The Theory of Vibration Isolation

Background

Soils, floors, ceilings, walls, etc. deflect as the result of applied forces. Cyclical forces generated by machines result in work done on the floors, etc. Under steady state conditions, this work is stored as potential energy in the floor each cycle and returned as work in forcing the machine back to its equilibrium position. Disturbance is transmitted during this flexing.

Vibration Isolation is needed when disturbing force magnitudes are expected to be great enough to cause damage or annoyance.

Assumption	Fact
1. We know the effects of vibration isolation (efficiency)	Formula for calculation shown below.
2. We know the magnitude of the disturbing forces created by the machines	Equipment manufacturers rarely provide these data. These forces are seldom known except in generalities.
3. We know the magnitude of disturbing forces beyond	Detailed calculations require so many simplifying assumptions that the resulting answers have questionable value in addition to being prohibitively expensive. Reliance is placed on brief calculations, general rules, and past experience.

Consideration of items 1. and 2. is essential to determine acceptable isolation efficiency. Unfortunately manifold complexities prevent inclusion of steps for determination of these efficiencies in this document.

Natural frequency of isolation system f_n (cycles per minute)

Visualize a machine suspended barely above 4 springs (one on each corner). Now release the suspension. The machine will deflect the springs and be pushed up and return a number of times with diminishing deflection until it comes to rest. The spring deflection at rest is called the static deflection. The number of cycles per unit time is the natural frequency of the isolation system. Unlike multi-degree of freedom floors with limitless natural frequencies, springs essentially have only one natural frequency.

$$f_n = 188 \sqrt{\frac{1}{\text{static deflection (inches)}}}$$

$$\text{Vibration isolation efficiency \%} = 100\% \times \left[1 - \frac{1}{(f_d \div f_n)^2 - 1}\right]$$

Transmitted force f_t (pounds) $f_t = f_d$ (100% - isolation efficiency)

Note that fn must be compared to f_d for satisfactory isolation efficiency. Also note that the force transmitted can be greater than the disturbing force when f_n is close to or equals f_d. This condition is called resonance and is avoided in vibration isolation.

Natural frequency of floor or soil

Visualize the effect of dropping a load on the floor. This floor will deflect and spring back diminishingly a number of cycles until it comes to rest. The number of these cycles per unit time is a natural frequency of the floor. It is essentially independent of the magnitude of deflection and hence is a characteristic of a given floor if given a light tap or a hard jolt at the same location. The floor has many natural frequencies. The lowest natural frequency is called the fundamental. It is characterized by maximum deflection at mid span. The higher natural frequencies are generally less bothersome than the fundamental since they are less likely to be excited by machines in common use and are more quickly damped. The greater a floor deflects under a given load, the lower the fundamental frequency of that floor. Soft, springy floors have low fundamentals. Hard, solid floors have high fundamentals.

Disturbing frequency f_d (cycles per minute)

With few exceptions, the speed (RPM) of the machine will be most representative of the frequency of the disturbance. Disturbances are more readily transmitted when the disturbing frequency is close to a natural frequency of the floor or soil. For this reason, these characteristics are important considerations i designing a trouble-free installation.

Disturbing force f_d (pounds)

The disturbing force causes the problem. It is constantly changing from maximum positive through zero to maximum negative through zero to maximum positive each cycle. It results from unbalanced reciprocating and rotating masses. Its peak magnitude varies from ounces to tons. From less than 1% to over 60% of the weight of some types of machines. Generally this force will increase with time in a given machine as bearings wear, deposits form and moving parts get out of balance with each other.

Proper Sizing

Once it is determined as to what type of vibration dampening device is needed, weight loading is the next crucial step. As a built in safety measure, take the actual weight of supported pipe or equipment (consider all accessories - i.e. valves, insulation, brackets, etc...) and multiply by 1.25. Then refer to the sizing chart for the selected product to determine part number.

Sizing: Divide weight of equipment by points of support to determine load requirement per support.

Example: 240 Lb. (90.7 kg) piece of equipment, 4 support points, take 240 x 1.25 = 300 Lbs. (136.1kg) (safety measure), then take 300 ÷ 4 = 75 Lbs. (34.0 kg) Specify appropriate vibration device rated at 75 Lbs. (34.0 kg) for each of the support points.

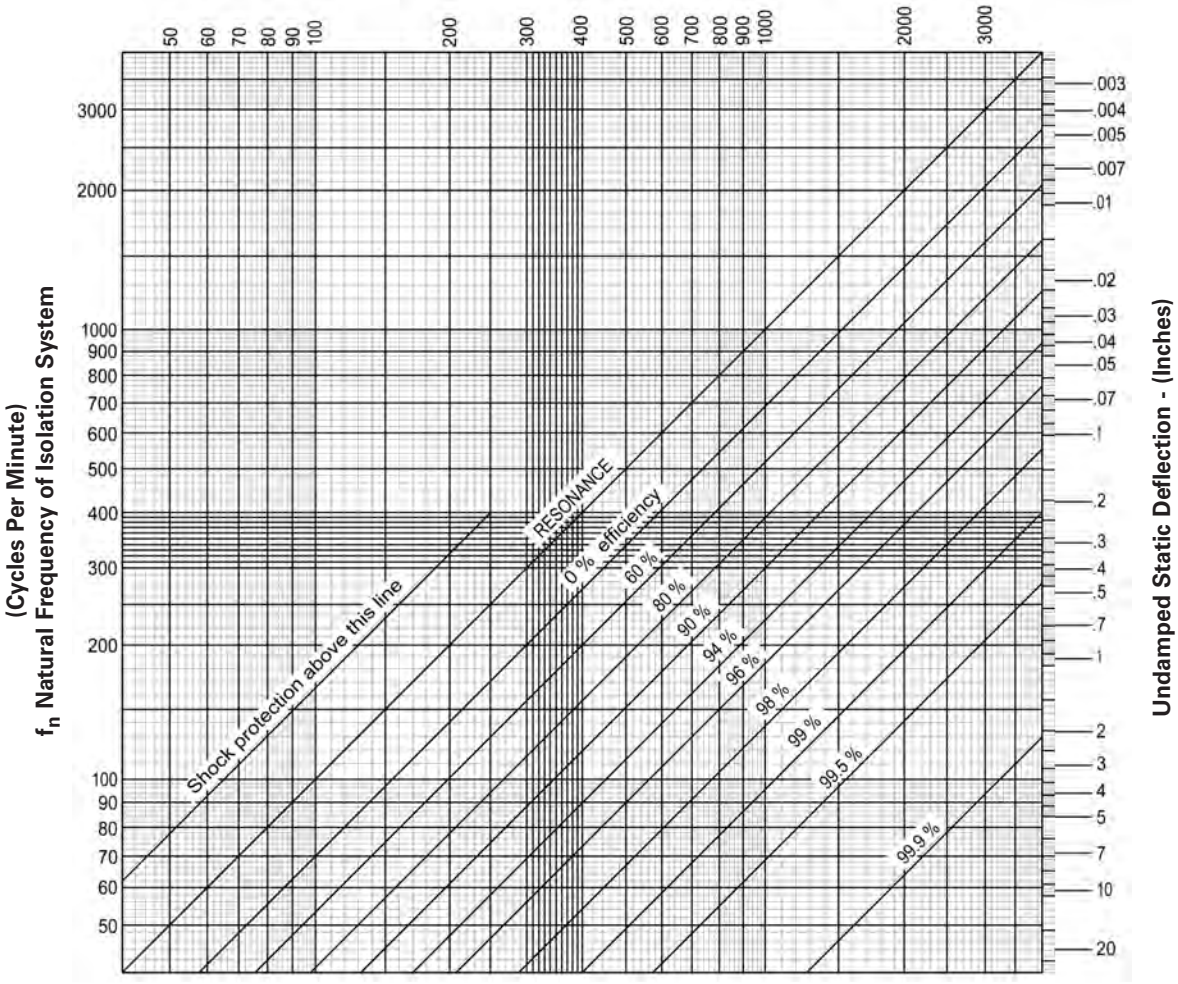
If weight of equipment is unequally proportionate, select mounts to satisfy the weight distribution.

IE Computer Isolation Efficiency

$$f_n = 188 \sqrt{\frac{1}{\text{static deflection (inches)}}} \qquad \text{Transmissibility} = \frac{1}{(f_d \div f_n)^2 - 1}$$

3 HX = 180 cpm = 1.1" Deflection

f_d Disturbing Frequency - (cycles per minute)



Critical Installations
96% to 99% Vibration Isolation Efficiency recommended (only 1% to 4% of disturbing vibration transmitted).

Standard Installations
90% to 95% Vibration Isolation Efficiency recommended (only 5% to 10% of disturbing vibration transmitted).

Non-Critical Installations
75% to 89% Vibration Isolation Efficiency recommended (only 11% to 24% of disturbing vibration transmitted).

For 1/4" (6.3mm) deflection: Specify B-Line series RM and RQ Neoprene Mountings or B-Line series RH Neoprene Hangers.

For 1/2" (12.7mm) deflection: Specify B-Line series RMD and RQD, (or JQTN fo OSHPD pre-approved) Neoprene Mountings or B-Line series RHD Neoprene Hangers.

For 1"-2" (25.4mm-50.8mm) deflection: Specify B-Line series CHSCS, CH30SCS, HHSCS, and HH30SCS Housed Spring Mountings.

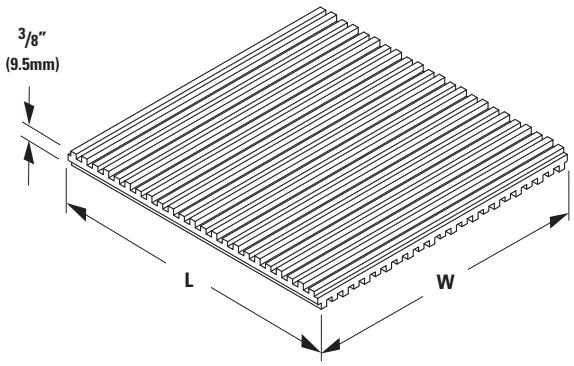
For larger deflection requirements, consult factory.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

NNP Type - Ribbed Neoprene Vibration Pad

Use: Is used under equipment to dampen noise and vibration in floor caused by medium and high speed equipment.

- Recommended load capacity: Up to 50 lbs./sq.in. (0.042 kgf/mm²) with a range of 25-70 lbs./sq.in. (0.021-0.059 kgf/mm²)
- Thickness: 3/8" (9.5mm)
- The NNP type has a deflection of 1/8" (3.1mm). For greater deflection, use multiple pads in layers
- Non-skid: The pad has an alternating height rib pattern to minimize slip
- Durable: Material is oil-resistant Neoprene
- Typical Applications: Air conditioners, cooling towers, compressors, fans, generators, pumps, piping, process equipment, transformers, etc.

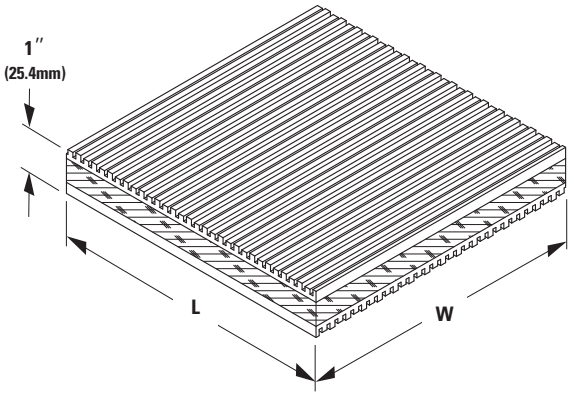


Part No.	Rated Load Lbs.	(kN)	Dimensions L in.	(mm)	W in.	(mm)	Std. Pkg.	Wt. Each Lbs.	(kg)
NNP-4	200	(.89)	2"	(50.8)	2"	(50.8)	48	.04	(.02)
NNP-9	450	(2.00)	3"	(76.2)	3"	(76.2)	36	.10	(.05)
NNP-16	800	(3.56)	4"	(101.6)	4"	(101.6)	24	.17	(.08)
NNP-36	1800	(8.00)	6"	(152.4)	6"	(152.4)	24	.39	(.18)
NNP-81	4050	(18.01)	9"	(228.6)	9"	(228.6)	Bulk	.87	(.39)
NNP-324	16200	(72.06)	18"	(457.2)	18"	(457.2)	6	3.50	(1.59)

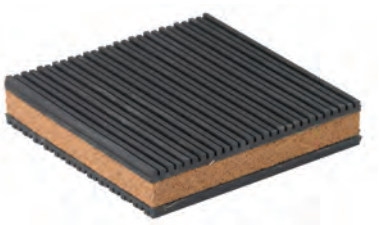
CNP Type - Cork and Ribbed Neoprene Vibration Pad

Use: Is used under equipment to dampen noise and vibration in floor caused by medium and high speed equipment.

- Recommended load capacity: Up to 50 lbs./sq.in. (0.042 kgf/mm²) with a range of 25-70 lbs./sq.in. (0.021-0.059 kgf/mm²)
- Thickness: 1" (25.4mm)
- The NNP type has a deflection of 3/16" (4.7mm). For greater deflection, use multiple pads in layers
- Non-skid: The pad has an alternating height rib pattern to minimize slip
- Durable: Material is oil-resistant Neoprene
- Typical Applications: Air conditioners, cooling towers, compressors, fans, generators, pumps, piping, process equipment, transformers, etc.



Part No.	Rated Load Lbs.	(kN)	Dimensions L in.	(mm)	W in.	(mm)	Std. Pkg.	Wt. Each Lbs.	(kg)
CNP-4	200	(.89)	2"	(50.8)	2"	(50.8)	48	.07	(.03)
CNP-9	450	(2.00)	3"	(76.2)	3"	(76.2)	36	.16	(.07)
CNP-16	800	(3.56)	4"	(101.6)	4"	(101.6)	24	.28	(.13)
CNP-25	1250	(5.56)	5"	(127.0)	5"	(127.0)	24	.44	(.20)
CNP-36	1800	(8.00)	6"	(152.4)	6"	(152.4)	24	.63	(.29)
CNP-81	4050	(18.01)	9"	(228.6)	9"	(228.6)	Bulk	1.40	(.64)
CNP-324	16200	(72.06)	18"	(457.2)	18"	(457.2)	6	5.60	(2.54)
CNP-3x36	5400	(24.02)	3"	(76.2)	36"	(914.4)	6	1.89	(.86)
CNP-4x36	7200	(32.02)	4"	(101.6)	36"	(914.4)	6	2.52	(1.14)

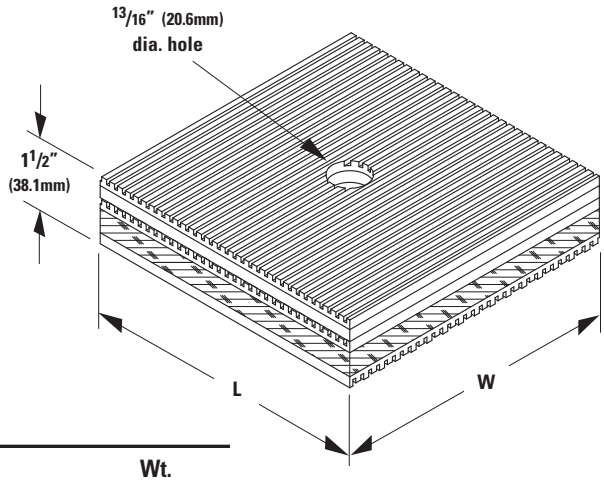


All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

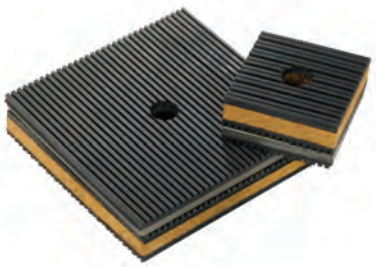
CNNK Type - Cork, Ribbed Neoprene and Steel Vibration Pad

Use: Is used to dampen noise and vibration in floor caused by medium and high speed equipment.

- Recommended load capacity:
  Up to 50 lbs./sq.in. (0.042 kgf/mm²) with a range of
  25-70 lbs./sq.in. (0.021-0.059 kgf/mm²)
- Overall thickness: 1 1/2" (38.1mm)
  Has 1/4" (6.3mm) steel plate for even weight distribution.
  Hole in center will accept up to 3/4" bolt
- The CNNK type has a deflection of 3/16" (4.7mm).
  For greater deflection, use multiple pads in layers
- Non-skid: The pad has an alternating height rib pattern to minimize slip
- Durable: Material is oil-resistant Neoprene
- Typical Applications: Air conditioners, cooling towers, compressors, fans, generators, pumps, piping, process equipment, transformers, etc.



