

MECHANICAL EQUIPMENT

Products

Air Conditioning & HVAC

Spring mounts

Introduction into Spring Mounts

There are five series of *Spring Mounts* originally designed by Mason Industries and now also manufactured locally by ACTOM. The application can be fitted with spring mounts directly mounted on the floor, or on a steel base or on a concrete filled base.

SLFA, B & C type mounts are open spring mounts that provide at least 25 mm deflection at rated loads up to 950 kg.

SLM type mounts are also open spring mounts using the same springs as SLFC, built up into multi-spring assemblies of 2, 3 or more springs to give higher load carrying capacities up to 15000 kg.

The *SLH* series are high deflection spring mounts designed for 50 to 75 mm deflection at rated loads up to 7520 kg. We have standard designs, or we can make special designs, for mounts giving 100 mm deflection or more and rated up to 18000 kg.

C type mounts use the A, B and C range of springs located in a robust 2 piece cast housing that gives extra horizontal stiffness. The two halves of the housing are separated by sponge rubber inserts which prevent metal to metal contact and limit movement during start up and shut down. Maximum capacity is 3800 kg.

The *SLR* range is a special design of restrained spring mounts for use with equipment such as chillers and boilers which have different weights when empty or filled with water, and equipment exposed to strong winds on roof tops such as cooling towers.

Mason spring mounts are equipped with height adjustment bolts which are used to compress the spring, lift the equipment off the floor and permit accurate leveling. The operation is most conveniently carried out using height saving brackets, as explained and illustrated on the next page.

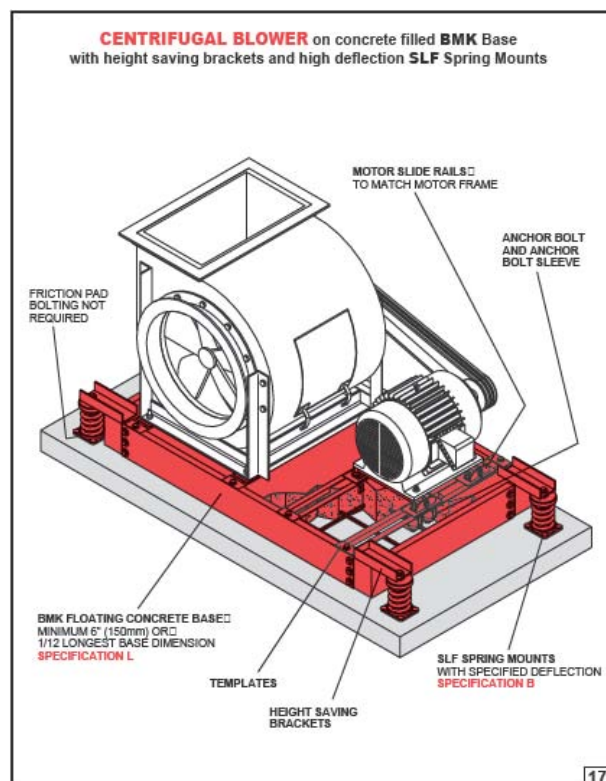


Applications

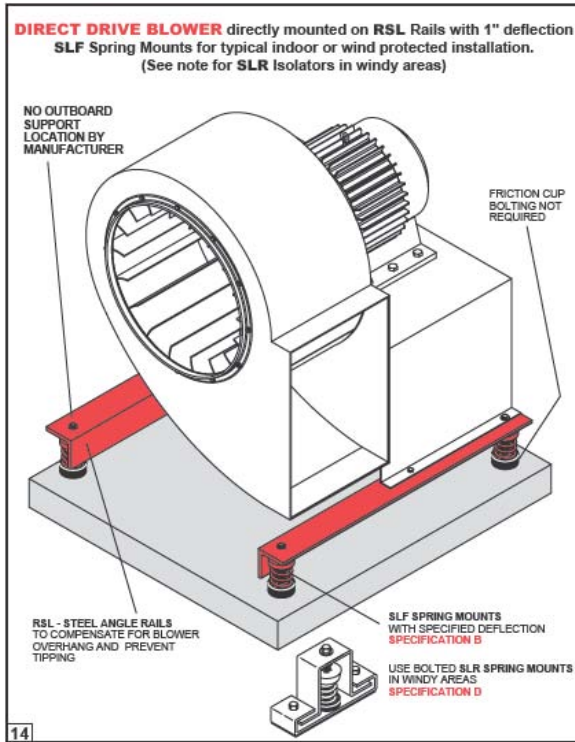
Centrifugal Fans

Spring mounts are used to isolate all types and sizes of fans or blowers.

The required spring deflection is determined by fan speed, motor power, equipment location and floor stiffness in the Engineering Section



Introduction into Spring Mounts



Centrifugal Fans / continued

Bases can be made of structural steel or concrete. Concrete greatly increases the stiffness of large bases, and prevents flexing at the corners.

