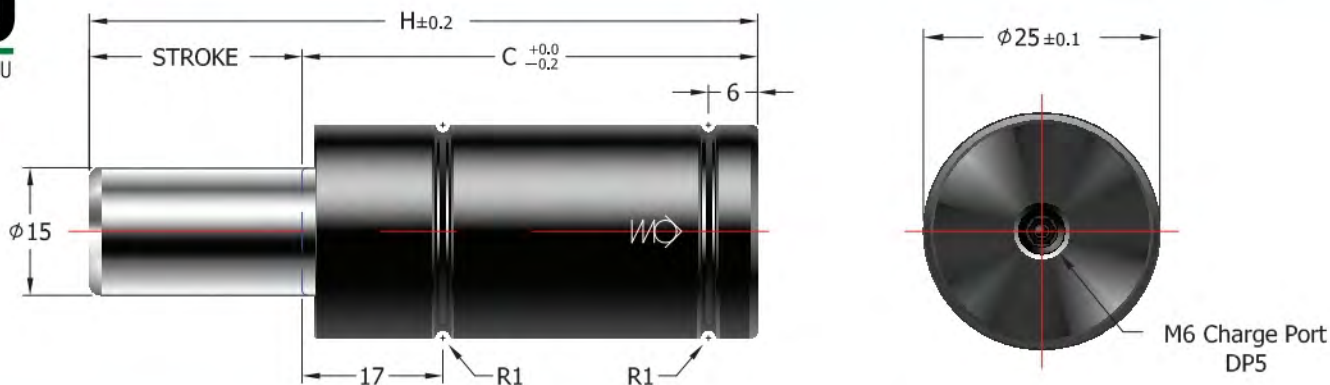
XP0170 MOUNT





TSP0320

NITROGEN GAS SPRING



규격 표기법

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

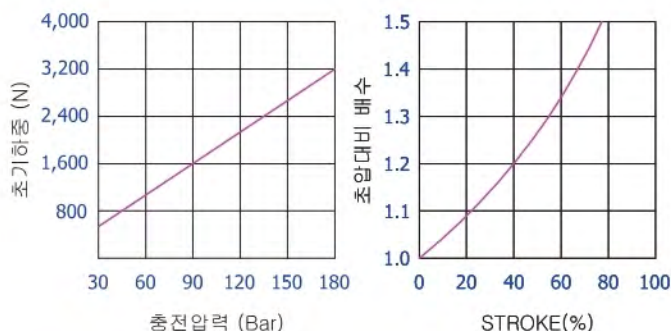
[주의!] TSP0320은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(180Bar)으로 출고됩니다.

TSP0320

Stroke		H	C	Force(N) (180 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
7	0.28	44	37	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

충전압력/압축량 대비 하중변화도표



TSP0320의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{17.7}$$

ex) 필요한 초기하중 2,500N인 GAS SPRING의 충전압력은?

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

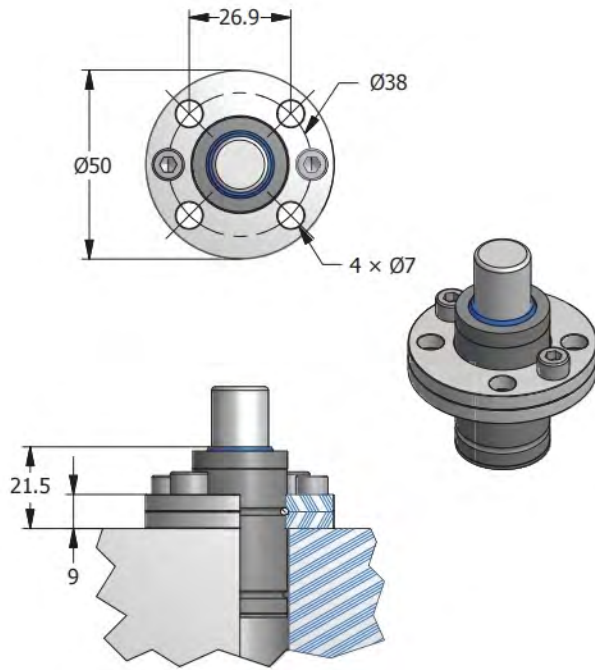


★ Bottom thread

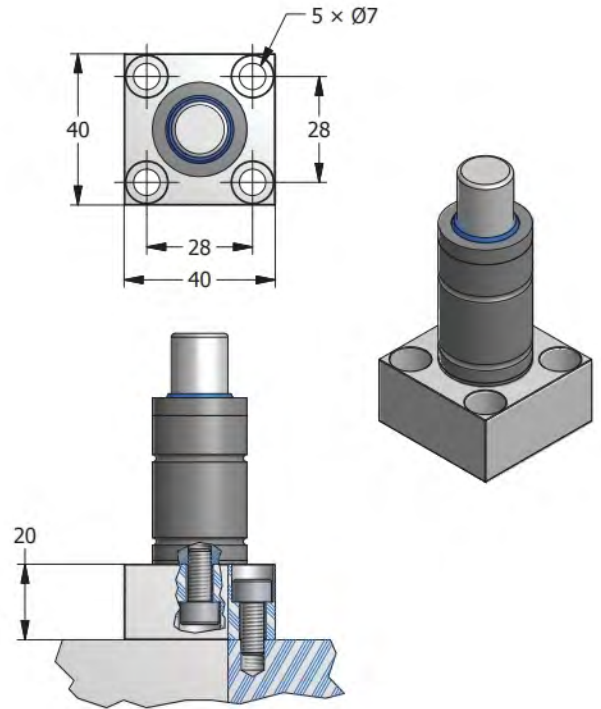
only to be used for strokes 7-25mm



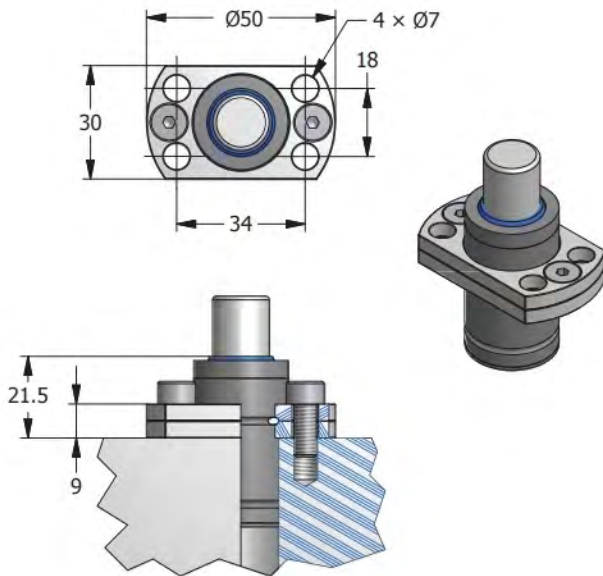
XR0320(SR0150) MOUNT



XB0320(SB0150) MOUNT



XG0320(SG0150) MOUNT





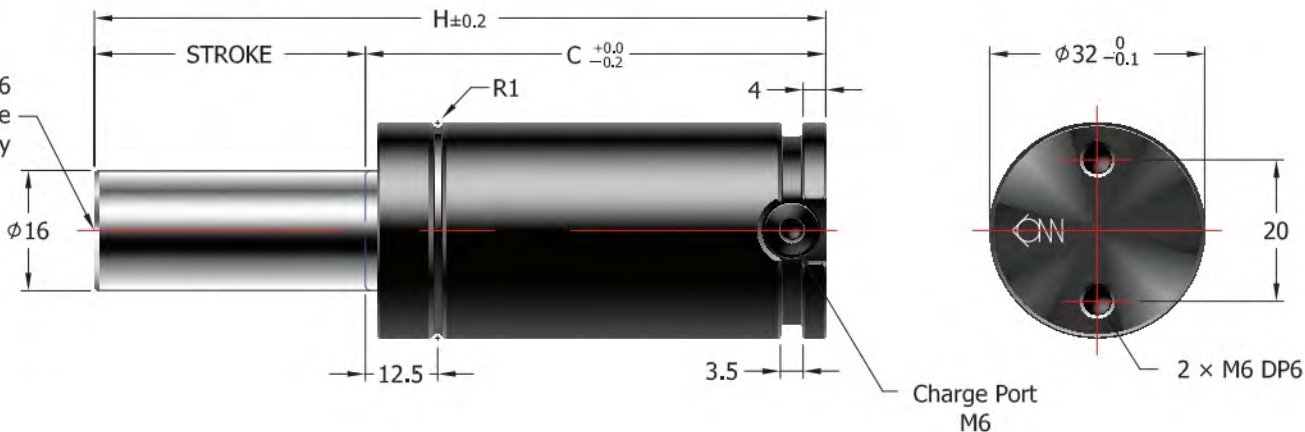
TSP0350

NITROGEN GAS SPRING



2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING TSP0350 × 050 S(F) - 180
 MODEL STROKE 단독형-S 충전압력 (Bar)
 배관형-F
 MOUNT XP0350
 REPAIR KIT RCX0350

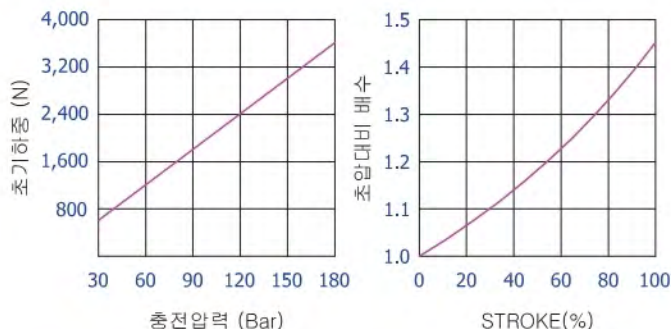
[주의!] TSP0350은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(180Bar)으로 출고됩니다.

TSP0350

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

* = at full stroke

■ 충전압력/압축량 대비 하중변화도표



■ TSP0350의 충전 압력(Bar) 계산식

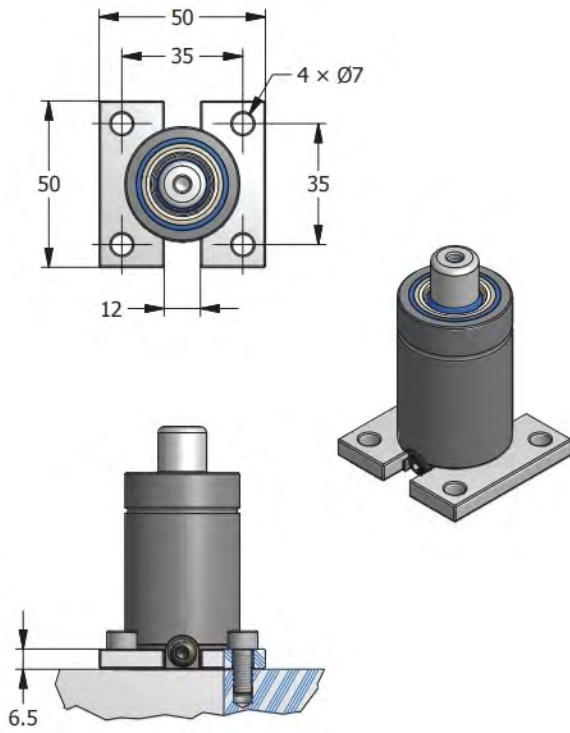
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{20.1}$$

ex) 필요한 초기하중 3,300N인 GAS SPRING의 충전압력은?

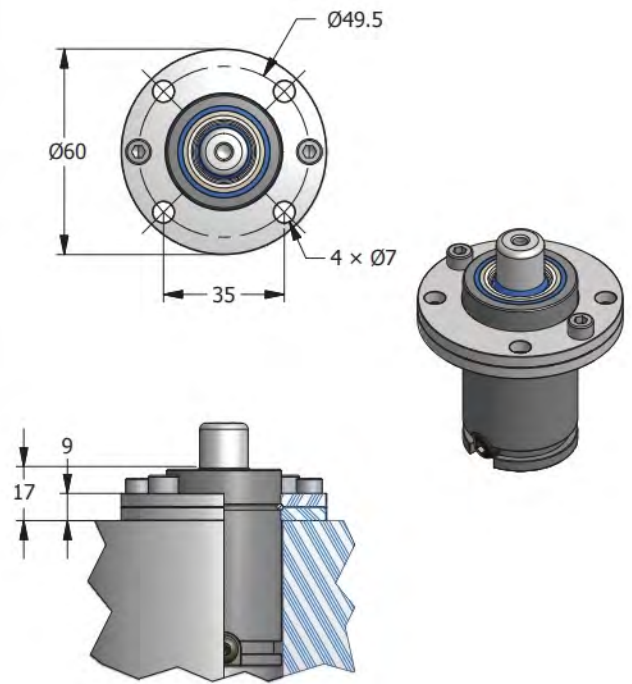
$$164(\text{Bar}) = \frac{3,300(\text{N})}{20.1}$$



XP0350 MOUNT



XR0350 MOUNT





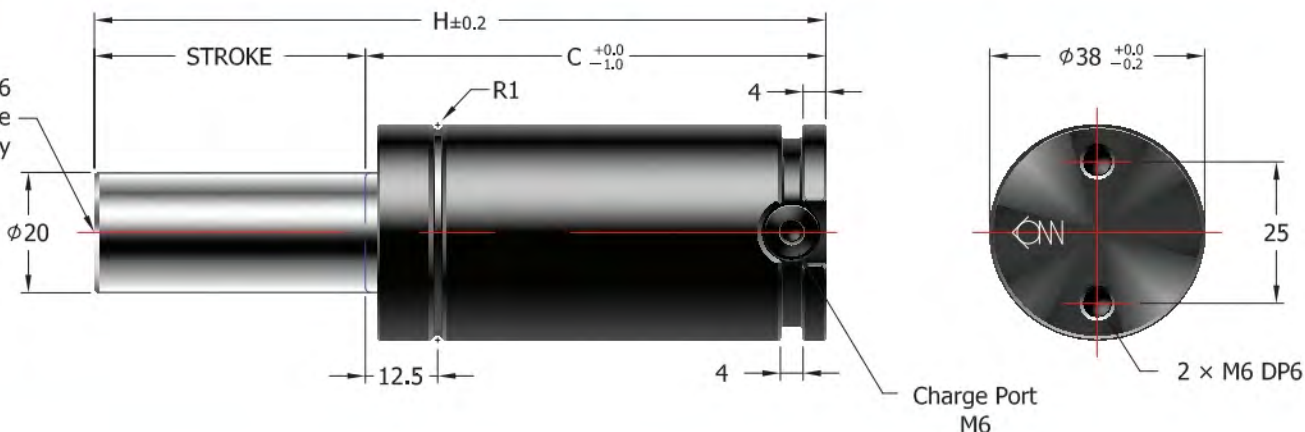
TSP0500

NITROGEN GAS SPRING



2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TSP0500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

150
충전압력
(Bar)

MOUNT

XP0500

REPAIR KIT

RCX0500

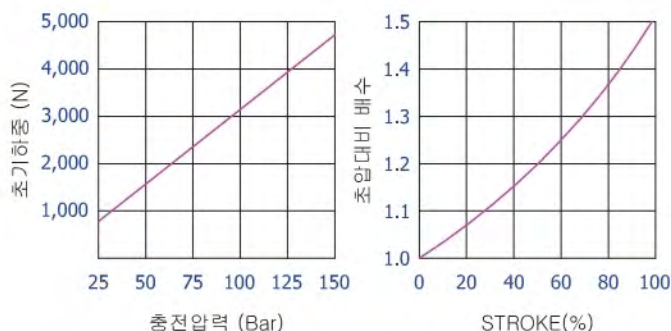
[주의!] TSP0500은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSP0500

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
10	0.39	50	40	4,700	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		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

■ 충전압력/압축량 대비 하중변화도표



■ TSP0500의 충전 압력(Bar) 계산식

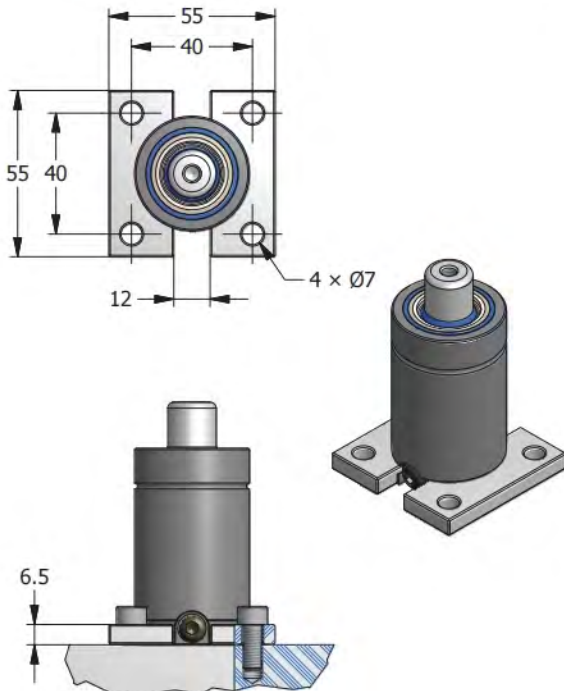
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{31.4}$$

ex) 필요한 초기하중 4,000N인 GAS SPRING의 충전압력은?

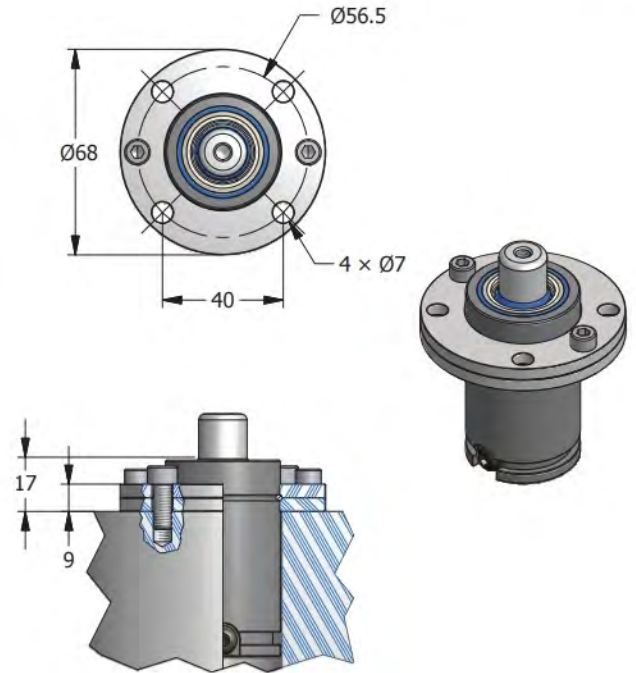
$$127(\text{Bar}) = \frac{4,000(\text{N})}{31.4}$$



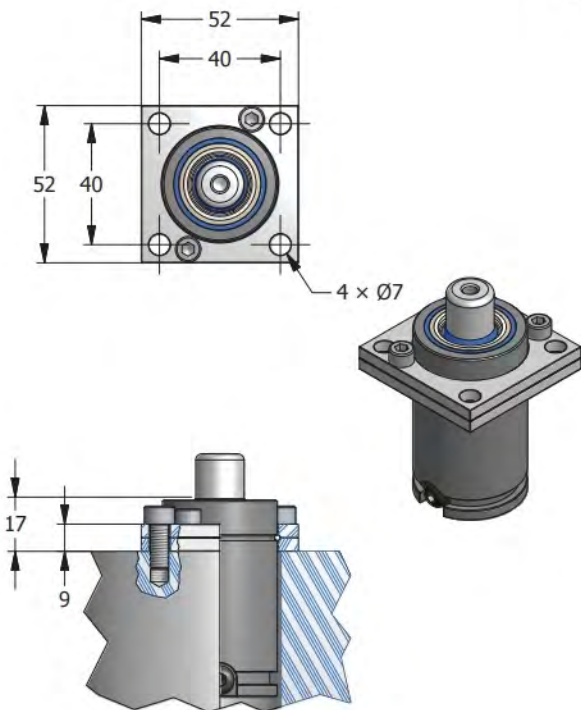
XP0500(SP0300) MOUNT



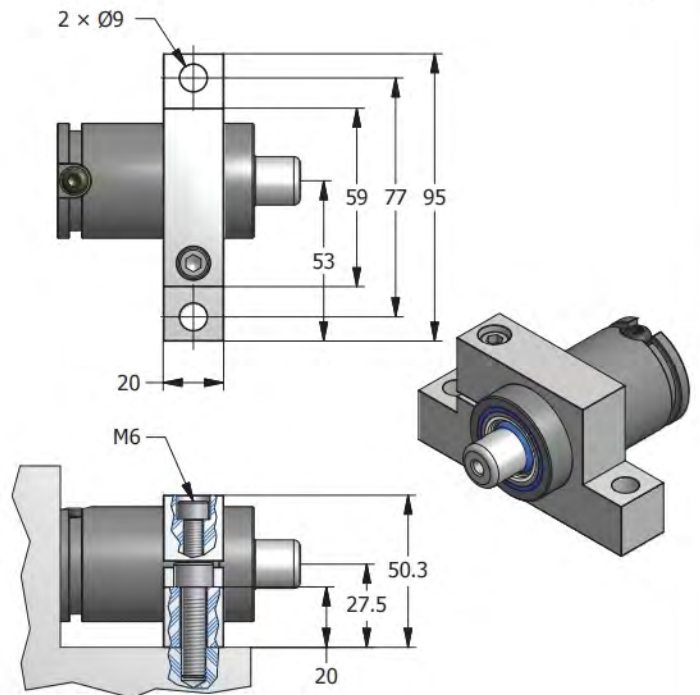
XR0500(SR0300) MOUNT



XT0500(ST0300) MOUNT



XC0500(SC0300) MOUNT





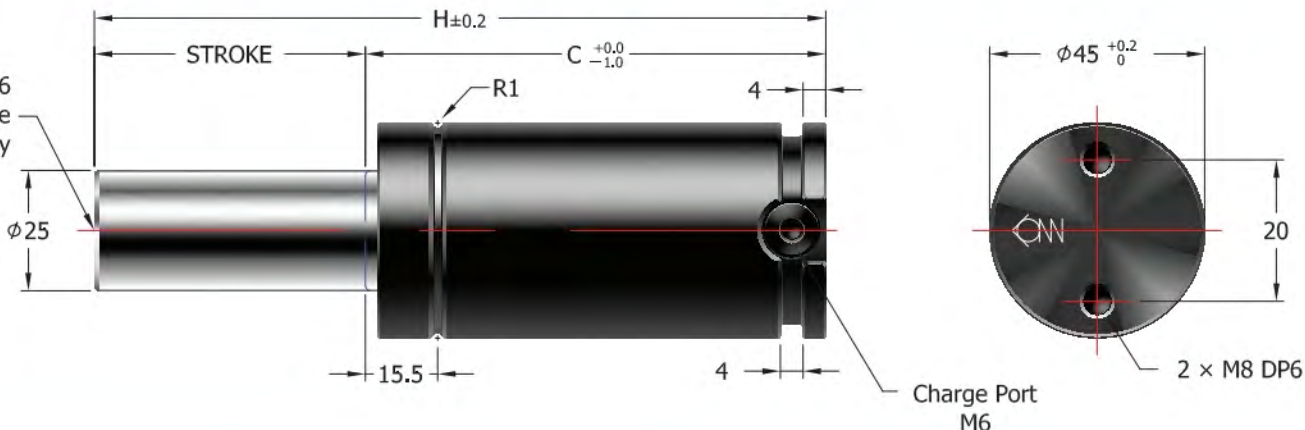
TSP0750

NITROGEN GAS SPRING



2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TSP0750
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

150
충전압력
(Bar)

MOUNT

XP0750

REPAIR KIT

RCX0750

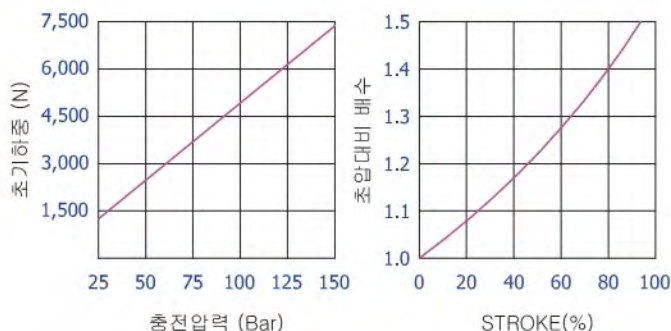
[주의!] TSP0750은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSP0750

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
10	0.39	52	42	7,400	10,600	15.9	0.40
13	0.51	58	45	7,400	10,900	19.8	0.42
16	0.63	64	48	7,400	11,000	23.7	0.44
20	0.79	72	52	7,400	11,100	28.9	0.47
25	0.98	82	57	7,400	11,300	35.4	0.50
30	1.18	92	62	7,400	11,300	41.9	0.53
35	1.38	102	67	7,400	11,400	48.4	0.56
38	1.50	108	70	7,400	11,400	52.3	0.58
40	1.57	112	72	7,400	11,400	55.0	0.59
45	1.77	122	77	7,400	11,500	61.5	0.63
50	1.97	132	82	7,400	11,500	68.0	0.66
60	2.36	152	92	7,400	11,600	81.0	0.72
63	2.48	158	95	7,400	11,600	84.9	0.74
70	2.76	172	102	7,400	11,600	94.0	0.79
75	2.95	182	107	7,400	11,600	100.5	0.82
80	3.15	192	112	7,400	11,600	107.0	0.85
90	3.54	212	122	7,400	11,600	120.0	0.92
100	3.94	232	132	7,400	11,700	133.0	0.98
125	4.92	282	157	7,400	11,700	165.6	1.14

* = at full stroke

충전압력/압축량 대비 하중변화도표



TSP0750의 충전 압력(Bar) 계산식

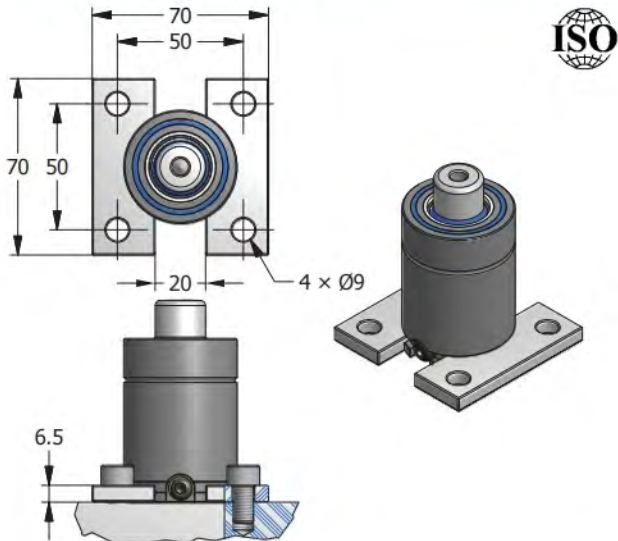
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{49.1}$$

ex) 필요한 초기하중 6,000N인 GAS SPRING의 충전압력은?

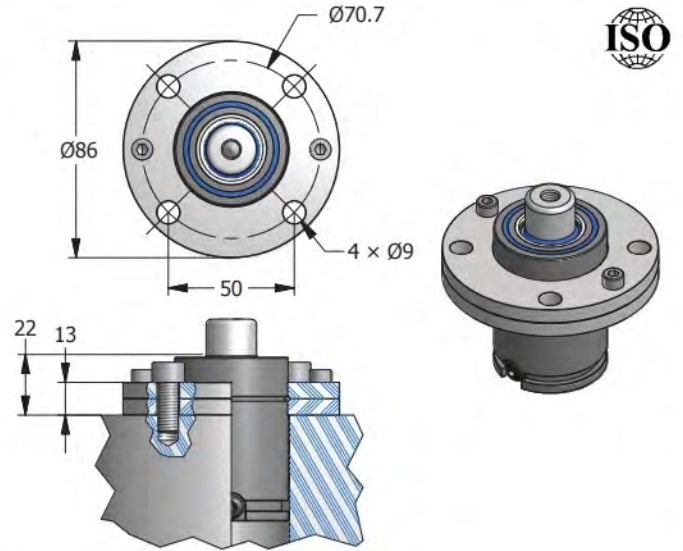
$$122(\text{Bar}) = \frac{6,000(\text{N})}{49.1}$$



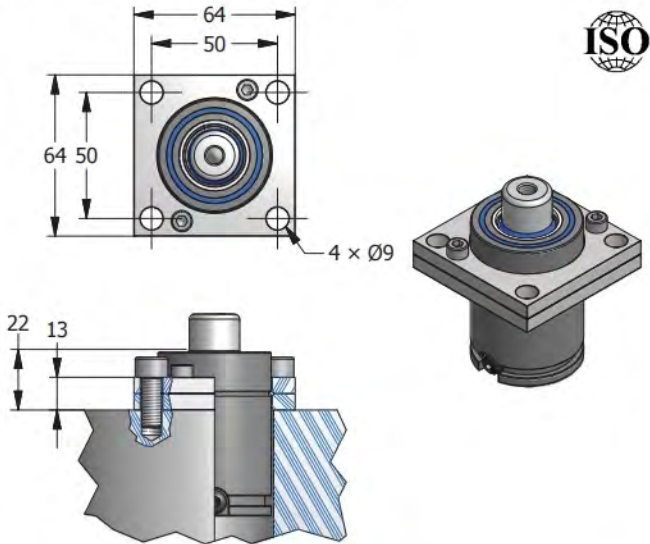
XP0750(SP0500) MOUNT



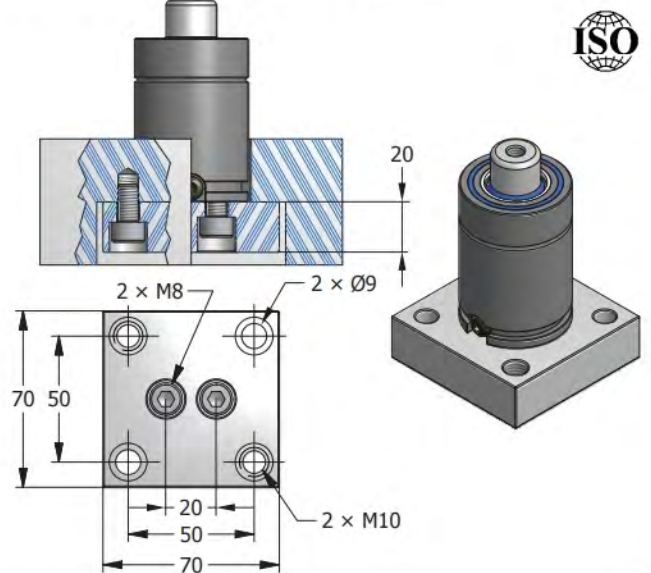
XR0750(SR0500) MOUNT



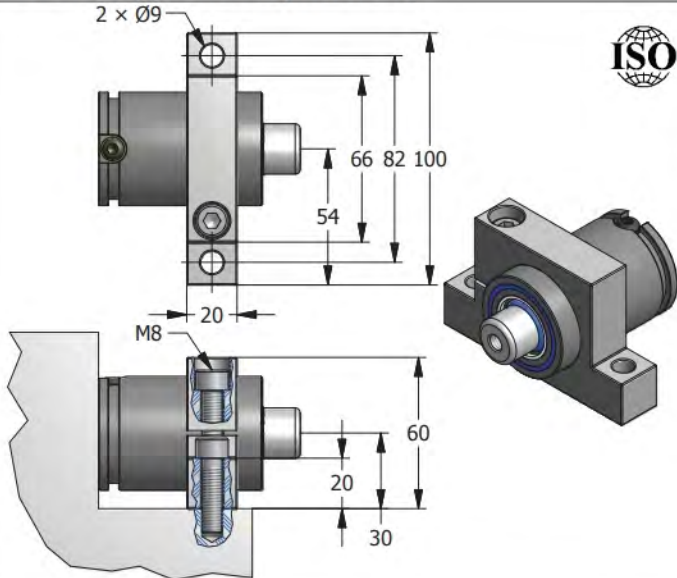
XT0750(ST0500) MOUNT



XB0750(SB0500) MOUNT



XC0750(SC0500) MOUNT





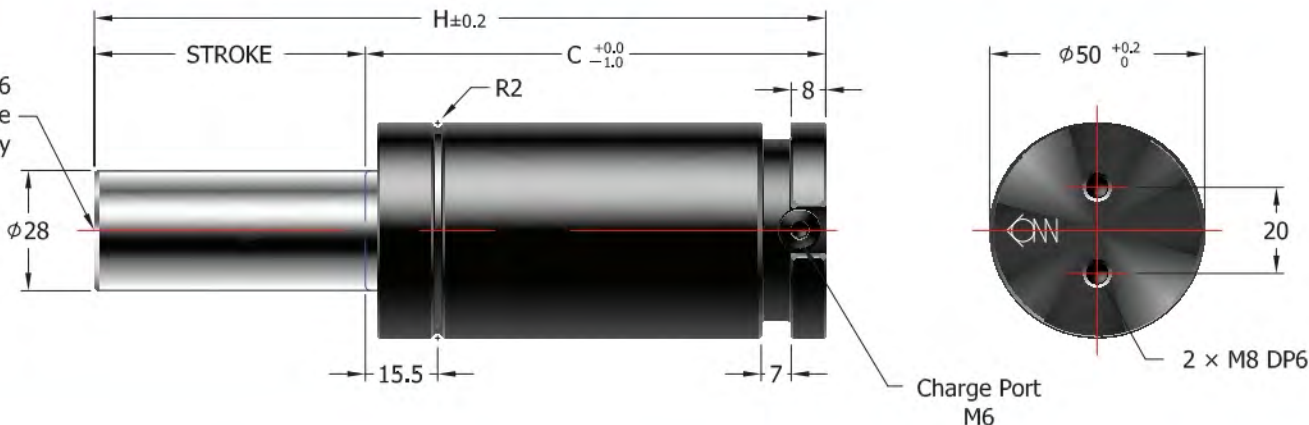
TSP1000

NITROGEN GAS SPRING



2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TSP1000
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XP1000

REPAIR KIT

RCX1000

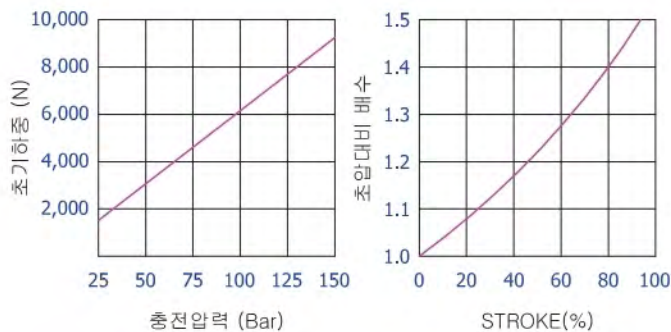
[주의!] TSP1000은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSP1000

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
13	0.51	64	51	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

■ 충전압력/압축량 대비 하중변화도표



■ TSP1000의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{61.5}$$

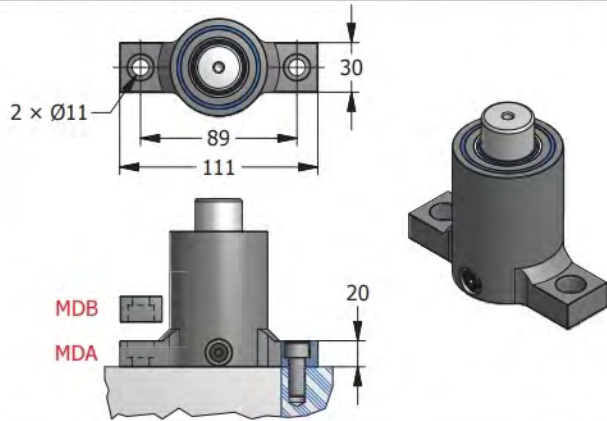
ex) 필요한 초기하중 8,500N인 GAS SPRING의 충전압력은?

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



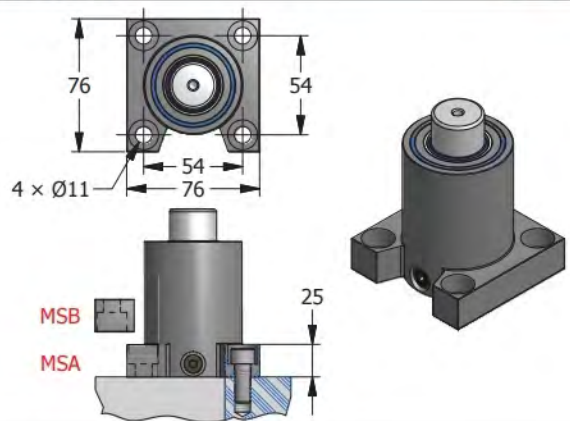
MD MOUNT

일체형



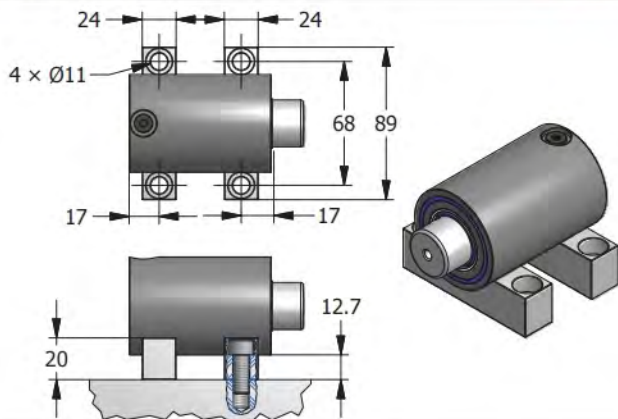
MS MOUNT

일체형

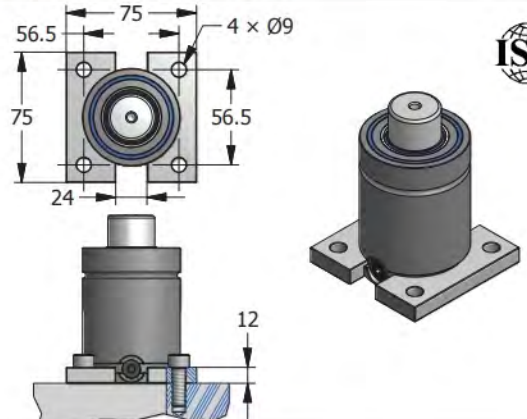


MK MOUNT

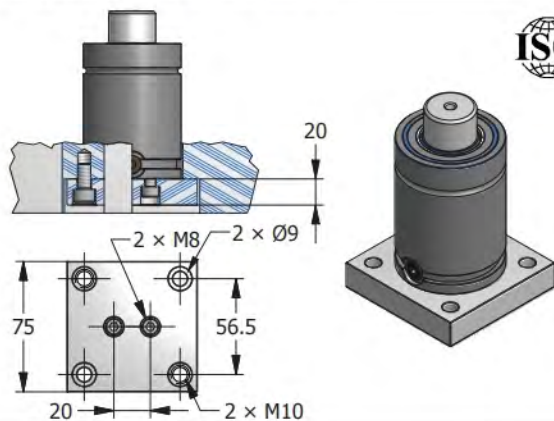
일체형



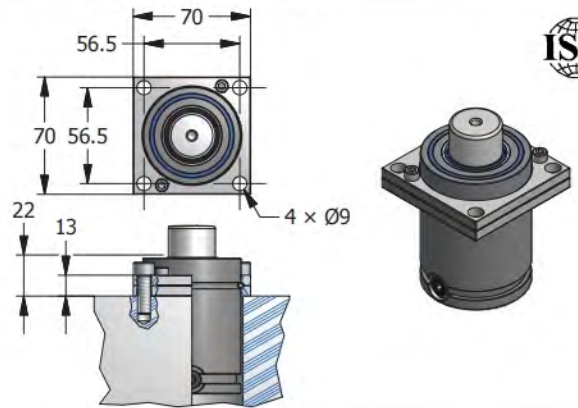
XP1000(SP0750) MOUNT



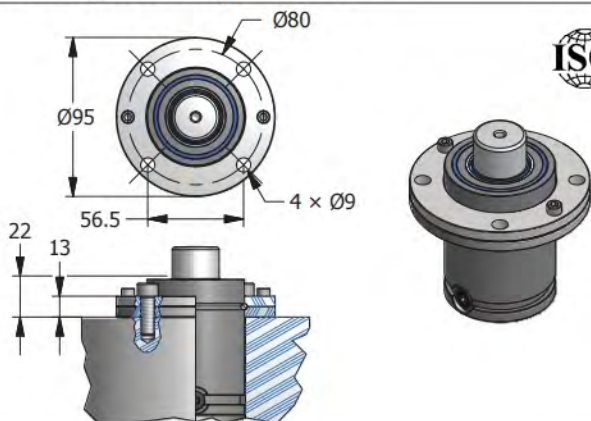
XB1000(SB0750) MOUNT



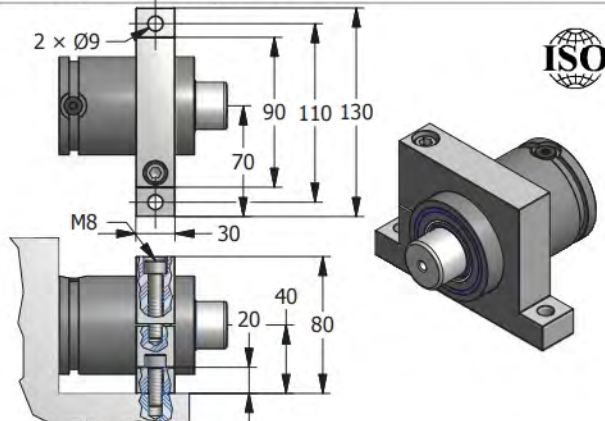
XT1000(ST0750) MOUNT



XR1000(SR0750) MOUNT



XC1000(SC0750) MOUNT





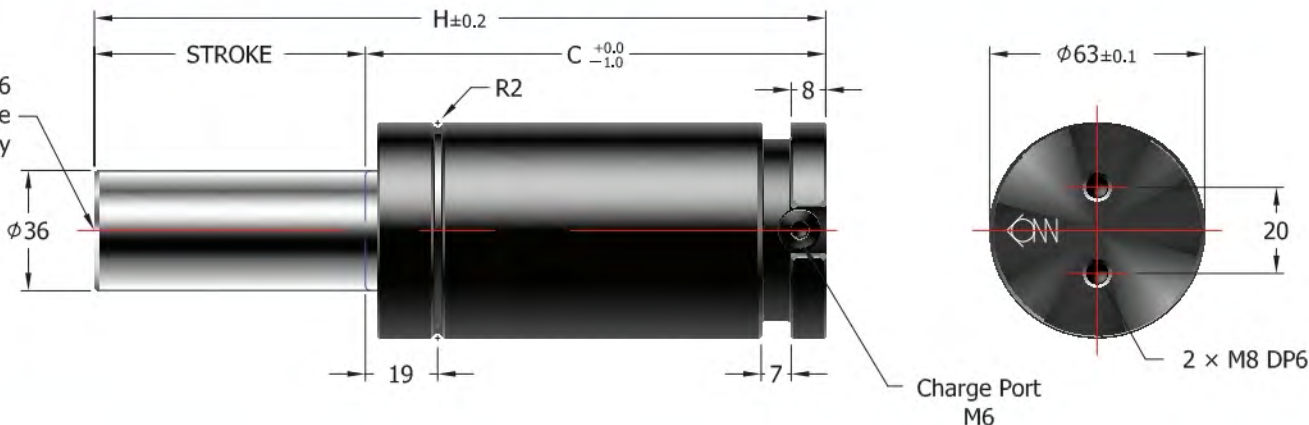
TSP1500

NITROGEN GAS SPRING



2014/68/EU

M6
Maintenance only



규격 표기법

GAS SPRING

TSP1500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XP1500

REPAIR KIT

RCX1500

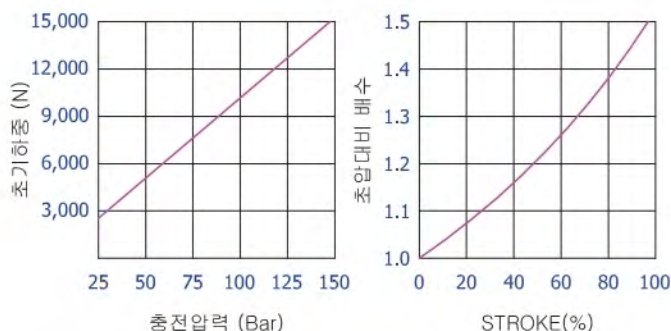
[주의!] TSP1500은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSP1500

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
13	0.51	70	57	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

■ 충전압력/압축량 대비 하중변화도표



■ TSP1500의 충전 압력(Bar) 계산식

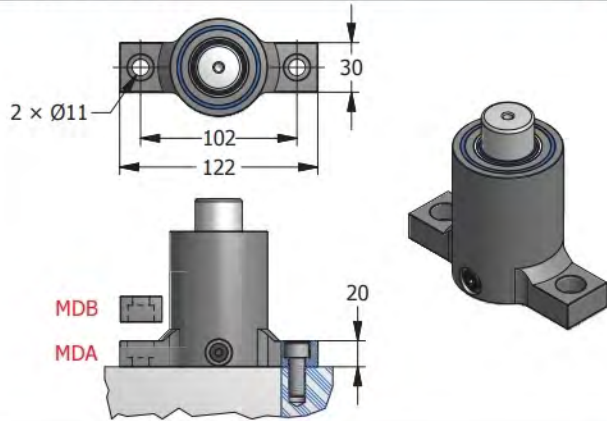
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{101.7}$$

ex) 필요한 초기하중 12,000N인 GAS SPRING의 충전압력은?

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

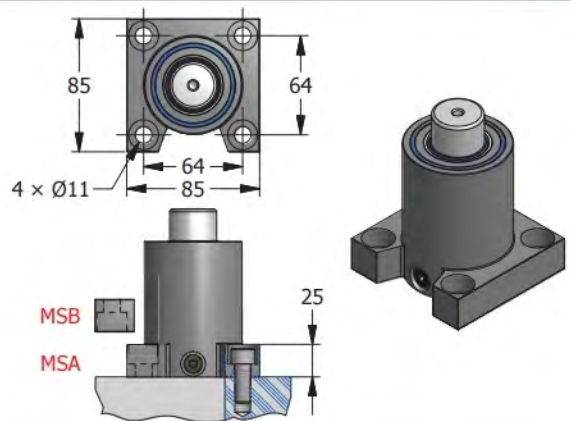
MD MOUNT

일체형



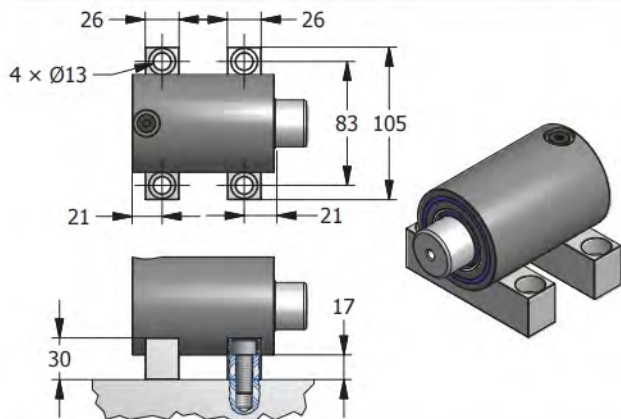
MS MOUNT

일체형

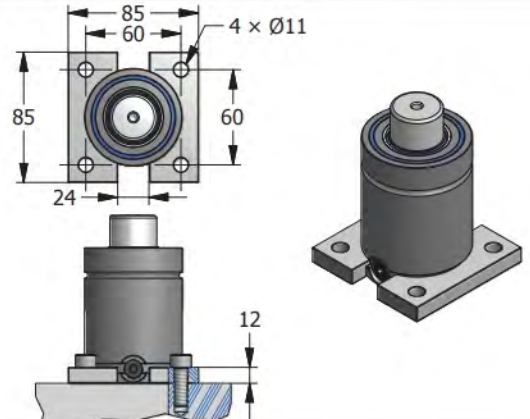


MK MOUNT

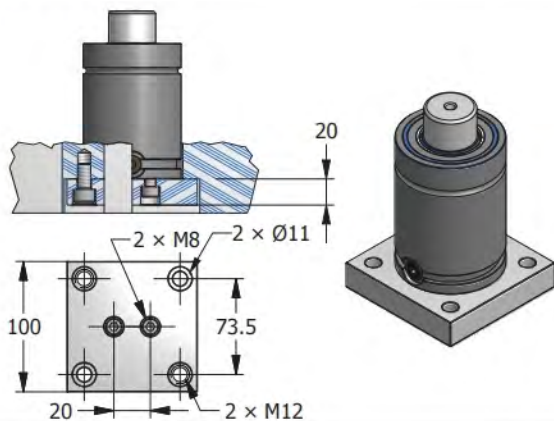
일체형



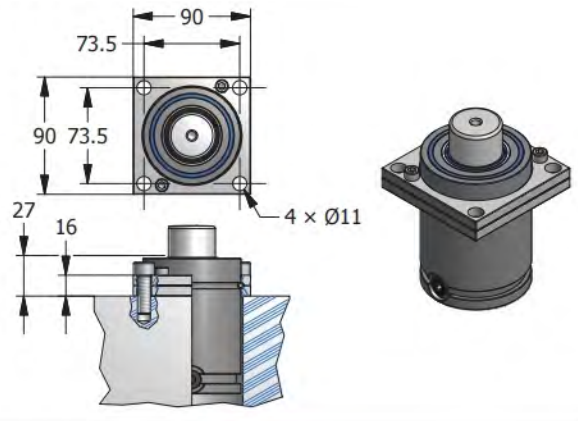
XP1500 MOUNT



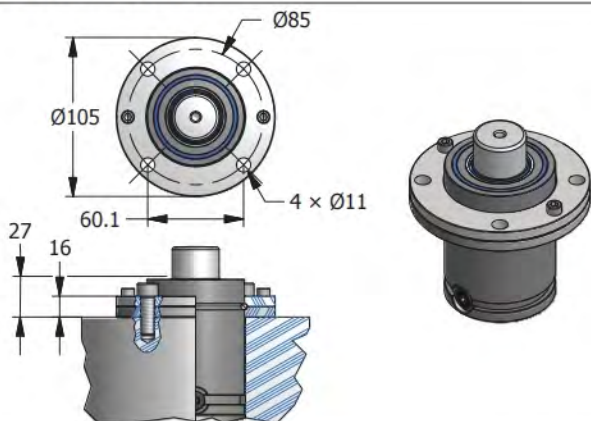
XB1500 MOUNT



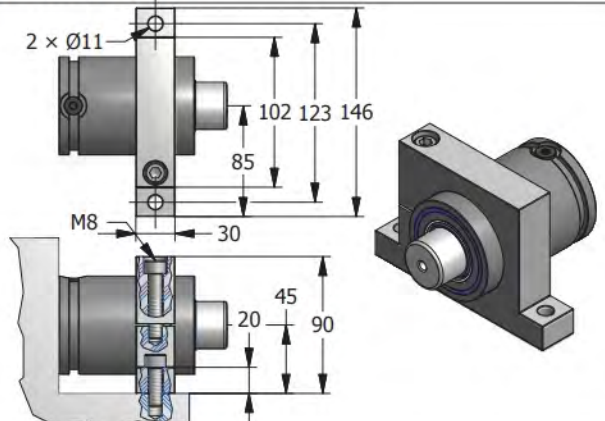
XT1500 MOUNT



XR1500 MOUNT



XC1500 MOUNT





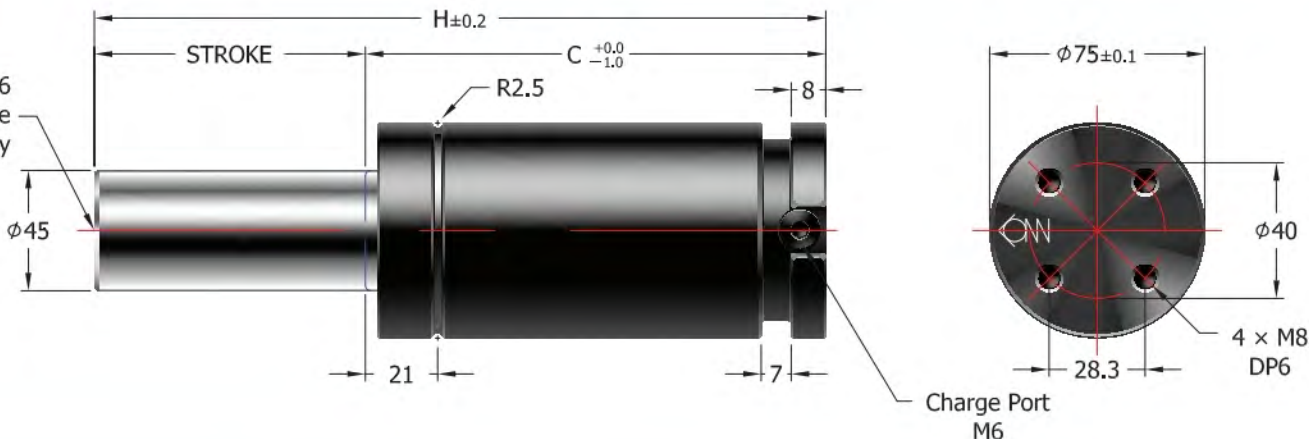
TSP2400

NITROGEN GAS SPRING



2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TSP2400
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XP2400

REPAIR KIT

RCX2400

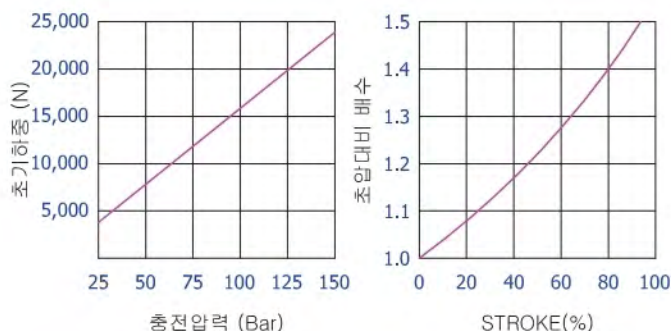
[주의!] TSP2400은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSP2400

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
16	0.63	77	61	23,800	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		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

■ 충전압력/압축량 대비 하중변화도표



■ TSP2400의 충전 압력(Bar) 계산식

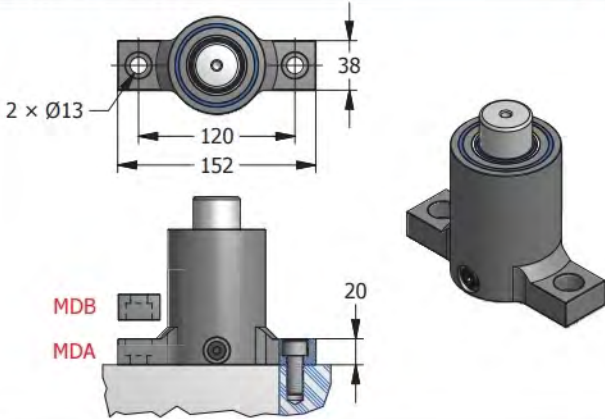
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{159.0}$$

ex) 필요한 초기하중 20,000N인 GAS SPRING의 충전압력은?

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

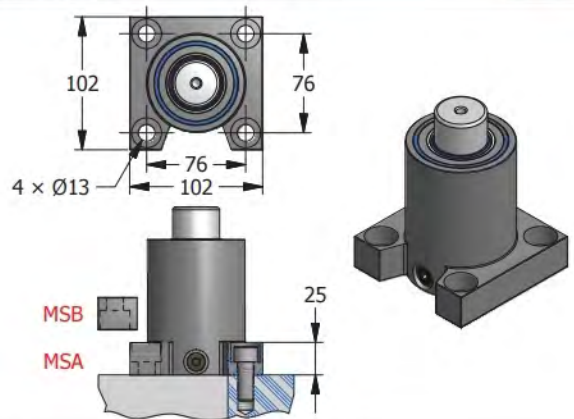
MD MOUNT

일체형



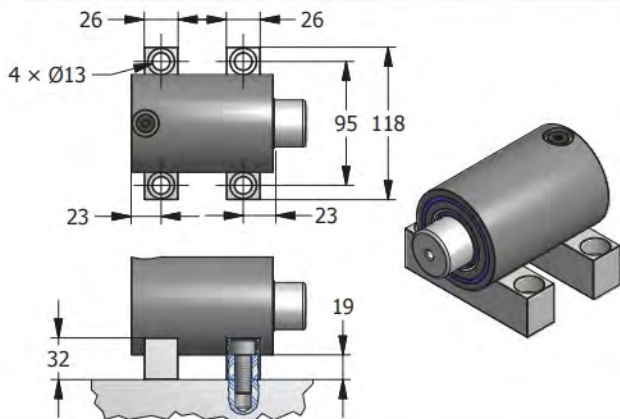
MS MOUNT

일체형

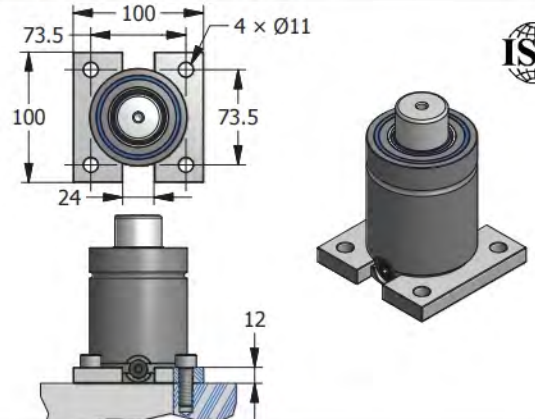


MK MOUNT

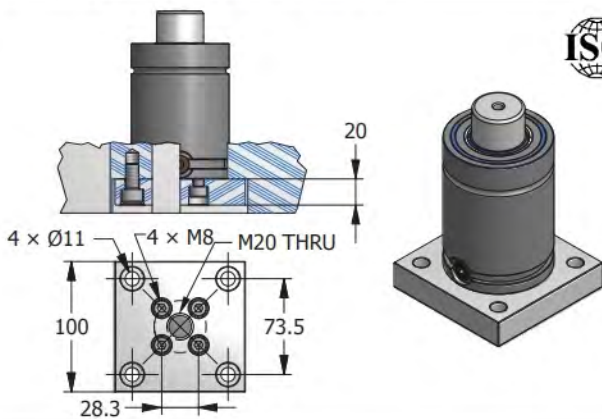
일체형



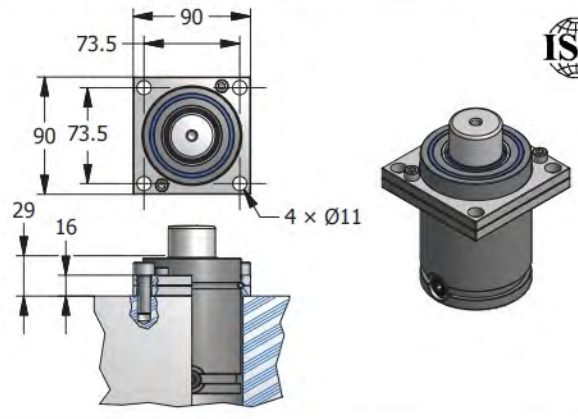
XP2400(SP1500) MOUNT



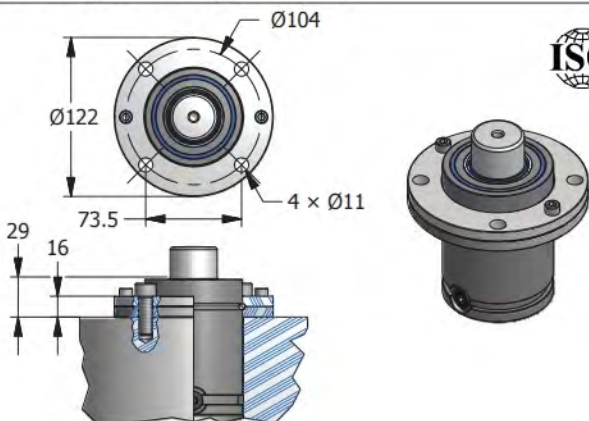
XB2400(SB1500) MOUNT



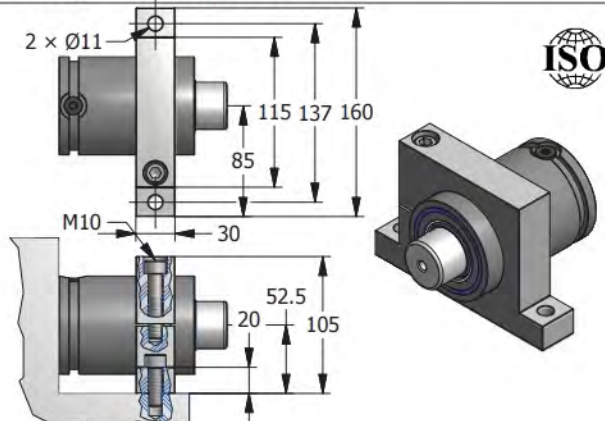
XT2400(ST1500) MOUNT



XR2400(SR1500) MOUNT



XC2400(SC1500) MOUNT





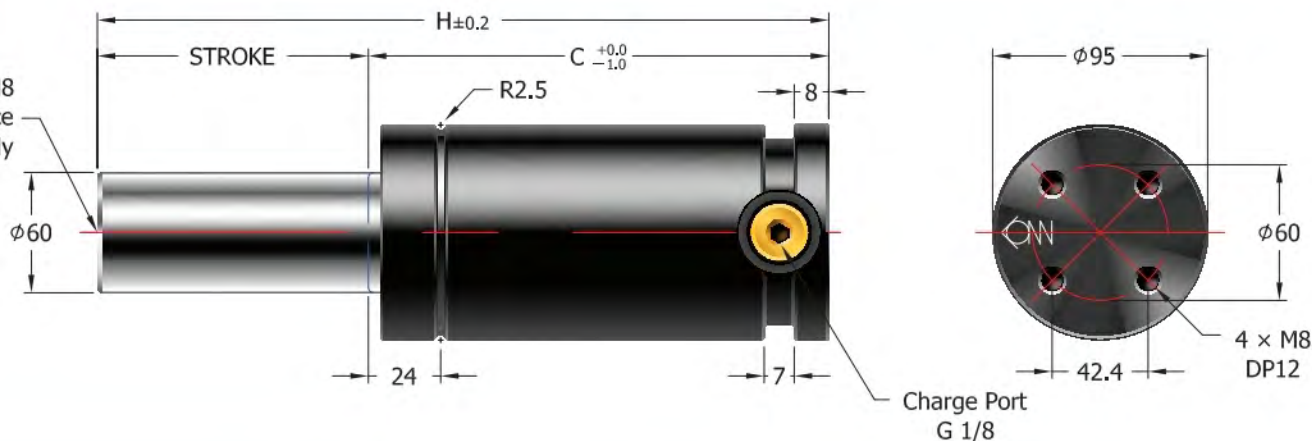
TSP4200

NITROGEN GAS SPRING



2014/68/EU

M8
Maintenance
only



규격 표기법

GAS SPRING TSP4200 × 050 S(F) - (MSA) - 150
 MODEL STROKE 단독형-S 일체형 마운트 (선택사항) 충전압력 (Bar)
 MOUNT XP4200
 REPAIR KIT RCX4200

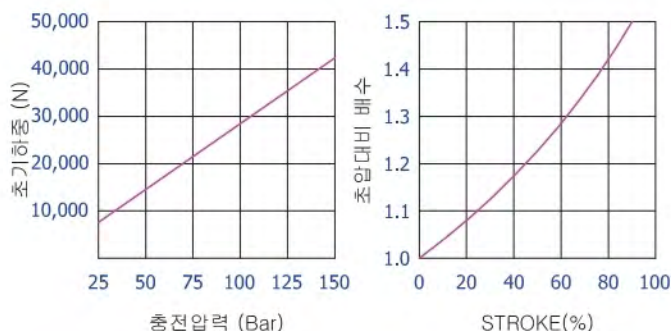
[주의!] TSP4200은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSP4200

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
16	0.63	90	74	42,200	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		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

■ 충전압력/압축량 대비 하중변화도표



■ TSP4200의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{282.6}$$

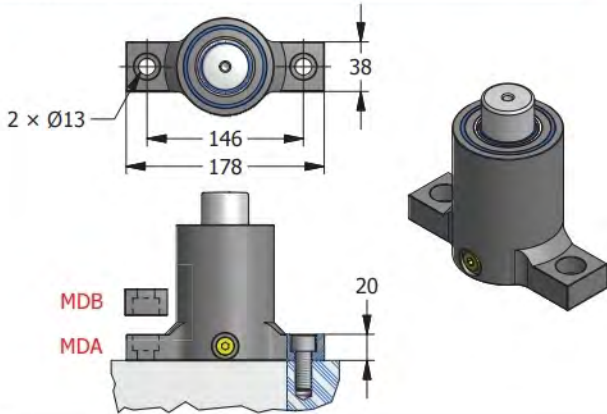
ex) 필요한 초기하중 35,000N인 GAS SPRING의 충전압력은?

