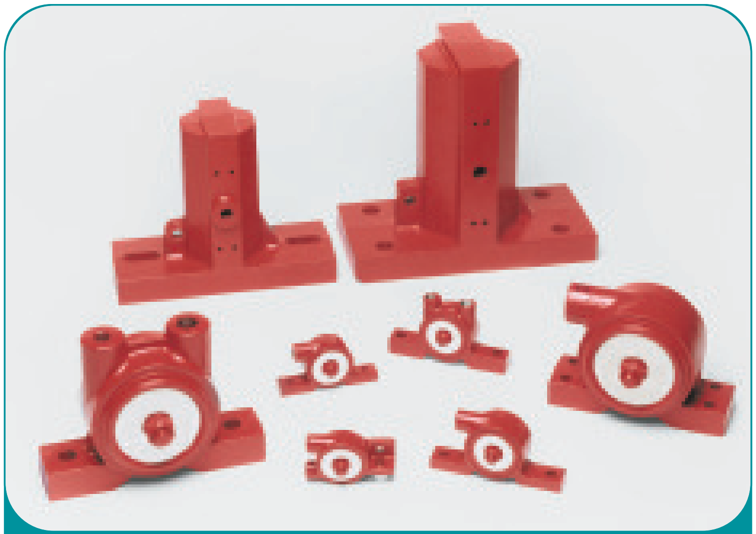
Syntron® Pneumatic Vibrators

Syntron Material Handling offers two types of Syntron® Pneumatic Vibrators – turbine and piston. Turbine models feature rotary action designed to keep noise to a minimum. Operating speed is adjusted by simply varying the air supply.

Syntron piston vibrators feature one piece, cast iron, flat base construction which produces high impact, linear force and efficient energy transfer. They are ideal for mining, chemical, concrete, plastics, steel, foundry and paper industries.

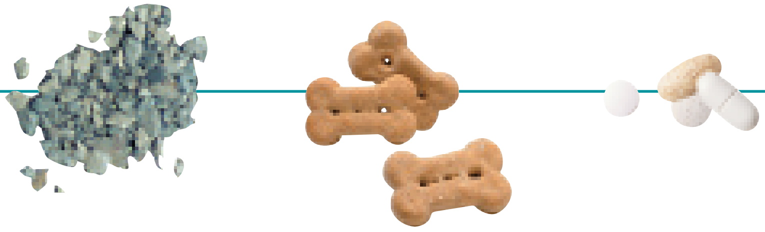
Syntron Pneumatic Bin Vibrators also come with the technical expertise of Syntron Material Handling's application specialists, who have been providing productive solutions for a wide variety of material handling problems for more than 80 years.



Syntron® Pneumatic Vibrators

Syntron® Pneumatic Turbine Vibrator mounted on stainless steel hopper.

Syntron® Pneumatic Piston vibrator maintains consistent flow of coal from a coal bin to a vibrating feeder.

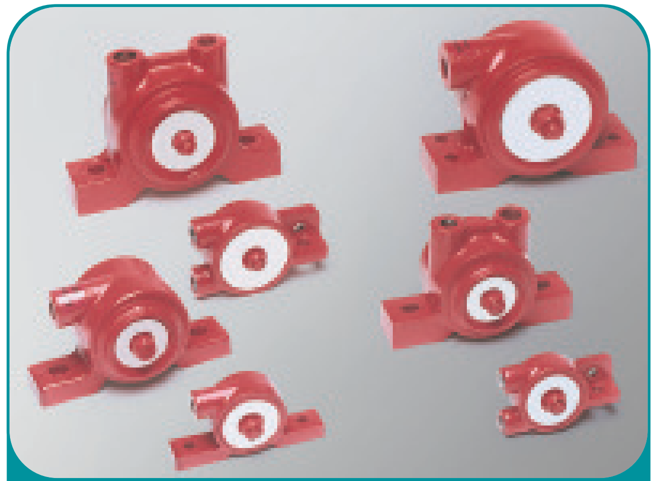


Syntron® Pneumatic Turbine Vibrators

Syntron® Pneumatic Turbine Vibrators from Syntron Material Handling offer a convenient, reliable alternative to other vibrators. Designed to keep noise pollution at a minimum, Syntron Turbine Vibrators aid in controlling the flow of material in almost any application, from screening, sizing and separating both fine and coarse materials, to aiding the flow of materials from supply hoppers and chutes, to driving parts feeders.*

Unlike other vibrators, Syntron turbine vibrators use compressed air to turn a turbine wheel, allowing air to be channeled through the unit and then through a muffler. This makes turbine vibrators convenient in locations where electricity is not readily available. Speed is adjusted by simply varying the air supply. Additionally, the vibrator's sealed bearings are prelubricated for life, making them ideal for food and other applications where oily exhaust air is unacceptable. And, their compact, totally enclosed construction eliminates concern over environmental factors such as dust, dirt or moisture.

There are three types of Syntron Pneumatic Turbine Vibrators: TAM, TBM and TB.



