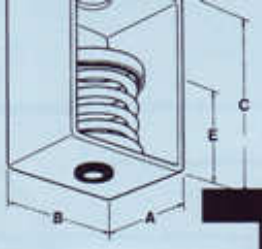
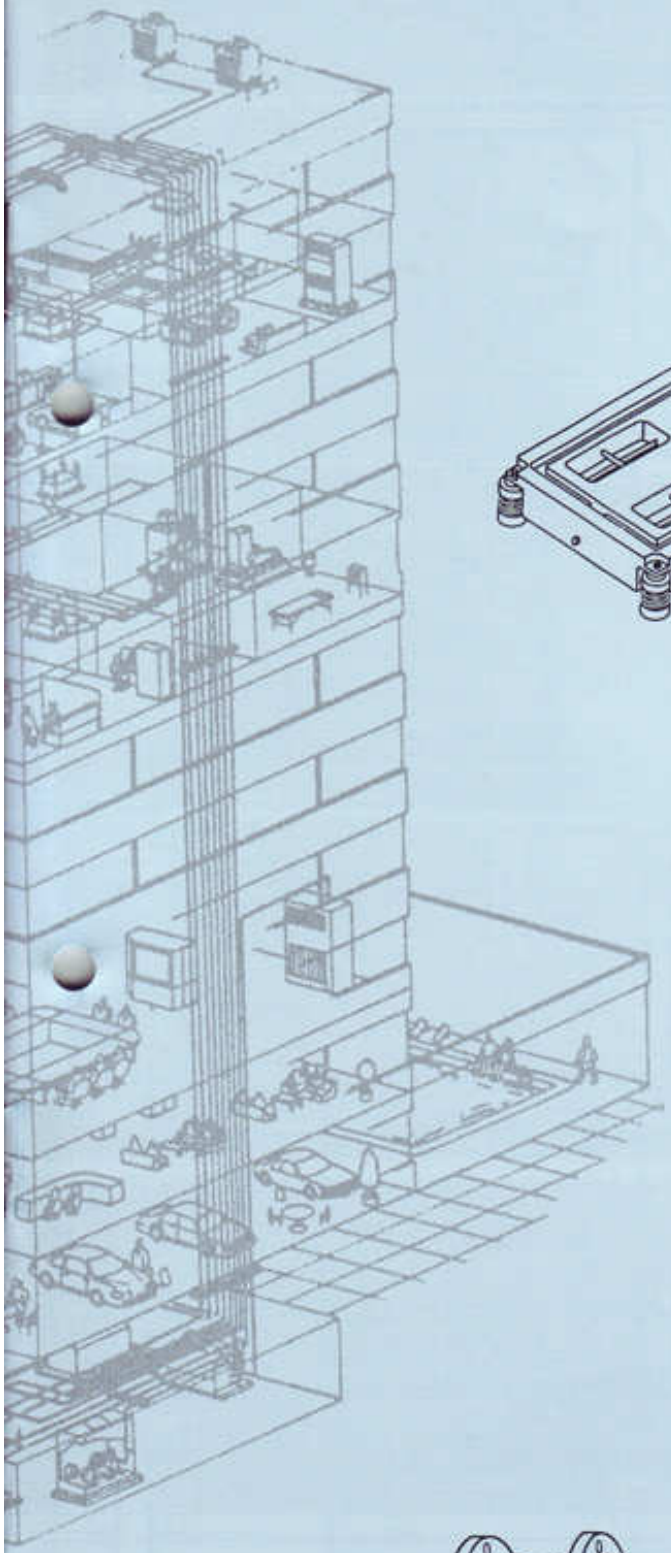
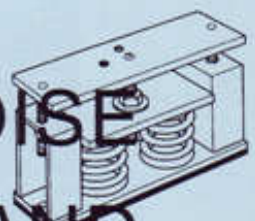
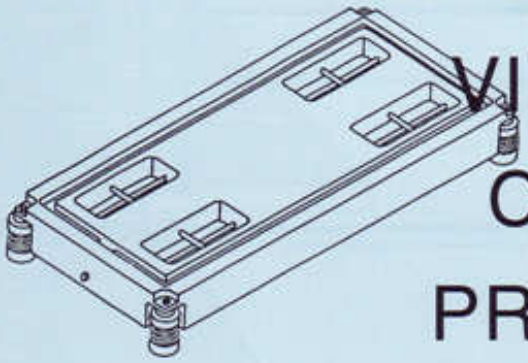