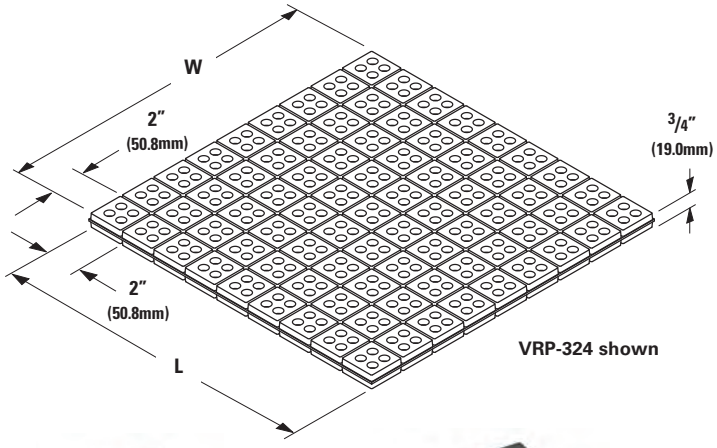
Part No.	Rated Load Lbs.	(kN)	Dimensions L in.	(mm)	W in.	(mm)	Std. Pkg.	Wt. Each Lbs.	(kg)
CNNK-4	200	(.89)	2"	(50.8)	2"	(50.8)	48	.40	(.18)
CNNK-9	450	(2.00)	3"	(76.2)	3"	(76.2)	36	.90	(.41)
CNNK-16	800	(3.56)	4"	(101.6)	4"	(101.6)	24	1.60	(.73)
CNNK-25	1250	(5.56)	5"	(127.0)	5"	(127.0)	24	2.50	(1.13)
CNNK-36	1800	(8.00)	6"	(152.4)	6"	(152.4)	Bulk	3.50	(1.59)
CNNK-64	3200	(14.23)	8"	(203.2)	8"	(203.2)	6	6.20	(2.81)



VRP Type - Rubber Cube Vibration Pad

Use: Is used to dampen noise and vibration in floor caused by medium and high speed equipment.

- Recommended load capacity:
  Up to 45 lbs./sq.in. (0.038 kgf/mm²) per 1 square inch
- Overall thickness: 3/4" (19.0mm)
- Rated deflection is 3/16" (4.7mm).
- Durable: Material is natural rubber composition
- Each square has 4 suction holes (1/2" (12.7mm) diameter) to provide a non-skid effect. The standard VRP pad has 81 squares that are 2" x 2" (50.8mm x 50.8mm) making the pad itself 18" x 18" (457.2mm x 457.2mm). These squares are easily cut or torn to desired sizes.



VRP-324 shown


VRP-4


VRP-16


VRP-36

Part No.	Rated Load Lbs.	(kN)	Dimensions L in.	(mm)	W in.	(mm)	Std. Pkg.	Wt. Each Lbs.	(kg)
VRP-4	180	(.80)	2"	(50.8)	2"	(50.8)	Bulk	.10	(.05)
VRP-16	720	(3.20)	4"	(101.6)	4"	(101.6)	Bulk	.41	(.19)
VRP-36	1620	(7.20)	6"	(152.4)	6"	(152.4)	Bulk	.90	(.41)
VRP-324	14580	(64.85)	18"	(457.2)	18"	(457.2)	3	8.15	(3.70)


VRP-324

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

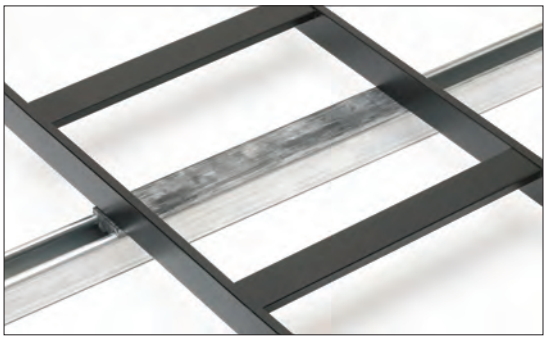
BVS Type - Vibra Strip™ for 1 5/8" (41.3mm) wide Eaton B-Line series channel

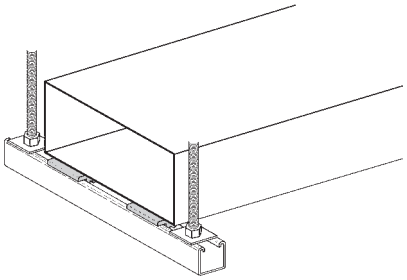
Use: Dampen noise and vibration of equipment when mounted on strut.

- When inserted in channel slot, provides an excellent isolation medium between equipment, duct, piping, etc., and the support channel.
- Vibra Strip is furnished in 12" (304.8mm) or 120" (3.05m) lengths, may be cut to satisfy specific requirement.
- Durable: 45 durometer Neoprene
- Temperature Range: -20°F (-28.9°C) to 212°F (100°C) (continuous)

BVS-12

BVS-120





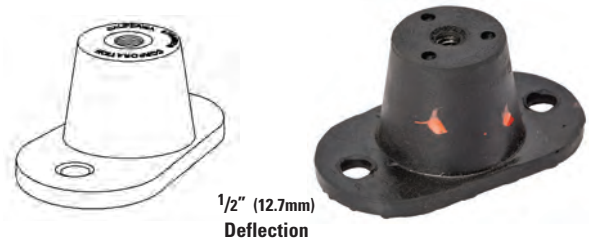
Part No.	Max. Load Lbs. per Lineal In. Lbs.	(kg/25.4 mm)	Length in.	(mm)	Std. Pkg.	Wt. Each Lbs.	(kg)
BVS-12	40	(18.1)	12"	(304.8)	25	.46	(.21)
BVS-120	40	(18.1)	120"	(3048.0)	1	4.56	(2.07)

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

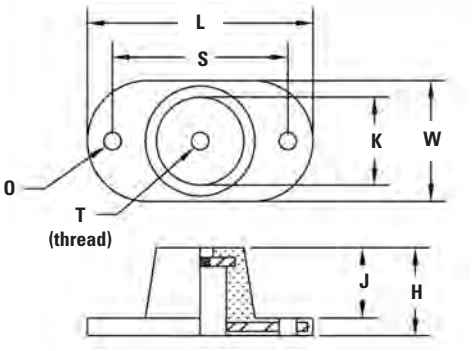
RM & RM-D Type - Neoprene Mount

Use: To minimize or prevent noise and vibration from transferring between equipment and floor or solid support structure. Typical applications include air handling units, air conditioners, compressors, pumps, machine tools, motors, business machines, transformers, furnaces, etc.

1/4" (6.3mm) Deflection



1/2" (12.7mm) Deflection



Typical Part Numbering

RM - 80 A

Type Load Mount Size

RM Series for 1/4" (6.3mm) Deflection

Part No.	Mount Size	Maximum Load Lbs.	(kN)	Color Code
RM-40A	A	40	(0.18)	Orange
RM-55A	A	55	(.0.25)	Yellow
RM-80A	A	80	(0.35)	Green
RM-130A	A	130	(0.58)	Blue
RM-120B	B	120	(0.53)	Orange
RM-200B	B	200	(.0.89)	Yellow
RM-280B	B	280	(1.24)	Green
RM-400B	B	400	(1.78)	Blue
RM-300C	C	300	(.1.33)	Yellow
RM-520C	C	520	(2.31)	Green
RM-750C	C	750	(3.33)	Blue
RM-1100C	C	1100	(4.89)	White
RM-1800F	F	1800	(8.00)	Green
RM-3000F	F	3000	(13.3)	Blue
RM-5000F	F	5000	(22.2)	Green

RM-D Series for 1/2" (12.7mm) Deflection

Part No.	Mount Size	Maximum Load Lbs.	(kN)	Color Code
RM-D-40A	A	40	(0.18)	Orange
RM-D-55A	A	55	(.0.25)	Yellow
RM-D-80A	A	80	(0.35)	Green
RM-D-130A	A	130	(0.58)	Blue
RM-D-120B	B	120	(0.53)	Orange
RM-D-200B	B	200	(.0.89)	Yellow
RM-D-280B	B	280	(1.24)	Green
RM-D-400B	B	400	(1.78)	Blue
RM-D-300C	C	300	(.1.33)	Yellow
RM-D-520C	C	520	(2.31)	Green
RM-D-750C	C	750	(3.33)	Blue
RM-D-1100C	C	1100	(4.89)	White
RM-D-1800F	F	1800	(8.00)	Green
RM-D-3000F	F	3000	(13.3)	Blue
RM-D-5000F	F	5000	(22.2)	Green

Dimensions

Mount Size	L in.	(mm)	S in.	(mm)	W in.	(mm)	O in.	(mm)	T	K in.	(mm)	H RM in.	(mm)	H RM-D in.	(mm)	J RM in.	(mm)	J RM-D in.	(mm)
A	3 3/16	(81.0)	2 3/8	(27.8)	1 13/16	(47.5)	11/32	(8.7)	5/16"-18	1 1/4	(31.7)	1	(25.4)	1 1/2	(38.1)	13/16	(20.6)	1 5/16	(33.3)
B	3 7/8	(98.4)	3	(76.2)	2 3/8	(60.3)	11/32	(8.7)	3/8"-16	1 3/4	(44.4)	1 1/4	(31.7)	1 13/16	(46.0)	1 1/32	(26.2)	1 9/16	(39.7)
C	5 1/2	(134.7)	4 1/8	(104.8)	3 1/4	(82.5)	9/16	(14.3)	1/2"-13	2 1/2	(63.5)	1 1/2	(38.1)	2 1/2	(63.5)	1 1/4	(31.7)	2 1/4	(57.1)
F	7 1/2	(190.5)	6 1/8	(155.6)	4 7/8	(123.8)	9/16	(14.3)	5/8"-11	4 3/8	(111.1)	1 5/8	(41.3)	2 3/4	(69.8)	1 3/8	(34.9)	2 1/2	(63.5)

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

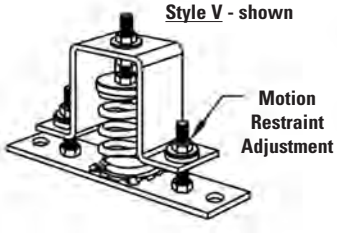
OS Type - Steel Spring Isolator/Restraint - 1" (25.4mm) & 2" (50.8mm) Deflection

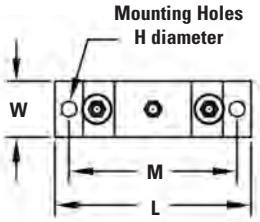
Use: To support and isolation of vibrations between equipment or frame mounted equipment and the floor or supporting structure

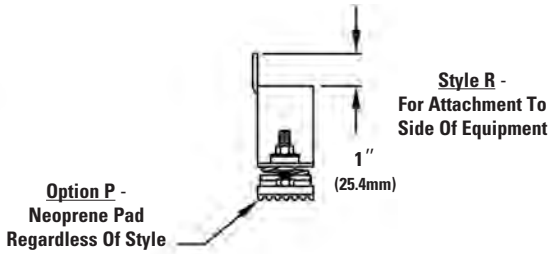
- Neoprene pad 1/4" (6.3mm) thick under spring regardless of style
- All OS Type isolator/restraints feature large diameter springs with O.D. not less than 80% of rated deflection height
- Adjust load transfer while motion restraint adjustments are loose
- For compact support of heavy loads, some OS's include inner springs. For lower profile support of heavy loads when required, OSE's have clustered springs

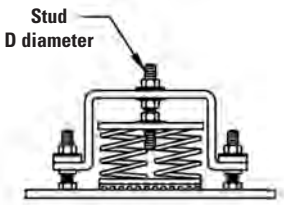
Style V

Style R



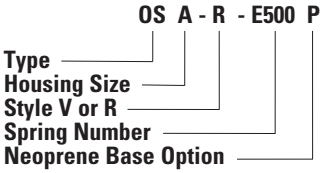






Style V - OSE 4 Spring

Typical Part Numbering



Part Numbers - E Springs - 1" (25.4mm) Deflection

Housing Size A	Housing Size B	Housing Size E
OSA-(*)-E21(**)	OSB-(*)-ET255(**)	OSE-(*)-E976(**)
OSA-(*)-E55(**)	OSB-(*)-ET347(**)	OSE-(*)-E1272(**)
OSA-(*)-E79(**)	OSB-(*)-ET473(**)	OSE-(*)-E1660(**)
OSA-(*)-E106(**)	OSB-(*)-E630(**)	OSE-(*)-E2000(**)
OSA-(*)-E143(**)	OSB-(*)-E806(**)	OSE-(*)-E2532(**)
OSA-(*)-E187(**)	OSB-(*)-E1030(**)	OSE-(*)-E3204(**)
OSA-(*)-E244(**)	OSB-(*)-E1230(**)	OSE-(*)-E4128(**)
OSA-(*)-E318(**)	OSB-(*)-E1430(**)	
OSA-(*)-E415(**)	OSB-(*)-E1810(**)	
OSA-(*)-E500(**)	OSB-(*)-E2210(**)	
OSA-(*)-E633(**)		
OSA-(*)-E801(**)		

(*) Insert Style V or R
(**) Insert Option P when required

Part Numbers - F Springs - 2" (50.8mm) Deflection

Housing Size A	Housing Size B	Housing Size E	Housing Size F
OSA-(*)-F33(**)	OSB-(*)-FT121(**)	OSE-(*)-F332(**)	OSF-(*)-F1159(**)
OSA-(*)-F43(**)	OSB-(*)-FT171(**)	OSE-(*)-F480(**)	OSF-(*)-F1408(**)
OSA-(*)-F59(**)	OSB-(*)-FT241(**)	OSE-(*)-F620(**)	OSF-(*)-F1710(**)
OSA-(*)-F83(**)	OSB-(*)-F348(**)	OSE-(*)-F780(**)	OSF-(*)-F2149(**)
OSA-(*)-F120(**)	OSB-(*)-F453(**)	OSE-(*)-F944(**)	OSF-(*)-F2700(**)
OSA-(*)-F155(**)	OSB-(*)-F590(**)	OSE-(*)-F1200(**)	
OSA-(*)-F195(**)	OSB-(*)-F676(**)		
OSA-(*)-F236(**)	OSB-(*)-F787(**)		
OSA-(*)-F300(**)	OSB-(*)-F918(**)		

(*) Insert Style V or R
(**) Insert Option P when required

Dimensions

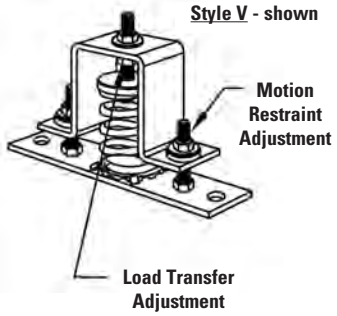
Housing Size	L in.	L (mm)	M in.	M (mm)	T in.	T (mm)	W in.	W (mm)	D in.	D (mm)	H in.	H (mm)	Approx. Oper. Height in.	Approx. Oper. Height (mm)
A	7	(177.8)	6	(152.4)	2 3/4	(69.8)	2	(50.8)	3/8	(9.5)	9/16	(14.3)	4 1/2	(114.3)
B	10 1/2	(266.7)	9	(228.6)	4	(101.6)	3 1/2	(88.9)	1/2	(12.7)	11/16	(17.5)	5 1/2	(139.7)
E	14	(355.6)	12	(304.8)	6	(152.4)	5	(127.0)	5/8	(15.9)	11/16	(17.5)	5	(127.0)
F	14	(355.6)	12	(304.8)	6	(152.4)	5	(127.0)	5/8	(15.9)	11/16	(17.5)	8	(203.3)

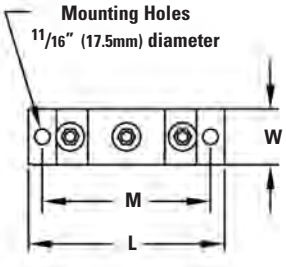
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

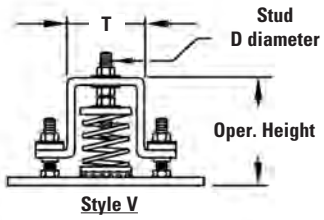
OS Type - Steel Spring Isolator/Restraint - 3" (76.2mm) Deflection

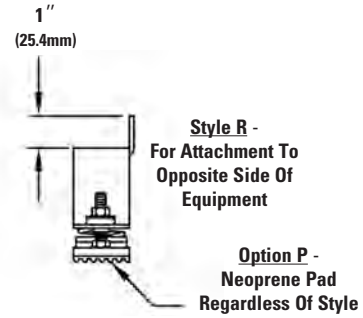
Use: To support and isolation of vibrations between equipment or frame mounted equipment and the floor or supporting structure.

