VM-3530E

Installation, Operation and Maintenance Instructions

UNIT VIBRATORS MODELS D30P AND D30S

ERIEZ MAGNETICS HEADQUARTERS: 2200 ASBURY ROAD, ERIE, PA 16506–1402 U.S.A.
WORLD AUTHORITY IN SEPARATION TECHNOLOGIES

Introduction

This manual details the proper steps for installing, operating and maintaining the Eriez Unit Vibrator.

Careful attention to these requirements will assure the most efficient and dependable performance of this equipment.

If there are any questions or comments about the manual, please call Eriez Manufacturing at 814/835-6000 for Unit Vibrator assistance.

⚠ CAUTION

Safety labels must be affixed to this product. Should the safety label(s) be damaged, dislodged or removed, contact Eriez for replacement.

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Installation

Mounting

The best location for a unit vibrator on a hopper depends upon a large number of different factors, but in most cases vibrators can be satisfactorily located by applying three general rules:

1. The vibrator should have a reasonably broad and symmetrical span of hopper wall to vibrate; for this reason it is best to locate it on the vertical centerline of one of the sloping panels.
2. The location should be such as to deliver maximum energy at the point of the most troublesome bridging or arching, or at a point somewhat below. The location should also be such as to promote material flow by agitation in the discharge region. Since these optimum location points normally occur in the lower half of the sloping part of the hopper, mounting the unit one-fourth to one-third of the distance up the sloping panel usually gives satisfactory results.
3. The vibrator should be located on a hopper wall having the least slope with respect to the horizontal. If the selected panel does not have sufficient inherent stiffness to make the vibrator impact and deliver rated energy, it should be stiffened by the addition of a welded-on plate or structural steel channel. Refer to Figures 1-4 and Table 1. The vibrator may be mounted on the plate with bolts passing through both plate and hopper wall, or on the outer face of the channel with bolts passing through the channel web. Either bolts or securely welded studs may be used in mounting. It is recommended that locknuts or lockwashers be used to prevent loosening due to vibration. Where two units are used on a conical or a square (or nearly square) hopper, they should preferably be located on opposite faces at slightly different levels. On long narrow hoppers, two (or more) vibrators may be mounted side by side. To insure top efficiency, be sure the vibrator is securely and tightly fastened to the mounting surface. Fasteners should be checked frequently for tightness.

After welding, check the channel with a straight edge between mounting studs for flatness. If a crown in the channel is evident, grind the area smooth to insure a FLAT surface to surface contact. A bowed channel can cause the ears on the vibrator to break or cause loss of vibration.