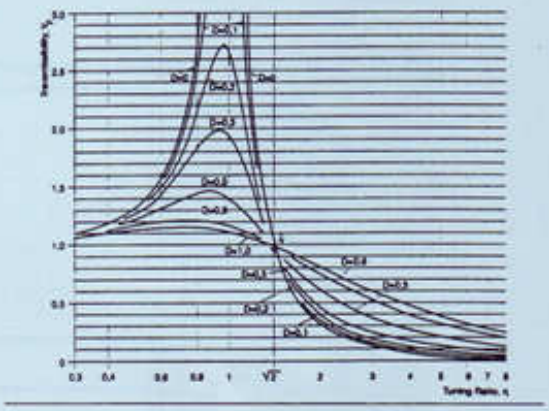
TOZEN

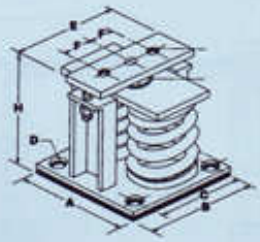


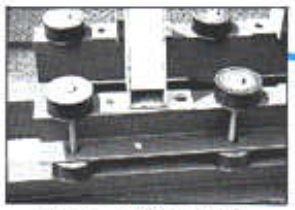


NOISE AND VIBRATION CONTROL PRODUCTS









INT. ANCHOR

PTM-D

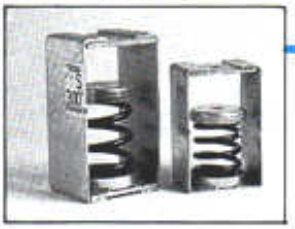
PT-TUFFLEX

PTM-D

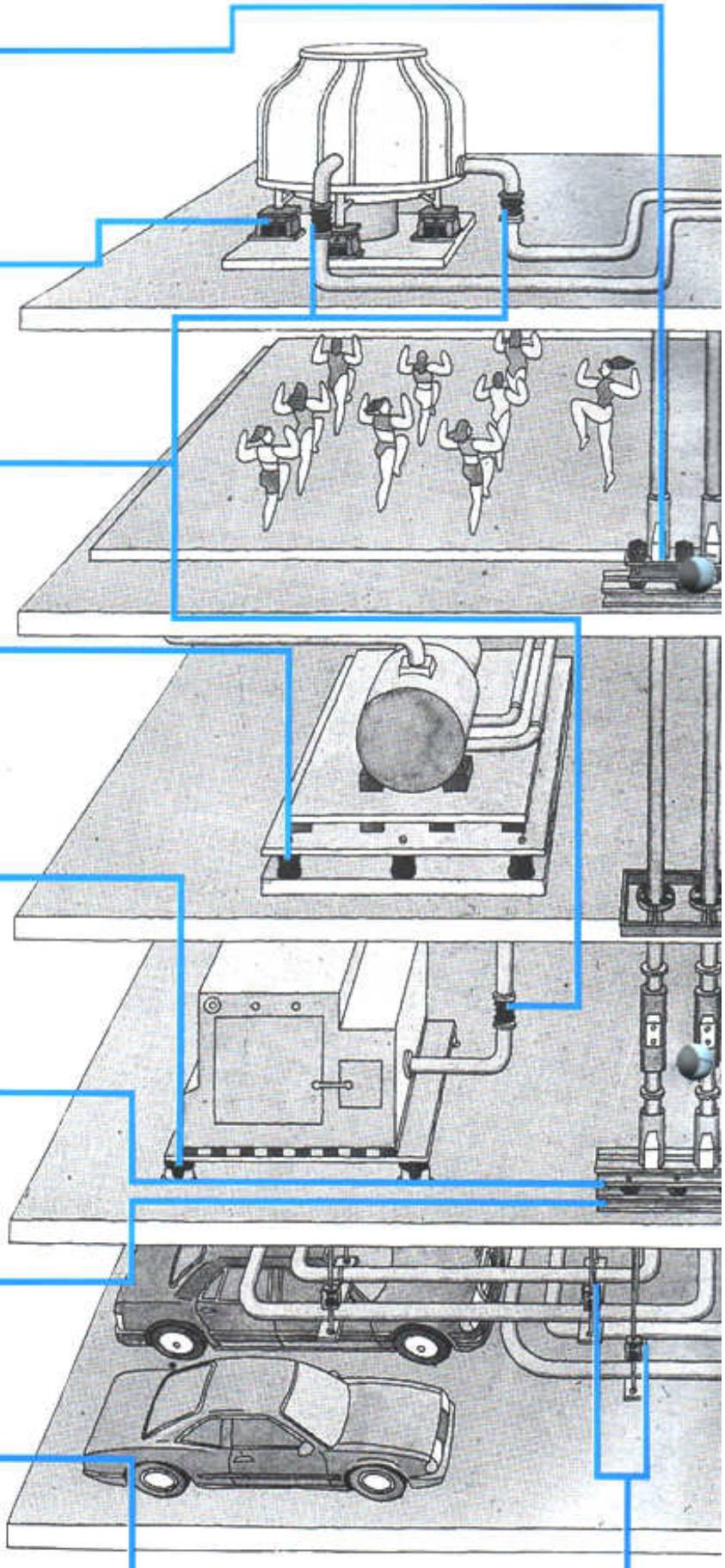
PTM-C

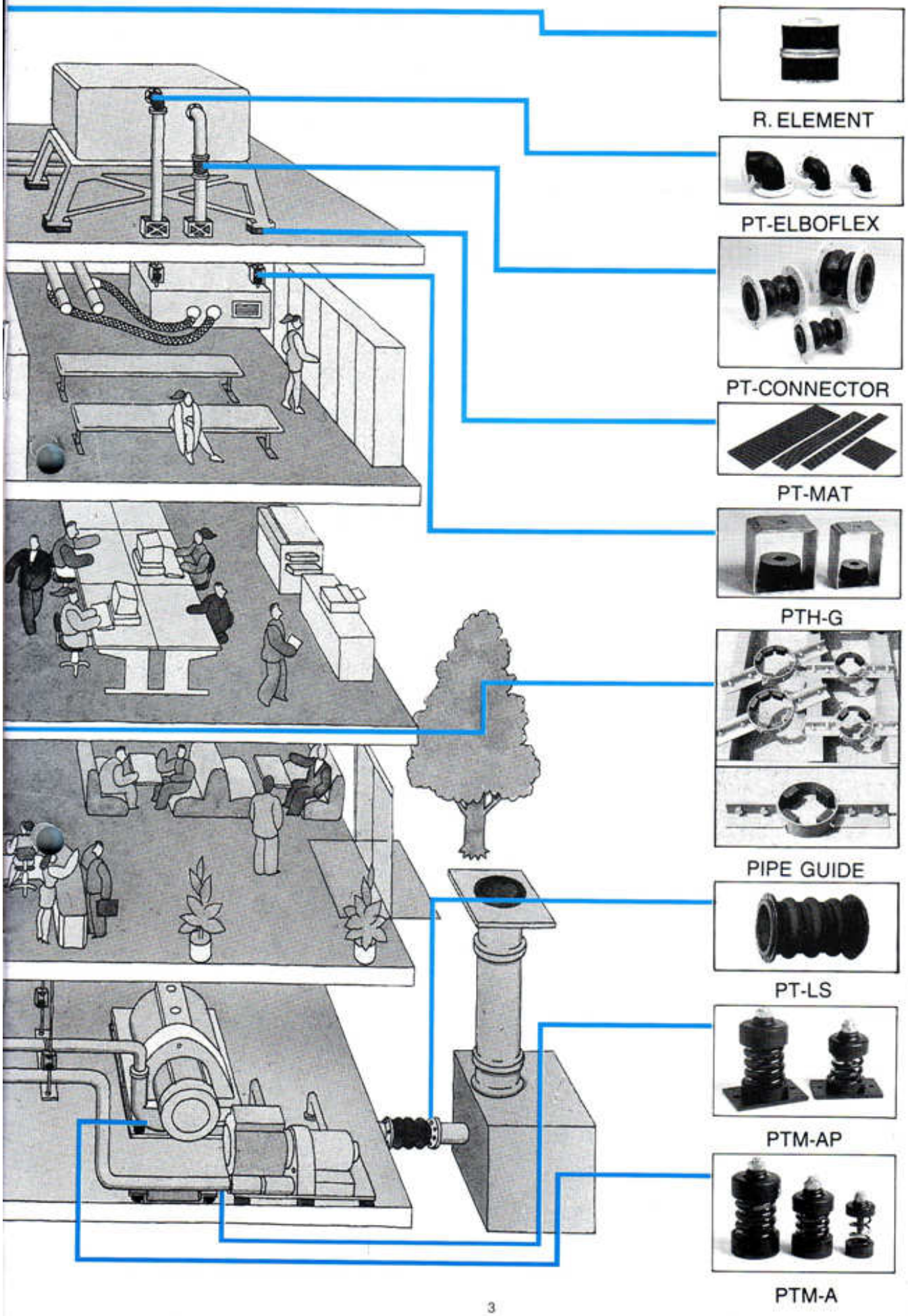
MAIN ANCHOR

PTM-G



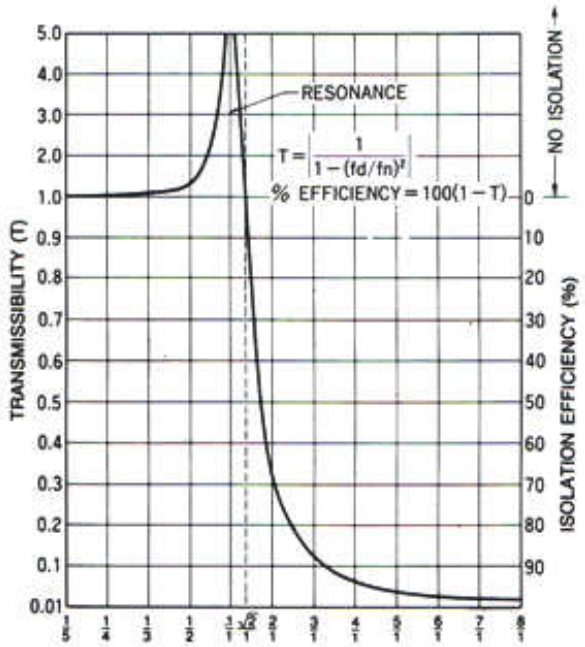
PTH-S




R. ELEMENT
PT-ELBOFLEX
PT-CONNECTOR
PT-MAT
PTH-G
PIPE GUIDE
PT-LS
PTM-AP
PTM-A

Today, most of sophisticated buildings are provided with air conditioning systems and other equipments to create a comfortable working or living environment. However, these mechanical equipments generate vibration and vibration induced noise, which has became a major sources of occupant complaint in modern buildings. The noise and vibration problem is compounded by increasing uses of lighter weight construction and equipments located in penthouses or intermediate level mechanical rooms. It increased structureborne vibration and noise transmission. Not only is the physical vibration in the structure distrubing, but noise which is regenerated by the structural movement may be heard in other remote sections of the building structure.

VIBRATION TRANSMISSIBILITY CURVE FOR AN ISOLATED SYSTEM



Equipment Operating Speed (fd)

Isolator Natural Frequency (fn)

(Fig. 1)

TOZEN vibration and noise control products are designed to isolate or reduce the damaging structure vibration and annoying noise produced by the mechanical equipments. Owing to continuous research and development program, Tozen vibration and noise control products are recognized as a best solution to every day problems and for complex applications requiring optimum vibration and noise control.

Effectiveness of the vibration control, or vibration isolating efficiency is a function of the ratio of the equipment operating frequency, fd, to isolator natural frequency, fn. Figure 1 shown a typical vibration transmissibility curve for vibrating equipments supported on isolators. When the fd = fn, the system resonance occurs, the exciting forces will be amplified rather than reduced. As isolator natural frequency, fn, becomes lower than distributing frequency, fd, the isolation range is entered when the ratio of fd/fn becomes bigger than $\sqrt{2}$. In Figure 2, the formula expressed the natural frequency of the isolator is a function of isolator deflection. Theoretically, it is desirable to select isolators with a natural frequency as far below the equipment operating speed as possible to achieve the highest degree of vibration control. However, when the ratio approaches 6:1, it takes very large increases in static deflection to reduce isolator natural frequency and further reduce transmission.

$$fn = 947 \sqrt{\frac{1}{\text{deflection in mm}}}$$

(Fig.2)

Theoretical isolation efficiency shown on the transmissibility curve (Fig. 1) assumes the isolators are located on a rigid floor. This rigidity seldom occurs in above grade applications. In practice, considerable building deflection can occur, which may reduce the effectiveness of the vibration isolators. Vibration isolators must be selected to compensate for the floor deflection. Longer spans also allow the structure to be more flexible, permitting the building to be more easily set in operating speeds, equipment horsepower, damping and other factors have been taken into consideration.

By specifying Tozen vibration isolator by type and deflection rather than isolation efficiency, transmissibility, or other theoretical parameters. The consulting engineer can compensate for floor deflection and building resonances by selecting isolators which are satisfactory to provide minimum vibration transmission and which have more deflection than the supporting floor.

When the specifier permits equipment suppliers to provide "appropriate" isolators, which are not manufactured under Tozen or equivalent high Standards, a satisfactory job is not ensured, since different brands of isolators may be furnished and no one supplier except Tozen can carry the full responsibility for a building free of vibration and noise as specified.

To apply the information from the Selection Guide, base type, isolator type, and minimum deflection, columns are added to the equipment schedule, and the isolator specifications are incorporated into mechanical specifications for the project. Then, for each piece of mechanical equipment, base type, isolator type and minimum deflection are entered, as tabulated in the Selection Guide.

GENERAL SPECIFICATION

Unless otherwise noted on the equipment schedule, all mechanical equipment shall be mounted on vibration isolators to prevent the transmission of vibration and mechanical transmitted sound to the building structure. Vibration isolators shall be selected in accordance with the weight distribution so as to produce reasonably uniform deflection. Deflections shall be as noted on the equipment schedule. For spring isolators, the outside diameter of the spring shall not less than 80% of the compressed height at rated load and shall have a minimum of 50% over load capacity.

SPECIFICATION-FLOOR MOUNT SPRING ISOLATORS

Spring vibration isolator shall be free standing, laterally stable without any house, snubbers, or guides and complete with steel cup reinforced rubber cups at the top and bottom. All mountings shall be provided with adjusting bolt, cap screw and washer in top cup for leveling and attachment to equipment. Floor mount spring vibration isolators shall be Model PTM-AP as manufactured by Tozen

SPECIFICATION-SPRING HANGERS

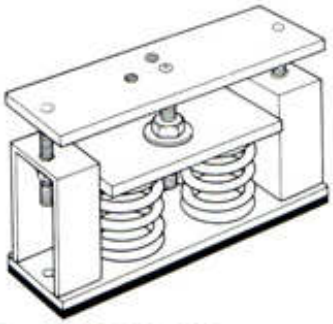
Vibration isolators for suspended equipment shall be hangers consist of a free standing, laterally stable steel spring with load transfer steel cup with rubber washer in series, assembled in a welded rectangular steel box. Vibration isolating hangers shall be Model PTH-S, as manufactured by Tozen

SPECIFICATION-HOUSED SPRING ISOLATORS

Spring vibration isolators shall be housed spring type consist of a steel spring and load cap housed in a cast iron assembly, with rubber sponge snubbers designed to stablize the isolator and prevent metal to metal connection. The top loading plate shall complete with leveling bolt and lock nut or otherwise, internal leveling devise shall be featured. The housing bottom shall be bonded to a 8mm thick non-skid noise isolation rubber pad and shall be slot holed to allow bolting to the supporting structure. Housed spring vibration isolators shall be Model PTM-C, as manufactured by Tozen

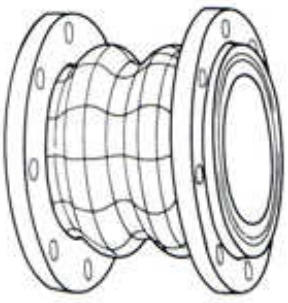
SPECIFICATION-SPRING AND RUBBER COMBINATION HANGERS

Vibration isolators for suspended equipment where both high and low frequency vibrations are to be isolated, shall be hangers consisting of a laterally stable steel spring in series with a moulded noise absorbing rubber insert, assembled in a welded rectangular steel box. The combination vibration isolating hangers shall be Model PTH-SG, as manufactured by Tozen



SPECIFICATION-RESTRAINED SPRING ISOLATIORS

Restrained isolator shall consist of laterally stable steel springs assembled into a welded steel housing assembly designed to limit vertical movement of the supported equipment. Housing assembly shall be of fabricated steel members and consist of a load transfer plate at the top complete with tapped holes, adjusting and leveling bolts, vertical restraints, isolation washers and a bottom plate with non-skid noise isolation rubber pad and holes provided for anchoring to supporting structure. Vibration isolators shall be Model PTM-D, as manufactured by Tozen



SPECIFICATION-RUBBER FLEXIBLE JOINTS

Vibration isolating flexible joint shall be moulded of multiple layer synthetic rubber and nylon reinforcing fabric. Straight connectors up to 50mm diameter may have threaded ends and triple sphere. Straight connectors over 32mm shall be twin sphere moulded with raised faces and provided with floating steel flanges. Connectors shall be pressure rated at 20 kg/cm2 and vacuum of 500mmHg at ambient temperature. Control rods shall be furnished when recommended by manufacturer. Flanged end twin sphere rubber connector shall be Model PT-Connector;theraded ends triple sphere rubber connector shall be Model PT-SSS, as manufactured by Tozen

SELECTION GUIDE

Selection Guide for Tozen Vibration Isolator

EQUIPMENT TYPE - Category & Capacity	GRADE SUPPORTED SLAB			6 METER FLOOR SPAN		
	Base Type	Isolator Type	Minimum Deflection	Base Type	Isolator Type	Minimum Deflection
Refrigeration Machines						
- Reciprocating Chillers	A	2	6	A	4	20
- Centrifugal Chillers	A	1	6	A	4	20
- Open Centrifugal Chillers	C	1	6	C	4	20
- Absorption Chillers	A	1	6	A	4	20
Air compressors						
- Tank Mounted	A	3	20	A	3	20
- Base Mounted	C	3	20	C	3	20
Pumps-Close coupled						
- Up to 6 kW	B/C	2	6	C	3	20
- 7.5 kW & over						
- Flexible coupled						
- Up to 30 kW	C	3	20	C	3	20
- 37 to 93 kW	C	3	20	C	3	20
- 110 kW & over	C	3	20	C	3	20
Cooling Towers						
- Up to 300 rpm	A	1,2	6	A	4	65
- 301 to 500 rpm	A	1,2	6	A	4	65
- 501 rpm & over	A	1,2	6	A	4	20
Axial, Tubular & Fan heads						
- Up to 550mm dia.	A/B	2	6	A/B	3	20
- 600mm wheel dia. & over						
- Up to 300 rpm	B/C	3	65	C	3	90
- 301 to 500 rpm	B/C	3	20	C	3	40
- 501 rpm & over	B/C	3	20	C	3	40
Centrifugal Fans & Vent Sets						
- Up to 550mm wheel dia.	A/B	2	6	A/B	3	20
- 600mm wheel dia. & over						
- Up to 37 kW						
- Up to 300 rpm	B	3	65	B	3	90
- 301 to 500 rpm	B	3	40	B	3	40
- 501 rpm & over	B	3	20	B	3	20
- 45 kW & up						
- Up to 300 rpm	B/C	3	65	C	3	90
- 301 to 500 rpm	B/C	3	20	C	3	40
- 501 rpm & over	B/C	3	20	C	3	40
Packaged air Handing Equipments						
- Up to 7.5 kW	A	2	6	A	3	20
- 11 kW & over						
- Up to 500 rpm	A	2	6	A	3	20
- 501 rpm & over	A	2	6	A	3	20

Base Types:

A. No base, isolators attached directly to equipment
B. Structural steel rails or base
C. Concrete inertia base

Isolator Types:

1. Rubber pad
2. Rubber floor isolator and hanger
3. Unhoused floor isolator or hanger
4. Restrained spring isolator

(mm)