Syntron® Pneumatic Turbine Vibrators

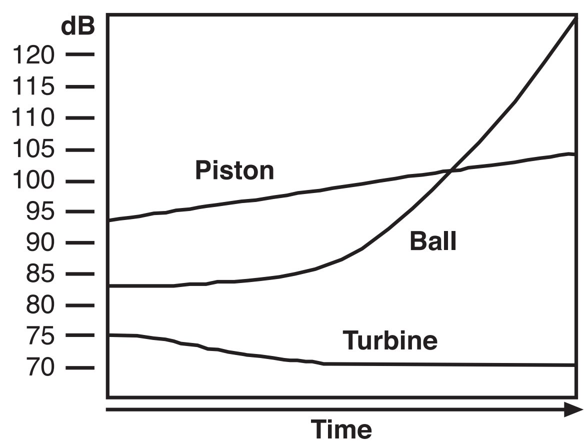
* For low-pressure applications, please contact Syntron Material Handling for recommendations.

Features and Benefits

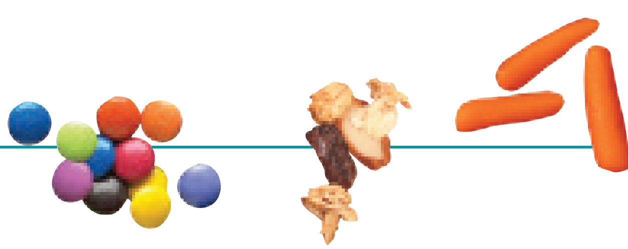
- Rotary action provides low noise level
- Adjustable air pressure allows easy adjustment of force to suit varying applications
- Sealed and prelubricated bearings require no additional lubrication
- Totally enclosed construction permits placement in dusty, dirty or wet locations
- Energy-conserving design requires less air than comparable ball vibrators
- Air efficiency remains constant throughout vibrator life
- Orbital action facilitates material flow in chutes
- Oversized bearings promote longer life
- Rugged, durable construction for many years of safe, reliable performance
- Malleable iron housings except as noted
- Wide range of sizes

A lifetime of quiet, reliable operation

Turbine vibrators maintain 70-75 decibels throughout their entire life, as compared to sharp increases in noise levels of ball, roller, and piston type vibrators. Turbine sound levels actually decrease during a short "break in" period and retain a constant low sound level throughout their life.



Vibrator Life Curve



Selecting the Proper Syntron® Pneumatic Turbine Vibrator

Bins or Hoppers

In order to move material in a bin or hopper, the friction between the material and the bin wall must be broken. Once the friction is broken, material cannot cling to the sides of the bin and it will flow out through the discharge. For 80 percent of all turbine bin vibrator applications, the vibrator force needed to accomplish this is simply calculated as follows:

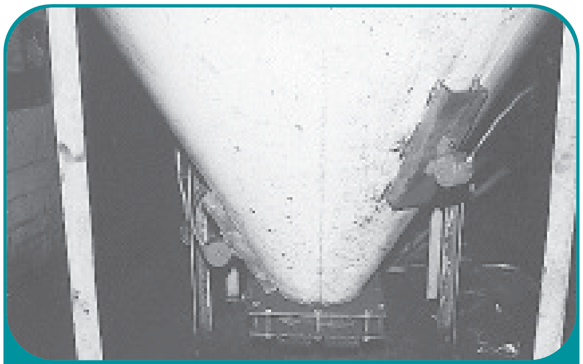
- Calculate the weight of the material in the transition or sloping part of the bin. Normally, this is the only place where the friction between the material and the bin side has to be broken. Do not calculate the total weight, only what is in the transition part of the bin.
- For conical bins, calculate as follows:
  0.261 x dia.^{2} x height x material density in lb/ft^3 (kg/m^3)
- For rectangular bins, calculate as follows:
  Length x width x height x 1/3 x material density.a

NOTE: For selecting the proper pneumatic piston vibrator model, see page 42.

When the weight (lb) has been calculated, divide the weight by 10 to get the force or impact needed from the vibrator (lbf). If the weight is calculated in kg, divide the weight by 1.02 to get the force or impact needed from the vibrator (N). For example: The conical part of a 25-ton bin contains 7000 lb. Divide 7,000 by 10 to get the force (lbf) or impact needed from the vibrator. Find a suitable vibrator on pages 35, 36 and 38.

Additional considerations when sizing vibrators to bins:

- If the bin side angle is less than 30 degrees, select a larger vibrator.
- If the bin has a vertical section, select a larger vibrator.
- If the bin wall is extra thick (see tables pages 35, 36 and 38), select a larger vibrator.
- On very sticky and hard to move materials, it is better to use two small vibrators instead of one large one (size the two smaller ones by dividing the required force in half).



Two Syntron® model TB-320 Pneumatic Turbine Vibrators mounted on a batch hopper.

Vibrating Tables for Packing Materials

Dense materials respond best to high-frequency vibration while light, fluffy or flaky materials respond best to low-frequency vibration. For packing or settling materials, use a vibrator with an impact force of one-and-a-half to two times larger than the weight of the material plus container. Find a suitable vibrator on pages 36 and 38.

Vibrating Screens

For self-cleaning screens, use a vibrator with a centrifugal force (impact) four times the weight of the material plus the weight of the screen.

