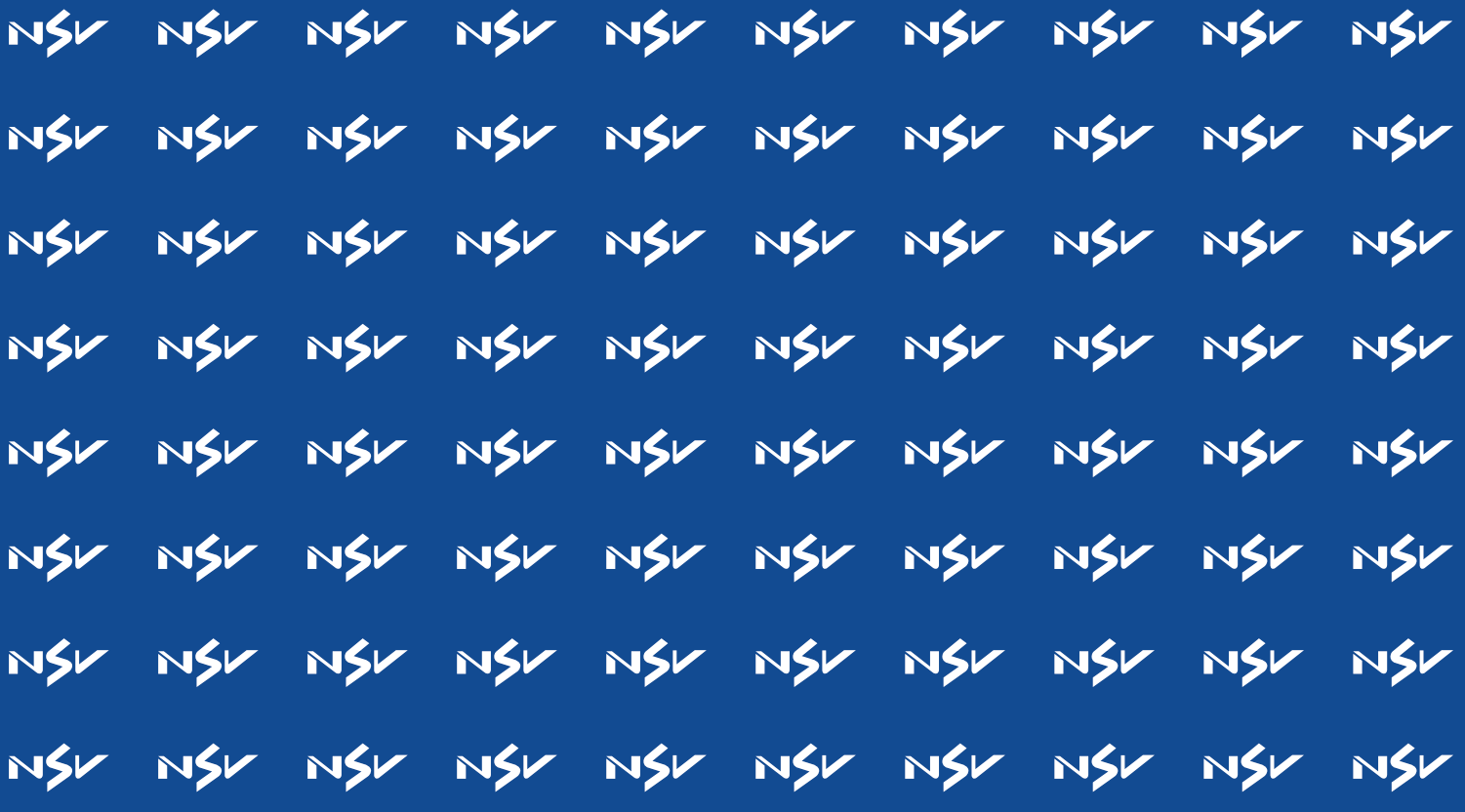


Noise Control

Shock Control

Vibration Control

Seismic Control





INTRODUCTION

Since its foundation on March 1, 1986, NSV has been manufacturing noise-control, vibration-control, and shock-control products for more than 30 years, contributing greatly to developments in construction.

Recently, we have been making extreme efforts in technical research and development for seismic control, which has recently been drawing lots of attention.

As an industry leader in Korea, we provide the top services through our company philosophy of "Creating a Pleasant Environment" and the best technology.

Company Overview

| Company Name
NSV Co., Ltd.

| Seoul Office
28 Hyoryeong-ro, 55-gil, Seocho-gu, Seoul (Seocho-dong)
Tel. +82-2-598-1988 Fax. +82-2-598-1989

| Headquarters and Factory
547 Aenggogae-ro, Namdong-gu, Incheon (Gojan-dong)
Tel. +82-32-812-2015 Fax. +82-32-812-2014

| R&D Center
547 Aenggogae-ro, Namdong-gu, Incheon (Gojan-dong)
Tel. +82-32-816-7992 Fax. +82-32-816-7993

Business Domains

Anti-noise and vibration equipment (noise/vibration fields), Seismic/vibration control research and design (structure/construction), Engineering (noise/vibration fields) Measurement agency business (noise/vibration fields), Construction (machine and equipment installation/metal structure and joiner's work)

Certifications

ISO 9001, ISO 14001, KS certification, KC certification, OHSMS/OHSAS 18001, KFI certification, UL certification



Business Fields and Products

| Manufacturing

Anti-Noise/Vibration/Shock Products

- Silencer for Air Handling Unit (Rectangular, Circular)
- Sound Chamber, Sound Elbow
- Enclosure
- Reverberation Chamber, Anechoic Chamber, Echo Chamber
- Anti-Vibration Spring Mount, Anti-Vibration Neoprene Mount
- Anti-Vibration Pad, Neoprene Hanger
- Spring Hanger, Inertia Base
- Fixed Spring Hanger for Piping, Variable Spring Hanger for Piping
- Pipe Support
- Jack-up Mount, PO-MAT
- Flexible Connector
- Plywood Panel
- Multi-Purpose Valve
- Water Hammer Arrester
(for sanitary, air-conditioning, and fire-extinguishing purposes)
- Air Spring, Vibration Isolation System

- Elastomeric Bearings
- Earthquake Shock Absorber, Seismic Stopper
- Sound Barrier

Firefighting Seismic Products

- Subway Structure Vibration Control Measures
- Anti-Noise/Vibration Measures in Plants
- Other Anti-Noise/Vibration/Shock Products

| Engineering Service

- Measurement and analysis of noise/vibration/shock
- Test and control measures for noise/vibration/shock
- Sound/vibration analysis
- Other engineering services for special noise/vibration/shock
- Engineering services for ship noise/vibration

VIBRATION CONTROL

SMA Spring Mount (Deflection : 25mm)



68

2SMA Spring Mount (Deflection : 25mm)



70

SMA2 Spring Mount (Deflection : 50mm)



72

SMA3 Spring Mount (Deflection : 75mm)



74

SMB Spring Mount (Deflection : 25mm)



75

SMB2 Spring Mount (Deflection : 50mm)



77

NSM/NSM2 Spring Mount (Deflection : 25mm, 50mm)



79

FSL Spring Mount (Deflection : 25mm)



81

FSL2 Spring Mount (Deflection : 50mm)



83

FSL3 Spring Mount (Deflection : 75mm)



85

SH Spring Hanger (Deflection : 25mm)



86

VH20 Spring Hanger (Deflection : 25mm) / (Previously named VH)



88

VH61 Spring Hanger (Deflection : 25mm) / (Previously named VSH)



89

VH62 Spring Hanger (Deflection : 50mm) / (Previously named VSH2)



90

RH10 Rubber Hanger (Deflection : 3.5~13mm) / (Previously named RH)



92

RH20 Ceiling Rubber Hanger (Deflection : 5mm) / (Previously named CH)



93

RH30 Rubber Hanger (Deflection : 3.5~5mm) / (Previously named VHB)



93

RH40 Type Rubber Hanger (Deflection : 11mm) / (Previously named VHM)



94

NBN Rubber Bushing Nut (Deflection : 3~8mm)



94

NTR Thrust Restraint (Deflection : 25mm)



95

NTR2 Thrust Restraint (Deflection : 50mm)



96

RPA Pipe Anchor & Guide (Deflection : 3~9mm)



98

CLAMP Riser Pipe Clamp



100

VB-1000 Rubber Mount (Deflection : 5.0~9.0mm) / (Previously named VB)



102

VB-1030H Rubber Oval Mount (Deflection : 5.0~9.0mm) / (Previously named VB0-30)



102

VB-2000 Rubber Mount (Deflection : 11~20mm) / (Previously named V0)



104

VM-1000 Rubber Mount (Deflection : 6~8mm)



104

VM-2000 Rubber Mount (Deflection : 8mm)



105

VM-3000 Rubber Mount (Deflection : 6mm)



105

VM-4000 Rubber Mount (Deflection : 6~16mm)



106

VM-5000 Rubber Mount (Deflection : 15mm)



106

VC Conical Mount (Deflection : 15mm)



109

SRP Spring Rubber Pad (Deflection : 5.5~7mm)



111

SRM Spring Rubber Mount (Deflection : 5.5mm)



113

SRA Spring Rubber Mount (Deflection : 6~12mm)



114

SRH-U Spring Rubber Mount (Deflection : 5.5mm)



115

PRODUCT OVERVIEW

VIBRATION CONTROL

SRH-SH Spring Rubber Mount (Deflection: 5.5mm)



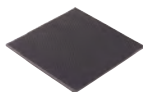
116

VP-1000 Rubber Pad (Deflection: 4~10mm)



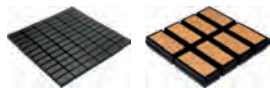
117

VP-2000 Rubber Pad (Deflection: 3~6mm)



118

VP-3000 Rubber Pad (Deflection: 6/12mm)



118

IB Inertia Base Series



120

SB Elasticity Structural Base



121

NFC10S Flexible Connector // (Previously named NFC-S)



122

NFC10 Flexible Connector // (Previously named NFC-1)



122

NFC20 Flexible Connector // (Previously named NFC-2)



122

NV10 Flexible Connector // (Previously named NVC)



124

VD60 Spring Damper Mount // (Previously named VDM)



125

VAM10 Air Mount (Air pressure: 1.5~6Kg/mm) // (Previously named VAM)



126

VAM20 Pneumatic Leveling Isolator // (Previously named VAD)



127

VAM52 Flange Type Air Spring Mount



128

VAM90 Pneumatic Isolation Table // (Previously named VAT)



128

VF Foot Rubber Mount (Deflection: 3.5mm)



129

VWM10 Wire Mount // (Previously named VWM)



130

VWM20 Wire Mount // (Previously named VWR)



131

VWM51 Wire-Spring Mount (Deflection: 25mm) // (Previously named VWA)



132

VWM52 Wire-Spring Mount (Deflection: 50mm) // (Previously named VWA2)



133

VWM62 Wire-Spring Mount (Deflection: 50mm) // (Previously named VWS)

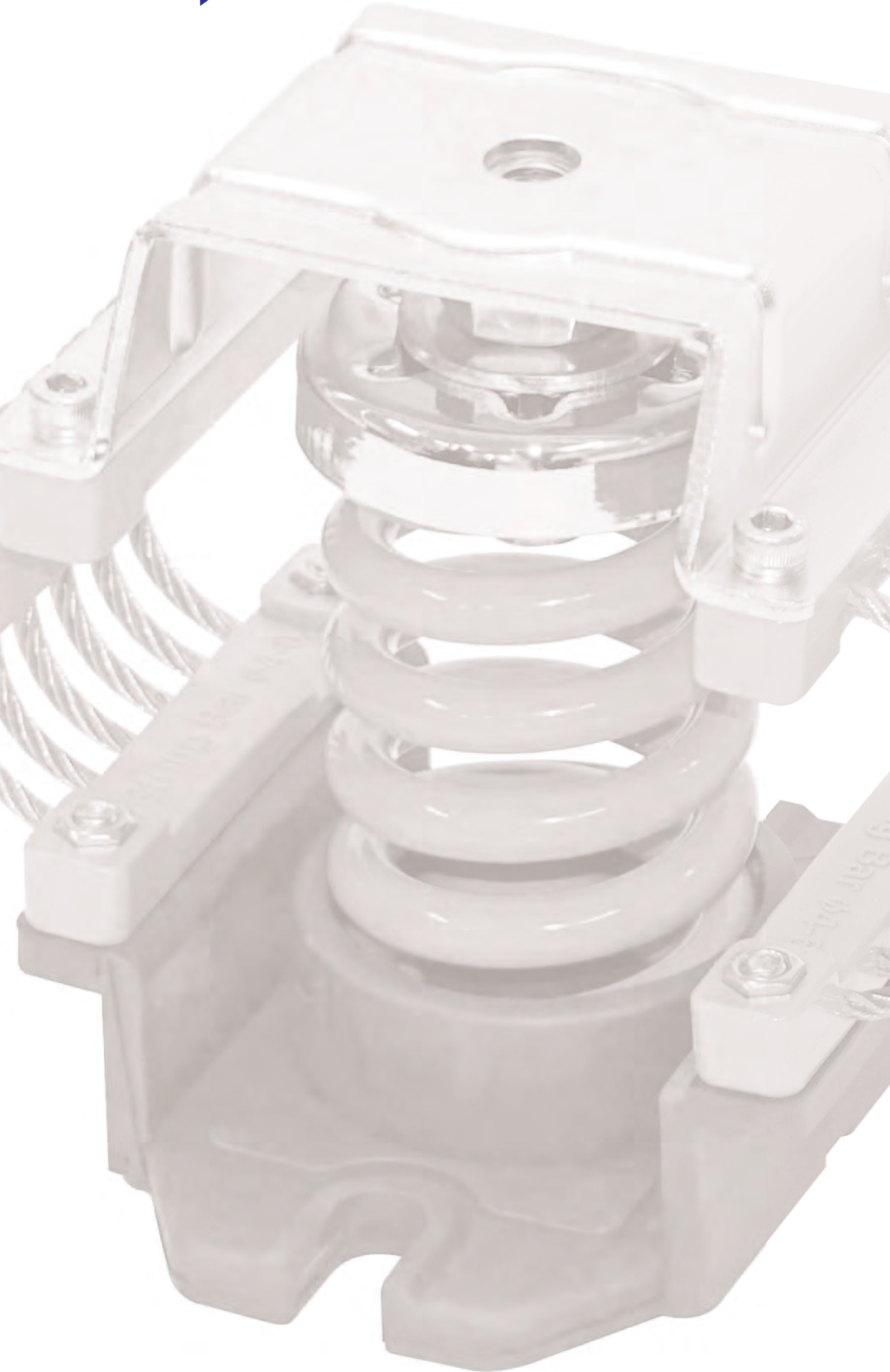


135

Vibration
Control



ISO 9001/ISO 14001
OHSAS 18001
MADE IN KOREA



VIBRATION CONTROL

Information for prevention of vibration

Overview of vibration

1. The definition of vibration

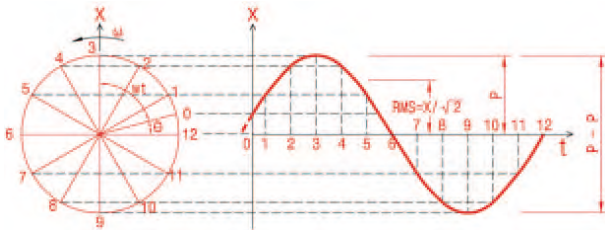
Vibration is the phenomenon that the position of a certain point varies in one direction and then in the opposite direction repeatedly, from the reference position. It is defined in the Noise and Vibration Control Act as "oscillation generated due to the use of machines, devices, systems, or other materials."

2. Effects of vibration

Vibration has effects of decreasing the life span and efficiency of machines, and causes something like psychological unease as well as biological disorder to human beings. It is considered a public nuisance when the frequency of vibration is in the range of 1 ~ 90Hz. In terms of the level of vibration, the range is 60 ~ 90dB.

Basics of vibration

The simplest form of vibration is the simple harmonic motion, and in this case the movement of the point under discussion is analyzed as being of sine function.



The simple harmonic motion is composed of amplitude (Peak, Peak-to-Peak, Root Mean Square, RMS), period (Angular Velocity, Frequency, Period), etc.

- ① Peak (P): The distance between the reference point and the summit.
- ② Peak-to-Peak (P-P): The distance between the minimum point and the maximum point.
- ③ Root Mean Square (RMS): Root of the Mean of the Squares during one cycle.
- ④ Angular Velocity (ω): The angular velocity of a rotating point, given in rad/sec.
- ⑤ Frequency (f): The number of repetitions for a given time period, given in Hz.
- ⑥ Period (T): The time taken for one cycle of the repetitive movement, given in sec.

Terms, units, and expressions of vibration

The simplest form of vibration, simple harmonic motion, can be expressed in terms of displacement, velocity, acceleration, etc.

1. Displacement (x)

Vibration expressed as a function of displacement and time.
where X: radius of rotation
(Units: cm, mm, m)

Overview of vibration

2. Velocity (v)

Variation of the displacement during a given time period.

$$V = \frac{dx}{dt} = \omega \times X \cdot \cos(\omega t + \phi)$$

(Units: m/s, cm/s, kine, mm/s)

3. Acceleration (a)

Variation of the velocity during a given time period.

$$V = \frac{d^2x}{dt^2} = \omega^2 \times X \cdot \sin(\omega t + \phi)$$

(Units: m/s², cm/s², gal)

4. Vibration Acceleration Level (VAL)

The physical quantity of the vibration expressed in terms of the degree of the stimulus humans can feel.

$$VAL = 20 \log \left(\frac{a}{a_r} \right) \text{dB}$$

where

a: Acceleration of the vibration in RMS (m/s²)

a_r: Reference acceleration (10⁻⁵m/s²)

5. Vibration Level

VAL in frequency range of 1 ~ 9Hz, compensated for the human sensitivity characteristics regarding vibration, given in dB.

$$VL = VAL + W_n \text{dB}(V), \text{dB}(H)$$

W_n: Compensation factor for the human sensitivity to frequency.

6. Unit conversion

Items	Results	Units
dB → Acceleration(a)	$a = 10(\text{dB}/20) \times 10^{-5}$	m/s ²
Acceleration(a) → Velocity(v)	$a/2\pi f$	m/s
Acceleration(a) → Displacement(μ)	$a/(2\pi f)^2$	m

Effects of vibration

1. Effects on human senses

Humans feel pain most on the waist, chest, back at 6Hz. And at 13Hz, sense the vibration most on the head, and on the cheeks and eyelids, to the degree it is felt.

2. Biological effects

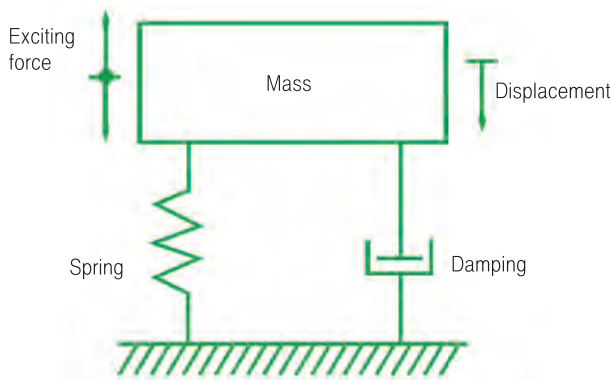
In case of vibration, the number of heart beats increases. The Oxygen consumption increases at 1 ~ 3Hz.

3. Effects on human body

- ① Vibration on whole body: Vibration suffered by people who drive cars or work at factories.
- ② Vibration on specific parts of body: Vibration suffered by workers who use rock drills, grinders, etc., extensively. Disorders such as abnormality in peripheral blood vessel functions, etc., might be result from this exposure.

Protection from vibration

Protection from vibration can be accomplished by blocking the exciting force generated when running machines from being transmitted to the floor of the building, through the use of high elasticity materials like rubber pads, springs, etc. for supporting the machines.



1. Exciting force of the device

In case of reciprocating motion and gyration, there vibrations might occur due to an unbalance or swaying of the device, and the force making the vibration is called the exciting force. The exciting force of the rotating machine is expressed as follows:

where

$$F = mr\omega^2$$

F: Exciting force, r: Eccentric distance, m: Eccentric mass ω : Angular velocity

2. Exciting frequency

The exciting frequencies generated by each type of device are as listed below.

Type of device	Exciting frequency
Turbo-refrigerator	Compressor rpm
Reciprocating compressor	Compressor rpm
Pump	Pump rpm
Fan	Fan rpm
Air conditioner	Fan rpm
Cooling tower	Number of impellers x rpm
Packaged air conditioner	Fan rpm

3. Transmission Ratio

The exciting force generated when running the machine is transmitted to the floor of the building through springs and dampers, and the ratio of the exciting force transmitted to the floor to the total exciting force generated by the machine is the Transmission on Ratio.

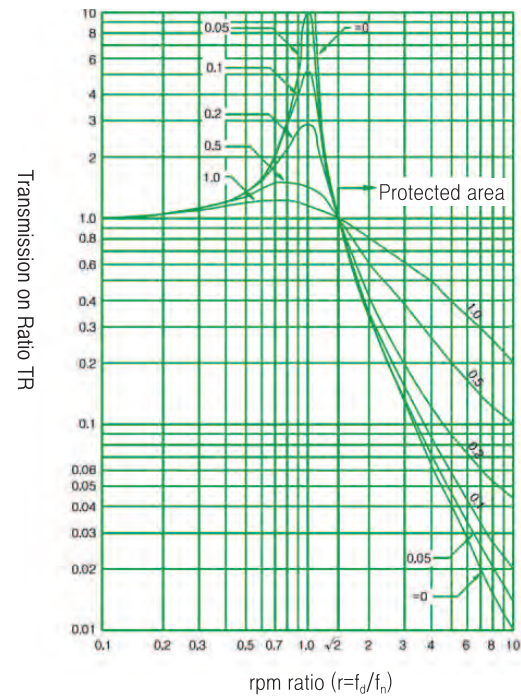
$$TR = \frac{\sqrt{1 + (2\zeta r)^2}}{(1 - r^2)^2 + (2\zeta r)^2} = \frac{1}{|1 - r^2|} (\because \zeta = 0)$$

Where

r : rpm ratio ($=f_d/f_n$) f: rotational acceleration (exciting frequency)

f_n : natural frequency($= \frac{1}{2\pi} \sqrt{\frac{k}{m}}$) k: spring constant

M : mass ζ : damping ratio




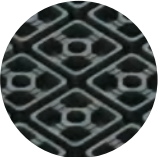

- ① Relationship between rpm ratio and Transmission on Ratio
 If $r = 1$, $TR = \infty$ (Resonance)
 If $r < \sqrt{2}$, $TR > 1$, (Transmitted force) > External force
 If $r = \sqrt{2}$, $TR = 1$, (Transmitted force) = External force
 If $r > \sqrt{2}$, $TR < 1$, (Transmitted force) < External force – Protected area
- ② Change in Transmission on Ratio due to the change in Damping Ratio (ζ)
 As far as $r < \sqrt{2}$, the bigger the Damping Ratio the smaller the Transmission on Ratio, thus a bigger Damping Ratio is desirable.
 As far as $r > \sqrt{2}$, the smaller the Damping Ratio the smaller the Transmission on Ratio, thus a smaller Damping Ratio is desirable.
- ③ Things to be taken care of when designing for protection from vibration.
 – As far as possible, making the rpm ratio (r) greater than or equal to 3 is required.
 – In the case of $r < \sqrt{2}$, making $r < 0.4$ is required.
 – In case the exciting frequency of the device starts from 0, the resonant point is in the way of increasing the frequency, thus adding the damper with $\zeta = 0.2$ is required.

4. Protection effect

- ① Vibration blocking rate (I): The degree the vibration is blocked
 $I = (1 - TR) \times 100$ [%]
- ② ΔV : Expresses the vibration protecting effect in dB.
 $\Delta V = 20 \text{Log}(1/TR)$ dB

Information for prevention of vibration

The types and features of the materials used for preventing vibration

Items	For water supply	Features	Precautions	Usage
Metal Spring	<ul style="list-style-type: none"> ① Blocks vibration using the elasticity of the metal spring ② Various types including coil spring, leaf spring, circular spring are used. For air conditioners, coil springs are used most. 	<p><Advantages></p> <ul style="list-style-type: none"> ① Spring constants are selectable. ② Spring with small constant is available. <p><Disadvantages></p> <ul style="list-style-type: none"> ① It has to pass through the resonance frequency during start/stop (high vibration) ② Surging occurs at high frequency due to natural frequency (structural sound transmission). 	<ul style="list-style-type: none"> ① Not able to block sound. ② Spring constant can be made small, but in turn, vibration is high. Distance should be ensured between devices, pipes, ducts, etc. 	Vibration protection for general rotating machines such as pumps, motors, fans.
	<ul style="list-style-type: none"> ① Plates with special uneven surface for making elasticity. ② In a broad sense it might be considered as a kind of vibration reducing rubber. 	<p><Advantages></p> <p>Cheap and easy to use.</p> <p><Disadvantages></p> <p>Structurally the spring constant can't be made small, thus it is not for low frequency vibration, and the effect is restrictive also.</p>	<ul style="list-style-type: none"> ① In case more than 2 ea. are stacked, steel plates with thickness of 2 ~ 3mm should be inserted in between. ② Chemical characteristics should be taken into account as in the case of vibration reducing rubber. 	It's effective when used for high frequency vibration, and generally used for refrigerators, air conditioners, etc.
Vibration Reducing Rubber	<ul style="list-style-type: none"> ① Made of natural or synthetic rubber having proper hardness. Easy to form. Easy to handle with metal plate. Uses the elasticity of rubber. ② Compressed type, shear type, complex type, twisted type, etc., categorized by elasticity of rubber. Circular type, square type, cylinder type, mountain type, etc., by shape. ③ Compressed type has high weight taking capability and thus is most generally used. Shear type is used for low weight and low rpm because small spring constant is achievable. ④ In the case of the complex type, spring constants for 3 directions can be decided properly, and in the twisted type, twisted vibration can be reduced. 	<p><Advantages></p> <ul style="list-style-type: none"> ① Flexible in forming, thus, spring constants can be properly selected for X, Y, and Z directions, respectively. ② Resonance is reduced due to the high viscosity of rubber. ③ No surging, thus sound blocking capability is excellent. ④ Many kinds of standardized products are available. <p><Disadvantages></p> <ul style="list-style-type: none"> ① The spring constants vary depending on the temperature, thus care should be taken when using outside the temperature range of 10 ~ 70°C. ② Spring constant varies depending on the degree of deformation of rubber. ③ Small spring constants can't be achieved. ④ Oil-proof capability, temperature characteristics, aging characteristics, etc., are dependent on the kinds of rubber. ⑤ Spring constant can't be decided accurately because the static spring and dynamic spring constants are different due to viscoelastic characteristics. 	<ul style="list-style-type: none"> ① Chemical characteristic of vibration reducing rubber should be taken care of. ② When designing vibration reducing rubber, dynamic spring constant should be used. ③ Be sure to use the vibration reducing rubber within the allowed weight range because it has creeping characteristics. ④ Allowable weight is limited by the degree of deformation. To avoid instability due to buckling, it is desirable to limit the allowable compressive strain and shearing strain to under 20% and 25%, respectively for static weight, and under 5%, 10%, respectively for dynamic weight. <p>For other detailed information, refer to the technical data, catalogs, etc., from manufacturers.</p>	Most generally used for air conditioners, and can be used also for vibration reducing of air conditioning devices, pipes, and ducts.

Selection Guide for Vibration Isolation, ASHRAE HANDBOOK 2015

Equipment Type	Shaft Power kW and Other	RPM	Equipment Location (Note 1)										Reference Notes		
			Slab on Grade		Floor Span										
					Up to 6 m		6 to 9 m		9 to 12 m						
			Base Isolator Type	Min. Defl., mm	Base Isolator Type	Min. Defl., mm	Base Isolator Type	Min. Defl., mm	Base Isolator Type	Min. Defl., mm					
Refrigeration Machines and Chillers															
Reciprocating	All	All	A	2	6.4	A	4	19	A	4	38	A	4	64	2,3,12
Centrifugal, scroll	All	All	A	1	6.4	A	4	19	A	4	38	A	4	38	2,3,4,8,12
Screw	All	All	A	1	25	A	4	38	A	4	64	A	4	64	2,3,4,12
Absorption	All	All	A	1	6.4	A	4	19	A	4	38	A	4	38	
Air-cooled recip., scroll	All	All	A	1	6.4	A	4	38	A	4	38	A	4	64	2,4,5,12
Air-cooled screw	All	All	A	4	25	A	4	38	B	4	64	B	4	64	2,4,5,8,12
Air Compressors and Vacuum Pumps															
Tank-mounted horiz.	≤7.5	All	A	3	19	A	3	19	A	3	38	A	3	38	3,15
	≥11	All	C	3	19	C	3	19	C	3	38	C	3	38	3,15
Tank-mounted vert.	All	All	C	3	19	C	3	19	C	3	38	C	3	38	3,15
Base-mounted	All	All	C	3	19	C	3	19	C	3	38	C	3	38	3,14,15
Large reciprocating	All	All	C	3	19	C	3	19	C	3	38	C	3	38	3,14,15
Pumps															
Close-coupled	≤5.6	All	B	2	6.4	C	3	19	C	3	19	C	3	19	16
	≥7.5	All	C	3	19	C	3	19	C	3	38	C	3	38	16
Large inline	3.7 to 19	All	A	3	19	A	3	38	A	3	38	A	3	38	
	≥22	All	A	3	38	A	3	38	A	3	38	A	3	64	
End suction and split case	≤30	All	C	3	19	C	3	19	C	3	38	C	3	38	16
	37 to 93	All	C	3	19	C	3	19	C	3	38	C	3	64	10,16
	≥110	All	C	3	19	C	3	38	C	3	64	C	3	89	10,16
Packaged pump systems	All	All	A	3	19	A	3	19	A	3	38	C	3	64	
Cooling Towers															
	All	Up to 300	A	1	6.4	A	4	89	A	4	89	A	4	89	5,8,18
		301 to 500	A	1	6.4	A	4	64	A	4	64	A	4	64	5,18
		501 and up	A	1	6.4	A	4	19	A	4	19	A	4	38	5,18
Boilers															
Fire-tube	All	All	A	1	6.4	B	4	19	B	4	38	B	4	64	4
Water-tube, copper fin	All	All	A	1	3	A	1	3	A	1	3	B	4	6.4	
Axial Fans, Plenum Fans, Cabinet Fans, Fan Sections, Centrifugal Inline Fans															
Up to 560 mm diameter	All	All	A	2	6.4	A	3	19	A	3	19	C	3	19	4,9
610 mm diameter and up	≤500 Pa SP	Up to 300	B	3	64	C	3	89	C	3	89	C	3	89	9,8
		300 to 500	B	3	19	B	3	38	C	3	64	C	3	64	9,8
		501 and up	B	3	19	B	3	38	B	3	38	B	3	38	9,8
	≥501 Pa SP	Up to 300	C	3	64	C	3	89	C	3	89	C	3	89	3,8,9
		300 to 500	C	3	38	C	3	38	C	3	64	C	3	64	3,8,9
		501 and up	C	3	19	C	3	38	C	3	38	C	3	64	3,8,9
Centrifugal Fans															
Up to 560 mm diameter	All	All	B	2	6.4	B	3	19	B	3	19	B	3	38	9,19
610 mm diameter and up	≤30	Up to 300	B	3	64	B	3	89	B	3	89	B	3	89	8,19
		300 to 500	B	3	38	B	3	38	B	3	64	B	3	64	8,19
		501 and up	B	3	19	B	3	19	B	3	19	B	3	38	8,19
	≥37	Up to 300	C	3	64	C	3	89	C	3	89	C	3	89	2,3,8,9,19
		300 to 500	C	3	38	C	3	38	C	3	64	C	3	64	2,3,8,9,19
		501 and up	C	3	25.4	C	3	38	C	3	38	C	3	64	2,3,8,9,19
Propeller Fans															
Wall-mounted	All	All	A	1	6.4	A	1	6.4	A	1	6.4	A	1	6.4	
Roof-mounted	All	All	A	1	6.4	A	1	6.4	B	4	38	D	4	38	
Heat Pumps, Fan-Coils, Computer Room Units															
Heat Pumps, Fan-Coils, Computer Room Units	All	All	A	3	19	A	3	19	A	3	19	A/D	3	38	
Condensing Units															
Condensing Units	All	All	A	1	6.4	A	4	19	A	4	38	A/D	4	38	
Packaged AH, AC, H and V Units															
All	≤7.5	All	A	3	19	A	3	19	A	3	19	A	3	19	19
	≤11	Up to 300	A	3	19	A	3	89	A	3	89	C	3	89	2,4,8,19
	≤1 kPa SP	301 to 500	A	3	19	A	3	64	A	3	64	A	3	64	4,19
		501 and up	A	3	19	A	3	38	A	3	38	A	3	38	4,19
	>1 kPa SP11	Up to 300	B	3	19	C	3	89	C	3	89	C	3	89	2,3,4,8,9
	>1 kPa SP	301 to 500	B	3	19	C	3	38	C	3	64	C	3	64	2,3,4,9
		501 and up	B	3	19	C	3	38	C	3	38	C	3	64	2,3,4,9

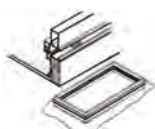
► BASE TYPE

- A. No Base B. Structural steel rails or base

isolators attached directly to equipment

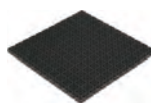


- C. Concrete inertia base D. Curb-mounted base



► ISOLATOR TYPE

RUBBER PAD (TYPE 1)



RESTRAINED SPRING ISOLATOR (TYPE 4)



RUBBER MOUNT (TYPE 2)



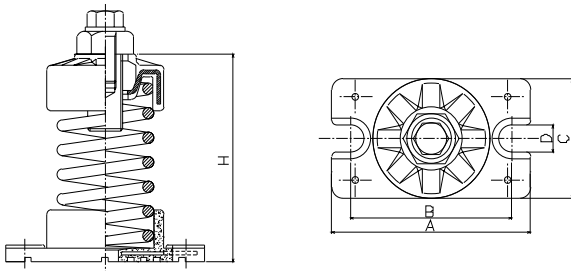
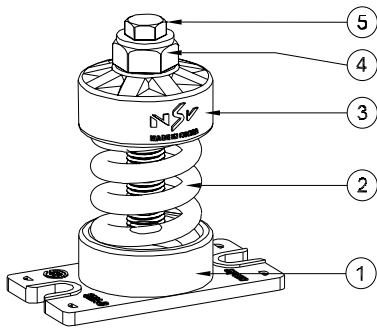
SPRING ISOLATOR (TYPE 3)



THRUST RESTRAINT (TYPE 5)



SMA Spring Mount (Deflection : 25mm)



■ Features

An open-spring mount is, in general, used together with the additional load base. It is easy to install and check; also its static deflection is visible to the naked eye. The spring is in between the upper cap and the bottom cap without any guide, and the bottom cap is mounted with the base plate having a hole for the anchor bolt. Plus, the steel plate is inserted inside the cap and at the top of the mount, there is a level-control bolt made up of the control bolt, cap, screw and washer. There is also a drain hole inside the bottom base, which facilitates drainage.