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



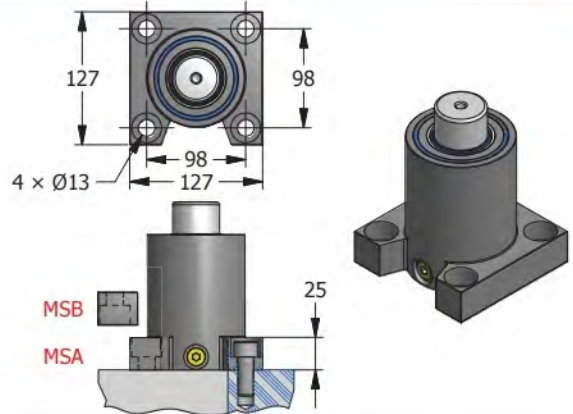
MD MOUNT

일체형



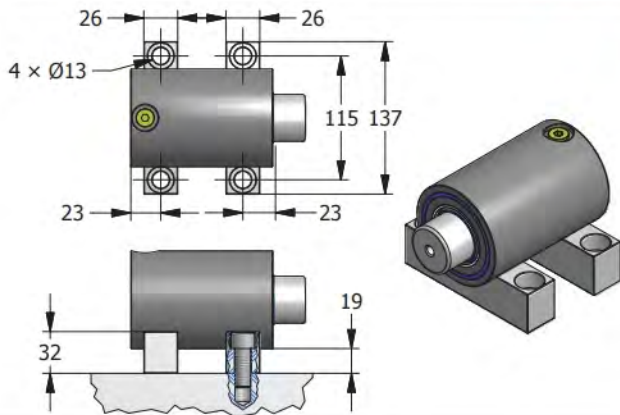
MS MOUNT

일체형

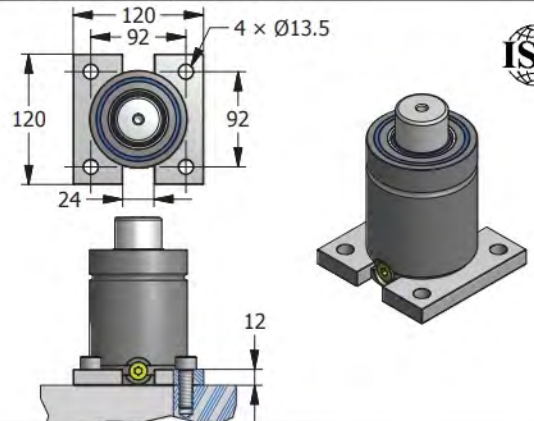


MK MOUNT

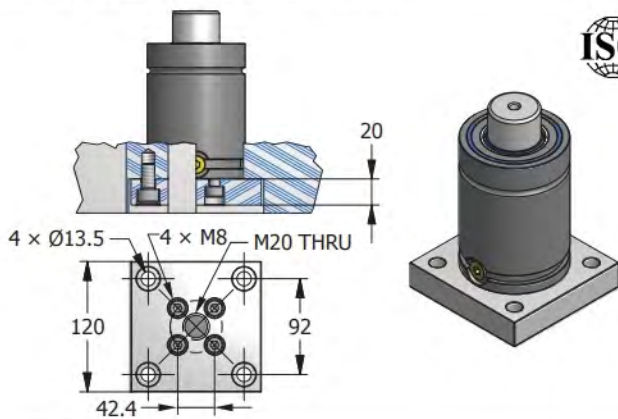
일체형



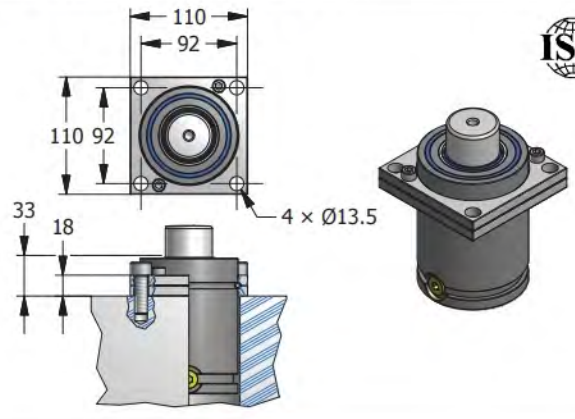
XP4200(SP3000) MOUNT



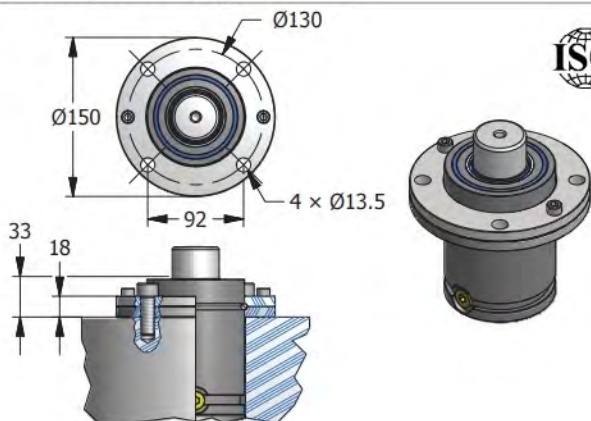
XB4200(SB3000) MOUNT



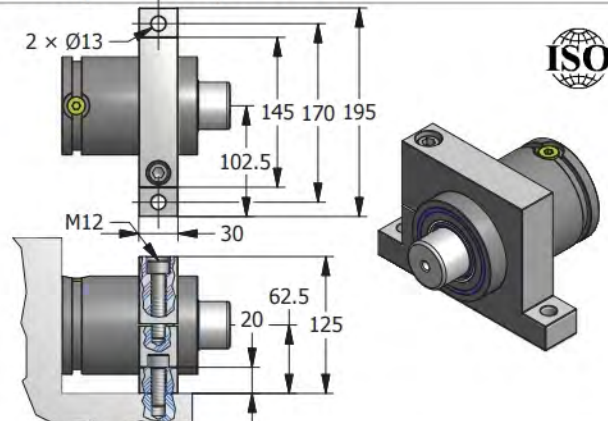
XT4200(ST3000) MOUNT



XR4200(SR3000) MOUNT



XC4200(SC3000) MOUNT





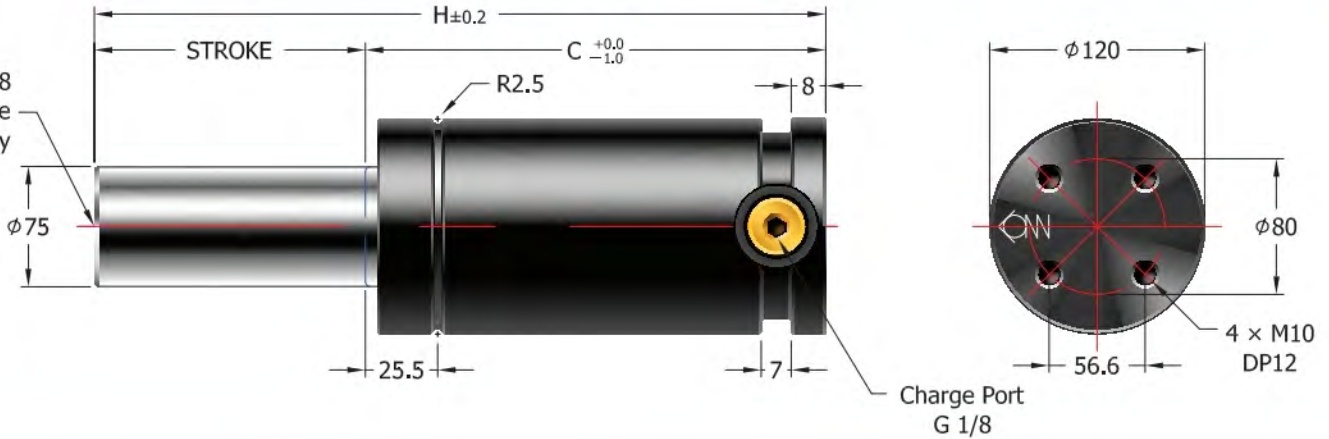
TSP6600

NITROGEN GAS SPRING

PED

2014/68/EU

M8
Maintenance
only



규격 표기법

GAS SPRING

TSP6600
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XP6600

REPAIR KIT

RCX6600

[주의!] TSP6600은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSP6600

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

■ 충전압력/압축량 대비 하중변화도표



■ TSP6600의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{441.6}$$

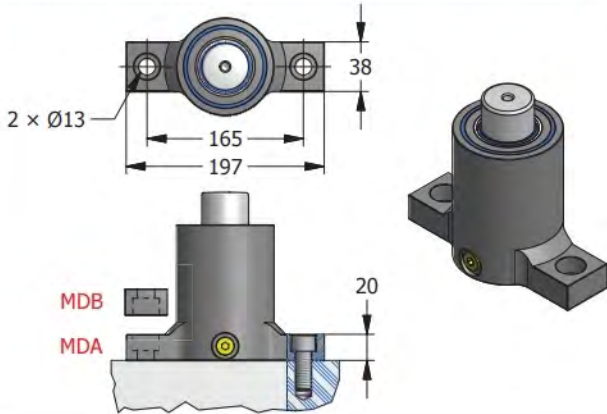
ex) 필요한 초기하중 60,000N인 GAS SPRING의 충전압력은?

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



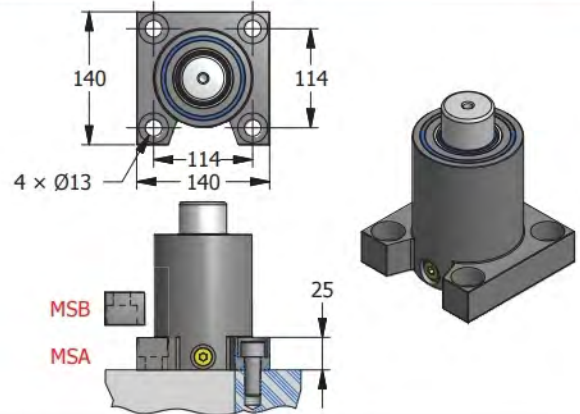
MD MOUNT

일체형



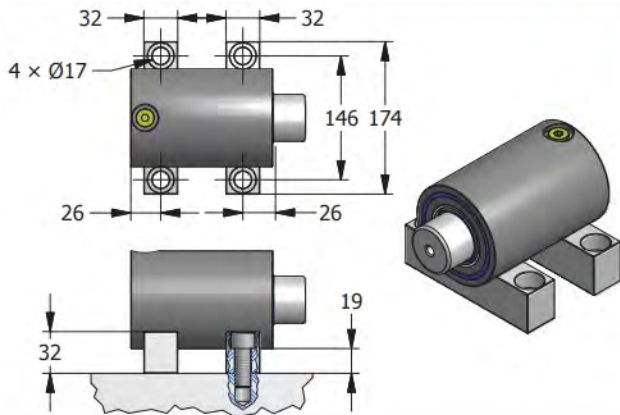
MS MOUNT

일체형

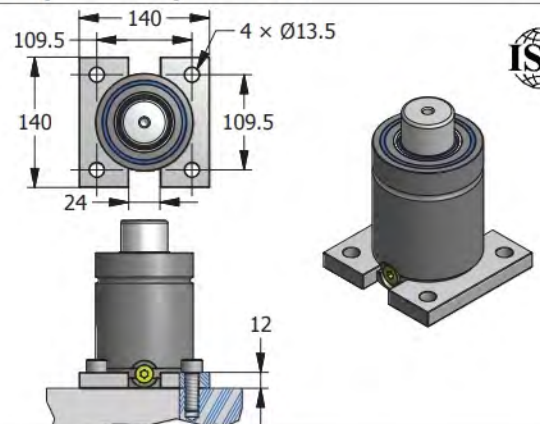


MK MOUNT

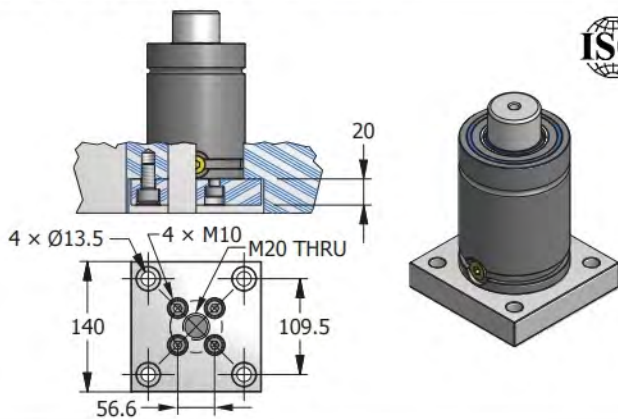
일체형



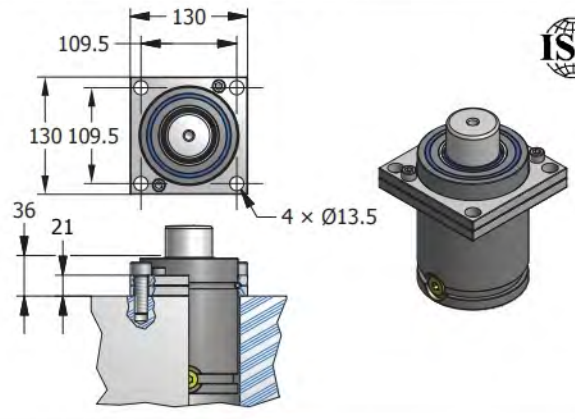
XP6600(SP5000) MOUNT



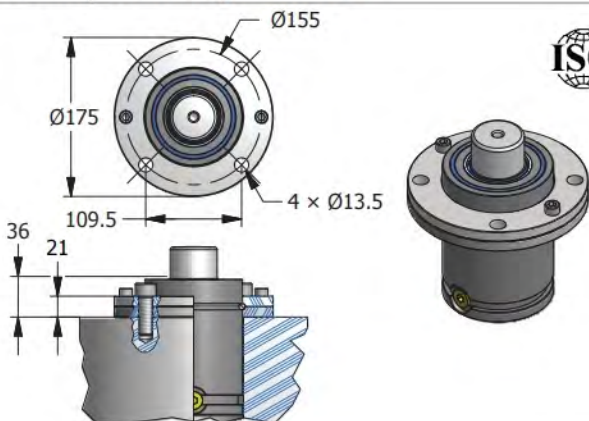
XB6600(SB5000) MOUNT



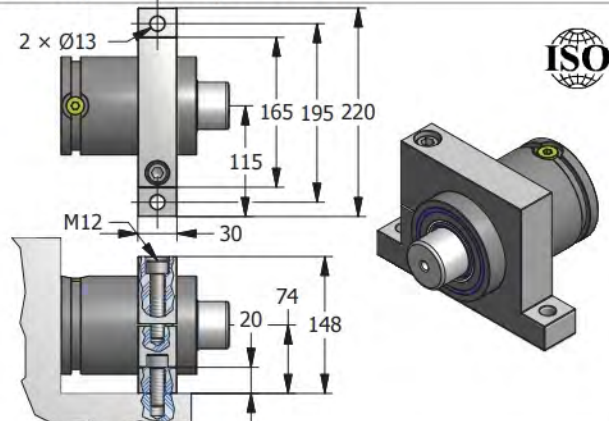
XT6600(ST5000) MOUNT



XR6600(SR5000) MOUNT



XC6600(SC5000) MOUNT





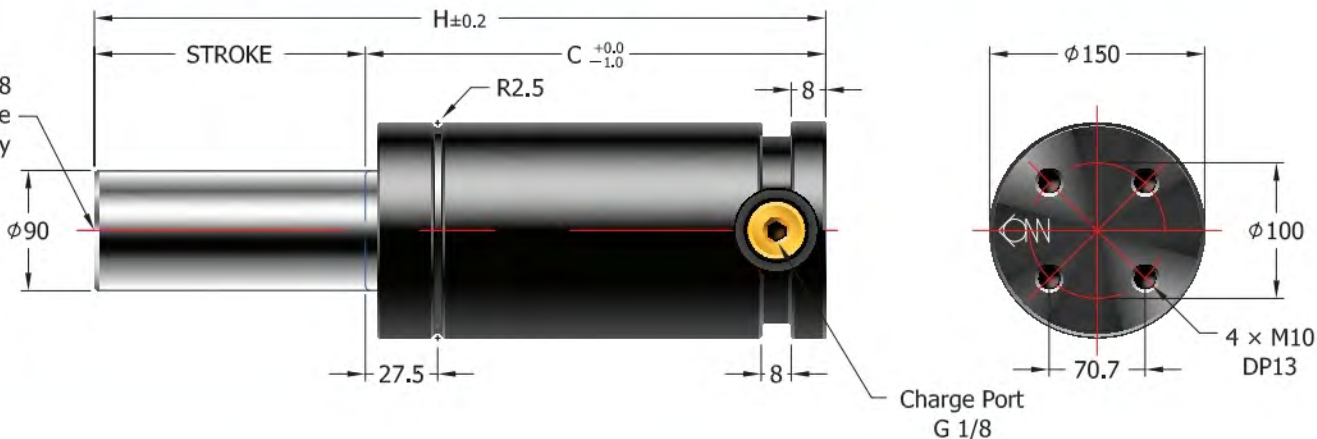
TSP9500

NITROGEN GAS SPRING



2014/68/EU

M8
Maintenance
only



규격 표기법

GAS SPRING

TSP9500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XP9500

REPAIR KIT

RCX9500

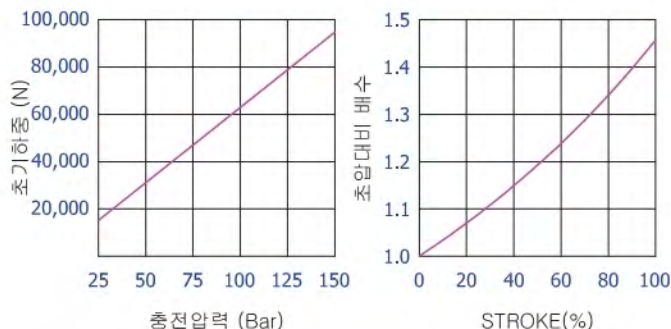
[주의!] TSP9500은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSP9500

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
20	0.79	118	98	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

■ 충전압력/압축량 대비 하중변화도표



■ TSP9500의 충전 압력(Bar) 계산식

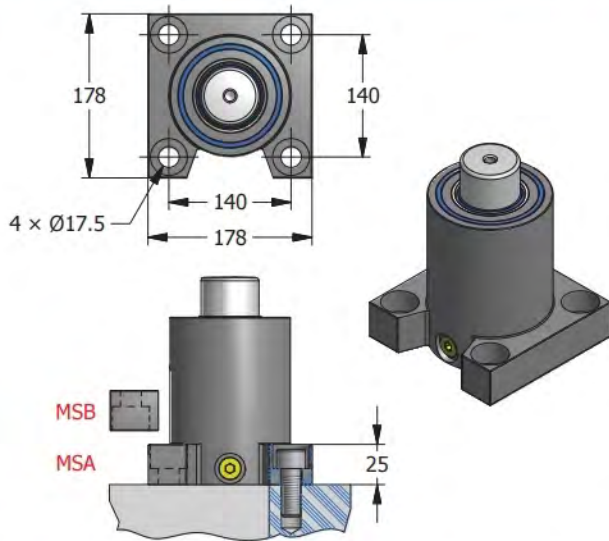
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{635.9}$$

ex) 필요한 초기하중 85,000N인 GAS SPRING의 충전압력은?

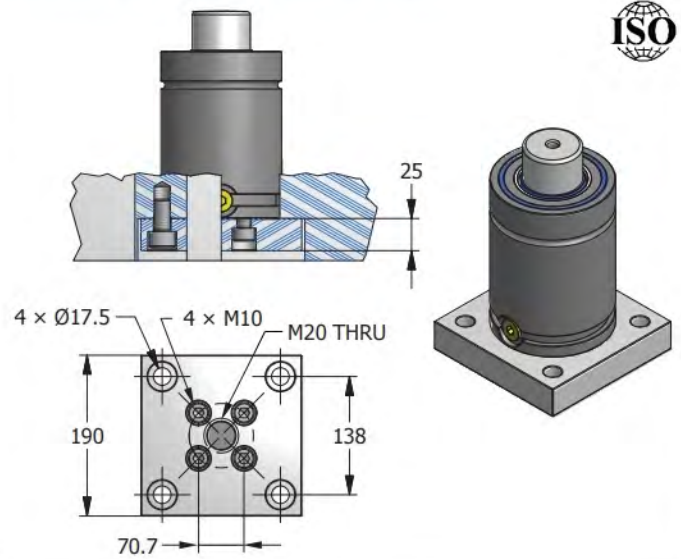
$$134(\text{Bar}) = \frac{85,000(\text{N})}{635.9}$$

MS MOUNT

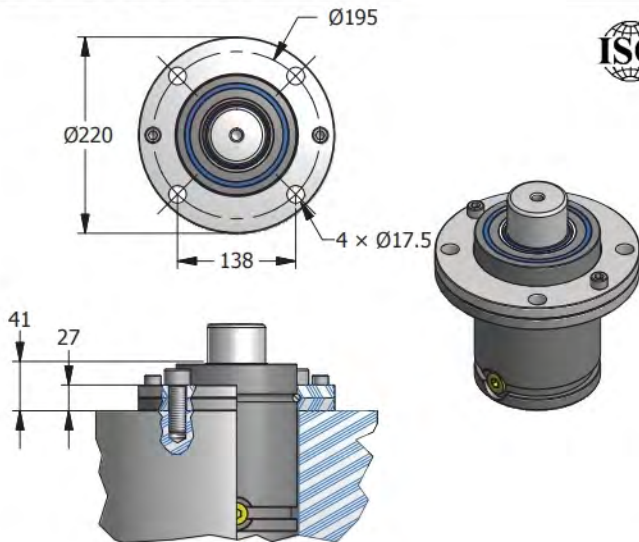
일체형



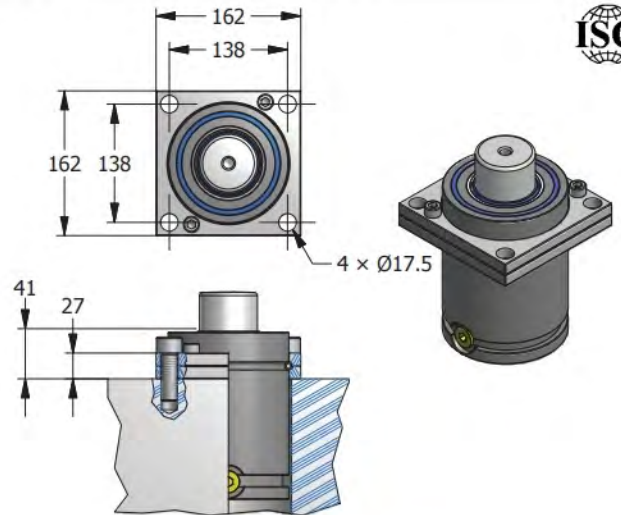
XB9500(SB7500) MOUNT



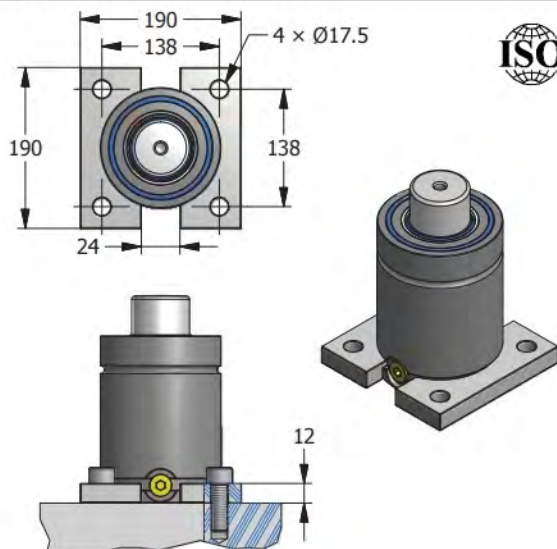
XR9500(SR7500) MOUNT



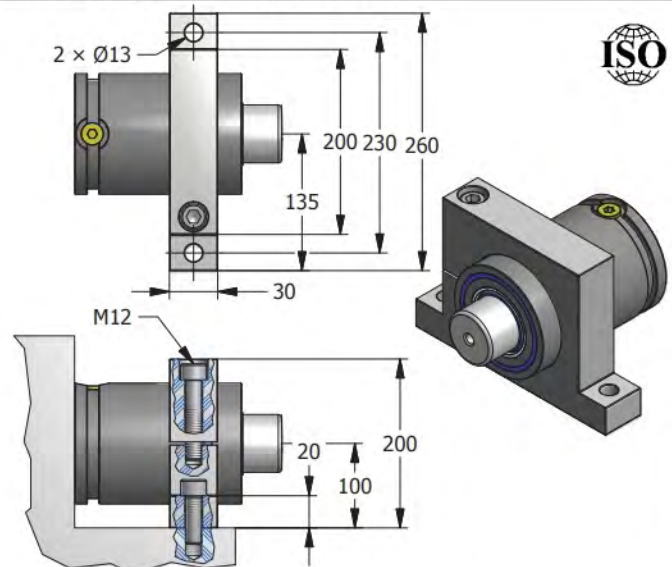
XT9500(ST7500) MOUNT

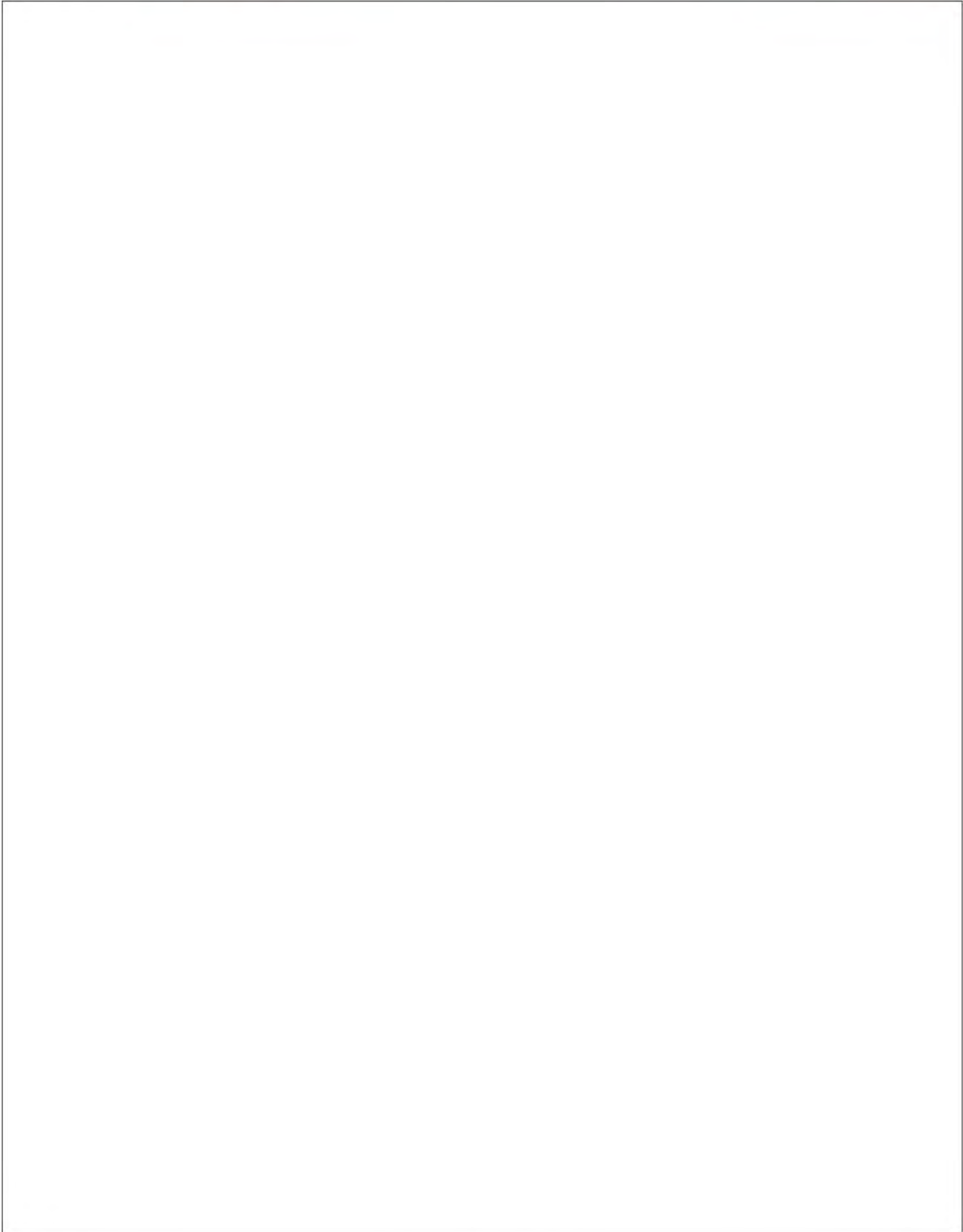


XP9500(SP7500) MOUNT



XC9500(SC7500) MOUNT







TSX SERIES



2014/68/EU



ISO 9001 인증기업



www.shinweon.com

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NITROGEN GAS SPRING



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STABLE XTRA HIGH POWER

■ 일반 제원

- 충전재
질소가스 (N₂)
- 최대 충전 압력
150 ~ 180 bar (at 20℃)
- 최소 충전 압력
25 bar (at 20℃)
- 작동 온도
0 to 80℃
- 온도에 따른 압력 증가량
±0.3% / ℃
- 분당 최대 스트로크 왕복
~50 to 100 (at 20℃)
- 피스톤 로드 속도
0 ~ 0.8 m/s
- 로드 표면처리
도금 열처리
- 실린더 표면처리
특산화 피막

■ Model별 제원

종류 TYPE	Stroke (mm)	실린더 외경 Φ(mm)	Rod 외경 Φ(mm)	초기하중 (N)	최대하중 (N)	최대충전압력
TSX0350	10~125	32	16	3,600	5,400	180Bar
TSX0500	10~125	38	20	4,700	7,200	150Bar
TSX0750	10~125	45	25	7,400	11,700	150Bar
TSX1000	13~125	50	28	9,200	14,600	150Bar
TSX1500	13~125	63	36	15,200	23,900	150Bar
TSX2400	16~125	75	45	23,800	38,100	150Bar
TSX4200	16~125	95	60	42,200	69,200	150Bar
TSX6600	16~125	120	75	66,000	105,600	150Bar

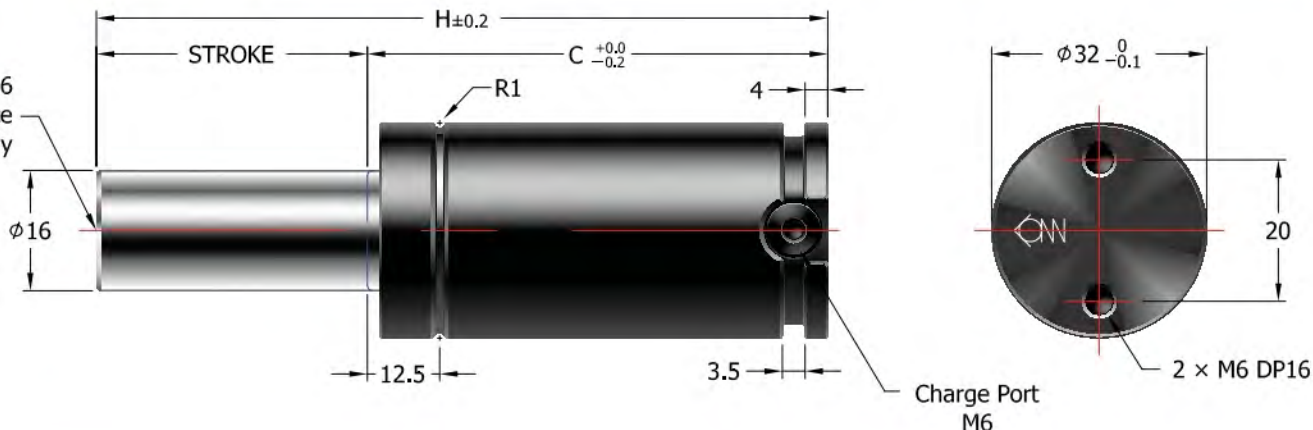
※ 상기 사양은 성능개선을 위해 예고없이 변경될 수 있습니다.





2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TSX0350
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

180
충전압력
(Bar)

MOUNT

XP0350

REPAIR KIT

RCX0350

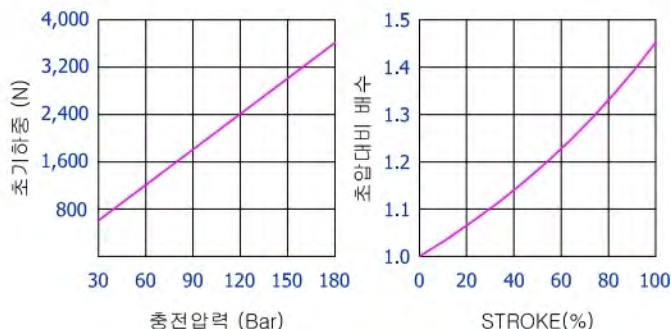
[주의!] TSX0350은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(180Bar)으로 출고됩니다.

TSX0350

Stroke		H	C	Force(N) (180 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(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	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

■ 충전압력/압축량 대비 하중변화도표



■ TSX0350의 충전 압력(Bar) 계산식

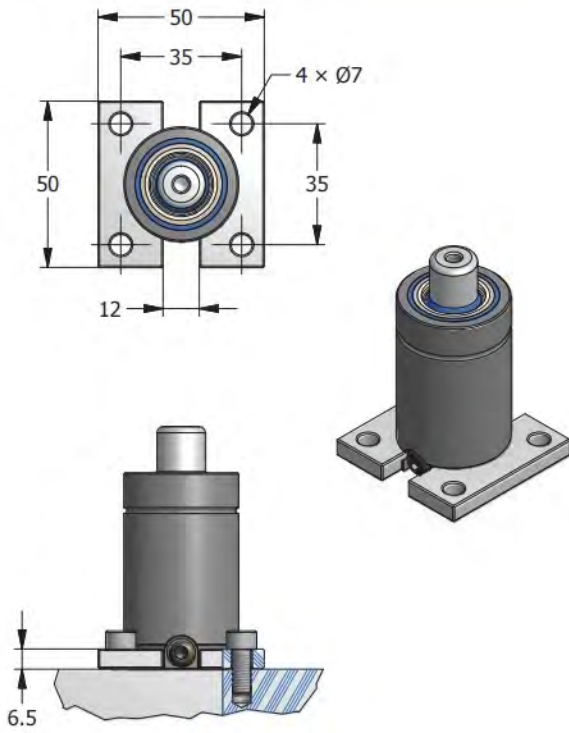
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{20.1}$$

ex) 필요한 초기하중 3,300N인 GAS SPRING의 충전압력은?

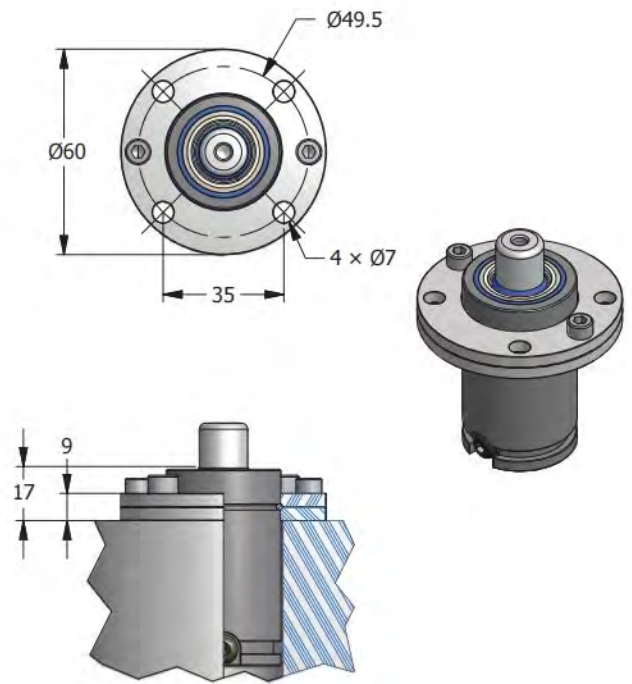
$$164(\text{Bar}) = \frac{3,300(\text{N})}{20.1}$$



XP0350 MOUNT



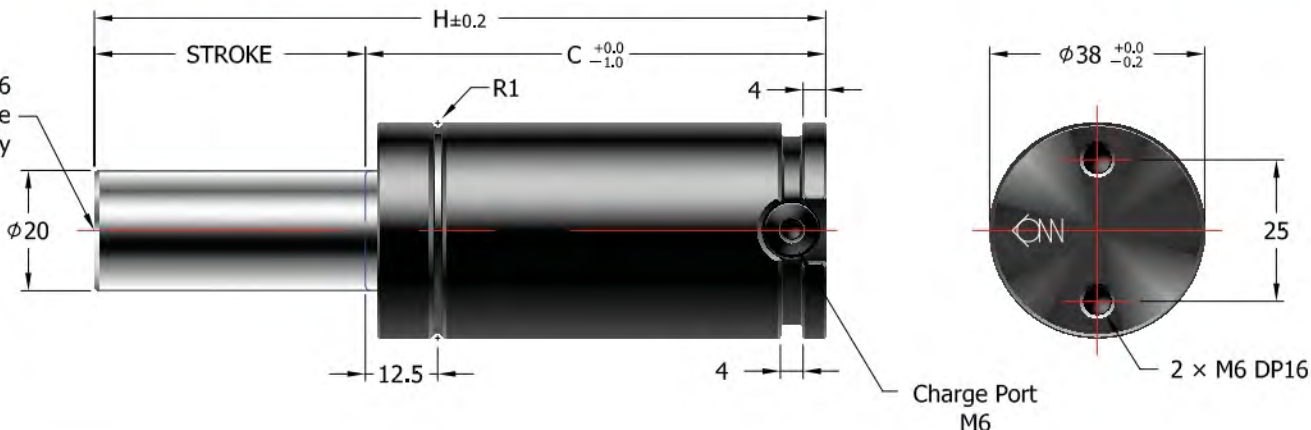
XR0350 MOUNT





2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TSX0500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

150
충전압력
(Bar)

MOUNT

XP0500

REPAIR KIT

RCX0500

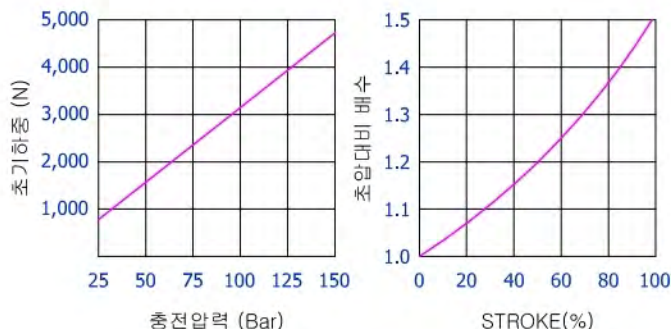
[주의!] TSX0500은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSX0500

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

■ 충전압력/압축량 대비 하중변화도표



■ TSX0500의 충전 압력(Bar) 계산식

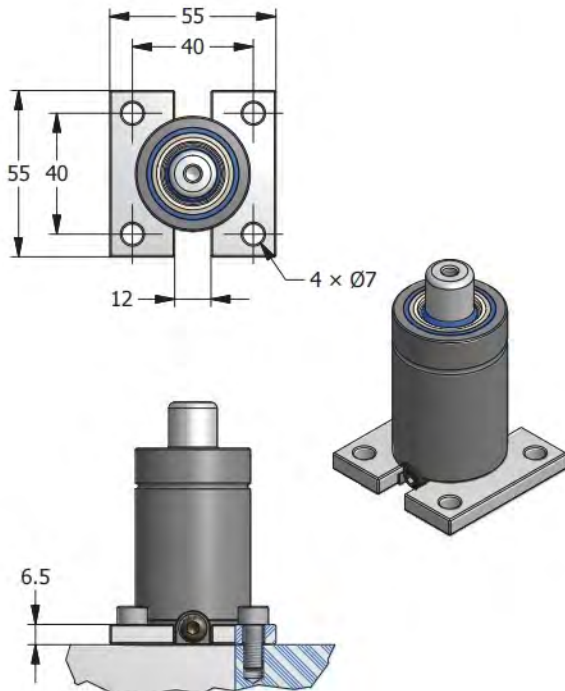
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{31.4}$$

ex) 필요한 초기하중 4,000N인 GAS SPRING의 충전압력은?

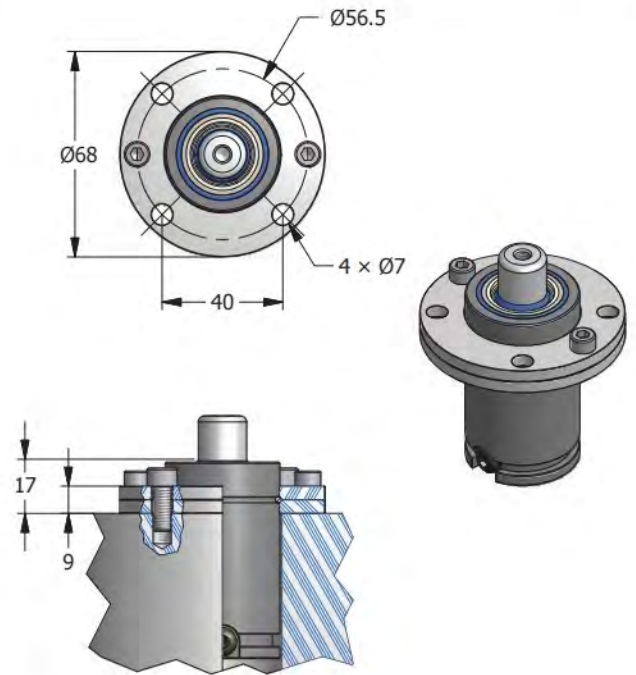
$$127(\text{Bar}) = \frac{4,000(\text{N})}{31.4}$$



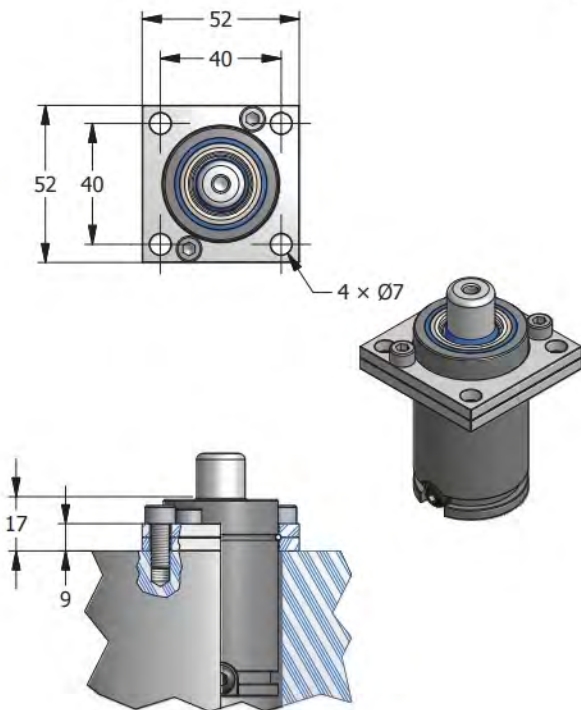
XP0500(SP0300) MOUNT



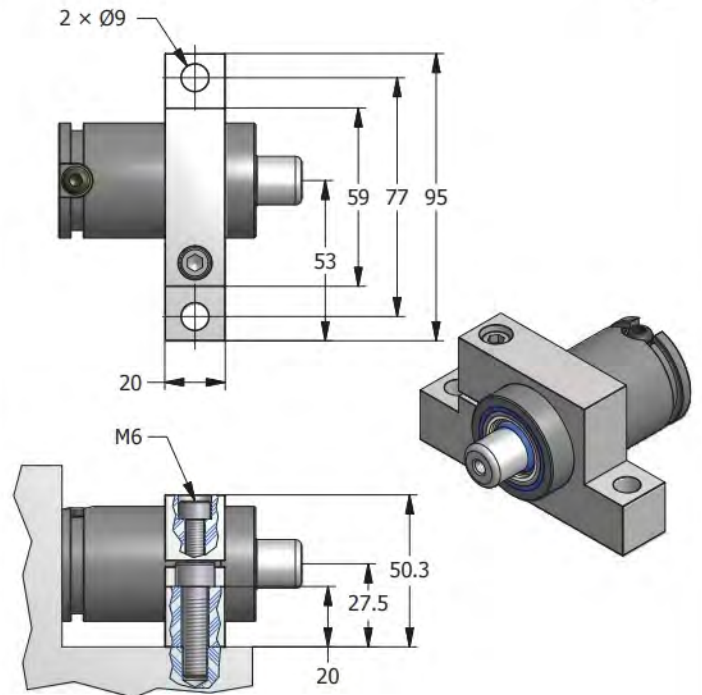
XR0500(SR0300) MOUNT



XT0500(ST0300) MOUNT



XC0500(SC0300) MOUNT





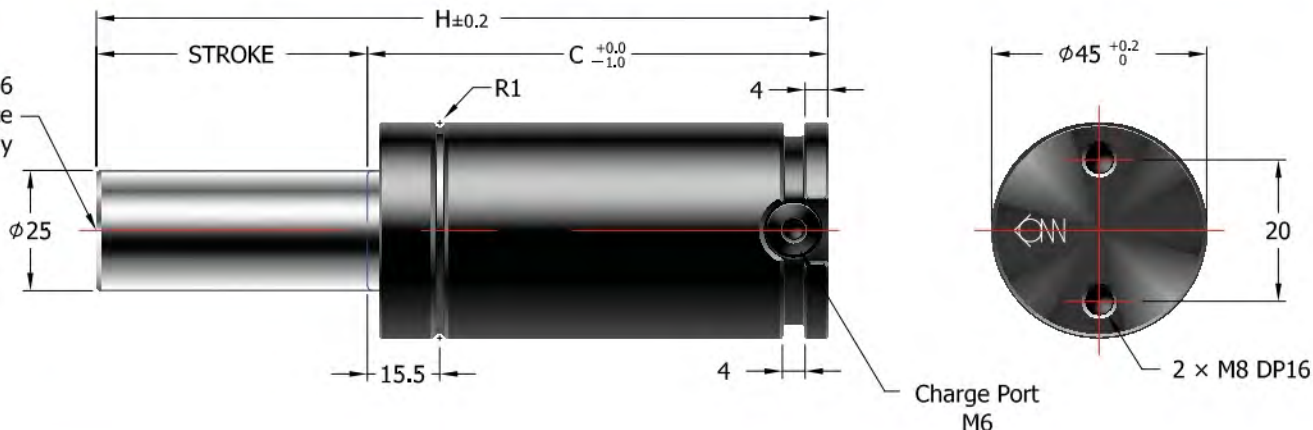
TSX0750

NITROGEN GAS SPRING



2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TSX0750
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

150
충전압력
(Bar)

MOUNT

XP0750

REPAIR KIT

RCX0750

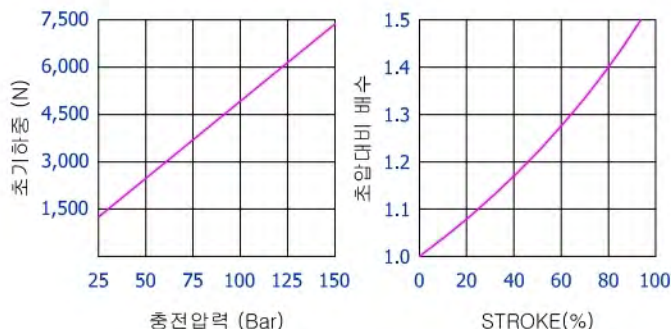
[주의!] TSX0750은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSX0750

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
10	0.39	67	57	7,400	10,200	17.9	0.55
13	0.51	73	60	7,400	10,500	21.8	0.57
16	0.63	79	63	7,400	10,600	25.7	0.59
20	0.79	87	67	7,400	10,800	30.9	0.62
25	0.98	97	72	7,400	11,000	37.4	0.65
30	1.18	107	77	7,400	11,100	43.9	0.68
35	1.38	117	82	7,400	11,200	50.4	0.71
38	1.50	123	85	7,400	11,300	54.3	0.73
40	1.57	127	87	7,400	11,300	57.0	0.74
45	1.77	137	92	7,400	11,300	63.5	0.78
50	1.97	147	97	7,400	11,400	70.0	0.81
60	2.36	167	107	7,400	11,500	83.0	0.87
63	2.48	173	110	7,400	11,500	86.9	0.89
70	2.76	187	117	7,400	11,500	96.0	0.94
75	2.95	197	122	7,400	11,500	102.5	0.97
80	3.15	207	127	7,400	11,600	109.0	1.00
90	3.54	227	137	7,400	11,600	122.0	1.07
100	3.94	247	147	7,400	11,600	135.0	1.13
125	4.92	297	172	7,400	11,700	167.6	1.29

* = at full stroke

■ 충전압력/압축량 대비 하중변화도표



■ TSX0750의 충전 압력(Bar) 계산식

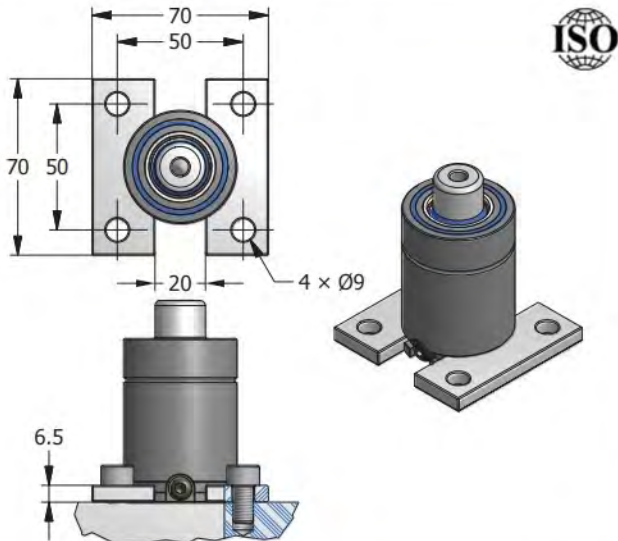
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{49.1}$$

ex) 필요한 초기하중 6,000N인 GAS SPRING의 충전압력은?

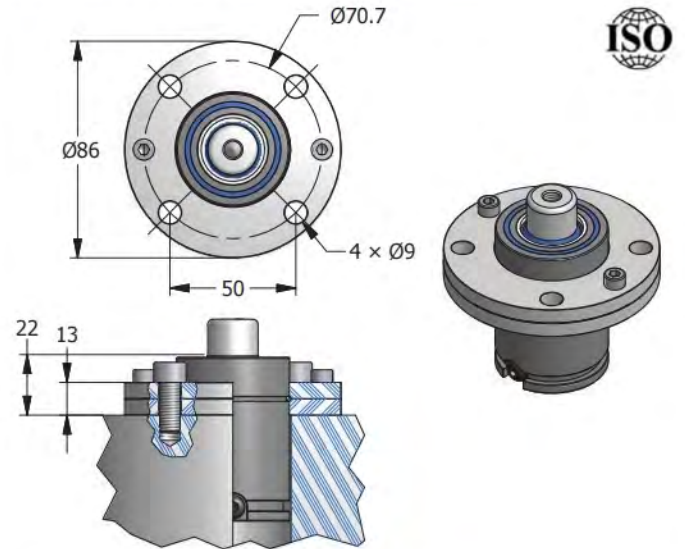
$$122(\text{Bar}) = \frac{6,000(\text{N})}{49.1}$$



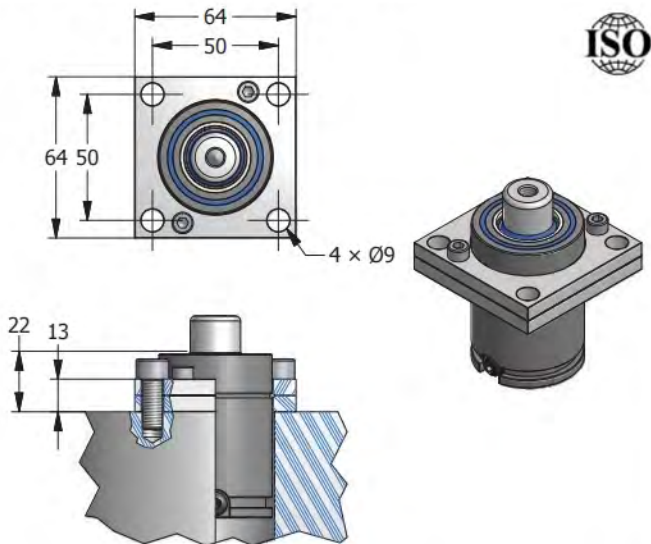
XP0750(SP0500) MOUNT



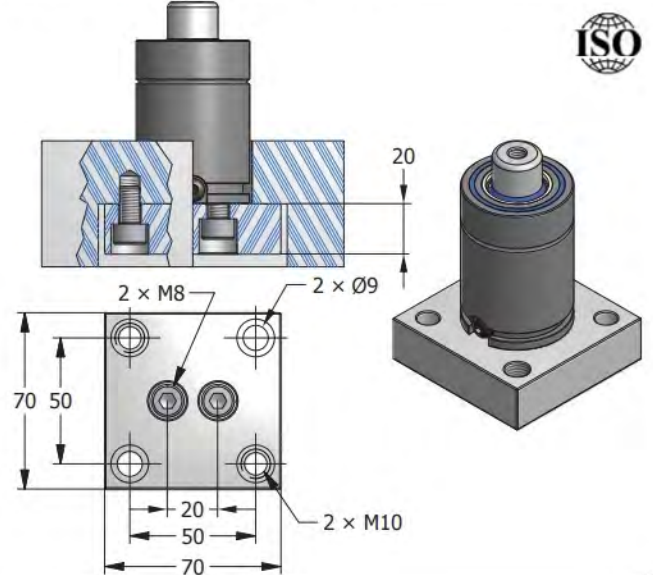
XR0750(SR0500) MOUNT



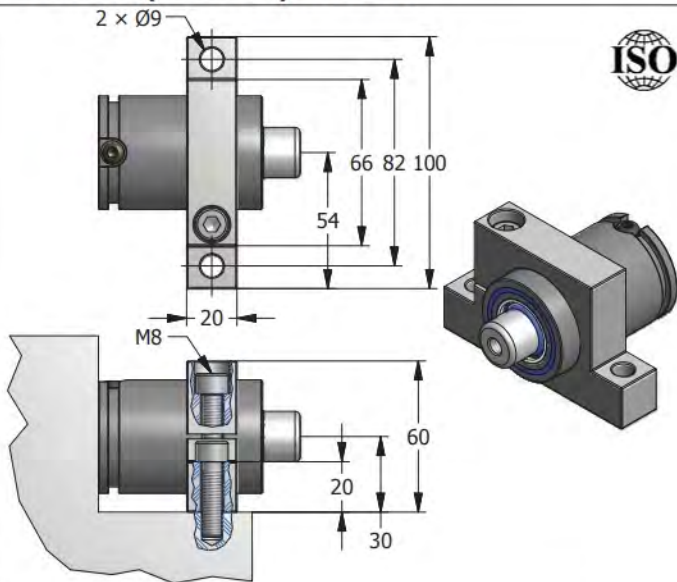
XT0750(ST0500) MOUNT



XB0750(SB0500) MOUNT



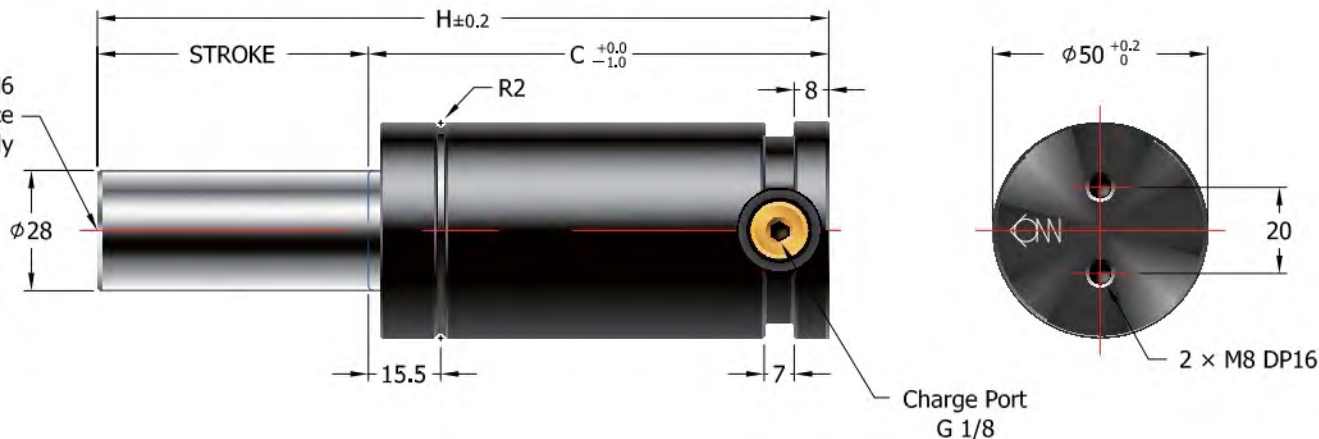
XC0750(SC0500) MOUNT





2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TSX1000
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
총전압력
(Bar)

MOUNT

XP1000

REPAIR KIT

RCX1000

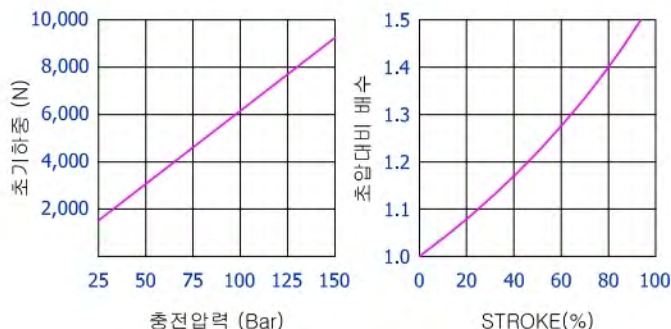
[주의!] TSX1000은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSX1000

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
13	0.51	78	65	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	0.85	
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

■ 충전압력/압축량 대비 하중변화도표



■ TSX1000의 충전 압력(Bar) 계산식

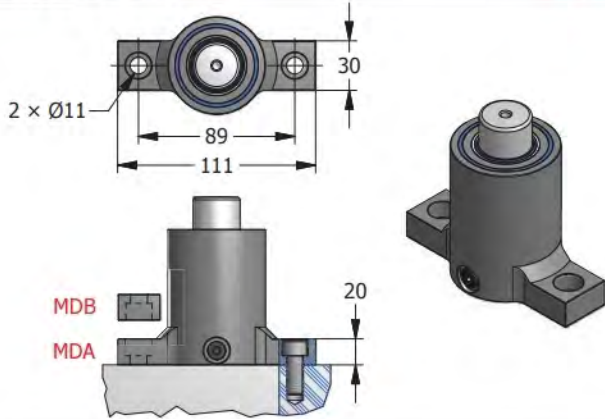
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{61.5}$$

ex) 필요한 초기하중 8,500N인 GAS SPRING의 충전압력은?

