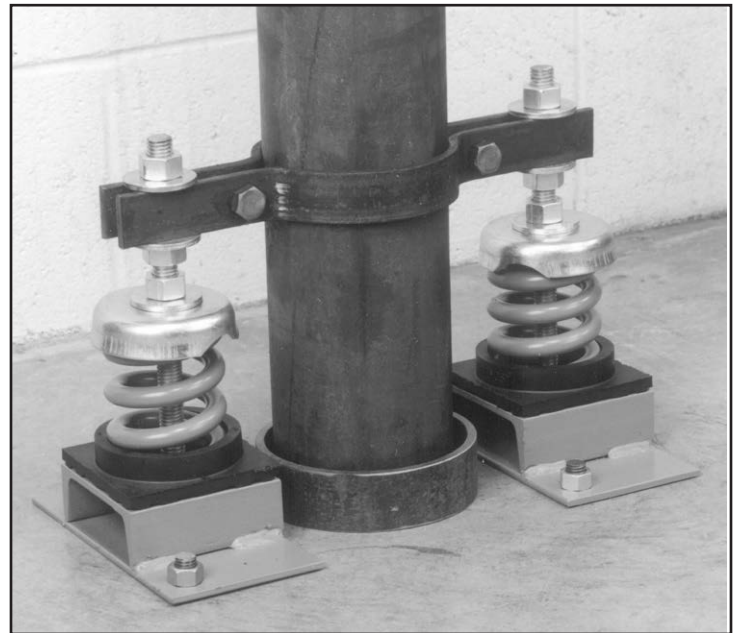


KINETICS®

Restrained Spring Isolators Model FRS

Description

Kinetics Model FRS vibration isolators consist of free-standing, large diameter, stable steel springs assembled into top and bottom load plate assemblies, which provide vertical restraint in the event load is removed or external forces are applied. Spring elements are complete with 1/4 in. (6 mm) thick noise isolation pads, and they have an adjusting and leveling bolt as part of the top load plate assembly. Holes are provided for bolting to the structure, and the leveling bolt allows attachment to the supported equipment. To assure stability, the springs have a lateral stiffness greater than 0.8 times the rated vertical stiffness, and are designed to provide a minimum of 50% overload capacity. FRS springs are available with deflections from 1.00" to 2.00" (25 mm to 51 mm), and with capacities from 35 to 3500 lbs. (16 kg to 1588 kg).



Application

Model FRS vertically restrained spring isolation mounts are recommended as a noise and vibration isolator for mechanical equipment located near critical areas, when it is desired to limit upward travel during high wind loads, maintenance, or where external forces are brought to bear on the supported equipment.

Kinetics Model FRS spring isolators are recommended for the isolation of vibration produced by equipment subject to weight change or external forces, such as air-cooled condensers, fans, and other rooftop equipment. Model FRS springs are also recommended for the support of vertical pipe risers, where upright motion must be limited, yet the riser isolated from the building.

Operating static deflections are available up to 2.00" (51 mm), in capacities of up to 3500 lbs. (1588 kg).

