



KINETICS® FHS & FHSL

SEISMIC CONTROL SPRING ISOLATORS

Features

- All-directional restraint with vertical limit stops.
- Field-interchangeable spring coils.
- Galvanized housing and polyester powder coated coils.
- Constant free height & operating height.
- Equipment motion limited to 0.2" (5 mm) in all directions, at the isolator.
- California Pre-Approval Number R-0433

Application

Kinetics FHS and FHSL seismic control spring isolators are recommended for noise and vibration isolation for mechanical equipment located near critically quiet areas when there is a possibility that the equipment to be isolated will be subjected to the external forces associated with an earthquake. FHS/FHSL isolators are used to reduce the transmission of noise and vibration into supporting structures from supported mechanical equipment. Motion during an earthquake which would otherwise displace life support and emergency equipment is limited, and the equipment remains in position. Anchorage of FHS/FHSL isolators should be designed by a professional engineer and isolators selected based on calculated anticipated forces.

Description

FHS/FHSL seismic control spring isolators meet the specifications for Kinetics FDS isolators. Additionally, FHS isolators include a steel housing assembly to limit both lateral and vertical movement of the supported equipment during an earthquake without degrading the vibration isolation of the spring during normal equipment operating conditions.

FHS/FHSL isolators incorporate a steel housing which encloses a neoprene snubber. Depending on the load and seismic code, an optional steel load spreader plate may be applied to distribute the load among concrete anchors. A neoprene pad fitted in series with the spring is provided. Equipment attachment is by way of a bolt screwed downward through the equipment foot. Equipment motion is limited to approximately 0.2" (5 mm) in any direction, at the isolator. In conformance with all current building code standards, the restraining system is designed to withstand a minimum 1.0 g acceleration force. Removal of the isolator for servicing is quick and easy as the isolator is not fitted with a protruding stud.

Specifications

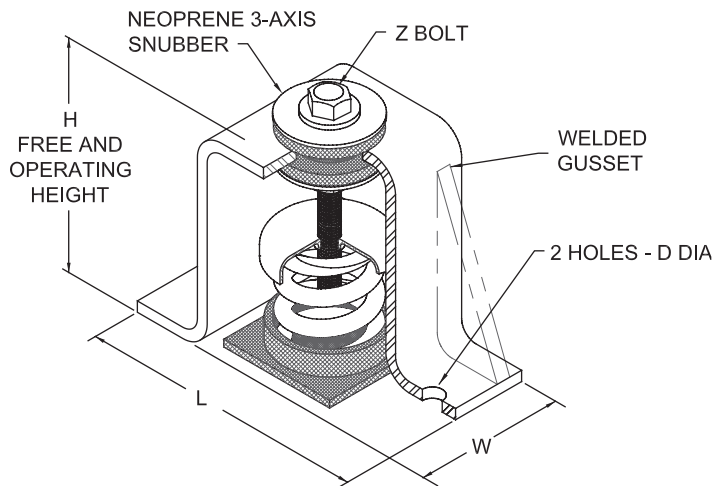
Spring isolators shall be seismic control restrained spring isolators, incorporating a single vibration isolator, having all the characteristics of Kinetics FDS open spring isolators as previously specified. Springs shall be restrained using a housing engineered to limit both lateral and vertical movement of the supported equipment during an earthquake without degrading the vibration isolation of the spring during normal equipment operating conditions.

Vibration isolators shall incorporate a steel housing and snubbing grommet system designed to limit motion to approximately 0.2" (5 mm) in any direction and to prevent any direct metal-to-metal contact between the supported member and the fixed housing. The restraining system shall be designed to

withstand a force equivalent to 1.0 g in any lateral or vertical direction without yield or failure. Where the capacity of the anchorage hardware in concrete is inadequate for the required seismic loadings, an adapter plate to allow the addition of more or larger anchors will be fitted to fulfill these requirements. In addition to the primary isolation spring, the load path will include a minimum 0.25 inch (6mm) thick neoprene pad.