- Neoprene pad 1/4" (6.3mm) thick under spring regardless of style
- All OS Type isolator/restraints feature large diameter springs with O.D. not less than 80% of rated deflection height
- Adjust load transfer while motion restraint adjustments are loose
- For compact support of heavy loads, some OS's include inner springs. For lower profile support of heavy loads when required, OSE's have clustered springs









Part Numbers - G Springs - 3" (76.2mm) Deflection

Housing Size	
OSB	OSF
OSB-(*)-3YW162(**)	OSF-(*)-G853(**)
OSB-(*)-G213(**)	OSF-(*)-3YW1036(**)
OSB-(*)-G303(**)	OSF-(*)-G1223(**)
OSB-(*)-3YW325(**)	
OSB-(*)-3YW496(**)	

(*) Insert Style V or R
(**) Insert Option P when required

Typical Part Numbering

OS B - V - G213 P

- OS — Type
- B — Housing Size
- V — Style V or R
- G213 — Spring Number
- P — Neoprene Base Option

Dimensions

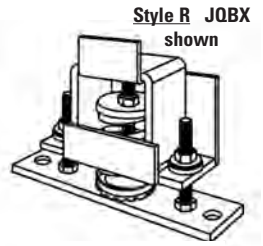
Housing Size	L in. (mm)	W in. (mm)	M in. (mm)	T in. (mm)	D in. (mm)	Approx. Oper. Height in. (mm)
OSB	10 1/2 (266.7)	3 1/2 (88.9)	9 (228.6)	4 (101.6)	1/2 (12.7)	5 1/2 (139.7)
OSF	14 (355.6)	5 (127.0)	12 (304.8)	6 (152.4)	5/8 (15.9)	8 (203.2)

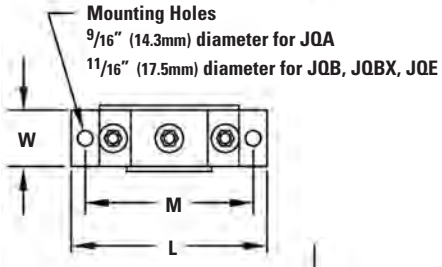
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

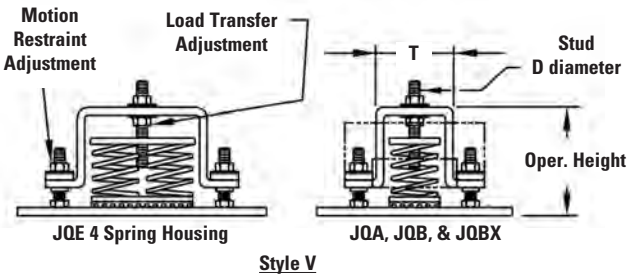
JQ Type - Isolator/Restraints - 1" (25.4mm) Deflection with California Pre-Approved Seismic Protection OPA-0070

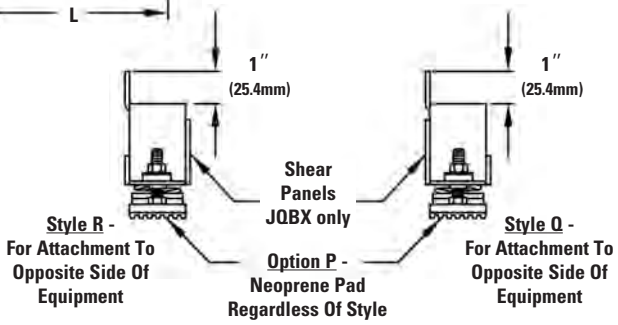
Use: To support and isolation of vibrations between equipment or frame mounted equipment and the floor or supporting structure. Pre-approved for state of California health care projects (OSHPD)

- Neoprene pad 1/4" (6.3mm) thick under spring regardless of style
- All JQ Type isolator/restraints feature large diameter springs with O.D. not less than 80% of rated deflection height
- Adjust load transfer while motion restraint adjustments are loose
- For compact support of heavy loads, some JQ include inner springs. For lower profile support of heavy loads when required, JQE's have clustered springs
- Housings are HDG with Zinc Plated hardware Springs are Zinc Plated or Powder Coated









Part Numbers - E Springs - 1" (25.4mm) Deflection

Housing Size			
JQA	JQB	JQBX	JQE
JQA-(*)-E21(**)	JQB-(*)-ET255(**)	JQBX-ET255(*)(**)	JQE-(*)-E976(**)
JQA-(*)-E55(**)	JQB-(*)-ET347(**)	JQBX-ET347(*)(**)	JQE-(*)-E1272(**)
JQA-(*)-E79(**)	JQB-(*)-ET473(**)	JQBX-ET473(*)(**)	JQE-(*)-E1660(**)
JQA-(*)-E106(**)	JQB-(*)-E630(**)	JQBX-E630(*)(**)	JQE-(*)-E2000(**)
JQA-(*)-E143(**)	JQB-(*)-E806(**)	JQBX-E806(*)(**)	JQE-(*)-E2532(**)
JQA-(*)-E187(**)	JQB-(*)-E1030(**)	JQBX-E1030(*)(**)	JQE-(*)-E3204(**)
JQA-(*)-E244(**)	JQB-(*)-E1230(**)	JQBX-E1230(*)(**)	JQE-(*)-E4128(**)
JQA-(*)-E318(**)	JQB-(*)-E1430(**)	JQBX-E1430(*)(**)	
JQA-(*)-E415(**)	JQB-(*)-E1810(**)	JQBX-E1810(*)(**)	
JQA-(*)-E500(**)	JQB-(*)-E2210(**)	JQBX-E2210(*)(**)	
JQA-(*)-E633(**)			
JQA-(*)-E801(**)			

(*) Insert Style V, R, or Q
(**) Insert Option P when required

Typical Part Numbering

JQ A - R - E500 P

- Type
- Housing Size
- Style V, R, or Q
- Spring Number
- Neoprene Base Option

OPA-0070 – Pre-Approved Maximum Allowable Loads

Housing Size	Horizontal Lbs. (kN)	Vertical Lbs. (kN)
JQA	800 (3.56)	1660 (7.38)
JQB	1000 (4.45)	1600 (7.11)
JQBX	1500 (6.67)	2000 (8.89)
JQE	3200 (14.23)	4300 (19.12)

Dimensions

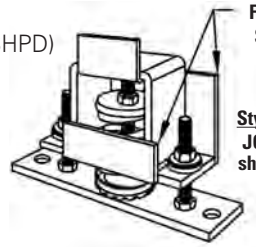
Housing Size	L in. (mm)	W in. (mm)	M in. (mm)	T in. (mm)	D in. (mm)	Approx. Oper. Height in. (mm)
JQA	7 (177.8)	2 (50.8)	6 (152.4)	2 3/4 (69.8)	3/8 (9.5)	4 1/2 (114.3)
JQB/JQBX	10 1/2 (266.7)	3 1/2 (88.9)	9 (228.6)	4 (101.6)	1/2 (12.7)	5 1/2 (139.7)
JQE	14 (355.6)	5 (127.0)	12 (304.8)	6 (152.4)	5/8 (15.9)	5 (127.0)

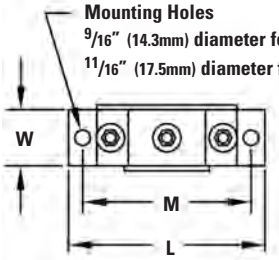
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

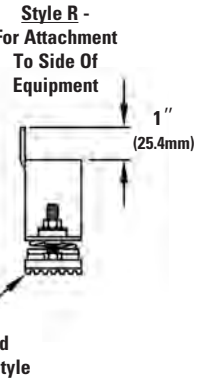
JQ Type - Isolator/Restraints - 2" (50.8mm) Deflection with California Pre-Approved Seismic Protection OPA-0070

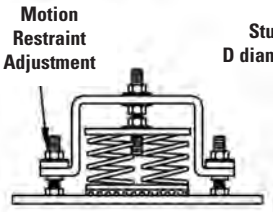
Use: To support and isolation of vibrations between equipment or frame mounted equipment and the floor or supporting structure.
Pre-approved for state of California health care projects (OSHPD)

- Neoprene pad 1/4" (6.3mm) thick under spring regardless of style
- All JQ Type isolator/restraints feature large diameter springs with O.D. not less than 80% of rated deflection height
- Adjust load transfer while motion restraint adjustments are loose
- For compact support of heavy loads, some JQ include inner springs. For lower profile support of heavy loads when required, JQE's have clustered springs
- Housings are HDG with Zinc Plated hardware Springs are Zinc Plated or Powder Coated

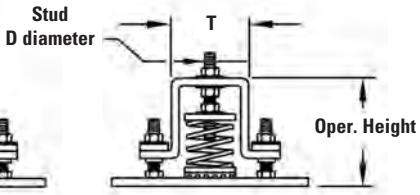








JQE 4 Spring Housing



JQA, JQB, JQBX, JQE, & JQF

Style V

Part Numbers - F Springs - 2" (50.8mm) Deflection

Housing Size			
JQA	JQB***	JQE	JQF
JQA-(*)-F33(**)	JQB_-(*)-FT121(**)	JQE_-(*)-F332(**)	JQF-(*)-F1159(**)
JQA-(*)-F43(**)	JQB_-(*)-FT171(**)	JQE_-(*)-F480(**)	JQF-(*)-F1408(**)
JQA-(*)-F59(**)	JQB_-(*)-FT241(**)	JQE_-(*)-F620(**)	JQF-(*)-F1710(**)
JQA-(*)-F83(**)	JQB_-(*)-F348(**)	JQE_-(*)-F780(**)	JQF-(*)-F2149(**)
JQA-(*)-F120(**)	JQB_-(*)-F453(**)	JQE_-(*)-F944(**)	JQF-(*)-F2700(**)
JQA-(*)-F155(**)	JQB_-(*)-F590(**)	JQE_-(*)-F1200(**)	
JQA-(*)-F195(**)	JQB_-(*)-F676(**)		
JQA-(*)-F236(**)	JQB_-(*)-F787(**)		
JQA-(*)-F300(**)	JQB_-(*)-F918(**)		

(*) Insert Style V or R
(**) Insert Option P when required
*** Leave blank for JQB style or insert X in part number for JQBX style

Typical Part Numbering

JQ A - R - F236 P

- Type
- Housing Size
- Style V or R
- Spring Number
- Neoprene Base Option

OPA-0070 – Pre-Approved Maximum Allowable Loads

Housing Size	Horizontal Lbs.	(kN)	Vertical Lbs.	(kN)
JQA	800	(3.56)	1660	(7.38)
JQB	1000	(4.45)	1600	(7.11)
JQBX	1500	(6.67)	2000	(8.89)
JQE	3200	(14.23)	4300	(19.12)
JQF	2900	(12.90)	4000	(17.79)

Dimensions

Housing Size	L in.	(mm)	W in.	(mm)	M in.	(mm)	T in.	(mm)	D in.	(mm)	Approx. Oper. Height in.	(mm)
JQA	7	(177.8)	2	(50.8)	6	(152.4)	2 3/4	(69.8)	3/8	(9.5)	4 1/2	(114.3)
JQB/JQBX	10 1/2	(266.7)	3 1/2	(88.9)	9	(228.6)	4	(101.6)	1/2	(12.7)	5 1/2	(139.7)
JQE	14	(355.6)	5	(127.0)	12	(304.8)	6	(152.4)	5/8	(15.9)	5	(127.0)
JQF	14	(355.6)	5	(127.0)	12	(304.8)	6	(152.4)	5/8	(15.9)	8	(203.2)

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

JQ-TQN Type - Top Quality Neoprene Isolator/Restraints - 1/2" (12.7mm) Deflection with California Pre-Approved Seismic Protection OPA-0070

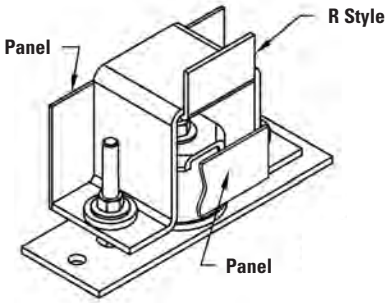
Use: For support of light equipment or framed equipment and isolation with a cushion to prevent vibration transference to structure.
Pre-approved for state of California health care projects (OSHPD)

Style V

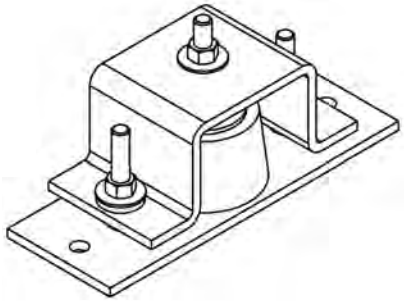
Style R

- Adjust load transfer while motion restraint adjustments are loose
- Housings are HDG with Zinc Plated hardware

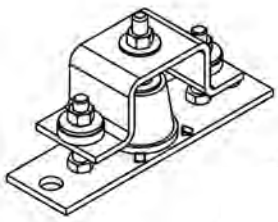
JQBX TQN 520
Style R shown



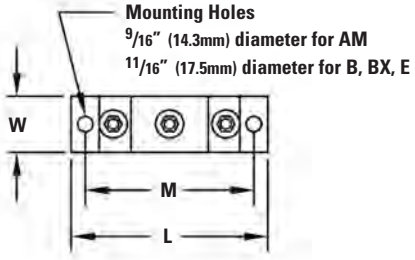
JQE TQN 4200
Style V shown

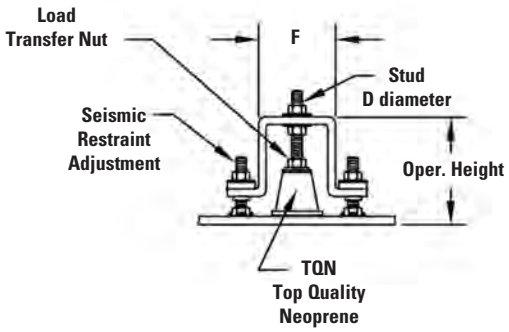


JQAM TQN 55
Style V shown

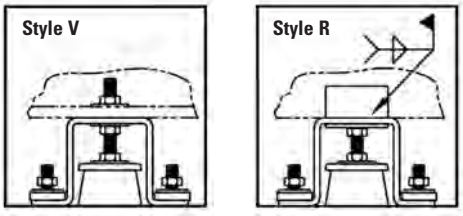


Panels	
JQB	No
JQBX	Yes





Load Transfer Styles



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

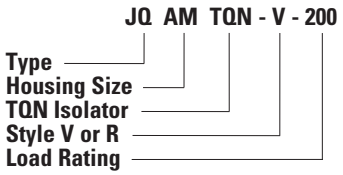
JQ-TQN Type - Top Quality Neoprene Isolator/Restraints - 1/2" (12.7mm) Deflection con't. with California Pre-Approved Seismic Protection OPA-0070

1/2" (12.7mm) Rated Static Deflection

Part No.	Maximum Load in.	(mm)	Color Code
JQAMTQN-(*)-40	40	(0.18)	Yellow
JQAMTQN-(*)-55	55	(.0.25)	Green
JQAMTQN-(*)-80	80	(0.35)	Blue
JQAMTQN-(*)-120	120	(0.53)	Orange
JQAMTQN-(*)-200	200	(.0.89)	Yellow
JQAMTQN-(*)-280	280	(1.24)	Green
JQAMTQN-(*)-400	400	(1.78)	Blue
JQBTQN-(*)-300	300	(1.33)	Yellow
JQBTQN-(*)-520	520	(2.31)	Green
JQBTQN-(*)-750	750	(3.33)	Blue
JQBTQN-(*)-1100	1100	(4.89)	White
JQBXTQN-(*)-300	300	(1.33)	Yellow
JQBXTQN-(*)-520	520	(2.31)	Green
JQBXTQN-(*)-750	750	(3.33)	Blue
JQBXTQN-(*)-1100	1100	(4.89)	White
JQETQN-(*)-1800	1800	(8.00)	Green
JQETQN-(*)-3000	3000	(13.34)	Blue
JQETQN-(*)-5000	5000	(22.24)	White

(*) Insert Style V or R

Typical Part Numbering



OPA-0070 – Pre-Approved Maximum Allowable Loads

Housing Size	Horizontal Lbs.	(kN)	Vertical Lbs.	(kN)
AM	600	(2.67)	900	(4.00)
B	1000	(4.45)	1600	(7.11)
BX	1500	(6.67)	2000	(8.89)
E	3200	(14.23)	4300	(109.22)