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

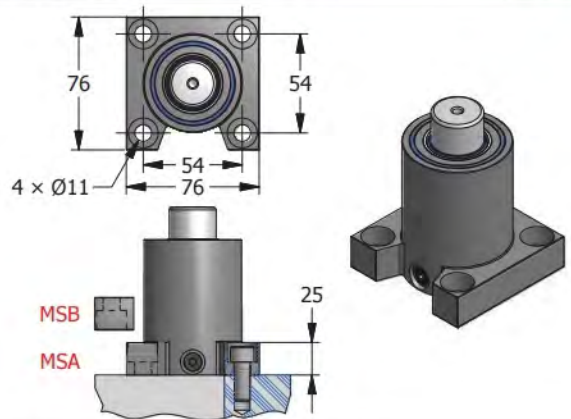
MD MOUNT

일체형



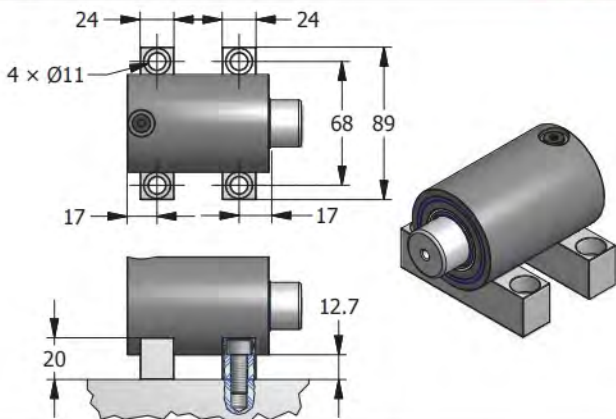
MS MOUNT

일체형

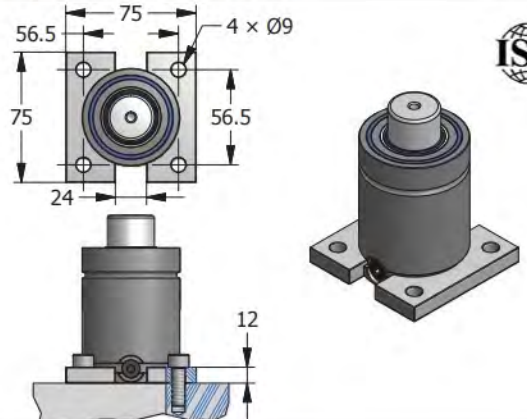


MK MOUNT

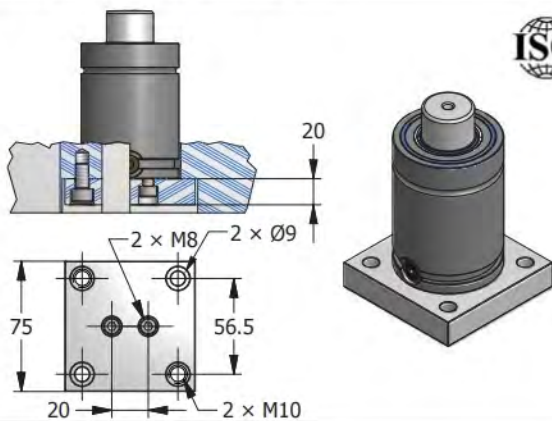
일체형



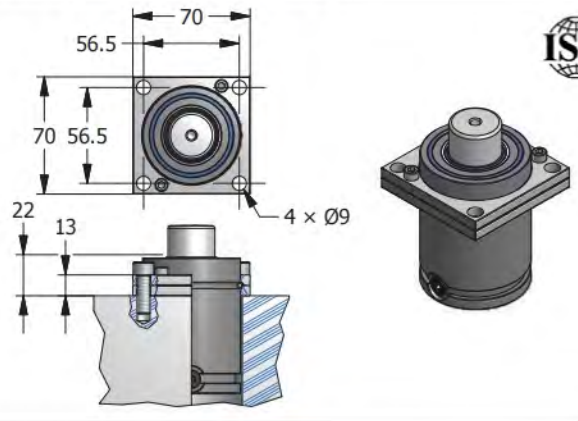
XP1000(SP0750) MOUNT



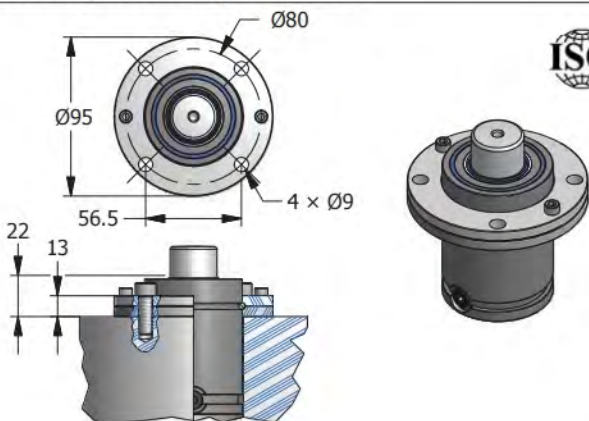
XB1000(SB0750) MOUNT



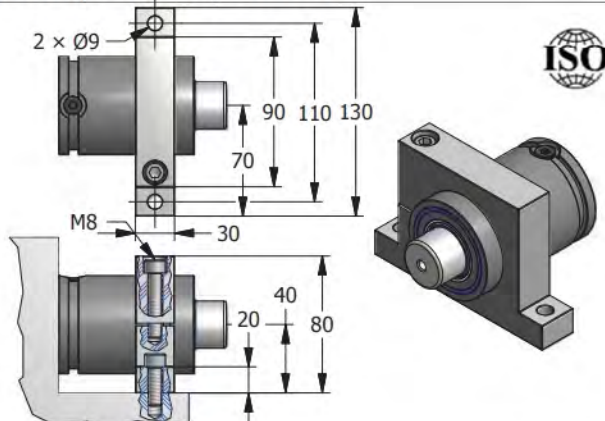
XT1000(ST0750) MOUNT



XR1000(SR0750) MOUNT



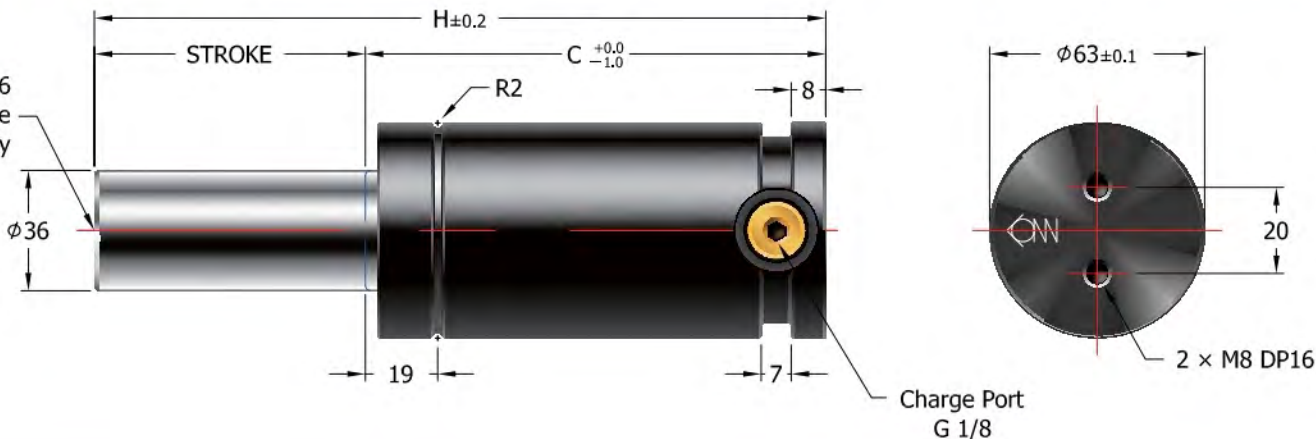
XC1000(SC0750) MOUNT





2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TSX1500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XP1500

REPAIR KIT

RCX1500

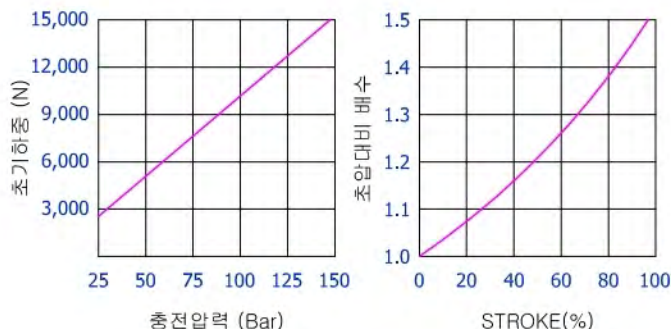
[주의!] TSX1500은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSX1500

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
13	0.51	78	65	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

■ 충전압력/압축량 대비 하중변화도표



■ TSX1500의 충전 압력(Bar) 계산식

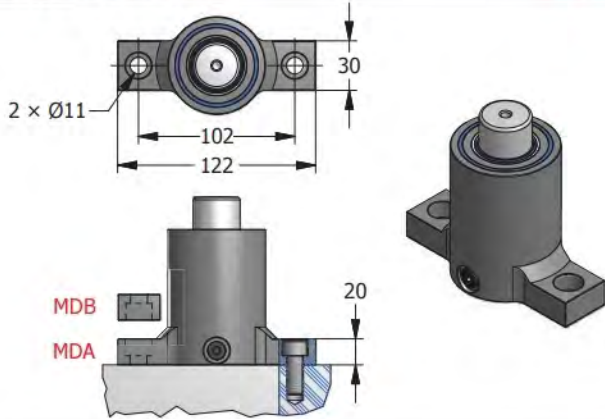
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{101.7}$$

ex) 필요한 초기하중 12,000N인 GAS SPRING의 충전압력은?

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

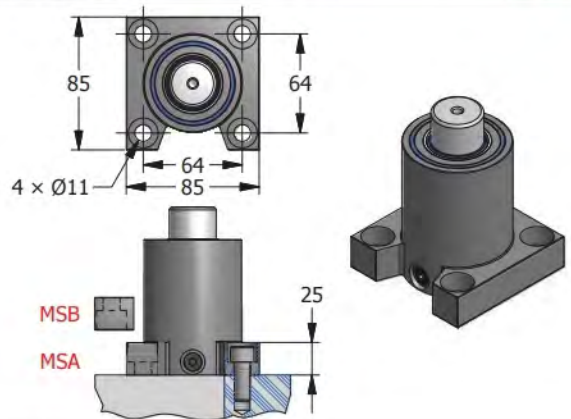
MD MOUNT

일체형



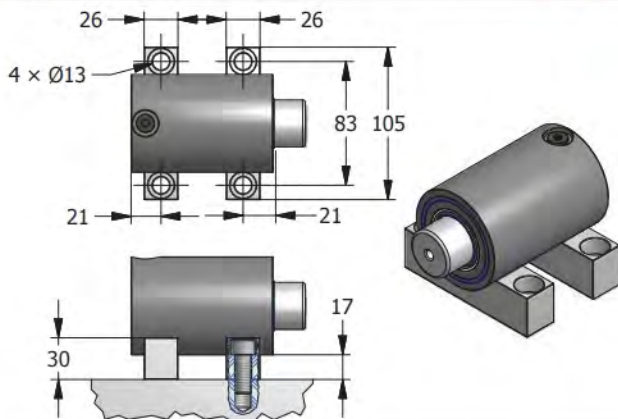
MS MOUNT

일체형

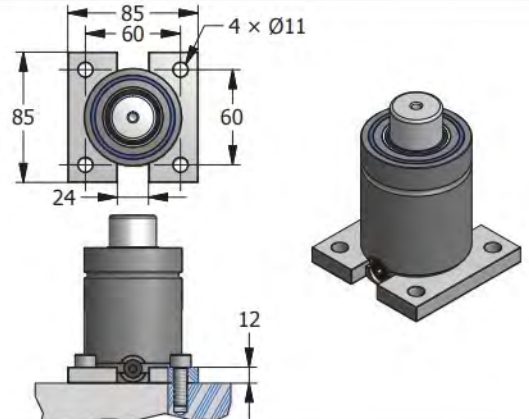


MK MOUNT

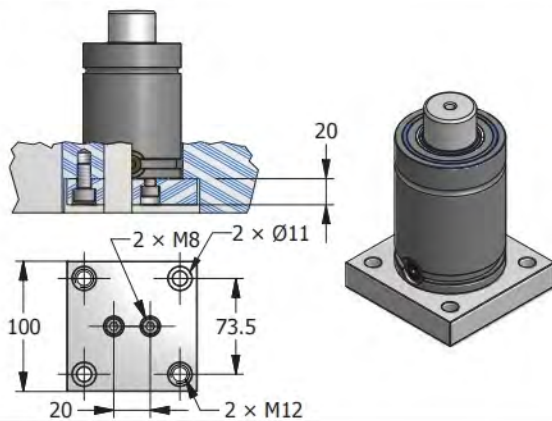
일체형



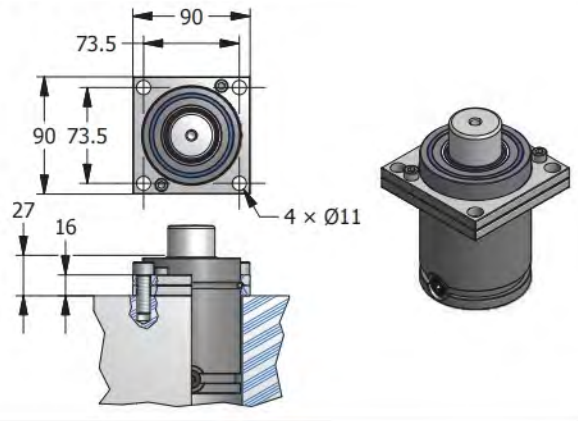
XP1500 MOUNT



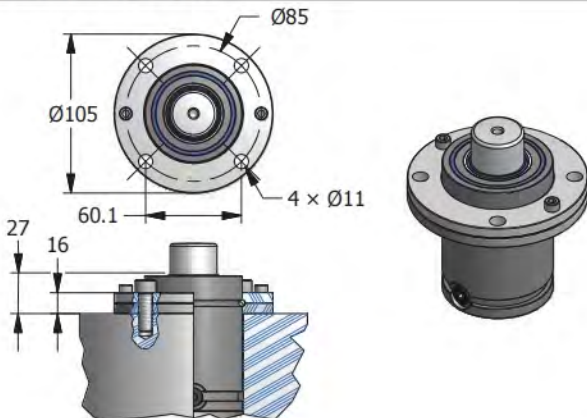
XB1500 MOUNT



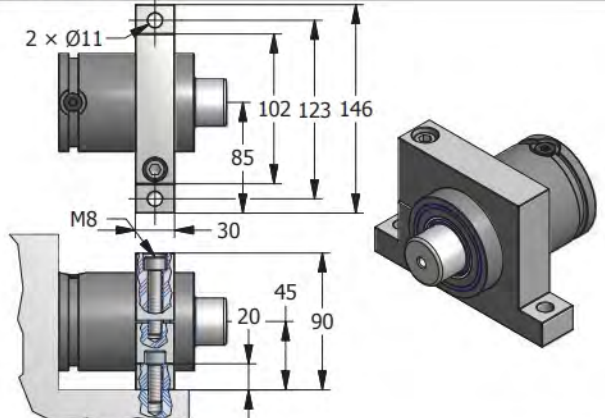
XT1500 MOUNT



XR1500 MOUNT



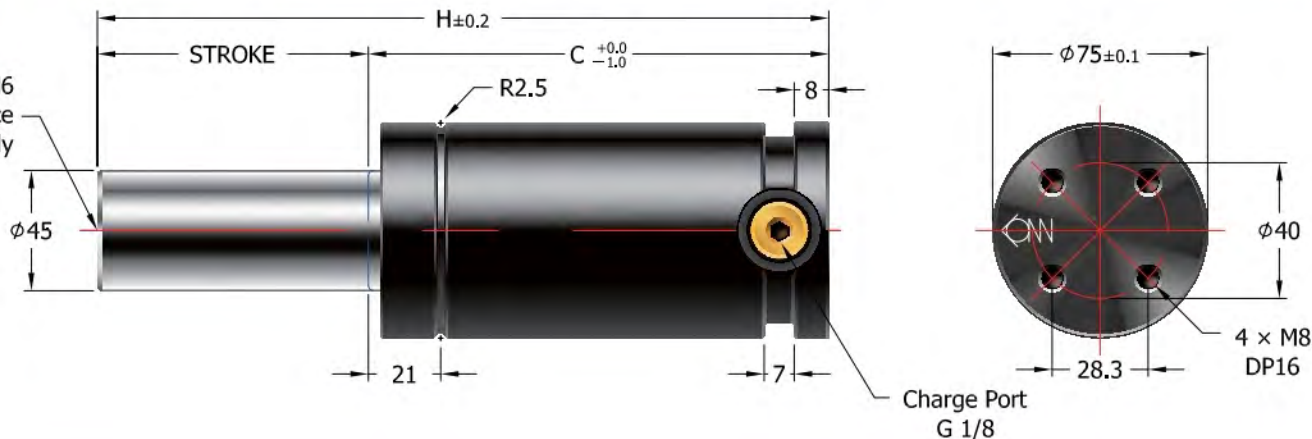
XC1500 MOUNT





2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TSX2400
MODEL

× 050
STROKE

S(F) —
단독형-S
배관형-F

(MSA) —
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XP2400

REPAIR KIT

RCX2400

[주의!] TSX2400은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSX2400

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
16	0.63	91	75	23,800	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		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

■ 충전압력/압축량 대비 하중변화도표



■ TSX2400의 충전 압력(Bar) 계산식

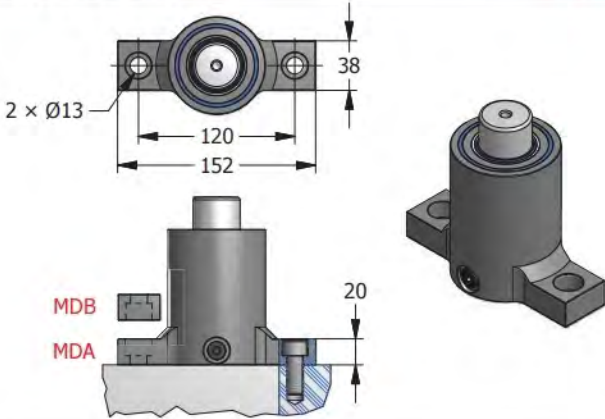
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{159.0}$$

ex) 필요한 초기하중 20,000N인 GAS SPRING의 충전압력은?

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

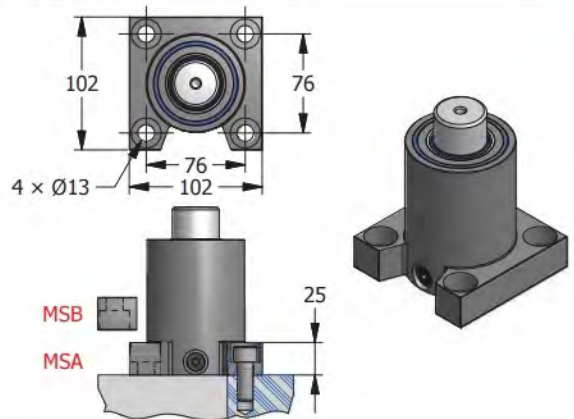
MD MOUNT

일체형



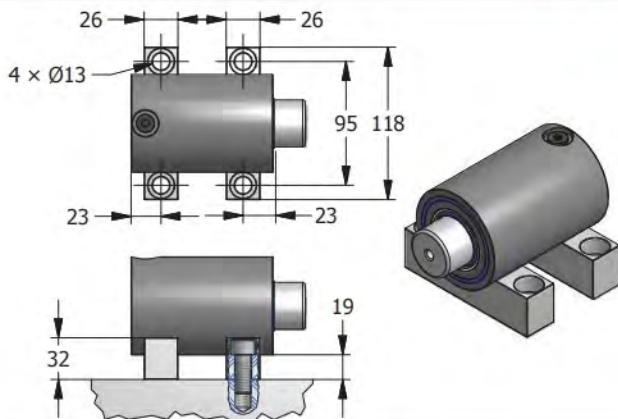
MS MOUNT

일체형

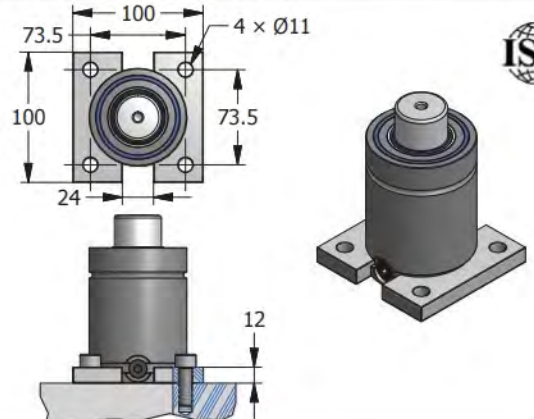


MK MOUNT

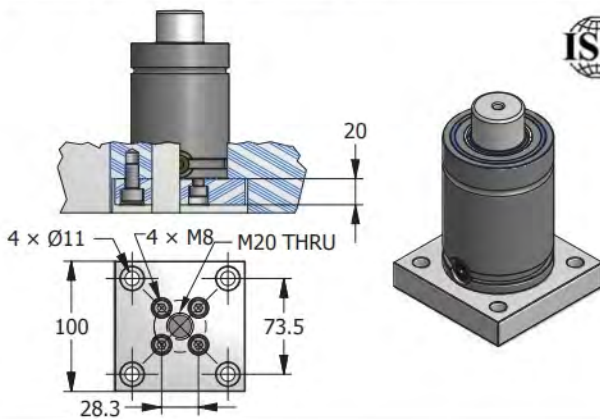
일체형



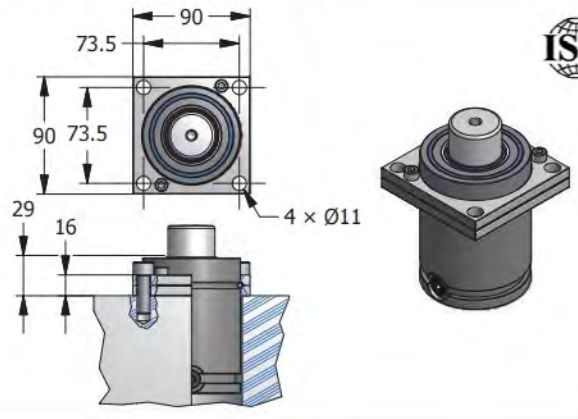
XP2400(SP1500) MOUNT



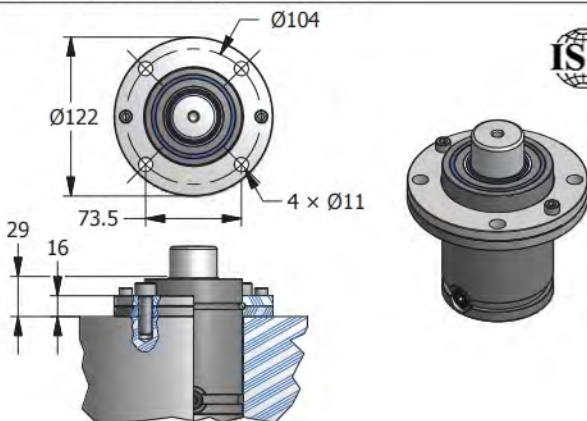
XB2400(SB1500) MOUNT



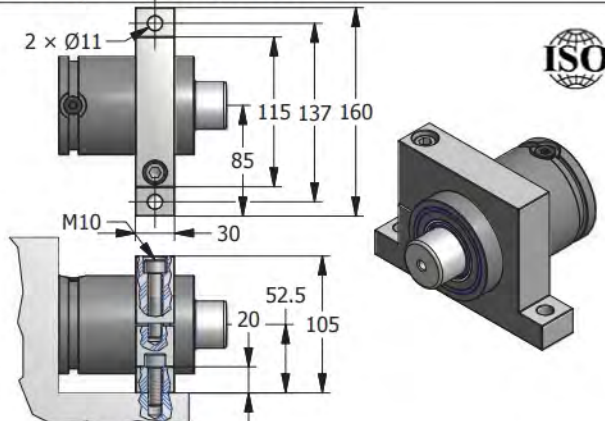
XT2400(ST1500) MOUNT



XR2400(SR1500) MOUNT



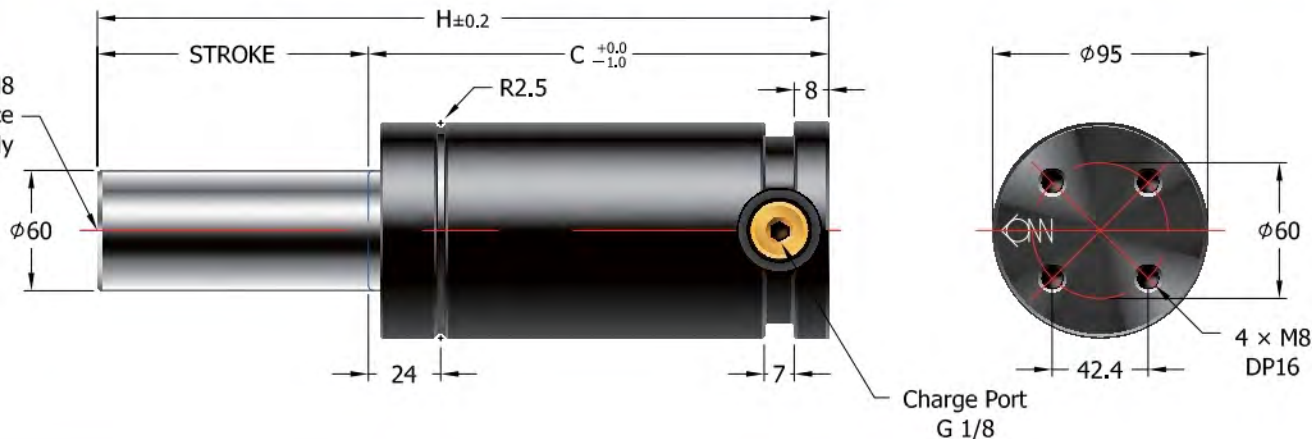
XC2400(SC1500) MOUNT





2014/68/EU

M8
Maintenance
only



규격 표기법

GAS SPRING

TSX4200
MODEL

× 050
STROKE

S(F) —
단독형-S
배관형-F

(MSA) —
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XP4200

REPAIR KIT

RCX4200

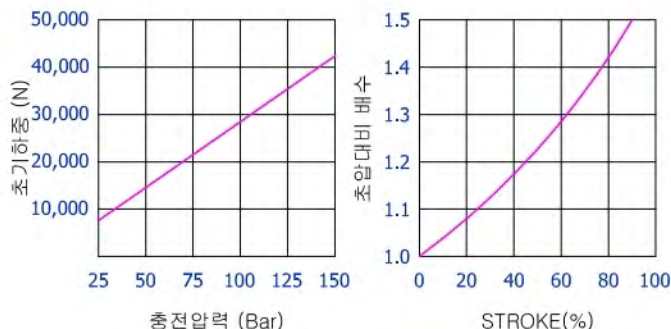
[주의!] TSX4200은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSX4200

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (㎤)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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

■ 충전압력/압축량 대비 하중변화도표



■ TSX4200의 충전 압력(Bar) 계산식

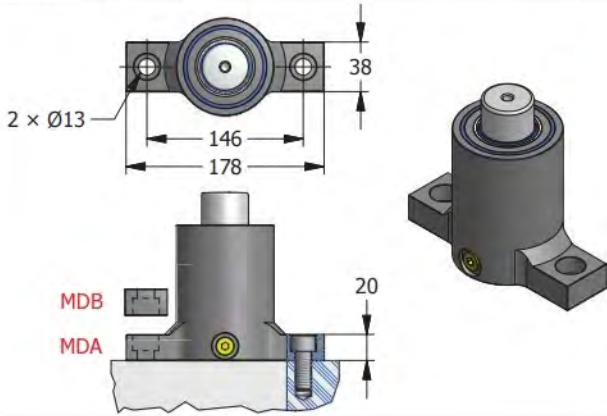
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{282.6}$$

ex) 필요한 초기하중 35,000N인 GAS SPRING의 충전압력은?

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

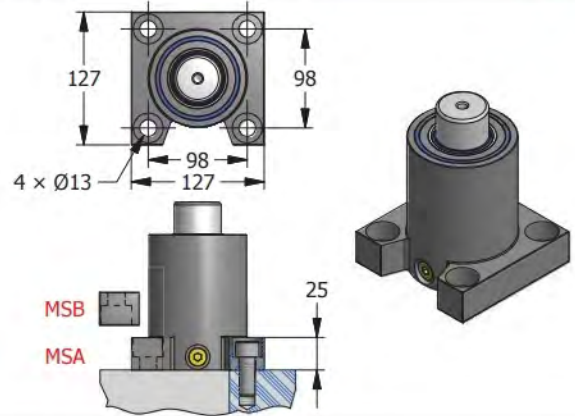
MD MOUNT

일체형



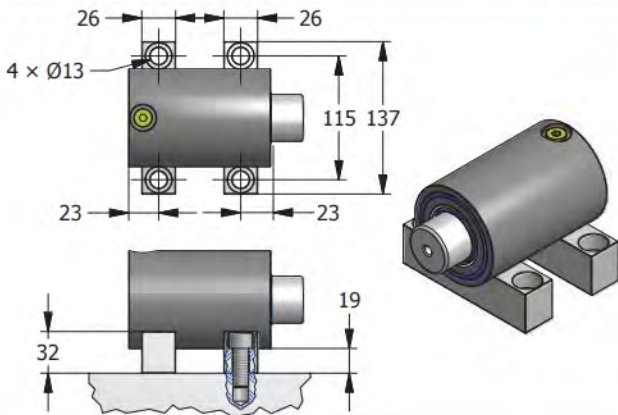
MS MOUNT

일체형

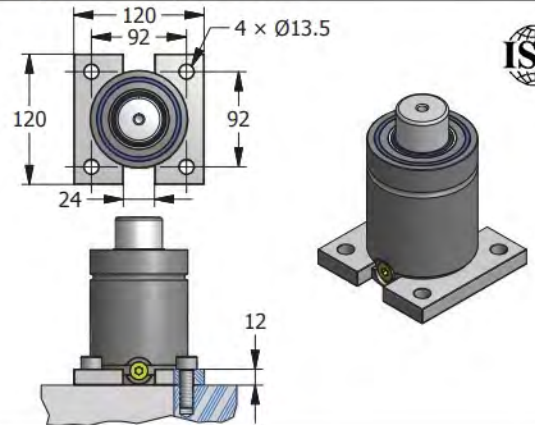


MK MOUNT

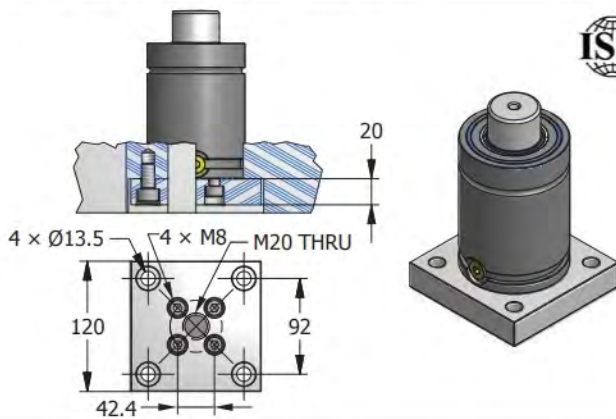
일체형



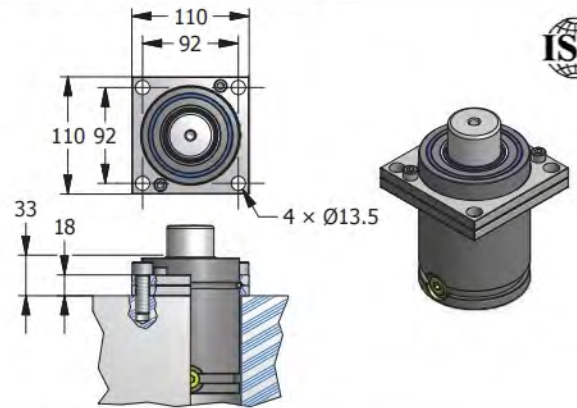
XP4200(SP3000) MOUNT



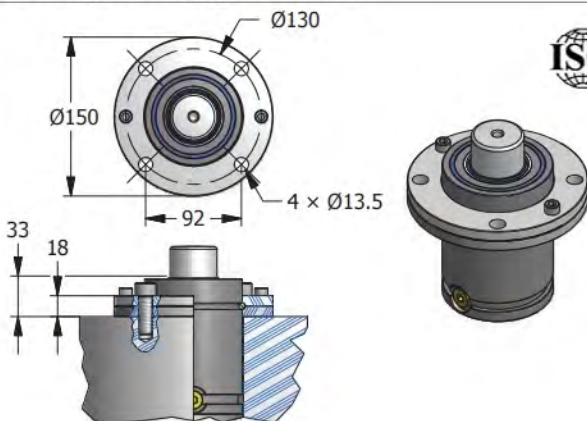
XB4200(SB3000) MOUNT



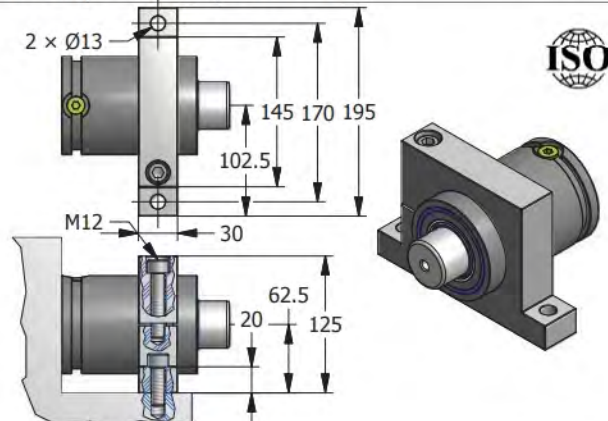
XT4200(ST3000) MOUNT



XR4200(SR3000) MOUNT



XC4200(SC3000) MOUNT





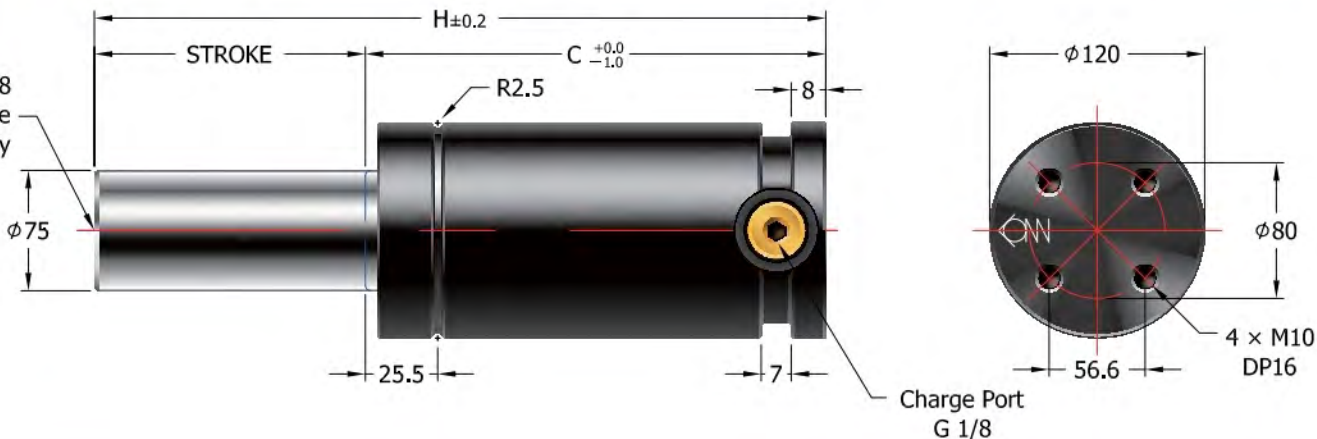
TSX6600

NITROGEN GAS SPRING



2014/68/EU

M8
Maintenance
only



규격 표기법

GAS SPRING

TSX6600
MODEL

× 050
STROKE

S(F) —
단독형-S
배관형-F

(MSA) —
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XP6600

REPAIR KIT

RCX6600

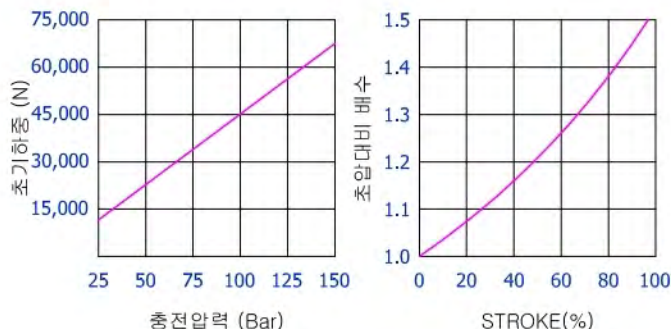
[주의!] TSX6600은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TSX6600

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
16	0.63	104	88	66,000	87,600	285.7	6.11
20	0.79	112	92	66,000	90,200	329.1	6.29
25	0.98	122	97	66,000	92,600	383.5	6.52
30	1.18	132	102	66,000	94,600	437.8	6.75
35	1.38	142	107	66,000	96,200	492.1	6.97
38	1.50	148	110	66,000	97,000	524.7	7.11
40	1.57	152	112	66,000	97,500	546.5	7.21
45	1.77	162	117	66,000	98,600	600.8	7.43
50	1.97	172	122	66,000	99,500	655.2	7.66
60	2.36	192	132	66,000	101,000	763.8	8.11
63	2.48	198	135	66,000	101,400	796.4	8.25
70	2.76	212	142	66,000	102,100	872.5	8.57
75	2.95	222	147	66,000	102,600	926.8	8.80
80	3.15	232	152	66,000	103,100	981.2	9.03
90	3.54	252	162	66,000	103,800	1089.9	9.48
100	3.94	272	172	66,000	104,400	1198.5	9.94
125	4.92	322	197	66,000	105,600	1470.2	11.08

* = at full stroke

■ 충전압력/압축량 대비 하중변화도표



■ TSX6600의 충전 압력(Bar) 계산식

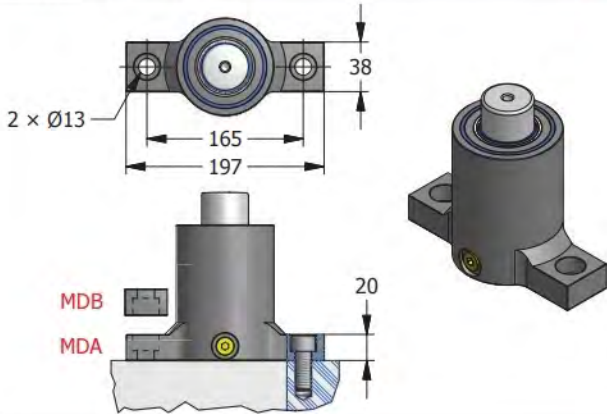
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{441.6}$$

ex) 필요한 초기하중 60,000N인 GAS SPRING의 충전압력은?

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

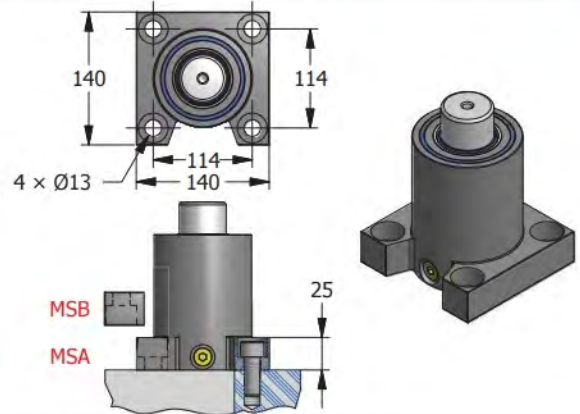
MD MOUNT

일체형



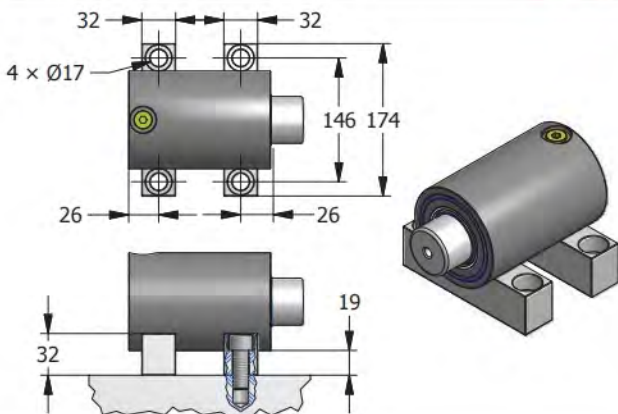
MS MOUNT

일체형

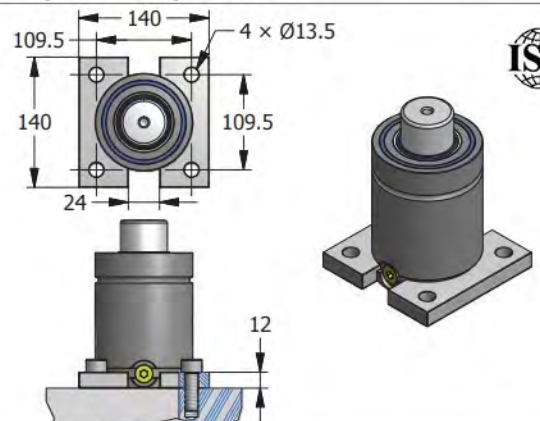


MK MOUNT

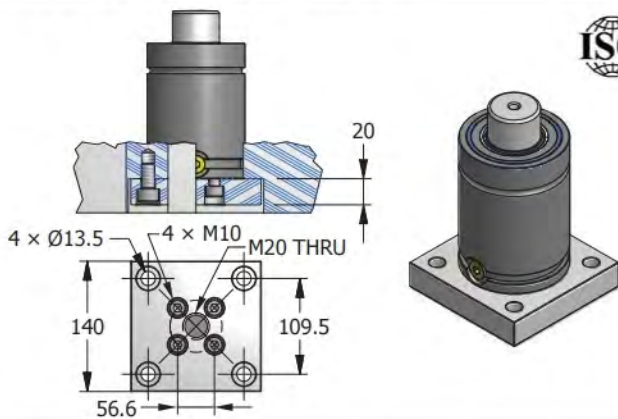
일체형



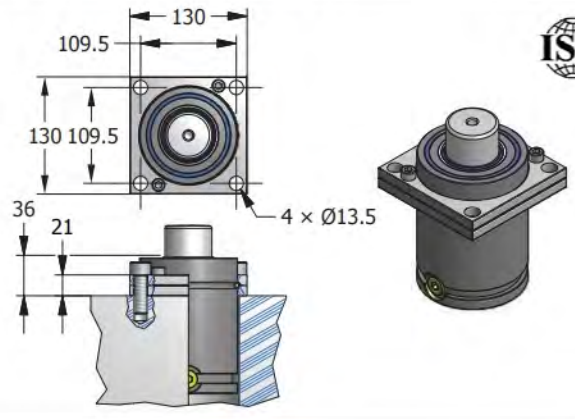
XP6600(SP5000) MOUNT



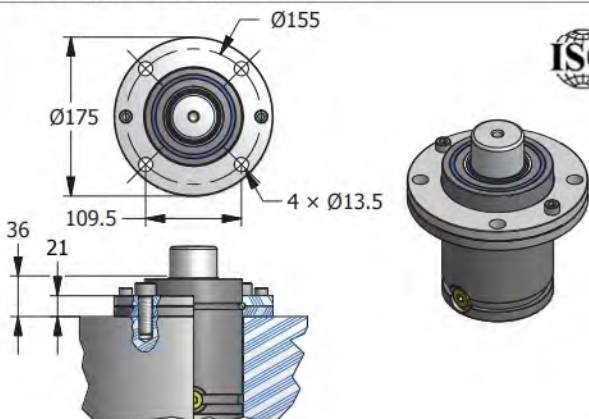
XB6600(SB5000) MOUNT



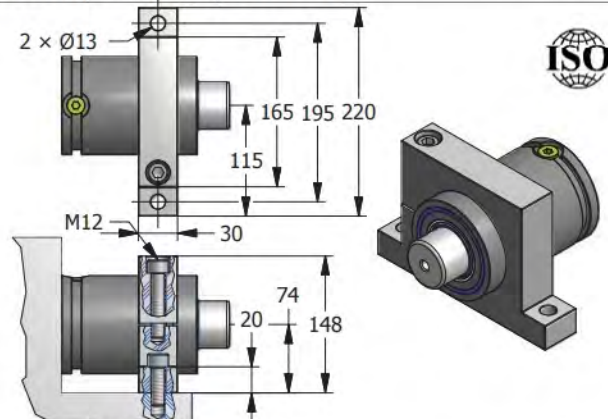
XT6600(ST5000) MOUNT

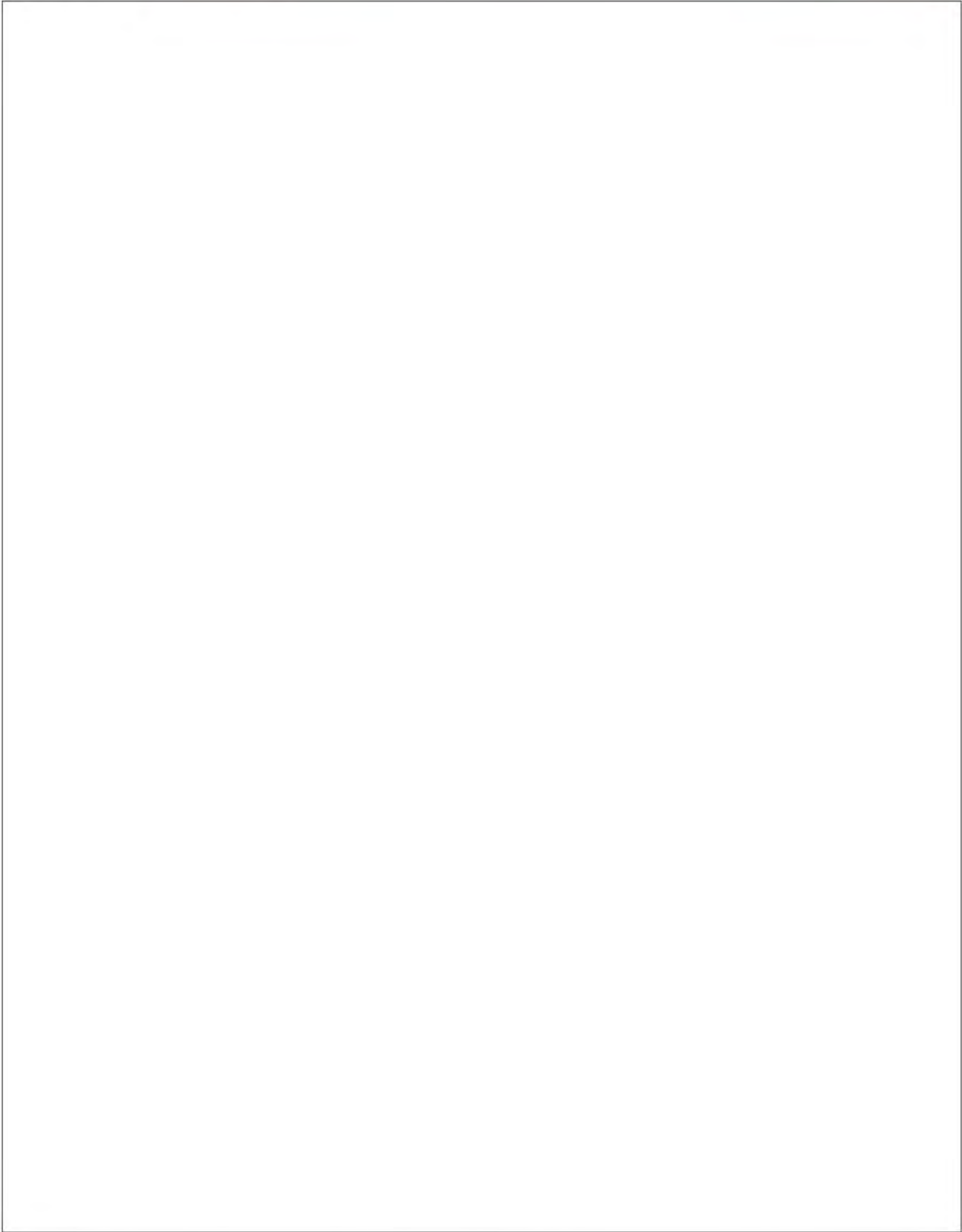
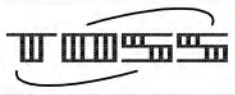


XR6600(SR5000) MOUNT



XC6600(SC5000) MOUNT







TST SERIES



CONTENTS

NITROGEN GAS SPRING



TST1000	54
TST2400	56
TST4200	58
TST6600	60
TST9500	62

STABLE XTRA HIGH POWER

■ 일반 제원

- 충전재
질소가스 (N₂)
- 최대 충전 압력
150 bar (at 20°C)
- 최소 충전 압력
25 bar (at 20°C)
- 작동 온도
0 to 80°C
- 온도에 따른 압력 증가량
±0.3% / °C
- 분당 최대 스트로크 왕복
~50 to 100 (at 20°C)
- 피스톤 로드 속도
0 ~ 0.8 m/s
- 로드 표면처리
도금 열처리
- 실린더 표면처리
흑산화 피막

■ Model별 제원

종류 TYPE	Stroke (mm)	실린더 외경 Φ(mm)	Rod 외경 Φ(mm)	초기하중 (N)	최대하중 (N)	최대충전압력
TST1000	13~125	50	28	9,200	14,600	150Bar
TST2400	16~125	75	45	23,800	38,100	150Bar
TST4200	16~125	95	60	42,200	69,200	150Bar
TST6600	16~125	120	75	66,000	105,600	150Bar
TST9500	20~125	150	90	95,000	149,100	150Bar

※ 상기 사양은 성능개선을 위해 예고없이 변경될 수 있습니다.





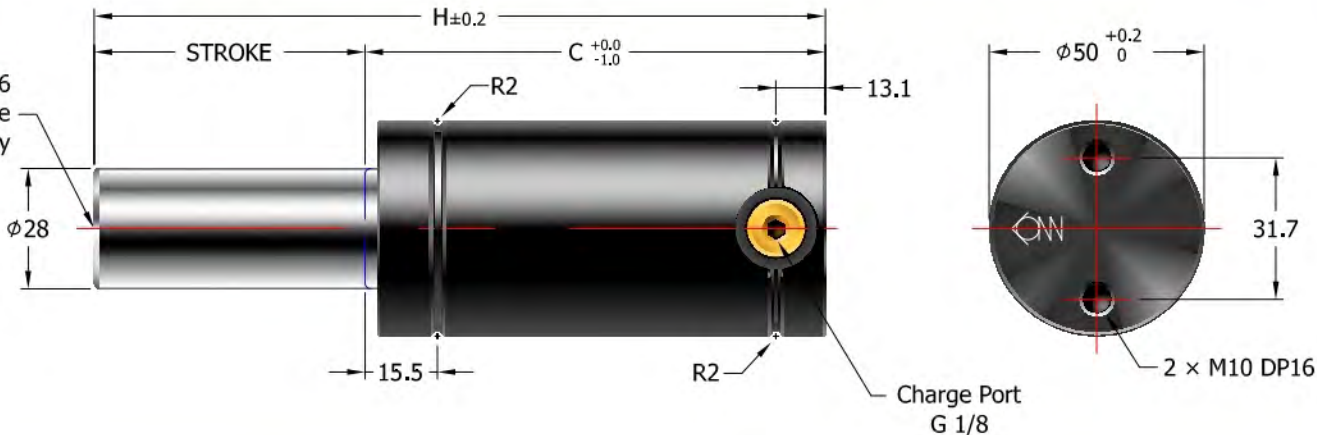
TST1000

NITROGEN GAS SPRING



2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TST1000
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XT1000

REPAIR KIT

RCX1000

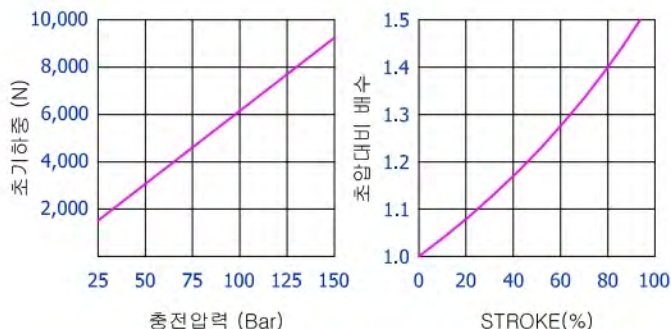
[주의!] TST1000은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TST1000

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
13	0.51	78	65	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	0.85	
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

■ 충전압력/압축량 대비 하중변화도표



■ TST1000의 충전 압력(Bar) 계산식

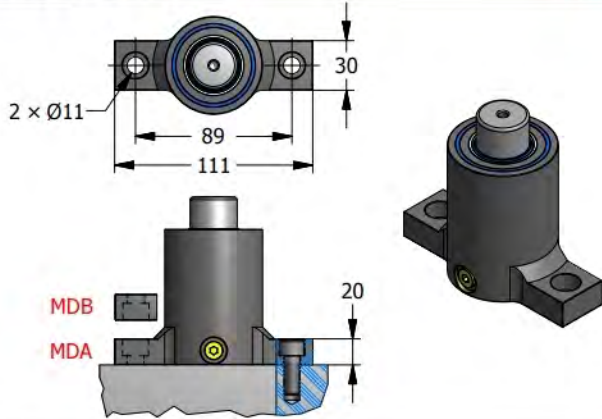
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{61.5}$$

ex) 필요한 초기하중 8,500N인 GAS SPRING의 충전압력은?

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

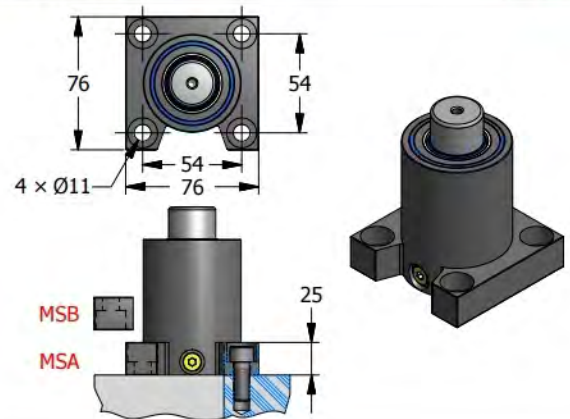
MD MOUNT

일체형



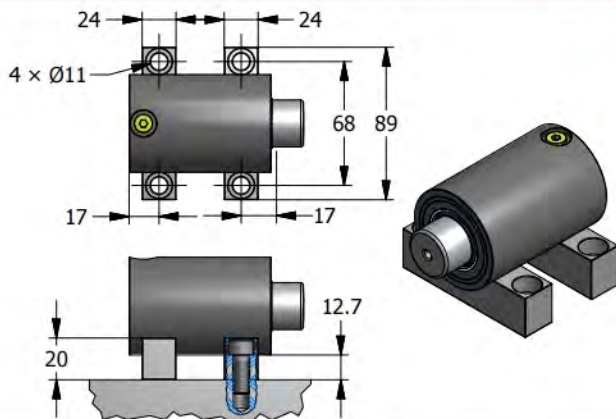
MS MOUNT

일체형

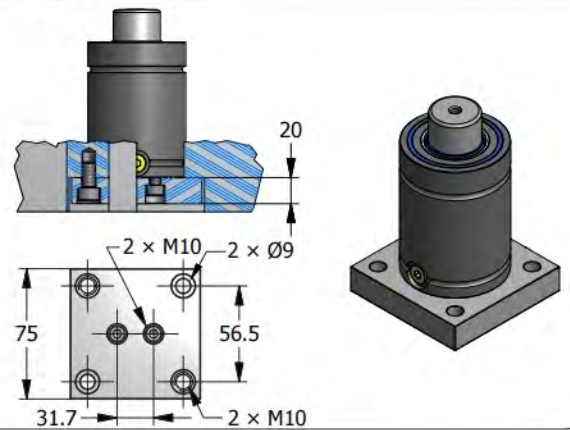


MK MOUNT

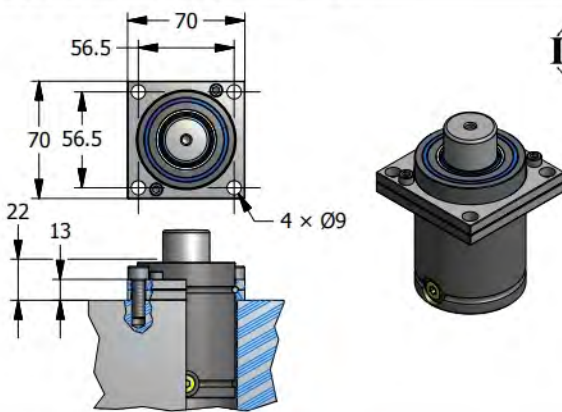
일체형



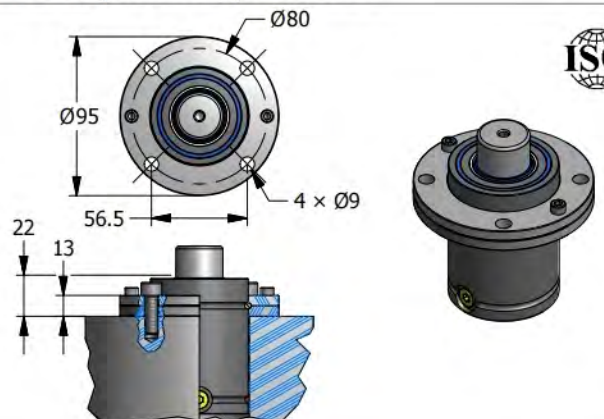
TB1000 MOUNT



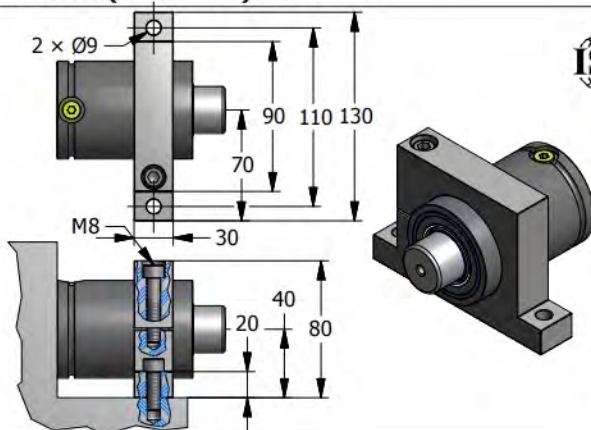
XT1000(ST0750) MOUNT



XR1000(SR0750) MOUNT



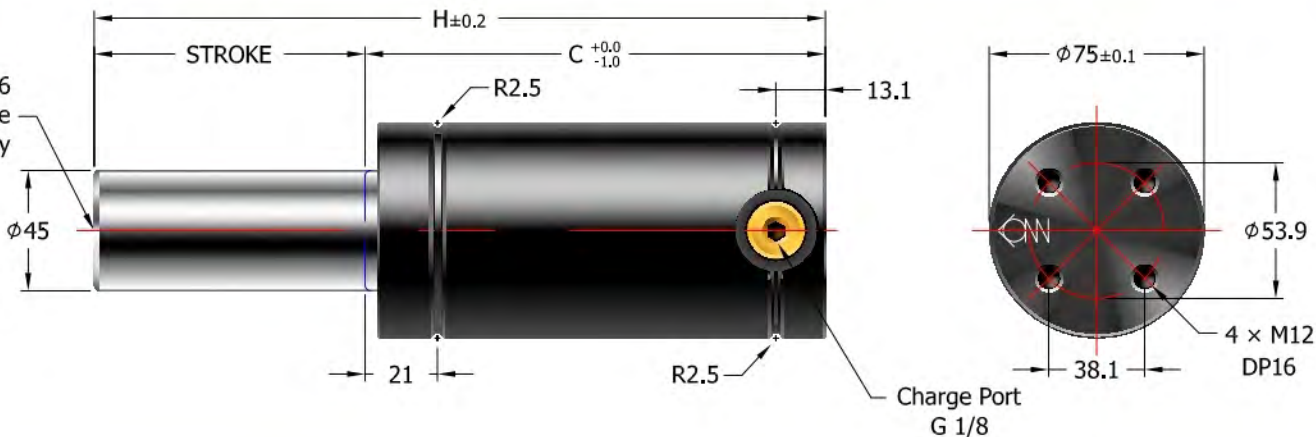
XC1000(SC0750) MOUNT





2014/68/EU

M6
Maintenance
only



규격 표기법

GAS SPRING

TST2400
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

- (MSA) -
일체형 마운트
(선택사항)

- 150
충전압력
(Bar)

MOUNT

XT2400

REPAIR KIT

RCX2400

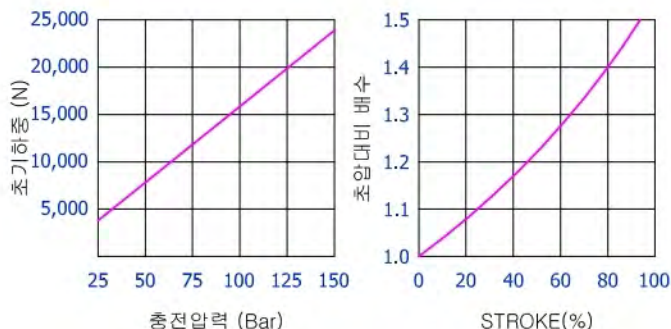
[주의!] TST2400은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TST2400

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
16	0.63	91	75	23,800	33,000	91.5	1.96
20	0.79	99	79	23,800	33,800	107.6	2.03
25	0.98	109	84	23,800	34,600	127.7	2.11
30	1.18	119	89	23,800	35,100	147.8	2.19
35	1.38	129	94	23,800	35,600	167.9	2.27
38	1.50	135	97	23,800	35,800	180.0	2.32
40	1.57	139	99	23,800	36,000	188.0	2.35
45	1.77	149	104	23,800	36,300	208.2	2.43
50	1.97	159	109	23,800	36,500	228.3	2.51
60	2.36	179	119	23,800	36,900	268.5	2.68
63	2.48	185	122	23,800	37,000	280.6	2.72
70	2.76	199	129	23,800	37,200	308.7	2.85
75	2.95	209	134	23,800	37,300	328.8	2.93
80	3.15	219	139	23,800	37,400	349.0	3.01
90	3.54	239	149	23,800	37,600	389.2	3.17
100	3.94	259	159	23,800	37,800	429.4	3.33
125	4.92	309	184	23,800	38,100	530.0	3.75

* = at full stroke

■ 충전압력/압축량 대비 하중변화도표



■ TST2400의 충전 압력(Bar) 계산식

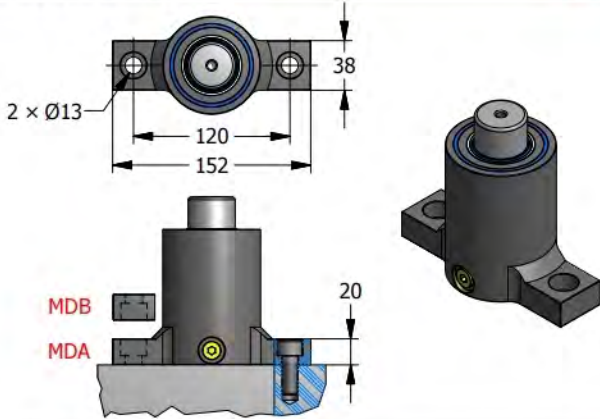
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{159.0}$$

ex) 필요한 초기하중 20,000N인 GAS SPRING의 충전압력은?

