

Bin Vibrators

...Only from Eriez.

Hi-Vi Electromagnetic

Twelve AC drive units to improve flow of hard-to-handle materials in bins, hoppers and chutes.

Eriez' unique Hi-Vi magnetic drive circuit provides a simple yet powerful solution to difficult material feeding applications.

These vibrators, with their totally enclosed patented magnetic drive, can be used for applications ranging from the tiniest hopper to huge bunkers with reinforced heavy steel plate and liners. Hi-Vi's concentrated vibration, with its powerful positive drive in both directions, applies a superior action to bin walls...and results in more economical, more efficient flow of hard-to-handle materials.

Simple AC controls operate the vibrators with "watch-like" precision. In addition, you get all the features that for years have made Eriez Feeders the leaders in quality and dependability.

FEATURES

- Electro-permanent magnet drive
- AC operation
- Simple controls
- Encapsulated coils
- "Pinpoint" vibration
- Enclosed drive element
- Low power consumption



ELECTRO-PERMANENT MAGNETIC DRIVE

The basic simplicity of a drive powered by alternately opposing and attracting magnetic forces assures low maintenance. There are no sliding or rotating parts. Power consumption is low, installation easy. The positive driving force of Eriez units provides stability, control, and unexcelled accuracy.

AC Operation

Vibrators are simply wired into AC lines.

Simple Controls

Compact variable transformer-type controls regulate vibrator performance by varying applied voltage. Control is stepless from 0 to 100 % of capacity, with excellent linearity. Almost no heat is generated. SCR controls are available for automated operation. Single vibrators or groups of vibrators can be remotely controlled from one station. Controls with solid-state components are available for all units.

Encapsulation

The coil and magnet in Eriez' drive unit are encapsulated in epoxy, eliminating coil movement and thus extending trouble-free coil life.

Enclosed Drive Element

The completely enclosed drive element, dust and moisture resistant, extends coil life, makes external cleaning easier. Special enclosures are available for dusty locations where Class II Group G equipment is normally used.

High Temperature Units

Standard units operate at temperatures up to 130°F (54°C). High-temperature units are available for temperatures up to 300°F (150°C).

Types of Vibrators Available

Designation	Type
N	Inertia
S	Metal to rubber impact
P	Metal to metal impact
U	Metal to metal double impact

Model	Frequency
N, P and S	3600 vibrations/minute on 60 cycle current
U	7200 vibrations/minute on 60 cycle current

POWER SAVERS!

Eriez Feeders Use up to **80% LESS POWER** than some competitive units

Model	Watts	Model	Watts
20N	20	50P	30
30N	40	55P	60
30P	15	60U	110
40P	30	70U	130

The Patented Eriez Hi-Vi Magnetic Drive Circuit

Old-style electromagnetic vibratory equipment operates with an inefficient attract release system: a spring-mounted moving mass is alternately attracted by a rectified pulsating DC electromagnet and returned to its original position solely by the springs. The Eriez Hi-Vi system, on the other hand, incorporates a lifetime permanent magnet (part of a spring-mounted moving mass) whose poles are intermeshed with those of an electromagnet powered directly by an AC line. This results in the spring-mounted moving mass being both attracted and repelled by the AC electromagnet equally on each half of the AC cycle.

In the diagram below, the poles of the permanent magnet are shown intermeshed in the air gaps of the AC electromagnet. The polarity of the permanent magnet is fixed, while the polarity of the electromagnet alternates at line frequency. The electromagnet polarity is shown as it exists on one side of the AC sine wave; note that both poles of the permanent magnet are attracted toward the unlike electromagnet poles while being repelled in the same direction by the like poles. Thus there are four forces acting together to drive the armature and moving mass in the same direction.

