MMPM-470G

Installation, Operation and Maintenance Instructions

HEAVY MEDIA PERMANENT MAGNETIC WET DRUM SEPARATOR

ERIEZ MAGNETICS HEADQUARTERS: 2200 ASBURY ROAD, ERIE, PA 16506–1402 U.S.A.
WORLD AUTHORITY IN ADVANCED TECHNOLOGY FOR MAGNETIC, VIBRATORY and INSPECTION APPLICATIONS

Introduction

New improvements in magnetic materials and technology are applied in Eriez Model HMDA Wet Drum Separators. Permanent rather than electro magnets are used; new magnetic circuits have been designed to concentrate the separating force within the actual depth of the slurry flow; improved tanks take maximum advantage of better separating efficiency.

Eriez Wet Drum Separators are designed and ruggedly built for long, hard service – but certain installation, operating and maintenance procedures must be observed. A careful reading of these instructions will assure the separators' most efficient and dependable performance.

CAUTION - STRONG MAGNET

This equipment includes one or more extremely powerful magnetic circuits. The magnetic field may be much stronger than the Earth's background field at a distance several times the largest dimension of the equipment.

- **If you use a heart pacemaker or similar device you must never approach the equipment because your device may malfunction in the magnetic field, with consequences up to and including death.**
- **To avoid serious pinch-type injuries caused by objects attracted to the magnet, keep all steel and iron objects well away from the equipment. Do not allow hands, fingers, and other body parts to be caught between the equipment and nearby steel or iron objects.**
- **Keep credit cards, computer disks, and other magnetic storage devices away from the equipment because magnetically stored information may be corrupted by the magnetic field.**
- **Keep electronic devices, such as computers or monitors, away from the equipment because exposure to the magnetic field may result in malfunction or permanent damage to such devices.**

Contact Eriez if you have a question regarding these precautions.

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 MODEL HMDA WET DRUM MAGNETIC SEPARATOR

General Description

HMDA Wet Drum Separators are designed primarily for use in heavy media system recovery circuits for recovery of magnetite or ferrosilicon. They are designed to be fed a slurry or “pulp” of finely divided particles suspended in water. Optimum pulp densities of 5% to 25% solids by weight are most commonly handled. Pulps with densities over and under this range may be handled under certain circumstances.

A wet drum separator consists of a magnetic drum, tank, support frame and drive assembled as follows: A stationary agitation type alternating pole magnetic element is mounted on a stationary shaft. A cylindrical stainless steel shell encloses this assembly and is secured to drum heads. The drum heads and shell assembly rotate on bearings around the fixed shaft and magnetic element. The entire drum is assembled inside one of several specially designed tanks which control the water level and discharge rate of the separator. The tank, drum and drive assembly are supported by a rugged steel frame.

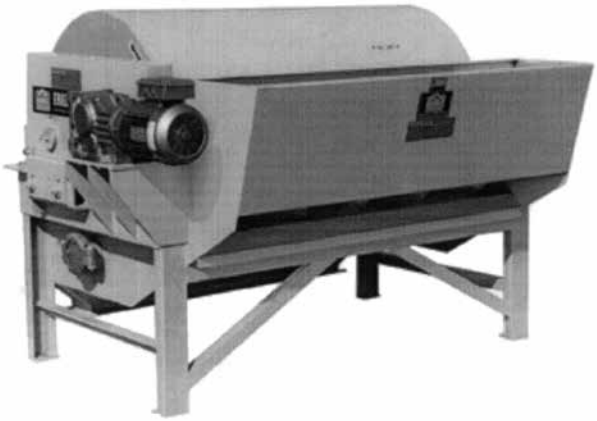

FIGURE 1

Installation

GENERAL

Use care when lifting the separator to avoid damage to the equipment.

⚠ CAUTION

DO NOT apply slings to the drum shell to lift the drum separator. Lift the separator by lugs provided or attach a sling to the frame. If the drum is to be removed, slings should be attached to the shaft ends with a spreader bar, keeping the sling free of the drum shell.

DO NOT rest the drum on the shell surface. Provide supports for the shaft ends.

DO NOT allow workmen to stand on or rest heavy objects on the shell surface.

BEFORE OPERATING, revolve the drum shell by hand to check for possible damage or distortion. The drum shell must not be allowed to rub internally or externally. Make sure nothing has been allowed to get between the drum shell and tank which could jam or otherwise damage the drum.

