



www.kobapage.com

Hydraulic

Shock Absorber & Buffer

Softly
Safety
Smoothly



KOBA
SHOCK ABSORBERS

Your Best Partner

KOBA
SHOCK ABSORBERS한국
KOBA

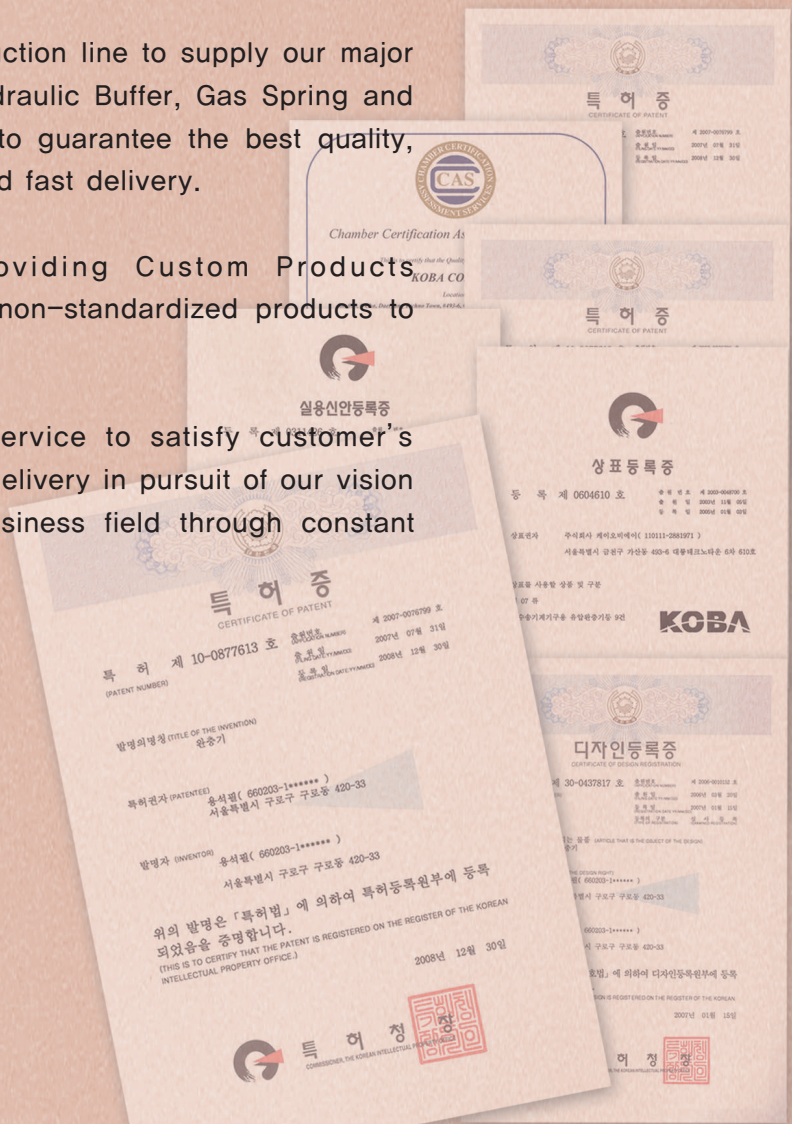
World Best of Shock Absorbers & Buffers...!

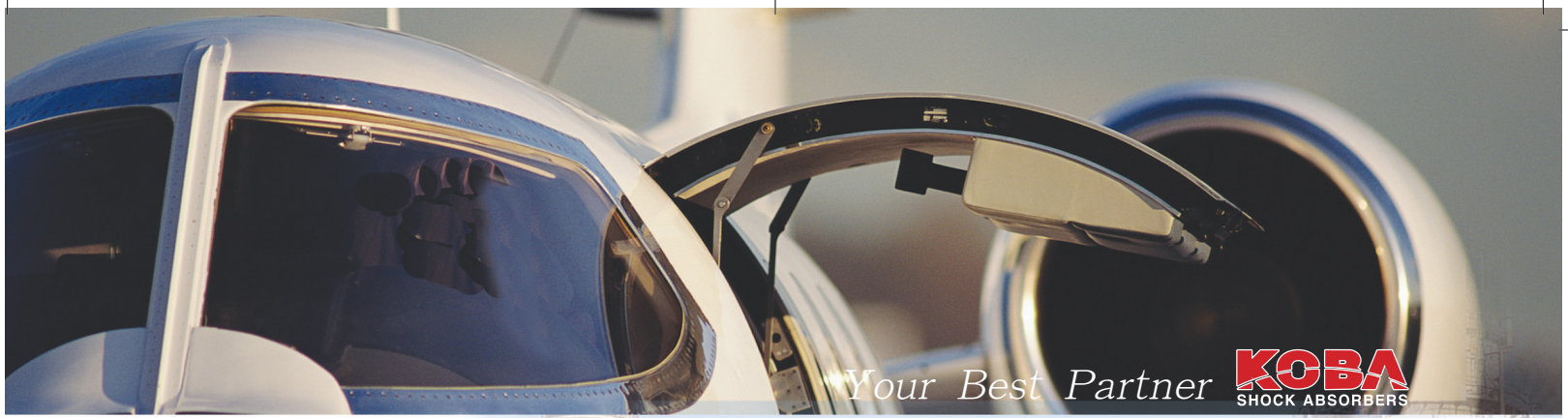
KOBA Co., Ltd is professional manufacturer of Shock Absorbers and Buffers, that accumulated know-how since established in 1993.

We have constructed a systematic production line to supply our major products reliably – Shock Absorber, Hydraulic Buffer, Gas Spring and Hydro Check – we are doing our best to guarantee the best quality, responsible customer support service and fast delivery.

We have also adopted the “ Providing Custom Products (customization)” system to manufacture non-standardized products to meet the various needs of customers.

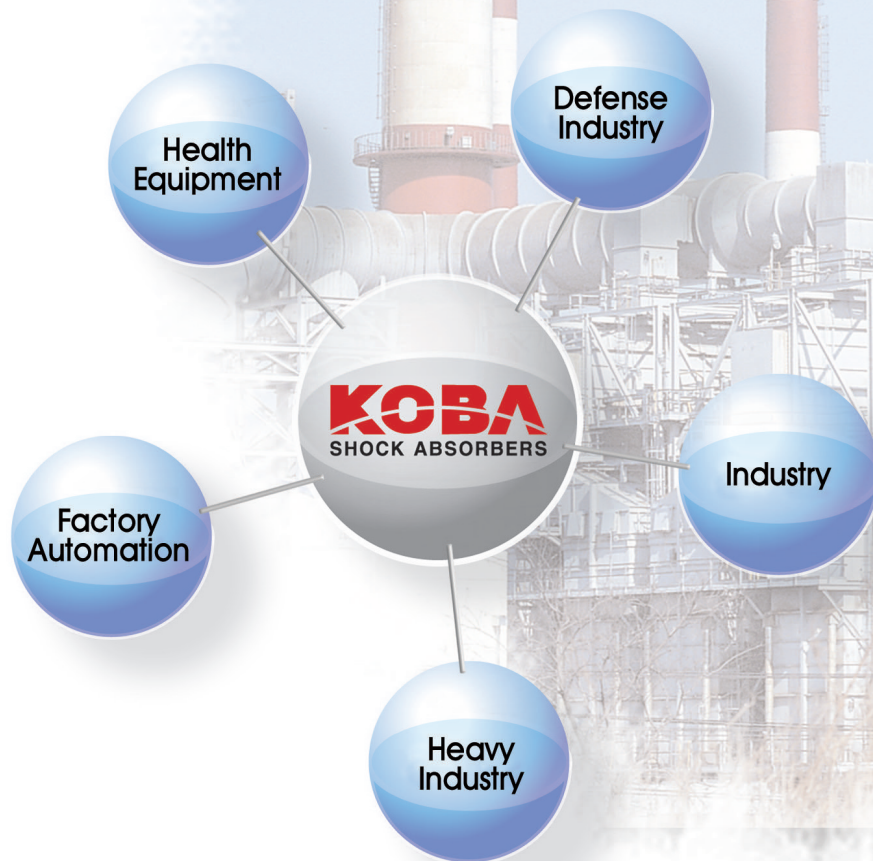
KOBA Co., Ltd promises the best service to satisfy customer's requirements with high quality and fast delivery in pursuit of our vision to be the world best maker in this business field through constant research and development.





World Best of Shock Absorbers & Buffers...!

KOBA Industrial Shock Absorber is used in various industries like Factory Automation, Heavy industry, Defense Industry, Health machine and etc to save the costs, to improve machine efficiency, to increase operating life of machine and to reduce noise pollution and maintenance costs.



Domestic Clients

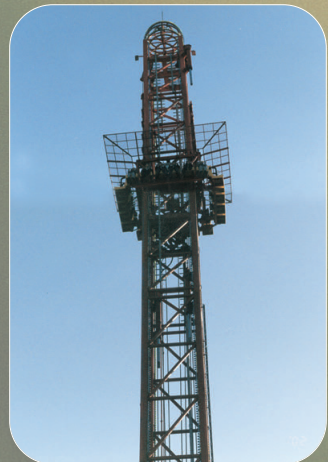
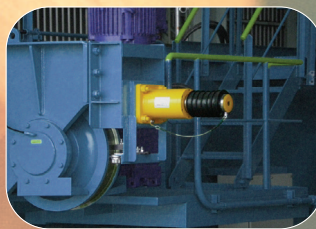


Hydraulic

Shock Absorbers & Buffer Application



Application...



Hydraulic

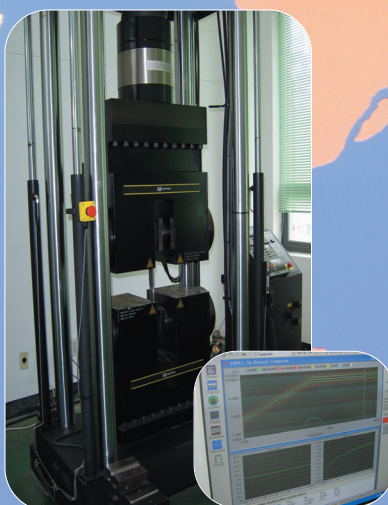
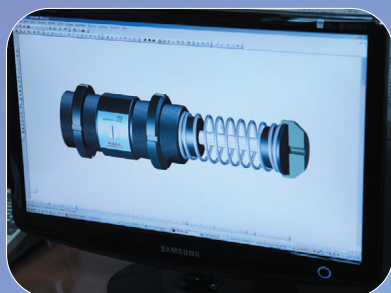
Shock Absorbers

&

Buffer Work System



Work System,,,



Hydraulic Shock Absorbers

KMA Series Engineering Data (Adjusting Type) P32 ~ P42									
Model	Stroke (mm) S	Max Energy / Cycle (Nm) Et	Max energy / Hour (Nm) EtC	Effective Weight (kg) We	Return Spring Force (N)		Weight (g)	Thread	
					Extension	Compression			
KMA12-14	14	5	15,000	1.1-50	3.0	7.1	44	M12×1.0	
KMA14-12	12	10	25,450	1.2-56	3.2	6.7	72.5	M14×1.5	
KMA16-12	12	18	34,500	2.3-144	4.7	10.2	93	M16×1.5	
KMA20-16	16	35	62,100	4.3-280	6.5	17.2	179	M20×1.5	
KMA25-25	25	78	74,500	13-1,273	11.4	26	345.5	M25×1.5	
KMA27-25(F)	25	78	74,500	13-1,273	11.4	26	362.5	M27×1.5(F) M27×3.0	
-40	40	107	85,600	15-1,500	11.7	25.4	510.3	M27×2.0	
KMA30-35	35	196	100,500	32-2,500	28.6	72.1	650.3	M30×1.5	
KMA36-25	25	128	93,200	20-1,800	25.5	46.1	837	M36×1.5	
-50	50	256	113,700	42-2,700	22.7	50.3	1,010	M36×1.5	

KMS Series Engineering Data (Self Adjusting Type) P43 ~ P52													
Model	Stroke (mm) S	Max Energy / Cycle (Nm) Et	Max Energy / Hour (Nm) EtC	Effective Weight (kg) We			Impact Velocity (m/sec) (V)			Return Spring Force (N)		Weight (g)	Thread
				S1	M2	H3	S1	M2	H3	Extension	Compression		
KMS08-06	6	3	6,000	less 0.6	less 1.3	less 6.0	less 3.2	less 2.2	less 1.1	2.8	5.8	15.5	M8×1.0
KMS10-08	8	6	12,600	less 0.8	less 2.5	less 12	less 4.0	less 2.2	less 1.2	3.2	7.5	24	M10×1.0
KMS12-10	10	8	16,000	less 2.0	less 4.5	less 18	less 3.0	less 2.0	less 1.0	3.6	7.0	35.5	M12×1.0
KMS14-15(F)	15	10	35,000	less 2.2	less 6.0	less 30	less 3.0	less 2.0	less 0.8	3.2	7.4	66.5	M14×1.0(F) M14×1.5
KMS20-20	20	32	57,000	less 8.5	less 25	less 79	less 2.8	less 1.6	less 0.9	9.0	16.8	170.5	M20×1.5
-30	30	52	31,100	less 10	less 23	less 40	less 3.2	less 2.1	less 1.6	6.3	16.8	188.5	
-50	50	82	37,800	less 11	less 25	less 46	less 3.9	less 2.6	less 1.9	7.8	16.6	268.6	
KMS25-25(F)	25	80	73,000	less 22	less 40	less 160	less 2.7	less 2.0	less 1.0	14.3	29.2	310	M25×1.5(F) M25×2.0
-40	40	110	94,000	less 32	less 55	less 453	less 2.6	less 2.0	less 1.2	13.7	30.9	342.5	M25×2.0
-50	50	120	41,000	less 35	less 60	less 142	less 2.6	less 2.0	less 1.3	13.9	30.5	457.5	
-80	80	160	54,520	less 36	less 55	less 125	less 3.0	less 2.4	less 1.6	14.9	29.8	577.5	
KMS36-25	25	110	125,000	less 33	less 86	less 272	less 2.6	less 1.6	less 0.9	25.5	46.1	887.5	M36×1.5
-50	50	220	162,000	less 49	less 91	less 364	less 3.0	less 2.2	less 1.1	24.4	44.6	994	
-80	80	340	232,800	less 66	less 140	less 470	less 3.2	less 2.2	less 1.2	25.4	45.6	1280	

Hydraulic Shock Absorbers

KHA Series Engineering Data (Adjusting Type)								P53 ~ P65
Model	Stroke (mm) S	Max Energy / Cycle (Nm) Et	Max energy / Hour (Nm) EtC	Effective Weight (kg) We	Return Spring Force (N)		Weight (kg)	Thread
					Extension	Compression		
KHA42-25	25	250	125,000	36-3,600	28	56	1.25	M42×1.5
-50	50	500	166,000	45-6,150	38	86	1.4	
-75	75	750	200,000	54-9,500	32	88	1.6	
KHA64-50	50	1,300	270,000	82-12,600	65	148	3.7	M64×2.0
-100	100	2,600	360,000	115-17,000	45	157	4.5	
-150	150	3,900	420,000	140-22,000	47	199	5.3	
KHA85-50	50	2,300	370,000	200-37,000	148	315	6.4	M85×2.0
-90	90	4,000	650,000	230-40,000	121	365	7.6	
-125	125	5,700	930,000	300-43,000	102	191	8.6	
-165	165	7,300	1,210,000	360-45,000	98	429	9.8	
KHA115-50	50	3,700	1,501,000	370-44,000	187	427	16	M115×2.0
-100	100	7,400	1,805,000	370-57,000	178	482	19	
-150	150	11,100	2,100,000	370-89,000	185	538	21	
-200	200	14,800	2,405,000	390-118,000	185	665	31	
-250	250	18,500	2,710,000	440-145,000	184	649	34	

Hydraulic Buffer

KHG Series Engineering Data(Self Adjusting Type)							P66 ~ P81		
Model	Stroke <i>(mm)</i>	Max Energy Buffer/Stroke <i>(kJ Et</i>	Max Energy Absorption/Hour <i>(kJ/h EtC</i>	Max Buffer Force <i>(kN Fm</i>	Repulsion Force		Max Side Load Angle(<i>°</i>)		Weight <i>(Kg)</i>
	<i>S</i>				Extend(<i>kN</i>)	Compression(<i>kN</i>)	R Type	F Type	
KHG65-25	25	2	100	100	1.0	3.2	3.5	3.5	6
-50	50	4	200	100		4.7	3.5	3.5	7
-75	75	6	300	100		5.3	3.0	3.0	8
-100	100	8	400	100		6.6	3.0	3.0	9
-125	125	10	500	100		6.6	2.5	2.5	10
-150	150	12	600	100		6.6	2.0	2.0	11
-200	200	16	800	100		9.0	2.0	2.0	12

Hydraulic Buffer

KHG Series Engineering Data(Self Adjusting Type) P66 ~ P81									
Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) E _T	Max Energy Absorption/Hour (kJ/h) E _{TC}	Max Buffer Force (kN) F _m	Repulsion Force		Max Side Load Angle(°)		Weight (Kg)
					Extend(kN)	Compression(kN)	R Type	F Type	
KHG85-50	50	8	600	200	1.5	10	4.0	3.5	12
-100	100	16	1,200	200		13	3.0	3.0	15
-150	150	24	1,800	200		17	2.0	2.0	18
-200	200	32	2,400	200		19	1.8	1.5	20
-250	250	40	2,850	200		20	1.5	1.2	22
KHG100-50	50	11	750	280	2.4	16	5.0	4.0	17
-80	80	18	1,200	280		16	4.5	4.0	20
-100	100	23	1,600	287		16	5.0	4.0	25
-120	120	27	1,800	280		20	4.5	3.5	27
-150	150	34	2,300	287		20	4.5	3.5	28
-200	200	46	3,100	287		20	4.0	3.0	34
-250	250	58	3,600	290		25	3.5	2.5	39
-300	300	69	4,200	289		25	3.0	2.0	43
-400	400	90	5,400	280		25	2.5	2.0	49
-500	500	110	6,600	275		25	2.5	2.0	55
-600	600	125	7,200	260		25	2.0	1.5	62
-800	800	140	7,900	210		25	2.0	1.5	73
KHG120-100	100	45	2,900	562	3.5	38	4.0	4.5	41
-150	150	70	4,400	583		38	4.0	3.5	48
-200	200	92	5,800	575		38	3.5	3.5	58
-250	250	114	7,200	570		40	3.0	3.0	65
-300	300	130	8,500	540		40	3.0	2.5	72
-400	400	160	10,000	500		40	2.5	2.0	78
-500	500	180	11,500	450		40	2.0	1.5	86
-600	600	200	12,800	415		40	2.0	1.5	95
-800	800	240	13,600	375		40	2.0	1.3	112
-1000	1000	280	14,500	350		40	2.0	1.3	118
KHG130-250	250	120	8,200	550	4.5	40	4.5	4.0	85
-300	300	140	9,600	550		40	4.5	4.0	92
-400	400	180	12,000	550		50	4.0	3.5	106
-500	500	220	15,000	550		50	3.5	3.5	118

Hydraulic Buffer

KHG Series Engineering Data(Self Adjusting Type) P66 ~ P81									
Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) Et	Max Energy Absorption/Hour (kJ/h) EtC	Max Buffer Force (kN) Fm	Repulsion Force		Max Side Load Angle(°)		Weight (Kg)
					Extend(kN)	Compression(kN)	R Type	F Type	
-600	600	260	17,800	550	4.5	50	2.0	1.5	127
-800	800	300	19,000	460		50	2.0	1.5	148
KHG140-100	100	62	3,800	760	5.5	38	4.5	4.0	60
-150	150	91	5,800	760		65	4.5	4.0	72
-200	200	124	9,800	730		70	4.0	3.5	85
-300	300	175	12,000	730		70	3.5	2.5	110
-400	400	234	15,000	730		78	2.5	1.5	135
-500	500	270	17,000	680		78	2.0	1.3	150
-600	600	300	20,000	630		78	2.0	1.3	160
-800	800	325	25,000	510		78	2.0	1.3	185
-1000	1000	360	27,500	450		78	1.6	1.2	200
KHG150-100	100	70	4,000	880	6.2	45	4.0	4.5	77
-200	200	136	7,200	850		75	4.0	3.5	90
-300	300	183	13,000	770		75	3.5	3.5	135
-400	400	243	13,500	760		75	3.0	3.0	146
-500	500	285	17,400	710		85	3.0	2.5	166
-600	600	323	21,000	670		85	2.5	2.0	176
-800	800	367	25,600	580		85	2.0	1.5	220
-1000	1000	410	28,000	330		85	2.0	1.5	253
KHG180-100	100	80	4,500	980	8	75	4.5	4.0	110
-200	200	160	10,000	980		80	4.5	4.0	126
-250	250	200	12,800	980		80	4.5	4.0	140
-400	400	280	14,500	880		90	4.5	4.0	168
-500	500	350	18,000	880		100	4.0	3.5	198
-600	600	430	23,000	890		100	3.5	3.0	235
-800	800	570	27,000	890		100	3.0	2.5	295
-1000	1000	720	29,000	890		110	2.5	2.0	360

Hydraulic Buffer

KHS Series Engineering Data(Self Adjusting Type)								P82 ~ P87
Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) ET	Max Energy Absorption/Hour (kJ/h) ETC	Buffer Force (kN)	Return Spring Force (kgf)		Max Side Load Angle(°)	Weight (Kg)
					Extension	Compression		
KHS64-50	50	0.5	10	12.5	6.5	14.8	3	5
KHS90-50	50	4	80	100	14.2	30.5	3	8.5
-75	75	6	108	100	10.5	19	3	9.5
-100	100	8	128	100	9.9	42	3	12
KHS100-50	50	4.4	79	110	14.2	30.5	3	14
-100	100	8.8	140	110	9.9	42	3	17
KHS130-70	70	10	170	179	18.2	42.5	3	21
-100	100	15	270	188	17.8	48	3	24
-150	150	21	294	175	18.3	53.5	2.5	28
KHS170-80	80	24	432	375	18.2	44.3	3	38
-150	150	45	630	375	18.3	53.5	2	48
KHS190-100	100	40	720	500	17.8	48	2.5	52
-150	150	60	840	500	18.3	53.5	2	64
KHS220-100	100	44	792	550	40.5	134	2.5	69
-150	150	66	924	550	41.8	131	2	76
KHS250-100	100	60	1,080	750	38.5	111.2	2.5	130
-150	150	90	1,260	750	34.2	107.5	2	140
-200	200	120	1,560	750	33	105	2	150
-300	300	180	2,160	750	38	121.8	2	170
KHS300-150	150	117	1,638	975	46	142	2	186
-250	250	180	2,340	1,125	45	151	1.5	206
KHS340-200	200	200	2,600	1,250	51	162	1.5	275
-300	300	300	3,600	1,250	49	176	1.5	305
KHS360-250	250	294	3,822	1,470	68	178	1.5	324
-400	400	470	4,700	1,470	64	182	1.5	376

Gas Spring

KG Series Engineering Data(Push Type)				P88 ~ P90
Model	Max Stroke (mm) S	Max Force (N)	Type	
KG15	200	300	S	
KG18	250	600		
KG22	300	900	I	
KG30	350	1,200		
KG35	400	2,000	R	
KG40	500	3,000		
KG50	700	5,000	L	
KG70	1000	8,000		
KG100	1300	12,000	H	
			Y	

Gas Spring Pull Type

NEW

KGP Series Engineering Data(Pull Type)				P91 ~ P92
Model	Max Stroke (mm) S	Max Force (N)	Type	
KGP22	300	200	S	
KGP30	350	900		
KGP35	400	1,200	R	
KGP40	500	1,500		
KGP50	700	2,000	H	
KGP75	1000	3,000		

Gas Spring Free Lock Type

KGL Series Engineering Data				P93
Model	Stroke (mm) S	Max Force (N)	Type	
KGL28-50	50	100 ~ 1,300		
-80	80			
-100	100			
-150	150			
-200	200			

Hydro Check

KHC Series Engineering Data					P94 ~ P97
Model	Stroke (mm) S	Max Load Angle Fron Axis	Speed Adjustment Range		Weight (g)
			Load Limits	Feed Rate Limits	
KHC24-15	15	12°	100~2,500N	0.2~30mm/sec	385
-30	30	1°			450
-60	60	0.5°			635
-90	90	0.3°			745
-120	120	0.2°			885
KHC31-40	40	1°	450~3,500N	0.2~30mm/sec	1040
-60	60	0.5°			1245
-100	100	0.3°			1655
KHC38-60	60	0.5°	1,500~5,000N	0.3~30mm/sec	2490
-100	100	0.3°			3310

Contents

1. D escription	(13)
2. G eneral Information for Shock Absorber	(14)
3. S tandards of Model selection	(17)
4. H ow to calculate for Model selection	(20)
5. I nstruction Manual for Shock Absorber	(28)
6. S hock Absorber KMA Series	(33)
7. S hock Absorber KMS Series	(43)
8. S hock Absorber KHA Series	(53)
9. H ydraulic Buffer KHG Series	(67)
10. H ydraulic Buffer KHS Series	(82)
11. G as Spring KG, Series	(88)
12. G as Spring KGP, Series	(91)
13. G as Spring KGL Series	(93)
14. H ydro Check KHC Series	(94)

Hydraulic Shock Absorbers



	KMA Series is small-sized units that can be adjusted by Adjustment Dial (up to 180°) according to collision speed. With using Bumper Head Type, it provides a positive stop to prevent damage caused by the piston "bottoming out" in stage of stroke without Stop Collar.
	KMS Series is self-adjustable and small sized units. It is specially designed with multiple orifice to smoothly stop moving loads. With using Bumper Head Type, it provides a positive stop to prevent damage caused by the piston "bottoming out" in stage of stroke without Stop Collar.
	KHA Series is mid-sized units for the medium and heavy moving loads. It is adjusting type by Adjustment Dial (up to 180°) according to collision speed.
	KHG Series is self-adjustable units designed for heavy industries. It absorbs larger shock energy by using special oil and Nitrogen gas and uses compressed Nitrogen gas to return piston rod.
	KHS Series is self-adjustable and mid sized units designed for heavy industries. It is specially designed with multiple orifice to smoothly stop moving loads.
	KG, KGP Series (Gas Spring) have various strengths, including small Spring Constant, Long Stroke, Speed Control at compression and Stable Strength compared to general plate spring or coil spring and is widely used across the industries. May be customized into various type, e.g, Stroke, Speed Force or Mount Type according to customer needs.
	KGL Series (Free Lock Gas Spring) have all advantage of general Gas Spring with the Free Lock feature that allows you to set the stroke anywhere you want by pressing Lock Pin.
	KHC Series (Hydro Check) enables precise speed and location control. It can precisely control the speed of any moving loads and comes in various strokes.

Hydraulic Shock Absorbers

Why KOB Shock Absorber is need

As mechanical operating parts of industrial machineries, such as automated assembly machines, various conveyors, and safety devices for machine tools, are becoming faster, they generate shock, vibration and noise that affect the performance of overall machineries and cause safety issues in working environments.

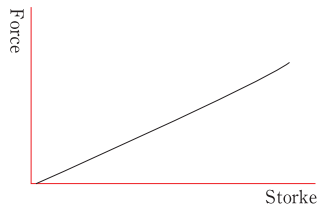
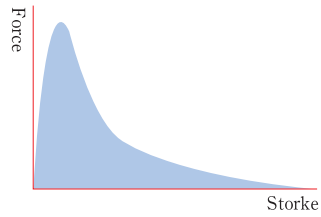
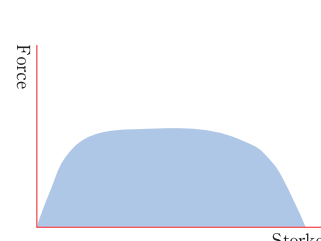
Shock Absorber is hydraulic buffer developed to solve these problems.

KOBA Shock Absorber provide controlled, predictable deceleration by absorbing the shock and vibration from production facilities. It protect the facilities from destruction, frequent collisions and wearing due to vibration. KOBA Shock Absorber is possible to prevent aging of production facilities. save cost by shortening operating hours and improving productivity, reduce noise pollution and increase production.

KOBA Shock Absorber comes in various types and capacities to satisfy your needs.

SHOCK ABSORBER Performance Comparison Chart

Ordinary shock absorbers, rubber, spring buffer, and pneumatic cushions have below mentioned characteristic.

Rubber Spring Buffer	When decelerating an object in motion using rubber or spring, the compression strength is not consistent and resistance increases as it compresses to generate a larger repulsive force. Thus the object is shocked again by these devices. Even if shock is absorbed at first, the repulsive force is delivered back to the object. These devices have undesirable recoil effect.	
Hydraulic/Pneumatic Device	When using hydraulic / pneumatic cylinders, dashpot and valve to decelerate with limited orifice holes, a huge resistance is generated at the start of the stroke. As resistance increases at first and slow reduces, the shock can not be fully absorbed.	
KOBA Hydraulic Shock Absorber	In order to minimize shock that is generated when stopping the moving loads, it uses several orifice to maintain the resistance consistent throughout all ranges of stroke and stop the moving loads smoothly. All models of KOBA Hydraulic Shock Absorber use multiple orifice structure for smooth stopping of moving loads.	

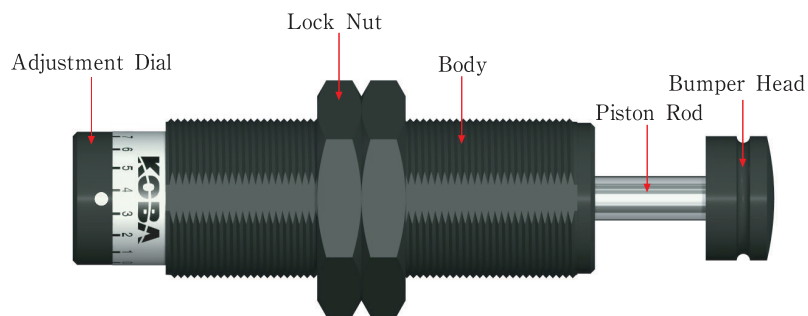
Structure and Principle of SHOCK ABSORBER

- Shock Absorber is consists of Body, Bumper Head, Piston Rod, Adjustment Dial and Lock Nut.
- Body consists of several screw threads to increase surface area and effectively discharge heat by absorbing shock at collision.
Screws can also be used for easy fixing.
- Bumper Head reduces noise and serves as stopper.
- Piston Rod gradually reduces the speed of object and stops it smoothly.

Hydraulic Shock Absorbers

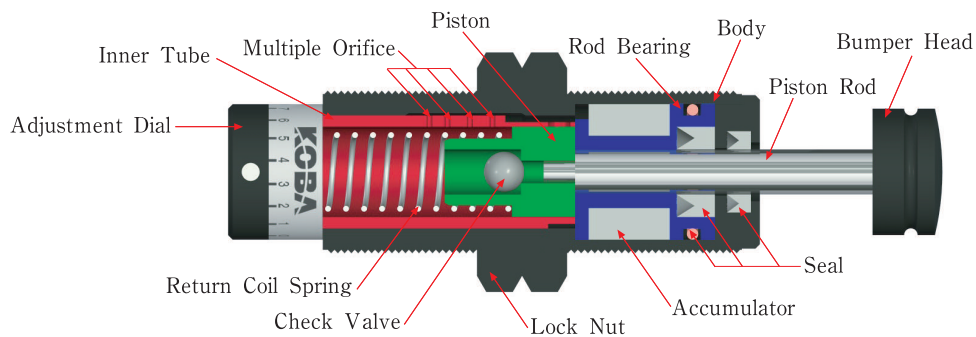


5. Adjustment Dial can adjust Damping Energy according to the speed of collision. It makes to get optimum Performance according to weight of load and collision speed
6. Lock Nut can accurately and stably control the position when used with the screws on body.



Internal Structure and Operation Principle of SHOCK ABSORBER

Shock Absorber includes Piston, Check Valve, Accumulator, Inner Tube, Multiple Orifice, return Coil Spring, oil, etc. As Piston Rod enters Inner Tube according to stroke, Check Valve closes and Oil is inserted into Inner Tube through Orifice. In this process, Oil is increased as much as volume of Rod and saved in Accumulator. In return, Check valve opens and compressed Coil Spring quickly returns Piston rod to its original position.



Principle of Energy Absorption

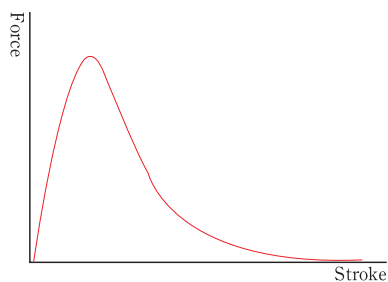
When Moving object collide onto Piston rod, the collision is delivered to the oil in Inner Tube through Piston. In result, the oil inside is flown through orifice in Inner Tube and generates pressure in Inner Tube. In this case, resistance (force=press in Inner tube * the surface area of Piston) delivered to the object. Shock Absorber uses this resistance to brake and decelerate the moving loads. If the size of Orifice and the viscosity of oil are consistent, the pressure inside Inner Tube becomes square larger than the speed of collision. This is called "Speed Square Resistance"

Hydraulic Shock Absorbers

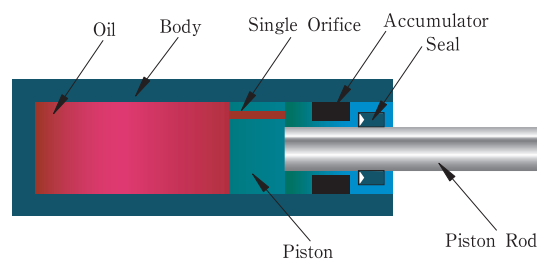


Single Orifice Type

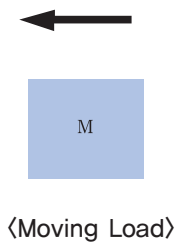
Single Orifice Type consists of **Dashpot structure**, which uses the gap between piston and Cylinder Tube or creates a Hole, **Single Tube structure** with Orifice on Piston, and **Single Orifice structure** (adjustable) on Dual Tube Type. The resistance of each structure is shown below. When Piston moves inside Cylinder Tube, a large pressure is generated inside Inner Tube at first. The area of orifice remains consistent throughout all ranges of stroke and the resistance increases instantly right after collision and decreases at the end of stroke as speed decreases with the progress of stroke.



〈Performance Curve〉



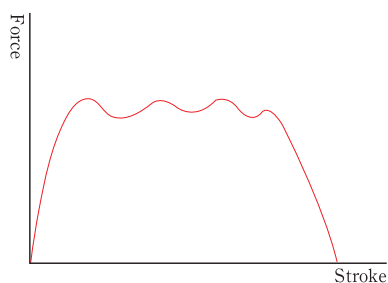
〈Fig.〉



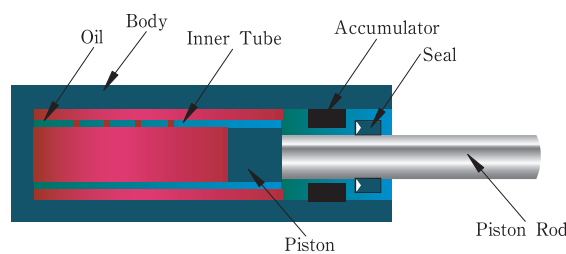
〈Moving Load〉

Multiple Orifice Type

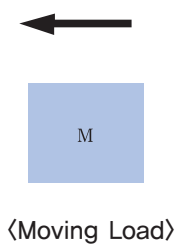
This type consists of Out Tube and Inner Tube. Similar to Single Orifice Type, the pressure generated inside Inner Tube as Piston passes through it becomes the resistance. The area of Orifice at collision is larger than that of Single Orifice Type and the resistance is maintained consistent throughout all range of Stoke to stop the colling object smoothly. It is also possible to customize the properties of resistance accor



〈Performance Curve〉



〈Fig.〉



〈Moving Load〉

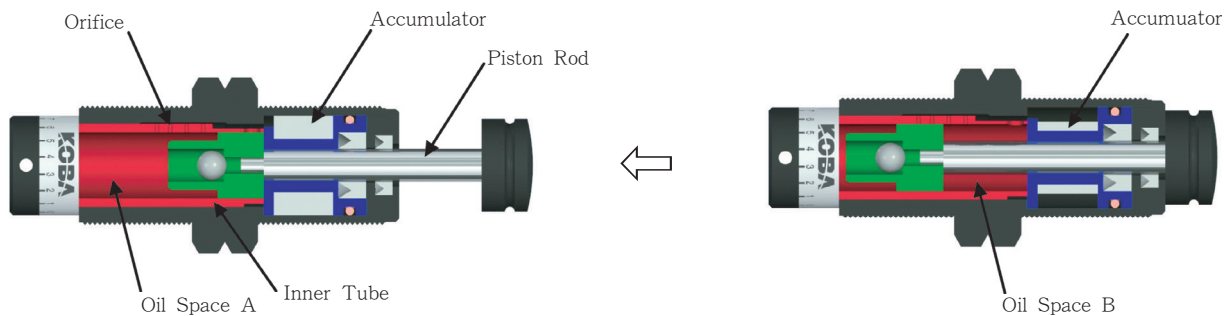
Accumulator

To explain the function of Accumulator, when a heavy object collides onto Shock Absorber as shown in Fig.1. Piston Rod initiates stoke and oil flows to the back of Piston through Orifice. Finally, the volume of oil space "B" is decreased as much as the size of Piston Rod and all of the oil in Oil space "A" cannot transfer to Oil space "B". As there needs to be enough space to receive Piston Rod, Accumulator is compressed with the pressure of oil to save the oil as much as the volume of Piston Rod.

Hydraulic Shock Absorbers



The specialized oil for Shock Absorber is compatible with Accumulator and using unauthorized oil will damage accumulator and affect the overall performance of Shock Absorber.



〈Fig. 1〉

How to select right model of Shock Absorber

1. 4 Key factors to select the right Model

- 1.1 Load Weight : W(Kg)
- 1.2 Impact Velocity : V(m/sec)
- 1.3 Propelling Force : F(N)
- 1.4 Cycles per Hour : C(Cycle/Hour)

2. Steps to select the right Model

2.1 Check the conditions

- Check how the object will hit the Shock Absorber :
Horizontal motion, Vertical motion, Inclined motion, or rotary motion. With or without Propelling force
- Check the maximum Weight
- Check the Velocity of moving loads : if the Velocity is not determined due to cylinder collision or something like that, in this case, the velocity is assumed as twice of average velocity.

2.2 Calculate the Kinetic energy (Ek)

- With the reference of Formulae described in catalog, Calculate the Kinetic energy.

$$E_k = (W \times V^2) / 2$$

2.3 Check the Propelling Force

- Check the Propelling Force F(N) and if yes, with the reference of Formulae described in catalog, find the propelling Force. With this, select the temporary Model compared Engineering Data in catalog.

2.4 Select the Stroke of Shock Absorber.

- With the temporary model, select the Stroke of Shock Absorber.

2.5 Find Propelling Energy

- Find Propelling Energy with the reference of Formulae described in catalog. $E_w = F \times S$

2.6 Find Total Energy per cycle ET and select the Model of Shock Absorber

- $E_T = E_k + E_w$

Hydraulic Shock Absorbers



2.7 Check the total Energy per hour E_{TC} .

- Find the Total Energy per hour with cycle per hour and Total Energy per cycle and check it within the range of selected model's in Engineering Data in Catalog.

$$E_{TC} \geq E_T \times C$$

2.8 Check the Effective Weight (W_e)

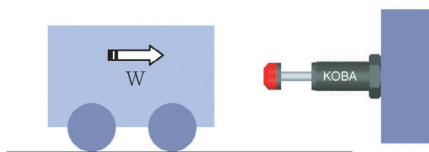
- In the case of collision with Propelling Force, Check the Effective Weight (W_e). Especially you should check it in the case of low velocity (under 0.3m/s),

$$W_e = (2 \times E_T) / V^2 \quad [\text{The Calculated the value of } W_e \text{ should be within the range described in Engineering Data in catalog.}]$$

In the case of collision without propelling force, the Effective weight is same as weight of moving loads ($W_e = W$)

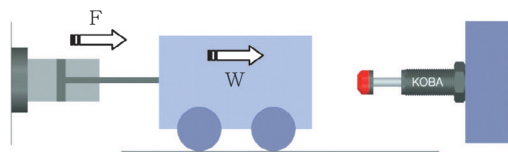
- Even if the moving loads is same Weight and Velocity, the Effective weights are very different depending on the propelling force and the installation location of Shock Absorber so you should check the Effective weight always.

