

Installation, Operation and Maintenance Instructions



UNIT VIBRATORS - D40P, D40S, D50P AND D50S

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 Eriez bin vibrators.

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

If there are any questions or comments about the manual, please call the factory at 814/835-6000.



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 is dependent 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, the panel should be stiffened by the addition of a welded-on plate or structural steel channel to at least approximate the stiffness of a wall having rated thickness. 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. Locknuts or lockwashers should be used to prevent loosening due to vibration. NOTE: Mounting surface must be flat (check with straight edge) to ensure proper operation of equipment. 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 efficiency, be sure the vibrator is securely and tightly fastened to the mounting surface. Fasteners should be checked frequently for tightness.

Electrical Connections

REFER TO FIGURES 1 AND 2

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

Where no control is used, connections are as shown in Figure 1. Where control is used, connections are as shown in Figure 2. 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.

Eriez unit vibrators cannot be operated by Direct Current.

YOU ARE NOW READY TO OPERATE YOUR UNIT VIBRATOR

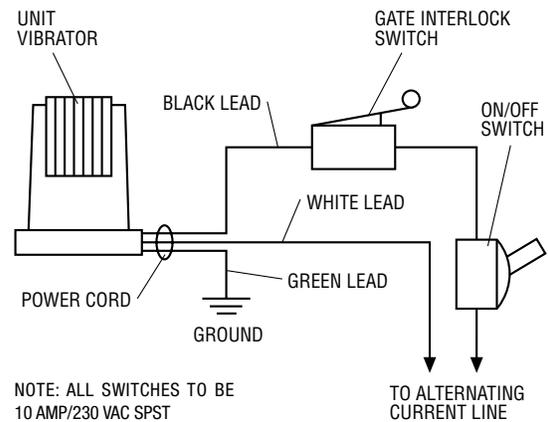


FIGURE 1

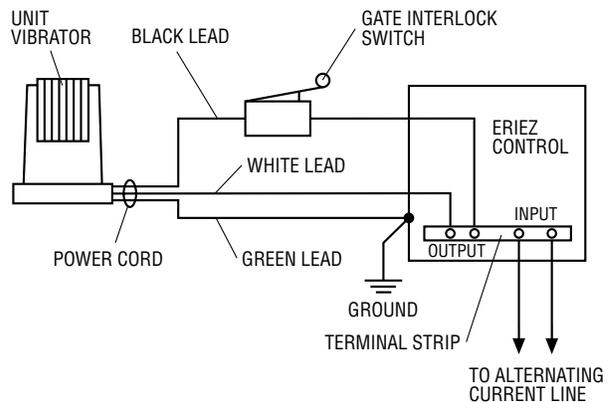


FIGURE 2

Operation and Maintenance

To start in operation after all connections have been made, turn the switch (Figure 3) to the on position 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.



FIGURE 3

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.

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 4). Normal operating displacement should be .045 to .050. (1.1 mm to 1.3 mm).

The mounting bolts, as well as all fasteners in the vibrator assembly, should be checked frequently 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 armature or in the base cavity, may also cause a 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 Unit Vibrator Service Chart at the back of this instruction manual.

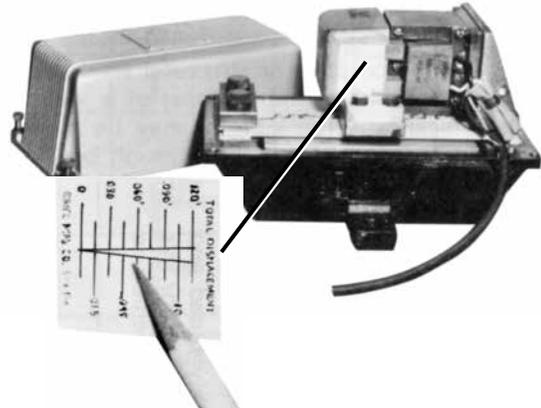


FIGURE 4

Air Gap Adjustment

For best performance, the air gaps between the pole pieces and the E-frame legs (see Figure 5) 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.

To correct for striking or other E-frame misalignment:

1. Slightly loosen the bolts holding the E-frame assembly to the E-frame bracket.
2. Using a standard feeler gauge or an Eriez .072" (1.8 mm) gap spacer gauge, adjust the E-frame so that the upper air gap is .072" (1.8 mm) wide and uniform from side to side.
3. Tighten the bolts and recheck for striking.

