

MASON INDUSTRIES, Inc.

Manufacturers of Vibration Control Products

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2101 W. Crescent Ave., Suite D Anaheim, CA 92801 714/535-2727 FAX 714/535-5738 Info@MasonAnaheim.com www.MasonAnaheim.com FREE STANDING
SPRING MOUNTS and
HEIGHT SAVING
BRACKETS



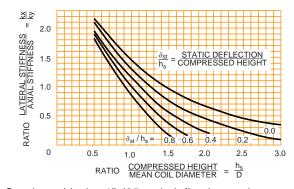
The Type **SLF** spring design evolved after many years of experience using springs within guided housing as the primary isolator. Since the old housing acted telescopically, the internal springs were designed for vertical stiffness and deflection only. Early attempts to use these tall slender springs out of their housing failed as the springs showed immediate instability or they fell over when subjected to minor horizontal forces.

It was important to eliminate the housing as they had a tendency to bind whenever they were cocked and to transmit vibration in the horizontal directions. We knew that if the springs were unhampered they would not only do better vertically, but do an equally fine job in isolating the horizontal disturbances.

Our research showed that springs could be designed with horizontal stiffnesses as high, or even higher than the vertical by carefully adhering to the ratios of the spring's compressed height to the mean coil diameter, and the static deflection to the compressed height as shown in the graph.



SINGLE SPRING 1" (25mm) Deflection SLF MOUNT



Starting with the 1" (25mm) deflection series, we paid great attention to these design factors and our springs became short stable columns. When we had tested and were completely satisfied with the 1" (25mm) designs, we moved on the 2" (51mm), 3" (76mm), 4" (102mm) and 5" (127mm) deflection series. Every spring table now includes data on the ratio of the spring diameter to the compressed height, and the ratio of the horizontal to the vertical spring constants. Our specifications suggest a minimum ratio of 0.75 between the spring diameter and the compressed height as a good working rule, although some of our designs exceed this number.



SINGLE SPRING 1" (25mm) Deflection SLFH MOUNT

MULTIPLE SPRING 1" (25mm) Deflection SLF MOUNT

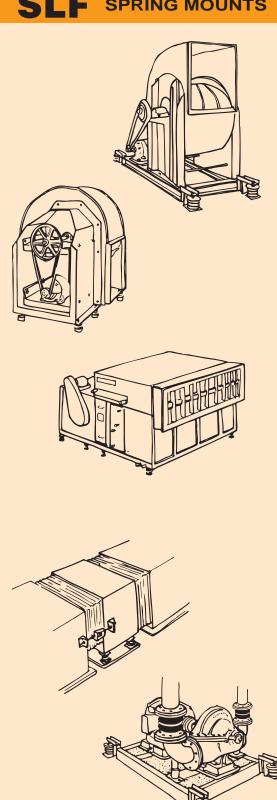
All of these springs are designed so as not to exceed the elastic limit when the coils are closed up and the springs are compressed solid. This prevents damage when the springs are overloaded and assures a return to the spring's free height. The rated loads and deflections allow for 50% additional travel to solid to accommodate weight distribution errors and to keep the springs operating in a low stress range. In our Nominal 1" (25mm) Deflection A, B, and C Spring series the smallest rated deflection is 1" (25mm) although some of the lighter springs can deflect as much as 2" (51mm). The springs are used individually or in clusters to develop greater capacity. Some of our B2 and C2 springs only meet competitive criteria and do not have 50% additional travel. This is clearly noted in our catalog Data Sheet DS-208.

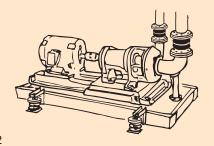
In an effort to develop a foolproof simple isolator using these sophisticated springs, we have merely added a neoprene friction pad on the bottom to help prevent the passage of noise and a spring loading and adjustment bolt at the top with a locking cap screw. You will find that these adjustment bolts are very substantial because they must be made rigid enough to maintain the alignment of the top of the spring with the base plate, and the head of the bolt is actually the equipment supporting surface. The bolts are tapped to receive the locking cap screw as this methods makes it easy to remove the isolator for servicing. The 5" (127mm) deflection springs are sometimes furnished with three adjustment bolts in a tripod arrangement to maintain the top plate stability. Other stabilizing methods use single oversized bolts or pull-down brackets. In some cases SLF mountings with smaller deflections are similarly designed when there are large horizontal forces such as in the isolation of a horizontal compressor. There is no need to bolt this mounting down in most cases because of the friction pad and the spring's reduction of the horizontal forces before they get down to the base plate.