㉠ Without Propelling Force



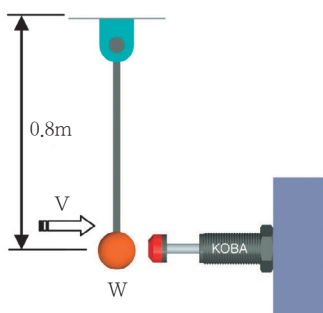
$$\begin{array}{ll} W=50\text{kg} & V=2\text{m/sec} \\ E_k=100\text{Nm} & E_w=0 \\ E_T=100\text{Nm} & W_e=50\text{kg} \end{array}$$

㉡ With Propelling Force



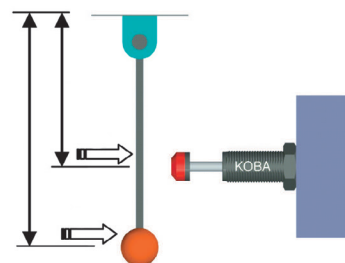
$$\begin{array}{lll} W=50\text{kg} & V=2\text{m/sec} & \text{Stroke}=0.1\text{m} \\ E_k=100\text{Nm} & \text{Cylinder Bore Diameter}=80\text{mm} & \\ \text{Pressure}=5\text{bar} & F=2512\text{N} & E_w=251.2\text{Nm} \\ E_T=351.2\text{Nm} & W_e=175.6\text{kg} & \end{array}$$

㉢ Without Propelling Force



$$\begin{array}{lll} W=20\text{kg} & V=2\text{m/sec} & E_k=40\text{Nm} \\ E_w=0 & E_T=40\text{Nm} & W_e=20\text{kg} \end{array}$$

㉣ With Propelling Force



$$\begin{array}{lll} W=20\text{kg} & V=2\text{m/sec} & \text{Stroke}=0.1\text{m} \\ V_D=1.25\text{m/s} & E_k=40\text{Nm} & E_w=31.36\text{Nm} \\ E_T=71.36\text{Nm} & W_e=91.34\text{kg} & \end{array}$$

Hydraulic Shock Absorbers



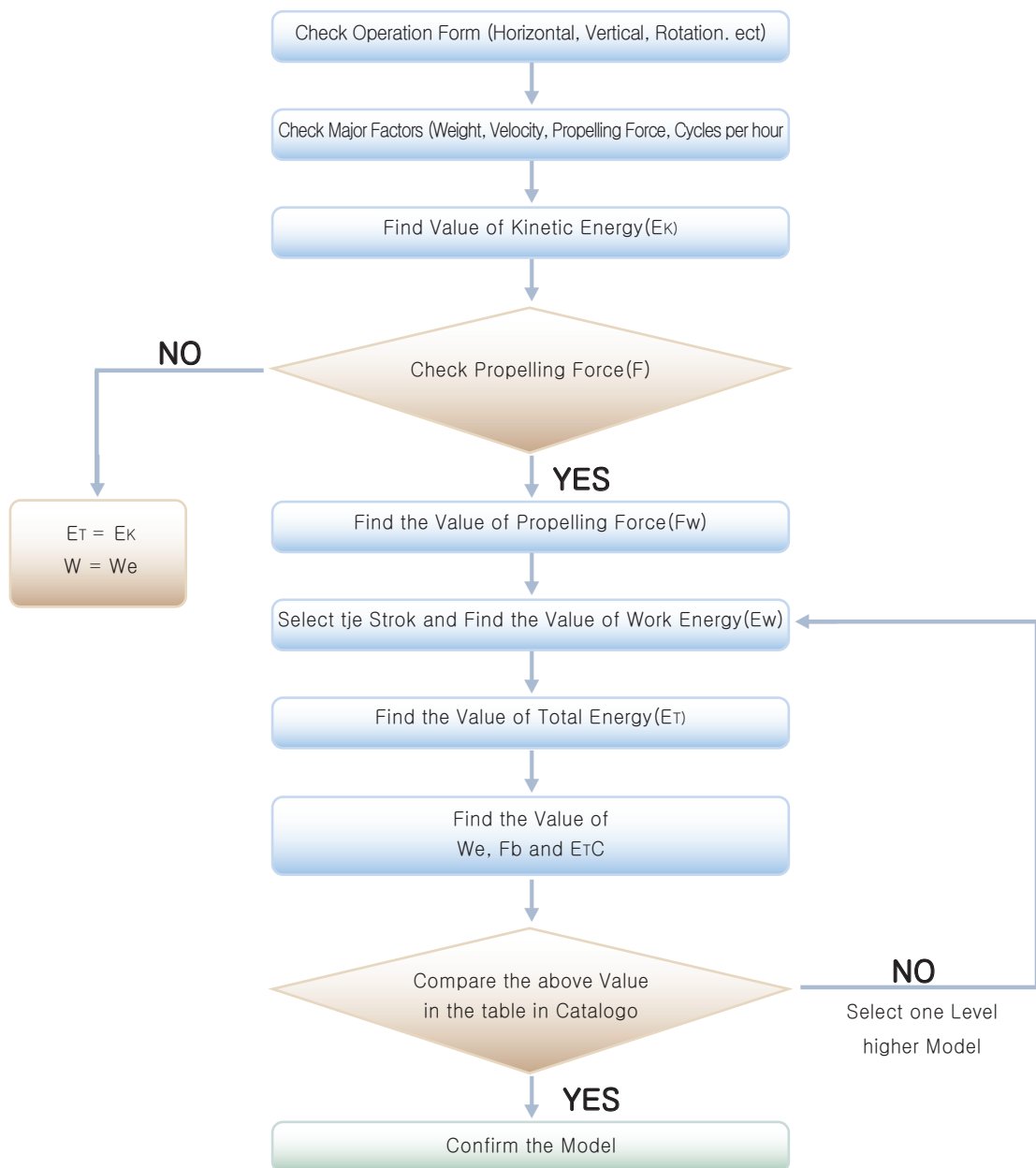
2.9 Check the Ambient Temperature

- Ambient Temperature : $-10 \sim 80^{\circ}\text{C}$
- Please contact KOB A if you use our product at other range of temperature except above mentioned.

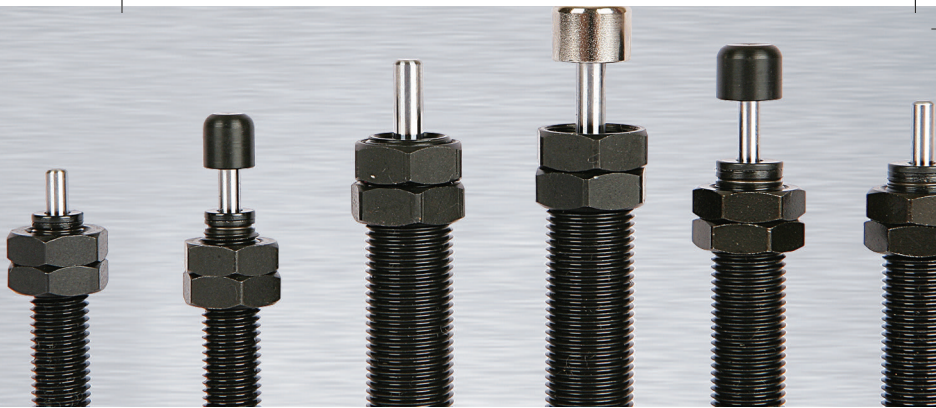
2..10 Remark

- You' d better to visit our web site www.kobapage.com to select right model easily.

MODEL Selection FLOW - CHART



Hydraulic Shock Absorbers



Formulae for selection model of SHOCK ABSORBER

1. Symbol

Unit	Description	Symbol	Unit	Description	Symbol
E_k	Nm	Kinetic Energy	d	mm	Cylinder Rod Diameter
E_w	Nm	Work Energy	D	mm	Cylinder Bore Diameter
E_t	Nm	Total Energy	g	m/sec^2	Gravitational Acceleration
E_{TC}	Nm/hr	Total Energy Absorbed per Hour	T	Nm	Propelling Torque
F_b	N	Buffer Shock Force	H	m	Drop Height
F	N	Propelling Force	W	Kg	Weight
W_e	Kg	Effective Weight	P	bar	Operating Pressure
S	mm	Stroke of Shock Absorber	ω	rad/s	Angular Velocity
C	$Cycle/h$	Cycle/h	α	$^{\circ} (degree)$	Angle of Incline
V	m/s	Impact Velocity	I	Nm/sec^2	Moment of Inertia
V_D	m/s	Actual Impact Velocity	μ	μ	Coefficient of Friction
P	kW	Motor Power	a	m/sec^2	Acceleration / Deceleration

1kgf = 9.81N, 1Nm = 1J, 1MPa = 10bar = 10.2kg/cm², 1g = 9.8m/sec²

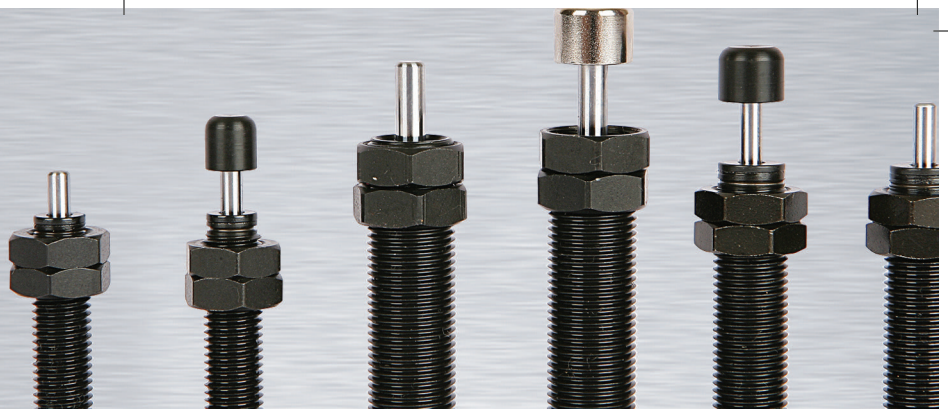
Hydraulic Shock Absorbers



2. Calculation Formulae

Description			Formulae
Kinetic Energy (Ek)	General Inertial Moving		$E_K = (W \times V^2) / 2$
	Vertical Free Falling		$E_K = W \times g \times H$
Work Energy (Ew)			$E_W = F \times S$
Total Energy (ET)			$E_T = E_K + E_W$
Total Energy Absorbed per Hour (ETC)			$E_TC = E_T \times C$
Maximum Buffer Shock Force (Fb) (It is necessary to check the strength of the area to install Shock Absorber. Consider the Safety Factor.)			$F_b = E_T / (S \times 0.8)$
Propelling Force (F)	Motor Power Propelling		$F = (3000 \times kW) / V$
	Cylinder Propelling(Horizontal Extension)		$F = 0.0785 \times D^2 \times P$
	Cylinder Propelling(Horizontal Compression)		$F = 0.0785 \times (D^2 - d^2) \times P$
	Cylinder Propelling (Vertical) (F1 : Cylinder propelling Force)	Moving loads Falling	$F = F_1 + (W \times g)$
		Moving loads Raising	$F = F_1 - (W \times g)$
	Vertical Free Falling		$F = W \times g$
	Horizontal Friction Conveyor Belt (Apply the Coefficient of friction as 0.1~0.2 generally)		$F = W \times g \times \mu$
Effective Weight (We)			$We = (2 \times E_T) / V^2$ (In the case of General Inertial Moving We = W)
Impact Velocity	Vertical Free Falling		$V = \sqrt{2 \times g \times H}$
	With Acceleration (Ex: Air Cylinder)		$V = \frac{2D}{t}$ (D = Distance)
	Without Acceleration (Ex: Hydraulic Cylinder, Motor)		$V = \frac{2}{t}$ (D = Distance)
Deceleration (a)			$a = V^2 / (2 \times S)$
Stopping Time (t)			$t = \frac{2 \times S}{0.8 \times V}$

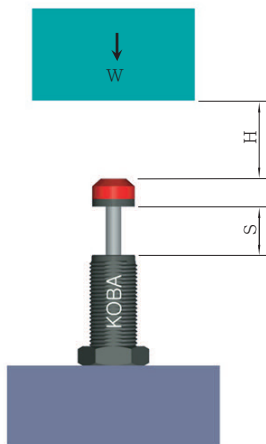
Hydraulic Shock Absorbers



K OBA Shock Absorbers

A. Free Falling Weight

- Weight $W=1200\text{kg}$
- Height $H=0.5\text{m}$
- Cycles/Hour $C=250/\text{hr}$



$$E_K = W \cdot g \cdot H = 1200 \times 9.8 \times 0.5 = 5880\text{Nm}$$

Temporary Selection Model : KHA 115 - 100 (Stroke: 100)

$$E_W = W \cdot g \cdot S = 1200 \times 9.8 \times 0.1 = 1176\text{Nm}$$

$$E_T = E_K + E_W = 5880 + 1176 = 7056\text{Nm}$$

$$E_T C = E_T \cdot C = 7056 \times 250 = 1764000\text{Nm/hr}$$

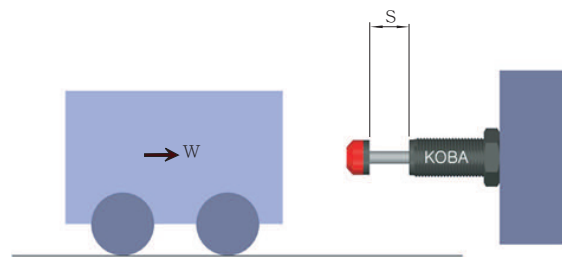
$$V = \sqrt{2 \cdot g \cdot H} = \sqrt{2 \times 9.8 \times 0.5} = 3.1\text{m/sec}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 7056}{3.1^2} = 1468.5\text{kg}$$

Model : KHA 115 - 100

B. Horizontal Moving Loads

- Weight $W=500\text{kg}$
- Impact Velocity $V=1.5\text{m/sec}$
- Cycles/Hour $C=200/\text{hr}$



$$E_K = \frac{W \cdot V^2}{2} = \frac{500 \times 1.5^2}{2} = 562.5\text{Nm}$$

Temporary Selection Model : KHA 42-75 (Stroke: 75)

$$E_W = 0$$

$$E_T = E_K + E_W = 562.5 + 0 = 562.5\text{Nm}$$

$$E_T C = E_T \cdot C = 562.5 \times 200 = 112500\text{Nm/hr}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 562.5}{1.5^2} = 500\text{kg}$$

Model : KHA 42 - 75

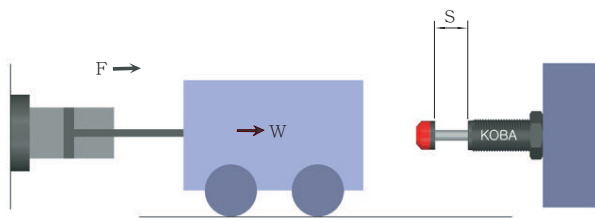
Hydraulic Shock Absorbers



K OBA Shock Absorbers

C. Horizontal Moving Load with propelling Force

- Weight $W=800\text{kg}$
- Operation Pressure $P=5\text{bar}$
- Impact Velocity $V=1.8\text{m/sec}$
- Cycles/Hour $C=200/\text{hr}$
- Cylinder Bore Diameter $d=80\text{mm}$



$$E_K = \frac{W \cdot V^2}{2} = \frac{800 \times 1.8^2}{2} = 1296\text{Nm}$$

$$F = 0.0785 \cdot d^2 \cdot P = 0.0785 \times 80^2 \times 5 = 2512\text{N}$$

Temporary Selection Model : KHA 64 - 100(Stroke: 100)

$$E_W = F \cdot S = 2512 \times 0.1 = 251.2\text{Nm}$$

$$E_T = E_K + E_W = 1296 + 251.2 = 1547.2\text{Nm}$$

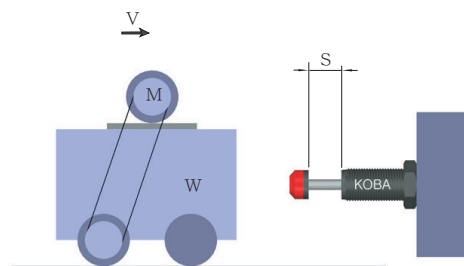
$$E_T C = E_T \cdot C = 1547.2 \times 200 = 309440\text{Nm/hr}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 1547.2}{1.8^2} = 955.1\text{kg}$$

Model : KHA 64 - 100 or KHA 85 - 50

D. Horizontal Moving Load propelled by Motor

- Weight $W=1200\text{kg}$
- Impact Velocity $V=1.6\text{m/sec}$
- Motor Power $P=1\text{KW}$
- Cycles/Hour $C=130/\text{hr}$



$$E_K = \frac{W \cdot V^2}{2} = \frac{1200 \times 1.6^2}{2} = 1536\text{Nm}$$

$$F = \frac{3000 \cdot P}{V} = \frac{3000 \times 1}{1.6} = 1875\text{N}$$

Temporary Selection Model : KHA 64 - 100(Stroke: 100)

$$E_W = F \cdot S = 1875 \times 0.1 = 187.5\text{Nm}$$

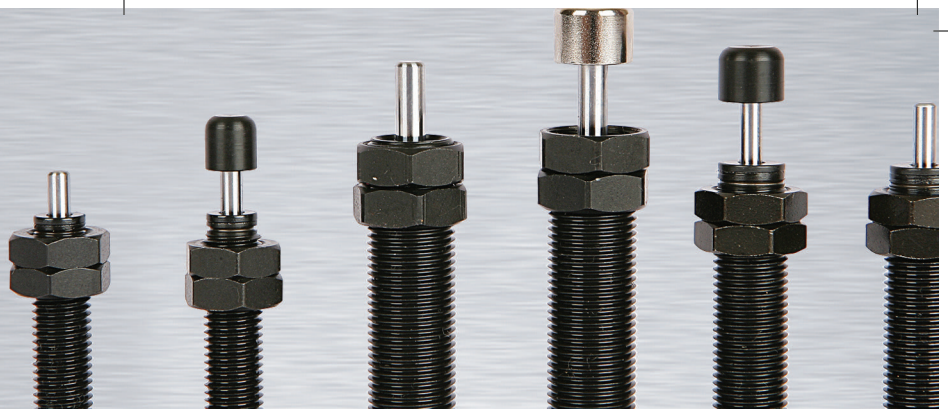
$$E_T = E_K + E_W = 1536 + 187.5 = 1723.5\text{Nm}$$

$$E_T C = E_T \cdot C = 1723.5 \times 130 = 224055\text{Nm/hr}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 1723.5}{1.6^2} = 1346.5\text{kg}$$

Model: KHA 64 - 100 or KHA 85 - 50

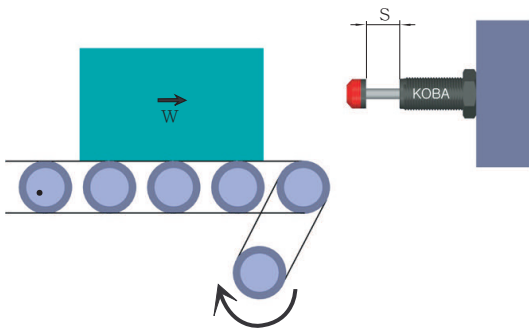
Hydraulic Shock Absorbers



K OBA Shock Absorbers

E. Horizontal Moving Load (Driven Roller Free Flow System)

- Weight $W=50\text{kg}$
- Cycles/Hour $C=100/\text{hr}$
- Impact Velocity $V=1.5\text{m/sec}$
- Coefficient of Friction $\mu=0.3$



$$E_K = \frac{W \cdot V^2}{2} = \frac{50 \times 1.5^2}{2} = 56.3\text{Nm}$$

$$F = W \cdot g \cdot \mu = 50 \times 9.8 \times 0.3 = 147\text{N}$$

Temporary Selection Model : KMA 25 - 25(Stroke: 25)

$$E_W = F \cdot S = 147 \times 0.025 = 3.7\text{Nm}$$

$$E_T = E_K + E_W = 56.3 + 3.7 = 60\text{Nm}$$

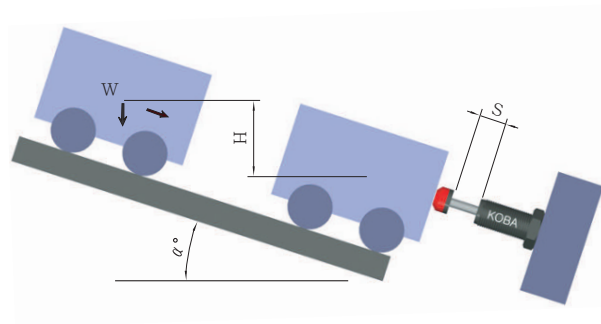
$$E_T C = E_T \cdot C = 60 \times 100 = 6000\text{Nm/hr}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 60}{1.5^2} = 53.3\text{kg}$$

Model: KMA 25 - 25

F. Free Moving Load Down an inclined Plane

- Weight $W=60\text{kg}$
- Cycles/Hour $C=200/\text{hr}$
- Height $H=0.3\text{m}$
- Angular of Incline $\alpha=25^\circ$



$$E_K = W \cdot g \cdot H = 60 \times 9.8 \times 0.3 = 176.4\text{Nm}$$

$$F = W \cdot g \cdot \sin \alpha = 60 \times 9.8 \times 0.42 = 247\text{N}$$

Temporary Selection Model : 36 - 50(Stroke: 50)

$$E_W = F \cdot S = 247 \times 0.05 = 12.4\text{Nm}$$

$$E_T = E_K + E_W = 176.4 + 12.4 = 188.8\text{Nm}$$

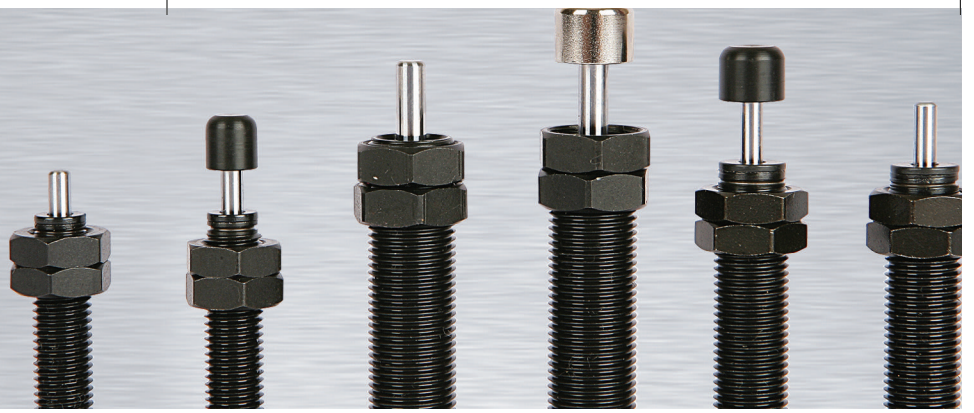
$$E_T C = E_T \cdot C = 188.8 \times 200 = 37760\text{Nm/hr}$$

$$V = \sqrt{2 \cdot g \cdot H} = \sqrt{2 \times 9.8 \times 0.3} = 2.4\text{m/sec}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 188.8}{2.4^2} = 65.6\text{kg}$$

Model: KMA 36 - 50 or KHA 42 - 25

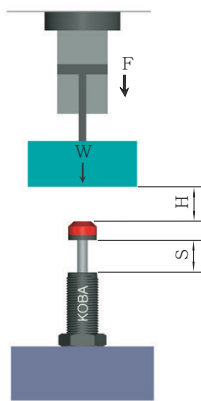
Hydraulic Shock Absorbers



K OBA Shock Absorbers

G. Vertical moving Load with propelling Force Downward

- Weight $W=500\text{kg}$
- Impact Velocity $V=1\text{m/sec}$
- Cylinder Bore Diameter $d=100\text{mm}$
- Cycles/Hour $C=250/\text{hr}$
- Operation Pressure $P=5\text{bar}$



$$E_K = \frac{W \cdot V^2}{2} = \frac{500 \times 1^2}{2} = 250 \text{ Nm}$$

$$F = 0.0785 \cdot d^2 \cdot P + W \cdot g$$

$$= 0.0785 \times 100^2 \times 5 + 500 \times 9.8 = 8825 \text{ N}$$

Temporary Selection Model : KHA 64 - 50 (Stroke: 50)

$$E_W = F \cdot S = 8825 \times 0.05 = 441.25 \text{ Nm}$$

$$E_T = E_K + E_W = 250 + 441.25 = 691.25 \text{ Nm}$$

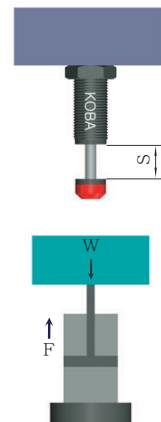
$$E_{TC} = E_T \cdot C = 691.25 \times 250 = 172812.5 \text{ Nm/hr}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 691.25}{1^2} = 1382.5 \text{ kg}$$

Model : KHA 64 - 50

H. Vertical moving Load with propelling Force Upward

- Weight $W=100\text{kg}$
- Impact Velocity $V=1.6\text{m/sec}$
- Cylinder Bore Diameter $d=125\text{mm}$
- Cycles/Hour $C=200/\text{hr}$
- Operation Pressure $P=5\text{bar}$



$$E_K = \frac{W \cdot V^2}{2} = \frac{100 \times 1.6^2}{2} = 128 \text{ Nm}$$

$$F = 0.0785 \cdot d^2 \cdot P - W \cdot g$$

$$= 0.0785 \times 125^2 \times 5 - 100 \times 9.8 = 5152.81 \text{ N}$$

Temporary Selection Model : KHA 42 - 50 (Stroke: 50)

$$E_W = F \cdot S = 5152.81 \times 0.05 = 257.64 \text{ Nm}$$

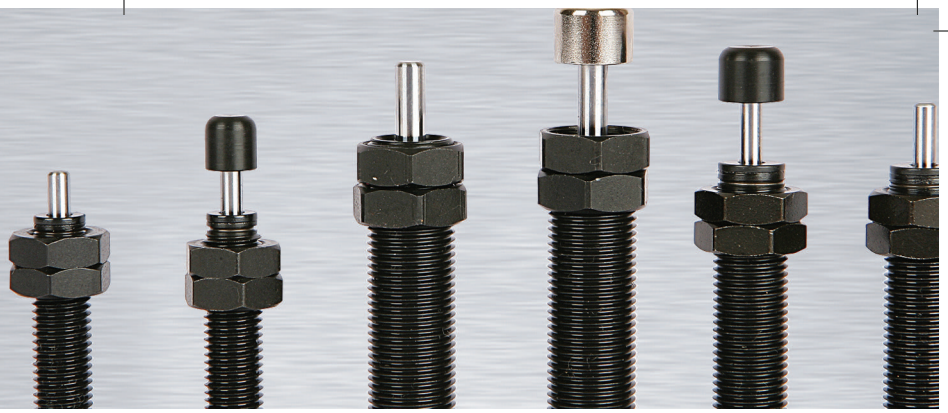
$$E_T = E_K + E_W = 128 + 257.64 = 385.64 \text{ Nm}$$

$$E_{TC} = E_T \cdot C = 385.64 \times 200 = 77128 \text{ Nm/hr}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 385.64}{1.6^2} = 301.28 \text{ kg}$$

Model : KHA 42 - 50

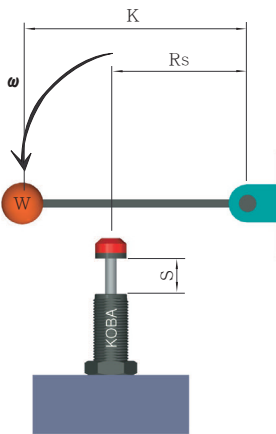
Hydraulic Shock Absorbers



K OBA Shock Absorbers

I. Vertical Free Falling about Pivot Point

- Weight $W=500\text{kg}$
- Cycles/Hour $C=200/\text{hr}$
- Impact Velocity $V=2\text{m/sec}$
- Turning Radius $K=0.8\text{m}$
- $R_s=0.6\text{m}$



$$I \text{ (Moment of Inertia)} = W \cdot K^2 = 500 \times 0.8^2 = 320 \text{ Nm/sec}^2$$

$$\omega = \frac{V}{K} = \frac{2}{0.8} = 2.5 \text{ rad/sec}$$

$$E_K = \frac{I \cdot \omega^2}{2} = \frac{320 \times 2.5^2}{2} = 1000 \text{ Nm}$$

$$F = \frac{W \cdot g \cdot K}{R_s} = \frac{500 \times 9.8 \times 0.8}{0.6} = 6533.3 \text{ N}$$

Temporary Selection Model : KHA 85 - 50 (Stroke: 50)

$$E_W = F \cdot S = 6533.3 \times 0.05 = 326.7 \text{ Nm}$$

$$E_T = E_K + E_W = 1000 + 326.7 = 1326.7 \text{ Nm}$$

$$E_T C = E_T \cdot C = 1326.7 \times 200 = 265340 \text{ Nm/hr}$$

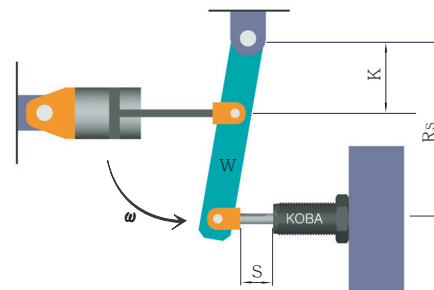
$$V_I = R_s \cdot \omega = 0.6 \times 2.5 = 1.5 \text{ m/sec}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 1326.7}{1.5^2} = 1179.3 \text{ kg}$$

Model : KHA 85 - 50

J. Swing Arm with propelling Force

- Weight $W=600\text{kg}$
- Angular Velocity $\omega=3.0\text{rad/sec}$
- Cylinder Bore Diameter $d=80\text{mm}$
- Turning Radius $K=0.6\text{m}$
- Cycles/Hour $C=150/\text{hr}$
- Operation Pressure $P=5\text{bar}$
- $R_s=0.6\text{m}$



$$I \text{ (Moment of Inertia)} = W \cdot K^2 = 600 \times 0.6^2 = 216 \text{ Nm/sec}^2$$

$$E_K = \frac{I \cdot \omega^2}{2} = \frac{216 \times 3.0^2}{2} = 972 \text{ Nm}$$

$$F = \frac{0.0785 \cdot d^2 \cdot P \cdot K}{R_s} = \frac{0.0758 \times 80^2 \times 5 \times 0.6}{0.8} = 1884 \text{ N}$$

Temporary Selection Model : KHA 64 - 50 (Stroke: 50)

$$E_W = F \cdot S = 1884 \times 0.05 = 94.2 \text{ Nm}$$

$$E_T = E_K + E_W = 972 + 94.2 = 1066.2 \text{ Nm}$$

$$E_T C = E_T \cdot C = 1066.2 \times 150 = 159930 \text{ Nm/hr}$$

$$V = R_s \cdot \omega = 0.6 \times 3 = 1.8 \text{ m/sec}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 1066.2}{1.8^2} = 370.21 \text{ kg}$$

Model : KHA 64 - 50

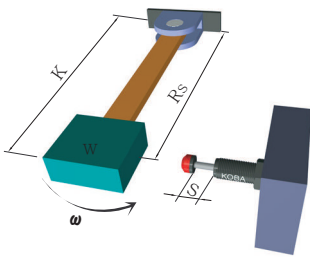
Hydraulic Shock Absorbers



K OBA Shock Absorbers

K. Horizontal Rotating Load

- Weight $W=50\text{kg}$
- Angular Velocity $\omega=1.5\text{rad/sec}$
- Cycles/Hour $C=140/\text{hr}$
- Turning Radius $K=0.8\text{m}$
- $R_s=0.6\text{m}$



$$I \text{ (Moment of Inertia)} = W \cdot K^2 = 50 \times 0.8^2 = 32\text{Nm/sec}^2$$

$$E_K = \frac{I \cdot \omega^2}{2} = \frac{32 \times 1.5^2}{2} = 36\text{Nm}$$

Temporary Selection Model : 25 - 25(Stroke: 25)

$$E_W = 0$$

$$E_T = E_K + E_W = 36 + 0 = 36\text{Nm}$$

$$E_T C = E_T \cdot C = 36 \times 140 = 5040\text{Nm/hr}$$

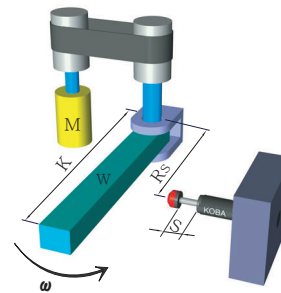
$$V = R_s \cdot \omega = 0.6 \times 1.5 = 0.9\text{m/sec}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 36}{0.9^2} = 88.9\text{kg}$$

Model : KMA 25 - 25

L. Horizontal Rotating Load with Torque

- Weight $W=120\text{kg}$
- Angular Velocity $\omega=2.0\text{rad/sec}$
- Cycles/Hour $C=160/\text{hr}$
- Turning Radius $K=0.9\text{m}$
- Torque $T=130\text{Nm}$
- $R_s=0.6\text{m}$



$$I \text{ (Moment of Inertia)} = W \cdot K^2 = 120 \times 0.9^2 = 97.2\text{Nm/sec}^2$$

$$E_K = \frac{I \cdot \omega^2}{2} = \frac{97.2 \times 2.0^2}{2} = 194.4\text{Nm}$$

$$F = \frac{T}{R_s} = \frac{130}{0.6} = 217\text{N}$$

Temporary Selection Model : 36 - 50(Stroke: 50)

$$E_W = F \cdot S = 217 \times 0.05 = 10.9\text{Nm}$$

$$E_T = E_K + E_W = 194.4 + 10.9 = 205.3\text{Nm}$$

$$E_T C = E_T \cdot C = 205.3 \times 160 = 32848\text{Nm/hr}$$

$$V = R_s \cdot \omega = 0.6 \times 2.0 = 1.2\text{m/sec}$$

$$W_e = \frac{2 \cdot E_T}{V^2} = \frac{2 \times 205.3}{1.2^2} = 285.1\text{kg}$$

Model : KMA 36 - 50 or KHA 42 - 25

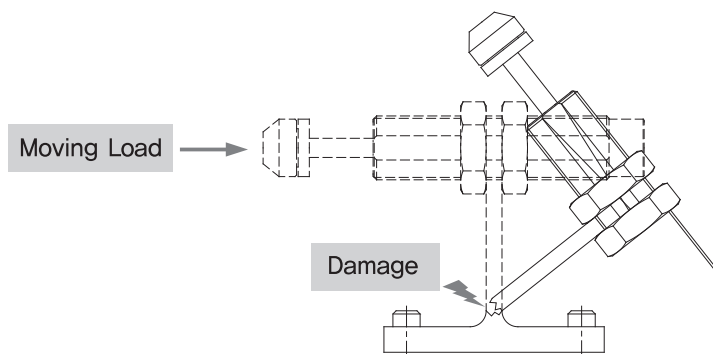
Hydraulic Shock Absorbers Instruction Manual



1 SHOCK ABSORBERS

The Shock Absorber of KOBA is designed to operate several million times and assures its long life if you keep following regulations.

- 1 - 1 Ensure that the capacity of Shock Absorber is correct.
- 1 - 2 Do not paint or weld to Shock Absorber body.
- 1 - 3 Do not paint or mark on Piston rod. (It makes occurred oil leakage and reduce the lifetime of Shock Absorber.)
- 1 - 4 The Adjustment Dial of KOBA Shock Absorber is set on "0" on delivery from factory. Set adjustment from "0" to max by gradually until desired damping force is achieved. Lock the Adjustment by tightening Set Screw after the damping adjustment.
- 1 - 5 Do not keep near the fire and do not throw it away in the fire because Shock absorber' inside is filled with oil so there is possibility to ignite.
- 1 - 6 Check the installation strength before usage. there is possibility to be broken the Shock Absorber in the case of using it under lack of installation strength. Installation strength can be found from "Maximum Shock power * Safety Factor".



- 1 - 7 Refer to below table for the proper lock nut installation. Insufficient or excessive tightening of lock nut may cause the Shock Absorber working loose due to structural vibration.

Screw Diameter (mm)	M8x1.0	M10x1.0	M12x1.0	M14x1.0 M14x1.5	M16x1.5	M20x1.5	M25x1.5 M25x2.0	M27x2.0 M27x3.0	M30x1.5	M36x1.5	M42x1.5
Nut fitting Torque(N.m)	3.9	7.8	7.8	9.8	14.7	29.4	49	58.8	78.4	98	392

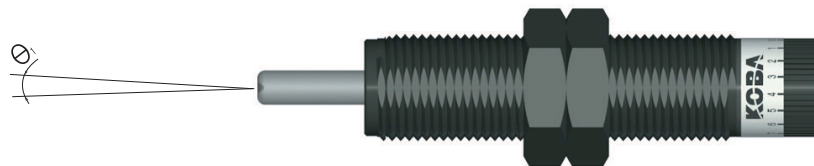
It is more effective to use anaerobic adhesive.

- 1 - 8 Shield the Shock Absorber to protect it from foreign material such as dust, acids, steam, solvents, cutting fluids, and weld flash.
- 1 - 9 Check the operating temperature range of Shock Absorber (-10℃~80℃) to get best performance.
If you need to use Shock Absorber in other temperature exceed standard operating temperature,
Please contact us.

Hydraulic Shock Absorbers Instruction Manual



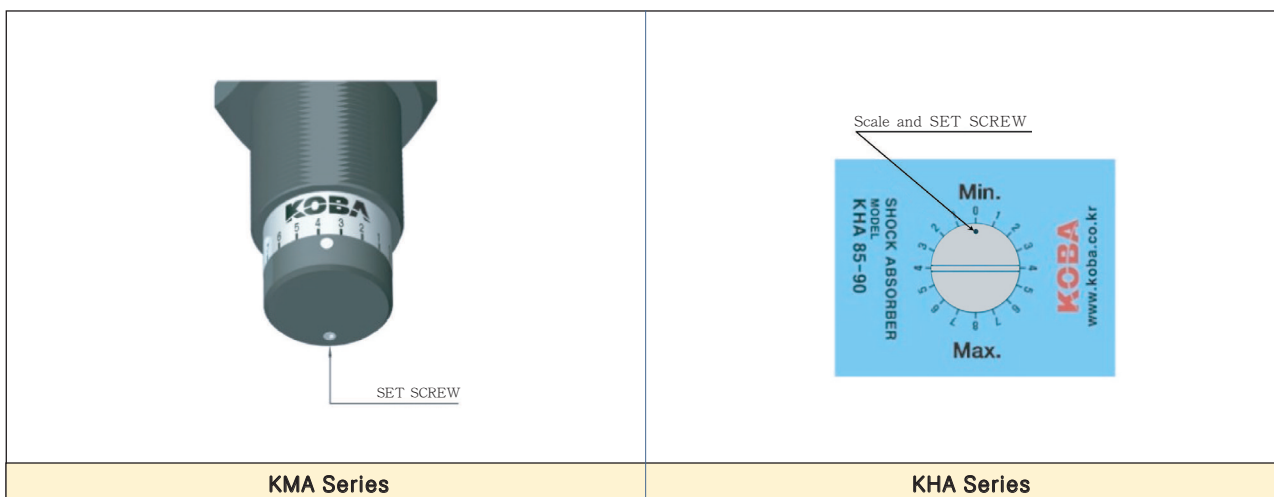
- 1 - 10 Ensure that the load impact should be perpendicular to the axis of Shock Absorber when installing each other. In the case that the moving load is impacted with the angle of deviation over ($\Theta=1^\circ$), the Shock Absorber working loose will be caused by Return fault and unbalanced abrasion of shock absorption part due to bending of Piston rod.



2 Effective Weight of Shock Absorber

Adjusting Type of Shock Absorber is designed to get suitable resistance force according to impact velocity by controlling the area of orifice. The Maximum effective weight listed in catalog means that the minimum area of orifice of Adjusting Type Shock Absorber at minimum velocity in the relation of Impact Velocity, Orifice are and Effective Weight. So in the case that the value of Effective Weight calculated according to given formulae, is exceeded over Maximum Effective Weight mentioned in catalog, it is difficult to set the suitable orifice area. The effective weight is also important factor to select optimum model.

The Adjustment Dial of KMA 14, 20, 25, 27, 36 Series & KHA Type

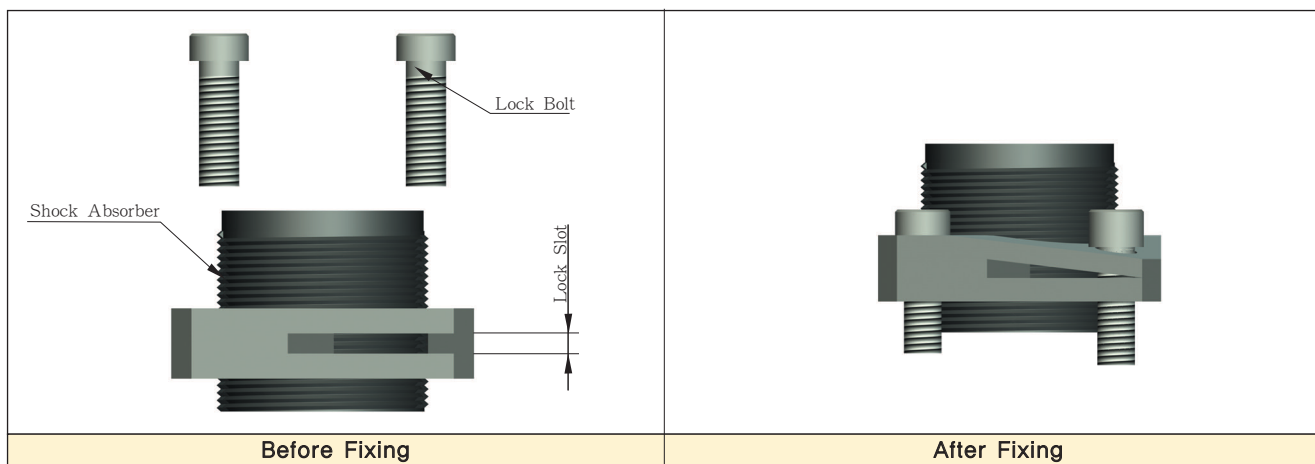


Hydraulic Shock Absorbers Instruction Manual



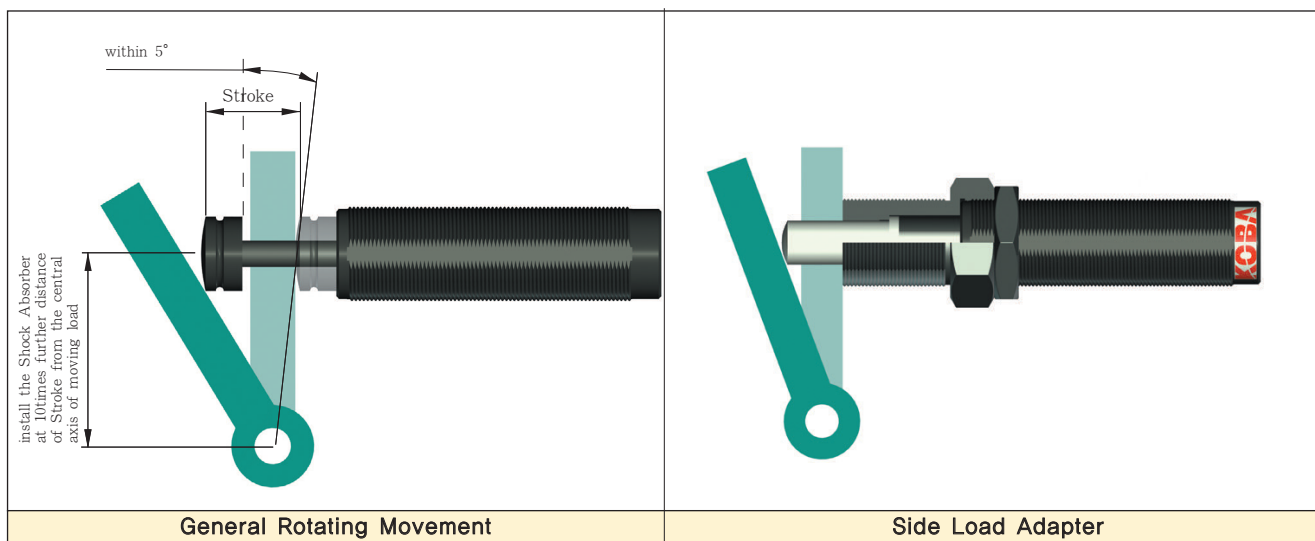
2 - 1 How to fix Flange

First select the location to fix the flange and fix the Lock Bolt. in this case, the pressure will be applied to Lock Slot so the flange will be fastened accurately at the desired location.