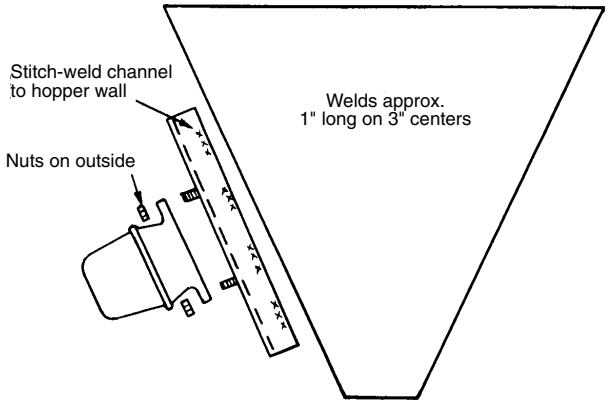

FIGURE 1
Weld locations

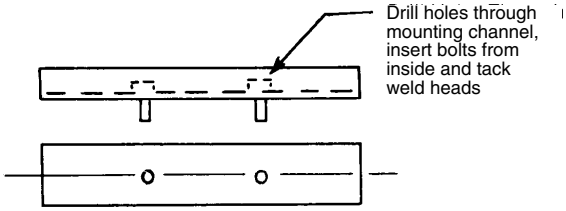

FIGURE 2
Channel detail

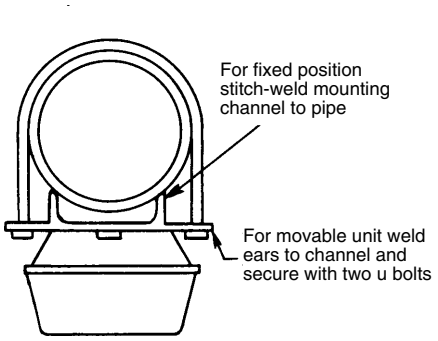

FIGURE 3
Pipe vibrators

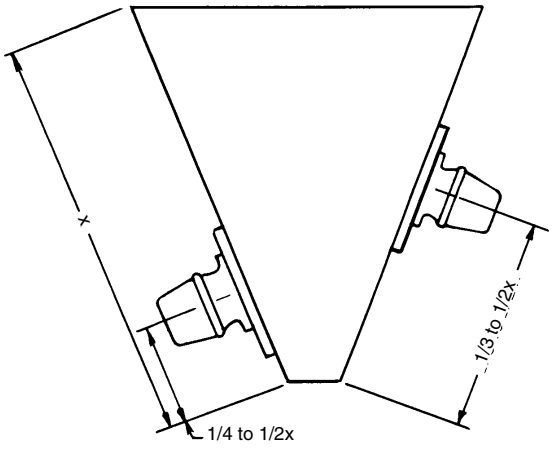

FIGURE 4
Positioning multiple vibrators

Vibrator	Channel		Approximate		Mounting Bolts	
	in	mm	in	mm	in	mm
D20N	2	51	12	305	3/8-16 x 1-1/2 lg	m10-1.5 pitch x 40mm
D30N, D30P, D30S	2	51	12	305	1/2-13 x 1-1/2	m12-1.75 pitch x 40mm
D40P and D40S	4	102	24-30	610-762	1/2-13 x 1-3/4	m12-1.75 pitch x 45mm
D50P and D50S	4	102	24-30	610-762	1/2-13 x 1-3/4	m12-1.75 pitch x 45mm
D55P and D55S	10	254	36	914	5/8-11 x 2	m16-2.00 pitch x 50mm
D60U	15	381	36-48	914-1219	1/2-13 x 2-1/2	m12-1.75 pitch x 60mm
D70U	18	457	36-48	914-1219	3/4-10 x 2-1/2	m20-2.50 pitch x 60mm

NOTE: All mounting bolts to be SAE Grade 5. Dimensions and specifications to change without notice

TABLE 1

Installation (cont.)

Electrical Connections
(FIGURES 5 & 6)

Check the specifications of the power line to be certain that it is the same as that shown on the nameplate of the vibrator (or control, if used).

Where no control is used, connections are as shown in Figure 5. Where control is used, connections are as shown in Figure 6. Ground connections should always be used as shown. A GATE INTERLOCK SWITCH SHOULD BE PROVIDED SO THAT THE UNIT VIBRATOR IS OFF WHEN THE DISCHARGE OPENING IS CLOSED.

NOTE: Eriez Unit Vibrators cannot be operated by Direct Current.

You are now ready to operate your Unit Vibrator.

