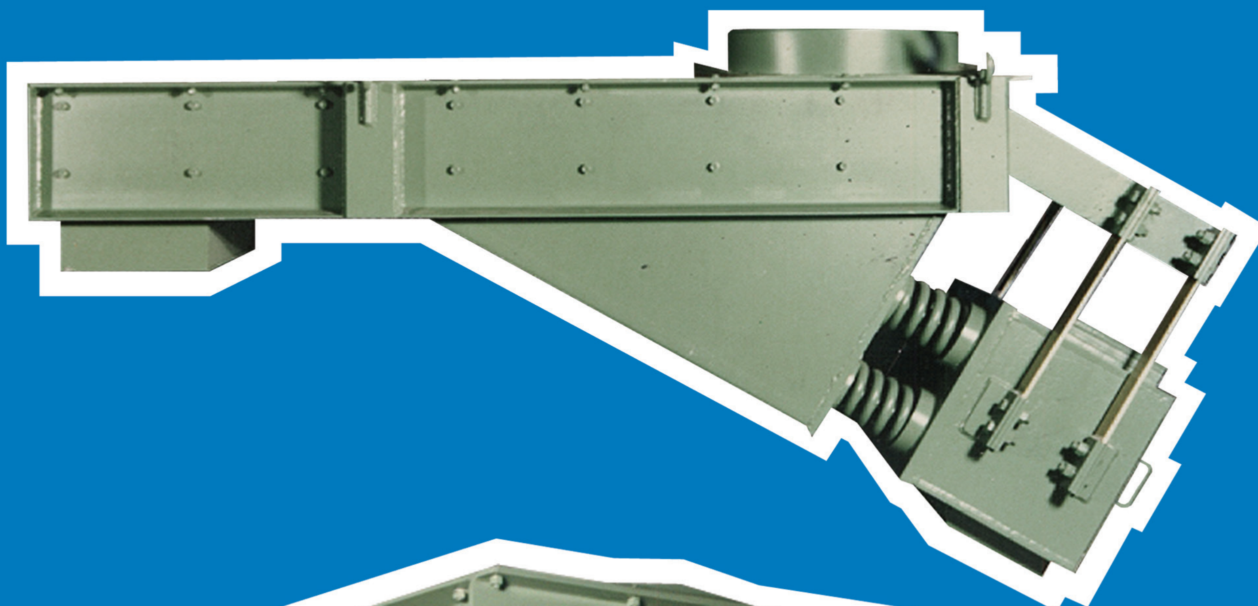
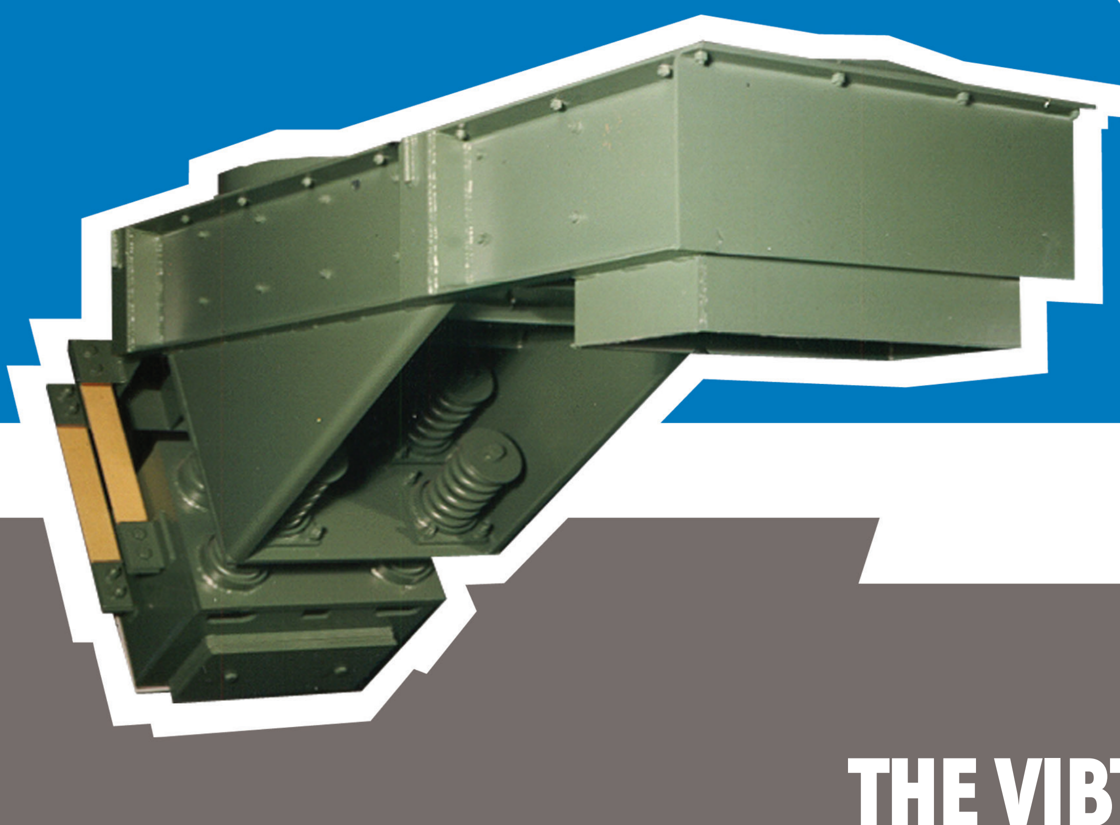
VIBTRON