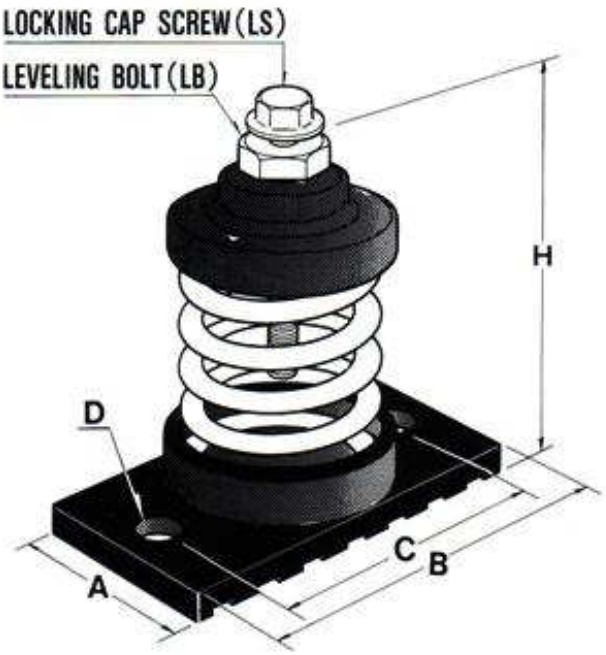
9 METER FLOOR SPAN			12 METER FLOOR SPAN			15 METER FLOOR SPAN		
Base Type	Isolator Type	Minimum Deflection	Base Type	Isolator Type	Minimum Deflection	Base Type	Isolator Type	Minimum Deflection
A	4	40	A	4	65	A	4	65
A	4	40	A	4	65	A	4	65
C	4	40	C	4	65	C	4	65
A	4	40	A	4	65	A	4	65
A	3	40	A	3	65	A	3	65
C	3	40	C	3	40	C	3	65
C	3	20	C	3	20	C	3	20
C	3	40	C	3	40	C	3	40
C	3	40	C	3	65	C	3	65
C	3	40	C	3	65	C	3	90
A	4	90	A	4	90	A	4	90
A	4	65	A	4	65	A	4	90
A	4	40	A	4	40	A	4	65
A/B	3	20	A/C	3	20	A/C	3	40
C	3	90	C	3	90	C	3	90
C	3	65	C	3	65	C	3	65
C	3	40	C	3	40	C	3	65
A/B	3	20	A/C	3	20	A/C	3	20
B	3	90	B	3	90	B	3	90
B	3	40	B	3	65	B	3	65
B	3	20	B	3	40	B	3	65
C	3	90	C	3	90	C	3	90
C	3	65	C	3	65	C	3	90
C	3	40	C	3	90	C	3	90
A	3	20	A	3	20	A	3	40
A	3	40	A	3	40	A	3	65
A	3	40	A	3	40	A	3	65

TOZEN MODEL PTM-AP FLOOR MOUNTING SINGLE SPRING ISOLATOR
MODEL PTM-AM HEAVY LOADING MULTIPLE SPRING ISOLATOR

TOZEN Model PTM-AP is a series of unhoused spring vibration isolators consist of high deflection, laterally stable steel springs assembled with a leveling devise at the top and non-skid acoustical pad at the bottom. Model PTM-AP employs moulded rubber upper and lower holding cup with build in leveling feature and a mounting plate base to allow for bolting the isolators to the structure. Model PTM-AM are multiple spring isolator for heavy loading applications.

The design of the spring elements are comply to JIS B2704 for semi-permenant use. To assure lateral stability, outside diameter of the spring elements do not less not 0.8 times to compressed height of the spring at rated load. All the springs are designed to provide a minimum of 50% overload capacity.

PTM-AP series vibration isolator are available with standard deflections at 25mm, and available up to 100mm, with load capacity from 10 to 1,400 Kgs for single spring isolators and 5600 Kgs for multiple spring isolators. Tozen PTM-AP series spring isolators are highly effective for control of both high and low frequency vibration produced by mechanical equipments, such as reciprocating air or refrigeration compressors, pumps, packaged air handling and air conditioning equipments, centrifugal and axial fans, internal combustion engines, etc.



MODEL : PTM-AP

APPLICATION

TOZEN PTM-AP series spring isolators are recommended for use in isolating floor mounted sources of noise and vibration located near critically quiet areas.

PTM-AP series spring isolators are typically used to reduce the transmission of noise and vibration from low speed mechanical equipments into a building structure. PTM-AP series spring isolators are used in a wide range of applications, such as, reciprocating air or refrigeration compressors, close coupled and base mounted pumps, package air handling and refrigeration equipments, centrifugal fans, internal combustion engines and similar equipments.

SPECIFICATION

Vibration isolators shall be floor mounted or free standing, laterally stable steel springs without housing, snubbers or guides. The isolator shall be complete with steel cup reinforced rubber cups at the top and bottom. All mounting shall be provided with adjusting bolt, cap screw and washer in top cup for leveling and attachment to the equipment.

Spring elements shall have a outside diameter not less than 0.8 times of the compressed height of the spring at rated load. All spring shall be designed to provide a minimum of 50% overload capacity.

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

Spring isolation mounts for floor mounted equipment shall be Model PTM-AP, as manufactured by Tozen.

TOZEN MODEL PTM-AP FLOOR MOUNTING SINGLE SPRING ISOLATOR
MODEL PTM-AM HEAVY LOADING MULTIPLE SPRING ISOLATOR

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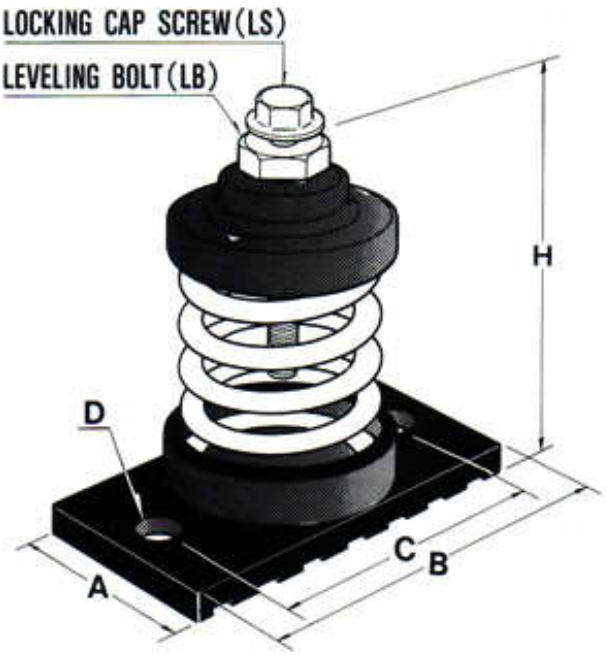

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Springs shall be selected to provide operating static deflections shown on the Vibration Isolation Schedule or as indicated on the project documents. Springs shall be colour coded or otherwise identified to indicate load capacity.

Spring isolation mounts for floor mounted equipment shall be Model PTM-AP, as manufactured by Tozen.

TOZEN PTM-AP TYPE 25 MM DEFLECTION SINGLE SPRING ANTI-VIBRATION MOUNTING

(mm)

MODEL	RATED CAPACITY		MOUNT CONSTANT	SPRING ELEMENT			OPERATING HEIGHT	PTM-AP TYPE				LOCKING CAP SCREW	LEVELING BOLT
	(KGs)	(Lbs)	(Kg/mm)	COLOR CODE	O.D.	FREE HEIGHT	(H)	(A)	(B)	(C)	(D)	(LS)	(LB)
PTM-AP-10S	10	22	0.4	GREEN									
PTM-AP-15S	15	33	0.6	BLUE									
PTM-AP-25S	25	55	1	WHITE									
PTM-AP-35S	35	77	1.4	YELLOW									
PTM-AP-50S	50	110	2	ORANGE	50	80	130	64	120	90	10	M10	M16
PTM-AP-80S	80	176	3.2	PINK									
PTM-AP-120S	120	264	4.8	RED									
PTM-AP-175ES	175	385	7	SILVER									
PTM-AP-225ES	225	495	9	GOLD									
PTM-AP-150M	150	330	6	ORANGE									
PTM-AP-200M	200	440	8	PINK									
PTM-AP-300M	300	660	12	RED									
PTM-AP-450M	450	990	18	GREEN									
PTM-AP-600EM	600	1320	24	SILVER	75	100	160	92	150	120	12	M12	M22
PTM-AP-825EM	825	1815	33	GOLD									
PTM-AP-975EM	975	2145	39	NOTE-1									
PTM-AP-1100EM	1100	2420	44	BLUE									
PTM-AP-1400EM	1400	3080	56	NOTE-2									

* Dimensions revision are made on 17 May 1995

NOTE-1: Models marked with a BROWN spring inside a GOLD spring.
NOTE-2: Models marked with a WHITE spring inside a BLUE spring.
NOTE-3: All springs are free standing and laterally stable. (Outside diameter do not less 0.8 times of compressed height)
NOTE-4: All springs are designed to provide additional travel to solid of at least 50% rated load.
NOTE-5: Please refer to relevant brochure or factory for greater deflection and loading.

TOZEN PTM-AM TYPE MUTLIPLE SPRING TYPE 25MM DEFLECTION ANTI-VIBRATION MOUNTING

(mm)

MODEL	RATED CAPACITY		MOUNT CONSTANT	SPRING COLOR CODE	OPERATING HEIGHT	(A)	(B)	(C)	(D)	(E)	LOCKING CAP SCREW	LEVELING BOLT
	(Kgs)	(Lbs)	(Kg/mm)		(H)						(LS)	(LB)
PTM-AM-1652EM	1650	3630	66	GOLD								
PTM-AM-1952EM	1950	4290	78	NOTE-1	160	85	285	245	16	220	M12	M22
PTM-AM-2202EM	2200	4840	88	BLUE								
PTM-AM-2802EM	2800	6160	112	NOTE-2								
PTM-AM-3304EM	3300	7260	132	GOLD								
PTM-AM-3904EM	3900	8580	156	NOTE-1								
PTM-AM-4404EM	4400	9680	176	BLUE	165	190	235	195	16	190	M16	M30
PTM-AM-5004EM	5000	11000	200	NOTE-3								
PTM-AM-5604EM	5600	12320	224	NOTE-2								

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NOTE-3: Models marked with a BROWN spring inside a BLUE spring.
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NOTE-6: Please refer to relevant brochure or factory for greater deflection and loading.

TOZEN PTM-AP TYPE 25 MM DEFLECTION SINGLE SPRING ANTI-VIBRATION MOUNTING

(mm)

MODEL	RATED CAPACITY		MOUNT CONSTANT	SPRING ELEMENT			OPERATING HEIGHT	PTM-AP TYPE				LOCKING CAP SCREW	LEVELING BOLT
	(KGs)	(Lbs)	(Kg/mm)	COLOR CODE	O.D.	FREE HEIGHT	(H)	(A)	(B)	(C)	(D)	(LS)	(LB)
PTM-AP-10S	10	22	0.4	GREEN									
PTM-AP-15S	15	33	0.6	BLUE									
PTM-AP-25S	25	55	1	WHITE									
PTM-AP-35S	35	77	1.4	YELLOW									
PTM-AP-50S	50	110	2	ORANGE	50	80	130	64	120	90	10	M10	M16
PTM-AP-80S	80	176	3.2	PINK									
PTM-AP-120S	120	264	4.8	RED									
PTM-AP-175ES	175	385	7	SILVER									
PTM-AP-225ES	225	495	9	GOLD									
PTM-AP-150M	150	330	6	ORANGE									
PTM-AP-200M	200	440	8	PINK									
PTM-AP-300M	300	660	12	RED									
PTM-AP-450M	450	990	18	GREEN									
PTM-AP-600EM	600	1320	24	SILVER	75	100	160	92	150	120	12	M12	M22
PTM-AP-825EM	825	1815	33	GOLD									
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NOTE-3: All springs are free standing and laterally stable. (Outside diameter do not less 0.8 times of compressed height)
NOTE-4: All springs are designed to provide additional travel to solid of at least 50% rated load.
NOTE-5: Please refer to relevant brochure or factory for greater deflection and loading.

TOZEN PTM-AM TYPE MUTLIPLE SPRING TYPE 25MM DEFLECTION ANTI-VIBRATION MOUNTING

(mm)

MODEL	RATED CAPACITY		MOUNT CONSTANT	SPRING COLOR CODE	OPERATING HEIGHT	(A)	(B)	(C)	(D)	(E)	LOCKING CAP SCREW	LEVELING BOLT
	(Kgs)	(Lbs)	(Kg/mm)		(H)						(LS)	(LB)
PTM-AM-1652EM	1650	3630	66	GOLD								
PTM-AM-1952EM	1950	4290	78	NOTE-1	160	85	285	245	16	220	M12	M22
PTM-AM-2202EM	2200	4840	88	BLUE								
PTM-AM-2802EM	2800	6160	112	NOTE-2								
PTM-AM-3304EM	3300	7260	132	GOLD								
PTM-AM-3904EM	3900	8580	156	NOTE-1								
PTM-AM-4404EM	4400	9680	176	BLUE	165	190	235	195	16	190	M16	M30
PTM-AM-5004EM	5000	11000	200	NOTE-3								
PTM-AM-5604EM	5600	12320	224	NOTE-2								

* Dimensions revision are made on 17 May 1995

NOTE-1: Models marked with a BROWN spring inside a GOLD spring.
NOTE-2: Models marked with a WHITE spring inside a BLUE spring.
NOTE-3: Models marked with a BROWN spring inside a BLUE spring.
NOTE-4: All springs are free standing and laterally stable. (Outside diameter do not less 0.8 times of compressed height).
NOTE-5: All springs are designed to provide additional travel to solid of at least 50% rated load.
NOTE-6: Please refer to relevant brochure or factory for greater deflection and loading.