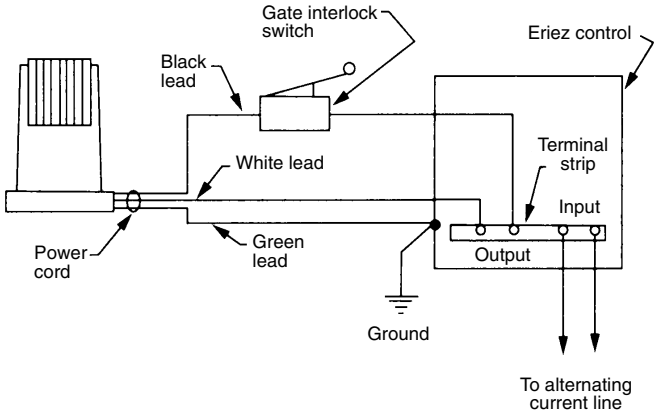

FIGURE 5

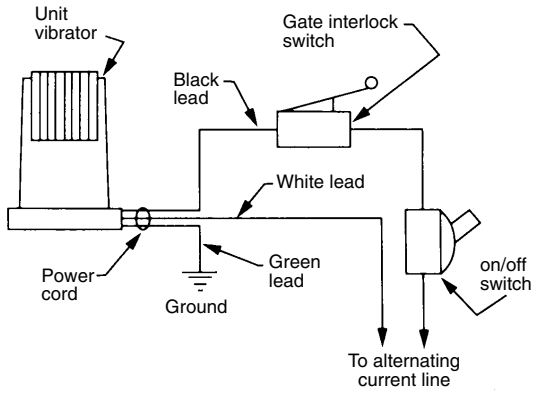

FIGURE 6

Operation & Maintenance

To start in operation after all connections have been made, turn the unit vibrator on and open the hopper discharge gate. No warm-up period is required. If an Eriez controller is used, with the switch on and the discharge gate open, adjust the control to the desired vibration output level. As the control knob is rotated clockwise, the vibration output will increase.

Eriez unit vibrators are operated by an alternating current electromagnet energized directly from any single phase AC source of the correct voltage and frequency. No intermediate rectification equipment is required. The Eriez controller may be used to reduce the vibration output to the desired level.

Routine Maintenance and Checking

In normal operation with the unit properly installed and the cover in place, the unit will operate with a solid metallic hammering sound (P type unit) or a dull, more subdued hammering sound (S type unit). This steady hammering sound is a necessary by-product of the metal-to-metal or metal-to-elastomer impacting action of this type of vibrator.

Spurious rattling or tinny noises should not be in evidence. Such noises indicate loose or resonant parts in the system.

For inspection and checking purposes, units may be operated temporarily with the cover removed. In checking the total armature displacement, the width of the blurred bar at the top or bottom of the armature may be measured with a scale, or an Eriez total displacement sticker may be used (see Figure 7).

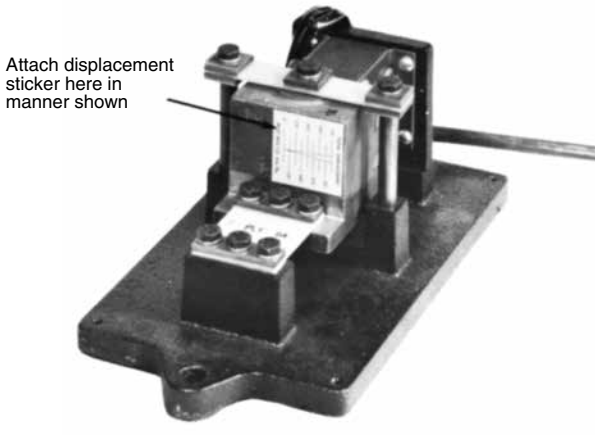

FIGURE 7

For best performance, the air gaps between the pole pieces and the E-Frame legs (see Figure 8) should be checked occasionally for striking or misalignment and, if necessary, readjusted. Check for striking by inserting a narrow piece of thin white paper into each of the four air gaps while the unit is operating in its normal position; if the paper is marked, the pole faces are striking. Such a condition, if allowed to continue, may result in serious damage to the unit.

With unit operating, observe where the gray lines on the sticker meet. This point will be higher or lower as the displacement changes. Opposite this point read total displacement on the printed scale.

THESE UNITS ARE DESIGNED TO HAVE A TOTAL ARMATURE DISPLACEMENT OF .055" TO .060" DEPENDING UPON THE APPLICATION AND ADJUSTMENT.

To correct for striking or other E-Frame misalignment, slightly loosen the bolts holding the E-Frame assembly to the E-Frame bracket and, using a standard feeler gauge or an Eriez .090"(2.3mm) gap spacer gauge, adjust the E-Frame so that the upper air gap is .090" (2.3mm) wide and uniform from side to side. Tighten the bolts and recheck for striking.