Dimensions

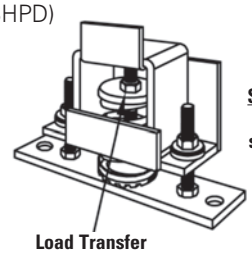
Housing Size	L in.	(mm)	W in.	(mm)	M in.	(mm)	F in.	(mm)	D in.	(mm)	Approx. Oper. Height in.	(mm)
AM	7	(177.8)	2	(50.8)	6	(152.4)	2 3/4	(69.8)	3/8	(9.5)	2 3/4	(69.8)
B / BX	10 1/2	(266.7)	3 1/2	(88.9)	9	(228.6)	4	(101.6)	1/2	(12.7)	5	(127.0)
E	14	(355.6)	5	(127.0)	12	(304.8)	6	(152.4)	5/8	(15.9)	5	(127.0)

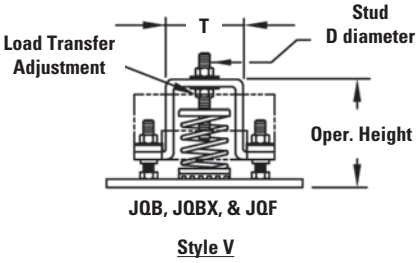
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

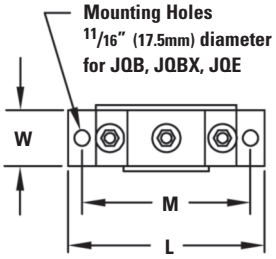
JQ Type - Isolator/Restraints - 3" (76.2mm) Deflection with California Pre-Approved Seismic Protection OPA-0070

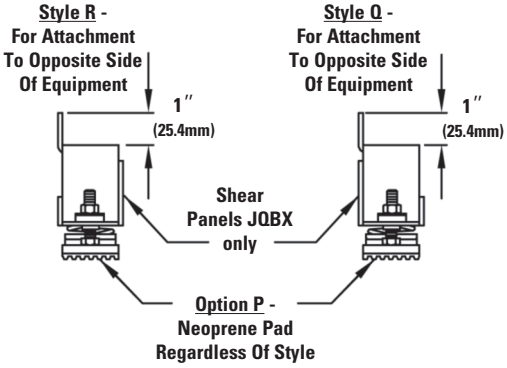
Use: For compact support or low profile support of heavy loads.
Pre-approved for state of California health care projects (OSHPD)

- Neoprene pad 1/4" (6.3mm) thick under spring regardless of style
- All JQ Type isolator/restraints feature large diameter springs with O.D. not less than 80% of rated deflection height
- Adjust load transfer while motion restraint adjustments are loose
- Housings are HDG with Zinc Plated hardware Springs are Zinc Plated or Powder Coated









Part Numbers - G Springs - 3" (76.2mm) Deflection

Housing Size		
JQB	JQBX	JQF
JQB-(*)-3YW162(**)	JQBX-(*)-3YW162(**)	JQF-(*)-G853(**)
JQB-(*)-G213(**)	JQBX-(*)-G213(**)	JQF-(*)-3YW1036(**)
JQB-(*)-G303(**)	JQBX-(*)-G303(**)	JQF-(*)-G1223(**)
JQB-(*)-3YW325(**)	JQBX-(*)-3YW325(**)	
JQB-(*)-3YW496(**)	JQBX-(*)-3YW496(**)	

(*) Insert Style V, R, or Q
(**) Insert Option P when required

Typical Part Numbering

JQ B - V - G213 P

- Type
- Housing Size
- Style V, R, or Q
- Spring Number
- Neoprene Base Option

OPA-0070 – Pre-Approved Maximum Allowable Loads

Housing Size	Horizontal Lbs. (kN)	Vertical Lbs. (kN)
JQB	1000 (4.45)	1600 (7.11)
JQBX	1500 (6.67)	2000 (8.89)
JQF	2900 (12.90)	4000 (17.79)

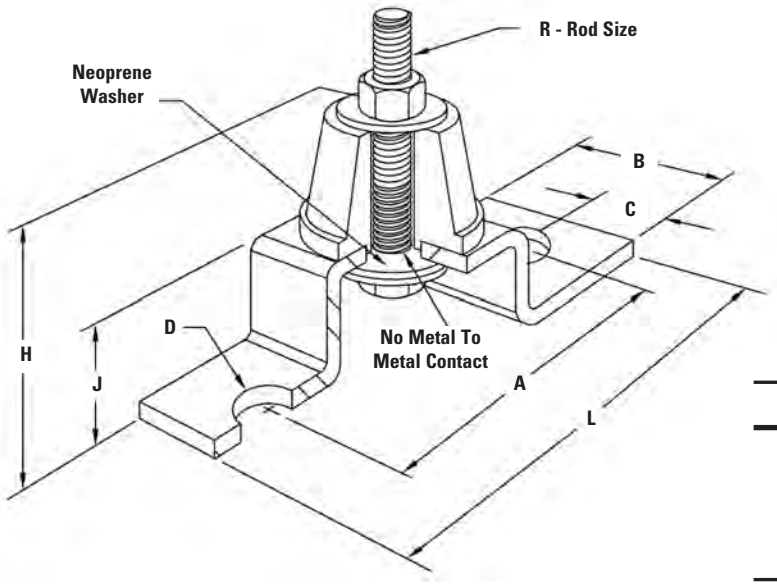
Dimensions

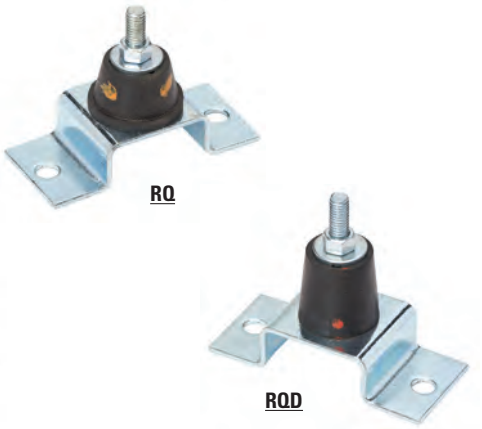
Housing Size	L in. (mm)	W in. (mm)	M in. (mm)	T in. (mm)	D in. (mm)	Approx. Oper. Height in. (mm)
JQB/JQBX	10 1/2 (266.7)	3 1/2 (88.9)	9 (228.6)	4 (101.6)	1/2 (12.7)	5 1/2 (139.7)
JQF	14 (355.6)	5 (127.0)	12 (304.8)	6 (152.4)	5/8 (15.9)	8 (203.2)

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

RQ & RQD Type - Neoprene Mount with Integrak Seismic Restraints

Use: For support of light equipment or framed light equipment while preventing transfer of vibration to structure





Typical Part Numbering

RQ - A130

Type

Mount Number

1/4" (6.3mm) Maximum Deflection

Part No.	Maximum Load Lbs.	(kN)	Color Code
RQ-A40	40	(0.18)	Orange
RQ-A55	55	(.0.25)	Yellow
RQ-A80	80	(0.35)	Green
RQ-A130	130	(0.58)	Blue
RQ-B120	120	(0.53)	Orange
RQ-B200	200	(0.89)	Yellow
RQ-B280	280	(1.24)	Green
RQ-B400	400	(1.678)	Blue
RQ-C300	300	(1.33)	Yellow
RQ-C520	520	(2.31)	Green
RQ-C750	750	(3.33)	Blue
RQ-C1100	1100	(4.89)	White

1/2" (12.7mm) Maximum Deflection

Part No.	Maximum Load Lbs.	(kN)	Color Code
RQD-A40	40	(0.18)	Orange
RQD-A55	55	(.0.25)	Yellow
RQD-A80	80	(0.35)	Green
RQD-A130	130	(0.58)	Blue
RQD-B120	120	(0.53)	Orange
RQD-B200	200	(0.89)	Yellow
RQD-B280	280	(1.24)	Green
RQD-B400	400	(1.678)	Blue
RQD-C300	300	(1.33)	Yellow
RQD-C520	520	(2.31)	Green
RQD-C750	750	(3.33)	Blue
RQD-C1100	1100	(4.89)	White

Dimensions

Neoprene Type	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	L in. (mm)	J in. (mm)	R	H in. (mm)
RQ-A	3 1/2 (88.9)	2 (50.8)	1 (25.4)	7/16 (11.1)	4 1/2 (114.3)	1 (25.4)	3/8"-16	2 (50.8)
RQ-B	4 5/16 (109.5)	2 1/2 (63.5)	1 1/4 (31.7)	9/16 (14.3)	5 3/8 (136.5)	1 1/2 (38.1)	5/8"-11	2 3/4 (69.8)
RQ-C	5 (127.0)	3 1/4 (82.5)	1 5/8 (41.3)	11/16 (17.5)	6 3/16 (157.2)	1 7/8 (47.6)	3/4"-10	3 3/8 (85.7)
RQD-A	3 1/2 (88.9)	2 (50.8)	1 (25.4)	7/16 (11.1)	4 1/2 (114.3)	1 (25.4)	3/8"-16	2 (50.8)
RQD-B	4 5/16 (109.5)	2 1/2 (63.5)	1 1/4 (31.7)	9/16 (14.3)	5 3/8 (136.5)	1 1/2 (38.1)	5/8"-11	2 3/4 (69.8)
RQD-C	5 (127.0)	3 1/4 (82.5)	1 5/8 (41.3)	11/16 (17.5)	6 3/16 (157.2)	1 7/8 (47.6)	3/4"-10	3 3/8 (85.7)

Type RQ: Single Deflection (1/4" (6.3mm) Maximum)

Type RQD: Double Deflection (1/2" (12.7mm) Maximum)

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

Reference Tables

For use in selecting hangers for standard pipe

Nominal Pipe Size		Weight Per Foot (25.4mm) Standard Pipe				Hanger Selection Load 10′ (3.05m) Spacing	
		Dry or Steam Filled		Water Filled			
in.	(mm)	lbs.	(kg)	lbs.	(kg)	lbs.	(kN)
3/4	(20)	1.13	(0.51)	1.36	(0.61)	21	(0.09)
1	(25)	1.68	(0.76)	2.06	(0.93)	55	(024)
1 1/4	(32)	2.28	(1.03)	2.93	(1.33)	55	(024)
1 1/2	(40)	2.73	(1.24)	3.62	(1.64)	55	(024)
2	(50)	3.68	(1.67)	5.15	(2.33)	79	(0.35)
2 1/2	(65)	5.82	(2.64)	7.91	(3.59)	143	(0.63)
3	(80)	7.62	(3.45)	10.85	(4.92)	143	(0.63)
3 1/2	(90)	9.20	(4.17)	13.52	(6.13)	187	(0.83)
4	(100)	10.89	(4.94)	16.45	(7.46)	244	(1.08)
4 1/2	(115)	12.64	(5.73)	19.50	(8.84)	244	(1.08)
5	(125)	14.81	(6.72)	23.55	(10.68)	318	(1.41)
6	(150)	19.18	(8.70)	31.80	(14.42)	415	(1.84)
7	(175)	24.05	(10.91)	40.85	(18.53)	500	(2.22)
8	(200)	28.60	(12.97)	50.50	(22.90)	715	(3.18)
9	(225)	33.90	(15.38)	61.10	(27.71)	1060	(4.71)
10	(250)	40.50	(18.37)	75.00	(24.02)	1060	(4.71)
12	(300)	49.60	(22.50)	99.00	(44.90)	1430	(6.36)

Selection based on water filled pipe only. Add weight of fittings if any and reselect.

125# Cast Iron pipe fitting approximate weights

Nominal Pipe Size		Strainer		Check Valve		Gate Valve		Elbow		Tee		Flange	
in.	(mm)	lbs.	(kg)	lbs.	(kg)	lbs	(kg)	lbs	(kg)	lbs	(kg)	lbs	(kg)
1 1/2	(40)	20	(9.1)	25	(11.3)	30	(13.6)	15	(6.8)	20	(9.1)	3.5	(1.6)
2	(50)	30	(13.6)	25	(11.3)	40	(18.1)	20	(9.1)	25	(11.3)	6	(2.7)
2 1/2	(65)	40	(18.1)	35	(15.9)	50	(22.7)	25	(11.3)	35	(15.9)	8	(3.6)
3	(80)	50	(22.7)	45	(20.4)	70	(31.7)	30	(13.6)	40	(18.1)	9	(4.1)
4	(100)	85	(38.5)	80	(36.3)	110	(49.9)	55	(24.9)	70	(31.7)	16	(7.2)
5	(125)	110	(49.9)	120	(54.4)	140	(63.5)	70	(31.7)	90	(40.8)	20	(9.1)
6	(150)	140	(63.5)	155	(70.3)	415	(1.84)	90	(40.8)	115	(52.1)	25	(11.3)
8	(200)	205	(93.0)	305	(138.3)	250	(113.4)	120	(54.4)	175	(79.4)	34	(15.4)
10	(250)	330	(149.7)	455	(206.4)	475	(215.4)	245	(111.1)	295	(133.8)	53	(24.0)
12	(300)	440	(199.6)	675	(306.2)	690	(313.0)	375	(54.4)	405	(183.7)	71	(32.2)

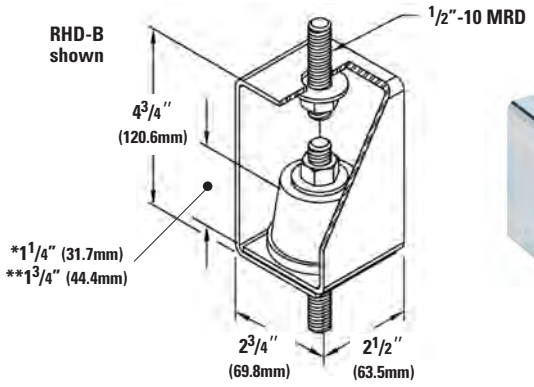
For 250# fittings, multiply above values by 1.8.

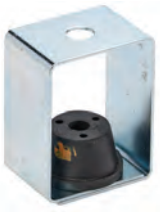
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

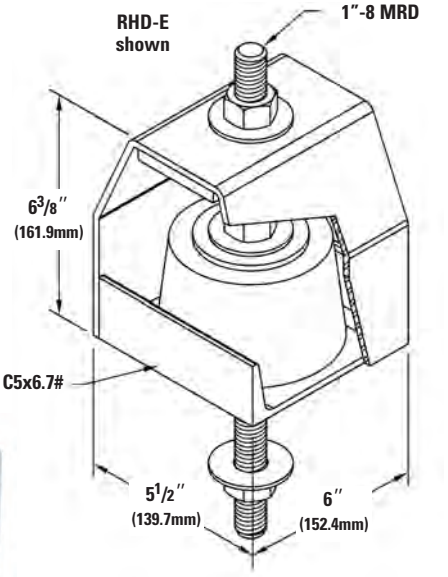
RH & RHD Type - Neoprene Hanger

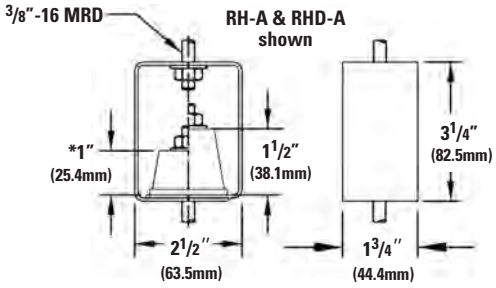
Use: Used to dampen noise and vibration from suspended high speed equipment. To be used with all thread rod for single and trapeze type support systems.