TOZEN PTM-AP2 TYPE AND PTM-AM2 TYPE 50MM DEFLECTION SINGLE & MULTIPLE SPRING VIBRATION ISOLATOR

(mm)

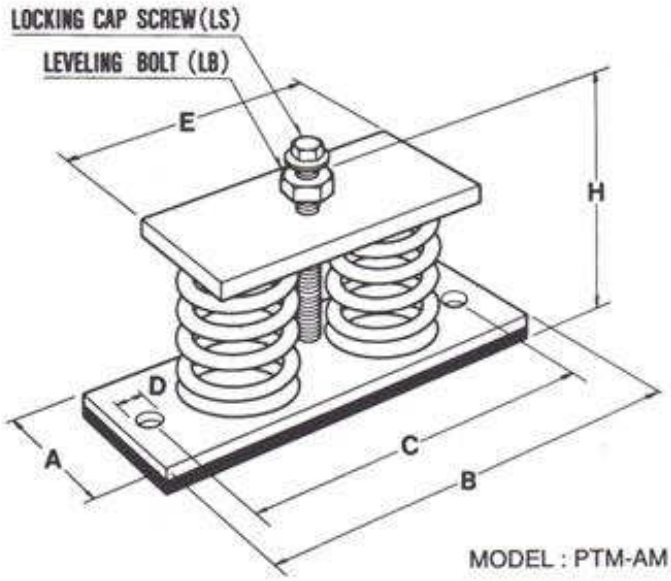
MODEL	RATED CAPACITY		MOUNT CONSTANT	SPRING ELEMENT			OPERATING HEIGHT	(A)	(B)	(C)	(D)	(E)	LOOKING CAP SCREW	LEVELING BOLT
	(Kgs)	(Lbs)	(Kg/mm)	COLOR CODE	O.D.	FREE HEIGHT	(H)						(LS)	(LB)
PTM-AP2-25S	25	55	0.5	WHITE	75	120	180	90	150	120	12	-	M12	M22
PTM-AP2-35S	35	77	0.7	YELLOW										
PTM-AP2-50S	50	110	1	ORANGE										
PTM-AP2-80ES	80	176	1.6	PINK										
PTM-AP2-125ES	125	275	2.5	RED										
PTM-AP2-175ES	175	385	3.5	SILVER										
PTM-AP2-250ES	250	550	5	GOLD										
PTM-AP2-175EM	175	385	3.5	ORANGE	90	145	200	104	160	130	14	-	M12	M22
PTM-AP2-245EM	245	539	4.9	PINK										
PTM-AP2-350EM	350	770	7	RED										
PTM-AP2-525EM	525	1155	10.5	GREEN										
PTM-AP2-750EM	750	1650	15	SILVER										
PTM-AP2-1050EM	1050	2310	21	NOTE-1										
PTM-AM2-1502EM	1500	3300	30	SILVER	90	145	200	100	315	275	16	255	M12	M22
PTM-AM2-2102EM	2100	4620	42	NOTE-1										
PTM-AM2-3004EM	3000	6600	60	SILVER	90	145	210	240	285	245	16	225	M16	M30
PTM-AM2-4204EM	4200	9240	84	NOTE-1										

NOTE-1: Models marked with a BROWN spring inside a Silver spring.

NOTE-2: All springs are free standing and laterally stable. (Outside diameter do not less 0.8 times of compressed height)

NOTE-3: All springs are designed to provide additional travel to solid of at least 50% rated load.

NOTE-4: Please refer to relevant brochure or factory for greater deflection and loading.



MODEL : PTM-AM

TOZEN PTM-AP2 TYPE AND PTM-AM2 TYPE 50MM DEFLECTION SINGLE & MULTIPLE SPRING VIBRATION ISOLATOR

(mm)

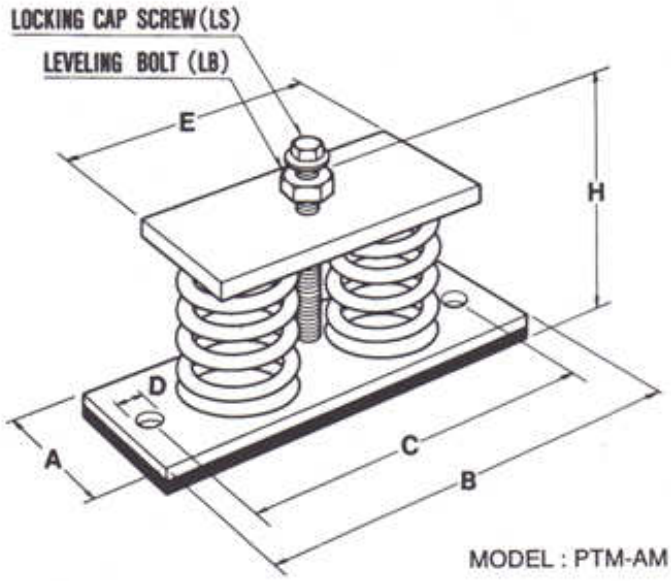
MODEL	RATED CAPACITY		MOUNT CONSTANT	SPRING ELEMENT			OPERATING HEIGHT	(A)	(B)	(C)	(D)	(E)	LOOKING CAP SCREW	LEVELING BOLT
	(Kgs)	(Lbs)	(Kg/mm)	COLOR CODE	O.D.	FREE HEIGHT	(H)						(LS)	(LB)
PTM-AP2-25S	25	55	0.5	WHITE	75	120	180	90	150	120	12	-	M12	M22
PTM-AP2-35S	35	77	0.7	YELLOW										
PTM-AP2-50S	50	110	1	ORANGE										
PTM-AP2-80ES	80	176	1.6	PINK										
PTM-AP2-125ES	125	275	2.5	RED										
PTM-AP2-175ES	175	385	3.5	SILVER										
PTM-AP2-250ES	250	550	5	GOLD										
PTM-AP2-175EM	175	385	3.5	ORANGE	90	145	200	104	160	130	14	-	M12	M22
PTM-AP2-245EM	245	539	4.9	PINK										
PTM-AP2-350EM	350	770	7	RED										
PTM-AP2-525EM	525	1155	10.5	GREEN										
PTM-AP2-750EM	750	1650	15	SILVER										
PTM-AP2-1050EM	1050	2310	21	NOTE-1										
PTM-AM2-1502EM	1500	3300	30	SILVER	90	145	200	100	315	275	16	255	M12	M22
PTM-AM2-2102EM	2100	4620	42	NOTE-1										
PTM-AM2-3004EM	3000	6600	60	SILVER	90	145	210	240	285	245	16	225	M16	M30
PTM-AM2-4204EM	4200	9240	84	NOTE-1										

NOTE-1: Models marked with a BROWN spring inside a Silver spring.

NOTE-2: All springs are free standing and laterally stable. (Outside diameter do not less 0.8 times of compressed height)

NOTE-3: All springs are designed to provide additional travel to solid of at least 50% rated load.

NOTE-4: Please refer to relevant brochure or factory for greater deflection and loading.



MODEL : PTM-AM

TOZEN TYPE PTM-AP3 AND PTM-AM3 75MM DEFLECTION SPRING VIBRATION ISOLATOR

(mm)

MODEL	RATED CAPACITY		MOUNT CONSTANT	SPRING ELEMENT			OPERATING HEIGHT	(A)	(B)	(C)	(D)	(E)	LOOKING CAP SCREW	LEVELING BOLT
	(Kgs)	(Lbs)	(Kg/mm)	COLOR CODE	O.D.	FREE HEIGHT	(H)						(LS)	(LB)
PTM-AP3-180ES	180	396	2.4	ORANGE										
PTM-AP3-255ES	255	561	3.4	PINK	90	170	220	100	170	140	14	-	M12	M22
PTM-AP3-375ES	375	825	5	RED										
PTM-AP3-555EL	555	1221	7.4	PINK										
PTM-AP3-810EL	810	1782	10.8	RED	110	190	250	125	195	165	14	-	M12	M22
PTM-AP3-1065EL	1065	2343	14.2	NOTE-1										
PTM-AM3-1112EL	1110	2442	14.8	PINK										
PTM-AM3-1622EL	1620	3564	21.6	RED	110	190	255	125	360	330	16	295	M12	M22
PTM-AM3-2132EL	2130	4686	28.4	NOTE-1										

NOTE-1: Models marked with a BROWN spring inside a RED spring.

NOTE-2: All Springs are free standing and laterally stable. (Outside diameter do not less 0.8 times of compressed height)

NOTE-3: All springs are designed to provide additional travel to solid of at least 50% rated load.

NOTE-4: Please refer to relevant brochure of factory for greater deflection and loading.

INSTALLATION INSTRUCTION

1. Block or lift up the equipment to a level that the equipment leg or base is 5mm higher than isolator's operating height (see catalogue). If common base & height saving isolator bracket is used, keep 50mm clearance between the base and floor. Maintain this height until piping installation is completed.
2. Locate the spring isolator under the hole in equipment leg or isolator bracket. Connect locking cap screw and washer, but do not tighten.
3. Transfer the equipment weight to the spring by taking two anti-clockwise turns on each leveling bolt around the unit until springs are compressed just enough to remove the blocks.
4. Tighten the locking cap screw to lock the assembly.

REMARKS:

A. DON'T install the equipment on the support of free spring, it would cause an insufficient operating height for the spring isolator when the installation is completed.

B. Weight of vertical piping and valves shall be taken over by the suspension hangers or support.

C. Install the flexible joint at the final, follow the pre-extension instruction which may specified or suggested by the flexible joint manufacturer.

D. Bolting down-In most cases, it is not necessary to bolt equipment to the floor, as the non-slip rubber pad or mounting cup prevent movement. Where bolting is required, avoid a direct metal contact between bolt and mounting, to prevent transmission of acoustical frequencies; the bolt shank shall be clear in the hole and a rubber washer used under the bolt head. Bolts shall only be tightened a half turn more than hand tight.

TOZEN MODEL PTM-C HOUSED SPRING ISOLATOR

DESCRIPTION - TOZEN PTM-C spring vibration isolators consist of high deflection, laterally stable springs assembled into telescoping cast iron housings which are complete with a 8mm thick ribbed noise absorbing pad bonded to bottom and with internal or external adjusting and leveling bolt as a part of the top assembly. Holes or slots are provided in all isolators for bolting to the structure. Model PTM-C spring isolators are designed with a preadjusted snubbing feature to reduce movement during start-up and shut-down. Model PTM-C spring isolators are available in standard deflection of 25mm with load capacity from 150 Kgs to 1,400 Kgs. Tozen Model PTM-C spring isolators are typically used to isolate vibration produced by mechanical, industrial, or process machinery where more damping is required and less motion can be tolerated than with free standing spring isolators.

APPLICATION - TOZEN Model PTM-C housed spring isolator mounts are used to isolate high and low frequency vibration generated by floor mounted mechanical equipment located in non-critical and semi-critical areas.

Model PTM-C spring isolators are typically used to isolate the vibration produced by light weight mechanical equipment, having lowest operating speeds of 1,200rpm, located on grade supported slabs, or short structural floor spans, when the isolator to equipment connection is such that a leveling bolt can be extended above the mount and act as a leveling and attachment bolt for the supporting equipment.

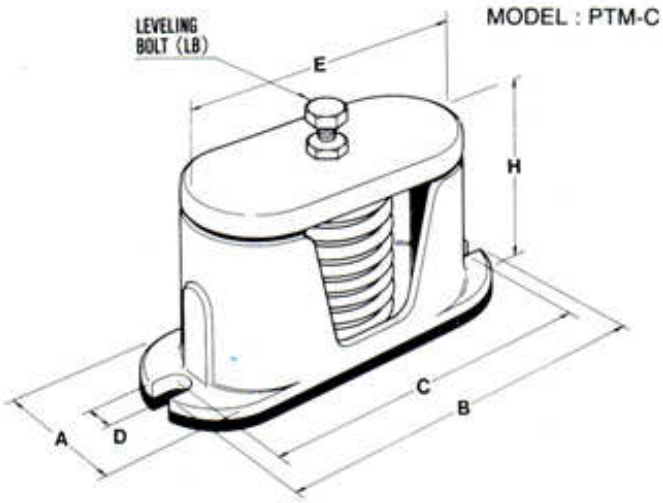
Model PTM-C isolators are available as Model PTM-CH which complete with tapped holes at the top loading plate for bolting to the supporting equipment. Internal leveling devise is provided for height adjustment which is accessible through the side opening by means of an open end wrench.

Model PTM-C isolators are available as Model PTM-CG which complete with non-skid rubber pad bonded at the top loading plate to eliminate the need for bolting down the supporting equipment. Internal leveling devise is provided for height adjustment which is accessible through the side opening by means of an open end wrench.

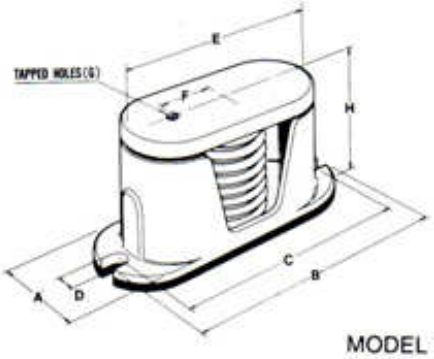
Built-in adjustable snubber are available with Model PTM-CS isolators for high horizontal thrust application which are recommended for applications under punch presses, drop hammers, clickers and other industrial equipments.

