

Buffering is excellent Shock absorption is also easy



Shenzhen Putian vibration motor Co., Ltd.

Address of headquarters: Block 6, Shajing Wanfeng 98 Industry City,
Bao'an District, Shenzhen City, Guangdong Province
TEL :0755-27460501 0755-27460502 0755-27460503
FAX:0755-27460606
<http://www.putiamotor.com>
E-mail:jiahonpcb@163.com

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Purina elastic vibration support



Shenzhen Putian vibration motor Co., Ltd.

Situated at Shajing Wanfeng 98 Industry City, Bao'an District, Shenzhen City, Shenzhen Putian Vibration Motor Co., Ltd. boasts progressive industrial vibration technology and independent R&D center, and has been committed to furnishing high-quality product and technical services for customers all the time. We develop, produce and sell the elastic tensioner used for chain and belt drive and the elastic vibration support used as vibration screen.

Favorable damping property and aging resistance of elastic vibration support present the following advantages:

- High-efficiency vibration isolation
- Maintenance-free
- Long service life
- Resonance avoidance

Meeting various forms of screening and vibration feeding equipment



Elastic vibration support

Elastic vibration support of AB (ordinary series) and AB-HD (heavy duty series) of Purina is designed for the following applications:

Vibration screen
Vibrating feeder
Vibrating dryer

Jolting table
Other vibrating equipment

This sample furnishes the operating principle of Purina elastic vibration support, provides simple method for equipment selection and simplifies common view of different vibrating equipment.



AB



AB-HD

Each square case of elastic vibration support of Purina contains 4 special-shaped rubber twist element to guarantee that the elastic vibration support has very high vibration absorption capacity.



Purina AB stainless steel series



Elastic torsion element

Such four torsion element and shell are combined in different methods to form two types of elastic vibration supports: AB and AB-HD. Such two types of support arms are different in the length and opening angle. They present the same overall dimension, but AB-HD owns higher rigidity and can bear greater vertical load.

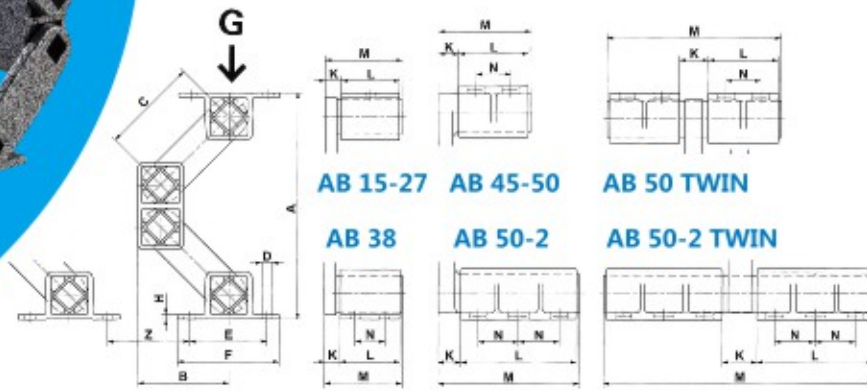
Such two kinds of models demonstrate very low inherent frequency, close to 2Hz. Therefore, even if external motivation frequency is very low, the vibrator equipment can achieve the vibration absorption efficiency of more than 98%.

Besides, their noise is extremely low.



Elastic vibration support

AB type (standard black gray)
AB type (stainless steel)