The action described has the effect of progressively closing the magnetizing circuit through the electromagnet core, providing a progressively increasing

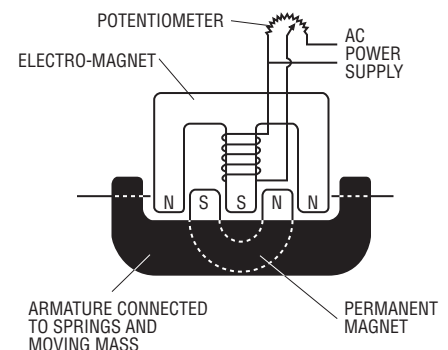


Figure 1. Eriez Magnetic Drive Circuit

magnetizing force upon the permanent magnet. The demagnetizing force is very minor, since the action described also has the effect of progressively opening the demagnetizing circuit.

On the opposite side of the sine wave the polarities of the electromagnet are reversed, the armature is driven in the opposite direction, and again there is a net magnetizing force on the permanent magnet. There is always a predominant magnetizing force impressed upon the permanent magnet that prevents it from losing its strength.

Since the amplitude of vibration depends directly upon the forces applied at the poles, and since these forces depend directly upon the applied AC voltage, simple variation of the AC voltage from zero to maximum results in similar amplitude variation from zero to maximum.

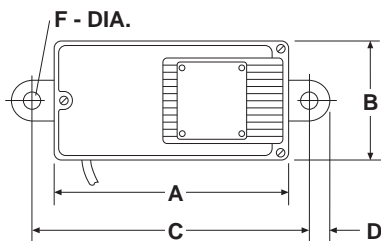
SERIES 20N - 30N

These two noiseless models are ideal for many light-duty applications.



	20N	30N
Power Supply (50 or 60 Cycle, Single Phase)	115, 230 or 460V	115, 230 or 460V
Full Load Power Input and Current at 115V/60	20W/ 0.6 Amp	40W/ 1.2 Amp
Control	Model D	Model FT
Weight (without control box)	9.5 lb. (4.3 kg)	17 lb. (7.7 kg)
Weight (with control box)	14.5 lb. (6.6 kg)	23 lb. (10.4 kg)
Shipping Weight (without control box)	13 lb. (5.9 kg)	21 lb. (9.5 kg)

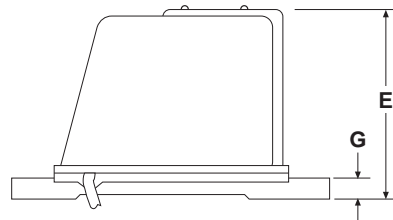
DIMENSIONS



20N
For 5 cu ft (.14 cu m)
Bin Capacity
Min. Wall-18 Ga. (1.3 mm)
Max. Wall-3/32" (2.4 mm)

30N
For 15 cu ft (.42 cu m)
Bin Capacity
Min. Wall-3/32" (2.4 mm)
Max. Wall-1/8" (3.2 mm)

Mount on 2" (50 mm) channel
12" (300 mm) long



		A	B	C	D	E	F	G	H
20N	in	6 1/4	3 7/16	7 1/2	1/2	5 5/8	7/16	3/4	--
	mm	159	87	191	13	143	11	19	--
30N	in	8 1/2	4 1/4	10	3/4	6 7/8	5/8	3/4	--
	mm	216	108	254	19	175	16	19	--

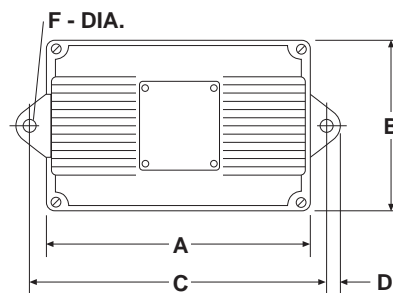
SERIES 30P - 30S

These two additional light-duty models operate on the impact principle and provide 3,600 vibrations per minute on 60-cycle current. Model 30P impacts steel on steel.