SLF mountings of the proper deflection are recommended for all vibration control applications where it is not necessary to cope with weight removal or seismic and wind load problems. Excessive discharge pressures can be dealt with by adding mass through the use of floating inertia bases or where mass is not a practical solution, by the addition of horizontal thrust restraints.



The **SLFH** series of mounts are identical to the style **SLF** except for having two or four holes in the base to allow for bolting to the structure. Since it is expensive to bolt mountings down, and any bolting procedure tends to bypass the acoustical action of the neoprene pad on the bottom of the mounting, it is strongly recommended that you use the Type **SLF** unless the **SLFH** must be used because of elevated installations on steel beams, etc.





BELT DRIVEN CENTRIFUGAL FAN and MOTOR

SLF springs are used to isolate all kinds of fan equipment. Deflections are determined by fan speed, size, motor horsepower and equipment location as discussed in the VCS-IOO Engineering Specification and Selection Guide. Bases may be made of structural steel or concrete. The sketch shows a centrifugal fan on a type WFSL base with 3" (76mm) deflection springs.

UTILITY SET

Utility sets are normally direct mounted on 1" (25mm) deflection SLF springs as illustrated. ICS rails are used in conjunction with the springs when higher deflections are required or there is an unsupported fan scroll that causes over balancing. KSL concrete filled bases are recommended for outdoor locations because of the need for wind resistance.

FACTORY ASSEMBLED AIR HANDLING EQUIPMENT

Factory assembled air handling equipment may be direct mounted as shown or placed on ICS rails when higher deflections are called for. It is important to study the equipment base or legs to determine whether rails are needed for structural reinforcement.

FAN HEAD

A fan head develops high horizontal thrust because of the negative pressure on the very large inlet area. The SLF springs cannot handle this thrust without Horizontal Thrust Restraints as sketched or massive concrete filled bases to increase the resistive weight and spring constants.

END SUCTION PUMP or DOUBLE SUCTION PUMP

SLF spring mountings of the proper deflection are recommended for all pump isolation problems. While steel bases may be used, concrete is preferred for greater rigidity and the possibility of grouting in the pump base. Bases should be made large enough to support the suction and discharge elbows whenever possible. Thus, Double Suction bases become wide and End Suction bases long.

> SLF applications are by no means limited to these sketches. We have merely tried to illustrate the many modes of application and some of the design considerations.

VERTICAL PUMPS

Vertical pump bases using SLF mountings should be made large enough for stability and extended as required to support the piping before attachment to the pump flanges. This piping support reduces the strain on the pump casing.

CLOSE COUPLED PUMP

Close coupled pumps are generally unstable when mounted directly on SLF mountings because they are small in configuration and have a severe overhang on the pump end. A concrete base makes them less sensitive to external forces so the installation becomes much more workmanlike and practical. SLF deflections depend on location and pump size.

DIRECTLY DRIVEN REFRIGERATION COMPRESSOR UNIT

1" (25mm) deflection SLF mountings can be directly attached to the isolated equipment. Mountings of different capacities would be used at the two ends to compensate for the uneven weight distribution and provide reasonably uniform deflection. This use of springs of different capacity but the same potential deflection applies to all isolator selections.

BELT DRIVEN AIR COMPRESSOR

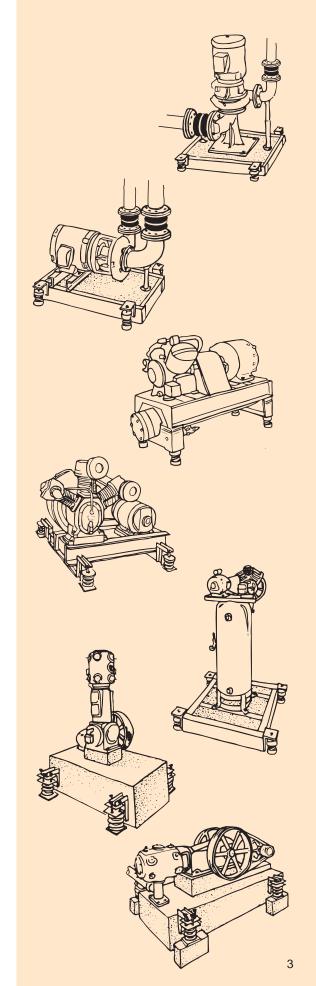
When 2" (51mm) or higher deflection SLF mountings are used we normally recommend ICS rails to minimize elevations. In this particular case the rails project beyond the flywheel to compensate for the overhang. The higher deflections are used to increase efficiency at the low operating speed.