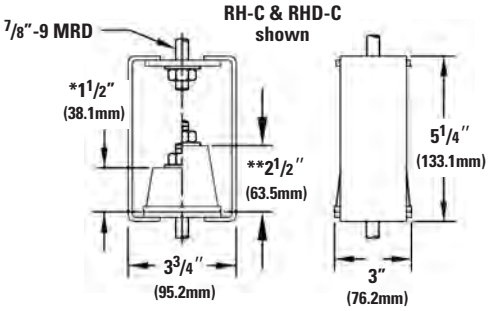
- *Type RH: Single deflection - 1/4" (6.3mm) maximum
- **Type RHD: Double deflection - 1/2" (12.7mm) maximum
- MRD is maximum rod diameter
- Housing finish: Zinc Plated
- Threaded rods, nuts, and washers are furnished separately











1/4" (6.3mm) Maximum Single Deflection

Part Number	Maximum Load lbs.	(kN)	Color Code
RH-40-A	40	(0.09)	Yellow
RH-55-A	55	(0.24)	Green
RH-80-A	80	(0.35)	Blue
RH-130-A	130	(0.47)	White
RH-120-B	120	(0.53)	Orange
RH-200-B	200	(0.69)	Yellow
RH-280-B	280	(0.83)	Green
RH-400-B	400	(1.08)	Blue
RH-300-C	300	(1.41)	Yellow
RH-520-C	520	(1.75)	Green
RH-750-C	750	(2.27)	Blue
RH-1100-C	1100	(31.8)	White

Typical Part Numbering

RH - 280 - B

- **Type**
- **Load Rating**
- **Size**

1/2" (12.7mm) Maximum Double Deflection

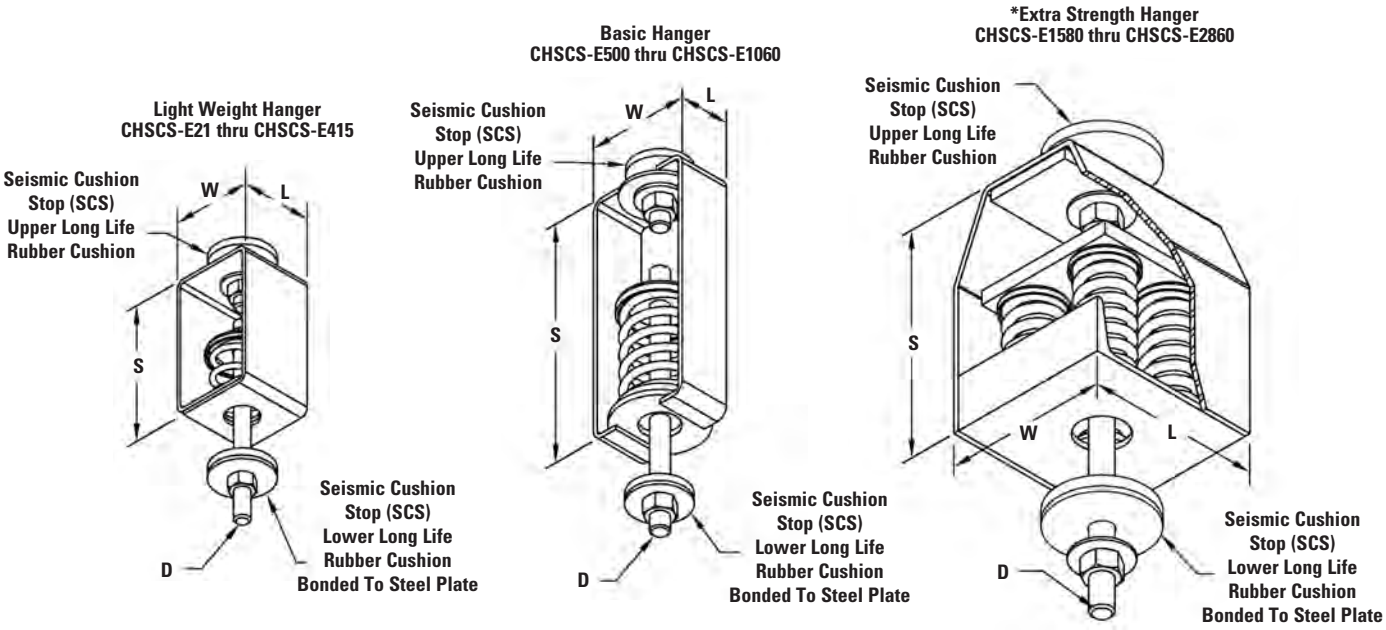
Part Number	Maximum Load lbs.	(kN)	Color Code
RHD-40-A	40	(0.09)	Yellow
RHD-55-A	55	(0.24)	Green
RHD-80-A	80	(0.35)	Blue
RHD-130-A	130	(0.47)	White
RHD-120-B	120	(0.53)	Orange
RHD-200-B	200	(0.69)	Yellow
RHD-280-B	280	(0.83)	Green
RHD-400-B	400	(1.08)	Blue
RHD-300-C	300	(1.41)	Yellow
RHD-520-C	520	(1.75)	Green
RHD-750-C	750	(2.27)	Blue
RHD-1100-C	1100	(31.8)	White
RHD-1700-E	1700	(4.71)	Green
RHD-2700-E	2700	(6.76)	Blue
RHD-4200-E	4200	(8.72)	White

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

CHSCS Type - Spring Hanger with Seismic Cushion Stop - 1" (25.4mm) Deflection

Use: Used to dampen noise and vibration from suspended high speed equipment. To be used with all thread rod for single and trapeze type support systems.

- All housing sizes have been tested to carry five times the maximum load without failure
- Spring rated deflection is 1" (25.4mm)
- SFH = Free Height
- Threaded rod, nuts, and washers supplied separately
- * Housings are specially reinforced for extra strength



Typical Part Numbering

CHSCS - E143

Type
Load

Dimensions

Part Number	Maximum Load lbs.	(kN)	SFH in.	(mm)	S in.	(mm)	W in.	(mm)	L in.	(mm)	SCS Diameter in.	(mm)	D Diameter
CHSCS-E21	21	(0.09)	2 5/8	(66.7)	4 3/4	(120.6)	2 3/4	(69.8)	2 1/2	(63.5)	2 3/8	(60.3)	3/8"-16
CHSCS-E55	55	(0.24)	2 3/4	(69.8)	4 3/4	(120.6)	2 3/4	(69.8)	2 1/2	(63.5)	2 3/8	(60.3)	3/8"-16
CHSCS-E79	79	(0.35)	2 5/8	(66.7)	4 3/4	(120.6)	2 3/4	(69.8)	2 1/2	(63.5)	2 3/8	(60.3)	3/8"-16
CHSCS-E106	106	(0.47)	2 5/8	(66.7)	4 3/4	(120.6)	2 3/4	(69.8)	2 1/2	(63.5)	2 3/8	(60.3)	3/8"-16
CHSCS-E143	143	(0.63)	2 5/8	(66.7)	4 3/4	(120.6)	2 3/4	(69.8)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CHSCS-E187	187	(0.83)	2 5/8	(66.7)	4 3/4	(120.6)	2 3/4	(69.8)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CHSCS-E244	244	(1.08)	2 3/4	(69.8)	4 3/4	(120.6)	2 3/4	(69.8)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CHSCS-E318	318	(1.41)	3 1/8	(79.4)	4 3/4	(120.6)	2 3/4	(69.8)	2 1/2	(63.5)	2 3/8	(60.3)	5/8"-11
CHSCS-E415	415	(1.84)	3 1/16	(77.8)	4 3/4	(120.6)	2 3/4	(69.8)	2 1/2	(63.5)	2 3/8	(60.3)	5/8"-11
CHSCS-E500	500	(2.22)	3 1/4	(82.5)	7 1/2	(190.5)	3 1/4	(82.5)	2 3/4	(69.8)	3	(76.2)	3/4"-10
CHSCS-715	715	(3.18)	4 1/4	(107.9)	7 1/2	(190.5)	3 1/4	(82.5)	2 3/4	(69.8)	3	(76.2)	3/4"-10
CHSCS-1060	1060	(4.71)	4 1/4	(107.9)	7 1/2	(190.5)	3 1/4	(82.5)	2 3/4	(69.8)	3	(76.2)	3/4"-10
CHSCS-1430 *	1430	(6.36)	4 1/4	(107.9)	8 3/8	(212.7)	6	(152.4)	6	(152.4)	3	(76.2)	7/8"-9
CHSCS-2120 *	2120	(9.43)	4 1/4	(107.9)	8 3/8	(212.7)	6	(152.4)	6	(152.4)	3	(76.2)	7/8"-9
CHSCS-2860 *	2860	(12.72)	4 1/4	(107.9)	8 3/8	(212.7)	6	(152.4)	6	(152.4)	3	(76.2)	7/8"-9

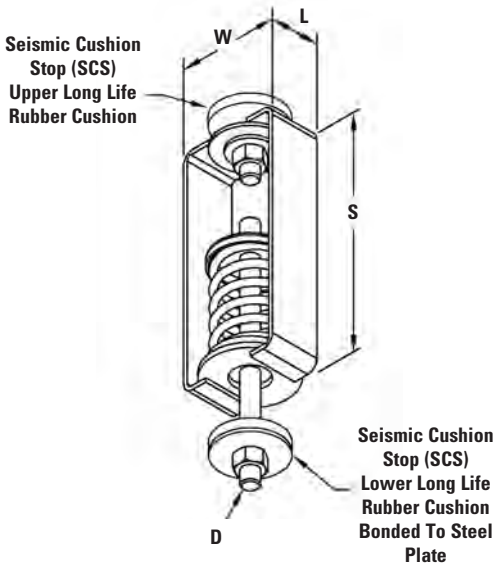
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

CHSCS Type - Spring Hanger with Seismic Cushion Stop - 2" (50.8mm) Deflection

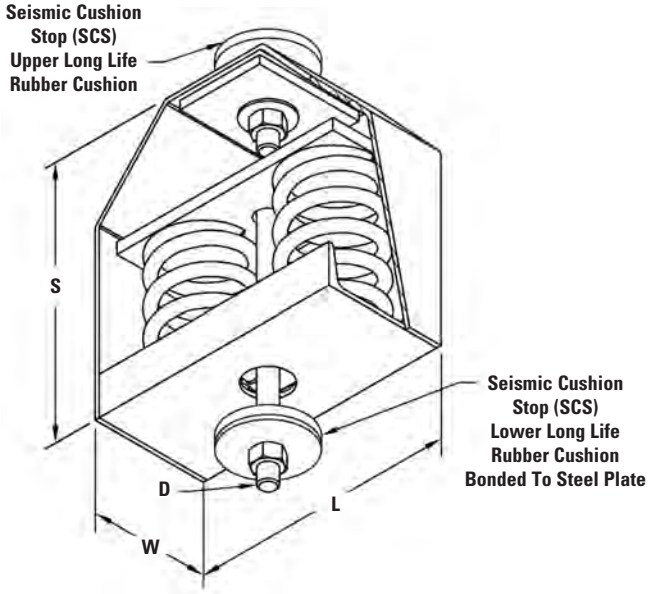
Use: Used to dampen noise and vibration from suspended high speed equipment. To be used with all thread rod for single and trapeze type support systems.

- All housing sizes have been tested to carry five times the maximum load without failure
- Spring rated deflection is 2" (50.8mm)
- SFH = Free Height
- Threaded rod, nuts, and washers supplied separately
- * Housings are specially reinforced for extra strength

Basic Hanger
CHSCS-F59 thru CHSCS-F918



***Extra Strength Hanger**
CHSCS-F1159 thru CHSCS-F3420



Typical Part Numbering

CHSCS - F120
Type
Load

Dimensions

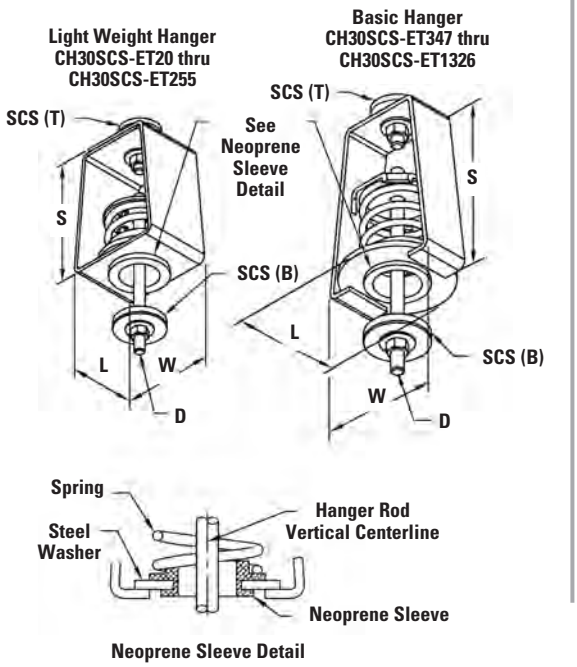
Part Number	Maximum Load lbs.	(kN)	SFH in.	(mm)	S in.	(mm)	W in.	(mm)	L in.	(mm)	SCS Diameter in.	(mm)	D Diameter
CHSCS-F59	59	(0.26)	4 1/4	(107.9)	9	(228.6)	3	(76.2)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CHSCS-F83	83	(0.37)	4 1/4	(107.9)	9	(228.6)	3	(76.2)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CHSCS-F120	120	(0.53)	4 1/4	(107.9)	9	(228.6)	3	(76.2)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CHSCS-F155	155	(0.69)	4 1/4	(107.9)	9	(228.6)	3	(76.2)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CHSCS-F195	195	(0.87)	4 9/16	(115.9)	9	(228.6)	3	(76.2)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CHSCS-F241	241	(1.07)	4 1/2	(114.3)	10	(254.0)	5 1/2	(139.7)	4 1/2	(114.3)	2 3/8	(60.3)	1/2"-13
CHSCS-F348	348	(1.55)	5	(127.0)	10	(254.0)	5 1/2	(139.7)	4 1/2	(114.3)	2 3/8	(60.3)	5/8"-11
CHSCS-F453	453	(2.01)	5	(127.0)	10	(254.0)	5 1/2	(139.7)	4 1/2	(114.3)	2 3/8	(60.3)	5/8"-11
CHSCS-F590	590	(2.62)	5	(127.0)	11	(279.4)	5 1/4	(133.3)	4 1/2	(114.3)	2 3/8	(60.3)	3/4"-10
CHSCS-F676	676	(3.00)	5	(127.0)	11	(279.4)	5 1/4	(133.3)	4 1/2	(114.3)	2 3/8	(60.3)	3/4"-10
CHSCS-F787	787	(3.50)	5	(127.0)	11	(279.4)	5 1/4	(133.3)	4 1/2	(114.3)	2 3/8	(60.3)	3/4"-10
CHSCS-F918	918	(4.08)	5	(127.0)	11	(279.4)	5 1/4	(133.3)	4 1/2	(114.3)	2 3/8	(60.3)	3/4"-10
CHSCS-F1159 *	1159	(5.15)	6 7/16	(163.5)	11	(279.4)	6	(152.9)	5	(127.0)	3	(76.2)	3/4"-10
CHSCS-F1408 *	1408	(6.26)	6 7/16	(163.5)	11	(279.4)	6	(152.9)	5	(127.0)	3	(76.2)	7/8"-9
CHSCS-F1710 *	1710	(7.60)	6 7/16	(163.5)	11	(279.4)	6	(152.9)	5	(127.0)	3	(76.2)	7/8"-9
CHSCS-F2318 *	2318	(10.31)	6 7/16	(163.5)	11 1/4	(285.7)	11	(279.4)	5	(127.0)	3	(76.2)	7/8"-9
CHSCS-F2816 *	2816	(12.52)	6 7/16	(163.5)	11 1/4	(285.7)	11	(279.4)	5	(127.0)	3	(76.2)	7/8"-9
CHSCS-F3420 *	3420	(15.21)	6 7/16	(163.5)	11 1/4	(285.7)	11	(279.4)	5	(127.0)	3	(76.2)	7/8"-9

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

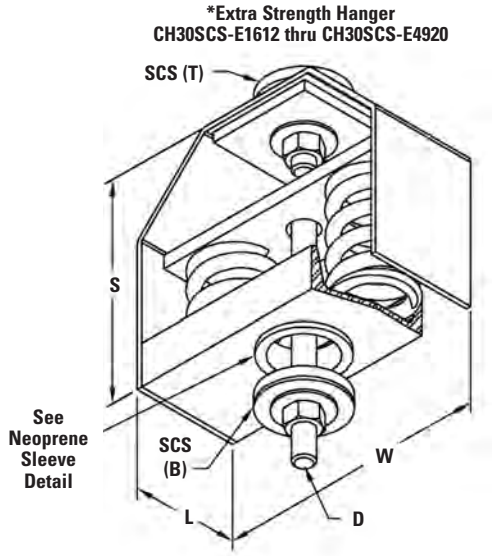
CH30SCS Type - 15° Tilt, 1" (25.4mm) Deflection Combination Hanger - Spring & Neoprene with Seismic Cushion Stop

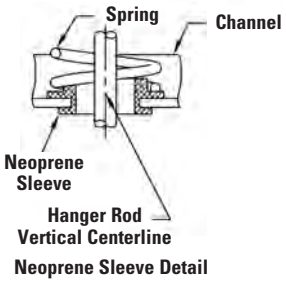
Use: Used to dampen noise and minor vibration from suspended high speed equipment. To be used with all thread rod for single and trapeze type support systems.Used where uncertain alignment is anticipated during installation. At rated load the hanger rod will operate to a full 15° tilt in any direction from vertical centerline.

