

# VIBRATION ISOLATORS

Accessories

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**ELTA**



# VIBRATION ISOLATORS

## Introduction

### Vibration Isolation

To isolate unwanted fan vibration, it was once sufficient to mount the offending equipment on a piece of cork or felt. But today, with greater knowledge and higher expected standards, this traditional solution is usually inadequate, both in large building structures and in the general industrial environment.

In building construction, improved design allows lighter but inherently more flexible structures to be used. At the same time, increasingly powerful equipment is needed and may often be installed in upper level plantrooms. Fan vibration, therefore, can be a major problem in such structures.

### Importance Of Static Deflection

Isolation of vibration is accomplished by supporting the equipment on resilient mounting elements such as springs or rubber, which compress under the equipment's weight. The degree of isolation achieved is directly related to the amount of compression (i.e. static deflection) of the mounting.

The greater the static deflection which can be achieved (without compressing to solid) the better the resulting vibration isolation.

When determining the level of isolation efficiency which might be acceptable in any situation, consideration must be given to the following:

- Fan type and operating weight.
- Magnitude and nature of the vibrating forces.
- Restrictions on fan motion.
- Location of the fan in the building structure.

For example, an isolation efficiency of 80% is normally satisfactory for a 5kW machine located in the basement but totally inadequate for a 100kW machine installed on a flexible upper level floor, particularly when adjacent to valuable office or residential accommodation. In this case an isolation efficiency close to 97% would be recommended.

### Using Vibration Mountings

Some simple guidelines for successful vibration control:

1. Mounting support points and load ratings should be selected so that the static deflections of all mountings are as uniform as possible.
2. Unrestricted movement of resiliently mounted equipment is essential for effective isolation.
  - a) Ensure that adequate clearance is maintained around the installed equipment, particularly underneath it, to permit free movement - especially where high deflection mountings are used.
  - b) All connections to resiliently supported equipment should themselves be flexible. As well as restricting equipment motion, any fixed connection can offer a direct path for transmission of vibration to the surrounding structure, bypassing the isolation system.
3. Top-heavy machinery, especially when mounted on a narrow base, can become unstable if mountings are located too close to each other beneath the equipment. Such instability can be avoided by use of outrigger brackets which space the mountings further apart and raise the mounting location points closer to the vertical centre of gravity of the equipment.
4. A rigid base is essential for resiliently supported equipment to avoid misalignment of drive components. Any flexibility in the machine base should be eliminated by the addition of steel stiffeners or use of a concrete inertia base.
5. Ductwork and ancillary equipment should not impose dead loads on the resiliently mounted equipment (such as attenuators). Where this is not possible, their weight should be separately supported or allowed for when calculating the total weight.

# VIBRATION ISOLATORS

## Static Deflection Guide

The table provides a guide to the isolator type and necessary static deflection for given values of operating speed and isolation efficiency. It also suggests appropriate levels of isolation efficiency for various operating locations.

To use the table, read the minimum static deflection directly against machine disturbing frequency (operating speed) and required isolation efficiency.

Two static deflection figures appear, one for basement or on-grade installations; the other for upper level installations where some allowance is made for flexibility of the supporting structure. Select the appropriate figure.

	Isolation Efficiency, 80%		Isolation Efficiency, 90%		Isolation Efficiency, 95%		Isolation Efficiency, 98%		
	Ground Floor	Upper Floor	Ground Floor	Upper Floor	Ground Floor	Upper Floor	Ground Floor	Upper Floor	
	Disturbing Frequency rps (Hz)								
	Isolator Static Deflection, mm								
<b>High Defl. Springs</b>	5.0	60	90	110	150	-	-	-	-
	8.5	-	35	40	50	70	90	-	-
	12	-	-	-	-	40	50	100	120
<b>25mm Defl. Springs</b>	17	-	-	-	-	-	-	50	60
	12	11	18	20	25	-	-	-	-
	17	-	10	10	15	18	25	-	-
<b>Rubber Mountings</b>	25	-	-	-	-	-	11	20	25
	25	3	5	5	8*	8*	-	-	-
	33	2	4	4	5	6	8*	-	-
	50	1	1.5	1.5	3	4	5	7*	10*