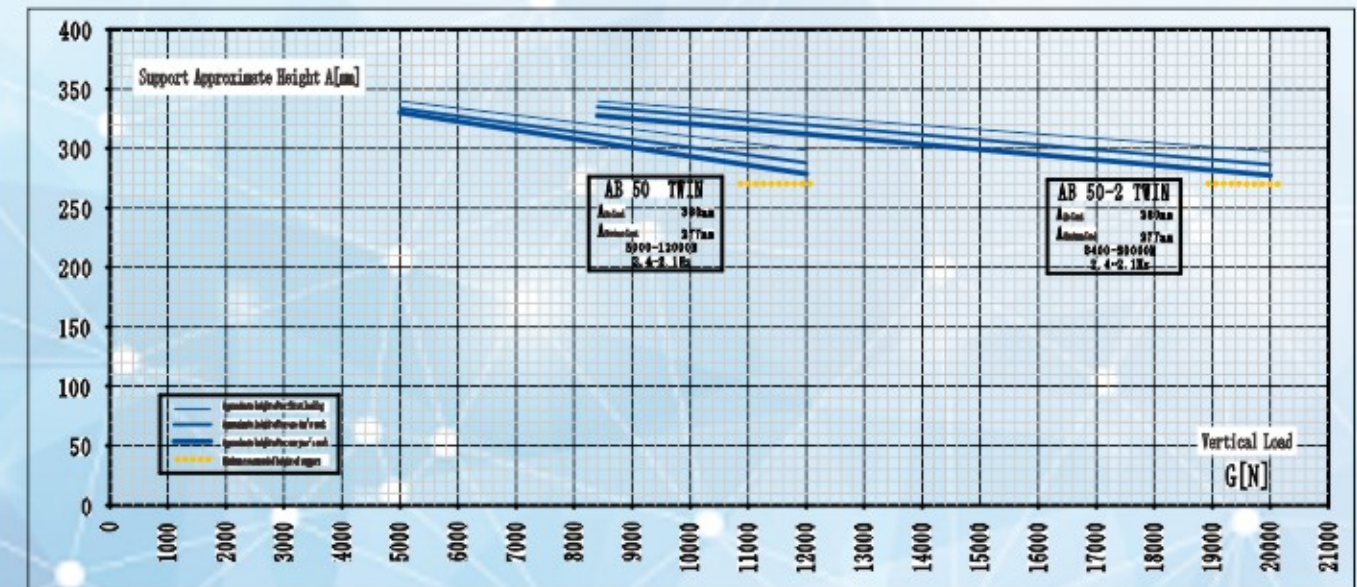
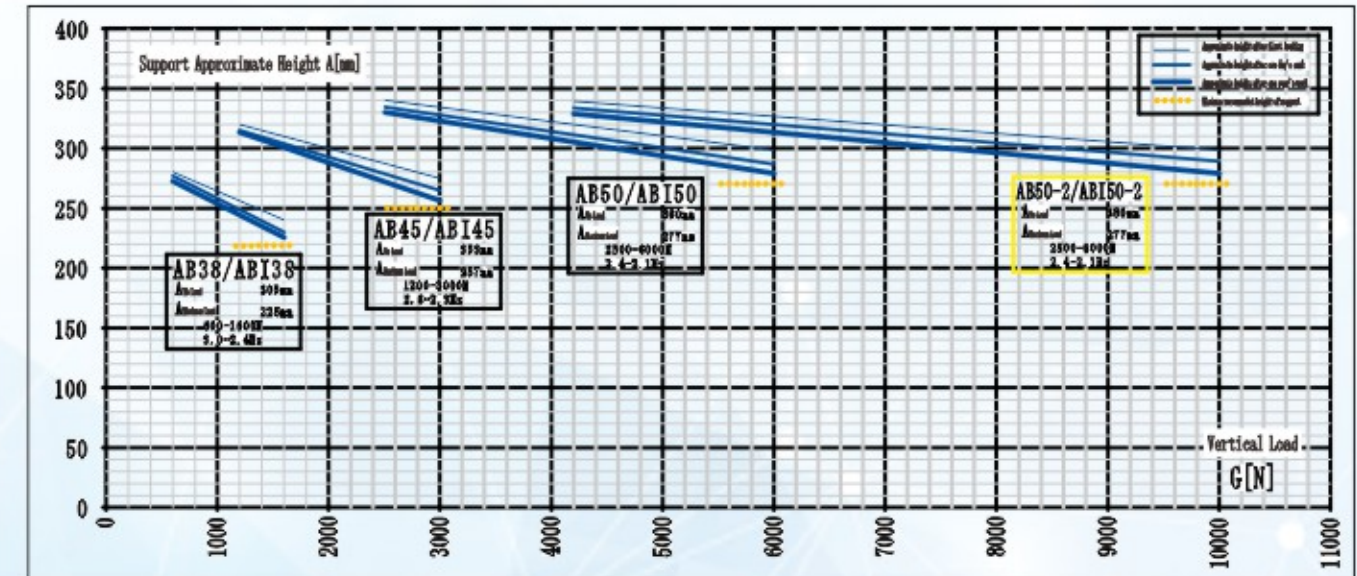
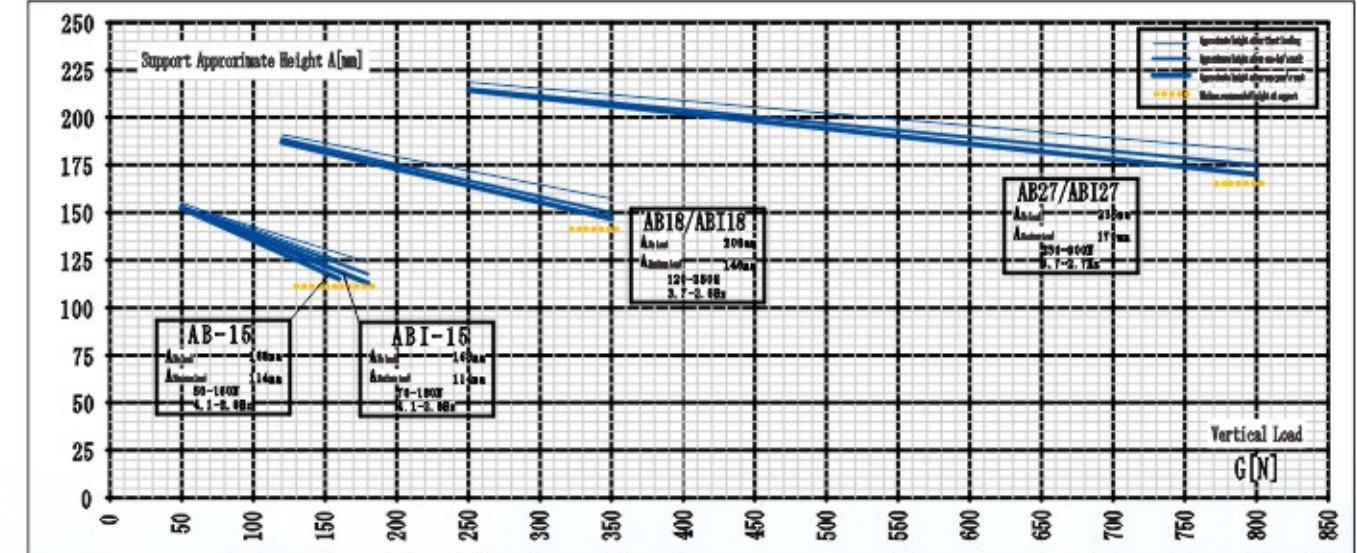


Model	Load Range G _{Min} ~G _{Max} [N]	A	A*	B	B*	C	D	E	F	H	K	L	M	N	Weight [kg]
AB 08	20 ~ 50	80	40	30	30	30	ø 6.8	45	60	3	5	30	39	-	0.33
AB 15	50 ~ 160	168	114	70	88	80	ø 7	50	65	3	10	40	52	-	0.5
AB 15	70 ~ 180						7x10								0.9
AB 18	120 ~ 350	208	146	88	109	100	ø 9	60	80	3.5	14	50	67	-	1.2
AB 18							9x15								1.7
AB 27	250 ~ 800	235	170	94	116	100	ø 11	80	105	4.5	17	60	80	-	2.2
AB 27							11x20								3.3
AB 38	600 ~ 1600	305	225	120	147	125	ø 13	100	125	6	21	80	104	40	5.1
AB 38							13x20								7.6
AB 45	1200 ~ 3000	353	257	141	172	140	13x26	115	145	8	28	100	132	58	11.5
AB 45				137	168										13.5
AB 50	2500 ~ 6000	380	277	150	184	150	17x27	130	170	12	35	120	160	60	19.1
AB 50															21.9
AB 50-2	4200 ~ 10000	380	277	150	184	150	17x27	130	170	12	40	200	245	70	32.2
AB 50-2															35.4
AB 50 TWIN	5000 ~ 12000	380	277	150	184	150	17x27	130	170	12	50	120	300	60	35.0
AB 50-2 TWIN	8400 ~ 20000	380	277	150	184	150	17x27	130	170	12	60	200	470	70	54.0