THE VIBTRON_NF
MECHANICAL VIBRATING FEEDER

THE VIBTRON_NF MECHANICAL VIBRATING FEEDER OPERATES QUIETLY AND EFFICIENTLY WHILE SAVING ENERGY AND MAINTENANCE COSTS

VIBTRON_NF mechanical vibrating feeders are precision-tuned to their own natural frequencies... and "in tune" with the materials they carry... so load-weight and damping actually boost feeder performance. Sub-resonant tuning characteristics are utilized to create the efficient transfer of materials in mining and quarrying operations, as well as aggregate, chemical, and industrial processes. Widespread installations of these energy-saving feeders include transferring bulk, lumpy materials from hoppers to crushers, mullers, grinders, dryers, and conveyors. The wide availability of deck-size and power options complement the high burden-to-energy ratio to make the **VIBTRON_NF** feeder a natural for your next installation.

The computer-designed trough, complete with rugged drive structure, offers benefits from **VIBTRON**'s years of experience in building higher-stressed electromagnetic feeders. Coupling drive springs connect the exciter assembly to the trough. This design has been engineered and calculated based on size requirements and the burden of material to be handled *(FIGURE 1)*.

The heart of the feeder is the exciter assembly which transmits vibrating forces to the deck and induces conveying action in the material on the deck. The assembly is completely enclosed in a rugged steel housing and consists of a standard shaker motor *(FIGURE 2)*.

Single, multiple, remote, or local control arrangements are available. Our feeders offer 0-100% adjustable capacity S.C.R. (Silicon Controlled Rectifier) control for manual or fully automatic operation depending on your system design.

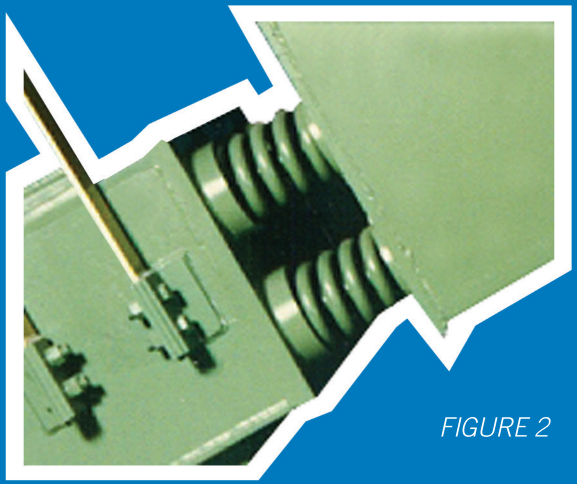


FIGURE 2

Large amounts of reserve energy from steel coil-springs are transmitted to the feeder deck. The steel springs have a very low damping coefficient and consume small amounts of power compared to rubber or the other type of drive spring. Since temperature and humidity variances have little effect, we accurately apply lower horsepower motors, thereby reducing operating costs.