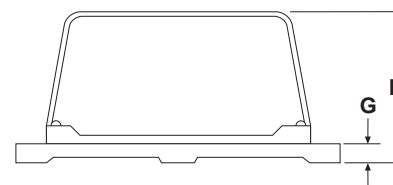
	30P - 30S
Power Supply (50 or 60 Cycle, Single Phase)	115, 230 or 460V
Full Load Power Input and Current at 115V/60	10W/ 0.5 Amp
Control	Model FT
Weight (without control box)	18 lb. (8.2 kg)
Weight (with control box)	23 lb. (10.4 kg)
Shipping Weight (without control box)	22 lb. (10 kg)

DIMENSIONS



30P-30S
For 20 cu ft (.57 cu m)
Bin Capacity
Min. Wall-1/16" (1.6 mm)
Max. Wall-1/8" (3.2 mm)

Mount on 2" (50 mm) channel
12" (300 mm) long



		A	B	C	D	E	F	G	H
30P-	in	8 7/8	5 5/8	10	1/2	5	5/8	5/8	--
30S	mm	225	143	254	13	127	16	16	--

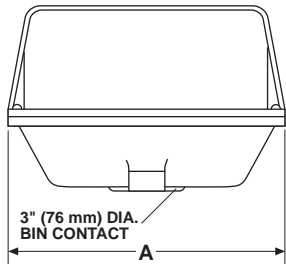
SERIES 40P - 40S

For medium-duty applications, these two impact models will effectively handle a wide variety of hard-to-move materials. In addition to the standard model, the 40P is available on special order for high-temperature applications up to 300°F (150°C).



	40P	40S
Power Supply (50 or 60 Cycle, Single Phase)	115, 230 or 460V	115, 230 or 460V
Full Load Power Input and Current at 115V/60	30W/ 1.4 Amp	40W/ 1.6 Amp
Control	Model FT	Model FT
Weight (without control box)	41 lb. (18.6 kg)	46 lb. (20.1 kg)
Weight (with control box)	47 lb. (21.3 kg)	52 lb. (23.6 kg)
Shipping Weight (without control box)	46 lb. (20.9 kg)	51 lb. (23.1 kg)

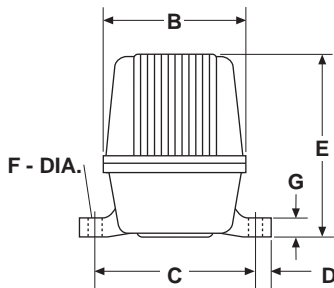
DIMENSIONS



40P - 40S
For 3 Tons (2.7 MT)
Bin Capacity
 Min. Wall-1/8" (3.2 mm)
 Max. Wall-1/4" (6.4 mm)

Mount on 4" (100 mm) channel
 24" - 30" (600-750 mm) long

A steel mounting channel
 should be utilized to produce
 maximum performance.



		A	B	C	D	E	F	G	H
40P	in	11 1/4	5 3/4	6 1/2	5/8	7 5/16	5/8	3/4	--
	mm	286	146	165	16	186	16	19	--
40S	in	11 1/4	5 3/4	6 1/2	5/8	7 9/16	5/8	3/4	--
	mm	286	146	165	16	192	16	19	--

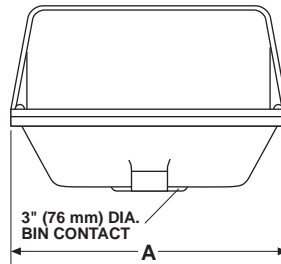
SERIES 50P - 50S

These two impact models will give excellent performance on many medium-duty types of installations. A modified Model 50P is available for high-temperature applications.



	50P	50S
Power Supply (50 or 60 Cycle, Single Phase)	115, 230 or 460V	115, 230 or 460V
Full Load Power Input and Current at 115V/60	40W/ 1.6 Amp	45W/ 1.8 Amp
Control	Model FT	Model FT
Weight (without control box)	50 lb. (22.7 kg)	55 lb. (25 kg)
Weight (with control box)	56 lb. (25.4 kg)	61 lb. (27.7 kg)
Shipping Weight (without control box)	55 lb. (24.9 kg)	60 lb. (27.2 kg)

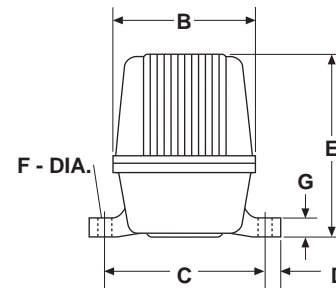
DIMENSIONS



50P - 50S
For 6 Tons (5.4 MT)
Bin Capacity
 Min. Wall-1/4" (6.4 mm)
 Max. Wall-5/16" (8 mm)