Non-critical Areas	General Areas	Critical Areas	Critical Areas
Factories, Workshops, Garages, Warehouses, Laundries, Basements.	Schools, Dept. stores, Super-markets, Telephone exchanges, Hotels.	Multi-storey buildings, Offices, Hospitals - service area, Churches, Schools, Restaurants.	Multi-storey buildings, Hospitals - ward areas, Broadcasting studios, Theatres, Auditoriums, Libraries

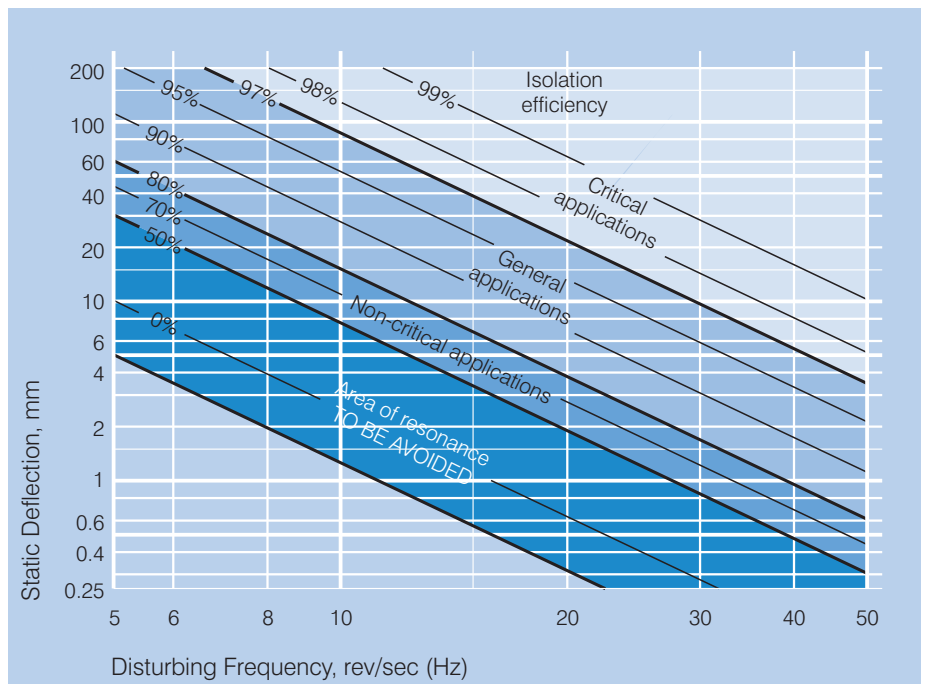
Additional Information: These figures are to be used as a guide only.

\* Double deflection rubber mount required.

## Isolation Efficiency Chart

This chart illustrates the theoretical relationship between isolation efficiency, disturbing frequency and static deflection for a simple isolation system on a rigid foundation. It is also grouped into zones suggesting isolation efficiency ranges appropriate to different applications.

To use the chart, determine the lowest rotational speed of the equipment and consider this to be the disturbing frequency. Move vertically to intersect the diagonal line corresponding to the percentage isolation required; then move horizontally left and read the static deflection required of the mounting.



# RUBBER-IN-SHEAR MOUNTS



## Dimensions & Selection Tables

### Features

These mounts provide effective isolation of noise and vibration from equipment speeds of 16 r/s (6-pole) upwards.

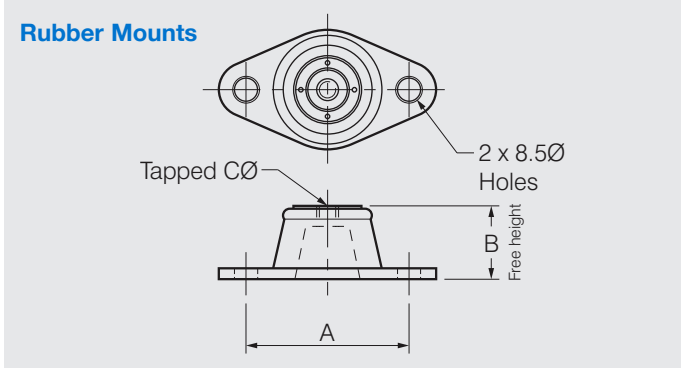
#### Types NR and NRD only

- Threaded insert in the top for equipment fastening.
- Rated static deflection from 5-10mm.
- Non-skid ribbed base; bolting down not normally required.
- Colour-coded for easy identification of the load range.
- Corrosion-resistant element; metal parts embedded in the elastomer.