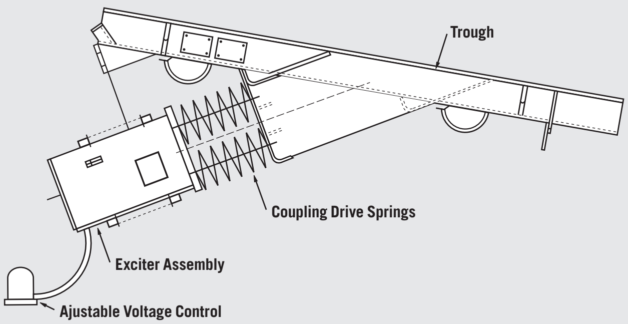


FIGURE 1

NF FEEDER COMPONENTS

NF feeder components consist of a computer-designed trough, coupling drive springs, an exciter assembly, and adjustable voltage control.

FEEDER CAPACITIES AND DIMENSIONS

VIBTRON application expertise and service follow-up assure increased capacities as a result of proper hopper design, as well as installation and operating advice. Smaller, more efficient feeders will normally be specified with systematic application of throat opening to trough length. Some conditions make excessive bin loading practical. Under these conditions, **VIBTRON** will advise changes in performance resulting from the overload.

Optimal performance among varying trough lengths is illustrated in *FIGURE 3*. **VIBTRON**'s years of feeder design produce more efficient, energy-saving installations. Precisely engineered combinations of throat opening, deck length, angle of repose, and slope applied to material will result in larger capacities with reduced operating costs.

FEEDER MODEL WITH RATED CAPACITIES

	CAPACITY IN STPH	SLOPE IN DEGREES	WEIGHT IN LBS.	HP
NF 1805	200	10	1270	2
NF 2405	250	10	1300	2
NF 3005	300	10	1500	2
NF 3606	500	10	1700	2
NF 4207	600	10	2650	2
NF 4807	700	10	2980	3
NF 6008	800	12	4200	3
NF 7208	1400	12	4300	3
NF 8410	1800	15	6100	5
NF 9610	2000	15	7200	5
NF 10810	2500	15	8400	7.5
NF 12010	3000	15	8600	7.5
NF 15010	3500	15	12000	10
NF 18010	4000	15	14000	10

TABLE 1

TABLE 1
- Positive drive arrangement, standard shaker motors.
- Capacities shown include an additionnal 15% capacity gained by using stainless steel or polymer bottom liners.
- Deck sizes are available from 18" wide in 6" increments.

RECOMMENDED HOPPER DESIGN/LENGTH OF DECK IN RELATION TO MATERIAL DEPTH

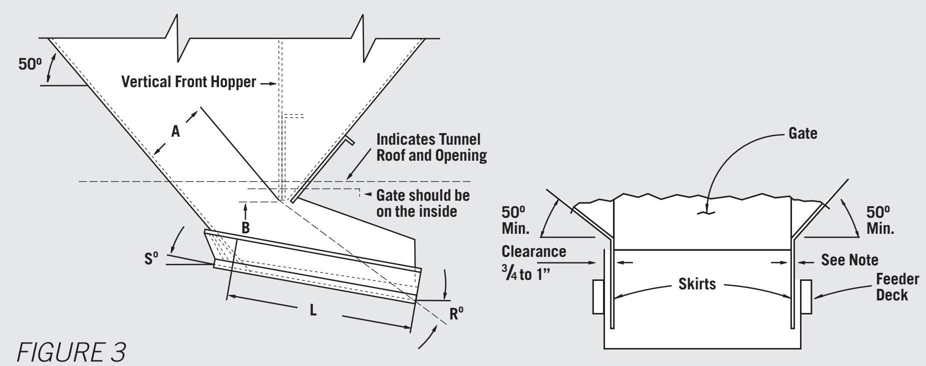


FIGURE 3

THROAT OPENING IN INCHES A AND B	AVERAGE MATERIAL DEPTH IN INCHES D	DECK LENGTH IN INCHES L	SLOPE IN DEGREES S	AVERAGE ANGLE OF REPOSE IN DEGREES R
23	15	60	10	35
29	19	72	10	35
33	22	84	10	35
33	22	96	12	35
36	24	108	15	35
38	25	120	15	35

TABLE 2

NOTE: Width between skirts affects capacity. Thickness of skirts (with or without liners) should be minimal.
NOTE: Throat openings of hopper are based on 50 lbs./cu. ft. of material. For other materials, multiply the A and B dimensions by the approximate density factor. If this is impractical due to particle size, consult **VIBTRON** processing products.