2 - 2 Precaution - in case of rotation

As shown below picture, install the Shock Absorber at 10times further distance of Stroke from the central axis of moving load to prevent unbalanced shock absorption. Do not use Urethane Cap in rotating movement. If the distance is not enough to meet above mentioned, use the Side Load adapter option.





Hydraulic Shock Absorbers





■ **KMA Series**



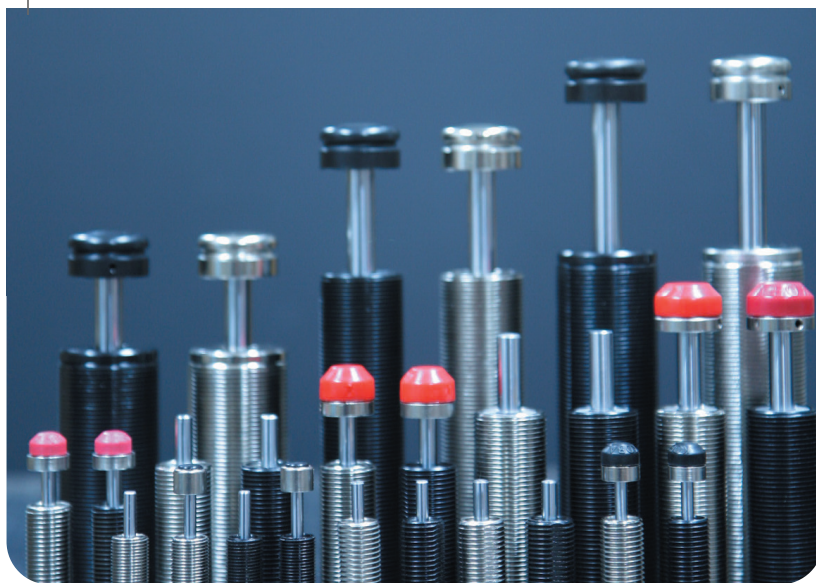
■ **KMS Series**



■ **KHA Series**



KMA Series (Adjusting Type)



Properties

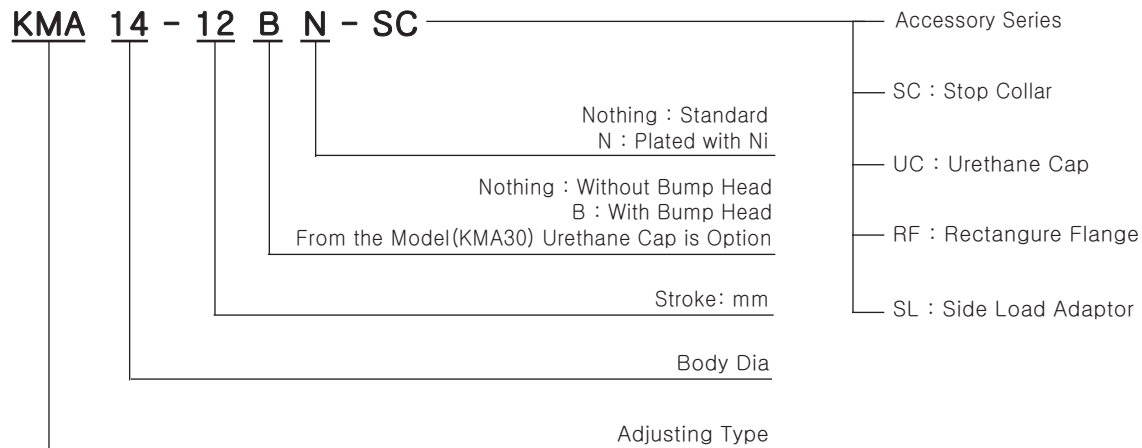
- KMA Model is adjustable type in order to control with easy the range of damping according to impact velocity with rotating the Adjustment Dial 180° to right and left.
- The Body of KMA Model is consisted in several screw threads to increase the surface area so it makes discharge thermal energy faster by absorbing shock at collision. it is easy to fix at the location you want.
- The Piston Rod of KMA Model is plated with hard Cr and the bearing is made of a special material that remains durable for a long time to ensure a long lifespan.
- The Bumper Head prevents “Bottoming out” without the need of Stop Collar because KMA Model has designed special structure and in the case of using Cap, it makes reduce the noise.
- Providing Custom Product : KOBAlways supply Special Shock Absorber to meet the Customer’s special requirements.
- Operation Temperature : Standard Oil : -10~80℃
Special Oil : -40~120℃
- Application : Robots, Packing Machine, Looming machine, Machine tools, Automobile manufacture facilities, Tire manufacture facilities, Casing Facilities Semiconductor manufacture facilities, Safety devices, etc

Engineering Data

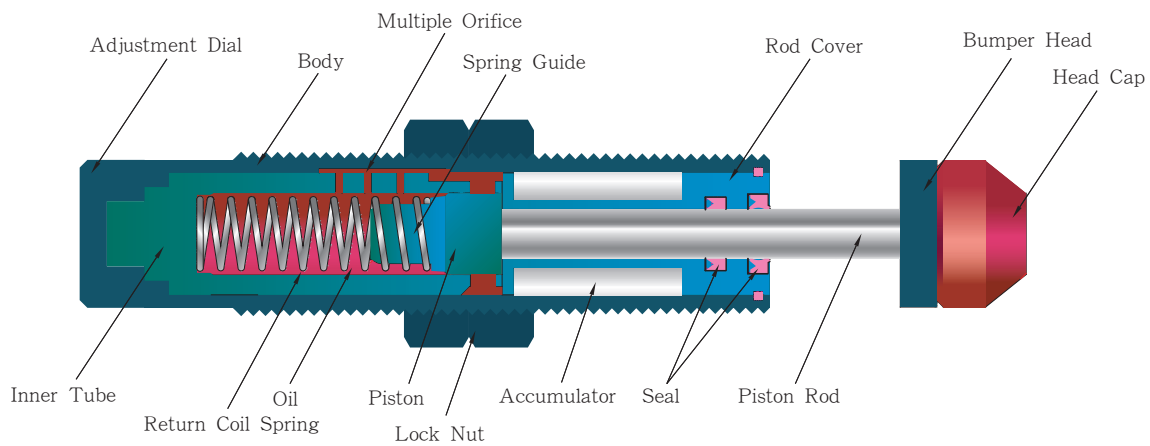
Model	Stroke (mm) S	Max Energy / Cycle (Nm) Et	Max energy / Hour (Nm) EtC	Effective Weight (kg) We	Return Spring Force (N)		Weight (g)	Thread	Page
					Extension	Compression			
KMA12-14	14	5	15,000	1.1-50	3.0	7.1	44	M12×1.0	35
KMA14-12	12	10	25,450	1.2-56	3.2	6.7	72.5	M14×1.5	36
KMA16-12	12	18	34,500	2.3-144	4.7	10.2	93	M16×1.5	37
KMA20-16	16	35	62,100	4.3-280	6.5	17.2	179	M20×1.5	38
KMA25-25	25	78	74,500	13-1,273	11.4	26	345.5	M25×1.5	39
KMA27-25(F)	25	78	74,500	13-1,273	11.4	26	362.5	M27×1.5(F) M27×3.0	40
KMA27-40	40	107	85,600	15-1,500	11.7	25.4	510.3	M27×2.0	
KMA30-35	35	196	100,500	32-2,500	28.6	72.1	650.3	M30×1.5	41
KMA36-25	25	128	93,200	20-1,800	25.5	46.1	837	M36×1.5	42
-50	50	256	113,700	42-2,700	22.7	50.3	1,010		

Hydraulic Shock Absorbers

KMA Series Ordering Information



KMA Series Internal Structure



Accessory Series Charts

Option

Accessories	Side Load Adaptor	Urethane Cap	Stop Collar	Rectangular Flange
Model Symbols	SL	UC	SC	RF
KMA12-14	●		●	
KMA14-12	●		●	
KMA16-12	●		●	
KMA20-16	●		●	
KMA25-25	●		●	
KMA27-25	●		●	
-40			●	
KMA30-35	●	●	●	
KMA36-25	●	●	●	●
-50		●	●	●

KMA

KMS

KHA

KHG

KHS

KG / KGP

KGL

KHC

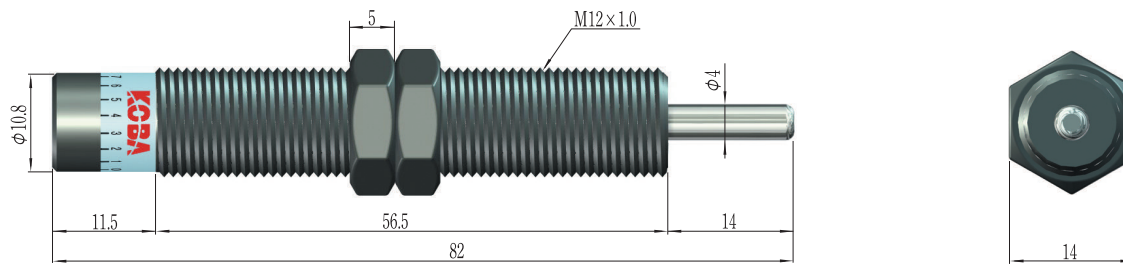
Adjusting Type

KMA12 Series

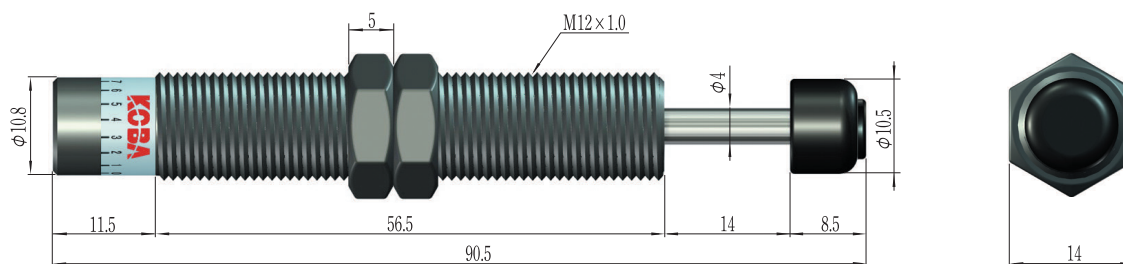
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_TC</i>	Effective Weight (kg) <i>W_e</i>	Return Spring Force (N)		Weight (g)	Thread
					Extension	Compression		
KMA12-14	14	5	15,000	1.1-50	3.0	7.1	44	M12×1.0
KMA12-14B								

KMA12-14

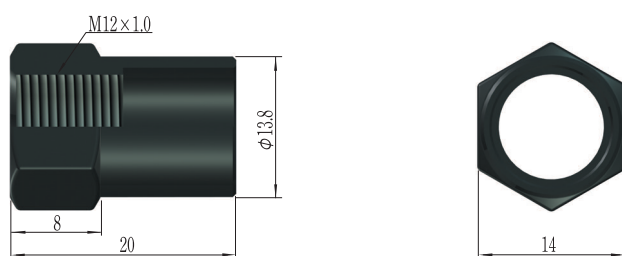


KMA12-14B



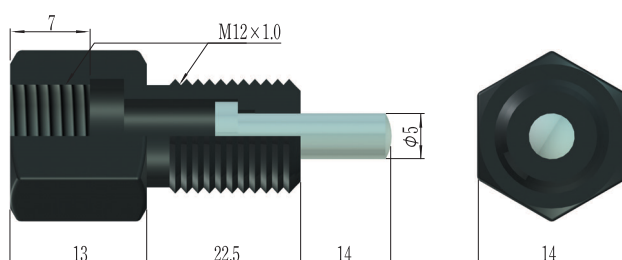
Accessory

SC12



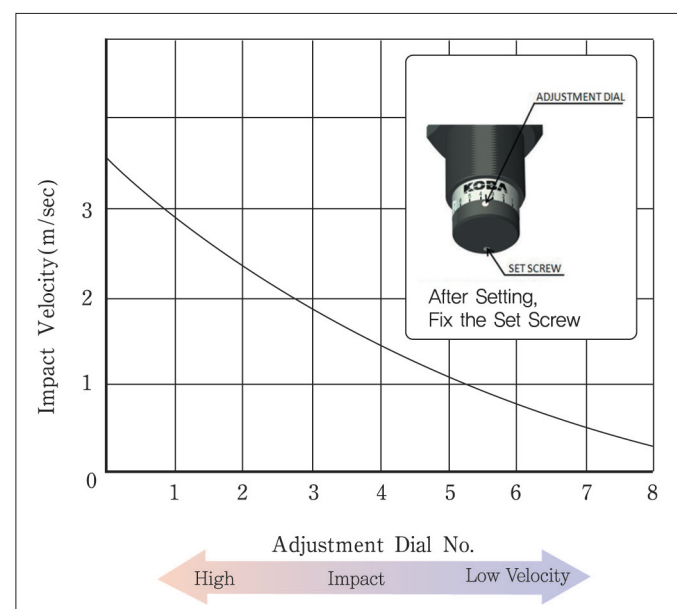
- Stop Collar -

SL1214



- Side Load Adapter -

Useable Adjustment Setting Range



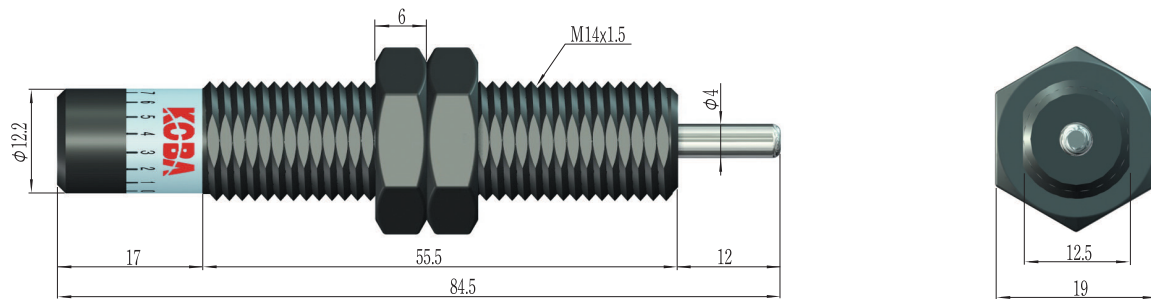
KMA14 Series

Hydraulic Shock Absorbers

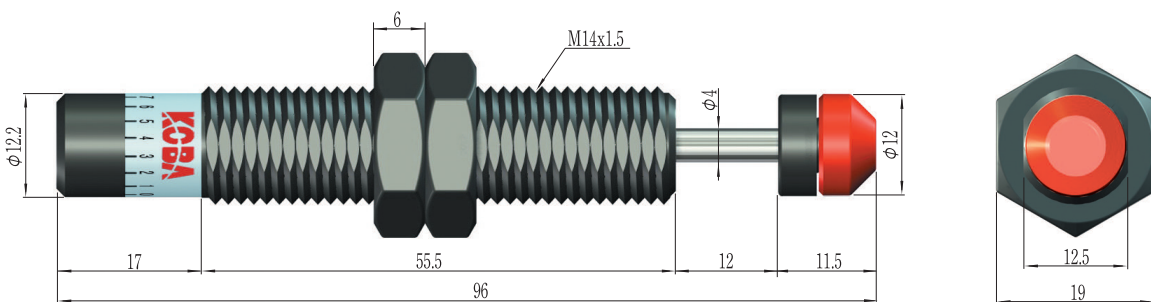
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>Et</i>	Max Energy / Hour (Nm) <i>EtC</i>	Effective Weight (kg) <i>We</i>	Return Spring Force (N)		Weight (g)	Thread
					Extension	Compression		
KMA14-12	12	10	25,450	1.2-56	3.2	6.7	72.5	M14×1.5
KMA14-12B								

KMA14-12

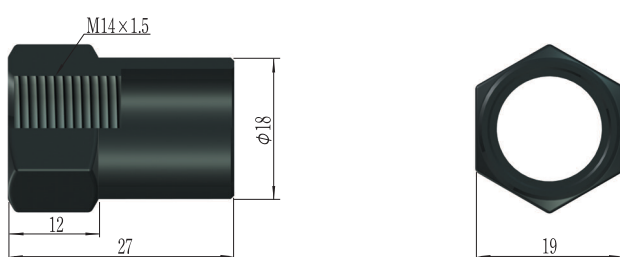


KMA14-12B



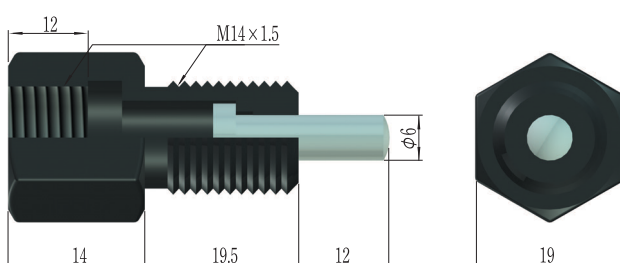
Accessory

SC14



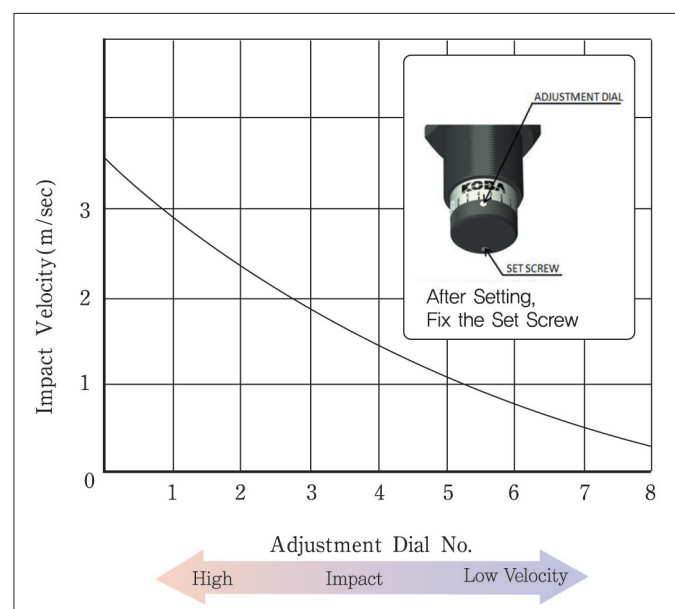
- Stop Collar -

SL1412



- Side Load Adapter -

Useable Adjustment Setting Range



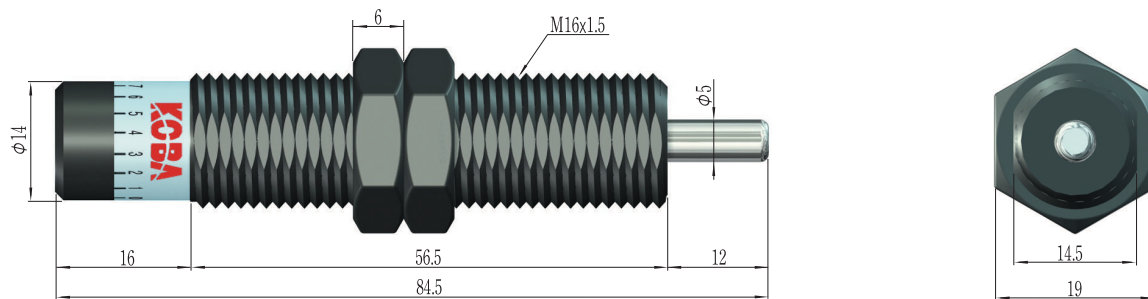
Adjusting Type

KMA16 Series

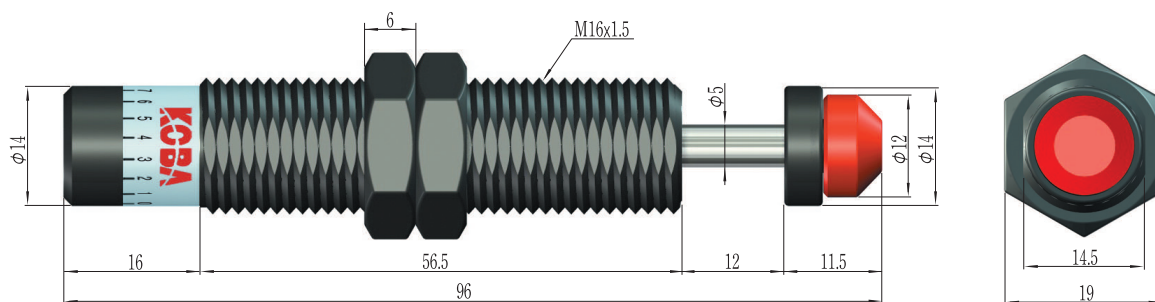
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_TC</i>	Effective Weight (kg) <i>W_e</i>	Return Spring Force (N)		Weight (g)	Thread
					Extension	Compression		
KMA16-12	12	18	34,500	2.3-144	4.7	10.2	93	M16×1.5
KMA16-12B								

KMA16-12

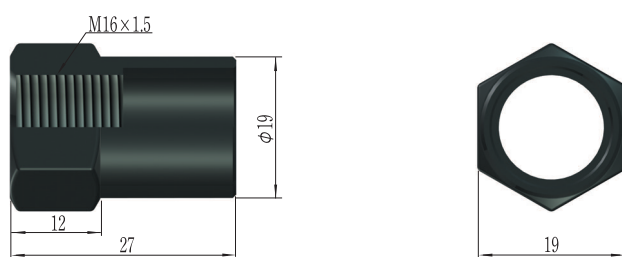


KMA16-12B



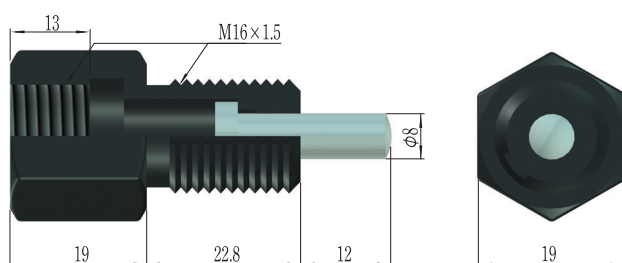
Accessory

SC16



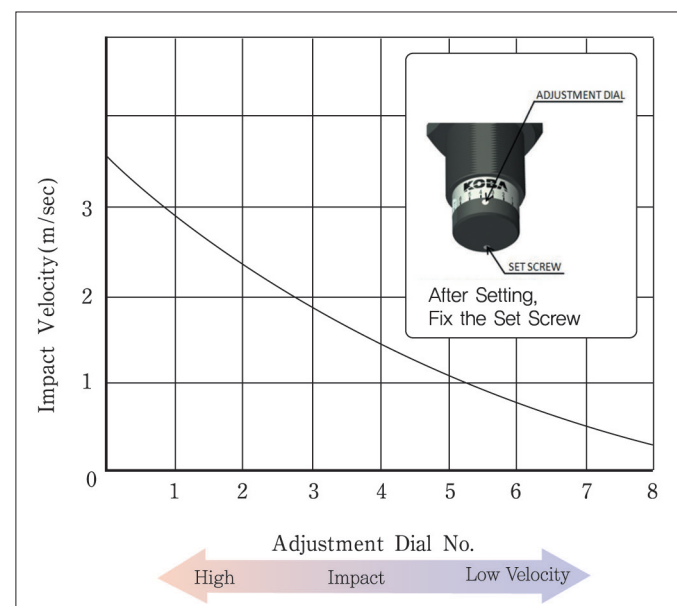
- Stop Collar -

SL1612



- Side Load Adapter -

Useable Adjustment Setting Range



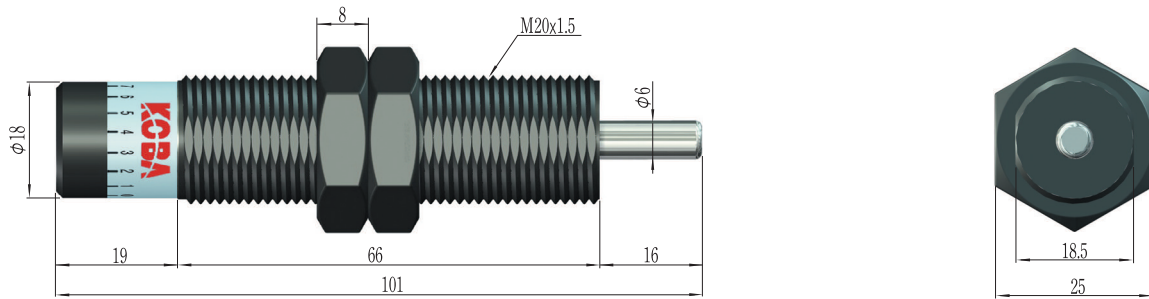
KMA20 Series

Hydraulic Shock Absorbers

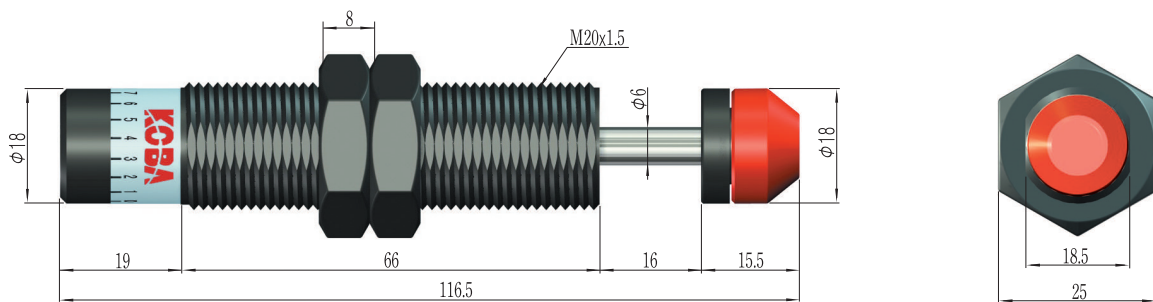
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>Et</i>	Max Energy / Hour (Nm) <i>EtC</i>	Effective Weight (kg) <i>We</i>	Return Spring Force (N) <i>N</i>		Weight (g) <i>G</i>	Thread
					Extension	Compression		
KMA20-16 KMA20-16B	16	35	62,100	4.3-280	6.5	17.2	179	M20×1.5

KMA20-16

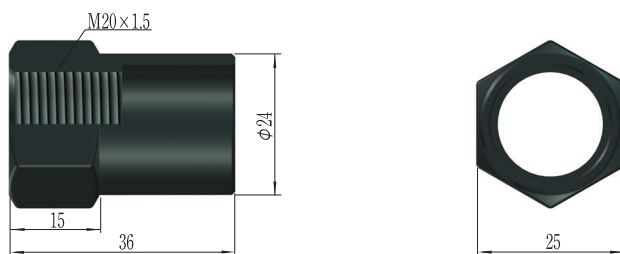


KMA20-16B



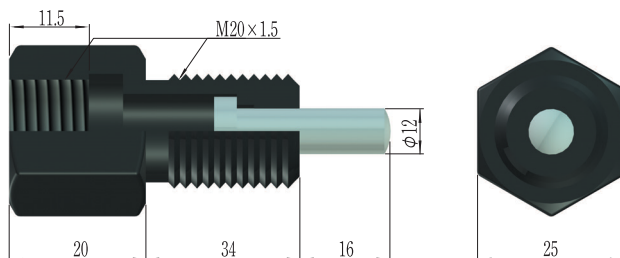
Accessory

SC20



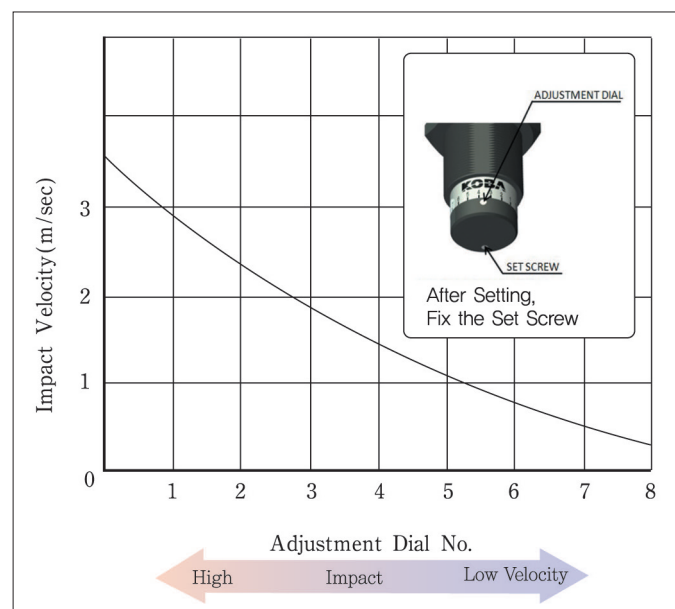
- Stop Collar -

SL2016



- Side Load Adapter -

Useable Adjustment Setting Range



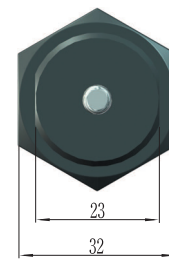
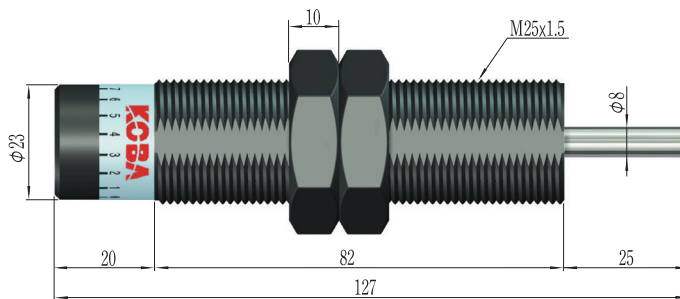
Adjusting Type

KMA25 Series

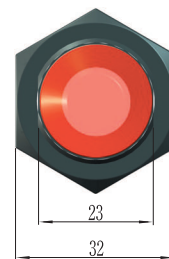
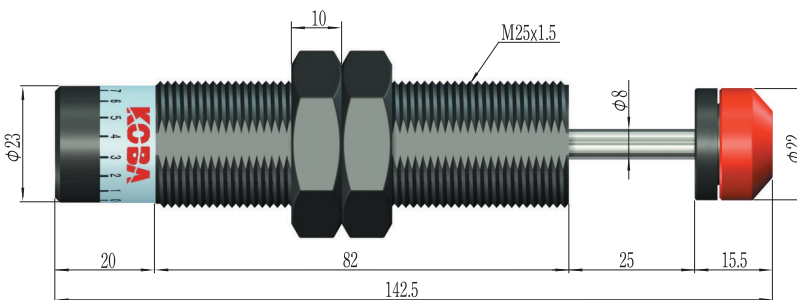
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_TC</i>	Effective Weight (kg) <i>W_e</i>	Return Spring Force (N)		Weight (g)	Thread
					Extension	Compression		
KMA25-25	25	78	74,500	13-1,273	11.4	26	345.5	M25×1.5
KMA25-25B								

KMA25-25

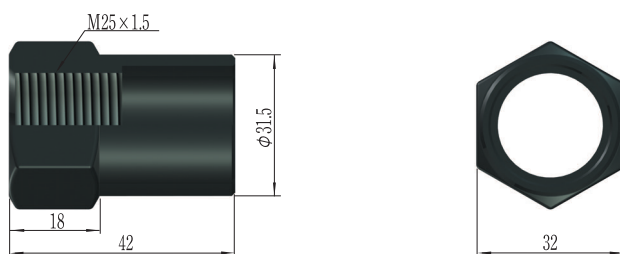


KMA25-25B



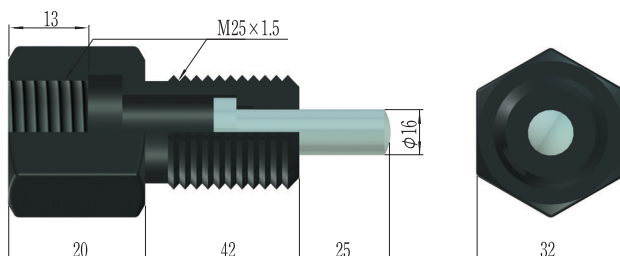
Accessory

SC25



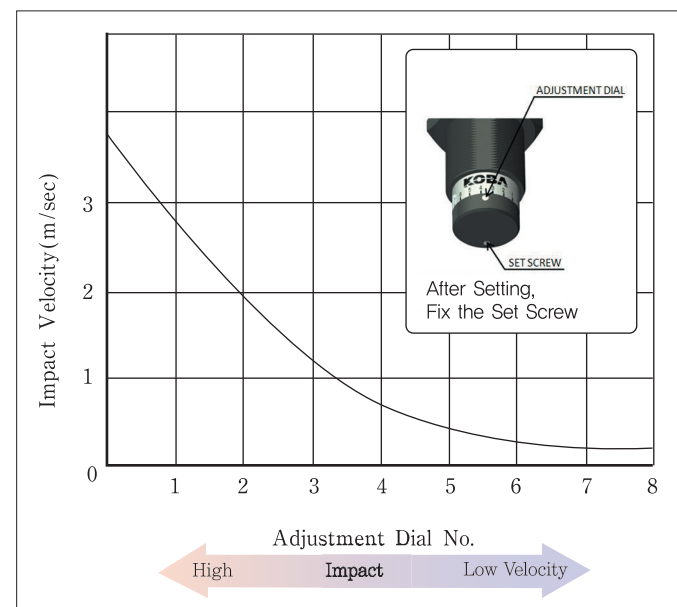
- Stop Collar -

SL2525



- Side Load Adapter -

Useable Adjustment Setting Range



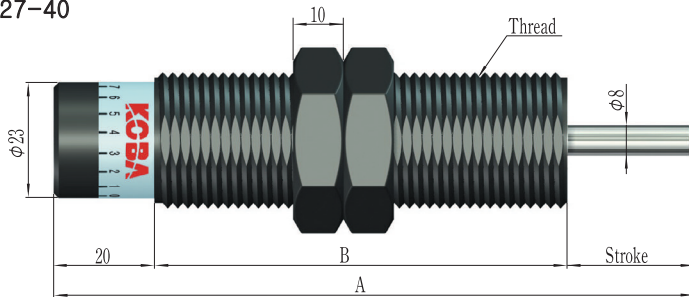
KMA27 Series

Hydraulic Shock Absorbers

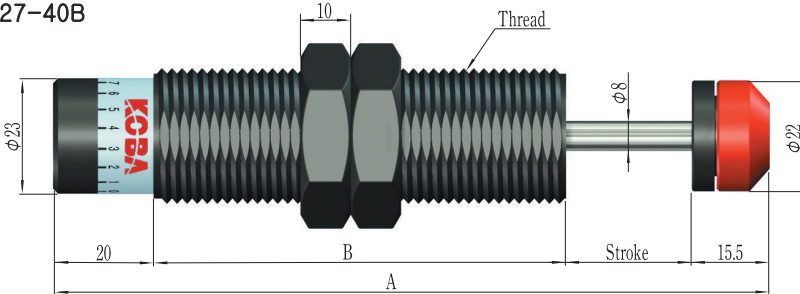
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_TC</i>	Effective Weight (kg) <i>W_e</i>	Return Spring Force (N)		Weight (g)	A	B	Thread
					Extension	Compression				
KMA27-25	25	78	74,500	13-1,273	11.4	26	362.5	127	82	M27×3.0
KMA27-25B								142.5	82	
KMA27-25(F)								127	82	M27×1.5(F)
KMA27-25B(F)								142.5	82	
KMA27-40	40	107	85,600	15-1,500	11.7	25.4	510.3	180	120	M27×2.0
KMA27-40B								195.5	120	

KMA27-25(F) KMA27-40

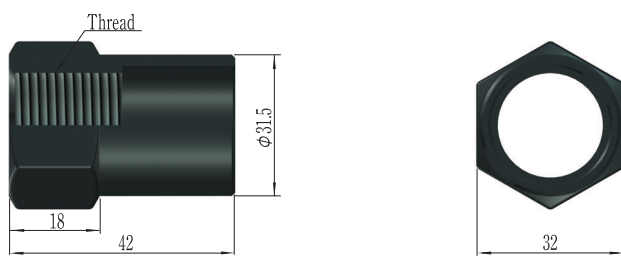


KMA27-25B(F) KMA27-40B



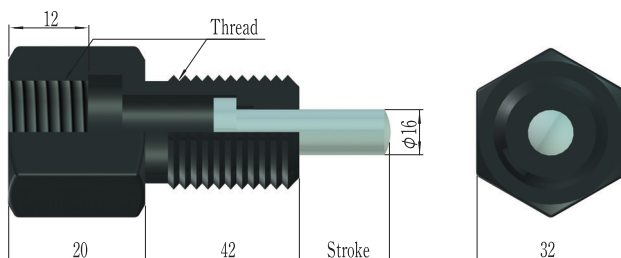
Accessory

SC27, SC27F



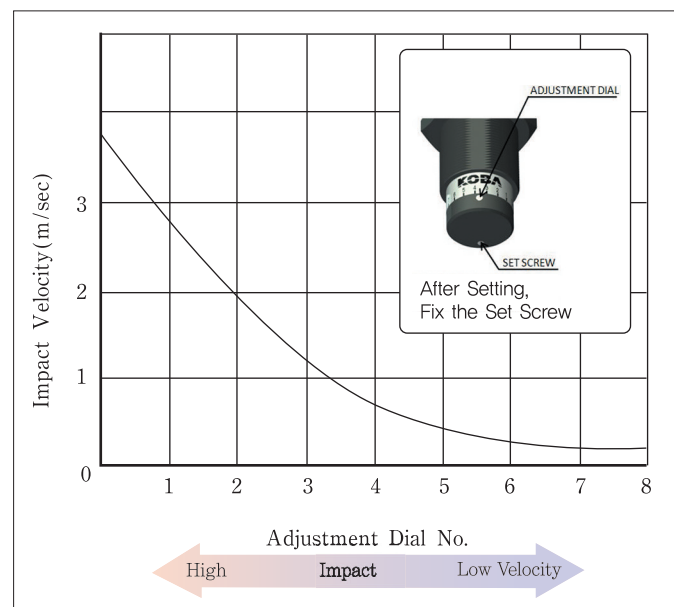
- Stop Collar -

SL2725(M27×3.0), SL2725F(M27×1.5)



- Side Load Adapter -

Useable Adjustment Setting Range



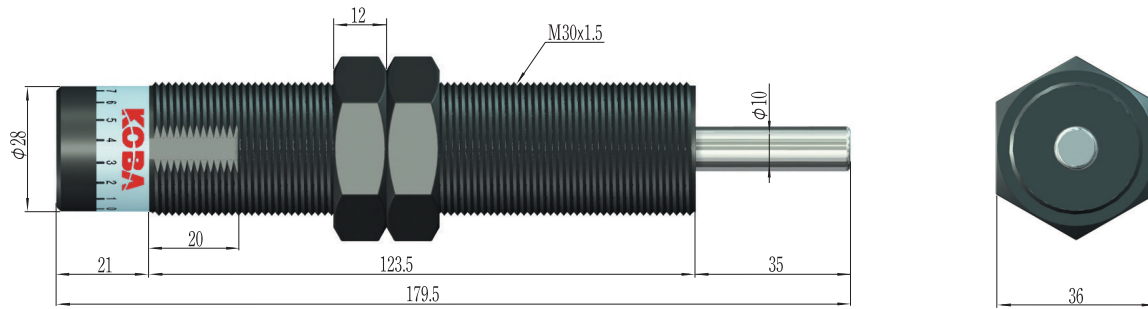
Adjusting Type

KMA30 Series

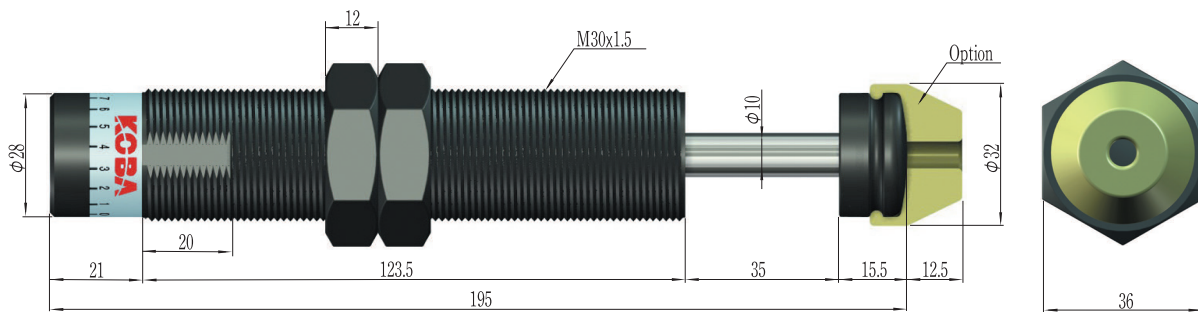
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_TC</i>	Effective Weight (kg) <i>W_e</i>	Return Spring Force (N)		Weight (g)	Thread
					Extension	Compression		
KMA30-35	35	196	100,500	32-2,500	28.6	72.1	650.3	M30×1.5
KMA30-35B								