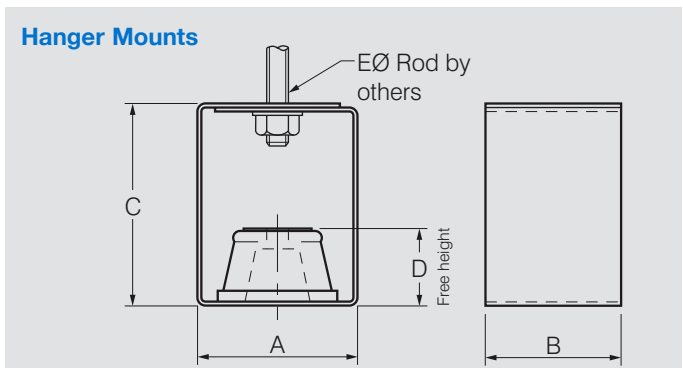
#### Types RH and RHD only

- Rated static deflection from 5-10mm.
- Colour-coded for easy identification of the load range.
- Corrosion-resistant element; metal parts embedded in the elastomer
- Heavy-duty steel cage.
- If mechanical or fire damage occurs, the metal plates in the hanger element interlock so that complete loss of support is unlikely.
- Fully weatherproofed.

If features or ratings are required beyond that shown, please contact Elta.



Model Number	Colour	Max. Load kg/mt	Static Defl. mm	Dimensions, mm		
				A	B	CØ
<b>Single deflection</b>						
NR1	Blue	17	5	60	28	M10
	White	25	5			
	Red	40	5			
NR2	White	70	6	76	32	M10
	Red	100	6			
<b>Double deflection</b>						
NRD1	Blue	17	8	60	35	M10
	White	25	8			
	Red	40	8			
NRD2	White	70	10	76	44	M10
	Red	100	10			



Model Number	Colour	Max. Load kg/mt	Static Defl. mm	Dimensions, mm				
				A	B	C	D	EØ
<b>Single deflection</b>								
RH1	Blue	17	5	60	50	75	31	10
	White	25	5					
	Red	40	5					
RH2	White	70	6	75	65	130	41	16
<b>Double deflection</b>								
RHD1	Blue	17	8	60	50	75	38	10
	White	25	8					
	Red	40	8					
RHD2	White	70	10	75	65	130	54	16

### How To Order

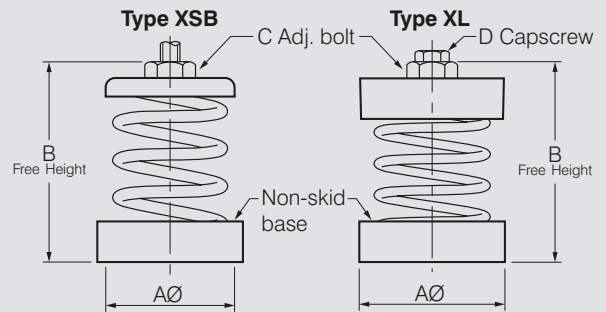
When selecting vibration isolators, divide the weight of the unit being isolated by the number of mounts being used to determine the kg/mount required. Then select the mount with the next highest weight loading and deflection required. Vibration isolators are generally used in sets of four.

# SPRING MOUNTS - 25MM DEFLECTION



## Dimensions & Selection Tables

### Open Spring Mounts



## Features

A low cost easily-installed, all-purpose spring mount in which the spring can be quickly interchanged to give a wide range of load-deflection characteristics, provides effective isolation of noise and vibration.

We have only featured the spring mounts most commonly used with the equipment shown in this catalogue.

### Types XSB and XL only

- Heavy-duty steel spring.
- Colour-coded for easy identification of the load range.
- Built-in levelling bolt with locking capscrew, capable of compensating for full static deflection.
- Separate top and bottom location cups.
- Rubber-isolated bolt hole in base.
- Moulded noise-absorbing rubber base cup with non-skid surface.