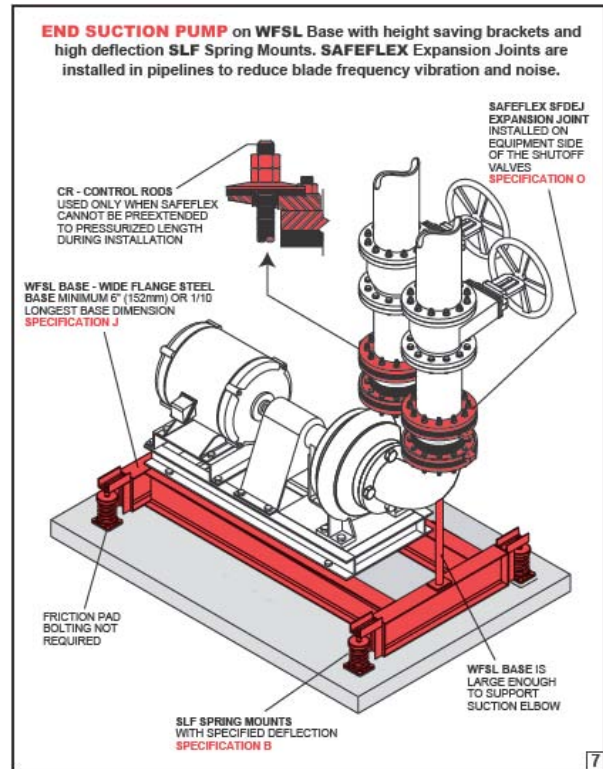
The illustration shows a steel base with SLF mounts

Centrifugal Pumps

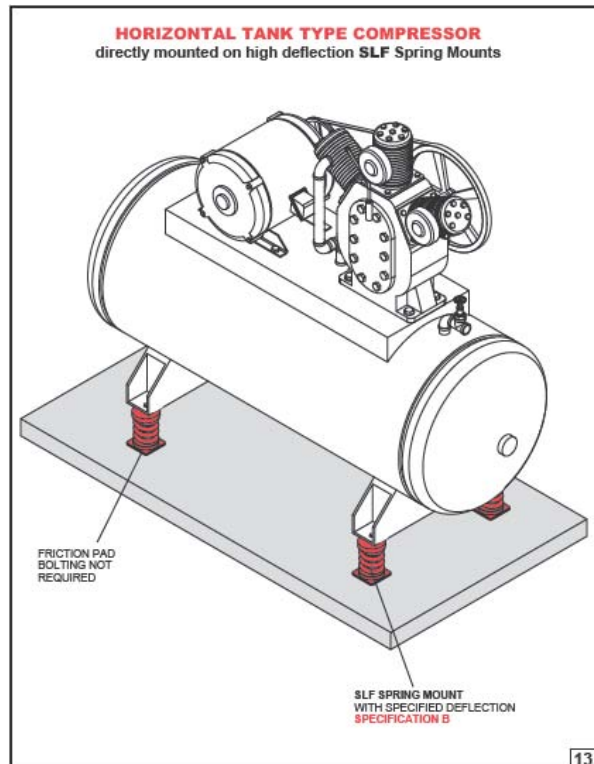
Spring mounts are excellent for all pump isolation problems. Bases should be made large enough to support the suction and discharge elbows if possible.

Bases must be rigid to maintain shaft alignment. The illustration show concretes a steel base with high deflection SLF mounts.

Height saving brackets makes it easy to lift the equipment off the floor.



Introduction into Spring Mounts

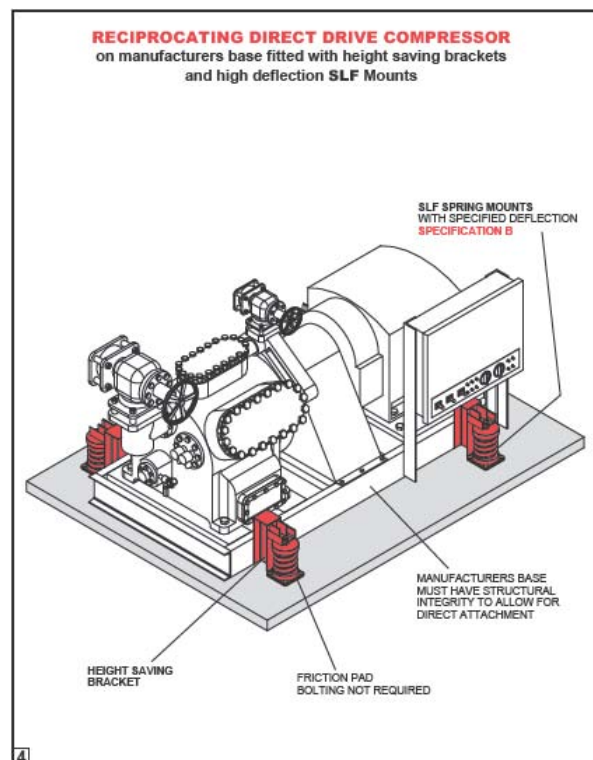


Compressors

Spring mounts are particularly suitable for reciprocating compressors, with higher deflection springs necessary for slower speed compressors.