If installed where exposed to direct sunlight, thermal distortion of the drum occurring when the drum is not operating, may be sufficient to cause dragging on the magnets when the drum is operated. To prevent this, hose down the upper drum surface before operation, until it reaches approximately the source temperature as the surface not exposed to the sun.

Installation

ADJUSTMENTS

Magnet Adjustment

The drum and magnet positions are set at the factory prior to shipment. However, the magnet position may change during shipment due to road (transport) vibration, etc. If this occurs the magnetic element must be re-positioned.

Note that the magnet position is indicated by a scribed and painted sector on the shaft end. The magnet position may also be felt by means of a small iron object held to the drum surface. Optimum magnet position will be found to vary depending on the particular operation involved. Generally, best results will be found with the magnet set so that the centerline of the discharge pole is slightly above the concentrate lip. (See Magnet Adjustment Section).

Tank And Frame Adjustment

The tank and frame assembly should be checked across the width and length to make sure it is level. If not, shims should be placed between the frame pads and supporting foundation.

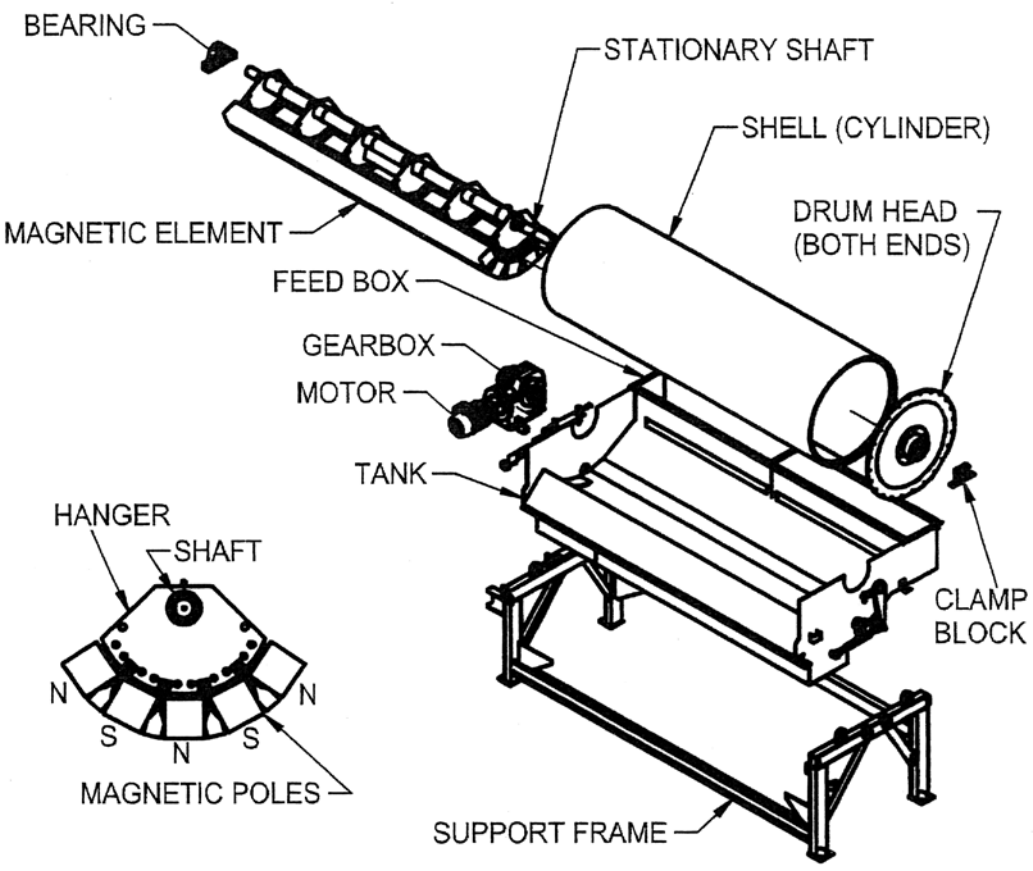

FIGURE 2

Operation

The magnetic element is permanently magnetic and incorporates highly oriented Erium 25 (Ceramic VIII) magnet material. It requires no external power source.

AC power requirements for the drive motor are stipulated on the nameplate fixed to the motor housing.

