VM-3651

Installation, Operation and Maintenance Instructions

VIBRATING FEEDERS & CONVEYORS
MODEL TMR

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 Mechanical Vibrating Feeder/Conveyor.

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 Conveyor assistance.

⚠ WARNING

Suspension mounting inherently involves risk of damage to property or injury to personnel located under or near the equipment, should a suspension component fail. As with all suspended equipment, access to the area under this machine should be restricted. *Specifications for suspension components given in this manual are suggestions only, and the user is entirely responsible for final selection of suspension method and details.* Select and properly use suspension components with rated capacities (including all appropriate reduction factors) that provide adequate safety when the weight of the equipment and all possible loading conditions and upsets are taken into account. Consult Eriez at 814-835-6000 if additional information regarding Eriez equipment is needed to make this selection.

⚠ 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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ERIEZ VIBRATING FEEDER/CONVEYOR - MODEL TMR

Installation

Damage in Shipment
When you receive your conveyor, examine it carefully for damage. If damage is found, report it immediately to Eriez Magnetics and the freight carrier.

Handling
It is important to handle this equipment carefully to avoid twisting or bending the frame or pans. If lift lugs are provided, they must be used; otherwise, lift with slings wrapped below the conveyor base. Do not lift by the tray.

A spreader board over the pan should be used to prevent your chain or cable from bending the pan while lifting.

An excessively large amount of weight placed on the pans or springs could damage the unit.

Installation Procedures
Conveyors are arranged for either base or suspension mounting. Base pads should be fastened to floor or framework to maintain conveyor position. Adequate space must be provided between pan and/or base with any surrounding solid object to prevent interference. Conveyors arranged for suspension mounting should be hung from the base using eyebolts with rubber or steel coil isolation springs as provided by Eriez. See Figure 1.

The isolation assemblies should be welded to suitable overhead structure. Wire rope and/or turnbuckles may be used for greater suspension height. Tension on all suspension parts should be equal. Conveyors are normally mounted horizontal but can be mounted up to 10 degrees downslope. In this position, velocity of 80 feet per minute (24 mpm) can be obtained, depending on material characteristics. If feeding conveyor from storage hopper, care must be taken to minimize headload.

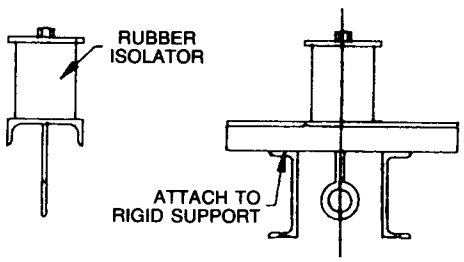


FIGURE 1

Wiring
Wiring to the motor should enter from a flexible conduit. Use of a motor starter and circuit protection is recommended. Wiring must be properly sized to prevent line voltage drop.

Motors commonly supplied are 900 rpm, dual voltage polyphase. Connect wiring according to the manufacturer's instruction, usually located on the nameplate or in the conduit box cover.

Motor rotation should be such that the left and right motors spin in the opposite direction from each other. See Principle of Operation on next page.

When controller is supplied, connect according to instructions enclosed with this equipment.

TYPICAL ERIEZ MODEL TMR

Operation & Maintenance

Principle of Operation

Feeder tray motion is provided by eccentric weights mounted on synchronized, counter-rotating, twin motors. The motors are in balance with one another to eliminate the isolation problems associated with single eccentric drive systems. Feed rate can be varied by adjusting the weights. The twin motor drives operate on standard AC power.

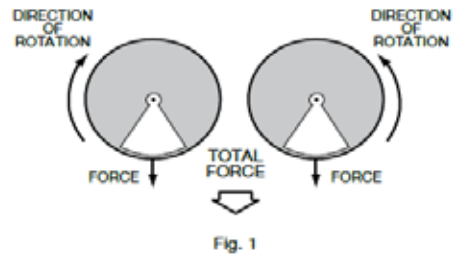


Fig. 1

Both eccentrics in down position.
Resultant force is downward.

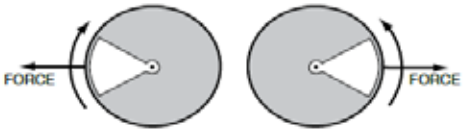


Fig. 2

Both eccentrics outward and opposed, 180° apart.
Resultant force is zero due to cancellation effect.

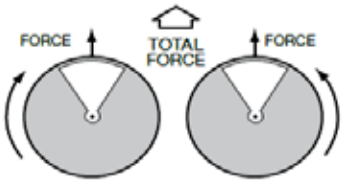


Fig. 3

Both eccentrics in up position.
Resultant force is upward.