VERTICAL TANK TYPE AIR COMPRESSOR

It is important to exercise caution when applying spring mountings to tall machines with small base dimensions. The use of a concrete filled type K base with SLF mountings lowers the center of gravity in addition to enlarging the base dimensions. Thus, the installation becomes much more stable.

SLOW SPEED VERTICAL or HORIZONTAL COMPRESSOR or VACUUM PUMP

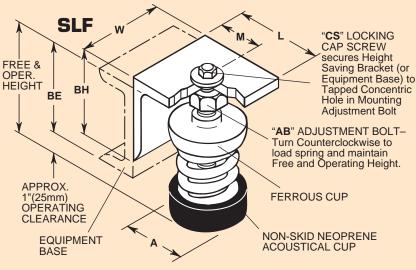
Slow speed, large bore and stroke reciprocating compressors or vacuum pumps have large residual unbalanced forces that make direct mounting impossible because of excessive motion. The concrete inertia block mass is calculated from unbalanced force data supplied by the manufacturer. It is often as much as seven times the equipment weight. Vertical compressors are located over the combined vertical center of gravity. The springs under horizontal compressors are elevated to the horizontal CG. Three adjustment bolts are most important to maintain horizontal SLF stiffness.

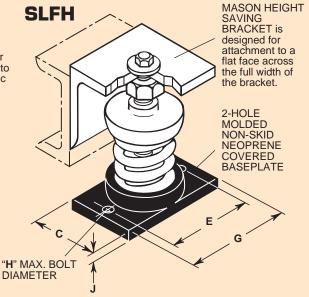


MASON INDUSTRIES

1"(25mm) Deflection SLF SINGLE SPRING MOUNTS

Change designation to SLFH when base plate with bolt holes is required.





Matching Height Saving Bracket

BH- Bracket Height BE- Bracket Elevation

Туре	Size	L (in) (mm)	M (in) (mm)	W (in) (mm)	BE (in) (mm)	BH (in) (mm)
SLF- SLFH-	X A-45 – A-400 A-510 – A-625 B & C	21/2 64 21/2 64 21/2 64 4 102	2 51 2 51 2 51 23/4 70	3 76 3 76 3 76 3 76	23/4 70 31/4 83 35/8 92 5 127	21/2 64 21/2 64 21/2 64 4 102

All springs have additional travel to solid equal to 50% of the rated deflection.

Solid Spring Height = Free Height minus 1.5 times Rated Deflection.

Ratings & Dimensions for 1"(25mm) Deflection Single Spring Mounts (inches millimeters)