NOTE: Coarse, lumpy, sticky or wet materials respond best to high-frequency vibration; powdery and dry materials respond best to low-frequency vibration.

Consolidating Concrete

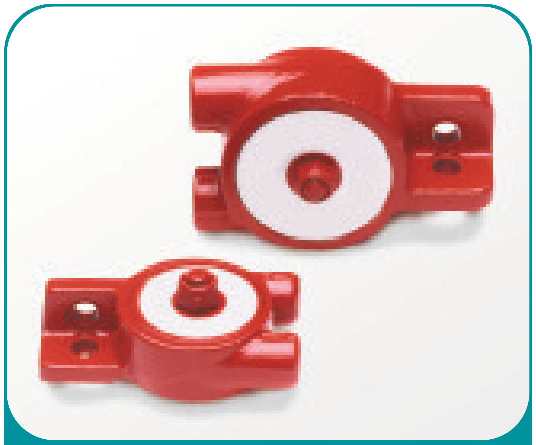
For three-inch "slump" concrete, use a vibrator with the same force (impact) as the weight of concrete and form. For one- to two-inch slump concrete, an additional 30 to 50 percent impact is needed. For dry mixes (zero slump), increase the impact by 100 to 200 percent.

Chutes

The force required of the vibrator is equal to the weight of the chute plus vibrator plus maximum material in the chute. See page 40 for more details.

TAM Turbine Vibrator Series

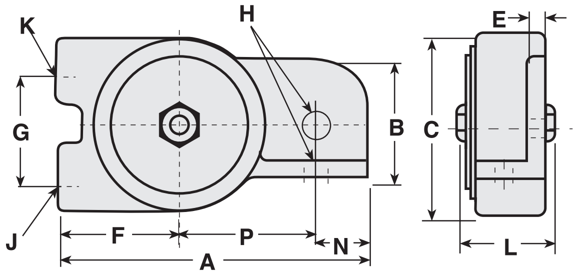
For Small to Medium Applications



Syntron® TAM Pneumatic Turbine Vibrator models

Features

- Low noise, 70 dB or less ●
- Adjustable speed
- Maintenance free; never needs lubrication, even for continuous duty operation
- Versatile mounting design
- Threaded exhaust for muffler or closed system
- Ideal for use in screening, sizing, settling, aiding flow in parts feeders and for moving powdered materials through hoppers and chutes; also unjamming caps, parts and cans



Specifications

	Weight		60 psi		80 psi					Max Material in Bin▲		Bin Wall Thickness	
			Speed		Speed		Force						
Model	lb	kg	vpm	cfm	vpm	cfm	lbs	N	dB●	lb	kg	in	mm
◆ TAM-100	5 oz	.142	12,000	3.5	--	--	20	89	66	200	91	1/32 - 1/16	0.8 - 1.6
◆ TAM-130	9 oz	.255	8,000	4.5	10,500	5.5	75	334	67	750	340	1/16 - 3/16	1.6 - 4.7
◆ TAM-160	12 oz	.340	8,500	5	9,000	7	160	712	67	1600	726	3/16 - 5/16	4.7 - 7.9
◆ TAM-190	15 oz	.425	8,500	5	10,000	7	250	1112	70	2500	1134	3/16 - 3/8	4.7 - 9.5

Data obtained on laboratory test block. Frequency and force will decrease on less rigid mount. Data subject to design changes.

◆ Aluminum construction. Balance of models have malleable iron housings.

● Decibel from A-scale at 1 meter and 80 psi

N = Centrifugal force in Newtons

▲ Rule of thumb for sizing = 1 lb (.4536 kg) Vibrator Force for each 10 lb (4.536 kg) of bin content at 80 psi
or 9.8 N (5.5 bar) Vibrator Force for each 10 kg of bin content at 80 psi.

Note: For low-pressure applications, or to operate outside listed parameters, please contact Syntron Material Handling for recommendations.

Dimensions

	A		B		C		E		F		G		H■		J,K★	L		N		P	
Model	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in -NPT	in	mm	in	mm	in	mm
TAM-100	3 1/4	83	1	25	1 7/8	37	5/16	16	1 1/4	32	1 1/4	32	5/16	8	1/8	1 5/8	41	1/2	12	1 3/8	35
TAM-130	3 3/4	95	1 3/16	30	2 1/4	57	5/16	16	1 3/4	44	1 1/4	32	3/8	10	1/8	1 7/8	48	9/16	14	1 9/16	40
TAM-160	4 1/8	105	1 1/4	32	2 9/16	65	5/16	16	1 3/4	44	1 5/8	41	3/8	10	1/4	2	51	11/16	17	1 13/16	46
TAM-190	4 1/8	105	1 1/4	32	2 9/16	65	5/16	16	1 3/4	44	1 5/8	41	3/8	10	1/4	2	51	11/16	17	1 13/16	46