Mount on 4" (100 mm) channel
 24" - 30" (600-750 mm) long

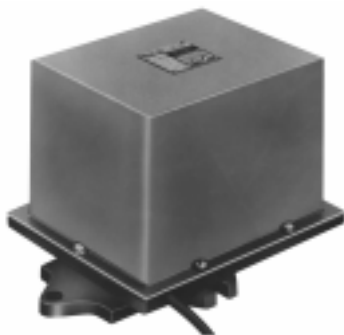
A steel mounting channel
 should be utilized to produce
 maximum performance.



		A	B	C	D	E	F	G	H
50P	in	11 1/4	5 3/4	6 1/2	5/8	7 13/16	5/8	3/4	--
	mm	286	146	165	16	198	16	19	--
50S	in	11 1/4	5 3/4	6 1/2	5/8	8 1/16	5/8	3/4	--
	mm	286	146	165	16	205	16	19	--

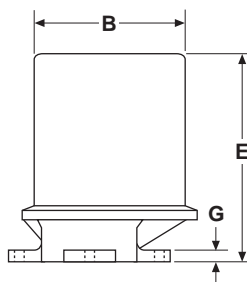
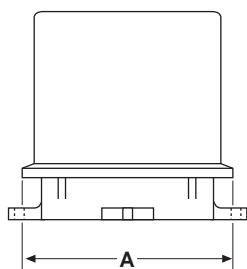
SERIES 55P - 55S

Two heavy-duty impact models in the medium size range are available for larger capacity applications. The powerful action of the 55 series makes them a popular unit for the more difficult material moving jobs.



55P - 55S	
Power Supply (50 or 60 Cycle, Single Phase)	115, 230 or 460V
Full Load Power Input and Current at 115V/60	60W/ 4 Amp
Control	Model G
Weight (without control box)	72 lb. (32.7 kg)
Weight (with control box)	84 lb. (38.1 kg)
Shipping Weight (without control box)	82 lb. (37.2 kg)

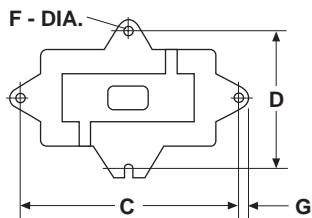
DIMENSIONS



55P - 55S
For 18 Tons (16.3 MT)
Bin Capacity
Max. Wall-1/4" (6.4 mm)
Min. Wall-5/16" (8 mm)

Mount on 10" (250 mm)
channel 36" (900 mm) long

A steel mounting channel
should be utilized to produce
maximum performance.



	A	B	C	D	E	F	G	H
55P-	in 11 1/4	9 1/4	11 1/2	7 1/4	9 3/4	11 1/16	5/8	--
55S	mm 286	235	292	184	283	18	16	--

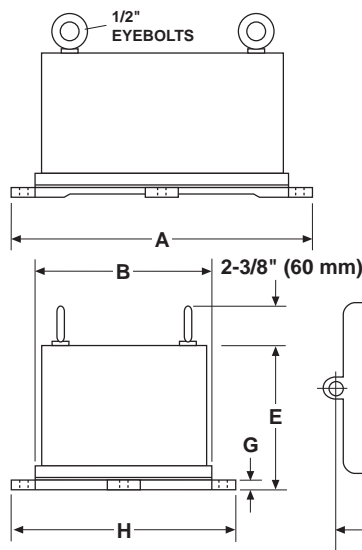
SERIES 60U

This is a rugged model that operates on the "double impact" principle, producing 7200 vibrations per minute from a 60-cycle power supply. It provides a "cushioned" impact and is ideally suited to handling sticky materials as well as fine clinging type materials.