Model	Natural Frequency G _{Min} -G _{Max} [Hz]	Z	Dynamic Elastic Stiffness		Maximum allowable values at different rotational speeds						Light Alloy Housing	Steel Welded Parts	Ductile Iron	Painted ROSTA Blue	Stainless steel castings	
					720 min ⁻¹		960 min ⁻¹		1440 min ⁻¹							
			cd Vertical [N/mm]	cd Horizontal [N/mm]	sw Max [mm]	K Max	sw Max [mm]	K Max	sw Max [mm]	K Max						
AB 15	4.0-2.8	65	10	6	14	4.1	12	6.2	8	9.3	x	x			x	
AB 15																x
AB 18	3.7-2.6	80	20	14	17	4.9	15	7.7	8	9.3	x	x			x	
AB 18																
AB 27	3.7-2.7	80	40	25	17	4.9	14	7.2	8	9.3	x	x			x	
AB 27																
AB 38	3.0-2.4	100	60	30	20	5.8	17	8.8	8	9.3	x	x			x	
AB 38																
AB 45	2.8-2.3	115	100	50	21	6.1	18	9.3	8	9.3	x	x	x	x		
AB 45																
AB 50	2.4-2.1	140	190	85	22	6.4	18	9.3	8	9.3			x	x		
AB 50																
AB 50-2	2.4-2.1	140	320	140	22	6.4	18	9.3	8	9.3			x	x		
AB 50-2																
AB 50 TWIN	2.4-2.1	140	380	170	22	6.4	18	9.3	8	9.3		x	x	x		
AB 50-2 TWIN	2.4-2.1	140	640	280	22	6.4	18	9.3	8	9.3		x	x	x		
			Under Rated Load Low Speed 960min Amplitude sw=8mm		If acceleration > 9.3g, use of AB is not recommended						Material					

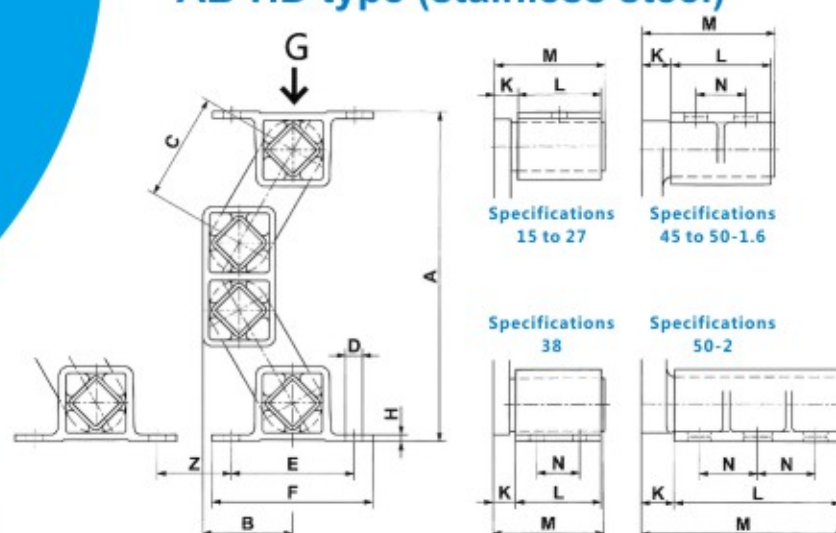
* Compression load G and height after final permanent deformation (about 1 year after running)

Permanent deformation specification and height curve graph of AB type support





Elastic vibration support AB-HD type (standard black gray) AB-HD type (stainless steel)