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

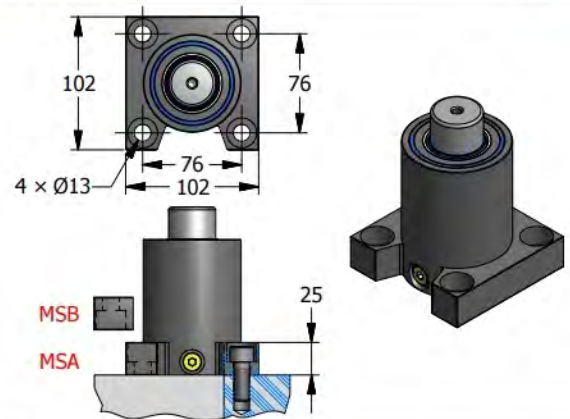
MD MOUNT

일체형



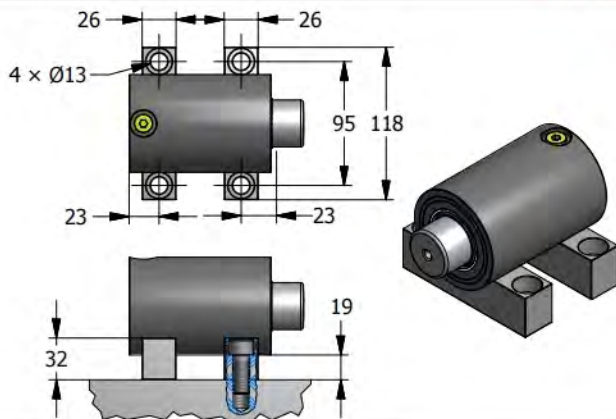
MS MOUNT

일체형

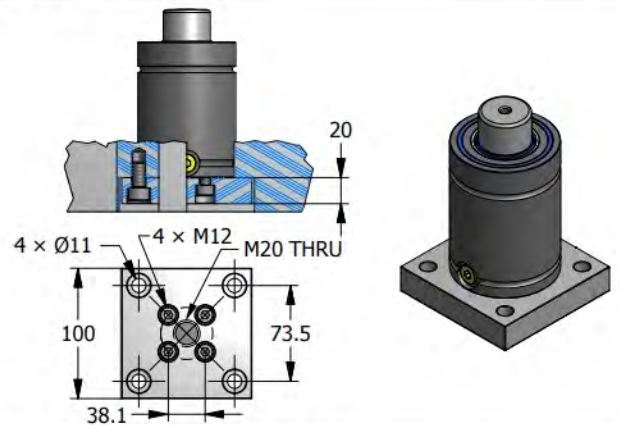


MK MOUNT

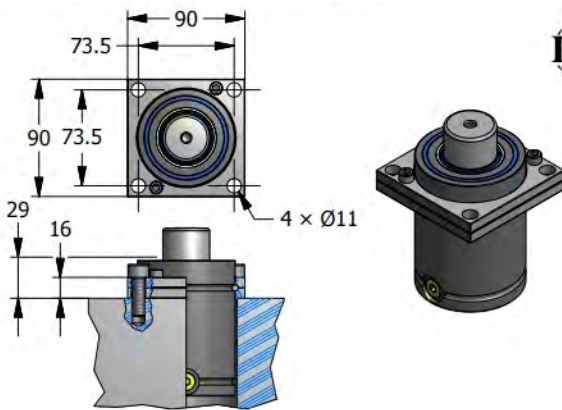
일체형



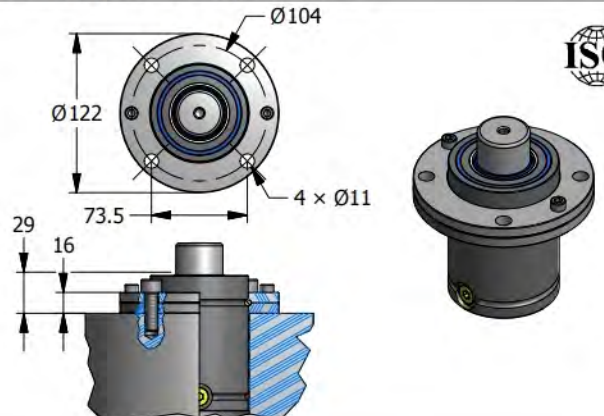
TB2400 MOUNT



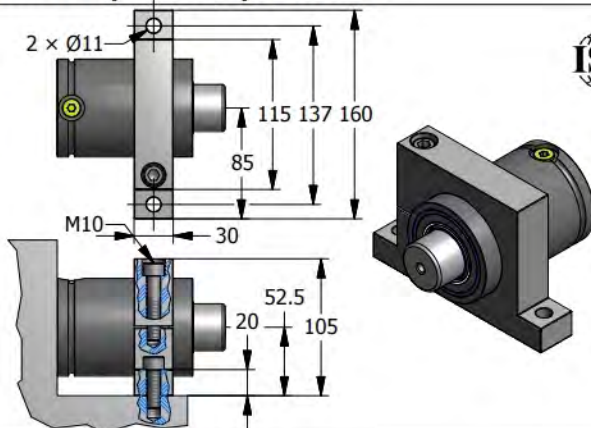
XT2400(ST1500) MOUNT



XR2400(SR1500) MOUNT



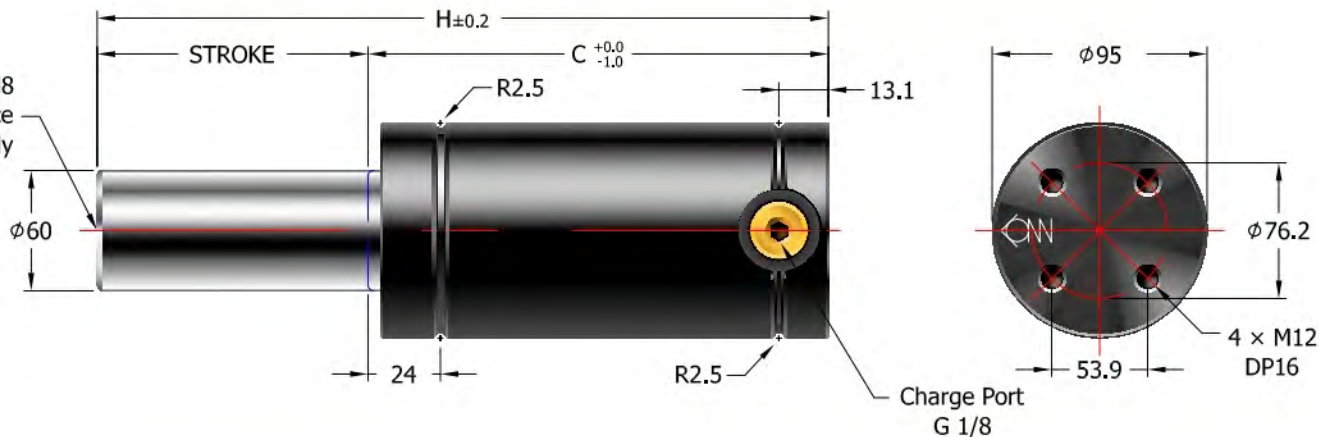
XC2400(SC1500) MOUNT





2014/68/EU

M8
Maintenance
only



규격 표기법

GAS SPRING

TST4200
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XT4200

REPAIR KIT

RCX4200

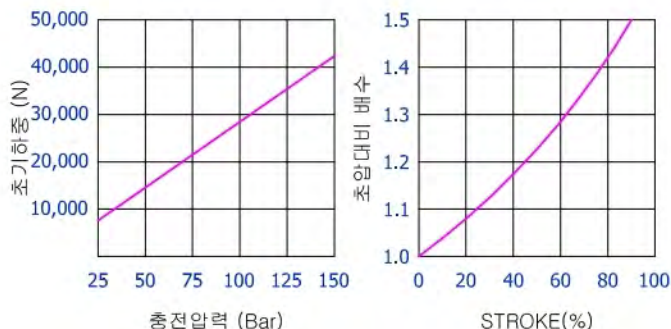
[주의!] TST4200은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TST4200

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
16	0.63	94	78	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

■ 충전압력/압축량 대비 하중변화도표



■ TST4200의 충전 압력(Bar) 계산식

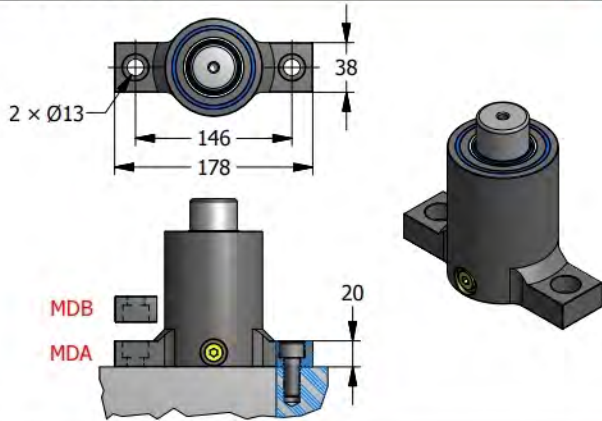
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{282.6}$$

ex) 필요한 초기하중 35,000N인 GAS SPRING의 충전압력은?

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

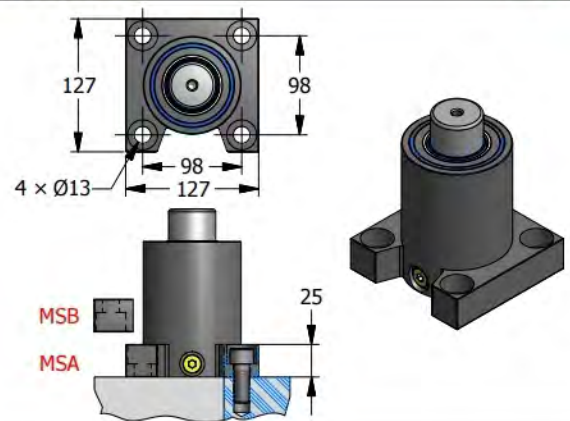
MD MOUNT

일체형



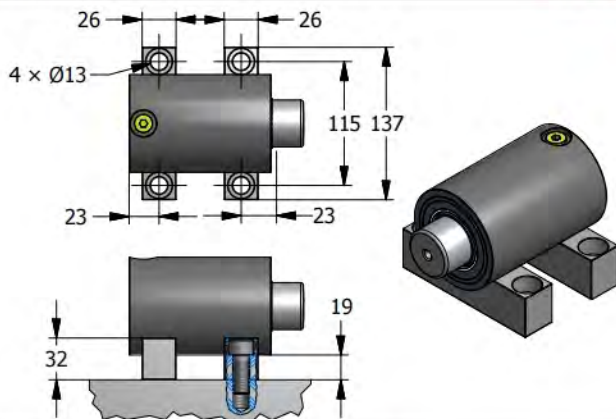
MS MOUNT

일체형

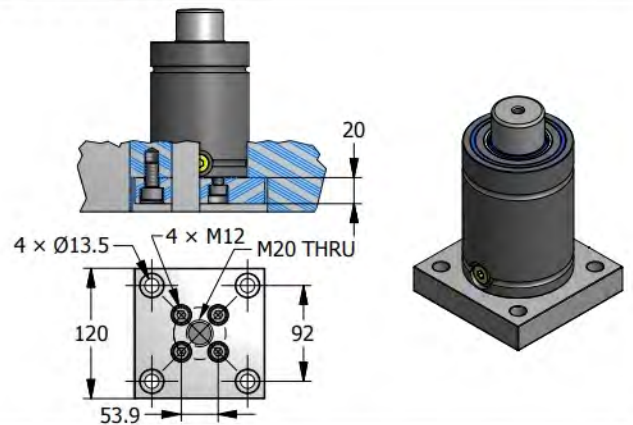


MK MOUNT

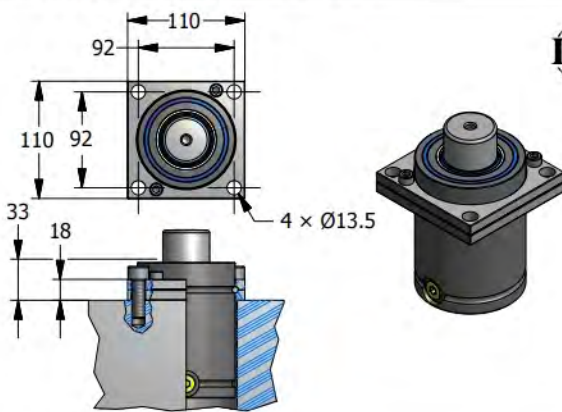
일체형



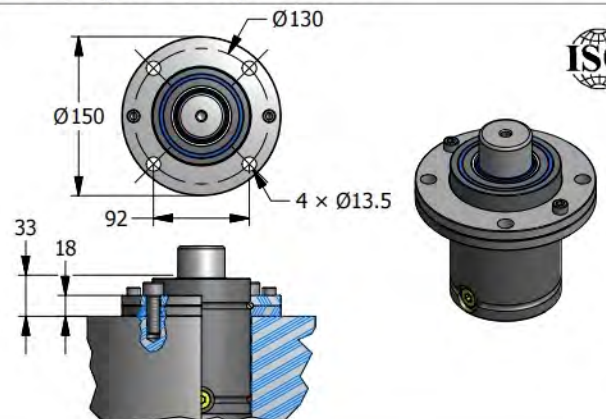
TB4200 MOUNT



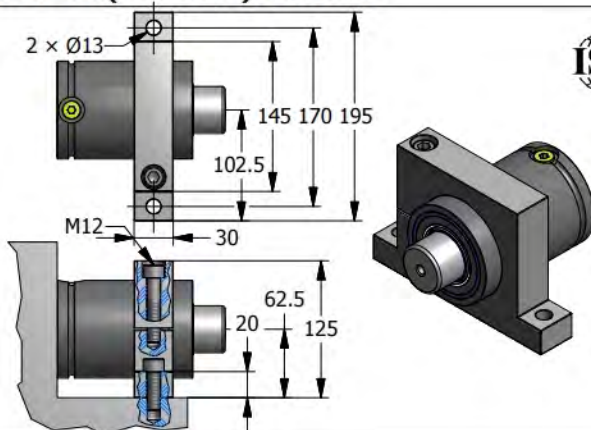
XT4200(ST3000) MOUNT



XR4200(SR3000) MOUNT



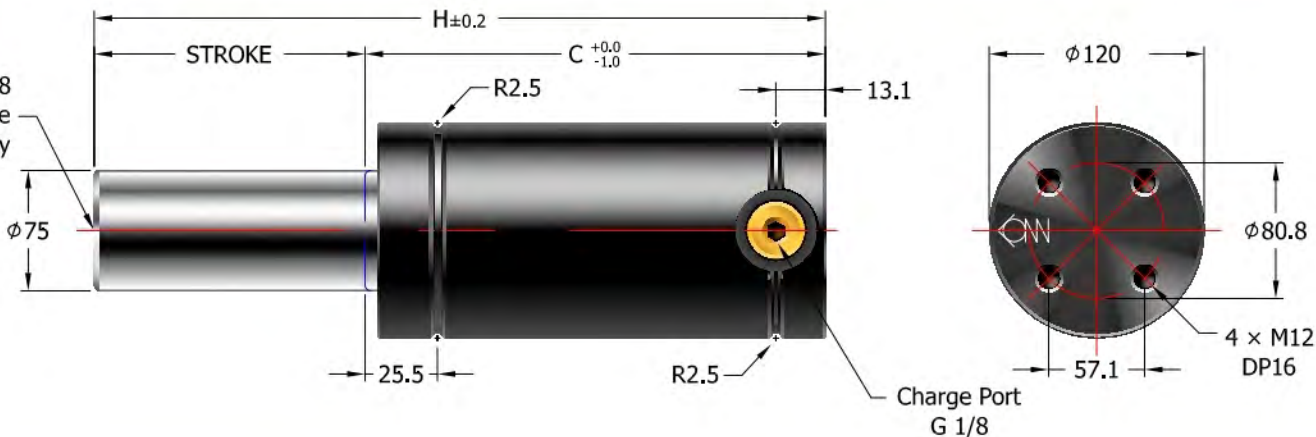
XC4200(SC3000) MOUNT





2014/68/EU

M8
Maintenance
only



규격 표기법

GAS SPRING

TST6600
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XT6600

REPAIR KIT

RCX6600

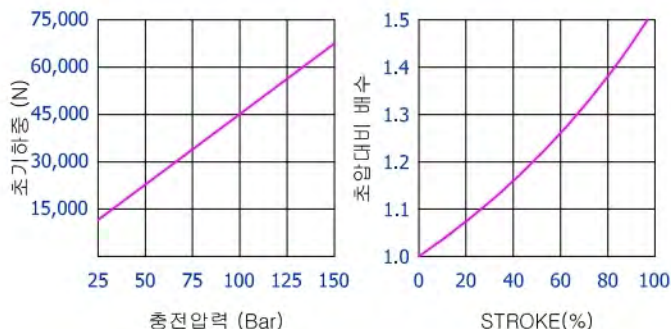
[주의!] TST6600은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TST6600

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

■ 충전압력/압축량 대비 하중변화도표



■ TST6600의 충전 압력(Bar) 계산식

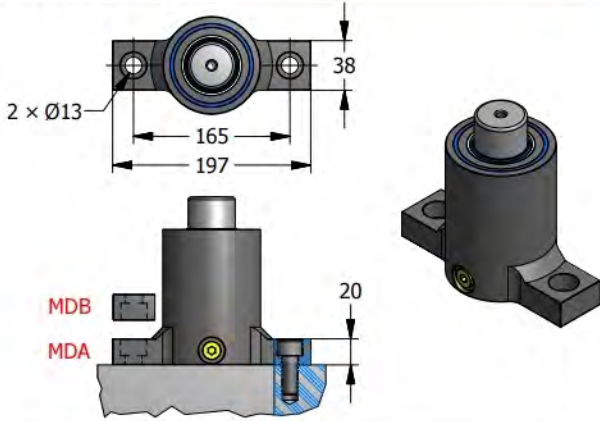
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{441.6}$$

ex) 필요한 초기하중 60,000N인 GAS SPRING의 충전압력은?

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

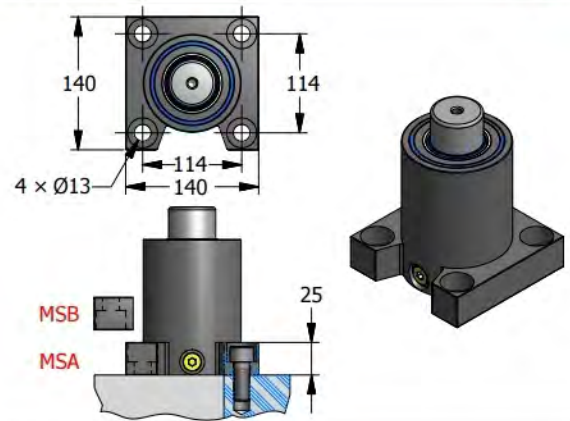
MD MOUNT

일체형



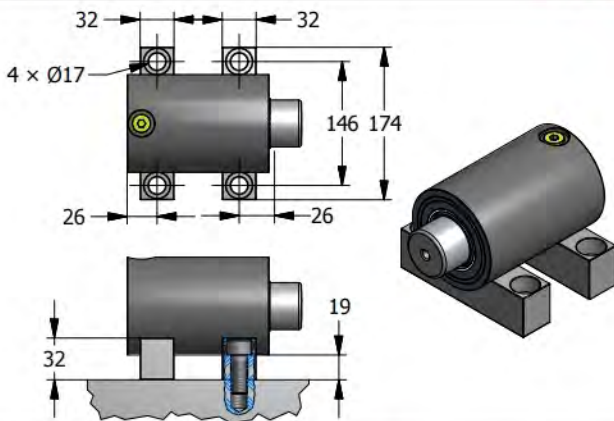
MS MOUNT

일체형

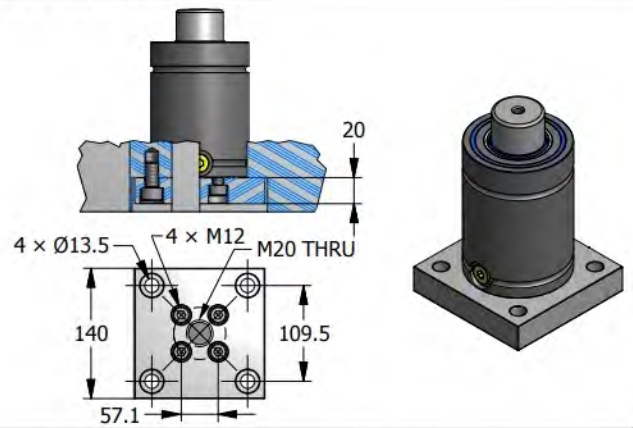


MK MOUNT

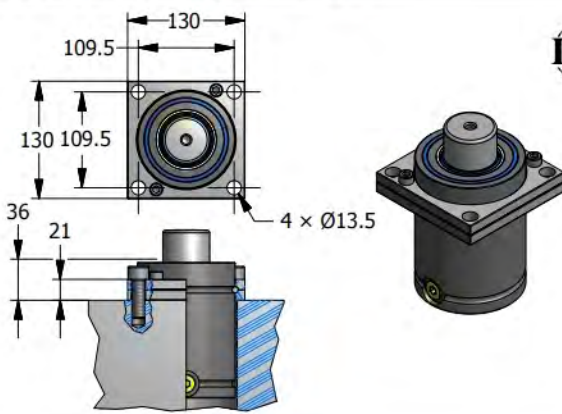
일체형



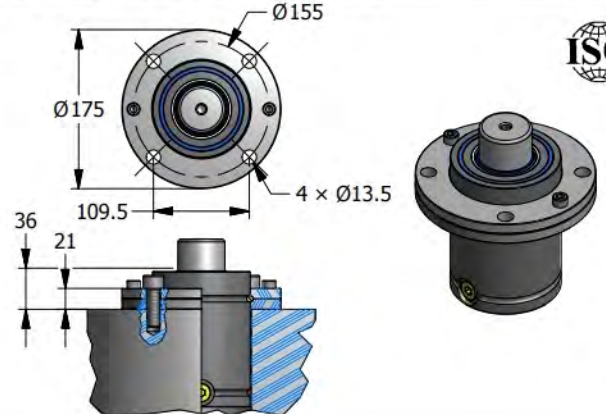
TB6600 MOUNT



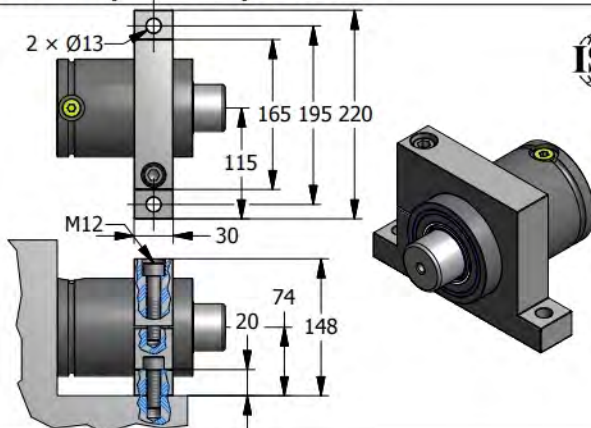
XT6600(ST5000) MOUNT



XR6600(SR5000) MOUNT



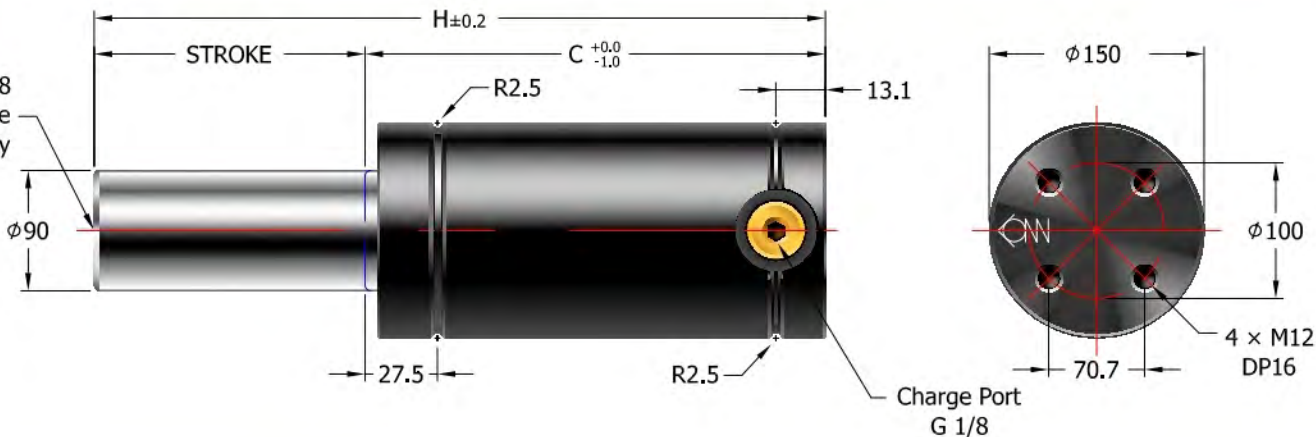
XC6600(SC5000) MOUNT





2014/68/EU

M8
Maintenance
only



규격 표기법

GAS SPRING

TST9500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

XT9500

REPAIR KIT

RCX9500

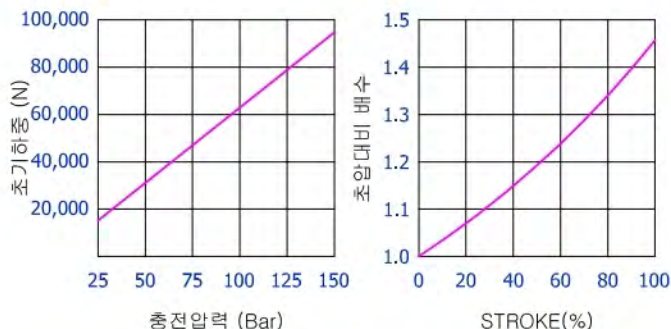
[주의!] TST9500은 충전 압력을 별도로 지정하지 않을 경우 표준충전압력(150Bar)으로 출고됩니다.

TST9500

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
20	0.79	118	98	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

■ 충전압력/압축량 대비 하중변화도표



■ TST9500의 충전 압력(Bar) 계산식

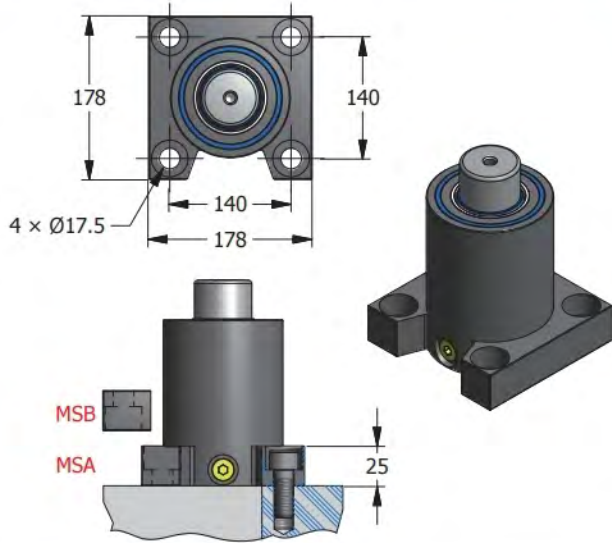
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{635.9}$$

ex) 필요한 초기하중 85,000N인 GAS SPRING의 충전압력은?

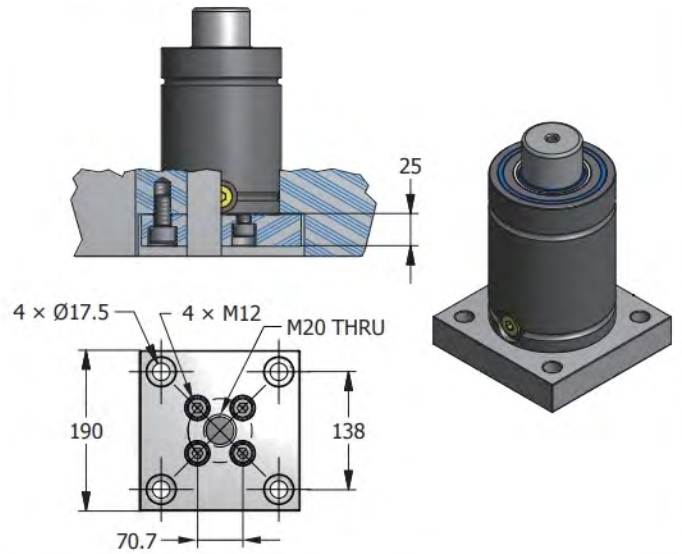
$$134(\text{Bar}) = \frac{85,000(\text{N})}{635.9}$$

MS MOUNT

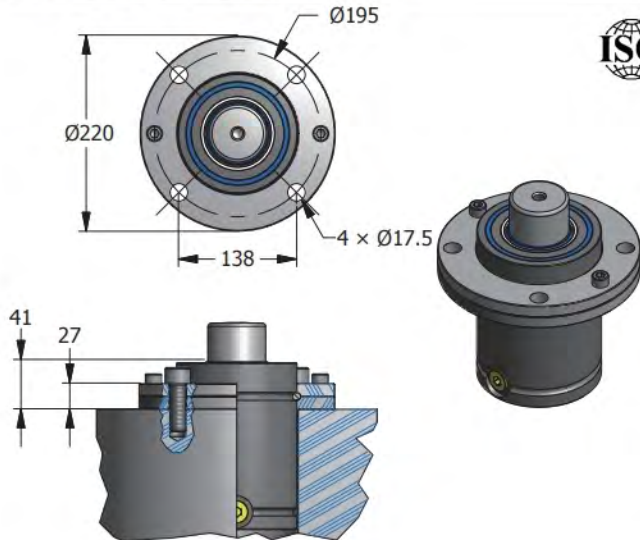
일체형



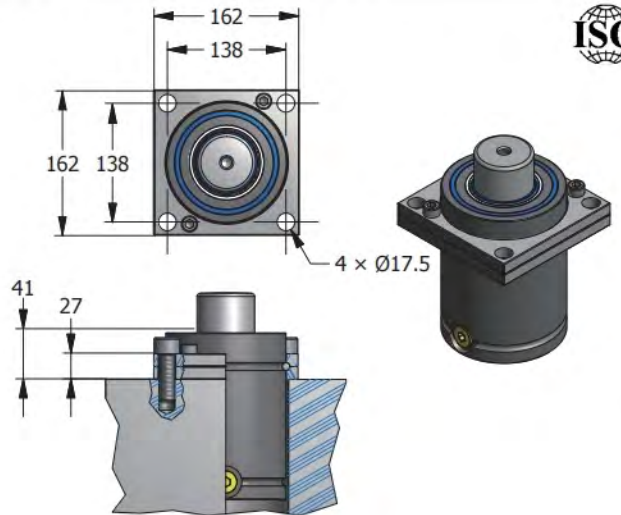
TB9500 MOUNT



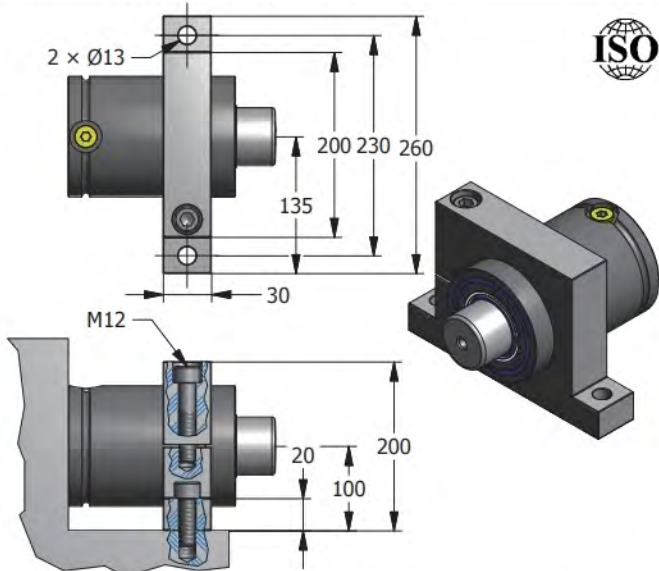
XR9500(SR7500) MOUNT

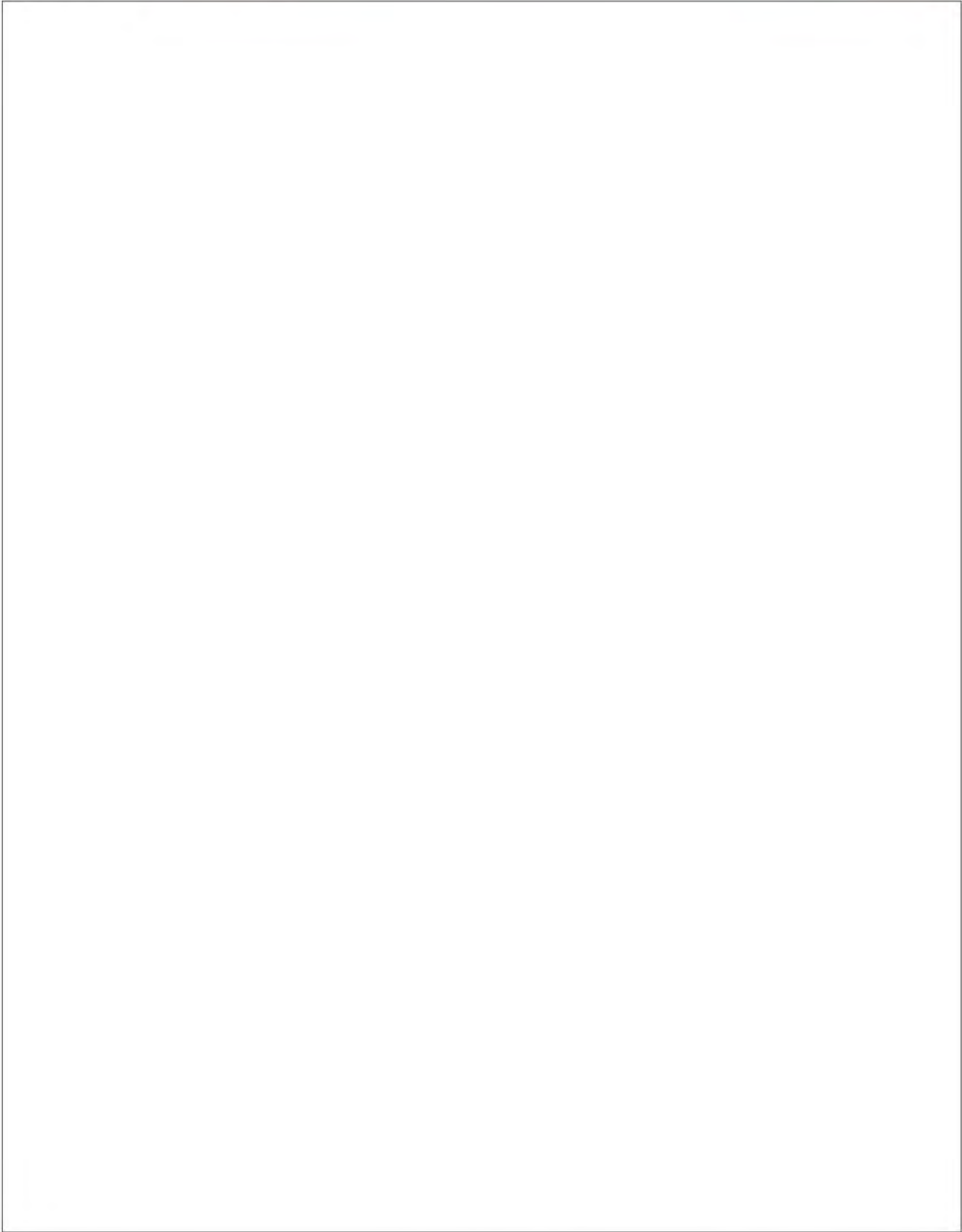
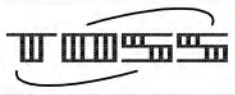


XT9500(ST7500) MOUNT



XC9500(SC7500) MOUNT







TSM SERIES



CONTENTS

NITROGEN GAS SPRING



TSM50	66
TSM70	67
TSM90	68
TSM0150	70
TSM0300	72
TSM0500	74
TSM0750	76
TSM1500	78
TSM3000	80
TSM5000	82

COMPACT TYPE

■ 일반 제원

- 충전재
질소가스 (N₂)
- 최대 충전 압력
150 ~ 180 bar (at 20℃)
- 최소 충전 압력
25 bar (at 20℃)
- 작동 온도
0 to 80℃
- 온도에 따른 압력 증가량
±0.3% / °C
- 분당 최대 스트로크 양복
~50 to 100 (at 20℃)
- 피스톤 로드 속도
0 ~ 0.8 m/s
- 로드 표면처리
도금 열처리
- 실린더 표면처리
흑산화 피막

■ Model별 제원

종류 TYPE	Stroke (mm)	실린더 외경 Φ(mm)	Rod 외경 Φ(mm)	초기하중 (N)	최대하중 (N)	최대충전압력
TSM50	7~125	12	6	P66 참조	P66 참조	P66 참조
TSM70	7~125	15	7	P67 참조	P67 참조	P67 참조
TSM90	7~125	19	8	P68 참조	P68 참조	P68 참조
TSM0150	10~125	25	12	P70 참조	P70 참조	P70 참조
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

※ 상기 사양은 성능개선을 위해 예고없이 변경될 수 있습니다.



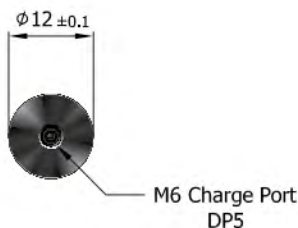
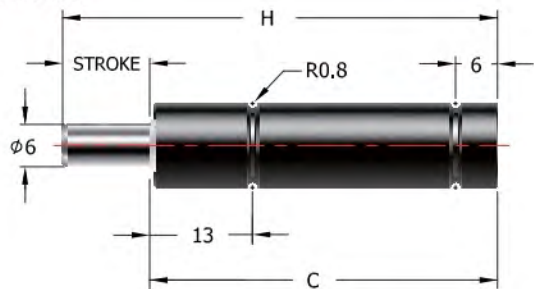


TSM50

NITROGEN GAS SPRING



2014/68/EU



YELLOW

RED

BLUE

GREEN

규격 표기법

GAS SPRING

TSM50
MODEL

× 050
STROKE

— 180(YELLOW)

충전압력
(Bar)

MOUNT

SG50

REPAIR KIT

Non-repairable

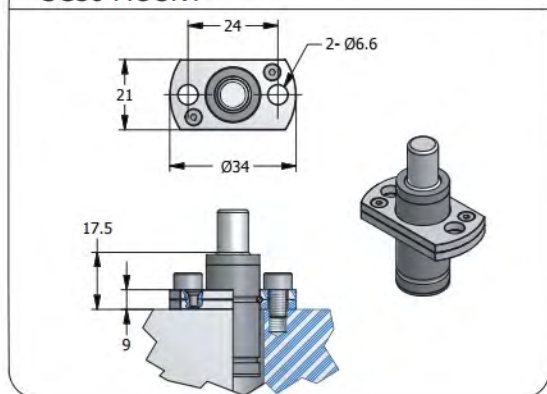
TSM50

Stroke		H	C	Force (N) (180•135•90•45 bar / +20℃)				Gas vol. (cm ³)	weight (kg)
(mm)	(inch)			End force*	End force*	End force*	End force*		
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

* 기타 특수한 규격은 당사에 문의 바랍니다.

SG50 MOUNT



Note:

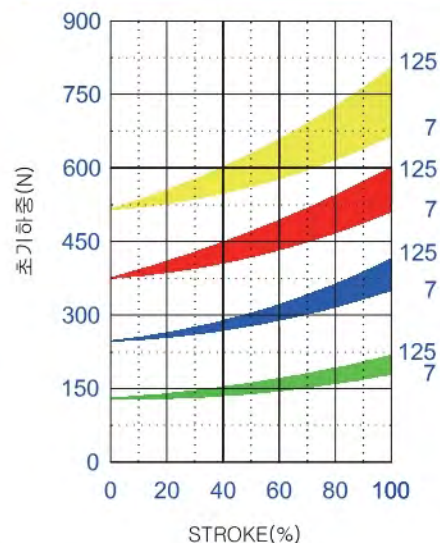
TOSS GAS SPRING TSM50을 비롯한 전규격 GAS SPRING의 실가동 STROKE는 규격보다 약 10%의 여유를 확보하여야 합니다. TSM50은 어떠한 경우에도 분해하여서는 안됩니다.



★ Bottom 체결 STROKE

7 - 25mm strokes에 대해서만 사용하실 수 있습니다.

■ 색상별 하중변화도표



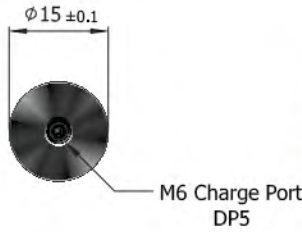
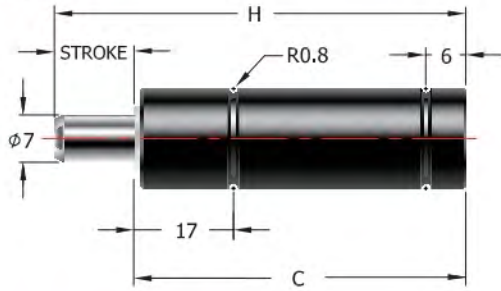
TSM50은 초기하중별구분으로 하기도표와 같이 4종류가 있습니다. 출하시 색상별로 충전되어있으며 압력조정과 질소GAS 재충전은 불가능합니다.

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





2014/68/EU



YELLOW

RED

BLUE

GREEN

규격 표기법

GAS SPRING

TSM70
MODEL

× 050
STROKE

— 180(YELLOW)
충전압력
(Bar)

MOUNT

SG70

REPAIR KIT

Non-repairable

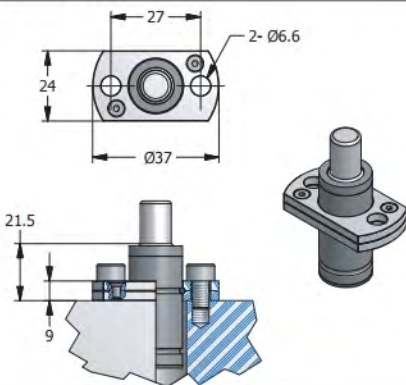
TSM70

Stroke		H	C	Force(N) (180-135-90-45 bar / +20℃)				Gas vol. (cm ³)	weight (kg)
(mm)	(inch)			End force*	End force*	End force*	End force*		
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

* 기타 특수한 규격은 당사에 문의 바랍니다.

SG70 MOUNT



Note:

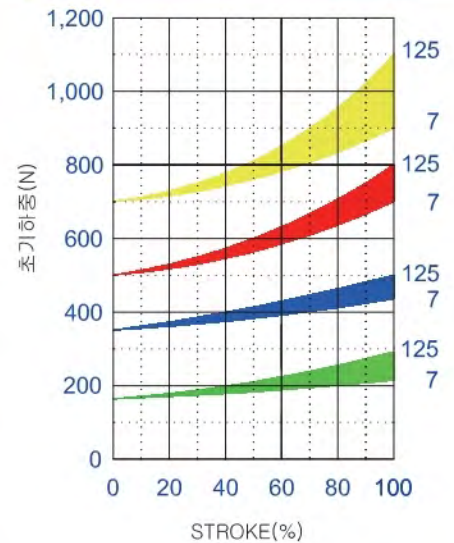
TOSS GAS SPRING TSM70을 비롯한 전규격 GAS SPRING의 실가동 STROKE는 규격보다 약 10%의 여유를 확보하여야 합니다. TSM70은 어떠한 경우에도 분해하여서는 안됩니다.



★ Bottom 체결 STROKE

7 - 25mm strokes에 대해서만 사용하실 수 있습니다.

■ 색상별 하중변화도표



TSM70은 초기하중별구분으로 하기도표와 같이 4종류가 있습니다. 출하시 색상별로 충전되어있으며 압력조정과 질소GAS 재충전은 불가능합니다.

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



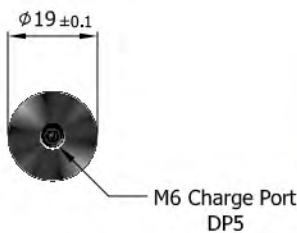
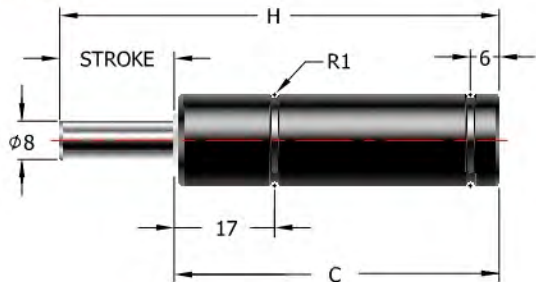


TSM90

NITROGEN GAS SPRING



2014/68/EU



YELLOW

RED

BLUE

GREEN

규격 표기법

GAS SPRING

TSM90
MODEL

× 050
STROKE

— 180(YELLOW)

충전압력
(Bar)

MOUNT

SG90

REPAIR KIT

Non-repairable

TSM90

Stroke		H	C	Force(N) (180-140-100-60 bar / +20°C)				Gas vol. (cm ³)	weight (kg)
(mm)	(inch)			End force*	End force*	End force*	End force*		
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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

Note:

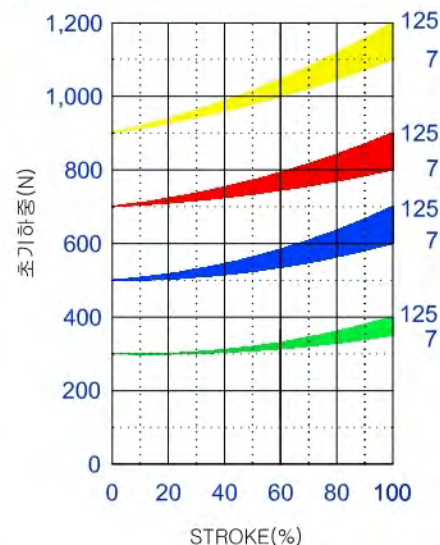
TOSS GAS SPRING TSM90을 비롯한 전규격 GAS SPRING의 실가동 STROKE는 규격보다 약 10%의 여유를 확보하여야 합니다. TSM90은 어떠한경우에도 분해하여서는 안됩니다.



★ Bottom 체결 STROKE

7 - 25mm strokes에 대해서만 사용하실 수 있습니다.

색상별 하중변화도표



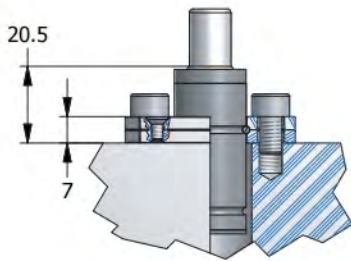
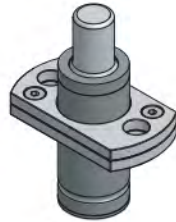
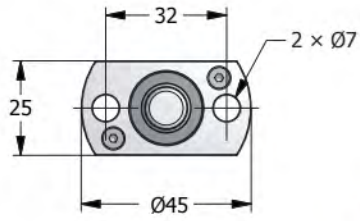
TSM90은 초기하중별구분으로 하기도표와 같이 4종류가 있습니다. 출하시 색상별로 충전되어있으며 압력조정과 질소GAS 재충전은 불가능합니다.

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

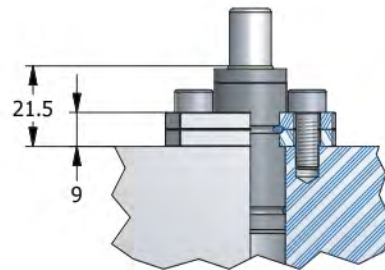
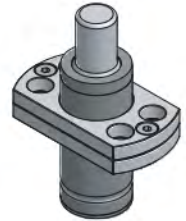
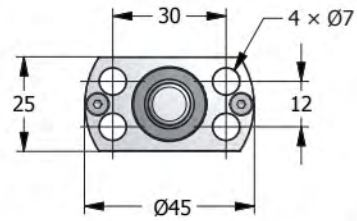




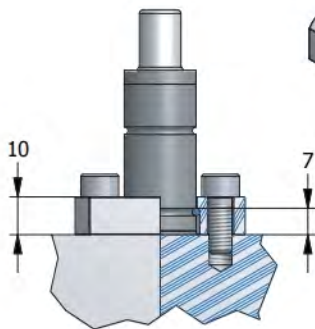
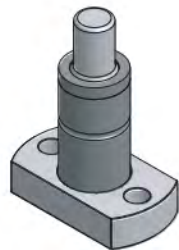
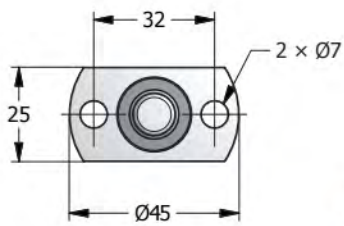
SG90 MOUNT



SC90 MOUNT



SP90 MOUNT



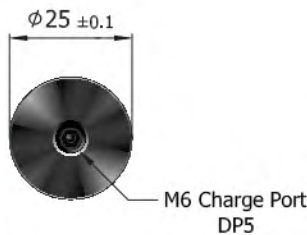
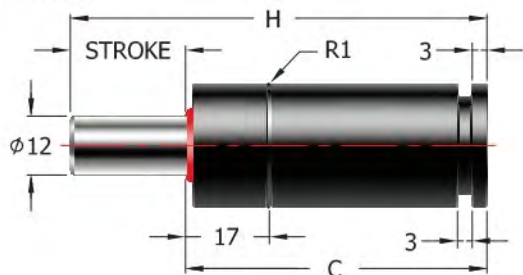


TSM0150

NITROGEN GAS SPRING



2014/68/EU



YELLOW

RED

BLUE

GREEN

규격 표기법

GAS SPRING

TSM0150
MODEL

× 050
STROKE

— 175(YELLOW)

충전압력
(Bar)

MOUNT

SP0150

REPAIR KIT

Non-repairable

TSM0150

Stroke		H	C	Force(N) (175·135·90·45 bar / +20 ℃)				Gas vol. (cm ³)	weight (kg)
(mm)	(inch)			End force*	End force*	End force*	End force*		
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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

Note:

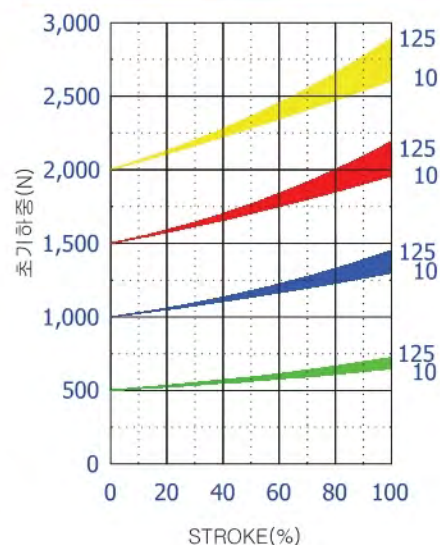
TOSS GAS SPRING TSM0150을 비롯한 전규격 GAS SPRING의 실가동 STROKE는 규격보다 약 10%의 여유를 확보하여야 합니다. TSM0150은 어떠한경우에도 분해하여서는 안됩니다.



★ Bottom thread

only to be used for strokes 10~25mm

색상별 하중변화도표

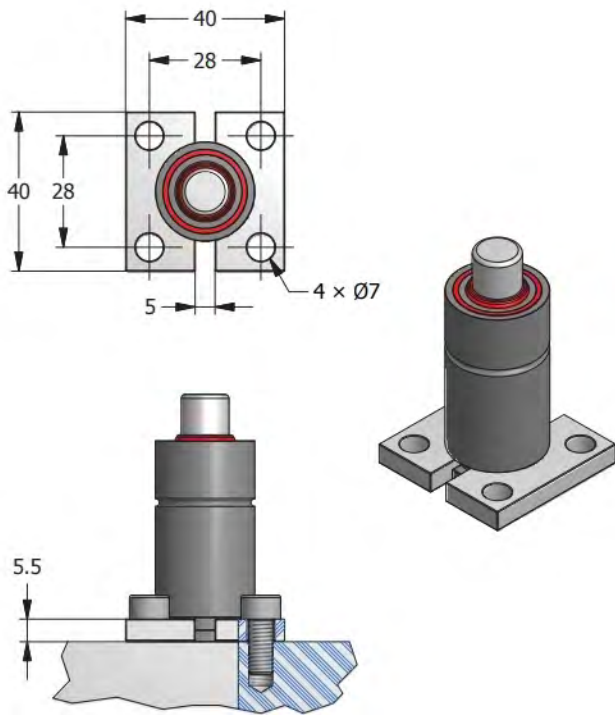


TSM0150은 초기하중별구분으로 하기도표와 같이 4종류가 있습니다. 출하시 색상별로 충전되어있으며 압력조정은 불가능하며 질소GAS 재충전은 가능합니다.

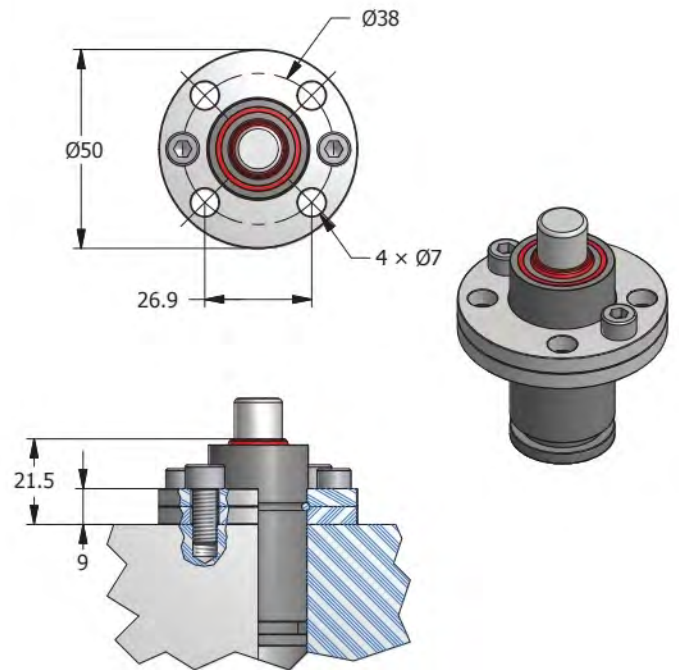
Color	Force (N)	bar
YELLOW	2,000	175
RED	1,500	135
BLUE	1,000	90
GREEN	500	45



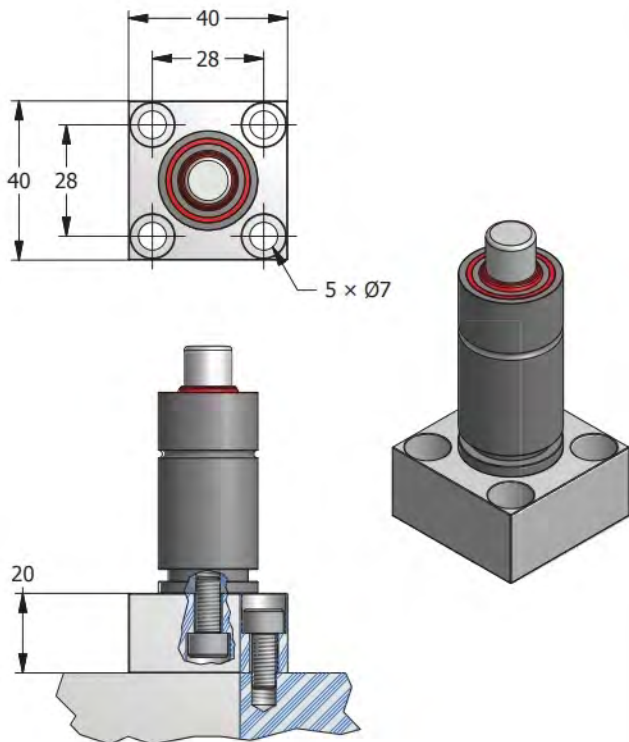
SP0150 MOUNT



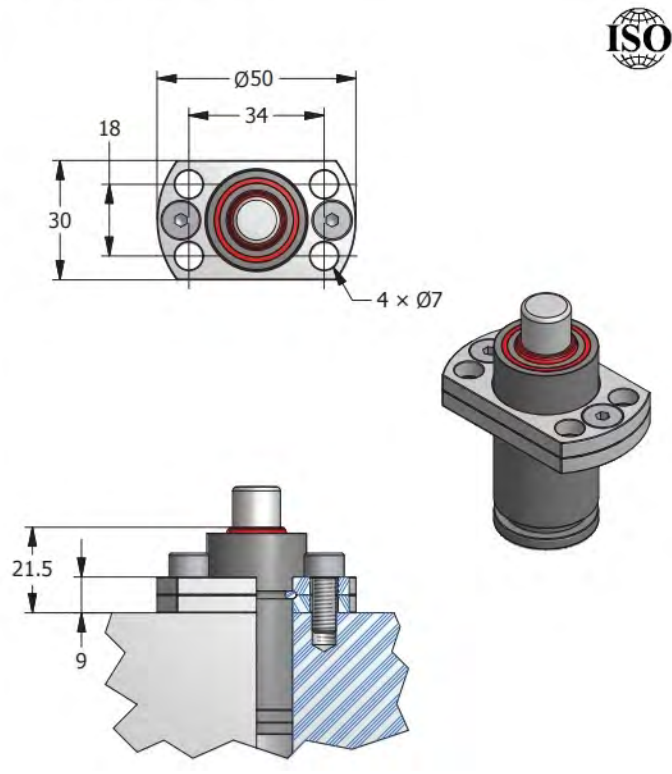
SR0150 MOUNT



SB0150 MOUNT



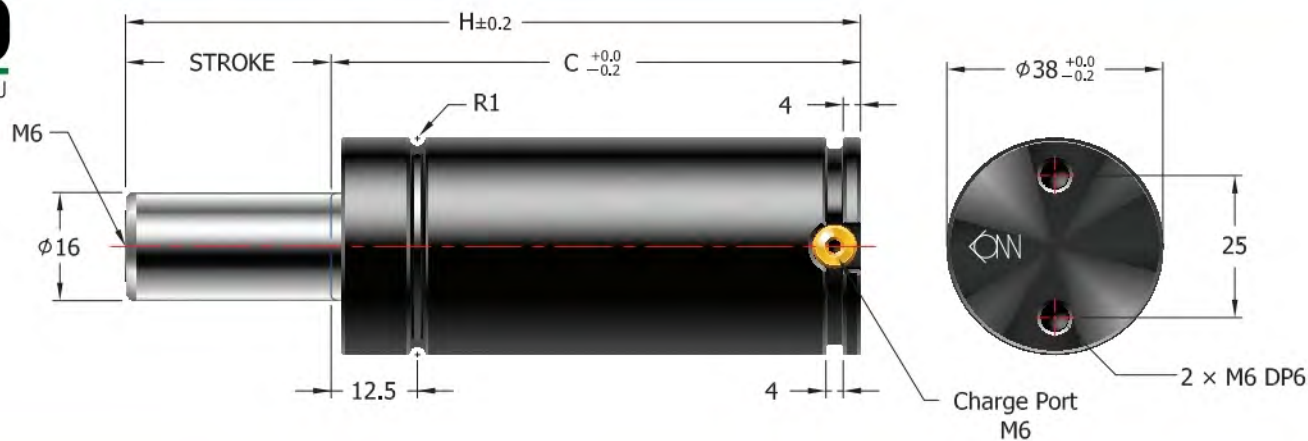
SG0150 MOUNT





TSM0300

NITROGEN GAS SPRING



규격 표기법

GAS SPRING

TSM0300
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

150
충전압력
(Bar)

MOUNT

SP0300

REPAIR KIT

RCM0300

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

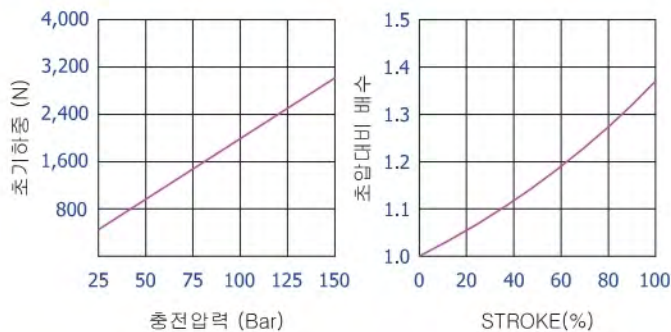
TSM0300

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSM0300의 충전 압력(Bar) 계산식

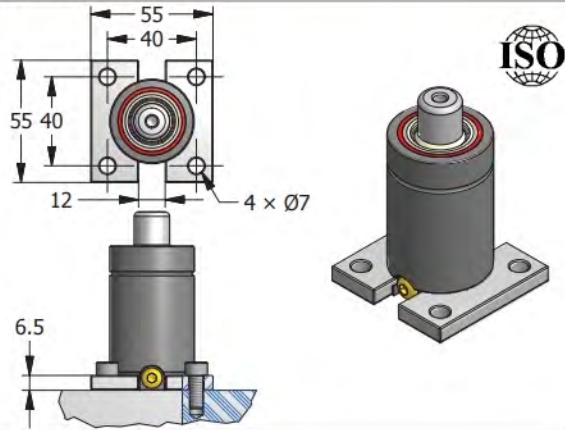
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{20.1}$$

ex) 필요한 초기하중 2,500N인 GAS SPRING의 충전압력은?