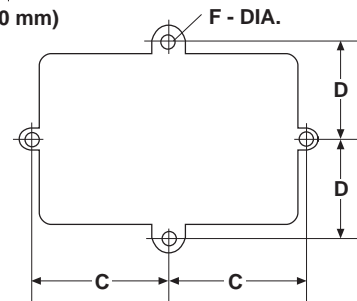
60U	
Power Supply (50 or 60 Cycle, Single Phase)	115, 230 or 460V
Full Load Power Input and Current at 115V/60	110W/ 4 Amp
Control	Model G
Weight (without control box)	160 lb. (72.6 kg)
Weight (with control box)	172 lb. (78 kg)
Shipping Weight (without control box)	170 lb. (77.1 kg)

DIMENSIONS



60U
For 30 Tons (27.2 MT)
Bin Capacity
Min. Wall-5/16" (8 mm)
Max. Wall-7/16" (11 mm)

Mount on 15" (400 mm) channel
36" - 48" (900-1200 mm) long



	A	B	C	D	E	F	G	H
60U	in 18 3/4	10 5/8	8 5/8	6	9 7/8	5/8	5/8	14
	mm 476	270	219	152	251	16	16	356

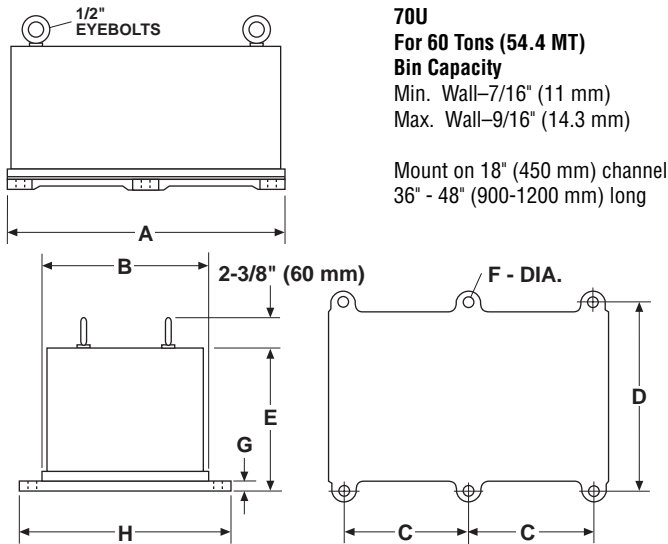
SERIES 70U

The rugged 70U is the largest of our “double impact” type vibrators. Built for heavy-duty applications, this model is ideally suited for use on large hoppers and bunkers which are constructed of heavy plate. Heavy bracing and liners do not affect the vibrating performance of this unit.



70U	
Power Supply (50 or 60 Cycle, Single Phase)	115, 230, 460 or 575V
Full Load Power Input and Current at 115V/60	130W/ 7 Amp
Control	Model GH
Weight (without control box)	305 lb. (138.3 kg)
Weight (with control box)	322 lb. (146.1 kg)
Shipping Weight (without control box)	320 lb. (145.1 kg)

DIMENSIONS



70U
For 60 Tons (54.4 MT)
Bin Capacity
Min. Wall-7/16" (11 mm)
Max. Wall-9/16" (14.3 mm)

Mount on 18" (450 mm) channel
36" - 48" (900-1200 mm) long

	A	B	C	D	E	F	G	H
70U	in 23	14	10 1/4	15 1/2	11 5/8	13/16	11/16	17 1/2
	mm 584	356	260	394	295	21	18	445

Dimensions and specifications are subject to change without notice.

HI-VI CONTROLS



No rectifier is needed with Eriez Hi-Vi electromagnetic vibrators; just wire into any AC line. Controls are available to provide a precise amount of vibration, if required. They are of the potentiometer, variable auto-transformer or solid state type. Their function is to vary the applied line voltage from zero to 100%, and hence the vibration from zero to maximum.

Stepless control assures the exact amount of vibration for difficult applications. There is no surge of uncontrolled vibration, but rather a smooth increase from zero to maximum.

The controls for Eriez' "N12" Series units for dusty locations are built in totally enclosed J. I. C. electrical housings designed to provide protection against oil, coolant, water, dust, etc.