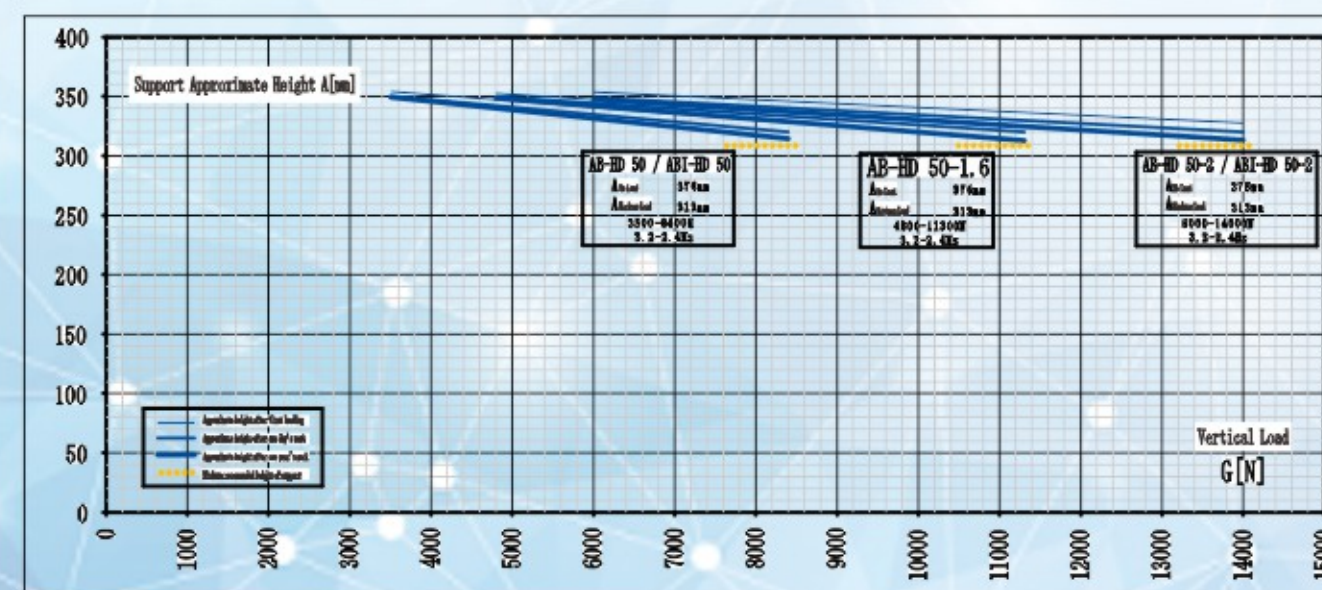
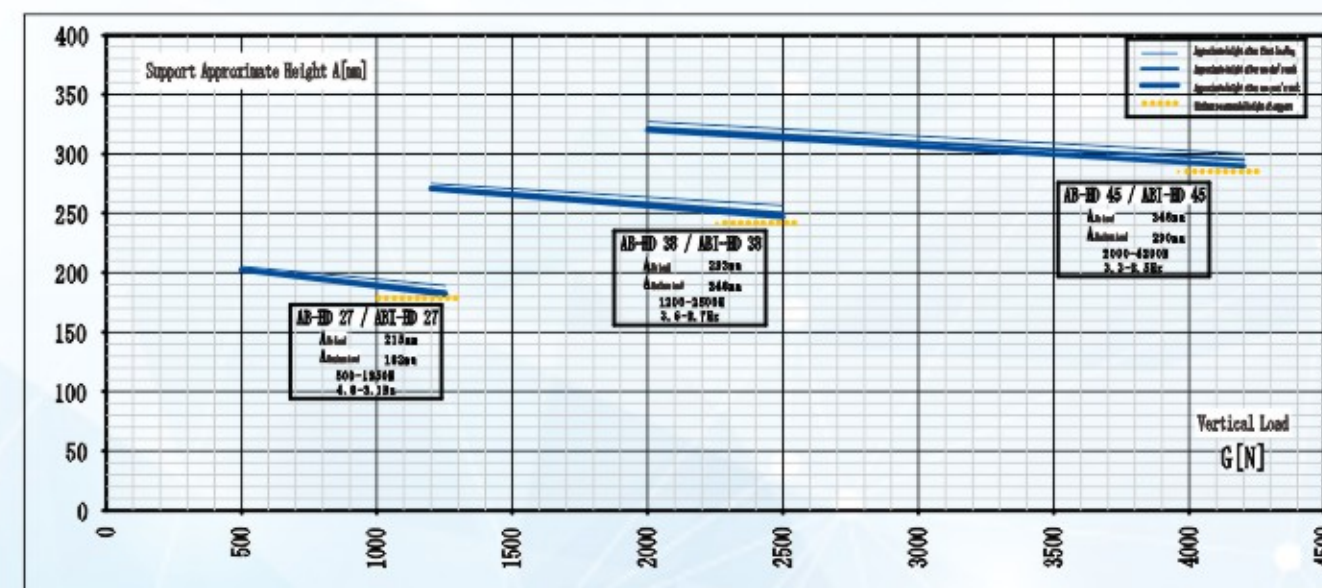
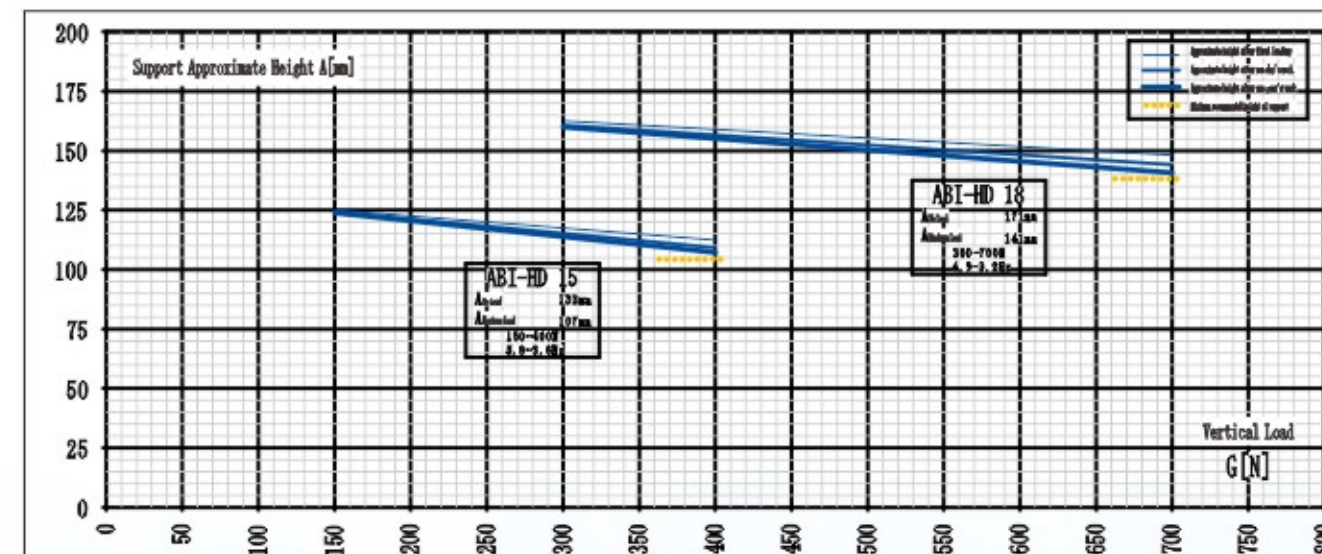


Model	Load Range G _{Min} -G _{Max} [N]	A	A*	B	B*	C	D	E	F	H	K	L	M	N	Weight [kg]
AB-HD 15	150 - 400	132	107	36	50	45	7x10	50	65	3	10	40	52	-	0.8
AB-HD 18	300 - 700	171	141	47	64	60	9x15	60	80	3.5	14	50	67	-	1.5
AB-HD 27	500 - 1250	215	182	59	78	70	ø11 11x20	80	105	4.5	17	60	80	-	2.0
AB-HD 27															3.3
AB-HD 38	1200 - 2500	293	246	79	106	95	ø13 13x20	100	125	6	21	80	104	40	4.9
AB-HD 38															7.3
AB-HD 45	2000 - 4200	346	290	98	130	110	13x26	115	145	8	28	100	132	58	11.3
AB-HD 45				94	126										13.6
AB-HD 50	3500 - 8400	376	313	105	141	120	17x27	130	170	12	40	120	165	60	20.4
AB-HD 50															22.3
AB-HD 50-1.6	4800 - 11300	376	313	105	141	120	17x27	130	170	12	40	160	205	70	27.1
AB-HD 50-2	6000 - 14000	376	313	105	141	120	17x27	130	170	12	45	200	250	70	32.4
AB-HD 50-2															35.8