MAGNET ADJUSTMENT

For initial operation or after replacement of parts in the drum and hub, the magnet position should be checked. If adjustment of the magnet is required the following procedure should be followed:

Loosen both shaft clamps. On the end of the shaft opposite the drive motor, a hole is provided for adjustment of the magnet with the use of a 1-1/4" (32 mm) diameter bar. The colored area on the end of the shaft indicates the approximate position of the magnetic area. Using this as a guide, slide a small iron nut across the drum surface until it is attracted and held by the trailing edge of the magnet. Once you have done this, adjust the position of the magnet until the iron nut is approximately 2" (50 mm) above the discharge lip. Making sure the magnet is held in place, tighten the shaft clamps (See Figure 3).

The magnet setting as described above should result in a satisfactory point of discharge; however, slight adjustment up or down can be made from the normal position to obtain optimum results. In which the magnitite is in the horizontal plain (stick outward) at the discharge lip.

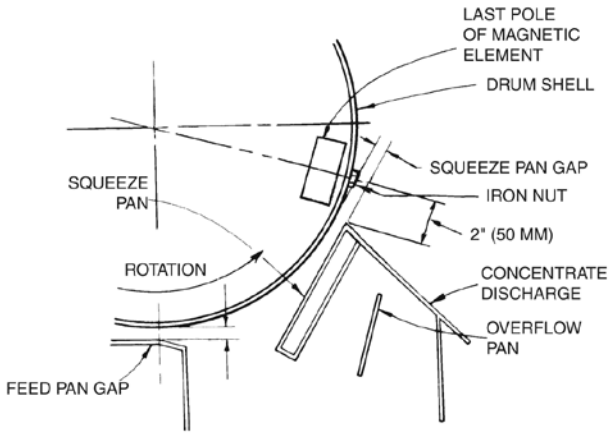

FIGURE 3

		Model HMDA	Self-Leveling	CL1
36" ø	Feed Pan Gap	1-1/4" (32)	1-1/2" (38)	2" (51)
	Squeeze Pan Gap	1-1/4" (32)	1" (25)	2" (51)
48" ø	Feed Pan Gap	1-1/4" (32)	1-3/4" (44)	2" (51)
	Squeeze Pan Gap	1-1/4" (32)	2" (51)	2" (51)

FEED AND SQUEEZE-PAN ADJUSTMENT

Feed and squeeze-pan clearances are set at the factory, but are adjustable by moving the drum horizontally or vertically as required. Slotted shaft clamp mounting holes provide room for lateral movement and vertical adjustment is accomplished by adding or removing shims beneath the shaft and frame.

WATER LEVEL AND OVERFLOW ADJUSTMENT

It is very important in this type of separator to maintain the proper water level. Overflow volume should be from 40% to 50% of total tailings flow. This is controlled by the size of the tailings discharge openings and the volume of feed. Since the feed should be constant, adjustment is made by changing the size of the tailings reducer bushings. Restricting the openings will increase overflow and vice versa.

An external water level overflow weir is provided on HMDA Models. A proper water level can be maintained when water is overflowing the weir located between the holes in the tank side plate (See Figure 4).

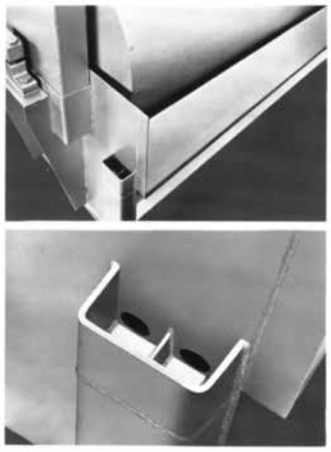

FIGURE 4

Operation

TANK STYLES

Style I - Concurrent

This design is most effective for producing an extremely clean magnetic concentrate from relatively coarse materials and is widely used in heavy media recovery systems.

Feed is introduced at one end of the separator and flows in the direction of the drum rotation. Magnetic material is immediately picked up by the powerful magnetic element. As the material is transported by the revolving drum surface, the special magnetic element agitates the material to free entrapped non-magnetic particles. Non-magnetic material is discharged at the bottom through the tailings discharge opening. The magnetic particles are held to the drum surface and pass through an opening between the drum shell and the “squeeze-pan” where excess water is forced out. The magnetic material is then discharged on the discharge lip at the opposite side of the tank from the feed.

The relatively long travel of magnetic material through the water while being agitated by the special magnet design gives a good washing action and produces a clean magnetic concentrate.