SPECIAL "N12" SERIES FOR INSTALLATION IN DUSTY LOCATIONS WHERE CLASS 11 GROUP G EQUIPMENT WOULD NORMALLY BE USED

Models 20N through 70U are available specially constructed for these out-of-the-ordinary installations. Because these units are totally enclosed, gasketed, and have no sliding or rotating parts, they are acceptable by fire underwriters agencies for use in those areas where Class 11, Group G equipment would normally be used in insured plants. Special waterproof coatings are also available at extra cost. J. I. C. Control Housings are available for use where oil, water, dust, etc., are present.

APPLICATION OF HI-VI VIBRATORS ON BINS HOPPERS AND CHUTES

Factors To Consider

The size of a Hi-Vi Vibrator necessary to provide proper material movement depends upon a number of factors – the hopper size, shape, physical construction, thickness of hopper plate, hopper stiffness, type and mesh size of the material to be moved and percent of moisture present in the material.

Coarse (20 mesh) and dry materials offer the least resistance and are most easily handled. These same materials ground fine (200 mesh) or containing moisture, require considerably more Hi-Vi dynamic concentrated action to produce the desired flow, as well as a control to pick the exact amount of vibration required. The two main problems generally eliminated by the use of vibrators are arching and rat-holing. Arching occurs when material bridges over the hopper opening. It is usually corrected by installing a vibrator directly at the center of the area of arching. Rat-holing is usually eliminated by installing two or more vibrators at equal distances around the hopper at different levels.

Choosing the Correct Hi-Vi Bin Vibrator

Although other factors are taken into consideration, the size of vibrator to be used is mainly determined by the hopper wall thickness and the volume or size of the hopper. Generally speaking (see diagrams on back page), the best location for optimum movement of most materials is from one-fourth to one-third of the way up a wall having the least slope, that is, the least angle to the horizontal.

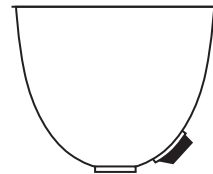
It is recommended that the vibrator be mounted on an open panel, provided such panel has the inherent stiffness needed to obtain maximum output from the vibrator. If such stiffness is lacking, the panel can be stiffened by the addition of structural members such as a channel. Upon request, the Eriez Engineering Department will advise on the proper method of stiffening any particular hopper for best transfer of vibratory energy.

The use of a control box provides an adjustment to compensate for variations in the contents of a bin or hopper.

Eriez Vibrators are normally rated for ambient temperatures up to 130°F (55 °C), but higher rated units are available on order.

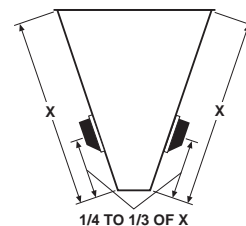
Parabolic Hoppers

Hoppers of this shape should have the vibrators mounted within 12-inch (300 mm) of the outlet frame...much closer to the discharge than on the other containers. Mount on center line utilizing channel for mounting.



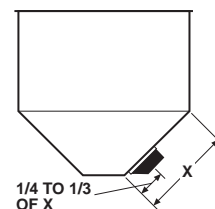
Rectangular Hoppers

Mount same as above and on the center line. One vibrator will vibrate 3 sides of a hopper this shape, to a degree which is generally sufficient. If additional vibration is required, a second unit can be mounted on the opposite side at a different height.



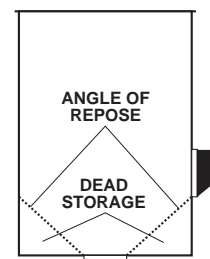
Rectangular Bins with Hopper Bottom

Mount same as for Rectangular Hopper. Possibly a larger unit will be required because of superimposed load. This style container is easily vibrated, for the hopper portion is generally smaller for a corresponding quantity of material than where all of the material is held in a hopper portion.