Model	Natural Frequency G _{Min} -G _{Max} [Hz]	Z	Dynamic Elastic Stiffness		Maximum allowable values at different rotational speeds						Light Alloy Housing	Steel Welded Parts	Ductile Iron	Painted ROSTA Blue	Stainless steel castings	
			cd Vertical [N/mm]	cd Horizontal [N/mm]	720 min ⁻¹		960 min ⁻¹		1440 min ⁻¹							
					sw Max [mm]	K Max	sw Max [mm]	K Max	sw Max [mm]	K Max						
AB-HD 15	5.8-3.6	35	18	10	8	2.3	7	3.6	5	5.8						x
AB-HD 18	4.9-3.2	50	32	20	10	2.9	9	4.6	7	8.1						x
AB-HD 27	4.8-3.1	60	70	33	12	3.5	10	5.2	8	9.3	x	x			x	
AB-HD 27																
AB-HD 38	3.6-2.7	90	100	48	15	4.3	13	6.7	8	9.3	x	x			x	
AB-HD 38																
AB-HD 45	3.3-2.5	100	150	72	17	4.9	14	7.2	8	9.3	x	x	x	x		
AB-HD 45																
AB-HD 50	3.3-2.4	120	270	130	18	5.2	15	7.7	8	9.3			x	x		
AB-HD 50																
AB-HD 50-1.6	3.3-2.4	120	360	172	18	5.2	15	7.7	8	9.3		x	x	x		
AB-HD 50-2	3.3-2.4	120	450	215	18	5.2	15	7.7	8	9.3			x	x		
AB-HD 50-2																
			Under Rated Load Low Speed 960min Amplitude sw=8mm		If acceleration > 9.3g, use of AB is not recommended						Material					

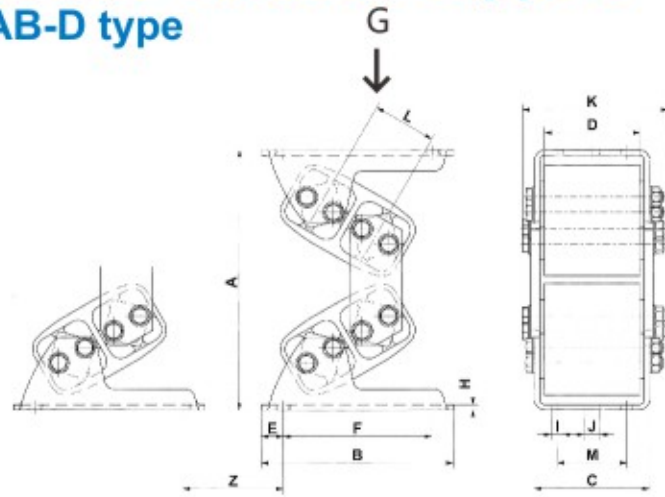
* Compression load G and height after final permanent deformation (about 1 year after running)

Permanent deformation specification and height curve graph of AB-HD type support





Elastic vibration support AB-D type



Model	Load Range G _{Min} -G _{Max} [N]	A No Load	A* Maximum Load	B	C	D	E	F	H	I	J	K	L	M	Weight [kg]
AB-D 18	500 1200	137	112	115	61	50	12.5	90	3	9	9	74	31	30	1.3
AB-D 27	1000 2500	184	148	150	93	80	15	120	4	9	11	116	44	50	2.9
AB-D 38	2000 4000	244	199	185	118	100	17.5	150	5	11	13.5	147	60	70	7.5
AB-D 45	3000 6000	298	240	220	132	110	25	170	6	13.5	18	168	73	80	11.5
AB-D 50	4000 9000	329	272	235	142	120	25	185	6	13.5	18	166	78	90	22.0
AB-D 50-1.6	6000 12000	329	272	235	186	160	25	185	8	13.5	18	214	78	90	25.5
AB-D 50-2	8000 16000	329	272	235	226	200	25	185	8	13.5	18	260	78	90	29.0

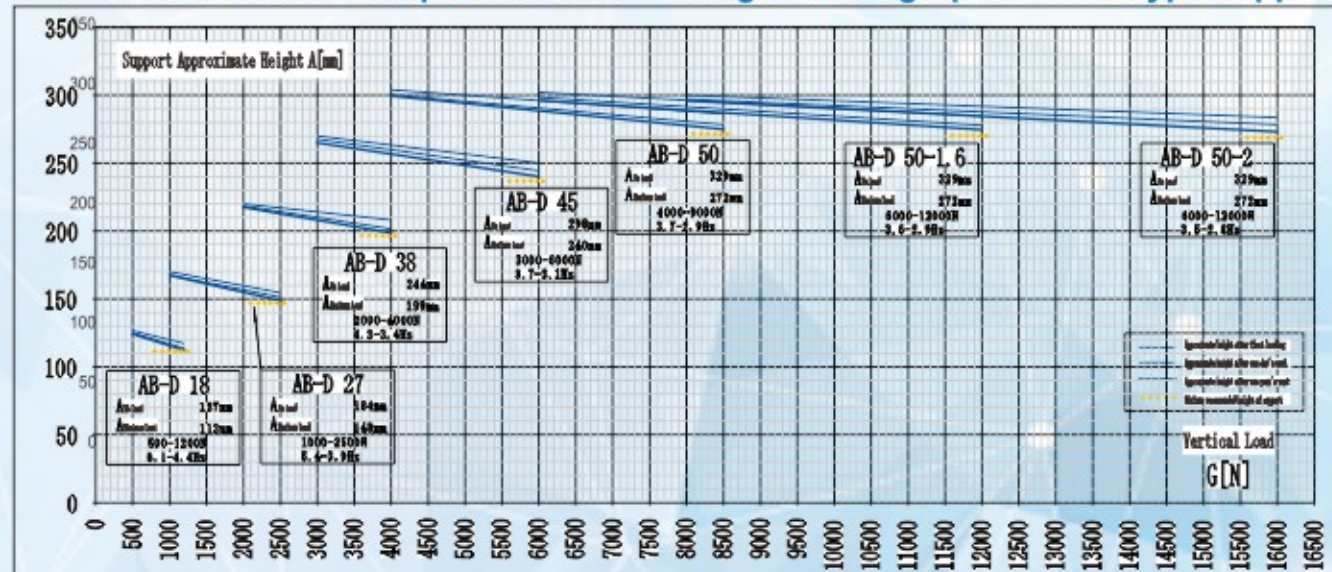
Model	Natural Frequency G _{Min} -G _{Max} [Hz]	Z	Dynamic Elastic Stiffness			Maximum allowable values at different rotational speeds						Light Alloy Housing	Steel Welded Parts	Ductile Iron	Painted ROSTA Blue
			cd Vertical [N/mm]	sw Amplitude [mm]	cd Horizontal [N/mm]	720 min ⁻¹		960 min ⁻¹		1440 min ⁻¹					
						sw Max [mm]	K Max	sw Max [mm]	K Max	sw Max [mm]	K Max				
AB-D 18	6.1-4.4	30	100	4	20	5	1.4	5	2.6	4	4.6	x	x		x
AB-D 27	5.4-3.9	35	160	4	35	7	2.0	6	3.1	5	5.8	x	x		Partial
AB-D 38	4.3-3.4	40	185	6	40	9	2.6	8	4.1	6	7.0	x	x		Partial
AB-D 45	3.7-3.1	55	230	8	70	11	3.2	9	4.6	7	8.1	x	x		Partial
AB-D 50	3.7-2.9	55	310	8	120	12	3.5	10	5.2	8	9.3	x	x	x	x
AB-D 50-1.6	3.6-2.9	55	430	8	160	12	3.5	10	5.2	8	9.3	x	x	x	x
AB-D 50-2	3.5-2.8	55	540	8	198	12	3.5	10	5.2	8	9.3	x	x	x	x
			Under Rated Load Low Speed 960min Amplitude sw=8mm			If acceleration > 9.3g, use of AB is not recommended						Material			