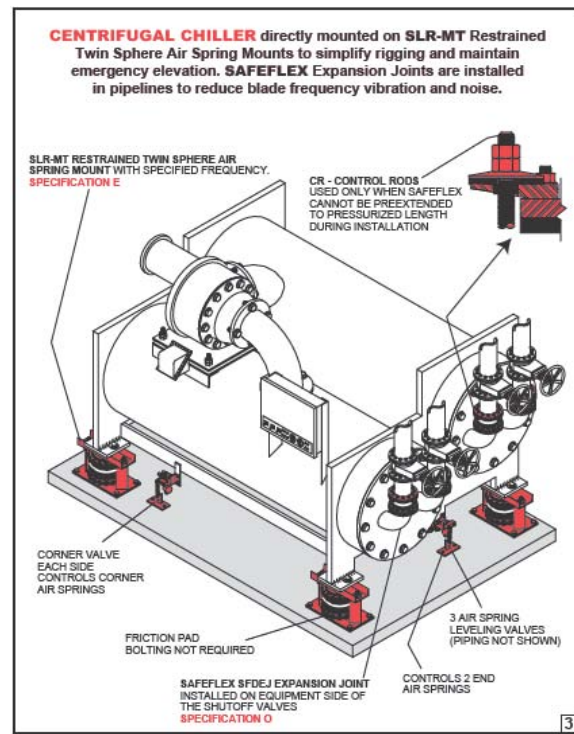
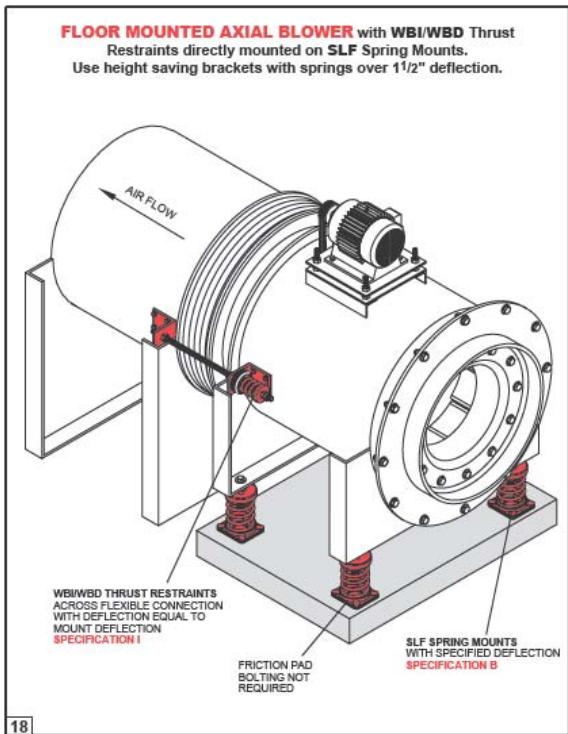
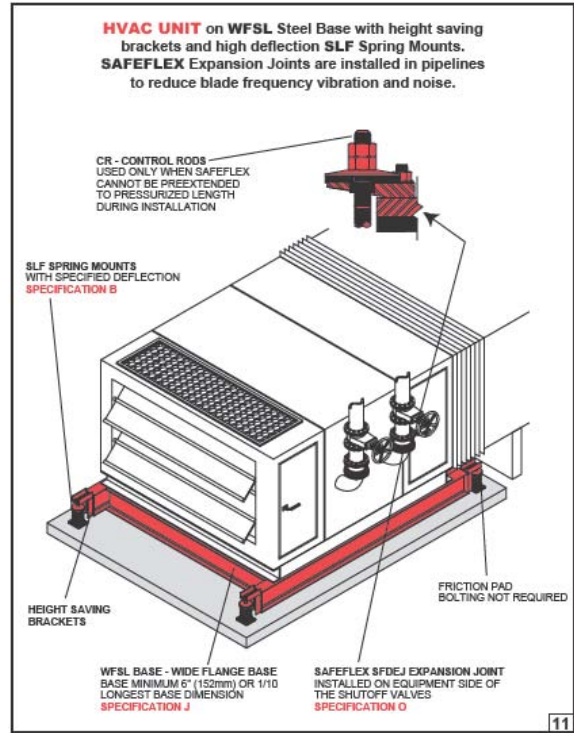
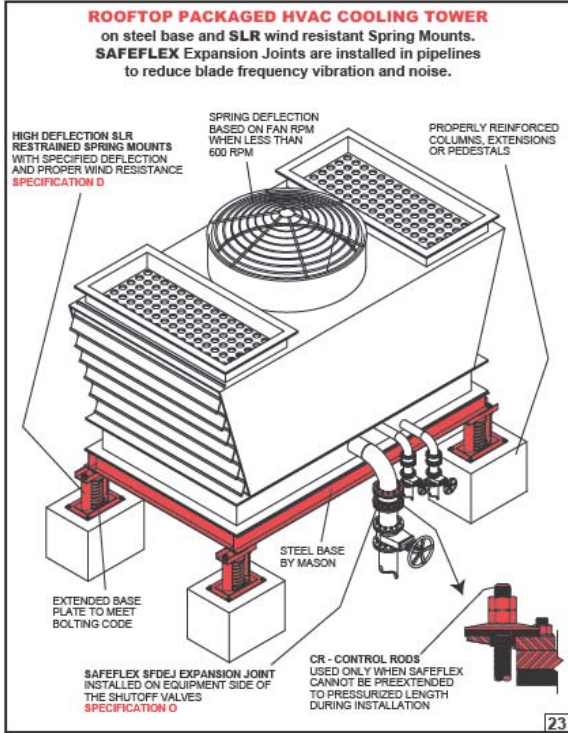
Mounts must be properly selected to ensure they compensate for uneven weight distribution at the compressor end and motor end and provide equal or nearly equal deflection.