KMA30-35

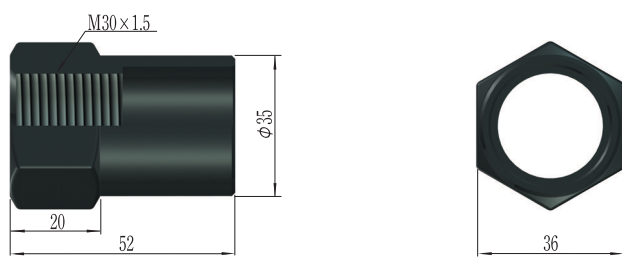


KMA30-35B



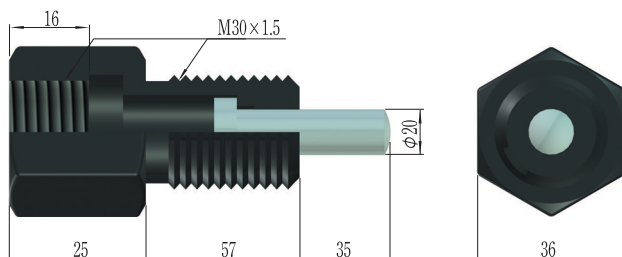
Accessory

SC30



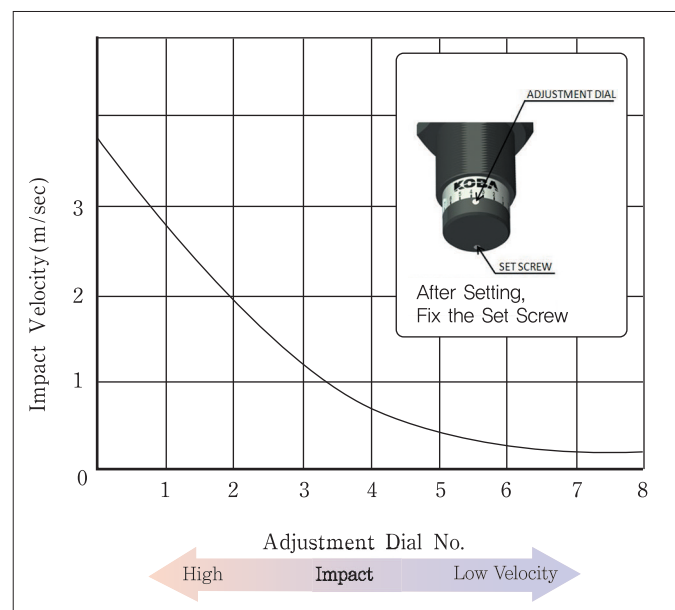
- Stop Collar -

SL3035



- Side Load Adapter -

Useable Adjustment Setting Range



KMS Series (Self Adjusting Type)

Properties

- KMS Series is self adjusting type and is specially designed with multiple orifice to smoothly absorb shock.
- KMS Series has Oil Lock in Inner Tube and Bumper Head that prevents "Bottoming out" can substitute Stop Collar.
- The Body is consisted of several screw threads and it makes easy installation at the location you want and to use with various accessories.
- The Piston rod is plated with hard Cr to resist wearing and protects Seal to ensure a long lifespan.
- Providing Custom Product : KOBA always supply Special Shock Absorber to meet the Customer's special requirements.
- Operation Temperature : Standard Oil : -10~80℃
Special Oil : -40~120℃



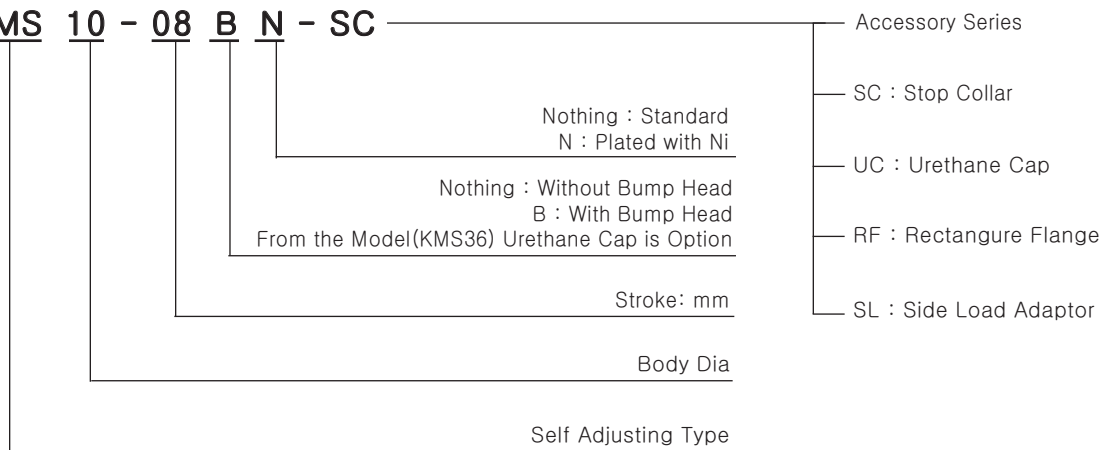
Engineering Data

Model	Stroke <i>(mm)</i>	Max Energy / Cycle <i>(Nm) ET</i>	Max Energy / Hour <i>(Nm) ETC</i>	Effective Weight <i>(kg) We</i>			Impact Velocity <i>(m/sec) (V)</i>			Return Spring Force <i>(N)</i>		Weight <i>(g)</i>	Thread	Page
	<i>S</i>			S1	M2	H3	S1	M2	H3	Extension	Compression			
KMS08-06	6	3	6,000	less 0.6	less 1.3	less 6.0	less 3.2	less 2.2	less 1.1	2.8	5.8	15.5	M8×1.0	45
KMS10-08	8	6	12,600	less 0.8	less 2.5	less 12	less 4.0	less 2.2	less 1.2	3.2	7.5	24	M10×1.0	46
KMS12-10	10	8	16,000	less 2.0	less 4.5	less 18	less 3.0	less 2.0	less 1.0	3.6	7.0	35.5	M12×1.0	47
KMS14-15(F)	15	10	35,000	less 2.2	less 6.0	less 30	less 3.0	less 2.0	less 0.8	3.2	7.4	66.5	M14×1.0(F) M14×1.5	48
KMS20-20	20	32	57,000	less 8.5	less 25	less 79	less 2.8	less 1.6	less 0.9	9.0	16.8	170.5	M20×1.5	49
-30	30	52	31,100	less 10	less 23	less 40	less 3.2	less 2.1	less 1.6	6.3	16.8	188.5		
-50	50	82	37,800	less 11	less 25	less 46	less 3.9	less 2.6	less 1.9	7.8	16.6	268.5		
KMS25-25(F)	25	80	73,000	less 22	less 40	less 160	less 2.7	less 2.0	less 1.0	14.3	29.2	310	M25×1.5(F) M25×2.0	50
-40	40	110	94,000	less 32	less 55	less 453	less 2.6	less 2.0	less 1.2	13.7	30.9	342.5	M25×2.0	
-50	50	120	41,000	less 35	less 60	less 142	less 2.6	less 2.0	less 1.3	13.9	30.5	457.5		
-80	80	160	54,520	less 36	less 55	less 125	less 3.0	less 2.4	less 1.6	14.9	29.8	577.5		
KMS36-25	25	110	125,000	less 33	less 86	less 272	less 2.6	less 1.6	less 0.9	25.5	46.1	887.5	M36×1.5	51
-50	50	220	162,000	less 49	less 91	less 364	less 3.0	less 2.2	less 1.1	24.4	44.6	994		
-80	80	340	232,800	less 66	less 140	less 470	less 3.2	less 2.2	less 1.2	25.4	45.6	1280		

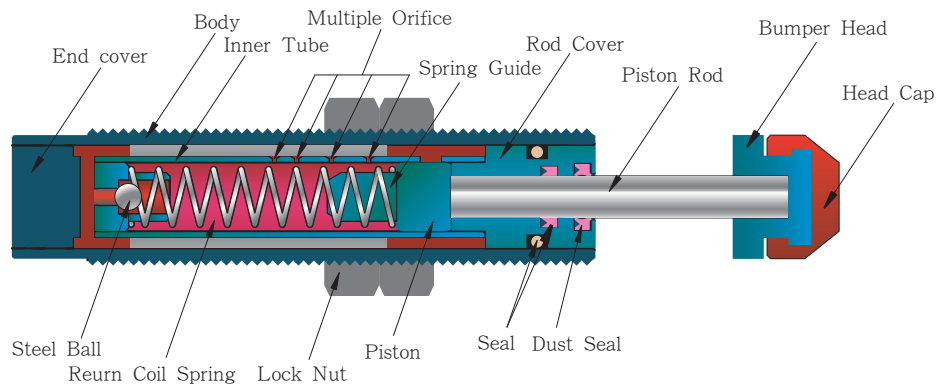
Hydraulic Shock Absorbers

KMS Series Ordering Information

KMS 10 - 08 B N - SC



KMS Series Internal Structure



Accessory Series Charts

Option

Accessories	Side Load Adapter	Urethane Cap	Stop Collar	Rectangular Flange
Symbols	SL	UC	SC	RF
Model				
KMS08-06	●		●	
KMS10-08	●		●	
KMS12-10	●		●	
KMS14-15	●		●	
KMS20-20	●		●	
-30			●	
-50			●	
KMS25-25	●		●	
-40			●	
-50			●	
-80			●	
KMS36-25	●	●	●	●
-50		●	●	●
-80		●	●	●

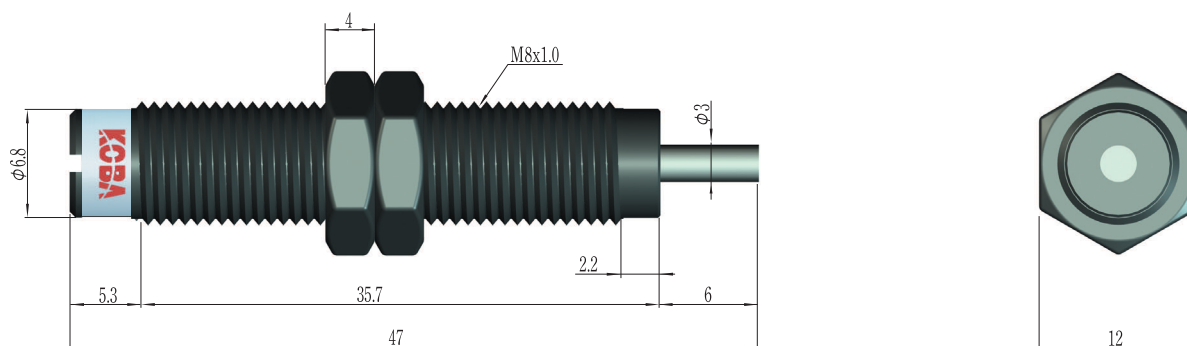
Self-Adjusting Type

KMS08 Series

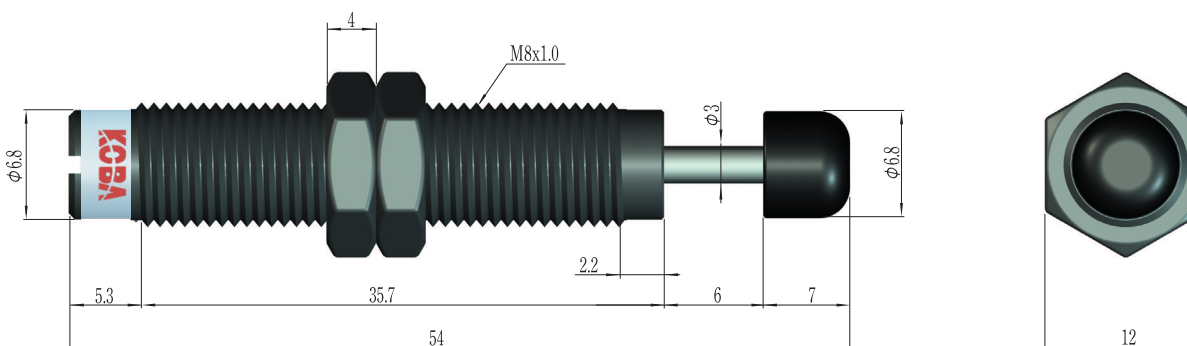
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>ET</i>	Max Energy / Hour (Nm) <i>ETC</i>	Effective Weight (kg) <i>W_e</i>			Impact Velocity (m/sec) (V)			Return Spring Force (N)		Weight (g)	Thread
				S1	M2	H3	S1	M2	H3	Extension	Compression		
KMS08-06	6	3	6,000	less 0.6	less 1.3	less 6.0	less 3.2	less 2.2	less 1.1	2.8	5.8	15.5	M8×1.0
KMS08-06B													

KMS08-06

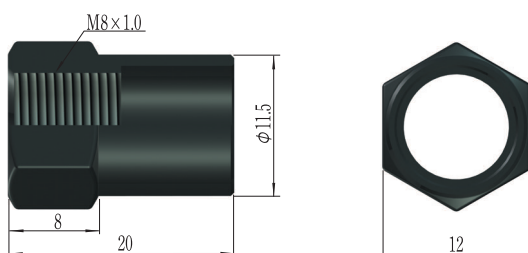


KMS08-06B



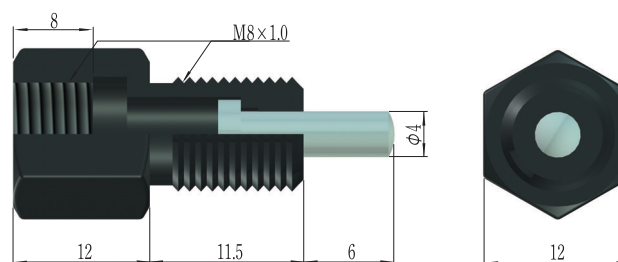
Accessory

SC08



- Stop Collar -

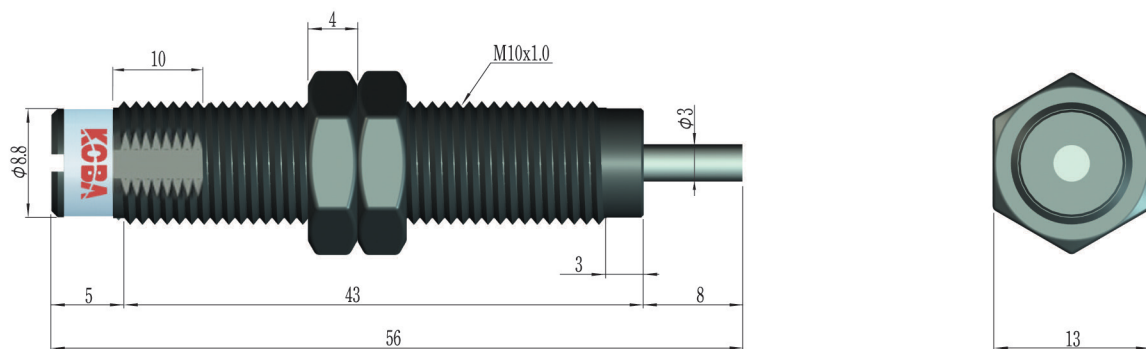
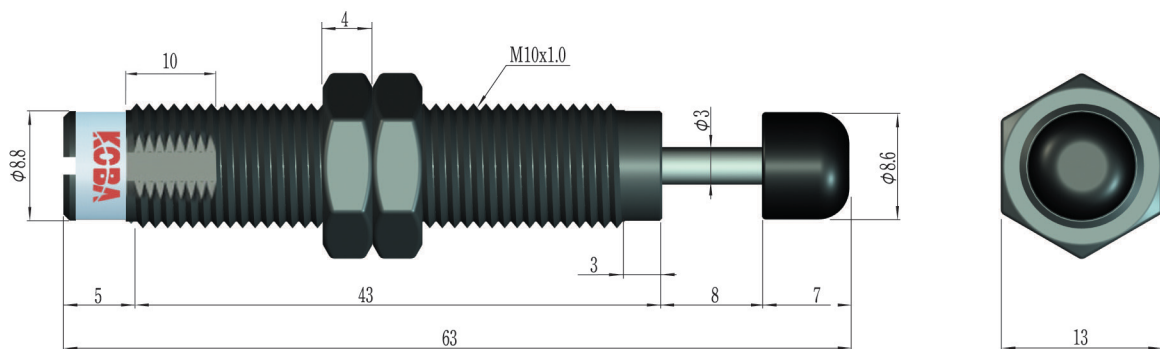
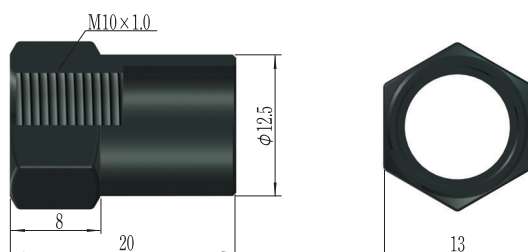
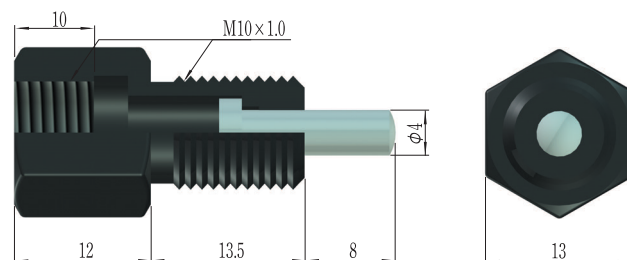
SL0806



- Side Load Adapter -

KMS10 Series**Hydraulic Shock Absorbers****Engineering Data**

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_{TC}</i>	Effective Weight (kg) <i>W_e</i>			Impact Velocity (m/sec) (V)			Return Spring Force (N)		Weight (g)	Thread
				S1	M2	H3	S1	M2	H3	Extension	Compression		
KMS10-08	8	6	12,600	less 0.8	less 2.5	less 12	less 4.0	less 2.2	less 1.2	3.2	7.5	24	M10×1.0
KMS10-08B													

KMS10-08**KMS10-08B****Accessory****SC10****- Stop Collar -****SL1008****- Side Load Adapter -**

KMA

KMS

KHA

KHG

KHS

KG / KGP

KGL

KHC

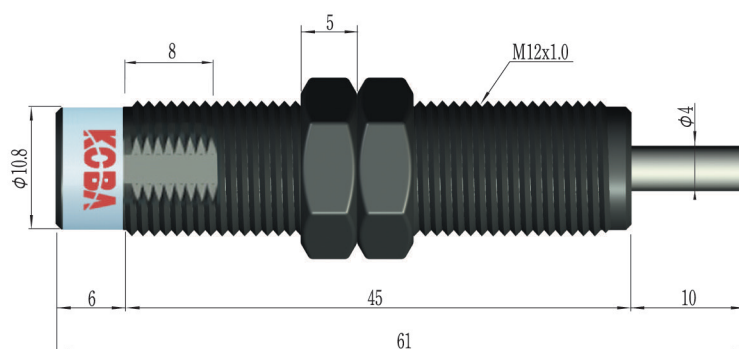
Self-Adjusting Type

KMS12 Series

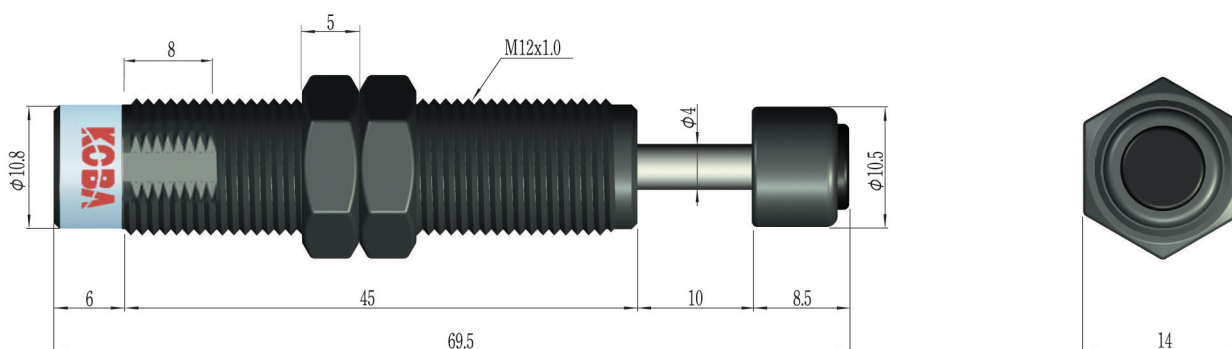
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_TC</i>	Effective Weight (kg) <i>W_e</i>			Impact Velocity (m/sec) (V)			Return Spring Force (N)		Weight (g)	Thread
				S1	M2	H3	S1	M2	H3	Extension	Compression		
KMS12-10	10	8	16,000	less 2.0	less 4.5	less 18	less 3.0	less 2.0	less 1.0	3.6	7.0	35.5	M12×1.0
KMS12-10B													

KMS12-10

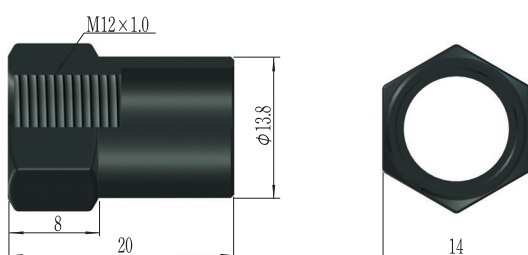


KMS12-10B



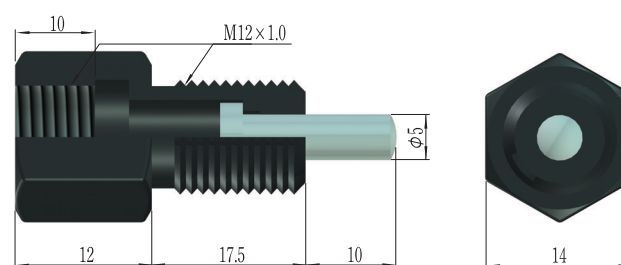
Accessory

SC12



- Stop Collar -

SL1210

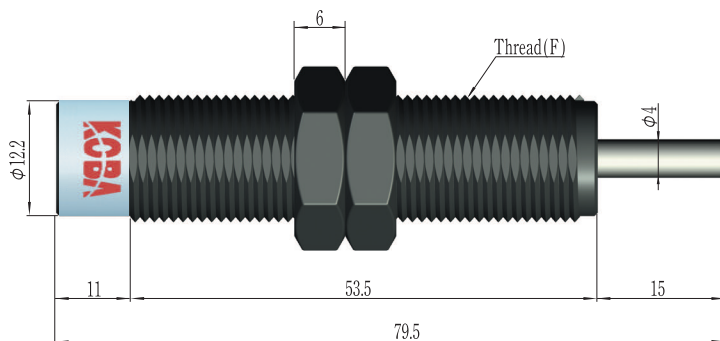


- Side Load Adapter -

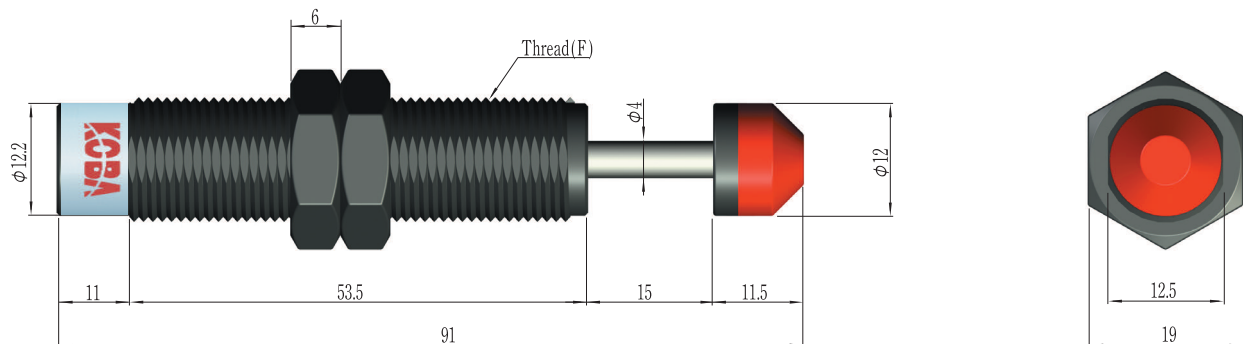
KMS14 Series**Hydraulic Shock Absorbers****Engineering Data**

Model	Stroke (mm) S	Max Energy / Cycle (Nm) E _T	Max Energy / Hour (Nm) E _T C	Effective Weight (kg) W _e			Impact Velocity (m/sec) (V)			Return Spring Force (N)		Weight (g)	Thread
				S1	M2	H3	S1	M2	H3	Extension	Compression		
KMS14-15	15	10	35,000	less 2.2	less 6.0	less 30	less 3.0	less 2.0	less 0.8	3.2	7.4	66.5	M14×1.5
KMS14-15(F)													M14×1.0(F)
KMS14-15B													M14×1.5
KMS14-15B(F)													M14×1.0(F)

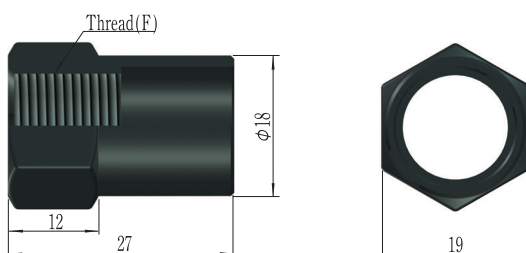
KMS14-15
KMS14-15(F)



KMS14-15B
KMS14-15B(F)

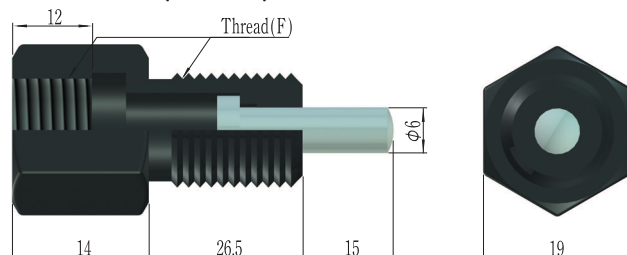
**Accessory**

SC14(M14x1.5)
SC14F(M14x1.0)



- Stop Collar -

SL1415(M14x1.5)
SL1415F(M14x1.0)



- Side Load Adapter -

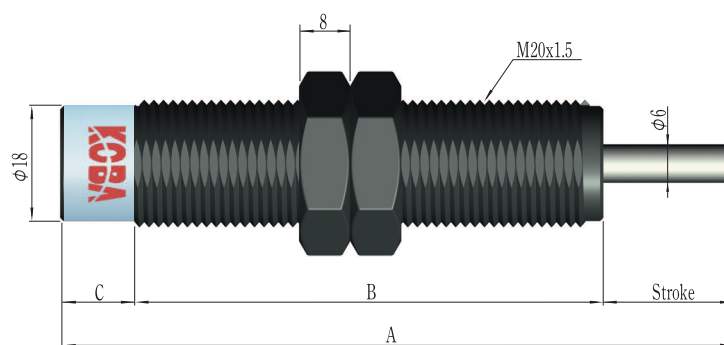
Self-Adjusting Type

KMS20 Series

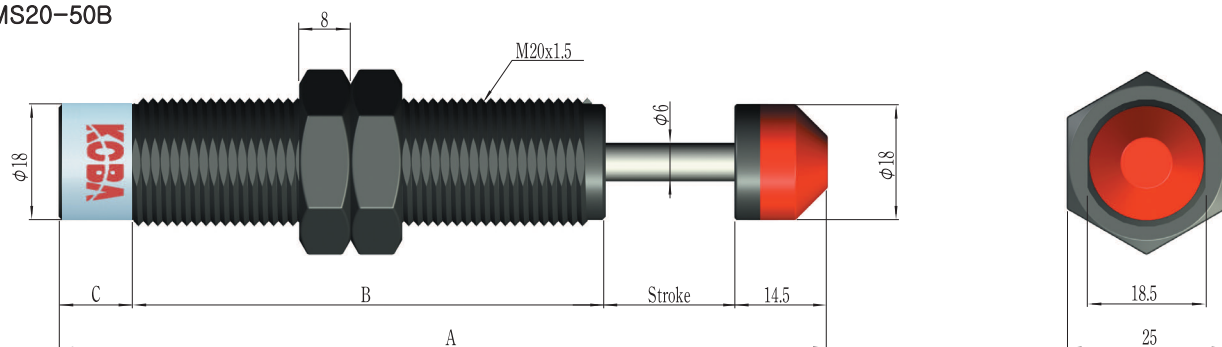
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_{TC}</i>	Effective Weight (kg) <i>W_e</i>			Impact Velocity (m/sec) (<i>V</i>)			Return Spring Force (N)		Weight (g)	Thread	A	B	C
				S1	M2	H3	S1	M2	H3	Extension	Compression					
KMS20-20	20	32	57,000	less 8.5	less 25	less 79	less 2.8	less 1.6	less 0.9	9.0	16.8	170.5	M20×1.5	105	74	11
KMS20-20B														119.5	74	11
KMS20-30B	30	52	31,100	less 10	less 23	less 40	less 3.2	less 2.1	less 1.6	6.3	16.8	188.5		144.5	89	11
KMS20-50B	50	82	37,800	less 11	less 25	less 46	less 3.9	less 2.6	less 1.9	7.8	16.6	268.6		228.5	90	74

KMS20-20

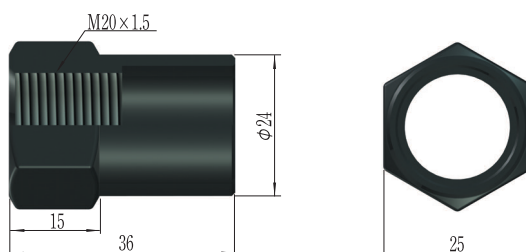


KMS20-20B KMS20-30B KMS20-50B



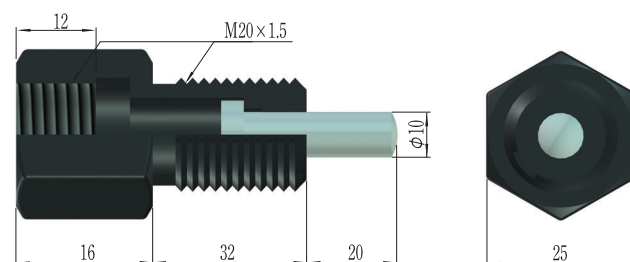
Accessory

SC20



- Stop Collar -

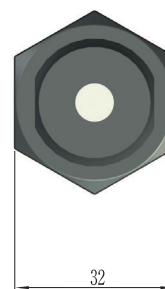
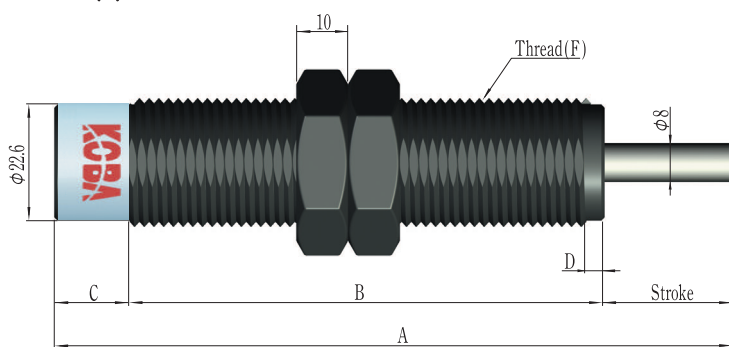
SL2020



- Side Load Adapter -

KMS25 Series**Hydraulic Shock Absorbers****Engineering Data****Dimension**

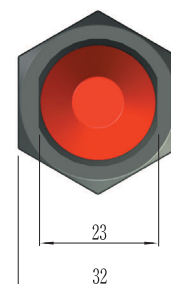
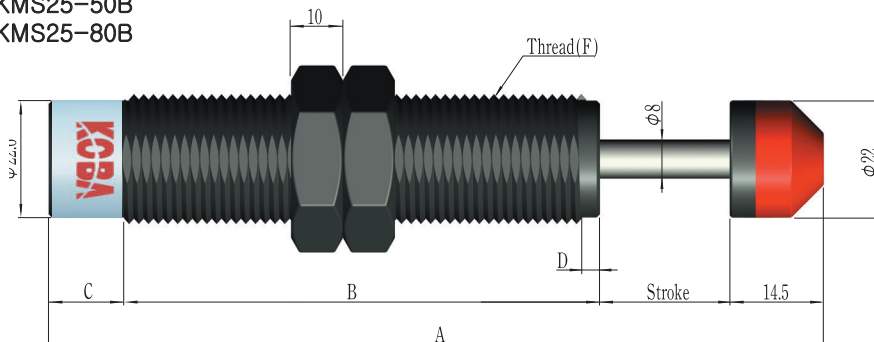
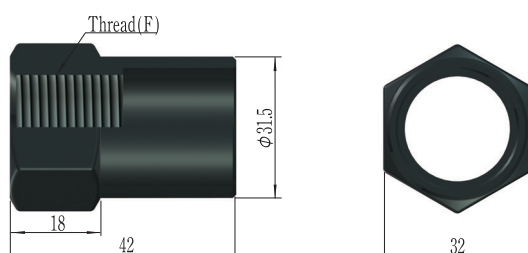
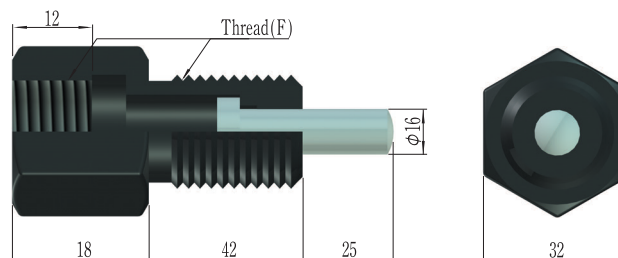
Model	Stroke (mm) S	Max Energy / Cycle (Nm) E _T	Max Energy / Hour (Nm) E _{TC}	Effective Weight (kg) W _e			Impact Velocity (m/sec) (V)			Return Spring Force (N)		Weight (g)	Thread	A	B	C	D
				S1	M2	H3	S1	M2	H3	Extension	Compression						
KMS25-25	25	80	73,000	less 22	less 40	less 160	less 2.7	less 2.0	less 1.0	14.3	29.2	310	M25×2.0	124	87	12	3
KMS25-25(F)													M25×1.5(F)	124	87	12	3
KMS25-25B													M25×2.0	138.5	87	12	3
KMS25-25B(F)													M25×1.5(F)	138.5	87	12	3
KMS25-40B	40	110	94,000	less 32	less 55	less 453	less 2.6	less 2.0	less 1.2	13.7	30.9	342.5	M25×2.0	174.5	108	12	3
KMS25-50B	50	120	41,000	less 35	less 60	less 142	less 2.6	less 2.0	less 1.3	13.9	30.5	457.5		234.5	100	70	12
KMS25-80B	80	160	54,200	less 36	less 55	less 125	less 3.0	less 2.4	less 1.6	14.9	29.8	577.5		328.5	137	97	12

KMS25-25(F)**KMS25-25B(F)**

KMS25-40B

KMS25-50B

KMS25-80B

**Accessory****SC25
SC25F****- Stop Collar -****SL2525(M25x2.0)
SL2525F(M25x1.5)****- Side Load Adapter -**

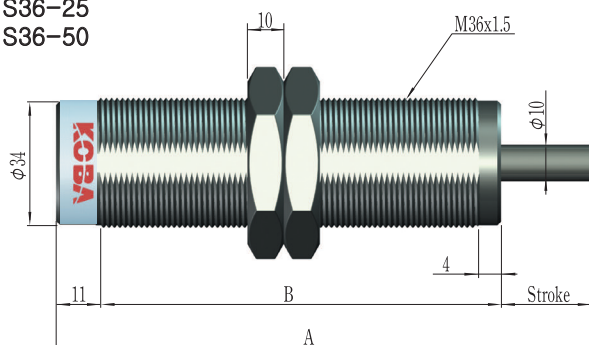
Self-Adjusting Type

KMS36 Series

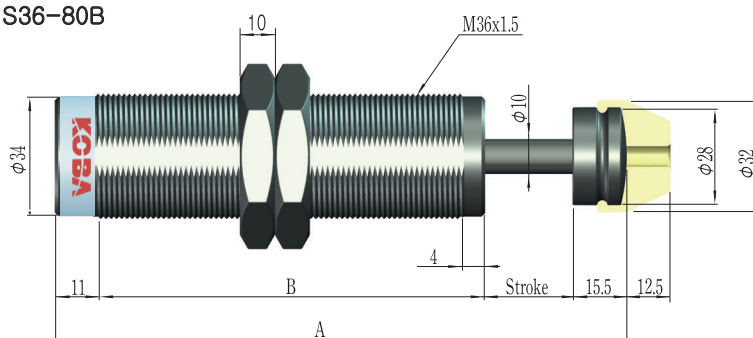
Engineering Data

Model	Stroke <i>(mm)</i>	Max Energy / Cycle <i>(Nm)</i> <i>E_T</i>	Max Energy / Hour <i>(Nm)</i> <i>E_TC</i>	Effective Weight <i>(kg)</i> <i>W_e</i>			Impact Velocity <i>(m/sec)</i> <i>(V)</i>			Return Spring Force <i>(N)</i>		Weight <i>(g)</i>	Thread	A	B
	<i>S</i>			S1	M2	H3	S1	M2	H3	Extension	Compression				
KMS36-25	25	110	125,000	less 33	less 86	less 272	less 2.6	less 1.6	less 0.9	25.5	46.1	887.5	M36×1.5	148	112
KMS36-25B															
KMS36-50	50	220	162,000	less 49	less 91	less 364	less 3.0	less 2.2	less 1.1	24.4	44.6	994		198	137
KMS36-50B															
KMS36-80B	80	340	232,800	less 66	less 140	less 470	less 3.2	less 2.2	less 1.2	25.4	45.6	1280			353.5

KMS36-25 KMS36-50

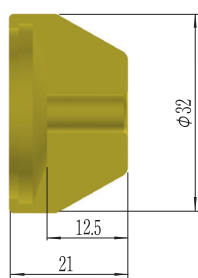


KMS36-25B KMS36-50B KMS36-80B



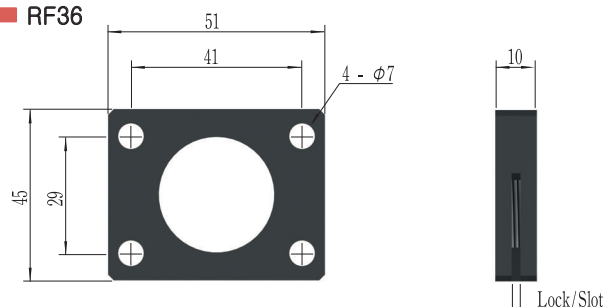
Accessory

UC36



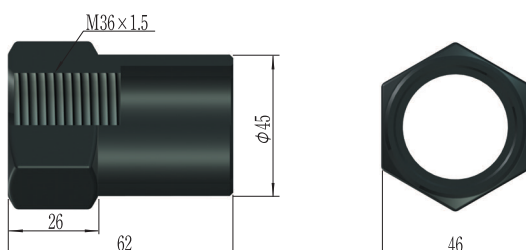
- Urethane Cap -

RF36



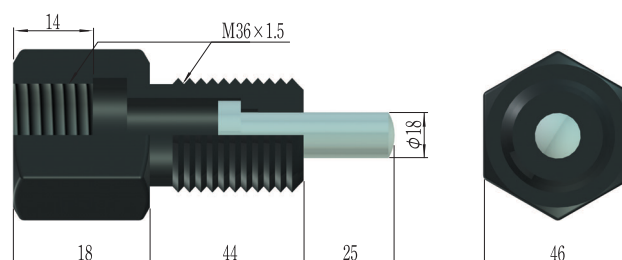
- Rectangular Flange -

SC36



- Stop Collar -

SL3625



- Side Load Adapter -

Hydraulic Shock Absorbers

■ KMA, KMS Accessories Installation

Accessories	Examples	비고
Lock Nut		Installation is simply done by fastening Lock Nut.
Stop Collar +Lock Nut		Stop Collar guarantees accurate stopping and positioning and protects the body of Shock Absorber.
Side Load Adapter +Lock Nut		Used to shorten the distance to Shock Absorber or lessen unbalanced load during rotation to prevent unbalanced abrasion of Shock Absorber.
Flange Mount		Use to Square Flange or Rectangular Flange to conveniently fix Shock Absorber.