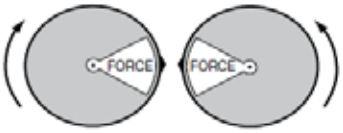


Fig. 4

Both eccentrics inward and opposed, 180° apart.
Resultant force is zero due to cancellation effect.

Rotation direction is not critical providing rotation is in the opposite direction.

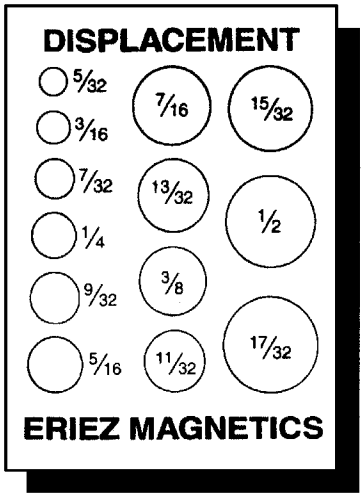
FIGURE 2

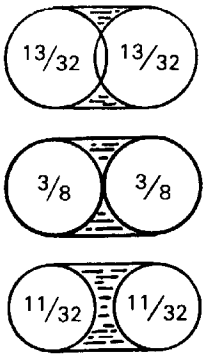
Special Troughs & Attachments

Eriez Engineering Service Department should always be consulted before undertaking the design or construction of special troughs. The troughs as furnished by Eriez should not be modified or attachments added without first consulting Eriez, as the feeders and conveyors are a tuned two-mass system and damage will result. To do so will void the warranty.

Deflection

Eriez TMR conveyors are normallly set at approximately 7/16" (11 mm) pan deflection or otherwise stated on outline drawing. This can be checked with an Eriez deflection sticker. The sticker is read while the equipment is operating by looking at the optical illusion in which the printed circles appear as double. Read the deflection where the two circles touch. A deflection sticker is shown in Figure 3.





This is the way the circles would look if the pan deflection is 3/8" (9.5mm).

FIGURE 3

The deflection may also be read by holding a pencil very steadily (resting against a solid object) and touching the pan side with the pencil point while the pan is operating. Then, stop the equipment and measure the deflection indicated by the line drawn on the side of the pan.

Do not operate with pan deflections greater than 7/16" (11 mm) because spring damage will result.

The total of pan and base deflection must not exceed 11/16" (18 mm) for TMR conveyors. This deflection should be taken at full voltage and with material feeding at maximum capacity.

Adjustment of Force Output
To decrease the centrifugal force output, a quick and easy adjustment can be made to the eccentric weight position at each of the motors.

1. Disconnect all power to the unit.
2. Remove both end covers, exposing the eccentric weights. Each end of the shaft has a percentage calibration from zero to 100%. See photo illustration.
3. Loosen only the outer eccentric weight at each end of the motor (use a metric wrench). Rotate the dot (punch mark or similar indicator) to the desired force output percentage position. Do the same at both ends of the motor.
4. Be certain weights have been retightened securely and replace motor and end covers back to their proper position.

Motor vibrations are easily adjusted by setting the indicator on the eccentric weight to the proper (% of maximum force) output.

IMPORTANT
Both ends of the motor must be adjusted to the same setting.

For more information on reading tray displacement, see Eriez' YouTube channel and look for "How to Read Eriez Vibratory Displacement Stickers."

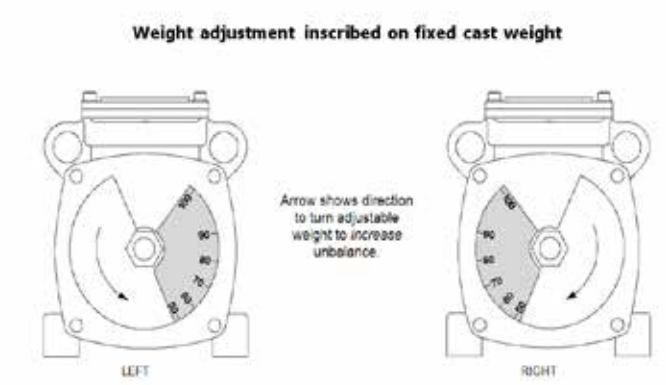


FIGURE 4
Adjustable weights set at 50%.
Fixed weight shaded.

IMPORTANT
- **Never loosen the inside eccentric weights closest to the motor.**
- **Never operate the motor vibrator while the weights at opposite ends are set at different settings.**
- **Be certain eccentric weights are retightened securely.**

Adjustment by Adding/Removing Springs
Deflection may also be adjusted by adding or removing leaf springs.