■ Usage

- ◆ For pump vibration isolator stand
- ◆ For ventilator
- ◆ For air conditioning units
- ◆ For equipment having a small horizontal reaction

■ Specification

No.	Name of Components	Material	Standard
1	Lower Spring Cap Base Plate	CR	KS M 6617
		SS400	KS D 3503
2	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
3	Upper Spring Cap	CR	KS M 6617
		SS400	KS D 3503
4	Level Bolt	SS400	KS B 1002
5	Cap Screw	SS400	KS B 1002

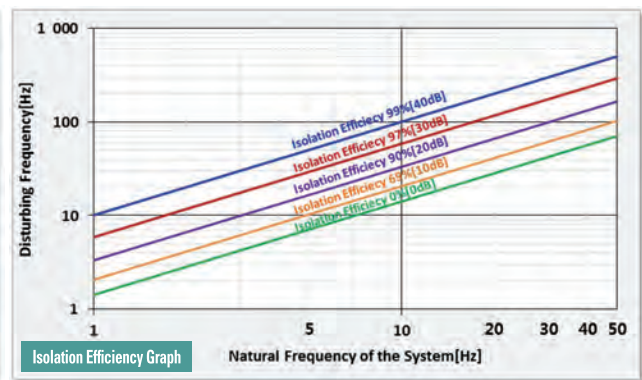
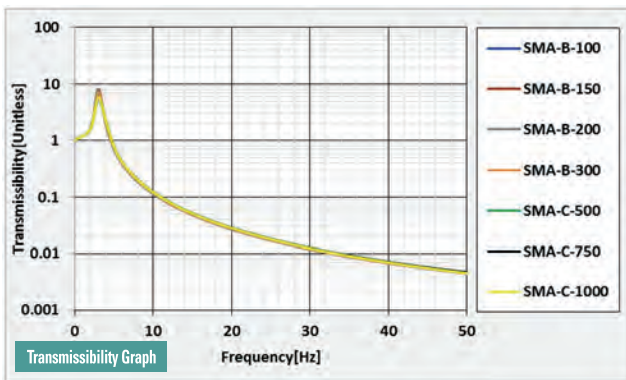
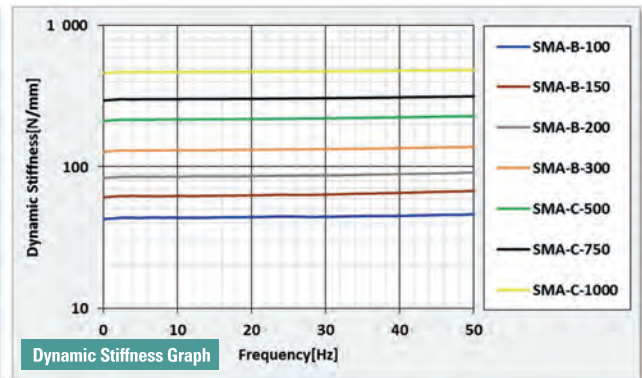
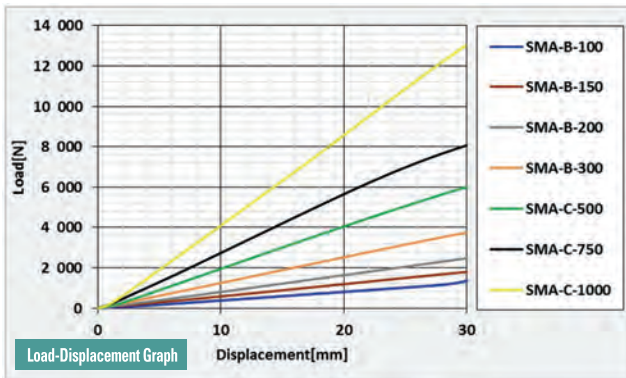
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)						
					A	B	C	D	H	Level Bolt	Cap Screw
SMA-A-50	50	2.0	0.35	Red	90	74	53	12	94	M16 x 45	M10 x 25
SMA-A-75	75	3.0	0.39	Black							
SMA-A-100	100	4.0	0.41	Blue							
SMA-B-100	100	4.0	1.10	Blue	130	100	70	13	128	M20 x 90	M12 x 25
SMA-B-150	150	6.0	1.12	Brown							
SMA-B-200	200	8.0	1.18	White							
SMA-B-300	300	12.0	1.34	Orange							
SMA-B-400	400	16.0	1.34	Pink							
SMA-C-500	500	20.0	2.00	Green							
SMA-C-600	600	24.0	2.08	Blue	150	120	84	13	144	M20 x 90	M12 x 25
SMA-C-750	750	30.0	2.12	Black							
SMA-C-1000	1000	40.0	2.32	Yellow							
SMA-C-1200	1200	48.0	2.20	Red							

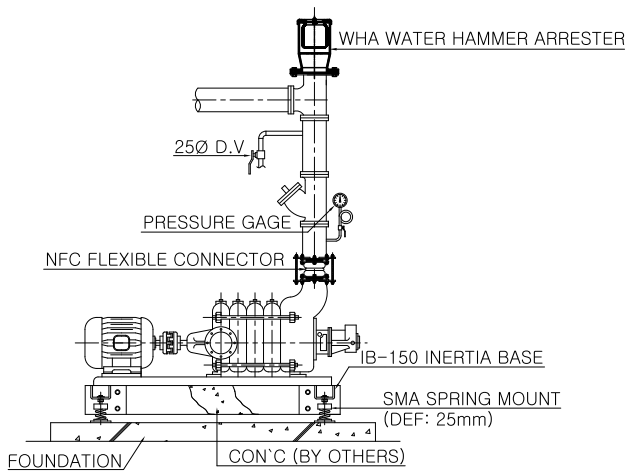
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

SMA Spring Mount (Deflection : 25mm)

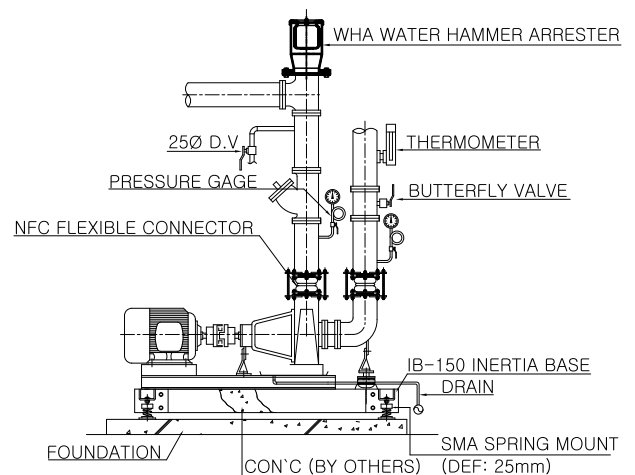
■ SMA Test Data



■ Installation Features



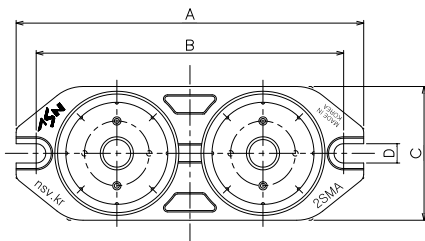
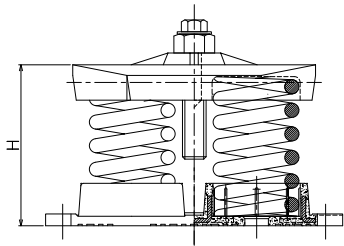
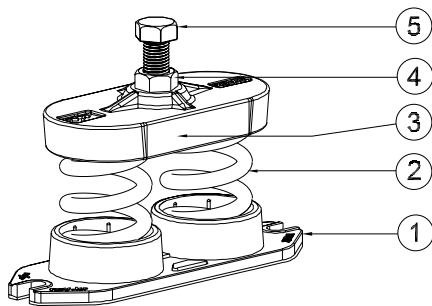
MULTI STAGE PUMP DETAIL



SINGLE STAGE PUMP DETAIL



2SMA Spring Mount (Deflection : 25mm)



■ Features

Open spring mount is, in general, used together with an additional load base. Not only is it easy to install, but it also it a static deflection visible to the naked eye. It is excellent in reducing vibration with left-right and up-down stability. Its upper/bottom housings are made of castings with 2EA mounted springs. Because it is open type, it can be used to reduce the vibrations that heavy equipment creates without having to use too many.

■ Usage

- ◆ For pumps (single stage and multi stage, turbine, double suction types)
- ◆ For air conditioning units (horizontal, vertical, hybrid, built-in, detachable, etc)
- ◆ For ventilators (sirocco, air-foil, turbo double suction and single suction types, etc)
- ◆ For all kinds of vibrating objects

■ Specification

No.	Name of Components	Material	Standard
1	Rubber Housing	CR	KS M 6617
2	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
3	Upper Spring Cap	GC	KS D 4301
4	Level Bolt	SS400	KS B 1002
5	Cap Screw	SS400	KS B 1002

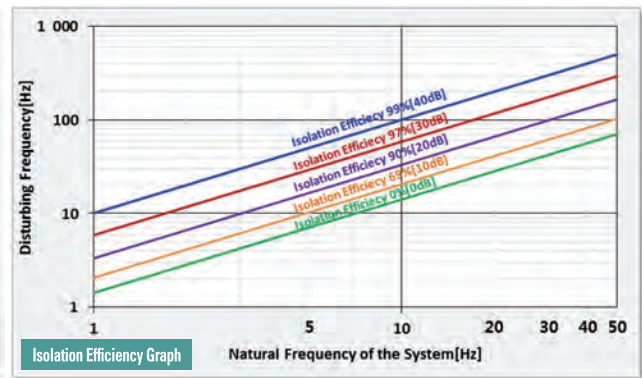
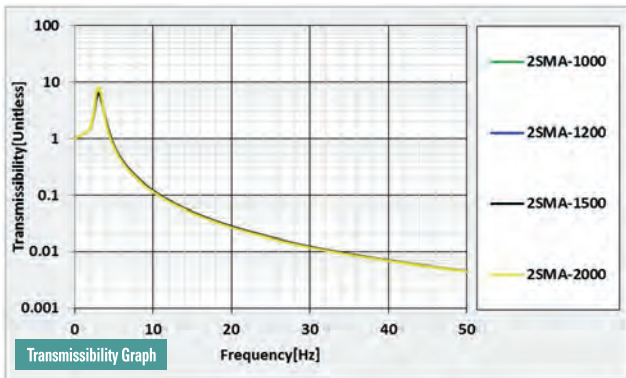
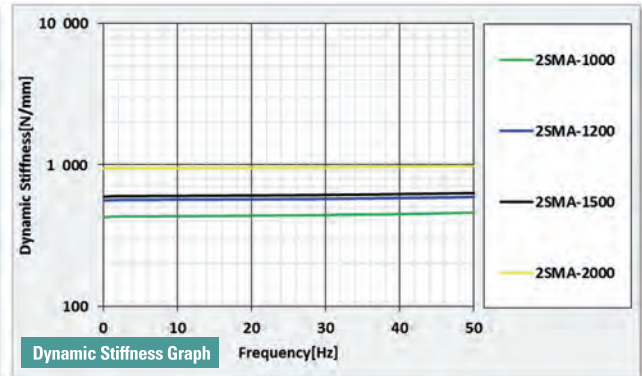
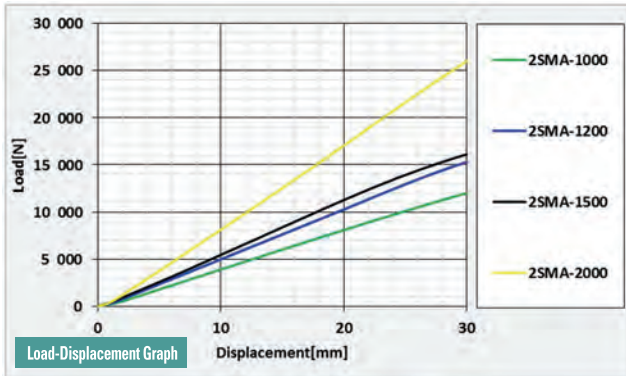
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)						
					A	B	C	D	H	Level Bolt	Cap Screw
2SMA-1000	1000	40	7.36	Green	252	223	97	14	139	M20 x 90	M12 x 25
2SMA-1200	1200	48	7.52	Blue							
2SMA-1500	1500	60	7.68	Black							
2SMA-2000	2000	80	8.04	Yellow							
2SMA-2400	2400	96	8.12	Red							

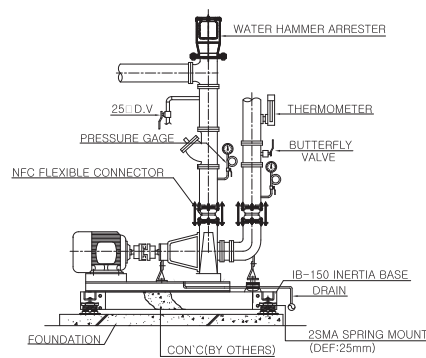
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

2SMA Spring Mount (Deflection : 25mm)

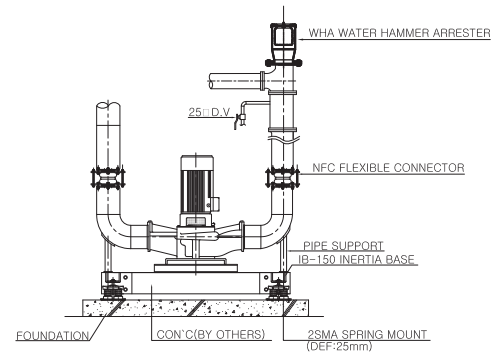
2SMA Test Data



Installation Features



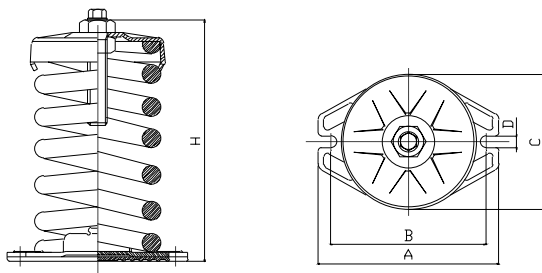
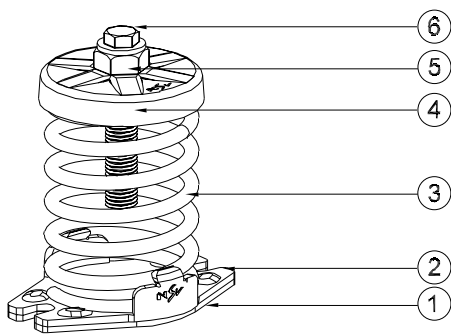
SINGLE VOLUTE PUMP DETAIL



IN-LINE PUMP DETAIL



SMA2 Spring Mount (Deflection : 50mm)



■ Features

As an open spring mount, it is usually used together with the inertia base. It is easy to install and has a static deflection that is visible to the naked eye, which facilitates inspection after installation. It has the same components as SMA type, but has a static deflection of 50 mm, and therefore, it is used when operation of equipment needs to be quieter, such as when air conditioners and fans and are installed on the ground level within the building. The top cap is made of SS400 steel plate, and it can be welded to the bottom structure, when it is made of steel, like the H beam, without making an extra hole for installation. There is a CR type pad attached on the base plate for a slip resistant and high frequency isolation.

■ Usage

- ◆ For standing pipes
- ◆ For high-efficient vibration control of ventilators (ground level)
- ◆ For high-efficient vibration control of air conditioning units (ground level)
- ◆ For high-efficient vibration control of equipment that needs to be kept quiet

■ Specification

No.	Name of Components	Material	Standard
1	Non Skid Pad	CR	KS M 6617
2	Lower Housing	SS400	KS D 3503
3	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
4	Upper Spring Cap	SS400	KS D 3503
5	Level Bolt	SS400	KS B 1002
6	Cap Screw	SS400	KS B 1002

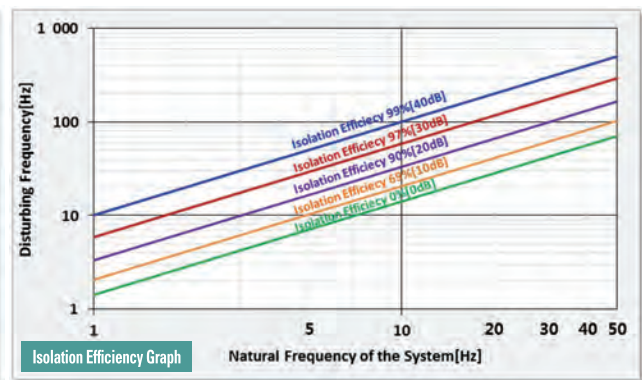
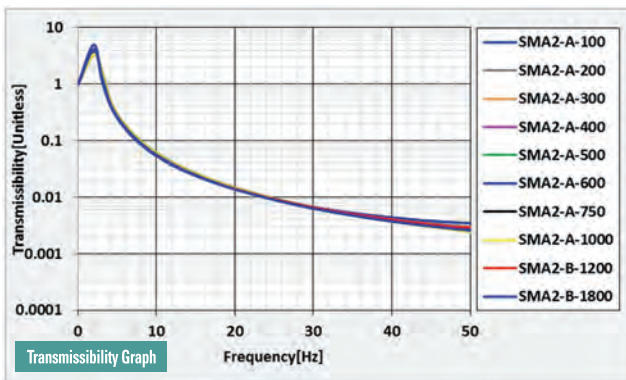
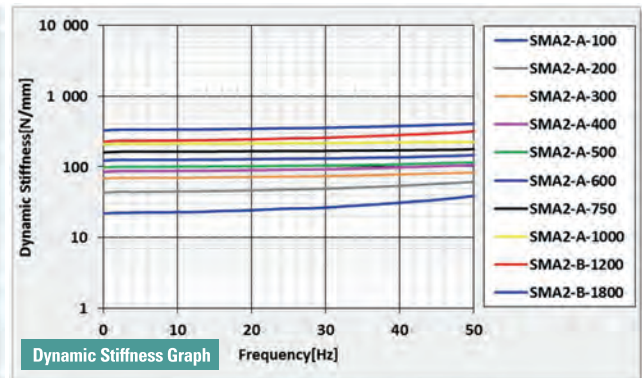
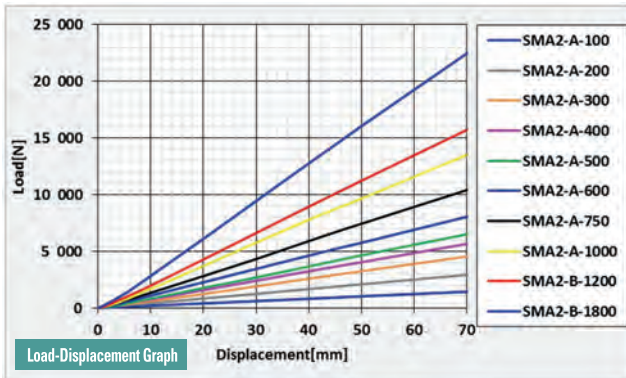
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)						
					A	B	C	D	H	Level Bolt	Cap Screw
SMA2-A-100	100	2	2.00	Blue	150	123	106	14	170	M20 x 90	M12 x 25
SMA2-A-150	150	3	2.00	Brown							
SMA2-A-200	200	4	2.04	White							
SMA2-A-300	300	6	2.18	Orange							
SMA2-A-400	400	8	2.46	Pink							
SMA2-A-500	500	10	2.78	Green							
SMA2-A-600	600	12	3.34	Blue							
SMA2-A-750	750	15	3.08	Black	190	170	138	14	250	M20 x 90	M12 x 25
SMA2-A-1000	1000	20	3.38	Yellow							
SMA2-B-1200	1200	24	7.60	Red							
SMA2-B-1500	1500	30	7.62	Black							
SMA2-B-1800	1800	36	7.12	Blue							
SMA2-B-2000	2000	40	8.90	Yellow	214	184	160	14	289	M24 x 110	M12 x 25
SMA2-B-2500	2500	50	11.60	Brown							
SMA2-C-3000	3000	60	12.60	White							
SMA2-C-3500	3500	70	13.40	Black							
SMA2-C-4000	4000	80	13.40	Orange							

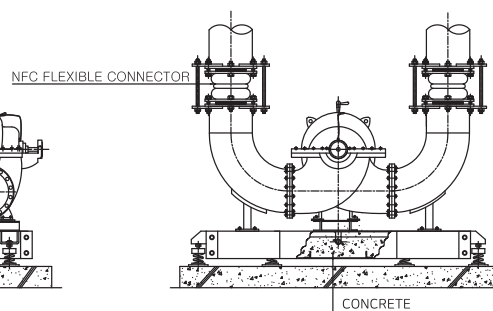
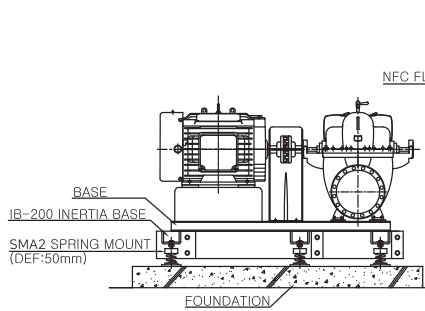
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

SMA2 Spring Mount (Deflection : 50mm)

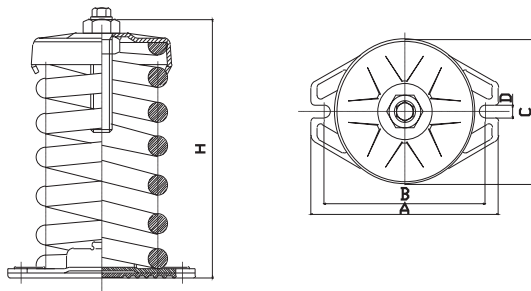
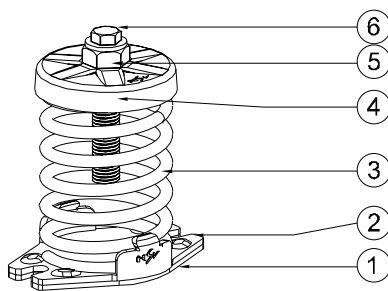
SMA2 Test Data



Installation Features



SMA3 Spring Mount (Deflection : 75mm)



■ Features

It has same features and intended purpose as SMA2 type, but it uses the spring having a static deflection of 75 mm, which makes it better suited for more delicate vibration control than SMA2 type. The average length of slab is 6~9 mm and it is applied to equipment with the natural frequency less than 8.3Hz (500RPM) installed on rooftop. In this case, it must have the natural frequency of less than 2Hz and the static deflection of at least 60 mm.

■ Usage

- ◆ For high-efficient vibration control of standing pipes
- ◆ For high-efficient vibration control of ventilator (ground level)
- ◆ For high-efficient vibration control of air conditioning unit (ground level)
- ◆ For high-efficient vibration control of equipment that needs to be kept quiet

■ Specification

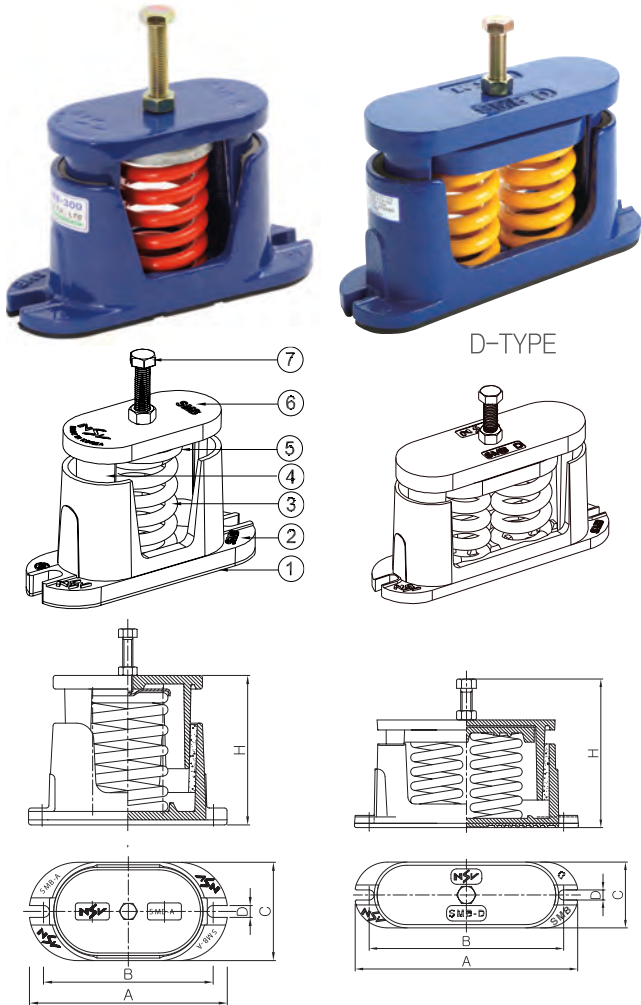
No.	Name of Components	Material	Standard
1	Non Skid Pad	CR	KS M 6617
2	Lower Housing	GC	KS D 4301
3	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
4	Upper Spring Cap	SS400	KS D 3503
5	Level Bolt	SS400	KS B 1002
6	Cap Screw	SS400	KS B 1002

■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)						
					A	B	C	D	H	Level Bolt	Cap Screw
SMA3-A-200	200	2.7	8.1	White	190	170	138	14	250	M20 x 110	M12 x 25
SMA3-A-300	300	4	8.1	Orange							
SMA3-A-400	400	5.3	8.2	Pink							
SMA3-A-500	500	6.7	9.5	Green							
SMA3-A-600	600	8	9.7	Blue							
SMA3-A-750	750	10	9.7	Black							
SMA3-A-1000	1000	13.3	9.8	Yellow	214	184	160	14	289	M24 X 110	M12 x 40
SMA3-B-1200	1200	16	14.8	Red							
SMA3-B-1500	1500	20	14.9	Black							
SMA3-B-1800	1800	24	15.2	Blue							
SMA3-B-2000	2000	32	15.5	Yellow							
SMA3-B-2500	2500	33.3	15.6	Brown							
SMA3-C-3000	3000	40	24.1	White	260	234	204	16	329	M24 x 140	M12 x 40
SMA3-C-3500	3500	46.6	25.2	Black							
SMA3-C-4000	4000	53.3	26.8	Orange							

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

SMB Spring Mount (Deflection : 25mm)



■ Features

As an enclosed spring mount, it has the spring between upper and bottom housings. An anchor hole is on the bottom housing and the tap is on the top housing, which allows level control of the bolt with a level bolt and nut to be used. Plus, the spring cap with a bolt guided hole is at the top of the spring to distribute the load transferred from the level bolt and the anti-frictioner is attached between upper and bottom housings, which somewhat reduces attenuation and friction caused by left-right and top-down relative displacement when the equipment is running. There is a CR pad attached on the bottom of the bottom housing to compensate disadvantages of the spring transferring high frequency due to a kind of surging effect.

■ Usage

- ◆ For pumps, refrigerators, compressors and power generators
- ◆ For ventilators
- ◆ For air conditioning units
- ◆ For equipment with a large horizontal reaction

■ Specification

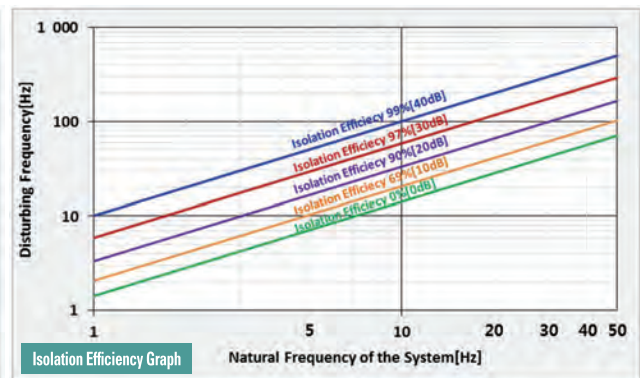
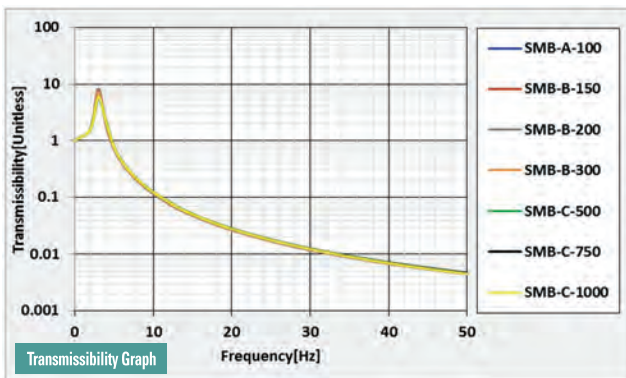
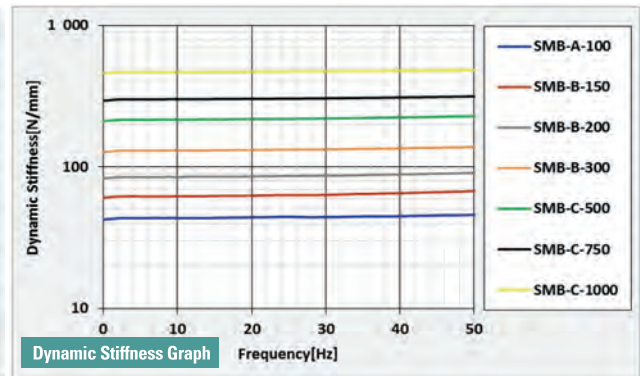
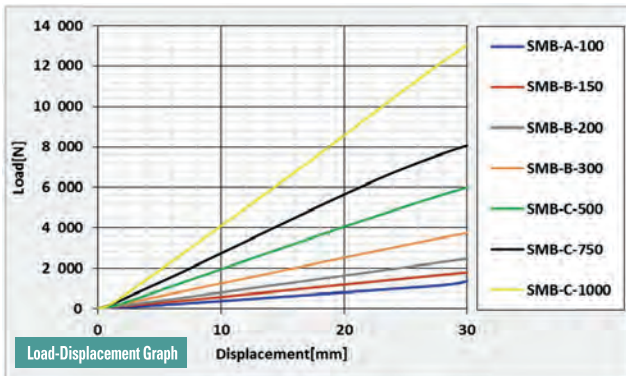
No.	Name of Components	Material	Standard
1	Non Skid Pad	CR	KS M 6617
2	Lower Housing	GC	KS D 4301
3	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
4	Anti-Frictioner	Sponge	-
5	Spring Cap	SS400	KS D 3503
6	Upper Housing	GC	KS D 4301
7	Level Bolt	SS400	KS B 1002

■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)					
					A	B	C	D	H	Level Bolt
SMB-A-10	10	0.4	1.16	Pink	139	117	57	12	102	M10 x 60
SMB-A-25	25	1	1.20	Yellow						
SMB-A-50	50	2	1.34	Red						
SMB-A-75	75	3	1.34	Black						
SMB-A-100	100	4	1.30	Blue						
SMB-B-100	100	4	3.64	Blue	205	170	76	13	135	M12 x 65
SMB-B-150	150	6	3.64	Brown						
SMB-B-200	200	8	3.70	White						
SMB-B-300	300	12	3.94	Orange						
SMB-B-400	400	16	3.86	Pink						
SMB-C-500	500	20	6.00	Green	228	196	93	13	150	M16 x 80
SMB-C-600	600	24	6.06	Blue						
SMB-C-750	750	30	6.14	Black						
SMB-C-1000	1000	40	6.32	Yellow						
SMB-D-1200	1200	48	13.38	Blue	306	277	94	13	170	M16 x 80
SMB-D-1500	1500	60	13.54	Black						
SMB-D-2000	2000	80	13.88	Yellow						

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

■ SMB Test Data



■ Explanation(Commonness)

1. Vibration Transmissibility(T_r)

Vibration Transmissibility is the amplitude ratio of Output to Input.

$$T_r = \frac{\text{Output Amplitude}}{\text{Input Amplitude}} = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2}, \eta = \frac{\text{Disturbing Frequency of the equipment}}{\text{Natural Frequency of the Isolator (Damping}(c) = 0)}$$

2. Natural Frequency(F_n) of Vibration Isolation System

The mass and spring stiffness dictate a natural frequency of the system.

$$F_n = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$$

3. Isolation Efficiency(E)

Isolation Efficiency in percent transmission is related to Vibration Transmissibility $E = 100(1 - T_r)$

ex) Disturbing Frequency of the equipment=100 Hz,

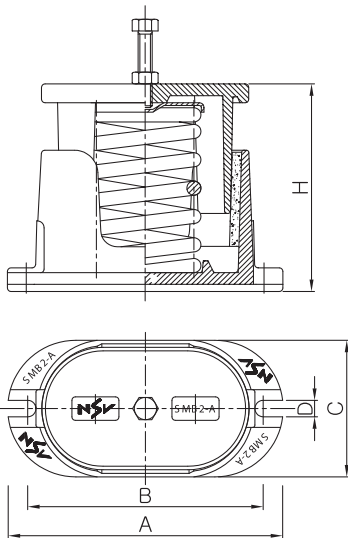
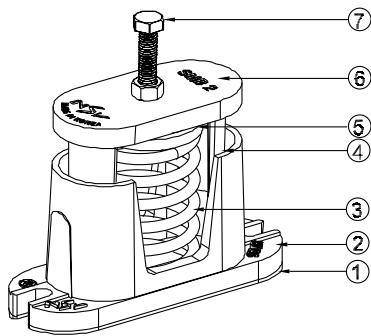
Natural Frequency of the isolator=10Hz

$$T_r = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2} = \sqrt{\left(\frac{1}{1-\left(\frac{100}{10}\right)^2}\right)^2} = 0.101 \quad E = 100(1 - T_r) = 100(1-0.101)=99(\%)$$

■ Installation Features



SMB2 Spring Mount (Deflection : 50mm)



■ Features

As an enclosed spring mount, it has the same features and intended purpose as the SMB type, but is equipped with the spring having a static deflection of 50 mm. It is used when equipment like air conditioners and fans installed on a group floor of the building need to be kept quite when running.