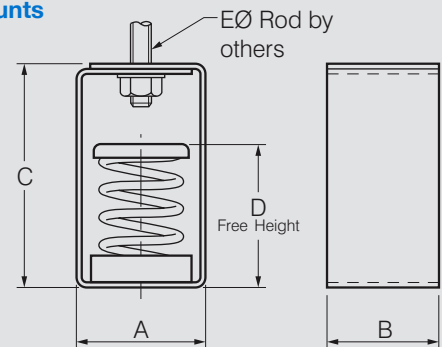
### Type SHS only

- Heavy-duty steel spring.
- Colour-coded for easy identification of the load range.
- Heavy-duty steel cage.
- Large diameter lower isolated rod clearance hole in the cage.
- Fully weatherproofed.

If features or ratings are required beyond that shown, please contact Elta.

Model Number	Colour	Max. Load kg/mt	Static Defl. mm	Dimensions, mm			
				AØ	B	C	D
<b>XSB-9</b>	Yellow	10	33				
<b>XSB-10</b>	Brown	15	33				
<b>XSB-11</b>	Blue	30	33				
<b>XSB-12</b>	Black	50	28	55	106	M12	-
<b>XSB-13</b>	Red	75	25				
<b>XSB-14</b>	Green	125	25				
<b>XSB-16</b>	Grey	175	20				
<b>XSB-17</b>	Orange	200	15				
<b>XL-92</b>	Yellow	50	33				
<b>XL-93</b>	Brown	100	33	80	127	M16	M10
<b>XL-94</b>	Blue	150	30				
<b>XL-95</b>	Black	200	30				
<b>XL-96</b>	Red	250	28				
<b>XL-97</b>	Green	300	28	80	132	M16	M10
<b>XL-98</b>	Grey	400	25				

### Hanger Mounts



Model Number	Colour	Max. Load kg/mt	Static Defl. mm	Dimensions, mm				
				A	B	C	D	EØ
<b>SHS-9</b>	Yellow	10	33					
<b>SHS-10</b>	Brown	15	33					
<b>SHS-11</b>	Blue	30	33					
<b>SHS-12</b>	Black	50	28	75	65	130	86	12
<b>SHS-13</b>	Red	75	25					
<b>SHS-14</b>	Green	125	25					
<b>SHS-16</b>	Grey	175	20					
<b>SHS-17</b>	Orange	200	15					

## How To Order

When selecting vibration isolators, divide the weight of the unit being isolated by the number of mounts being used to determine the kg/mount required. Then select the mount with the next highest weight loading and deflection required. Vibration isolators are generally used in sets of four.

# SPRING MOUNTS - 50MM DEFLECTION



## Features

An easily-installed, all-purpose spring mount in which the spring can be quickly interchanged to give a wide range of load-deflection characteristics, provides effective isolation of noise and vibration.

We have only featured the spring mounts most commonly used with the equipment shown in this catalogue.

### Types XLD and XWD only

- Heavy-duty steel spring.
- Colour-coded for easy identification of the load range.
- Built-in levelling bolt with locking capscrew, capable of compensating for full static deflection.
- Separate top and bottom location cups.
- Rubber-isolated bolt hole in base.
- Moulded noise-absorbing rubber base cup with non-skid surface.

### Type SHLD and SHWD only

- Heavy-duty steel spring.
- Colour-coded for easy identification of the load range.
- Heavy-duty steel cage.
- Large diameter lower isolated rod clearance hole in the cage.
- Fully weatherproofed.

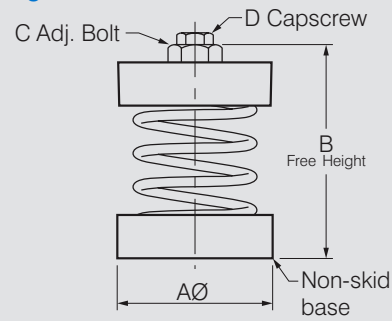
If features or ratings are required beyond that shown, please contact Elta.

## How To Order

When selecting vibration isolators, divide the weight of the unit being isolated by the number of mounts being used to determine the kg/mount required. Then select the mount with the next highest weight loading and deflection required. Vibration isolators are generally used in sets of four.