SPECIFICATION - Vibration isolators shall be housed spring type consists of a steel spring and load cap housed in a cast iron assembly, with rubber sponge snubbers designed to stabilize the isolators and prevent metal to metal connection of top and bottom housing sections. The top loading plate shall complete with leveling bolt and lock nut or otherwise, internal leveling devise shall be featured.

The housing bottom shall be bonded to a 8mm thick ribbed rubber pad and shall be slotted or drilled to allow bolting to the supporting structure.



MODEL : PTM-C



MODEL : PTM-CH

Model PTM-CH with tapped holes at the top loading plate

Outside diameter of the spring elements shall not less than 0.8 times to the compressed height of the spring at the rated load. All springs shall be designed to provided a minimum of 50% overload capacity.

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

Vibration isolators shall be Model PTM-C, as manufactured by Tozen.

TOZEN PTM-C TYPE HOUSING TYPE 25 MM DEFLECTION ANTI-VIBRATION MOUNTING

(mm)

MODEL	RATED CAPACITY		MOUNT CONSTANT	SPRING COLOUR	OPERATING HEIGHT (H)			(A)	(B)	SLOT PITCH	SLOT HOLE	TOP PLATE LENGTH	CH-TYPE		C-TYPE LEVELING
	(Kgs)	(Lbs)	(Kg/mm)	CODE	C-TYPE	CH-TYPE	CG-TYPE			(C)	(D)	(E)	(F)	(G)	BOLT(LB)
PTM-C-150M	150	330	6	ORANGE											
PTM-C-200M	200	440	8	PINK											
PTM-C-300M	300	660	12	RED											
PTM-C-450M	450	990	18	GREEN											
PTM-C-600EM	600	1320	24	SILVER	147	163	171	94	216	194	13	162	45	M12	M16
PTM-C-825EM	825	1815	33	GOLD											
PTM-C-975EM	975	2145	39	NOTE-1											
PTM-C-1100EM	1100	2420	44	BLUE											
PTM-C-1400EM	1400	3080	56	NOTE-2											

NOTE-1: Models marked with a BROWN spring inside a GOLD spring.

NOTE-2: Models marked with a WHITE spring inside a BLUE spring.

NOTE-3: All springs are free standing and laterally stable. (Outside diameter do not less than 0.8 times of compressed height)

NOTE-4: Please refer to relavent brochure of factory for greater defaction and loading.

NOTE-5: PTM-C type External Leveling Bolt (LB) is suitable for maximum 25mm bracket or base thckness please specify for equipment base thicker than 25mm.

INSTALLATION INSTRUCTION

A. For PTM-C (External level adjusted) spring isolators

1. Take out the leveling bolt and lock nut from the top of the isolator.
2. Lift or block up the equipment leg or isolator bracket to 5mm higher isolator's operating height (see catalogue) and slide the isolators into position. Put the levelling bolt & lock nut back into position.
3. Transfer the equipment weight to the spring by taking two clockwise turns on each leveling bolt around the unit until springs are compressed just enough to remove blocks.
4. Tighten the lock nut to lock the assembly.

B. For PTM-CH & PTH-CG (Internal level adjusted) spring isolators

1. Check that the internal levelling nut is adjusted up to underside of the top plate.
2. Lift or block up the equipment to 5mm higher than isolator's operating height (see catalogue) and slide the isolators into position and adjust the levelling nut until the top plate is in contact with equipment base. Insert fastening screws (if used) through the equipment base into top of the mounting and tighten.
3. Transfer the equipment weight to the spring by taking two anti-clockwise turns on each leveling bolt around the unit until springs are compressed just enough to remove blocks.

REMARKS:

a. When the equipment are not subject to raise to the required height, height saving bracket may be attached to the equipment. The height of bracket connection from the bottom of the base shall be 50mm less than the isolator's operating height or to keep a 50mm clearance between the ground and equipment.

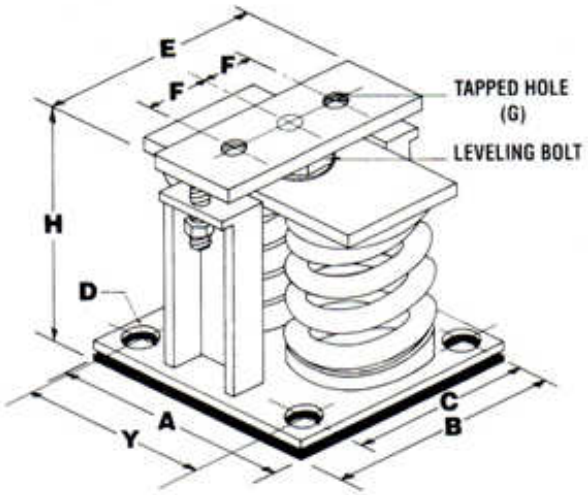
b. DON'T install the equipment on the support of free spring, it would cause an insufficient operating hegiht for the spring isolator when the installation is completed.

c. Weight of vertical piping and valves shall be taken over by the suspension hangers or support.

d. Install the flexible joint at final, follow the pre-extension instruction which may specified or sugguested by the flexible joint manufacturer.

e. Where bolting is required, avoid a direct metal contact between bolt and mounting, to prevent trasmission of acoustical frequencies; the bolt shank shall be clear in the hole and a rubber washer used under the bolt head. Bolts shall only be tightened a half turn more than hand tight.

TOZEN MODEL PTM-D RESTRAINED SPRING ISOLATOR



MODEL : PTM-D

TOZEN PTM-D series vibration isolators consist of free standing laterally stable steel springs assembled into welded steel housing assemblies fabricated to limit vertical movement of the isolated equipments when equipment loads are reduced or if the equipments are subjected to large external forces. Spring elements are completed with an internal adjusting and leveling bolt. Tapped holes are provided at the top load plate for bolting to equipment. A 10mm thick non-skid noise absorbing rubber pad is bonded at the bottom plate with holes for bolting to the structure. All the spring elements are comply to JIS B2704 for semi-permenant use. To assure lateral stability, outside diameter of the spring elements do not less than 0.8 times of the compressed height of the spring at rated load. All the spring are designed to provide a minimum of 50% overload capacity.

PTM-D series vibration isolator are shipped with standard deflections of 25mm, and available up to 100mm, with load capacities from 150 Kgs to 11,200 Kgs. Model PTM-D spring isolators are recommended for the isolation of vibration produced by equipment carrying a large fluid load which may be drained, such as boilers and chillers, and for the isolation of cooling towers, air cooled condensers, etc, where motion due to wind loads must be minimized.

APPLICATION - Model PTM-D mounts are typically used to reduce the transmission of noise and vibration into supporting structures from equipments carrying a large fuild load that may be drained, such as boilers and for cooling towers, which also require hold down for wind loads.

SPECIFICATION - Vibration isolators for equipment which is subject to load variabtions and large external or torquing forces shall consist of laterally stabie steel springs assembled into a welded steel housing assembly designed to limit vertical movement of the supported equipment.

Housing assembly shall be of fabricated steel members and consist of a load transfer plate at the top complete with tapped holes, adjusting and leveling bolts, vertical restraints, isolation washers and a bottom plate with non-skid noise isolation pad and holes provided for anchoring to supporting structure.

Spring elements shall have a outside diameter not less than 0.8 times to the compressed height of the spring rated load. All springs shall be designed to provide a minimum of 50% overload capacity.

Vibration isolators shall be Model PTM-D, as manufactured by Tozen.

INSTALLATION INSTRUCTION

1. Check that the internal leveling nut is adjusted up to underside of the top plate.
2. Lift or block up the equipment to 5mm higher than isolator's operating height (see catalogue) and slide the isolators into position and adjust the levelling nut until the top plate is in contact with equipment base. Insert fastening screws (if used) through the equipment base into top of the mounting and tighten.
3. Check alignment of the base so that restraining bolts are central with clearance holes in the restraining bracket.
4. Transfer the equipment weight to the spring by taking two clockwise turns on each leveling bolt around the unit until springs are compressed just enough to remove blocks.
5. Adjust restraining nuts to give 2-3mm clearance between the resilient washer and the underside of the restraining bracket. Check the levelling again after the system is filled with water.
6. Tighten the lock nut to lock the assembly.

REMARKS:

a. When the equipment are not subject to raise to the required height, height saving bracket may be attached to the equipment. The height of bracket connection from the bottom of the base shall be 50mm less than the isolator's operating height or to keep a 50mm clearance between the ground and equipment.
b. DON'T install the equipment on the support of free spring, it would cause an insufficient operating height for the spring isolator when the installation is completed.
c. Weight of vertical piping and valves shall be taken over by the suspension hangers or support.
d. Install the flexible joint at final, follow the pre-extension instruction which may specified or sugguested by the flexible joint manufacturer.
e. Where bolting is required, avoid a direct metal contact between bolt and mounting, to prevent transmission of acoustical frequencies; the bolt shank shall be clear in the hole and a rubber washer used under the bolt head. Bolts shall only be tightened a half turn more than hand tight.

TOZEN PTM-D TYPE SINGLE AND MULTIPLE SPRING 25MM DEFLECTION RESTRAINED SPRING ISOLATOR

(mm)

MODEL	RATED CAPACITY (Kgs)	RATED CAPACITY (Lbs)	MOUNT CONSTANT (Kg/mm)	SPRING COLOR CODE	OPERATING HEIGHT (H)	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(Y)
PTM-D-151M	150	330	6	ORANGE	160	100	184	154	16	184	40	M12	-
PTM-D-201M	200	440	8	PINK									
PTM-D-301M	300	660	12	RED									
PTM-D-451M	450	990	18	GREEN									
PTM-D-601EM	600	1320	24	SILVER									
PTM-D-826EM	825	1815	33	GOLD									
PTM-D-976EM	975	2145	39	NOTE-1									
PTM-D-1101EM	1100	2420	44	BLUE									
PTM-D-1401EM	1400	3080	56	NOTE-2									
PTM-D-902M	900	1980	36	GREEN	205	200	195	155	18	195	40	M16	160
PTM-D-1202EM	1200	2640	48	SILVER									
PTM-D-1652EM	1650	3630	66	GOLD									
PTM-D-1952EM	1950	4290	78	NOTE-1									
PTM-D-2202EM	2200	4840	88	BLUE									
PTM-D-2802EM	2800	6160	112	NOTE-2									
PTM-D-3304EM	3300	7260	132	GOLD	205	170	280	240	20	280	45	M16	95
PTM-D-3904EM	3900	8580	156	NOTE-1									
PTM-D-4404EM	4400	9680	176	BLUE									
PTM-D-5004EM	5000	11000	200	NOTE-3									
PTM-D-5604EM	5600	12320	224	NOTE-2									
PTM-D-6606EM	6600	14520	264	BLUE	205	170	420	380	20	420	110×2	M16	95
PTM-D-7506EM	7500	16500	300	NOTE-3									
PTM-D-8406EM	8400	18480	336	NOTE-2									

* Dimensions revision are made on 17 May 1995

NOTE-1: Models marked with a BROWN spring inside a GOLD spring.

NOTE-2: Models marked with a WHITE spring inside a BLUE spring.

NOTE-3: Models marked with a BROWN spring inside a BLUE spring.

NOTE-4: All springs are free standing and laterally stable. (Outside diameter do not less 0.8 times of compressed height).

NOTE-5: All springs are designed to provide additional travel to solid of at least 50% rated load.

NOTE-6: Please refer to relevant brochure or factory for greater deflection and loading.

TOZEN PTM-D2 TYPE SINGLE AND MULTIPLE SPRING 50MM DEFLECTION RESTRAINED SPRING ISOLATOR

(mm)

MODEL	RATED CAPACITY (Kgs)	RATED CAPACITY (Lbs)	MOUNT CONSTANT (Kg/mm)	SPRING COLOR CODE	OPERATING HEIGHT (H)	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(Y)
PTM-D2-176	175	385	3.5	ORANGE	205	100	200	170	16	200	40	16	-
PTM-D2-246	245	539	4.9	PINK									
PTM-D2-351	350	770	7	RED									
PTM-D2-526	525	1155	10.5	GREEN									
PTM-D2-751	750	1650	15	SILVER									
PTM-D2-1051	1050	2310	21	NOTE-1									
PTM-D2-1502	1500	3300	30	SILVER	250	230	210	170	18	210	40	16	190
PTM-D2-2102	2100	4620	42	NOTE-1									
PTM-D2-3004	3000	6600	60	SILVER	250	200	310	270	20	310	50	16	125
PTM-D2-4204	4200	9240	84	NOTE-1									
PTM-D2-4506	4500	9900	90	SILVER	250	200	430	390	20	430	110×2	16	125
PTM-D2-6306	6300	13860	126	NOTE-1									

* Dimensions revision are made on 17 May 1995

NOTE-1: Models marked with a BROWN spring inside a red spring.