■ Usage

- ◆ For high-efficient vibration isolation of pumps, refrigerators, compressors and power generators
- ◆ For high-efficient vibration isolation of ventilators
- ◆ For high-efficient vibration isolation of air conditioning units
- ◆ For equipment having large horizontal reaction

■ Specification

No.	Name of Components	Material	Standard
1	Non Skid Pad	CR	KS M 6617
2	Lower Housing	GC	KS D 4301
3	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
4	Anti-Frictioner	SPONGE	-
5	Spring Cap	SS400	KS D 3503
6	Upper Housing	GC	KS D 4301
7	Level Bolt	SS400	KS B 1002

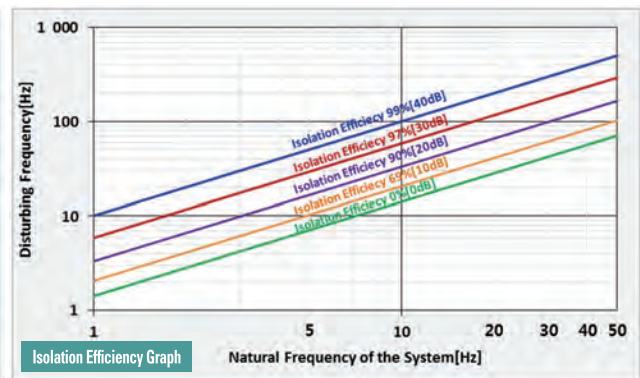
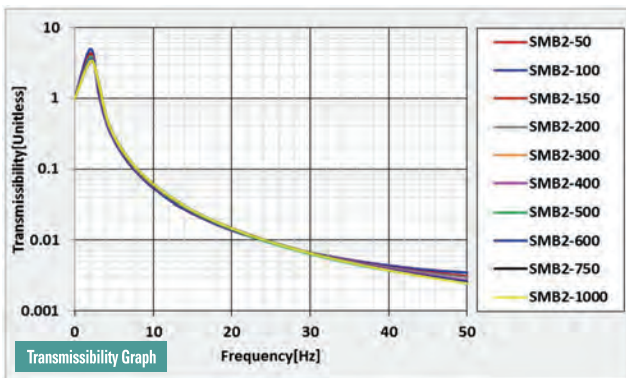
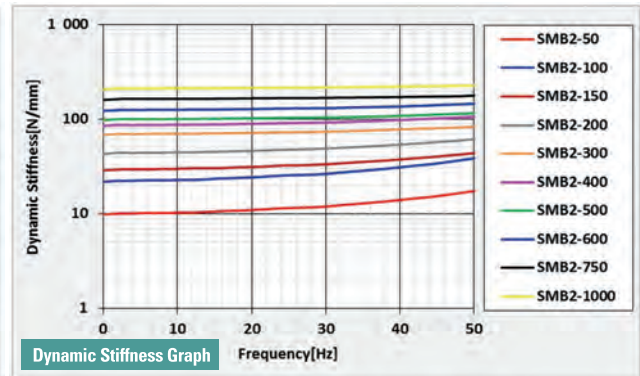
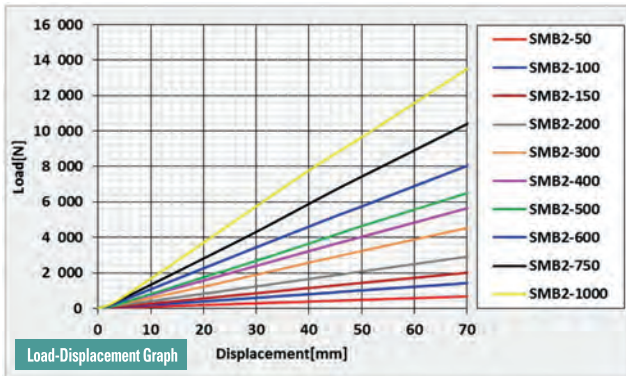
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)					
					A	B	C	D	H	Level Blot
SMB2-50	50	1	8.30	Red	232	203	116	14	178	M12 x 80
SMB2-100	100	2	8.30	Black						
SMB2-150	150	3	8.56	Brown						
SMB2-200	200	4	8.52	White						
SMB2-300	300	6	8.64	Orange						
SMB2-400	400	8	8.65	Pink						
SMB2-500	500	10	8.75	Green						
SMB2-600	600	12	8.78	Blue						
SMB2-750	750	15	8.56	Black						
SMB2-1000	1000	20	8.90	Yellow						

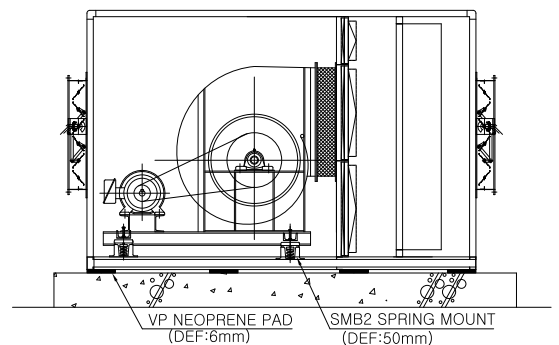
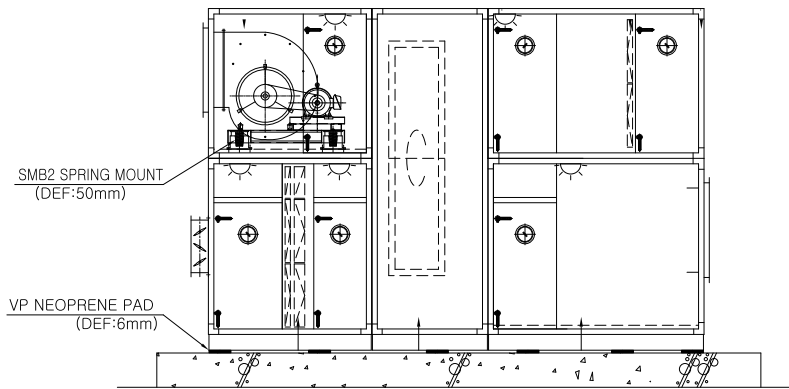
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

SMB2 Spring Mount (Deflection : 50mm)

■ SMB2 Test Data



■ Installation Features

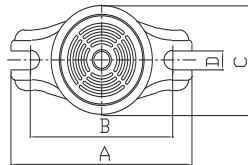
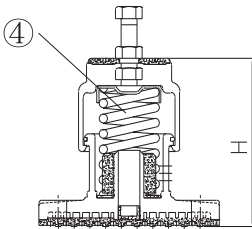
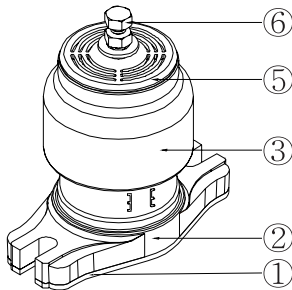


TOTAL HEAT EXCHANGER DETAIL

VENTILATION UNIT DETAIL



NSM/NSM2 Spring Mount (Deflection : 25mm, 50mm)



■ Features

It is a closed spring mount with excellent anti-vibration effects. Because the spring is not exposed to the outside, it is corrosion-resistant and it has a gauge at the center to help check deflection. The top and bottom housings are made of POLYCARBONATE plastic, which is stable regardless of load and strength, and anti-friction inside the housing reduces structure-borne noise. Plus, the anti-vibration neoprene pad on the top and bottom contact surfaces prevents structure-borne noise from getting transferred to the base of the equipment when it is in contact with STEEL and concrete.

■ Usage

- ◆ For ventilators
- ◆ For air handling units
- ◆ For pumps and standing pipes
- ◆ For equipment with large horizontal reaction

■ Specification

No.	Name of Components	Material	Standard
1	Lower Non Skin Pad	CR	KS M 6617
2	Lower Housing	E-PLASTIC	-
3	Upper Housing	E-PLASTIC	-
4	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
5	Upper Non Skid Pad	CR	KS M 6617
6	Level Bolt	SS400	KS B 1012

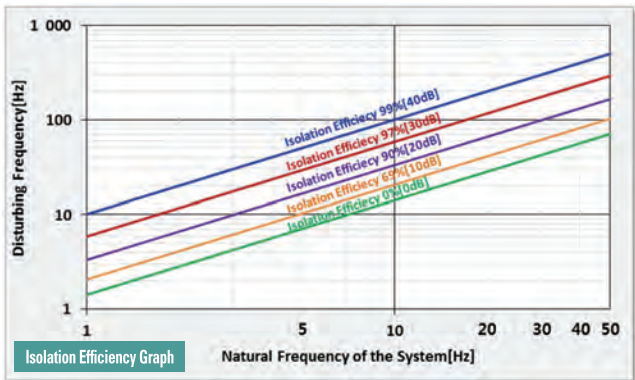
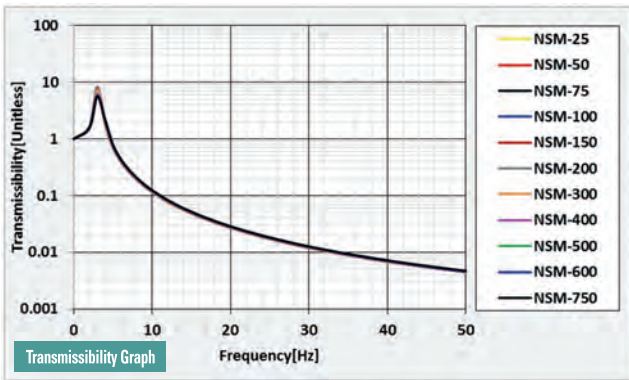
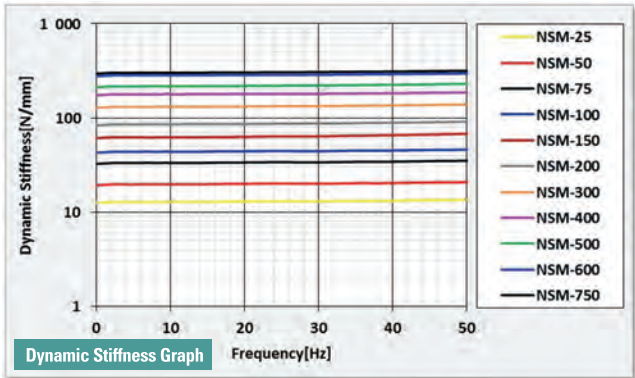
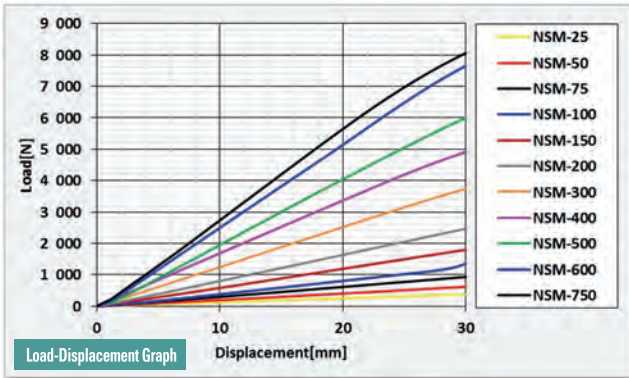
■ Dimension & Selection Guide

Type	Capacity(kgf)	Spring Constant(kgf/mm)	Weight(kg)	Deflection(mm)	Dimension(mm)					
					A	B	C	D	H	Level Blot
NSM-A-25	25	1	0.44	25	132	104	74	13	115	M10 x 60
NSM-A-50	50	2	0.46							
NSM-A-75	75	3	0.50							
NSM-A-100	100	4	0.54							
NSM-B-150	150	6	1.16							
NSM-B-200	200	8	1.22		170	134	99	14	143	M12 x 65
NSM-B-300	300	12	1.36							
NSM-B-400	400	16	1.38							
NSM-C-500	500	20	2.08							
NSM-C-600	600	24	2.14							
NSM-C-750	750	30	2.22	50	190	152	110	14	167	M16 x 80
NSM2-50	50	1	2.44							
NSM2-100	100	2	2.50							
NSM2-150	150	3	2.46							
NSM2-200	200	4	2.50							
NSM2-300	300	6	2.70							
NSM2-400	400	8	3.06							
NSM2-500	500	10	2.76							
NSM2-600	600	12	2.62							
NSM2-750	750	15	2.92							

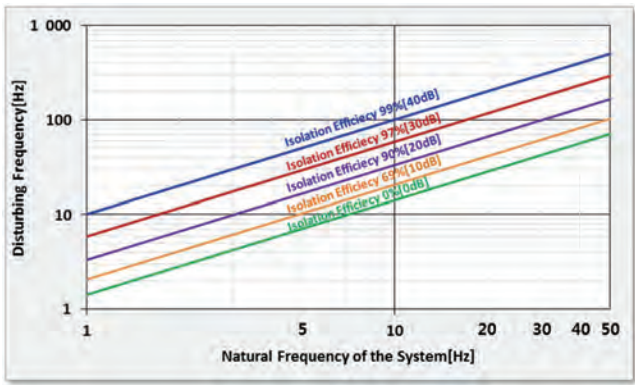
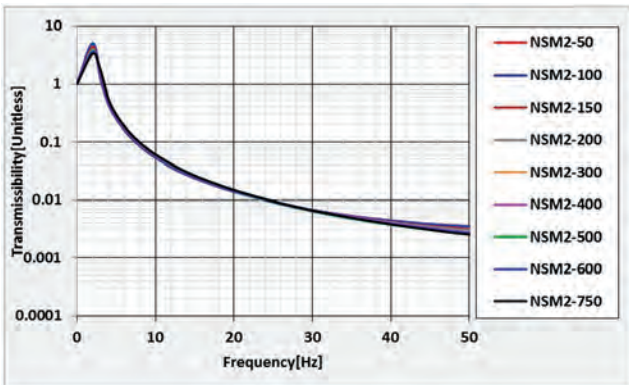
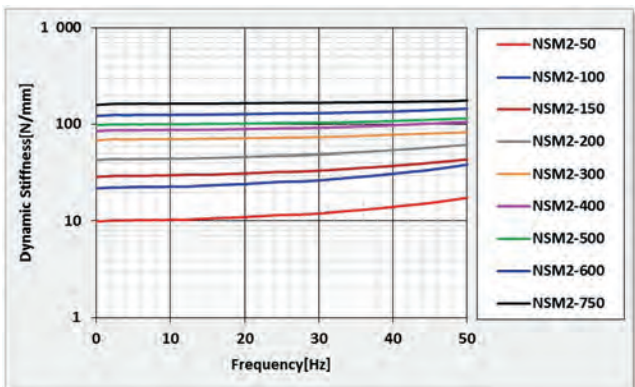
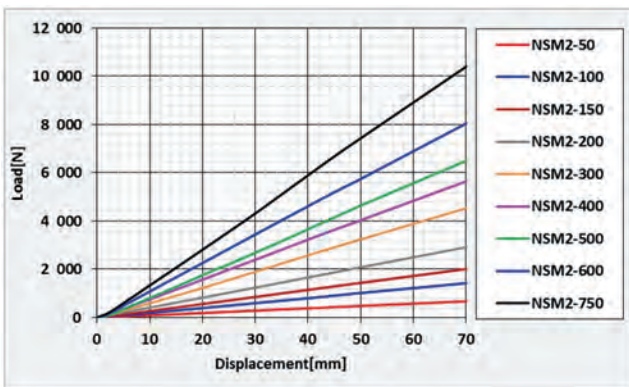
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

NSM/NSM2 Spring Mount (Deflection : 25mm, 50mm)

NSM Test Data



NSM2 Test Data



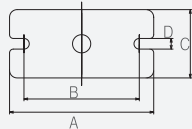
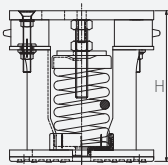
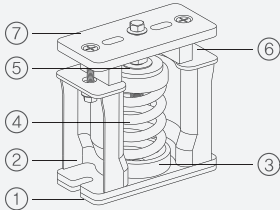
FSL Spring Mount (Deflection : 25mm)

■ Features

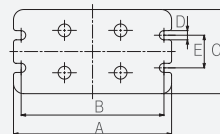
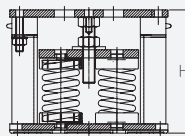
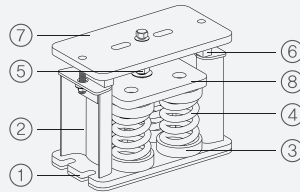
It is a free standing mount with a vertical movement limiting device. It is designed to restrict vertical deflection when there is any change in the weight of equipment and/or structure (for example, pouring water out of a cooling tower, refrigerator) to prevent damage and distortion of equipment and pipe. The upper housing (compression plate) has a restrain bolt and level bolt while CR-type acoustical non skid pad on the bottom to prevent transfer of high-frequency vibration.



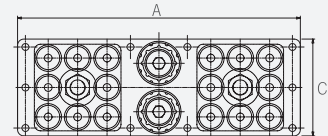
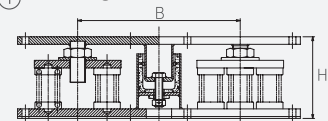
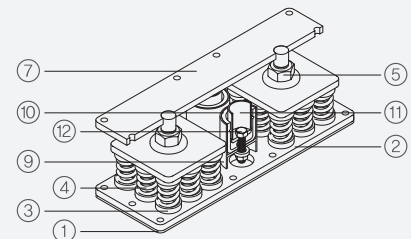
FSL-1



FSL-4



FSL-16



■ Usage

- ◆ For refrigerator of reciprocating and turbo types
- ◆ For cooling towers
- ◆ For other large pieces of equipment of which weight often changes

■ Specification

No.	Name of Components	Material	Standard
1	Non Skid Pad	CR	KS M 6617
2	Lower Housing	SS400	KS D 3503
3	Spring Seat	CR	KS M 6617
4	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
5	Level Bolt&Nut	SS400	KS B 1002
6	Space Bar	Plastic	-
7	Upper Housing	SS400	KS D 3503
8	Middle Plate	SS400	KS D 3503
9	Lower Stopper	SS400	KS D 3503
10	Guide Rubber	CR	KS M 6617
11	Upper Stopper	SS400	KS D 3503
12	Stopper Level Bolt&Nut	SS400	KS B 1002

■ Installation Features



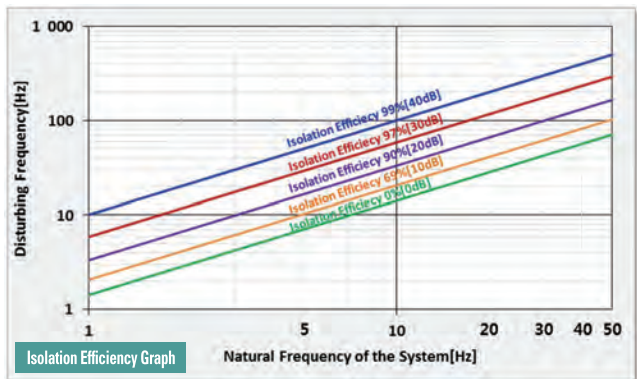
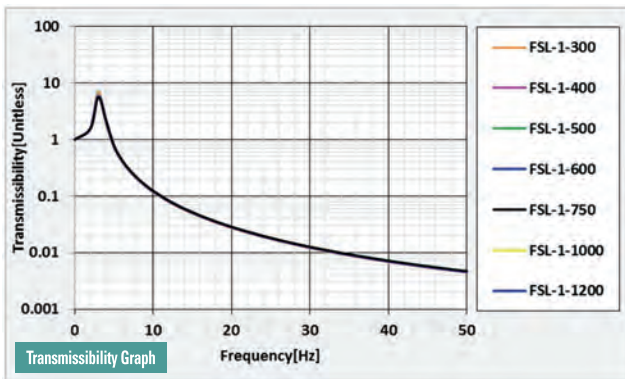
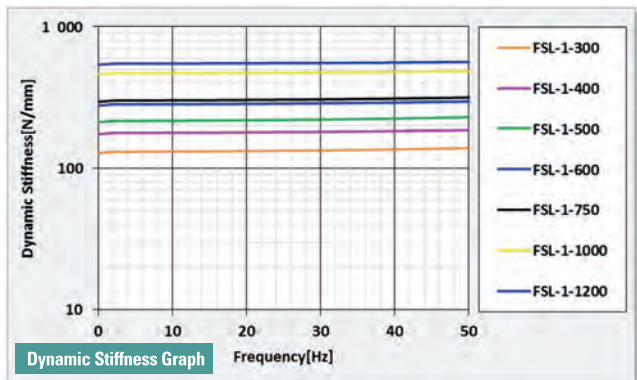
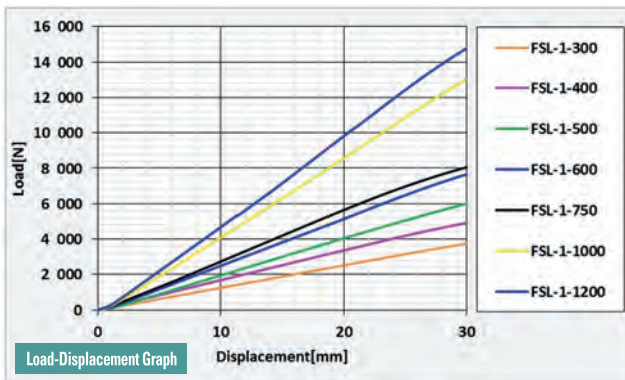
FSL Spring Mount (Deflection : 25mm)

Dimension & Selection Guide By Loads

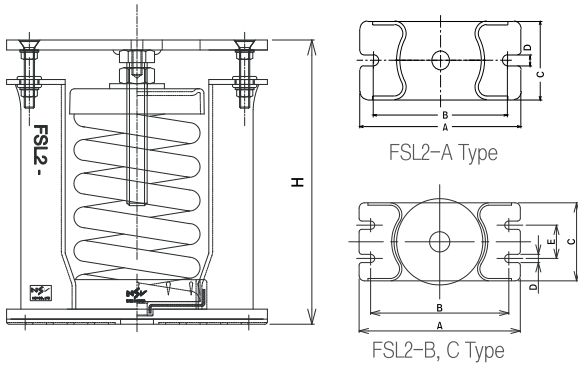
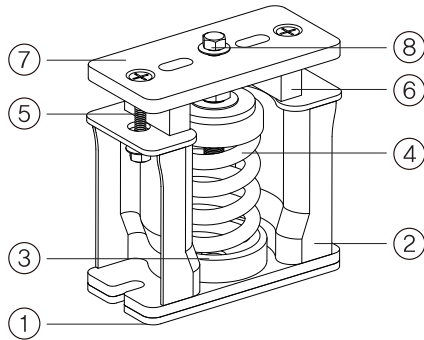
Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)						
					A	B	C	D	E	H	Level Blot
FSL-1-300	300	12	3.90	Orange	190	153	90	14	-	199	M16 x 90
FSL-1-400	400	16	3.92	Pink							
FSL-1-500	500	20	4.46	Green							
FSL-1-600	600	24	4.54	Blue							
FSL-1-750	750	30	4.60	Black							
FSL-1-1000	1000	40	4.78	Yellow							
FSL-1-1200	1200	48	4.66	Red	302	262	90	14	-	199	M20 x 90
FSL-2-1200	1200	48	8.78	Blue							
FSL-2-1500	1500	60	8.94	Black							
FSL-2-2000	2000	80	9.32	Yellow							
FSL-2-2400	2400	96	9.06	Red	310	280	165	18	64	242	M24 x 110
FSL-4-3000	3000	120	24.40	Black							
FSL-4-4000	4000	160	25.10	Yellow							
FSL-4-4800	4800	192	24.60	Red	570	313	215	15	175	217	M36 x 120
FSL-8-8000	8000	320	46.30	Yellow							
FSL-8-9600	9600	384	47.90	Red							
FSL-8-12000	12000	480	49.50	Black							
FSL-16-16000	16000	640	169.80	Yellow	894	514	306	22	256	258	M48 x 140
FSL-16-19200	19200	768	173.00	Red							
FSL-16-24000	24000	960	176.20	Black							

(NOTE) The specification and data are subject to change without prior to for improvement of product performance and quality.

FSL Test Data



FSL2 Spring Mount (Deflection : 50mm)



■ Features

As a type of FSL series, it uses SMA2 type (static deflection of 50mm) and prevents damage and distortion of the equipment and pipe. The upper housing (compression plate) has a restraint bolt and level bolt, while the CR-type acoustical non skid pad on the bottom is to prevent the transfer of high-frequency vibration.

■ Usage

- ◆ For refrigerator of reciprocating and turbo types
- ◆ For cooling towers
- ◆ For other large pieces of equipment of which weight often changes

■ Specification

No.	Name of Components	Material	Standard
1	Non Skid Pad	CR	KS M 6617
2	Lower Housing	SS400	KS D 3503
3	Spring Seat	CR	KS M 6617
4	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
5	Restraint Bolt	SS400	KS B 1002
6	Space Bar	Plastic	-
7	Upper Housing	SS400	KS D 3503
8	Level Bolt	SS400	KS B 1002

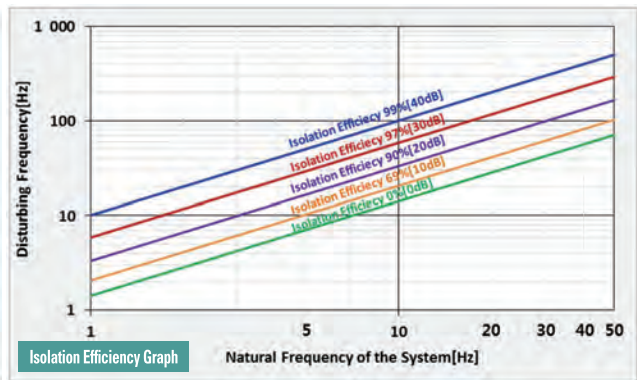
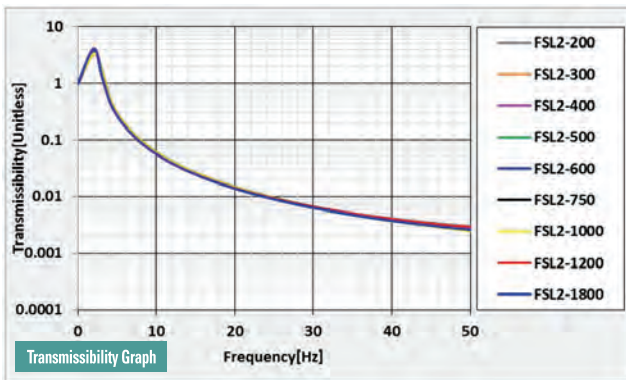
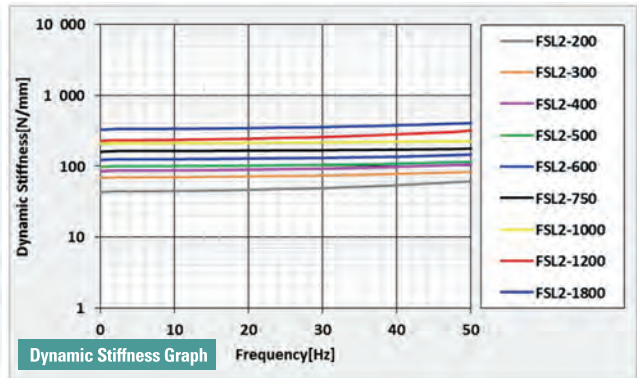
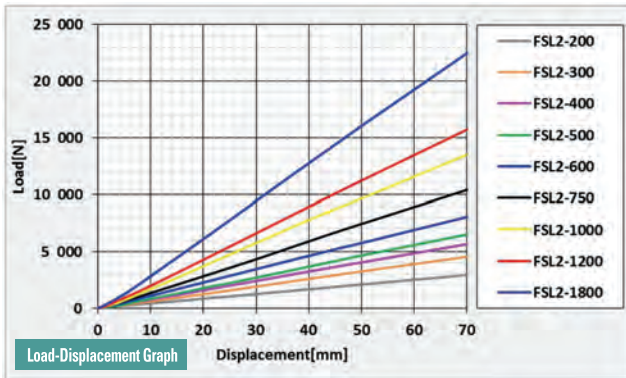
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)						
					A	B	C	D	E	H	Level Blot
FSL2-A-200	200	4	10.60	White	220	183	100	14	-	212	M20 x 90
FSL2-A-300	300	6	10.70	Orange							
FSL2-A-400	400	8	10.90	Pink							
FSL2-A-500	500	10	18.00	Green							
FSL2-A-600	600	12	18.50	Blue							
FSL2-A-750	750	15	19.00	Black							
FSL2-A-1000	1000	20	19.50	Yellow	280	234	150	14	64	288	M20 x 110
FSL2-B-1200	1200	24	20.00	Red							
FSL2-B-1500	1500	30	32.50	Black							
FSL2-B-1800	1800	36	33.00	Blue							
FSL2-B-2000	2000	40	33.50	Yellow							
FSL2-B-2500	2500	50	34.00	Brown							
FSL2-C-3000	3000	60	39.00	White	310	266	150	16	64	338	M24 x 110
FSL2-C-3500	3500	70	40.00	Black							
FSL2-C-4000	4000	80	42.00	Orange							

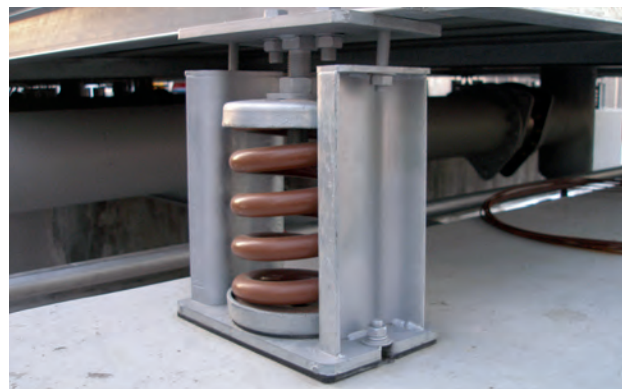
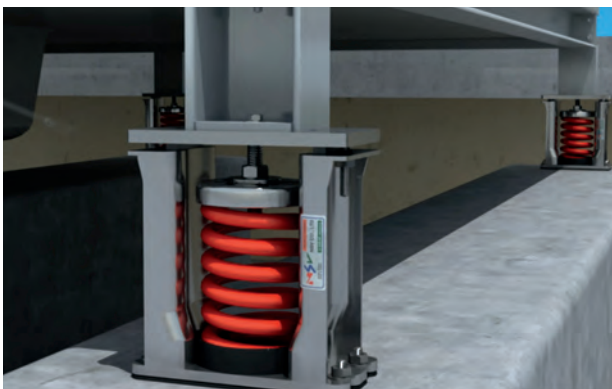
(NOTE) The specification and data are subject to change without prior to for improvement of product performance and quality.

FSL2 Spring Mount (Deflection : 50mm)

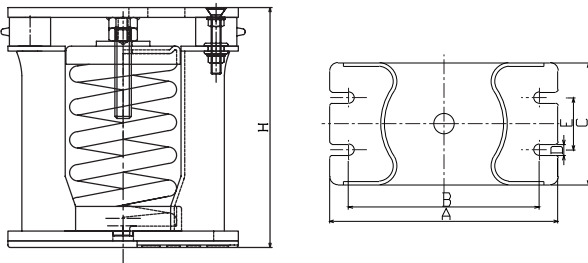
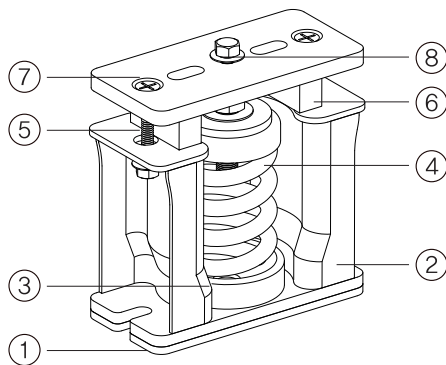
FSL2 Test Data



Installation Features



FSL3 Spring Mount (Deflection : 75mm)



■ Features

Though it has same features as FSL2 type, it uses a spring with the static deflection of 75mm and therefore, it is used when more delicate vibration control is required. For example, it is mounted on equipment installed on a rooftop having the average slab length of 6-9 m and natural frequency less than 8.3 Hz (500RPM). In such a case, the natural frequency of the vibration control system needs to have the natural frequency of less than 2 Hz and at least 60 mm static deflection. FSA3 series spring is used in this model.

■ Usage

- ◆ High-efficiency vibration control for refrigerators of reciprocating and turbo types
- ◆ High-efficiency vibration control for cooling towers
- ◆ High-efficiency vibration control for other large pieces of equipment of which undergoes frequent weight changes (such as semiconductor production facilities)

■ Specification

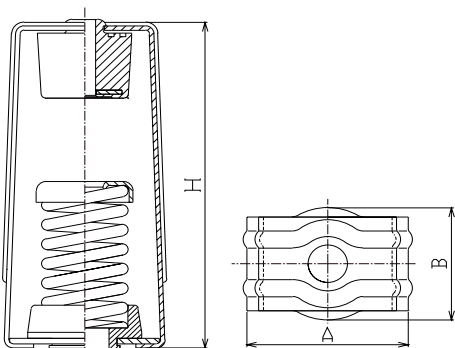
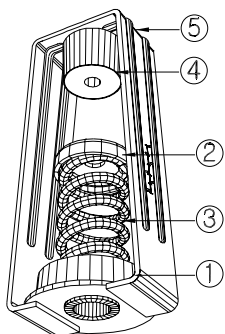
No.	Name of Components	Material	Standard
1	Non Skid Pad	CR	KS M 6617
2	Lower Housing	SS400	KS D 3503
3	Spring Seat	CR	KS M 6617
4	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
5	Restraint Bolt	SS400	KS B 1002
6	Space Bar	Plastic	-
7	Upper Housing	SS400	KS D 3503
8	Level Bolt	SS400	KS B 1002

■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)						
					A	B	C	D	E	H	Level Blot
FSL3-A-200	200	2.7	15.50	White	280	234	150	14	64	288	M20 x 140
FSL3-A-300	300	4	16.40	Orange							
FSL3-A-400	400	5.3	15.70	Pink							
FSL3-A-600	600	8	16.90	Blue							
FSL3-A-750	750	10	17.40	Black							
FSL3-A-1000	1000	13.3	19.00	Yellow							
FSL3-A-1200	1200	16	20.20	Red							
FSL3-A-1500	1500	20	21.60	Black							
FSL3-A-1800	1800	24	21.80	Blue							
FSL3-A-2000	2000	26.6	22.70	Yellow							
FSL3-A-2500	2500	33.3	23.40	Brown	270	234	160	16	64	343	M24 x 170
FSL3-B-3000	3000	40	40.60	White							
FSL3-B-3500	3500	46.6	42.20	Black							
FSL3-B-4000	4000	53.3	44.50	Orange							

(NOTE) The specification and data are subject to change without prior to for improvement of product performance and quality.

SH Spring Hanger (Deflection : 25mm)



■ Features

The SH type anti-vibration spring hanger ensures that vibration generated from the equipment and/or stress by thermal expansion in the pipe and duct while the equipment is running are not transferred to the structure through pipe and duct. The housing needs to be strong enough to stand the weight of the equipment without causing resonance from its own vibration. With the coil spring having a static deflection of 25 mm, the product can maintain the system's natural frequency down to 3~5 Hz and the CR type housing fixture is mounted on top of the housing to prevent high frequency that is passed through pipe and duct from getting into the structure on top of the hanger. Plus, the CR type spring sheet is attached at the bottom to block the high frequency resulting from the vibration that the spring generates itself.