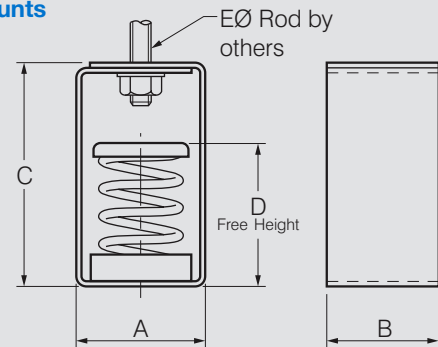
## Dimensions & Selection Tables

### Open Spring Mounts



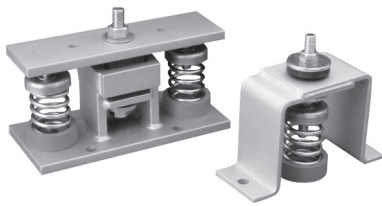
Model Number	Colour	Max. Load kg/mt	Static Defl. mm	Dimensions, mm			
				AØ	B	C	D
XLD-44	Black x2	6	50	80	137	M16	M10
XLD-45	White x2	9	50				
XLD-46	White/Vio	14	50				
XLD-47	Violet x2	22	50				
XLD-48	Vio/Yello	35	50				
XLD-49	Yellow x2	55	50				
XWD-33	White	50	50				
XWD-34	Violet	75	50				
XWD-35	Yellow	110	50	99	187	M20	M12
XWD-36	Brown	150	50				
XWD-37	Orange	200	50				
XWD-38	Oran/Bla	250	50	99	195	M20	M12
XWD-39	Oran/Gre	350	40				

### Hanger Mounts



Model Number	Colour	Max. Load kg/mt	Static Defl. mm	Dimensions, mm				
				A	B	C	D	EØ
SHLD-44	Black x2	6	50					
SHLD-45	White x2	9	50					
SHLD-46	White/Vio	14	50	95	75	180	124	12
SHLD-47	Violet x2	22	50					
SHLD-48	Vio/Yello	35	50					
SHLD-49	Yellow x2	55	50					
SHWD-33	White	50	50					
SHWD-34	Violet	75	50					
SHWD-35	Yellow	110	50	115	100	200	142	16
SHWD-36	Brown	150	50					
SHWD-37	Orange	200	50					
SHWD-38	Oran/Bla	250	50	115	100	200	150	16
SHWD-39	Oran/Gre	350	40					

# SEISMIC MOUNTS



## Features

Seismic mounts should be used in locations where earthquakes or seismic disturbances are considered to be a potential hazard. Seismic restraint is specified in AS1170.4 and NZS4219.

### Features include:

- Rugged fabricated steel construction
- Heavy duty stable steel spring
- Acoustic isolation pad
- Single fully adjustable central vertical restraint bolt
- Fully weatherproofed

The seismic mounts shown here cover most fan applications, i.e. 25mm deflection and light to medium duty applications. Details of our complete range of seismic mountings are available on request.

### Full load capacities & static deflections

CSM - refer to XSB spring mounts

CLM - refer to XL spring mounts

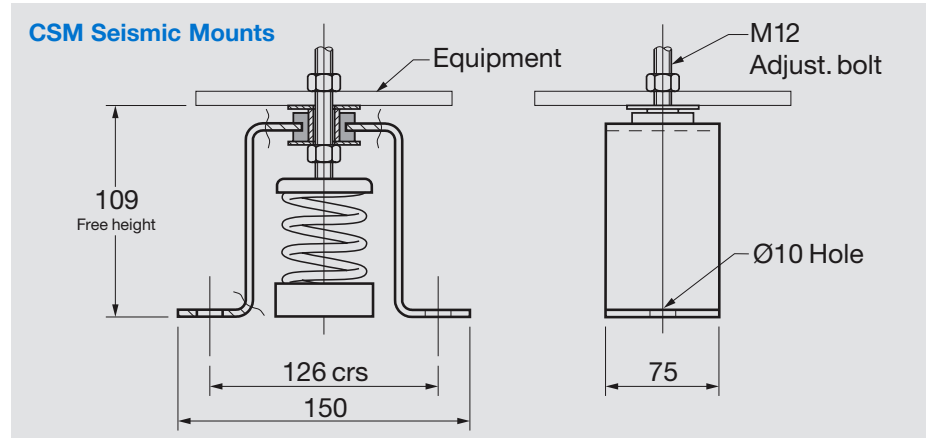
CWM - refer to Elta for XW spring mount data.