Under Rated Load
Low Speed 960min
Amplitude sw=8mm

If acceleration > 9.3g, use of AB is not
recommended

Material

Permanent deformation specification and height curve graph of AB-D type support

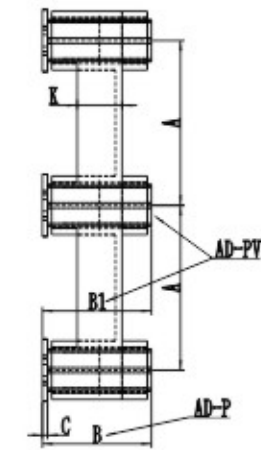
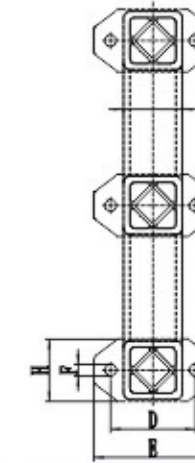


* Compression load G and height after final permanent deformation (about 1 year after running)

Double rocker arm

AD-P /
AD-PV

Flange mounting

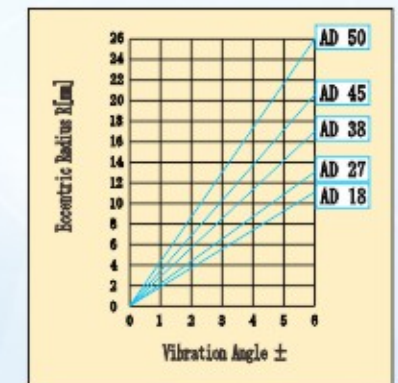
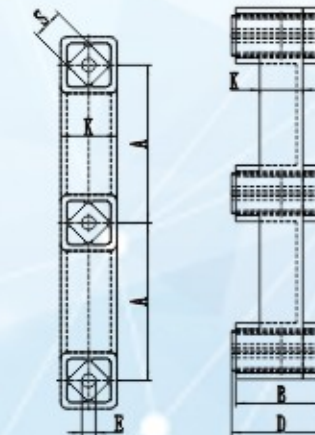


Symmetrical arrangement of AD-PV type mounting flange

Serial Number	Model	G [N]	Cd [N/mm]	A	B	B1	C	D	E	øF	H	K	Weight [kg]	Material
07 111 001	AD-P 18	150	120	23	100	62	5	60	85	9.5	35	40 x 20	1.2	Steel Welded Parts, Coated in PURINA Blue
07 121 001	AD-PV 18	300	240	31	120	73	5	80	110	11.5	45	55 x 34	2.6	
07 111 002	AD-P 27	600	500	45	160	95	6	100	140	14	60	70 x 50	5.5	
07 121 002	AD-PV 27	1' 200	1' 000	50	200	120	8	130	180	18	70	80 x 40	8.5	
07 111 003	AD-P 38	1' 800	1' 500	56	250	145	10	140	190	18	80	90 x 50	12.9	
07 121 003	AD-PV 38													
07 111 004	AD-P 45													
07 121 004	AD-PV 45													
07 111 005	AD-P 50													
07 121 005	AD-PV 50													

AD-C

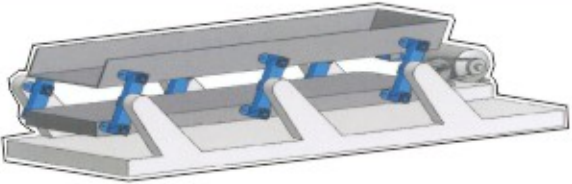
Friction mounting
of central hole



Serial Number	Model	G [N]		Cd [N/mm]							Weight [kg]	Material	
		K=2	K=3		A	B	D $\overset{0}{-0.3}$	øE	K	DS		Internal Components	Housing
07 101 001	AD-C 18	150	120	23	100	50	55	13 $\overset{0}{-0.2}$	40x20	18	0.8	Light Alloy	Steel Welded Parts, Coated in PURINA Blue
07 101 002	AD-C 27	300	240	31	120	60	65	16 $\overset{+0.5}{+0.3}$	55x34	27	1.8		
07 101 003	AD-C 38	600	500	45	160	80	90	20 $\overset{+0.5}{+0.2}$	70x50	38	4.1		
07 101 004	AD-C 45	1' 200	1' 000	50	200	100	110	24 $\overset{+0.5}{+0.2}$	80x40	45	6.1		

Cd= dynamic stiffness value, when vibration frequency ns= 300-600 min-1 and vibration angle α= ±5°