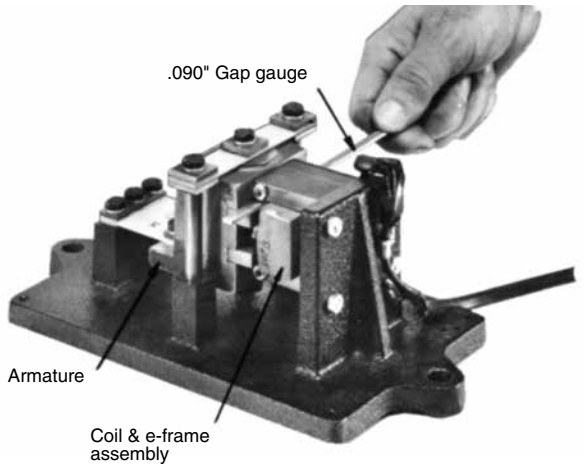

FIGURE 8

The mounting bolts, as well as all fasteners in the vibrator assembly, should be checked periodically for tightness. Loose fasteners anywhere in the assembly or mounting may result in a loss of efficiency. Foreign material, if allowed to accumulate on the E-Frame and moving assembly or on the base, may also result in loss of efficiency. Such foreign material should be blown out with an air hose.

Eriez vibrators do not require lubrication of any kind. For possible troubles and their remedies, refer to the Vibrator Service Chart at the back of this instruction material.

Repairs

Springs Replacement

Although spring failure will rarely occur if the unit is operated within its limitations, a spring may eventually fail for one reason or another. Such failure will show up in the units gradually becoming weak or inoperative. A faulty spring will be indicated by irregular white areas adjacent to the spring clamps, or as excessively worn areas under the edges of the clamps. Refer to the Parts List and order a new set of springs from the factory. Be sure to include the serial number of the unit when ordering.

A new set of springs will consist of one top spring and one bottom spring. The top spring is a 6-ply; however, the bottom spring is a 7-ply for 60 cycle and a 6-ply for 50-cycle operation. Always replace both the top and the bottom springs when making spring repairs. Replace the bottom spring with an identical new 6 or 7-ply spring only, according to the frequency applied.

Both springs are readily replaceable after removing the cover only. It is recommended that only one spring be removed at a time. All spacers should be replaced correctly (see Figure 9) and all bolts should be tight. The air gap should be checked and readjusted if required, per “Routine Maintenance and Checking” section, Figure 8. The unit can now be operated and checked for deflection, and can be readjusted if required per “Load Adjustment” section.

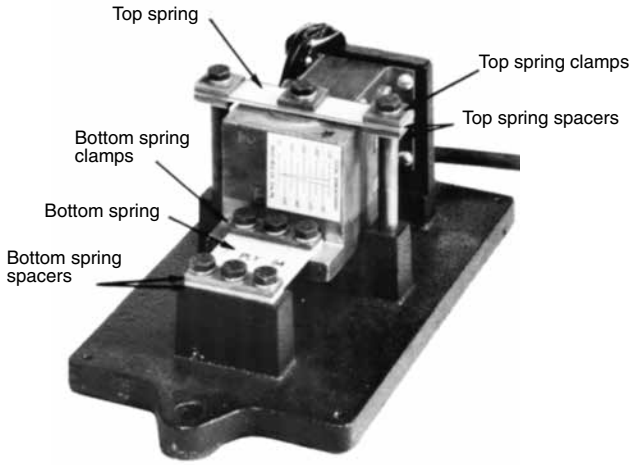

FIGURE 9

Coil Replacement

Since the coil is permanently embedded on the center leg of the E-Frame, the coil and E-Frame must be replaced as a unit. In removing the old coil and E-Frame, disconnect the power cord by cutting the coil leads on the coil side of the crimp connectors. This will leave enough wire on the cord for proper re-connection.

Then remove the four bolts securing the electrical assembly to the base casting (see Figure 10). Remove the entire E-Frame assembly and install a factory replacement. Before fastening the new assembly in place, the gaps should be adjusted in accordance with instructions previously given. BE SURE ALL BOLTS ARE TIGHT.