In the illustrations the belt driven compressor above stands on SLF type mounts and the small direct coupled unit on the right on SLF mounts with height saving brackets.



Introduction into Spring Mounts

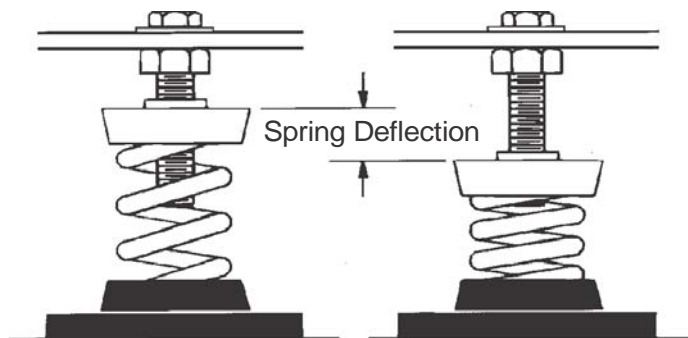
Other Applications



Introduction into Spring Mounts

Adjustment Bolts

Mason spring mount (except for Type SL) are equipped with *Height Adjustment Bolts*. The amount that the spring is compressed by the load it has to support can be compensated by unscrewing the adjustment bolt by the same amount, so that the Free Height (before loading) and Operating Height (after loading) are the same.

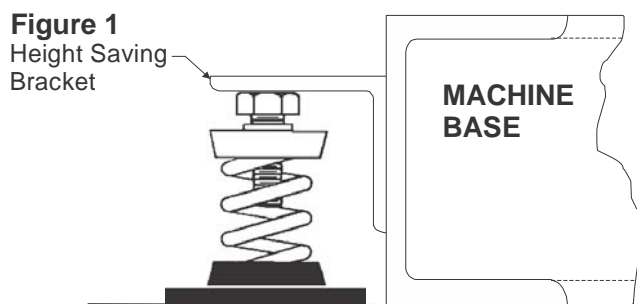


Height Saving Brackets



Height Saving Brackets are an accessory that can be added to equipment bases so that spring mountings can be used not only to isolate vibration from the floor but also to jack the equipment base off the floor to the required elevation, and then level it.

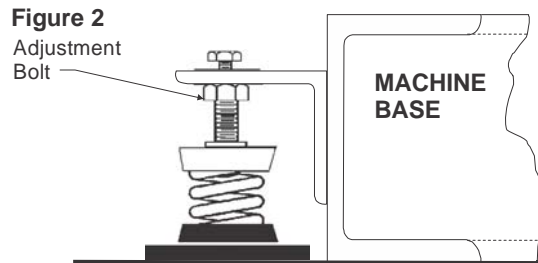
Figure 1 shows a base with a height saving bracket welded or bolted on. The underside of the bracket is located at the elevation of the spring mounting's "free height".



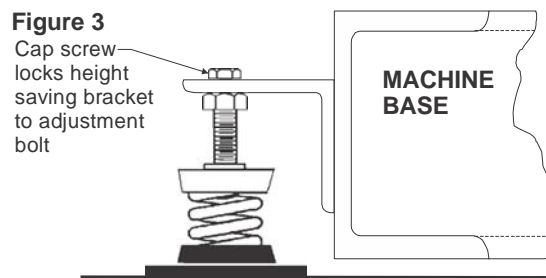
Introduction into Spring Mounts

Height Saving Brackets / continued ...

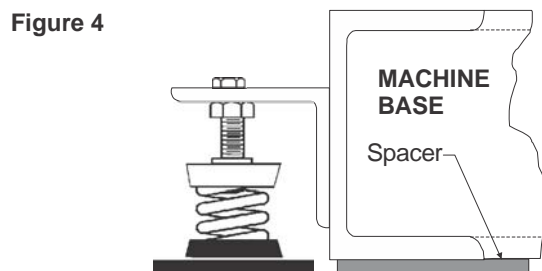
When the adjustment bolt is turned anticlockwise, and comes up against the height saving bracket, it starts to compress the spring, as in Figure 2.



When the spring is compressed by the amount necessary to accept the load it will not compress any further. Any additional turning of the adjustment bolt will lift the base off the floor as in Figure 3. The procedure is to work around the equipment from mounting to mounting (4 or 6 or however many), adjusting each a little at a time, until they are all taking their load. A further couple of turns of each bolt will then raise the equipment to the required elevation. A final adjustment will ensure the base is dead level.