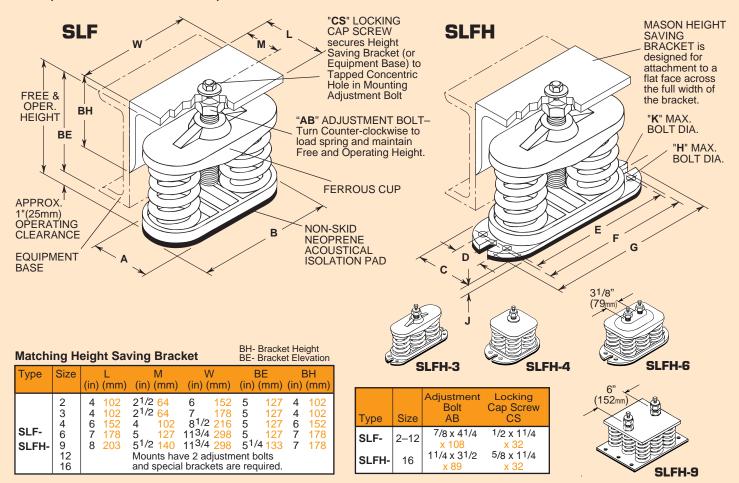
Туре	Size	Rated Capacity (lbs) (kg)	Rated Defl. (in) (mm)	Spring Constant (lbs/in)(kg/mm)	Spring Color	Spring Spring OD		Free 8 Oper Ht		С	E	G	Max. Bolt Dia. H	J	Adjust- ment Bolt AB	Locking Cap Screw CS
	X-23 [†] X-33 [†] X-54 [†] X-76 [†] X-113 [†] X-130 [†] X-175 [†] X-210 [†]	23 10 33 15 54 24 76 34 113 51 130 59 175 79 210 95	1.50 38 1.30 33 1.40 36 1.22 31 1.20 30 1.20 30 1.20 30 1.20 30	18 0.26 30 0.45 45 0.67 73 1.10 113 1.70 130 1.97 175 2.63 210 3.17	Brown Red White Black Yellow Purple Silver Blue	11/2 38	21/2 64	33/4 95	2 51		Ξ	=		-	1/2 x 21/2 x 64	1/4 x 1 x 25
SLF-	A-45 A-75 A-125 A-200 A-310 A-400	45 20 75 34 125 57 200 91 310 141 400 181	1.60 41 1.50 38 1.33 34 1.15 29 1.00 25 1.00 25	28 0.49 50 0.89 94 1.68 174 3.14 310 5.64 400 7.24	Blue Orange Brown Black Yellow Green	13/4 44	3 76	41/4 108	21/8 54	2 ¹ / ₄ 57	3 76	33/4 95	1/4 6	3/8 10	5/8 x 21/2 x 64	3/8 x 1 x 25
SLFH-	A-510 A-625	510 231 625 283	1.00 25 1.00 25	510 9.24 625 11.32	Red White	13/4 44 13/4 44	31/8 79 33/8 86	45/8 117	21/8 54	21/4 57	3 76	33/4 95	1/4 6	3/8 10	5/8 x 21/2 x 64	3/8 x 1 x 25
	B-65 B-85 B-115 B-150 B-280 B-450 B-750 B-1000	65 29 85 39 115 52 150 68 280 127 450 204 750 340 1000 454	2.10 53 2.10 53 2.00 51 2.00 51 1.60 41 1.31 33 1.12 28 1.00 25	31 0.55 40 0.74 57 1.02 75 1.33 174 3.10 344 6.18 670 12.14 1000 18.16	Brown White ^{††} Silver Orange Green Red White Blue	23/8 60	4 102	6 152	23/4 70	2 ⁷ /8 73	41/8 105	53/8 137	1/2 13	3/8 10	7/8 x 41/4 x 108	1/2 x 11/4 x 32
4 1	C-1000 C-1350 C-1750 C-2100 C-2385 C-2650 C-2935	1000 454 1350 612 1750 794 2100 953 2385 1082 2650 1202 2935 1331	1.00 25 1.00 25 1.00 25 1.00 25 1.00 25 1.00 25 1.00 25	1000 18.16 1350 24.48 1750 31.76 2100 38.12 2385 43.28 2650 48.08 2935 53.24	Black Yellow Black* Yellow* Yellow** Red* Red**	27/8 73	41/8 105	6 152	31/4 83	33/8 86	43/4 121	61/8 156	1/2 13	3/8 10	7/8 x 41/4 x 108	¹ /2 x 1 ¹ /4 x 32

1"(25mm) Deflection SLF MULTIPLE SPRING MOUNTS

Change designation to SLFH when base plate with bolt holes is required.

All springs have additional travel to solid equal to 50% of the rated deflection. Solid Spring Height = Free Height minus 1.5 times Rated Deflection.

Multiple spring mounts have C size springs. SLF-2, SLF-3, SLF-4, SLF-6, SLF-9, SLF-12 & SLF-16 have 2, 3, 4, 6, 9, 12 & 16 springs respectively.



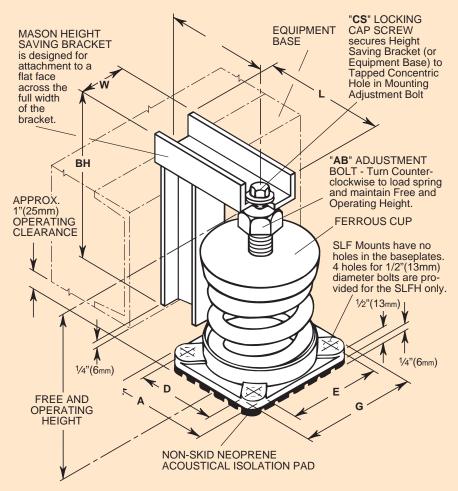
Ratings & Dimensions for 1"(25mm) Deflection Single Spring Mounts (inches millimeters)