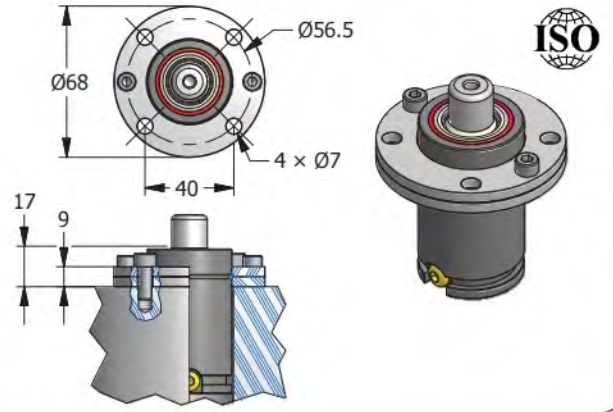
$$124(\text{Bar}) = \frac{2,500(\text{N})}{20.1}$$



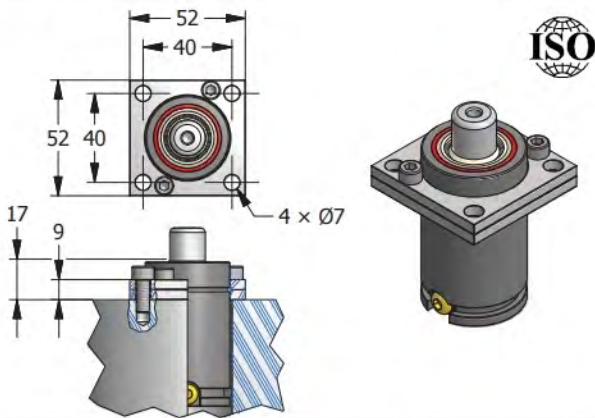
SP0300 MOUNT



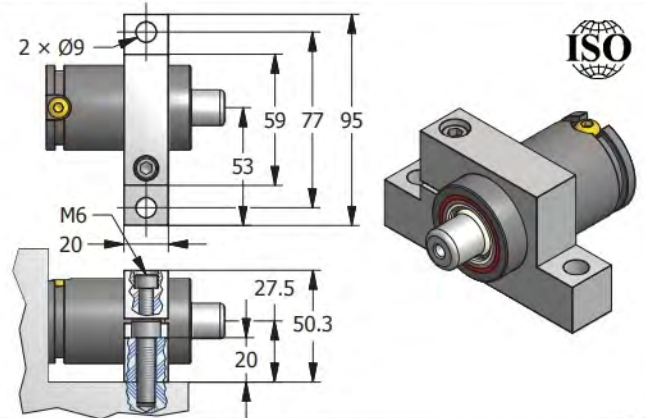
SR0300 MOUNT



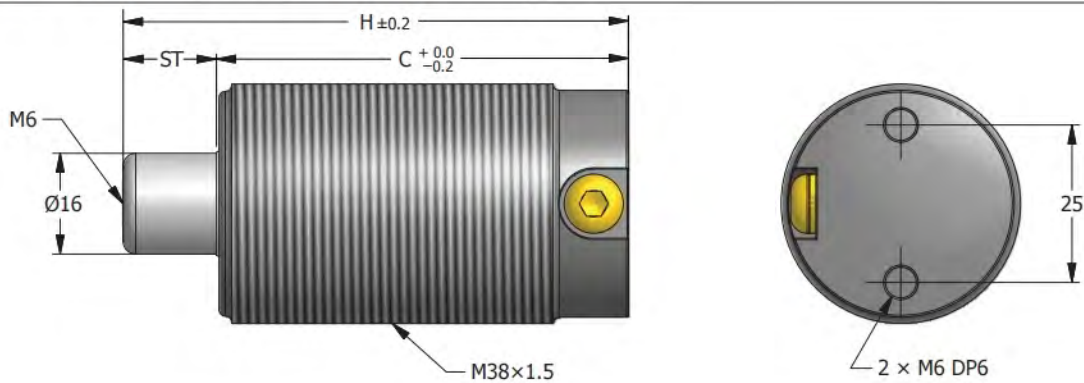
ST0300 MOUNT



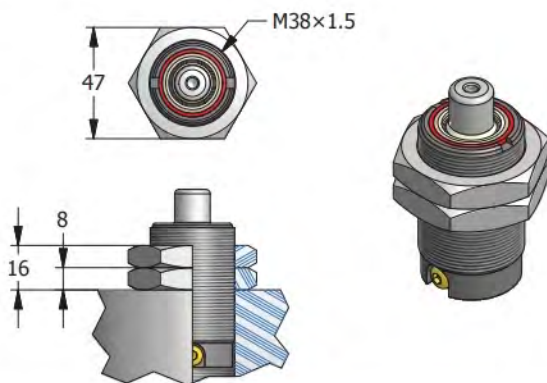
SC0300 MOUNT



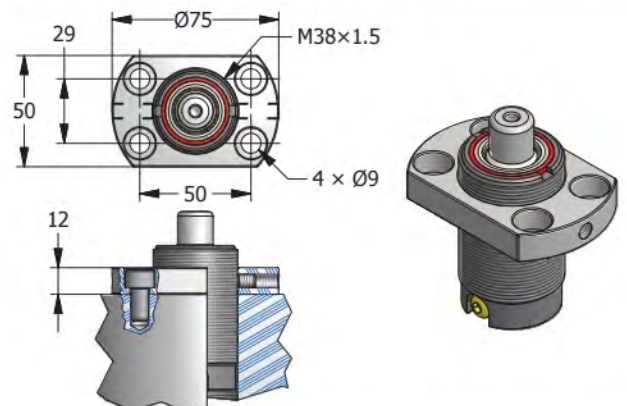
TTM0300 (Threaded Option)



SN0300 MOUNT For TTM0300



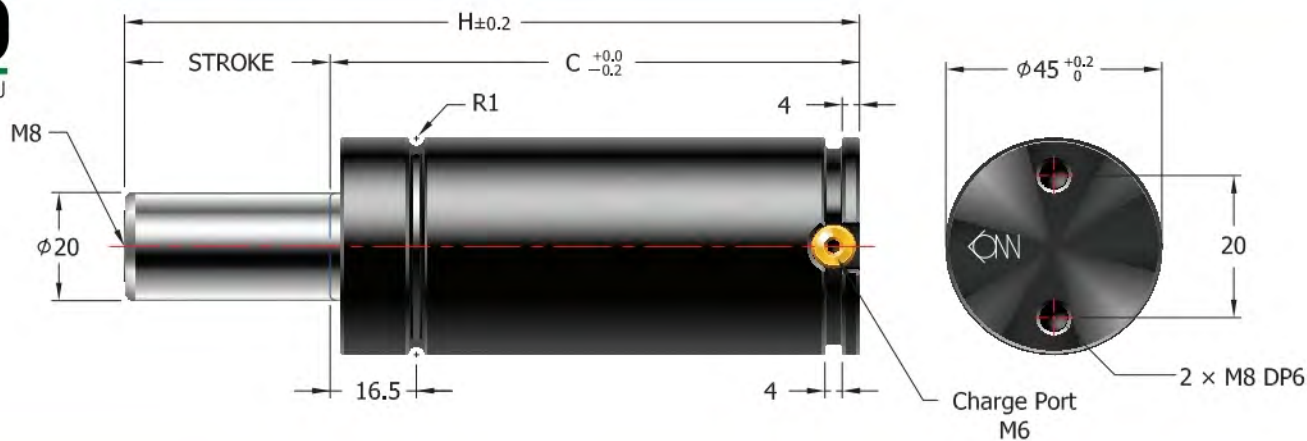
SG0300 MOUNT For TTM0300





TSM0500

NITROGEN GAS SPRING



규격 표기법

GAS SPRING

TSM0500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

150
충전압력
(Bar)

MOUNT

SP0500

REPAIR KIT

RCM0500

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

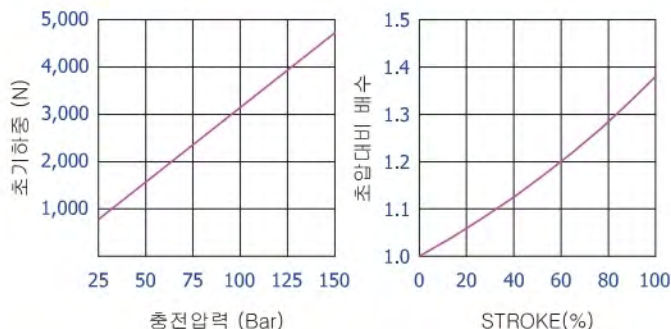
TSM0500

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSM0500의 충전 압력(Bar) 계산식

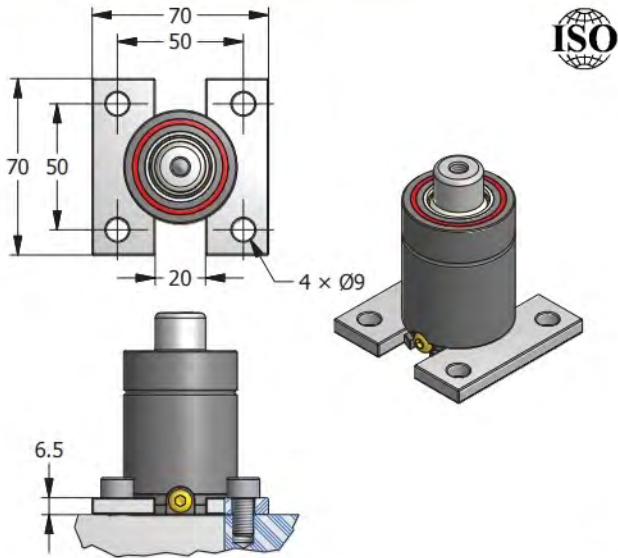
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{31.4}$$

ex) 필요한 초기하중 4,000N인 GAS SPRING의 충전압력은?

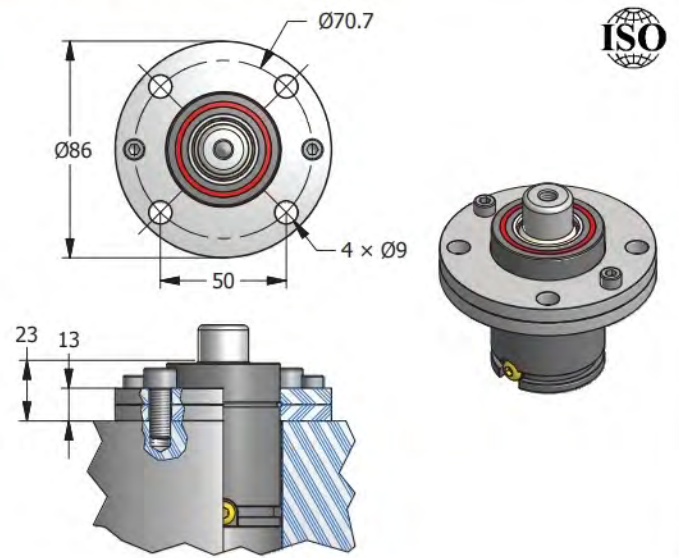
$$127(\text{Bar}) = \frac{4,000(\text{N})}{31.4}$$



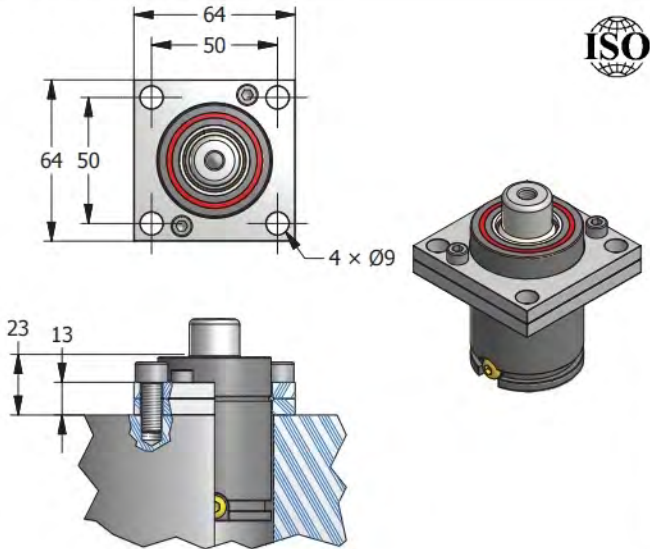
SP0500 MOUNT



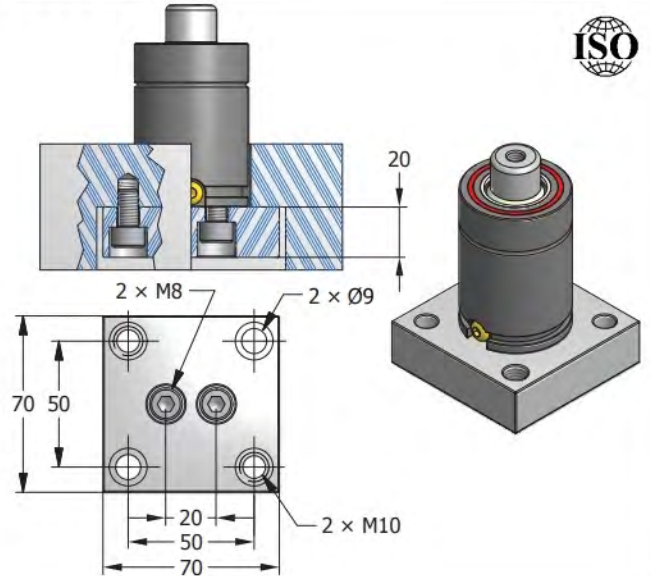
SR0500 MOUNT



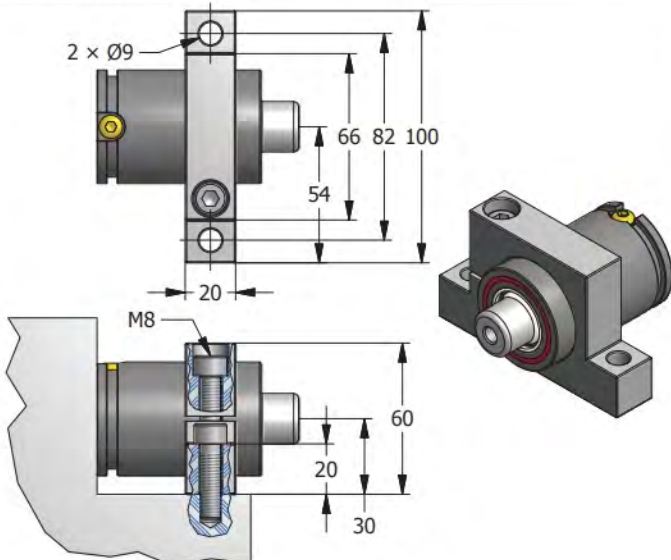
ST0500 MOUNT



SB0500 MOUNT



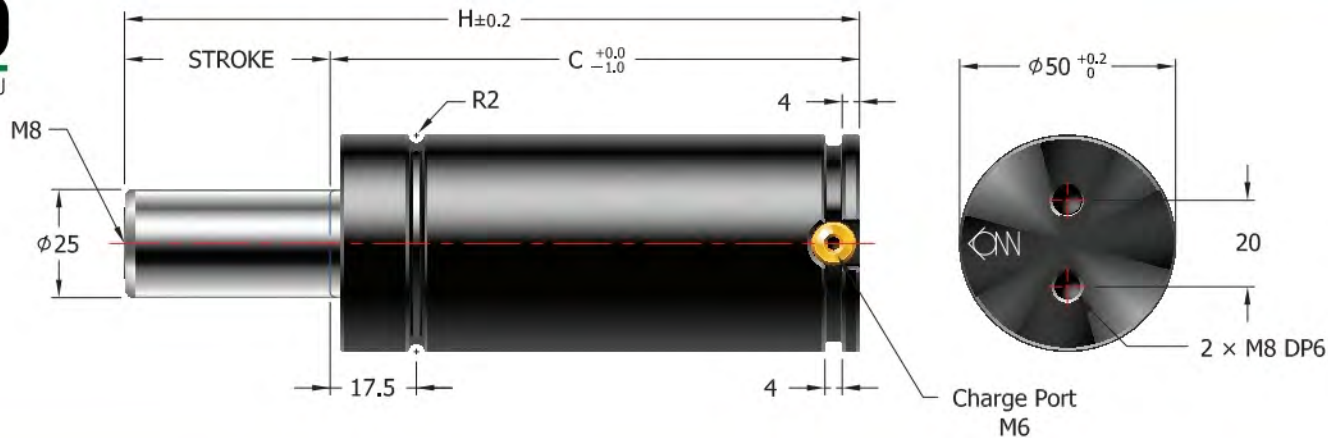
SC0500 MOUNT





TSM0750

NITROGEN GAS SPRING



규격 표기법

GAS SPRING

TSM0750
MODEL

× 050
STROKE

S(F) - (MSA) -
단독형-S 일체형 마운트
배관형-F (선택사항)

150
충전압력
(Bar)

MOUNT

SP0750

REPAIR KIT

RCM0750

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

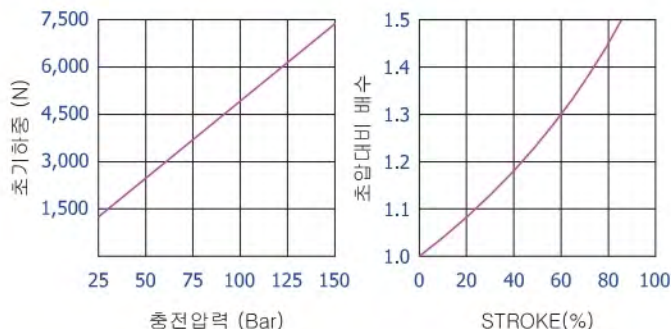
TSM0750

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
10	0.39	70	60	7,350	11,700	13.2	0.75
12.7	0.50	75.4	62.7	7,350	11,800	16.6	0.78
15	0.59	80	65	7,350	11,800	19.5	0.80
20	0.79	90	70	7,350	11,900	25.7	0.86
25	0.98	100	75	7,350	11,900	32.0	0.92
30	1.18	110	80	7,350	11,900	38.3	0.94
35	1.38	120	85	7,350	11,900	44.6	1.02
38	1.50	126	88	7,350	12,000	48.4	1.04
40	1.57	130	90	7,350	12,000	50.9	1.06
45	1.77	140	95	7,350	12,000	57.1	1.10
50	1.97	150	100	7,350	12,000	63.4	1.14
60	2.36	170	110	7,350	12,000	76.0	1.24
63	2.48	176	113	7,350	12,000	79.8	1.26
70	2.76	190	120	7,350	12,000	88.5	1.34
75	2.95	200	125	7,350	12,000	94.8	1.38
80	3.15	210	130	7,350	12,000	101.1	1.43
90	3.54	230	140	7,350	12,000	113.7	1.53
100	3.94	250	150	7,350	12,000	126.2	1.62
125	4.92	300	175	7,350	12,000	157.6	1.84

* = at full stroke

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSM0750의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{49.1}$$

ex) 필요한 초기하중 6,000N인 GAS SPRING의 충전압력은?

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



MD MOUNT 일체형

30, 89, 111, 2 × Ø11, 20, MDB, MDA

MS MOUNT 일체형

76, 54, 76, 4 × Ø11, 25, MSB, MSA

MT MOUNT 일체형

30, 89, 111, 2 × Ø11, 19, MTA, C7

MR MOUNT 일체형

Ø90, Ø110, 4 × Ø11, 19, MRA, C7

MK MOUNT 일체형

24, 24, 68, 89, 4 × Ø11, 17, 17, 12.7, 20

SP0750M MOUNT

56.5, 75, 4 × Ø9, 75, 56.5, 24, 6.5

SB0750 MOUNT ISO

20, 2 × Ø9, 75, 56.5, 2 × M8, 2 × M10, 20

ST0750 MOUNT ISO

56.5, 70, 4 × Ø9, 70, 56.5, 13, 24

SR0750 MOUNT ISO

Ø80, Ø95, 4 × Ø9, 56.5, 13, 24

SC0750 MOUNT ISO

2 × Ø9, 90, 110, 130, 70, M8, 30, 40, 80, 20

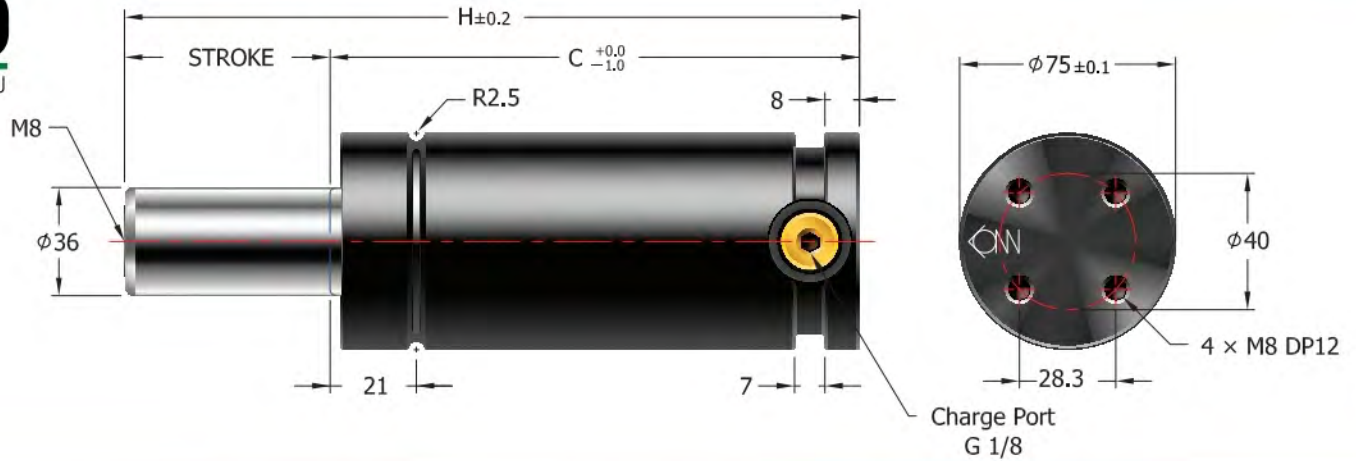


TSM1500

NITROGEN GAS SPRING



2014/68/EU



규격 표기법

GAS SPRING

TSM1500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

SP1500

REPAIR KIT

RCM1500

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

TSM1500

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표

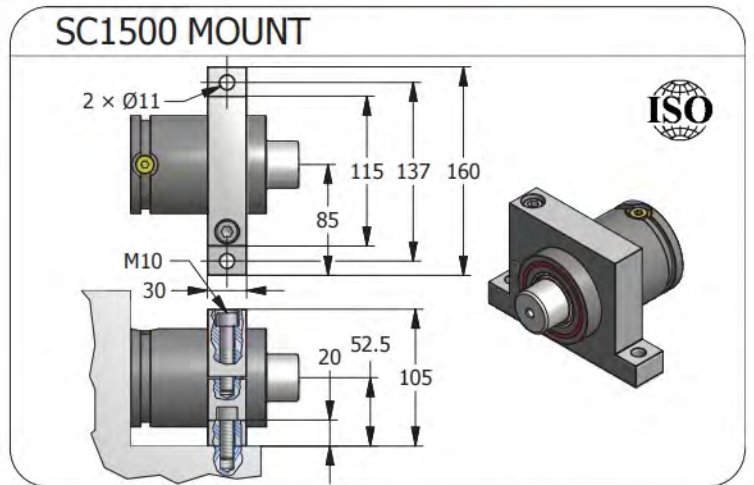
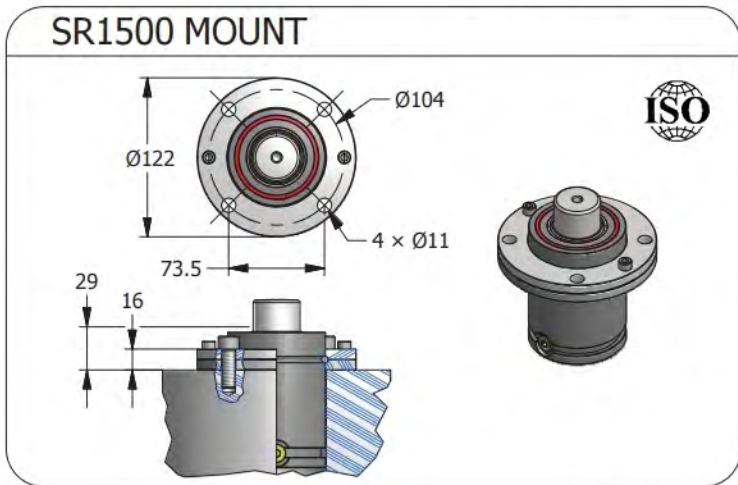
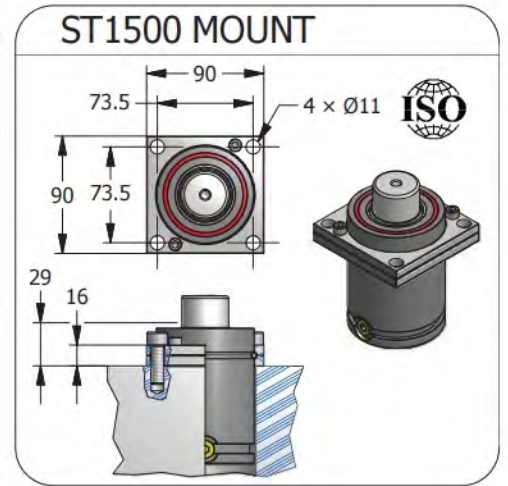
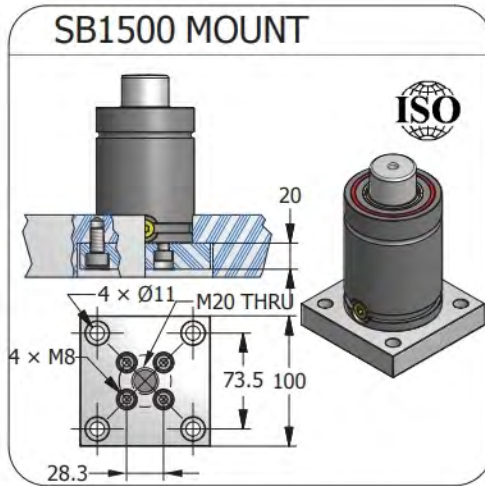
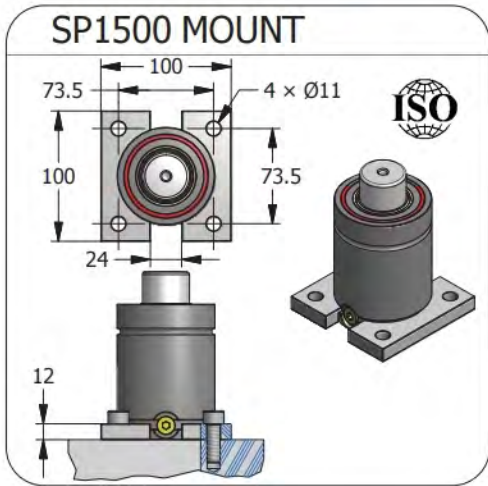
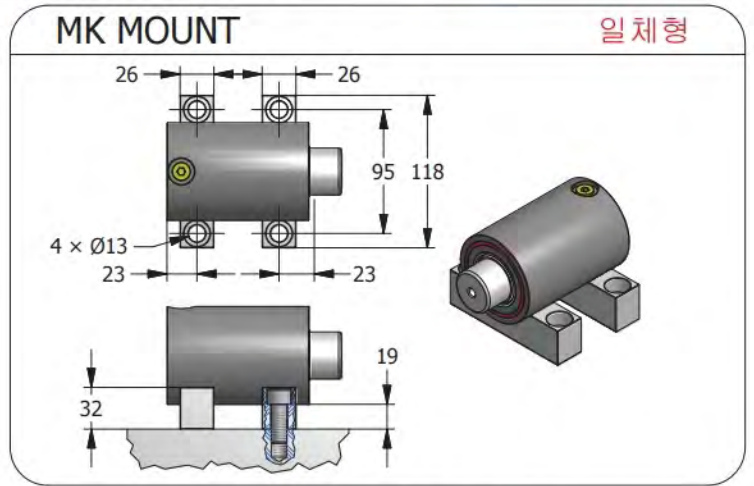
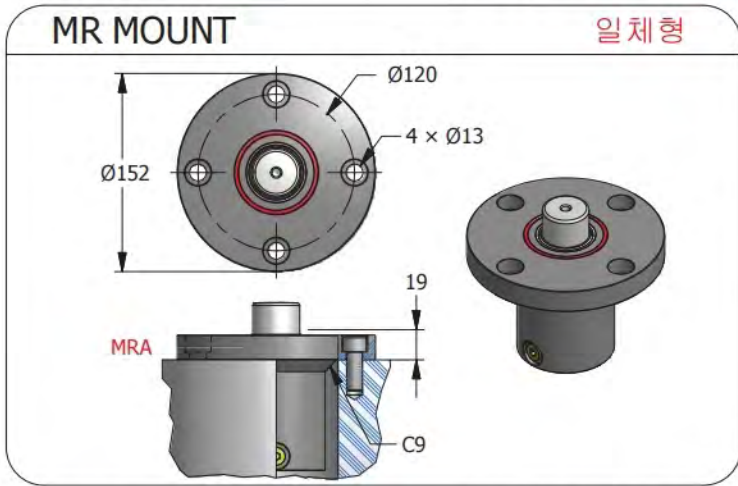
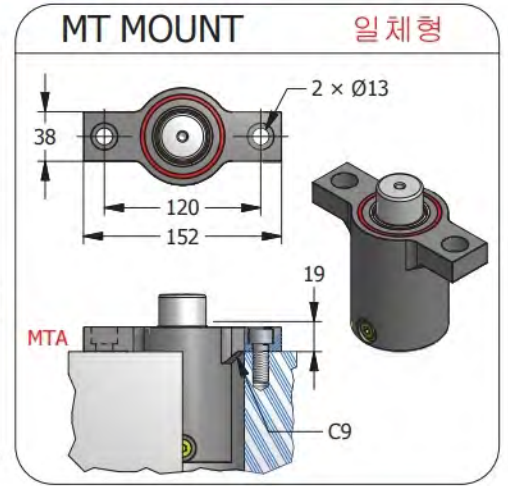
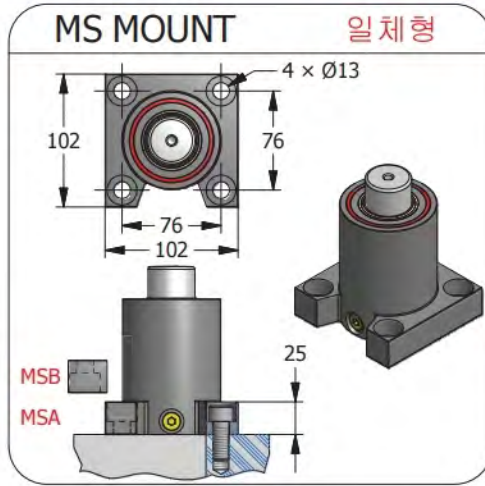
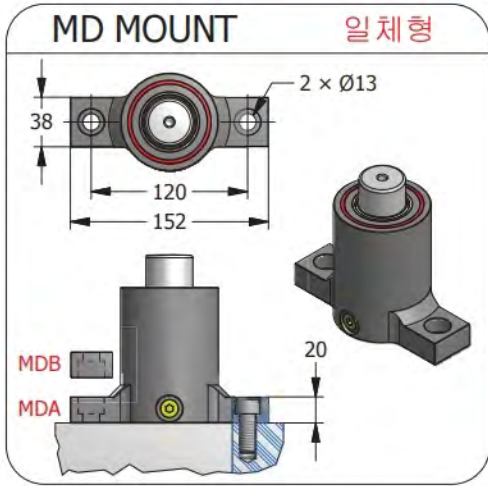


■ TSM1500의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{101.7}$$

ex) 필요한 초기하중 12,000N인 GAS SPRING의 충전압력은?

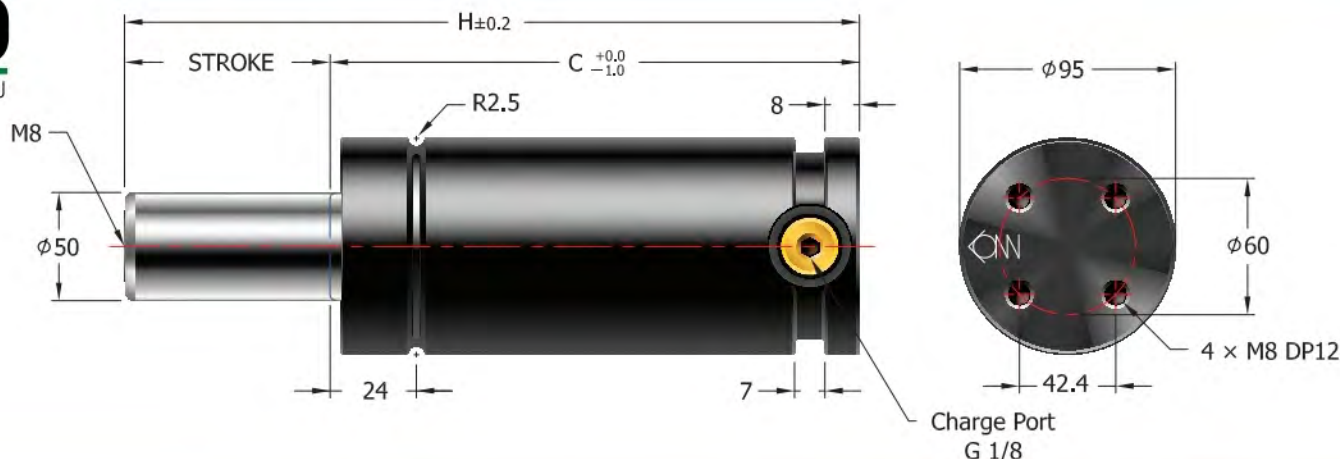
$$118(\text{Bar}) = \frac{12,000(\text{N})}{101.7}$$





TSM3000

NITROGEN GAS SPRING



규격 표기법

GAS SPRING

TSM3000
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

SP3000

REPAIR KIT

RCM3000

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

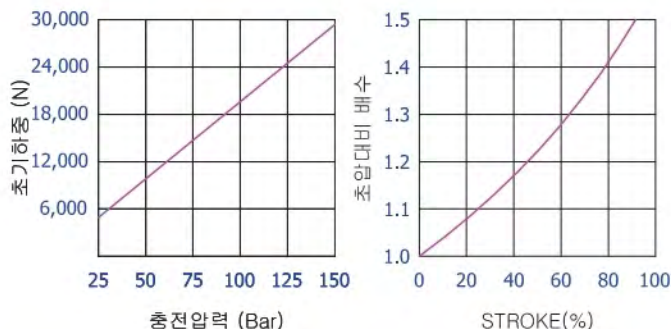
TSM3000

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표

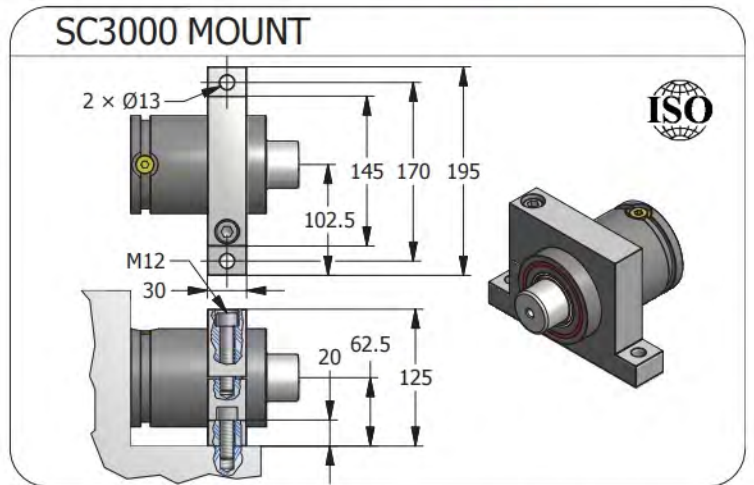
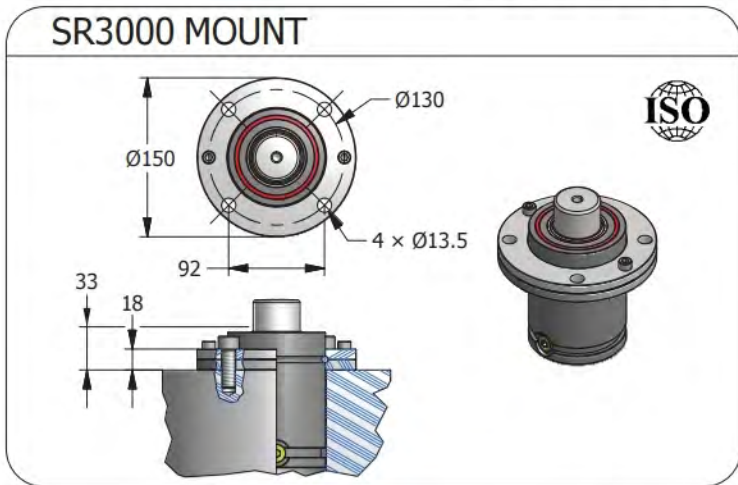
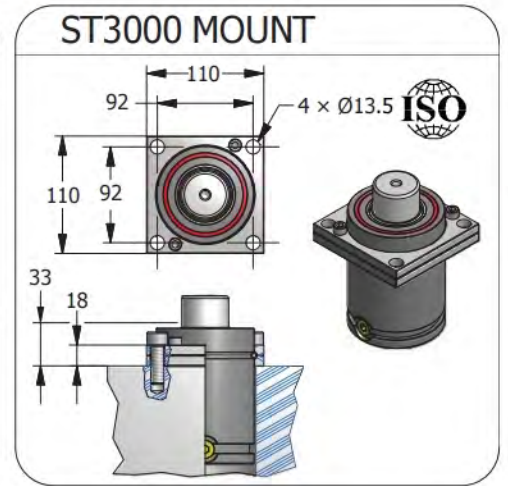
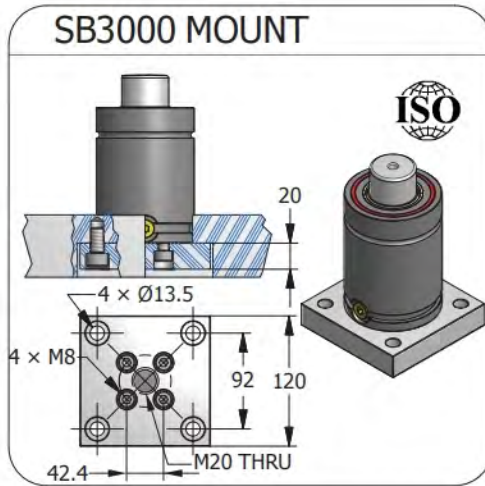
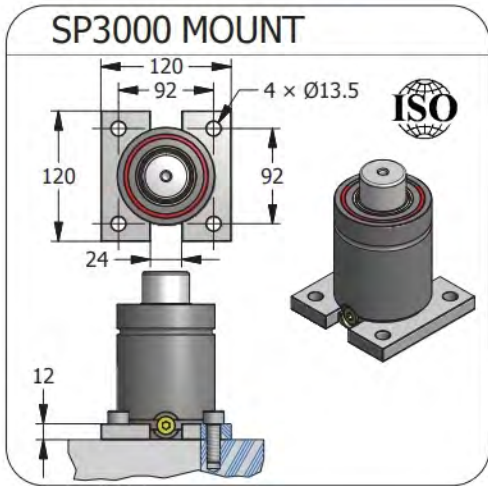
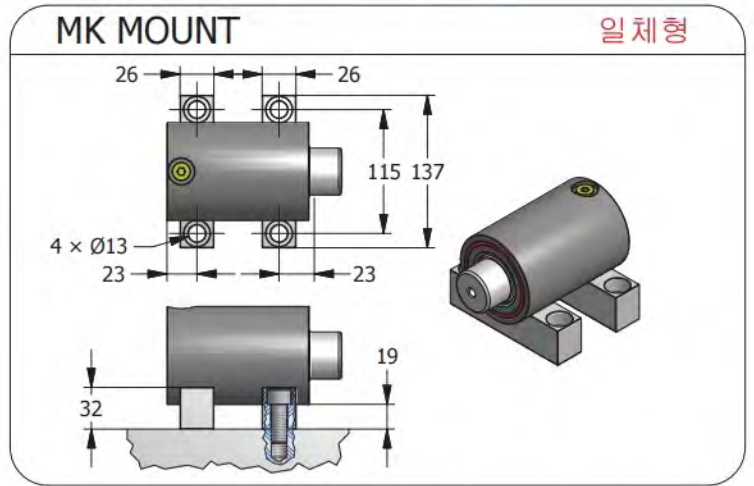
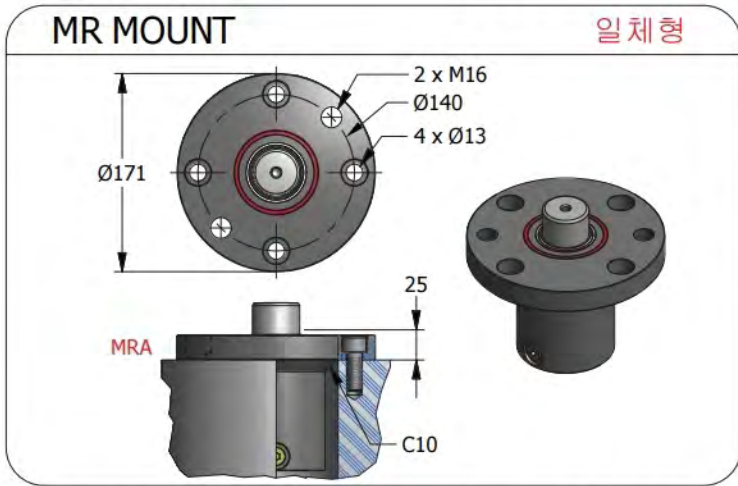
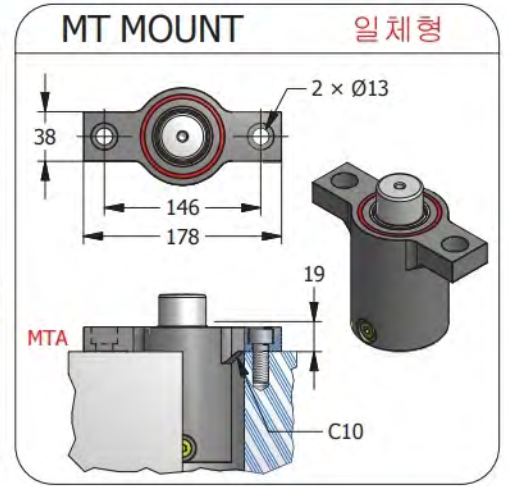
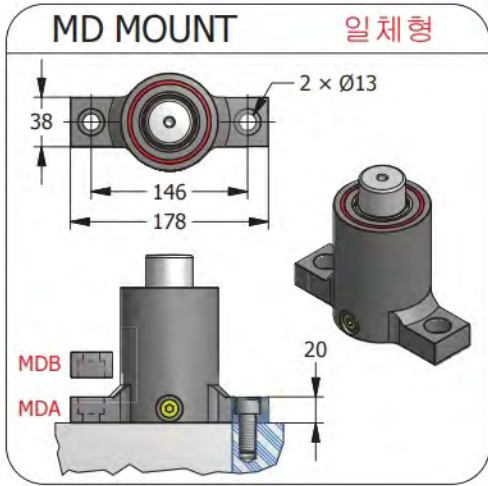


■ TSM3000의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{196.2}$$

ex) 필요한 초기하중 25,000N인 GAS SPRING의 충전압력은?

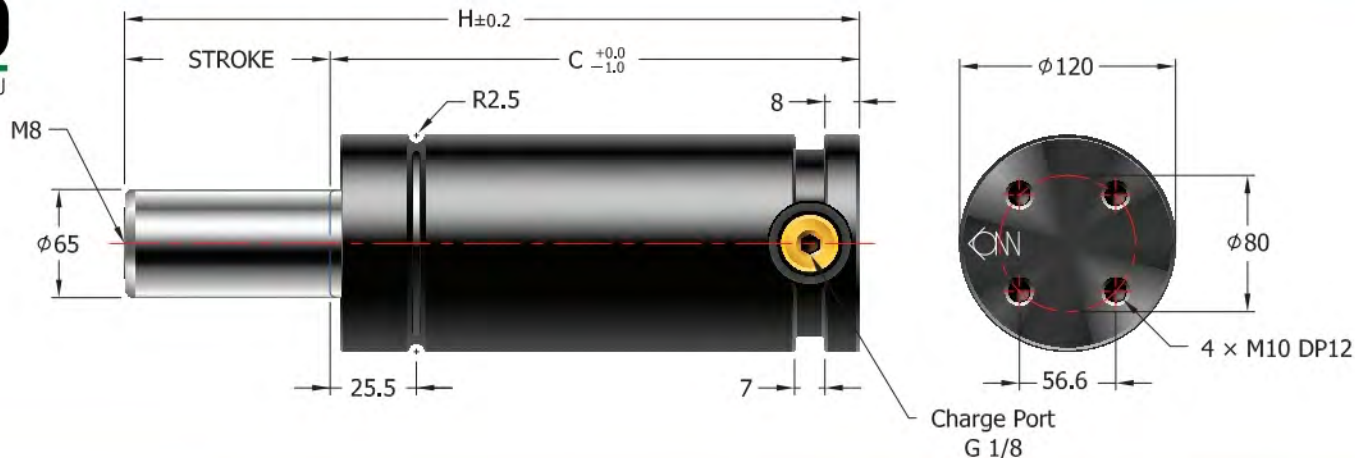
$$127(\text{Bar}) = \frac{25,000(\text{N})}{196.2}$$





TSM5000

NITROGEN GAS SPRING



규격 표기법

GAS SPRING

TSM5000
MODEL

× 050
STROKE

S(F) - (MSA) -
단독형-S 일체형 마운트
배관형-F (선택사항)

150
충전압력
(Bar)

MOUNT

SP5000

REPAIR KIT

RCM5000

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

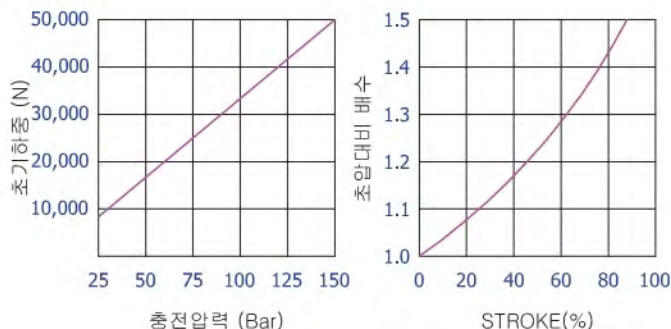
TSM5000

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSM5000의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{331.7}$$

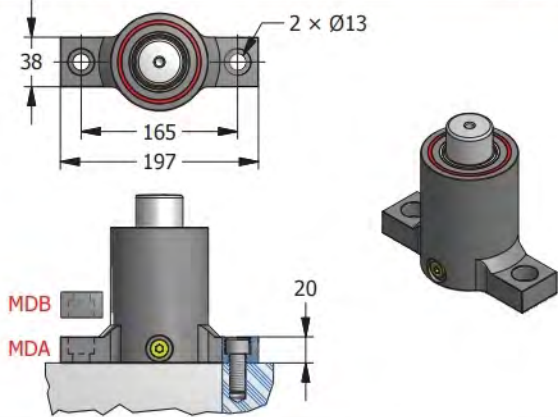
ex) 필요한 초기하중 38,000N인 GAS SPRING의 충전압력은?

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



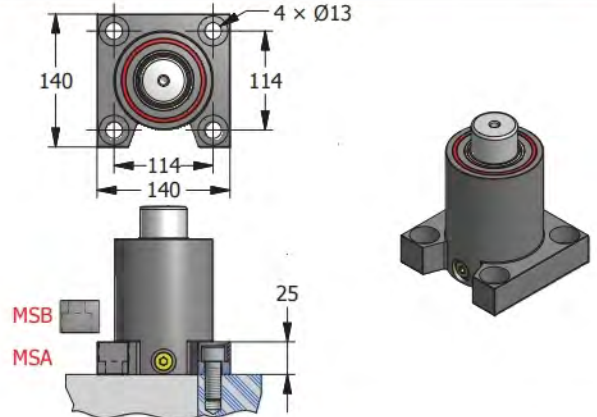
MD MOUNT

일체형



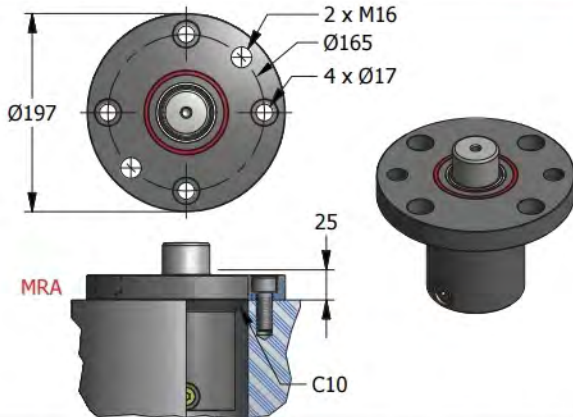
MS MOUNT

일체형



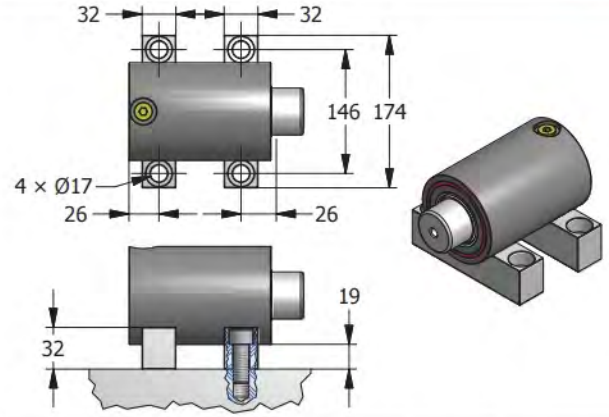
MR MOUNT

일체형

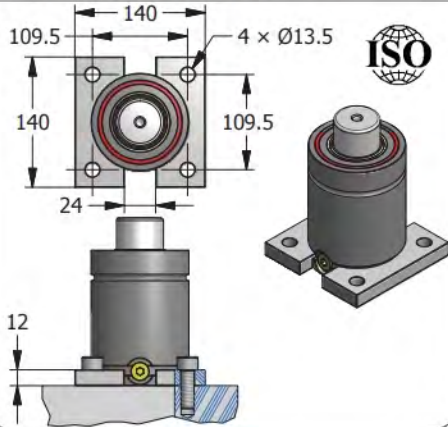


MK MOUNT

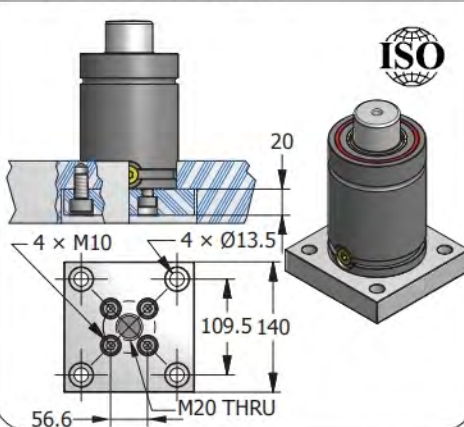
일체형



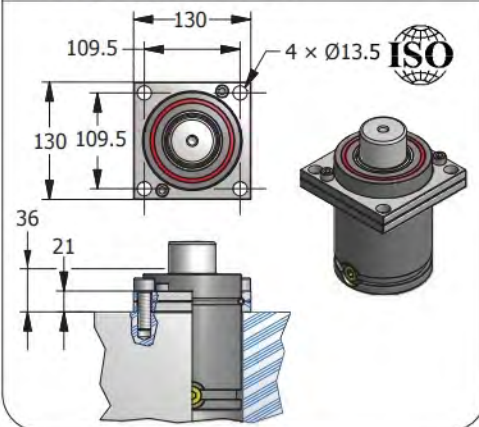
SP5000 MOUNT



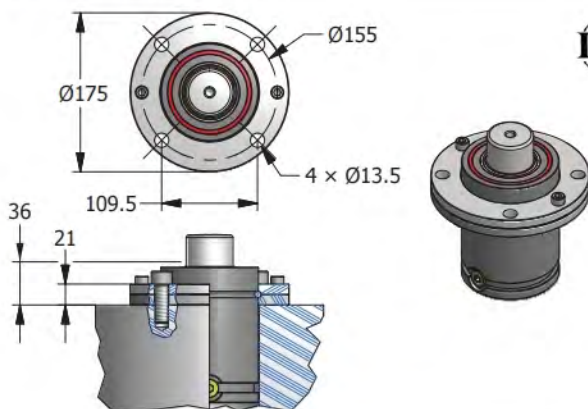
SB5000 MOUNT



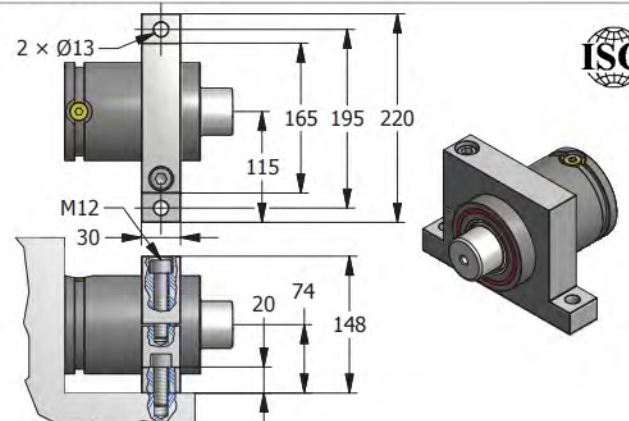
ST5000 MOUNT

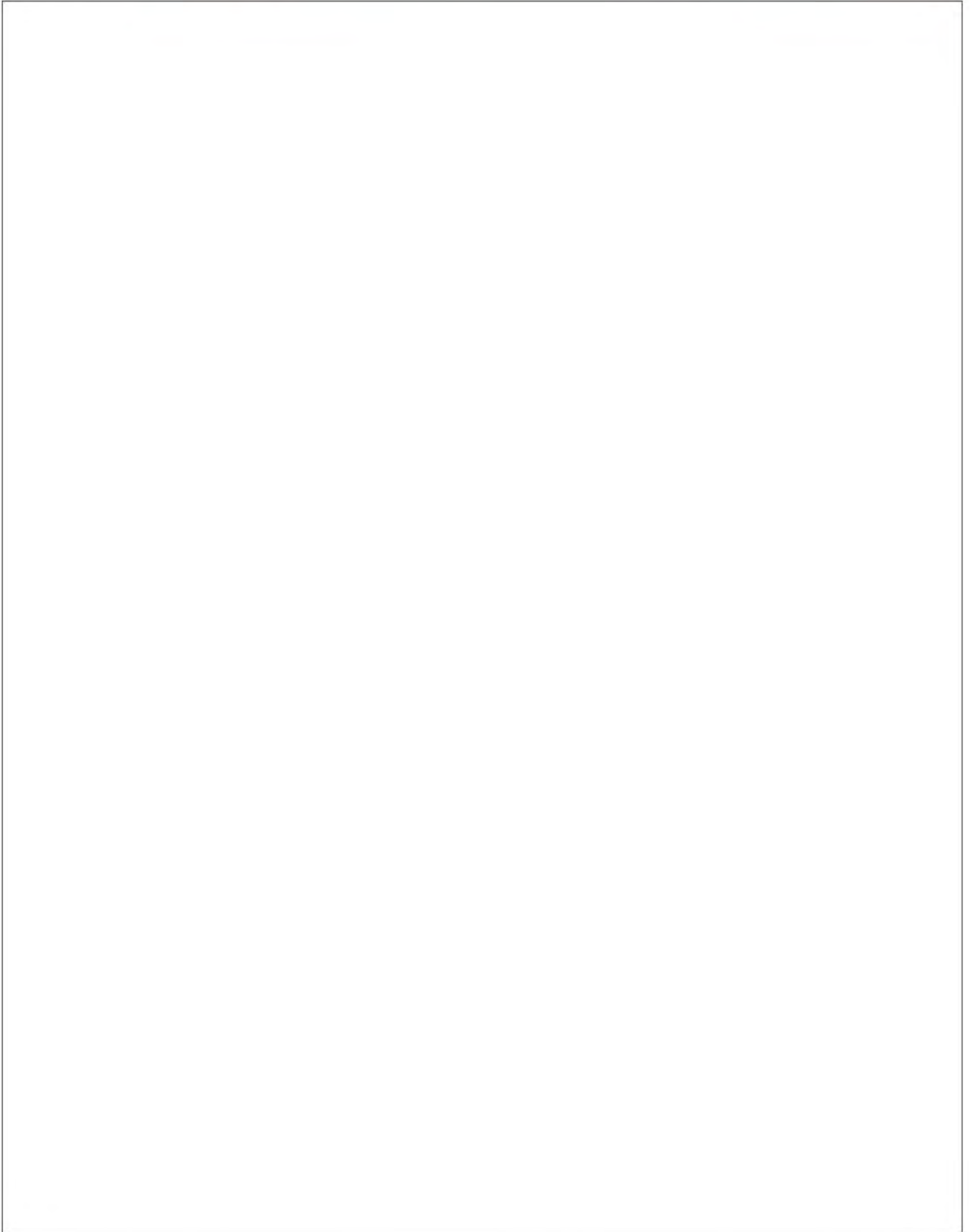


SR5000 MOUNT



SC5000 MOUNT







TSS SERIES

PED
2014/68/EU



JAS-ANZ
SMC
ISO 9001 인증기업

ISO 14001:2004

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NITROGEN GAS SPRING



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TOSS STANDARD

■ 일반 제원

- 충전재
질소가스 (N₂)
- 최대 충전 압력
150 bar (at 20℃)
- 최소 충전 압력
25 bar (at 20℃)
- 작동 온도
0 to 80℃
- 온도에 따른 압력 증가량
±0.3% / ℃
- 분당 최대 스트로크 왕복
~50 to 100 (at 20℃)
- 피스톤 로드 속도
0 ~ 0.8 m/s
- 로드 표면처리
도금 열처리
- 실린더 표면처리
흑산화 피막

■ Model별 제원

종류 TYPE	Stroke (mm)	실린더 외경 Φ(mm)	Rod 외경 Φ(mm)	초기하중 (N)	최대하중 (N)	최대충전압력
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

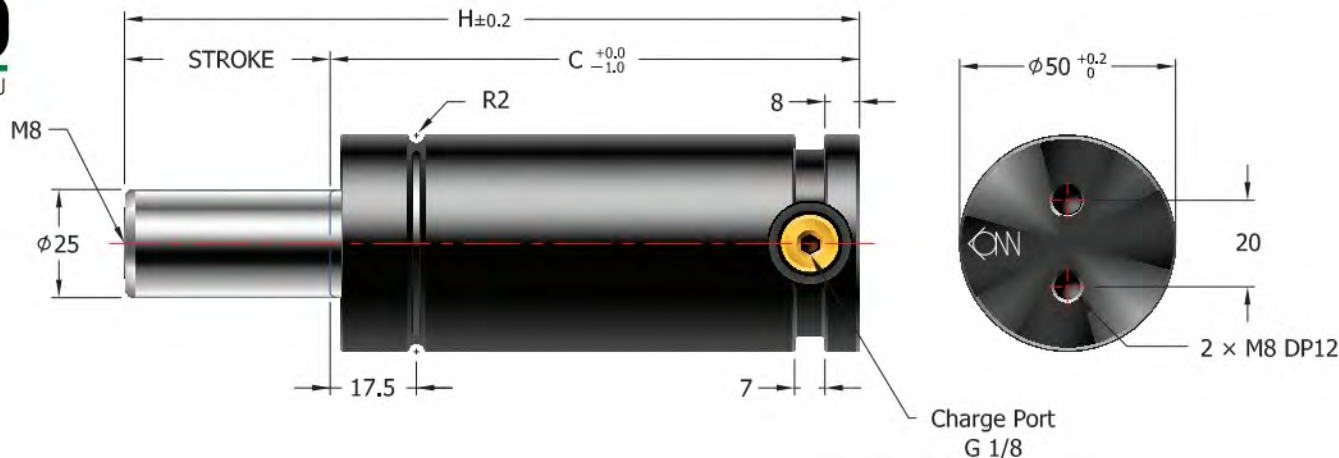
※ 상기 사양은 성능개선을 위해 예고없이 변경될 수 있습니다.





TSS0750

NITROGEN GAS SPRING



규격 표기법

GAS SPRING

TSS0750
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

SP0750

REPAIR KIT

RCS0750

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

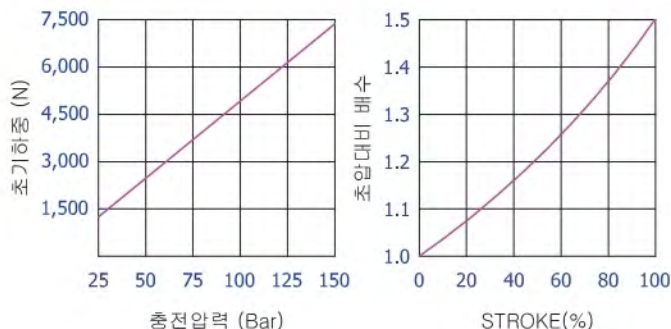
TSS0750

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSS0750의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{49.1}$$

ex) 필요한 초기하중 6,000N인 GAS SPRING의 충전압력은?