TABLE 3

DENSITY	50	60	70	80	90	100
FACTOR	1.0	0.8	0.7	0.6	0.55	0.5

DIMENSIONS (dimensions in inches)

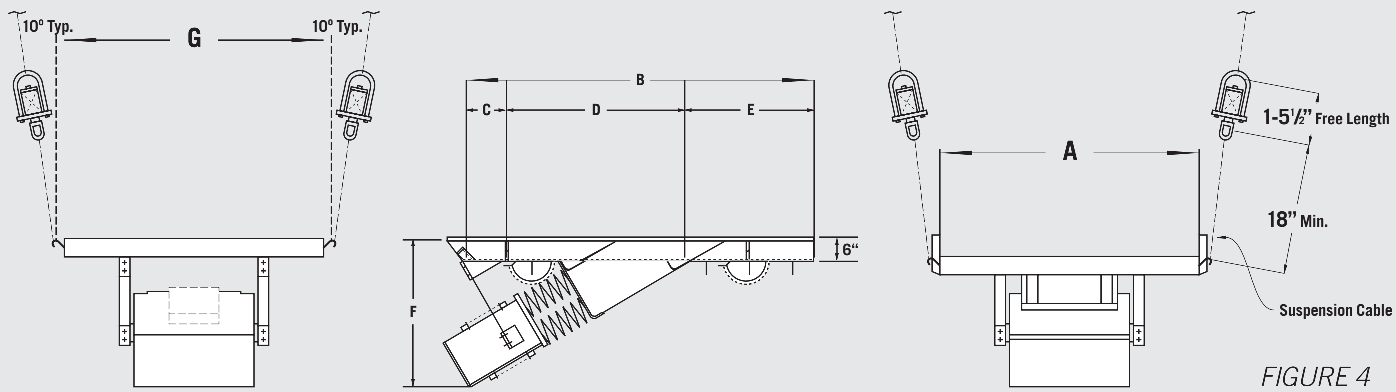


FIGURE 4

RATED CAPACITIES AND FEEDER SELECTION

RATED CAPACITY

Most units may be quickly and accurately sized by using the capacity chart *(FIGURE 5)*. Sizes corresponding with dots are minimum recommended widths and lengths for each capacity. Consult **VIBTRON** processing products for capacities over 6,000 T.P.H.

Use either stainless steel or polymer bottom liners for maximum capacity. These may increase capacity by as much as 15% over other liners. Maximum capacities are used in the capacity chart *(FIGURE 5)*. Rates will change approximately 3% to 5% per degree of slope change from those listed.

CAPACITY CHART

Lump coal at 50 lbs./cu. ft.
Granular stone at 100 lbs./cu. ft.