Dimensions and Capacities

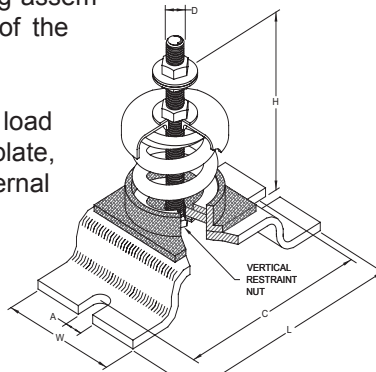
| Type | Spring color | Rated Capacity | | Rated Deflection | | Spring O.D. | | Free Height | | L | | W | | C | | A | | H | | D | |
|------------|--------------|----------------|------|------------------|----|-------------|----|-------------|-----|------|-----|------|-----|------|-----|------|----|-------|-----|------|----|
| | | lbs | kg | in | mm | in. | mm | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm | in | mm |
| FRS-1-35 | Blue | 35 | 16 | 1.52 | 39 | 1.75 | 44 | 3.19 | 81 | 4.75 | 121 | 3.00 | 76 | 3.75 | 95 | 0.44 | 11 | 6.00 | 152 | 0.50 | 13 |
| FRS-1-70 | Green | 70 | 32 | 1.36 | 35 | 1.75 | 44 | 3.19 | 81 | 4.75 | 121 | 3.00 | 76 | 3.75 | 95 | 0.44 | 11 | 6.00 | 152 | 0.50 | 13 |
| FRS-1-120 | Gray | 120 | 54 | 1.18 | 30 | 1.75 | 44 | 3.19 | 81 | 4.75 | 121 | 3.00 | 76 | 3.75 | 95 | 0.44 | 11 | 6.00 | 152 | 0.50 | 13 |
| FRS-1-220 | Brown | 220 | 100 | 1.07 | 27 | 1.75 | 44 | 3.19 | 81 | 4.75 | 121 | 3.00 | 76 | 3.75 | 95 | 0.44 | 11 | 6.00 | 152 | 0.50 | 13 |
| FRS-1-370 | Orange | 370 | 168 | 0.96 | 24 | 1.75 | 44 | 3.19 | 81 | 4.75 | 121 | 3.00 | 76 | 3.75 | 95 | 0.44 | 11 | 6.00 | 152 | 0.50 | 13 |
| FRS-1-500 | Beige | 500 | 227 | 1.00 | 25 | 1.75 | 44 | 3.19 | 81 | 4.75 | 121 | 3.00 | 76 | 3.75 | 95 | 0.44 | 11 | 6.00 | 152 | 0.50 | 13 |
| FRS-1-600 | Chrome | 600 | 272 | 1.00 | 25 | 1.75 | 44 | 3.19 | 81 | 4.75 | 121 | 3.00 | 76 | 3.75 | 95 | 0.44 | 11 | 6.00 | 152 | 0.50 | 13 |
| FRS-1-700 | Bge/Wht | 700 | 318 | 1.00 | 25 | 1.75 | 44 | 3.19 | 81 | 4.75 | 121 | 3.00 | 76 | 3.75 | 95 | 0.44 | 11 | 6.00 | 152 | 0.50 | 13 |
| FRS-1-805 | Chr/Wht | 805 | 365 | 1.01 | 26 | 1.75 | 44 | 3.19 | 81 | 4.75 | 121 | 3.00 | 76 | 3.75 | 95 | 0.44 | 11 | 6.00 | 152 | 0.50 | 13 |
| FRS-1-50 | Beige | 50 | 23 | 1.00 | 25 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-100 | Chrome | 100 | 45 | 1.00 | 25 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-250 | Blue | 250 | 113 | 1.79 | 45 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-450 | Green | 450 | 204 | 1.54 | 39 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-625 | Black | 625 | 283 | 1.44 | 37 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-800 | Gray | 800 | 363 | 1.31 | 33 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-1000 | Red | 1000 | 454 | 1.15 | 29 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-1250 | Brown | 1250 | 567 | 1.09 | 28 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-1700 | Orange | 1700 | 771 | 0.95 | 24 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-2200 | Org/Gry | 2200 | 998 | 1.00 | 26 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-2465 | Blue | 2465 | 1118 | 1.00 | 25 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-2865 | Blue/Gry | 2865 | 1300 | 1.00 | 25 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-1-3500 | Blue/Brn | 3500 | 1588 | 1.00 | 25 | 3.00 | 76 | 4.20 | 107 | 8.00 | 203 | 4.50 | 114 | 6.50 | 165 | 0.69 | 17 | 9.00 | 229 | 0.63 | 16 |
| FRS-2-100 | Gray | 100 | 45 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-135 | Beige | 135 | 61 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-185 | Brown | 185 | 84 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-225 | Gray/Brn | 225 | 102 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-250 | Blue | 250 | 113 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-375 | Blue/Brn | 375 | 170 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-500 | Green | 500 | 227 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-625 | Gm/Brn | 625 | 283 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-750 | Black | 750 | 340 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-875 | Blk/Brn | 875 | 397 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-995 | Orange | 995 | 451 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-1120 | Org/Brn | 1120 | 508 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-1400 | Org/Grn | 1400 | 635 | 2.01 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-1600 | Red | 1600 | 726 | 2.00 | 51 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |
| FRS-2-1975 | Red/Grn | 1975 | 896 | 1.98 | 50 | 3.50 | 89 | 6.09 | 155 | 8.00 | 203 | 4.50 | 114 | 4.50 | 165 | 0.69 | 17 | 11.00 | 279 | 0.63 | 16 |

Specifications

Vibration isolators for equipment which is subject to load variations, wind loads, or large external or torquing forces shall consist of large diameter, laterally stabile steel springs assembled into formed or structural steel mounting assemblies designed to limit vertical movement of the supported equipment.

The assembly shall incorporate a bottom load plate and restraint assembly, a top load plate, a leveling and restraining bolt, and an internal noise isolation pad.

Isolators shall be provided with means for anchoring to the supporting structure and for attachment to the supported equipment.



Spring elements shall have a lateral stiffness greater than 0.8 times the rated vertical stiffness and shall be designed to provide a minimum of 50% overload capacity.

Springs shall be selected to provide operating static deflections shown on the Vibration Isolation Schedule or as indicated on the project documents. Springs shall be color coded or otherwise identified to indicate load capacity.

Vibration isolators shall be Model FRS, as manufactured by Kinetics Noise Control, Inc.



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