■ Usage

- ◆ For high-efficient vibration control of axial, in-line fan, machine room, pipes in air-conditioning room and ducts
- ◆ For high-efficient vibration control of suspended ceiling desk system in, for example, studios and acoustical laboratories

■ Specification

No.	Name of Components	Material	Standard
1	Spring Seat	CR	KS M 6617
2	Spring Cap	SS400	KS D 3503
3	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
4	Housing Fixture	CR	KS M 6617
5	Hanger Housing	SS400	KS D 3503

(NOTE) Housing Fixture A/B Type Hardness : 60° / Housing Fixture C Type Hardness : 70°

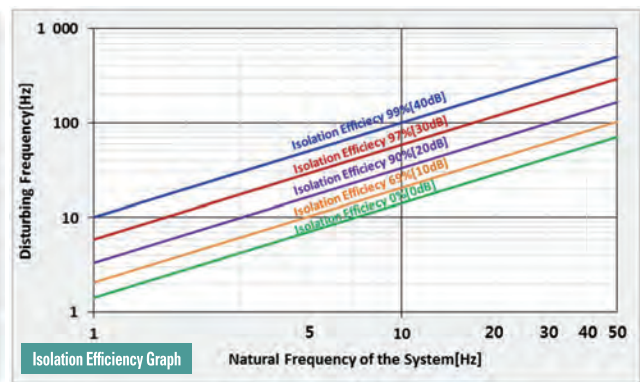
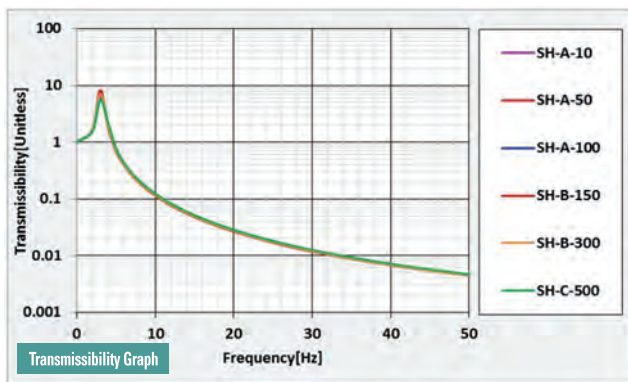
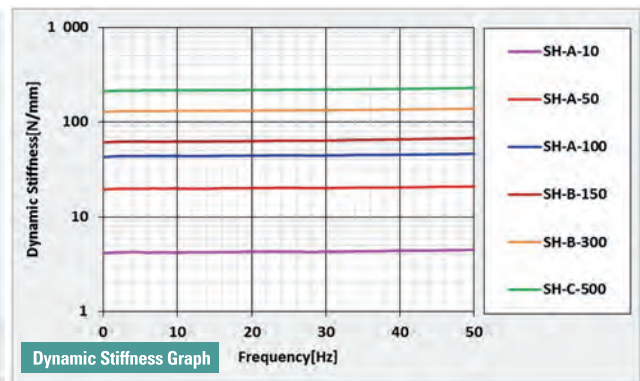
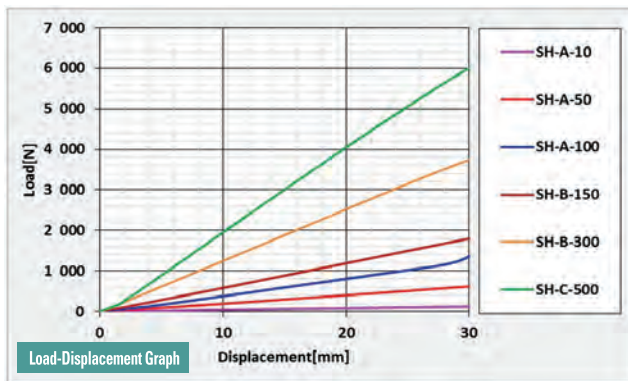
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)			
					A	B	H	Level Blot
SH-A-10	10	0.4	0.70	Pink	82	60	172	M10
SH-A-25	25	1	0.74	Yellow				
SH-A-50	50	2	0.76	Red				
SH-A-75	75	3	0.80	Black				
SH-A-100	100	4	0.84	Blue				
SH-B-150	150	6	1.80	Brown	103	79	215	M12
SH-B-200	200	8	1.84	White				
SH-B-300	300	12	1.98	Orange				
SH-B-400	400	16	2.02	Pink				
SH-C-500	500	20	3.34	Green				
SH-C-600	600	24	3.40	Blue	118	100	243	M16
SH-C-750	750	30	3.50	Black				
SH-C-1000	1000	40	3.68	Yellow				

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

SH Spring Hanger (Deflection : 25mm)

SH Test Data



Explanation(Commonness)

1. Vibration Transmissibility(T_r)

Vibration Transmissibility is the amplitude ratio of Output to Input.

$$T_r = \frac{\text{Output Amplitude}}{\text{Input Amplitude}} = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2} \cdot \eta = \frac{\text{Disturbing Frequency of the equipment}}{\text{Natural Frequency of the Isolator (Damping}(c) = 0)}$$

2. Natural Frequency(F_n) of Vibration Isolation System

The mass and spring stiffness dictate a natural frequency of the system.

$$F_n = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$$

3. Isolation Efficiency(E)

Isolation Efficiency in percent transmission is related to Vibration Transmissibility $E = 100(1 - T_r)$

ex) Disturbing Frequency of the equipment=100 Hz,

Natural Frequency of the isolator=10Hz

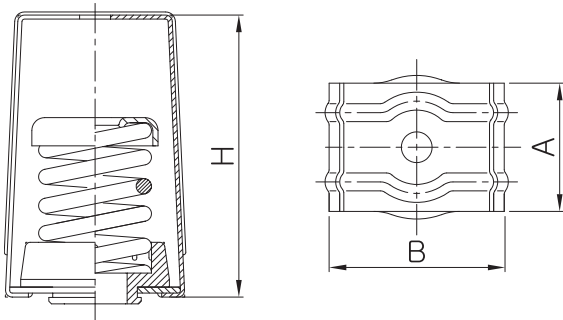
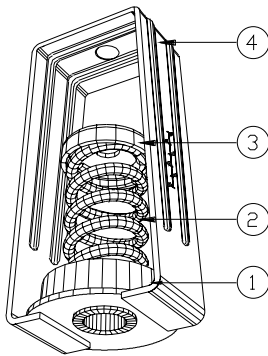
$$T_r = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2} = \sqrt{\left(\frac{1}{1-\left(\frac{100}{10}\right)^2}\right)^2} = 0.101 \quad E = 100(1 - T_r) = 100(1-0.101)=99(\%)$$

Installation Features



VH20 Spring Hanger (Deflection : 25mm)

※ The model name of VH product has changed to VH20



■ Features

The VH20 type anti-vibration spring hanger prevents the transfer of vibration generated from equipment and/or stress resulted from thermal expansion in pipes and ducts during operation. Its housing needs to be strong enough to stand the weight of the equipment and avoid resonance due to the vibration it generates. With the coil spring having a static deflection of 25 mm, it can maintain the system's natural frequency down to 3~5 Hz and the CR type housing fixture is mounted on the housing to avoid the transfer of high frequency from pipes and ducts into the structure on top of the hanger. Plus, the CR type spring sheet is attached on the bottom to block high frequency resulting from the vibration that the spring itself generates.

■ Usage

- ◆ For high-efficient vibration control of axial, in-line fan, machine rooms, pipes in air-conditioning rooms and ducts
- ◆ For high-efficient vibration control of suspended ceiling desk system in, for example, studios and acoustical laboratories

■ Specification

No.	Name of Components	Material	Standard
1	Spring Seat	CR	KS M 6617
2	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
3	Spring Cap	SS400	KS D 4301
4	Hanger Housing	SS400	KS D 3503

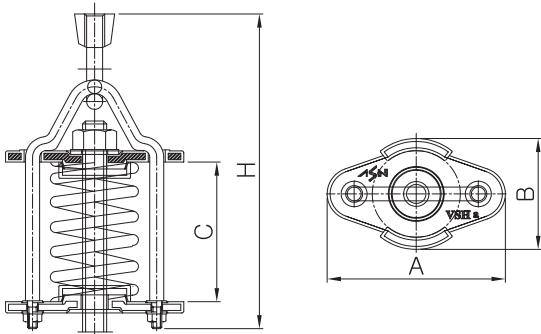
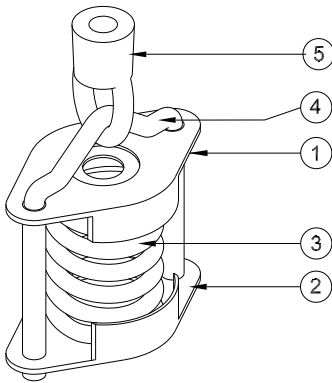
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)			
					A	B	H	Level Blot
VH20-A-10	10	0.4	0.38	Pink	50	70	135	M10
VH20-A-25	25	1	0.42	Yellow				
VH20-A-50	50	2	0.44	Red				
VH20-A-75	75	3	0.48	Black				
VH20-A-100	100	4	0.52	Blue				
VH20-B-150	150	6	1.40	Brown	60	96	170	M12
VH20-B-200	200	8	1.44	White				
VH20-B-300	300	12	1.60	Orange				
VH20-B-400	400	16	1.65	Pink				

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VH61 Spring Hanger (Deflection : 25mm)

※ The model name of VSH product has changed to VH61



■ Features

The VH61 type anti-vibration spring hanger prevents the transfer of vibration generated from equipment and/or stress resulted from thermal expansion in the pipes and ducts during operation. Unlike the SH type, it uses a V-bolt instead of the housing, which allows it to withstand a dynamic load. Using the coil spring with a static deflection of 25 mm, it maintains the system's natural frequency to 3~5 Hz and using the CR type guide Rubber attached on the top plate, it prevents the high frequency transferred through pipes and ducts from passing into the structure on top of the hanger. In addition, it can be assembled with 60% of the available load using the pre-setting nut to prevent the equipment from moving around by the distortion of the spring, and because the spring is coupled with V-bolt, the spring does not fall apart when moving the mount.

(Option) The hanger rod can be installed using the hole on the top/bottom plates to suspend the equipment.

■ Usage

For high-efficient vibration control of axial, in-line fan, machine rooms, pipes in air-conditioning rooms and ducts

■ Specification

No.	Name of Components	Material	Standard
1	Upper Plate(neoprene coating)	SS400	KS D 3503
2	Lower Plate(neoprene coating)	SS400	KS D 3503
3	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
4	Hanging V-Blot	SS400	-
5	I-Nut	SS400	-

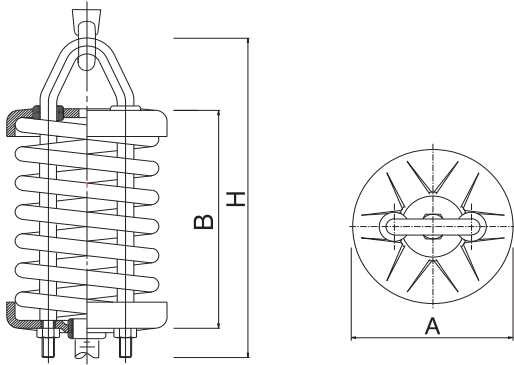
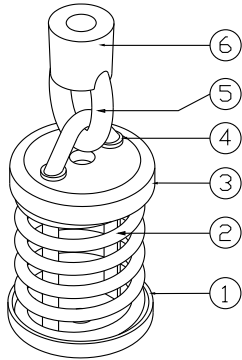
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)					
					A	B	C	H	I-Nut	Hanging Bolt
VH61-A-10	10	0.4	0.36	Pink	89	57	71	160	3/8"	M10
VH61-A-25	25	1	0.40	Yellow						
VH61-A-50	50	2	0.44	Red						
VH61-A-75	75	3	0.46	Black						
VH61-A-100	100	4	0.50	Blue						
VH61-B-150	150	6	1.14	Brown	108	74	98	214	1/2"	M12
VH61-B-200	200	8	1.18	White						
VH61-B-300	300	12	1.32	Orange						
VH61-B-400	400	16	1.58	Pink						

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VH62 Spring Hanger (Deflection : 50mm)

※ The model name of VSH2 product has changed to VH62



■ Features

Though it has the same features and intended purpose as VH62 type, it has a static deflection of 50 mm, which makes it best suitable for pipes and ducts in semiconductor plants. It uses a hanger rod bolt on the upper-spring cap to fix onto equipment and the upper I-nut when installed on a suspended ceiling structure.

(Option) The hanger rod can be installed using the hole on top/bottom plates to suspend the equipment.

■ Usage

- ◆ For high-efficient vibration control of axial, in-line fan, machine rooms, pipes in air-conditioning rooms and ducts
- ◆ For high-efficient vibration control of suspended ceiling deck system in, for example, acoustical laboratories and studios
- ◆ For pipes and ducts installed in semiconductor plants

■ Specification

No.	Name of Components	Material	Standard
1	Lower Plate	SS400	KS D 3503
2	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
3	Upper Spring Cap	SS400	KS D 3503
4	Guide Rubber	CR	KS M 6617
5	Hanging V-Bolt	SS400	-
6	I-Nut	SS400	-

■ Dimension & Selection Guide

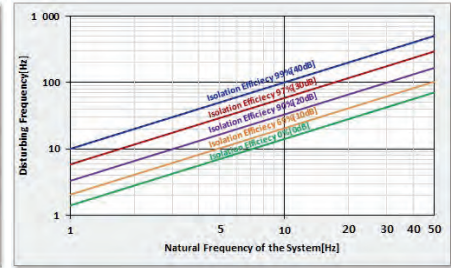
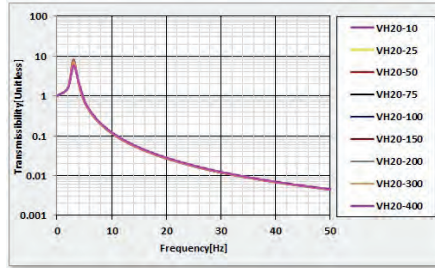
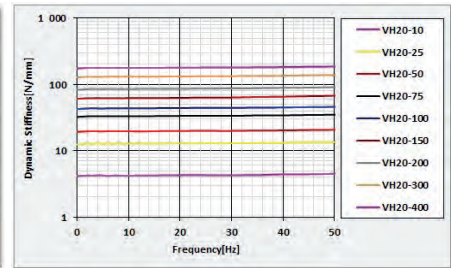
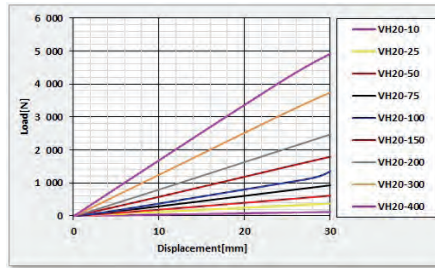
Type	Capacity (kgf)	Spring Constant (kgf/mm)	Weight (kg)	Color	Dimension(mm)				
					A	B	H	I-Nut	Hanging Bolt
VH62-10	10	0.2	1.66	Pink	106	150	202	1/2"	M12
VH62-25	25	0.5	1.80	Yellow					
VH62-50	50	1	2.10	Red					
VH62-75	75	1.5	2.10	Black					
VH62-100	100	2	2.16	Blue					
VH62-150	150	3	2.12	Brown					
VH62-200	200	4	2.16	White					
VH62-300	300	6	2.30	Orange					
VH62-400	400	8	2.70	Pink					
VH62-500	500	10	2.42	Green					
VH62-600	600	12	2.28	Blue					
VH62-750	750	15	2.58	Black					
VH62-1000	1000	20	2.76	Yellow					

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VH20/VH61/VH62 Spring Hanger

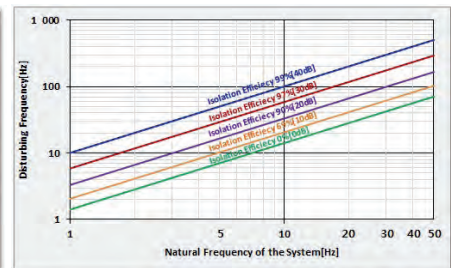
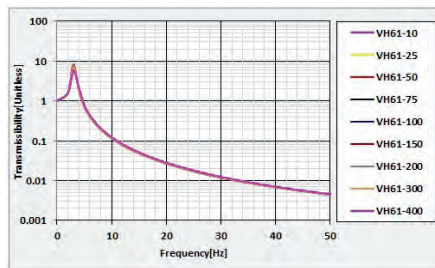
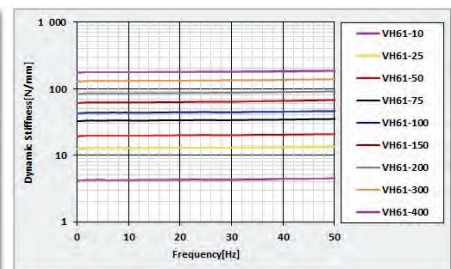
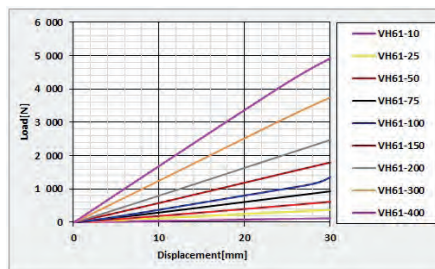
VH20 Test Data

- | | | |
|---|---|--|
| 1 | 2 | 1. Load-Displacement Graph |
| 3 | 4 | 2. Dynamic Stiffness Graph
3. Transmissibility Graph
4. Isolation Efficiency Graph |



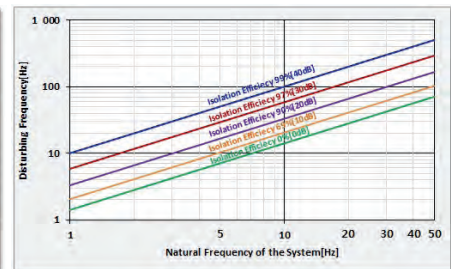
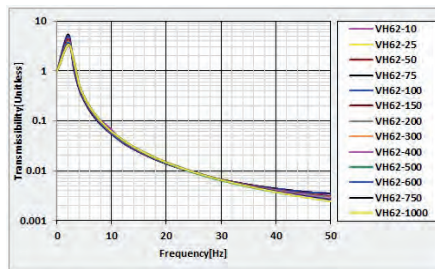
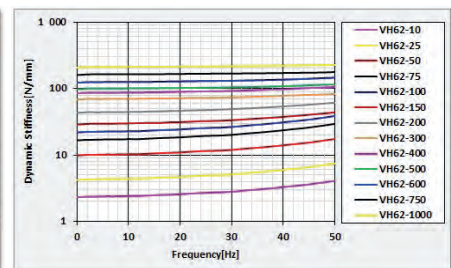
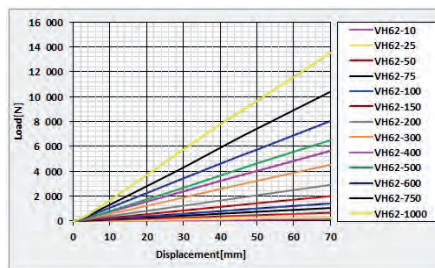
VH61 Test Data

- | | | |
|---|---|--|
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| 3 | 4 | 2. Dynamic Stiffness Graph
3. Transmissibility Graph
4. Isolation Efficiency Graph |



VH62 Test Data

- | | | |
|---|---|--|
| 1 | 2 | 1. Load-Displacement Graph |
| 3 | 4 | 2. Dynamic Stiffness Graph
3. Transmissibility Graph
4. Isolation Efficiency Graph |



RH10 Rubber Hanger (Deflection : 3.5~13mm)

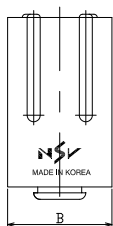
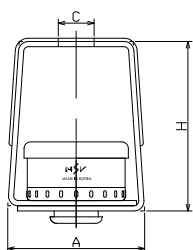
※ The model name of RH product has changed to RH10



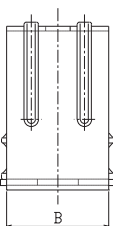
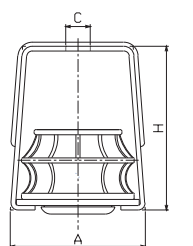
RH10-A, B, C Type



RH10-M Type



RH10-M Type



RH10-A, B, C Type

■ Features

RH10 type anti-vibration rubber hanger prevents the transfer of vibration generated from equipment or its parts to the structure, and its housing is strong enough to stand load transferred and avoid resonance. With the open rubber having a static deflection of 3.5~13 mm, it can maintain the system's natural frequency down to 5~12 Hz.

■ Usage

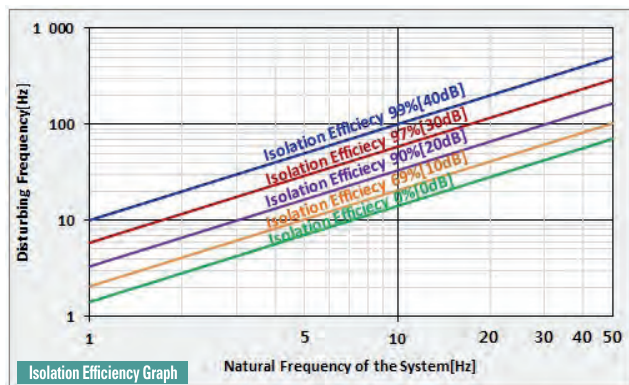
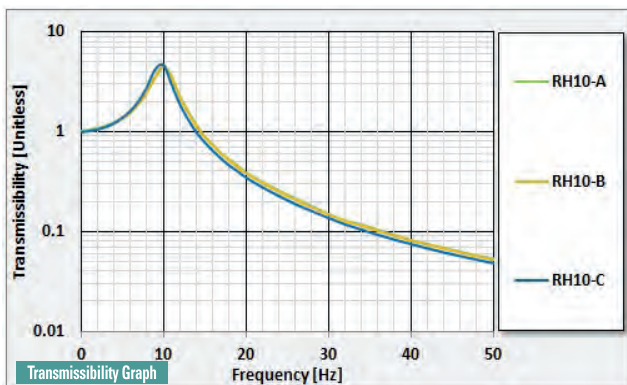
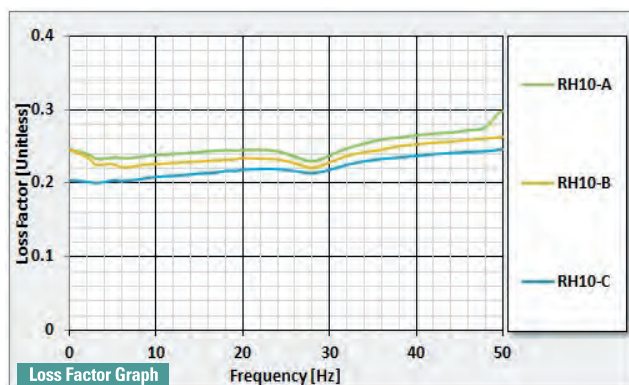
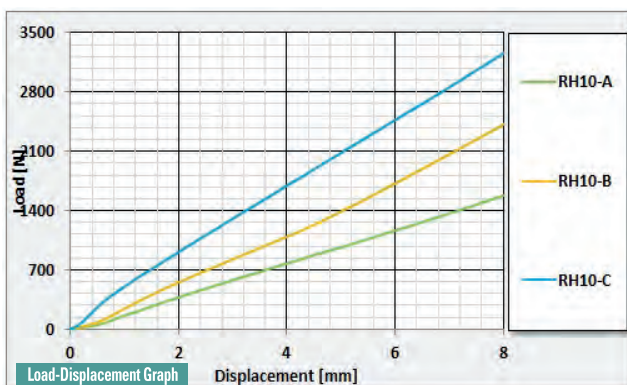
- ◆ For machine rooms, ventilators in air conditioning rooms and ducts
- ◆ For small fan and duct in line fan
- ◆ For structures suspended from the ceiling of, for example, studios and acoustical laboratories
- ◆ For ceiling mounted FCU

■ Dimension & Selection Guide

Type	Capacity (kgf)	Hardness (Hs)	Deflection (mm)	Weight (kg)	Dimension(mm)				
					A	B	C	H	Hanging Bolt
RH10-M	25~50	60±5	3.5	-	42	32	Ø11	52	M10
RH10-A	25~100		3.5~13	0.36	68	50	Ø12	80	M10
RH10-B	150~400		5.0~13	0.76	91	70	Ø14	102	M12
RH10-C	500~750		6.7~13	1.24	105	75	Ø20	120	M16

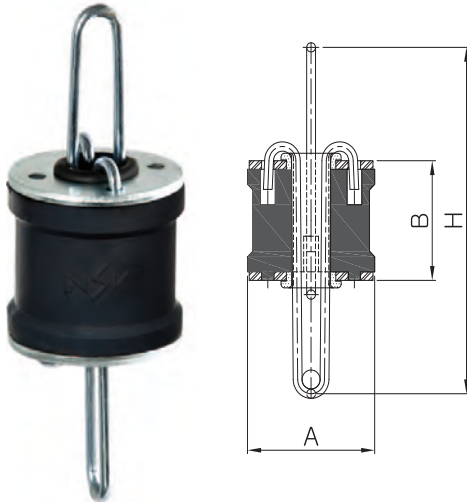
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

■ RH10 Test Data



RH20 Ceiling Rubber Hanger (Deflection : 5mm)

※ The model name of CH product has changed to RH20



■ Features

It is a vibration-control hanger equipped with galvanized steel inside vibration-proof neoprene rubber. It has two wires at the top and bottom, which are used to suspend objects when a bolt and nut are not available. It has a static deflection of 5.0 mm, capable of keeping the natural vibration down to 7 Hz.

■ Usage

- ◆ For machine rooms, small pipes in air-conditioning room and ducts
- ◆ For structures installed on the ceiling of, for example, studio and acoustical laboratory

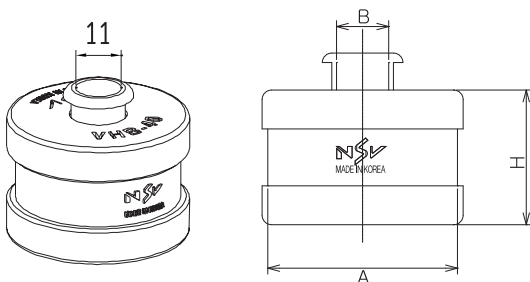
■ Dimension & Selection Guide

Type	Capacity(kgf)	Hardness(Hs)	Weight(kg)	Color(Steel)	Dimension(mm)		
					A	B	H
RH20-50	25~50	50±5	0.06	Silver	35	32	97
RH20-60	45~70	60±5	0.06	Gold			

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

RH30 Rubber Hanger (Deflection : 3.5~5mm)

※ The model name of VHB product has changed to RH30



■ Features

The hanger consists of neoprene vibration-proof rubber body where top and bottom are steel capped. It is mainly used as vibration-proof purpose for small fan and pipe duct and its static displacement is 5mm. It can stand the weight of 100kgf.

■ Usage

- ◆ Vibration-proofing for small fan, duct in line fan
- ◆ Vibration-proofing for ceilings of studio, acoustical laboratory, etc.

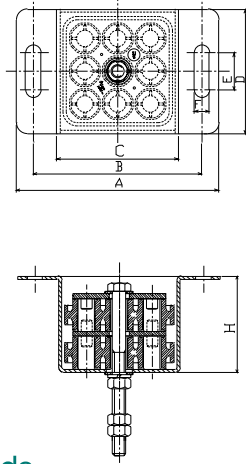
■ Dimension & Selection Guide

Type	Capacity (kgf)	Hardness (Hs)	Deflection (mm)	Dimension(mm)		
				A	B	H
RH30-30	100	60±5	3.5	30	11	18
RH30-40	120		5.0	42		28

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

RH40 Type Rubber Hanger (Deflection : 11mm)

※ The model name of VHM product has changed to RH40



Dimension & Selection Guide

Type	Capacity (kgf)	Deflection (mm)	Dimension(mm)							Level Bolt	
			A	B	C	D	E	F	H		
RH40-400	400	11	185	154	111	114	34	14	88	M20	
RH40-600	600										
RH40-800	800										
RH40-1000	1000		240	210	166	170	34	14	88		M24
RH40-1200	1200										
RH40-1500	1500										
RH40-2000	2000										

(NOTE) The specification and data are subject to change without prior to for improvement of product performance and quality.

Features

RH-40 type anti-vibration spring rubber hanger prevents the transfer of vibration generated from equipment and/or stress resulted from thermal expansion in pipes and ducts during operation. A high-elastic alignment product, SRP with combined features of anti-vibration rubber (multi-axis serviceability, high-frequency isolation, soundproofing and attenuation) and metal spring (low natural frequency) is inserted and the external robust, stable housing is made of stainless steel to prevent corrosion when installed outdoors.

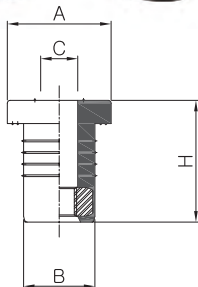
Usage

- ◆ For high-efficient vibration control of jet fan, axial, machine rooms, pipes in air conditioning rooms and ducts
- ◆ For high-efficient vibration control of suspended ceiling deck system in, for example, acoustical laboratories and studios

Specification

No.	Name of Components	Material	Standard
1	Middle Plate	STS 304	KS D 3503
2	SRP Mount	CR	KS M 6617
3	Cover Housing	STS 304	KS D 3503
4	Bottom Plate	STS 304	KS D 3503
5	Hanger Bolt/Nut	STS 304	KS B 3503

NBN Rubber Bushing Nut (Deflection : 3~8mm)



Features

It is used to install equipment that is too small to mount the vibration isolator, and control the vibration of equipment and/or device that causes micro-vibration after being fastened using Bolt and Nut. It is made of anti-vibration neoprene rubber, which seals the joint. Its natural frequency changes according to tightening torque, but it is about 12~15Hz on average. It maintains a vibration isolation efficiency of 67~81% and reduces about 9.5~14.4dB of vibration. (No. of revolution per minute: 1,800 RPM)

Usage

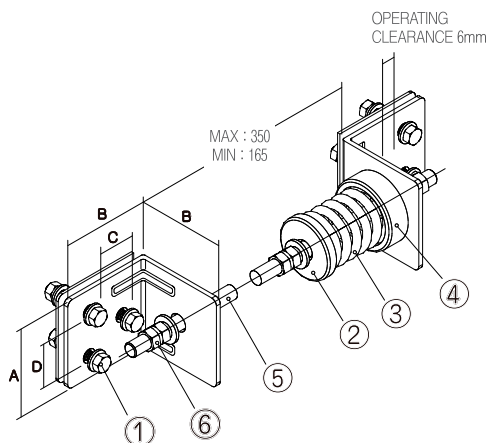
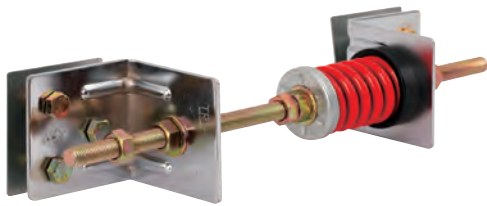
- ◆ Used to fix and control vibration of motors installed on small equipment
- ◆ Used to fix and control vibration of all kinds of pipes, ducts and construction materials
- ◆ Used to fix and control vibration of all kinds of guide signs/posts
- ◆ Used to fix and control vibration of all kinds of lighting
- ◆ Used to fix and control vibration of speakers connected to electronic/audio equipment

Dimension & Selection Guide

Type	Capacity (kgf)	Applied Diamete (kgf)	Hardness (Hs)	NUT	TORQUE (Kg.cm)	Dimension(mm)			
						A	B	C	H
NBN-M3	6	7~7.4	55±5	M3 x 0.5	3~5	9.5	6.9	3.3	12
NBN-M4	7	9~9.4		M4 x 0.7	4~6	11.9	8.9	4.3	15
NBN-M5	10	10~10.4		M5 x 0.8	5~8	14.9	9.9	5.3	18
NBN-M6	15	12.4~12.8		M6 x 1.0	8~10	17.9	12.3	6.4	21
NBN-M8	30	16.4~16.8		M8 x 1.25	10~15	23.9	16.3	8.4	27

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

NTR Thrust Restraint (Deflection : 25mm)



■ Features

NTR, which consists of steel housing, spring, CR type rubber and space rod, is a vibration control device designed to prevent the generation of reactionary force in the direction opposite to air flow when related equipment such as fan and ventilator runs. NTR is preset to 80% of the load capacity in the production stage and users can adjust it up to 6 mm when installing it. It should be installed next to the center of the direction in which the air flows through the duct. Plus, it is easy to distinguish one from another because the springs differ in color depending on their load capacity. In general, NTR is used only when the thrust is more than 5% of the weight of the equipment.

■ Usage

- ◆ Used to prevent thrust on the joint of fan part separating canvas
- ◆ Used to prevent thrust on ventilator(Airfoil, Sirocco, Axial, In-line, etc)

■ Specification

No.	Name of Components	Material	Standard
1	Housing	SS400	KS D 3503
2	Still Cap	SS400	KS D 3503
3	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
4	Neoprene Cup	CR	KS M 6617
5	Threaded Rod	SS400	KS D 3503
6	Nut	SS400	KS B 1002

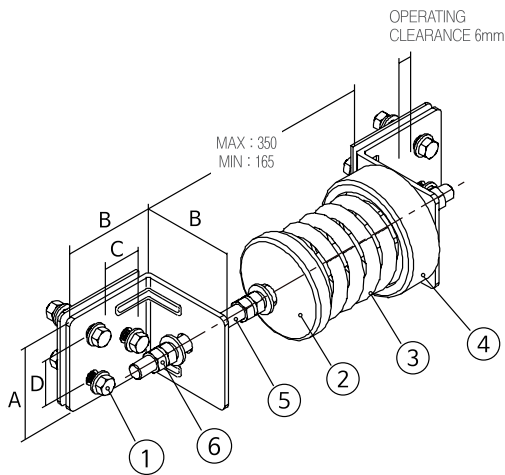
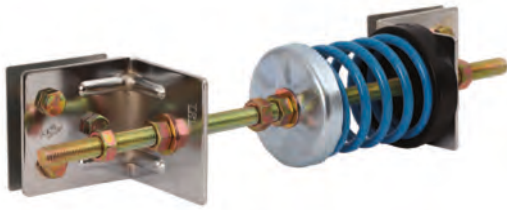


■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Deflection (mm)	Color	Dimension(mm)				
					A	B	C	D	Space Rod
NTR-A-50	50	2	25	Red	70	84	40	40	M12 x 500
NTR-A-75	75	3		Black					
NTR-A-100	100	4		Blue					
NTR-B-150	150	6	25	Brown	70	84	40	40	M16 x 500
NTR-B-200	200	8		White					
NTR-B-300	300	12		Orange					
NTR-B-400	400	16		Pink					
NTR-B-500	500	20		Green					
NTR-B-600	600	24		Blue					
NTR-B-750	750	30		Black					
NTR-B-1000	1000	40		Yellow					

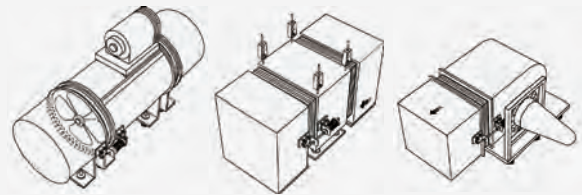
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

NTR2 Thrust Restraint (Deflection : 50mm)



■ Features

NTR, which consists of steel housing, spring, CR type rubber and space rod, is a vibration control device designed to prevent the generation of reactionary force in the direction opposite to air flow when related equipment such as fan and ventilator runs. NTR is preset to 80% of the load capacity in the production stage and users can adjust it up to 6 mm when installing it. It should be installed next to the center of the direction in which the air flows through the duct. Plus, it is easy to distinguish one from another because the springs differ in color depending on their load capacity. In general, NTR is used only when the thrust is more than 5% of the weight of the equipment.