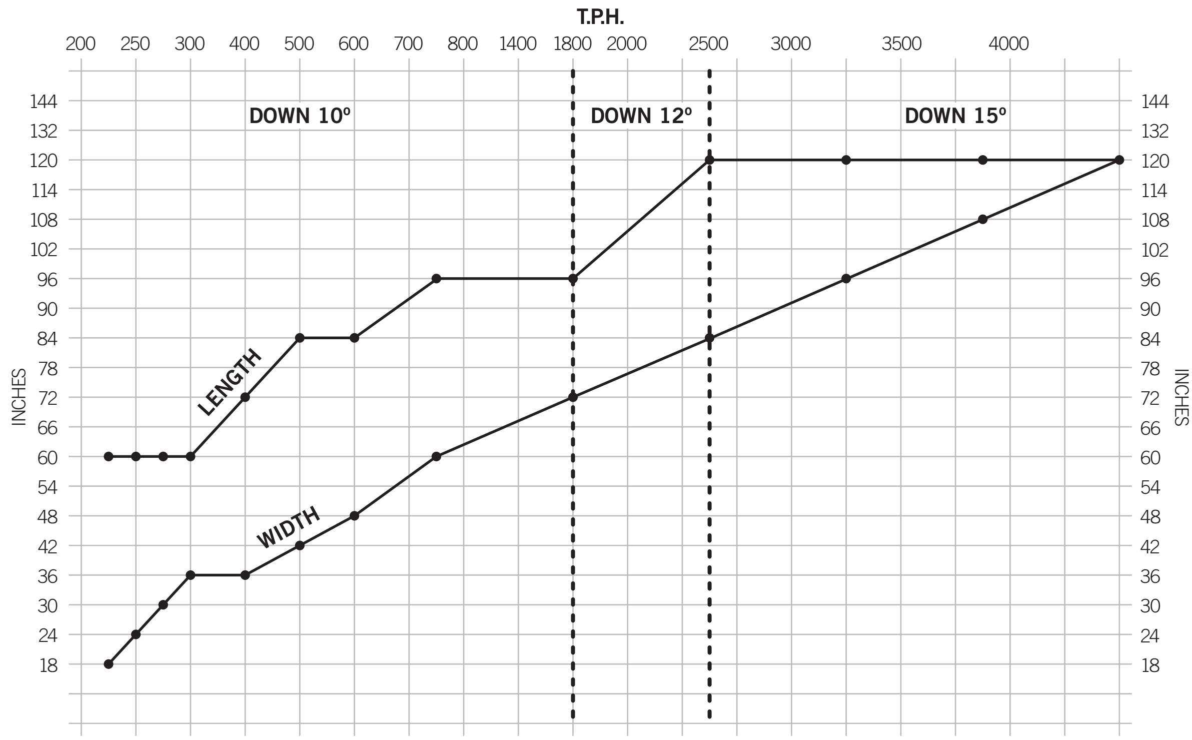


FIGURE 5

FIGURE 5
Recommendations shown indicate capacities using stainless steel polymer liners.

MODEL	Trough Size A	Trough Size B	C	D	E	F	G	HP
NF 1805	18	60	1	37½	21½	34	23¾	1
NF 2405	24	60	1	37½	21½	34	29¾	1
NF 3005	30	60	1	37½	21½	34	35¾	1
NF 3605	36	60	1	37½	21½	34	41¾	1
NF 3606	36	72	4¼	42	25¾	37	41¾	1
NF 4207	42	84	4¼	42	37¾	41	48	1
NF 4807	48	84	4¼	42	37¾	41	54	1.5
NF 6008	60	96	8	49	39	43	66	1.5
NF 7208	72	96	8	49	39	43	78	2
NF 8410	84	120	6	84	30	47	90	5
NF 9610	96	120	6	84	30	47	102	5
NF 10810	108	120	6	84	30	47	114¼	7.5
NF 12010	120	120	6	84	30	47	126¼	7.5
NF 15010	150	120	6	84	30	47	156¼	10
NF 18010	180	120	6	84	30	47	186¼	10

TABLE 4

TABLE 4
Consult prosessing products for liner and deck recommandations if size not shown. Use horsepower listed for equivalent sq. ft. of trough conveying surface as an approximation for sizes not listed.

FEEDER SELECTION

Once the desired capacity is known, minimum width and length may be determined. *FIGURE 5* represents varying capacities and size recommendations for lumpy 2" x 0 material at 50 lbs./cu. ft. Select capacity (listed horizontally under grid) in T.P.H. and move up the vertical capacity line to intersect with width indicator line. Feeder width is located at the left margin of the horizontal intersect. Feeder length may be determined in a similar manner by following the (vertical) capacity line upward to the length indicator line. If determined size falls between the vertical lines, you may select a standard size by progressing right to the next dot on the horizontal line.

NOTE: Reduce chart capacities by 8% for 2" x 0 material at 45 lbs./cu ft. Reduce chart capacities by 15% for 2" x 0 material at 40 lbs./cu. ft.