NOTE-2: All springs are free standing and laterally stable.

NOTE-3: All springs are designed to provide additional travel to solid of at least 50% rated load.

NOTE-4: Please consult the TECHNICAL DEPT. or representatives for a complete vibtation control design.

PTM-GP

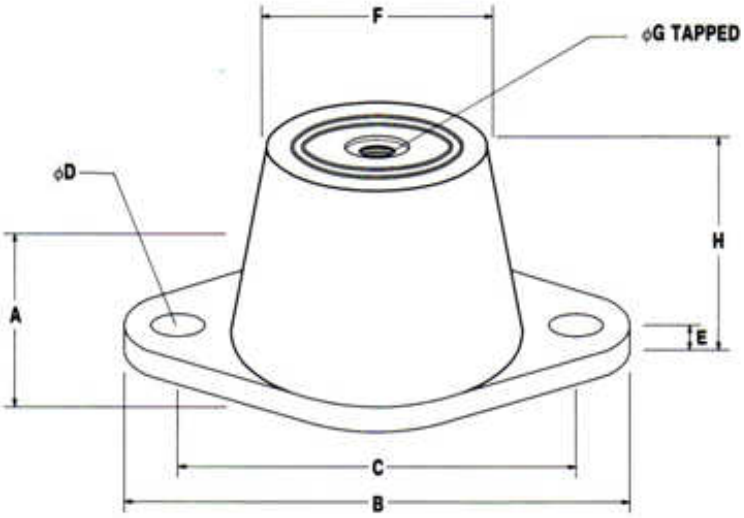
TOZEN MODEL PTM-GP FLOOR MOUNTED RUBBER VIBRATION ISOLATOR

DESCRIPTION: TOZEN Model PTM-GP vibration isolator are one-piece moulded neoprene with one cast-in load transfer steel plate at the top and baseplate at the bottom. The rubber is loaded in both shear and compression to provide the desirable straight line rubber-in-shear deflection curves as well as overload protection. The rubber ribbed baseplate provides skid resistance and need not be bolted to the floor on most installations. The standard neoprene rubber is oil resistant and had been designed to operate within the strain limits of the isolator to provide the maximum isolation and longest expectancy. Model PTM-GP is available in 9 sizes with load capacity from 30 Kgs to 450 Kgs. Standard static deflection of PTM-GP is 8-10mm.

APPLICATION: TOZEN PTM-GP rubber floor mounted can be used to isolate noise and high frequency vibration generated by mechanical equipments located on a grade supported structual slab or pier.

Model PTM-GP is recommended for the isolation of vibration produced by small pumps, vent sets, low pressure packaged air handling units, etc., and usually selected when first cost must be minimized.

SPECIFICATION: Vibration isolators shall be moulded from neoprene or oil resistant synthetic rubber. Rubber isolator shall incorporated with a cast-in-top steel load transfer plate in the load surface for bolting to the supported equipment and skid resistant baseplate with holes provided for anchoring to supporting structure. Rubber vibration isolator shall be Model PTM-GP, as manufactured by Tozen.



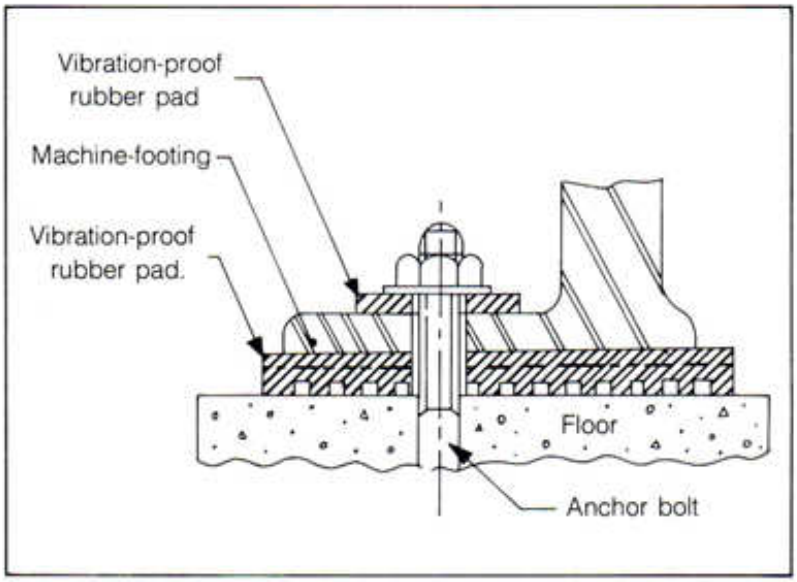
MODEL : PTM-GP

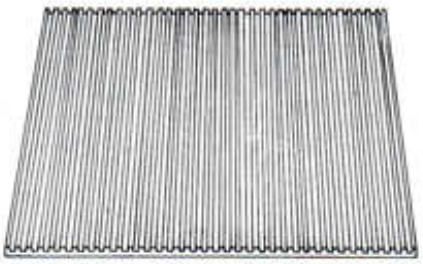
(mm)

MODEL	RATED CAPACITY (Kgs)	RATED CAPACITY (Lbs)	COLOR CODE	Dura-meter	FREE HEIGHT (H)	(A)	(B)	(C)	(D)	(E)	(F)	(G)
PTM-GP-30	30	66	WHITE	40	35	40	84	60	8	5	30	M8
PTM-GP-50	50	110	YELLOW	50								
PTM-GP-75	75	165	RED	60								
PTM-GP-100	100	220	WHITE	40	50	60	104	80	8	6	45	M10
PTM-GP-150	150	330	YELLOW	50								
PTM-GP-200	200	440	RED	60								
PTM-GP-250	250	550	WHITE	40	70	87	147	115	12	7	65	M12
PTM-GP-350	350	770	YELLOW	50								
PTM-GP-450	450	990	RED	60								

TOZEN PT-MAT VIBRATION ISOLATING RUBBER PAD

- TOZEN PT-MAT vibration isolating pads are produced from a high quality elastomer and moulded with crossed double ribs. 3 different thickness of PT-MAT at 55 durometer are designed for 6-8 Kgf/cm2 maximum unit load with different static deflection. Synthetic rubber compound allows PT-MAT to operate within the strain limits of the isolator and to provide long life expectancy. To obtain a greater deflection, two PT-MAT isolating pads can be stack together. When two isolating pads are laminated, they shall be seperated by a steel plate. Total 11 sizes of PT-MAT can be cut or drilled to meet field conditions. TOZEN PT-MAT isolating rubber pads can be used to isolate noise, shock and high frequency vibration produced by mechanical, industrial, or process equipment located on grade or located in other non-critical areas.





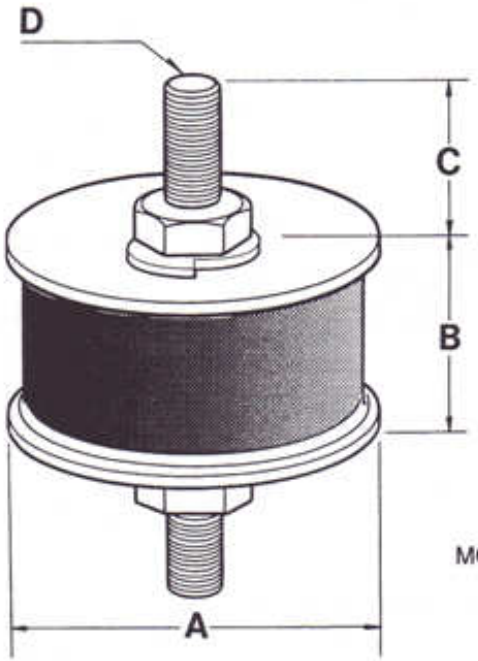
MODEL : PT-MAT

(mm)

MODEL	t	W	L	ALLOWABLE LOADING (Kgs/cm2)
PT-1030	10	300	300	8
PT-1100	10	100	1000	8
PT-1150	10	150	1000	8
PT-1300	10	300	1000	8
PT-1510	15	100	1000	7
PT-1515	15	150	1000	7
PT-1530	15	300	1000	7
PT-5000	15	100	5000	7
PT-2010	20	100	1000	6
PT-2015	20	150	1000	6
PT-2030	20	300	1000	6

TOZEN MODEL PTM-G VIBRATION ISOLATING RUBBER MOUNT

DESCRIPTION - TOZEN Model PTM-G vibration isolators are one piece moulded neoprene with two cast-in load transfer steel plates incorporate with bolt, spring washer and lock nut at the top and the bottom load surface for attachment to supported equipment. The sythetic rubber compound is oil resistant and has been designed to operate within the strain limits of the isolator to provide the maximum isolation and longest expectancy. Model PTM-G is recommended for the isolation of vibration produced by small pumps, vent sets, low pressure packaged air handling units, etc., and usually selected when first cost must be minimized.



MODEL : PTM-G

(mm)

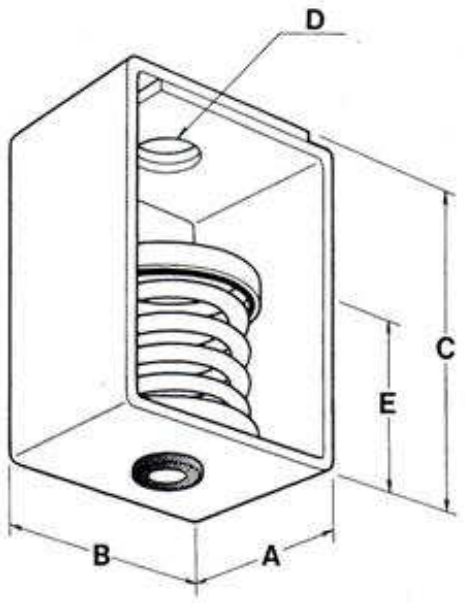
MODEL	RATED CAPACITY		MAXIMUM STATIC DEFL	A	B	C	D
	(Kgs)	(Lbs)					
PTM-G-20	20	44	2	20	15	18	M6
PTM-G-35	35	77	2	25	18	18	M6
PTM-G-70	70	154	4	35	26	22	M8
PTM-G-120	120	264	5	45	34	23	M8
PTM-G-175	175	395	6	55	40	32	M10
PTM-G-335	335	737	5	65	34	37	M12
PTM-G-435	435	957	6	75	42	37	M12
PTM-G-600	600	1320	8	90	50	37	M12
PTM-G-700	700	1540	8	110	66	46	M16
PTM-G-1500	1500	3300	8	150	70	51	M20

TOZEN PTH-S & PTH-S2 SPRING VIBRATION ISOLATING HANGER
PTH-SG & SG2 SPRING AND RUBBER VIBRATION ISOLATING HANGER

DESCRIPTION - TOZEN PTH-S Series vibration isolating hangers consist of a rectangular steel box incorporated with a free standing, laterally stable steel spring with load transfer steel cup with rubber washer. PTH-SG comes in series with a noise absorbing hanger rubber for better performance. This combination takes advantage of the best properties of both materials. Both design permits installation in the hanger rods or at the ceiling.

The design of the spring elements are comply to JIS B2704 for a semi-permenant use. To assure stability, outside diameter of the springs do not less than 0.8 times of the compressed height of the spring at rated load. All springs are designed to provide a minimum of 50% overload capacity. Model PTH-S spring hangers are available with 25 mm and 50 mm deflection with standard load capacity from 10 Kgs to 5,600 Kgs. PTH-SG spring and rubber hangers are available with load capacity up to 1,100 Kgs. PTH-S and PTH-SG series vibration isolating hangers are recommended for the isolation of vibration produced by suspended mechanical equipments, low speed suspended fans, transformers, ductwork, piping, etc.