■ Usage

- ◆ Used to prevent thrust on the joint of fan part separating canvas
- ◆ Used to prevent thrust on ventilator(Airfoil, Sirocco, Axial, In-line, etc)

■ Specification

No.	Name of Components	Material	Standard
1	Housing	SS400	KS D 3503
2	Still Cap	SS400	KS D 3503
3	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
4	Neoprene Cup	CR	KS M 6617
5	Threaded Rod	SS400	KS D 3503
6	Nut	SS400	KS B 1002

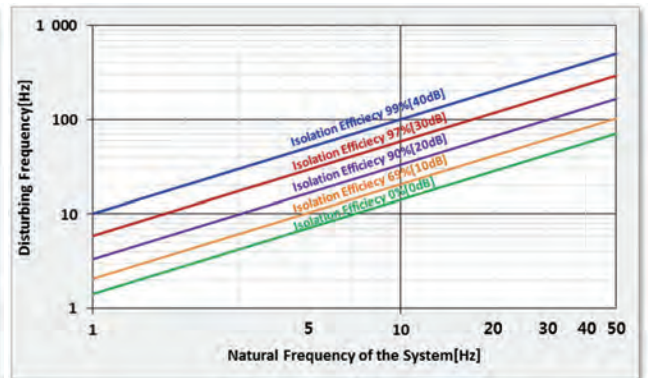
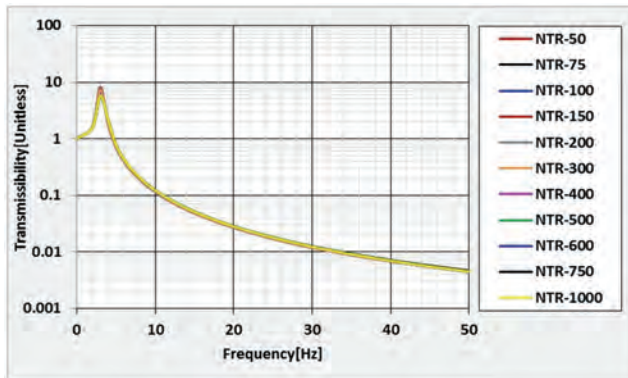
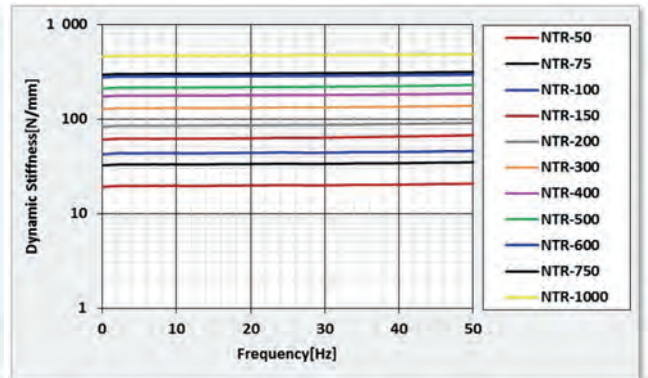
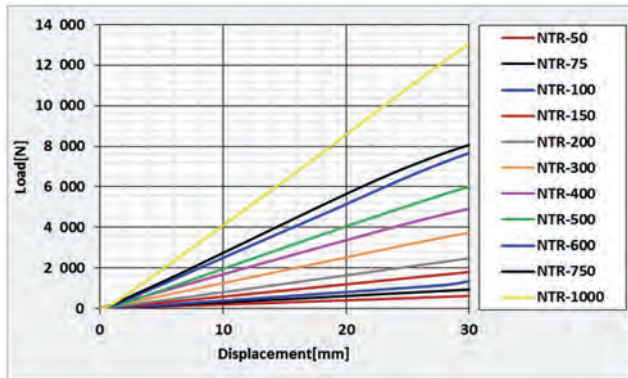
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Deflection (mm)	Color	Dimension(mm)				
					A	B	C	H	Space Rod
NTR2-50	50	1	50	Red	100	103	40	50	M16 x 500
NTR2-75	75	1.5		Black					
NTR2-100	100	2		Blue					
NTR2-150	150	3		Brown					
NTR2-200	200	4		White					
NTR2-300	300	6		Orange					
NTR2-400	400	8		Pink					
NTR2-500	500	10		Green					
NTR2-600	600	12		Blue					
NTR2-750	750	15		Black					
NTR2-1000	1000	20		Yellow					

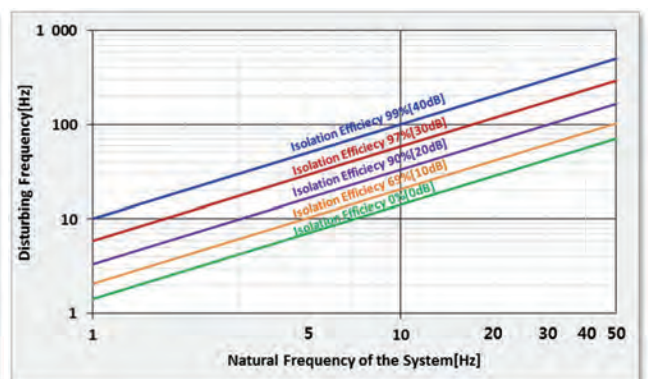
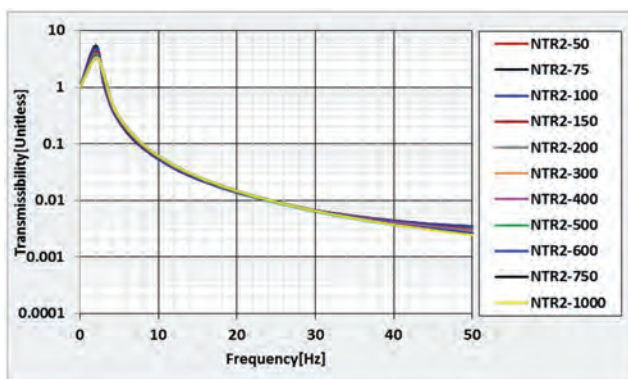
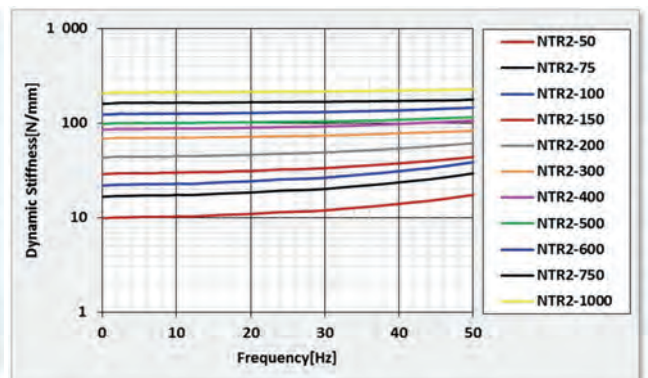
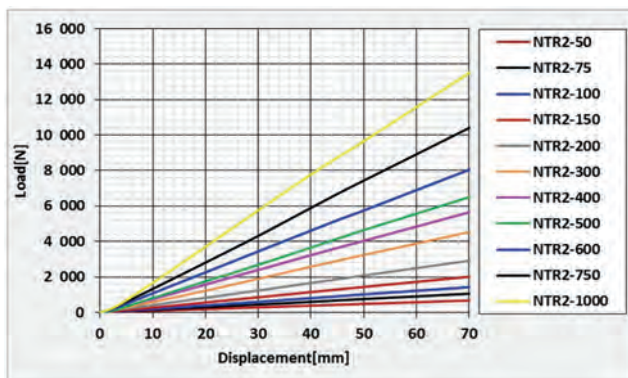
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

NTR/NTR2 Thrust Restraint

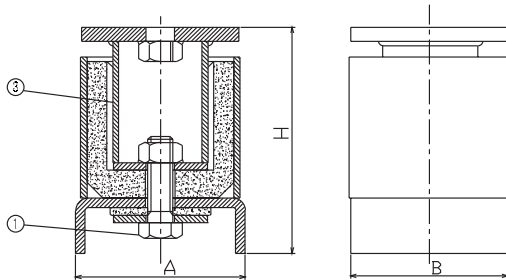
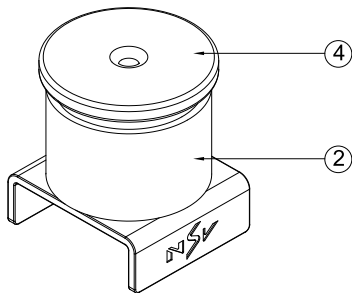
NTR Test Data



NTR2 Test Data



RPA Pipe Anchor & Guide (Deflection : 3-9mm)



■ Features

With a highly-elastic resilient element inside the steel housing, the product is used as a guide to reduce the stress generated by thermal expansion between floors during the expansion and contraction of vertical pipes and as an anchor to isolate structure-borne noise in both vertical and horizontal directions that has resulted from changes in the fluid pressure. Though the anchor and guide can reduce the amount of noise transferred, they are not elastic enough to isolate the vibration. In such a case, the spring isolated riser system is used to isolate noise as well as vibration. To use the product as a guide, the SRM anti-vibration rubber besides RPA type anchor can be used.

■ Usage

For the anchor and guide used to isolate structure-borne noise from vertical pipe.

■ Specification

No.	Name of Components	Material	Standard
1	Connection Bolt	SS400	KS B 1002
2	Lower Housing	SS400	KS D 3503
3	Resilient Element	CR	KS M 6617
4	Upper Housing	SPCD	KS D 3512

■ Dimension & Selection Guide

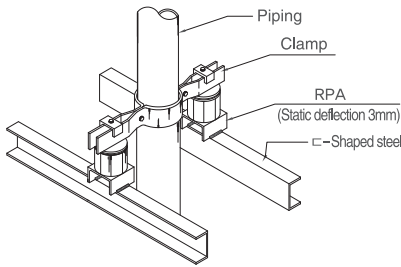
Type	Capacity (kgf)	Deflection (mm)	Dimension(mm)			
			A	B	H	Setting Bolt
RPA-75	250	3	83	75	97	M12
RPA-200	1500	5	108	100	122	M16
RPA-350	6000	7	150	140	162	M16
RPA-600	14000	7	230	216	230	M20
RPA-800	22000	9	280	270	263	M24

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

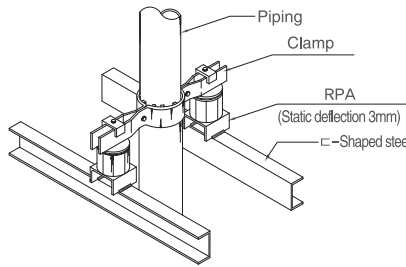
■ Installation Features



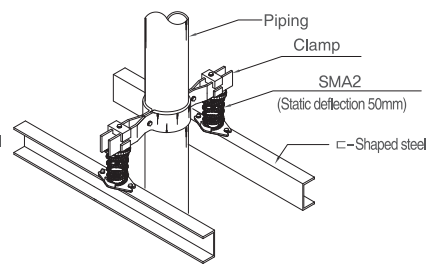
RPA Pipe Anchor & Guide (Deflection : 3~9mm)



Detailed drawing of pipe anchor

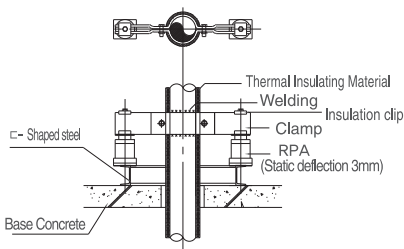


Detailed drawing of pipe guide

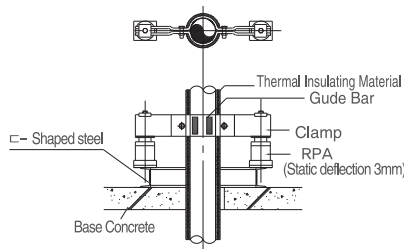


Detailed drawing of pipe spring

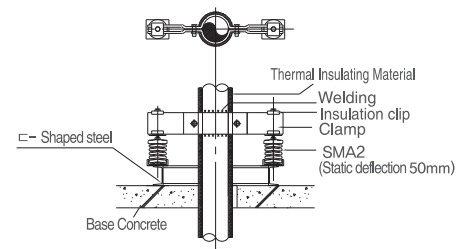
INSTALLATION DETAIL



Detailed drawing of pipe anchor



Detailed drawing of pipe guide



Detailed drawing of pipe spring

< Note >

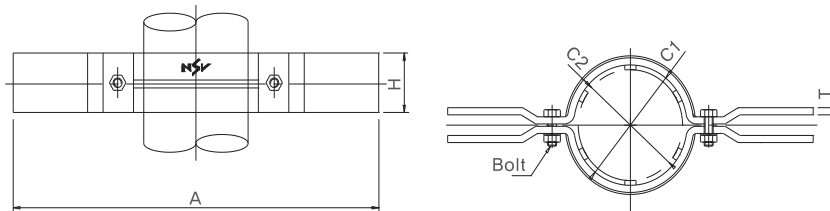
- Ⓐ: STRAIGHT PIPE: The length between a Guide and Guide D(m)
- Ⓑ: OFFSET PIPE: The length between a Anchor and Guide D(m)
- Ⓒ: The length between a Guide and Expansion Joint D(m)
- Ⓓ: The length between the first Guide and the second Guide D(m)

RPA Anchor & Guide Selection

Pipe diameter (A)	Anchor Recommendation Size				GUIDE Recommendation Size								
	EXPANSION THRUST		OFFSET THRUST	GUIDE SIZE	STRAIGHT PIPE		OFFSET PIPE		EXPANSION JOINT				
	12Kg/ cm ² 이하	12~24Kg/ cm ²	OFFSET(m)	Size	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Below 12Kg/ cm ²	12~24Kg/ cm ²			
25	RPA 75	RPA 75	0.20	RPA 75	RPA 75	② 12	① 7	0.2	①	0.6	3.6	①	3.6
32	75	75	0.25	75	75	12	7	0.2	①	0.6	3.6	①	3.6
40	75	75	0.27	75	75	12	7	0.25	①	0.9	3.6	①	3.6
50	75	75	0.29	75	75	② 12	② 7	0.25	②	0.9	3.6	②	3.6
65	RPA 75	RPA 200	0.33	RPA 75	RPA 75	12	9	0.3	①	1.0	3.6	①	3.6
80	75	200	0.37	75	75	12	11	0.3	①	1.0	5.1	①	4.2
100	200	200	0.42	75	75	12	11	0.4	①	1.4	7.5	①	5.7
125	200	200	0.45	75	75	② 15	② 11	0.6	②	2.0	9.0	②	6.9
150	RPA 200	RPA 350	0.50	RPA 200	RPA 200	15	11	0.6	①	2.0	11.1	①	8.1
200	350	350	0.56	200	200	15	15	0.76	①	2.8	13.5	①	9.9
250	350	350	0.64	200	200	② 18	② 18	1.0	②	3.6	17.4	②	12.6
300	350	600	0.69	350	200	② 22	② 22	1.2	②	4.3	18.0	②	14.4
350	RPA 350	RPA 600	0.72	RPA 350	RPA 350	26	26	1.4	②	5.0	21.0	②	15.3
400	350	600	0.78	350	350	26	26	1.6	②	5.7	23.0	②	16.8
450	600	800	0.83	350	350	26	26	1.8	②	6.4	26.0	②	18.3
500	600	800	0.87	350	350	② 36	② 26	2.0	②	7.1	27.0	②	19.5
600	RPA 800	-	-	RPA 600	RPA 350	36	36	2.4	①	8.5	31.0	①	22.5
650	800	Special type	-	600	600	36	36	3.0	①	10.0	32.0	①	25.5
700	800	-	-	600	600	36	36	3.0	①	10.0	32.0	①	25.5
750	800	-	-	600	600	② 36	② 36	3.0	①	10.0	32.0	①	25.5

CLAMP Riser Pipe Clamp

■ STEEL/STS CLAMP



■ CARBON STEEL CLAMP ANCHOR SPRING

Type	A	C1	T	H	Bolt
Φ25	400	Φ34.0	4.5	38	M10
Φ32		Φ42.7			
Φ40		Φ48.6			
Φ50	450	Φ60.5	6	50	M10
Φ65		Φ76.3			
Φ80		Φ89.1			
Φ100	550	Φ114.3	9	75	M12
Φ125		Φ139.8			
Φ150		Φ165.2			
Φ200	650	Φ216.3	9	75	M12
Φ250		Φ267.4		90	
Φ300	850	Φ318.5	9	90	M12
Φ350		Φ355.6			
Φ400	1000	Φ406.4	12	100	M22
Φ600	1200	Φ609.6	19	125	M24
Φ800	1450	Φ812.8	25	200	M36

■ CARBON STEEL CLAMP GUIDE

Type	A	C1	T	H	Bolt	Guide Bar
Φ25	400	Φ43.0	4.5	38	M10	20 x 38 x 4.5T(4EA)
Φ32		Φ51.7				20 x 38 x 4.5T(4EA)
Φ40		Φ57.6				20 x 38 x 4.5T(4EA)
Φ50	450	Φ69.5	6	50	M10	20 x 50 x 4.5T(4EA)
Φ65		Φ85.3				20 x 50 x 4.5T(4EA)
Φ80		Φ98.1				20 x 50 x 4.5T(4EA)
Φ100	550	Φ126.3	9	75	M12	20 x 75 x 6T(6EA)
Φ125		Φ141.8				20 x 75 x 6T(6EA)
Φ150		Φ177.2				20 x 75 x 6T(6EA)
Φ200	650	Φ228.3	9	75	M12	20 x 90 x 6T(8EA)
Φ250		Φ279.4		90		20 x 90 x 6T(8EA)
Φ300	850	Φ330.5	9	90	M12	20 x 90 x 6T(8EA)
Φ350		Φ367.6				20 x 90 x 6T(8EA)
Φ400	1000	Φ426.4	12	100	M22	40 x 95 x 10T(8EA)
Φ600	1200	Φ629.6	19	125	M24	40 x 120 x 10T(10EA)
Φ800	1450	Φ832.8	25	200	M36	40 x 198 x 12T(12EA)

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

■ COPPER CLAMP



■ COPPER CLAMP ANCHOR, SPRING

Type	A	C1	T	H	Bolt
Φ25	400	Φ28.58	4.5	38	M10
Φ32		Φ34.92			M10
Φ40		Φ41.28			M10
Φ50	450	Φ53.98	6	50	M10
Φ65		Φ66.68			M10
Φ80		Φ79.38			M10
Φ100	550	Φ104.78	8	75	M12
Φ125		Φ130.18			M12
Φ150		Φ155.58			M12
Φ200	650	Φ206.38	8	75	M12

■ Installation Features



CLAMP Riser Pipe Clamp

CLAMPING Installation Features

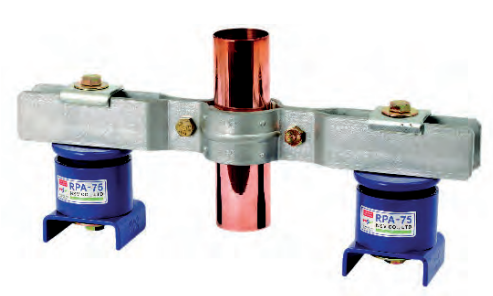
COPPER PIPE



WITH ANCHOR(Before welding)



WITH SPRING(Before welding)



WITH GUIDE



WITH SPRING RUBBER MOUNT(Before welding)

CARBON STEEL/STS PIPE



WITH ANCHOR(Before welding)



WITH SPRING(Before welding)



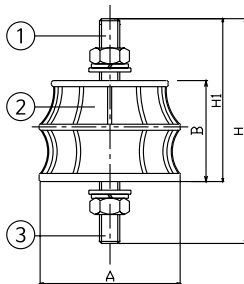
WITH GUIDE



WITH SPRING RUBBER MOUNT(Before welding)

VB-1000 Rubber Mount (Deflection : 5.0~9.0mm)

※ The model name of VB product has changed to VB-1000



■ Features

As a Bobbin (cylindrical) mount, it has the reinforcing of a steel plate on the top and bottom. It is excellent in reducing vibration and structure-borne noise resulting from impact. It is made of neoprene synthetic rubber, having outstanding oil and ozone resistance, and with the fixing rod on the top and bottom, it can be easily fastened using a nut.

■ Usage

- ◆ For small pumps, small ventilators, package air conditioning systems and plant rooms
- ◆ For all kinds of industrial machines and equipment

■ Specification

No.	Name of Components	Material	Standard
1	Bolt(upper)	SS400	KS B 1002
2	Rubber Mount	CR	KS M 6617
3	Bolt(lower)	SS400	KS B 1002

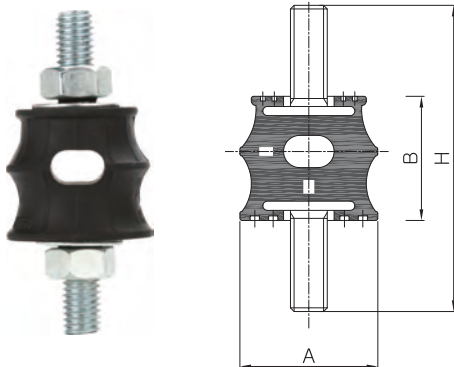
■ Dimension & Selection Guide

Type	Capacity(kgf)	Hardness(Hs)	Deflection(mm)	Dimension(mm)				
				A	B	H	H1	Bolt
VB-1040	50	60±5	5.0	40	35	86	60	M8 x 30
VB-1050	70			50	40	92	65	M8 x 30
VB-1060	100			60	40	101	70	M10 x 35
VB-1070	180		7.0	70	50	111	80	M10 x 35
VB-1080	300			80	50	111	80	M10 x 35
VB-1100	500			100	55	124	90	M12 x 45
VB-1120	800		9.0	120	55	132	94	M16 x 50
VB-1150	1000			150	60	150	105	M16 x 55

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VB-1030H Rubber Oval Mount (Deflection : 5.0~9.0mm)

※ The model name of VBO-30 product has changed to VB-1030H



■ Features

The VB-1030H is a rubber mount with an increased static deflection and Oval hole at the center to maintain the stable operation of the equipment against horizontal vibration. It has the hardness of 55±5 and with the M8 bolt, it can load up to 25kgf.

■ Usage

- ◆ For small pumps and small ventilators
- ◆ For small motors and measurement equipment

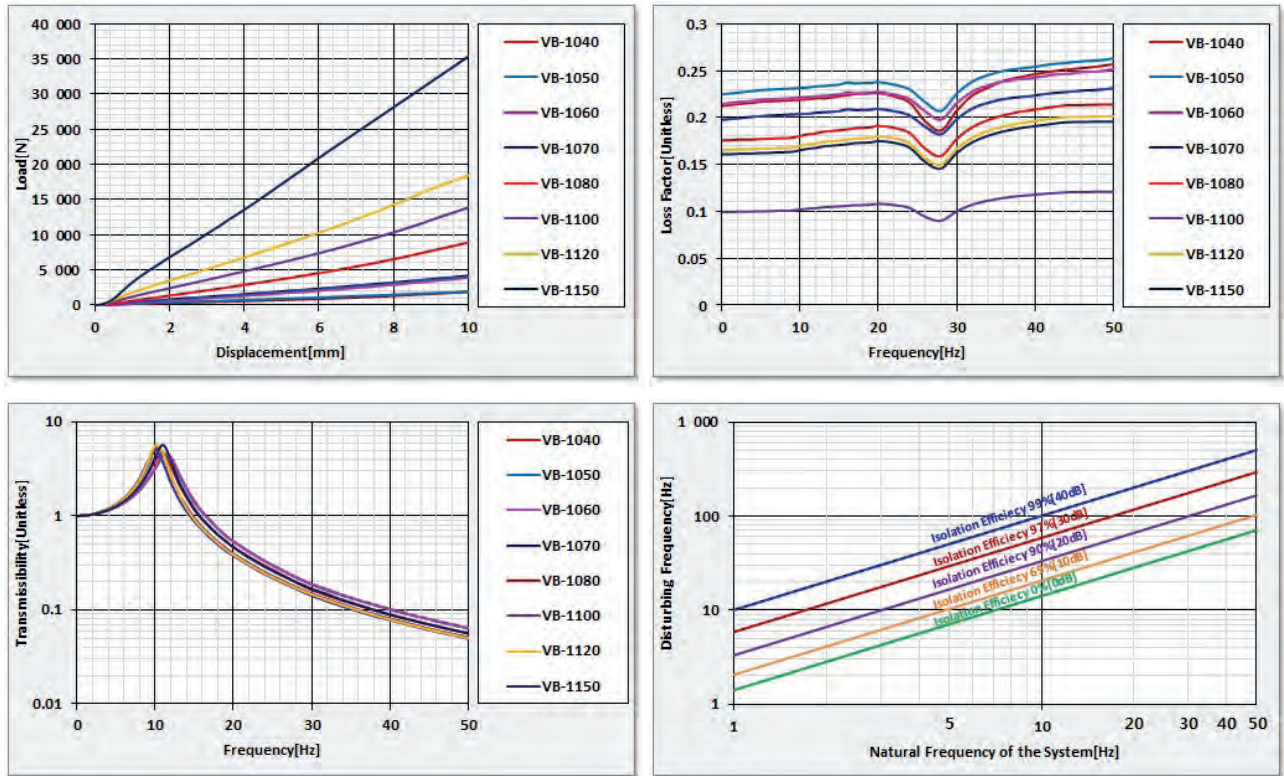
■ Dimension & Selection Guide

Type	Capacity(kgf)	Hardness(Hs)	Deflection(mm)	Dimension(mm)			
				A	B	H	Bolt
VB-1030H	30	60±5	5	30	27	66	M8 x 30

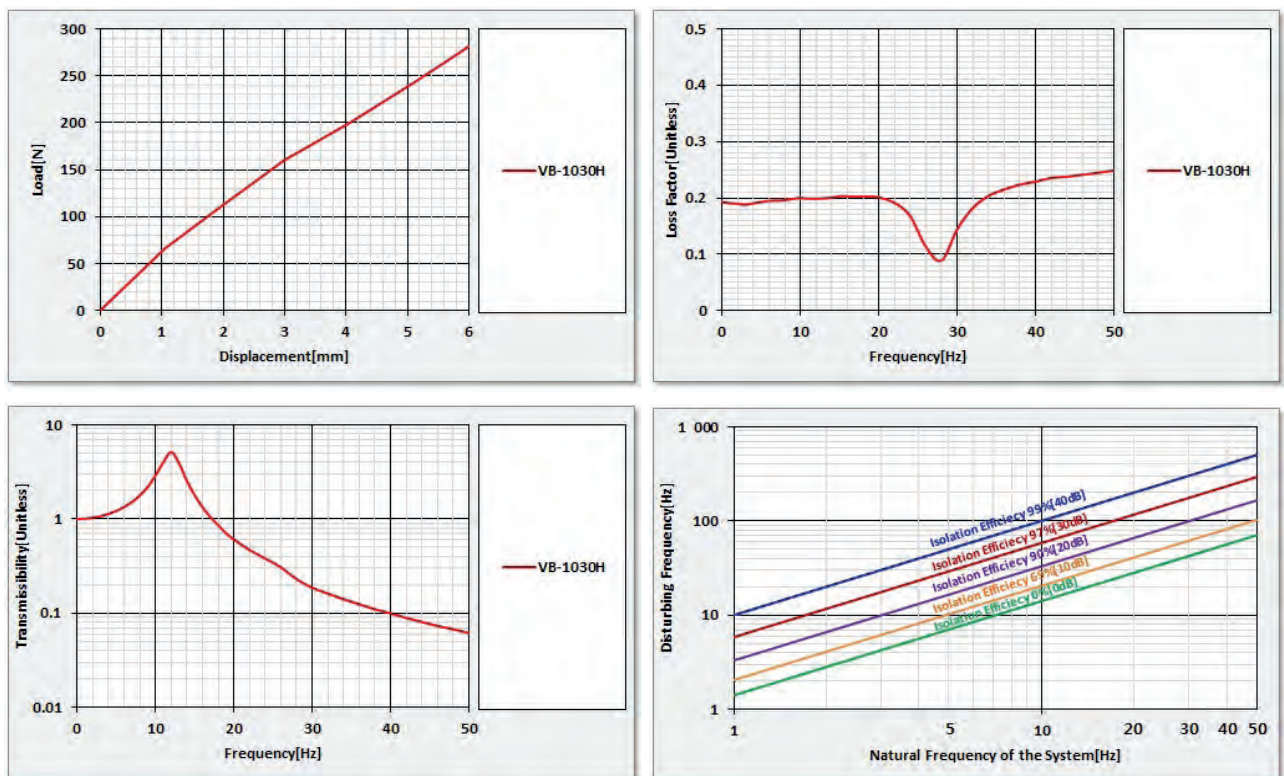
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VB-1000/VB-1030H Rubber Mount

■ VB-1000 Test Data

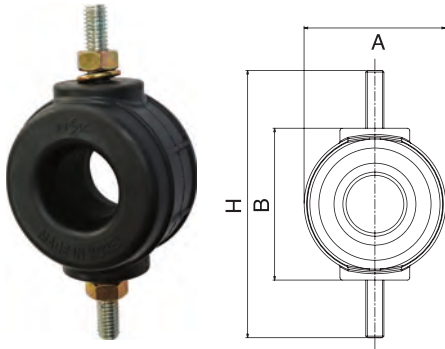


■ VB-1030H Test Data



VB-2000 Rubber Mount (Deflection : 11~20mm)

※ The model name of VO product has changed to VB-2000



■ Features

For VB-2000 rubber mount product, Oval hole is inserted into its center, to increase static displacement for light load, and to maintain stable transformation against horizontal vibration. Hardness of rubber mount is 60 ± 5 , and is manufactured using neoprene synthetic rubber with excellent oil resistance and ozone-proof features.

■ Usage

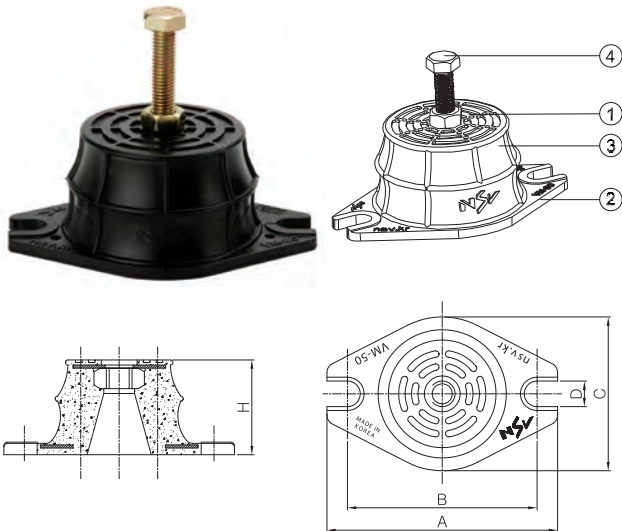
- ◆ Mini-pump, mini air blower dust protection
- ◆ Small sized motor and measuring equipment dust protection

■ Dimension & Selection Guide

Type	Capacity(kgf)	Spring Constant(kgf/mm)	Deflection(mm)	Dimension(mm)			
				A	B	H	Level Bolt
VB-2025	10	0.9	11	25	26	49	M5 x 15
VB-2035	16.7	1	17	34	38	61	M5 x 15
VB-2045	33.9	1.7	20	44	50	85	M6 x 20

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VM-1000 Rubber Mount (Deflection : 6~8mm)



■ Features

A VM-1000 mount is light, small and easy to install, so it can be used in high displacements. Plus, it has a wide application because it is designed to ensure structural stability. With a fixing nut inside the center of the neoprene rubber mount and steel plate on the top and bottom, it can be securely anchored to the ground.

■ Specification

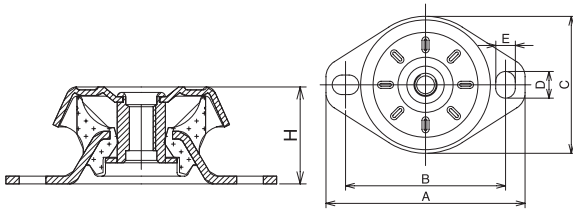
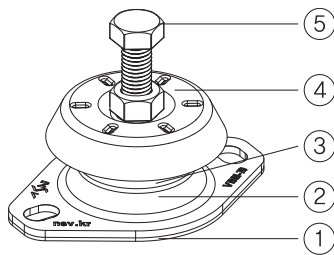
No.	Name of Components	Material	Standard
1	Upper Housing	SS400	KS D 3503
2	Lower Plate	SS400	KS D 3503
3	Body	CR	KS M 6617
4	Level Bolt	SS400	KS B 1002

■ Dimension & Selection Guide

Type	Capacity(kgf)	Hardness(Hs)	Deflection(mm)	Weight(kg)	Dimension(mm)					
					A	B	C	D	H	Level Bolt
VM-1040	60	60±5	6	0.18	75	60	46	8	35	M8
VM-1050	80		6	0.21	90	74	60	10	40	M10
VM-1060	120		6	0.31	113	90	69	10	45	M10
VM-1070	150		6	0.34	130	105	81	12	50	M10
VM-1080	300		8	0.42	130	110	90	12	50	M10
VM-1100	600		8	1.78	169	140	115	13	60	M12

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VM-2000 Rubber Mount(Deflection : 8mm)



■ Features

VM-2000 mount is a vibration isolator to easily control multi-axial vibration. Its inside is made of neoprene rubber to control excessive movement. At the center of rubber mounts there is a solid fixation nut, and the body was made of steel plate to fix firmly to the floor.