ENGINEERING TECHNOLOGY COUPLED WITH PROPER APPLICATION WILL RESULT IN LARGER LOADS DRIVEN BY LESS ENERGY

MINIMUM DRIVE/MAXIMUM LOAD

Precision sub-resonant tuning fully utilizes the natural frequency design, using minimal forces to drive a large mass. The headload of material is most important to the design and actually assists the overall performance of each unit. The headload has a mass effect and a damping effect on the mechanical vibration system of the feeder. The relationship of the complete feeder is illustrated in *FIGURE 6*.

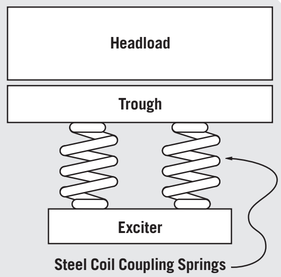


FIGURE 6

MINIMUM TROUGH-STROKE VARIATION

The empty feeder operates along a curve A (dashed line) with its natural frequency at point A. Trough stroke is inclined by point A on the vertical axis when the exciter frequency occurs at point A.
The loaded feeder (with headload) operates along curve B (solid line). Its natural frequency decreases to point B due to the weight of the burden's mass. The damping effect of the burden simultaneously changes the shape of performance curve B as illustrated. The exciter frequency also decreases from point A to B due to the additional load on the motor. The trough-stroke is now at point B on the vertical axis.

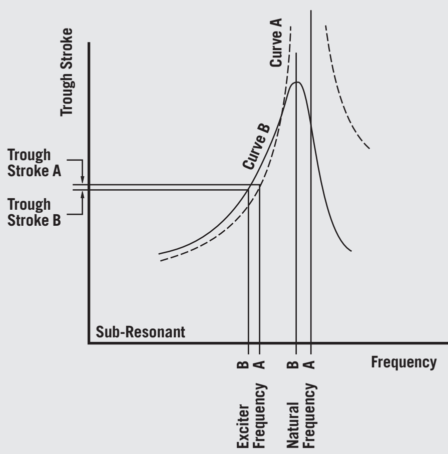


FIGURE 7

The **NF** feeder features maximum stability under varying load requirements. This stability results from a minimum of variance of trough-stroke between empty and loaded conditions. Minimal stroke variance is achieved through engineering offsetting mass and damping effects into the system. Adjustment of the exciter frequency results in smooth and effective variation of capacity (conveying speed).

The trend of the curves *(FIGURE 7)* shows a simultaneous increase or decrease of exciter frequency and trough-stroke achieved through adjustment in motor speed by varying the input voltage.

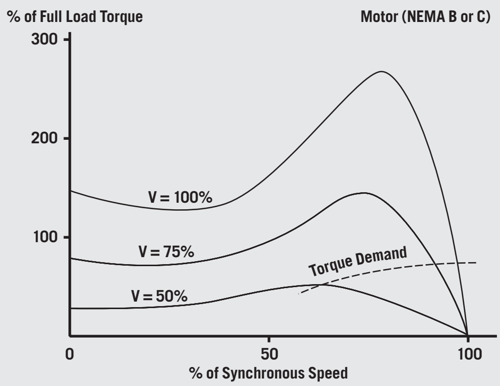


FIGURE 8

A typical example *(FIGURE 8)* of the motor speed adjustment for an empty unit shows the torque/speed curves (solid lines) of the motor at varying voltage applications, as well as the torque demand curve (dashed line). Motor speed changes follow the torque demand curve to give the most effective range of speed variation.