If in the above process the base has been lifted say 10 mm above the floor that does mean that the base is that much higher than at its starting elevation, when it was resting on the floor. That might spoil the alignment of a fan's flexible duct or a pump's pipe connections if they were already installed when the base was elevated. An alternative procedure is to place spacers under the base (say 10mm thick) to lift it to its final elevation, as in Figure 4. In that case the height saving bracket must be attached to the base 10 mm lower. Then follow the same procedure as before. When the springs are sufficiently compressed to accept the load it requires only another quarter turn of the adjustment bolt for the spacers to come free. The base is then "floating" at its original elevation.



Type SLF Spring Mounts



SLF

Type SLF spring mounts are single and open spring mounts for rated loads from 20 kg up to 950 kg with a maximum of 25mm deflection and our standard for all high efficiency installations. This is a bare spring design with a good ratio between the diameter and the working height to ensure lateral stability.

These mounts shall be free standing and laterally stable without any housing and complete with an acoustical rubber cup between the base plate and the support.

All of the 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.

These mounts have leveling bolts that must be rigidly bolted to the equipment. The ratio of the spring diameter divided by the compressed spring height shall be no less than 80%. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection.

The Type SLF spring mounts were originally designed by Mason Industries, Inc and now also manufactured locally by ACTOM Mechanical Equipment.



Markets

- Air conditioning
- Industrial

Applications

- Blowers
- HVAC units
- Pumps
- Compressors
- Large transformers
- Chillers
- Fans

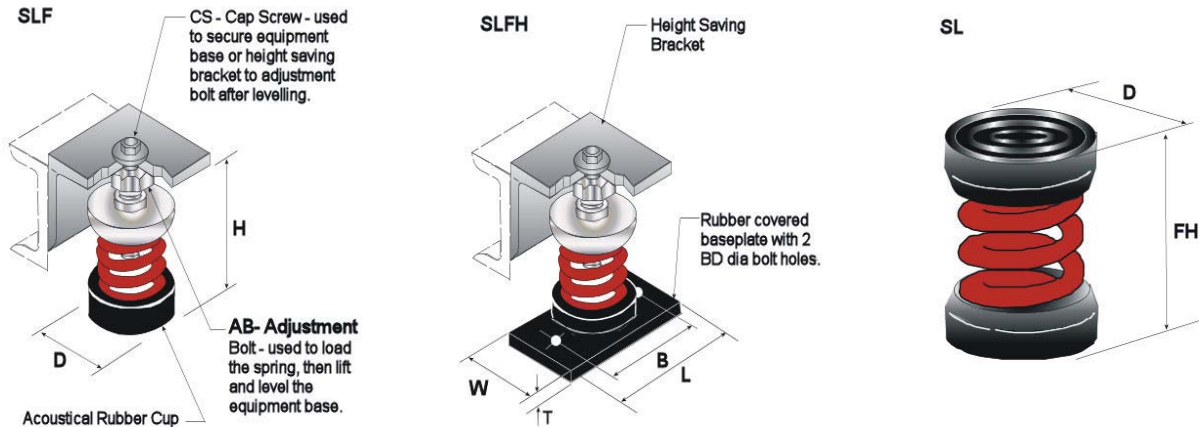


SLFH

SLF mounts 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 problems.

The *Type SLFH spring mounts* are identical to the style SLF except for having holes in the base to allow for bolting to the structure. It is strongly recommended that you use the type SLF unless the SLFH must be used because of elevated installations on steel beams, etc.

Type SLF Spring Mounts



Designation SLFH is used when base plate with bolt holes is required
 Designation SL is used when mounting without adjustment bolt is required

Dimensions in mm

Size	Rated Load [kg]	Rated Defl. [mm]	Spring Rate [kg/mm]	Spring Color	Sping only		SLF & SLFH			SLF & SL	SLFH only					SL only		
					OD	Free Height	Free operating Height	Adjustment Bolt	Cap Screw	Dia	Bolt Centre	Length	Width	ThickNess	Bolt Dia	Free Height		
																	H	AB
SLF A																		
45	20	40	0.5	Blue	44.5	76	114	M16x65	M10 x 25	54	76	98	57	7	M8	90		
75	34	38	0.9	Orange														
125	56	33	1.7	Red														
200	90	29	3.1	Black														
310	150	25	6.1	Yellow														
SLF B																		
60	27	54	0.5	Grey	60	102	150	M20x90	M10 x 25	70	104	135	72	10	M12	127		
140	64	49	1.3	Orange														
280	128	40	3.2	Green														
450	207	33	6.3	Red														
750	340	30	11.3	White														
1000	450	25	18.0	Blue														
SLF C																		
110	50	52	0.95	Orange	73	105	156	M20x30	M10 x 25	82	120	156	86	12	M12	132		
225	100	45	2.2	Blue														
435	200	39	5.1	Grey														
735	320	35	9.2	White														
1000	445	26	17.2	Black														
1350	615	25	24.6	Yellow														
1675	765	25	30.6	Yellow ¹														
2100	950	25	38.0	Yellow ²														

1 with grey inner spring
 2 with red inner spring

All mounts can be tagged for identification, if specified

Type C Spring Mounts



Type CE

Type C spring mounts are available in 5 sizes with 1, 2 or 4 springs giving load capacities from 20 kg to 3800 kg and spring deflections from 25 mm to over 50 mm depending on their loading.