- All housing sizes have been tested to carry five times the maximum load without failure
- Spring rated deflection is 1" (25.4mm)
- SFH = Free Height
- Threaded rod, nuts, and washers supplied separately
- * Housings are specially reinforced for extra strength



Neoprene Sleeve Detail





Neoprene Sleeve Detail

Typical Part Numbering

CH30SCS - ET129

Type
Load

SCS (T) = Seismic Cushion Stop (SCS) Upper Long Life Rubber Cushion

SCS (B) = Seismic Cushion Stop (SCS) Lower Long Life Rubber Cushion Bonded To Steel Plate

Dimensions

Part Number	Maximum Load lbs. (kN)	SFH in. (mm)	S in. (mm)	W in. (mm)	L in. (mm)	SCS Diameter in. (mm)	D Diameter
CH30SCS-ET20	20 (0.09)	1 7/8 (47.6)	4 3/4 (120.6)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	1/2"-13
CH30SCS-ET42	42 (0.18)	2 (50.8)	4 3/4 (120.6)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	1/2"-13
CH30SCS-ET80	80 (0.35)	2 1/8 (54.0)	4 3/4 (120.6)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	1/2"-13
CH30SCS-ET129	129 (0.57)	2 3/8 (60.3)	4 3/4 (120.6)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	1/2"-13
CH30SCS-ET194	194 (0.86)	2 3/8 (60.3)	4 3/4 (120.6)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	1/2"-13
CH30SCS-ET255	255 (1.13)	2 1/2 (63.5)	4 3/4 (120.6)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	1/2"-13
CH30SCS-ET347	347 (1.54)	2 3/4 (69.8)	6 (152.9)	5 5/16 (134.9)	4 1/4 (107.9)	2 3/8 (60.3)	5/8"-11
CH30SCS-ET473	473 (2.10)	2 7/8 (73.0)	6 (152.9)	5 5/16 (134.9)	4 1/4 (107.9)	2 3/8 (60.3)	5/8"-11
CH30SCS-ET667	667 (2.96)	3 1/8 (79.4)	7 (177.8)	5 7/8 (149.2)	4 3/4 (120.6)	3 (76.2)	3/4"-10
CH30SCS-ET940	940 (4.18)	3 3/8 (85.7)	7 (177.8)	5 7/8 (149.2)	4 3/4 (120.6)	3 (76.2)	3/4"-10
CH30SCS-ET1326	1326 (5.90)	3 5/8 (92.1)	7 (177.8)	5 7/8 (149.2)	4 3/4 (120.6)	3 (76.2)	7/8"-9
CH30SCS-E1612 *	1612 (7.17)	3 5/8 (92.1)	8 1/4 (209.5)	10 (254.0)	4 (101.6)	3 (76.2)	7/8"-9
CH30SCS-E2060 *	2060 (9.16)	3 7/8 (98.4)	8 1/4 (209.5)	10 (254.0)	4 (101.6)	3 (76.2)	1"-8
CH30SCS-E2460 *	2460 (10.94)	4 1/8 (104.8)	8 1/4 (209.5)	10 (254.0)	4 (101.6)	3 (76.2)	1"-8
CH30SCS-E2980 *	2980 (13.25)	4 1/8 (104.8)	8 1/4 (209.5)	10 (254.0)	4 (101.6)	3 (76.2)	1"-8
CH30SCS-E4120 *	4120 (18.32)	3 7/8 (98.4)	8 1/2 (215.9)	9 1/2 (241.3)	7 (177.8)	4 (101.6)	1 1/8"-7
CH30SCS-E4920 *	4920 (21.88)	4 1/8 (104.8)	8 1/2 (215.9)	9 1/2 (241.3)	7 (177.8)	4 (101.6)	1 1/8"-7

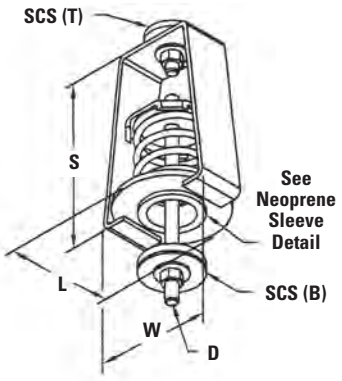
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

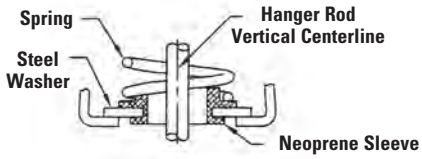
CH30SCS Type - 15° Tilt, 2" (50.8mm) Deflection Spring Hanger with Seismic Cushion Stop

Use: Used to dampen noise and minor vibration from suspended high speed equipment. To be used with all thread rod for single and trapeze type support systems.Used where uncertain alignment is anticipated during installation. At rated load the hanger rod will operate to a full 15° tilt in any direction from vertical centerline.

- All housing sizes have been tested to carry five times the maximum load without failure
- Spring rated deflection is 1" (25.4mm)
- SFH = Free Height
- Threaded rod, nuts, and washers supplied separately
- * Housings are specially reinforced for extra strength

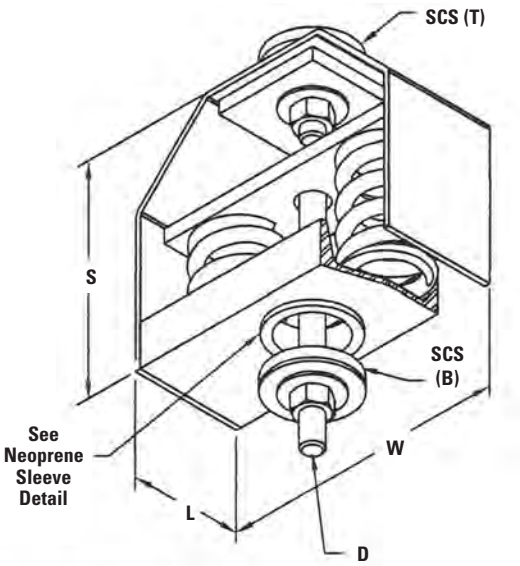
Basic Hanger
CH30SCS-FT30 thru CH30SCS-F590

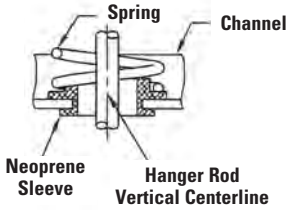




Neoprene Sleeve Detail

***Extra Strength Hanger**
CH30SCS-F696 thru CH30SCS-F3420





Neoprene Sleeve Detail

Typical Part Numbering

CH30SCS - FT121

Type
Load

SCS (T) =
Seismic Cushion Stop (SCS)
Upper Long Life Rubber Cushion

SCS (B) =
Seismic Cushion Stop (SCS)
Lower Long Life Rubber Cushion
Bonded To Steel Plate

Dimensions

Part Number	Maximum Load lbs.	(kN)	SFH in.	(mm)	S in.	(mm)	W in.	(mm)	L in.	(mm)	SCS Diameter in.	(mm)	D Diameter
CH30SCS-FT30	30	(0.13)	3 1/2	(88.9)	6 1/2	(165.1)	3 5/8	(92.1)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CH30SCS-FT41	41	(0.18)	3 1/2	(88.9)	6 1/2	(165.1)	3 5/8	(92.1)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CH30SCS-FT60	60	(0.26)	3 3/4	(95.2)	6 1/2	(165.1)	3 5/8	(92.1)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CH30SCS-FT85	85	(0.38)	3 3/4	(95.2)	6 1/2	(165.1)	3 5/8	(92.1)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
CH30SCS-FT121	121	(0.54)	4	(101.6)	8	(203.2)	5	(127.0)	4	(101.6)	2 3/8	(60.3)	1/2"-13
CH30SCS-FT171	171	(0.76)	4 1/4	(107.9)	8	(203.2)	5 1/4	(133.3)	4 1/2	(114.3)	3	(76.2)	1/2"-13
CH30SCS-FT241	241	(1.07)	4 1/2	(114.3)	8	(203.2)	5 1/4	(133.3)	4 1/2	(114.3)	3	(76.2)	1/2"-13
CH30SCS-F348	348	(1.55)	5	(127.0)	8	(203.2)	5 1/4	(133.3)	4 1/2	(114.3)	3	(76.2)	5/8"-11
CH30SCS-F453	453	(2.01)	5	(127.0)	8	(203.2)	5 1/4	(133.3)	4 1/2	(114.3)	3	(76.2)	5/8"-11
CH30SCS-F590	590	(2.62)	5	(127.0)	8	(203.2)	5 1/4	(133.3)	4 1/2	(114.3)	3	(76.2)	3/4"-10
CH30SCS-F696 *	696	(3.09)	5	(127.0)	9	(228.6)	10 3/8	(263.5)	4	(101.6)	3	(76.2)	3/4"-10
CH30SCS-F906 *	906	(4.03)	5	(127.0)	9	(228.6)	10 3/8	(263.5)	4	(101.6)	3	(76.2)	3/4"-10
CH30SCS-F1180 *	1180	(5.25)	5	(127.0)	9	(228.6)	10 3/8	(263.5)	4	(101.6)	3	(76.2)	3/4"-10
CH30SCS-F1352 *	1352	(6.01)	5	(127.0)	9	(228.6)	10 3/8	(263.5)	4	(101.6)	3	(76.2)	7/8"-9
CH30SCS-F1574 *	1574	(7.00)	5	(127.0)	9	(228.6)	10 3/8	(263.5)	4	(101.6)	3	(76.2)	7/8"-9
CH30SCS-F1836 *	1836	(8.16)	5	(127.0)	9	(228.6)	10 3/8	(263.5)	4	(101.6)	3	(76.2)	7/8"-9
CH30SCS-F2318 *	2318	(10.31)	6 1/2	(165.1)	11 1/2	(292.1)	12 3/8	(314.3)	5	(127.0)	4	(101.6)	7/8"-9
CH30SCS-F2816 *	2816	(12.52)	6 1/2	(165.1)	11 1/2	(292.1)	12 3/8	(314.3)	5	(127.0)	4	(101.6)	7/8"-9
CH30SCS-F3420 *	3420	(15.21)	6 1/2	(165.1)	11 1/2	(292.1)	12 3/8	(314.3)	5	(127.0)	4	(101.6)	7/8"-9

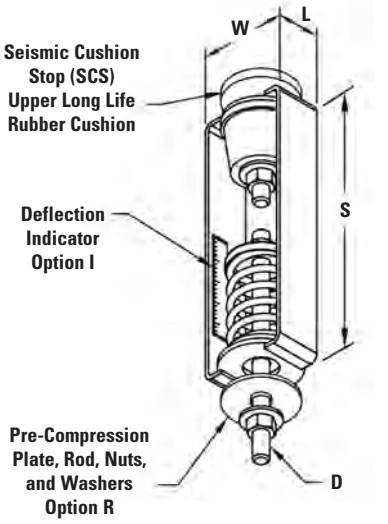
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

HHSCS Type - Combination Hanger Spring & Neoprene with Seismic Cushion Stop - 1 1/2" (38.1mm) Deflection

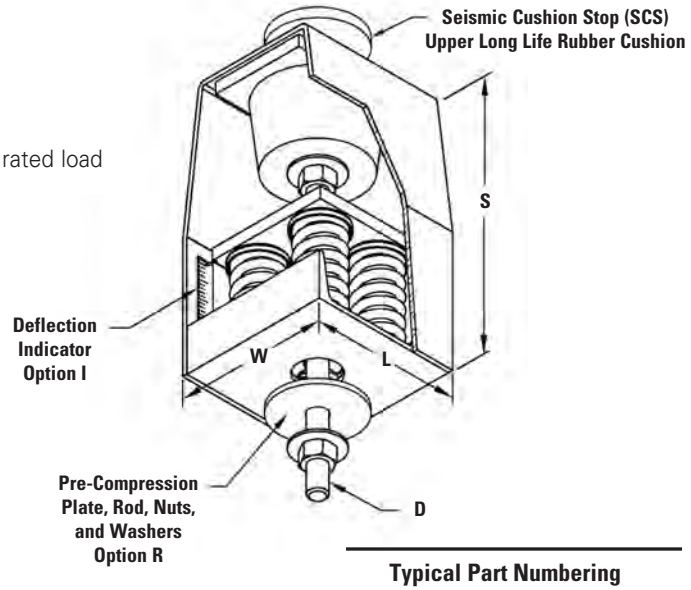
Use: Used to dampen noise and minor vibration from suspended high speed equipment. To be used with all thread rod for single and trapeze type support systems.Used where uncertain alignment is anticipated during installation. At rated load the hanger rod will operate to a full 15° tilt in any direction from vertical centerline.

- All housing sizes have been tested to carry five times the maximum load without failure
- Spring rated deflection is 2" (50.8mm) + neoprene rated deflection is 1/2" (12.7mm) = 2 1/2" (63.5mm)
- SFH = Free Height NFH = Neoprene Free Height
- Threaded rod, nuts, and washers supplied separately
- * Housings are specially reinforced for extra strength
- Minimum additional travel is 50% of rated deflection at rated load

Basic Hanger
HHSCS-E21 thru HHSCS-E1060



***Extra Strength Hanger**
HHSCS-E1580 thru HHSCS-E2860



Typical Part Numbering

HHSCS E106 R I

- Type
- Spring Load
- Pre-Compression Option
- Deflector Indicator Option

Dimensions

Part Number	Maximum Load lbs. (kN)	SFH in. (mm)	NFH in. (mm)	S in. (mm)	W in. (mm)	L in. (mm)	SCS Diameter	D Diameter
HHSCS-E21-R I	21 (0.09)	2 5/8 (66.7)	1 1/2 (38.1)	6 1/2 (165.1)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	3/8"-16
HHSCS-E55-R I	55 (0.24)	2 3/4 (69.8)	1 1/2 (38.1)	6 1/2 (165.1)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	3/8"-16
HHSCS-E79-R I	79 (0.35)	2 5/8 (66.7)	1 1/2 (38.1)	6 1/2 (165.1)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	3/8"-16
HHSCS-E106-R I	106 (0.47)	2 5/8 (66.7)	1 1/2 (38.1)	6 1/2 (165.1)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	3/8"-16
HHSCS-E143-R I	143 (0.63)	2 5/8 (66.7)	1 1/2 (38.1)	6 1/2 (165.1)	3 5/8 (92.1)	2 1/2 (63.5)	2 3/8 (60.3)	1/2"-13
HHSCS-E187-R I	187 (0.83)	2 5/8 (66.7)	1 3/4 (44.4)	7 1/2 (190.5)	3 1/4 (82.5)	2 3/4 (69.8)	2 3/8 (60.3)	1/2"-13
HHSCS-E244-R I	244 (1.08)	2 3/4 (69.8)	1 3/4 (44.4)	7 1/2 (190.5)	3 1/4 (82.5)	2 3/4 (69.8)	2 3/8 (60.3)	1/2"-13
HHSCS-E318-R I	318 (1.41)	3 1/8 (79.4)	1 3/4 (44.4)	7 1/2 (190.5)	3 1/4 (82.5)	2 3/4 (69.8)	2 3/8 (60.3)	5/8"-11
HHSCS-E415-R I	415 (1.84)	3 1/16 (77.8)	1 3/4 (44.4)	7 1/2 (190.5)	3 1/4 (82.5)	2 3/4 (69.8)	2 3/8 (60.3)	5/8"-11
HHSCS-E500-R I	500 (2.22)	3 1/4 (82.5)	2 1/2 (63.5)	9 3/4 (247.6)	3 7/8 (98.4)	3 1/4 (82.5)	2 3/8 (60.3)	3/4"-10
HHSCS-715-R I	715 (3.18)	4 1/4 (107.9)	2 1/2 (63.5)	9 3/4 (247.6)	3 7/8 (98.4)	3 1/4 (82.5)	2 3/8 (60.3)	3/4"-10
HHSCS-1060-R I	1060 (4.71)	4 1/4 (107.9)	2 1/2 (63.5)	9 3/4 (247.6)	3 7/8 (98.4)	3 1/4 (82.5)	2 3/8 (60.3)	3/4"-10
HHSCS-1430-R I *	1430 (6.36)	4 1/4 (107.9)	2 3/4 (69.8)	11 3/8 (289.9)	6 1/2 (165.1)	6 (152.4)	3 (76.2)	7/8"-9
HHSCS-2120-R I *	2120 (9.43)	4 1/4 (107.9)	2 3/4 (69.8)	11 3/8 (289.9)	6 1/2 (165.1)	6 (152.4)	3 (76.2)	7/8"-9
HHSCS-2860-R I *	2860 (12.72)	4 1/4 (107.9)	2 3/4 (69.8)	11 3/8 (289.9)	6 1/2 (165.1)	6 (152.4)	3 (76.2)	7/8"-9

Insert R for Option R (Pre-Compression Hardware) when required and I for Option I (deflection indicator) when required

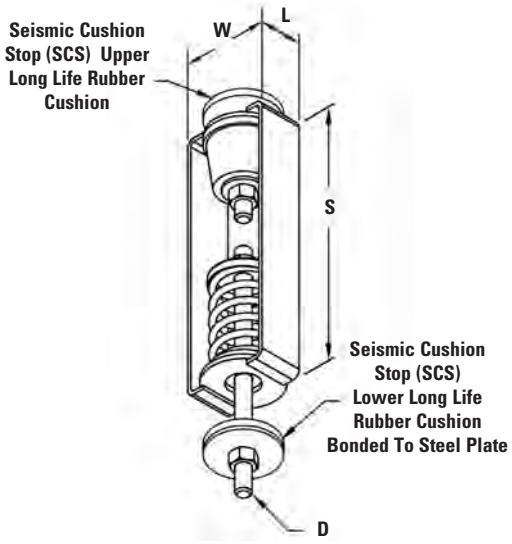
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

HHSCS Type - Combination Hanger Spring & Neoprene with Seismic Cushion Stop - 2 1/2" (63.5mm) Deflection

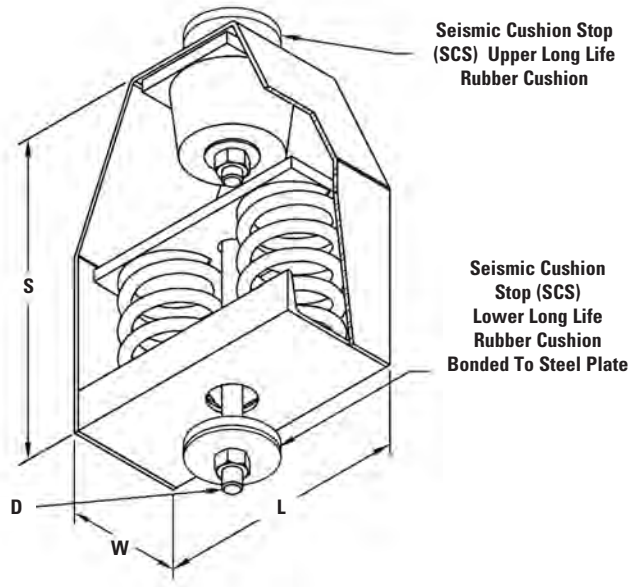
Use: Used to dampen noise and minor vibration from suspended high speed equipment. To be used with all thread rod for single and trapeze type support systems.Used where uncertain alignment is anticipated during installation. At rated load the hanger rod will operate to a full 15° tilt in any direction from vertical centerline.