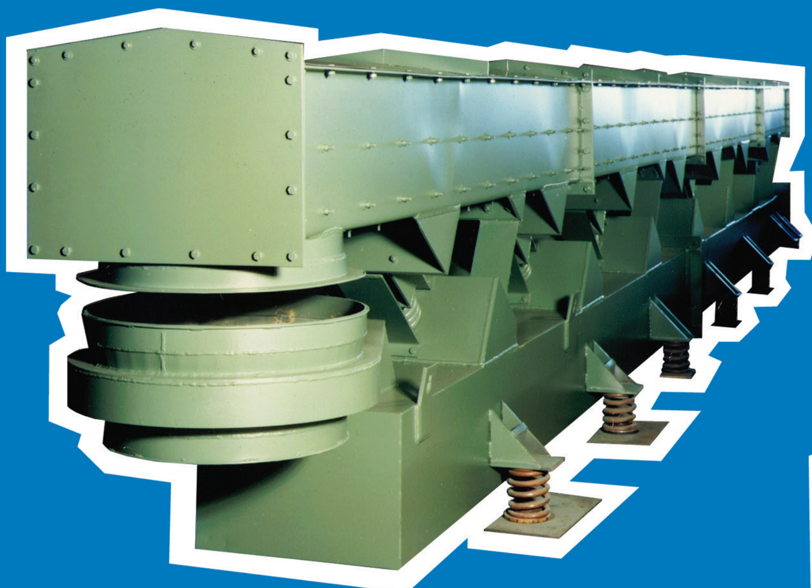
0–100% VARIABLE CAPACITY S.C.R. OR VARIABLE TRANSFORMER CONTROLS

S.C.R. CONTROLLERS

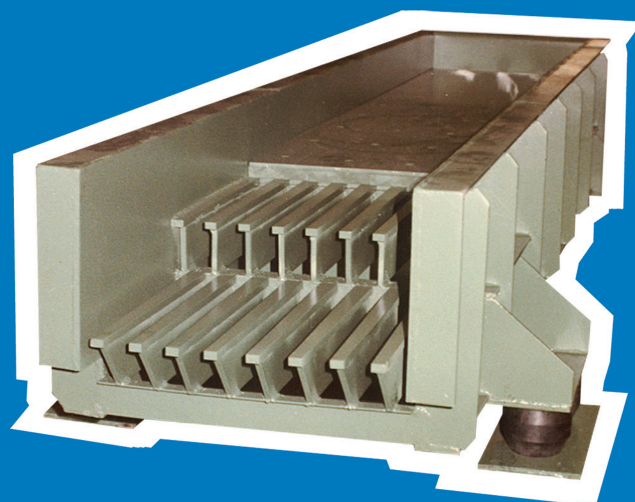
They offer our most complete flexibility in application. The silicon controlled rectifiers are adjustable from 0% to 100%. Single or multiple, remote or local control arrangements may be designed to your specifications. Stepless-control module requires little space and may be installed in hazardous areas (optional).

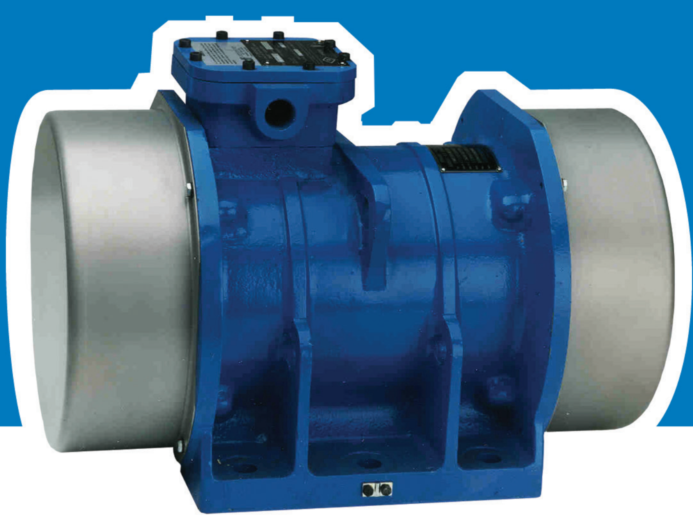
VIBTRON SPECIALTY EQUIPEMENT

▼ **RESONANCE VIBRATING CONVEYORS**



▼ **GRIZZLY FEEDERS**





◄ **VIBTRON SHAKER MOTORS**

OTHER VIBTRON PRODUCTS

- VIBRATING SCREENS
- CUSTOM-BUILT ELECTRONIC CONTROLS

VIBTRON

6257 25th. Avenue, Unit 4
Montreal, Quebec H1T 3L5
T 514_376_2218
F 514_721_2480
E-mail: info@vibtron.com

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