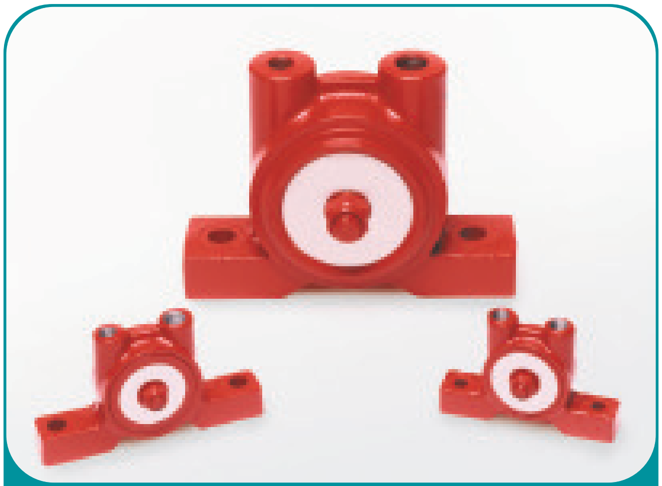
■ Bolt size ★ NPT pipe tap size

TBM Turbine Vibrator Series

For Light to Heavy Applications

Features

- Low noise and adjustable speed
- Maintenance free — never needs lubrication, even for continuous duty operation
- Ideal for pharmaceutical and food industries — non-lubricated air supply means no oily exhaust
- Threaded exhaust for muffler or closed system allows piping off of air exhaust in closed, sanitized systems
- Available in a wide range of sizes
- Ideal for fast moving parts or materials in small feeding tracks to large bins
- Malleable iron castings on most models



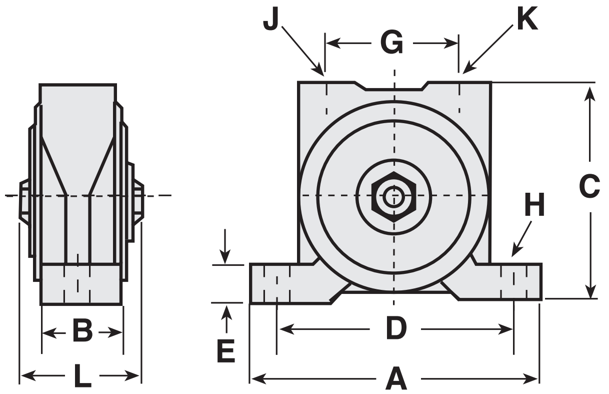
Syntron® TBM Pneumatic Turbine Vibrator models

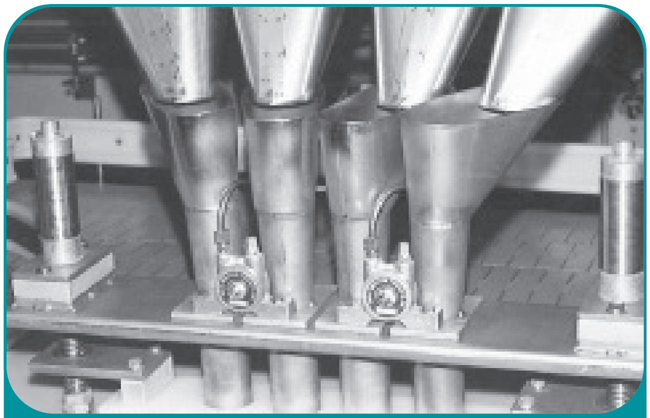
Specifications

	Weight		60 psi		80 psi					Max Material		Bin Wall	
			Speed		Speed		Force			in Bin▲		Thickness	
Model	lb	kg	vpm	cfm	vpm	cfm	lbs	N	dB●	lb	kg	in	mm
◆TBM-60	7 oz	.198	12,000	4	--	--	20	89	66	200	91	1/32 - 1/16	0.8 - 1.6
◆TBM-130	10 oz	.283	8,000	4.5	10,500	5.5	75	334	67	750	342	1/16 - 1/8	1.6 - 3.2
TBM-160	2	.9	9,500	7	11,000	8	160	712	70	1,600	726	3/16 - 5/16	4.7 - 7.9
TBM-190	3	1.4	5,500	7.5	7,200	8.5	270	1,201	71	2,700	1,225	3/16 - 3/8	4.7 - 9.5
TBM-250	5	2.3	5,200	8	7,200	9	480	2,136	72	4,800	2,177	5/16 - 7/16	7.9 - 11.1
TBM-320	8.5	3.9	5,500	9	6,800	10	600	2,669	70	6,000	2,722	3/8 - 7/16	9.5 - 11.1
TBM-380	13	5.8	4,500	16	5,000	18	670	2,981	74	6,700	3,039	7/16 - 1/2	11.1 - 12.7
TBM-440	17	7.7	4,300	18	4,800	21	700	3,114	76	7,000	3,175	1/2	12.7
TBM-510	18	8.2	4,000	18	4,500	21	900	4,004	77	9,000	4,082	1/2	12.7
TBM-570	25	11.3	3,600	21	4,000	26	1,050	4,671	83	10,500	4,763	1/2	12.7

Data obtained on laboratory test block. Frequency and force will decrease on less rigid mount. Data subject to design changes.
◆ Aluminum construction. Balance of models have malleable iron housings.
● Decibel from A-scale at 1 meter and 80 psi
N = Centrifugal force in Newtons
▲ Rule of thumb for sizing = 1 lb (.4536 kg) Vibrator Force for each 10 lb (4.536 kg) of bin content at 80 psi
or 9.8 N (5.5 bar) Vibrator Force for each 10 kg of bin content at 80 psi.