To facilitate servicing, the isolator will be designed in such a way that it can be removed without the requirement to lift or otherwise disturb the supported equipment.

Spring isolators shall be model FHS and FHSL as manufactured by Kinetics Noise Control.



Isolator Type	Spring Color	Rated Capacity		Rated Deflection		Spring O.D.		L		W		H		D		Z	
		lbs.	kg	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
FHSL-1-35	Blue	35	16	1.52	39	1.75	44	7.31	186	3.00	76	6.00	152	0.56	14	0.50	13
FHSL-1-70	Green	70	32	1.36	35	1.75	44	7.31	186	3.00	76	6.00	152	0.56	14	0.50	13
FHSL-1-120	Gray	120	54	1.18	30	1.75	44	7.31	186	3.00	76	6.00	152	0.56	14	0.50	13
FHSL-1-220	Brown	220	100	1.07	27	1.75	44	7.31	186	3.00	76	6.00	152	0.56	14	0.50	13
FHSL-1-370	Orange	370	168	0.96	24	1.75	44	7.31	186	3.00	76	6.00	152	0.56	14	0.50	13
FHSL-2-25	Gray	25	11	2.00	51	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-50	Blue	50	23	2.00	51	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-83	Blue/Gray	83	38	2.00	51	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-116	Blue/Blue	116	53	2.00	51	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-150	Green	150	68	2.00	51	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-183	Green/Gray	183	83	2.00	51	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-216	Green/Blue	216	98	2.00	51	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-245	Black	245	111	1.96	50	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-278	Black/Gray	278	126	1.96	50	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-311	Black/Blue	311	141	1.97	50	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-350	Beige	350	159	2.00	51	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-383	Beige/Gray	383	174	2.00	51	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13
FHSL-2-416	Beige/Blue	416	189	2.00	51	3.00	76	9.53	242	5.00	127	8.00	203	0.56	14	0.50	13