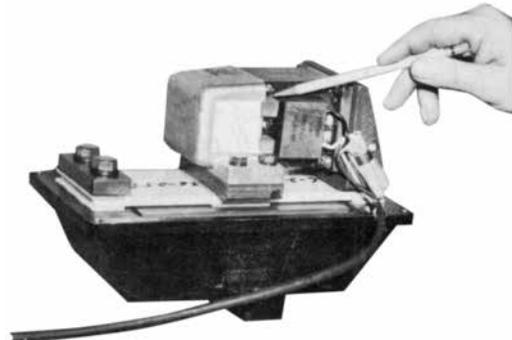


FIGURE 5

Repairs

Springs

Although spring failure will rarely occur if the unit is operated within its limitations, springs may eventually fail. Such failure will cause the unit to gradually become weak or inoperative. Faulty springs 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.

To replace the spring, proceed as follows:

1. Remove the armature and the center clamp block from the spring. Then remove the end clamp block, and finally the E-frame assembly and E-frame bracket as a unit.
2. Without removing the hammer from the base cavity, install a factory replacement spring, USING THE NEW SPACERS FURNISHED WITH THE SPRING and replacing the steel spacer shims in their original positions (see Figure 6). Be sure that the countersunk flat head bolts holding the center clamp block to the spring are very tight and that, after tightening, they are securely staked with a center punch.
3. Reassemble the unit, being careful that all bolts are tight and that the upper air gap is adjusted to .072" (1.8 mm) in accordance with instructions given above.

If, after installation of the new spring, the vibrator does not produce bin displacement equal to the original, the hammer anvil gap should be adjusted for best effect by adding or removing spacer shims. See the Load Adjustment section.

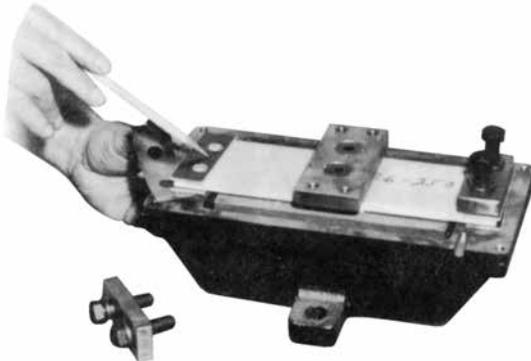


FIGURE 6

Coil

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. Lock out/Tag out equipment to be serviced. 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 armature and disengage the armature from the E-frame (see Figure 7). 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.**

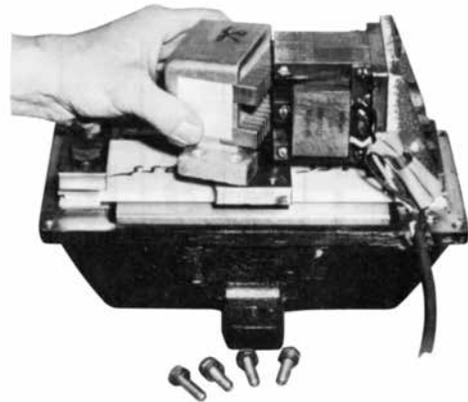


FIGURE 7

Repairs (cont.)

Load Adjustment

A method is provided for adjusting the vibrator to heavier or lighter loads within the application range of the vibrator. This adjustment consists of spacer shims which may be used as required to vary the gap between the impact hammer and the anvil and thus provide the best impacting condition for the particular application, along with maximum safety for the vibrator. These rectangular steel shims are placed between the lower end spacer and the base casting at each end of the spring (see Figure 8 and Parts List).

All vibrators are shimmed for the normal operating condition (rated bin wall thickness, etc.) when they leave the factory; additional shims are provided in an envelope shipped with the unit. The following is a guide for use in adjustment to unusually heavy or light loads

1. Heavy load condition (rigid surfaces, heavy masses). Under this condition, the hammer may vibrate excessively and cause striking of the pole pieces. Check for striking as described in Routine Maintenance and Checking. Eliminate the striking and adjust for best performance by removing shims.
2. Light load condition (resilient surfaces, light masses). Under this condition, the hammer may not vibrate and impact sufficiently to move the load as much as desired. In this case the performance can often be improved by adding or removing shims. Which method will be the most successful depends entirely upon the characteristics of the load.



FIGURE 8

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)
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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		

Refer To Table 1. Service Chart

1. Incorrect Voltage

Check nameplate specifications and line voltage.

2. Loose Fastenings/Improper Mounting

Remove cover and check all bolts—make certain that bolts to bin are tight. Mounting surface must be flat. Check with straight edge.

3. Foreign Matter 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 readjust (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 Casting

Check—return to factory for repairs.

14. Extreme Heat

Ambient temperatures exceeding 120°F (50°C) – reduce ambient temperature.

15. Rubber Covered Anvil or Impact Pads Worn

Check and replace if necessary (40S & 50S).

Note: Some safety warning labels or guarding may have been removed before photographing this equipment

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