APPLICATION - Tozen PTH-S and PTH-SG hangers are used to isolate suspended sources of both audible and inaudible noise and vibration. Suspended mechanical equipment such as in-line fans, cabinet fans, and piping and ductwork in close proximity to mechanical equipment, are typical uses of TOZEN PTH-S and PTH-SG hangers. Standard PTH-S and PTH-SG hangers are shipped fully assembled and ready for installation in threaded metal rod suspension



MODEL : PTH-S

TOZEN PTH-S TYPE 25 MM DEFLECTION SPRING HANGER

(mm)

MODEL	RATED CAPACITY		SPRING CONSTANT (Kg/mm)	SPRING CONSTANT CODE	A	B	C	D	E
	(Kgs)	(Lbs)							
PTH-S-10	10	22	0.4	GREEN					
PTH-S-15	15	33	0.6	BLUE					
PTH-S-25	25	55	1	WHITE					
PTH-S-35	35	77	1.4	YELLOW					
PTH-S-50	50	110	2	ORANGE	60	85	140	15	92
PTH-S-80	80	176	3.2	PINK					
PTH-S-120	120	264	4.8	RED					
PTH-S-175E	175	385	7	SILVER					
PTH-S-225E	225	495	9	GOLD					
PTH-S-300	300	660	12	RED				18	115
PTH-S-450	450	990	18	GREEN				18	115
PTH-S-600E	600	1320	24	SILVER	85	115	180	24	120
PTH-S-825E	825	1815	33	GOLD				24	120
PTH-S-1100E	1100	2420	44	BLUE				24	120
PTH-S-1202E	1200	2640	48	SILVER					
PTH-S-1652E	1650	3630	66	GOLD					
PTH-S-1952E	1950	4290	78	GOLD + BR	230	130	290	30	145
PTH-S-2202E	2200	4840	88	BLUE					
PTH-S-2802E	2800	6160	112	BLUE + WHITE					
PTH-S-3304E	3300	7260	132	GOLD					
PTH-S-3904E	3900	8580	156	GOLD + BR					
PTH-S-4404E	4400	9680	176	BLUE	195	235	300	36	148
PTH-S-5004E	5000	11000	200	BLUE + BR					
PTH-S-5604E	5600	12320	224	BLUE + WHITE					

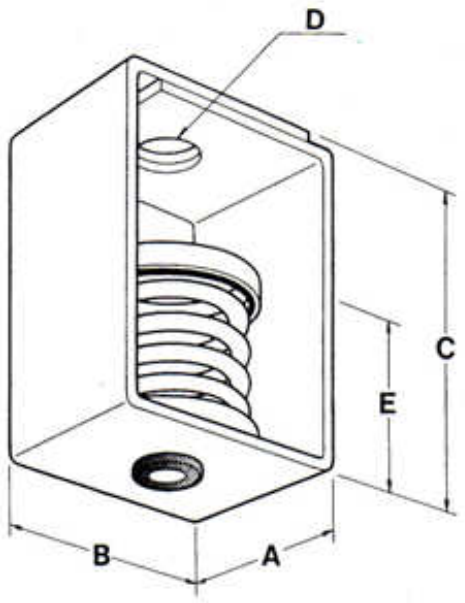
NOTE 1: All springs have an minimum additional travel to solid equal to 50% of rated load.
NOTE 2: Please refer to relevant brochure or consult factory for greater deflection and loading.
NOTE 3: Spring constant applies to spring only.
NOTE 4: Please consult factory for precompressed model and 30 degree arc capacity.

TOZEN PTH-S & PTH-S2 SPRING VIBRATION ISOLATING HANGER
PTH-SG & SG2 SPRING AND RUBBER VIBRATION ISOLATING HANGER

DESCRIPTION - TOZEN PTH-S Series vibration isolating hangers consist of a rectangular steel box incorporated with a free standing, laterally stable steel spring with load transfer steel cup with rubber washer. PTH-SG comes in series with a noise absorbing hanger rubber for better performance. This combination takes advantage of the best properties of both materials. Both design permits installation in the hanger rods or at the ceiling.

The design of the spring elements are comply to JIS B2704 for a semi-permenant use. To assure stability, outside diameter of the springs do not less than 0.8 times of the compressed height of the spring at rated load. All springs are designed to provide a minimum of 50% overload capacity. Model PTH-S spring hangers are available with 25 mm and 50 mm deflection with standard load capacity from 10 Kgs to 5,600 Kgs. PTH-SG spring and rubber hangers are available with load capacity up to 1,100 Kgs. PTH-S and PTH-SG series vibration isolating hangers are recommended for the isolation of vibration produced by suspended mechanical equipments, low speed suspended fans, transformers, ductwork, piping, etc.

APPLICATION - Tozen PTH-S and PTH-SG hangers are used to isolate suspended sources of both audible and inaudible noise and vibration. Suspended mechanical equipment such as in-line fans, cabinet fans, and piping and ductwork in close proximity to mechanical equipment, are typical uses of TOZEN PTH-S and PTH-SG hangers. Standard PTH-S and PTH-SG hangers are shipped fully assembled and ready for installation in threaded metal rod suspension



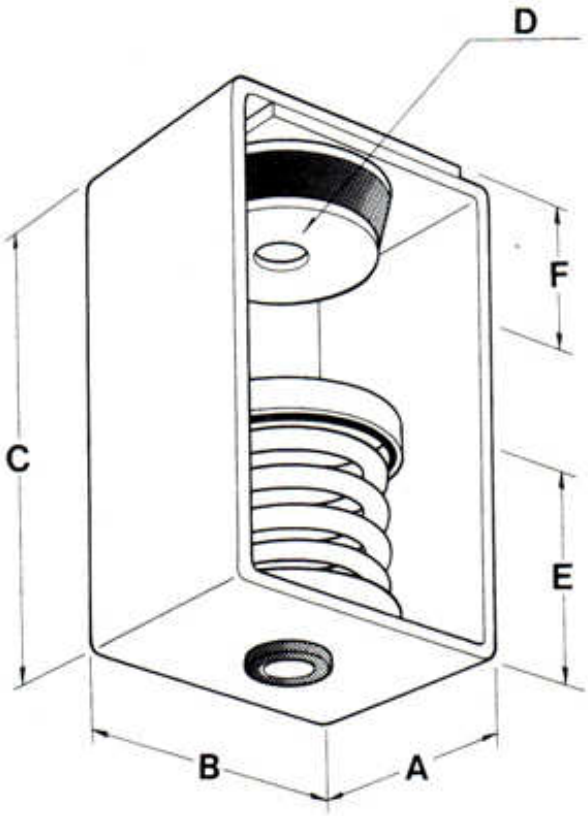
MODEL : PTH-S

TOZEN PTH-S TYPE 25 MM DEFLECTION SPRING HANGER

(mm)

MODEL	RATED CAPACITY		SPRING CONSTANT (Kg/mm)	SPRING CONSTANT CODE	A	B	C	D	E
	(Kgs)	(Lbs)							
PTH-S-10	10	22	0.4	GREEN	60	85	140	15	92
PTH-S-15	15	33	0.6	BLUE					
PTH-S-25	25	55	1	WHITE					
PTH-S-35	35	77	1.4	YELLOW					
PTH-S-50	50	110	2	ORANGE					
PTH-S-80	80	176	3.2	PINK					
PTH-S-120	120	264	4.8	RED					
PTH-S-175E	175	385	7	SILVER					
PTH-S-225E	225	495	9	GOLD					
PTH-S-300	300	660	12	RED	85	115	180	18	115
PTH-S-450	450	990	18	GREEN				18	115
PTH-S-600E	600	1320	24	SILVER				24	120
PTH-S-825E	825	1815	33	GOLD				24	120
PTH-S-1100E	1100	2420	44	BLUE				24	120
PTH-S-1202E	1200	2640	48	SILVER	230	130	290	30	145
PTH-S-1652E	1650	3630	66	GOLD					
PTH-S-1952E	1950	4290	78	GOLD + BR					
PTH-S-2202E	2200	4840	88	BLUE					
PTH-S-2802E	2800	6160	112	BLUE + WHITE					
PTH-S-3304E	3300	7260	132	GOLD	195	235	300	36	148
PTH-S-3904E	3900	8580	156	GOLD + BR					
PTH-S-4404E	4400	9680	176	BLUE					
PTH-S-5004E	5000	11000	200	BLUE + BR					
PTH-S-5604E	5600	12320	224	BLUE + WHITE					

NOTE 1: All springs have an minimum additional travel to solid equal to 50% of rated load.
NOTE 2: Please refer to relevant brochure or consult factory for greater deflection and loading.
NOTE 3: Spring constant applies to spring only.
NOTE 4: Please consult factory for precompressed model and 30 degree arc capacity.



MODEL : PTH-SG

systems. Tozen PTH-S and PTH-SG hangers can be provided with labour saving accessories for adaption to wire or strap suspension systems. Both Model PTH-S and PTH-SG hangers may be factory preloaded or provided with positioning plate for ease in erecting piping at a fixed elevation. Higher load capacities, larger deflections and 30 degree ARC capacity available.

SPECIFICATION - Type, 1, Vibration isolators for suspended equipment, with minimum static deflection requirement exceeding of 6mm shall be hangers consisting of a free standing, laterally stable steel spring with load transfer steel cup with rubber washer in series, assembled in a welded rectangular steel box. The spring elements shall have a outside diameter not less than 0.8 times of the compressed height of the spring at rated load. All springs shall be designed to provide a minimum of 50% overload capacity. Vibration isolating hangers shall be Model PTH-S, as manufactured by Tozen.

Type 2, Vibration isolators for suspended equipment with minimum static deflection requirement exceeding 6mm and where both high and low frequency vibrations are to be isolated, shall be hangers consisting of a laterally stable steel spring in series with a moulded noise absorbing rubber insert, assembled in a welded rectangular steel box. The spring elements shall have a outside diameter not less than 0.8 times of the compressed height of the spring at rated load. The combination vibration isolating hangers shall be Model PTH-SG, as manufactured by Tozen.

TOZEN PTH-SG TYPE 25 MM DEFLECTION SPRING AND RUBBER HANGER

(mm)

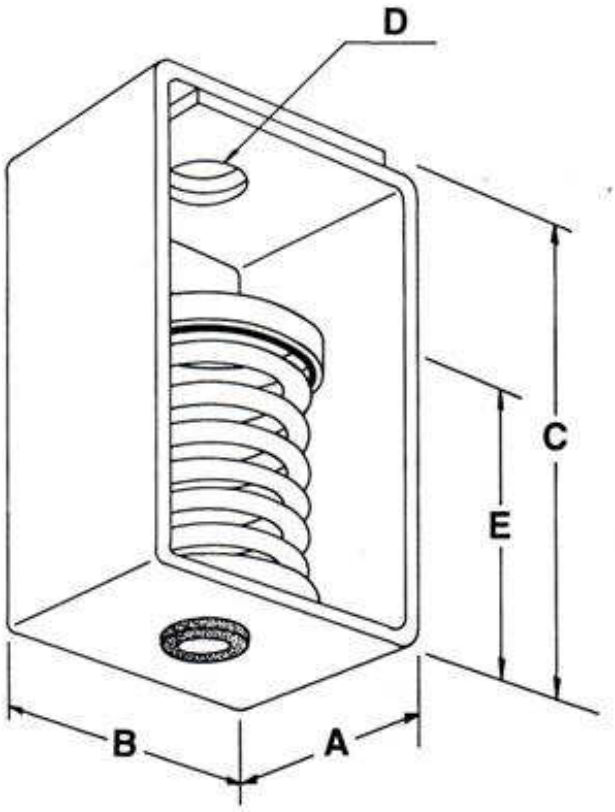
MODEL	RATED CAPACITY		SPRING CONSTANT	SPRING COLOR CODE	A	B	C	D	E	F	MAXIMUM ROD DIA. (MRD)
	(Kgs)	(Lbs)	(Kg/mm)								
PTH-SG-25	25	55	1	WHITE	60	85	180	15	92	34	14
PTH-SG-35	35	77	1.4	YELLOW							
PTH-SG-50	50	110	2	ORANGE							
PTH-SG-80	80	176	3.2	PINK							
PTH-SG-120	120	264	4.8	RED							
PTH-SG-175E	175	385	7	SILVER							
PTH-SG-225E	225	495	9	GOLD							
PTH-SG-150	150	330	6	ORANGE	85	115	225	18	115	45	16
PTH-SG-200	200	440	8	PINK							
PTH-SG-300	300	660	12	RED							
PTH-SG-450	450	990	18	GREEN							
PTH-SG-600E	600	1320	24	SILVER	100	130	265	20	120	58	18
PTH-SG-825E	825	1815	33	GOLD							
PTH-SG-1100E	1100	2420	44	BLUE							

NOTE-1. All springs have an minimum additional travel to solid equal to 50% of rated load.
NOTE-2. Please refer to relevant brochure or consult factory for greater deflection and loading.
NOTE-3. Spring constant applies to spring only, rubber element has a straight line deflection curve.
NOTE-4. Please consult factory for precompressed model and 30 degree ARC capacity.

PTH-S2

INSTALLATION INSTRUCTION

1. Consider the height and location of the hanger and prepare the upper and lower hanging rod (bolt) in same proper length.
2. Attach the upper hanging rod (bolt) to the ceiling.
3. Connect the lower hanging rod (bolt) to the hanger. Pre-compress the hanger spring element (Approx. 10mm) by tighten a restraint nut and washer at the bottom of the hanger.
4. Attach the hanger to the upper hanging rod (bolt).
5. Attach the haging rod (bolt) to the pipe, duct or equipment bracket.
6. Install all other hangers by repeating instruction 1-5.
7. After the pipe or equipment is filled with water, release the restraint nut. Leveling adjust the hanger by the nut at the top of the element to obtain even level installation.
8. Final check the spring hanger in a proper deflection and don't install the hanging rod (bolt) in a inclined position.