Load Adjustment

A means is provided for adjusting the vibrator to heavier or lighter loads within the application range of the vibrator. This adjustment consists of a threaded impact anvil that can be adjusted up or down to increase or decrease the space between the impact pad and anvil. Proper adjustment provides the best impacting condition for the particular application and insures maximum performance of the vibrator. (See Figure 10).

All vibrators are pre-set for normal operating conditions (rated bin wall thickness, etc.) when they leave the factory. For unusually heavy or light loads it may be necessary to adjust the impact anvil to achieve ultimate performance; however, the maximum deflection of the armature must not be allowed to exceed .060" at full line voltage.

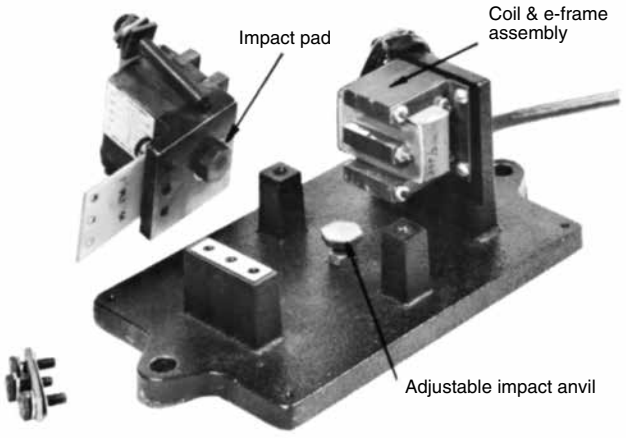

FIGURE 10

Troubleshooting

TABLE 1
Service chart

	Nature of problem	Incorrect voltage	Loose fastenings/ improper mounting	Foreign material inside of unit	Faulty controls or wiring	Incorrect factory adjustment	Blown fuse or circuit breaker	Line voltage variation	Coil failure	Incorrect air gap adjustment	Spring failure	Product or volume variation	Loose or broken cover	Broken base or other casting	Extreme heat over 120°F (50°C)	Rubber covered anvil or impact pads worn (40S-50S)
Initial Installation	Reduced or low output	1	2	3	4	5		7		9		11		13	14	
	Noisy but output okay		2	3		5				9			12	13		
	Noisy certain periods only		2					7								
Develop after satisfactory initial operation	Completely inoperative				4		6		8	9	10			13		
	Operating but reduced output	1	2	3	4			7		9	10	11		13		15
	Output okay - too much noise			3						9	10		12	13		15
	Gradual fading			3	4				8		10					15
	Inconsistent output			3	4			7		9		11		13		

Numbered Squares indicate possible sources of trouble. Numbers in Squares indicate corrective measures to be taken. See list on next page.

IMPORTANT: Be sure the power supply (voltage and cycle) matches that shown on the nameplates. UNIT Vibrators will not operate on Direct Current.

REFER TO TABLE 2.

1. **Incorrect Voltage**
   Check nameplate specifications and line voltage.
2. **Loose Fastenings**
   Remove cover and check all bolts. Make certain that bolts to bin are tight.
3. **Foreign Material inside of Unit**
   Remove cover and clean with air hose.
4. **Faulty Controls or Wiring**
   Check and replace if necessary.
5. **Incorrect Factory Adjustment**
   Adjust air gap (see maintenance instructions).
6. **Blown Fuse or Circuit Breaker**
   Check and correct. Check all wiring for short circuits.
7. **Line Voltage Variation**
   Check and install voltage regulator if necessary.
8. **Coil Failure**
   Check, remove and install new coil (see maintenance instructions).
9. **Incorrect Air Gap Adjustment**
   Check and re-adjust (see maintenance instructions).
10. **Spring Failure**
    Check and replace. Order new from factory. Follow maintenance instructions.
11. **Product or Volume Variation**
    Possibly incurable. Customer to decide and correct if practical.
12. **Loose or Broken Cover**
    If broken cover, order new and tighten screws. All models have cover gaskets.
13. **Broken Base or Other Casting**
    Check. Return to factory for repairs.
14. **Extreme heat over 120°F**
    Ambient temperature exceeding 120°F.
15. **Rubber covered Anvil or Impact Pads Worn (D30S)**
    Install replacement anvil or pads. (See maintenance instructions).