- All housing sizes have been tested to carry five times the maximum load without failure
- Spring rated deflection is 2" (50.8mm) + neoprene rated deflection is 1/2" (12.7mm) = 2 1/2" (63.5mm)
- SFH = Free Height NFH = Neoprene Free Height
- Threaded rod, nuts, and washers supplied separately
- * Housings are specially reinforced for extra strength
- Minimum additional travel is 50% of rated deflection at rated load

Basic Hanger
HHSCS-F59 thru HHSCS-F918



***Extra Strength Hanger**
HHSCS-F1159 thru HHSCS-F3420



Typical Part Numbering

HHSCS - F120
Type
Load

Dimensions

Part Number	Maximum Load lbs.	(kN)	SFH in.	(mm)	NFH in.	(mm)	S in.	(mm)	W in.	(mm)	L in.	(mm)	SCS Diameter in.	(mm)	D Diameter
HHSCS-F59	59	(0.26)	4 1/4	(107.9)	1 1/2	(38.1)	9	(228.6)	3	(76.2)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
HHSCS-F83	83	(0.37)	4 1/4	(107.9)	1 1/2	(38.1)	9	(228.6)	3	(76.2)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
HHSCS-F120	120	(0.53)	4 1/4	(107.9)	1 1/2	(38.1)	9	(228.6)	3	(76.2)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
HHSCS-F155	155	(0.69)	4 1/4	(107.9)	1 3/4	(44.4)	9	(228.6)	3	(76.2)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
HHSCS-F195	195	(0.87)	4 1/2	(114.3)	1 3/4	(44.4)	9	(228.6)	3	(76.2)	2 1/2	(63.5)	2 3/8	(60.3)	1/2"-13
HHSCS-F241	241	(1.07)	4 1/2	(114.3)	1 3/4	(44.4)	10	(254.0)	5 1/2	(139.7)	4 1/2	(114.3)	2 3/8	(60.3)	1/2"-13
HHSCS-F348	348	(1.55)	5	(127.0)	1 3/4	(44.4)	10	(254.0)	5 1/2	(139.7)	4 1/2	(114.3)	2 3/8	(60.3)	5/8"-11
HHSCS-F453	453	(2.01)	5	(127.0)	1 3/4	(44.4)	10	(254.0)	5 1/2	(139.7)	4 1/2	(114.3)	2 3/8	(60.3)	5/8"-11
HHSCS-F590	590	(2.62)	5	(127.0)	2 1/2	(63.5)	11	(279.4)	5 1/4	(133.3)	4 1/2	(114.3)	3	(76.2)	3/4"-10
HHSCS-F676	676	(3.00)	5	(127.0)	2 1/2	(63.5)	11	(279.4)	5 1/4	(133.3)	4 1/2	(114.3)	3	(76.2)	3/4"-10
HHSCS-F787	787	(3.50)	5	(127.0)	2 1/2	(63.5)	11	(279.4)	5 1/4	(133.3)	4 1/2	(114.3)	3	(76.2)	3/4"-10
HHSCS-F918	918	(4.08)	5	(127.0)	2 1/2	(63.5)	11	(279.4)	5 1/4	(133.3)	4 1/2	(114.3)	3	(76.2)	3/4"-10
HHSCS-F1159 *	1159	(5.15)	6 3/8	(161.9)	2 3/4	(69.8)	11	(279.4)	6	(152.9)	5	(127.0)	3	(76.2)	3/4"-10
HHSCS-F1408 *	1408	(6.26)	6 3/8	(161.9)	2 3/4	(69.8)	11	(279.4)	6	(152.9)	5	(127.0)	3	(76.2)	7/8"-9
HHSCS-F1710 *	1710	(7.60)	6 3/8	(161.9)	2 3/4	(69.8)	11	(279.4)	6	(152.9)	5	(127.0)	3	(76.2)	7/8"-9
HHSCS-F2318 *	2318	(10.31)	6 3/8	(161.9)	2 3/4	(69.8)	11 1/4	(285.7)	11	(279.4)	5	(127.0)	3	(76.2)	7/8"-9
HHSCS-F2816 *	2816	(12.52)	6 3/8	(161.9)	2 3/4	(69.8)	11 1/4	(285.7)	11	(279.4)	5	(127.0)	3	(76.2)	7/8"-9
HHSCS-F3420 *	3420	(15.21)	6 3/8	(161.9)	2 3/4	(69.8)	11 1/4	(285.7)	11	(279.4)	5	(127.0)	3	(76.2)	7/8"-9

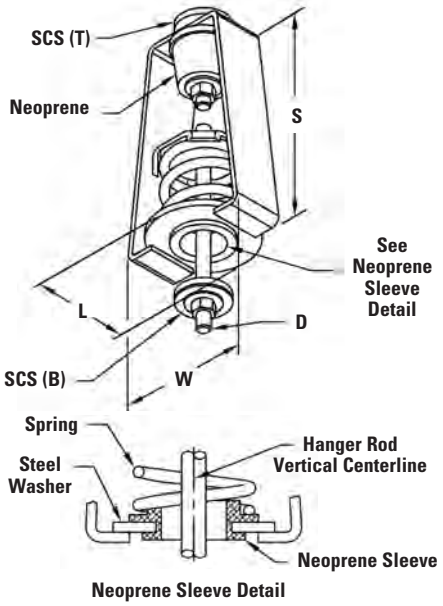
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

HH30SCS Type - 15° Tilt, 1 1/2" (38.1mm) Deflection Combination Hanger - Spring & Neoprene with Seismic Cushion Stop

Use: Used to dampen noise and minor vibration from suspended high speed equipment. To be used with all thread rod for single and trapeze type support systems.Used where uncertain alignment is anticipated during installation. At rated load the hanger rod will operate to a full 15° tilt in any direction from vertical centerline.

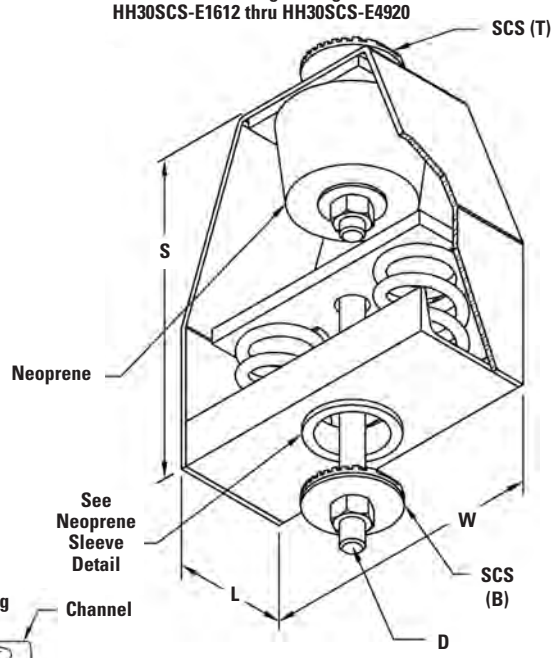
- All housing sizes have been tested to carry five times the maximum load without failure
- Spring rated deflection is 1" (25.4mm) + neoprene rated deflection is 1/2" (12.7mm) = 1 1/2" (38.1mm)
- SFH = Free Height NFH = Neoprene Free Height
- Threaded rod, nuts, and washers supplied separately
- * Housings are specially reinforced for extra strength
- Minimum additional travel is 50% of rated deflection at rated load

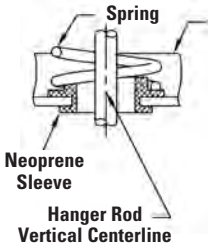
Basic Hanger
HH30SCS-ET20 thru HH30SCS-ET1326



Neoprene Sleeve Detail

*** Extra Strength Hanger**
HH30SCS-E1612 thru HH30SCS-E4920





Neoprene Sleeve Detail

Typical Part Numbering

HH30SCS - ET129
Type
Load

SCS (T) = Seismic Cushion Stop (SCS) Upper Long Life Rubber Cushion

SCS (B) = Seismic Cushion Stop (SCS) Lower Long Life Rubber Cushion Bonded To Steel Plate

Dimensions

Part Number	Maximum Load lbs.	(kN)	SFH in.	(mm)	NFH in.	(mm)	S in.	(mm)	W in.	(mm)	L in.	(mm)	SCS Diameter in.	(mm)	D Diameter
HH30SCS-ET20	20	(0.09)	1 7/8	(47.6)	1 1/2	(38.1)	6 1/2	(165.1)	3 5/8	(92.1)	2 1/2	(63.5)	2 3/8	(60.3)	3/8"-16
HH30SCS-ET42	42	(0.18)	2	(50.8)	1 1/2	(38.1)	6 1/2	(165.1)	3 5/8	(92.1)	2 1/2	(63.5)	2 3/8	(60.3)	3/8"-16
HH30SCS-ET80	80	(0.35)	2 1/8	(54.0)	1 1/2	(38.1)	6 1/2	(165.1)	3 5/8	(92.1)	2 1/2	(63.5)	2 3/8	(60.3)	3/8"-16
HH30SCS-ET129	129	(0.57)	2 3/8	(60.3)	1 1/2	(38.1)	6 1/2	(165.1)	3 5/8	(92.1)	2 1/2	(63.5)	2 3/8	(60.3)	3/8"-16
HH30SCS-ET194	194	(0.86)	2 3/8	(60.3)	1 3/4	(44.4)	7 1/2	(190.5)	4	(101.6)	3	(76.2)	2 3/8	(60.3)	1/2"-13
HH30SCS-ET255	255	(1.13)	2 1/2	(63.5)	1 3/4	(44.4)	7 1/2	(190.5)	4	(101.6)	3	(76.2)	2 3/8	(60.3)	1/2"-13
HH30SCS-ET347	347	(1.54)	2 3/4	(69.8)	1 3/4	(44.4)	8 1/2	(215.9)	5 5/16	(134.9)	4 1/4	(107.9)	2 3/8	(60.3)	5/8"-11
HH30SCS-ET473	473	(2.10)	2 7/8	(73.0)	2 1/2	(63.5)	8 1/2	(215.9)	5 5/16	(134.9)	4 1/4	(107.9)	2 3/8	(60.3)	5/8"-11
HH30SCS-ET667	667	(2.96)	3 1/8	(79.4)	2 1/2	(63.5)	10	(254.0)	5 7/8	(149.2)	4 3/4	(120.6)	3	(76.2)	3/4"-10
HH30SCS-ET940	940	(4.18)	3 3/8	(85.7)	2 1/2	(63.5)	10	(254.0)	5 7/8	(149.2)	4 3/4	(120.6)	3	(76.2)	3/4"-10
HH30SCS-ET1326	1326	(5.90)	3 5/8	(92.1)	2 3/4	(69.8)	10	(254.0)	5 7/8	(149.2)	4 3/4	(120.6)	3	(76.2)	7/8"-9
HH30SCS-E1612 *	1612	(7.17)	3 5/8	(92.1)	2 3/4	(69.8)	11 1/4	(285.7)	10	(254.0)	4	(101.6)	3	(76.2)	7/8"-9
HH30SCS-E2060 *	2060	(9.16)	3 7/8	(98.4)	2 3/4	(69.8)	11 1/4	(285.7)	10	(254.0)	4	(101.6)	3	(76.2)	1"-8
HH30SCS-E2460 *	2460	(10.94)	4 1/8	(104.8)	2 3/4	(69.8)	11 1/4	(285.7)	10	(254.0)	4	(101.6)	3	(76.2)	1"-8
HH30SCS-E2980 *	2980	(13.25)	4 1/8	(104.8)	2 3/4	(69.8)	11 1/4	(285.7)	10	(254.0)	4	(101.6)	3	(76.2)	1"-8
HH30SCS-E4120 *	4120	(18.32)	3 7/8	(98.4)	2 3/4	(69.8)	12	(304.8)	9 1/2	(241.3)	7	(177.8)	4	(101.6)	1"-8
HH30SCS-E4920 *	4920	(21.88)	4 1/8	(104.8)	2 3/4	(69.8)	12	(304.8)	9 1/2	(241.3)	7	(177.8)	4	(101.6)	1"-8

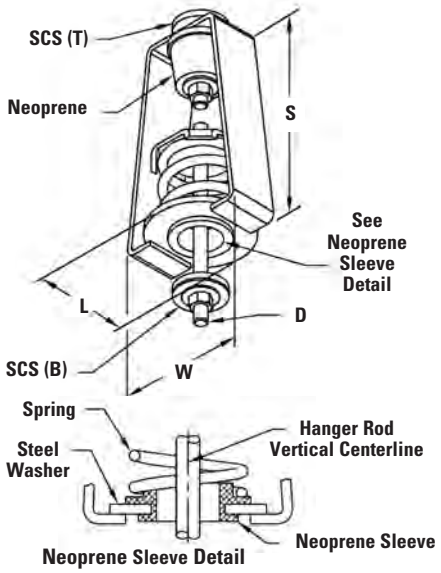
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

HH30SCS Type - 15° Tilt, 2 1/2" (63.5mm) Deflection Combination Hanger - Spring & Neoprene with Seismic Cushion Stop

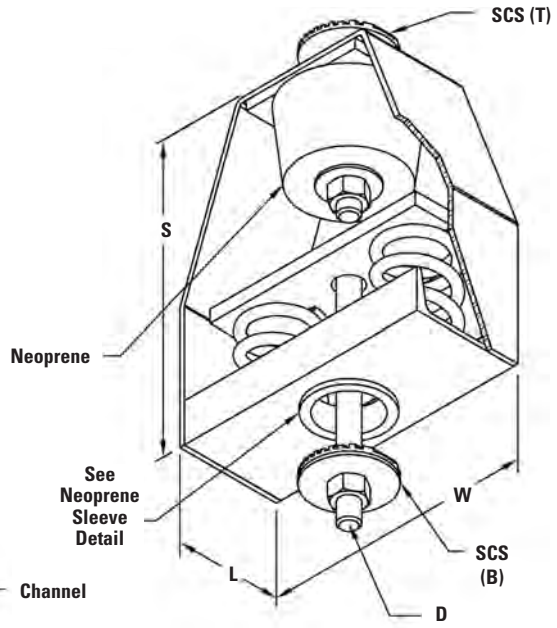
Use: Used to dampen noise and minor vibration from suspended high speed equipment. To be used with all thread rod for single and trapeze type support systems.Used where uncertain alignment is anticipated during installation. At rated load the hanger rod will operate to a full 15° tilt in any direction from vertical centerline.