Isolator Type	Spring Color	Rated Capacity		Rated Deflection		Spring O.D.		L		W		H		D		Z	
		lbs.	kg	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
FHS-1-35	Blue	35	16	1.52	39	1.75	44	7.31	186	3.00	76	6.00	152	0.44	11	0.50	13
FHS-1-70	Green	70	32	1.36	35	1.75	44	7.31	186	3.00	76	6.00	152	0.44	11	0.50	13
FHS-1-120	Gray	120	54	1.18	30	1.75	44	7.31	186	3.00	76	6.00	152	0.44	11	0.50	13
FHS-1-220	Brown	220	100	1.07	27	1.75	44	7.31	186	3.00	76	6.00	152	0.44	11	0.50	13
FHS-1-370	Orange	370	168	0.96	24	1.75	44	7.31	186	3.00	76	6.00	152	0.44	11	0.50	13
FHS-1-500	Beige	500	227	1.00	25	1.75	44	7.31	186	3.00	76	6.00	152	0.44	11	0.50	13
FHS-1-600	Chrome	600	272	1.00	25	1.75	44	7.31	186	3.00	76	6.00	152	0.44	11	0.50	13
FHS-1-700	Bge/Wht	700	318	1.00	25	1.75	44	7.31	186	3.00	76	6.00	152	0.44	11	0.50	13
FHS-1-805	Chr/Wht	805	365	1.01	26	1.75	44	7.31	186	3.00	76	6.00	152	0.44	11	0.50	13
FHS-1-50	Beige	50	23	1.00	25	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
FHS-1-100	Chrome	100	45	1.00	25	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
FHS-1-250	Blue	250	113	1.79	45	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
FHS-1-450	Green	450	204	1.54	39	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
FHS-1-625	Black	625	283	1.44	37	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
FHS-1-800	Gray	800	363	1.31	33	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
FHS-1-1000	Red	1000	454	1.15	29	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
FHS-1-1250	Brown	1250	567	1.09	28	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
FHS-1-1700	Orange	1700	771	0.95	24	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
FHS-1-2200	Org/Gry	2200	998	1.00	26	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
*FHS-1-2465	Blue	2465	1118	1.00	25	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
*FHS-1-2865	Blue/Gry	2865	1300	1.00	25	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
*FHS-1-3500	Blu/Brn	3500	1588	1.00	25	3.00	76	9.53	242	5.00	127	7.56	192	0.81	21	0.63	16
FHS-2-100	Gray	100	45	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-135	Beige	135	61	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-185	Brown	185	84	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-225	Gry/Brn	225	102	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-250	Blue	250	113	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-375	Blue/Brn	375	170	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-500	Green	500	227	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-625	Gm/Brn	625	283	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-750	Black	750	340	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-875	Blk/Brn	875	397	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-995	Orange	995	451	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-1120	Org/Brn	1120	508	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-1400	Org/Grn	1400	635	2.01	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-1600	Red	1600	726	2.00	51	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
*FHS-2-1975	Red/Grn	1975	896	1.98	50	3.50	89	10.38	264	5.00	127	9.31	237	0.69	16	0.50	13
FHS-2-2000	Orange	2000	907	2.00	51	5.00	127	11.50	292	6.00	152	11.38	289	1.06	22	0.75	19
FHS-2-2500	Blue	2500	1134	2.00	51	5.00	127	11.50	292	6.00	152	11.38	289	1.06	22	0.75	19
FHS-2-2750	Blue/Blu	2750	1247	2.00	51	5.00	127	11.50	292	6.00	152	11.38	289	1.06	22	0.75	19
FHS-2-3025	Blu/Grn	3000	1372	2.02	51	5.00	127	11.50	292	6.00	152	11.38	289	1.06	22	0.75	19
FHS-2-3500	Blu/Org	3500	1588	2.00	51	5.00	127	11.50	292	6.00	152	11.38	289	1.06	22	0.75	19
FHS-2-3900	Blu/Org/Grn	3900	1769	2.00	51	5.00	127	11.50	292	6.00	152	11.38	289	1.06	22	0.75	19
FHS-2-4100	Blu/Red	4100	1860	2.00	51	5.00	127	11.50	292	6.00	152	11.38	289	1.06	22	0.75	19
FHS-2-4500	Blu/Red/Grn	4500	2041	2.00	51	5.00	127	11.50	292	6.00	152	11.38	289	1.06	22	0.75	19
FHS-4-100	Gray	100	45	4.00	102	5.63	143	12.25	311	7.00	178	14.13	359	0.69	16	0.63	16
FHS-4-250	Blue	250	113	4.00	102	5.63	143	12.25	311	7.00	178	14.13	359	0.69	16	0.63	16
FHS-4-500	Green	500	227	4.00	102	5.63	143	12.25	311	7.00	178	14.13	359	0.69	16	0.63	16
FHS-4-750	Black	750	340	4.00	102	5.63	143	12.25	311	7.00	178	14.13	359	0.69	16	0.63	16
FHS-4-1000	Red	1000	454	4.00	102	5.63	143	12.25	311	7.00	178	14.13	359	0.69	16	0.63	16
FHS-4-1250	Brown	1250	567	4.00	102	5.63	143	12.25	311	7.00	178	14.13	359	0.69	16	0.63	16
FHS-4-1600	Orange	1600	726	4.00	102	5.63	143	12.25	311	7.00	178	14.13	359	0.69	16	0.63	16
*FHS-4-2250	Beige	2250	1021	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-2500	Bge/Blu	2500	1134	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-2750	Bge/Grn	2750	1247	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-3000	Bge/Blk	3000	1361	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-3250	Bge/Red	3250	1474	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-3500	Bge/Brn	3500	1588	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-3850	Bge/Org	3850	1746	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-4200	Chrome	4200	1905	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-4450	Chr/Blu	4450	2018	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-4700	Chr/Grn	4700	2132	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-4950	Chr/Blk	4950	2245	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-5200	Chr/Red	5200	2359	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-5450	Chr/Brn	5450	2472	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22
*FHS-4-5800	Chr/Org	5800	2631	4.00	102	8.00	203	14.75	375	10.00	254	16.19	411	1.06	22	0.88	22