NOTE: All major replacement parts must be purchased from Eriez Magnetics. See Parts List.

Troubleshooting

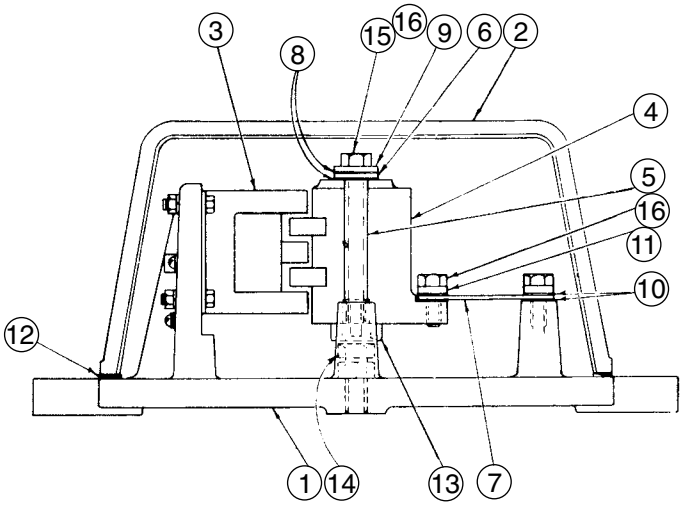

FIGURE 11
Model D30P

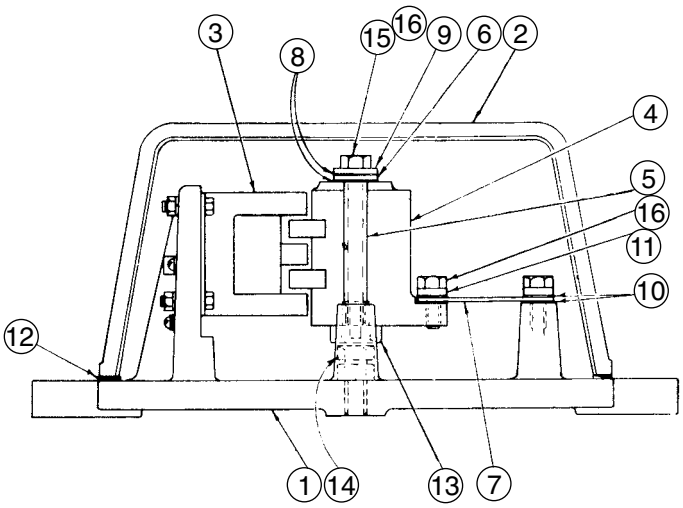

FIGURE 12
Model D30S

ITEM NUMBER	PART DESCRIPTION	QUANTITY
1	Base Casting	1
2	Cover	1
3	E-Frame Assembly (Specify nameplate voltage & frequency) (a) 115V (b) 230V	1
4	Armature Assembly	1
5	Spacer Post	2
6	Top Spring	1
7	Bottom Spring (a) 7 ply for 60 cy (b) 6 ply for 50 cy	1
8	Top Spring Spacer	6
9	Top Spring Clamp Block	5
10	Bottom Spring Spacer	4
11	Bottom Spring Clamp Block	2
12	Gasket	1
13	Impact Pad	1
14	Impact Anvil	1
15	Hex Head Screw	2
16	Hex Head Screw	5

Note: Parts listed above must be secured from Eriez Magnetics. When ordering parts, be sure to specify Vibratory Model and Style, Serial No., Name of Part, Part No., and Quantity. Parts not listed above (nuts, screws, washers, cord and cord clamp) are standard items obtainable at any industrial or electrical supply house.

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