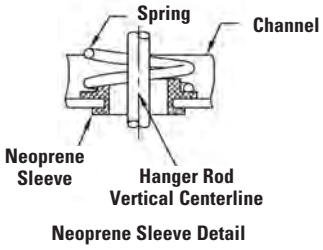
- All housing sizes have been tested to carry five times the maximum load without failure
- Spring rated deflection is 2" (50.8mm) + neoprene rated deflection is 1/2" (12.7mm) = 2 1/2" (63.5mm)
- SFH = Free Height NFH = Neoprene Free Height
- Threaded rod, nuts, and washers supplied separately
- * Housings are specially reinforced for extra strength
- Minimum additional travel is 50% of rated deflection at rated load

Basic Hanger
HH30SCS-FT30 thru HH30SCS-F590



*** Extra Strength Hanger**
HH30SCS-F696 thru HH30SCS-F3420





Neoprene Sleeve Detail

Typical Part Numbering

HH30SCS - FT121
Type
Load

Dimensions

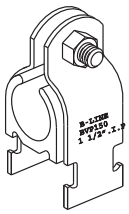
Part Number	Maximum Load lbs. (kN)	SFH in. (mm)	NFH in. (mm)	S in. (mm)	W in. (mm)	L in. (mm)	SCS Diameter in. (mm)	D Diameter
HH30SCS-FT30	30 (0.13)	3 1/2 (88.9)	1 1/2 (38.1)	8 (203.2)	5 (127.0)	4 (101.6)	2 3/8 (63.5)	1/2"-13
HH30SCS-FT41	41 (0.18)	3 1/2 (88.9)	1 1/2 (38.1)	8 (203.2)	5 (127.0)	4 (101.6)	2 3/8 (63.5)	1/2"-13
HH30SCS-FT60	60 (0.26)	3 3/4 (95.2)	1 1/2 (38.1)	8 (203.2)	5 (127.0)	4 (101.6)	2 3/8 (63.5)	1/2"-13
HH30SCS-FT85	85 (0.38)	3 3/4 (95.2)	1 1/2 (38.1)	8 (203.2)	5 (127.0)	4 (101.6)	2 3/8 (63.5)	1/2"-13
HH30SCS-FT121	121 (0.54)	4 (101.6)	1 1/2 (38.1)	8 (203.2)	5 (127.0)	4 (101.6)	2 3/8 (63.5)	1/2"-13
HH30SCS-FT171	171 (0.76)	4 1/4 (107.9)	1 3/4 (44.4)	10 (254.0)	5 1/4 (133.3)	4 1/2 (114.3)	3 (76.2)	1/2"-13
HH30SCS-FT241	241 (1.07)	4 1/2 (114.3)	1 3/4 (44.4)	10 (254.0)	5 1/4 (133.3)	4 1/2 (114.3)	3 (76.2)	1/2"-13
HH30SCS-F348	348 (1.55)	5 (127.0)	1 3/4 (44.4)	10 (254.0)	5 1/4 (133.3)	4 1/2 (114.3)	3 (76.2)	5/8"-11
HH30SCS-F453	453 (2.01)	5 (127.0)	1 3/4 (44.4)	11 (279.4)	5 1/4 (133.3)	4 1/2 (114.3)	3 (76.2)	5/8"-11
HH30SCS-F590	590 (2.62)	5 (127.0)	2 1/2 (63.5)	11 (279.4)	5 1/4 (133.3)	4 1/2 (114.3)	3 (76.2)	3/4"-10
HH30SCS-F696 *	696 (3.09)	5 (127.0)	2 1/2 (63.5)	11 (279.4)	10 3/8 (263.5)	4 (101.6)	3 (76.2)	3/4"-10
HH30SCS-F906 *	906 (4.03)	5 (127.0)	2 1/2 (63.5)	12 (304.8)	10 3/8 (263.5)	4 (101.6)	3 (76.2)	3/4"-10
HH30SCS-F1180 *	1180 (5.25)	5 (127.0)	2 1/2 (63.5)	12 (304.8)	10 3/8 (263.5)	4 (101.6)	3 (76.2)	3/4"-10
HH30SCS-F1352 *	1352 (6.01)	5 (127.0)	2 3/4 (69.8)	12 (304.8)	10 3/8 (263.5)	4 (101.6)	3 (76.2)	7/8"-9
HH30SCS-F1574 *	1574 (7.00)	5 (127.0)	2 3/4 (69.8)	12 (304.8)	10 3/8 (263.5)	4 (101.6)	3 (76.2)	7/8"-9
HH30SCS-F1836 *	1836 (8.16)	5 (127.0)	2 3/4 (69.8)	12 (304.8)	10 3/8 (263.5)	4 (101.6)	3 (76.2)	7/8"-9
HH30SCS-F2318 *	2318 (10.31)	6 1/2 (165.1)	2 3/4 (69.8)	14 1/4 (361.9)	12 3/8 (314.3)	5 (127.0)	4 (101.6)	7/8"-9
HH30SCS-F2816 *	2816 (12.52)	6 1/2 (165.1)	2 3/4 (69.8)	14 1/4 (361.9)	12 3/8 (314.3)	5 (127.0)	4 (101.6)	7/8"-9
HH30SCS-F3420 *	3420 (15.21)	6 1/2 (165.1)	2 3/4 (69.8)	14 1/4 (361.9)	12 3/8 (314.3)	5 (127.0)	4 (101.6)	7/8"-9

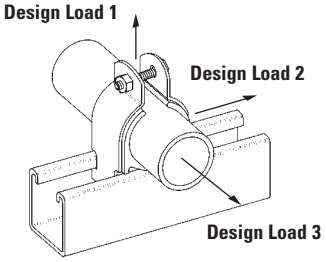
SCS (T) = Seismic Cushion Stop (SCS) Upper Long Life Rubber Cushion

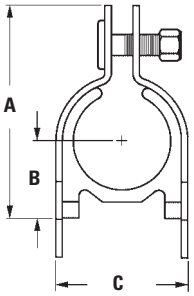
SCS (B) = Seismic Cushion Stop (SCS) Lower Long Life Rubber Cushion Bonded To Steel Plate

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

BVT Series - Vibra-Clamp™







- Easy one tool installation.
- Temperature Range: -40°F (-40°C) to +300°F (148.9°C)
- Dampens vibration and noise.
- Eliminates galvanic corrosion due to metal to metal contact.
- Resists most industrial oils and solvents.
- Secures tubing firmly to strut channel.

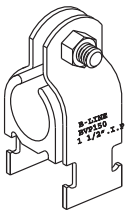
Part No.	O.D. Size in.	(mm)	Pipe Size in.	(mm)	Dimensions A in.	(mm)	B in.	(mm)	C in.	(mm)	Wt. Each Lbs.	(kg)
BVT025	1/4"	(6.3)	1/8"	(3)	1.22"	(30.9)	0.19"	(4.8)	0.49"	(12.4)	.11	(.05)
BVT037	3/8"	(9.5)	1/4"	(6)	1.36"	(34.5)	0.25"	(6.3)	0.61"	(15.5)	.12	(.05)
BVT050	1/2"	(12.7)	3/8"	(10)	1.49"	(37.8)	0.31"	(7.8)	0.74"	(18.8)	.14	(.06)
BVT062	5/8"	(15.9)	1/2"	(15)	1.62"	(41.1)	0.38"	(9.6)	0.86"	(21.8)	.15	(.07)
BVT075	3/4"	(19.0)	5/8"	(17)	1.87"	(47.4)	0.50"	(12.7)	1.15"	(29.2)	.19	(.08)
BVT087	7/8"	(22.2)	3/4"	(20)	2.00"	(50.8)	0.56"	(14.2)	1.27"	(32.2)	.21	(.09)
BVT112	1 1/8"	(28.6)	1"	(25)	2.25"	(57.1)	0.69"	(17.5)	1.52"	(38.6)	.26	(.12)
BVT137	1 3/8"	(34.9)	1 1/4"	(32)	2.51"	(63.7)	0.81"	(20.6)	1.78"	(45.2)	.38	(.17)
BVT162	1 5/8"	(41.3)	1 1/2"	(40)	3.00"	(76.2)	1.00"	(25.4)	2.20"	(55.9)	.40	(.18)
BVT212	2 1/8"	(54.0)	2"	(50)	3.52"	(89.4)	1.25"	(31.7)	2.70"	(68.6)	.55	(.25)
BVT262	2 5/8"	(66.6)	2 1/2"	(65)	4.02"	(102.1)	1.50"	(38.1)	3.20"	(81.3)	.55	(.25)
BVT312	3 1/8"	(79.4)	3"	(80)	4.53"	(115.0)	1.75"	(44.4)	3.70"	(93.9)	.64	(.29)
BVT362	3 5/8"	(92.1)	3 1/2"	(90)	5.05"	(128.2)	2.00"	(50.8)	4.23"	(107.4)	.76	(.34)
BVT412	4 1/8"	(104.8)	4"	(100)	5.55"	(140.9)	2.25"	(57.1)	4.73"	(120.1)	.93	(.42)
BVT612	6 1/8"	(155.5)	6"	(150)	7.62"	(193.5)	3.25"	(82.5)	6.74"	(171.1)	1.36	(.61)

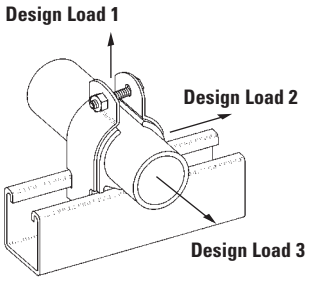
Part No.	Design Load 1 Lbs.	(kN)	Design Load 2 Lbs.	(kN)	Design Load 3 Lbs.	(kN)
BVT025	400	(1.78)	50	(0.22)	50	(0.22)
BVT037	400	(1.78)	50	(0.22)	50	(0.22)
BVT050	400	(1.78)	50	(0.22)	50	(0.22)
BVT062	400	(1.78)	50	(0.22)	50	(0.22)
BVT075	600	(2.67)	75	(0.33)	75	(0.33)
BVT087	600	(2.67)	75	(0.33)	75	(0.33)
BVT112	600	(2.67)	75	(0.33)	75	(0.33)
BVT137	600	(2.67)	75	(0.33)	75	(0.33)
BVT162	800	(3.56)	125	(0.55)	125	(0.55)
BVT212	800	(3.56)	125	(0.55)	125	(0.55)
BVT262	800	(3.56)	125	(0.55)	125	(0.55)
BVT312	800	(3.56)	125	(0.55)	125	(0.55)
BVT362	1000	(4.45)	200	(0.67)	150	(0.67)
BVT412	1000	(4.45)	200	(0.67)	150	(0.67)
BVT612	1000	(4.45)	200	(0.67)	150	(0.67)

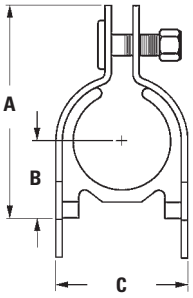
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

BVP Series - Vibra-Clamp™

- Easy one tool installation.
- Temperature Range: -40°F (-40°C) to +300°F (148.9°C)
- Dampens vibration and noise.
- Eliminates galvanic corrosion due to metal to metal contact.
- Resists most industrial oils and solvents.
- Secures pipe firmly to strut channel.

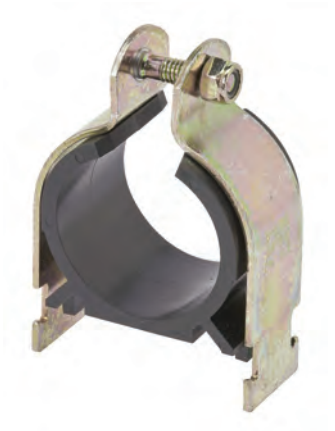






Part No.	O.D. Size in.	(mm)	Pipe Size in.	(mm)	Dimensions A in.	(mm)	B in.	(mm)	C in.	(mm)	Wt. Each Lbs.	(kg)
BVP025	0.540"	(13.7)	1/4"	(6)	1.61"	(39.9)	0.37"	(9.4)	0.87"	(22.1)	.15	(.07)
BVP037	0.675"	(17.1)	3/8"	(10)	1.86"	(47.2)	0.50"	(12.7)	1.15"	(29.2)	.18	(.08)
BVP050	0.875"	(22.2)	1/2"	(15)	1.99"	(50.5)	0.56"	(14.2)	1.27"	(32.3)	.20	(.09)
BVP075	1.050"	(26.7)	3/4"	(20)	2.25"	(57.1)	0.69"	(17.5)	1.52"	(38.6)	.21	(.09)
BVP100	1.312"	(33.3)	1"	(25)	2.51"	(63.8)	0.81"	(20.6)	1.77"	(45.0)	.20	(.09)
BVP125	1.660"	(42.2)	1 1/4"	(32)	3.00"	(76.2)	1.00"	(25.4)	2.21"	(56.1)	.36	(.16)
BVP150	1.900"	(48.3)	1 1/2"	(40)	3.21"	(81.5)	1.12"	(28.4)	2.41"	(61.2)	.40	(.18)
BVP200	2.375"	(60.3)	2"	(50)	3.77"	(95.8)	1.37"	(34.8)	2.96"	(75.2)	.45	(.20)
BVP250	2.875"	(73.0)	2 1/2"	(65)	4.28"	(108.7)	1.62"	(41.1)	3.46"	(87.9)	.54	(.24)
BVP300	3.500"	(88.9)	3"	(80)	5.05"	(128.3)	2.00"	(50.8)	4.24"	(107.7)	.81	(.37)
BVP350	4.000"	(101.6)	3 1/2"	(90)	5.55"	(140.9)	2.25"	(57.1)	4.74"	(120.3)	.87	(.39)
BVP400	4.500"	(114.3)	4"	(100)	6.05"	(153.7)	2.50"	(63.5)	5.24"	(133.1)	1.09	(.49)
BVP500	5.563"	(141.3)	5"	(125)	6.84"	(173.7)	3.00"	(76.2)	6.24"	(158.4)	1.36	(.61)
BVP600	6.625"	(168.3)	6"	(150)	8.24"	(209.3)	3.56"	(90.4)	7.36"	(186.9)	1.63	(.74)

Part No.	Design Load 1 Lbs.	(kN)	Design Load 2 Lbs.	(kN)	Design Load 3 Lbs.	(kN)
BVP025	400	(1.78)	50	(0.22)	50	(0.22)
BVP037	600	(2.67)	75	(0.33)	75	(0.33)
BVP050	600	(2.67)	75	(0.33)	75	(0.33)
BVP075	600	(2.67)	75	(0.33)	75	(0.33)
BVP100	600	(2.67)	75	(0.33)	75	(0.33)
BVP125	800	(3.56)	125	(0.55)	125	(0.55)
BVP150	800	(3.56)	125	(0.55)	125	(0.55)
BVP200	800	(3.56)	125	(0.55)	125	(0.55)
BVP250	800	(3.56)	125	(0.55)	125	(0.55)
BVP300	1000	(4.45)	200	(0.89)	150	(0.67)
BVP350	1000	(4.45)	200	(0.89)	150	(0.67)
BVP400	1000	(4.45)	200	(0.89)	150	(0.67)
BVP500	1000	(4.45)	200	(0.89)	150	(0.67)
BVP600	1000	(4.45)	200	(0.89)	150	(0.67)



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

B1999 - Vibra-Cushion™

OPM

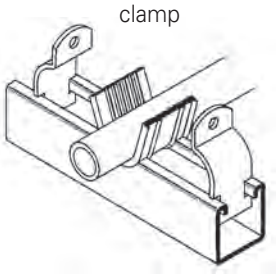
- Ideal Isolation Material
- Inhibits Galvanic Corrosion
- Dampens Sound and Vibration
- Service Temperature Range
  -75° F (-60°C) to +375°F (+190°C)
- Packaged - 20 Ft. (6.09m) per carton

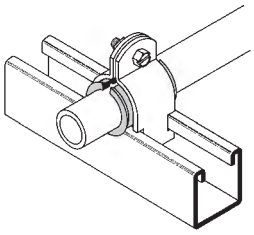
Vibra-Cushion is designed for use with refrigeration lines, HVAC, copper tubing, glass pipe and hydraulic lines. It provides an energy-absorption barrier between the lines and the mounting material and remains flexible thru its entire service range of -75°F (-60°C) to +375°F (+190°C).

This elastomer allows for expansion and contraction within the mounting system and prevents galvanic reaction between dissimilar metals.

Approvals: Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
Use with B2000 series clamps as shown

B2000 series clamp





Note: See Strut Catalog for sizing information.

ISO - ISO-PIPE™

- Non-adhesive rubber tape
- Fuses to itself
- Water resistant
- Prevents galvanic reaction caused by dissimilar metal contact
- Service Temperature Range
  -140° F (-95°C) to +395°F (+200°C)
- 1" (25.4mm) wide x 0.02" (0.5mm) thick
- Packaged - 36 Ft. (10.97m) per carton

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.