## How To Order

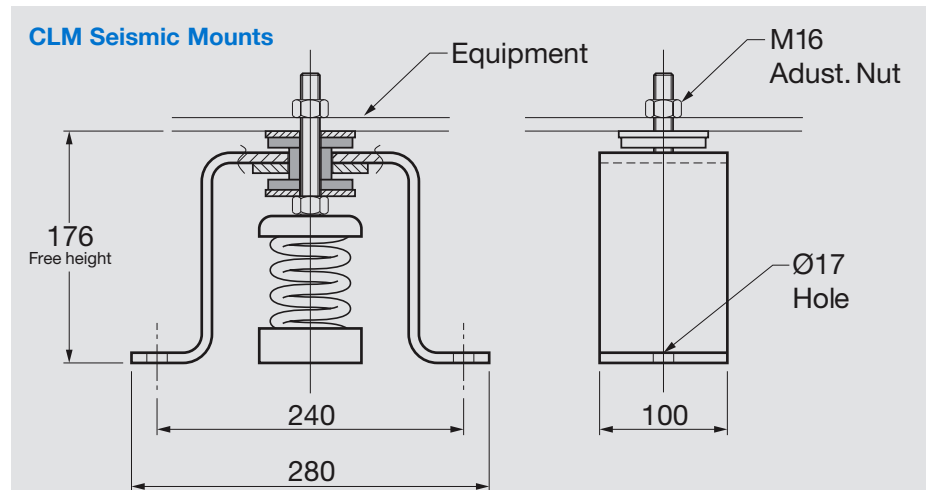
The selection of mounts for use in seismic applications is complex and should be referred to our Sales Engineers.

It is the customers responsibility to provide the 'static restraint capacity' required and should be checked against relevant standard or engineering specifications.

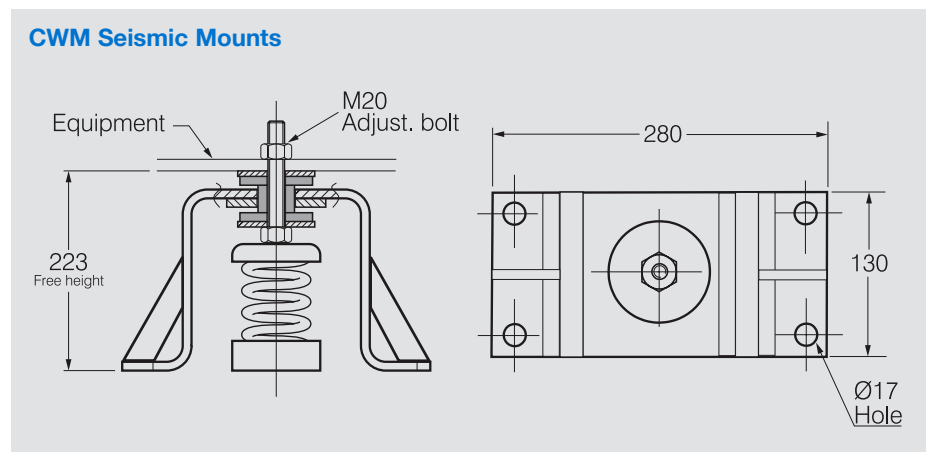
## Dimensions & Selection Tables



Model Number	Load Range, kg	Nominal Defl. mm	Static Restraint Capacity	
			Horizontal, kN	Vertical, kN
<b>CSM-9 to 17</b>	10-200	25	1.0	2.0



Model Number	Load Range, kg	Nominal Defl. mm	Static Restraint Capacity	
			Horizontal, kN	Vertical, kN
<b>CLM-89 to 100</b>	10-650	25	3.5	7.0



Model Number	Load Range, kg	Nominal Defl. mm	Static Restraint Capacity	
			Horiz. kN	Vert. kN
<b>CWM</b>	300-1275	25	6	12



Elta Asia Sdn Bhd

Tel +603 7846 0340  
Email info@elta.asia

elta.asia

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