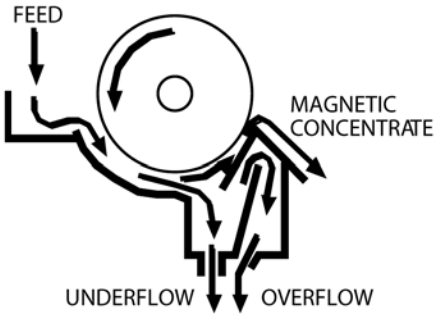

FIGURE 5

It is very important in this type of separator that the proper water level be maintained. Overflow volume should be from 40% to 50% of total tailings flow. Feed to the separator must remain constant to insure proper water level. Either lowering of water level or allowing too much underflow will result in excessive losses of magnetic material or an insufficiently cleaned concentrate.

Style Ii - Counter-Rotation

This separator is used where occasional surges in feed must be handled, where magnetic material losses are to be held to a minimum while an extremely clean concentrate is not required, and when high solids loading is encountered. Feed is introduced to the drum which is rotating in a direction opposite to that of the pulp flow. Magnetic material is picked up by the drum and immediately discharged. Since the tailings must flow under the magnetic arc of the drum surface before discharging, losses are held to a minimum.

It is important in this type of separator (a) for the solids to be fine; (b) to provide oversize protection to screen out solids larger than 1/4" (6 mm), and (c) that proper water level be maintained with overflow volume 40% to 50% of total tailings to prevent excessive losses.

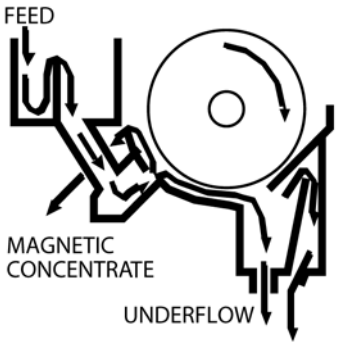

FIGURE 6

Style Iii - Self-Leveling Counter-Rotation

The Eriez Self-Leveling Wet Drum Magnetic Separator represents the newest available technology. This separator combines the best engineering and operational features and provides excellent performance with ease of operation, inspection, and maintenance.

The Eriez Self-Leveling tank has no discharge spigots to adjust. The tank level is controlled by removable weir bars on the discharge side of the tank. This arrangement allows the operator to maintain a constant tank level at any flowrate. The high capacity tank design accommodates surges and fluctuations in the feed rate. After startup no adjustment or monitoring are required.

Operation

Feed and squeeze-pan adjustments are performed by the adjustment of leveling and positioning of screws on both ends of the drum. There is no need to shim the drum to adjust the operating gap.

Each end of the tank is equipped with a 4-inch diameter clean-out port. Proper water level must be maintained as with the other type separators to obtain maximum efficiency.

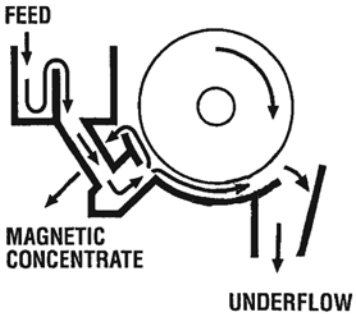

FIGURE 7

Maintenance

It is recommended that a weekly schedule for maintenance be conducted, as follows:

⚠ CAUTION
Bearing designs that require the drums to be stopped to lubricate must have the drive motor tagged and "locked-out" to prevent injury.

DRUM BEARINGS

All flange cartridge bearings require lubrication. Wipe all fittings to remove dirt and use a clean grease gun which has been filled with a high quality NLGI #2 lithium soap grease with petroleum oil. Enough grease is to be used to assure purging occurs around seals and or grease relief fittings. Operating the separator with damaged bearings may cause damage to magnetic element and shaft.

MOTOR

Instructions supplied by the manufacturer and attached to the motor and gear reducer should be followed.

DRUM SHELL

The drum shell and wear wrap should be checked regularly for punctures and grooves and replaced before water can enter the drum interior and cause serious damage. Check for loose or missing fasteners that bolt the drum shell to the end flanges.

CHAIN AND CHAIN SPROCKETS

The chain and chain sprockets should be clean and lightly coated with oil monthly. Also, inspect wear of the chain sprocket.

RECOMMENDED SPARE PARTS

Motor
Set of Bearings
Set of Seals
Set of Sprockets
Chain

World Authority in Advanced Technology for Magnetic, Vibratory and Inspection Applications
Headquarters: 2200 Asbury Road, Erie, PA 16506-1402 U.S.A.
Telephone: 814/835-6000 • 800/345-4946 • Fax: 814/838-4960 • International Fax: 814/833-3348
Web Site: http://www.eriez.com e-mail: eriez@eriez.com
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