MODEL : PTH-S2

TOZEN PTH-S2 TYPE 50 MM DEFLECTION SPRING HANGER

(mm)

MODEL	RATED CAPACITY		SPRING CONSTANT (Kg/mm)	SPRING COLOUR CODE	A	B	C	D	E
	(Kgs)	(Lbs)							
PTH-S2-25	25	55	0.5	WHITE					
PTH-S2-35	35	77	0.7	YELLOW					
PTH-S2-50	50	110	1	ORANGE					
PTH-S2-80E	80	176	1.6	PINK	85	115	180	18	133
PTH-S2-125E	125	275	2.5	RED					
PTH-S2-175E (S)	175	385	3.5	SILVER					
PTH-S2-250E	250	550	5	GOLD					
PTH-S2-175E (M)	175	385	3.5	ORANGE					
PTH-S2-245E	245	539	4.9	PINK					
PTH-S2-350E	350	770	7	RED	100	130	230	24	165
PTH-S2-525E	525	1155	10.5	GREEN					
PTH-S2-750E	750	1650	15	SILVER					

NOTE 1: All spring have an minimum additional travel to solid equal to 50% of rated load.

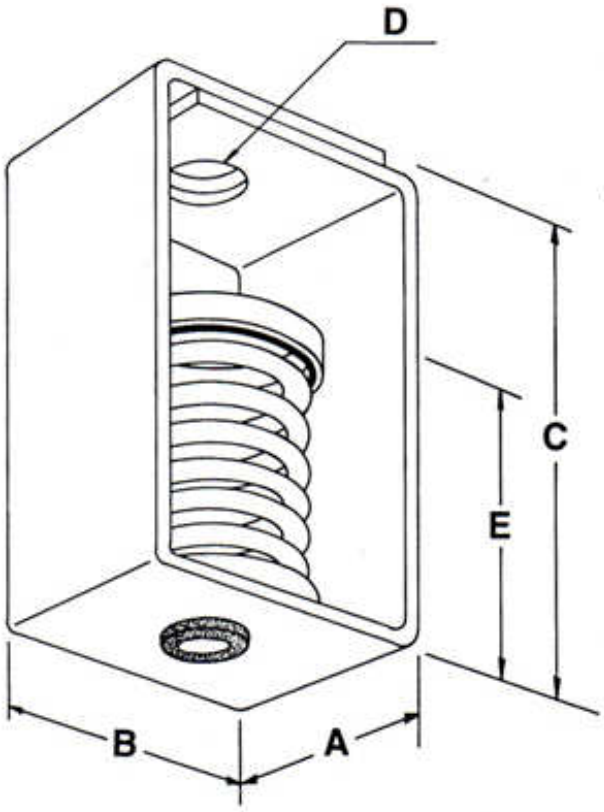
NOTE 2: Please refer to relevant brochure or consult factory for greater deflection and loading.

NOTE 3: Please consult factory for precompressed model and 30 degree ARC capacity.

PTH-S2

INSTALLATION INSTRUCTION

1. Consider the height and location of the hanger and prepare the upper and lower hanging rod (bolt) in same proper length.
2. Attach the upper hanging rod (bolt) to the ceiling.
3. Connect the lower hanging rod (bolt) to the hanger. Pre-compress the hanger spring element (Approx. 10mm) by tighten a restraint nut and washer at the bottom of the hanger.
4. Attach the hanger to the upper hanging rod (bolt).
5. Attach the haging rod (bolt) to the pipe, duct or equipment bracket.
6. Install all other hangers by repeating instruction 1-5.
7. After the pipe or equipment is filled with water, release the restraint nut. Leveling adjust the hanger by the nut at the top of the element to obtain even level installation.
8. Final check the spring hanger in a proper deflection and don't install the hanging rod (bolt) in a inclined position.



MODEL : PTH-S2

TOZEN PTH-S2 TYPE 50 MM DEFLECTION SPRING HANGER

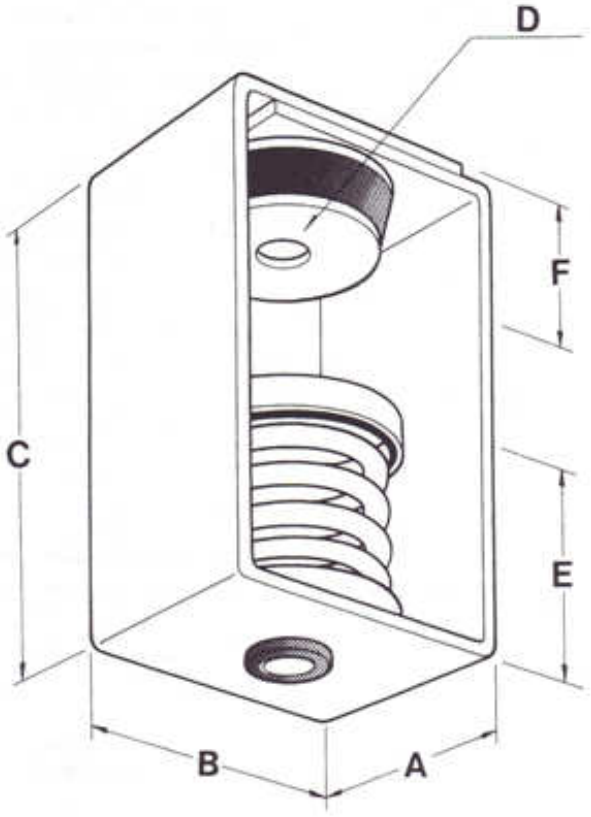
(mm)

MODEL	RATED CAPACITY		SPRING CONSTANT (Kg/mm)	SPRING COLOUR CODE	A	B	C	D	E
	(Kgs)	(Lbs)							
PTH-S2-25	25	55	0.5	WHITE					
PTH-S2-35	35	77	0.7	YELLOW					
PTH-S2-50	50	110	1	ORANGE					
PTH-S2-80E	80	176	1.6	PINK	85	115	180	18	133
PTH-S2-125E	125	275	2.5	RED					
PTH-S2-175E (S)	175	385	3.5	SILVER					
PTH-S2-250E	250	550	5	GOLD					
PTH-S2-175E (M)	175	385	3.5	ORANGE					
PTH-S2-245E	245	539	4.9	PINK					
PTH-S2-350E	350	770	7	RED	100	130	230	24	165
PTH-S2-525E	525	1155	10.5	GREEN					
PTH-S2-750E	750	1650	15	SILVER					

NOTE 1: All spring have an minimum additional travel to solid equal to 50% of rated load.

NOTE 2: Please refer to relevant brochure or consult factory for greater deflection and loading.

NOTE 3: Please consult factory for precompressed model and 30 degree ARC capacity.



MODEL : PTH-SG2

TOZEN PTH-SG2 TYPE 50 MM DEFLECTION SPRING HANGER

(mm)

MODEL	RATED CAPACITY		SPRING CONSTANT	SPRING COLOUR	A	B	C	D	E	F	MAX. ROD DIAMETER
	(Kgs)	(Lbs)	(Kg/mm)	CODE							(MRD)
PTH-SG2-25	25	55	0.5	WHITE							
PTH-SG2-35	35	77	0.7	YELLOW							
PTH-SG2-50	50	110	1	ORANGE							
PTH-SG2-80E	80	176	1.6	PINK	85	115	230	15	133	34	14
PTH-SG2-125E	125	275	2.5	RED							
PTH-SG2-175E (S)	175	385	3.5	SILVER							
PTH-SG2-250E	250	550	5	GOLD							
PTH-SG2-175E (M)	175	385	3.5	ORANGE							
PTH-SG2-245E	245	539	4.9	PINK	100	130	270	18	165	45	16
PTH-SG2-350E	350	770	7	RED							
PTH-SG2-525E	525	1155	10.5	GREEN							

NOTE-1: All springs have an minimum additional travel to solid equal to 50% of rated load.
NOTE-2: Please refer to relevant brochure or consult factory for greater deflection and loading.
NOTE-3: Spring constant applies to spring only, rubber element has a straight line deflection curve.
NOTE-4: Please consult factory for precompressed model and 30 degree ARC capacity.

TOZEN PTH-G VIBRATION ISOLATING RUBBER HANGER

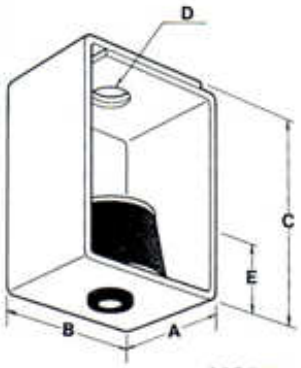
DESCRIPTION - TOZEN PTH-G vibration isolating rubber hangers are designed to reduce the transmission of vibration and noise produced by suspended equipments, piping and ductwork. PTH-G hangers incorporated with a noise aborbing rubber insert with cast-in load transfer. plate at the top and bottom, assembled into a rectangular steel box. Ultimate design of PTH-G hanger rubbers allows greater deflection without accelerating deterioration. PTH-G hangers are available in deflection maximum up to 6mm with capacities from 25 Kgs to 450 Kgs. PTH-G rubber hangers may be selected where first cost must be minimized. Model PTH-G are recommended for the isolation of vibration produced by suspended mechanical equipment, axial and exhaust fans, ductwork, piping, etc. Doulble deflection model PTH-GG adds another rubber element at the top of the hanger box.

APPLICATION- TOZEN PTH-G vibration isolating hangers are used to isolate suspended sources of audible frequency vibration, or isolation of noise in piping and ductwork systems. Model PTH-G hangers are shipped fully assembled and ready for installation in threaded rod suspended systems. Model PTH-G hangers can be provided with labor saving accessories for adaption to wire or strap suspension systems.

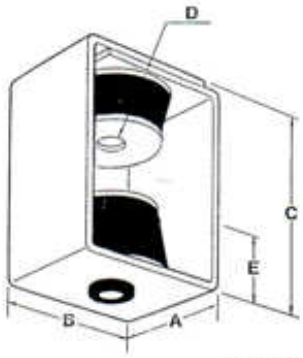
SPECIFICATION - Vibration isolators for suspended epuipments, piping and ductwork with maximum static deflection requirements under operation load conditions not exceeding 6mm shall be hangers consisting of a neoprene or synthetic rubber noise absorbing insert encased in a welded rectangular steel box.

The rubber insert shall be moulded from oil resistant compounds. with cast in load transfer plate at the top and bottom, shall be colour coded or otherwise identified to indicate load capacity.

Vibration isolating rubber hanger assembly shall be Model PTH-G, as manufactured by Tozen.



MODEL : PTH-G



MODEL : PTH-GG

TOZEN PTH-G TYPE RUBBER HANGER

(mm)

MODEL	DESIGN LOADING (Kgs)	DESIGN LOADING (Lbs)	RUBBER COLOR CODE	MAXIMUM STATIC DEFL.	DURO-METER	A	B	PTH-G C	PTH-GG C	D	E	MAXIMUM ROD DIA. (MRD)
PTH-G-25	25	55	WHITE	4	40	37	45	90	115	11	25	10
PTH-G-35	35	77	YELLOW		50							
PTH-G-50	50	110	ORANGE		55							
PTH-G-80	80	176	PINK	5	40	60	70	110	130	15	28	14
PTH-G-120	120	264	RED		50							
PTH-G-150	150	330	ORANGE		55							
PTH-G-200	200	440	PINK	6	40	85	98	135	160	18	39	18
PTH-G-300	300	660	RED		50							
PTH-G-450	450	990	GREEN		55							

NOTE-1: Hanger elements have similar straight line deflection curve.

NOTE-2: Please refer to reivent brochure or consult factory for wire or strap suspension systems.

TOZEN

SHANGHAI TOZEN TRADING COMPANY LIMITED
Dong Jing Station North,
Hu Song Line,
Song Jiang Country,
Shanghai, China
Tel : 8621-7613795, 7613428
Fax : 8621-7613795

TOZEN PHILIPPINES, INC.
Unit 505-506, Hosla Condominium 1
#49 Tomas Morato Avenue
Quezon City
Philippines
Tel : (632) 727-7640-43
Fax : (632) 727-3143
Establishment Date : Aug., 1997

TOZEN (HK) LTD.
Unit 1608, 16/F., Ho Lik Centre,
66A Sha Tsui Road,
Tsuen Wan, N.T.Hong Kong.
Phone : (852) 4132330
Telex : 46983 THK HX
Fax : (852) 4131697

Tozen (M) Sdn. Bhd.
Lot 26, Jalan BRP 9/1B,
Putra Industrial Park,
Bukit Rahman Putra,
47000 Sungai Buloh,
Selangor Darul Ehsan,
Malaysia.
Tel : (03) 6156 3636
Fax : (03) 6156 3232
Establishment Date : Sep., 1982

TOZEN (THAILAND) CO., LTD.
3388/62 18th Floor Sirirat Building Rama 4 Rd.
Klongton Klongtoey Bangkok 10110
Tel : (662) 367-5721-8
Fax : (662) 367-5729

TOZEN SANGYO CO., LTD.
40-3, Higashi-nippori 2-Chome,
Arakawa-ku, Tokyo 116, Japan
Phone : 03-3801-2191
Telex : TOZEN J27179
Fax : 03-3801-2410