Note: For low-pressure applications, or to operate outside listed parameters, please contact Syntron Material Handling for recommendations.





Pneumatic turbine vibrators mounted on a track to consolidate pills in a bottle filling operation.

Dimensions

Model	A		B		C		D		E		G		H■		Inlet J★	Exhaust K★	L	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in -NPT	in -NPT	in	mm
TBM-60	3 7/8	98	3/4	19	2 3/8	60	3	76	5/8	16	1 1/4	32	1/4	6	1/8	1/8	1 3/16	30
TBM-130	4 7/8	124	7/8	22	2 3/4	70	4	102	3/4	19	1 7/16	37	3/8	10	1/8	1/4	1 7/8	48
TBM-160	5 3/16	139	1 1/4	32	3 7/16	81	4	102	7/8	22	1 7/8	48	3/8	10	1/4	3/8	2 3/4	70
TBM-190	5 3/16	139	1 1/4	32	3 7/16	81	4	102	7/8	22	1 7/8	48	3/8	10	1/4	3/8	3 1/16	78
TBM-250	6 3/4	171	1 5/16	33	3 15/16	100	5	127	7/8	22	2 1/8	54	1/2	12	1/4	3/8	3 1/8	79
TBM-320	6 1/2	165	1 5/8	41	4 7/8	124	5	127	1 1/8	29	2 3/4	70	1/2	12	3/8	1/2	4	102
TBM-380	7 7/8	200	1 7/8	48	5 7/16	138	6	152	1 1/8	29	2 7/8	73	5/8	16	3/8	1/2	4 5/8	117
TBM-440	8 13/16	224	2 3/16	56	5 3/4	146	7	178	1 1/4	32	3 1/8	79	5/8	16	1/2	3/4	4 3/4	121
TBM-510	8 13/16	224	2 3/16	56	5 3/4	146	7	178	1 1/4	32	3 1/8	79	5/8	16	1/2	3/4	4 3/4	121
TBM-570	10 1/16	256	2 7/8	73	7	178	8	203	3/4	19	3 13/16	97	3/4	19	3/4	1	5 3/8	137

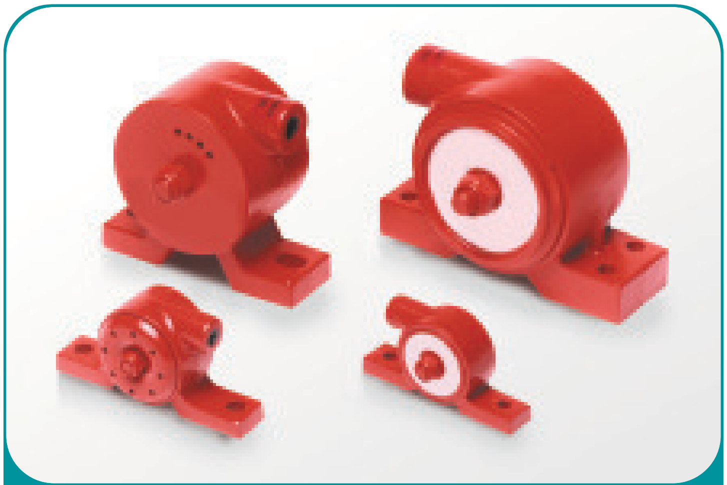
■ Bolt size ★ NPT pipe tap size

TB Turbine Vibrator Series

For Light to Heavy Applications

Features

- Low noise and adjustable speed
- Maintenance free; never needs lubrication, even for continuous duty operation
- Built-in muffler for quiet operation
- Ideal for use in air material conveying systems and medium size batch hoppers
- Models TB-2000 and TB-5000 are lightweight solutions for large bins, hoppers and chutes and are ideal for packing table and screen applications
- Malleable iron castings on most models



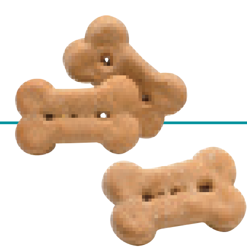
Syntron® TB Pneumatic Turbine Vibrator models.