KMA

KMS

KHA

KHG

KHS

KG / KGP

KGL

KHC

KHA Series (Adjusting Type)



Properties

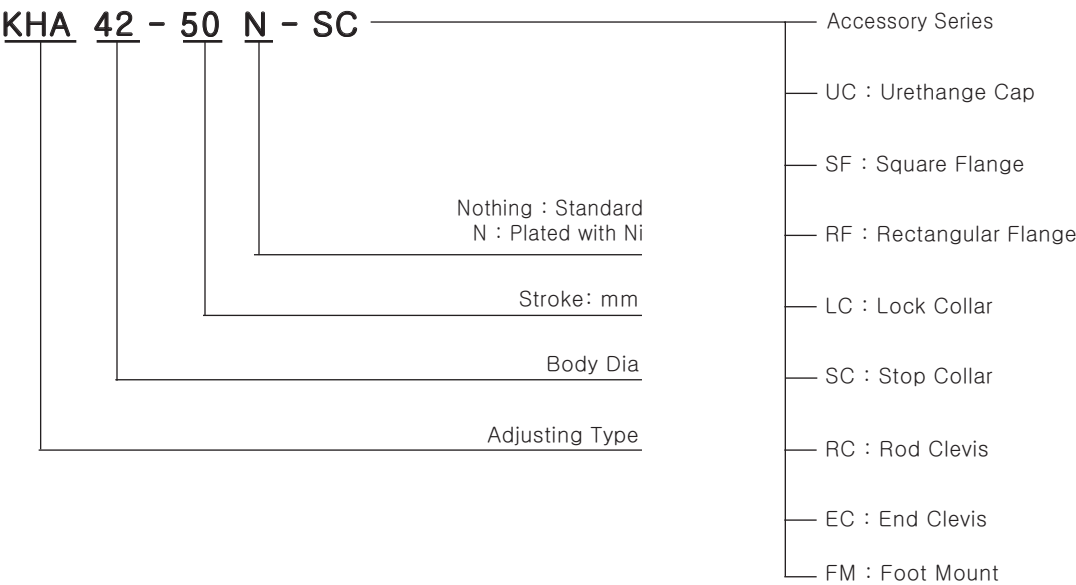
- KHA Model is adjustable type in order to control with easy the range of damping according to impact velocity with rotating the Adjustment Dial 180° to right and left.
- The Body of KHA Model is consisted in several screw threads to increase the surface area so it makes discharge thermal energy faster by absorbing shock at collision. it is easy to fix at the location you want.
- The Piston Rod of KHA Model is plated with hard Cr and the bearing is made of a special material that remains durable for a long time to ensure a long lifespan.
- The Bumper Head prevents "Bottoming out" without the need of Stop Collar because KHA Model has designed special structure and in the case of using Cap, it makes reduce the noise.
- Providing Custom Product : KOBA always supply Special Shock Absorber to meet the Customer's special requirements.
- Operation Temperature : Standard Oil : -10~80℃
Special Oil : -40~120℃
- Various Application : Robots, Packing Machine, Looming machine, Machine tools, Automobile manufacture facilities, Tire manufacture facilities, Casing Facilities Crane, Safety devices, etc

Engineering Data

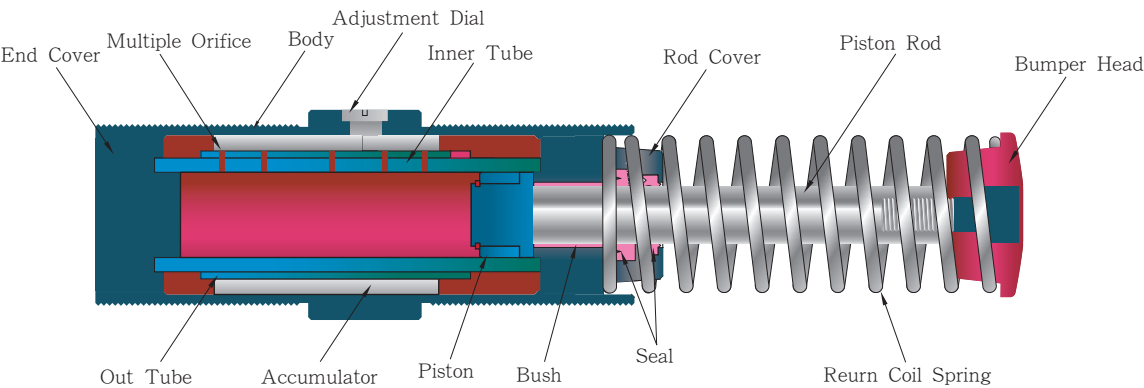
Model	Stroke (mm) S	Max Energy / Cycle (Nm) Er	Max energy / Hour (Nm) ErC	Effective Weight (kg) We	Return Spring Force (N)		Weight (kg)	Thread	Page
					Extension	Compression			
KHA42-25	25	250	125,000	36-3,600	28	56	1.25	M42×1.5	55
-50	50	500	166,000	45-6,150	38	86	1.4		
-75	75	750	200,000	54-9,500	32	88	1.6		
KHA64-50	50	1,300	270,000	82-12,600	65	148	3.7	M64×2.0	57
-100	100	2,600	360,000	115-17,000	45	157	4.5		
-150	150	3,900	420,000	140-22,000	47	199	5.3		
KHA85-50	50	2,300	370,000	200-37,000	148	315	6.4	M85×2.0	59
-90	90	4,000	650,000	230-40,000	121	365	7.6		
-125	125	5,700	930,000	300-43,000	102	191	8.6		
-165	165	7,300	1,210,000	360-45,000	98	429	9.8		
KHA115-50	50	3,700	1,501,000	370-44,000	187	427	16	M115×2.0	61
-100	100	7,400	1,805,000	370-57,000	178	482	19		
-150	150	11,100	2,100,000	370-89,000	185	538	21		
-200	200	14,800	2,405,000	390-118,000	185	665	31		
-250	250	18,500	2,710,000	440-145,000	184	649	34		

Hydraulic Shock Absorbers

KHA Series Ordering Information



KHA Series Internal Structure



Accessory Series Charts

Option

Accessories	Urethane Cap	Square Flange	Rectangular Flange	Lock Collar	Stop Collar	Rod Clevis	End Clevis	Foot Mount
Symbols Model	UC	SF	RF	LC	SC	RC	EC	FM
KHA42 Series	●	●	●	●	●	●	●	●
KHA64 Series	●	●	●	●	●	●	●	●
KHA85 Series	●	●		●	●	●	●	●
KHA115Series	●	●		●	●	●	●	●

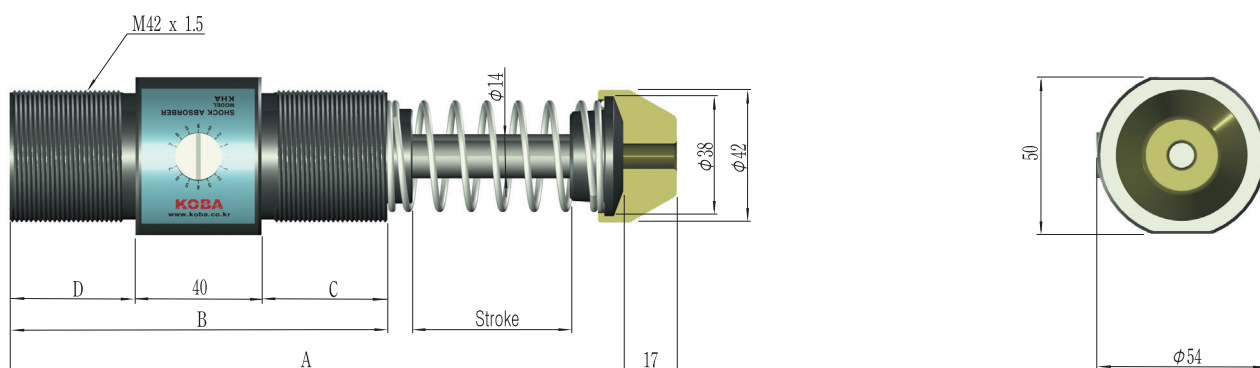
Adjusting Type

KHA42 Series

Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_TC</i>	Effective Weight (kg) <i>W_e</i>	Return Spring Force (N)		Weight (kg)	Thread
					Extension	Compression		
KHA42-25	25	250	125,000	36-3,600	28	56	1.25	M42×1.5
50	50	500	166,000	45-6,150	38	86	1.4	
75	75	750	200,000	54-9,500	32	88	1.6	

KHA42 Series

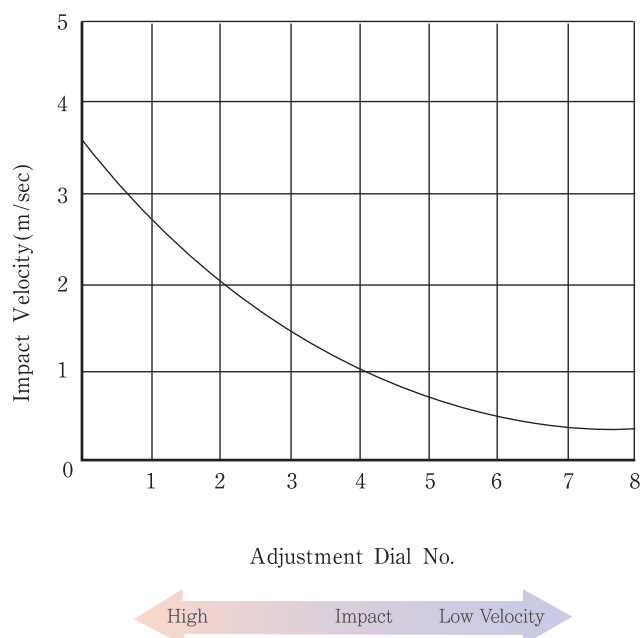


Dimension

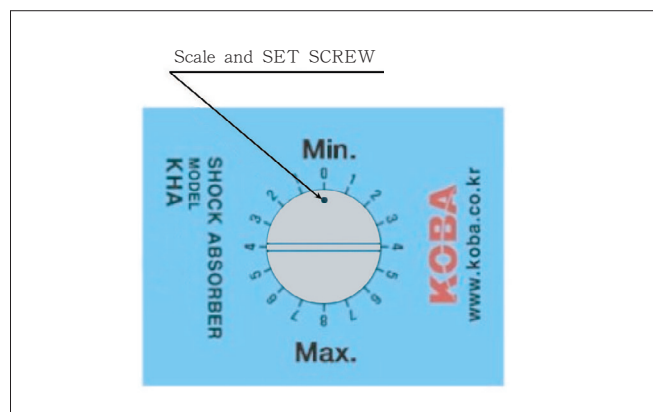
unit:mm

Model	Stroke (mm) <i>S</i>	A	B	C	D
KHA42-25	25	145	95	27	28
50	50	195	120	40	40
75	75	245	145	53	52

Useable Adjustment Setting Range

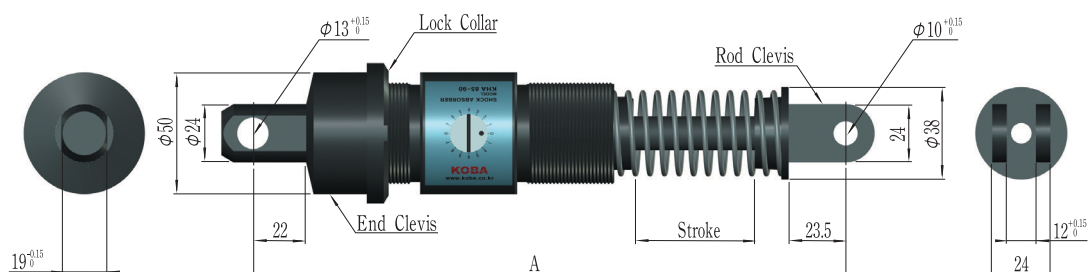


Adjusting Dial

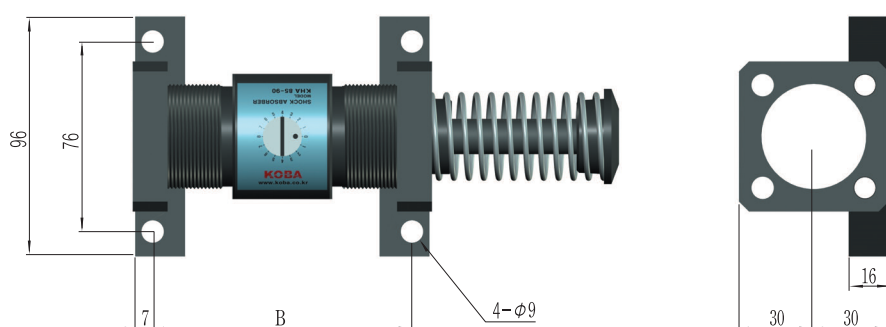


Hydraulic Shock Absorbers

Accessory



- Clevis Mount -



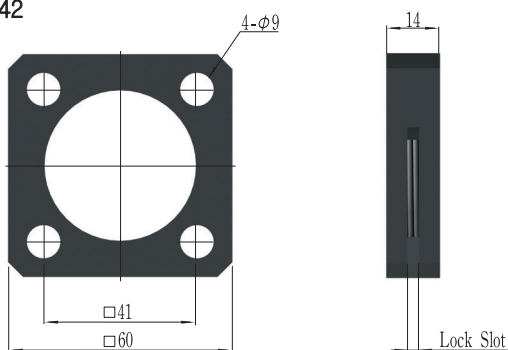
- Foot Mount -

Dimension

Model	Stroke	A	B
KHA42-25	25	200	81
50	50	250	106
75	75	300	131

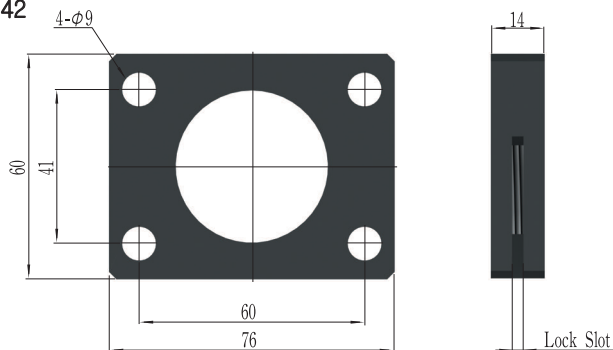
Accessory

SF42



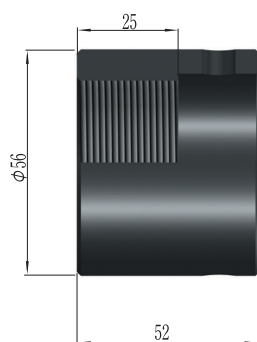
- Square Flange -

RF42



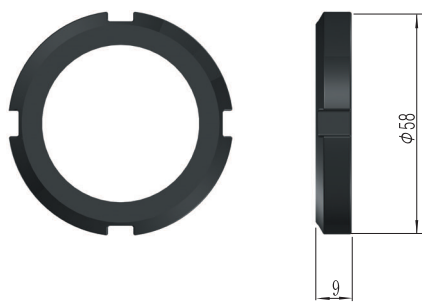
- Rectangular Flange -

SC42



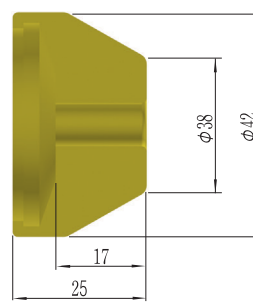
- Stop Collar -

LC42



- Lock Collar -

UC42



- Urethane Cap -

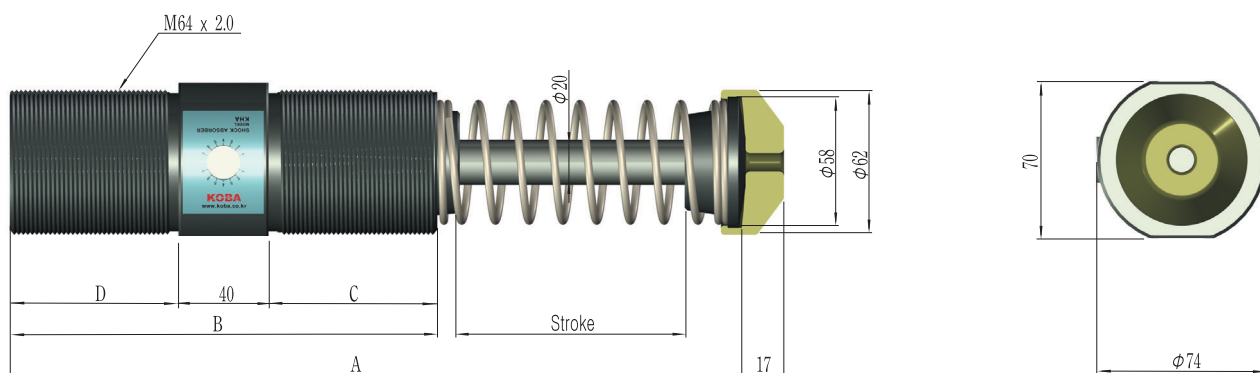
Adjusting Type

KHA64 Series

Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_TC</i>	Effective Weight (kg) <i>W_e</i>	Return Spring Force (N)		Weight (kg)	Thread
					Extension	Compression		
KHA64-50	50	1,300	270,000	82-12,600	65	148	3.7	M64×2.0
100	100	2,600	360,000	115-17,000	45	157	4.5	
150	150	3,900	420,000	140-22,000	47	199	5.3	

KHA64 Series

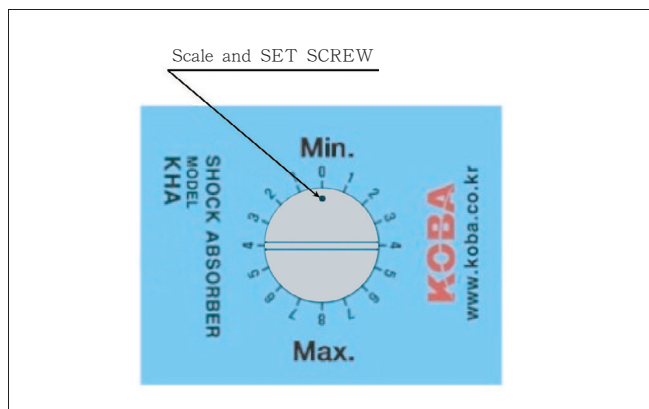


Dimension

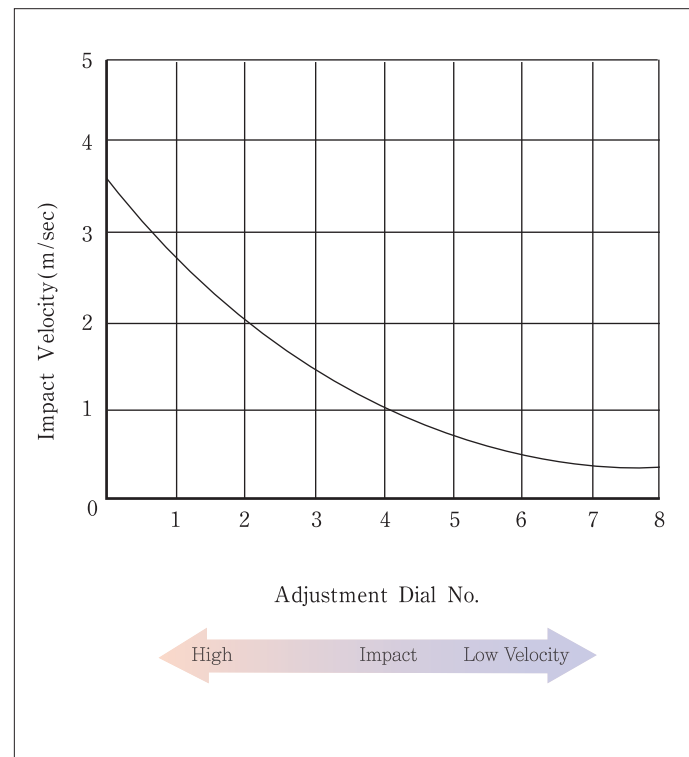
unit:mm

Model	Stroke (mm) <i>S</i>	A	B	C	D
KHA64-50	50	225	140	50	50
100	100	327	190	75	75
150	150	455	240	100	100

Adjusting Dial

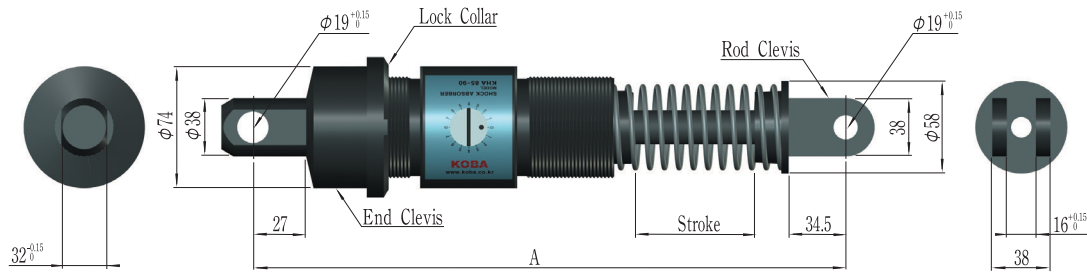


Useable Adjustment Setting Range



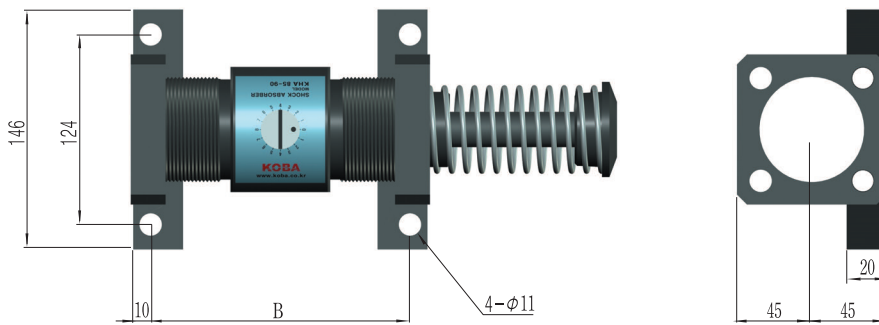
Hydraulic Shock Absorbers

Accessory



- Clevis Mount -

Dimension

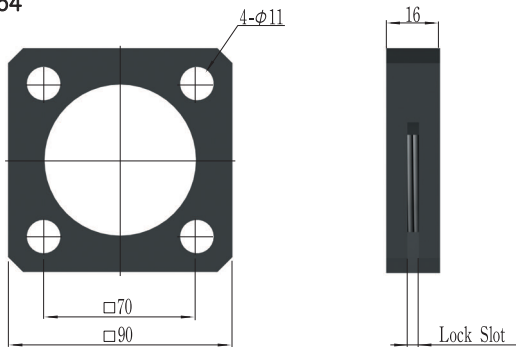


Model	Stroke	A	B
KHA64-50	50	305	120
100	100	409	170
150	150	534	220

- Foot Mount -

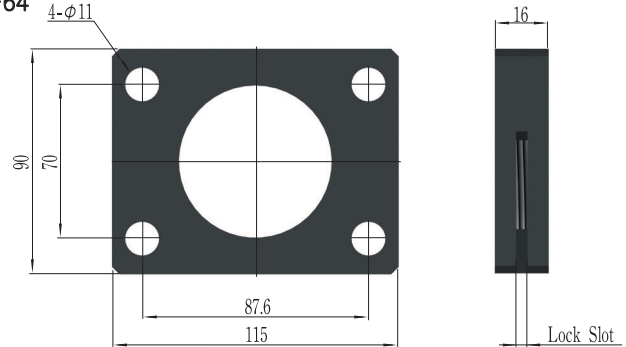
Accessory

SF64



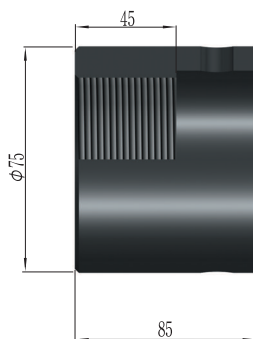
- Square Flange -

RF64



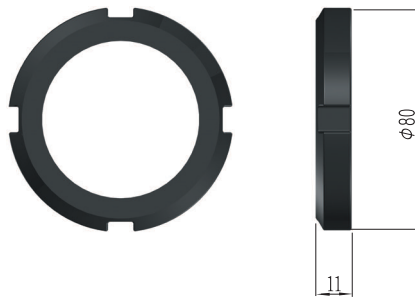
- Rectangular Flange -

SC64



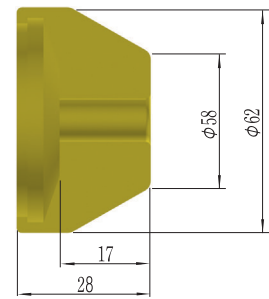
- Stop Collar -

LC64



- Lock Collar -

UC64



- Urethane Cap -

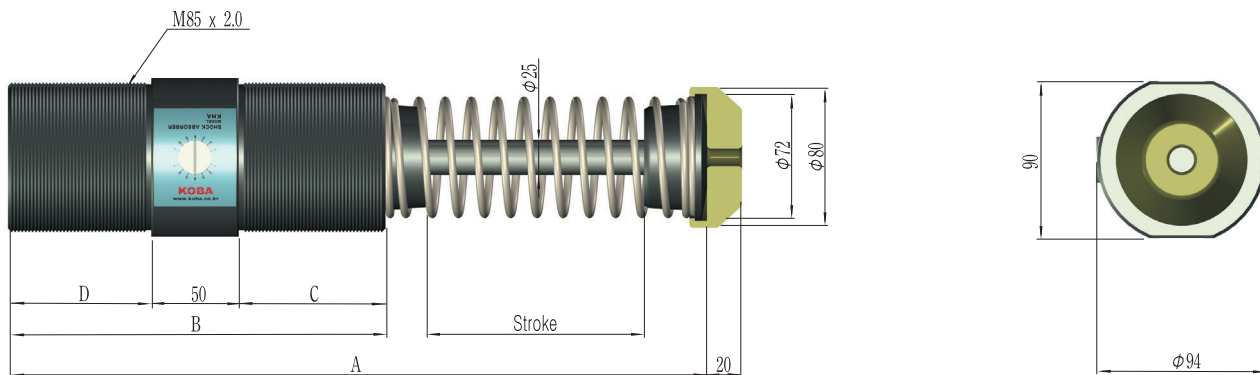
Adjusting Type

KHA85 Series

Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_TC</i>	Effective Weight (kg) <i>W_e</i>	Return Spring Force (N)		Weight (kg)	Thread
					Extension	Compression		
KHA85-50	50	2,300	370,000	200-37,000	148	315	6.4	M85×2.0
90	90	4,000	650,000	230-40,000	121	365	7.6	
125	125	5,700	930,000	300-43,000	102	191	8.6	
165	165	7,300	1,210,000	360-45,000	98	429	9.8	

KHA85 Series

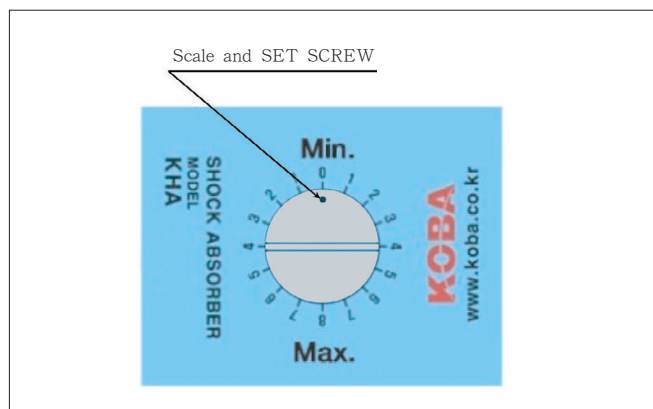


Dimension

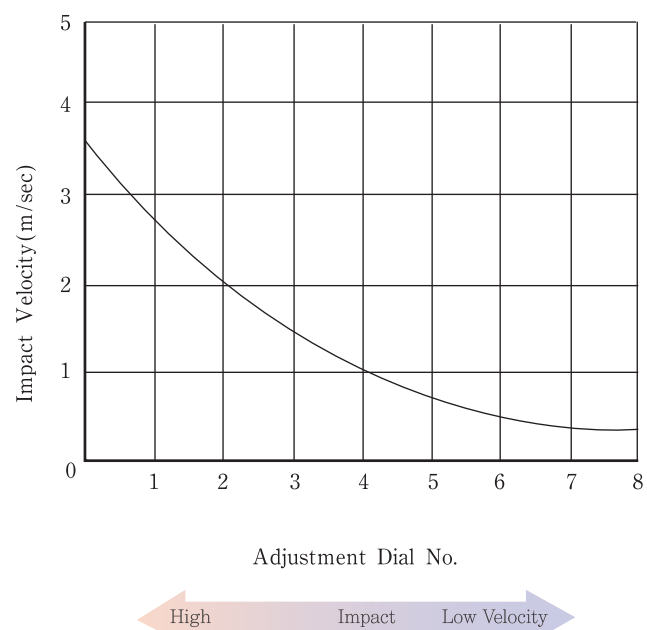
unit:mm

Model	Stroke (mm) <i>S</i>	A	B	C	D
KHA85-50	50	245	140	48	42
90	90	325	180	70	60
125	125	400	216	84	82
165	165	494	256	100	106

Adjusting Dial

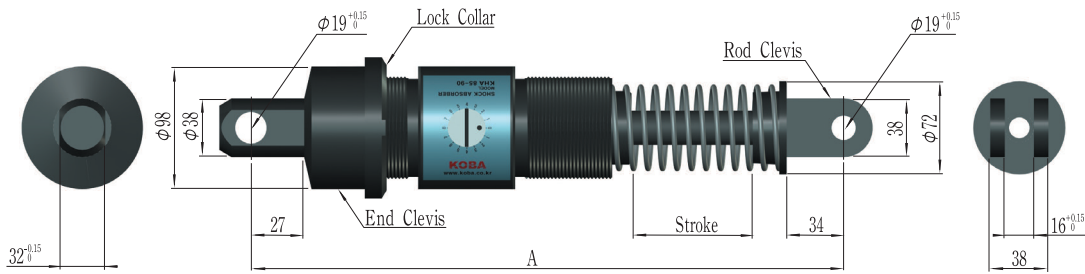


Useable Adjustment Setting Range



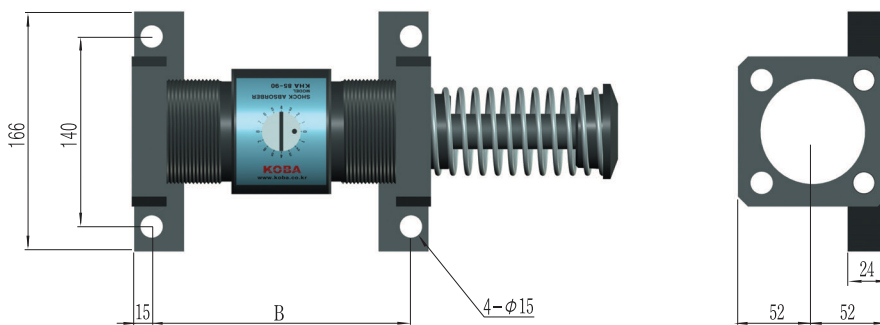
Hydraulic Shock Absorbers

Accessory



- Clevis Mount -

Dimension

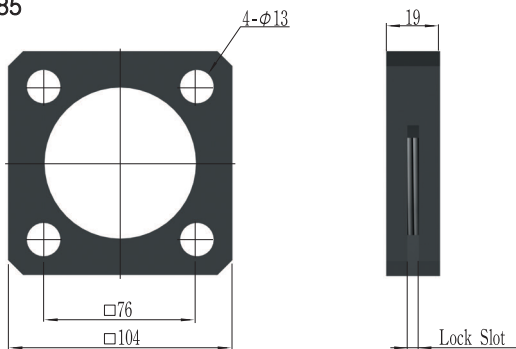


Model	Stroke	A	B
KHA85-50	50	325	110
90	90	405	150
125	125	480	185
165	165	575	225

- Foot Mount -

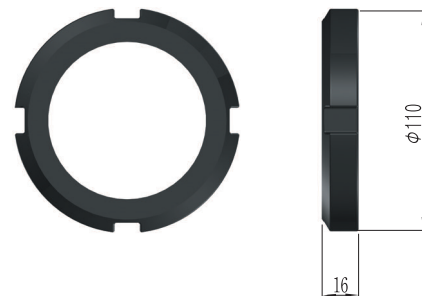
Accessory

SF85



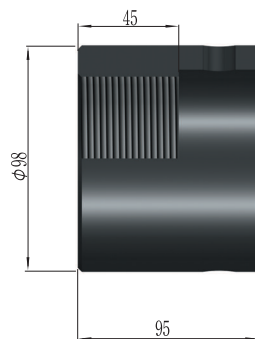
- Square Flange -

LC85



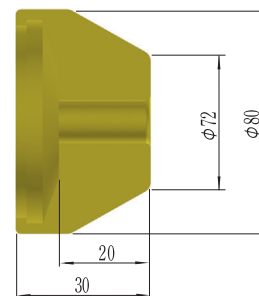
- Lock Collar -

SC85



- Stop Collar -

UC85



- Urethane Cap -

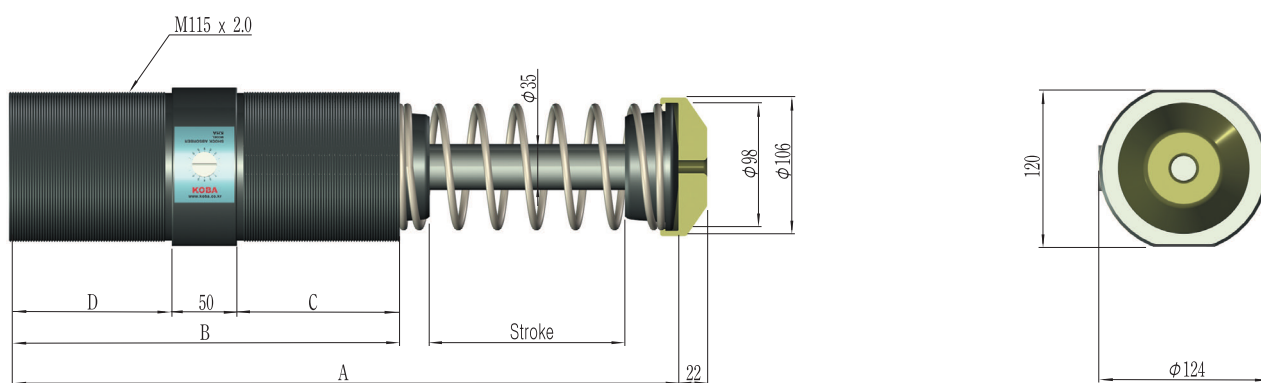
Adjusting Type

KHA115 Series

Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy / Cycle (Nm) <i>E_T</i>	Max Energy / Hour (Nm) <i>E_TC</i>	Effective Weight (kg) <i>W_e</i>	Return Spring Force (N)		Weight (kg)	Thread
					Extension	Compression		
KHA115-50	50	3,700	1,501,000	370-44,000	187	427	16	M115×2.0
100	100	7,400	1,805,000	370-57,000	178	482	19	
150	150	11,100	2,100,000	370-89,000	185	538	21	
200	200	14,800	2,405,000	390-118,000	185	665	31	
250	250	18,500	2,710,000	440-145,000	184	649	34	

KHA115 Series

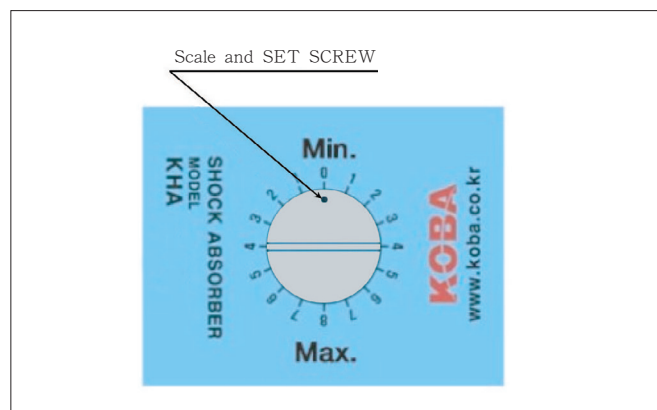


Dimension

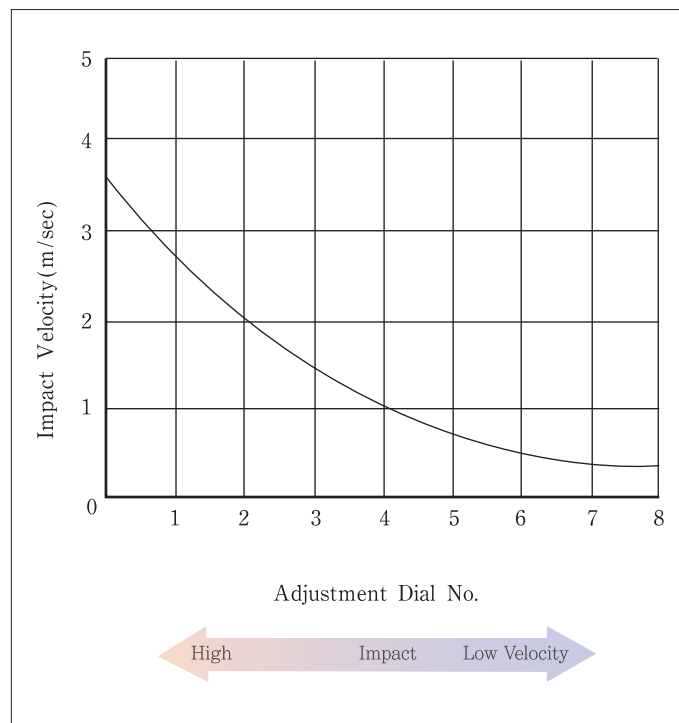
unit:mm

Model	Stroke (mm) <i>S</i>	A	B	C	D
KHA115-50	50	314	200	75	75
100	100	414	250	100	100
150	150	514	300	125	125
200	200	644	350	150	150
250	250	744	400	170	180

Adjusting Dial

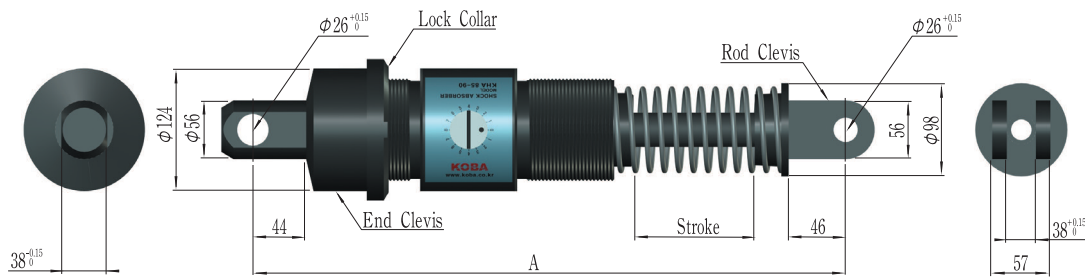


Useable Adjustment Setting Range



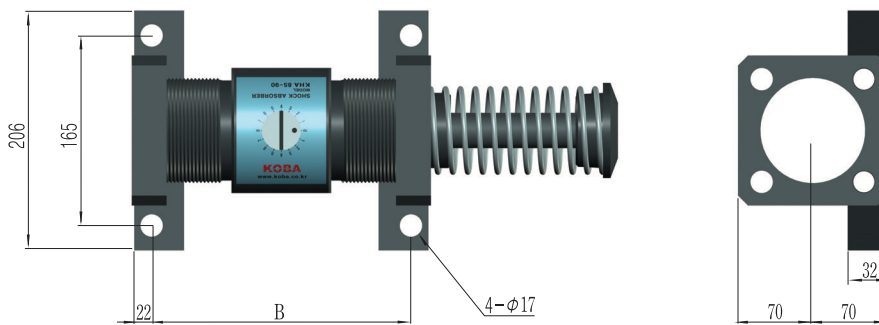
Hydraulic Shock Absorbers

Accessory



- Clevis Mount -

Dimension

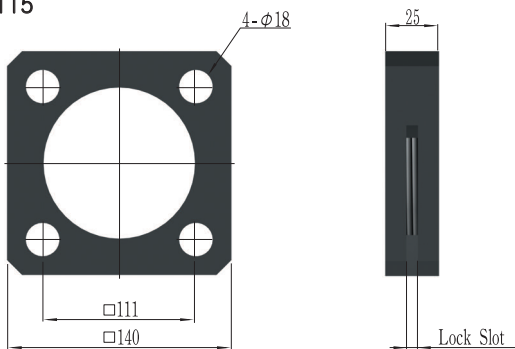


- Foot Mount -

Model	Stroke	A	B
KHA115-50	50	430	156
100	100	535	206
150	150	635	256
200	200	760	306
250	250	865	356

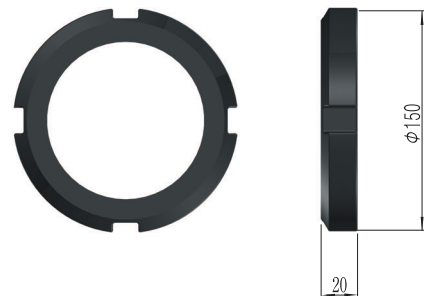
Accessory

SF115



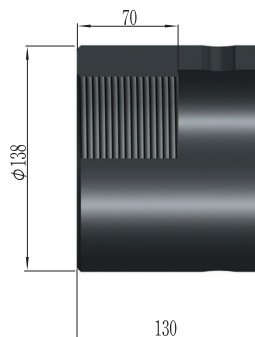
- Square Flange -

LC115



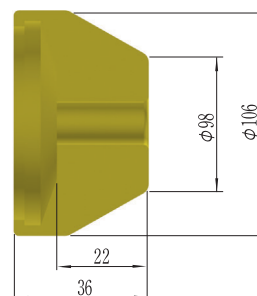
- Lock Collar -

SC115



- Stop Collar -

UC115

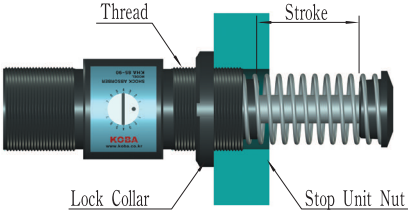
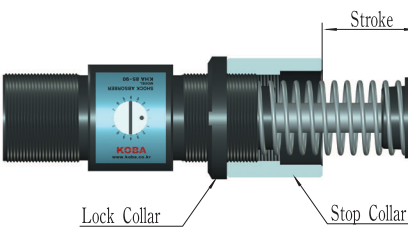
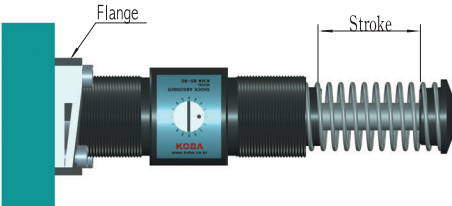
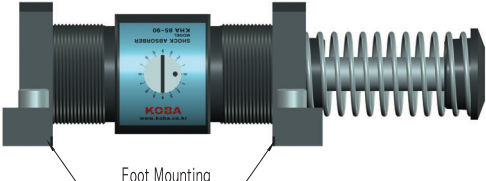
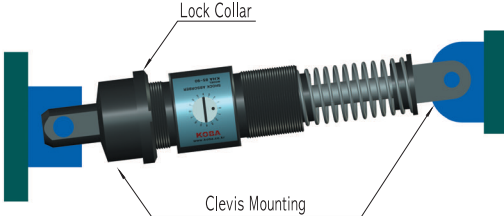


- Urethane Cap -

Adjusting Type

KHA Accessories Installation

Hydraulic Shock Absorbers

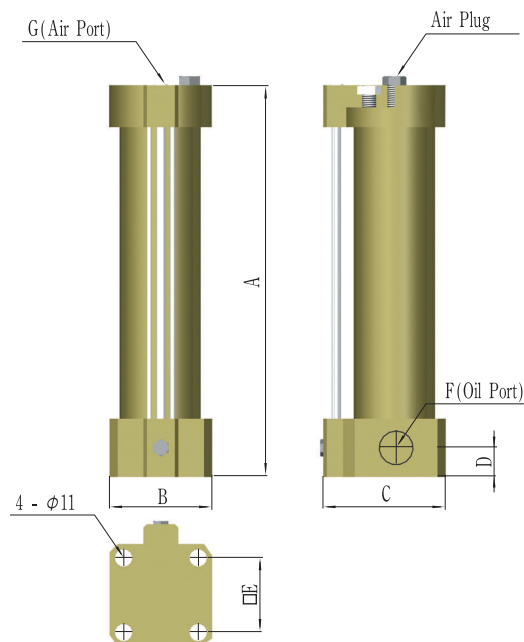
Accessories	Examples	비고
Lock Collar		Installation is simply done by fastening Lock Collar. This is basic installation.
Stop Collar + Lock Collar		Stop Collar guarantees accurate stopping and positioning and protects "Bottoming out" of Piston.
Flange Mount		Use to Square Flange or Rectangular Flange to conveniently fix Shock Absorber.
Foot Mount		Foot Mount is usually used in horizontal level and it is more convenient to use when the length of Shock Absorber is long.
Clevis Mount		Clevis Mount is used in Rotation movement to absorb the collision force indirectly and protect from unbalanced shock absorption.

