

# Installation, Operation and Maintenance Instructions



## **UNIT VIBRATOR MODELS – D20N & D30N**

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

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# 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 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 bin hopper is usually dependent on many factors. Two general considerations should be borne in mind in selection of mounting location.

- a) The unit vibrator must have a relatively free span of bin or hopper to vibrate.
- b) The vibrator should be so located as to deliver the vibration in the area where it is most effective in promoting flow by its agitation action and tendency to break up bridging and arching.

In view of the above considerations the unit vibrator should be located and mounted as follows:

1. Select a face of the hopper or bin that is not stiffened or obstructed by braces, supports, etc. In general, a sloping face of the hopper is to be preferred.
2. Mount the unit on the center line of the selected hopper wall approximately 1/4 of the distance up from the hopper discharge opening. Attachment to the hopper wall may be made by means of bolts with lock nuts or by welding suitable studs to the bin wall. Welded studs should be avoided unless experienced welders are available to provide perfect welds. In the case of thin walled hoppers, a mounting plate or channel of suitable size may be bolted or welded to the bin wall and the vibrator attached to this plate or channel by bolts or studs welded thereto. Refer to Eriez Instruction Sheet VT-3500. Where two units are used on the same bin, the units should preferably be located on opposite faces. **BE SURE THE VIBRATOR IS TIGHTLY ATTACHED TO THE BIN WALL.** Two or more units on one bin wall (or on opposite walls) must be properly "phased" to provide coordinated action for best movement of the material. This may be done by simply reversing the power line connections to one or more units.

## Electrical Connections

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

Where no control is used, connections are as shown in Fig. 1. Where an Eriez control is used, connections are as shown in Fig. 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 START YOUR VIBRATOR.**

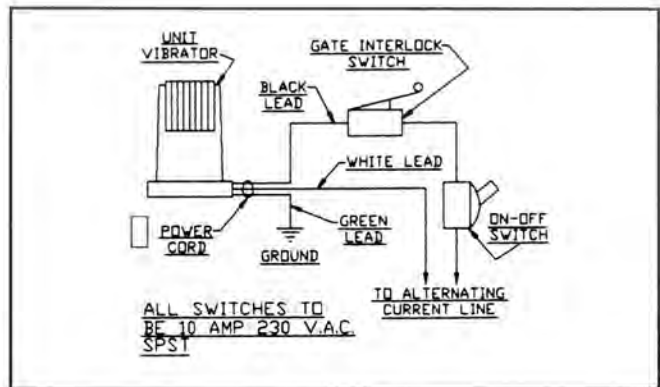


FIGURE 1

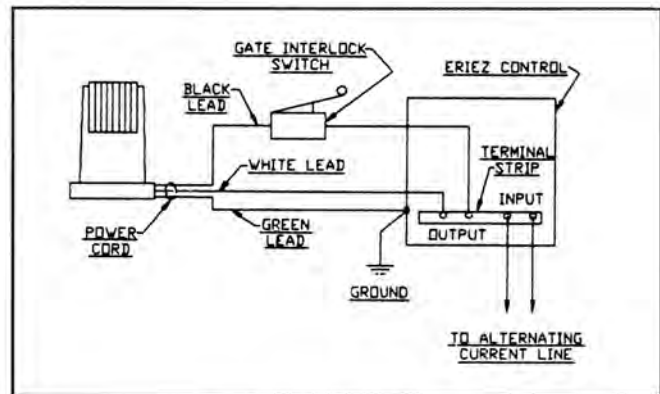


FIGURE 2

## Operation

To start in operation after all connections have been made, turn the vibrator on and open the bin discharge gate. No warm-up period is required. If an Eriez control is used, with the switch "on" and the discharge gate open, adjust the rheostat 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 control may be used to reduce the vibration output to the desired level.

### Routine Maintenance And Checking

In normal operation with the unit installed and the cover in place, the unit will operate with a moderate but distinct humming sound. Rattling or metal-to-metal hammering sound should not be evidenced. Most of the sound will be that produced by the motion of bin elements and will be readily distinguished by a careful observer.

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 Fig. 3).

THESE UNITS ARE DESIGNED TO HAVE A TOTAL ARMATURE DISPLACEMENT OF 1/16" TO 3/32" (1.6 TO 2.4mm) DEPENDING UPON THE MODEL, ADJUSTMENT AND APPLICATION.

For best performance, the air gaps between the pole pieces and the E-frame legs (see Fig. 3A) should be equal and uniform in width from side to side. For adjustment of these gaps use a spacer of approximately the same thickness as the air gap and preferably of non-magnetic material. Adjust the gaps by shifting the E-frame after loosening the E-frame fasteners.

The mounting bolts, as well as all fasteners in the Vibratory 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 moving assembly, may also result in loss of efficiency. Such foreign material may be blown out with an air hose.