*Includes Welded Gusset

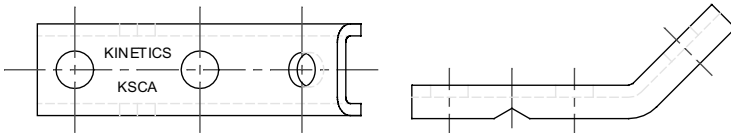
KINETICS®

Seismic Restraint for Isolated and Suspended Mechanical Equipment

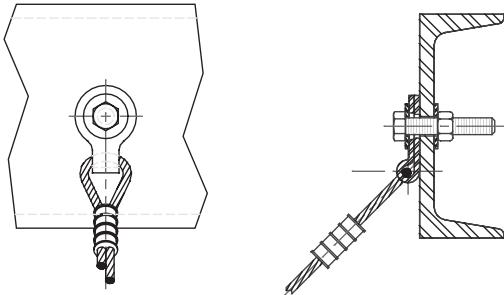
for -

- Piping
- Fans
- VAV & Fan Terminal Boxes
- Silencers & Mufflers
- Ductwork
- Air Handlers

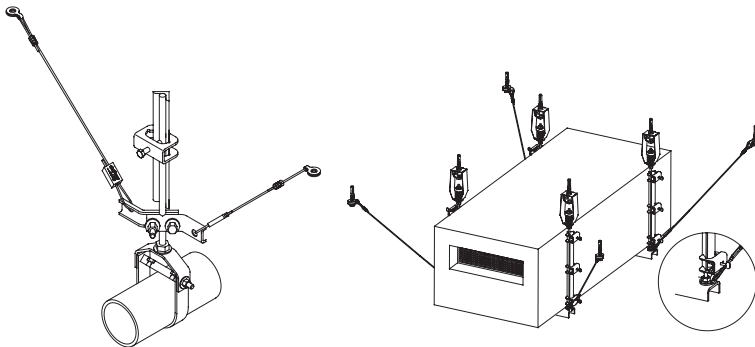
Kinetics KSCA Cable Attachment Bracket



Kinetics KSUA Cable Attachment Bracket



Kinetics KSUA Cable Attachment Bracket

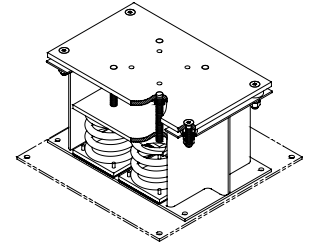


KINETICS®

Floor-Mounted Seismic Restraints

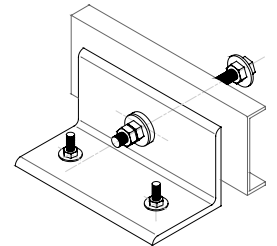
Restrained Spring Isolators Model FLSS

- Combination spring isolator & seismic restraint
- All-directional restraint with vertical limit stops



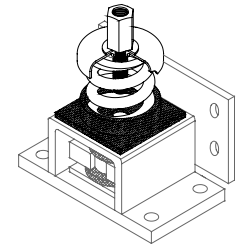
Seismic Snubber Model HS-5

- Double axis horizontal and vertical seismic restraint
- Standard capacities to 3,275 lbs.
- Can be bolted or welded in place

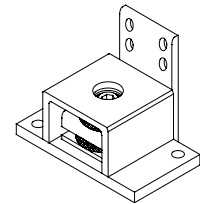


Modular Restraint/Isolator Model FMS

- Can be used as a restraint device or as a seismically rated vibration isolator assembly
- Restraint components are available in 8 sizes with horizontal force ratings to 70,000 lbs.
- Standard isolation elements are available to 4" deflection with support capacities to 23,000 lbs.
- Ideal for equipment mounted on structural frame or concrete inertia bases



Kinetics FMS with isolator



Kinetics FMS without isolator



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