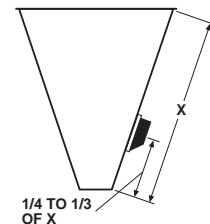
Rectangular or Cycindrical Bins with Flat Bottom and Center Discharge

Bins with a flat bottom and center discharge usually have a dead material storage which forms a hopper type discharge. The vibrator should be mounted on the side of the bin just above where the angle of repose intersects the sides. The motion will prevent material from forming a material wall around the outside of the bin and reduce dead space to a minimum.



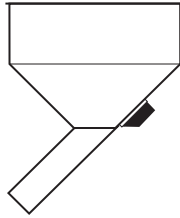
Conical Hoppers

Sheet metal containers in the form of an inverted frustrum of a cone are ideal for providing efficient vibration. The vibrator should be mounted directly to the hopper face about 1/4 to 1/3 of the distance from the discharge to the top. When two units are necessary, they should be mounted diametrically opposite but at a slightly different height and properly phased.



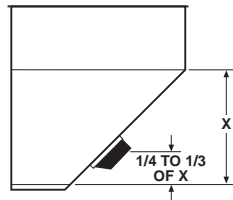
Hoppers with Chute Discharge

Mount the vibrator at the very bottom of this type hopper, next to bottom side of sloping chute discharge. This will vibrate the hopper as well as the discharge chute



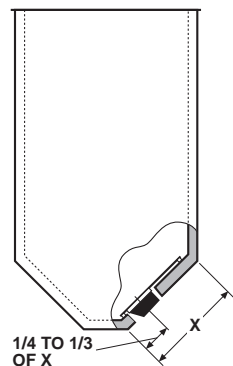
Hoppers with Vertical Sides

The vibrator should be mounted on the sloping portion of the hopper, opposite the vertical side. It should be 1/4 to 1/3 or less from discharge to top of sloping side (area).



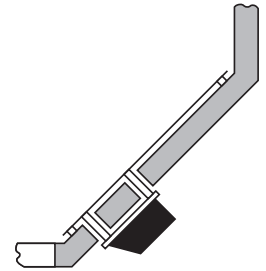
Concrete Hoppers

Vibrators can be mounted on concrete hoppers, providing a heavy steel liner is used. The liner should extend from the discharge opening up the entire side to which the vibrator is to be mounted. The liner should be held down fast and rest on longitudinal ribs welded along the edge of the plate close enough so material will not be able to seep underneath. At about 1/4 or less of the distance from the discharge to the top of the sloping side, a hole should be cut large enough to allow the vibrator to be mounted directly to the steel liner. Mount same as on steel hopper.



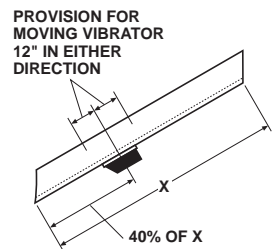
Wooden Hoppers

Wooden hoppers do not respond to vibration nearly as well as metal hoppers. Vibration cannot be transmitted around corners to other sides or over great distances. If construction is of planking supported on joists, then the same instructions apply as for steel hoppers. Bolt direct to planking and make sure you use a large enough unit. If the wooden hopper is lined with a metal plate(s) (as with concrete hopper) the vibrator may be mounted on stilts going through the plate but clearing the wooden planking.

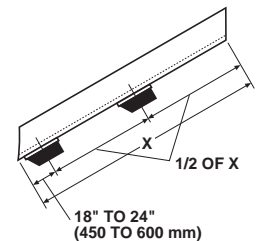


Inclined Chutes

Inclined chutes not steep enough to produce an easy flow of material, are benefited by the use of vibrators. One vibrator usually will handle a 10 to 14-foot (3000 to 4250 mm) length. The unit should be mounted below the center, so the lower portion receives the most vibration. When mounting, make provision for slight adjustment in both directions, for many times a slight position change will greatly enhance vibration efficiency.



On tubular chutes, the vibrator should be mounted to a flat or channel-shaped plate which, in turn, is clamped to the chute by means of "U" bolts.



When using more than one vibrator on long chutes, mount the first one within 2-feet (600 mm) of the discharge, the next halfway between first vibrator and upper end of chute.



World Authority in Advanced Technology for Magnetic, Vibratory and Metal Detection Applications

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