C type mounts use the type A, B and C range of springs. The spring or springs are enclosed in a robust cast iron housing to provide lateral strength. Sponge rubber inserts between the upper and lower castings limit movement during running up to speed and shutting down.

Type C spring mounts have an external adjustment bolt and lock nut which are convenient when the bolt is accessible from above. The adjustment bolt is used to compress the spring until it accepts the load and then to adjust all mountings so that the equipment is level.

The standard adjustment bolt and locknut are generally suitable for equipment bases up to 30 mm thick, depending on spring compression. Longer bolts can be supplied on request.

The Type C spring mounts were originally designed by Mason Industries, Inc and now also manufactured locally by ACTOM Mechanical Equipment.



Markets

- Air conditioning
- Industrial

Applications

- Fans
- Centrifugal Pumps
- Compressors
- Diesel Generator Sets
- Chillers
- Blowers
- Transformers



Type C

When external adjustment is not practical, specify *Type CIW spring mount* with internal adjustment and a Type W rubber friction pad cemented on top of the mounting. The internal adjustment nut is reached with an open spanner through the side opening.

Both the Type C and CIW are supplied with a Type W friction pad on the base of the lower casing. Two slotted holes are provided for locating or bolting down if required. CE and CIWE have four holes. However, a correctly selected Type C mount is absolutely safe and will never “walk”.

Type C Spring Mounts

Selection Table

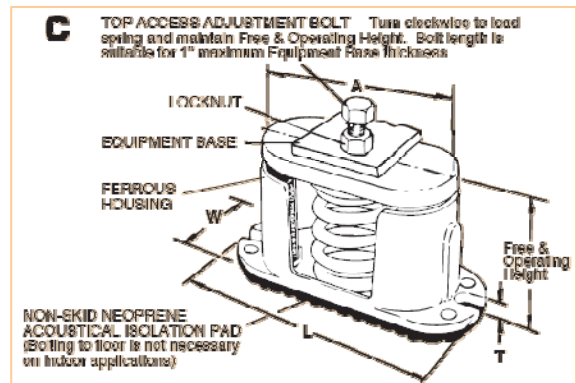
Type	Size	No off 'C' size Springs	Rated Load [kg]	Rated Deflection [mm]	Spring Rate [kg/mm]	Spring Color
CA	45	1	20	40	0.5	Blue
	75	1	34	38	0.9	Orange
	125	1	56	33	1.7	Red
	200	1	90	29	3.1	Black
	310	1	150	25	6.1	Yellow
CB	60	1	27	54	0.5	Grey
	140	1	64	49	1.3	Orange
	280	1	128	40	3.2	Green
	450	1	207	33	6.3	Red
	750	1	340	30	11.3	White
	1000	1	450	25	18.0	Blue
CC	110	1	50	52	0.95	Orange
	225	1	100	45	2.2	Blue
	435	1	200	39	5.1	Grey
	735	1	320	35	9.2	White
	1000	1	445	26	17.2	Black
	1350	1	615	25	24.6	Yellow
	1675	1	765	25	30.6	Yellow ¹
	2100	1	950	25	38.0	Yellow ²
CD	450	2	200	45	4.4	Blue
	870	2	400	39	10.2	Grey
	1470	2	640	35	18.4	White
	2000	2	890	26	34.4	Black
	2700	2	1230	25	49.2	Yellow
	3350	2	1530	25	61.2	Yellow ¹
	4200	2	1900	25	76.0	Yellow ²
CE	2940	4	1280	35	36.8	White
	4000	4	1780	26	68.8	Black
	5400	4	2460	25	98.4	Yellow
	6700	4	3060	25	122.4	Yellow ¹
	8400	4	3800	25	152.0	Yellow ²

1 with grey inner spring
2 with red inner spring

All mounts can be tagged for identification, if specified



Type CIW mounts have “side access internal” adjustment bolts. Turn clockwise to load spring and maintain Free & Operating Height.



Type C mounts have “external” adjustment bolts, used to load the spring and lift the top casting. When all mountings are elevated a small final adjustment will level the equipment. Then secure the nut.

Dimensions

Type	Overall Length L	Top Plate Length A	Bolt Centres	Width W	Free & Operating Height		Base & Pad Thickness T	Adjustment Bolt Size	Holding Down Bolts
					Type C	Type CIW			
CA	149	100	125	56	105	120	14	M10	2 x M8
CB	205	145	185	75	135	150	16	M12	2 x M12
CC	223	168	200	90	150	165	16	M16	2 x M12
CD	297	247	275	90	160	180	16	M16	2 x M12
CE	324	305	(286 x 128)	167	160	180	16	M20	4 x M12

Type SLR 25mm Deflection Spring Mounts



The SLR restrained mounting is designed for use with equipment such as chillers or boilers which have different weights when empty or filled with water, and equipment exposed to strong winds on roof tops such as cooling towers.