■ Specification

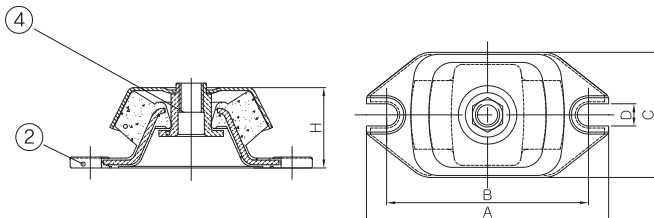
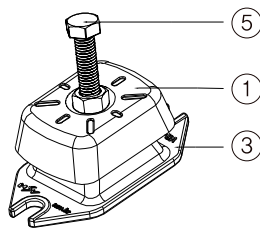
No.	Name of Components	Material	Standard
1	Non Skid Pad	CR	KS M 6617
2	Lower Housing	SS400	KS D 3503
3	Body	CR	KS M 6617
4	Upper Housing	SS400	KS D 3503
5	Level Bolt	SS400	KS B 1002

■ Dimension & Selection Guide

Type	Capacity (kgf)	Hardness (Hs)	Deflection (mm)	Weight (kg)	Dimension(mm)						
					A	B	C	D	E	H	Level Bolt
VM-2070	100	60±5	6	0.34	112	90	77	15	11	40	M12
VM-2080	300			0.73	135	110	90	17	13	45	M12
VM-2100	500			1.22	164	135	105	21	16	50	M16
VM-2120	1000			1.56	190	161	128	21	16	55	M16
VM-2150	1500			2.18	200	160	150	110	18	60	M16
VM-2180	2000			2.55	228	186	184	142	18	70	M16

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VM-3000 Rubber Mount(Deflection : 6mm)



■ Features

A VM-3000 mount is capable of controlling vibration in multi-axis directions. The top stainless steel cap prevents a distortion of the vibration isolator by oil and water, and moreover, neoprene rubber is used inside to control excessive movement. Plus, it can be firmly fixed to the ground with the fixing nut inside the center of the neoprene rubber mount and steel plate on top and bottom.

■ Specification

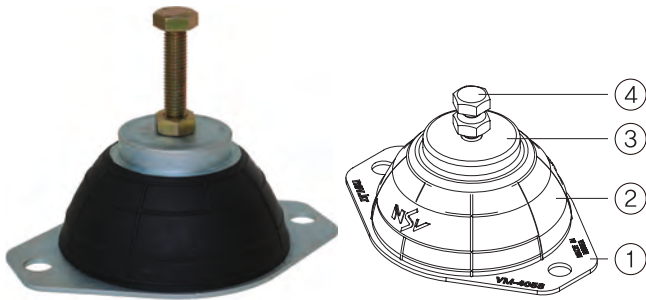
No.	Name of Components	Material	Standard
1	Upper Housing	STS 304	KS D 3698
2	Lower Plate	SS400	KS D 3503
3	Body (Rubber)	CR	KS M 6617
4	Fix Nut	SS400	KS D 3503
5	Lever Bolt	SS400	KS B 1002

■ Dimension & Selection Guide

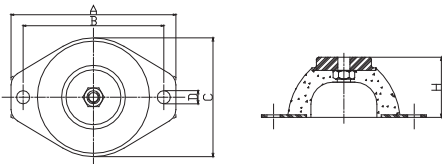
Type	Capacity(kgf)	Hardness(Hs)	Weight(kg)	Dimension(mm)					
				A	B	C	D	H	Level Bolt
VM-3060	100	60±5	0.24	120	100	62	11	41	M12
VM-3070	300		0.72	150	126	78	13	50	M12
VM-3090	500		1.80	180	150	94	16	60	M16
VM-3110	700		2.45	226	189	118	19	65	M16

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

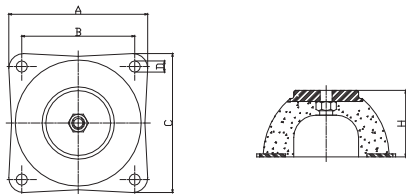
VM-4000 Rubber Mount (Deflection : 6~16mm)



VM-4053
VM-4058



VM-4078
VM-4100



■ Features

VM-4000 mounts is specifically designde to give large deflection at low loads. Although the mount design allows high deflection, the mountings are compact in weigh and easy to install. Provides passive vibration isolation on electronic instruments, measuring equipment and test cells.

■ Specification

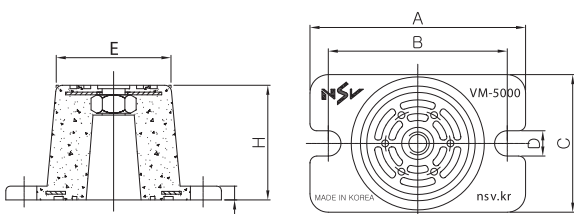
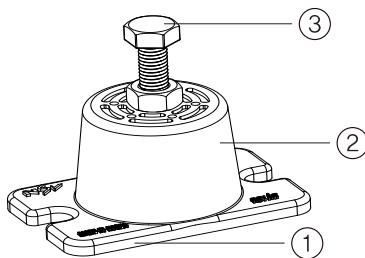
No.	Name of Components	Material	Standard
1	Lower Plate	SS400	KS D 3503
2	Body	CR	KS M 6617
3	Upper Plate	SS400	KS D 3503
4	Level Bolt	SS400	KS B 1002

■ Dimension & Selection Guide

Type	Capacity (kgf)	Hardness (Hs)	Weight (kg)	Dimension(mm)					
				A	B	C	D	H	Level Bolt
VM-4053	80	45	6	138	118	99	11	46.7	M12
VM-4058	100		9	150	128	108	12	54.7	M12
VM-4078	300		12	150	122	150	12	71.8	M14
VM-4100	500		16	200	160	200	13	93.8	M18

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VM-5000 Rubber Mount (Deflection : 15mm)



■ Features

It is a mount with top and bottom reinforcing plates made of CR (neoprene) type synthetic rubber having excellent oil and ozone resistance. A round-shaped rib line is on the top and bottom of the mount to prevent slipping from the equipment and the guide hole for anchoring is on the base plate for easier installation. It is simple, but has the largest static deflection, which makes it the most efficient anti-vibration mount with a wide range of applications.

■ Specification

No.	Name of Components	Material	Standard
1	Base Plate	SS400	KS D 3503
		CR	KS M 6617
2	Body	CR	KS M 6617
3	Level Bolt	SS400	KS B 1002

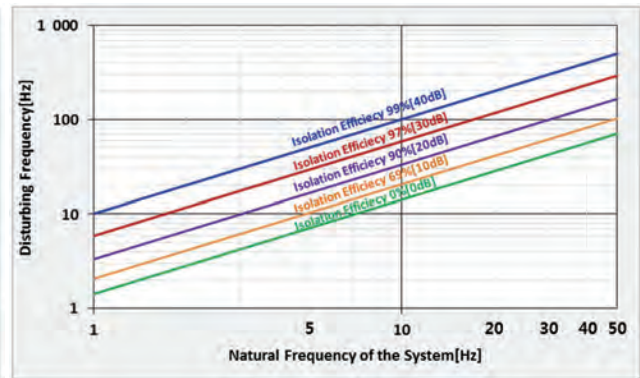
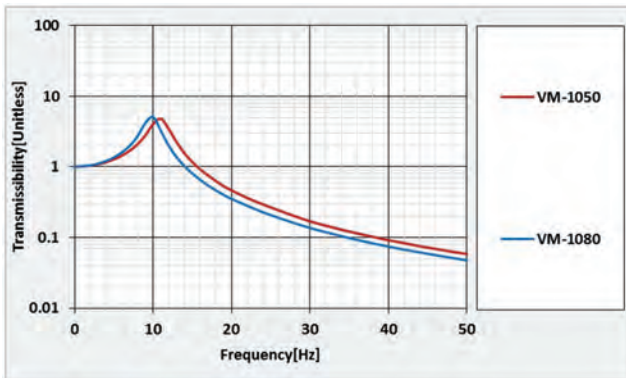
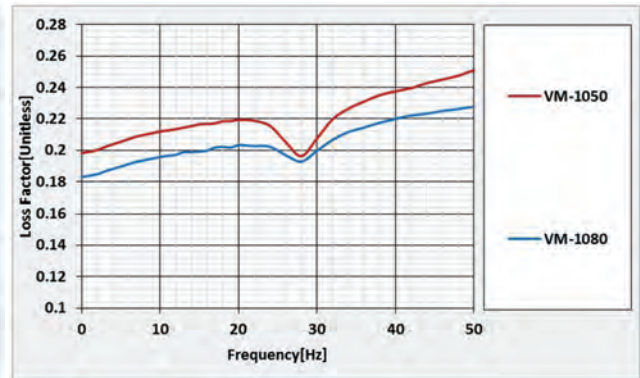
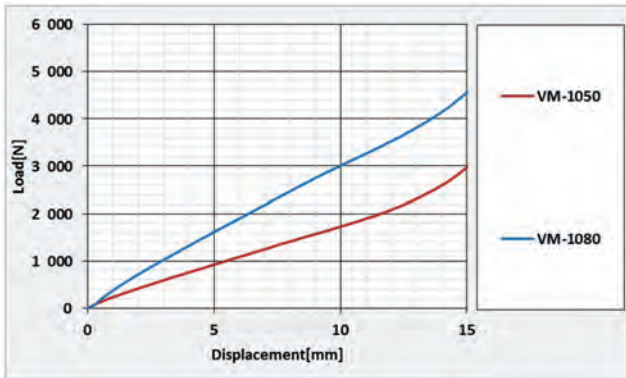
■ Dimension & Selection Guide

Type	Capacity (kgf)	Hardness (Hs)	Spring Constant (kg/mm)	Weight (kg)	Dimension(mm)						
					A	B	C	D	E	H	Level Bolt
VM-5050	300	60±5	20	0.26	94	78	60	11	50	46	M10
VM-5065	500		34	0.52	122	102	82	13	66	60	M12
VM-5085	1000		67	0.84	150	128	104	13	87	65	M12
VM-5115	2000		133	1.54	188	164	130	14	114	68	M12

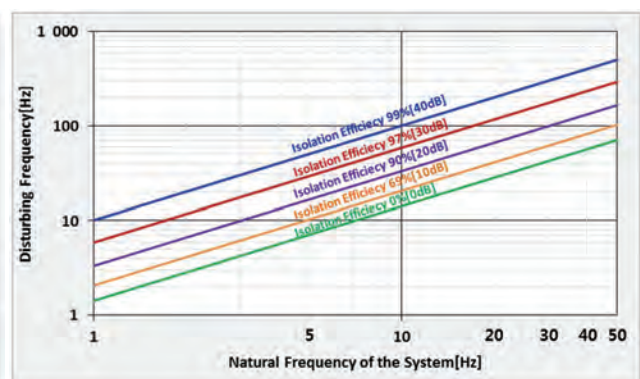
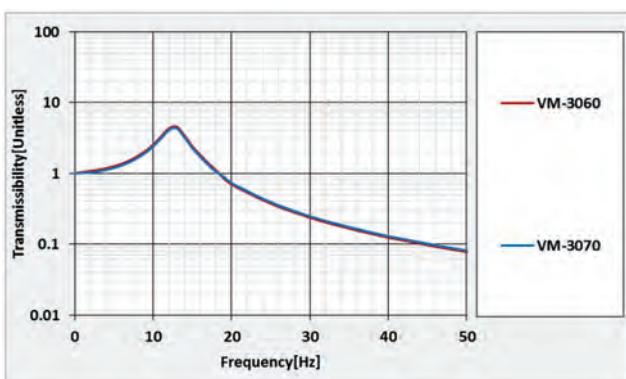
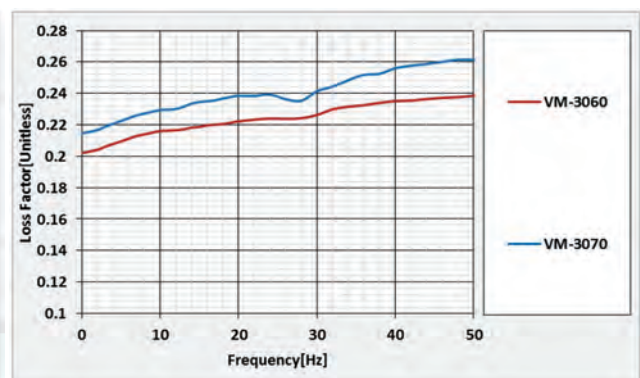
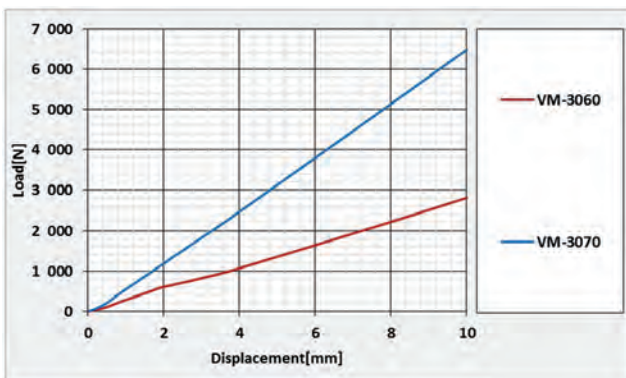
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VM-1000/VM-3000 Rubber Mount

VM-1000 Test Data

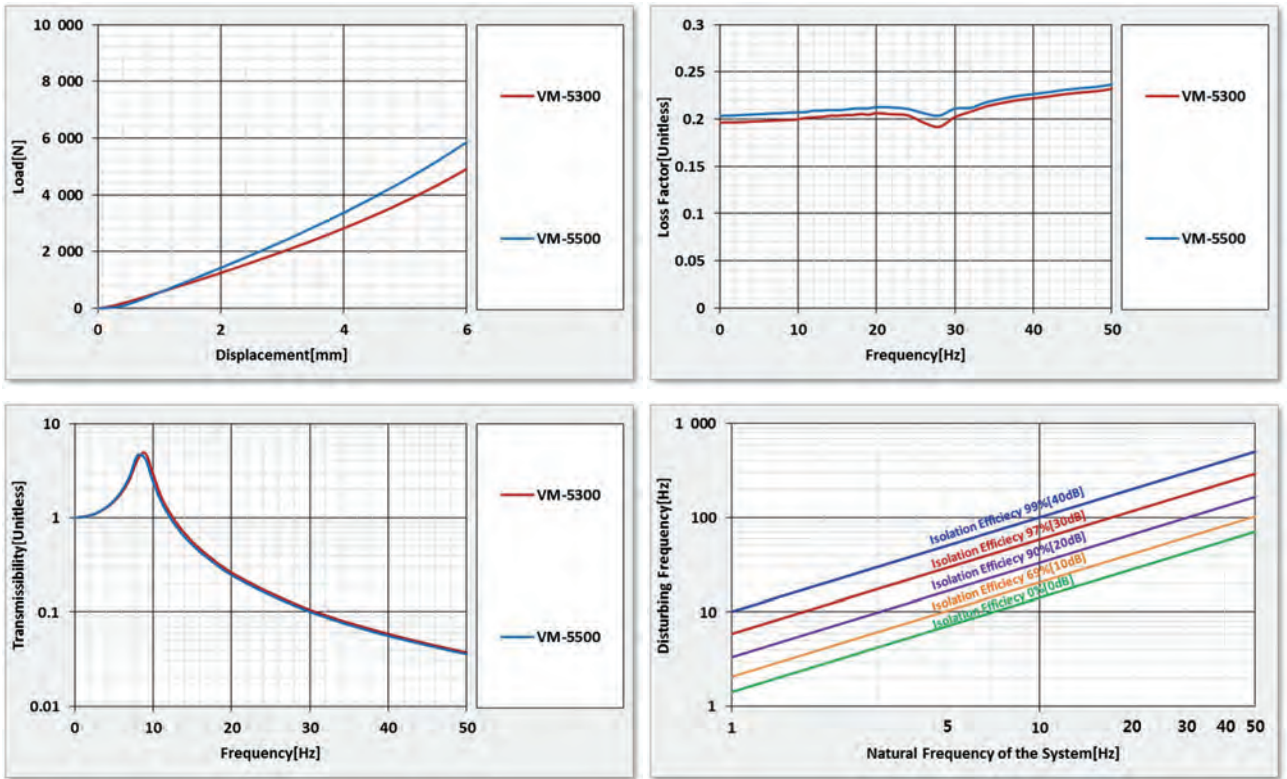


VM-3000 Test Data



VM-5000 Rubber Mount

VM-5000 Test Data



Explanation(Commonness)

1. Vibration Transmissibility(T_r)

Vibration Transmissibility is the amplitude ratio of Output to Input.

$$T_r = \frac{\text{Output Amplitude}}{\text{Input Amplitude}} = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2} \cdot \eta = \frac{\text{Disturbing Frequency of the equipment}}{\text{Natural Frequency of the Isolator (Damping}(c) = 0)}$$

2. Natural Frequency(F_n) of Vibration Isolation System

The mass and spring stiffness dictate a natural frequency of the system.

$$F_n = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$$

3. Isolation Efficiency(E)

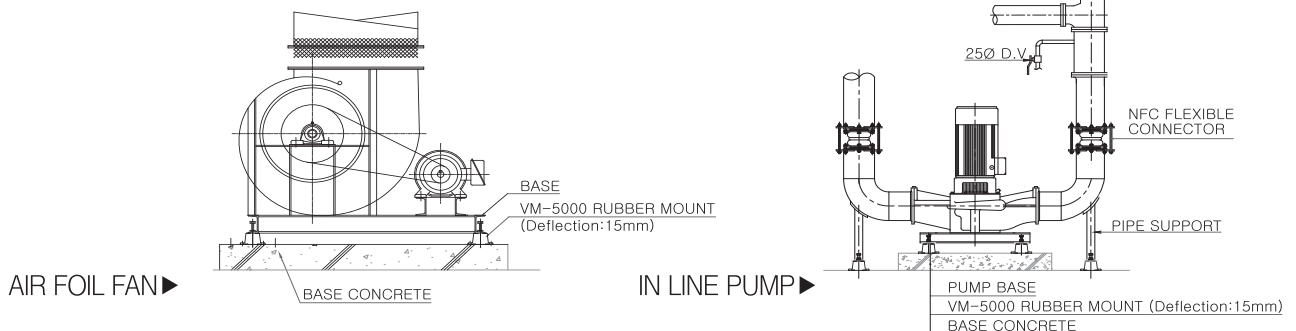
Isolation Efficiency in percent transmission is related to Vibration Transmissibility $E = 100(1 - T_r)$

ex) Disturbing Frequency of the equipment=100 Hz,

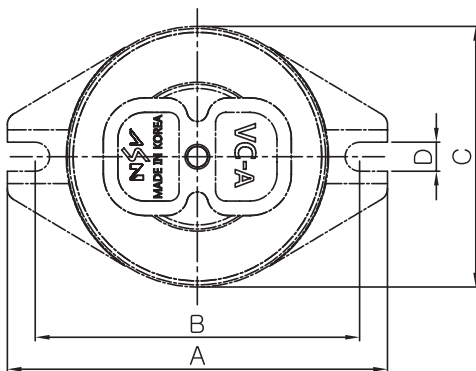
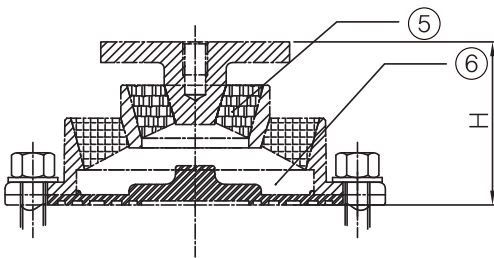
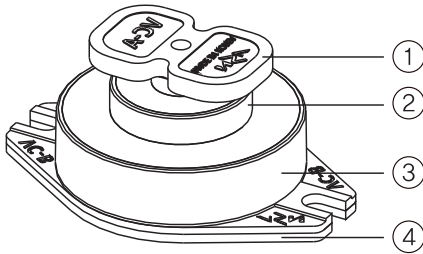
Natural Frequency of the isolator=10Hz

$$T_r = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2} = \sqrt{\left(\frac{1}{1-\left(\frac{100}{10}\right)^2}\right)^2} = 0.101 \quad E = 100(1 - T_r) = 100(1-0.101)=99(\%)$$

Installation Features



VC Conical Mount (Deflection : 15mm)



■ Features

The VC conical mount is a special vibration isolator having lower natural frequency (4.5 Hz) than the common rubber mount. Polyurethane or special synthetic neoprene rubber is inside VC conical mount, which makes it highly efficient, even in a low-frequency area. The anti-vibration pad is made of neoprene and is attached on the top and bottom of the contact surfaces to prevent structure-borne from passing through the bottom of the equipment when it touches steel and/or concrete. Plus, it is an omnidirectional vibration isolator, enabling stable operation of the equipment.

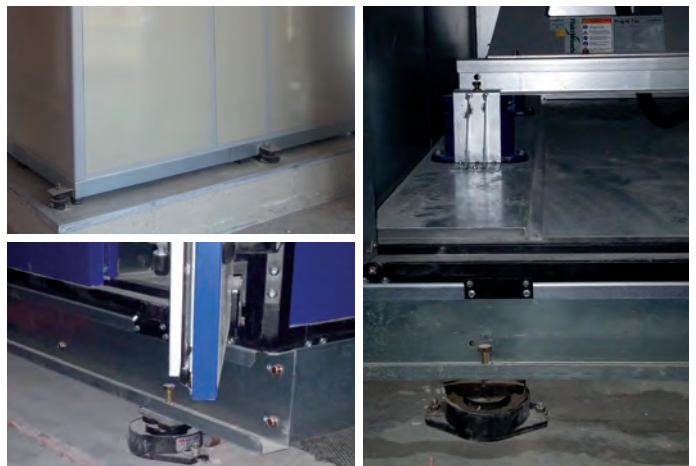
■ Usage

- ◆ For pumps, refrigerators, compressors and power generators
- ◆ For ventilators and air conditioning units
- ◆ For cooling towers
- ◆ For equipment having a large horizontal reaction

■ Specification

No.	Name of Components	Material	Standard
1	Upper Housing	GC	KS D 4301
2	Middle Housing	GC	KS D 4301
3	Lower Housing	GC	KS D 4301
4	Upper Rubber	CR	KS M 6617
5	Elastomer#1	PU or CR	KS M 6617
6	Elastomer#2	PU or CR	KS M 6617

■ Installation Features



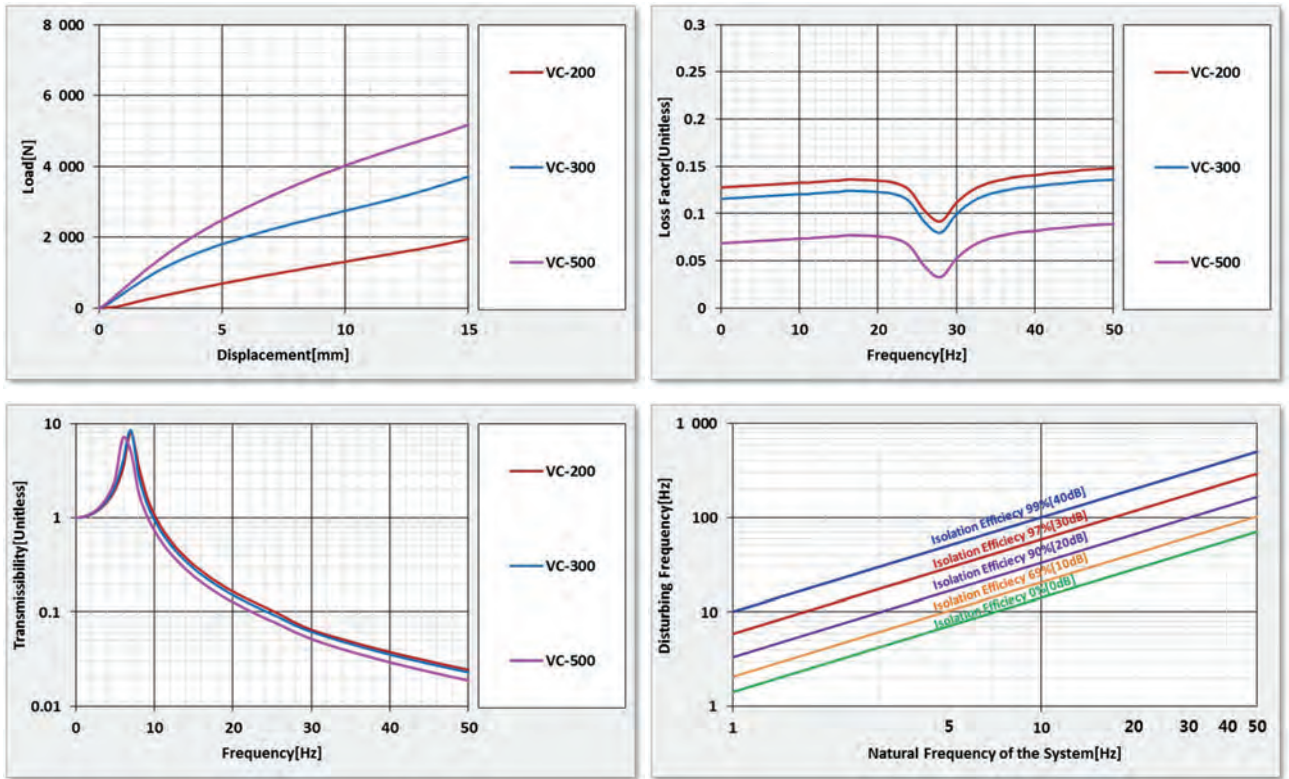
■ Dimension & Selection Guide

Type	Capacity (kgf)	Hardness (Hs)	Weight (kg)	Color	Dimension(mm)					
					A	B	C	D	H	Level bolt
VC-200	200	70 / 60	0.9	Yellow	184	157	127	14	79	M12
VC-300	300	80 / 70	1.0	Blue						
VC-500	500	85 / 75	1.0	Red						

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VC Conical Mount (Deflection : 15mm)

VC Test Data



Explanation(Commonness)

1. Vibration Transmissibility(T_r)

Vibration Transmissibility is the amplitude ratio of Output to Input.

$$T_r = \frac{\text{Output Amplitude}}{\text{Input Amplitude}} = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2} \cdot \eta = \frac{\text{Disturbing Frequency of the equipment}}{\text{Natural Frequency of the Isolator (Damping}(c) = 0)}$$

2. Natural Frequency(F_n) of Vibration Isolation System

The mass and spring stiffness dictate a natural frequency of the system.

$$F_n = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$$

3. Isolation Efficiency(E)

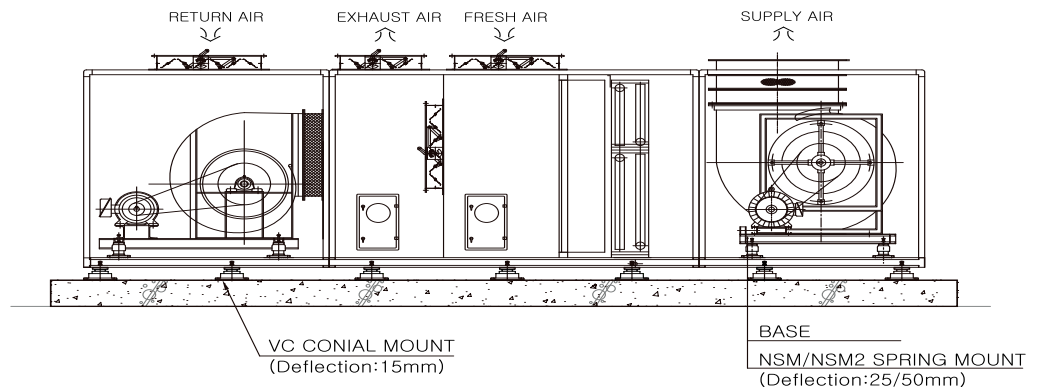
Isolation Efficiency in percent transmission is related to Vibration Transmissibility $E = 100(1 - T_r)$

ex) Disturbing Frequency of the equipment=100 Hz,

Natural Frequency of the isolator=10Hz

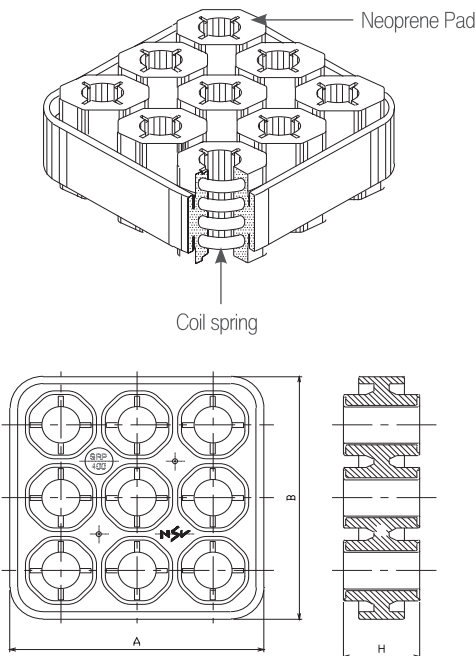
$$T_r = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2} = \sqrt{\left(\frac{1}{1-\left(\frac{100}{10}\right)^2}\right)^2} = 0.101 \quad E = 100(1 - T_r) = 100(1-0.101)=99(\%)$$

Installation Features



HORIZONTAL AIR CONDITIONER ▶

SRP Spring Rubber Pad (Deflection : 5.5~7mm)



■ Features

It is a highly-efficient product that provides 3~4 times higher vibration isolation efficiency than the conventional rubber pad by using the metal spring's low natural frequency and all of the advantages of anti-vibration rubber, such as multi-axis pavement, high frequency and noise isolation effects. By lowering its center of gravity as low as possible, the load can be evenly distributed on the pad.

■ Usage

- ◆ For facilities and equipment (PUMP, FAN, AHU)
- ◆ For industrial machines (Press, Shearing Machine)
- ◆ For horizontal pipes
- ◆ For vertical pipes Anchor and Guide
- ◆ For all kinds of equipment installed on a solid base

■ Specification

No.	Name of Components	Material	Standard
1	Rubber Pad	CR	KS M 6617
2	Coil Spring	SUP9	KS B 2402

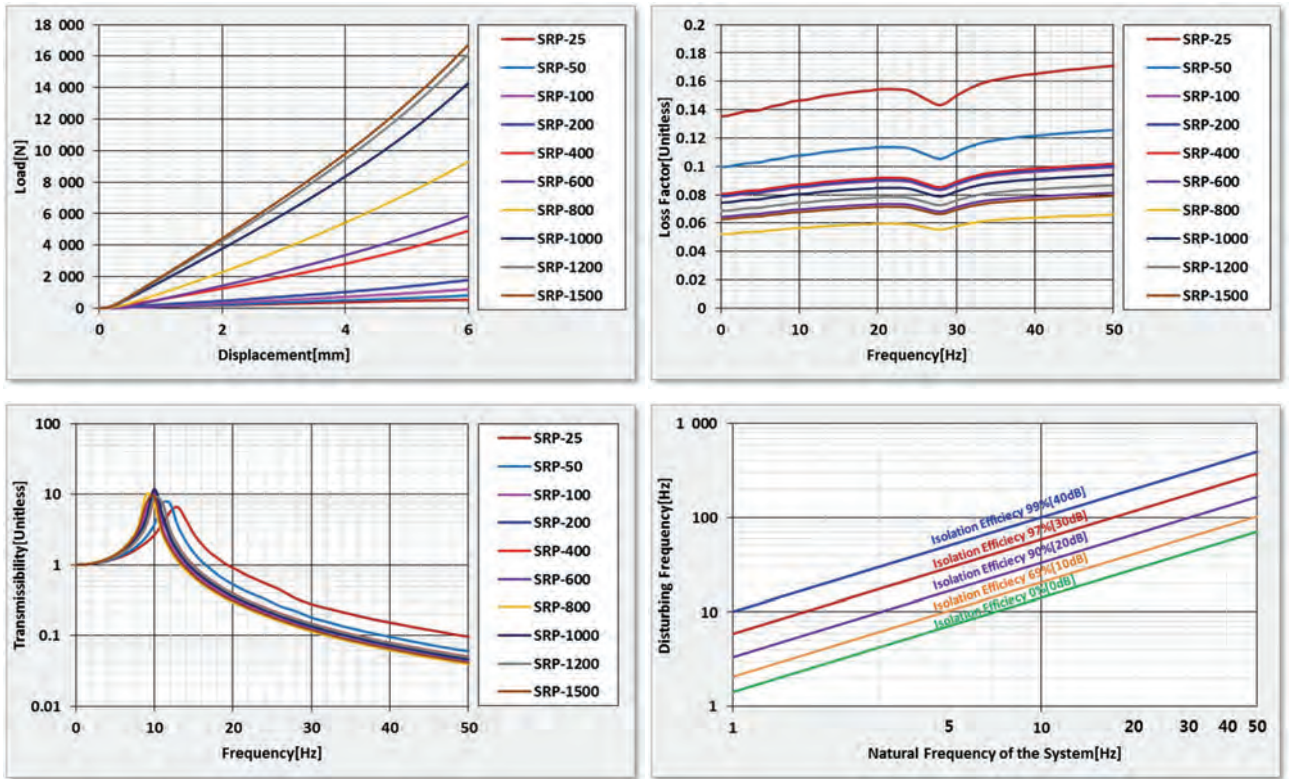
■ Dimension & Selection Guide

Type	Capacity (kgf)	Hardness (Hs)	Deflection (mm)	Weight (kg)	Dimension(mm)			
					A	B	H	
SRP-25	25	40±5	5.5	0.02	57	71	19	
SRP-50	50			0.04				
SRP-100	100			0.10	60	74	30	
SRP-200	200			0.12				
SRP-400	400			0.32	100	100	30	
SRP-600	600			0.33				
SRP-800	800			0.38				
SRP-1000	1000			0.84				
SRP-1200	1200			0.88	154	118	30	
SRP-1500	1500			0.88				
SRP-2000	2000		0.86					
SRP-2500	2500		0.92					
SRP-3000	3000			7.0	0.96	190	118	30

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

SRP Spring Rubber Pad (Deflection : 5.5~7mm)

SRP Test Data



Explanation(Commonness)

1. Vibration Transmissibility(T_r)

Vibration Transmissibility is the amplitude ratio of Output to Input.

$$T_r = \frac{\text{Output Amplitude}}{\text{Input Amplitude}} = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2}, \eta = \frac{\text{Disturbing Frequency of the equipment}}{\text{Natural Frequency of the Isolator (Damping } (c) = 0)}$$

2. Natural Frequency(F_n) of Vibration Isolation System

The mass and spring stiffness dictate a natural frequency of the system.

$$F_n = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$$

3. Isolation Efficiency(E)

Isolation Efficiency in percent transmission is related to Vibration Transmissibility $E = 100(1 - T_r)$

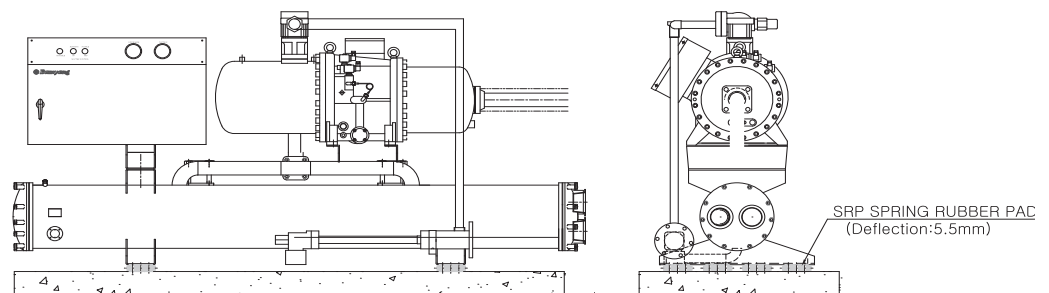
ex) Disturbing Frequency of the equipment=100 Hz,

Natural Frequency of the isolator=10Hz

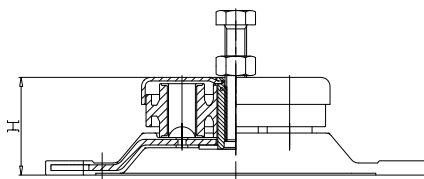
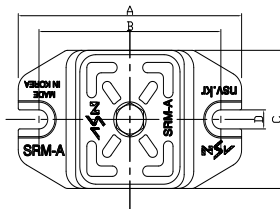
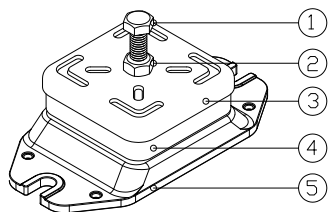
$$T_r = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2} = \sqrt{\left(\frac{1}{1-\left(\frac{100}{10}\right)^2}\right)^2} = 0.101 \quad E = 100(1 - T_r) = 100(1-0.101)=99(\%)$$

Installation Features

OUTDOOR UNIT
OF AIR CONDITIONAL ▶



SRM Spring Rubber Mount (Deflection : 5.5mm)



■ Features

It is an improved, mount version of SRP type spring rubber pad taking advantage of anti-vibration rubber and metal spring. SRM type enables control of the level to reduce horizontal deflection. Moreover, its external housing is made of stainless steel to prevent corrosion when installed outside.