Air Oil Tank & Check Valve Series

Properties

1) Air Oil Tank

- When the Air Oil Tank is used, it is more efficient to discharge the thermal energy in Shock Absorber. It makes the usage frequency per hour and lifetime of Shock Absorber increased. It also makes possible to control the returning velocity of Shock Absorber. When you use Air Oil Tank, it is not need to use Return spring.



- Operation Pressure : 3 ~ 7 bar (Max. 10bar)
- Operation Temperature : (-10~80℃)
- Usage법 : Fill the oil between 0 to L in the gauge of of Air Oil Tank.
- Precautions
 1. Air Oil Tank must be installed in higher position than Shock Absorber.
 2. Vent the air from the inside of device before operation.
 3. When you check the Air Oil Tank, you must remove the pressure from it by check valve.

Dimension

(unit) : mm

Model	A	B	C	D	E	F	G	H	APPLICABLE MODEL
KHO63-100	286	88	105	25	64	PT3/4	PT3/8	15	KHA42, KHA64 Series
KHO100-150	398	135	153	30	93	PT3/4	PT3/8	15	KHA85, KHA115 Series

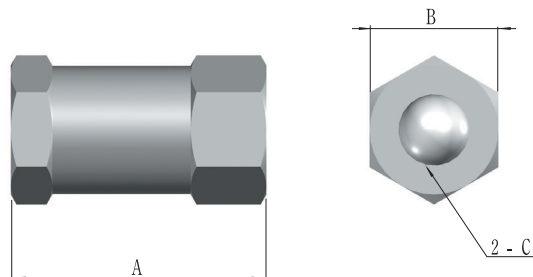
2) Check Valve

- Check Valve control the oil flow according to direction of oil between Shock Absorber and Air Oil Tank.

Dimension

단위(unit) : mm

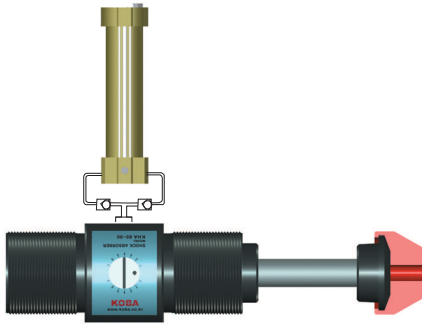
Model	A	B	C
KC 1/4	35	24	PT1/4
KC 3/8	35	24	PT3/8
KC 1/2	40	40	PT1/2
KC 3/4	60	48	PT3/4



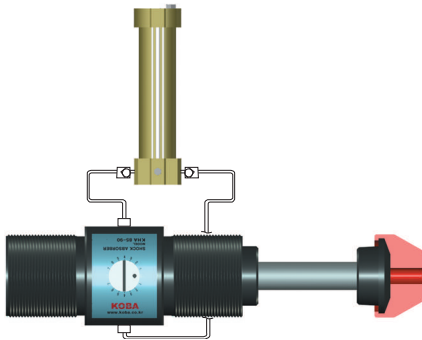
Adjusting Type

Application

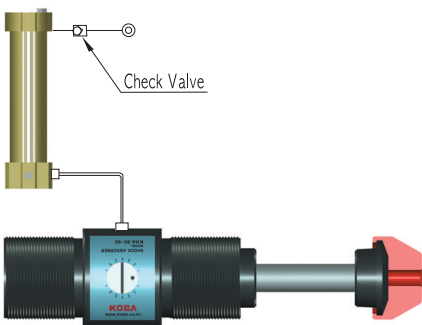
Hydraulic Shock Absorbers



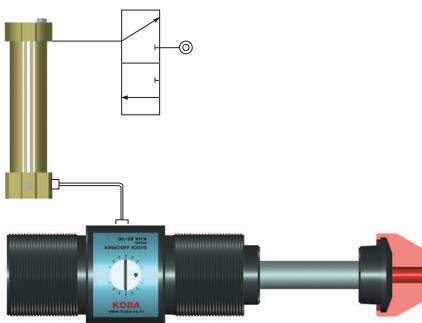
Consisted in cooling circuit as picture, heated oil will be delivered to the tank and fresh oil will be supplied to inside of Shock Absorber. It makes increase the energy capacity per hour.



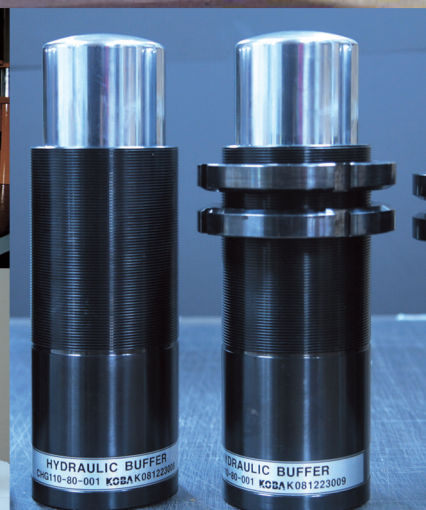
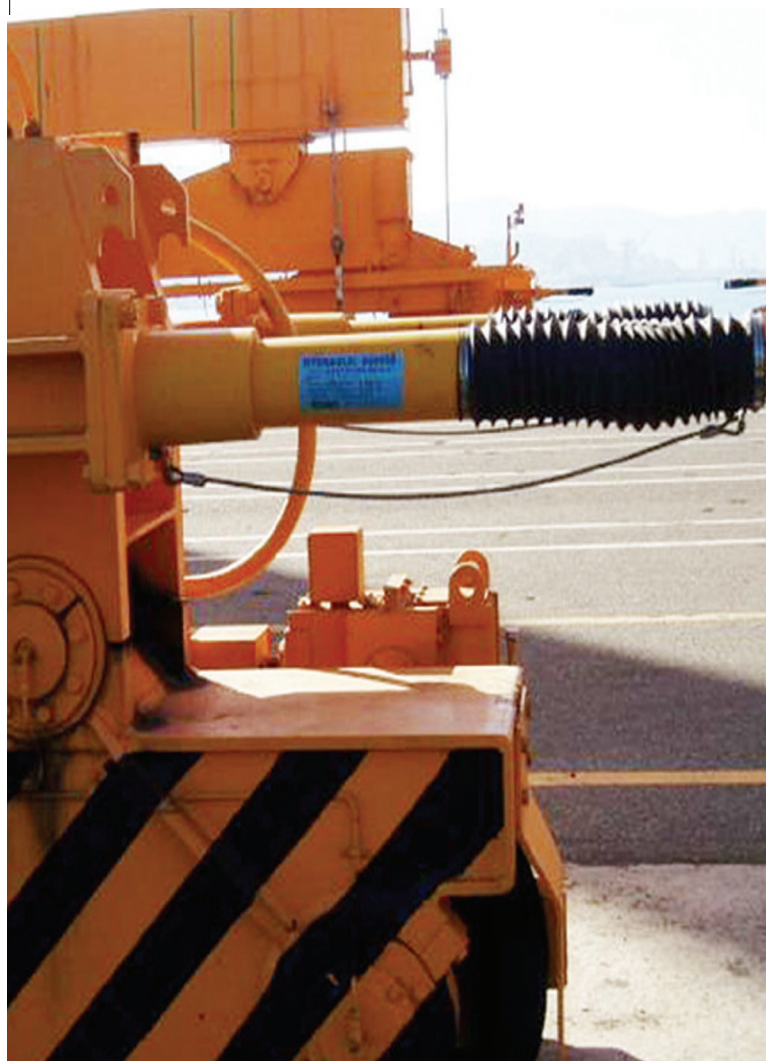
This cooling circuit is most efficient to discharge heat of oil located in shock Absorber.



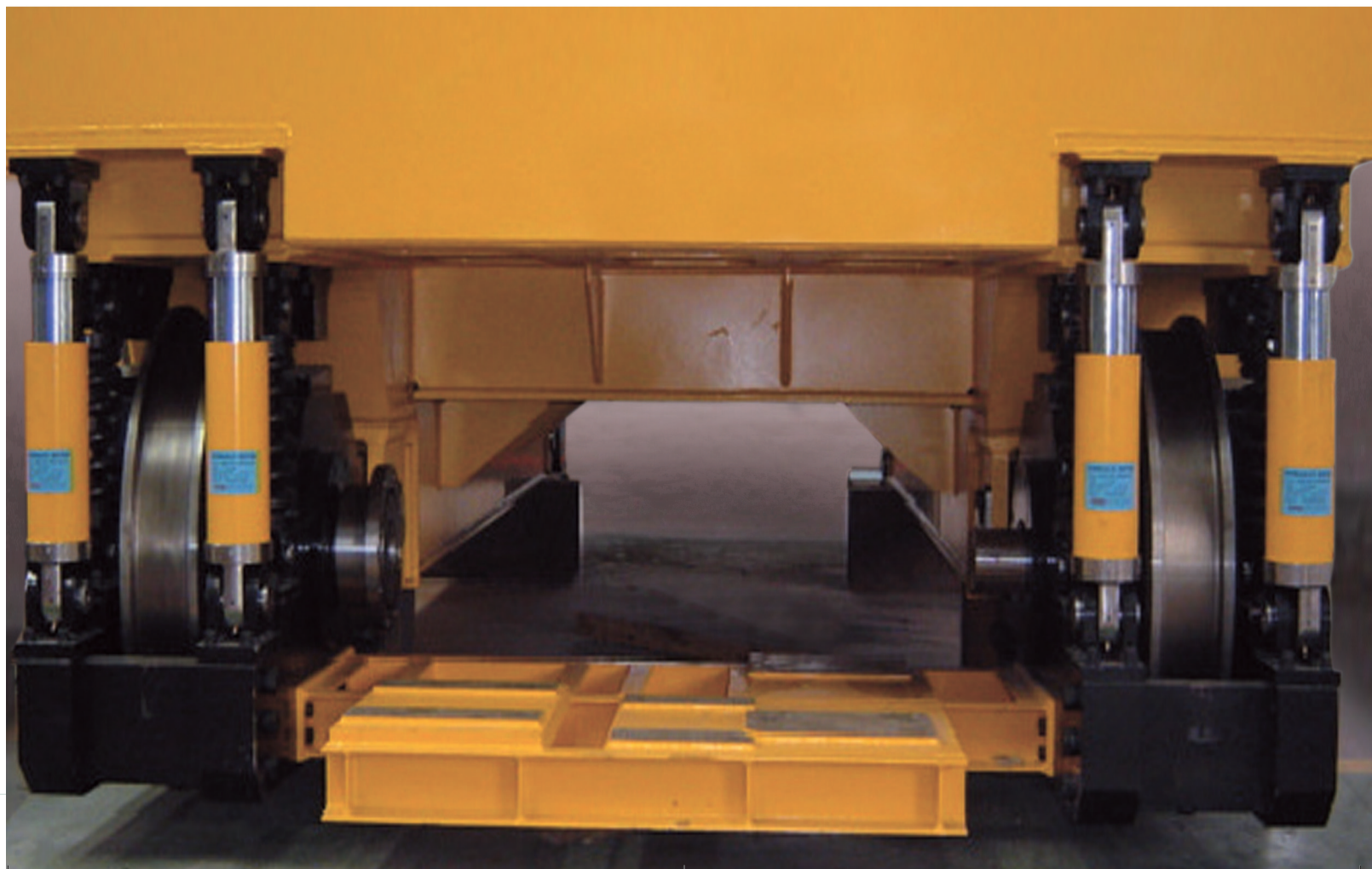
After operation of Shock Absorber, the Piston rod will be returned to the first stage immediately.



When you use Air valve in cooling circuit, it make the returning speed of Piston rod controlled.



Hydraulic Buffer



Heavy Duty



Property

KOBA Hydraulic Buffer Series for Heavy industries is large-capacity products. It protect your facilities and products from the impact during the moving. KOBA Hydraulic Buffer is made on the base of much experience and superior technology of KOBA. We have various reference list for Overseas and Domestic. We have good reputation from the various customers such as Heavy Industries, Steel Plant, Container Crane, Factory Automation Facilities, Railway, Distribution System Facilities, Transfer Car, Amusement Park Rides, Safety Device, etc. KOBA Hydraulic Buffer is met the Global Industries Safety Standards like OSHA, AISE, CMMA, DIIN, FEM. KOBA Hydraulic Buffer is self adjusting Type and has high Impact absorption efficiency over 85% because it designed and manufactured the orifice as the request of customer.



KHG Series



KHS Series

KOBA Hydraulic Buffer has various models for the range from 0.5kJ to720kJ.

We could supply special products to meet customer' s special requests for Impact velocity, the way how to control the weight, and the way how to install.

Hydraulic Buffer

Symbols

Symbol	Unit	Description
E_K	kJ	Kinetic Energy
E_W	kJ	Work Energy
E_T	kJ	Total Energy
E_TC	$kJ/hour$	Total Energy Absorbed per hour
F_M	kN	Maximum Buffer Force
V	m/sec	Impact Velocity
V_E	m/sec	Effective Velocity
S	m	Buffer Stroke
S_D	m/sec^2	Deceleration
C	$Cycle/hour$	Cycle per Hour
H	m	Drop Height
P	kW	Motor Power
g	m/sec^2 ($9.8m/sec^2$)	Acceleration
n	—	Min. Efficiency

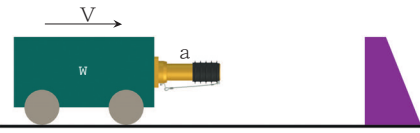
• $1Nm = 1J$, $1MPa = 10bar = 10.2kg/cm^2$, $1g = 9.8m/sec^2$

Formula

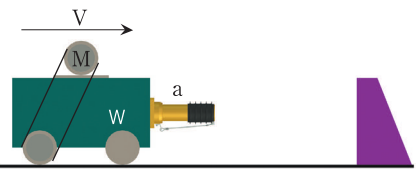
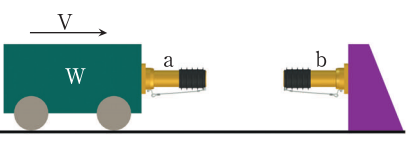
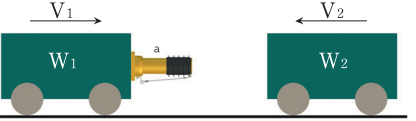
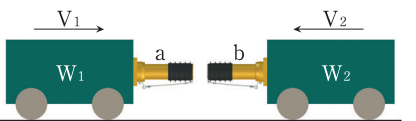
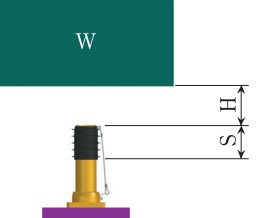
$$E_K = \frac{W \cdot V^2}{2} \quad E_TC = E_T \cdot C \quad E_W = F \times S \quad E_T = E_K + E_W \quad F_M = \frac{E_T}{S \cdot 0.8} \quad S_D = \frac{V_E^2}{2 \cdot S \cdot 0.8} \quad S \geq \frac{V^2}{2 \cdot S_D \cdot 0.8}$$

• Refer to Page 21 in Catalog related "F" (Propelling Force) Formulae.

Case of Application

Moving Weight	Example	Buffer Model	
a) $V = 0.6m/sec$ $W = 80ton$	$E_K = \frac{W \cdot V^2}{2} = \frac{80 \times 0.6^2}{2} = 14.4kJ$ $E_T = E_K$ $F_M = \frac{E_T}{S \cdot 0.8} = \frac{14.4}{0.1 \times 0.8} = 180kN$ $V_E = 0$ $S_D = \frac{V^2}{2 \cdot S \cdot 0.8} = \frac{0.6^2}{2 \times 0.1 \times 0.8} = 2.25m/sec^2$ $S = \frac{V^2}{2 \cdot S_D \cdot 0.8} = \frac{0.6^2}{2 \times 2.25 \times 0.8} = 0.1m = 100mm$	Temporary Selection Model	KHG85-100 Stroke : 100
		Final Model	KHG85-100

Heavy Duty

Moving Weight	Example	Buffer Model	
b) $V = 1.2\text{m/sec}$ $W = 200\text{ton}$ $P = 20\text{kW}$ 	$E_K = \frac{W \cdot V^2}{2} = \frac{200 \times 1.2^2}{2} = 144\text{kJ}$ $F = \frac{2.5 \cdot P}{V} = \frac{2.5 \times 20}{1.2} = 41.7\text{kJ}$ $E_W = F \cdot S = 41.7 \times 0.3 = 12.5\text{kJ}$ $E_T = E_K + E_W = 144 + 12.5 = 156.5\text{kJ}$ $F_M = \frac{E_T}{S \cdot 0.8} = \frac{156.5}{0.3 \times 0.8} = 652\text{kN}$	Temporary Selection Model	KHG140-300 Stroke : 300
		Final Model	KHG140-300 or KHS250-300
c) $V = 1.8\text{m/sec}$ $W = 150\text{ton}$ 	$E_K = \frac{0.5 \cdot W \cdot V^2}{2} = \frac{0.5 \cdot 150 \cdot 1.8^2}{2} = 121.5\text{kJ}$ $E_T = E_K$ $F_M = \frac{E_T}{S \cdot 0.8} = \frac{121.5}{0.3 \times 0.8} = 506.3\text{kN}$ $V_E = \frac{V}{2} = \frac{1.8}{2} = 0.9\text{m/sec}$ $S_D = \frac{V_E^2}{2 \cdot S \cdot 0.8} = \frac{0.9^2}{2 \times 0.3 \times 0.8} = 1.68\text{m/sec}^2$	Temporary Selection Model	KHG140-300 Stroke : 300
		Final Model	KHG140-300 or KHS250-300
d) $V_1 = 1.0\text{m/sec}$ $W_1 = 180\text{ton}$ $V_2 = 0.6\text{m/sec}$ $W_2 = 250\text{ton}$ 	$E_K = \frac{W_1 \cdot W_2 (V_1 + V_2)^2}{2(W_1 + W_2)} = \frac{180 \times 250 (1.0 + 0.6)^2}{2(180 + 250)} = 133.95\text{kJ}$ $E_T = E_K$ $F_M = \frac{E_T}{S \cdot 0.8} = \frac{133.95}{0.5 \times 0.8} = 418.60\text{kN}$ $V_E = V_1 + V_2 = 1.0 + 0.6 = 1.6\text{m/sec}$ $S_D = \frac{V_E^2}{2 \cdot S \cdot 0.8} = \frac{1.6^2}{2 \times 0.4 \times 0.8} = 4.00\text{m/sec}^2$	Temporary Selection Model	KHG120-400 Stroke : 400
		Final Model	KHG120-400 or KHS250-300
e) $V_1 = 1\text{m/sec}$ $W_1 = 220\text{ton}$ $V_2 = 0.7\text{m/sec}$ $W_2 = 260\text{ton}$ 	$E_K = \frac{W_1 \cdot W_2 (V_1 + V_2)^2}{4(W_1 + W_2)} = \frac{220 \times 260 (1 + 0.7)^2}{4(220 + 260)} = 86\text{kJ}$ $E_T = E_K$ $F_M = \frac{E_T}{S \cdot 0.8} = \frac{86}{0.2 \times 0.8} = 537.5\text{kN}$ $V_E = \frac{V_1 + V_2}{2} = \frac{1 + 0.7}{2} = 0.85\text{m/sec}$ $S_D = \frac{V_E^2}{2 \cdot S \cdot 0.8} = \frac{0.85^2}{2 \times 0.2 \times 0.8} = 2.25\text{m/sec}^2$	Temporary Selection Model	KHG120-200 Stroke : 200
		Final Model	KHG120-200 or KHS250-150
f) $H = 0.4\text{m}$ $W = 2.5\text{ton}$ 	$E_K = g \cdot W \cdot H = 9.81 \times 2.5 \times 0.4 = 9.81\text{kJ}$ $E_W = W \cdot g \cdot S = 2.5 \times 9.81 \times 0.15 = 3.67\text{kJ}$ $E_T = E_K + E_W = 9.81 + 3.67 = 13.48\text{kJ}$ $V = \sqrt{2 \cdot g \cdot H} = \sqrt{2 \times 9.81 \times 0.4} = 2.8\text{m/sec}$ $F_M = \frac{E_T}{S \cdot 0.8} = \frac{13.48}{0.15 \times 0.8} = 112.33\text{kN}$	Temporary Selection Model	KHG85-150 Stroke : 150
		Final Model	KHG85-150

Hydraulic Buffer KHG Series

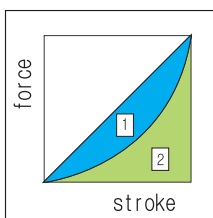
Properties

KHG Series is large-capacity products that satisfy higher energy absorption with hydraulic pressure and nitrogen gas to work together to buffer collision of heavy moving load. The multiple orifice inside is customized to fit customer requirements for maximum buffer efficiency.

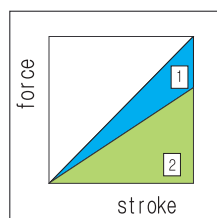
- Adjustment : Self Adjusting type
- Filling : Oil + N₂ Gas
- Operation Temperature : Standard (−10~80℃)
Special (−30~100℃)
- Return : N₂ Gas
- Piston Rod : Hard Chrome plating(Over 25 μm)
- Body and Mount : Epoxy Paint Coatings
- Application : Container Crane, Overhead Crane, Stacker Crane, Railway, Transfer Car, Amusement Rides,
Safety Device, Steel plant facilities.

Principle

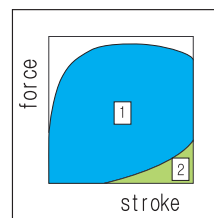
1. When the moving load is collided to Bumper Head, the Piston rod enters inner Tube according to stroke and Check Valve is closed with the Oil chamber compressed.
2. The oil in chamber is absorbed the impact force by discharging through Multiple Orifice.
3. Also Piston rod inside Body makes the oil push Chamber piston to compress Gas chamber according to stroke so the oil mutually interacts with Nitrogen gas to absorb shock efficiently and smoothly.
4. After Absorption of impact, compressed Gas chamber deliver the force to Oil chamber and the Check Valve open so The Piston rod is returned.



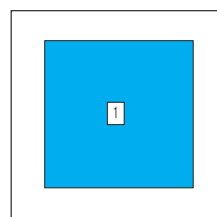
Rubber Damping
1. Low damping
2. High spring



Spring Damping
1. Low damping
2. High spring

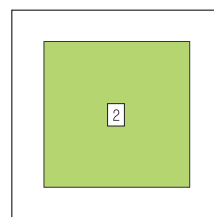


Hydraulic Buffer
1. Maximum damping
2. Low gas spring



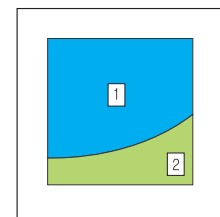
Oil damping energy

+



Gas spring energy

=



Total buffer energy

Heavy Duty

Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy Buffer/Stroke (kj) <i>E_k</i>	Max Energy Absorption/Hour (kj/h) <i>E_TC</i>	Max Buffer Force (kN) <i>F_m</i>	Static Reset		Max Side Load Angle(°)		Weight (Kg)	Page
					Extend(kN)	Compression(kN)	R Type	F Type		
KHG65-25	25	2	100	100	1.0	3.2	3.5	3.5	6	74
-50	50	4	200	100		4.7	3.5	3.5	7	
-75	75	6	300	100		5.3	3.0	3.0	8	
-100	100	8	400	100		6.6	3.0	3.0	9	
-125	125	10	500	100		6.6	2.5	2.5	10	
-150	150	12	600	100		6.6	2.0	2.0	11	
-200	200	16	800	100		9.0	2.0	2.0	12	
KHG85-50	50	8	600	200	1.5	10	4.0	3.5	12	75
-100	100	16	1,200	200		13	3.0	3.0	15	
-150	150	24	1,800	200		17	2.0	2.0	18	
-200	200	32	2,400	200		19	1.8	1.5	20	
-250	250	40	2,850	200		20	1.5	1.2	22	
KHG100-50	50	11	750	280	2.4	16	5.0	4.0	17	76
-80	80	18	1,200	280		16	4.5	4.0	20	
-100	100	23	1,600	280		16	5.0	4.0	25	
-120	120	27	1,800	280		20	4.5	3.5	27	
-150	150	34	2,300	280		20	4.5	3.5	28	
-200	200	46	3,100	280		20	4.0	3.0	34	
-250	250	58	3,600	280		25	3.5	2.5	39	
-300	300	69	4,200	280		25	3.0	2.0	43	
-400	400	90	5,400	280		25	2.5	2.0	49	
-500	500	110	6,600	275		25	2.5	2.0	55	
-600	600	125	7,200	260		25	2.0	1.5	62	
-800	800	140	7,900	210		25	2.0	1.5	73	
KHG120-100	100	45	2,900	570	3.5	38	4.0	4.5	41	77
-150	150	70	4,400	570		38	4.0	3.5	48	
-200	200	92	5,800	570		38	3.5	3.5	58	
-250	250	114	7,200	570		40	3.0	3.0	65	
-300	300	130	8,500	450		40	3.0	2.5	72	
-400	400	160	10,000	450		40	2.5	2.0	78	
-500	500	180	11,500	450		40	2.0	1.5	86	
-600	600	200	12,800	450		40	2.0	1.5	95	
-800	800	240	13,600	375		40	2.0	1.3	112	
-1000	1000	280	14,500	350		40	2.0	1.3	118	

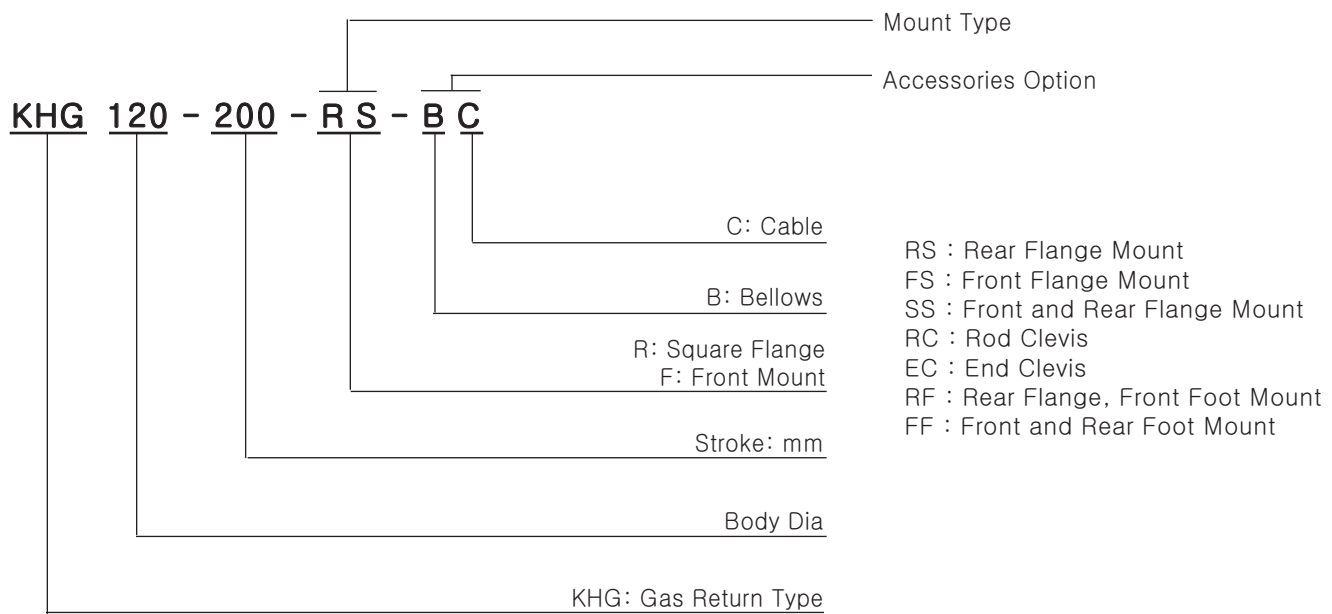
Hydraulic Buffer

Engineering Data

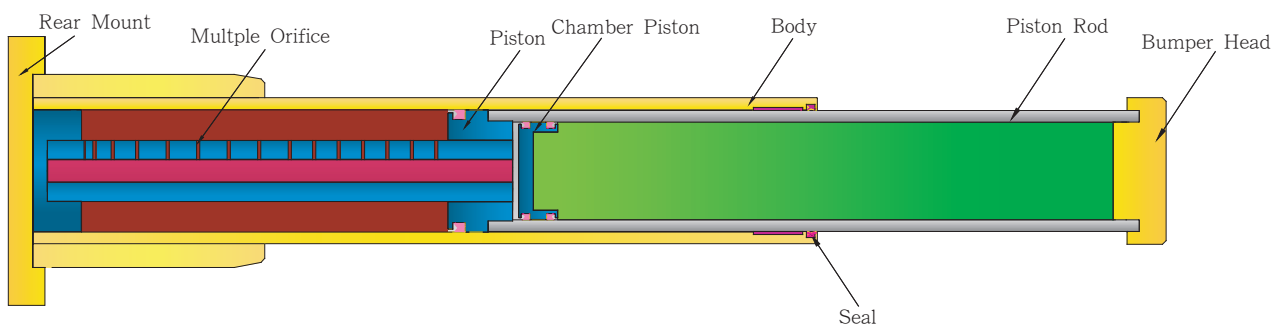
Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) Ek	Max Energy Absorption/Hour (kJ/h) EtC	Max Buffer Force (kN) Fm	Static Reset		Max Side Load Angle(°)		Weight (Kg)	Page
					Extend(kN)	Compression(kN)	R Type	F Type		
KHG130-250	250	120	8,200	550	4.5	40	4.5	4.0	85	78
-300	300	140	9,600	550		40	4.5	4.0	92	
-400	400	180	12,000	550		50	4.0	3.5	106	
-500	500	220	15,000	550		50	3.5	3.5	118	
-600	600	260	17,800	550		50	2.0	1.5	127	
-800	800	300	19,000	460		50	2.0	1.5	148	
KHG140-100	100	62	3,800	760	5.5	38	4.5	4.0	60	79
-150	150	91	5,800	760		65	4.5	4.0	72	
-200	200	124	9,800	730		70	4.0	3.5	85	
-300	300	175	12,000	730		70	3.5	2.5	110	
-400	400	234	15,000	730		78	2.5	1.5	135	
-500	500	270	17,000	680		78	2.0	1.3	150	
-600	600	300	20,000	630		78	2.0	1.3	160	
-800	800	325	25,000	510		78	2.0	1.3	185	
-1000	1000	360	27,500	450		78	1.6	1.2	200	
KHG150-100	100	70	4,000	880	6.2	45	4.0	4.5	77	80
-200	200	136	7,200	850		75	4.0	3.5	90	
-300	300	183	13,000	770		75	3.5	3.5	135	
-400	400	243	13,500	760		75	3.0	3.0	146	
-500	500	285	17,400	710		85	3.0	2.5	166	
-600	600	323	21,000	670		85	2.5	2.0	176	
-800	800	367	25,600	580		85	2.0	1.5	220	
-1000	1000	410	28,000	330		85	2.0	1.5	253	
KHG180-100	100	80	4,500	980	8	75	4.5	4.0	110	81
-200	200	160	10,000	980		80	4.5	4.0	126	
-250	250	200	12,800	980		80	4.5	4.0	140	
-400	400	280	14,500	880		90	4.5	4.0	168	
-500	500	350	18,000	880		100	4.0	3.5	198	
-600	600	430	23,000	890		100	3.5	3.0	235	
-800	800	570	27,000	890		100	3.0	2.5	295	
-1000	1000	720	29,000	890		110	2.5	2.0	360	

Heavy Duty

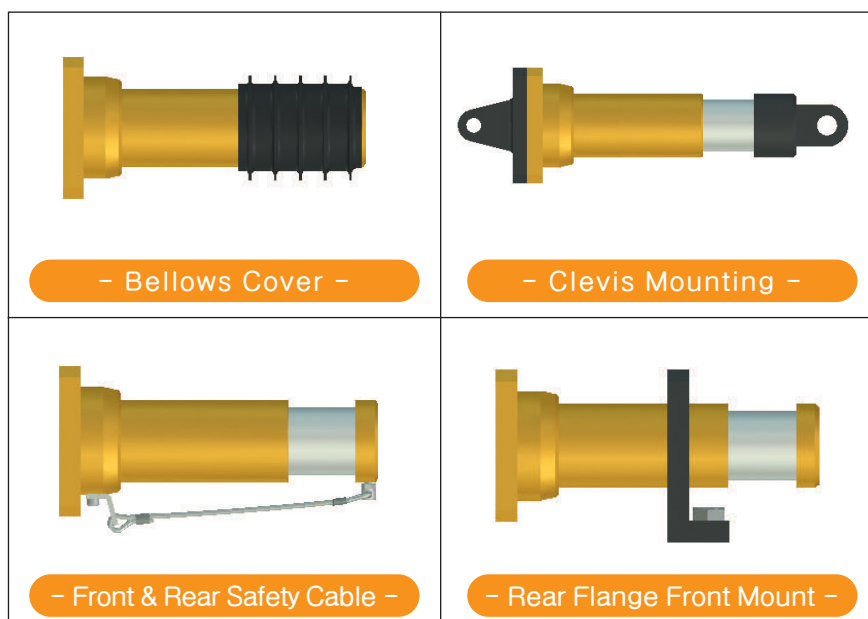
KHG, KHS Series Ordering Information



KHG Series Internal Structure



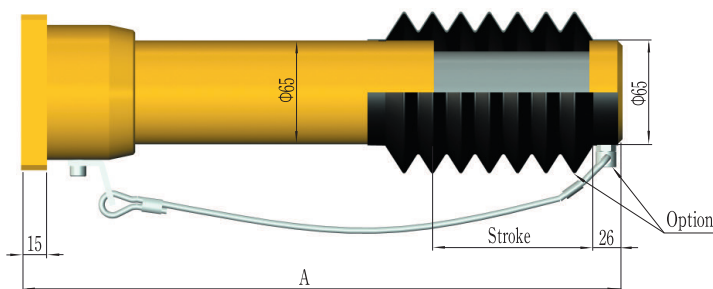
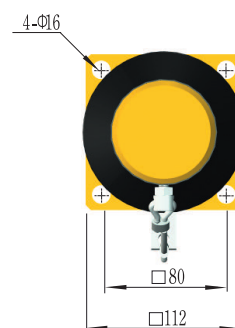
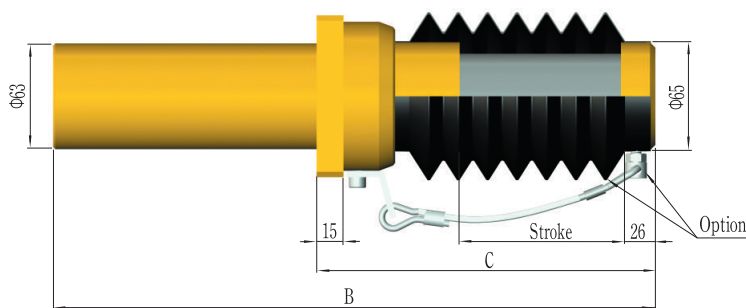
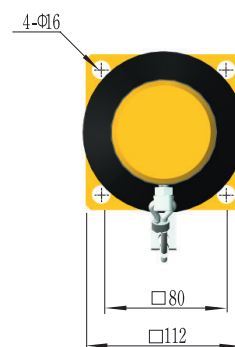
Accessory and Special Designs



- Temperature : $-30\sim 100^{\circ}\text{C}$
- Special Coating
- Body Chrome Plating
- Stainless Steel

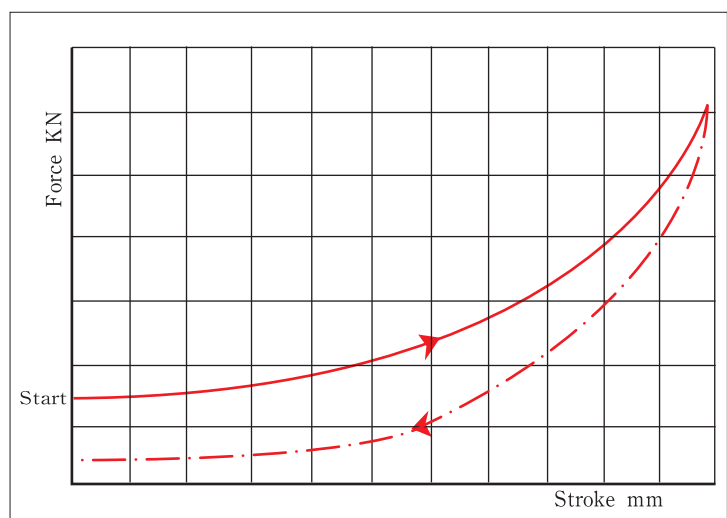
KHG65 Series**Hydraulic Buffer****Engineering Data**

Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) E _T	Max Energy Absorption/Hour (kJ/h) E _{TC}	Max Buffer Force (kN) F _m	Repulsion Force		Max Side Load Angle(°)		Weight (Kg)
					Extend(kN)	Compression(kN)	R Type	F Type	
KHG65-25	25	2	100	100	1.0	3.2	3.5	3.5	6
-50	50	4	200	100		4.7	3.5	3.5	7
-75	75	6	300	100		5.3	3.0	3.0	8
-100	100	8	400	100		6.6	3.0	3.0	9
-125	125	10	500	100		6.6	2.5	2.5	10
-150	150	12	600	100		6.6	2.0	2.0	11
-200	200	16	800	100		9.0	2.0	2.0	12

KHG65 Series**- Rear Mount -****- Rear Mount Flange -****- Front Mount -****- Front Mount Flange -****Dimension**

unit:mm

Model	Stroke (mm) S	Rear Type	Front Type		Mounting Bolt Size
		A	B	C	
KHG65-25	25	262	250	126	14
-50	50	312	300	151	
-75	75	372	360	176	
-100	100	432	420	231	
-125	125	497	485	256	
-150	150	552	540	281	
-200	200	672	660	371	

Gas Room Static Diagram

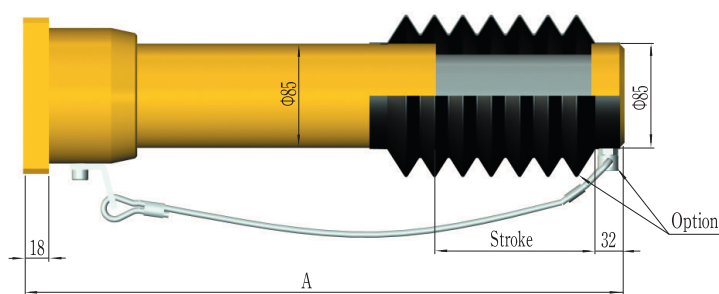
Self-Adjusting Type

KHG85 Series

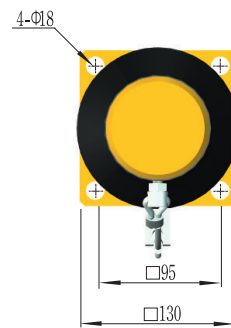
Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy Buffer/Stroke (kJ) <i>E_T</i>	Max Energy Absorption/Hour (kJ/h) <i>E_TC</i>	Max Buffer Force (kN) <i>F_m</i>	Repulsion Force		Max Side Load Angle(°)		Weight (Kg)
					Extend(kN)	Compression(kN)	R Type	F Type	
KHG85-50	50	8	600	200	1.5	10	4.0	3.5	12
-100	100	16	1,200	200		13	3.0	3.0	15
-150	150	24	1,800	200		17	2.0	2.0	18
-200	200	32	2,400	200		19	1.8	1.5	20
-250	250	40	2,850	200		20	1.5	1.2	22

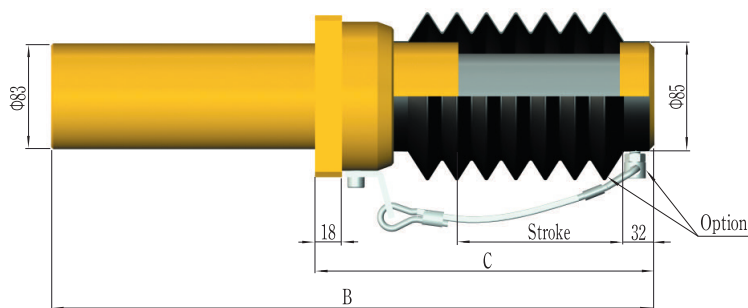
KHG85 Series



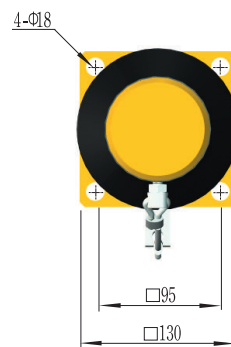
- Rear Mount -



- Rear Mount Flange -



- Front Mount -



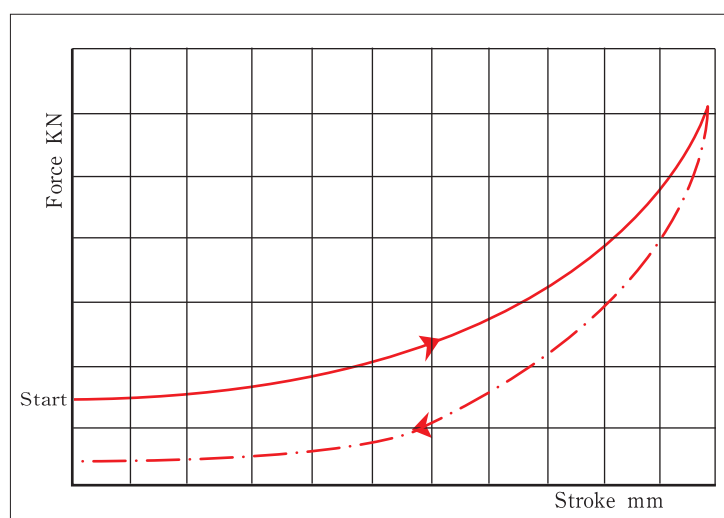
- Front Mount Flange -

Dimension

unit:mm

Model	Stroke (mm) <i>S</i>	Rear Type	Front Type		Mounting Bolt Size
		A	B	C	
KHG85-50	50	323	310	183	16
-100	100	463	450	242	
-150	150	603	590	305	
-200	200	743	730	367	
-250	250	883	870	430	