realings & Dimensions for 1 (25mm) Deflection of single opting mounts (mones imminicities)																	
Туре	Size	Rated Capacity (lbs) (kg)	Rated Defl. (in) (mm)	Spring Constant (lbs/in)(kg/mm)	Spring Color/ Stripe	Spring	g Only Free Height	Free & Ope Ht		В	С	D	E	F	G	Hole Max. Bolt Dia. H	Slot Max. Bolt Dia. J K
	2-2700 2-3500 2-4200	2700 1225 3500 1588 4200 1905	1.00 25 1.00 25 1.00 25	2700 49.00 3500 63.52 4200 76.20	Yellow Black* Yellow*	27/8 73	41/8 105	6 152	31/4 83	73/4 197	31/4 83	13/4 44	81/4 210	81/2 216	10 254	5/16 8	1/2 3/8 13 10
SLF-	3-5250 3-6300 3-7155 3-7950	5250 2381 6300 2858 7155 3245 7950 3606	1.00 25 1.00 25 1.00 25 1.00 25	5250 95.24 6300 114.32 7155 129.80 7950 144.24	Black* Yellow* Yellow** Red*	27/8 73	41/8 105	6 152	33/8 86	91/2 241	33/8 86	13/4 44	10 254	10 ¹ /4 260	113/4 298	5/16 8	1/2 3/8 13 10
	4-5400 4-7000 4-8400	5400 2449 7000 3175 8400 3810	1.00 <u>25</u> 1.00 <u>25</u> 1.00 <u>25</u>	5400 97.96 7000 127.00 8400 152.40	Yellow Black* Yellow*	27/8 73	41/8 105	6 152	61/4 159	61/4 159	61/4 159	21/4 57	71/2 191	71/2 191	93/8 238	1/2 13	1/2 1/2 13 13
SLFH-	6-12600 6-14310 6-15900 6-17610	12600 5715 14310 6491 15900 7212 17610 7988	1.00 25 1.00 25 1.00 25 1.00 25	12600 228.60 14310 259.64 15900 288.48 17610 319.52	Yellow* Yellow** Red* Red**	27/8 73	41/8 105	6 152	63/8 161	91/2 241	63/8 161	21/4 57	103/4 273	103/4 273	125/8 321	1/2 13	1/2 1/2 13 13
	9-18900 9-21465 9-23850	18900 8573 21465 9736 23850 10818	1.00 25 1.00 25 1.00 25	18900 342.92 21465 389.44 23850 432.72	Yellow* Yellow** Red*	27/8 73	41/8 105	7 178	9 229	9 229	9 229	6 152	11 279	=	12 ¹ / ₂ 318	1/2 13	1/2 — 13 —
	12-25200 12-28620 12-31800	25200 11431 28620 12982 31800 14424	1.00 25 1.00 25 1.00 25	25200 457.24 28620 519.28 31800 576.96	Yellow* Yellow** Red*	27/8 73	41/8 105	7 178	9 229	12 305	9 229	6 152	14 356	=	15 ¹ /2 394	1/2 13	1/2 — 13 —
	16-33600 16-38160	33600 15241 38160 17309	1.00 <u>25</u> 1.00 <u>25</u>	33600 609.64 38160 692.36	Yellow* Yellow**	27/8 73	41/8 105	8 203	12 305	13 330	12 305	6 152	15 381	_	16 ¹ / ₂ 419	1/2 13	1/2 — 13 —



2"(51mm), 3"(78mm), 4"(102mm) & 5"(127mm) Deflection 100 Series SLF SPRING MOUNTS

Change designation to SLFH when base plate with bolt holes is required.



All springs have additional travel to solid equal to 50% of the rated deflection.

Solid Spring Height = Free Height minus 1.5 times Rated Deflection.

Matching Height Saving Bracket

BE- Bracket Elevation

	-												
Туре	Size	(in) (mm)	(in) (mm)	W (in) (mm)	BH (in) (mm)								
2" 51mm Defl. SLF- SLFH-	101- 107 108 109 110 111 112 113 114 115 116 117		61/2 165 71/4 184 71/4 184 71/4 184 101/2 267 101/2 267 101/2 267	3 76 3 76 4 102 4 102 4 102 6 152 6 152 6 152 cial adjustr									
3" 76mm Defl. SLF- SLFH-	126- 130 131 132 133- 137 138- 139 140 141- 143	71/2 191 71/2 191 81/4 210 83/4 222 121/2 318 13 330 Mour	61/2 165 61/2 165 71/4 184 73/4 197	3 76 3 76 4 102 4 102 6 152 6 ¹ /2152 ecial adjustr	101/4 260 103/4 273 113/4 298 14 356 171/2 445 211/2 546 ment								
4" 102mm Defi. SLF- SLFH-	150- 153 154- 155 156- 158 159 160- 162 163- 165- 166- 167 168- 169	7 178 81/4210 81/4210 81/4210 11 279 14 356 141/2 368 Alterr	6 152 71/4 184 71/4 184 71/4 184 91/2 241 121/2 318 13 330 hate bracket	4 102 3 76 3 76 3 76 4 102 6 152 61/2165	113/8 289 121/2 318 131/8 333 141/8 359 173/8 441 213/8 543 241/4 616								
5" 127mm Defl. SLF- SLFH-	174- 198	illustration three Adjus	(See page 8) Matching Height Saving Bracket as shown in illustration on page 6. Pulldown Brackets or three Adjustment Bolts are designed for each special application as required. (See page 8)										