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



MD MOUNT 일체형

MS MOUNT 일체형

MT MOUNT 일체형

MR MOUNT 일체형

MK MOUNT 일체형

SP0750 MOUNT ISO

SB0750 MOUNT ISO

ST0750 MOUNT ISO

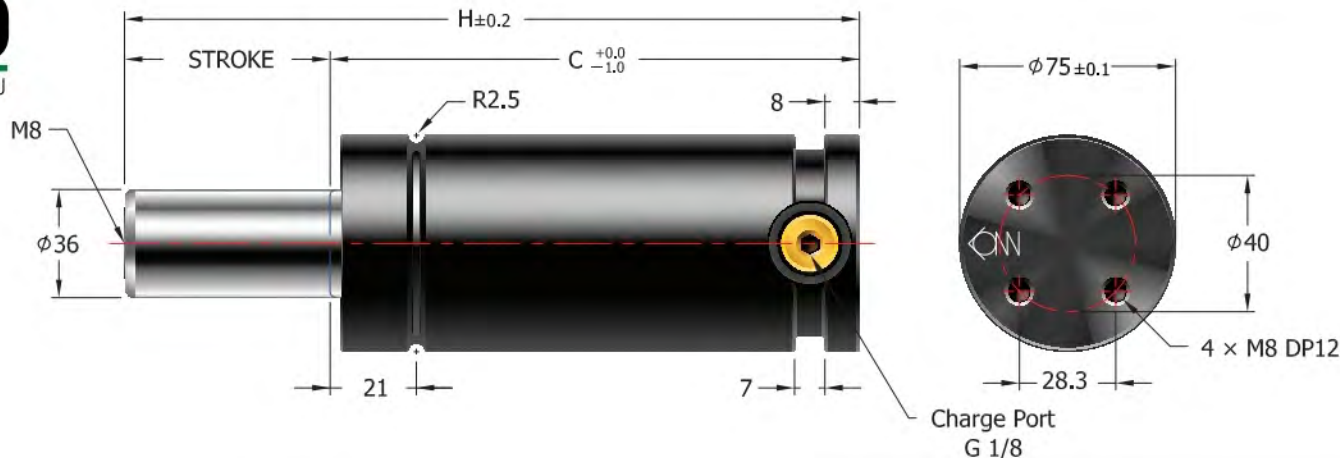
SR0750 MOUNT ISO

SC0750 MOUNT ISO



TSS1500

NITROGEN GAS SPRING



규격 표기법

GAS SPRING

TSS1500
MODEL

× 050
STROKE

S(F) - (MSA) -
단독형-S 일체형 마운트
배관형-F (선택사항)

150
충전압력
(Bar)

MOUNT

SP1500

REPAIR KIT

RCS1500

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

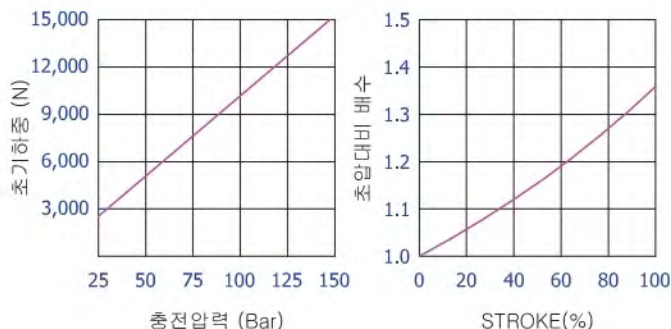
TSS1500

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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	11.81	702	402	22,000	972.1	8.27	

* = at full stroke

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표

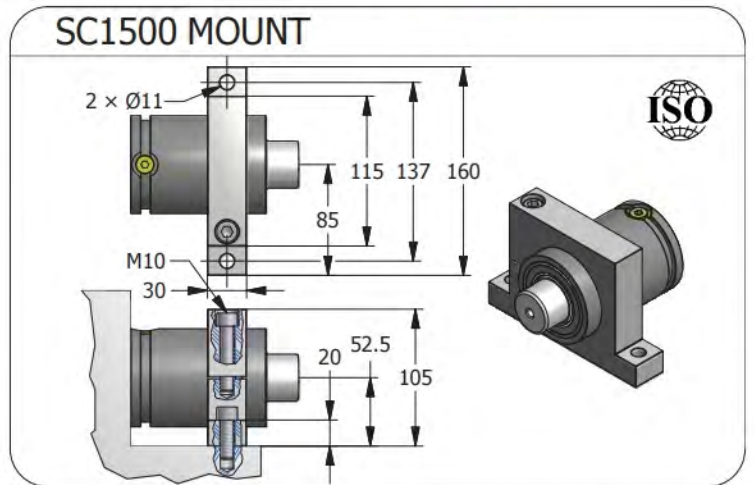
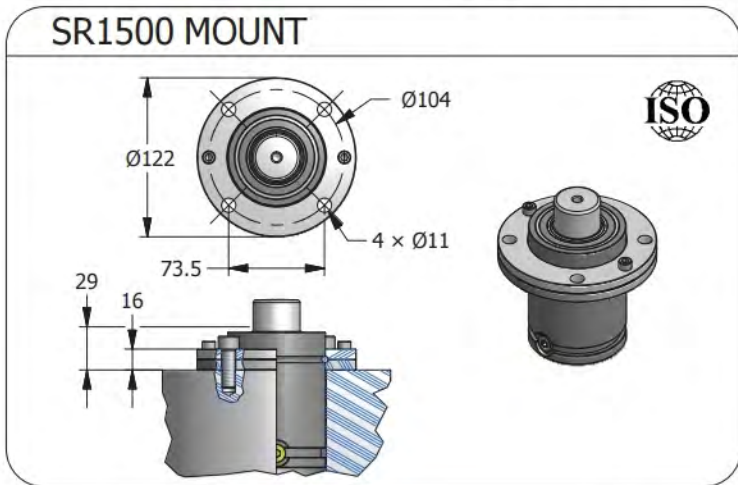
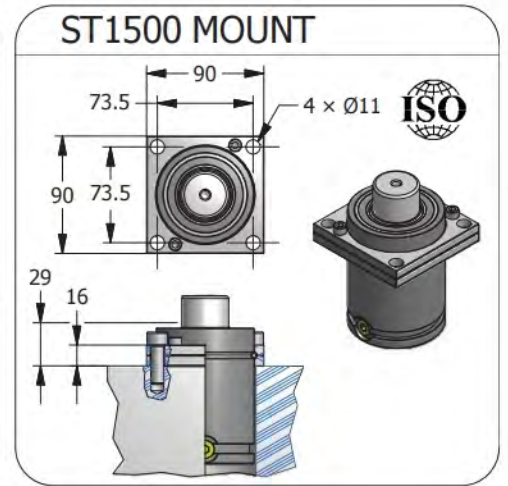
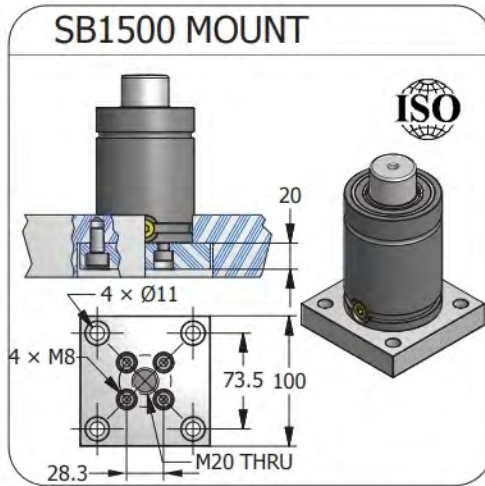
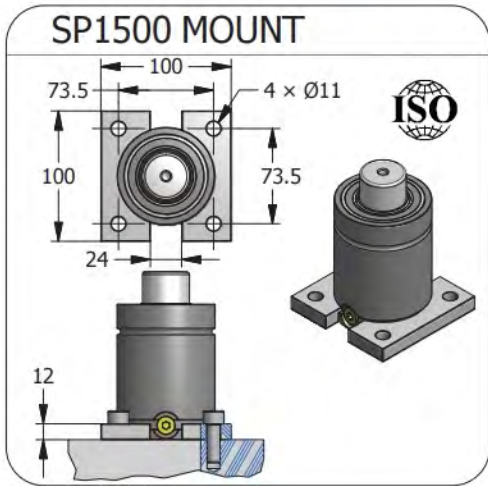
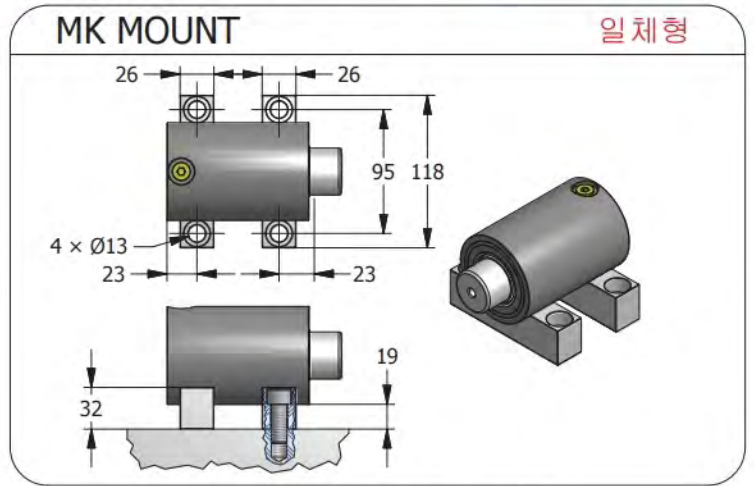
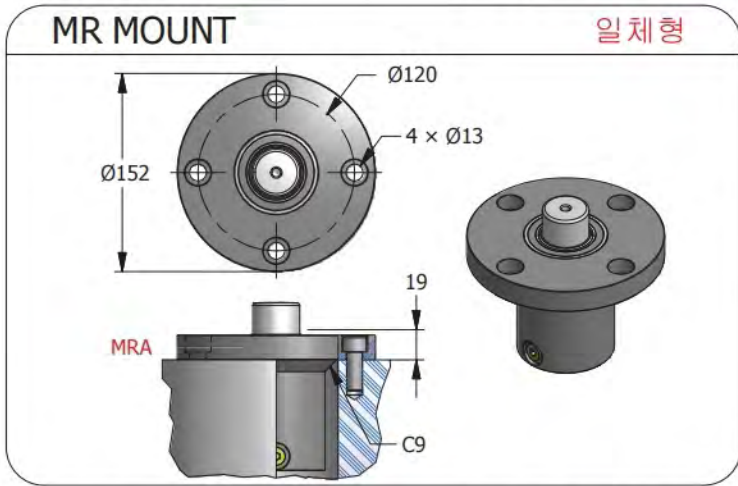
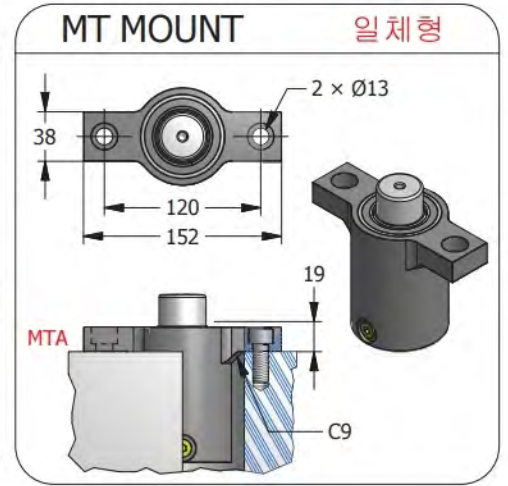
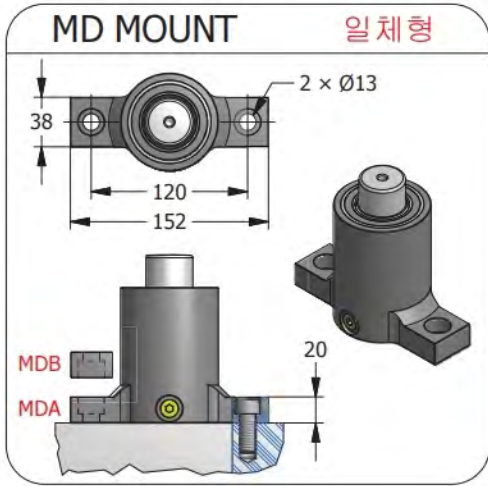


■ TSS1500의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{101.7}$$

ex) 필요한 초기하중 12,000N인 GAS SPRING의 충전압력은?

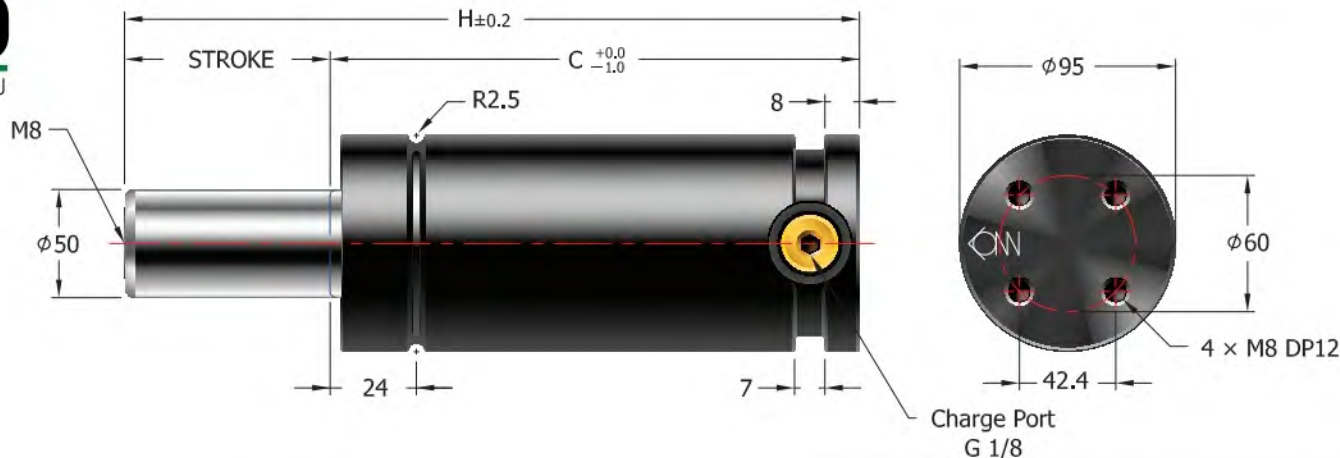
$$118(\text{Bar}) = \frac{12,000(\text{N})}{101.7}$$





TSS3000

NITROGEN GAS SPRING



규격 표기법

GAS SPRING

TSS3000
MODEL

× 050
STROKE

S(F) - (MSA) -
단독형-S 일체형 마운트
배관형-F (선택사항)

150
충전압력
(Bar)

MOUNT

SP3000

REPAIR KIT

RCS3000

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

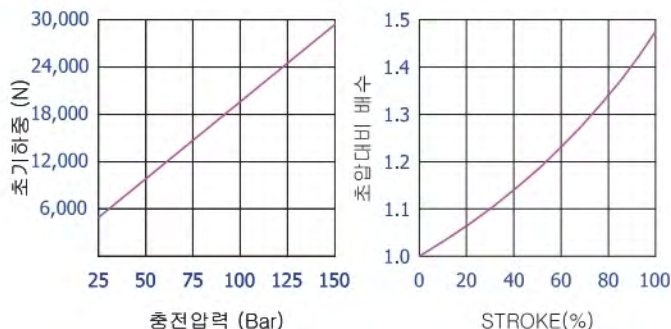
TSS3000

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSS3000의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{196.2}$$

ex) 필요한 초기하중 25,000N인 GAS SPRING의 충전압력은?

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



MD MOUNT 일체형

38, 146, 178, 2 x Ø13, 20, MDB, MDA

MS MOUNT 일체형

127, 98, 127, 4 x Ø13, 25, MSB, MSA

MT MOUNT 일체형

38, 146, 178, 2 x Ø13, 19, MTA, C10

MR MOUNT 일체형

Ø171, 2 x M16, Ø140, 4 x Ø13, 25, MRA, C10

MK MOUNT 일체형

26, 26, 115, 137, 4 x Ø13, 23, 23, 19, 32

SP3000 MOUNT ISO

120, 92, 120, 92, 24, 12, 4 x Ø13.5

SB3000 MOUNT ISO

20, 4 x Ø13.5, 4 x M8, 92, 120, 42.4, M20 THRU

ST3000 MOUNT ISO

110, 92, 110, 92, 33, 18, 4 x Ø13.5

SR3000 MOUNT ISO

Ø150, Ø130, 92, 4 x Ø13.5, 33, 18

SC3000 MOUNT ISO

2 x Ø13, 145, 170, 195, 102.5, M12, 30, 20, 62.5, 125

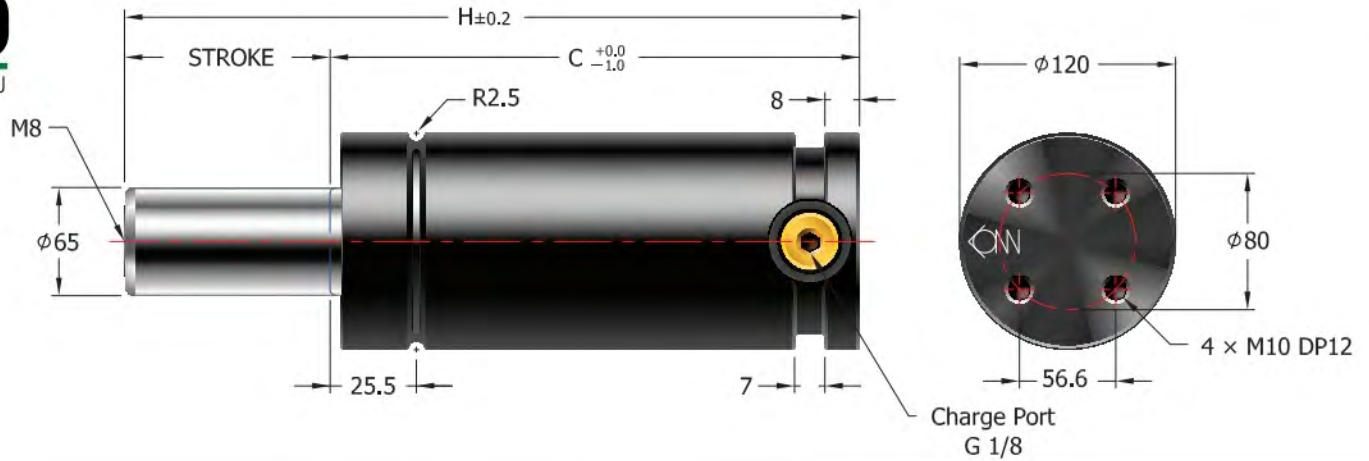


TSS5000

NITROGEN GAS SPRING



2014/68/EU



규격 표기법

GAS SPRING

TSS5000
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

SP5000

REPAIR KIT

RCS5000

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

TSS5000

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	10.34	
60	2.36	222	162	79,100	533.8	10.69	
63	2.48	228	165	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSS5000의 충전 압력(Bar) 계산식

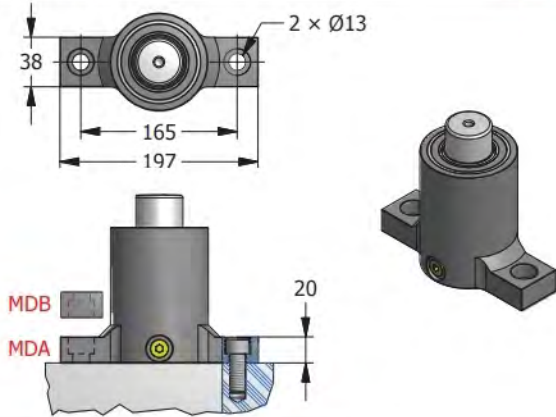
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{331.7}$$

ex) 필요한 초기하중 38,000N인 GAS SPRING의 충전압력은?

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

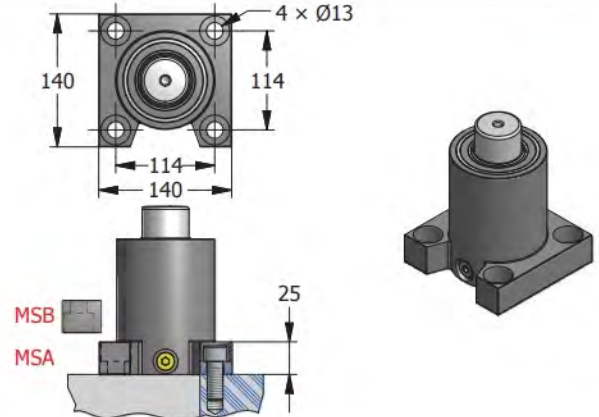
MD MOUNT

일체형



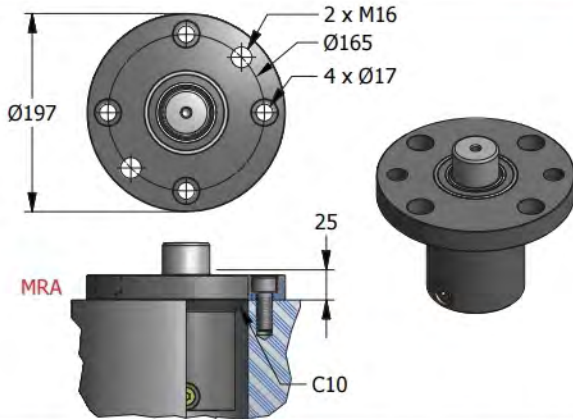
MS MOUNT

일체형



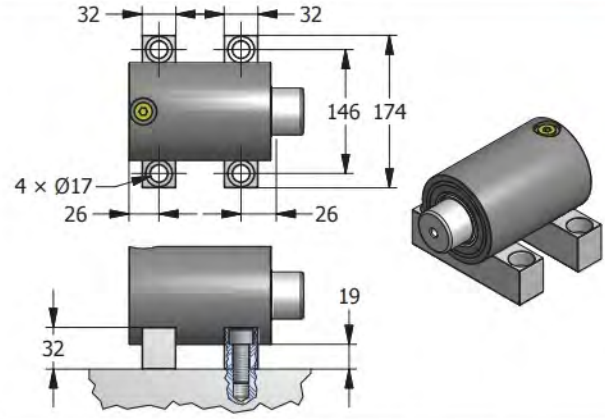
MR MOUNT

일체형

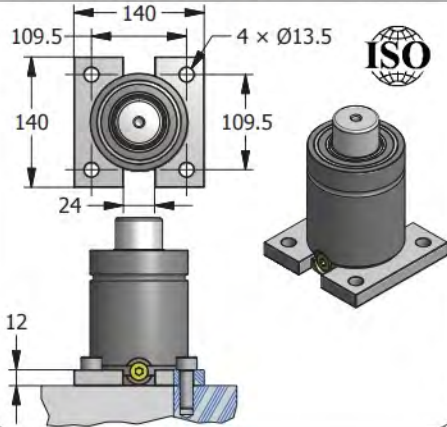


MK MOUNT

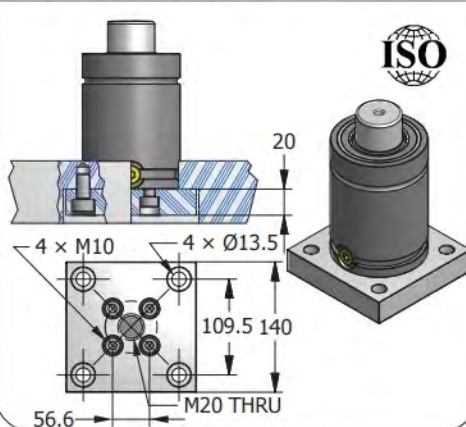
일체형



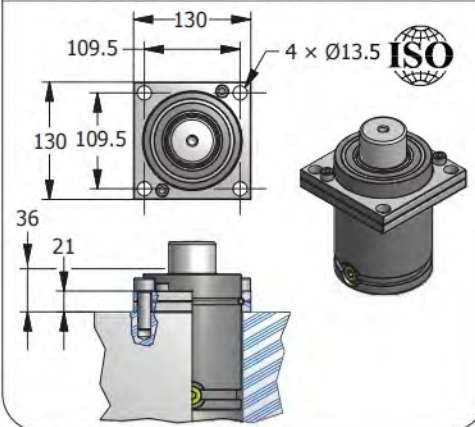
SP5000 MOUNT



SB5000 MOUNT

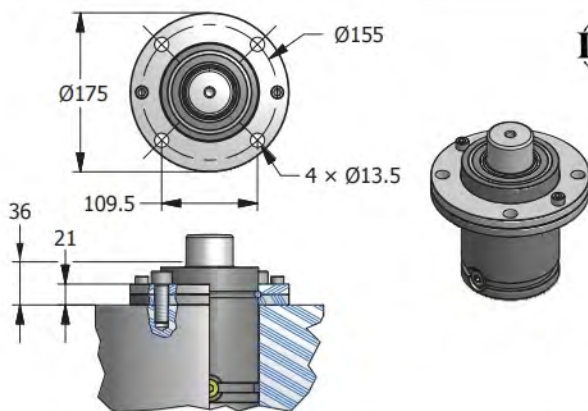


ST5000 MOUNT



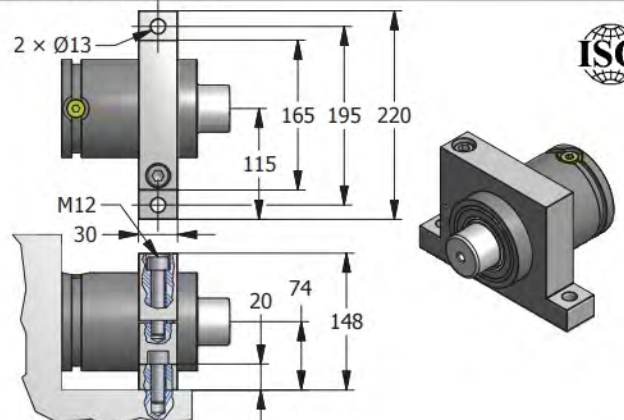
SR5000 MOUNT

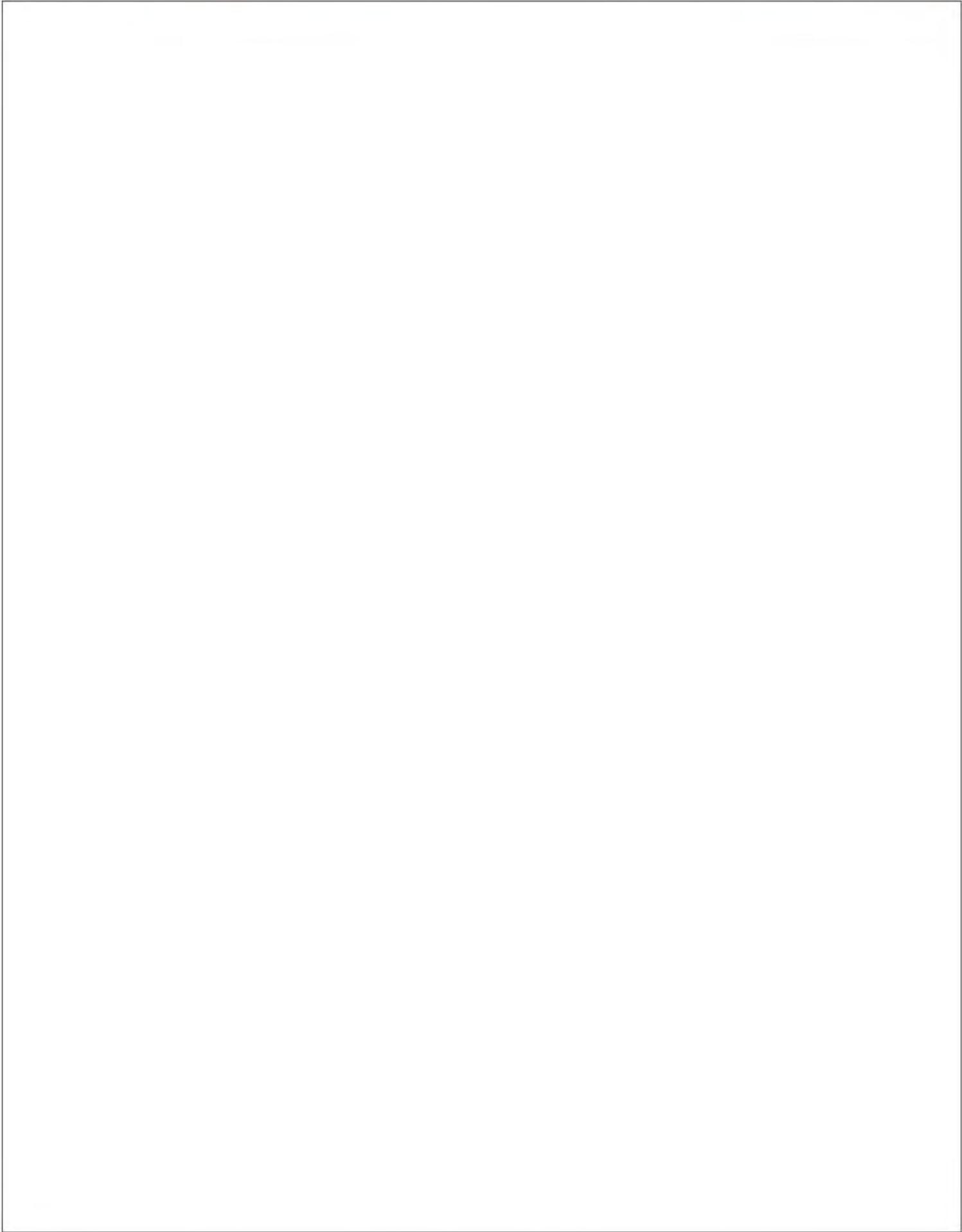
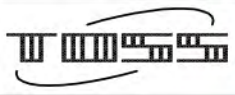
ISO



SC5000 MOUNT

ISO







TSL SERIES

PED
2014/68/EU



JAS-ANZ
SMC
ISO 9001 인증기업

ISO 14001:2004

www.qsnc.com

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ISO STANDARD

■ 일반 제원

- 충전재
질소가스 (N₂)
- 최대 충전 압력
150 bar (at 20℃)
- 최소 충전 압력
25 bar (at 20℃)
- 작동 온도
0 to 80℃
- 온도에 따른 압력 증가량
±0.3% / °C
- 분당 최대 스트로크 왕복
~50 to 100 (at 20℃)
- 피스톤 로드 속도
0 ~ 0.8 m/s
- 로드 표면처리
도금 열처리
- 실린더 표면처리
흑산화 피막

■ Model별 제원

종류 TYPE	Stroke (mm)	실린더 외경 Φ(mm)	Rod 외경 Φ(mm)	초기하중 (N)	최대하중 (N)	최대충전압력
TSL0500	10~160	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

※ 상기 사양은 성능개선을 위해 예고없이 변경될 수 있습니다.



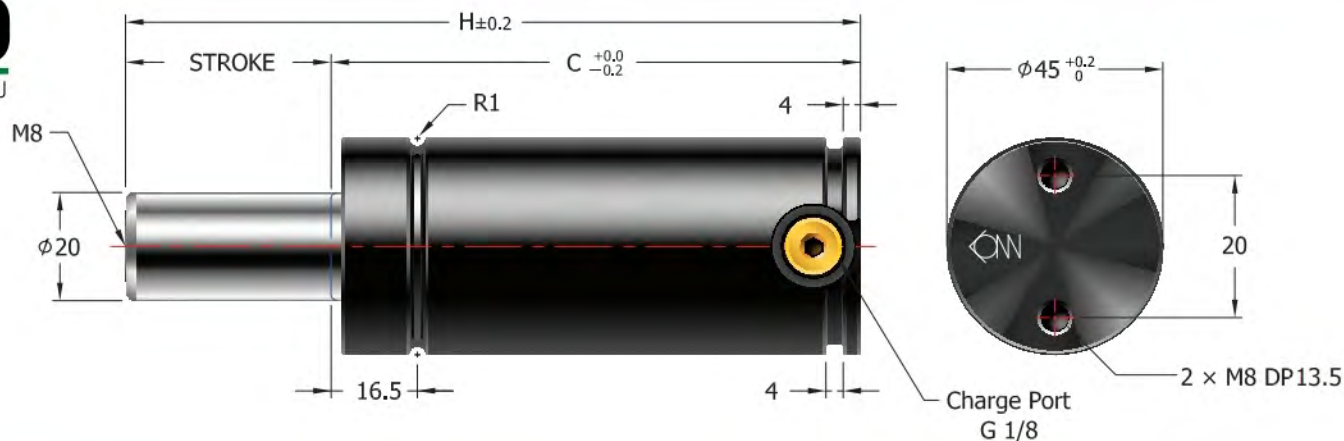


TSL0500

NITROGEN GAS SPRING



2014/68/EU



규격 표기법

GAS SPRING

TSL0500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

150
충전압력
(Bar)

MOUNT

SP0500

REPAIR KIT

RCL0500

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

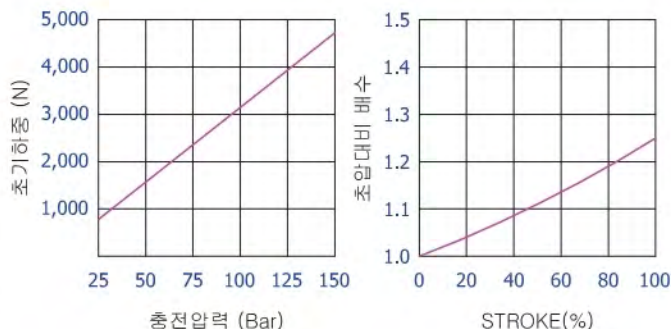
TSL 0500

Stroke		H	C	Force(N) (150 bar / +20℃)		Gas vol. (cm ³)	Weight (kg)	ISO
(mm)	(inch)			Initial	End force*			
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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSL0500의 충전 압력(Bar) 계산식

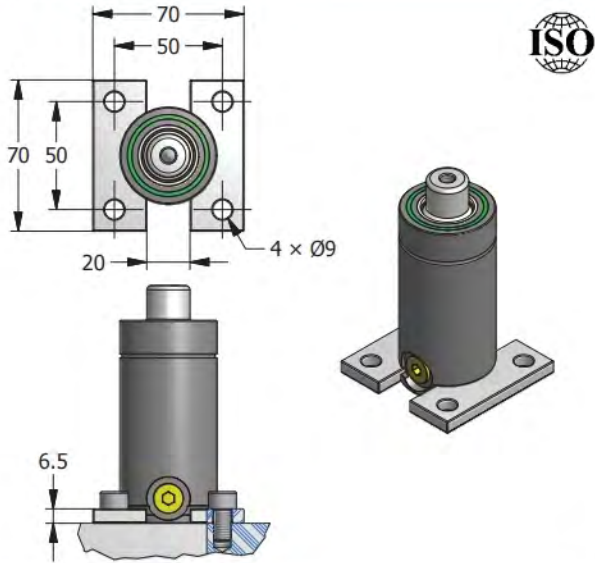
$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{31.4}$$

ex) 필요한 초기하중 4,000N인 GAS SPRING의 충전압력은?

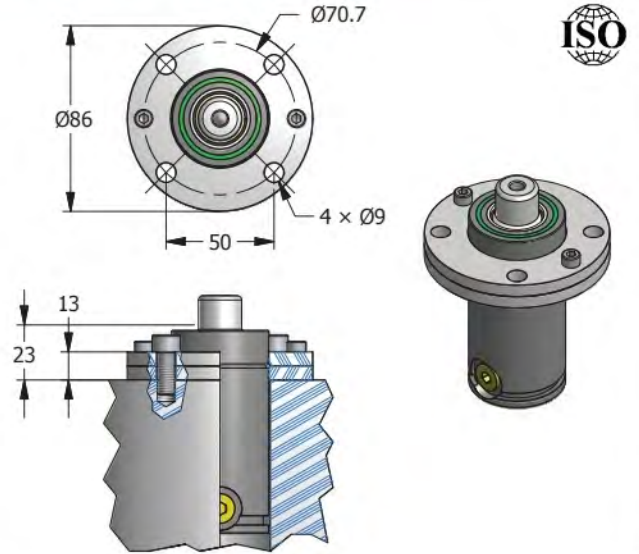
$$127(\text{Bar}) = \frac{4,000(\text{N})}{31.4}$$



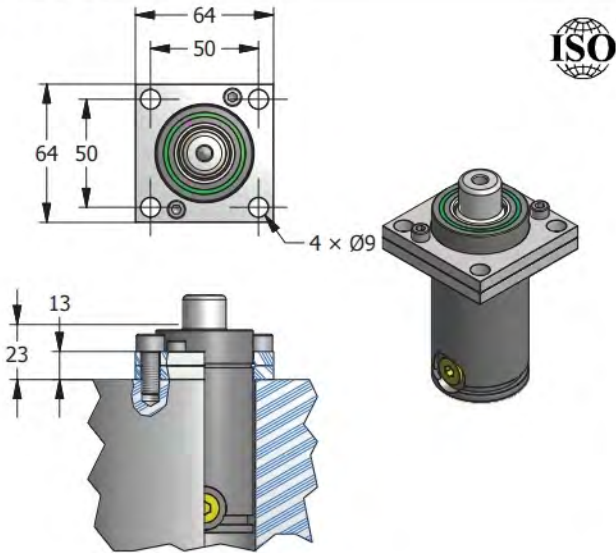
SP0500 MOUNT



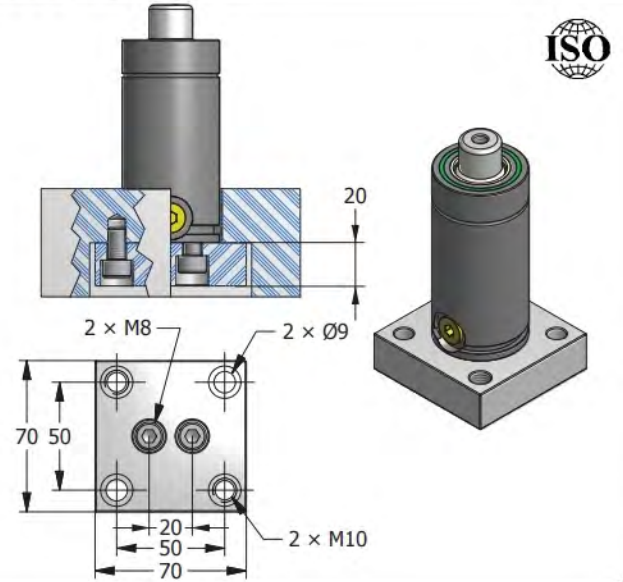
SR0500 MOUNT



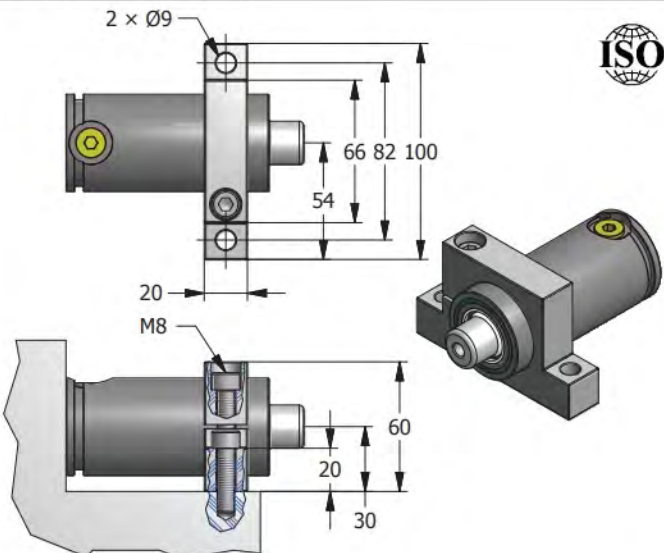
ST0500 MOUNT



SB0500 MOUNT



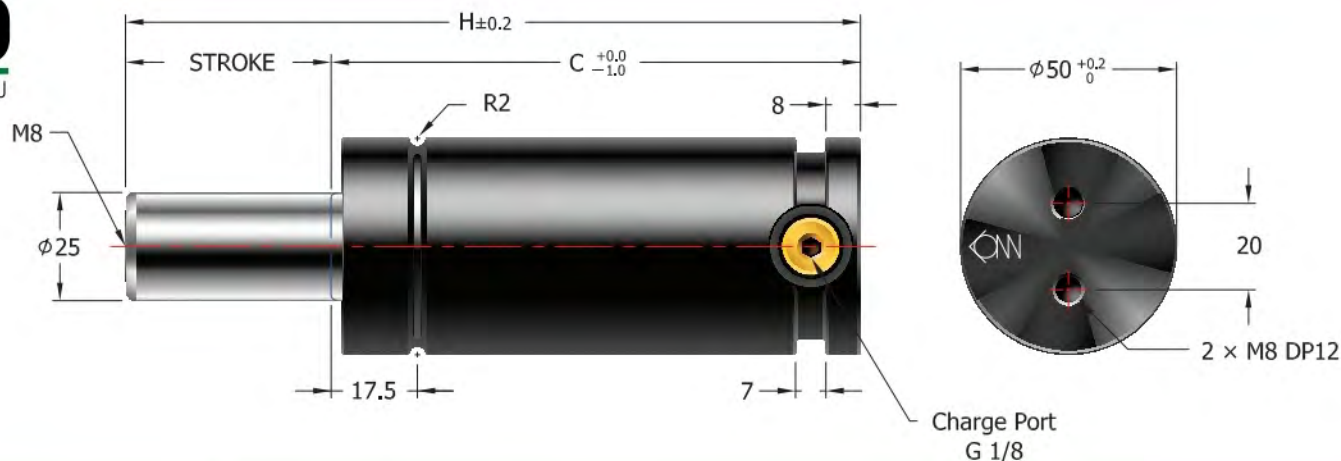
SC0500 MOUNT





TSL0750

NITROGEN GAS SPRING



규격 표기법

GAS SPRING TSL0750 × 050 S(F) - (MSA) - 150
 MODEL STROKE 단독형-S 일체형 마운트 충전압력
 배관형-F (선택사항) (Bar)
 MOUNT SP0750
 REPAIR KIT RCL0750

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

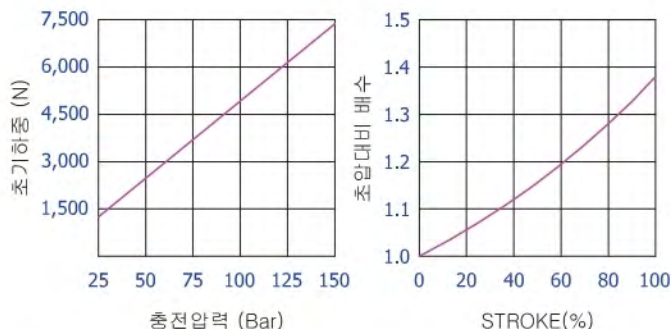
TSL0750

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표

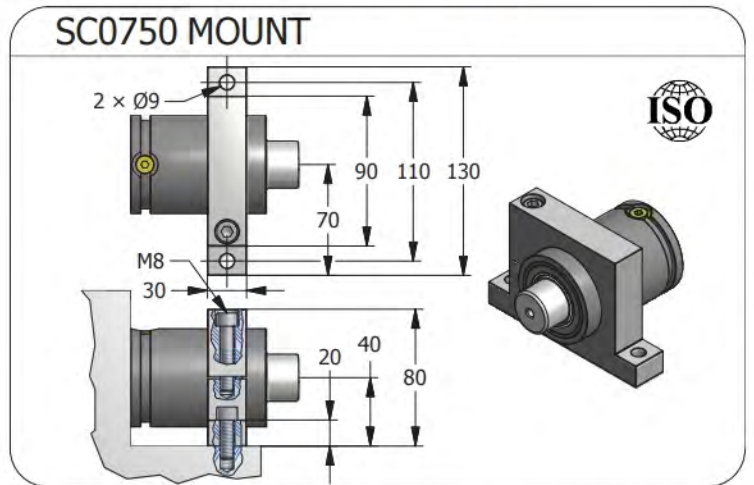
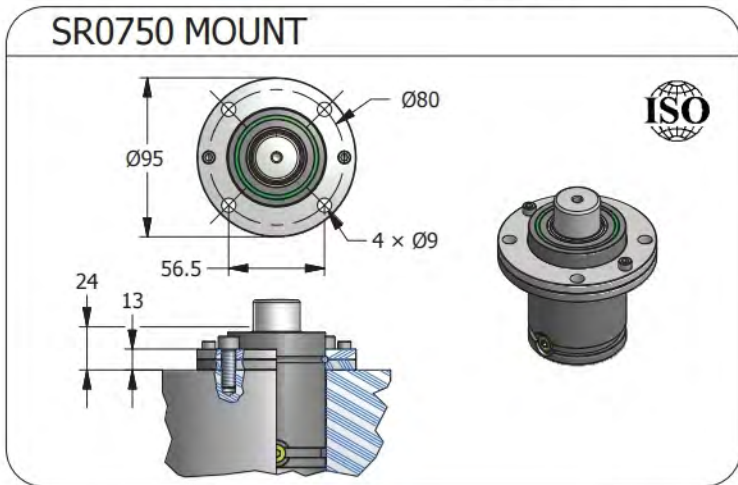
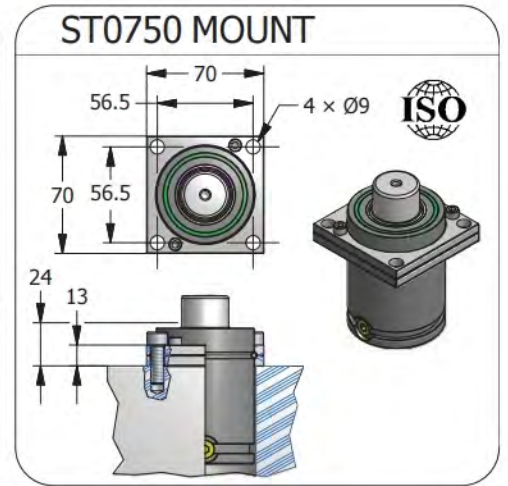
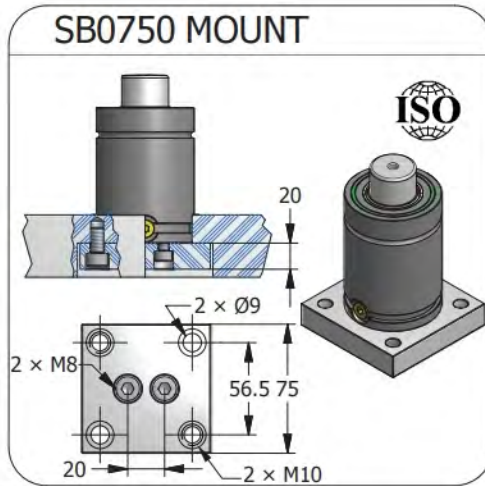
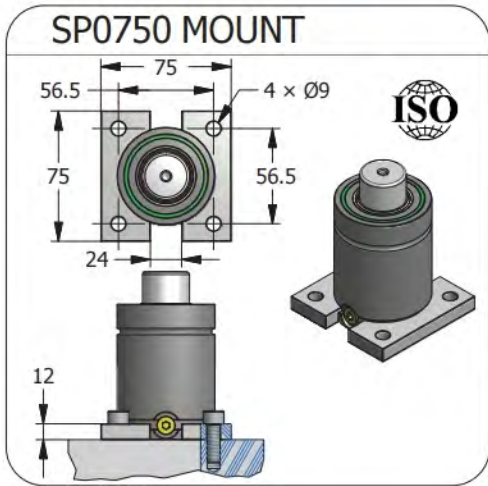
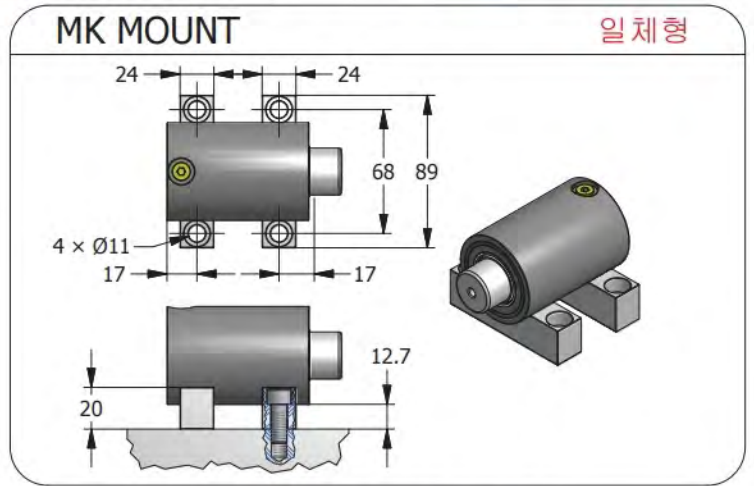
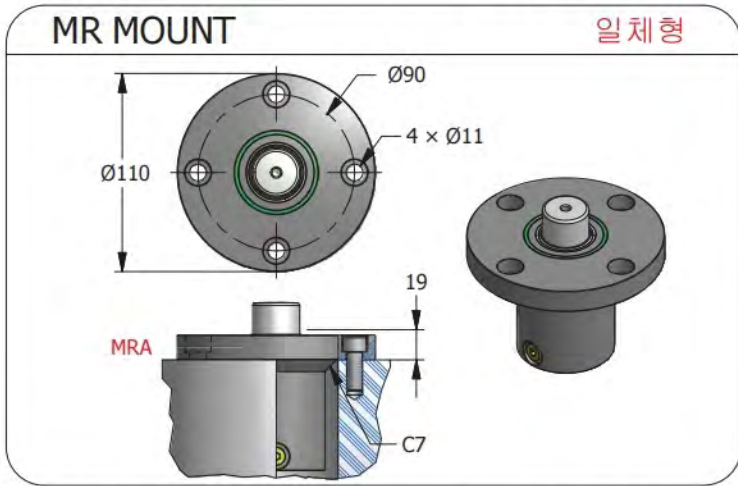
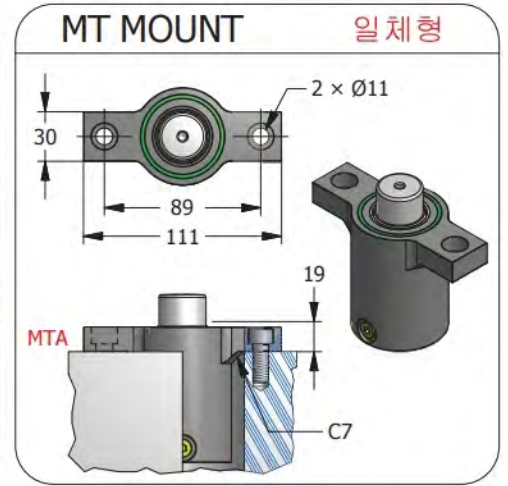
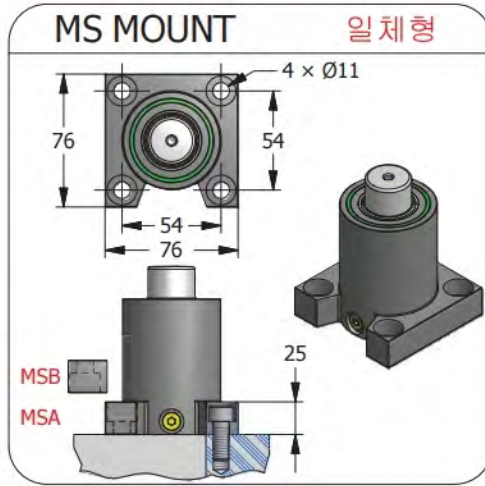
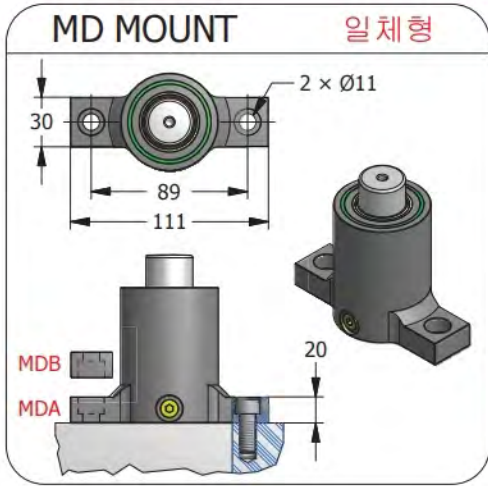


■ TSL0750의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{49.1}$$

ex) 필요한 초기하중 6,000N인 GAS SPRING의 충전압력은?

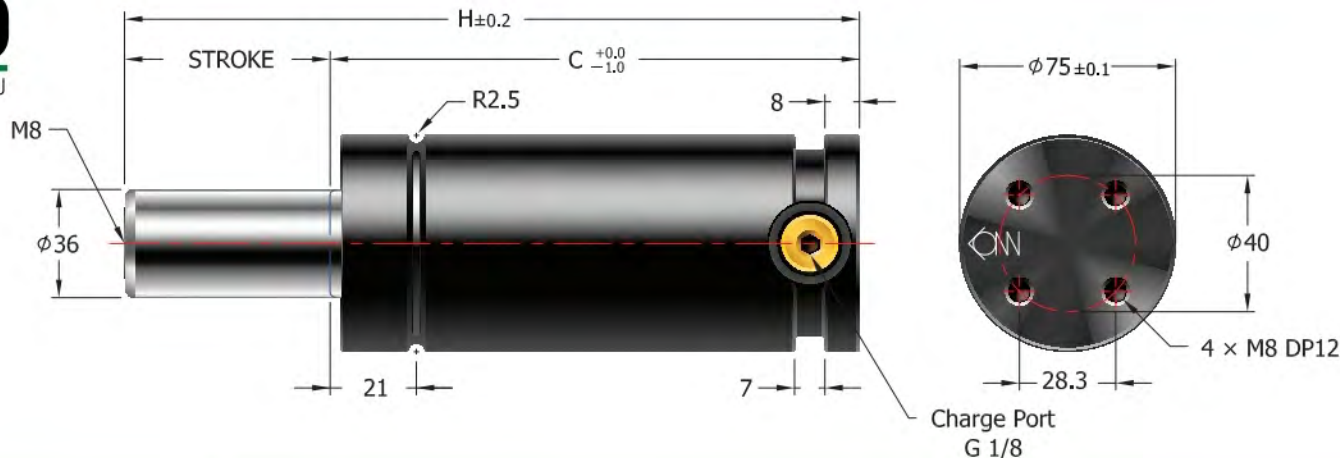
$$122(\text{Bar}) = \frac{6,000(\text{N})}{49.1}$$





TSL1500

NITROGEN GAS SPRING



규격 표기법

GAS SPRING

TSL1500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

SP1500

REPAIR KIT

RCL1500

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

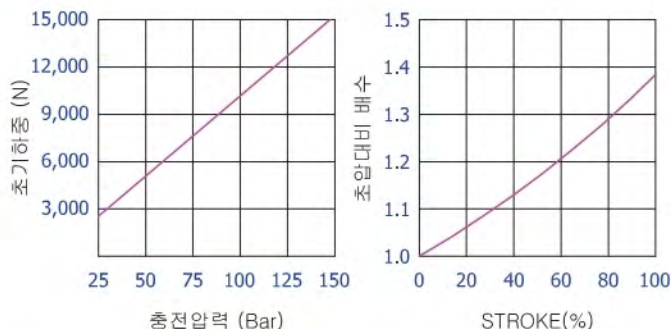
TSL1500

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표

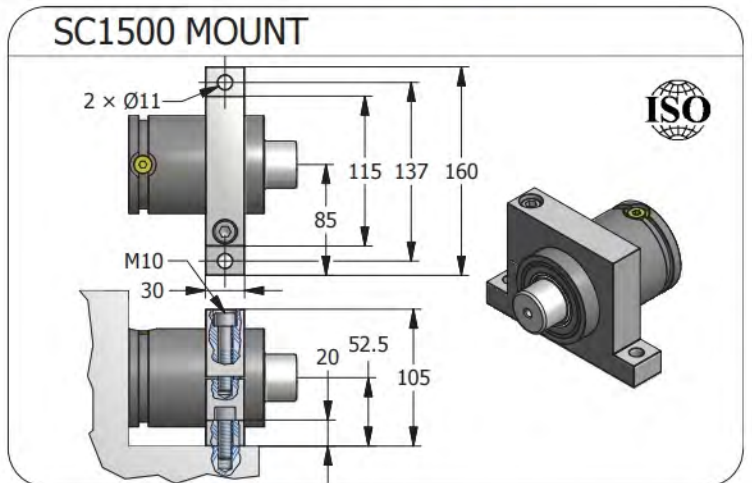
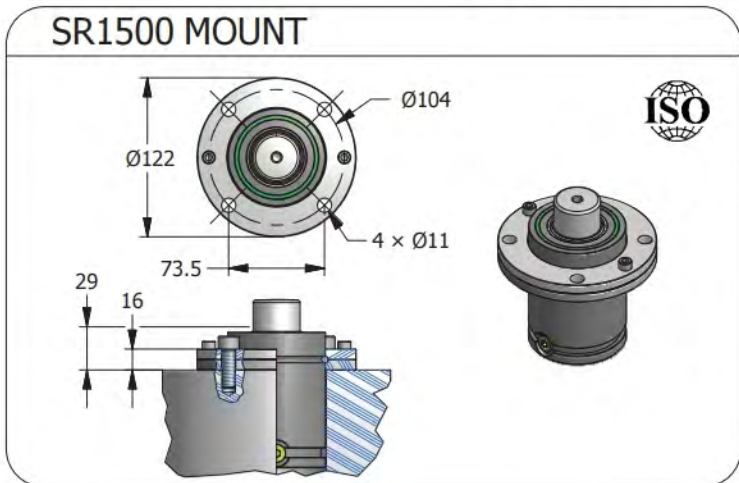
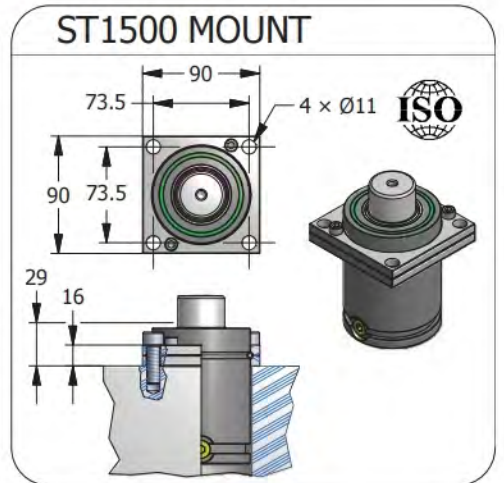
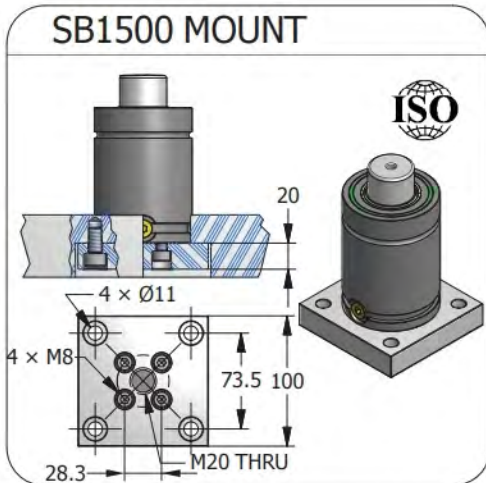
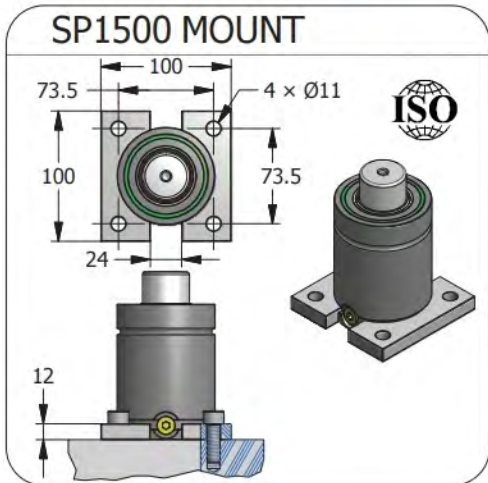
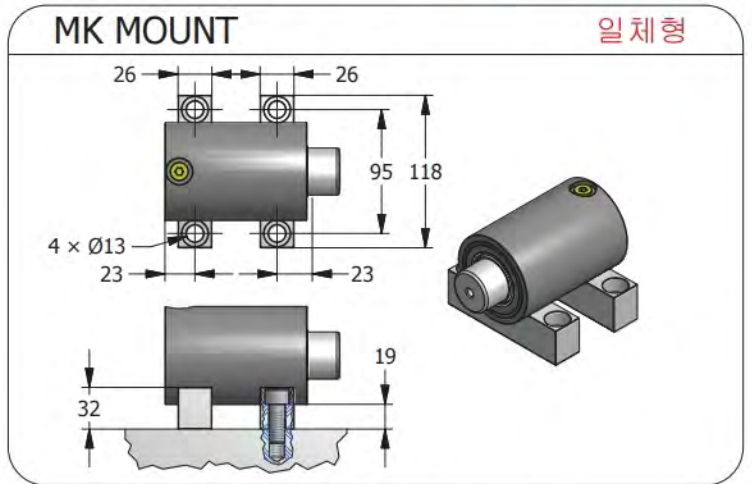
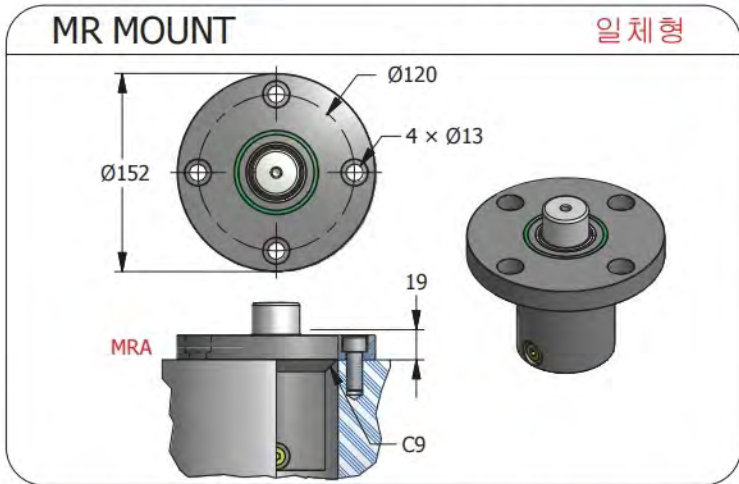
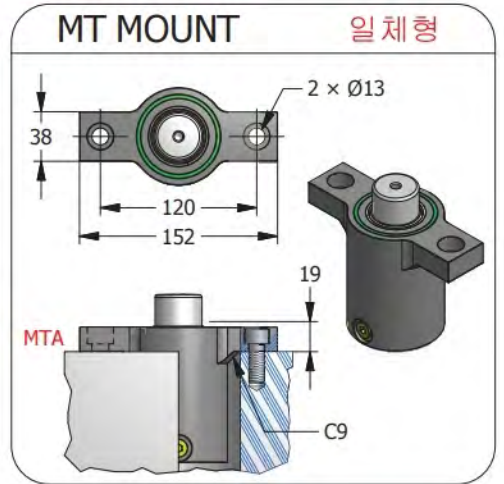
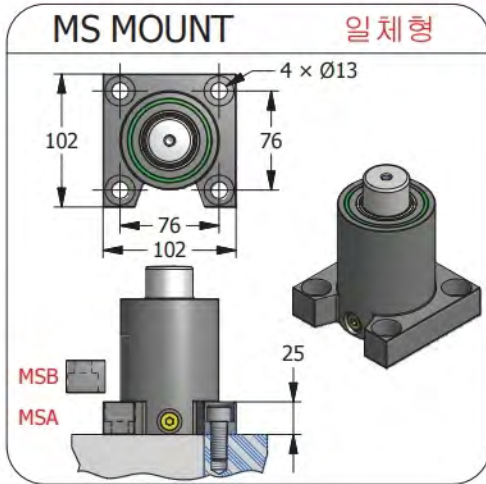
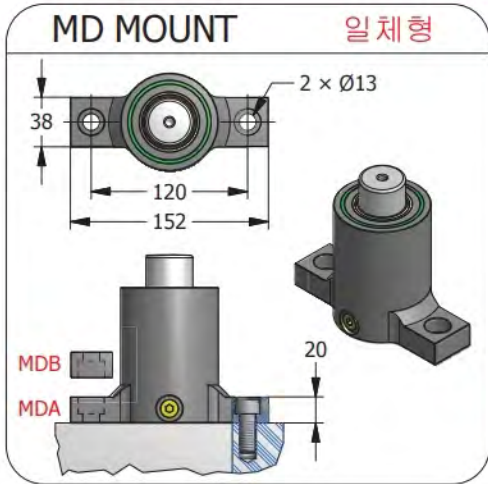


■ TSL1500의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{101.7}$$

ex) 필요한 초기하중 12,000N인 GAS SPRING의 충전압력은?