Specifications

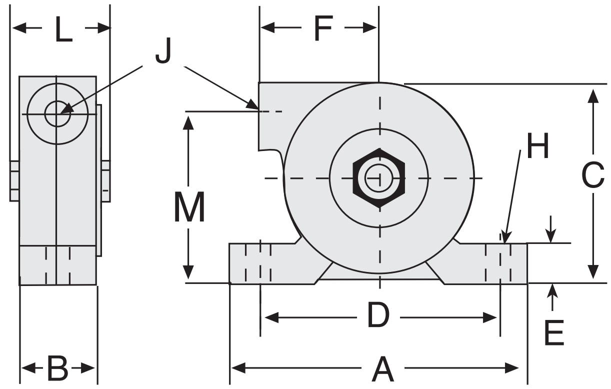
	Weight		60 psi		80 psi					Max Material in Bin▲		Bin Wall Thickness	
			Speed		Speed		Force						
Model	lb	kg	vpm	cfm	vpm	cfm	lbs	N	dB●	lb	kg	in	mm
◆TB-100	7 oz	.198	12,000	4	--	--	20	89	66	200	91	$^1/_{32}$ - $^1/_{16}$	0.8 - 1.6
◆TB-130	11 oz	.312	8,000	4.5	10,500	5.5	75	334	67	750	342	$^1/_{32}$ - $^1/_8$	0.8 - 3.2
TB-160	2	.9	10,000	7	12,000	8	160	712	70	1,600	726	$^3/_{16}$ - $^5/_{16}$	4.7 - 7.9
TB-190	3	1.4	4,200	7.5	7,200	9	270	1,201	70	2,700	1,225	$^3/_{16}$ - $^3/_8$	4.7 - 9.5
TB-250	4	1.8	5,500	9	7,200	10.5	500	2,225	70	5,000	2,268	$^5/_{16}$ - $^7/_{16}$	7.9 - 11.1
TB-320	6.5	2.9	5,200	9	6,800	11	600	2,669	69	7,000	3,175	$^7/_{16}$ - $^1/_2$	11.1 - 12.7
TB-380	11.5	5.2	4,600	16	5,200	17	725	3,226	72	7,250	3,289	$^7/_{16}$ - $^1/_2$	11.1 - 12.7
TB-510	15	6.8	4,000	18	4,500	21	900	4,004	77	9,000	4,082	$^1/_2$	12.7
TB-2000	23	10.5	4,000	30	6,000	35	2,000	8,900	78	20,000	9,072	$^1/_2$ - $^3/_4$	12.7 - 19
TB-5000	48	21.8	4,000	35	6,000	40	5,000	22,245	75	50,000	22,680	$^3/_4$ - 1 $^1/_4$	19 - 32

Data obtained on laboratory test block. Frequency and force will decrease on less rigid mount. Data subject to design changes.
◆ Aluminum construction. Balance of models have malleable iron housings.
● Decibel from A-scale at 1 meter and 80 psi
N = Centrifugal force in Newtons
▲ Rule of thumb for sizing = 1 lb (.4536 kg) Vibrator Force for each 10 lb (4.536 kg) of bin content at 80 psi.
or 9.8 N (5.5 bar) Vibrator Force for each 10 kg of bin content at 80 psi.

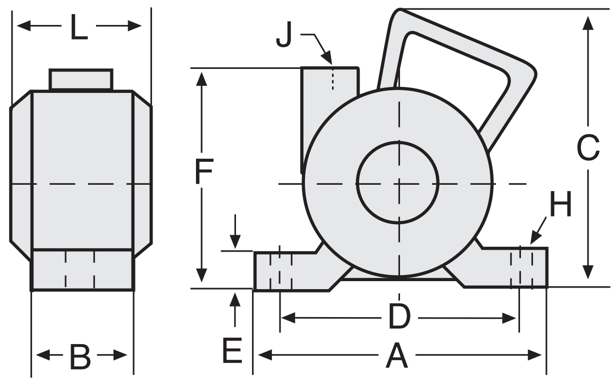
Note: For low-pressure applications, or to operate outside listed parameters, please contact Syntron Material Handling for recommendations.



All models *except* TB-2000 and TB-5000



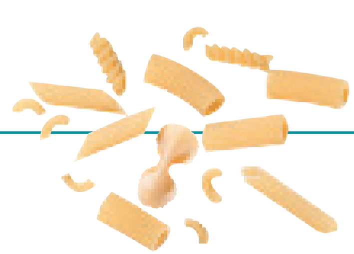
Models TB-2000 and TB-5000



Dimensions

Model	A in	A mm	B in	B mm	C in	C mm	D in	D mm	E in	E mm	F in	F mm	H■ in	H■ mm	J★ in -NPT	L in	L mm	M in	M mm
TB-100	3 7/8	98	3/4	19	2	51	3	76	5/16	8	1 5/16	33	1/4	6	1/8	1 7/16	37	1 11/16	43
TB-130	4 7/8	124	15/16	24	2 5/16	59	4	102	5/16	8	1 1/2	38	3/8	10	1/8	1 7/8	48	1 15/16	49
TB-160	5 1/16	129	1 5/16	33	2 5/16	59	4	102	5/16	8	1 7/8	48	3/8	10	1/4	2 3/4	70	2 1/2	64
TB-190	5 1/16	129	1 5/16	33	3 5/8	92	4	102	9/16	14	1 7/8	48	3/8	10	1/4	2 13/16	71	2 1/2	64
TB-250	5 3/8	137	1 1/2	38	3 1/2	89	4	102	9/16	14	2 1/4	57	1/2	12	1/4	3 1/16	78	2 15/16	87
TB-320	5 5/16	135	1 1/2	38	4 5/8	117	4	102	3/4	19	2 1/4	57	1/2	12	3/8	4	102	4 1/8	105
TB-380	6 5/8	168	2 1/8	54	4 7/8	124	5 1/2 x 1 1/4	140 x 32	1	25	2 7/8	73	3/8	10	3/8	4 3/8	111	4	102
TB-510	6 3/4	171	2 5/8	67	5 3/8	137	5 1/2 x 1 3/4	140 x 32	1	25	2 7/8	73	3/8	10	1/2	4 3/4	121	4 5/8	118
TB-2000	7 5/8	194	2	51	7 3/8	187	5 15/16	151	3/4	19	5 7/16	138	5/8	16	3/4	7 3/4	197	--	
TB-5000	10 1/16	256	3	76	9	229	8	203	1	25	6	153	3/4	19	1	8 5/8	216	--	