Ratings & Dimensions for 2"(51mm) Deflection 100 Series Spring Mounts (inches mm)

				, ,					,		•			
Туре	Size	Rated Capacity (lbs) (kg)	Rated Defl. (in) (mi	l Mount Constant m) (lbs/in)(kg/mi	Spring Color/ m) Stripe	Spring Spring OD	only Free Height	Free & Oper Ht	А	D	E	G	Adjust- ment Bolt AB	Locking Cap Screw CS
2" 51mm Defl.	1 -	125 57 200 91 310 141 500 227 740 336 1050 476 1400 635	2.50 64 2.50 64 2.50 64 2.50 64 2.40 61 2.10 53 2.00 51	50 0.89 80 1.42 125 2.20 200 3.55 310 5.51 500 8.98 700 12.45	Purple Brown Pink Green Red White Blue	33/4 95 33/4 95 33/4 95 33/4 95 33/4 95 33/4 95 33/4 95	53/4 146 53/4 146 53/4 146 53/4 146 53/4 146 57/8 149 57/8 149		41/4 108	31/4 83	4 102	43/4 120	7/8×53/4 × 146	¹ /2×11/4 × 34
SLF-	108 109 110 111	1660 753 2250 1021 3000 1361 4000 1814	2.05 52 2.00 51 2.00 51 2.00 51	810 14.48 1125 20.02 1500 26.69 2000 35.57	Silver Orange Gray Tan	41/2 114 41/2 114 5 127 5 127	63/4 171 71/2 191 71/2 191 71/2 191	8 203 9 229 9 229 9 229	5 127 5 127 51/2 140 51/2 140	4 102 4 102 41/4 108 41/4 108	41/4 108 41/4 108 51/4 133 51/4 133	51/4 133	7/8x53/4	1/2x11/4 x 34
SLFH-	112 113 114 115	5300 2404 7100 3221 9300 4218 12600 5715	2.00 51 2.00 51 2.00 51 2.00 51	2665 47.14 3550 63.16 4650 82.71 6300 112.06	Black Yellow Blue/Orng Blue/Red	51/2 140 6 152 63/4 171 63/4 171	83/4 222 10 254	10 ¹ /2 267 12 305		43/4 121 51/4 133 61/4 159 61/4 159	53/4 146 6 152 61/4 159 61/4 159	71/2 191 71/2 191	1 x 6 x 152	1/2×11/4 × 34
	116 117 118	16800 7620 28500 12927 40000 18144		8400 149.41 11175 198.88 19000 342.34	Blue/White Blue/Silver Blue/Gray	83/4 222	101/8 257 131/8 333 131/8 333	16 406	81/2 <mark>216</mark> 91/2 <mark>241</mark> 101/2 267	71/4 184 81/2 216 91/2 241	81/2 216	81/2 216 91/2 241 101/2 267	11/4x8 11/2x8 13/4x8	5/8x11/2 x 38 x 203



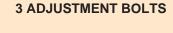
Ratings & Dimensions for 3"(76mm), 4"(102mm) & 5"(127mm) Deflection 100 Series Spring Mounts (inches mm)