These Vibrators do not require lubrication of any kind.

For possible troubles and their remedies, refer to the HI-VI Vibrator Service Chart in the back of the instruction material.



FIGURE 3

**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.**

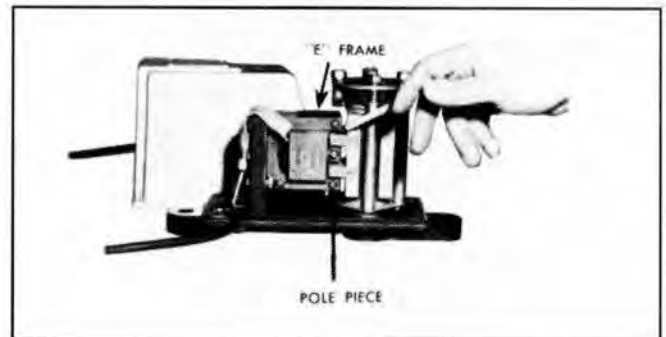


FIGURE 3A

# Repairs

## Springs

A failed rubber spring is usually indicated by cracks or tears in the top or bottom surface of the spring. Such faults can easily be detected if enough pressure is applied along the major axis to spread the cracks

Since only the top surface of the top spring can be seen without disassembly of parts, for a complete inspection of all surfaces it is necessary to remove the armature and spacer posts, in accordance with the following procedure (see Fig. 4):

1. Remove the stabilizer ring at the top of the armature-spring-spacer structure.
2. Remove and check the top spring.
3. Using a plier-wrench or a small pipe wrench, remove the spacer posts.
- 4a. For D20N: Remove the armature by pulling it backward until it clears the E-Frame. (See Fig. 4) If necessary, a screwdriver may be used as a pry to assist this operation.



FIGURE 4

- 4b. For D30N: Remove the bolts holding the E-Frame and lift the armature and E-Frame away from the base.
5. Remove and check the bottom spring. If a faulty spring is found, it is best to discard both springs and replace with a new set.

Re-assemble the parts in reverse order. In reinstalling the armature (Model D20N only) it will be necessary to exert heavy hand pressure to the top in order to engage the pole pieces in the E-Frame. RE-FASTEN ALL PARTS TIGHTLY.

In the D30N it will be necessary to readjust the air gaps. In some models the armature-spring-spacer structure is of a somewhat different form than that indicated, however, the disassembly-assembly procedure is essentially the same.

All parts, ESPECIALLY THE SPRINGS, should go back the same way they came off. It is well to mark old springs so that they will have the same position and orientation in reassembly. ALL REPLACEMENT SPRINGS WILL HAVE THE ARMATURE END PAINTED.

## Coil

Since the coil is 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 reconnection.

Then remove the four mounting bolts and slide the E-Frame out sideways (See Fig. 5). Before fastening the new E-Frame in place, the gaps should be adjusted in accordance with instructions previously given.



FIGURE 5

## Repairs (cont.)

### Load Adjustment

A means is provided for adjusting the Vibrator to light, intermediate, or heavy loads within the application range of the Vibrator. This adjustment consists of shims which may be used as required to reduce or increase the pre-stress of the springs and thus obtain the best vibratory output for lighter or heavier loads. These shims, which are in the form of .010" (.25mm) thick washers packed in a separate envelope, must be used as follows: (see Fig. 6).

1. Heavy load condition (maximum pre-stress)
  - no shims. The vibrators are in this condition when they leave the factory.
2. Intermediate load condition – one shim at the top of each spacer post (between the spacer post and the spring mounting plate).
3. Light load condition (minimum pre-stress)
  - Two shims at the top of each spacer post.

After inserting shims, the air gap should be checked and, if necessary, readjusted.

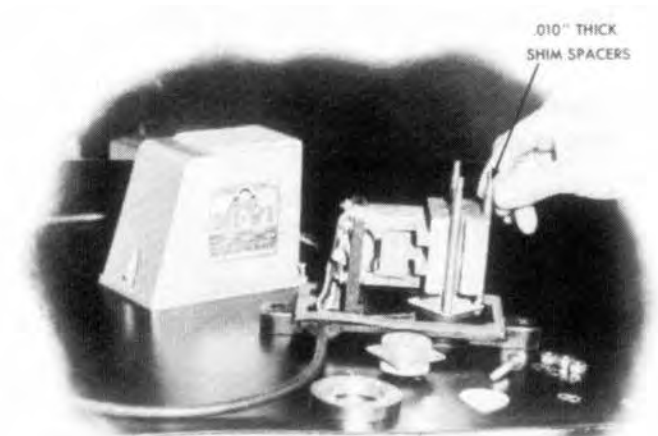
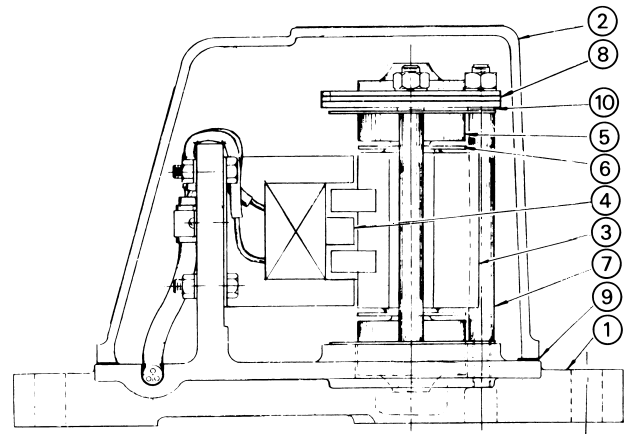