■ Usage

- ◆ For facilities and equipment (for example, PUMP, AHU and FAN)
- ◆ For industrial equipment (including Press, Shearing Machine and Lathe)
- ◆ For all kinds of equipment installed on a solid base
- ◆ For vertical and horizontal pipes

■ Specification

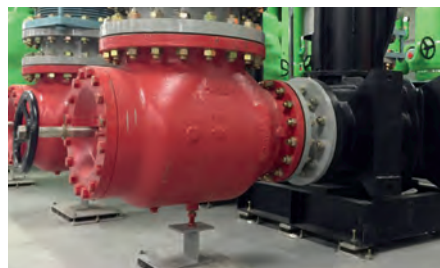
No.	Name of Components	Material	Standard
1	Level Bolt	SS400	KS B 1002
2	Nut	SS400	KS B 1002
3	UPPER HOUSING	STS304	KS D 3698
4	SRP PAD	SUP9	KS B 2402
		CR	KS M 6617
5	LOWER HOUSING	CR	KS M 6617
		SS400	KS D 3503

■ Dimension & Selection Guide

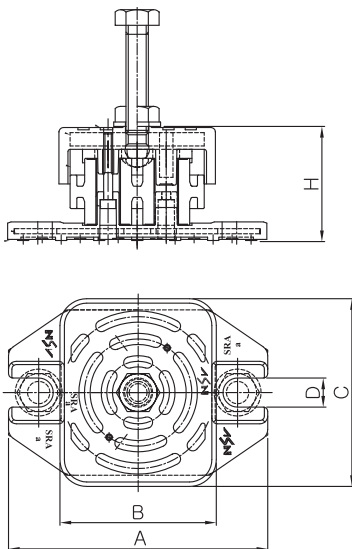
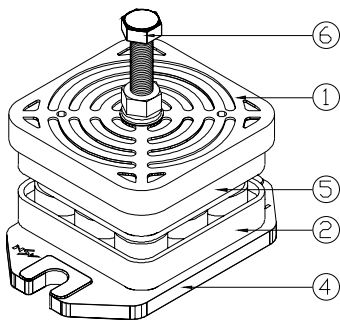
Type	Capacity (kgf)	Deflection (mm)	Weight (kg)	Dimension(mm)					
				A	B	C	D	H	Level Bolt
SRM-100	100	5.5	0.52	140	114	80	11	52	M10 x 60
SRM-200	200								
SRM-400	400		1.42	212	183	108	13	55	M12 x 65
SRM-600	600								
SRM-800	800		3.33	290	259	130	13	55	M12 x 65
SRM-1000	1000								
SRM-1200	1200								
SRM-1500	1500								
SRM-2000	2000								

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

■ Installation Features



SRA Spring Rubber Mount (Deflection : 6~12mm)



■ Features

SRA mount is an improved version of SRM spring rubber mount with upgraded shock and vibration control effects. With SRP spring rubber pad, it facilitates control of the level and moreover, this pad can be installed in 2 layers to increase efficiency. It is designed to insert a reinforcing plate in-between in order to remove insecurity when displacement increases and to bear the load in a stable manner while preventing separation. On the top and bottom of the SRA mount, bumpy neoprene housing with reinforcing material inside is mounted to prevent slipping from the equipment and to shut out structure-borne noise.

■ Usage

- ◆ For facilities and equipment (for example, pump, AHU and fan)
- ◆ For vertical/horizontal pipes and ducts
- ◆ For industrial equipment
- ◆ For machines that generate vibration in horizontal and vertical directions

■ Specification

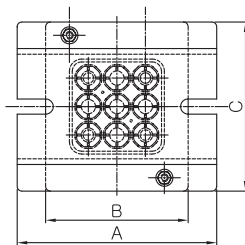
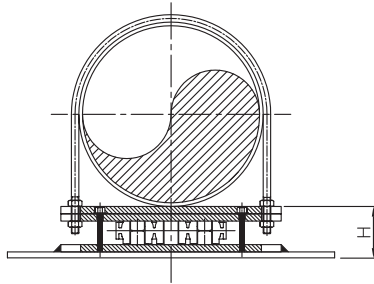
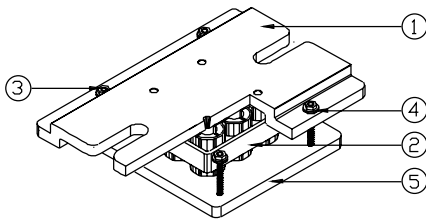
No.	Name of Components	Material	Standard
1	Upper Housing	CR	KS M 6617
2	SRP PAD	CR+SUP9	KS M 6617
3	Bolt	SS400	KS B 1003
4	Lower Housing	CR	KS M 6617
5	Middle plate	SS400	KS D 3503
6	Level Bolt	S400	KS B 1002

■ Dimension & Selection Guide

Model	Type	Capacity (kgf)	Deflection (mm)	Weight (kg)	Dimension(mm)					
					A	B	C	D	H	Level Bolt
SRA	SRA-100	100	6	0.64	116	89	84	13	51	M10 x 60
	SRA-200	200		0.66						
	SRA-400	400		1.86						
	SRA-600	600		1.88						
	SRA-800	800		1.84						
SRA-2	SRA-2-100	100	12	0.82	116	89	84	13	85	M10 x 60
	SRA-2-200	200		0.86						
	SRA-2-400	400		2.50						
	SRA-2-600	600		2.52						
	SRA-2-800	800		2.60						

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

SRH-U Spring Rubber Mount (Deflection : 5.5mm)



■ Features

It is an upgraded mount designed to control vibration from horizontal pipes using SRP type spring rubber pad with advantages of anti-vibration rubber and metal spring. SRH type is installed on top of steel structure individually or together to better absorb vibration from pipes. Plus, U-bolt slot hole is on steel plate of top and bottom housings, which facilitates installation and prevents pipes from getting out of their original location.

■ Usage

For horizontal pipes

■ Specification

No.	Name of Components	Material	Standard
1	Upper Housing	SS400	KS D 3503
2	SRP PAD	SUP9	KS B 2402
		CR	KS M 6617
3	Bolt & Nut	SS400	KS B 1002
4	Guide Rubber	CR	KS M 6617
5	Base Plate	SS400	KS D 3503

■ Dimension & Selection Guide

Pipe Diameter	SRP	A	B	C	H
Φ50	A(100,200)	110	84	86	40
Φ65		110	84	86	
Φ80		120	96	74	
Φ100		150	114	74	
Φ125		175	138	74	
Φ150		200	164	74	
Φ150	B(400~800)	220	160	122	42
Φ200	B(400~800)	270	210	122	
Φ250	B(400~800)	320	260	122	
Φ250	C(1000~2000)	320	260	140	
Φ300	B(400~800)	380	320	122	
Φ300	C(1000~2000)	380	320	140	
Φ350		422	320		
Φ400		470	410		
Φ450		520	420		
Φ500		562	502		

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

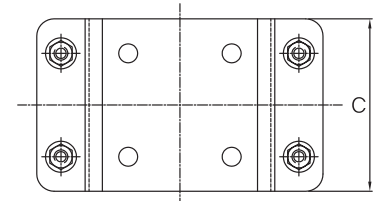
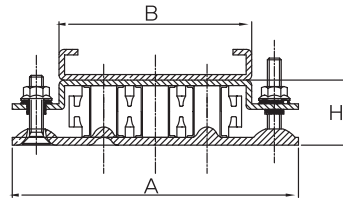
SRH-SH Spring Rubber Mount (Deflection : 5.5mm)

■ Features

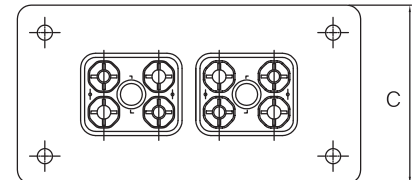
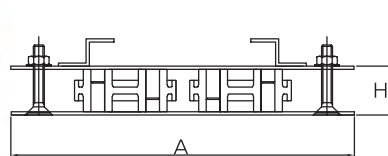
It is used as a sliding shoe on the pipe and installed using pipe clip & bolt. The allowed range of support spacing for horizontal pipe is from 2.0m to 5.0m. And the model changes depending on the support spacing.



SRH-A TYPE



SRH-B TYPE



■ SRH-A TYPE Dimension & Selection Guide

Pipe Diameter	SRP	A	B	C	H
Φ50	A(100,200)	166	80	100	40
Φ65					
Φ80					
Φ100					
Φ125	B(100~800)	166	105	100	
Φ150					
Φ200					
Φ250					
Φ300					
Φ350	C(400~2000)	266	156	140	
Φ400					
Φ450					

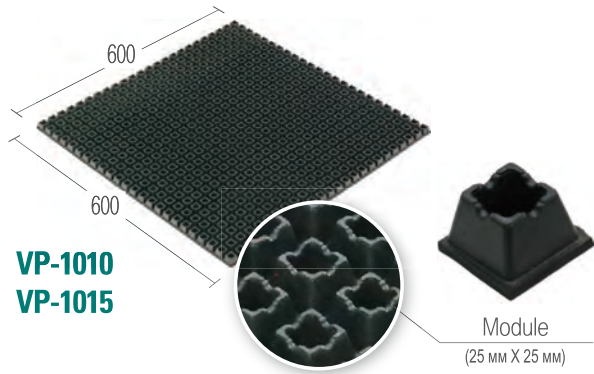
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

■ SRH-B TYPE Dimension & Selection Guide

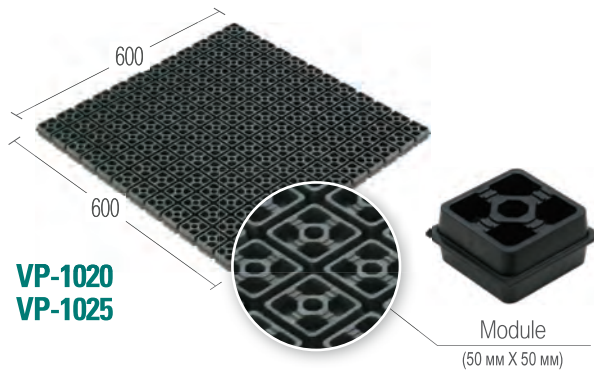
SRP	A	C	H
100X2EA	250	150	48
200X2EA	250	150	
100X2EA	250	150	
200X2EA	250	150	
200X2EA	250	150	
200X2EA	250	150	
400X2EA	350	150	
600X2EA	350	150	
600~800X2EA	350	150	
1000~1500X2EA	350	200	

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

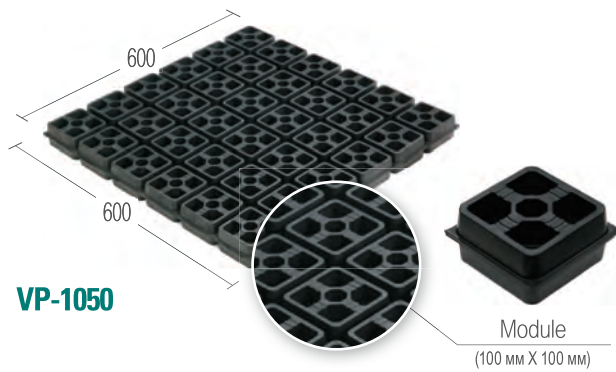
VP-1000 Rubber Pad (Deflection : 4~10mm)



VP-1010
VP-1015



VP-1020
VP-1025



VP-1050

■ Features

VP-1000 type is a vibration isolation pad made of CR(neoprene) with excellent oil and ozone resistance. An advantage is a wide range of working load due to the projected net area designed calculating working load and statistic displacement separately. Its modular design allows cutting it into small pieces as you want to use.

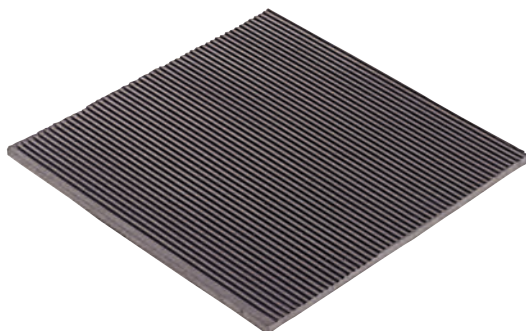
■ Application

- ◆ In general, to control HF vibration by installing it under the bottom of the machine
- ◆ To damp vibration from generators/air compressors/chillers/air handling units
- ◆ To damp vibration from various kinds of machine installed on the solid base.
- ◆ To prevent transmission of vibration and noise through the structures

■ Dimension & Selection Guide By Loads

Type	Capacity (kgf)	Deflection (mm)	Hardness (Hs)	Dimension (mm)			
				width	Length	Thickness	Module Size
VP-1010	21600	4	60±5	600	600	10	25 x 25
VP-1015	21600	5				15	25 x 25
VP-1020	20160	6				20	50 x 50
VP-1025	20160	7				25	50 x 50
VP-1050	24800	10				50	100 x 100

VP-2000 Rubber Pad (Deflection : 3-6mm)



■ Features

VP-2000 type is a vibration isolation pad made of CR(neoprene) with excellent oil resistance and ozone resistance. It has the excellent vibration isolation performance from serrated patterns engaged from the top and bottom surface making no horizontal shift and having enough deflection. Since the ability to support a load is proportional to the surface area, it can be used in various ways. Especially, it is an optimum vibro-isolating pad for structure borne sound. It can be designed into layered structure. With the large value of corresponding static displacement to the same load, the natural frequency of the lower system is variable.

■ Application

- ◆ In general, to control HF vibration by installing it under the bottom of the machine
- ◆ To damp vibration from generators/air compressors/chillers/air handling units
- ◆ To damp vibration form various kinds of machine installed on the solid base.
- ◆ To prevent transmission of vibration and noise through the structures

■ Dimension & Selection Guide

Type	Capacity(kgf)	Deflection(mm)	Hardness(Hs)	Dimension(mm)		
				width	Length	Thickness
VP-2008	16000	3	60±5	600	600	8
VP-2010	16400	4				10
VP-2012	16800	4				12
VP-2015	17600	5				15
VP-2020	18000	6				20

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VP-3000 Rubber Pad (Deflection : 6/12mm)



■ Features

Its cover made of CR(neoprene) with excellent oil and ozone resistance and the HD mat inside with outstanding damping characteristics dramatically improve damping performance. Its modular design allows cutting it into small pieces as you want to use.

■ Usage

- ◆ In general, to control HF vibration by installing it under the bottom of the machine
- ◆ To damp vibration from generators/air compressors/chillers/air handling units
- ◆ To damp vibration form various kinds of machine installed on the solid base
- ◆ To prevent transmission of vibration and noise through the structures

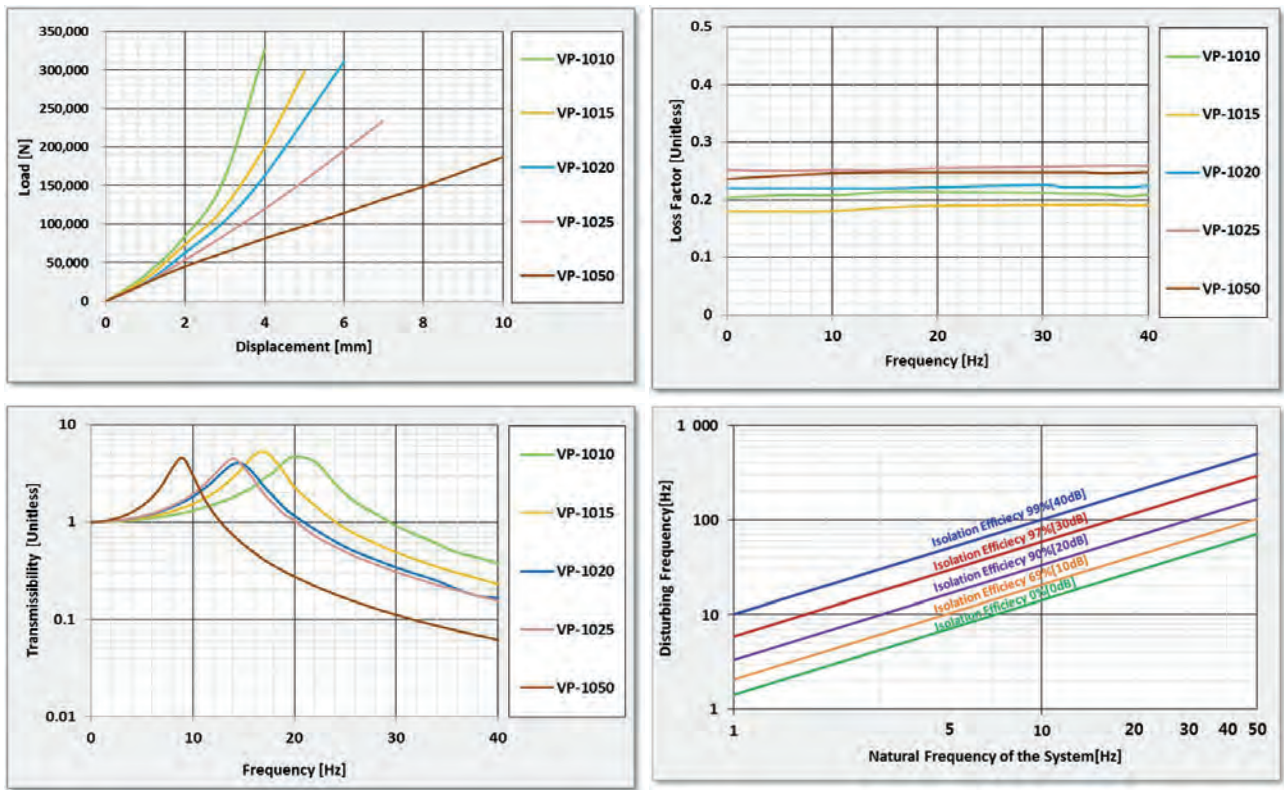
■ Dimension & Selection Guide

Type	Capacity(kgf)	Deflection(mm)	Weight(kg)	Dimension(mm)			
				width	Length	Thickness	Module Size
VP-3025	8000	6	60±5	600	600	25	100 x 50
VP-3050	8000	12				50	

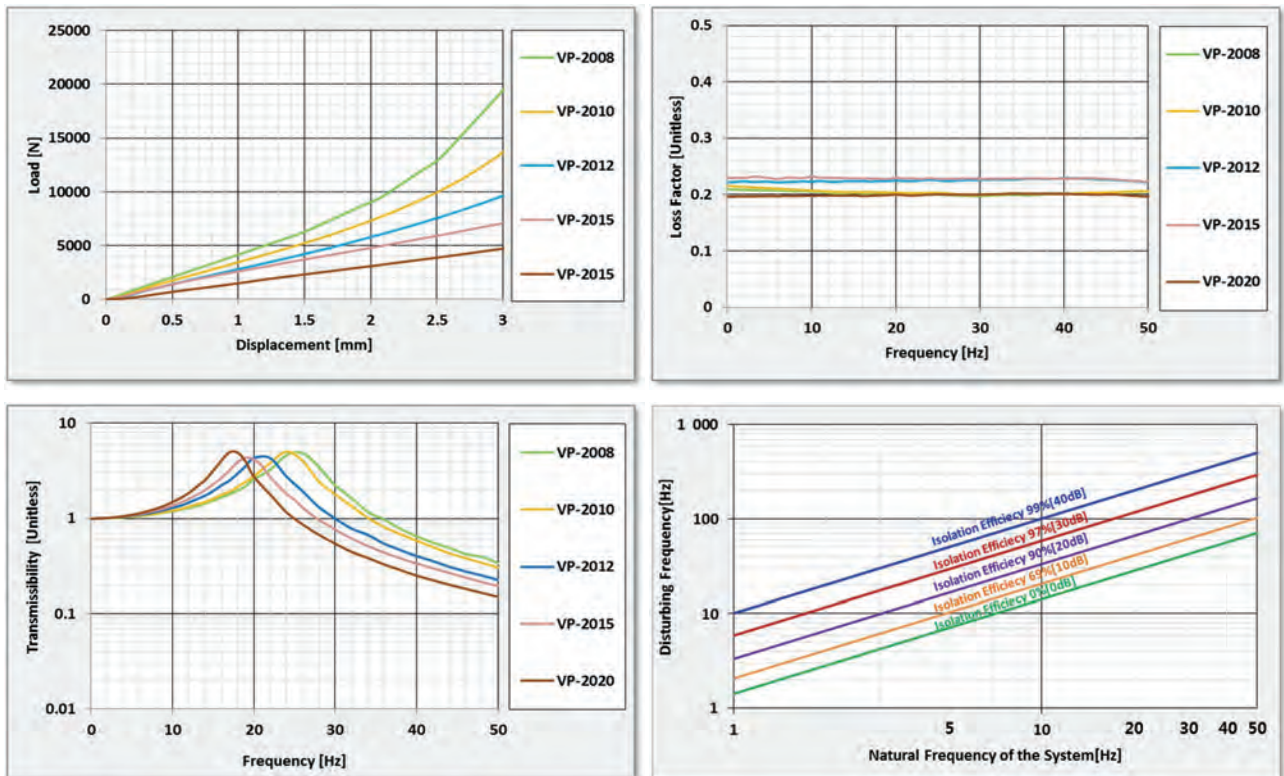
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VP-1000/VP-2000 Rubber Pad

VP-1000 Test Data



VP-2000 Test Data

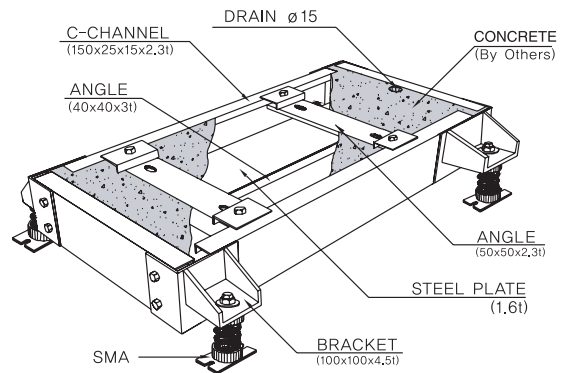
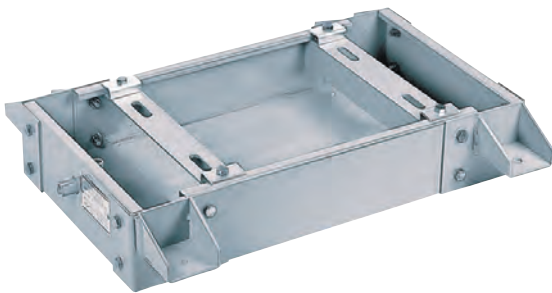


IB Inertia Base Series

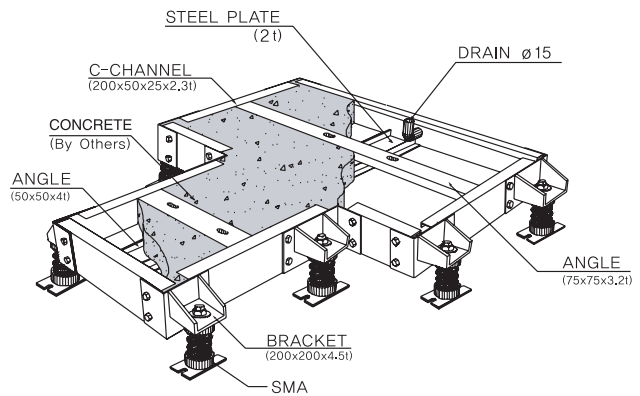
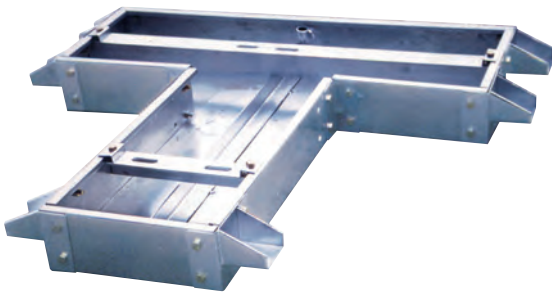
■ Features

IB (Inertia Base) is designed to shut out vibration that occurs while the pump is running, and at the same time, minimize the dynamic deflection resulting from the dynamic force generated when the load rapidly changes, using the weight of concrete. It consists of the base (┌-angle) with C-channel for an easier assembling of the base, pump and motor, bracket for mount and reinforcing bottom plate. The height (H) of Inertia Base is at least 150 mm, and it differs depending on horse power of the motor.

■ IB-150 series For Single-Suction Pumps (Single, Multi-Stage Volute, etc.)



■ IB-200 series For Double-Suction Pumps



■ Installation Features

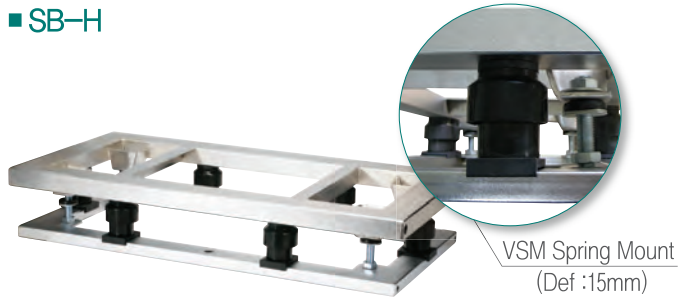


SB Elasticity Structural Base

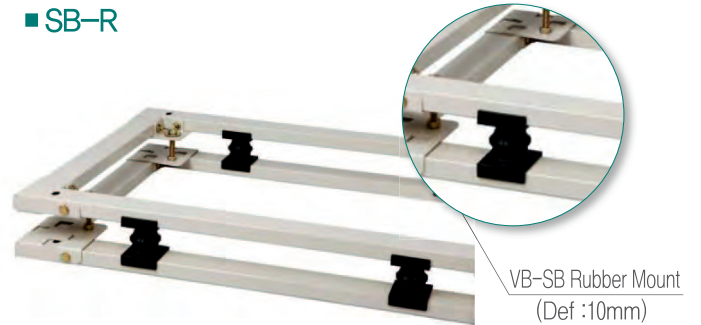
■ Features

GHP/EHP cools and heats the air through the circulation of refrigerant's heat pump cycle and it generates vibration when the compressor runs. In the case that several GHP/EHP are installed in a group, they could generate superposed oscillation, and as a result, cause damage. To prevent this, vibration isolators with a built-in stand are mounted on the equipment. This stand is double-structured with a stopper inside to ensure the structural stability against external pressure.

■ SB-H



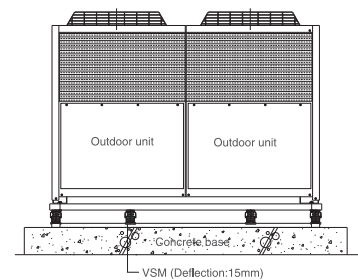
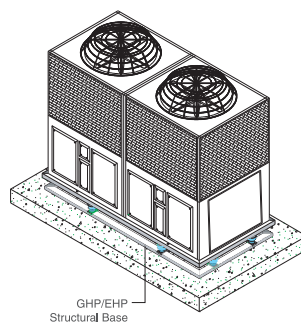
■ SB-R



■ SB-S



■ SB Installation Details Drawing



■ Installation Features



NFC Flexible Connector

NFC10S

※ The model name of NFC-S product has changed to NFC10S



Screw Type

NFC10

※ The model name of NFC-1 product has changed to NFC10



1Ball Type

NFC20

※ The model name of NFC-2 product has changed to NFC20



2Ball Type

■ Features

The flexible connector is mounted between pipes to absorb the stress resulting from the expansion and contraction of the pipe line and shut out the vibration caused by flow of fluid and vibration transferred from equipment. It also maintains an allowable connection error of pipe line, and by doing so, gives flexibility to the whole system.

- (a) Operating temperature: $-20^{\circ}\text{C} \sim +80^{\circ}\text{C}$
- (b) Operating pressure: for 10kgf/cm^2 and 20kgf/cm^2
- (c) Materials: NEOPRENE, EPDM

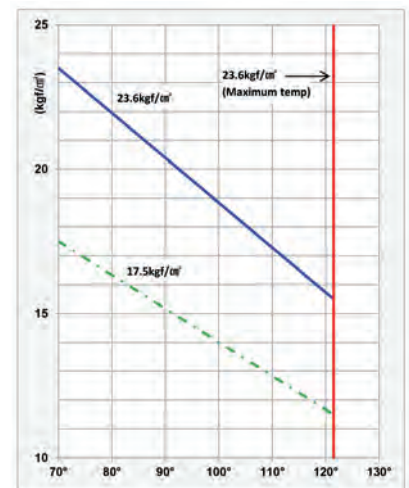
■ The composition of products

It is made of nylon tire cord, special synthetic rubber (NEOPRENE, EPDM) and piano steel wire. It has a stiffening ring between balls to avoid excessive expansion by internal pressure.

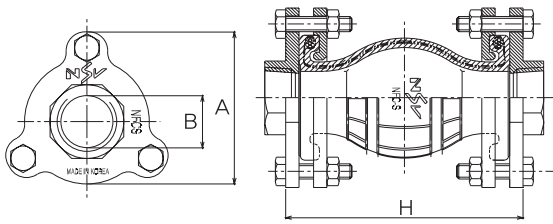
■ Product Special Feature

- (a) Excellent resistance against pressure. This product consist of synthetic rubber, nylon tire cord Fabric and piano steel wire. The destruction pressure is Within 55kgf/cm^2 and usage pressure is up to maximum 30kgf/cm^2 .
- (b) Large allowance of concentricity error. Due to Two arch structure, it has good flexibility to all direction. As having large amount of concentricity error allowance, this product protects equipment of pipe line from vibration or other shock damage.
- (c) Large allowance of banding angle and elasticity. This product has allowable banding angle and elasticity Enough to stand pipe-line movement owing to outside Impact.
- (d) Grate anti-vibration and anti-noise effect.
- (e) Good Water resistance, Thermal endurance, Weatherability and Chemical resistance.

■ Maximum Operating Pressure And Temperature



NFC Flexible Connector

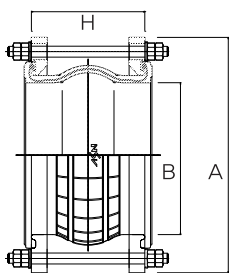


NFC10S (Screw Type)

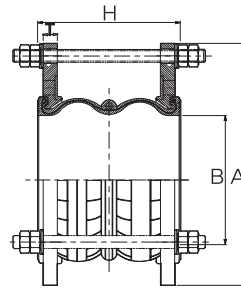
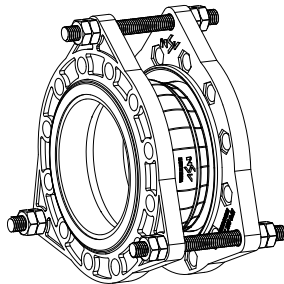
Dimension & Selection Guide

Type	Flange Dimension(mm)		
	A	B	H
NFC10S-25	81	25A	125
NFC10S-32	90	32A	143

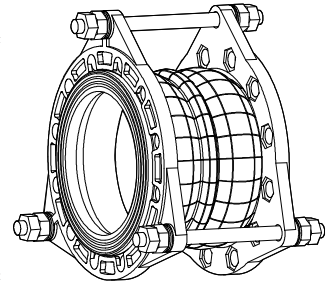
(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.