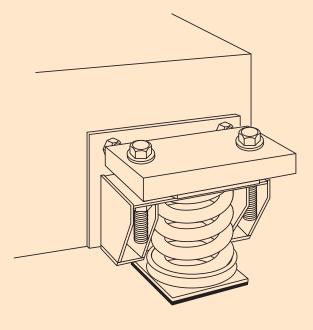
Ratings & Dimensions for 3"(76mm), 4"(102mm) & 5"(127mm) Deflection 100 Series Spring Mounts (in													`								
Туре	Size	Rate Capa (lbs) (city	Rat De	fl.	Con	ount istant)(kg/mr	Spring Color/ m) Stripe	Spri OD	ng	Only Free Height		ee & Oper Ht		Ą	D		E	G	Adjust- ment Bolt AB	Locking Cap Screw CS
3" 76mm Defl.	126 127 128 129 130 131	195 280 390 520 710 940 1280	88 127 177 236 322 426	3.25 3.25 3.25 3.25 3.25 3.25 3.25 3.25	83 83 83 83 83 83	60 85 120 160 220 290	1.06 1.53 2.13 2.84 3.88 5.13 7.00	Purple Brown Orange Green Red White Blue	33/4 33/4 4 4 41/2	95 95 102 102 114	63/8 162 61/2 165 61/2 165	8 8 8 81/2 81/2 9	203 203 203 216 216 229	41/4 41/4 41/2 41/2 5 5	108 108 114 114 127 127	31/4 83 31/4 83 35/8 92 35/8 92 4 10	3 4 3 4 2 41/4 2 41/4 2 41/4	102 102 108 108 108	43/4 121 43/4 121 5 127 5 127 51/4 133 51/4 133	7/8x53/4 × 146	1/2x11/4 x 32
SLF-	133 134 135 136	1770 2490 3300 4500	1129 1497	3.25 3.25 3.25 3.25	83 83	765 1000	18.04	Black Yellow Gray Blue/Brown	51/2 6	140 152	91/4 235 91/4 235 91/2 241 93/4 235	11 11		6 65/8	152 168	43/4 12 43/4 12 51/4 13 61/4 15	1 53/4 3 6	146 146 152 159	7 178 71/2 191	1 x 6	1/2x11/4 x 32
	137 138 139 140	6200 8300 11400 15200	3765 5171	3.25 3.25 3.25 3.25	83 83	2560 3500	45.36 62.30	Blue/Orng Blue/Red Blue/White Blue/Silver	73/4 73/4	197 197	107/8 276 11 279 121/4 311 123/4 324	131/4 131/4	337 337	81/2 81/2	216 216	71/4 18 71/4 18	4 71/4 4 71/4	184 184		11/4x8	5/8 x 11/2 x 38
	141 142 143	39000	12882 17690	3.25	83 83 1	8750 2000	155.20 213.13	Blue/Gray Blue/Green Blue/Yellow	101/4	260 279	16 ¹ /8 <mark>410</mark>	18	419 457 483	11	267 279 1 305 1	0 25	1 91/2 4 10 9 11	241 254 279	11 279	11/4x 8 x 11/2x 8 x 13/4x 8 x	(203
	150 151 152 153	240 330 420 530	150 191	4.38 4.38 4.38 4.38	121 121	75 95	0.98 1.35 1.72 2.16	Purple Brown Orange Green	5 5 5 5	127 127 127 127	83/8 213 81/2 213 83/8 213 83/8 213		254	51/2	140	41/4 10	8 51/4	133	61/2 165	7/8 x 8 x 203	1/2x11/4 x 32
4" 102mm Defl.	I	680 880 1120 1420	399 508	4.38 4.38 4.38 4.38	121 121	200 255	2.77 3.59 4.58 5.80	Red White Blue Black	6 6 6 6	152 152 152 152	87/8 225 91/8 232 97/8 251 10 254	103/4 12	273 305	65/8 65/8	168 168		3 6 3 6	152 152	71/2 191 71/2 191 71/2 191 71/2 191	1 x 8	1/2x11/4 x 32
SLF-	158 159	1840 2370		4.38 4.38			7.52 9.68	Yellow Gray			103/8 264 111/8 283		305 330	71/2 71/2		61/4 15 61/4 15			71/2 191 71/2 191	1 x 8 x 203	5/8x11/2 x 38
SLFH-	160	3000 3900	1361	4.38 4.38	121	695	12.26	Blue/Brwn Blue/Red	73/4	197	107/8 276	14	356	81/2	216	71/4 18 71/4 18	4 71/4	184	81/2 216	11/4 x 8	5/8x11/2
	161 162 163 164	5100 6500 8400	2313 2948	4.38 4.38	121 121	1155 1485	20.84 26.56	Blue/Orng Blue/White Blue/Silver	83/ ₄ 83/ ₄	222 222	113/8 289 111/2 292 131/4 337 133/8 340	14 17	356 432	91/ ₂ 91/ ₂	241 241	81/2 <mark>21</mark> 81/2 21	6 81/2 6 81/2	216 216	81/2 216 91/2 241 91/2 241 91/2 241	11/2 x 8 x 203	3/4 x 2 x 51
	165 166	10800 13800		4.38 4.38				Blue/Gray Blue/Green			14 ¹ /8 359 15 ³ /8 391		432 483		267 279 1		1 91/2 4 10	241 254	10 ¹ /2 267	13/4 x 8 x 203	3/4 x 2 x 51
	167 168 169	17800 22900 30000	10387	4.38	121	5235	93.58	Blue/Yellow Blue/Pink Blue/Tan		279		20	483 508 533	12 12	305 1 305 1 330 1	1 27 1 27	9 11 9 11 5 12	279 279 305	12 305 12 305	21/2 x 8 x 203	11/4 x 3 x 76
	174 175 176 177	70 320 370 460	145 168	5.31 5.31 5.31 5.38	135 135	60 70	1.07	Purple Brown Orange Green	6	152 152	97/8 251 10 ¹ / ₁₆ 256 10 254 10 ¹ / ₂ 267	'-	305	65/8	168	61/4 15	9 61/4	159	71/2 191	1 x 9 x 229	1/2x11/4 x 32
5" 127 _{mm} Defl.	I	560 670 830 1000 1240	304 376 454	5.38 5.38 5.38 5.38 5.37	137 137 137	125 155 185	1.85 2.22 2.74 3.31 4.13	White Blue Black Yellow	63/4 63/4	171 171 171	103/4 273 111/16 281 113/8 289 111/8 283 113/8 289	131/2								1 v 10	1/2x11/4 x 32
SLF-	185	1500 1830 2230 2710	830 1012	5.37 5.37 5.37 5.37	136 136	340 415	7.44	Gray Pink Silver Tan	73/4 73/4	197 197	12 ⁷ /16 316 11 ⁷ /8 302 12 305 12 ³ /4 324	15	381	81/2	216	71/4 <mark>18</mark>	4 71/4	184	81/2 <mark>216</mark>	1 ¹ / ₄ x 10 x 254	5/8x11/2 x 38
	187 188 189 190 191	3300 4100 4900 6000 7300	1860 2223 1852 2252	5.37 5.37	136 136 136 136	755 915 1120 1365	13.68 16.35 20.01 24.35	Blue/Orng Blue/Red Blue/White Blue/Yelw Blue/Silvr	83/4 91/16 91/2 91/2	222 230 241 241	123/4 324 133/8 340 137/16 341 145/8 371 153/16 386	16 16 17 17 ¹ /2	406 406 432	91/2 91/2 101/2	241 241 267	81/2 21 81/2 21 91/2 24	6 81/2 6 81/2 1 91/2	216 216 241	91/2 241 91/2 241 91/2 241 101/2 267 101/2 267	11/2 x 10	3/4 x 2 x 51
	192 193	9000	2777 3395	5.37 5.37	136 136	1670 2040	30.01 36.69	Blue/Gray Blue/Tan	101/4 101/4	260 260	155/8 397 16 406	18	457	11	279 1	0 25	4 10	254	11 279	13/4 x 10 x 254	3/4 x 2 x 51
	194 195 196	13300 16300 19800	6033 7394 8981	5.37 5.37 5.37	136 136 136	2482 3028 3694	44.36 54.37 66.04	Blue/Brown Blue/Pink Blue/Black	113/8 115/8	289 295	17 ¹ /8 435 18 457	20 21	483 508 533	12 13	305 1 305 1 330 1	1 27 12 30	9 11 9 11 5 12	279 279 305	12 305 13 330	2 x 10 x 254	1 x 2 ¹ /2 x 64
	197							Blue/Purple			191/2 495		584		356 1		0 13	330		2 v 10	11/4 x 3
	198	29000	13154	5.27	134	5500	90.10	Blue/Purple	13	330	191/8 486	23	584	14	356 1	3 33	0 13	330	14 356	x 254	x 76