Adding springs will decrease deflection at the same speed, and removing springs will increase deflection at the same shaft speed. Refer to Repairs-Spring Replacement in this manual for instruction on placing or adjusting springs.

NOTE: Material build-up on pan may increase pan deflection and cause tuning spring failure or cracks in tray and base.

If material build-up on the tray is anticipated, consult Eriez to discuss an over deflection monitor.

CAUTION
Do not operate unit with any associated equipment in direct contact with any part of the vibratory unit. Cracks can occur in the tray and base.

Spring Replacement
Before disassembling springs, note how the clamps, springs and spacers are arranged. They must be reassembled in the same order. There must always be a plastic spacer on both sides of the leaf springs.

Torque spring bolts to 78 ft. lbs. (106 Nm)

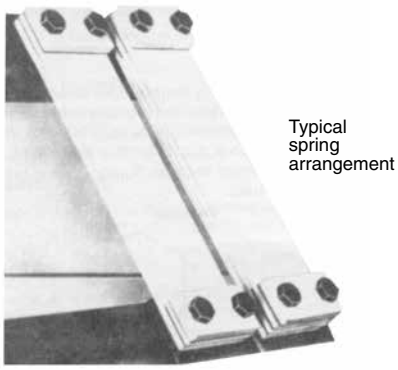


FIGURE 5

Lubrication
Use on the prescribed grease in the vibrator. If a different grease is used, the warranty will be void. Too much grease will cause bearings to overheat and result in premature bearing failure. Eriez recommends the use of SKF LGHP2 lubricant in Eriez ERV vibrators. For conveyors equipped with a Martin CD9 or CD12 vibrator lubricant with Kluber Staburags NBU 8EP grease. Refer to the Maintenance Table for lubrication schedule and quantity required for your vibrator.

Motor Replacement
Do NOT attempt to replace bearings on a rotary vibrator. In the event of a failure, contact Eriez.

Bearing must be replaced exclusively on the work bench by qualified personnel with the power supply deactivated.

- Disconnect the power supply to the electric vibrator.
- Dismantle the electric vibrator and place it on the bench.
- Remove the side covers.
- Remove the eccentric weights.
- Remove the bearing holder flanges through the threaded extraction holes.
- Remove the bearing using the special extractor.
- Fit a new bearing.
- Reassemble the electric vibrator.

During reassembly, keep all parts perfectly square to avoid misalignment as this can damage the bearings and bearing holders permanently. Check all screws, washers and gaskets to make sure there is no damage. Replace bearings if necessary.

Maintenance Tables
Consult Eriez or the parts list specific to the TMR at your location. When contacting Eriez, be sure to have the serial number available.

Eriez ERV-900 RPM Units		
Motor	**Maintenance**	
Power Output [Hp]	**Amount of Grease Per Bearing [grams]**	**Operating Time Between Regreasing {hours]**
0.31*	–	
0.47*	–	–
0.47*	–	–
0.67	15	1000
0.87	15	1000
1.34	18	1000
2.01	26	1000
2.68	70	1000
3.35	70	1000
3.89	70	1000
5.36	TO	1000
6.71	70	1000
9.12	90	1000

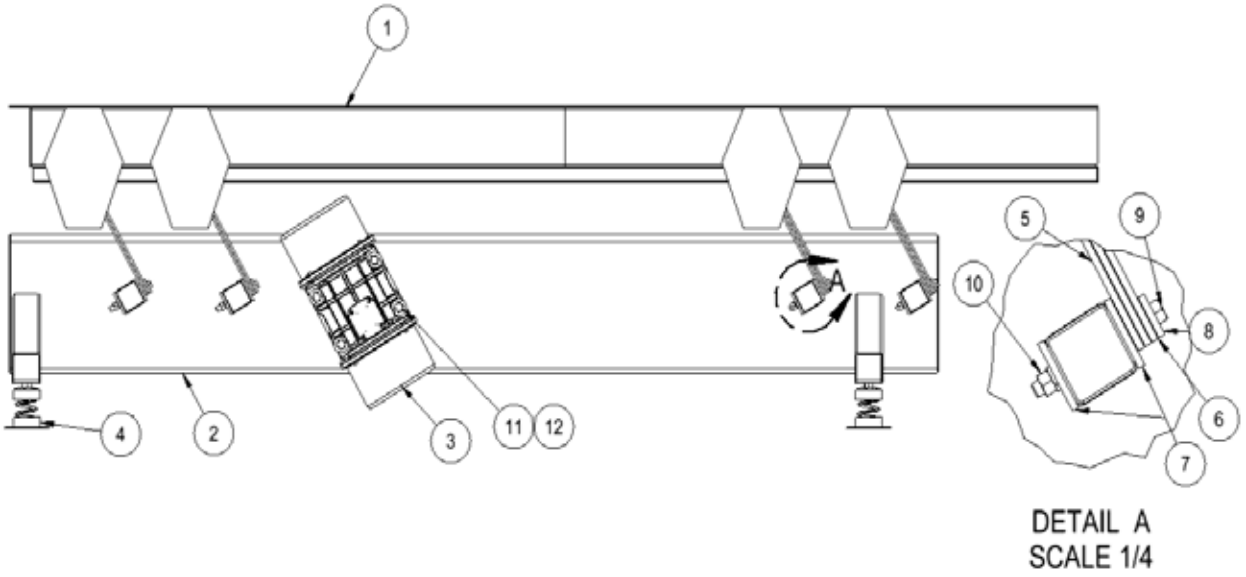
* No maintenance required. Replace bearing if failure occurs.