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



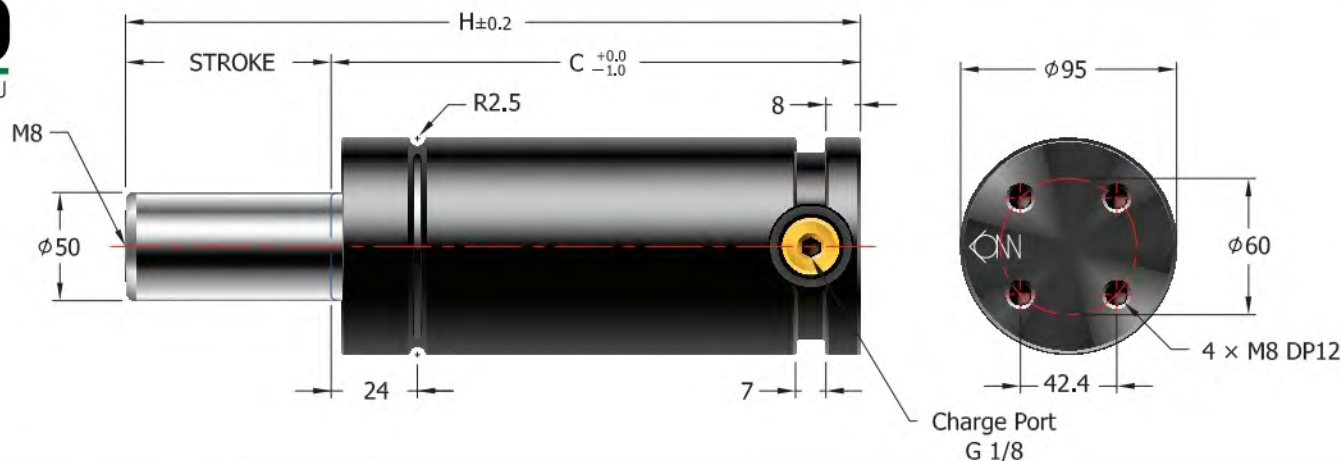


TSL3000

NITROGEN GAS SPRING



2014/68/EU



규격 표기법

GAS SPRING

TSL3000
MODEL

\times 050
STROKE

S(F) - (MSA) -
단독형-S 일체형 마운트
배관형-F (선택사항)

150
충전압력
(Bar)

MOUNT

SP3000

REPAIR KIT

RCL3000

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

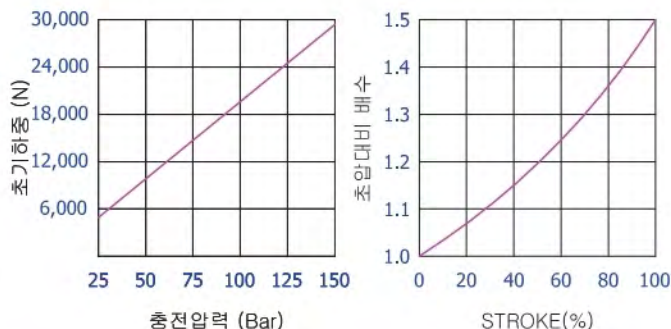
TSL3000

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표

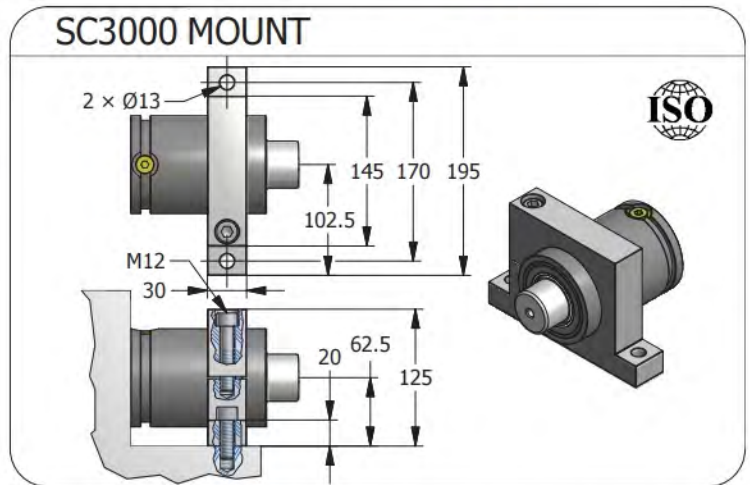
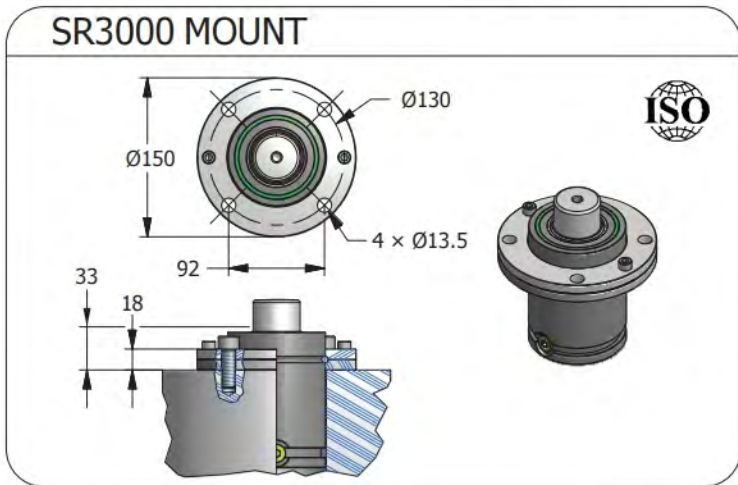
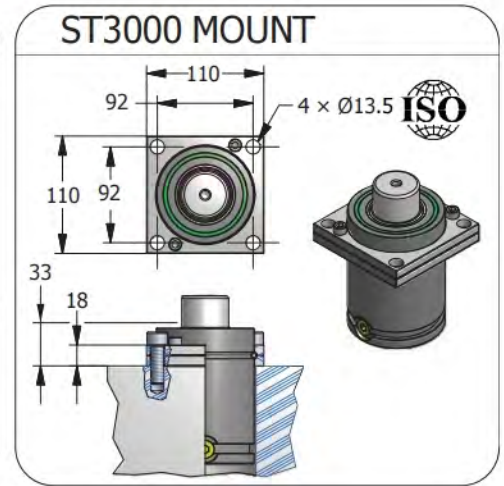
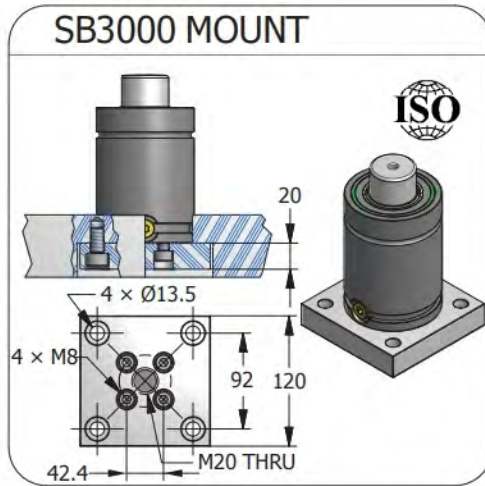
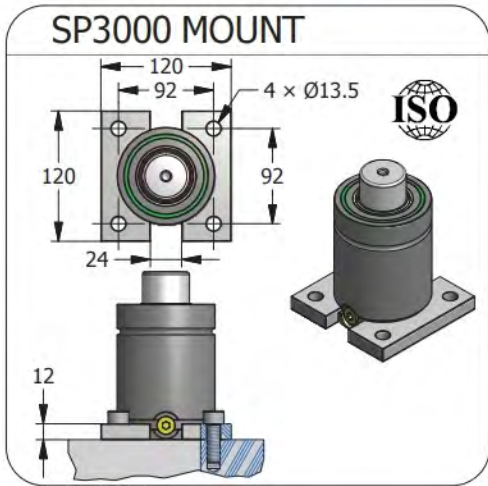
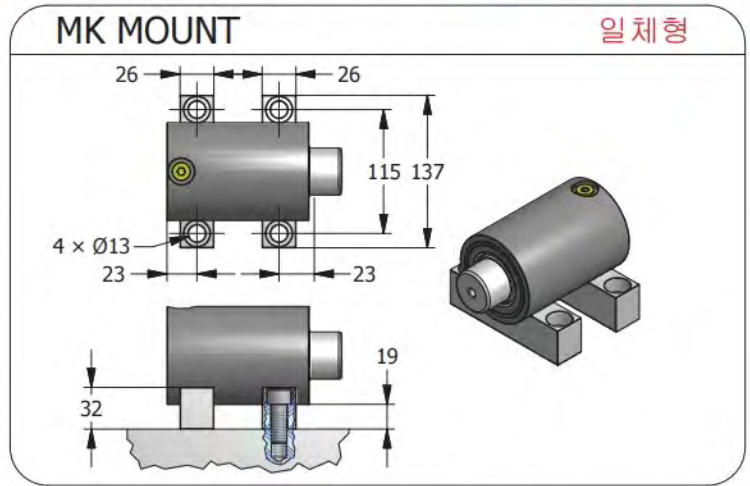
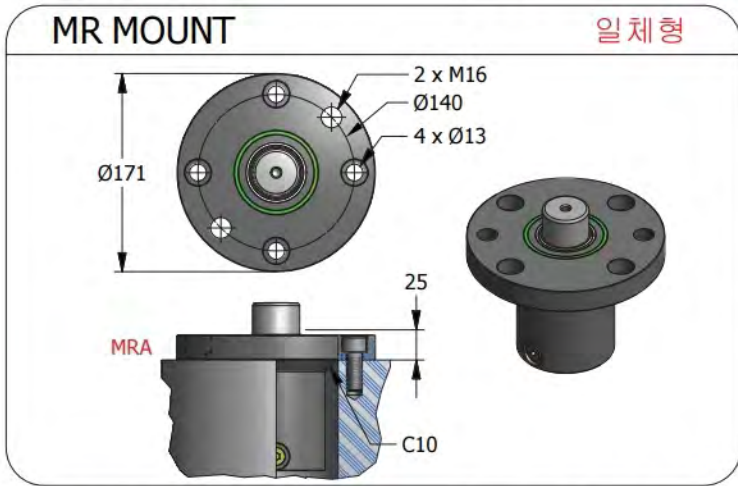
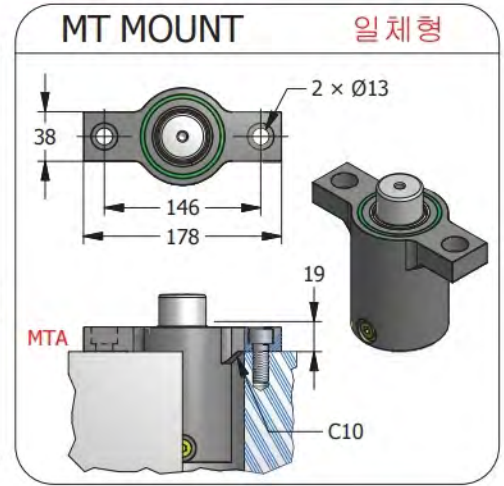
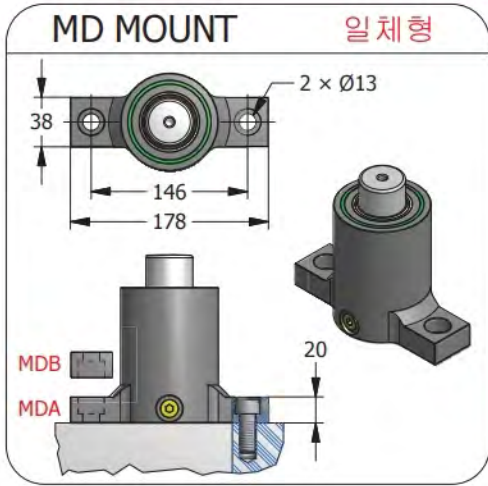


■ TSL3000의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{196.2}$$

ex) 필요한 초기하중 25,000N인 GAS SPRING의 충전압력은?

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



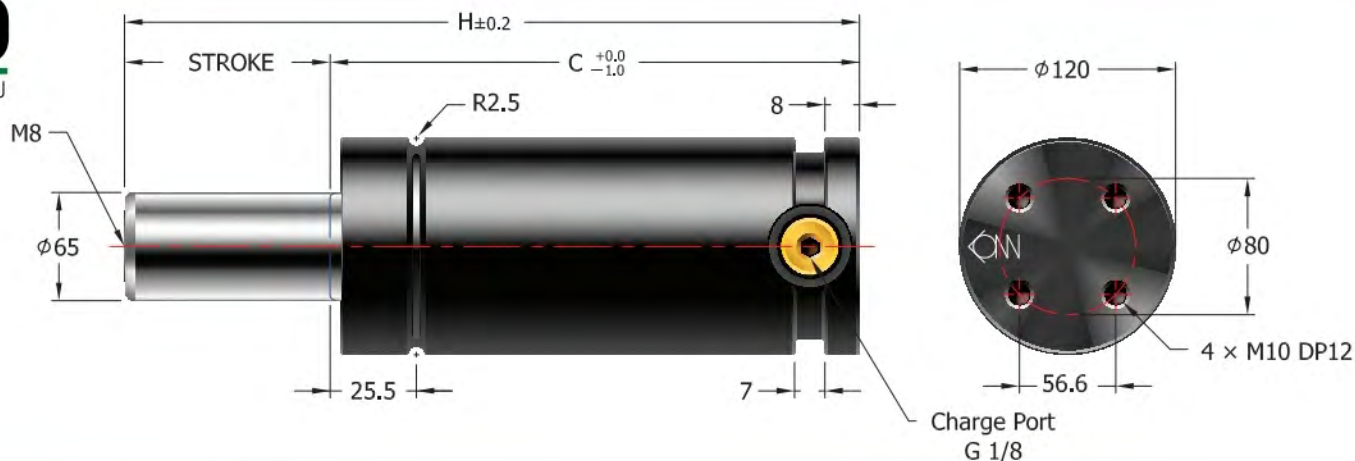


TSL5000

NITROGEN GAS SPRING



2014/68/EU



규격 표기법

GAS SPRING

TSL5000
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

SP5000

REPAIR KIT

RCL5000

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

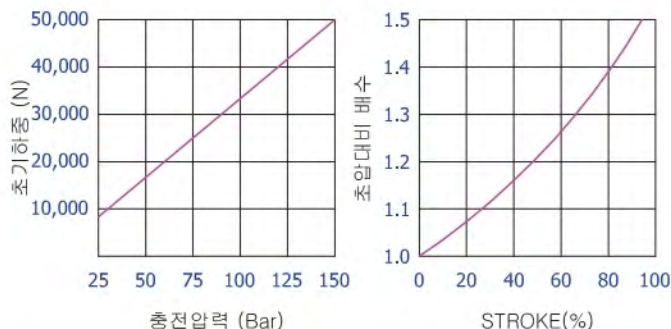
TSL5000

Stroke		H	C	Force (N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)
(mm)	(inch)			Initial	End force*		
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSL5000의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{331.7}$$

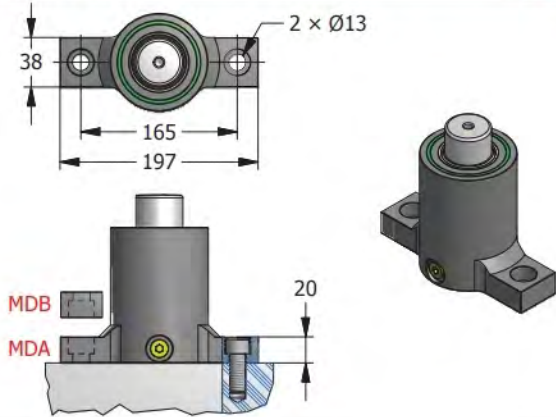
ex) 필요한 초기하중 38,000N인 GAS SPRING의 충전압력은?

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



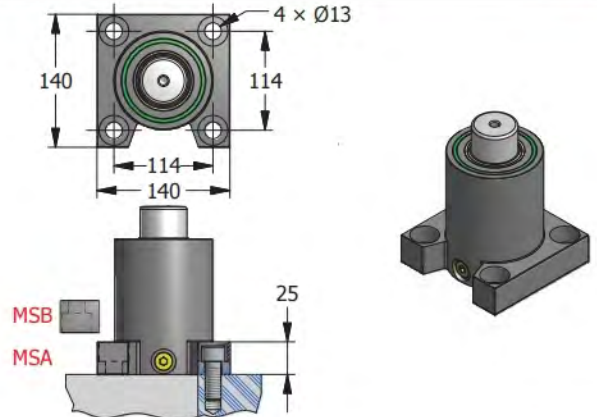
MD MOUNT

일체형



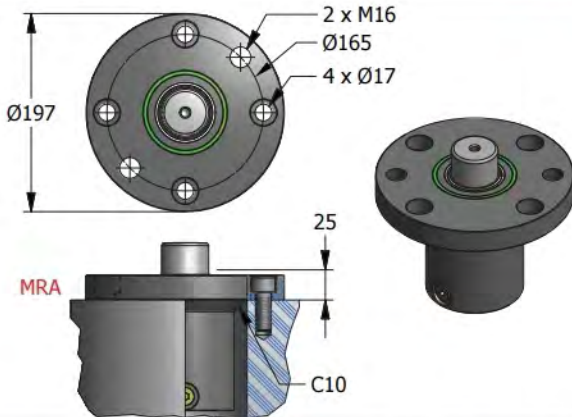
MS MOUNT

일체형



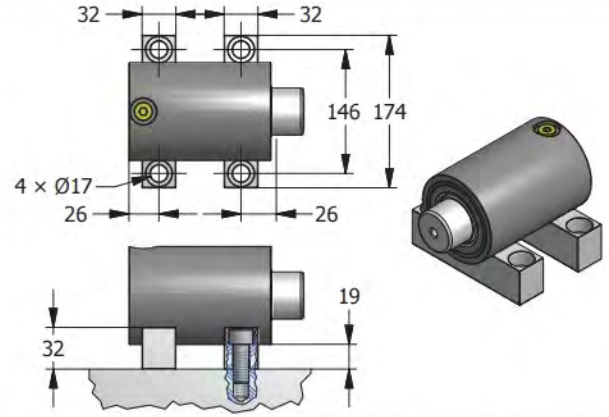
MR MOUNT

일체형

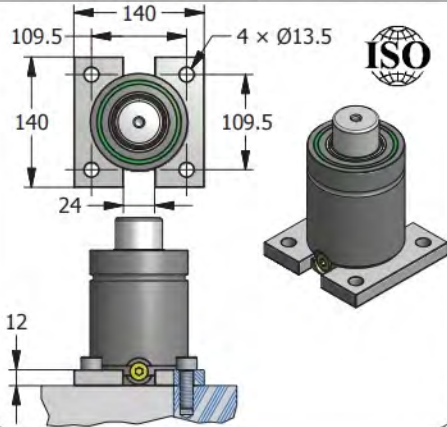


MK MOUNT

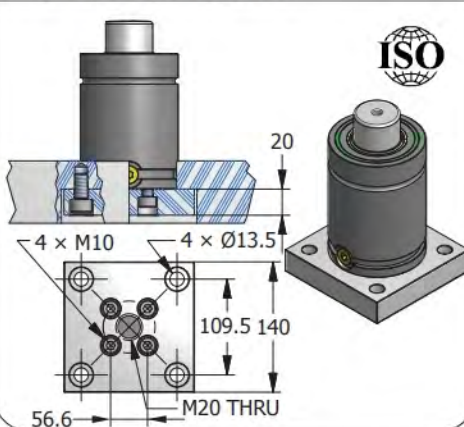
일체형



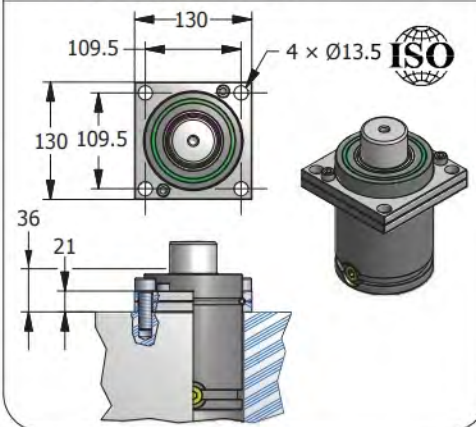
SP5000 MOUNT



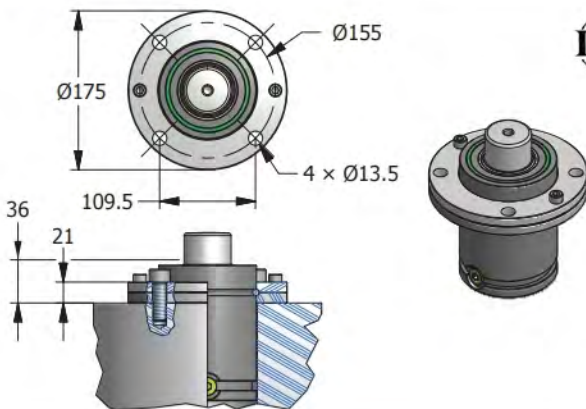
SB5000 MOUNT



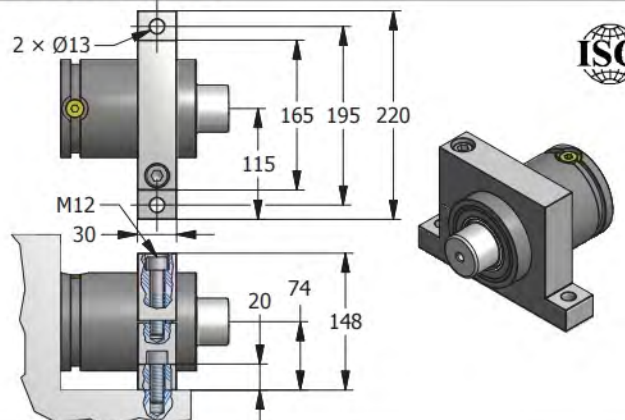
ST5000 MOUNT



SR5000 MOUNT



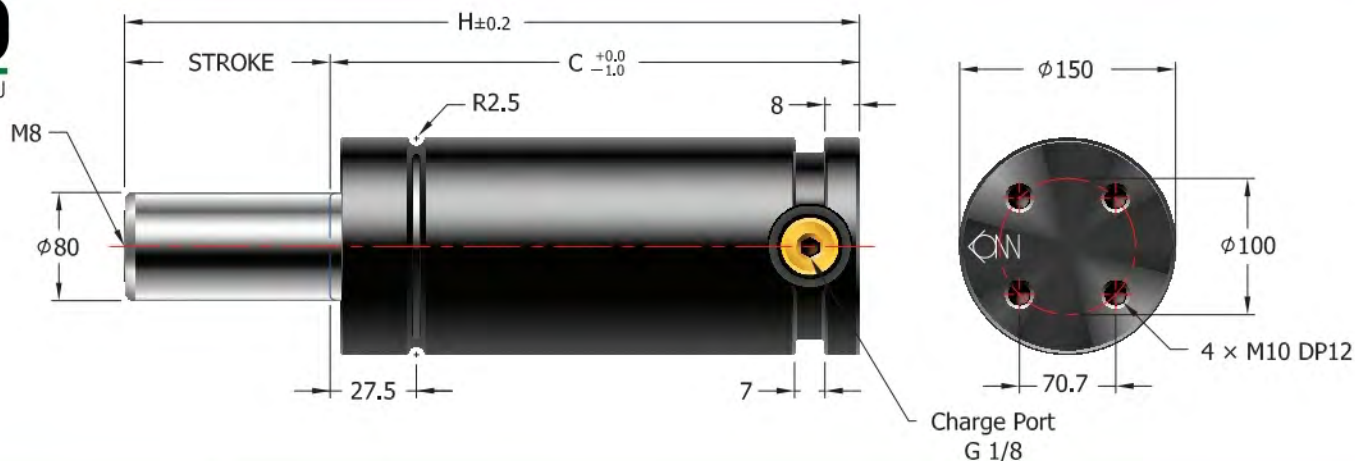
SC5000 MOUNT





TSL7500

NITROGEN GAS SPRING



규격 표기법

GAS SPRING

TSL7500
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

SP7500

REPAIR KIT

RCL7500

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

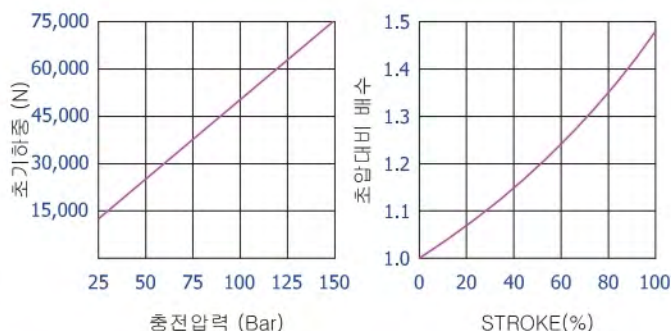
TSL7500

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)	ISO
(mm)	(inch)			Initial	End force*			
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	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSL7500의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{502.4}$$

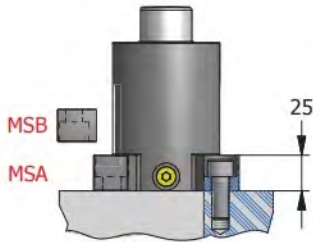
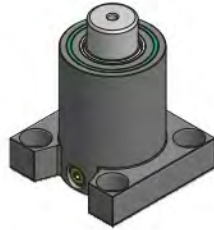
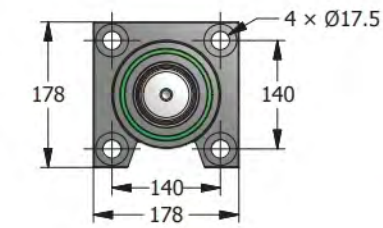
ex) 필요한 초기하중 65,000N인 GAS SPRING의 충전압력은?

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

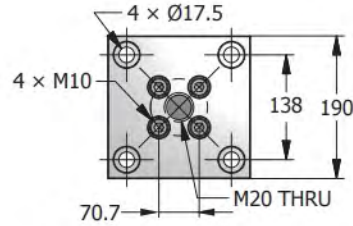
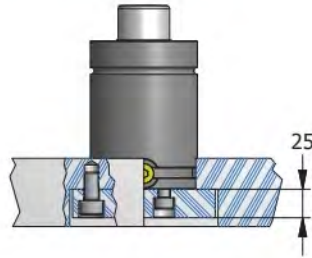


MS MOUNT

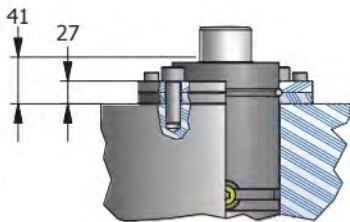
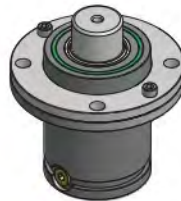
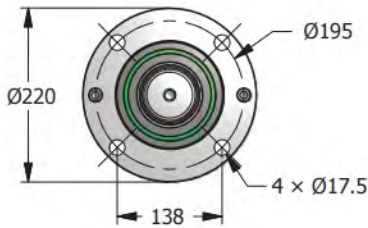
일체형



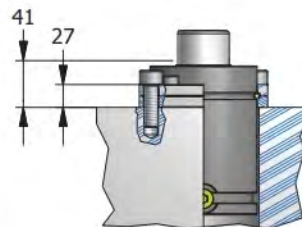
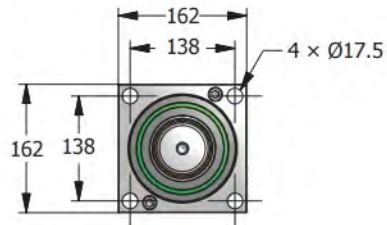
SB7500 MOUNT



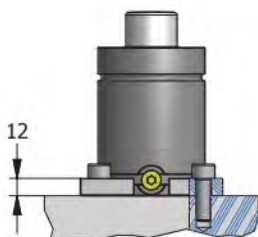
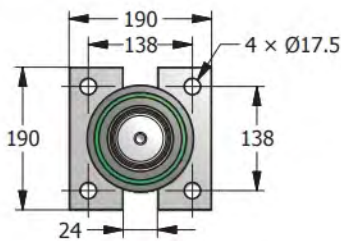
SR7500 MOUNT



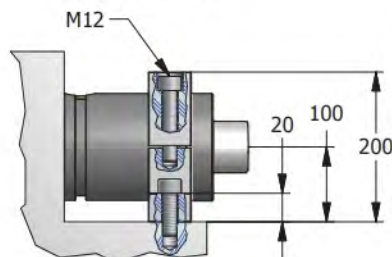
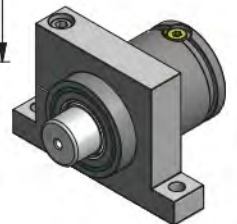
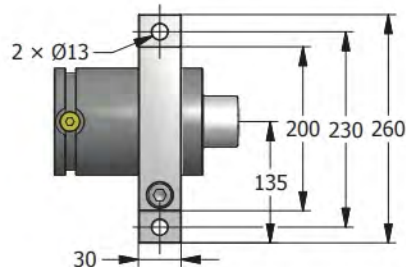
ST7500 MOUNT



SP7500 MOUNT



SC7500 MOUNT



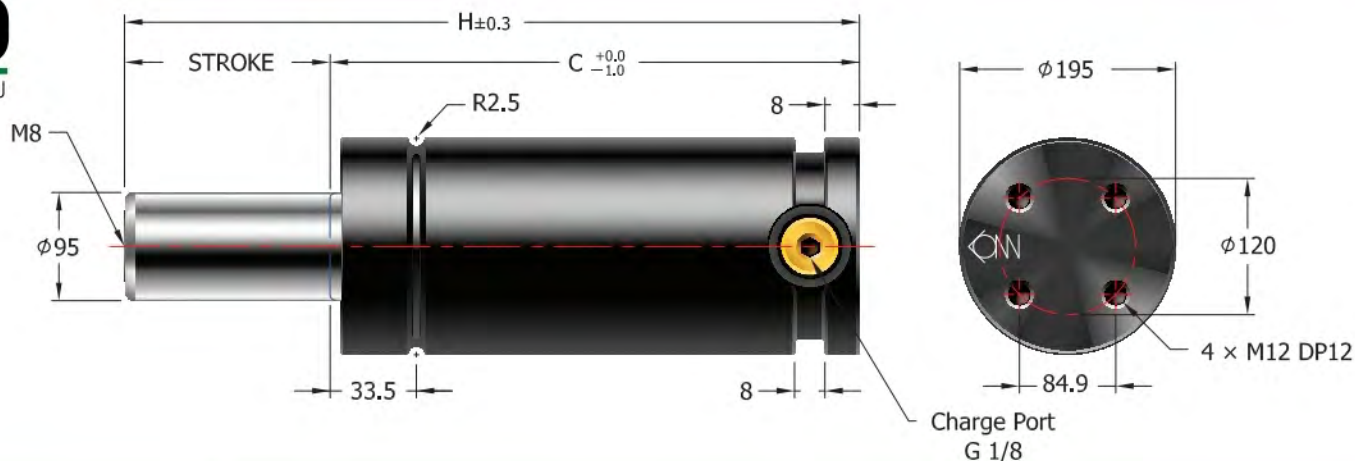


TSL10000

NITROGEN GAS SPRING



2014/68/EU



규격 표기법

GAS SPRING

TSL10000
MODEL

× 050
STROKE

S(F) -
단독형-S
배관형-F

(MSA) -
일체형 마운트
(선택사항)

150
충전압력
(Bar)

MOUNT

SP10000

REPAIR KIT

RCL10000

※ 충전압력은 별도 요구시만 명시하고 지정표기가 없을 경우 표준충전압력 150bar 로 충전됩니다.

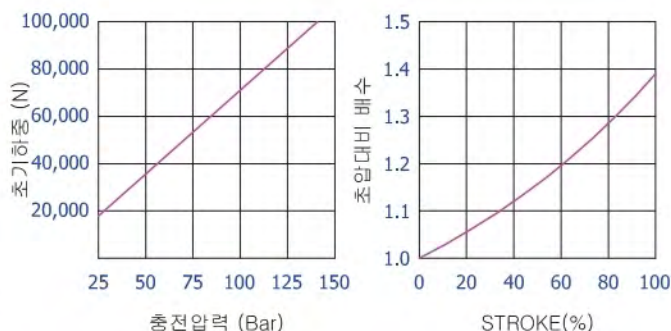
TSL10000

Stroke		H	C	Force(N) (150 bar / +20 ℃)		Gas vol. (cm ³)	Weight (kg)	ISO
(mm)	(inch)			Initial	End force*			
20	0.79	200	180	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

※ 기타 특수한 규격은 당사에 문의 바랍니다.

■ 충전압력/압축량 대비 하중변화도표



■ TSL10000의 충전 압력(Bar) 계산식

$$\text{충전압력(Bar)} = \frac{\text{초기하중(N)}}{708.5}$$

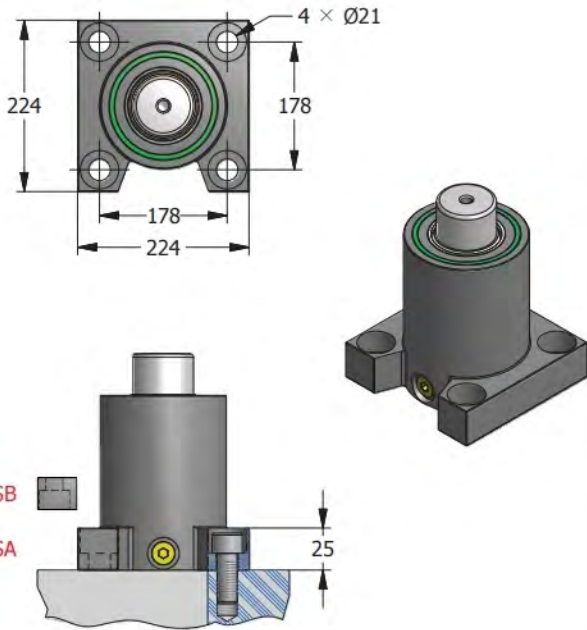
ex) 필요한 초기하중 85,000N인 GAS SPRING의 충전압력은?

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

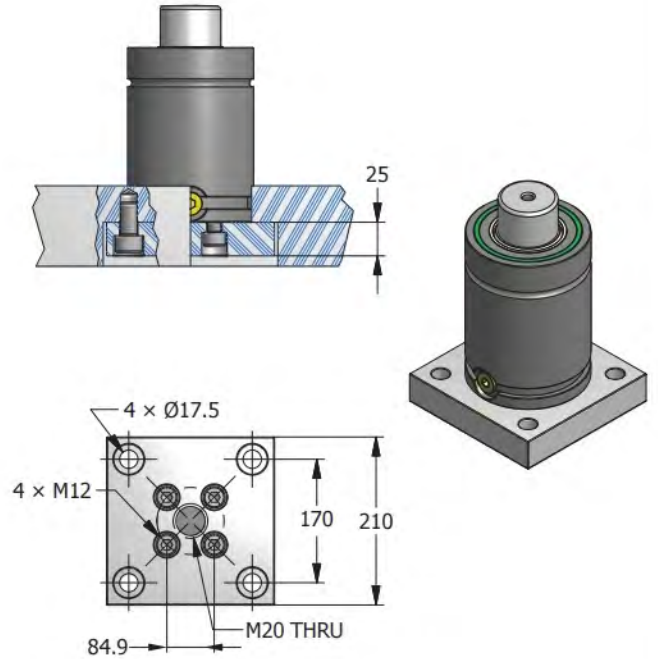


MS MOUNT

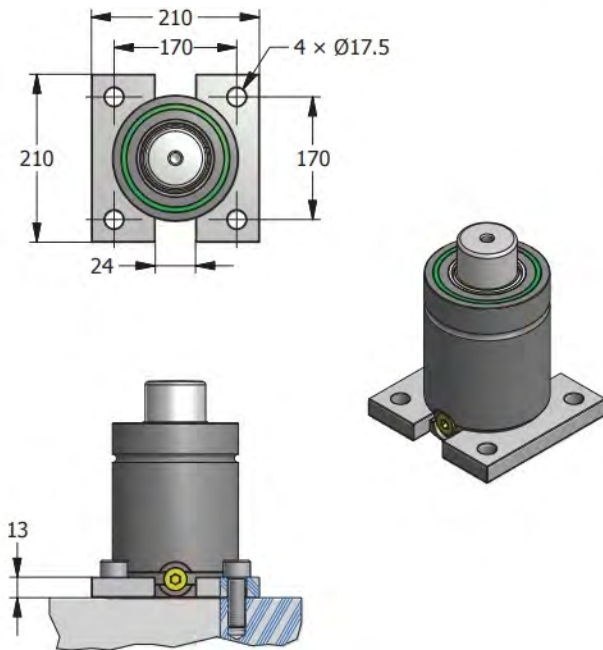
일체형



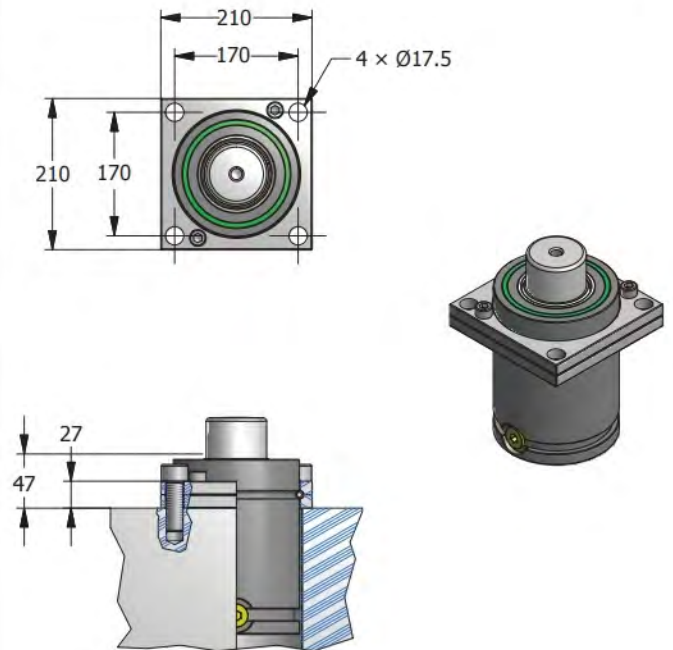
SB10000 MOUNT



SP10000 MOUNT



ST10000 MOUNT



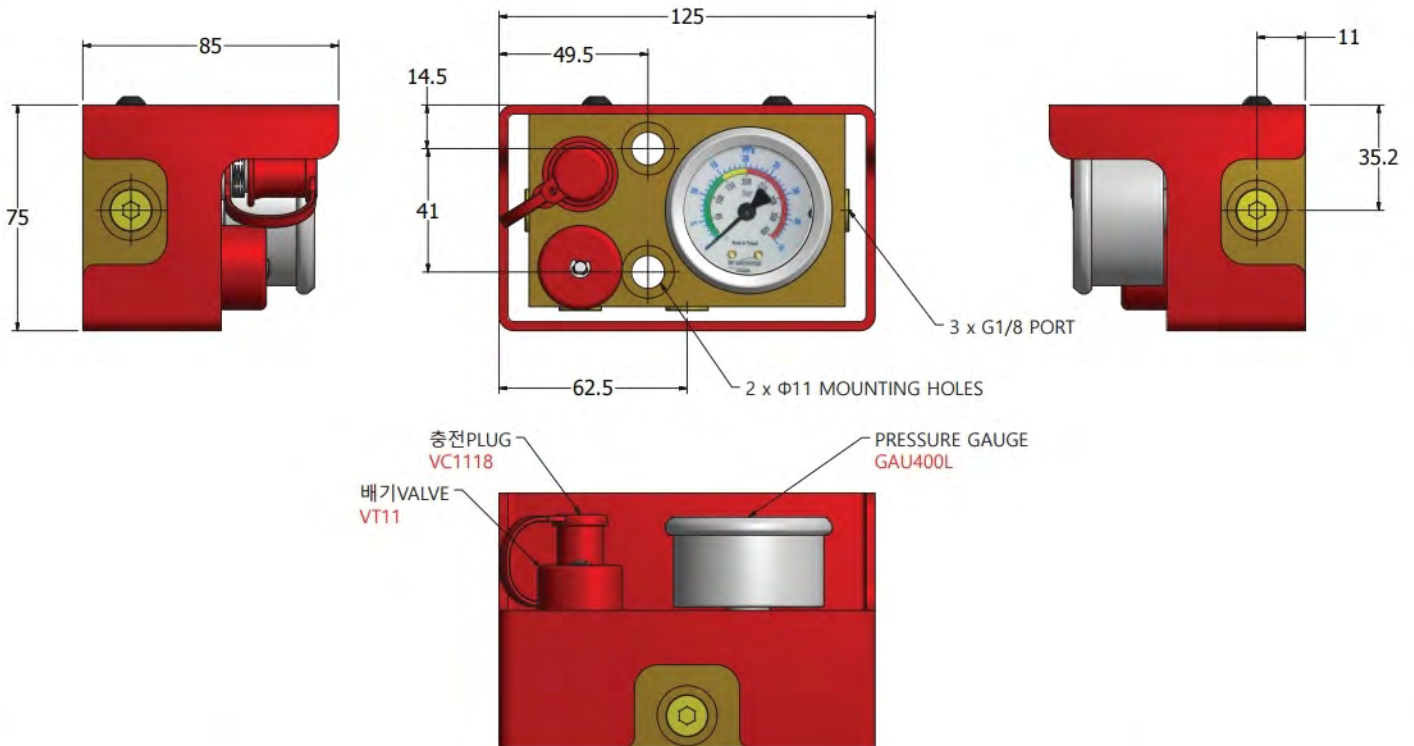
PAN3



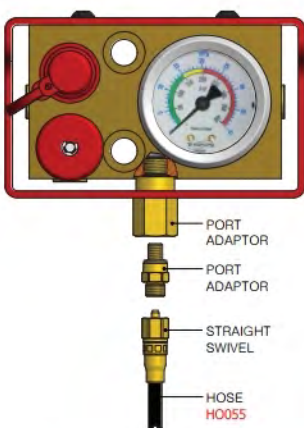
TOSS CONTROL PANEL은 연결된 GAS SPRING의 충전 압력 확인과 충전 및 배기용으로 사용됩니다.

TOSS CONTROL PANEL은 GAS SPRING과의 연결을 위한 3개의 연결구가 있으며 GAS 주입시 충전 PLUG를 통해 주입하고 배기 시는 압력 GAUGE를 확인하면서 배기 VALVE를 서서히 개방합니다.

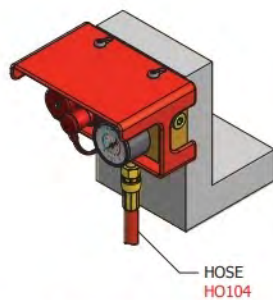
TOSS CONTROL PANEL은 질소(N₂) GAS 전용이므로 기타 물질의 충전을 금합니다.



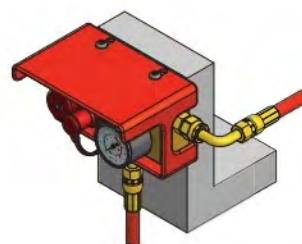
PAN3 사용 예



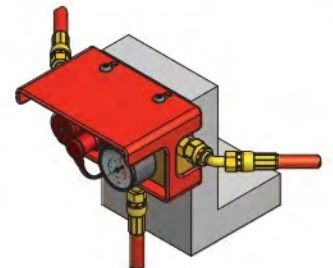
PAN3 + FITTING 연결도



1 PORT 사용



2 PORT 사용



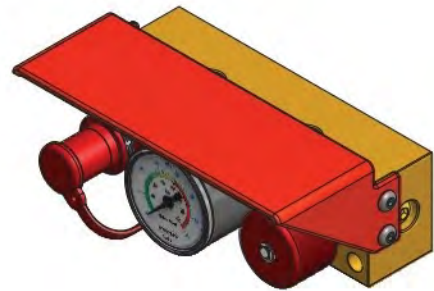
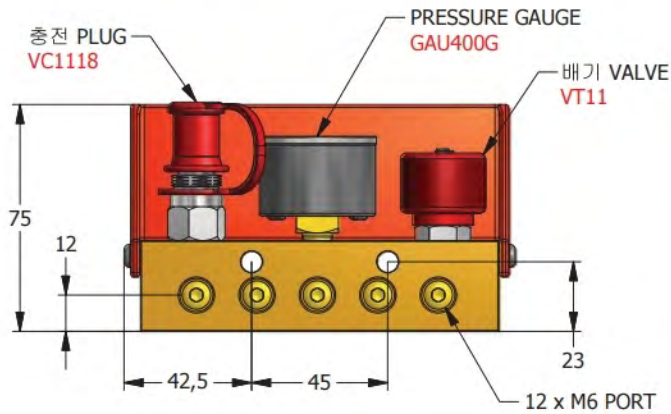
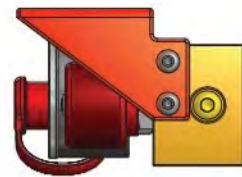
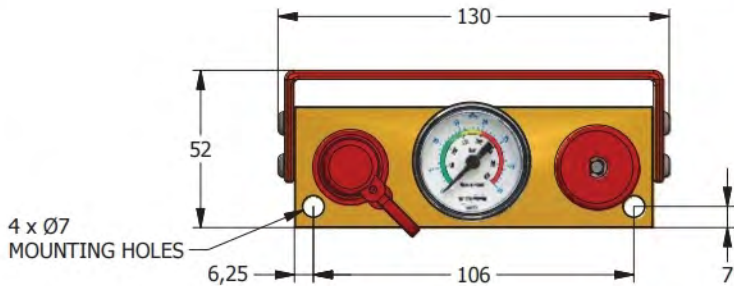
3 PORT 사용

PAN6

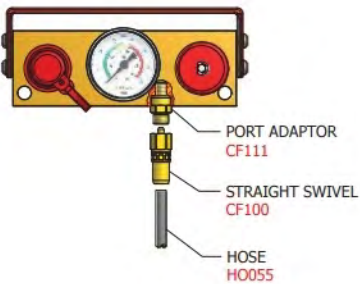
TOSS PAN6는 COMPACT FITTING을 배관하는 CONTROL PANEL 입니다.

TOSS CONTROL PANEL 은 GAS SPRING 과의 연결을 위한 12개의 연결구가 있으며 GAS주입 시 충전 PLUG를 통해 주입하고, 배기 시에는 압력 GAUGE를 확인하면서 배기 VALVE를 서서히 개방하여 주십시오.

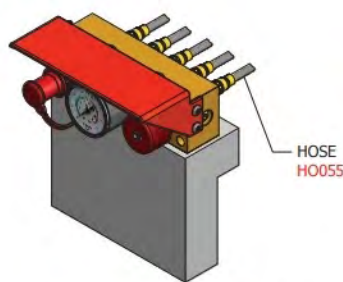
PAN3와 같이 현재 배관 내부 가스 압력측정과 가스의 주입, 배출 기능을 가지고 있습니다.



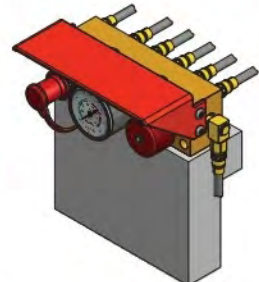
PAN6 사용 예



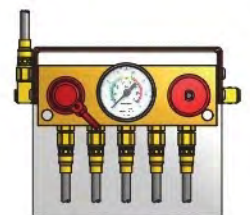
PAN6 + FITTING 연결도



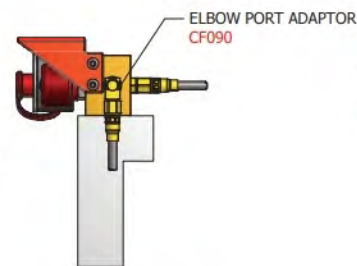
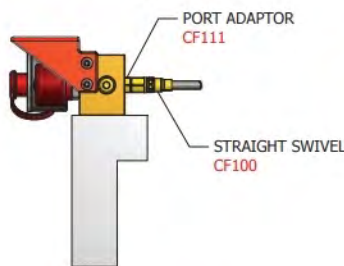
수직고정 5 PORT 사용



수직고정 7 PORT 사용



수평고정 7 PORT 사용

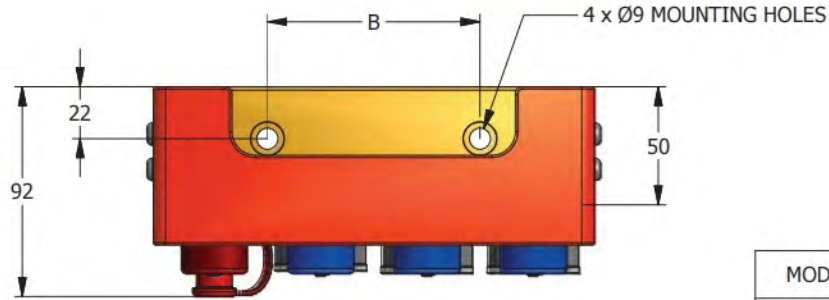


PSS SERIES

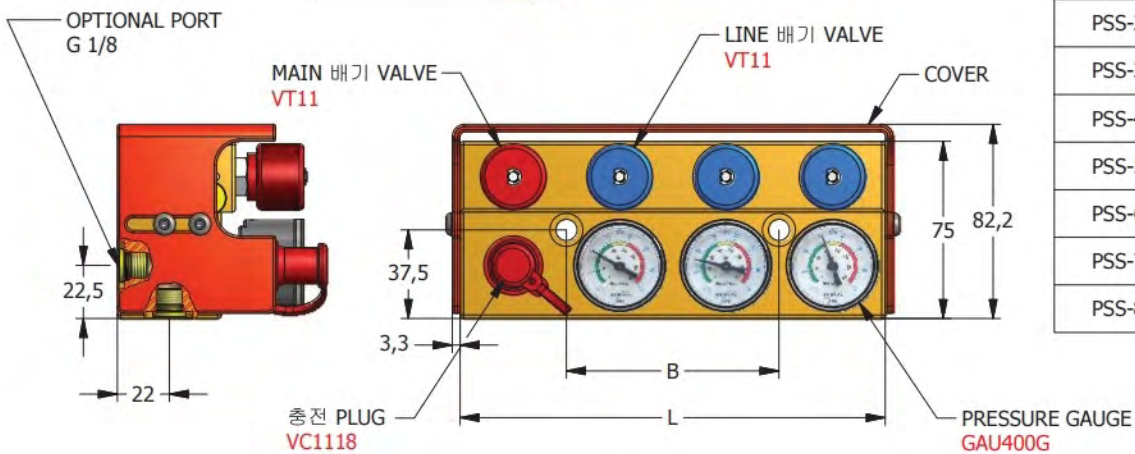
PSS MULTI PANEL은 단일 금형에 다종의 압력이 필요한 경우에 사용 됩니다.

독립적인 LINE을 통하여 사용자가 원하는 압력을 Model에 따라 최소 2 Line에서 최대 8 Line까지 사용 가능 합니다.

- PSS-2
- PSS-3
- PSS-4
- PSS-5
- PSS-6
- PSS-7
- PSS-8



MODEL	L	B
PSS-2	135	45
PSS-3	180	90
PSS-4	225	135
PSS-5	270	180
PSS-6	315	225
PSS-7	360	270
PSS-8	405	315

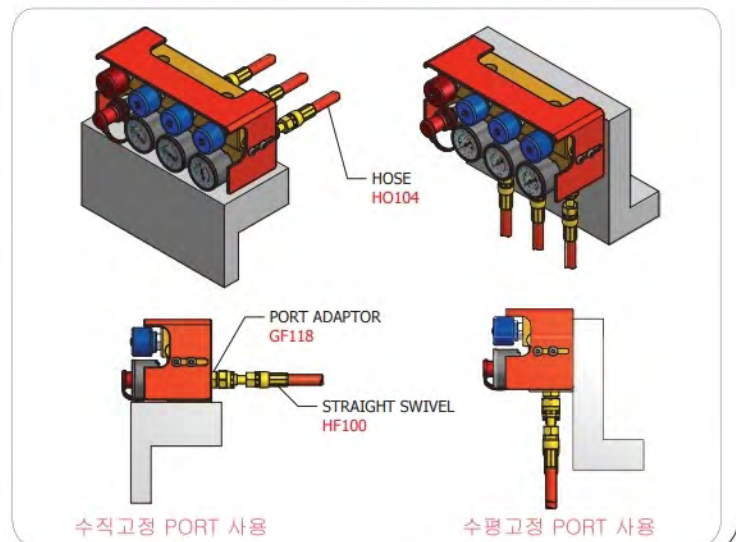
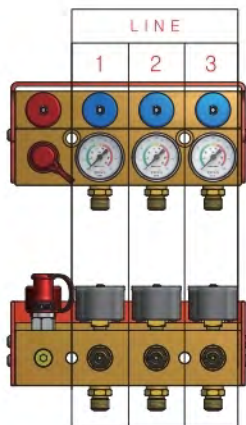
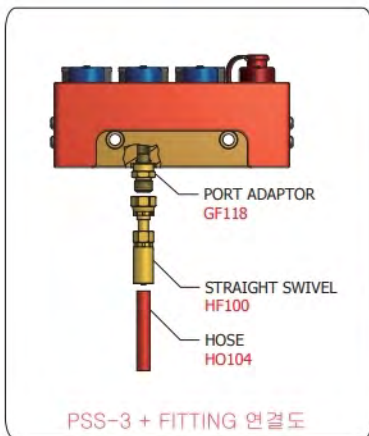


규격 표기법

HOW TO ORDER

PSS - 3
MULTI PANEL Line

PSS 사용 예





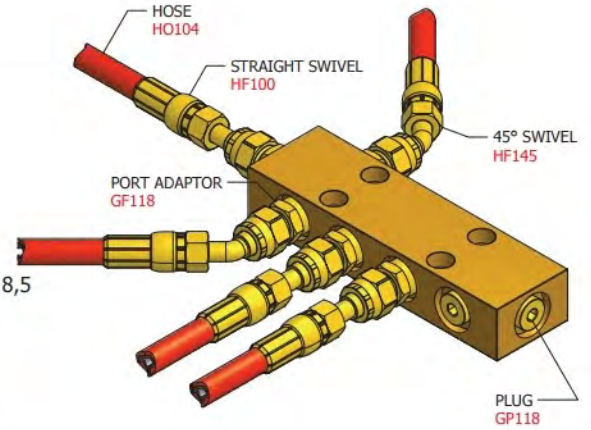
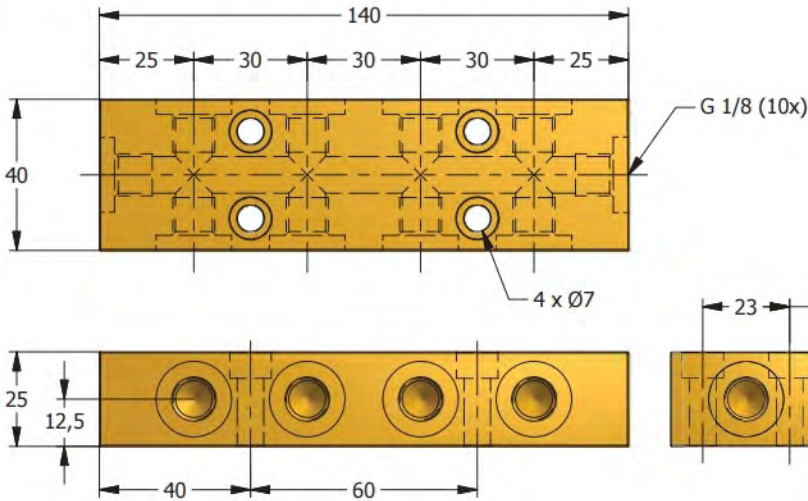
DISTRIBUTION BLOCK (분배 블록)

다양한 구조의 GAS SPRING을 상호 연결하는데 편리하게 적용할 수 있습니다.

분배 블록의 모든 제품들은 사용자가 원하는 특수 설계의 제작도 가능합니다.

HB-10

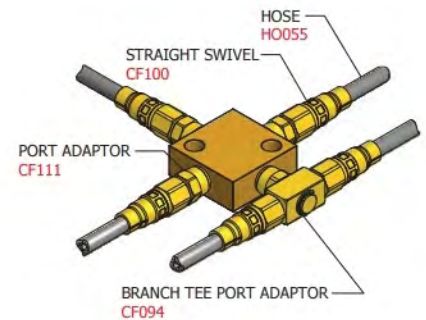
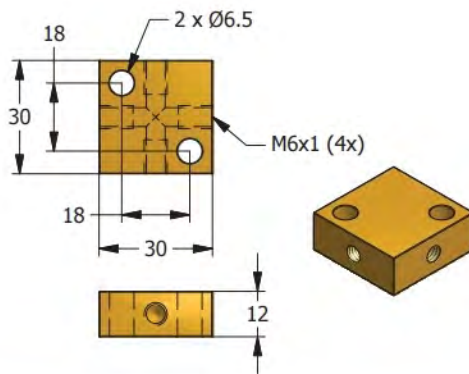
Distribution 10 Port Block



HB-10 사용 예

CB-4

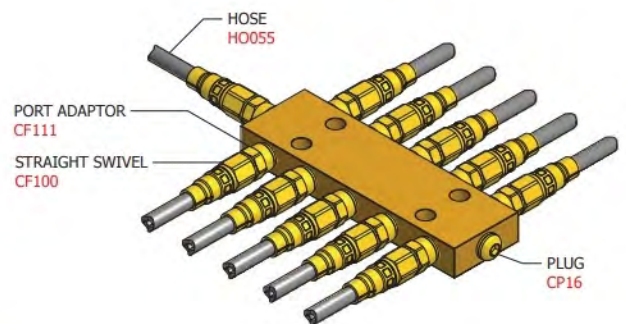
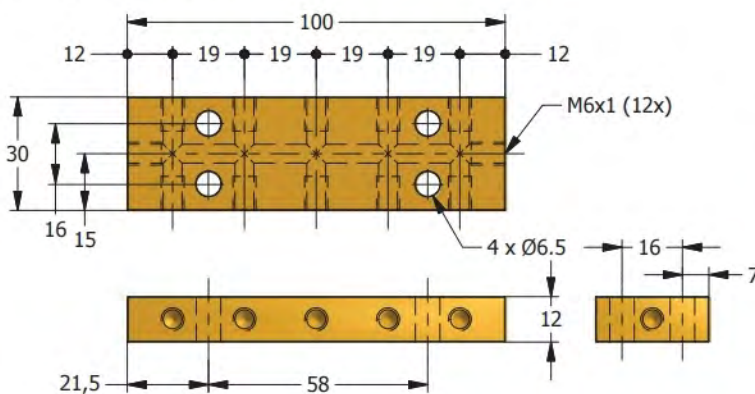
Compact 4 Block



CB-4 사용 예

CB-12

Compact 12 Block



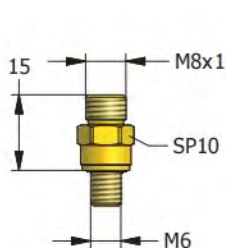
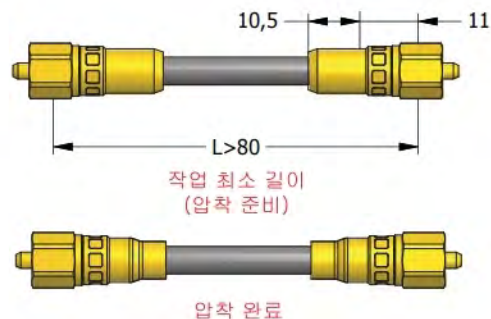
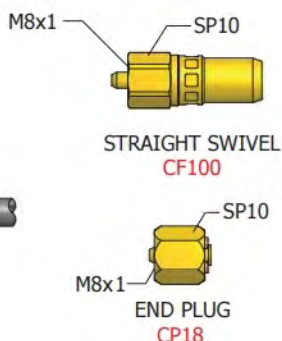
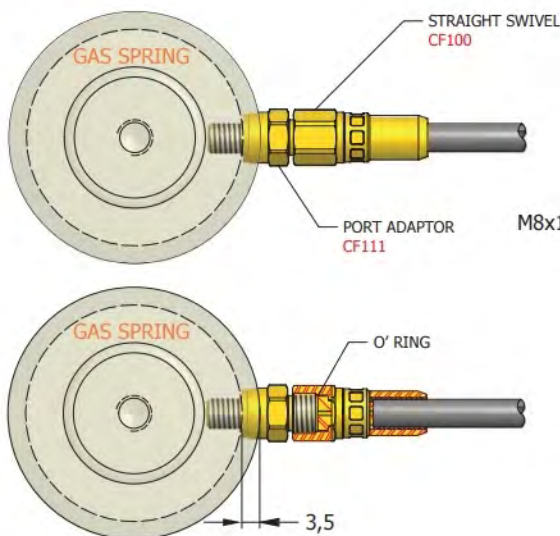
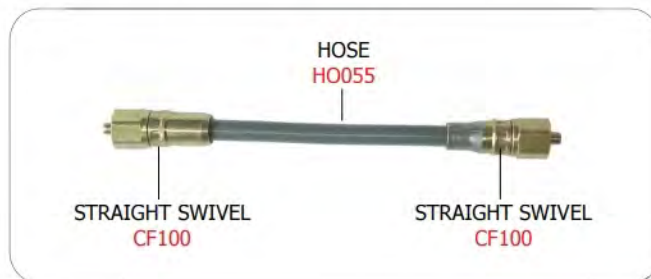
CB-12 사용 예

HOSE HO055

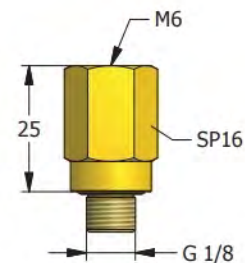


COMPACT FITTING

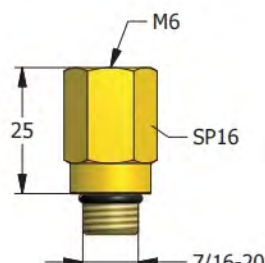
COMPACT FITTING은 FITTING 중 가장 작은 규격으로써 HOSE HO055와 조합하여 협소한 곳의 배관 작업이 가능합니다. 또한 GF FITTING의 배관에도 동시 적용이 가능하여 폭넓은 대응이 가능합니다.