Gas Room Static Diagram



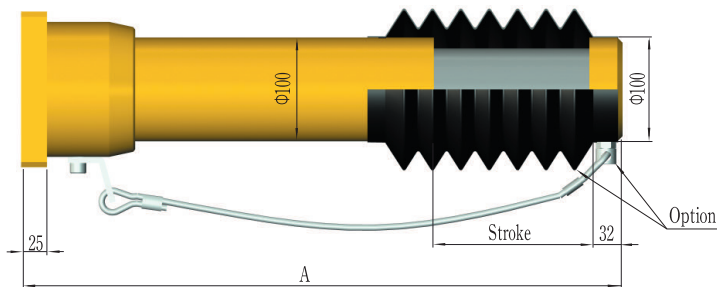
KHG100 Series

Hydraulic Buffer

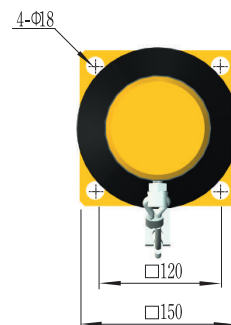
■ Engineering Data

Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) E _T	Max Energy Absorption/Hour (kJ/h) E _{TC}	Max Buffer Force (kN) F _m	Repulsion Force		Max Side Load Angle(°)		Weight (Kg)
					Extend(kN)	Compression(kN)	R Type	F Type	
KHG100-50	50	11	750	280	2.4	16	5.0	4.0	17
-80	80	18	1,200	280		16	4.5	4.0	20
-100	100	23	1,600	280		16	5.0	4.0	25
-120	120	27	1,800	280		20	4.5	3.5	27
-150	150	34	2,300	280		20	4.5	3.5	28
-200	200	46	3,100	280		20	4.0	3.0	34
-250	250	58	3,600	280		25	3.5	2.5	39
-300	300	69	4,200	280		25	3.0	2.0	43
-400	400	90	5,400	280		25	2.5	2.0	49
-500	500	110	6,600	275		25	2.5	2.0	55
-600	600	125	7,200	260		25	2.0	1.5	62
-800	800	140	7,900	210		25	2.0	1.5	73

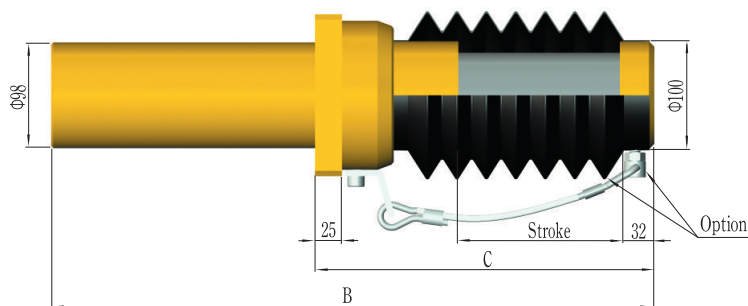
KHG100 Series



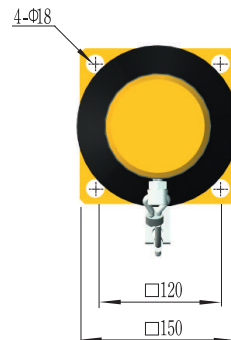
- Rear Mount -



- Rear Mount Flange -



- Front Mount -



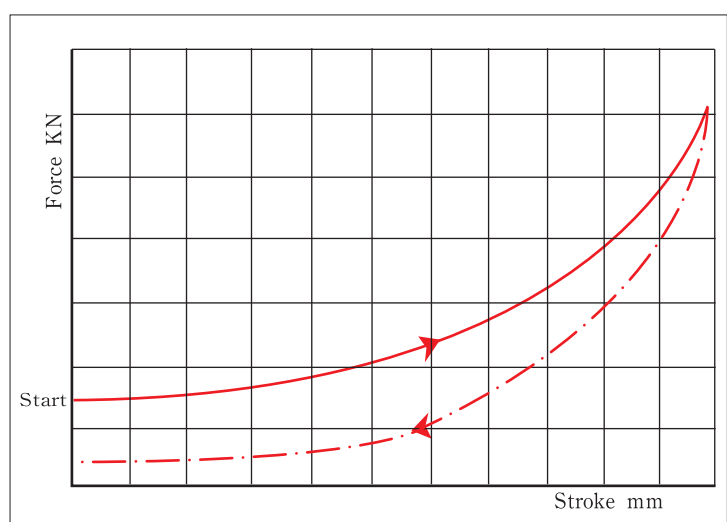
- Front Mount Flange -

■ Dimension

unit:mm

Model	Stroke <i>(mm)</i>	Rear Type	Front Type		Mounting Bolt Size
	<i>S</i>	A	B	C	
KHG100-50	50	302	282	175	16
-80	80	423	403	215	
-100	100	450	430	252	
-120	120	529	509	270	
-150	150	580	560	315	
-200	200	720	700	377	
-250	250	865	845	440	
-300	300	1,010	990	502	
-400	400	1,349	1,329	645	
-500	500	-	1,616	890	
-600	600	-	1,888	1,010	
-800	800	-	2,426	1,345	

■ Gas Room Static Diagram



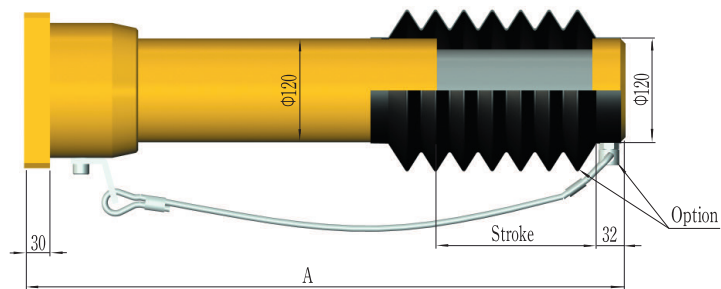
Self-Adjusting Type

KHG120 Series

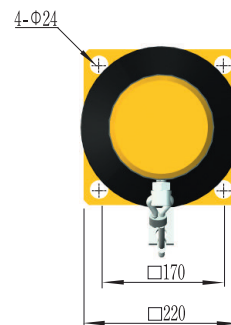
Engineering Data

Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) ET	Max Energy Absorption/Hour (kJ/h) ETC	Max Buffer Force (kN) Fm	Repulsion Force		Max Side Load Angle(°)		Weight (Kg)
					Extend(kN)	Compression(kN)	R Type	F Type	
KHG120-100	100	45	2,900	570	3.5	38	4.0	4.5	41
-150	150	70	4,400	570		38	4.0	3.5	48
-200	200	92	5,800	570		38	3.5	3.5	58
-250	250	114	7,200	570		40	3.0	3.0	65
-300	300	130	8,500	450		40	3.0	2.5	72
-400	400	160	10,000	450		40	2.5	2.0	78
-500	500	180	11,500	450		40	2.0	1.5	86
-600	600	200	12,800	450		40	2.0	1.5	95
-800	800	240	13,600	375		40	2.0	1.3	112
-1000	1000	280	14,500	350		40	2.0	1.3	118

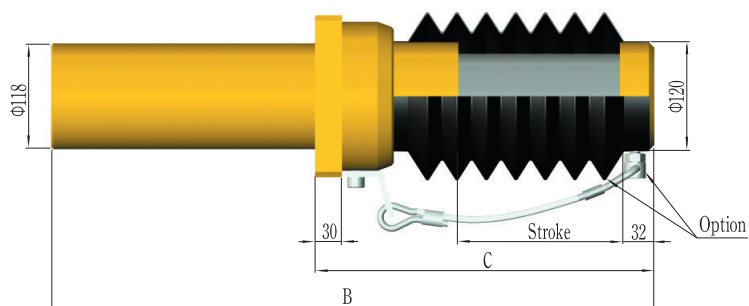
KHG120 Series



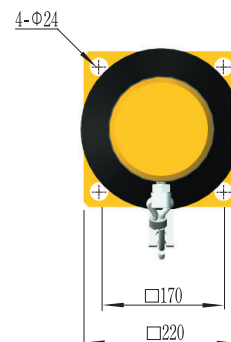
- Rear Mount -



- Rear Mount Flange -



- Front Mount -



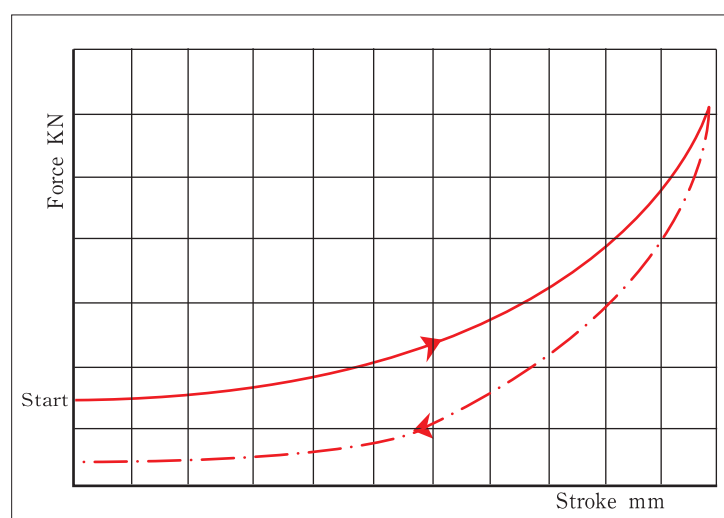
- Front Mount Flange -

Dimension

unit:mm

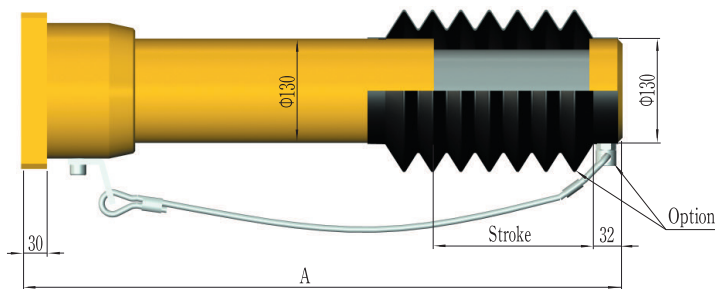
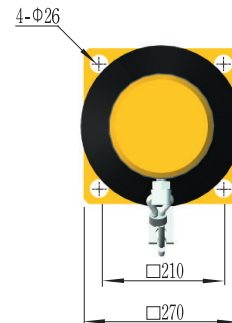
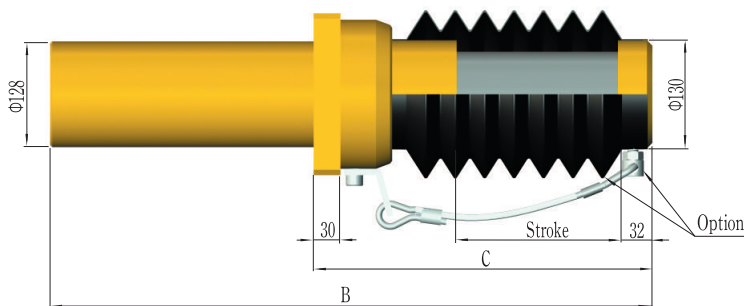
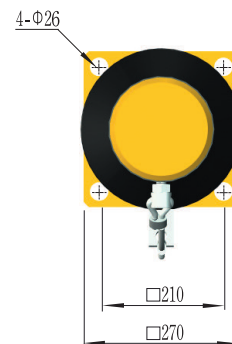
Model	Stroke <i>(mm)</i>	Rear Type	Front Type		Mounting Bolt Size
	<i>S</i>	A	B	C	
KHG120-100	100	470	450	277	22
-150	150	610	590	340	
-200	200	760	740	402	
-250	250	900	880	465	
-300	300	1,050	1,030	527	
-400	400	1,340	1,320	680	
-500	500	1,620	1,600	815	
-600	600	1,920	1,900	950	
-800	800	-	2,400	1,290	
-1000	1 000	-	2 960	1 360	

Gas Room Static Diagram



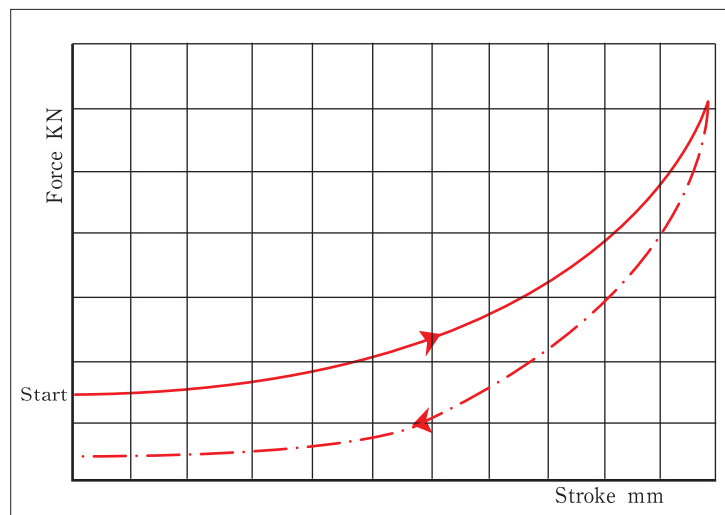
KHG130 Series**Hydraulic Buffer****Engineering Data**

Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) E _T	Max Energy Absorption/Hour (kJ/h) E _T C	Max Buffer Force (kN) F _m	Repulsion Force		Max Side Load Angle(°)		Weight (Kg)
					Extend(kN)	Compression(kN)	R Type	F Type	
KHG130-250	250	120	8,200	550	4.5	40	4.5	4.0	85
-300	300	140	9,600	550		40	4.5	4.0	92
-400	400	180	12,000	550		50	4.0	3.5	106
-500	500	220	15,000	550		50	3.5	3.5	118
-600	600	260	17,800	550		50	2.0	1.5	127
-800	800	300	19,000	460		50	2.0	1.5	148

KHG130 Series**- Rear Mount -****- Rear Mount Flange -****- Front Mount -****- Front Mount Flange -****Dimension**

unit:mm

Model	Stroke (mm) S	Rear Type	Front Type		Mounting Bolt Size
		A	B	C	
KHG130-250	250	897	893	545	24
-300	300	1,029	1,025	605	
-400	400	1,293	1,289	735	
-500	500	1,602	1,582	820	
-600	600	-	1,917	1,060	
-800	800	-	2,445	1,350	

Gas Room Static Diagram

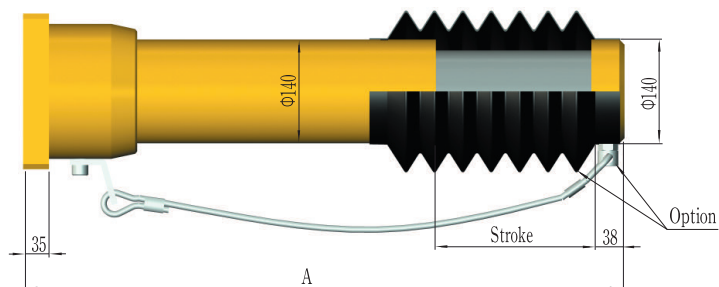
Self-Adjusting Type

KHG140 Series

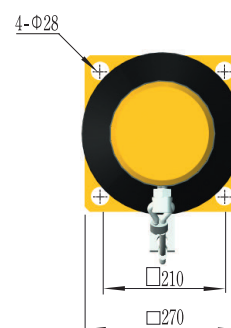
Engineering Data

Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) E _T	Max Energy Absorption/Hour (kJ/h) E _{TC}	Max Buffer Force (kN) F _m	Repulsion Force		Max Side Load Angle(°)		Weight (Kg)
					Extend(kN)	Compression(kN)	R Type	F Type	
KHG140-100	100	62	3800	760	5.5	38	4.5	4.0	60
-150	150	91	5800	760		65	4.5	4.0	72
-200	200	124	9800	730		70	4.0	3.5	85
-300	300	175	12,000	730		70	3.5	2.5	110
-400	400	234	15,000	730		78	2.5	1.5	135
-500	500	270	17,000	680		78	2.0	1.3	150
-600	600	300	20,000	630		78	2.0	1.3	160
-800	800	325	25,000	510		78	2.0	1.3	185
-1000	1,000	360	27,500	450		78	1.6	1.2	200

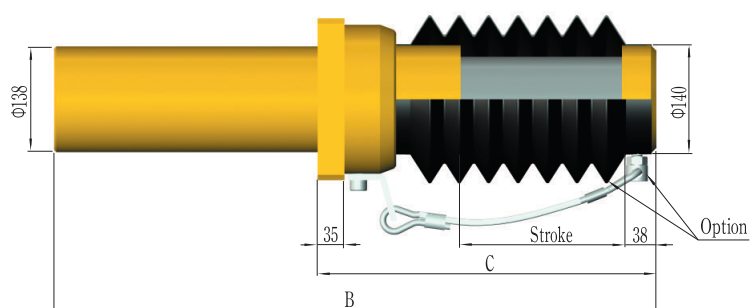
KHG140 Series



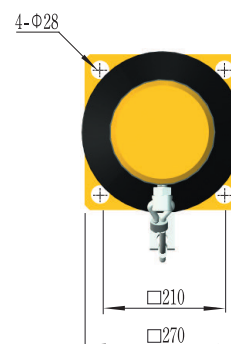
- Rear Mount -



- Rear Mount Flange -



- Front Mount -



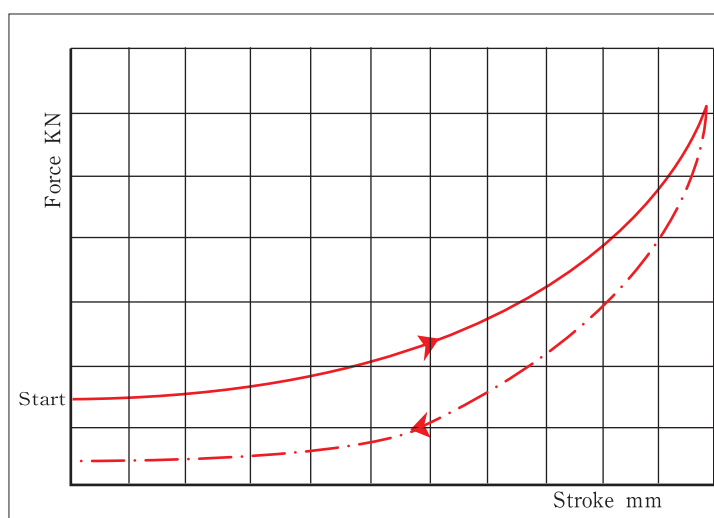
- Front Mount Flange -

Dimension

unit:mm

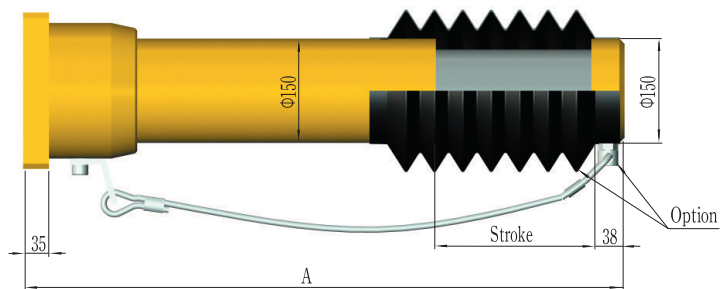
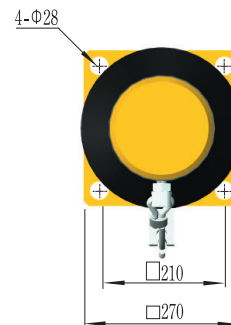
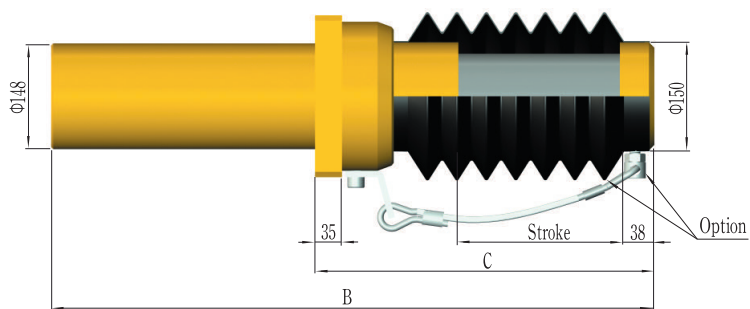
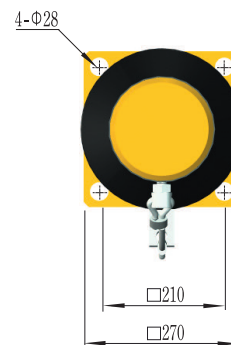
Model	Stroke (mm) S	Rear Type	Front Type		Mounting Bolt Size
		A	B	C	
KHG140-100	100	480	460	297	26
-150	150	620	600	360	
-200	200	770	750	422	
-300	300	1,060	1,040	547	
-400	400	1,350	1,330	712	
-500	500	1,630	1,610	847	
-600	600	1,930	1,910	982	
-800	800	2,350	2,330	1,252	
-1000	1,000	-	2,880	1,595	

Gas Room Static Diagram



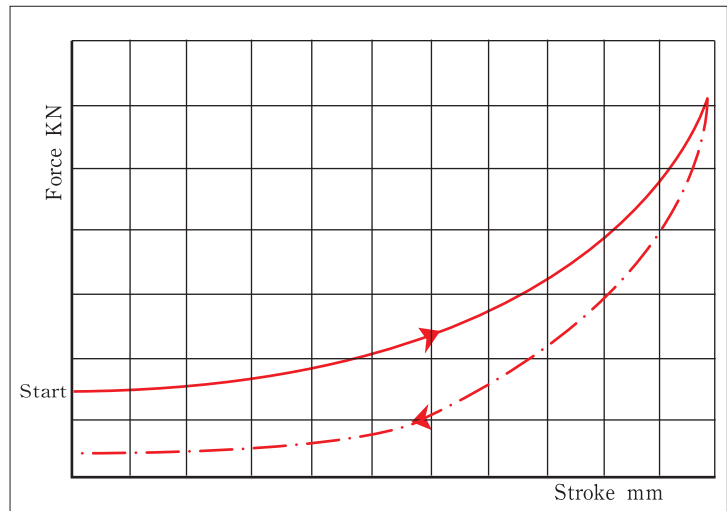
KHG150 Series**Hydraulic Buffer****Engineering Data**

Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) E _T	Max Energy Absorption/Hour (kJ/h) E _{TC}	Max Buffer Force (kN) F _m	Repulsion Force		Max Side Load Angle(°)		Weight (Kg)
					Extend(kN)	Compression(kN)	R Type	F Type	
KHG150-100	100	70	4000	880	6.2	45	4.0	4.5	77
-200	200	136	7200	850		75	4.0	3.5	90
-300	300	183	13,000	770		75	3.5	3.5	135
-400	400	243	13,500	760		75	3.0	3.0	146
-500	500	285	17,400	710		85	3.0	2.5	166
-600	600	323	21,000	670		85	2.5	2.0	176
-800	800	367	25,600	580		85	2.0	1.5	220
-1000	1,000	410	28,000	330		85	2.0	1.5	253

KHG150 Series**- Rear Mount -****- Rear Mount Flange -****- Front Mount -****- Front Mount Flange -****Dimension**

unit:mm

Model	Stroke (mm) S	Rear Type	Front Type			Mounting Bolt Size
			A	B	C	
KHG150-100	100	510	490	327	26	
-200	200	800	780	452		
-300	300	1,090	1,070	577		
-400	400	1,280	1,260	740		
-500	500	1,660	1,640	800		
-600	600	1,960	1,940	905		
-800	800	2,360	2,340	1,270		
-1000	1,000	2,910	2,890	1,625		

Gas Room Static Diagram

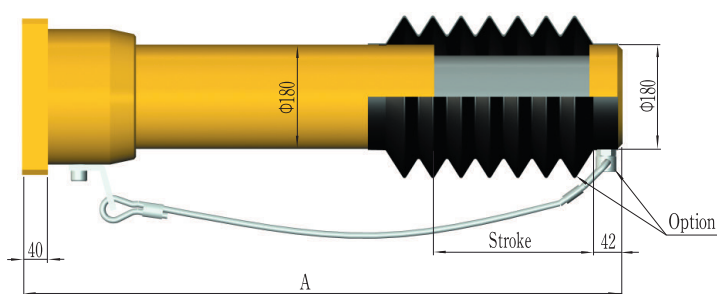
Self-Adjusting Type

KHG180 Series

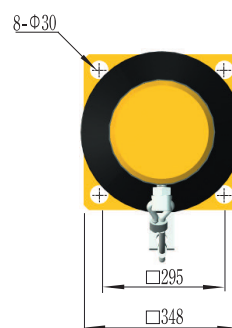
Engineering Data

Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) E _T	Max Energy Absorption/Hour (kJ/h) E _{TC}	Max Buffer Force (kN) F _m	Repulsion Force		Max Side Load Angle(°)		Weight (Kg)
					Extend(kN)	Compression(kN)	R Type	F Type	
KHG180-100	100	80	4,500	980	8	75	4.5	4.0	110
-200	200	160	10,000	980		80	4.5	4.0	126
-250	250	200	12,800	980		80	4.5	4.0	140
-400	400	280	14,500	880		90	4.5	4.0	168
-500	500	350	18,000	880		100	4.0	3.5	198
-600	600	430	23,000	890		100	3.5	3.0	235
-800	800	570	27,000	890		100	3.0	2.5	295
-1000	1,000	720	29,000	890		110	2.5	2.0	360

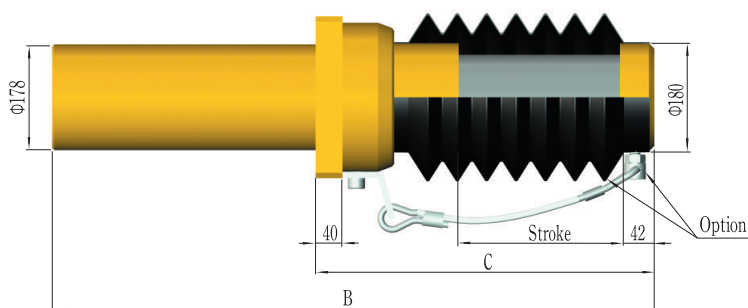
KHG180 Series



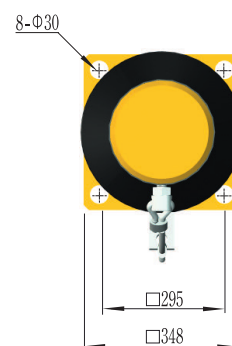
- Rear Mount -



- Rear Mount Flange -



- Front Mount -



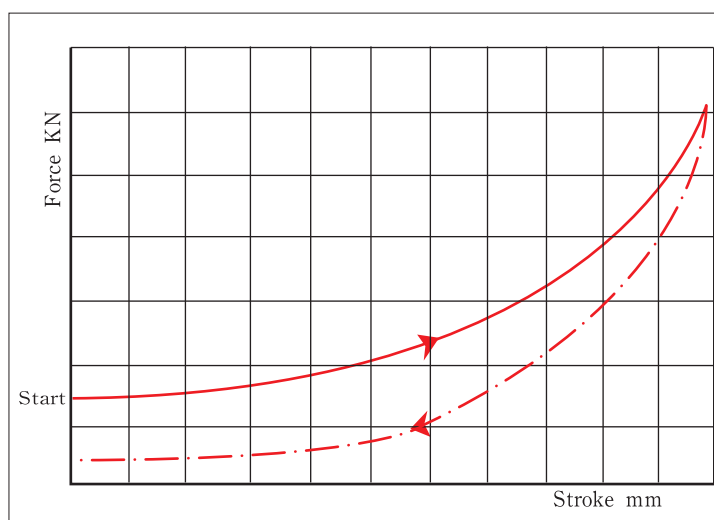
- Front Mount Flange -

Dimension

unit:mm

Model	Stroke (mm) S	Rear Type	Front Type		Mounting Bolt Size
		A	B	C	
KHG180-100	100	491	471	350	27
-200	200	760	740	450	
-250	250	850	830	550	
-400	400	1,486	1,466	804	
-500	500	1,766	1,746	939	
-600	600	2,066	2,046	1,074	
-800	800	2,666	2,646	1,344	
-1000	1,000	3,226	3,206	1,614	

Gas Room Static Diagram





Hydraulic Buffer KHS Series

Properties

- KHS Series is large-capacity hydraulic buffer. the best orifice is designed to fit the conditions and requirements of each user for high-efficiency buffering. It is suitable for production lines that require emergency control or repetitive operation control.
- Adjustment : Self Adjusting type
- Filling : Oil
- Operation Temperature : Standard (−10~80℃)
Special (−30~100℃)
- Return : Coil Spring
- Piston Rod : Hard Chrome plating(Over 25 μ m)
- Body and Mount : Epoxy Paint Coatings
- Application : Container Crane, Overhead Crane, Stacker Crane, Railway, Transfer Car, Amusement Rides,
Safety Device, Steel plant facilities.

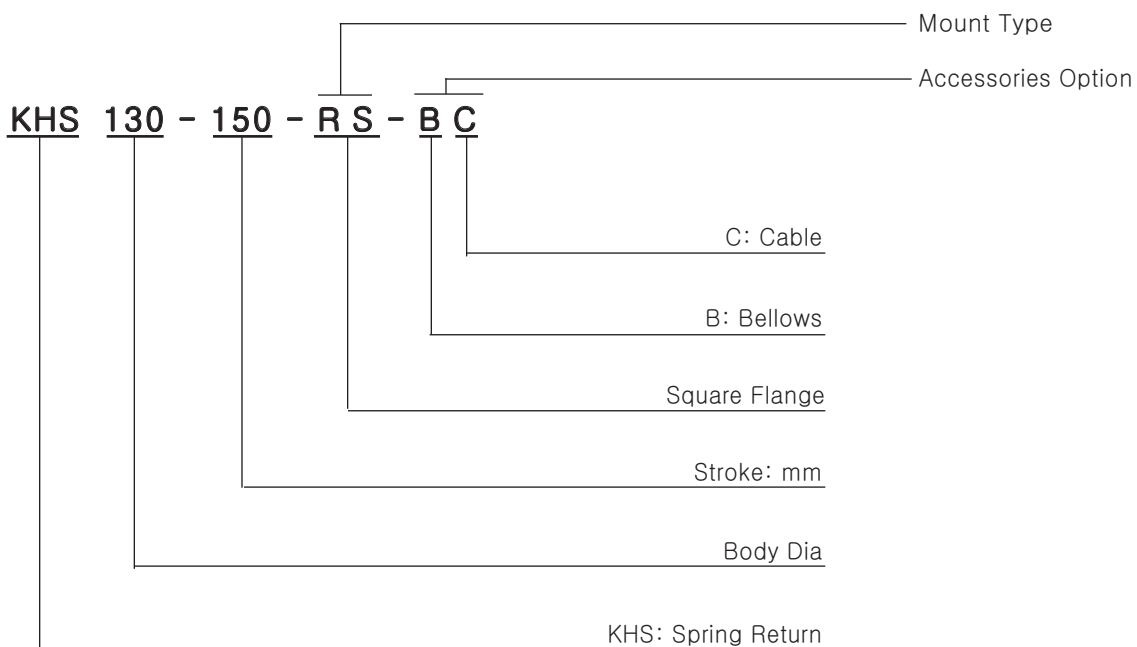


Engineering Data

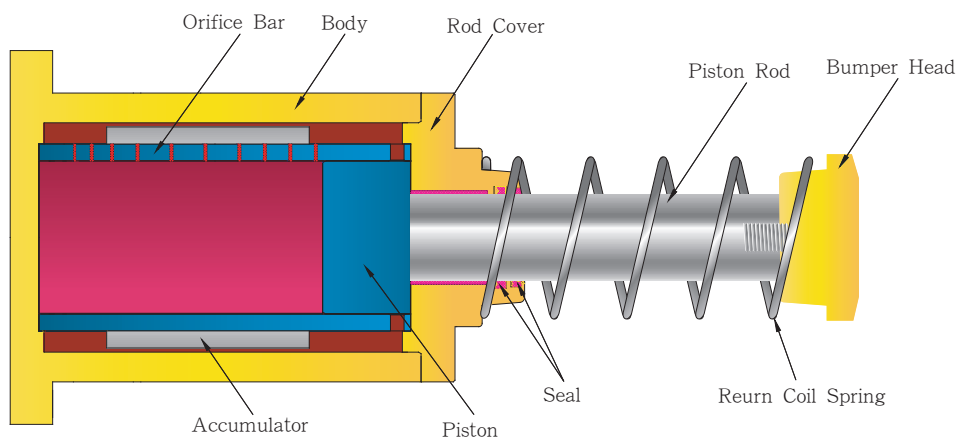
Model	Stroke (mm) S	Max Energy Buffer/Stroke (kj) Ek	Max Energy Absorption/ Hour (kj/h)	Buffer Force (kN)	Return Spring Force (kgf)		Max Side Load Angle(°)	Weight (Kg)	Page
					Extend	Compression			
KHS64-50	50	0.5	10	12.5	6.5	14.8	3	3	84
KHS90-50	50	4	80	100	14.2	30.5	3	8.5	
-75	75	6	108	100	10.5	19	3	9.5	
-100	100	8	128	100	9.9	42	3	12	
KHS100-50	50	4.4	79	110	14.2	30.5	3	14	
-100	100	8.8	140	110	9.9	42	3	16	85
KHS130-70	70	10	170	179	18.2	42.5	3	16	
-100	100	15	270	188	17.8	48	3	18	
-150	150	21	294	175	18.3	53.5	2.5	19	
KHS170-80	80	24	432	375	18.2	44.3	3	38	
-150	150	45	630	375	18.3	53.5	2	46	86
KHS190-100	100	40	720	500	17.8	48	2.5	48	
-150	150	60	840	500	18.3	53.5	2	60	
KHS220-100	100	44	792	550	40.5	134	2.5	67	
-150	150	66	924	550	41.8	131	2	74	
KHS250-100	100	60	1,080	750	38.5	111.2	2.5	130	87
-150	150	90	1,260	750	34.2	107.5	2	140	
-200	200	120	1,560	750	33	105	2	150	
-300	300	180	2,160	750	38	121.8	2	160	
KHS300-150	150	117	1,638	975	46	142	2	186	
-250	250	180	2,340	1,125	45	151	1.5	196	87
KHS340-200	200	200	2,600	1,250	51	162	1.5	275	
-300	300	300	3,600	1,250	49	176	1.5	305	
KHS360-250	250	294	3,822	1,470	68	178	1.5	322	87
-400	400	470	4,700	1,470	64	182	1.5	374	

Self-Adjusting Type

KHS Series Ordering Information



KHS Series Internal Structure



Principle

1. When the moving load is collided to Bumper Head, The Piston rod enters Inner Tube according to stroke.
The Check Valve is closed and Oil is discharging out of Inner Tube through Orifice.
In this process, oil increases as much as the volume of Piston rod saved in Accumulator.
2. During this process, KHS model absorbs the Impact Force with damping force.
3. In return, Check Valve opens and compressed Coil Spring quickly returns the piston rod to its original position.

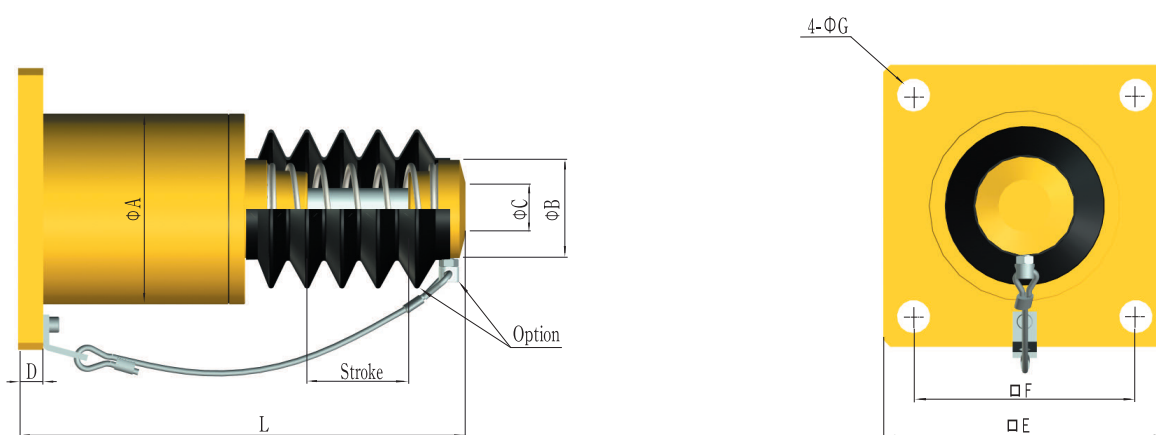
KHS Series

Hydraulic Buffer

Engineering Data

Model	Stroke (mm) <i>S</i>	Max Energy Buffer/Stroke (kJ) <i>E_k</i>	Max Energy Absorption/ Hour (kJ/h)	Buffer Force (kN)	Return Spring Force (kgf)		Max Side Load Angle(°)	Weight (Kg)
					Extend	Compression		
KHS64-50	50	0.5	10	12.5	6.5	14.8	3	3
KHS90-50	50	4	80	100	14.2	30.5	3	8.5
-75	75	6	108	100	10.5	19	3	9.5
-100	100	8	128	100	9.9	42	3	12
KHS100-50	50	4.4	79	110	14.2	30.5	3	14
-100	100	8.8	140	110	9.9	42	3	16

KHS64, 90, 100 Series



Dimension

unit:mm

Model	Stroke (mm) <i>S</i>	L	ØA	ØB	ØC	D	E	F	4-ØG
KHS64-50	50	200	64	42	16	12	90	65	4-Ø11
KHS90-50	50	240	90	78	30	16	130	100	4-Ø14
-75	75	280	90	78	30	16	130	100	4-Ø14
-100	100	360	90	78	30	16	130	100	4-Ø14
KHS100-50	50	240	100	84	30	16	130	100	4-Ø14
-100	100	340	100	84	30	16	130	100	4-Ø14

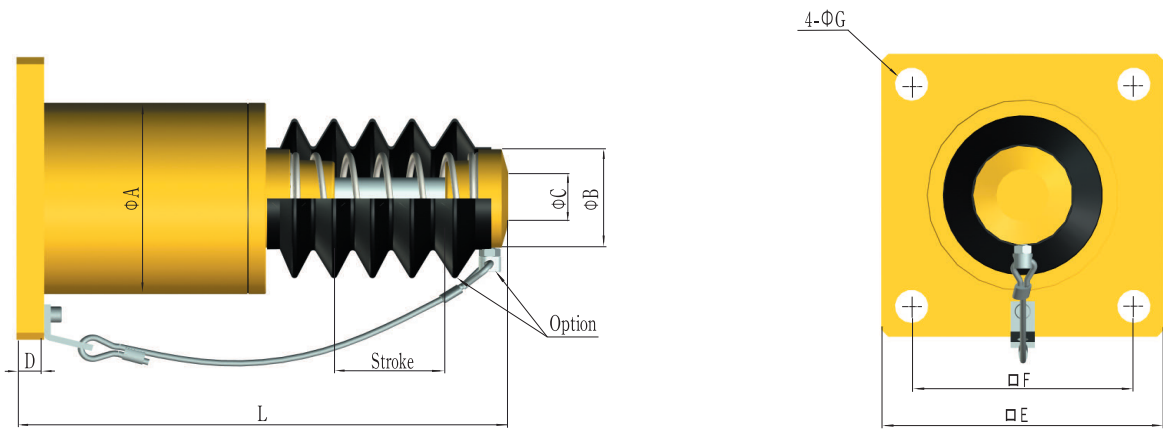
Self-Adjusting Type

KHS Series

Engineering Data

Model	Stroke (mm) S	Max Energy Buffer/Stroke (kj) Ek	Max Energy Absorption/ Hour (kj/h)	Buffer Force (kN)	Return Spring Force (kgf)		Max Side Load Angle(°)	Weight (Kg)
					Extend	Compression		
KHS130-70	70	10	170	179	18.2	42.5	3	16
-100	100	15	270	188	17.8	48	3	18
-150	150	21	294	175	18.3	53.5	2.5	19
KHS170-80	80	24	432	375	18.2	44.3	3	38
-150	150	45	630	375	18.3	53.5	2	46
KHS190-100	100	40	720	500	17.8	48	2.5	48
-150	150	60	840	500	18.3	53.5	2	60

KHS130, 170, 190 Series



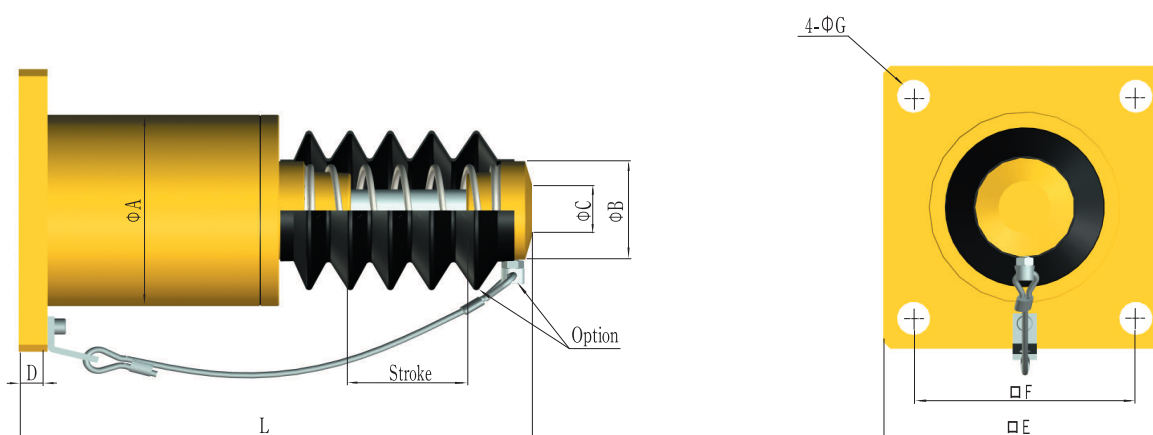
Dimension

unit:mm

Model	Stroke (mm) S	L	ØA	ØB	ØC	D	E	F	4-ØG
KHS130-70	70	290	130	98	35	19	170	130	4-Ø22
-100	100	350	130	98	35	19	170	130	4-Ø22
-150	150	490	130	98	35	19	170	130	4-Ø22
KHS170-80	80	360	170	98	50	22	220	170	4-Ø26
-150	150	500	170	98	50	22	220	170	4-Ø26
KHS190-100	100	440	190	98	60	25	280	220	4-Ø33
-150	150	540	190	98	60	25	280	220	4-Ø33