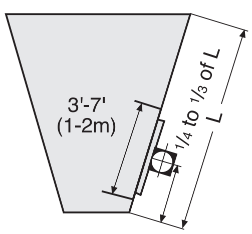
■ Bolt size ★ NPT pipe tap size



Mounting Syntron® Pneumatic Turbine Vibrators

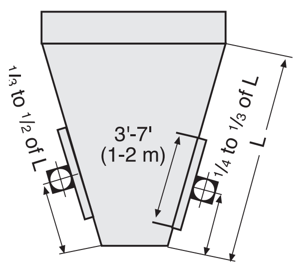
Vibrator selection and installation is based upon individual application requirements. For vibration distribution, each pneumatic turbine vibrator should be mounted midway, on a length of channel, welded with its legs against the side of the bin. All vibrator models can be mounted with the shaft in any position, from horizontal to vertical. For maximum effectiveness, chutes requiring vibrators should be independently isolated. In addition, the vibrator should be mounted midway on a channel located underneath the length of the chute.

Note: For free-flowing bulk material applications, vibrators on hoppers should operate only when the hopper is open to flow. Otherwise, packing of material can result.



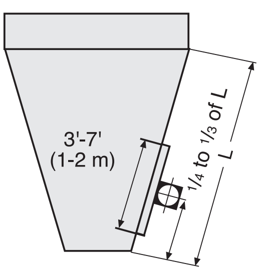
Conical Hoppers

Mount vibrator by channel-iron stiffener 3 to 7 feet long (1-2 m) to hopper wall, one-fourth to one-third the distance from the discharge to the top. A second vibrator (if necessary) should be mounted diametrically opposite and approximately halfway up the bin wall.



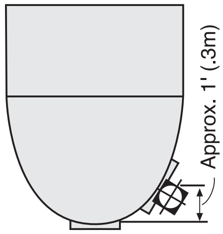
Rectangular Hoppers

Mount as for conical hoppers on the centerline of one side. A second vibrator may be required if complete cleaning of all corners and sides is desired. To mount, follow instructions for conical hoppers.



Rectangular Bins with Hopper Bottoms

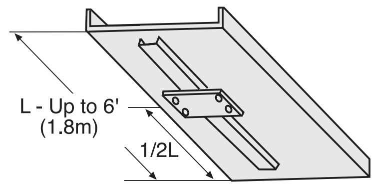
Usually requires larger force vibrators than conical or rectangular hoppers because of additional head load. Locate vibrator one-fourth to one-third the distance up sloping section of bin wall, and follow mounting instructions for conical hoppers.



Parabolic Bins or Hoppers

Mount vibrator within one foot of each discharge opening and in line with center of opening.

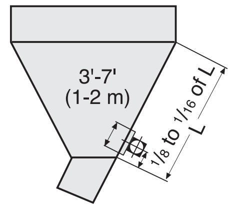
Chutes



To move the material in a chute, the chute should be inclined to no less than half the "angle of repose" of the material (at least 10 degrees). On chutes from 6 to 10 feet (1.8 - 3 m) long, two vibrators are needed; one should be placed 18-24 inches (457 - 610 mm) from the discharge and the other approximately in the middle. Since chutes are very sensitive to vibration, provision should be made to move lower vibrator six inches (152 mm) in either direction. This could mean the difference between moving the material or not moving it.

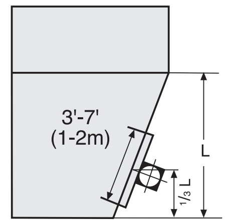
Bins with Sloping Discharge

Mount the vibrator one-eighth to one-sixteenth the distance up bin wall that is contiguous with the underside of chute. This lower mounting position puts vibrator close to bin discharge throat and assures vibration transference into chute.



Bin or Hopper with Vertical Side

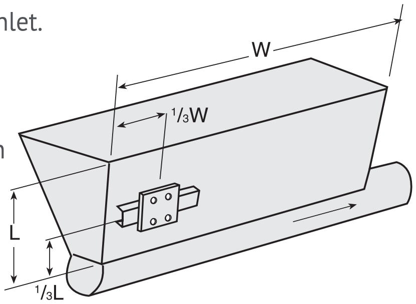
Mount vibrator on wall with the least slope. Follow mounting instructions for rectangular bins with hopper bottoms.



Note: Drawings illustrate typical installations. Specific installations may require slight variations. For other applications not covered here, please consult factory for recommendations.

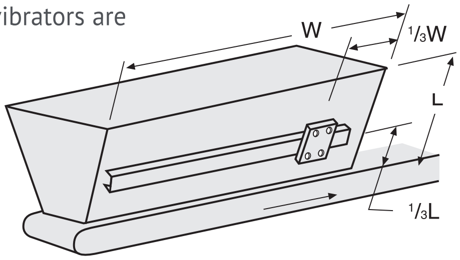
Screw Feeder

Feeds from the back. Vibrator should be 1/3 from the inlet. If two vibrators are used, place second vibrator on opposite side, 1/3 from the discharge. Do not run the vibrator at the discharge until the back of the bin is empty and the vibrator at the inlet is shut off.