Maintenance Tables *Continued*

Consult Eriez or the parts list specific to the TMR at your location. When contacting Eriez, be sure to have the serial number available.

Motor Characteristics				
Three Phase (900 RPM)				
Motor Power [Hp}	Maximum Force		Amp Draw	
	lbs	N	230V	460V
0.17	328	1459	0.4	0.8
0.28	573	2549	0.6	1.1
0.2	913	4061	0.4	0.7
0.35	1444	6423	0.6	1.2
0.4	2019	8981	0.7	1.3
1.1	2923	13002	1.1	2.2
1.2	3841	17086	1.3	2.6
1.8	4643	20653	2.1	4.2
2	6832	30390	2.6	5.2
2.9	8380	37276	3.0	6.0
3.2	9343	41560	3.3	6.5
4.3	11656	51848	4.0	7.9
5.8	14368	63912	4.8	9.5
5.8	15498	68939	4.8	9.5
6	14657	65198	5.0	10.0
8.5	21905	97438	6.0	12.0
8.7	24767	110169	6.8	13.5
10.9	30942	137637	9.8	19.5
12.7	38056	169282	10.0	20.0
17.4	48923	217620	12.0	24.0

Parts List



Item Number	Name	Quantity
1	Tray Assembly (Specify Width & Length)	1
2	Base Assembly (Specify Width & Length)	1
3	Vibrator Motor	2
4	Isolation Assembly	4
5	Spring	As Required
6	Spring Spacer	As Required
7	Tube Backing Plate	As Required
8	Spring Backing Plate	As Required
9	Spring Bolt	As Required
10	Spring Nut	As Required
11	Motor Bolt	8
12	Motor Washer	8

NOTE
When ordering parts, be sure to specify feeder model and style, part number and quantity.

Troubleshooting

PROBLEM	CAUSE	REMEDY
Low Deflection	Heavy load on pan	Reduce load, improve hopper design
	Pan hitting fixed object	Provide clearance
	Unit out of tune due to damaged springs	Replace springs
	Belt slipping	Tighten belt, replace if worn
	Motor stalling due to incorrect voltage	Check motor wiring and voltage and correct
	Shaft running too slow due to incorrect ratio	Check RPM and correct
	Object added to pans	Remove object
	Malfunctioning control	Check direct line
	Loose spring bolts	Tighten spring bolts
	Material buildup on pan	Keep pan clean
No Deflection	See Low Deflection	See Low Deflection
	Motor failure	Replace motor and find cause of failure
	No electricity	Check for electricity at terminals
	Broken, loose or thrown belt	Check belt and install properly
High Deflection	Shaft running too fast	Check RPM and correct
	Broken or damaged springs	Replace springs
	Object added to pans	Remove object
	Excessive temperature	Remove heat or reduce speed
	Material buildup on pan	Keep pan clean
Noisy Operation	Mounting has come loose or is inadequate	Check mounting and correct
	Pan hitting material or object	Provide clearance
	High deflection	See High Deflection
	Cracks or breaks in pan or frame	Repair cracks or breaks
	Loose object on pan	Remove or secure objects
	Bearing failure	Replace bearing
	Loose spring bolts	Tighten bolts
Motor Overload Protection Tripping	High deflection	See High Deflection
	Inadequate ventilation	Provide air circulation
	Incorrect voltage	Check motor wiring and voltage
	Excessively tight belt	Loosen belt
	Defective motor	Replace motor
	Bearing failure	Replace bearings
	Operating on two legs of three-phase line	Check terminals and fuses
	Pan jammed against external object or base	Provide clearance

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