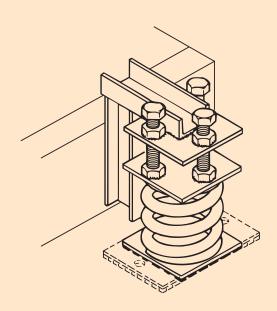


Alternate bracket and spring adjustment methods to improve stability and appearance when using 4" (102mm), 5" (127mm) and greater deflection springs.

PULL-DOWN BRACKET







SPRING CHARACTERISTICS

Spring Size	Rated Deflection	Ratio Kx/Ky	Ratio OD/OH	Spring Size	Rated Deflection	Ratio Kx/Ky	Ratio OD/OH
Х	1.00-1.30	0.75-1.00	0.92-1.40	101-118	2.00-2.55	0.71-1.10	0.82-1.15
Α	1.00-1.60	0.50-0.90	0.74-1.25	126-143	3.25	0.72-1.00	0.85-1.36
В	1.00-2.10	0.70-0.90	0.80-1.25	150-169	4.38	0.80-1.10	0.85-1.33
C & Multiples	1.00	0.90-1.10	0.92	174-198	5.27-5.38	0.70-1.00	0.92-1.31

PRODUCT FINISHES

All standard products have a painted finish unless otherwise indicated.

Special finishes include:

- Zinc Chromate
- Neoprene Dipping
- Cold Galvanized Paint
- Epoxy Finish
- Hot Dipped Galvanized Holders with Electro-Galvanized or Cadmium Plated Hardware, depending on size and method of attachment. Springs in these holders will be made rust resistant.



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