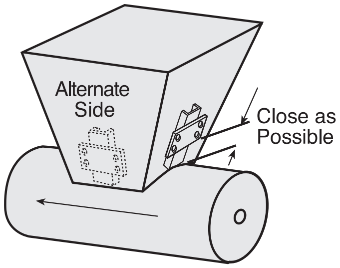
Long Bin

Belt conveyor feeds from front. Vibrator should be 1/3 from front. If two vibrators are used, place one on opposite side and 1/3 from back. Do not operate the back vibrator until the front is empty and the front vibrator is shut off.



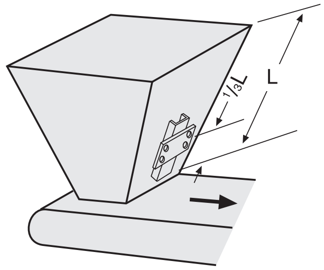
Short Screw Feeder

Place vibrator as close as possible to feeder.



Belt Conveyor and Standard Bin

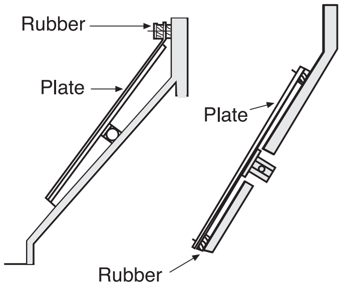
Mount vibrator on the belt discharge side of the hopper. Follow mounting instructions for the appropriate bin type on page 40.



Concrete Hopper or Lined Wooden Hopper

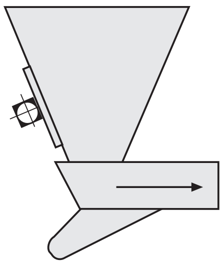
For wooden hoppers lined with thin sheet metal, attach vibrator mounting bolts to the hopper lining.

For concrete hoppers, secure a steel plate across the top inside of the hopper to the discharge opening along the side to which the vibrator will be mounted. At about 1/4 or less of the distance from the discharge to the vertical side, cut an opening to allow the vibrator to be bolted to the steel plate.



Vibrating Feeder and Standard Bin

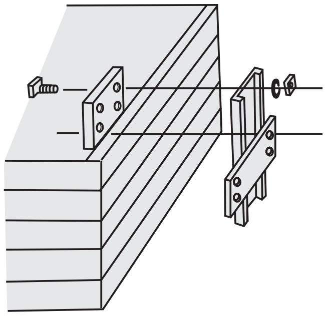
Mount vibrator on the feeder infeed side of the hopper. Follow mounting instructions for the appropriate bin type on page 40.



Note: Drawings illustrate typical installations. Specific installations may require slight variations. For other applications not covered here, please consult factory for recommendations.

Wood Bin

Use steel plate on inside and bolt to outside mounting plate.



Optimized Operation of Syntron® Turbine and Piston Pneumatic Vibrators

1. **Air Line to Vibrator** — In order to minimize pressure loss from the compressor, the inner diameter (ID) of the hose to the vibrator should be the same as or larger than the inlet ID (pipe size) of the vibrator.
2. **Flow Valve** — A flow control valve can tune the vibrator to the required force. The flow volume determines the force and frequency of the vibrator. Throttling the flow enables you to find the desired material discharge rate and avoid the natural frequency of the bin or hopper. If the bin wall and vibrator shake violently, increase or decrease the speed to run with minimum movement. Do not exceed the maximum air pressures shown on pages 35, 36, 38 and 43.
3. **Quick-Opening Valves** — Quick-opening valves can be used between the air regulator and vibrator to allow air to enter the vibrator at full starting force, even at low regulator valve settings. However, the air regulator must be installed at a sufficient distance from the quick-opening valve so that the air pressure between the two valves will build up enough to yield the necessary starting force.
4. **Water in the Line** — Water in the line should be avoided because it will remove the protective film of lubrication necessary to ensure proper operation.
5. **Air Filter** — Use an air cleaner in the line to prolong vibrator life and keep it at maximum efficiency and lowest energy consumption. In turbine vibrators, unclean air will accelerate wear of the housing and clog the muffler. In piston vibrators, unclean air will considerably diminish vibrator life and clog clearance between the cylinder and piston. It will also increase wear on the piston, as well as increase air consumption and diminish vibrator efficiency.
6. **Air Lubrication** — Lubrication is necessary ONLY for Piston Vibrators. Turbine vibrators have prelubricated bearings. Lubricated air may clog the muffler on turbine vibrators.
7. **Operation Requirements** — Do not operate a piston vibrator prior to mounting it to a mounting plate or channel.
8. **Using a Timer** — For better efficiency and longer vibrator life, operate the vibrator only as required to maintain flow.
9. **Empty Bin** — Do not operate a vibrator on an empty bin.
10. **Ambient Temperature** — Do not install pneumatic vibrators in environments where ambient temperatures exceed 180˚F.