FIGURE 6

# Parts List

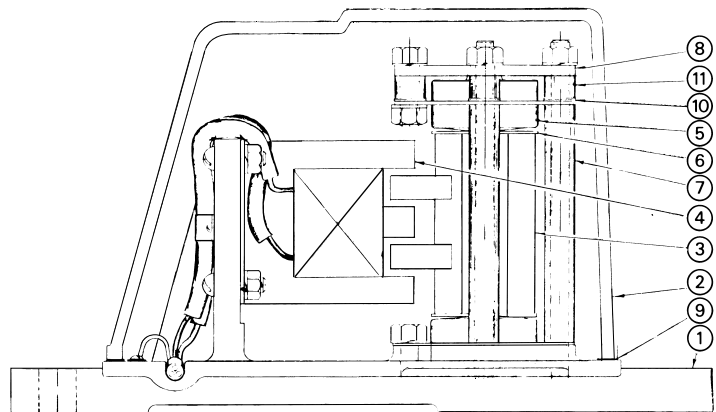
## MODEL D20N

Item Number	Name	Part Number	Quantity
1	Base Casting	101650	1
2	Cover	101654	1
3	Armature Assembly	109083	1
4	E-Frame Assembly		1
	115/60	101622	
	120/50	101623	
	230/60	101624	
	240/50	101625	
5	Springs (Furnished in sets of two only) (Specify 50/60 Hz)		2
6	Snubbing Washer	121031	2
7	Spacer Post	111012	3
8	Stabilizer Ring (Furnished in sets of 3 only)	121030	3
9	Gasket (Required only on Series M units)	196012	1
10	Shim	121033	6



## MODEL D30N

Item Number	Name	Part Number	Quantity
1	Base Casting	101675	1
2	Cover	101676	1
3	Armature Assembly	109085	1
4	E-Frame Assembly		1
	115/60	101660	
	120/50	101661	
	230/60	101662	
	240/50	101663	
5	Springs (Furnished in sets of two only) (Specify 50/60 Hz)		2
6	Snubbing Washer	121036	2
7	Spacer Post	111014	3
8	Stabilizer Ring (Furnished in sets of 3 only)	121035	3
9	Gasket (Required only on Series M units)	196013	1
10	Shim	121034	6
11	Spacer Sleeve	111013	4



Note: Parts listed above must be secured from Eriez. When ordering parts, be sure to specify Vibrator Model and Style, Part No., Voltage and Frequency, Name of Part, Part No., and Quantity.

Parts not listed above (nuts, screws, washers, cord, cord clamp) are standard items obtainable at any industrial or electrical supply house.





# Troubleshooting

TABLE 1. SERVICE CHART

Nature of Problem		Incorrect Voltage	Loose Fastenings	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	Bowed Mounting Channel, Plate or Hopper Wall
Initial Installation	Reduced or Low Output	1	2	3	4	5								13	14	15
	Noisy but Output Okay		2	3		5							12	13		
	Noisy Certain Periods Only		2					7								
Develop After Satisfactory Initial Operation	Completely Inoperative				4		6		8	9	10			13		15
	Operating but Reduced Output	1	2	3	4					9	10			13		15
	Output Okay Too Much Noise			3						9	10		12	13		
	Gradual Fading			3	4				8		10			13		
	Inconsistent Output			3	4			7				11				

• 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 name plates. Unit Vibrators will not operate on Direct Current.

## Troubleshooting (cont.)

- 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 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 bolts. All models have cover gaskets.
- 13. Broken Base or Other Casting**  
Check - return to factory for repairs.
- 14. Extreme Heat Over 120°F**  
Extreme heat - (ambient temperature exceeding 120°F (50°C)) need Hi-Temperature Drive unit (Max. 300°F (150°C)).
- 15. Bowed Mounting Channel, Plate or Hopper Wall**  
Check for bow in mounting channel, plate or hopper wall. Flat, surface to surface contact is to be kept. Grind smooth or replace with flat channel or mounting plate.



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

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

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