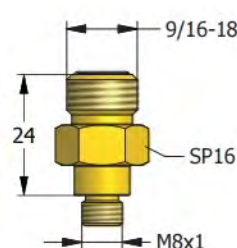
PORT ADAPTOR CF111



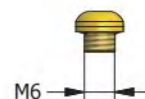
G 1/8 PORT ADAPTOR CF118



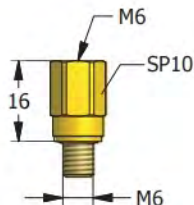
7/16 PORT ADAPTOR CF716



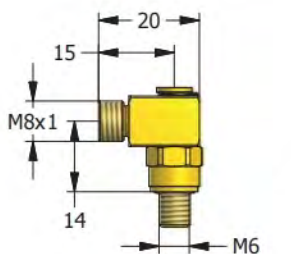
G 1/8 - M8 UNION CF188



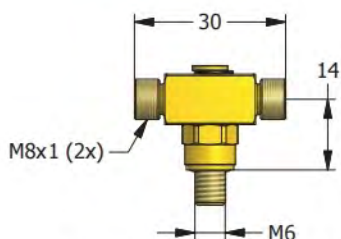
PLUG CP16



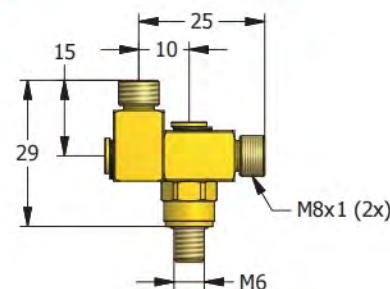
PORT ADAPTOR EXTENSION CF110



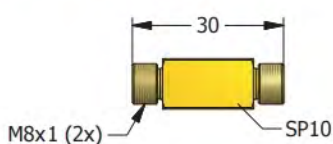
ELBOW PORT ADAPTOR CF090



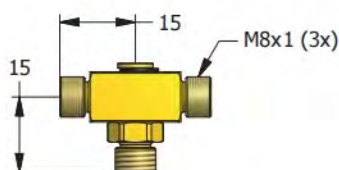
BRANCH TEE PORT ADAPTOR CF094



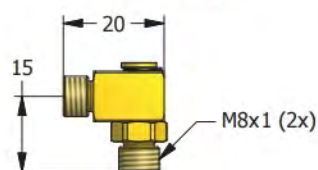
RUN TEE PORT ADAPTOR CF093



UNION CTH10



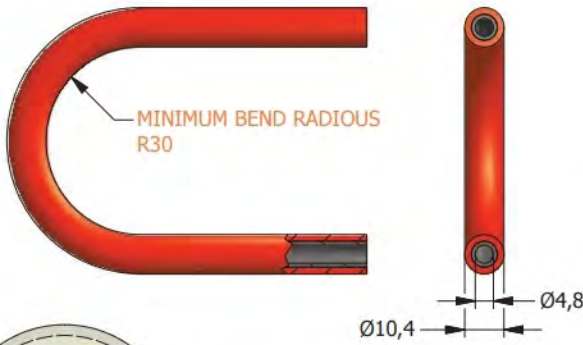
UNION TEE CTH93



UNION ELBOW CTH90



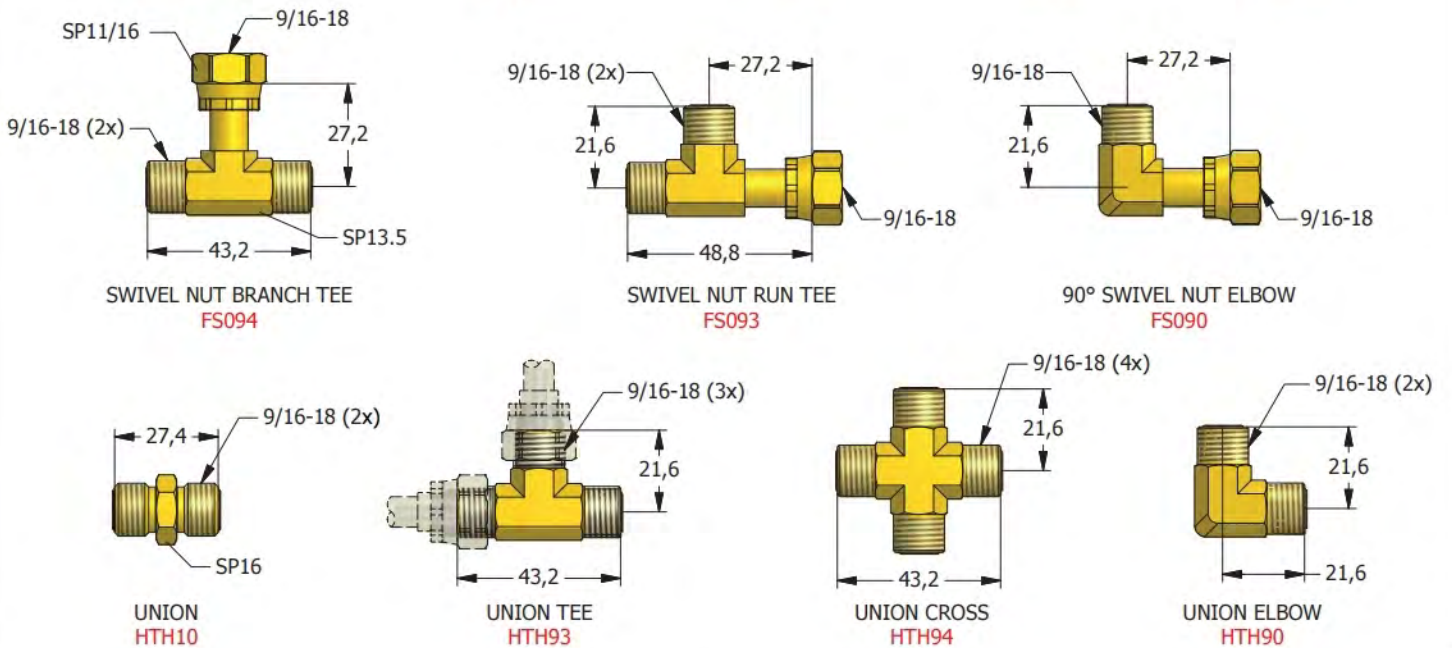
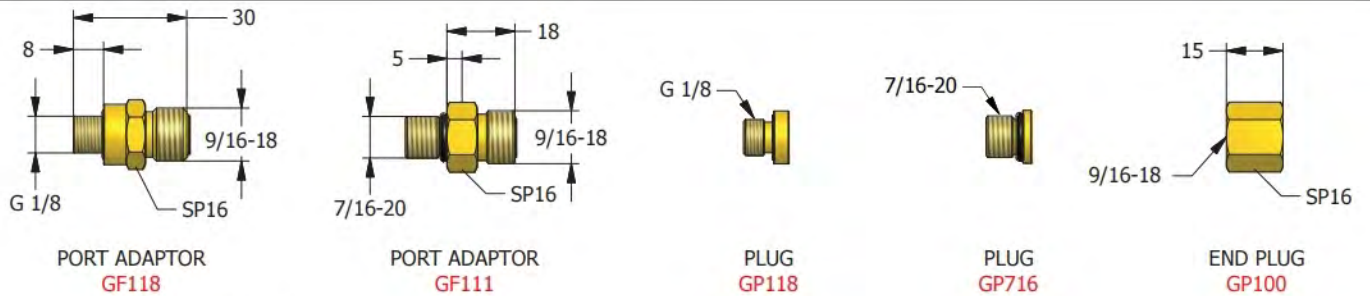
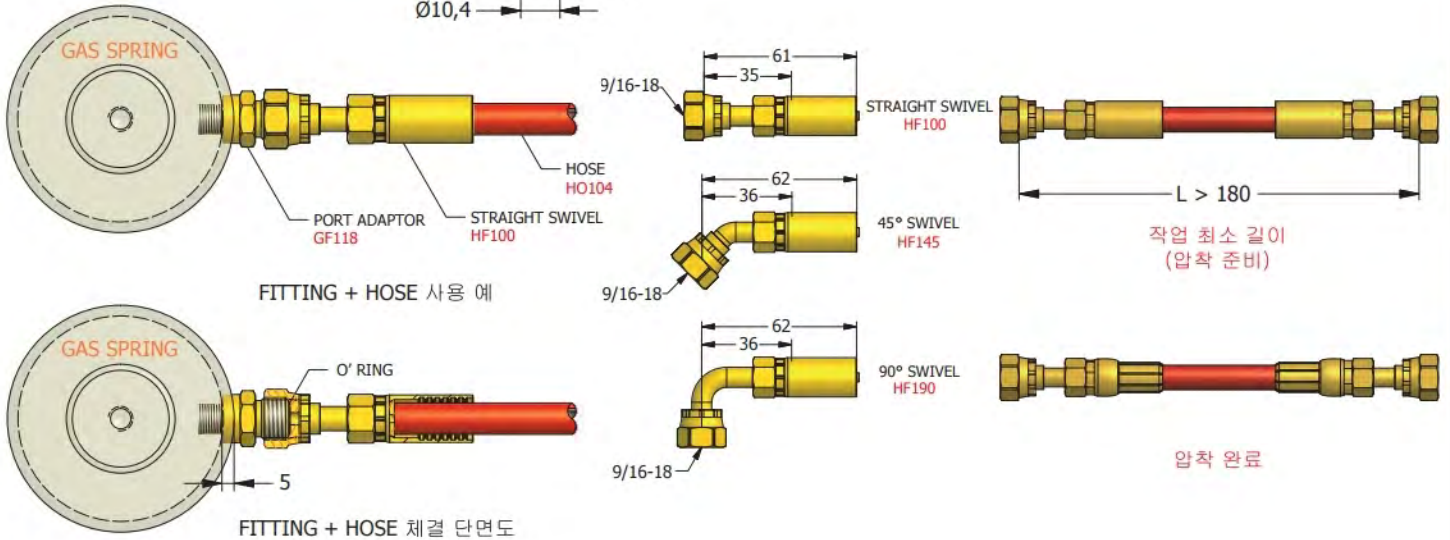
HOSE HO104



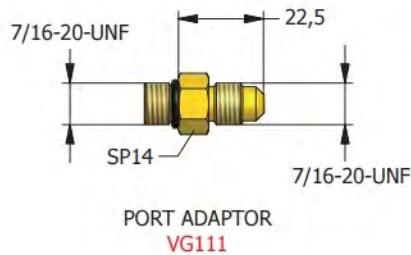
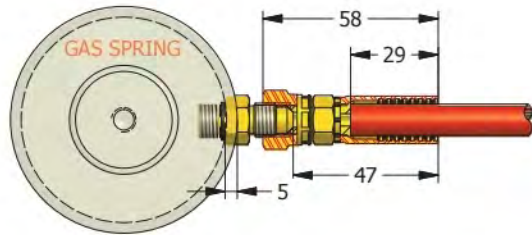
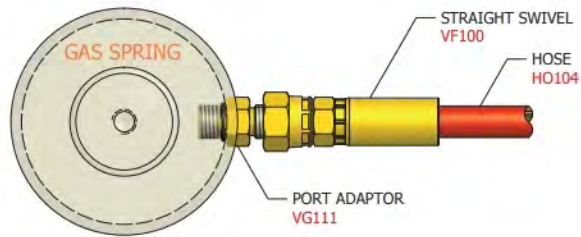
GF FITTING

GF FITTING에 HOSE HO104를 포함한 SYSTEM은 가장 널리 사용되고 있는 배관 SYSTEM 입니다. 다양한 FITTING 조합을 통해 배관 Line을 설치할 수 있습니다.

WORKING PRESSURE 200bar
BURST PRESSURE 700bar

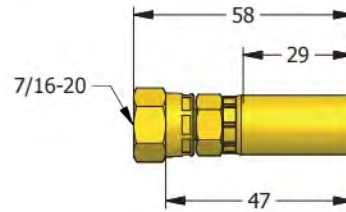


- PHASING OUT -

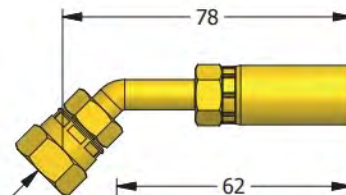


VF FITTING

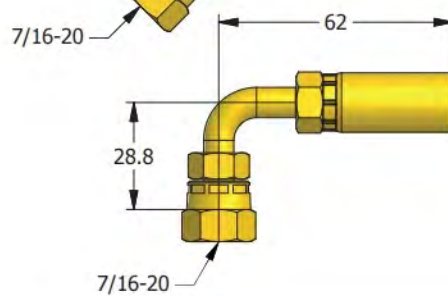
VF FITTING에 HOSE HO104를 조합한 SYSTEM은 SEALING이 아닌 면과의 접촉에 의해 체결되는 방식입니다. FITTING 조합을 통한 배관Line을 설치 할 수 있습니다.



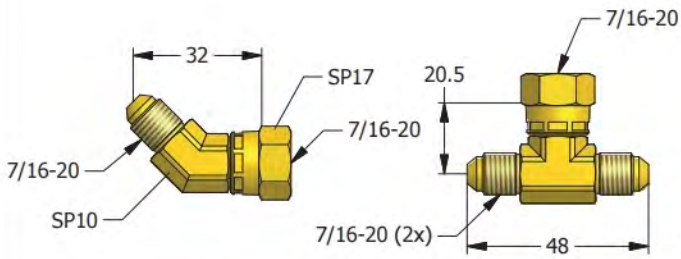
STRAIGHT SWIVEL
VF100



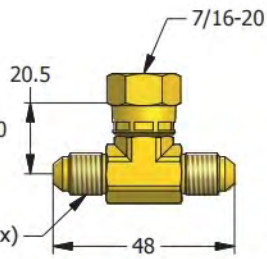
45° SWIVEL
VF145



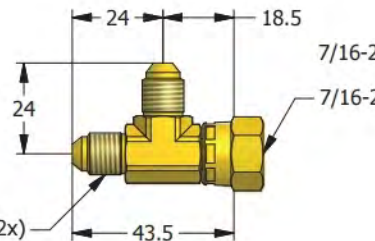
90° SWIVEL
VF190



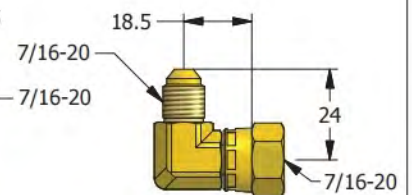
45° SWIVEL NUT ELBOW
VS045



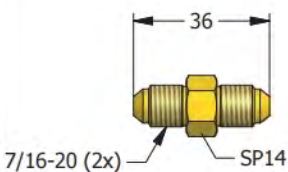
SWIVEL NUT BRANCH TEE
VS094



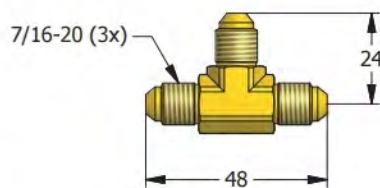
SWIVEL NUT RUN TEE
VS093



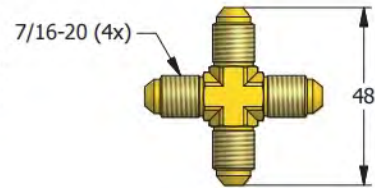
90° SWIVEL NUT ELBOW
VS090



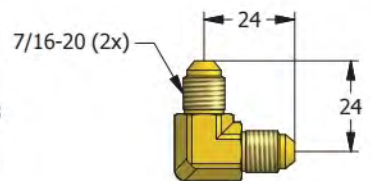
UNION
VTH10



UNION TEE
VTH93



UNION CROSS
VTH94



UNION ELBOW
VTH90



CHARGING METHOD

배관형 GAS SPRING의 압력 충전은 PANEL부 충전 PLUG를 통해 이루어지며 압력 조절은 배기 VALVE를 사용합니다.

단독형의 경우에는 PRESSURE TESTER를 이용해 압력 확인 및 충전을 하실 수 있습니다.



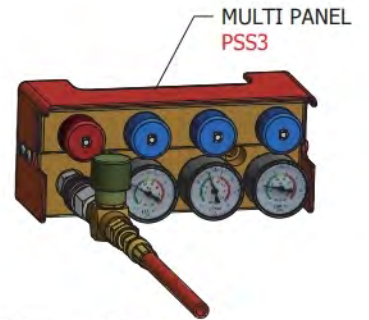
CONTROL PANEL
PAN6

◆ PAN6를 적용한 배관형에 GAS를 충전합니다.



CONTROL PANEL
PAN3

◆ PAN3를 적용한 배관형에 GAS를 충전합니다.



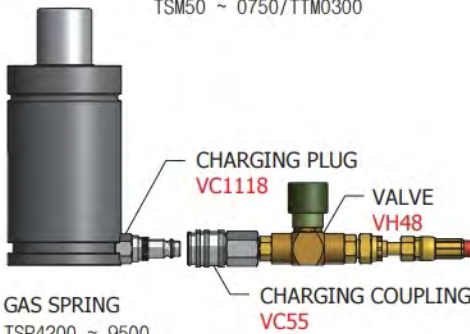
MULTI PANEL
PSS3

◆ PSS를 적용한 배관형에 LINE별 GAS를 충전합니다.



CM618

◆ GAS SPRING
TSP0170 ~ 2400
TSX0350 ~ 0750
TSM50 ~ 0750/TTM0300



GAS SPRING
TSP4200 ~ 9500
TSX1000 ~ 6600
TST1000 ~ 9500
TSM1500 ~ 5000
TSS0750 ~ 5000
TSL0500 ~ 10000

CHARGING PLUG
VC1118

VALVE
VH48

CHARGING COUPLING
VC55



PRESSURE TESTER
PT118

◆ 단독형 Gas Spring의 압력 확인과 충전 및 조절에 사용 됩니다.



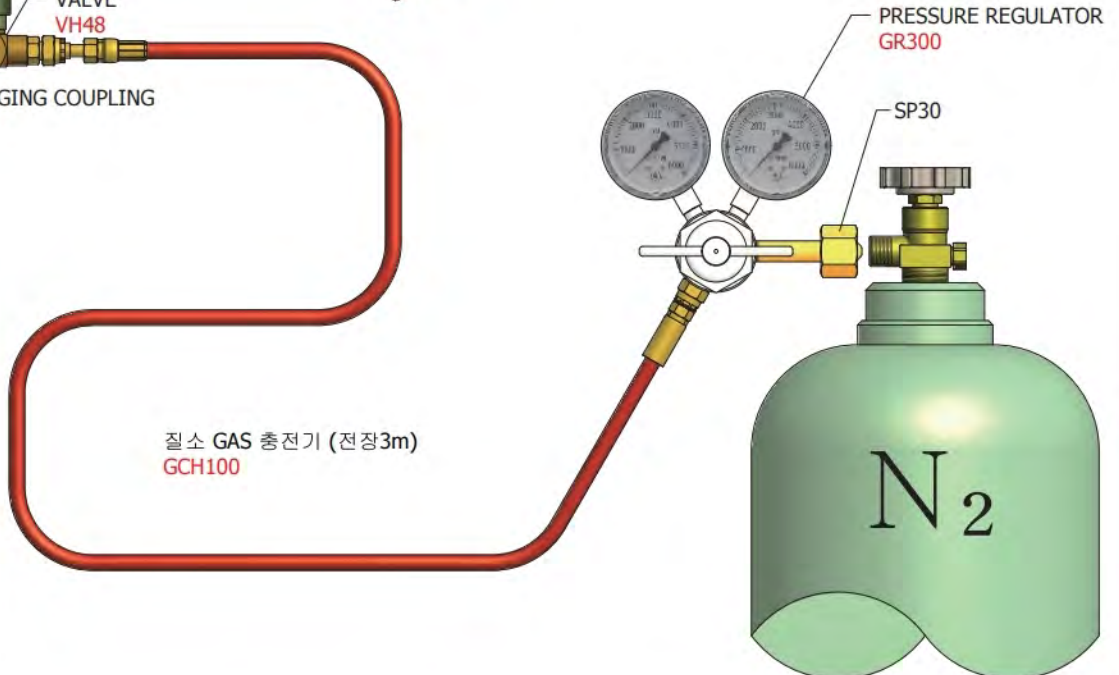
충전 ADAPTOR

M6 G 1/8

PORT ADAPTOR
CM618

G 1/8

충전 PLUG
VC1118



PRESSURE REGULATOR
GR300

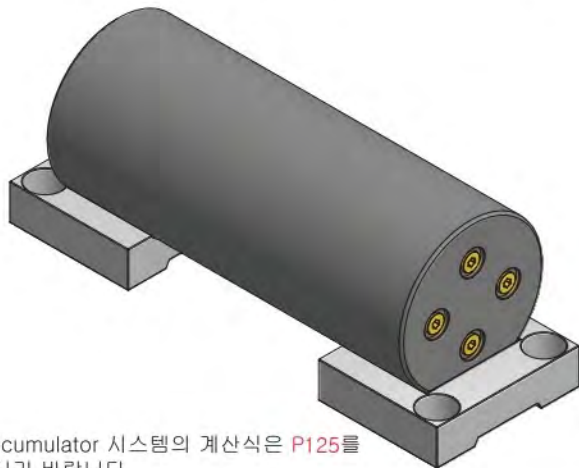
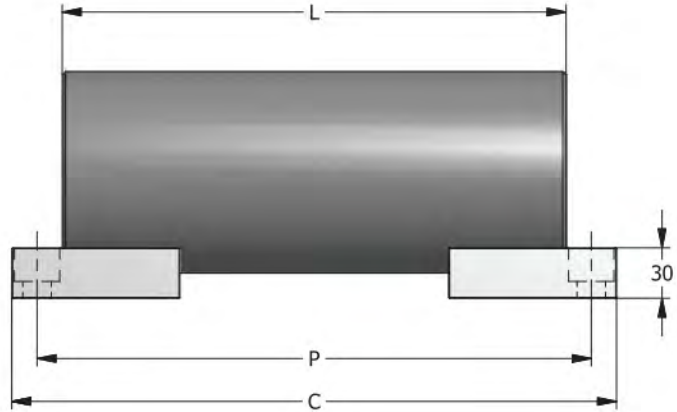
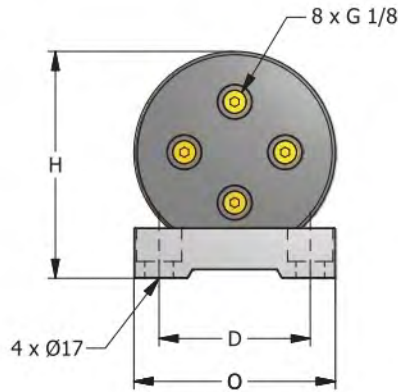
SP30

질소 GAS 충전기 (전장3m)
GCH100



압력분산 TANK

TOSS ACCUMULATOR는 연결형과의 결합으로 GAS SPRING의 초기 하중과 최종 하중의 변화량을 최소화하여 일정한 하중을 유지하여야하는 조건에 적용됩니다.



규격	용량 cm ³	L mm	C mm	P mm	H mm	O mm	D mm
TAN050-25	1,260	291	369	330	115	105	65
TAN050-50	2,510	541	619	580			
TAN050-75	3,770	791	869	830			
TAN080-25	1,960	291	369	330	135	130	90
TAN080-50	3,920	541	619	580			
TAN080-75	5,880	791	869	830			
TAN125-25	3,060	301	379	340	165	160	120
TAN125-50	6,130	551	629	590			
TAN125-75	9,200	801	879	840			
TAN210-25	5,340	301	379	340	215	210	170
TAN210-50	10,680	551	629	590			

* Toss Accumulator 시스템의 계산식은 P125를 참조 하시기 바랍니다.

규격 표기법

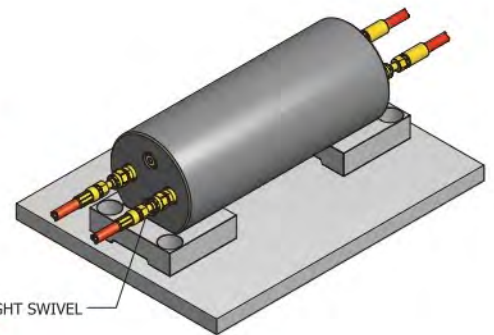
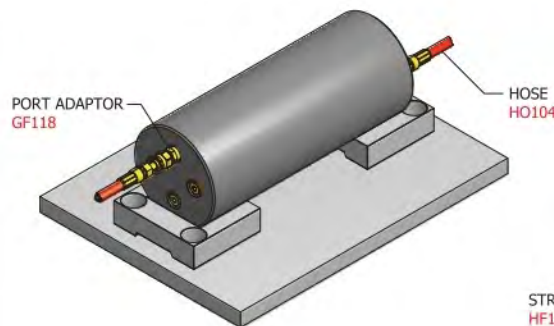
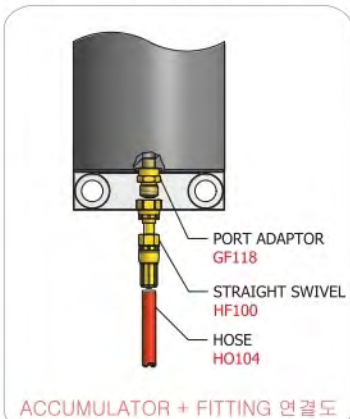
HOW TO ORDER

TAN 080-75

Accumulator

Specification

ACCUMULATOR 사용 예

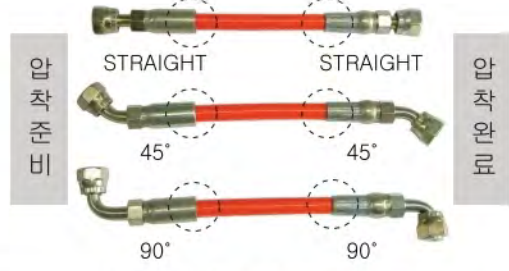




GF FITTING + HO104 HOSE 연결도

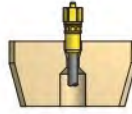


GF FITTING
SWIVEL 압착 단면도



GF FITTING + HOSE HO104 적용

COMPACT FITTING + HO055 HOSE 연결도

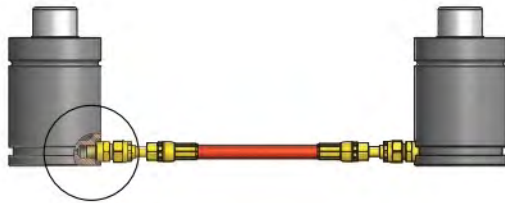


COMPACT FITTING
SWIVEL 압착 단면도

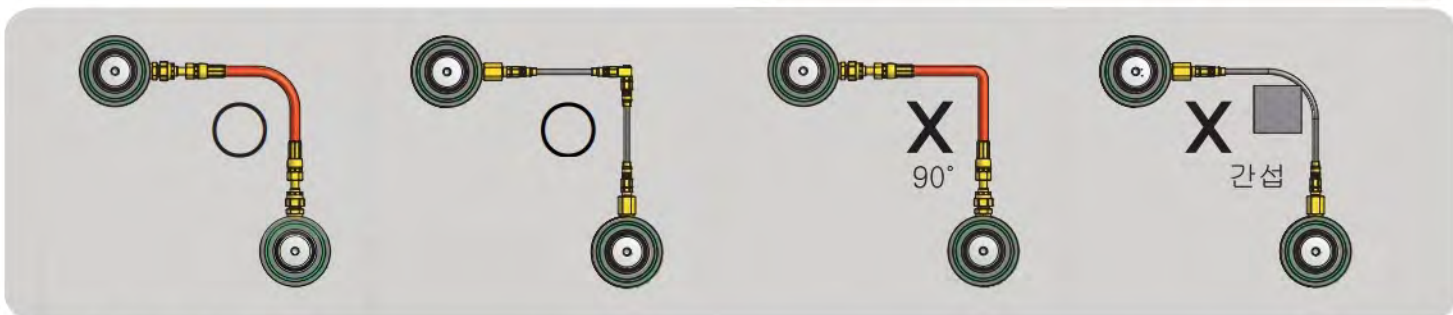
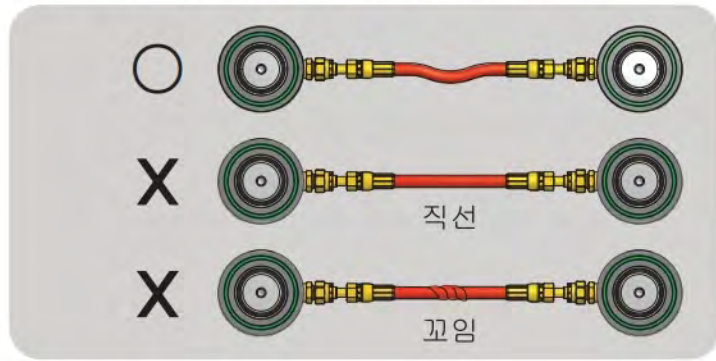


COMPACT FITTING + HOSE HO055 적용

◆ 배관형 GAS SPRING의 FITTING 예



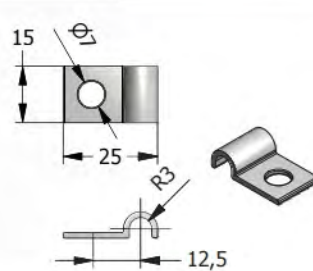
FITTING 체결부 단면도



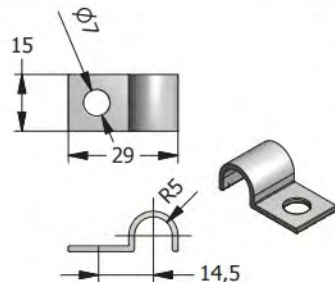
HOSE CLAMP



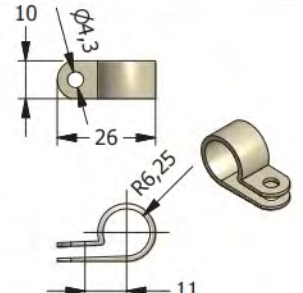
HOSE 고정에 사용합니다.



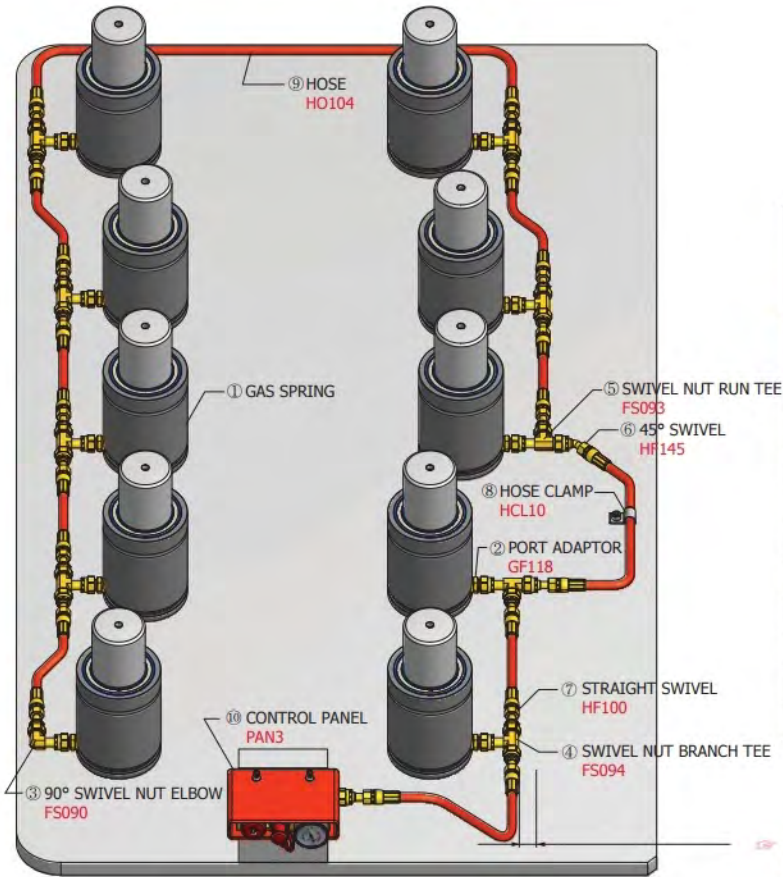
HCL06
HOSE_HO055 고정용



HCL10
HOSE_HO104 고정용



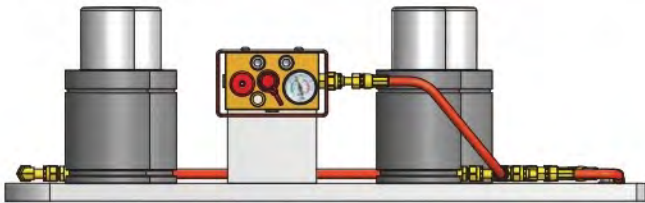
HCL48
HOSE_HO104 고정용



PAN3 적용 배관도 I

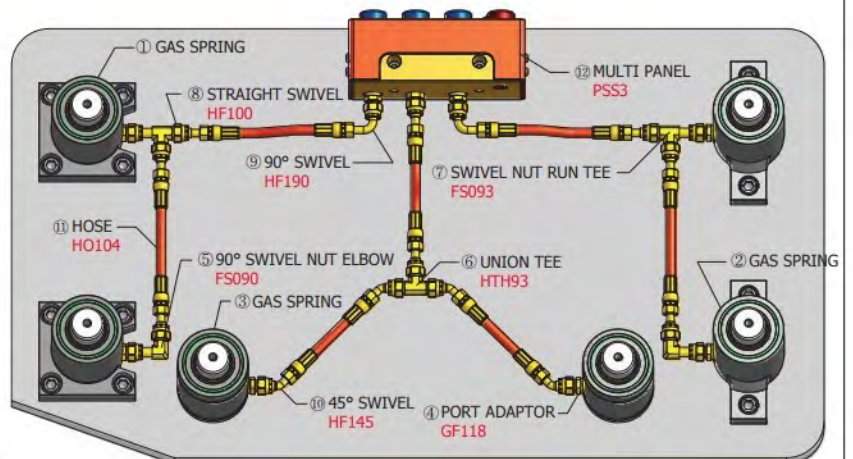
No.	MODEL	규격	수량	PAGE
1	GAS SPRING	TSP4200 x 060	10	P28
2	PORT ADAPTOR	GF118	11	P115
3	90° SWIVEL NUT ELBOW	FS090	1	P115
4	SWIVEL NUT BRANCH TEE	FS094	7	P115
5	SWIVEL NUT RUN TEE	FS093	2	P115
6	45° SWIVEL	HF145	1	P115
7	STRAIGHT SWIVEL	HF100	19	P115
8	HOSE CLAMP	HCL10	1	P119
9	HOSE	HO104	10	P115
10	CONTROL PANEL	PAN3	1	P110

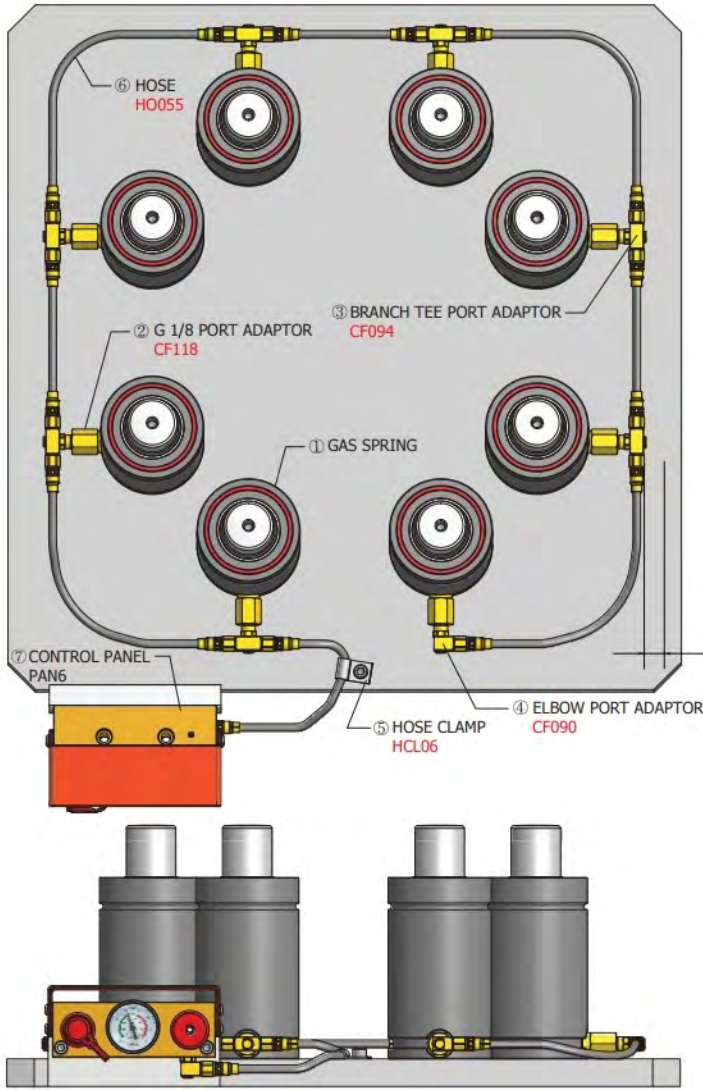
작업 시 주의 사항
(GF FITTING 적용 MODEL)
Fitting 체결 시 공구 간섭을 피하기 위한 작업공간을 20mm이상 확보하여야 합니다.



PSS3 적용 배관도 I

No.	MODEL	규격	수량	PAGE
1	GAS SPRING	TSL1500 x 025-MSA	2	P101
2	GAS SPRING	TSL1500 x 025-MDA	2	P101
3	GAS SPRING	TSL1500x025	2	P100
4	PORT ADAPTOR	GF118	9	P115
5	90° SWIVEL NUT ELBOW	FS090	2	P115
6	UNION TEE	HTH93	1	P115
7	SWIVEL NUT RUN TEE	FS093	2	P115
8	STRAIGHT SWIVEL	HF100	8	P115
9	90° SWIVEL	HF190	2	P115
10	45° SWIVEL	HF145	4	P115
11	HOSE	HO104	7	P115
12	MULTI PANEL	PSS3	1	P112





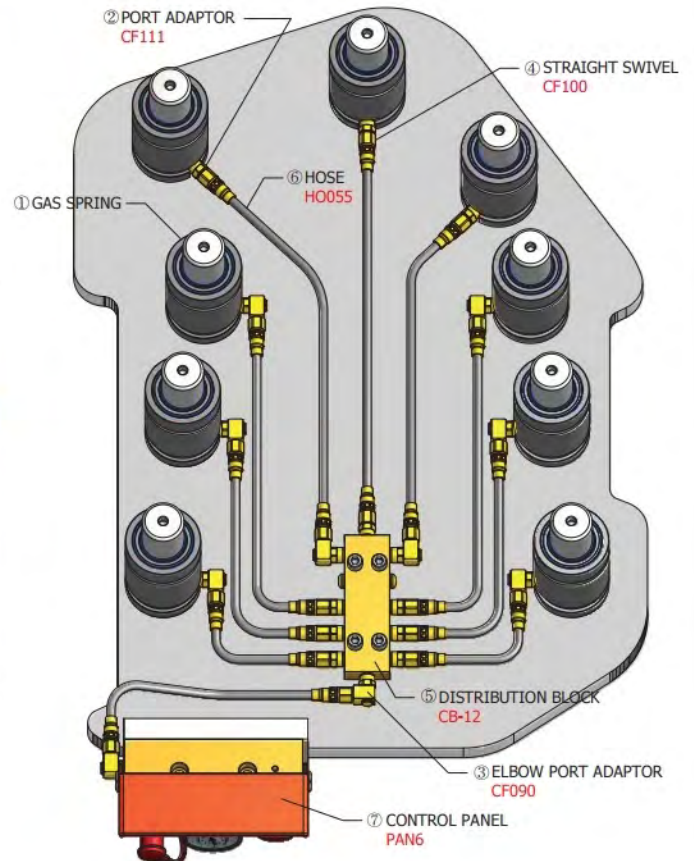
PAN6 적용 배관도 I

No.	MODEL	규격	수량	PAGE
1	GAS SPRING	TSM1500 x 038	8	P78
2	G 1/8 PORT ADAPTOR	CF118	8	P114
3	BRANCH TEE PORT ADAPTOR	CF094	7	P114
4	ELBOW PORT ADAPTOR	CF090	2	P114
5	HOSE CLAMP	HCL06	1	P119
6	HOSE	HO055	8	P114
7	CONTROL PANEL	PAN6	1	P111

작업 시 주의 사항
(COMPACT FITTING 적용 MODEL)
Fitting 체결 시 공구 간섭을 피하기 위한 작업공간을 15mm이상 확보하여야 합니다.

PAN6 적용 배관도 II

No.	MODEL	규격	수량	PAGE
1	GAS SPRING	TSP1000 x 030	9	P22
2	PORT ADAPTOR	CF111	10	P114
3	ELBOW PORT ADAPTOR	CF090	10	P114
4	STRAIGHT SWIVEL	CF100	20	P114
5	COMPACT 12 BLOCK	CB-12	1	P113
6	HOSE	HO055	10	P114
7	CONTROL PANEL	PAN6	1	P111



KARRYKRIMP HK8201

제품규격) HK8201

- HO104 Hose & Swivel Hose Adaptor 압착기
- HO104 Hose & Swivel Hose Adaptor의 결합을 할 수 있습니다.



ASSEMBLING TOOL MARK10

제품규격) MARK10

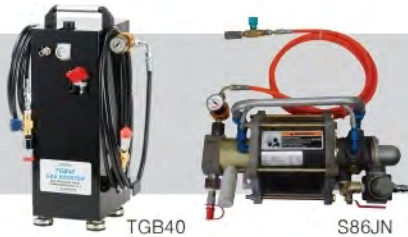
- HO055 Hose & Straight Swivel 압착기
- HO055 Hose & Straight Swivel의 결합을 쉽게 할 수 있습니다.
- 휴대가 간편해 이동 작업이 용이합니다.



GAS BOOSTERS TGB40 S86JN

제품규격) TGB40
S86JN

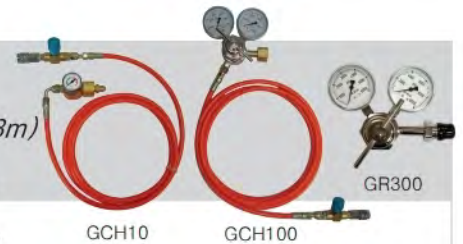
- Gas 압력 승압 장치
사용자가 원하는 압력 Setting이 가능합니다.
- 압력비 TGB40 (40:1)
S86JN (30:1)



HOSE ASSEMBLY GCH10 GCH100 (Length:3m)

제품규격) GCH10
GCH100

- Charging Hose System
- Pressure Regulator



HOSE SCISSORS HS10

제품규격) HS10

- Hose 절단용 가위



PRESSURE TESTER

PT118 (G 1/8용)
PT006 (M6용)
제품규격) PT118
PT006

- Cross Pressure Tester
- 휴대용 Pressure Tester기로 단독형의 압력 조절 및 충전에 사용합니다.
- 제품 규격에 맞는 모델을 선택 하시기 바랍니다.



CHARGING COUPLING VC55

제품규격) VC55

- Charging Female Coupling
- Charging Plug와 연결되어 Gas 주입 시 사용됩니다.



CHARGING PLUG VC1118 (G 1/8)

제품규격) VC1118

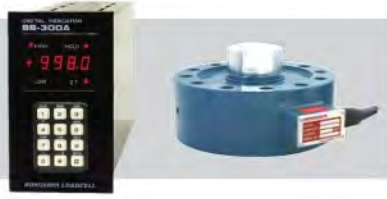
- Charging Male Plug
- Charging Coupling과 연결하여 Gas 주입 시 사용됩니다.





DIGITAL LOAD CELL
DLE10

제품규격) DLE10



- Digital 하중 검사 게이지
- 게이지 위에 Gas spring을 올려 하중값의 측정이 가능합니다.
- 하중 범위
- 0 ~ 10t (0 ~ 100kN)

COMPACT LOAD CELL
CLC

제품규격) CLC 1500



- Gas압력 게이지
- Compact Size로 제품에 올려 쉽고 정확한 압력값을 측정할 수 있습니다.
- 제품 규격에 맞는 모델을 선택 하시기 바랍니다.
- 표시 단위
- bar (0 ~ 400)
- Mpa (0 ~ 40)

VALVE TIGHTEN TOOL
VTT25

VTT26R
제품규격) VTT25
VTT26R



- Torque Driver
- Driver Type으로 Valve 조립 및 분해가 가능합니다.
- Over Torque에 의한 Valve파손 방지

VALVE CONTROL TOOL
VCT18 (G 1/8용)

VCT06 (M6용)
제품규격) VCT18
VCT06



- Gas Control Tool
- Gas spring 분해 시 Gas 배기에 사용됩니다.
- 제품 규격에 맞는 모델을 선택하시기 바랍니다.

STOPRING REMOVAL TOOL
SRT42 (0350 ~ 4200)

SRT50 (5000 ~ 10000)
제품규격) SRT42



- Gas Spring 분해 시 Stopring 제거에 사용됩니다.
- Valve Control Tool 사용 후 Stopring Removal Tool을 이용해 Stopring에 안착시킨 후 제거합니다.
- 제품 규격에 맞는 모델을 선택하시기 바랍니다.

T-REMOVAL TOOL
TRT06 (M6용)

TRT08 (M8용)
제품규격) TRT06



- Gas Spring 분해 Tool
- 사용 순서
① Valve Control Tool로 Gas제거
② Stopring Removal Tool로 Ring 제거
③ T-Removal Tool을 이용해 Rod Ass'y를 들어 올려 Cylinder에서 분리시킨다.
- 제품 규격에 맞는 모델을 선택하시기 바랍니다.

PRESSURE GAUGE
GAU400L

GAU400G
제품규격) GAU400L
GAU400G



- Compact Pressure Gauge
- 표시 단위
-bar (0 ~ 400)
-MPa (0 ~ 40)

VALVE
CV100

제품규격) CV100



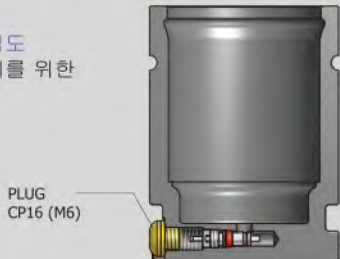
- Check Valve
- 배관 Type의 Gas Spring을 단독형으로 교체할 때 Valve Tighten Tool (VTT26R) 을 이용해 조립 및 분해 하실 수 있습니다.



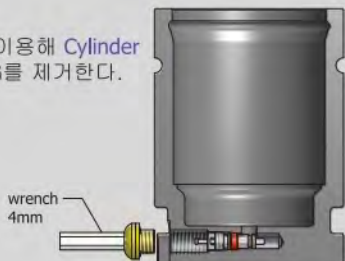
단독형과 배관 TYPE의 GAS SPRING을 작업 조건의 변경에 따라 단독형을 배관형으로, 배관형을 단독형으로의 변경을 할 수 있습니다.

단독형(M6 PORT) → 배관형(F)

1.1 단독형 조립도 배관형 교체를 위한 준비단계



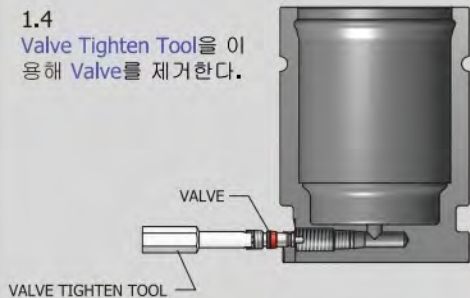
1.2 wrench를 이용해 Cylinder에서 PLUG를 제거한다.



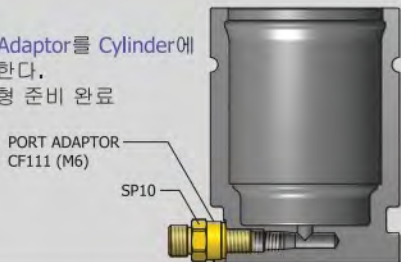
1.3 Valve Control Tool을 이용해 Valve를 눌러 Gas를 제거한다.



1.4 Valve Tighten Tool을 이용해 Valve를 제거한다.



1.5 Port Adaptor를 Cylinder에 장착한다. 배관형 준비 완료



APPLYCATION MODEL

- ◆ TSP4200 ~ 9500
- ◆ TSX1000 ~ 6600
- ◆ TST1000 ~ 9500
- ◆ TSM1500 ~ 5000
- ◆ TSS0750 ~ 5000
- ◆ TSL0500 ~ 10000

배관형 ↔ 단독형
(G 1/8, 7/16 PORT)
2.1 ~ 2.5 참조

- ◆ TSP0350 ~ 2400
- ◆ TSX0350 ~ 0750
- ◆ TSM0300 ~ 0750/TTM0300

단독형 ↔ 배관형
(M6 PORT)
1.1 ~ 1.5 참조

PLUG PORT ADAPTOR 제거 Tool

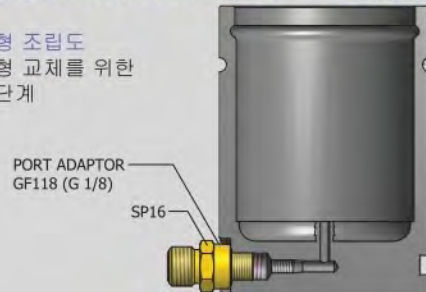
1. G 1/8
7/16-20 → 5mm wrench
M6 → 4mm wrench
2. M6용 PORT ADAPTOR
→ (SPANNER 10mm)
3. G 1/8
7/16용 PORT ADAPTOR
→ (SPANNER 16mm)

※ 작업시 주의사항

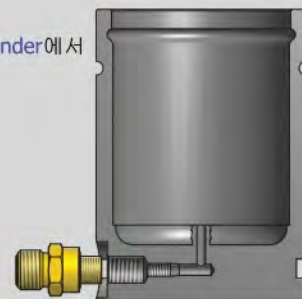
- 1.4 Valve를 풀기전 Cylinder내의 잔류 Gas가 남아 있는지 Valve Control Tool을 이용해 다시한번 확인한후 Valve를 제거한다.
- 1.5 Port Adaptor의 O' RING 장착 여부 확인 후 Cylinder에 장착한다.
- 2.3 Valve Tighten Tool을 이용해 Valve를 7.8 N·m Torque로 체결한다.
- 2.4 PLUG의 O' RING 장착 여부 확인후 Cylinder에 장착한다.

배관형(G 1/8, 7/16 PORT) → 단독형(S)

2.1 배관형 조립도 단독형 교체를 위한 준비단계



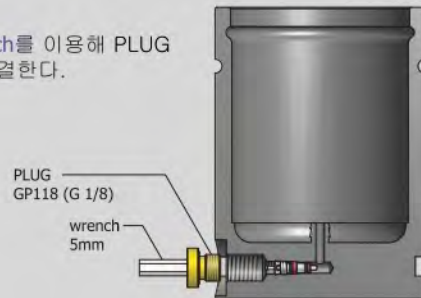
2.2 Port Adaptor를 Cylinder에서 제거한다.



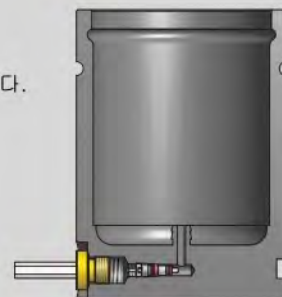
2.3 Valve Tighten Tool을 이용해 Valve를 장착한다.



2.4 wrench를 이용해 PLUG를 체결한다.



2.5 PLUG 체결을 완료한다. 단독형 준비 완료





■ 초압 대비 종압 압력비 계산식

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

예) TOSS GAS SPRING TSS5000 × 60을 STROKE 50mm로 사용하였을 경우 초압대비 종압의 압력비는?

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

- F = 압력비
- Va = Accumulator 내용량 (cm³)
- Vg = Gas Spring 내용량 (cm³)
- n = Gas Spring 수량
- S = 실사용 Stroke (cm)
- R = Piston Rod 단면적 (cm²)

■ Accumulator 적용시의 계산식

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

예) TOSS GAS SPRING TSS5000 × 60 수량 12개와 Accumulator TAN080-75 2개를 STROKE 50mm로 사용했을 경우 초압대비 종압의 압력비는?

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

■ 온도 변화에 따른 초기하중

☞ 보일의 법칙 - 일정한 온도에서, 기체의 부피는 압력에 반비례

$$P_1V_1 = P_2V_2 = \text{일정} \quad (P_1 = \text{처음압력}, P_2 = \text{나중압력})$$

☞ 샤를의 법칙 - 일정한 압력에서, 기체의 부피는 절대온도에 비례

$$\frac{V_1}{T_1} = \frac{V_2}{T_2} = \text{일정} \quad (T_1 = \text{처음온도}, T_2 = \text{나중온도})$$

- V₁ = 처음부피
- V₂ = 나중부피

☞ 위의 두가지 법칙을 조합하면 기체의 압력, 온도, 부피간의 관계를 알 수 있다. (보일-샤를의 법칙)

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2} = \text{일정}$$

여기서, 스프링 내부의 체적은 변하지 않으므로, $\frac{P_1}{T_1} = \frac{P_2}{T_2}$ 가 일정하다고 할 수 있다.

또한, 압력 $P = \frac{F}{A}$ (F = 하중, A = 하중이 가해지는 단면적) 에서 압력과 하중은 비례하므로,

$$\frac{F_1}{T_1} = \frac{F_2}{T_2} \text{ 역시 성립한다. 정리하면, } F_2 = F_1 \frac{T_2}{T_1}$$

예) 온도가 20℃일때 초기하중 7,350N인 GAS SPRING이 사용중 온도가 50℃ 까지 상승했다면 GAS SPRING의 하중은 얼마가 되는가?

$$F_1 = 7,350N, T_1 = 273 + 20^\circ C = 293^\circ K, T_2 = 273 + 50^\circ C = 323^\circ K \text{ (절대온도 } K = \text{섭씨온도 } C^\circ + 273)$$

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



■ 질소의 충전 사용량

※ 질소의 무게 환산

PV = nRT (이상기체 상태방정식)

필요한 질소 기체 몰수 $n = \frac{PV}{RT}$

P = 압력 (N/m²)
 V = 부피 (m³)
 n = 몰수 (mol)
 R = 기체상수 (J·mol⁻¹·K⁻¹)
 T = 절대온도 (K=273.15 + 섭씨온도)

※ 질소의 분자량 M = 28.01

예) TOSS GAS SPRING TSL1500×80 수량 8개와 TSM 3000×150 수량 6개를 배관 TYPE 으로 사용하고자 할 때, 충전에 필요한 질소가스의 총 사용량은 얼마인가?

제원: 질소가스 최초 충전압력 120 bar (35℃)
 용기 규격 (40.1 Liter)

※ 질소가스는 35℃에서 120bar를 유지하지만, 상온에서는 작업환경에 따라 초기압력이 110~115 bar로 실제 사용 됩니다. 또한, 질소가스의 압력이 40~50bar 이하로 내려가면 충전속도가 느려지면서 효율이 낮아지므로 실질적으로는 40~115bar 사이의 압력에서 충전이 용이합니다. 따라서 이 문제의 경우 TOSS GAS SPRING의 적정 충전 온도인 20℃에서 초기압력이 115bar인 경우 압력이 40bar로 낮아질때 까지만 질소충전이 용이하다는 점을 고려해서 계산해야 합니다.

풀이1) 실제 사용 가능한 질소가스의 양을 계산합니다.

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

☞ 질소의 질량(kg)으로 환산하려면, (몰수) x (분자량) → 123.4 mol x 28.01 ÷ 1000 = 3.5 kg
 즉, 40.1리터 규격의 봄베 1개에서 실제 충전에 사용가능한 질소가스의 양은 3.5kg이라고 생각하면 됩니다.

풀이2) 사용 가능한 3.5kg 에서 작업시 손실되는 양을 빼고, 가스스프링 내부로 충전되는 가스의 양을 계산합니다.

※ 배관작업 시 배관 Line과 Panel에 들어있는 충전량을 고려해 손실되는 질소 양을 약 30%정도로 봅니다.

$$3.5\text{kg} \times 0.7 = 2.45 \text{ kg}$$

풀이3) 사용하는 규격의 가스스프링 내부 충전에 필요한 가스의 양을 계산합니다.

문제에제시된 규격 : TSL1500 × 80의 체적 = 274.2 cm³, 충전압력: 150 bar (20℃)
 TSM3000 × 150의 체적 = 773.7 cm³

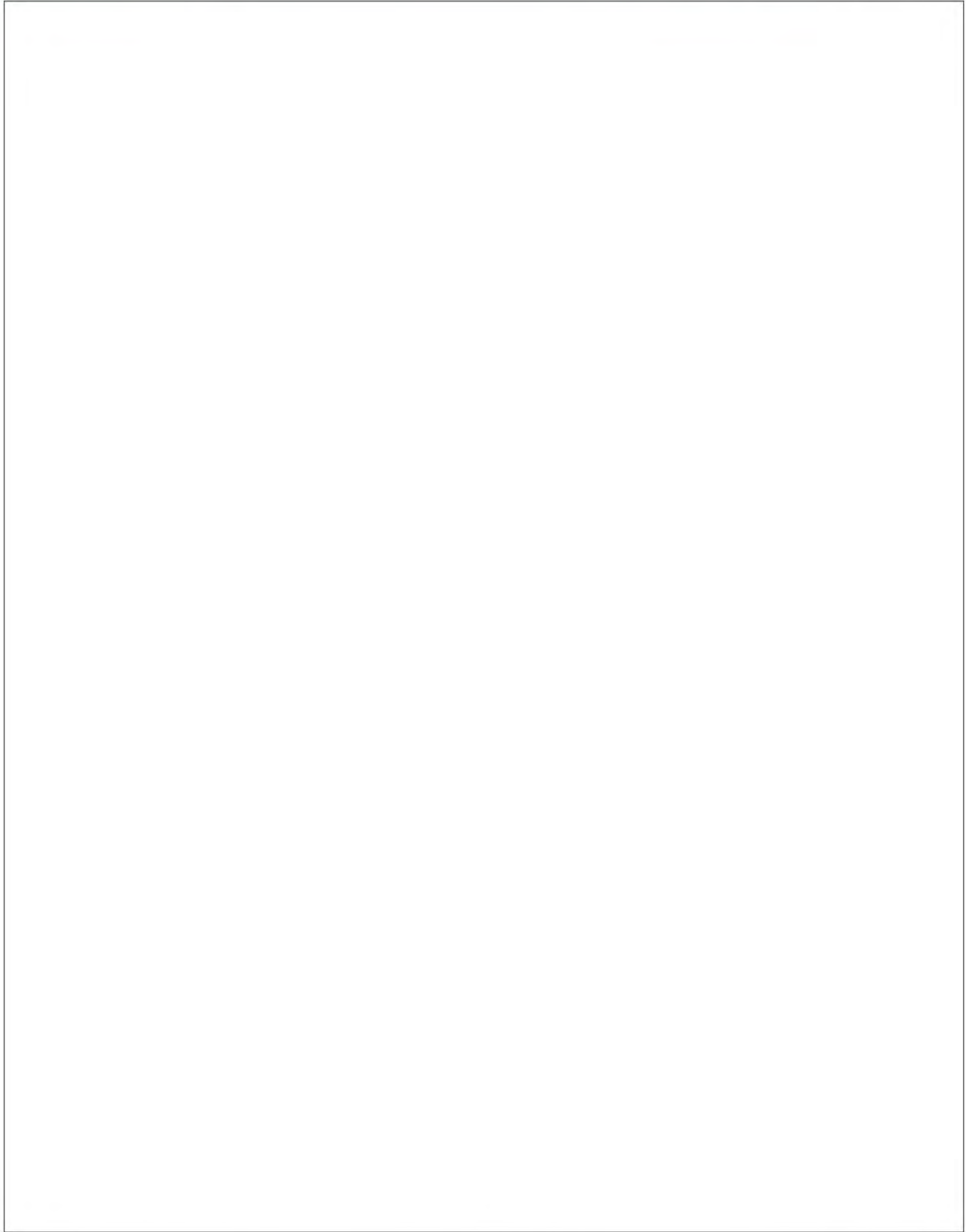
$$\frac{(150 \times 10^5 \text{ N/m}^2) \times [\{(274.2 \times 8) + (773.7 \times 6)\} \times 10^{-6} \text{ m}^3]}{(8.314 \text{ J}\cdot\text{mol}^{-1}\cdot\text{K}^{-1}) \times (20 + 273.15 \text{ K})} = 42.1 \text{ mol}$$

☞ 질소의 질량(kg)으로 환산하면, 42.1 mol x 28.01 ÷ 1000 = 1.2 kg

풀이4) 40.1Liter 봄베로 사용가능한 가스의 양을 충전에 필요한 양으로 나누어 줍니다.

$$2.45\text{kg} \div 1.2\text{kg} \approx 2\text{회}$$

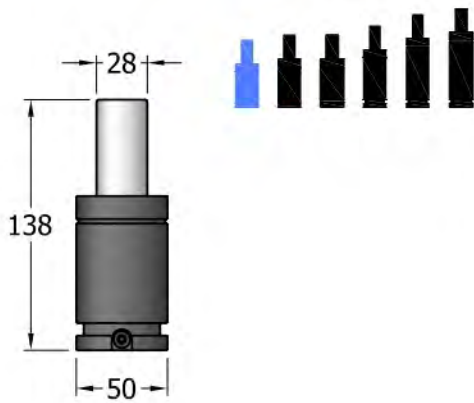
∴ 위와 같은 배관형 가스스프링을 충전할 때에는 40.1 Liter (120bar, 35℃)의 봄베로 약 2회 사용할 수 있습니다.



TSP Series

XTRA HIGH POWER

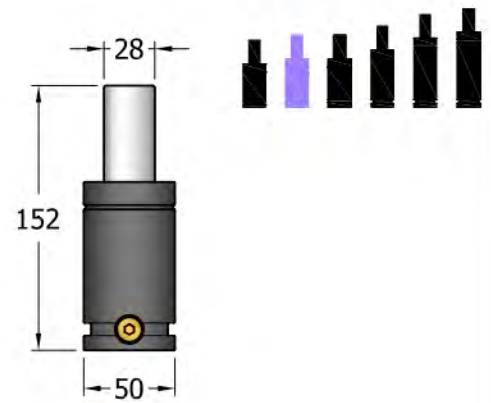
Ex. MODEL TSP1000 × 050



TSX Series

STABLE XTRA HIGH POWER

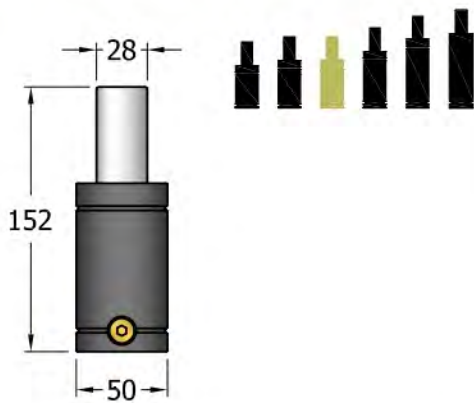
Ex. MODEL TSX1000 × 050



TST Series

STABLE XTRA HIGH POWER

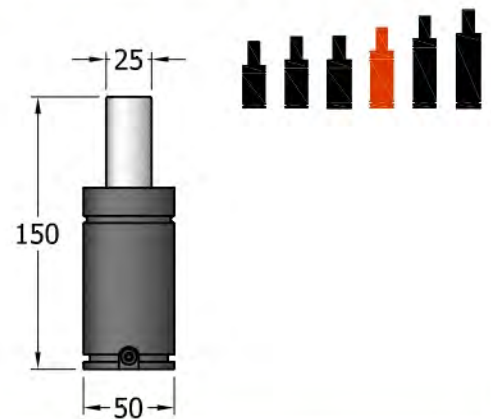
Ex. MODEL TST1000 × 050



TSM Series

COMPACT TYPE

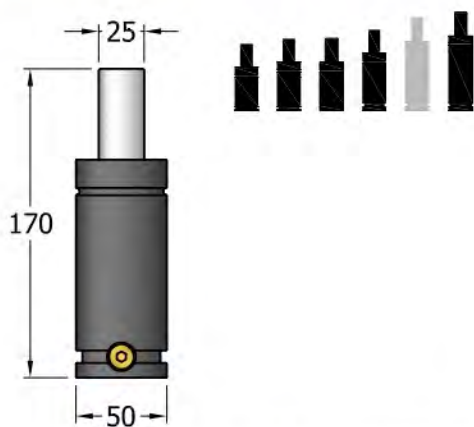
Ex. MODEL TSM0750 × 050



TSS Series

TOSS STANDARD

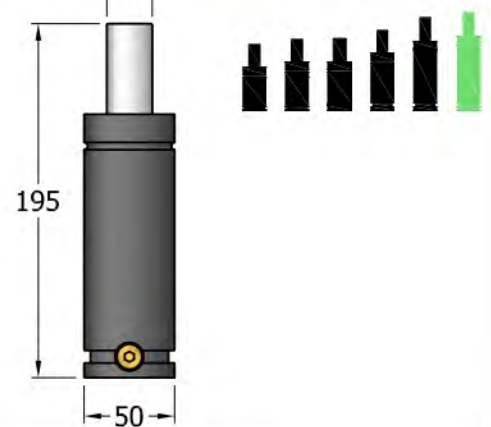
Ex. MODEL TSS0750 × 050



TSL Series

ISO STANDARD

Ex. MODEL TSL0750 × 050



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