The Type SLR mounts were originally designed by Mason Industries, Inc in the USA and now also manufactured locally by ACTOM.

The springs are located in a steel housing and the equipment stands on a separate load plate. The housing and load plate are separated by 10mm steel spacers, which establish both the installation and operating height. Two threaded studs fitted with washers and locknuts project down from the load plate through holes in the housing and serve to lock them together (separated by the spacers).



Markets

- Air conditioning
- Industrial

Applications

- Fans
- HVAC units
- Pumps
- Compressors
- Chillers
- Transformers

When the equipment is in position and ready for commissioning the locknuts can be slackened off. Then the spring mountings can be placed in position and the adjustment bolts wound out anticlockwise to load the springs, until the load plate lifts just enough to free the spacers. The equipment is then isolated. Its elevation has remained constant throughout. The position of the locknuts can then be adjusted so that in the event of the equipment weight being reduced, or of the wind threatening to lift the equipment, the vertical movement is restrained.

If the equipment weight is subsequently to be reduced, for example by emptying water from a boiler, the locknuts can be retightened beforehand in order to maintain the same elevation at the reduced load.

Type SLR 25mm Deflection Spring Mounts

Selection Table

Type	Size	No Of Springs	Rated Load [kg]	Rated Deflection [mm]	Spring Rate [kg/mm]	Spring Color
SLR-1-	225	1	100	45	2.2	Blue
	435	1	200	49	5.1	Grey
	735	1	320	35	9.2	White
	1000	1	445	26	17.2	Black
	1350	1	615	25	24.6	Yellow
	1675	1	765	25	30.6	Yellow ¹
	2100	1	950	25	38.0	Yellow ²
SLR-2-	450	2	200	45	4.4	Blue
	870	2	400	39	10.2	Grey
	1470	2	640	35	18.4	White
	2000	2	890	26	34.4	Black
	2700	2	1230	25	49.2	Yellow
	3350	2	1530	25	61.2	Yellow ¹
	4200	2	1900	25	76.0	Yellow ²
SLR-4-	2940	4	1280	35	36.8	White
	4000	4	1780	26	68.8	Black
	5400	4	2460	25	98.4	Yellow
	6700	4	3060	25	122.4	Yellow ¹
	8400	4	3800	25	152.0	Yellow ²
SLR-6-	10050	6	4600	25	184.2	Yellow ¹
	12600	6	5710	25	228.5	Yellow ²

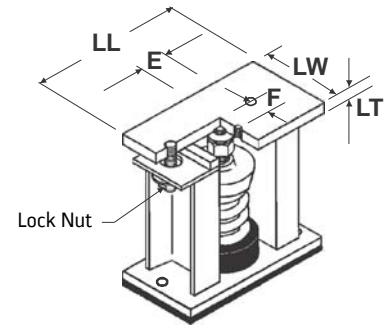
All mounts can be tagged for identification, if specified

- 1 with grey inner spring
- 2 with red inner spring

Standard finish is hot-dipped galvanised

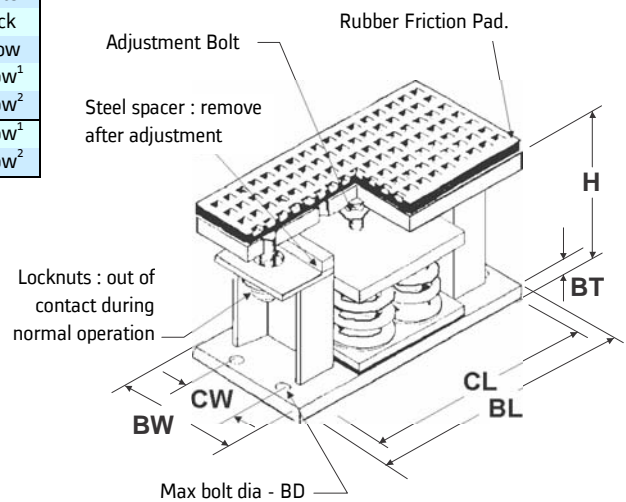
Larger sizes can be made to order. Dimensions are not published because they can be changed to meet the customer's particular requirement.

The mountings illustrated are SLR-1 and SLRW-4. Their top plates have been cross-sectioned to show the location of the steel spacers and the detail of the adjustment bolt and threaded studs.



SLR-1 & 2 have 2 bolt holes
2 Holes in top plate tapped TH unless otherwise specified.

SLR-1



SLR-4 & 6 have 4 bolt holes

SLRW-4

Dimensions

Size	Base Plate						Load Plate		SLR only					SLRW only		Adjustment Bolt Size	Lock nuts
	BL	BW	CL	CW	BT	BD	LL	LW	E	F	H	LT	TH	H	LT		
SLR-1	234	100	180	-	6	M16	234	100	25	25	185	10	M16	191	16	M20 x 90	M16
SLR-2	320	100	270	-	10	M16	320	100	25	25	185	10	M16	191	16	M20 x 90 (2)	M16
SLR-4	330	150	294	114	10	M16	320	100	25	25	185	10	M16	191	16	M20 x 90	M16
SLR-6	450	150	414	114	10	M16	426	150	*	*	185	12	M20	191	18	M20 x 90 (2)	M20

* Hole spacing can be specified

Type SLH High Deflection Spring Mounts



Mason Type SLH mounts are high deflection spring mounts used when low dynamic natural frequencies are required, down to or even below 2Hz.