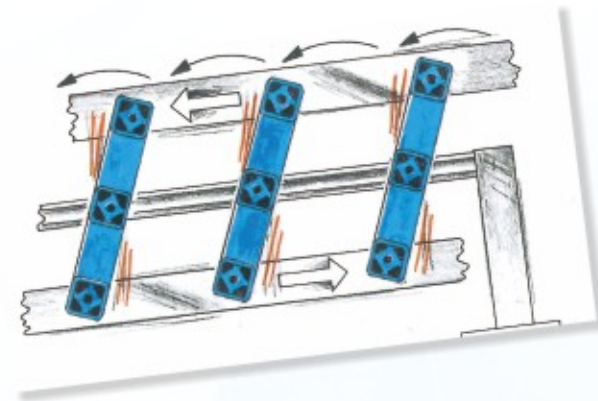
double-mass vibrating feeding system (mounting counterweight balancing system)

Structural design	Characteristic description	Applicable PURINA product
 "Fast" structure system provides high yield	Allowable acceleration: 1.5~5.0g	Elastic vibration support AD-P,AD-C,AR
	Material feeding speed: 10~45 m/min	Elastic drive joint ST
	Sieve body length: 25m at most	Elastic energy storage device DO-A

Such kind of "rapid" conveying equipment driven by crankshaft system can furnish very high production capacity. We connect counter weight and trough body via PURINA double rocker arm product. Since the counterweight system has the same weight as plastid 1 (trough body), such counterweight balancing system can completely absorb the inertia force generated by trough body. The above vibration trough and counterweight system (also called as another trough body) provide a kind of continuous application structure. Vibration trough and counter weight could convey loose materials in the same direction. For example, the sieve mesh is mounted on the above trough body, in this way, minor materials will fall down to the counter weight trough body via sieve pore and be transported to the discharge end.

The most important characteristic is that high-speed double mass feeding system can generate stable "resonant" motion. In the trough body, the equipment base and counter weight are mounted with enough quantity of double rocker arm support to guarantee that

equipment can run at the inherent frequency similar to the rocker arm. Besides, the extra DO-A elastic energy storage device can be mounted between trough body and equipment base or between counter weight and equipment base, to ensure the running of conveying equipment in resonance mode.



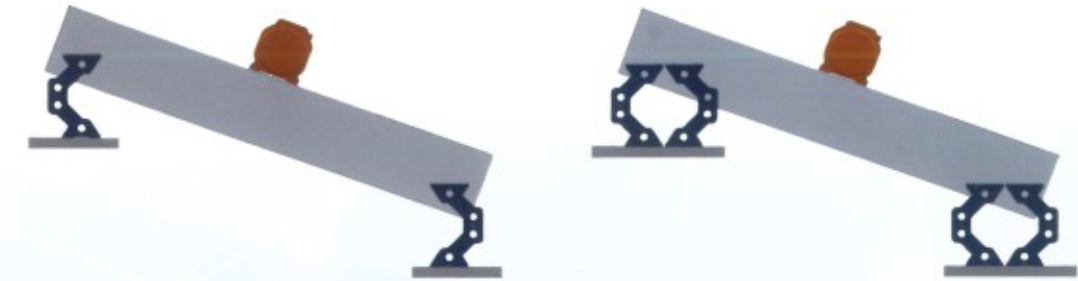
PURINA elastic vibration support and accessories customized by customer

Asymmetrical double rocker arm (vibration conveying equipment used at high speed)

To achieve maximum conveying speed (up to 60m/min), we suggest adopting double rocker arm products with asymmetric center distance (center distance between two-segment modules is 2:1). In general, we mount the driving structure on counter weight which is installed at the shorter rocker arm end. The weight of counter weight is twice that of the above trough body. The vibration trough is mounted at longer rocker arm end. The above information can explain why the jump amplitude of materials in vibration trough is twice counter weight amplitude. Moreover, such structure would greatly reduce the counter-acting force conveyed to the equipment base. Please contact us in case of consulting the asymmetrical double rocker arm.



If the dip angle of vibrating equipment is more than 10°, it is suggested to mount elastic vibration support in "mirror image" as shown in the following figure in order to guarantee the performance of elastic vibration support.



The elastic vibration support of jolting table shall be mounted in "mirror image".

Once the model selection of elastic vibration support is finished as per static index, it is necessary to conduct the dynamic check to avoid any damage in long-term use of vibrating equipment. These checks are very necessary, thus estimating real service performance.

Therefore, it is necessary to calculate double amplitude and acceleration of vibration part. (the material weight shall be considered, because such part of weight would compress the height of elastic vibration support)

$$stroke = \frac{Wm[cm] \cdot 10 \cdot n_{motors}}{M_{tot}} \quad [mm]$$

$$a_{max} = \frac{\left(\frac{2\pi}{60} \cdot RPM_{motor}\right)^2 \cdot stroke[mm]}{2 \cdot g \cdot 1000}$$

If their calculation results are less than the limit values in figure (refer to figure 8 and figure 9), they are the suitable model selection.

If one value surpasses the limit values, it is necessary to select mode again.

Some suggestions upon design of vibrating equipment

Some suggestions are listed in this part and must be considered at design stage to ensure correct use.

Stress of elastic vibration support under load:

The height of elastic vibration support at load shall be considered to avoid the problem occurrence upon use.

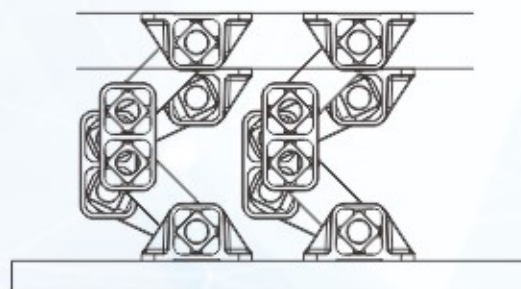
Previous chart displays the relations between load and height. The height as shown in figure is measured after the elastic vibration support runs for a period (300 hours). Actual height of elastic vibration support is related to ambient temperature, material loading method, frequency and amplitude.

Moreover, it is necessary to describe that these data are about the test of vibration table.

At the beginning of use, the height of elastic vibration support would change, and the height would decrease to 10-25mm based on different models.

It takes longer time to finish complete adjustment, but the height almost wouldn't change after a period. Such phenomenon is normal due to the inherent attribute of rubber parts.

If every supporting point adopts many elastic vibration supports, both the mounting distance when elastic vibration support is free of deformation and the mounting distance after compression of elastic vibration support shall be considered. Therefore, it is necessary to separate two elastic vibration supports to avoid the interference upon running of vibrating equipment (refer to the following schematic diagram).