NFC10 (1Ball Type)



NFC20 (2Ball Type)



Dimension & Selection Guide

Type	Flange Dimension(mm)				Dimension(mm)				Qty of Control Rod	
	A	B	H (1Ball)	H (2Ball)	Compression	Height	Concentricity	Curve	10K	20K
NFC10(20)-32	140	32A	125	150	38	13	16	30°	2	2
NFC10(20)-40	140	40A	125	150		13	16	30°		
NFC10(20)-50	155	50A	125	150		13	16	30°		
NFC10(20)-65	175	65A	125	160		13	22	30°		
NFC10(20)-80	185	80A	125	160		19	22	30°	3	3
NFC10(20)-100	210	100A	150	180		19	22	29°		
NFC10(20)-125	250	125A	150	180		19	22	24°		
NFC10(20)-150	280	150A	150	180		19	22	20°		
NFC10(20)-200	330	200A	175	220		19	22	15°	4	4
NFC10(20)-250	400	250A	175	220		22	32	30°		
NFC10(20)-300	445	300A	200	220		22	32	30°		
NFC10(20)-350	490	350A	200	250		22	32	30°		
NFC10(20)-400	560	400A	250			22	32	29°		

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

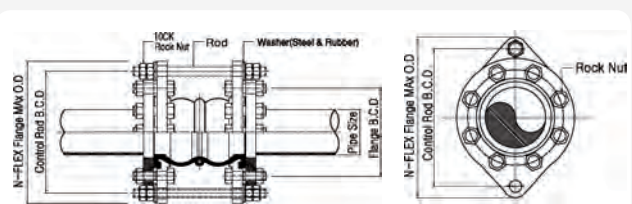
450A or larger products can be manufactured upon request



We use control rods with larger than 450A NFC products

Anchoring and Control rods of pipe line

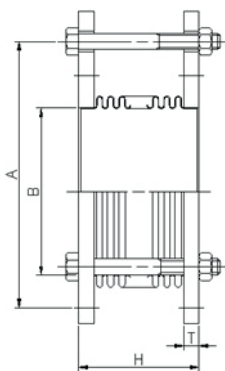
When use a Flexible connector, pipe line should expand or contract by only one direction anchor rods for Preventing flexible connector cracking. Or installing control rods on the flange of flexible connector protect pipe Line from damage owing to over-expansion or over-contraction.



Control Rod Installation Details

NV10 Flexible Connector

※ The model name of NVC product has changed to NV10



■ Features

It is installed on the intake/outlet of the pump to give flexibility, and at the same time, somewhat reduce vibration. Because it uses a multi-layered bellows, it has a small spring reaction. Plus, it transfers no vibration through brad as it does not use tie rod. It is made of stainless steel, which ensures a long lifespan and stable pipe system even at a high temperature.

■ Specification

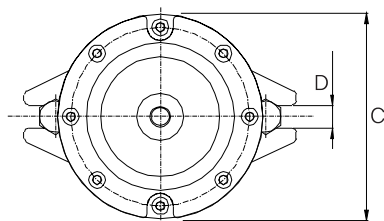
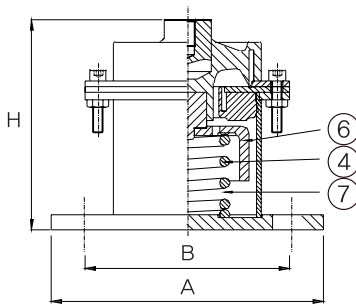
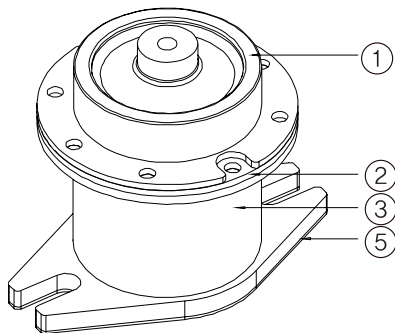
- ◆ Applied fluid : cool & hot water, steam, liquid
- ◆ Maximum operating pressure : 10kgf/20kgf cm²
- ◆ Maximum operating temperature : 220°C
- ◆ Connecting method : KS 10K/20K Flange
- ◆ Resisting pressure test : 15kgf/30kgf cm² in water
- ◆ Material : Bellows/STS, Flange/SS400

■ Dimension & Selection Guide

Type	FLANGE DIMENSION(mm)								MOVEMENT		
	A		B		T		H		Compression	Expansion	Concentricity
	10K	20K	10K	20K	10K	20K	10K	20K			
NV10(20)-32	170	170	46	46	16	19	80	85	12	3	3
NV10(20)-40	183	183	46	46	16	19	80	85			
NV10(20)-50	205	205	67	67	16	19	115	119			
NV10(20)-65	225	225	67	67	16	19	120	128			
NV10(20)-80	235	250	77	77	16	22	120	132			
NV10(20)-100	260	275	103	103	16	25	125	141			
NV10(20)-125	300	320	129	129	19	25	130	144			
NV10(20)-150	330	355	155	155	19	28	140	158			
NV10(20)-200	380	400	204	204	19	30	150	172			
NV10(20)-250	478	508	263	263	25	35	200	218			
NV10(20)-300	523	558	317	317	25	35	200	222			
NV10(20)-350	568	618	359	359	25	40	200	230			
NV10(20)-400	638	683	409	409	28	45	200	236			

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VD60 Spring Damper Mount



■ Features

It is a solid-bottom mount with the combined features of oil-filled damper, spring and rubber and it is very effective against shock power and periodic vibration. It first converts impulsive vibration into frictional heat energy using oil and then, dissipates periodic vibration using rubber and the spring. The rubber on top is a CR (neoprene)-type synthetic rubber having excellent oil and ozone resistant properties. Because the spring gains a static deflection after assembly, it can maintain a low-natural frequency, less than 5Hz.

■ Usage

- ◆ For high-efficient vibration control of cooling towers
- ◆ For high-efficient vibration control of heavy equipment (semiconductor production line)
- ◆ For equipment generating large impulsive vibration
- ◆ For equipment that is sensitive to surrounding vibration

■ Specification

No.	Name of Components	Material	Standard
1	Upper Cap	CR & GC	KS M 6617 / KS D 4301
2	Middle Cap	CR & GC	KS M 6617 / KS D 4301
3	Lower Cap	SS400	KS D 3503
4	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
5	Non Skid Pad	CR & GC	KS M 6617
6	Inner Damper	GC	KS D 4301
7	Damper Oil	—	FLUID OIL

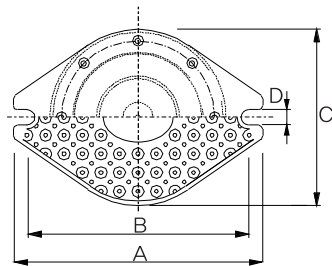
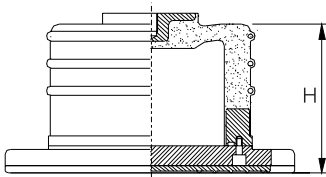
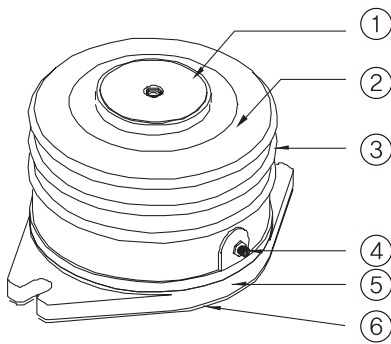
■ Dimension & Selection Guide

Type	Capacity (kgf)	Dimension(mm)					
		A	B	C	D	H	Level Bolt
VD60-500	500	184	132	124	18	190	M12
VD60-1000	1000	184	132	124	18	190	M12
VD60-1500	1500	270	198	202	22	230	M20
VD60-2000	2000	270	198	202	22	230	M20

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VAM10 Air Mount (Airpressure : 1.5~6Kg/mm)

※ The model name of VAM product has changed to VVM10



■ Features

An air spring mount is a highly-efficient mount offering features of acyuator as well as an isolator like a coil spring and anti-vibration pad. It can maintain constant vibration isolation efficiency and lower the system's natural frequency down to 2.5~5Hz. Plus, its height can be controlled through the control of internal air pressure and installed in a lower position than the conventional coil spring mount. It allows for a quite, noiseless operation, as it has a structure that does not transfer noise.

■ Usage

- ◆ For vacuum pumps and air compressors
- ◆ For optical measurement equipment and high-precision, semi-conductor manufacturing equipment
- ◆ For a power generator high-speed press
- ◆ For HVAC equipment and industrial machines

■ Specification

No.	Name of Components	Material	Standard
1	Upper Housing	AL	KS D 2331
2	Body	NBR	KS M 6642
3	Reinforcing Ring	SS400	KS D 3503
4	Air Value	BRASS	—
5	Lower Housing	AL	KS D 2331
6	Non Skid Pad	CR	KS M 6617

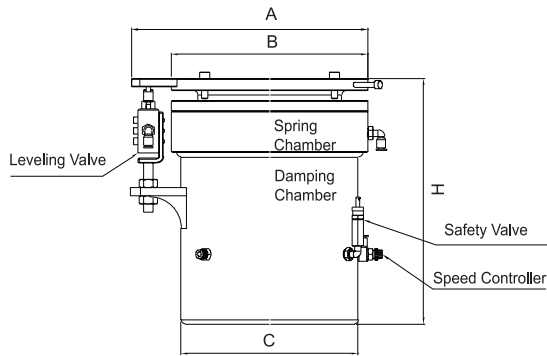
■ Dimension & Selection Guide

Type	Capacity(kgf)		Design Pressure (kg/cm ²)	Dimension(mm)					
	Min.	Max.		A	B	C	D	H	Level Bolt
VAM10-150	50	150	1.5~5.0	150	130	105	11	67	M12
VAM10-300	75	300	1.5~6.0	180	160	124	13	93	M12
VAM10-600	150	600	1.5~6.0	250	230	172	13	93	M12
VAM10-1200	300	1200	1.5~6.0	350	330	246	13	93	M16
VAM10-2400	1250	2400	1.5~6.0	480	460	340	14	95	M20

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VAM20 Pneumatic Leveling Isolator

※ The model name of VAD product has changed to VWM20



■ Features

It is used to control the vibration of high precision inspection and measurement equipment. Because it has a low natural frequency less than 2Hz and causes no surging, it can provide excellent vibration isolation performance. The double diaphragm can also be used to lower its natural frequency. The leveling valve performs automatic leveling while the orifice connecting spring chamber and damping chamber offer a high attenuation of fluid and the speed controller helps control the attenuation ratio. In addition, the piston and viscous oil can help reduce attenuation to be even lower.

■ Usage

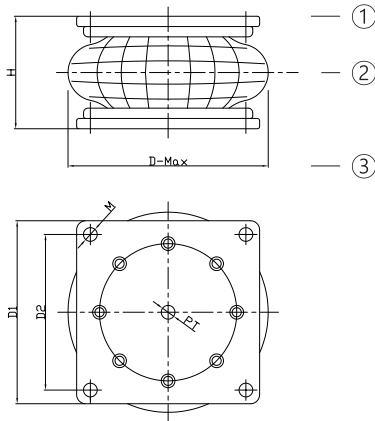
- ◆ High-precision measurement equipment, electron microscope and 3D coordinate measuring machine
- ◆ High-precision manufacturing machine and high-precision optical tester
- ◆ Environmental measurement equipment and high-precision calibration instrument
- ◆ High-precision vibration proofing foundation

■ Dimension & Selection Guide

Type	Capacity (kgf)	Dimension(mm)			
		A	B	C	H
VAM20-300	300	170	120	120	160
VAM20-800	800	220	170	150	220
VAM20-1500	1500	290	240	220	300
VAM20-3000	3000	350	300	270	300
VAM20-5000	5000	430	380	350	300
VAM20-10000	10000	550	500	460	300
VAM20-20000	20000	730	680	640	300

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VAM52 Flange Type Air Spring Mount



■ Features

VAM52 is a flange type Air Spring Mount of a structure which is capable of corresponding to 3-axis vibration and is effective for preventing vibration transmission of precision equipment and mechanical equipment. Thanks to the supplementary chamber and damper inside, it is possible to lower natural frequency or to achieve excellent damping characteristics.

■ Usage

- ◆ Vibration isolation for industrial machinery
- ◆ Vibration Isolation for facilities and precision equipment
- ◆ Manual vibration isolation in precision laboratories
- ◆ Vibration isolation for various equipments requiring low natural frequency

■ Specification

No.	Product Name	Material	Standard
1	Upper Bead Plate	SGCD	KS D 3506
2	Bellows	CR	KS M 6617
3	Lower Bead Plate	SGCD	KS D 3506

■ Dimension & Selection Guide By Loads

Type	Design Load (kgf)	Design Pressure (kgf/cm ²)	Maximum Design Displacement (mm)	Natural Frequency (Hz)	Dimension(mm)						Weight (kg)
					D1	D2	D-max	H	M	PT	
VAM52-450	45~450	1~7	+20/-15	4.0~5.0	120	100	Φ130	60	Φ9	1/8"	2.5
VAM52-600	60~600	1~7	+15/-25	3.5~4.5	144	124	Φ155	85	Φ10	1/4"	4
VAM52-900	100~900	1~7	+25/-40	2.8~3.8	168	140	Φ190	100	Φ10	1/4"	6
VAM52-1300	150~1300	1~7	+30/-60	2.6~3.4	204	176	Φ240	130	Φ12	1/4"	9.5
VAM52-3000	350~3000	1~7	+40/-60	2.4~3.0	280	240	Φ335	140	Φ14	1/4"	18

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VAM90 Pneumatic Isolation Table

※ The model name of VAT product has changed to VAM90



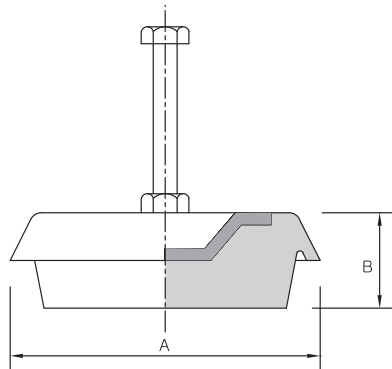
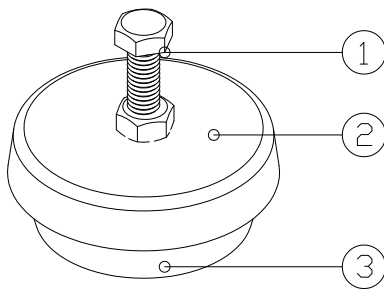
■ Features

A high-precision vibration control table can be made using VAM90 auto-level air spring vibration isolator. The bottom of the air spring is made of steel frame with a height of 700~750 mm on average, and it can be made to order depending on the size of equipment. It maintains the horizontal-level precision of $\pm 1/100$ mm and the horizontal natural frequency between the air-spring mount and plate of about 2Hz.

■ Usage

- ◆ High-precision measurement equipment, electron microscopes and 3D coordinate measuring machines
- ◆ Environmental measurement equipment and high-precision calibration instruments
- ◆ For high-precision manufacturing machines and high-precision optical testers

VF Foot Rubber Mount (Deflection : 3.5mm)



■ Features

The housing is made of strong steel plate with the bolt at the center to control the level when attached on the machine. Its round-shaped floor surface is made of bumpy rubber to isolate impulsive vibration and structure-borne noise, and at the same time, prevent slipping from the structure. It prevents the transfer of vibration from all kinds of machine tools in the most economical manner and reduces vibration acceleration to lengthen the life span of machines.

■ Usage

- ◆ For shock-generating machines like press and forging machines
- ◆ For all kinds of industrial machines, including injection machines, printing machines, timber manufacturers, emergency generators and transformers
- ◆ For machine tools like a lathe, grinder and milling M/C

■ Specification

No.	Name of Components	Material	Standard
1	Level Bolt	SS400	KS B 1002
2	Housing	SS400	KS D 3503
3	Rubber	CR	KS M 6617

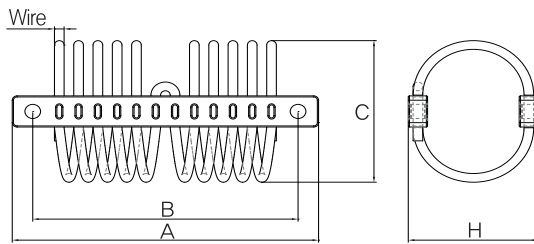
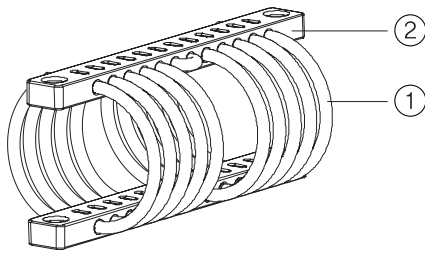
■ Dimension & Selection Guide

Type	Capacity (kgf)	Hardness (A)	Spring Constant (kgf/mm)	Deflection (mm)	Dimension(mm)		
					A	B	Level Bolt
VF-150	150	60±5	43	3.5	80	35	M10
VF-400	400		115		120	53	M12
VF-800	800		229		160	53	M16
VF-2000	2000		572		220	60	M20
VF-6000	6000		1715		300	70	M22
VF-10000	10000		2858		400	70	M24

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VWM10 Wire Mount

※ The model name of VWM product has changed to VWM10



■ Features

VWM10 is capable of isolating vibration using elasticity and attenuation effect of wire rope while absorbing shock. It does not cause surging and minimizes the transmissibility of vibration when it resonates.

■ Usage

- ◆ For equipment that requires vibration isolation and dynamic stability
- ◆ For equipment that needs a buffer
- ◆ For high-precision equipment that is installed inside moving containers
- ◆ For high-precision equipment installed in submarines and ships

■ Specification

No.	Name of Components	Material	Standard
1	Wire Rope	STS304	KS D 3514
2	Retainer Bar	STS304	-

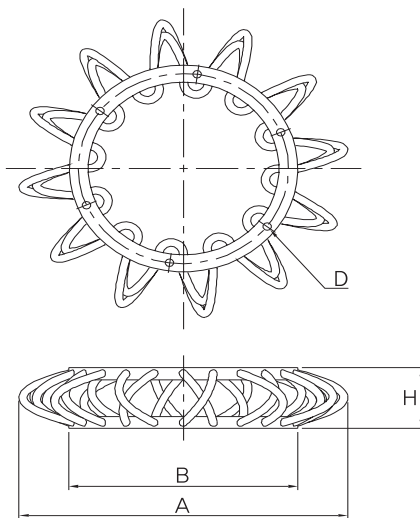
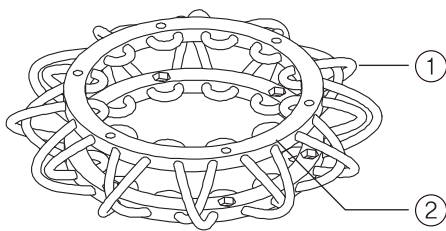
■ Dimension & Selection Guide

Model	Dimension(mm)						Ma.Travel (mm)	Max. Load (kgf)
	A	B	C	D	H	Wire		
VWM10-04-100	125	110	45	6.5	35	4	13	90
VWM10-04-200			55		45		16	50
VWM10-04-300			65		55		30	50
VWM10-05-100	125	110	45	6.5	35	5	13	200
VWM10-05-200			55		45		16	140
VWM10-05-300			65		55		30	90
VWM10-06-100	150	134	60	6.5	50	6	15	240
VWM10-06-200			70		60		25	170
VWM10-06-300			80		70		35	110
VWM10-08-100	190	170	80	8.5	70	8	25	270
VWM10-08-200			100		90		45	200
VWM10-08-300			120		110		65	160
VWM10-10-100	250	230	110	8.5	90	10	50	300
VWM10-10-200			130		110		60	240
VWM10-10-300			150		130		75	150
VWM10-12-100	250	230	130	8.5	110	12	55	600
VWM10-12-200			150		130		70	550
VWM10-12-300			170		150		95	400
VWM10-16-100	320	280	130	11.0	110	16	55	1300
VWM10-16-200			150		130		70	1000
VWM10-16-300			170		150		95	800
VWM10-22-100	420	380	140	12.0	130	22	50	1500
VWM10-22-200			165		150		70	1300
VWM10-22-300			190		170		90	1100

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VWM20 Wire Mount

※ The model name of VWR product has changed to VWM20



■ Features

It is a product that can work as an isolator that isolates vibration using elasticity and attenuation effects of wire rope and an absorber, which eases shock. Its circular Mount shape allows it to minimize coupling with the same stiffness for lateral load. It is effective in attenuation and blocking high frequency over 100Hz, which means that it minimizes transfer of vibration without surging. It is superior that coil spring or neoprene Rubber in terms of resistance against corrosion, heat, ozone and oil and moreover, it can make up for disadvantages of coil spring being lack in attenuation and rubber having the natural frequency.

■ Usage

- ◆ For equipment that needs vibration isolation and dynamic stability
- ◆ For equipment that needs shock-absorber
- ◆ For high-precision equipment that is installed inside the mobile container
- ◆ Used to isolate high-frequency vibration from, for example, transformer
- ◆ For super-precision machine tool
- ◆ For vibration damping of high-precision tester
- ◆ Used to control vertical/horizontal vibration

■ Specification

No.	Name of Components	Material
1	Wire Rope	STS304
2	Retainer Bar	STS304

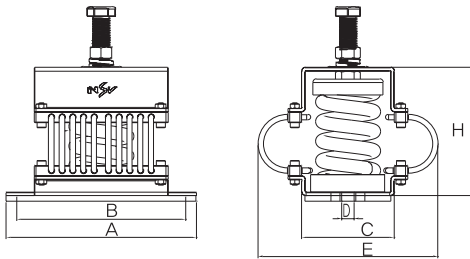
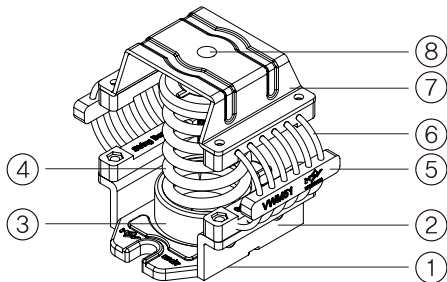
■ Dimension & Selection Guide

Type	Dimension(mm)				Max.Travel (mm)	Max. Load (kgf)
	A	B	C	H		
VWM20-90	170	90	6.2	50	30	30
VWM20-120	200	120				60
VWM20-170	250	170				100
VWM20-230	310	230				200

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.

VWM51 Wire-Spring Mount (Deflection : 25mm)

※ The model name of VWA product has changed to VWM51



■ Features

VWM51 offers elasticity of coil spring and excellent attenuation effect of wire rope, ensuring vibration isolation and dynamic stabilization of equipment.
Enhanced strength of wire mount helps bear large loads. Enhanced strength of wire mount helps bear large loads.

■ Usage

- ◆ For equipment that requires vibration isolation and dynamic stability
- ◆ For equipment that needs a buffer
- ◆ For reciprocating compressors and steam blowers
- ◆ For equipment that needs to control noise directing the floor right below

■ Specification

No.	Name of Components	Material	Standard
1	Lower Non Skid Pad	CR	KS M 6617
2	Lower Housing	SS400	KS D 3503
3	Spring Seat	CR	KS M 6617
4	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
5	Retainer Bar	E-Plastic	—
6	Wire Rope	STS304	KS D 3514
7	Upper housing	SS400	KS D 3503
8	Level Bolt	SS400	KS B 1002

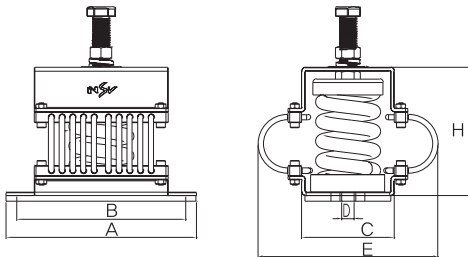
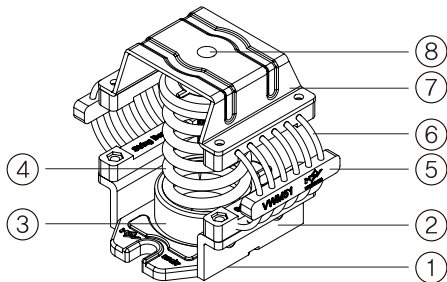
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Color	Dimension(mm)						
				A	B	C	D	E	H	Leveling Bolt
VWM51-A-100	100	4	Blue	138	108	89	13	165	142	M16 x 80
VWM51-A-150	150	6	Brown							
VWM51-A-200	200	8	White							
VWM51-A-300	300	12	Orange							
VWM51-A-400	400	16	Pink	192	162	112	16	210	179	M20 x 90
VWM51-B-500	500	20	Green							
VWM51-B-600	600	24	Blue							
VWM51-B-750	750	30	Black							
VWM51-B-1000	1000	40	Yellow							
VWM51-B-1200	1200	48	Red							
VWM51-B-1500	1500	60	Brown							

(NOTE) The specification and data are subject to change without prior notice for improvement of product performance and quality.

VWM52 Wire-Spring Mount (Deflection : 50mm)

※ The model name of VWA product has changed to VWM52



■ Features

It is a wire spring mount, has the same feature and purpose as VWM51 TYPE, but with static displacement of spring being 50mm, used when necessary to operate in quiet and calm manner of equipments requiring reciprocating compressor, steam blower, vibration reduction ability and dynamic stability.

■ Usage

- ◆ Reciprocating compressor, steam blower
- ◆ Used in high efficiency vibration reduction of equipments requiring vibration ability and dynamic stability.
- ◆ Used in high efficiency vibration reduction requiring buffer medium
- ◆ Used in high efficiency vibration reduction when necessary to remove noise from direct underneath layer

■ Specification

No.	Name of Components	Material	Standard
1	Lower Non Skid Pad	CR	KS M 6617
2	Lower Housing	SS400	KS D 3503
3	Spring Seat	CR	KS M 6617
4	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
5	Retainer Bar	E-Plastic	-
6	Wire Rope	STS304	KS D 3514
7	Upper housing	SS400	KS D 3503
8	Level Bolt	SS400	KS B 1002

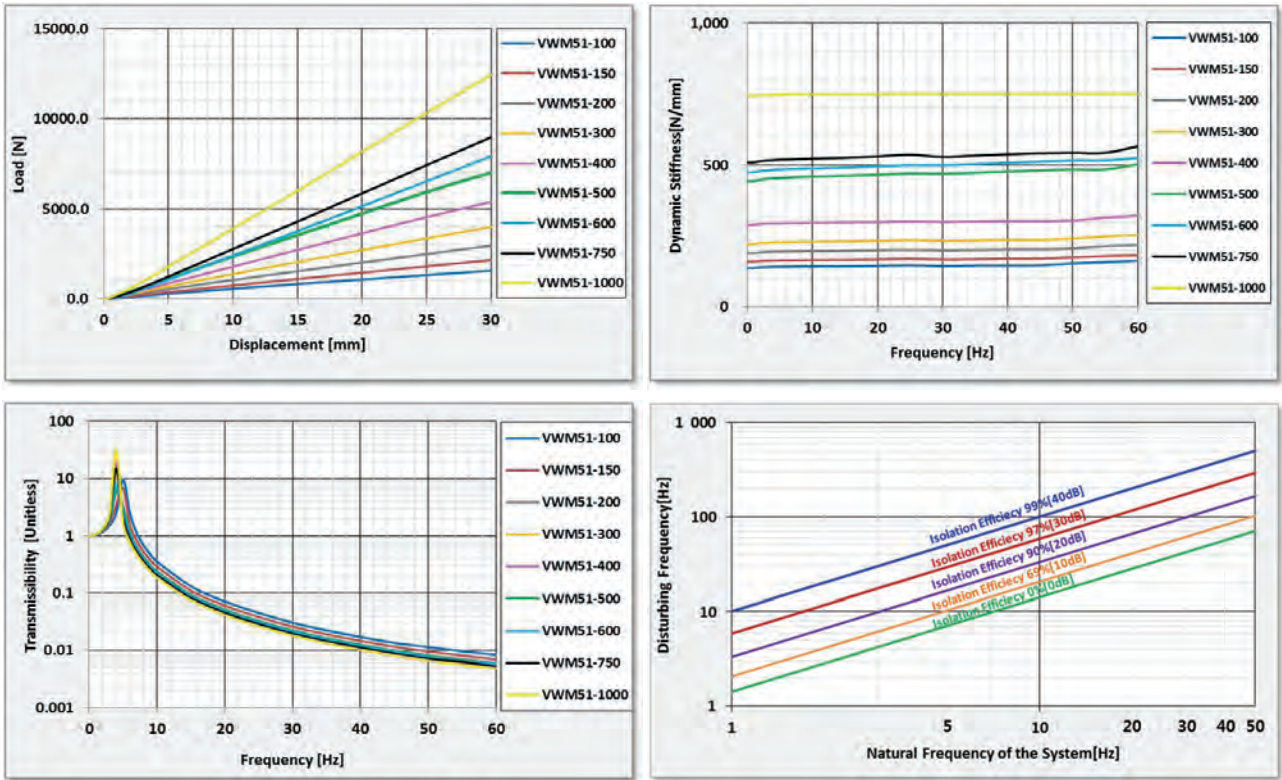
■ Dimension & Selection Guide

Type	Capacity (kgf)	Spring Constant (kgf/mm)	Color	Dimension(mm)						
				A	B	C	D	E	H	Leveling Bolt
VWM52-100	100	2	Blue	216	186	139	16	238	193	M16 x 80
VWM52-150	150	3	Brown							
VWM52-200	200	4	White							
VWM52-300	300	6	Orange							
VWM52-400	400	8	Pink							
VWM52-500	500	10	Green							
VWM52-600	600	12	Blue							
VWM52-750	750	15	Black							
VWM52-1000	1000	20	Yellow							
VWM52-1200	1200	24	Red							
VWM52-1500	1500	30	Brown							

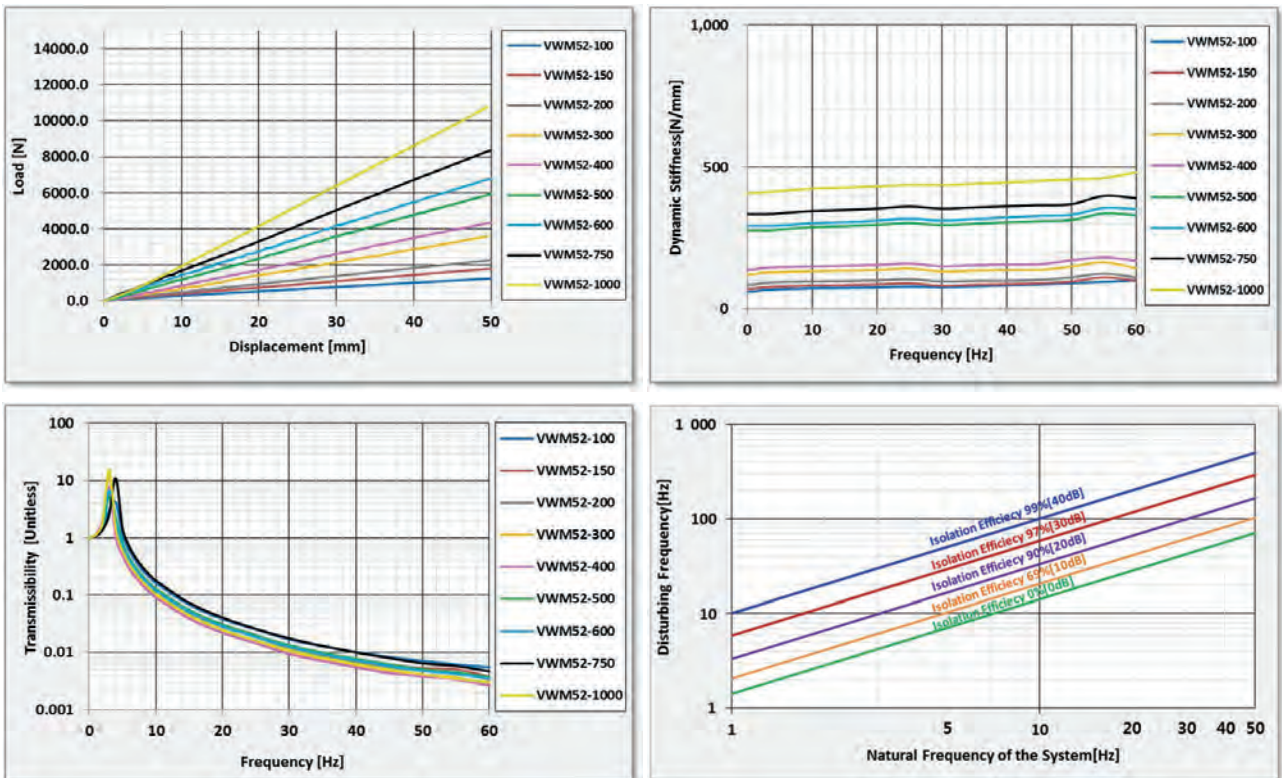
(NOTE) The specification and data are subject to change without prior to for improvement of product performance and quality.

VWM51/VWM52 Wire-Spring Mount

VWM51 – Test Data

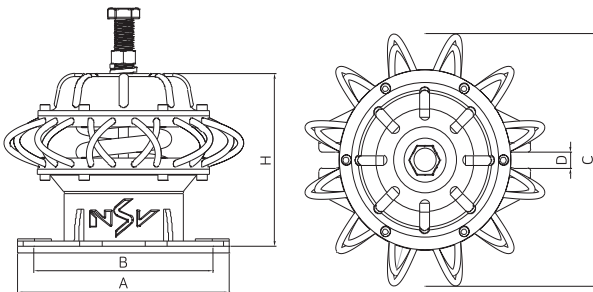
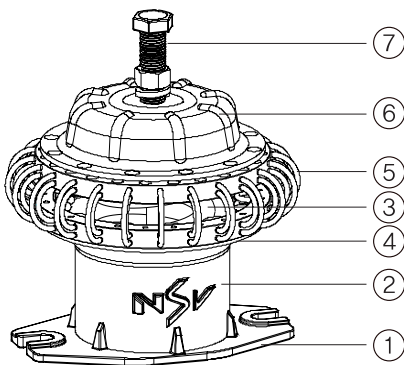


VWM52 – Test Data



VWM62 Wire-Spring Mount (Deflection : 50mm)

※ The model name of VWS product has changed to VWM62



■ Features

VWM62 offers elasticity of coil spring and excellent attenuation effect of wire rope, ensuring vibration isolation and dynamic stabilization of equipment.
enhanced strength of wire mount helps bear large loads

■ Usage

- ◆ For equipment that requires vibration isolation and dynamic stability
- ◆ For equipment that needs a buffer
- ◆ For equipment that needs horizontal elasticity
- ◆ For cooling towers, reciprocating compressors and steam blowers
- ◆ For equipment that needs to control noise directing the floor right below

■ Specification

No.	Name of Components	Material	Standard
1	Lower Non Skid Pad	CR	KS M 6617
2	Lower Housing	STS304	-
3	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
4	Retainer Bar	STS304	-
5	Wire Rope	STS304	KS D 3514
6	Upper housing	STS304	-
7	Level Bolt	SS400	KS B 1002

■ Dimension & Selection Guide

Type	Capacity	Spring Constant (kgf/mm)	Color	Dimension(mm)					
				A	B	C	D	H	Leveling Bolt
VWM62-100	100	2	Blue	201	170	214	15	170	M16 x 80
VWM62-150	150	3	Brown						
VWM62-200	200	4	White						
VWM62-300	300	6	Orange						
VWM62-400	400	8	Pink						
VWM62-500	500	10	Green						
VWM62-600	600	12	Blue						
VWM62-750	750	15	Black						
VWM62-1000	1000	20	Yellow						
VWM62-1200	1200	24	Red						
VWM62-1500	1500	30	Black						

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.



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NSV Co., Ltd.
Noise, Shock & Vibration Control



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