KHS Series**Hydraulic Buffer****Engineering Data**

Model	Stroke (mm) S	Max Energy Buffer/Stroke (kJ) Ek	Max Energy Absorption/ Hour (kJ/h)	Buffer Force (kN)	Return Spring Force (kgf)		Max Side Load Angle(°)	Weight (Kg)
					Extend	Compression		
KHS220-100	100	44	792	550	40.5	134	2.5	67
-150	150	66	924	550	41.8	131	2	74
KHS250-100	100	60	1,080	750	38.5	111.2	2.5	130
-150	150	90	1,260	750	34.2	107.5	2	140
-200	200	120	1,560	750	33	105	2	150
-300	300	180	2,160	750	38	121.8	2	160

KHS220, 250 Series**Dimension**

unit:mm

Model	Stroke (mm) S	L	ØA	ØB	ØC	D	E	F	4-ØG
KHS220-100	100	440	220	116	60	25	280	220	4-Ø33
-150	150	540	220	116	60	25	280	220	4-Ø33
KHS250-100	100	480	250	138	70	32	320	250	4-Ø33
-150	150	650	250	158	70	32	320	250	4-Ø33
-200	200	750	250	158	70	32	320	250	4-Ø33
-300	300	880	250	158	70	32	320	250	4-Ø33

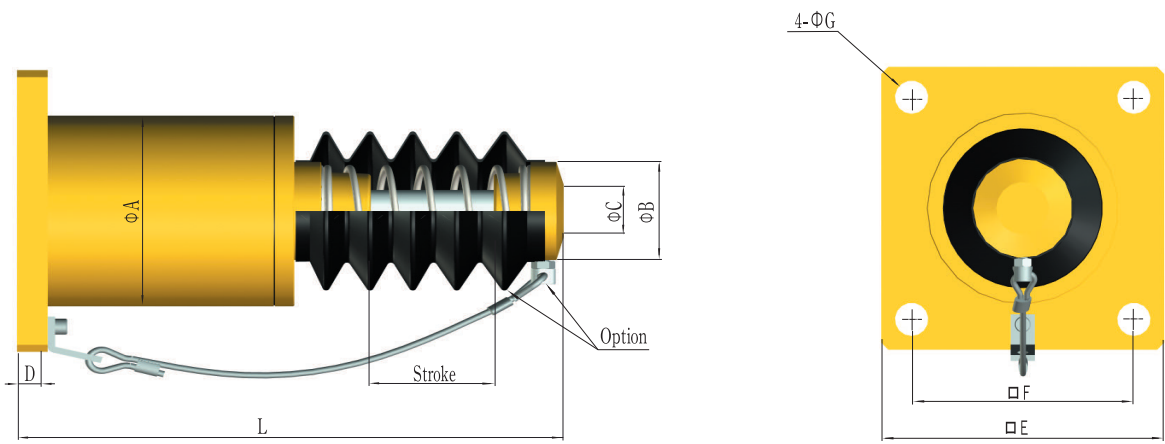
Self-Adjusting Type

KHS Series

Engineering Data

Model	Stroke (mm) S	Max Energy Buffer/Stroke (kj) Ek	Max Energy Absorption/ Hour (kj/h)	Buffer Force (kN)	Return Spring Force (kgf)		Max Side Load Angle(°)	Weight (Kg)
					Extend	Compression		
KHS300-150	150	117	1,638	975	46	142	2	186
-250	250	180	2,340	1,125	45	151	1.5	196
KHS340-200	200	200	2,600	1,250	51	162	1.5	275
-300	300	300	3,600	1,250	49	176	1.5	305
KHS360-250	250	294	3,822	1,470	68	178	1.5	322
-400	400	470	4,700	1,470	64	182	1.5	374

KHS300, 340, 360 Series



Dimension

unit:mm

Model	Stroke (mm) S	L	ØA	ØB	ØC	D	E	F	4-ØG
KHS300-150	150	650	300	170	80	36	400	300	4-Ø33
-250	250	850	300	170	80	36	400	300	4-Ø33
KHS340-200	200	800	340	228	100	45	440	340	4-Ø39
-300	300	1,000	340	228	100	45	440	340	4-Ø39
KHS360-250	250	900	356	280	100	45	460	360	4-Ø39
-400	400	1,200	356	280	100	45	460	360	4-Ø39



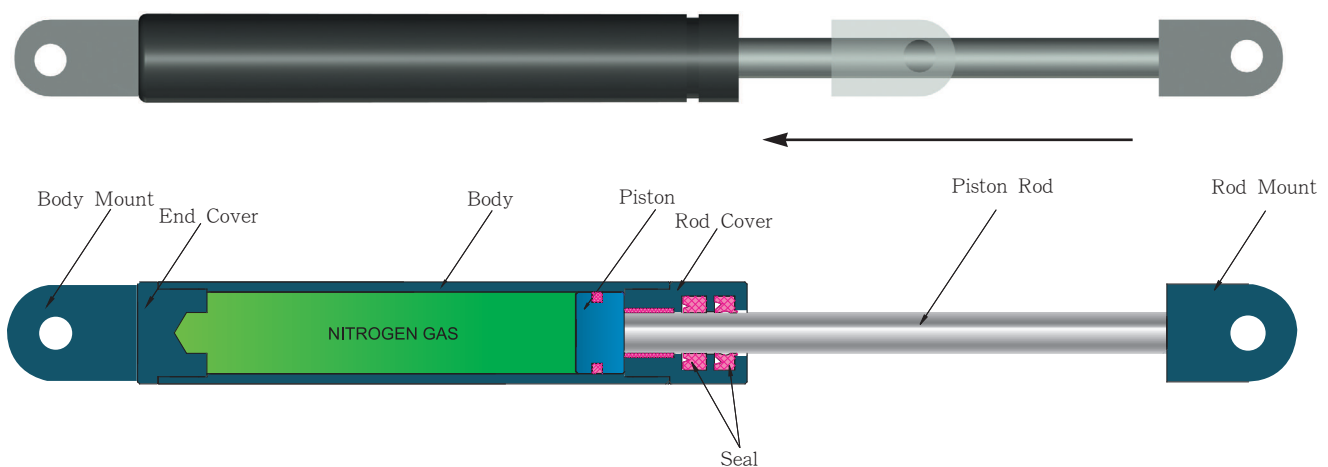
Gas Spring KG Series (Push TYPE)

Properties

- Gas Spring that uses nitrogen gas has a general specific characters of spring, long stroke, small repulsive force, lifts big loads with small units, allows speed control in compression and can be used in a variety of application. It also ensures stability compared to plate spring and coil spring.
- Operation Temperature : Standard (-10~60℃) Special (-30~100℃)
- KOBACan supply "Customs Products (customized)" for size, stroke, material, etc.
- Application : Semiconductor equipment, Machine cover, Manhole cover, Auxiliary power, vibrator cover, Mechanical equipment, Medical equipment, etc...

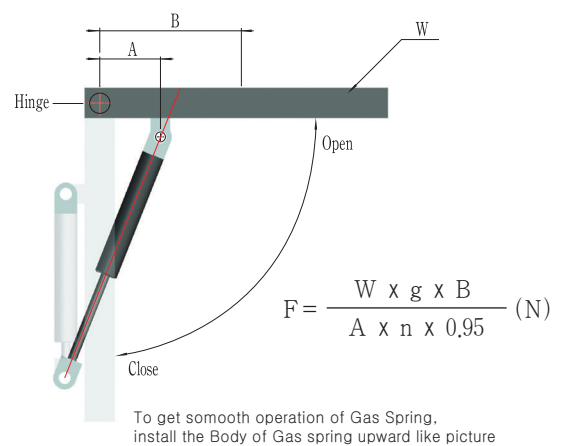
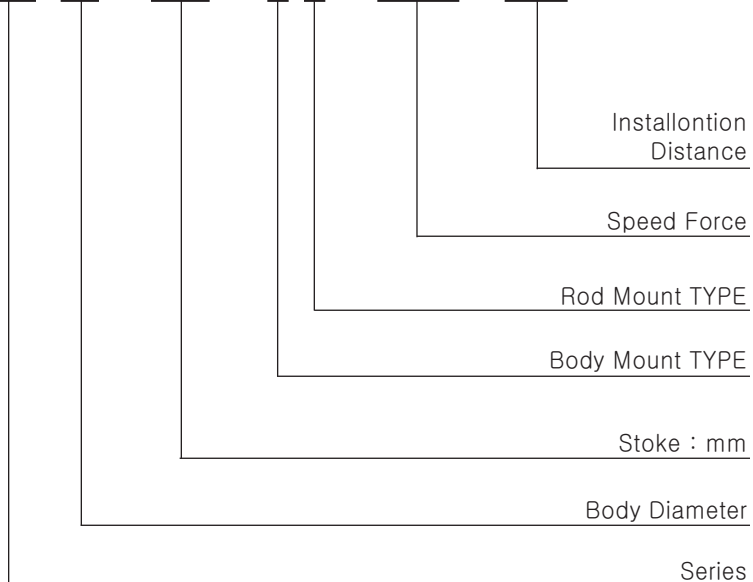


KG Series Internal Structure



KG Series Ordering Information

KG 30 - 100 - H H - 100N - 268



F : Spring force(N)
W : Gate Weight(Kg)
A : Distance from Hinge to Gas Spring (m)
B : Distance from Hinge to the center of gravity (m)
N : Number of Gas Spring in parallel
G : Gravitational Acceleration (9.8m/sec²)

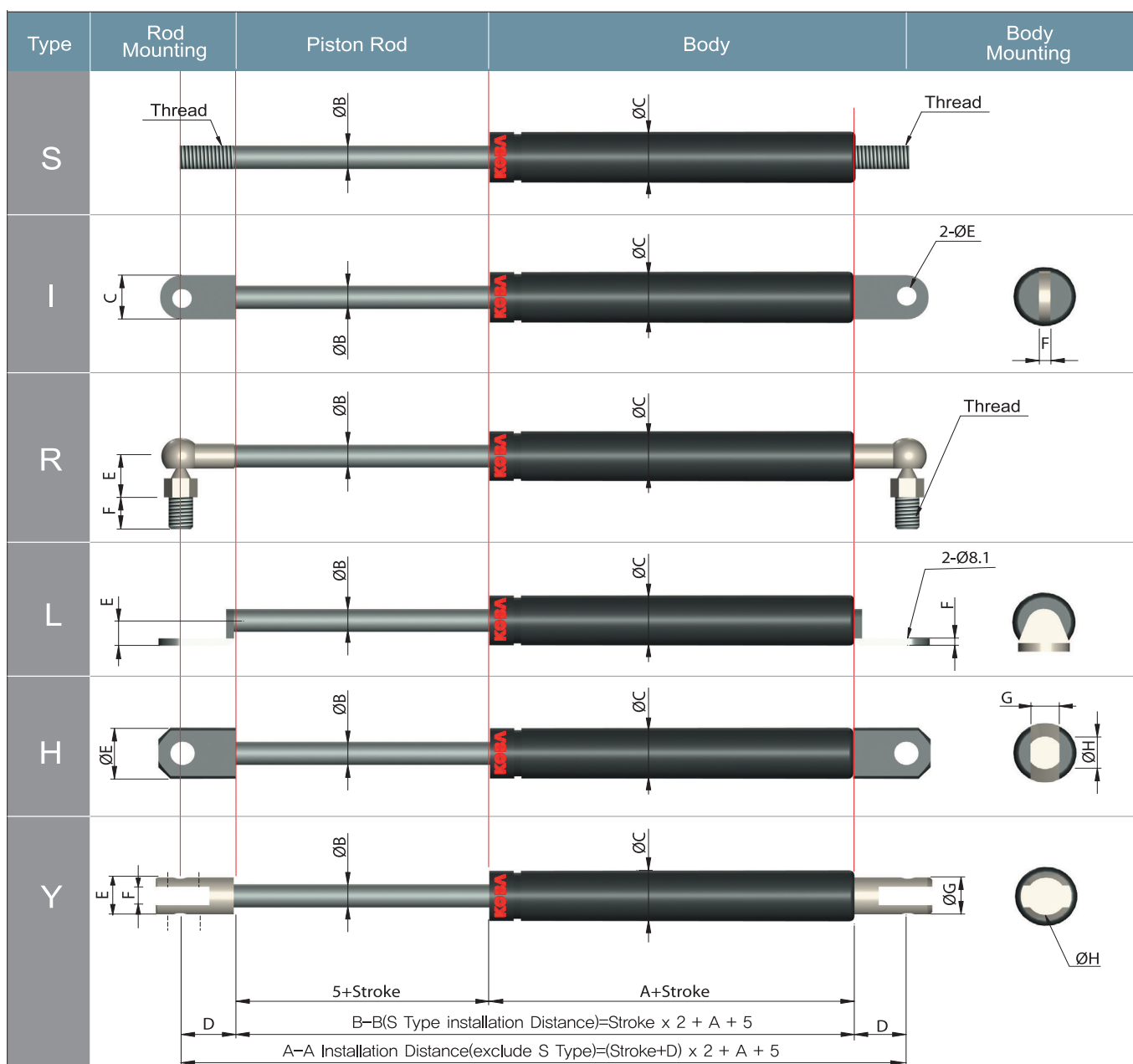
Push Type

KG Series

KG 15, 18, 22, 30 Series

GAS SPRING

Gas Spring



Dimension

unit:mm

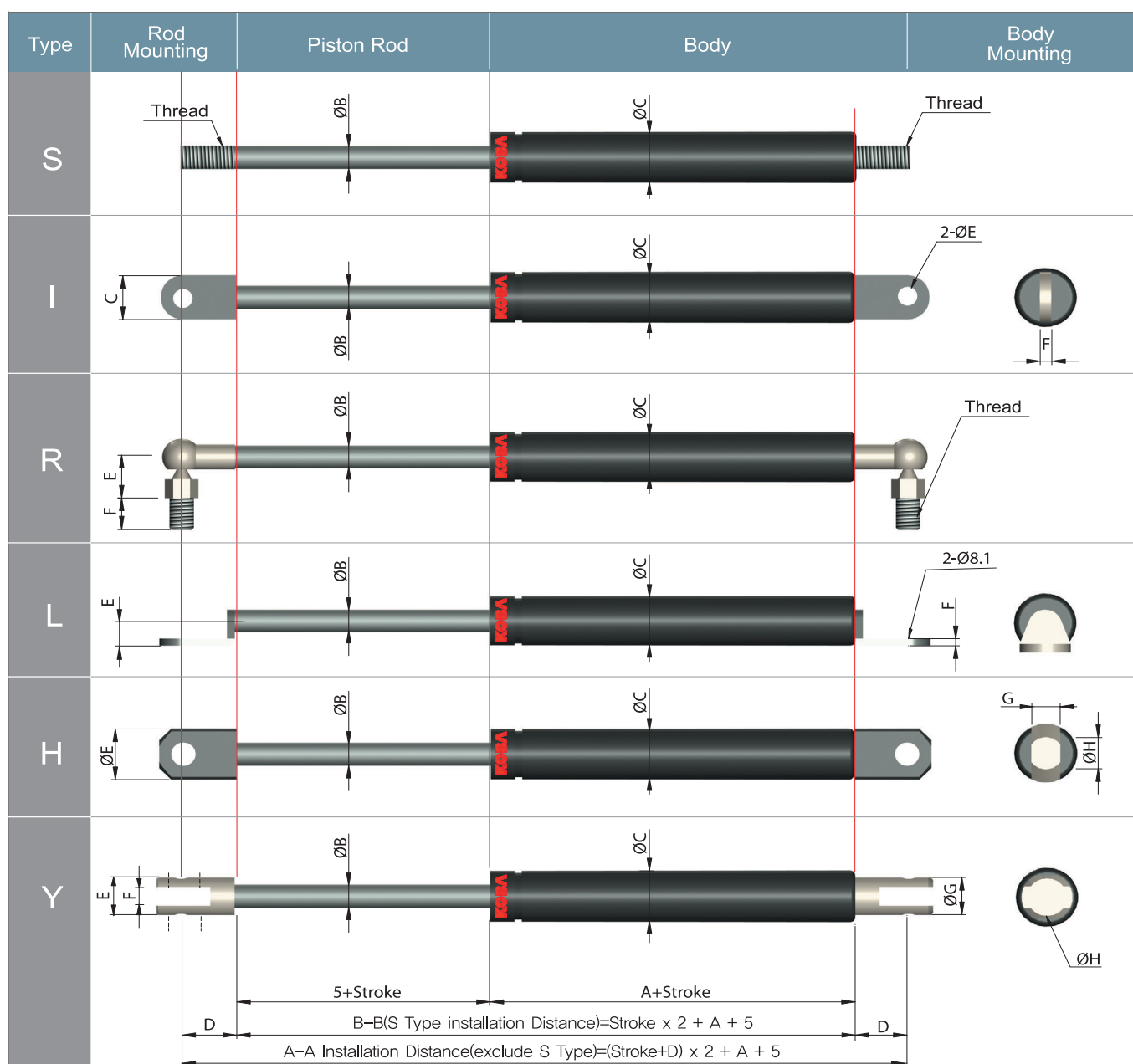
Model	Max Stroke (mm)	A	B	C	Mount Type	D	E	F	G	H	Thread	Max Force (N)
KG15	200	35	6	15	S	8	-	-	-	-	M6 x 1.0P	300
					I	13	8	3	-	-	-	
					R	20	13	12.5	-	-	M6 x 1.0P	
					L	15	9	3.2	-	-	-	
KG18	250	40	8	18	S	10	-	-	-	-	M8 x 1.25P	600
					I	19	8.1	4.0	-	-	-	
					R	22	18	14	-	-	M8 x 1.25P	
					L	15	9	3.2	-	-	-	
					H	19	18	-	10	8.1	-	
KG22	300	50	10	22	Y	32	16	8	18	8.1	-	900
					S	10	-	-	-	-	M10 x 1.5P	
					I	19	8.1	4.0	-	-	-	
					R	22	18	14	-	-	M10 x 1.5P	
					L	15	11	3.2	-	-	-	
KG30	350	55	16	30	H	19	22	-	10	8.1	-	1200
					Y	32	16	8	18	10.1	-	
					S	18	-	-	-	-	M14 x 2.0P	
					I	19	12.1	4.0	-	-	-	
					R	57	21.5	40.5	-	-	M14 x 2.0P	
					H	35	30	-	20	15	-	

KG Series

Push Type

KG 35, 40, 50, 75, 100 Series

GAS SPRING



Dimension

unit:mm

Model	Max Stroke (mm)	A	B	C	Mount Type	D	E	F	G	H	Thread	Max Force (N)
KG35	400	60	20	35	S	22	-	-	-	-	M16 x 2.0P	2,000
					R	64	23.5	42.5	-	-	M16 x 2.0P	
					H	35	30	-	20	15	-	
KG40	500	65	25	40	S	25	-	-	-	-	M18 x 1.5P	3,000
					R	71	26.5	41.5	-	-	M18 x 1.5P	
					H	40	35	-	28	16	-	
KG50	700	75	25	50	S	35	-	-	-	-	M20 x 1.5P	5,000
					R	77	27	41	-	-	M20 x 1.5P	
					H	45	40	-	36	20	-	
KG75	1000	85	35	75	S	41	-	-	-	-	M24 x 2.0P	8,000
					R	94	30	51	-	-	M24 x 2.0P	
					H	70	60	-	40	30	-	
KG100	1300	100	40	100	S	65	-	-	-	-	M30 x 2.0P	12,000
					R	110	35	56	-	-	M30 x 2.0P	
					H	75	70	-	50	35	-	

KMS

KMA

KHA

KHG

KHS

KG / KGP

KGL

KHC


NEW

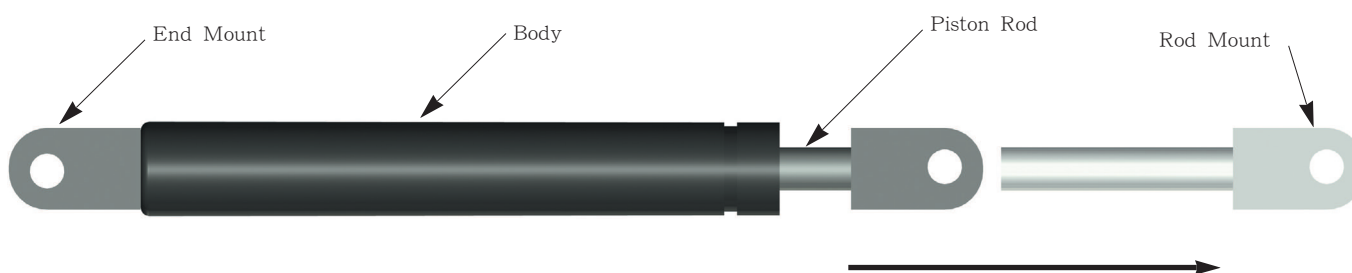
Gas Spring KGP Series (Pull TYPE)



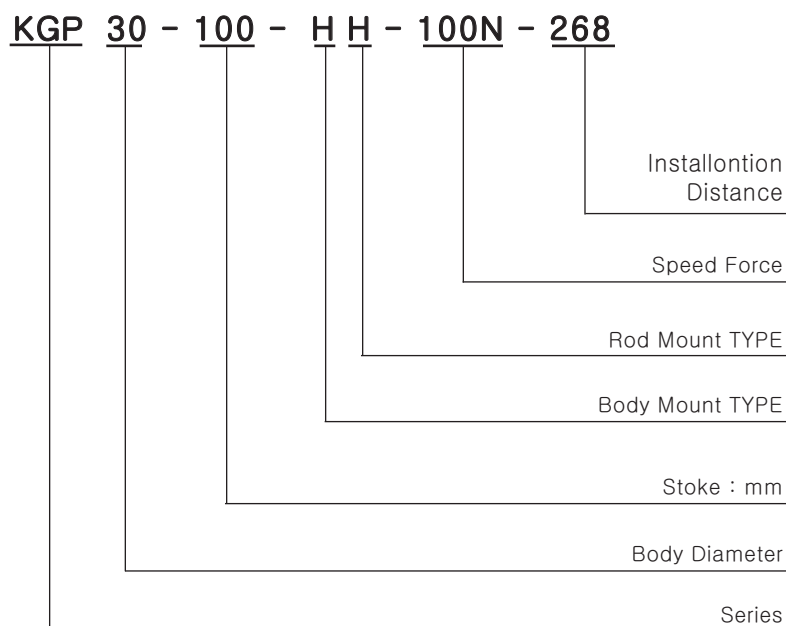
Properties

- General Gas spring is designed to be pushed but Pull type Gas Spring is designed to be pulled. It is widely used to operate mechanical covers with low strength to open /close covers on machines/tanks that operate horizontally, on semiconductor equipment, and where the general gas spring can not apply.
- Operation Temperature : Standard (−10~60℃) Special (−30~100℃)
- KOBACan supply “Customs Products (customized)” for size, stroke, material, etc.
- Application : Semiconductor equipment, Machine cover, Manhole cover, Auxiliary power, vibrator cover, Mechanical equipment, Medical equipment, etc...

■ KGP Series Internal Structure



■ KGP Series Ordering Information

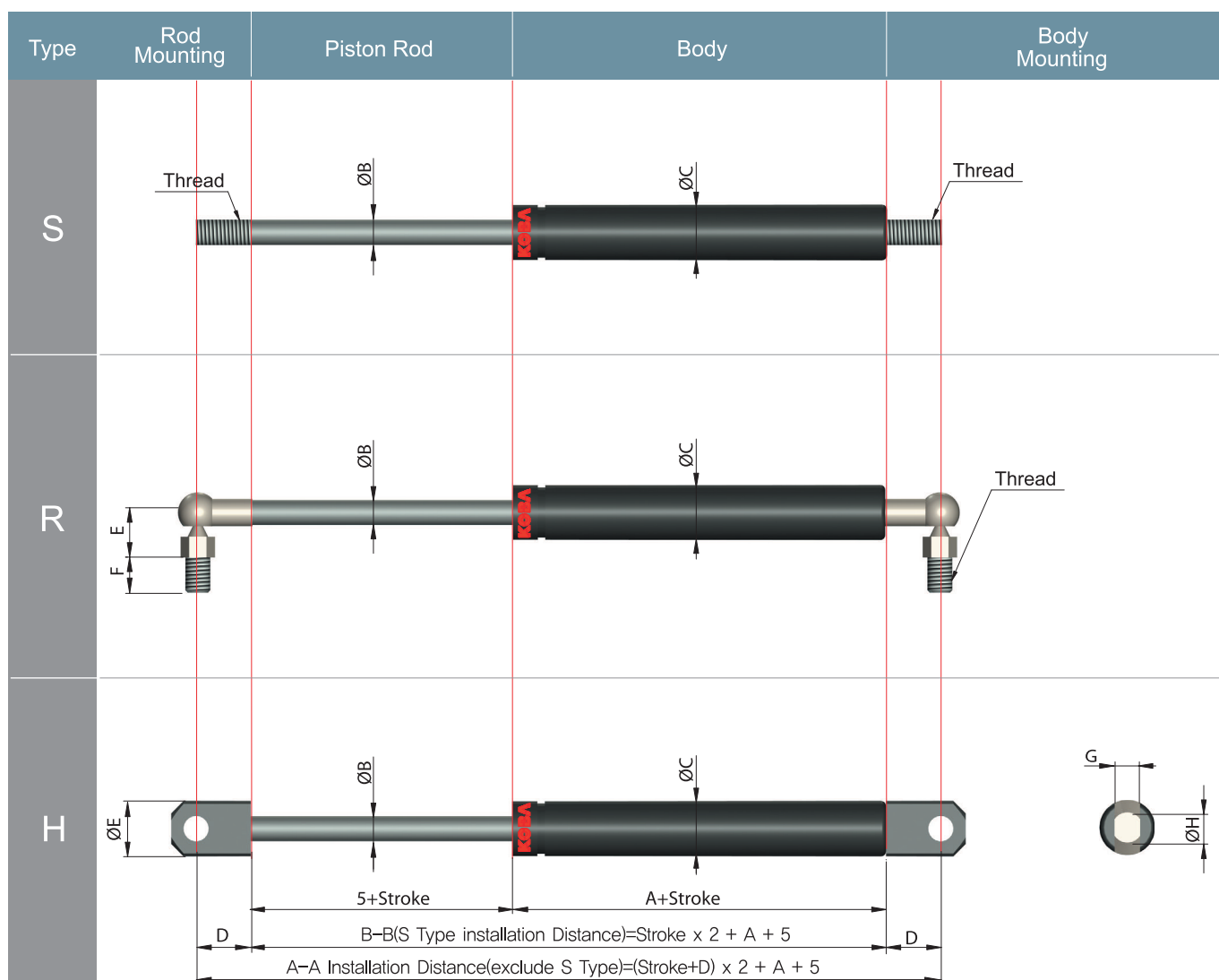


KGP Series

Pull Type

KGP22, 30, 35, 40, 50, 75 Series

GAS SPRING



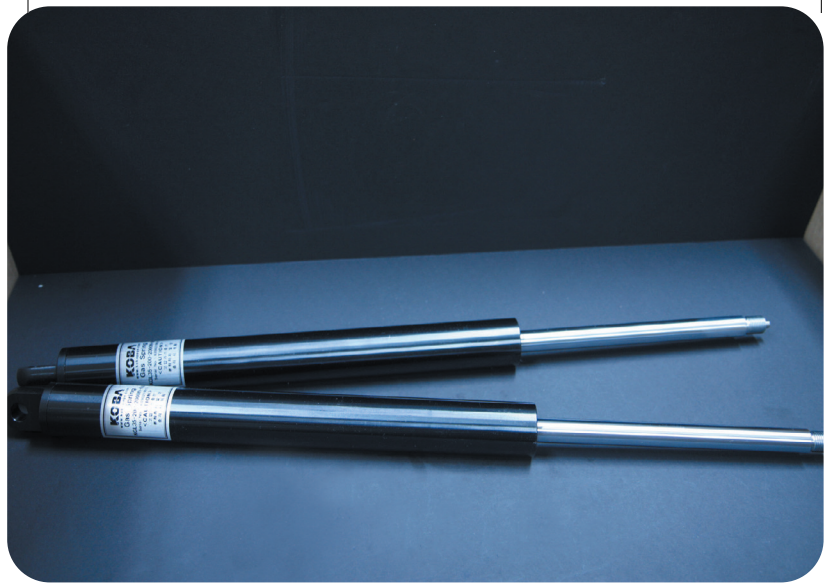
Dimension

unit:mm

Model	Max Stroke (mm)	A	B	C	Mount Type	D	E	F	G	H	Thread	Max Force (N)
KGP22	300	80	10	22	S	10	-	-	-	-	M10 x 1.5P	200
					R	22	18	14	-	-	M10 x 1.5P	
					H	19	22	-	10	10.1	-	
KGP30	350	85	12	30	S	18	-	-	-	-	M12 x 1.75P	900
					R	50	21.5	40.5	-	-	-	
					H	35	30	-	20	15	-	
KGP35	400	90	14	15	S	22	-	-	-	-	M14 x 2.0P	1200
					R	57	23.5	42.5	-	-	-	
					H	35	30	-	20	15	-	
KGP40	500	95	16	40	S	25	-	-	-	-	M16 x 2.0P	1500
					R	64	26.5	41.5	-	-	-	
					H	40	40	-	28	16	-	
KGP50	700	105	25	50	S	35	-	-	-	-	M20 x 1.5P	2000
					R	77	27	41	-	-	M20 x 1.5P	
					H	50	50	-	36	20	-	
KGP75	1000	115	25	75	S	41	-	-	-	-	M24 x 2.0P	3000
					R	94	30	51	-	-	M24 x 2.0P	
					H	70	60	-	40	30	-	



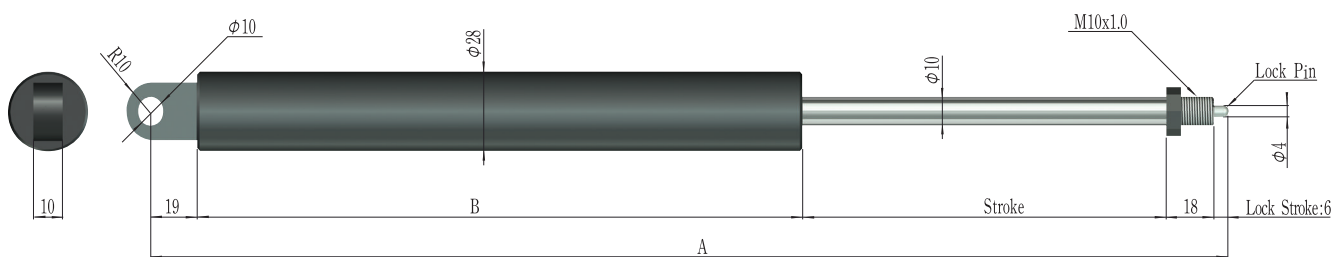
Gas Spring KGL Series (Free Lock TYPE)



Properties

- Free Lock Gas Spring has Free Lock feature that allows you to set the stroke anywhere you want by pressing Lock pin in addition to all general strengths of Gas Spring.
- Operation Temperature : Standard (−10~60℃) Special (−30~100℃)
- KOBAsupply "Customs Products (customized)" for size, stroke, material, etc.
- Application : Door, Auxiliary power, Chairs, Medical equipment, covers, etc...

KGL Series Internal Structure



KGL Series Ordering Information

KGL 28 - 50 - 200N - CO

CO: Special Order
Nothing : Standard

Speed Force

Stroke:mm

Body Diameter

Free Lock Gas Spring Series

Dimension

unit:mm

Model	Stroke	A	B	Force(N)
KGL28-50	50	250	157	100 ~ 1300
KGL28-80	80	330	207	
KGL28-100	100	370	227	
KGL28-150	150	470	277	
KGL28-200	200	550	307	



Hydro Check KHC Series



Properties

- Hydro Check Series enables precise speed and location control for the moving loads with various strokes.
- Hydro Check is easy to install and control and enables precise control of moving speed with a wide-range Adjustment Knob(300°) to elongate the lifespan of machine and tools. it is used for precise operations, such as auto feed drilling, grinding and cutting.
- Piston Rod is plated with hard Cr and the body is plated to prevent damage during operations.
- Accessories is easily fixed to Hydro Check with Snap Ring and Mounting Block and is easy to be relocated.
- The oil inside Hydro Check is automatically filtered and the operation speed is always controlled consistent for convenient operations under any conditions.
- Application : Where speed control is required .e.g. Drilling Machine, Cutting Machine, Safety device, boring machine, etc...
- Operation Temperature : Standards(-10~80℃)
Special (-30~100℃)

Ordering Information

KHC 24 - 15 - S - SO

SO: Special Order
Nothing : Standard

S : Step Check Unit

Stoke : mm

Body Diameter

Hydro Check Series

Adjusting Type

KHC24 Series

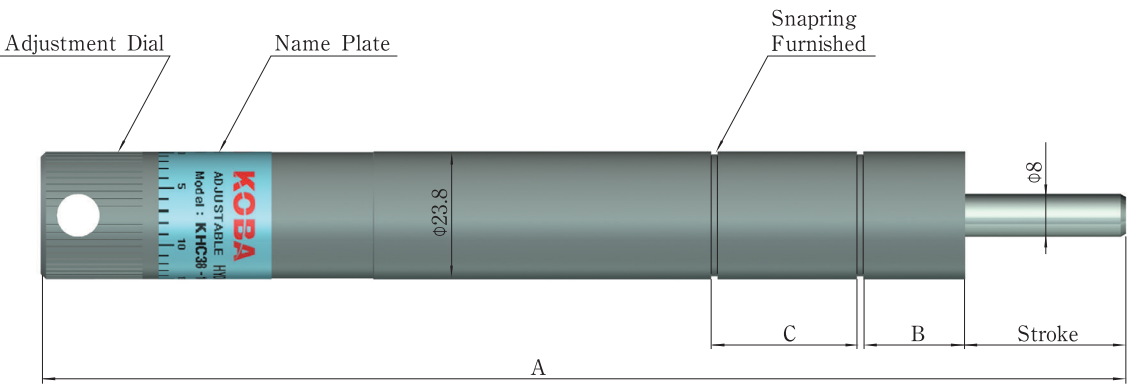
Dimension

Engineering Data

unit:mm

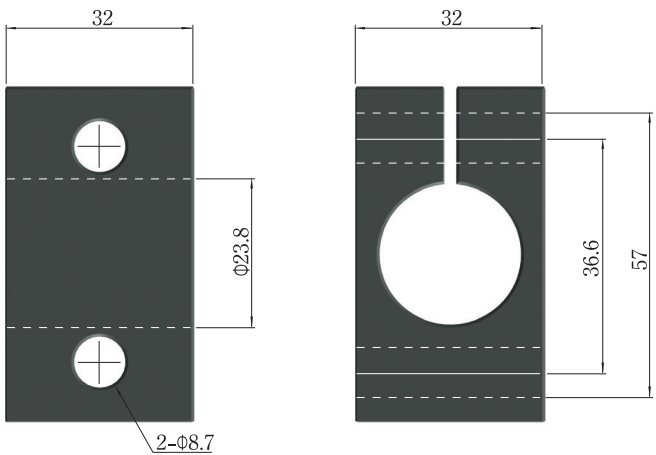
Model	Stroke (mm)	Dimention			Max load angle fron axis	Speed Adjustment Range		Weight (g)
		A	B	C		Load Limits	Feed Rate Limits	
KHC24-15	15	157.5	21	26	1.2°	100~2,500N	0.2~30mm/sec	385
KHC24-30	30	202.5	19		1°			450
KHC24-60	60	312.5	16		0.5°			635
KHC24-90	90	382.5	16		0.3°			745
KHC24-120	120	472.5	16		0.2°			885

KHC24 Series



Mount Block

► MB24



KHC31 Series

Adjustable Hydro Check

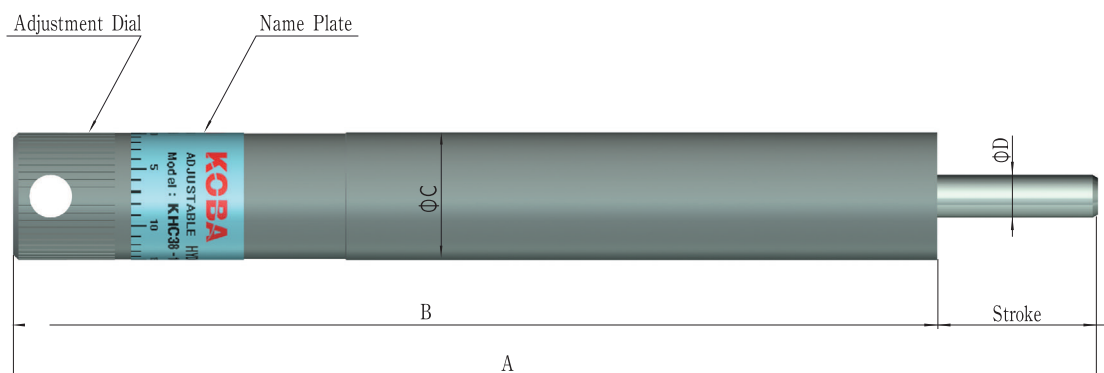
Dimension

Engineering Data

unit:mm

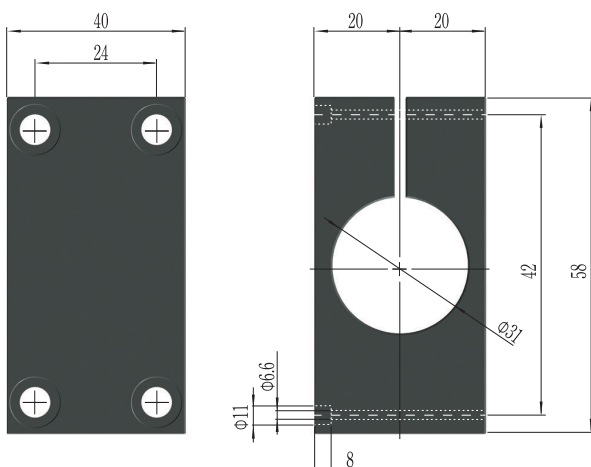
Model	Stroke (mm)	Dimention				Max load angle fron axis	Speed Adjustment Range		Weight (g)
		A	B	C	D		Load Limits	Feed Rate Limits	
KHC31-40	40	270	230	31	12	1°	450~350N	0.2~30mm/sec	1040
KHC31-60	60	340	279			0.5°			1245
KHC31-100	100	476	375			0.3°			1655
KHC38-60	60	321	261	38	14	0.5°	1,500~5,000N	0.3~30mm/sec	2490
KHC38-100	100	454	354			0.3°			3310

KHC 31, KHC 38

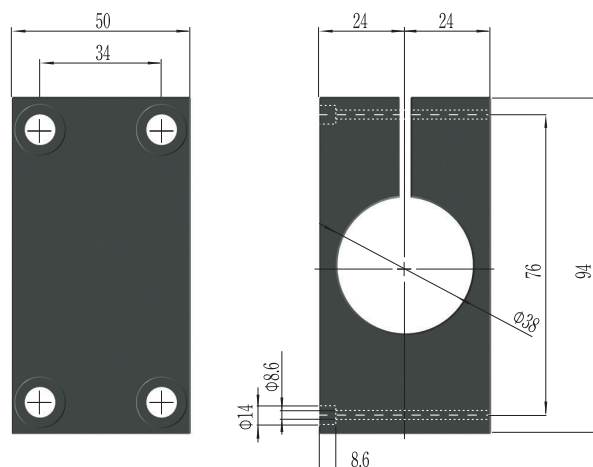


Mount Block

► MB31



► MB38



Step Check Unit Series

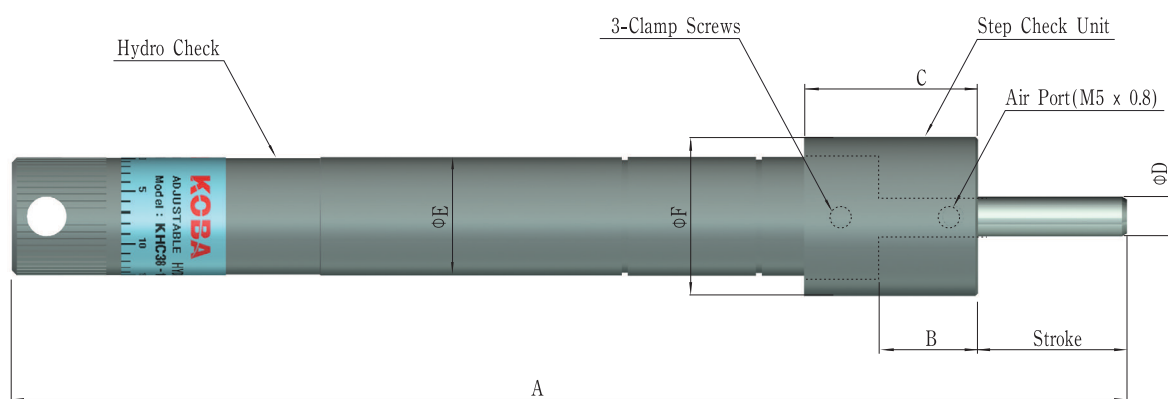
Adjustable Hydro Check

Dimension

unit:mm

Model	Stroke (mm)	A	B	C	D	E	F	G	Weight (g)
KHC24-30S	30	224.5	22	35	8	23.8	32	Air Return	500
KHC24-60S	60	332.5							685
KHC24-90S	90	404.5							795
KHC24-120S	120	494.5							935

Step Check Unit Series



Hydraulic Check

	■ Can be installed using two Snap Rings. Used when driving force is not very high.
	■ Mount Block is recommended when driving force is high and to install product at the desired location

Safety Suggestions

1. Do not fasten Hydro Check Body with bolt or alter it in anyway. (Contact KOB A if it needed)
2. Refer to the chart in Catalog to control the angle of Hydro check. If the location of installation is offset, it can cause unbalanced absorption to shorten the lifespan of Hydro Check or damage it.

Make the Future...!



Leading
the Shock Absorbers
&
Hydraulic Buffer



www.kobapage.com

KOBA



KOBA
SHOCK ABSORBERS



12F, A Block, KabeulGreatvalley, 60-5, Gasan-dong, Geumcheon-gu, Seoul, Korea
Tel : +82-2-3395-7800 Fax : +82-2-3397-7911 www.kobapage.com E-mail : koba@koba.co.kr