SLH403 to 418 designed for deflections up to 50 mm, and SLH426 to 436 for deflections up to 75 mm, are rated for loads up to 5720 kg.

The Type SLH mounts were originally designed by Mason Industries, Inc in the USA and now also manufactured locally by ACTOM Mechanical Equipment.



Applications for high deflection mounts include slow speed (under 500 rpm) machines such as or reciprocating compressors, and all types of equipment located in flexible structures or in sensitive buildings such as high rise offices, luxury hotels, hospitals and recording studios.

Markets

- Air conditioning
- Industrial

Applications

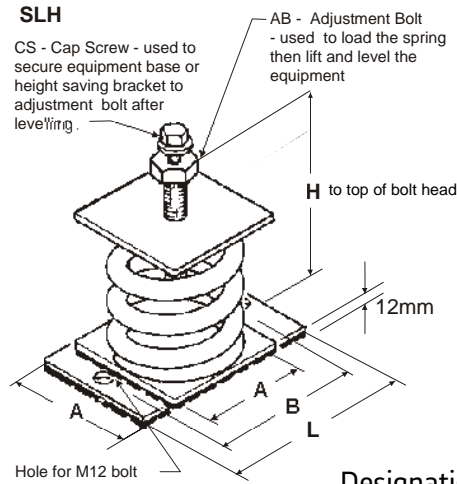
- Fans
- HVAC units
- Pumps
- Compressors
- Chillers
- Transformers

All Type SLH mounts are designed so that at the rated load and deflection (50 or 75 mm) there is a full 50% additional travel (and for dynamic loading) before the spring will go solid. Furthermore even when solid the spring material will never be overstressed.



Type SLH springs are also very stable. At the rated load, the spring diameter is usually equal to or more than its compressed height. This means that in the loaded condition SLH mounts are at least as stiff in the horizontal direction as in the vertical direction. Springs that are not so conservatively designed can be overstressed and may not be stable.

Type SLH High Deflection Spring Mounts



Dimensions in mm

Designation SLHH is used when base plate with bolt holes is required

	Size	Rated Load	Spring Rate	Spring only		SLH & SLHH				SLHH only	
				OD	Free Height	Free & Operating Height	Width	Adjustment Bolt	Cap Screw	Bolt Centre	Length
						H	A	AB	CS	B	L
Rated Deflection 50 mm	403	75	1.5	95	140	193	100	M24 x 125	M12 x 30	146	180
	404	105	2.1	95	140	193	100	M24 x 125	M12 x 30	146	180
	405	135	2.7	95	140	193	100	M24 x 125	M12 x 30	146	180
	406	185	3.7	95	140	193	100	M24 x 125	M12 x 30	146	180
	407	270	5.4	95	140	193	100	M24 x 125	M12 x 30	146	180
	408	335	6.7	114	165	218	130	M24 x 125	M12 x 30	172	206
	409	450	9.0	114	165	218	130	M24 x 125	M12 x 30	172	206
	410	605	12.1	127	165	218	130	M24 x 125	M12 x 30	172	206
	411	850	17.0	127	180	233	130	M24 x 125	M12 x 30	172	206
	412	1060	21.2	140	180	235	150	M24 x 125	M12 x 30	198	232
	413	1315	26.3	150	215	270	150	M24 x 125	M12 x 30	198	232
	414	1850	37.0	170	215	270	150	M24 x 125	M12 x 30	198	232
	415	2480	49.6	170	215	285	180	M30 x 150	M16 x 40	222	256
416	3465	69.3	180	225	295	180	M30 x 150	M16 x 40	222	256	
417	4315	86.3	195	250	322	200	M30 x 150	M16 x 40	248	282	
418	5720	114.4	200	275	347	200	M30 x 150	M16 x 40	248	282	
Rated Deflection 75 mm	426	95	1.2	114	180	233	130	M24 x 150	M12 x 30	172	206
	427	135	1.85	114	180	233	130	M24 x 150	M12 x 30	172	206
	428	180	2.4	127	187	240	130	M24 x 150	M12 x 30	172	206
	429	260	3.45	127	187	240	130	M24 x 150	M12 x 30	172	206
	430	360	4.85	140	210	265	150	M24 x 150	M12 x 30	198	232
	431	580	7.7	140	210	265	150	M24 x 150	M12 x 30	198	232
	432	765	10.2	150	210	265	150	M24 x 150	M12 x 30	198	232
	433	1000	13.35	170	240	301	180	M24 x 150	M12 x 30	222	256
	434	1450	19.35	170	240	301	180	M24 x 150	M12 x 30	222	256
	435	1930	25.75	195	290	362	200	M30 x 150	M16 x 40	248	282
436	3100	41.4	195	290	362	200	M30 x 150	M16 x 40	248	282	

ACTOM

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