Therefore:

The height of elastic support upon actual running is estimated in the chart (the estimated height can properly increase by several millimeters in cold environment or at medium load. On the contrary, the estimated height can properly decrease by several millimeters in heat or under heavy loads);

Upon feeding and blanking, the height of vibrating equipment may change between 10-25mm;

When every supporting point is mounted with 2 elastic vibration supports, the transverse dimension increases when the static or dynamic compression is considered;

Therefore, the proper interval shall be kept between elastic vibration supports, otherwise, collision may happen.

Material accumulation/ mechanical limit:

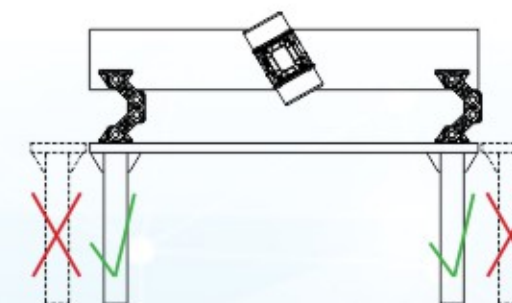
To avoid the damage of elastic vibration support resulting from the overload of vibrating equipment (for example, once the vibrating feeder stops running, but the materials continue loading). Therefore, it is necessary to introduce the mechanical limit device to avoid over-compression.

Following structure/ frame of spring:

It is necessary to mount the elastic vibration support in rigid area so that vibrating equipment can run correctly and effectively.

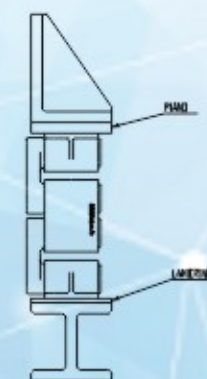
The most suitable position is to mount the elastic vibration support on the reinforcing rib, and mount at its locating point (please refer to the typical drawing on the right side).

If the elastic vibration support can't be mounted on the reinforcing rib due to other reasons, it is necessary to guarantee the base mounted presents high enough rigidity and can avoid the displacement or deformation resulting from vibration. If there isn't enough rigidity on base, the vibration would propagate within the system, generate noise and lead to the structural failure.



Support of mounting elastic vibration support:

The support needed by elastic vibration support shall be mounted by reference of "stress of elastic vibration support under load". It is suggested to consider the height of vibrating seat under load when determining actual height of vibrating equipment.



The position where the elastic vibration support bracket is mounted is one of the areas with the strongest rigidity in the whole vibrating equipment.

Therefore, it is suggested that the support and side panel used to mount elastic vibration support present high safety coefficient.

To enable the vibrating equipment to reach the optimal effect, it is suggested to mount the elastic vibration support horizontally (refer to the plan of support), and the mounting position shall keep away from the plane of gravity of vibrating equipment as far as possible.

If possible, to perfectly run the vibrating equipment, please note that the elastic vibration support of feed side and discharge side is equal to the distance of gravity center.

In the vertical direction, the upper bracket and the vibrating equipment are assembled to (not applicable in case of incline).

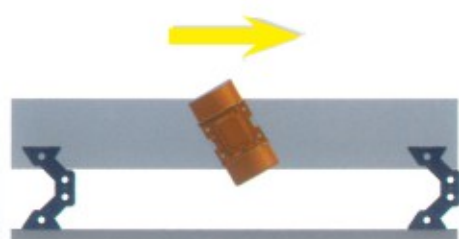
The vibrating equipment on the same plane of gravity.

In assembly process, the mounting position and direction must be noted.

Support arm of elastic vibration support presents the same effect when being close to or keeping away from side panel.

For most of vibrating equipment, correct mounting direction is that support arm of all elastic vibration supports shall be toward the direction of material movement.

In spite of this, we still suggest that the support arm of elastic vibration support is outward to facilitate mounting and other possible operations.



If the elastic vibration support is mounted by suspension (as shown in figure), the orientation of the elastic vibration support shall be contrary to the motion direction of material.



If the vibrating equipment is inclined and the dip angle is more than 10°, the elastic vibration support shall be mounted in the direction as shown in the figure, and the direction of support arm is outward.



The outward mounting of support arm is also applicable to the equipment with vertical vibration, such as swing table.



To enable the elastic vibration support and vibrating equipment to reach the optional performance, it is suggested to operate as below in the assembly process:

Hoist vibrating equipment with crane/ travelling crane (if infeasible, lift the device with four lifting jacks to parallel to the ground);

Put the elastic vibration support on the equipment base;

Fix screw when vibration part is close to elastic support;

Don't apply extra load when lowering the vibration part;

Temporarily tighten the screw of last stand;

Slowly lay down the vibration part and pay attention to observing the elastic vibration support: More importantly, their directions shall parallel to the feed direction of material (tolerance of $\pm 1^\circ$ refers to the support arm);

All screws shall be tightened.

It is necessary to consider the center of gravity of vibrating equipment and check whether the load is distributed on every support evenly when determining the elastic vibration support.

However, in most situations, the load can't perfectly distribute evenly, therefore, the compression amount of feeding port and discharge port is different.

If unnecessary tilt happens to the vibrating equipment, some metal gaskets could be padded between upper and lower support till the needed level is reached.

Post-assembly inspection

After running for a period, the elastic vibration support would change and its height would reduce under load. Such phenomenon due to the characteristics of rubber wouldn't affect the running of vibrating equipment.

Affected by different factors, the feed end and discharge end of materials may change in varying degrees. Therefore, it is suggested to check the height of elastic vibration support at both ends. If necessary, insert the metal gasket to correct the change of vibrating equipment.

It is suggested to check the running condition of vibrating equipment. If the running effect is poor, please check whether the elastic vibration support is mounted properly. If the height of elastic vibration support is inconsistent, it is suggested to check:

If the height of elastic vibration support is inconsistent, it is suggested to check:

If the vibration exciter driven by belt has problem, please check whether the stroke is excessive to avoid the extra load of vibrating equipment upon running;

Material may affect the center of gravity of vibrating equipment in special environmental conditions (very humid material), thus lowering the equipment performance.

Please contact our technical personnel at any time in case of needing further technical information, suggestions or analysis.