

Installation, Operation and Maintenance Instructions



CLIMAXX-ERIEZ HEAVY MEDIA WET DRUM MAGNETIC SEPARATOR

ERIEZ MAGNETICS HEADQUARTERS: 2200 ASBURY ROAD, P.O. BOX 10608, ERIE, PA 16514-0608 U.S.A.
WORLD AUTHORITY IN ADVANCED TECHNOLOGY FOR MAGNETIC, VIBRATORY and METAL DETECTION APPLICATIONS

Introduction

New improvements in magnetic materials and technology have been applied to the CLIMAXX-Eriez Heavy Media Wet Drum Magnetic Separators. An improved tank design, coupled with the use of a 6 pole wide-angle magnetic element, results in an improved magnetic separator efficiency, especially in the recovery of fine magnetic particles.

CLIMAXX-Eriez Magnetic Separators are ruggedly built and designed for long, hard service. However, certain installation, operating, and maintenance procedures must be observed. Care should be taken to follow the CLIMAXX-Eriez recommended procedures to be assured of the 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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General Description

The CLIMAXX-Eriez high efficiency wet drum magnetic separators are designed for use in heavy media circuits for the recovery of magnetite or ferrosilicon. The separators handle high concentrations of both magnetic and nonmagnetic material in the feed and the recovered magnetite or ferrosilicon is discharged from the separator at higher than normal densities.

The CLIMAXX-Eriez magnetic separators consist of an agitation type (alternating pole), wide angle (6 pole) magnetic element mounted on a stationary shaft and enclosed in a rotating stainless steel shell, or drum, secured to the drum heads. The shell and drum heads rotate on bearings around the fixed shaft and magnetic elements.

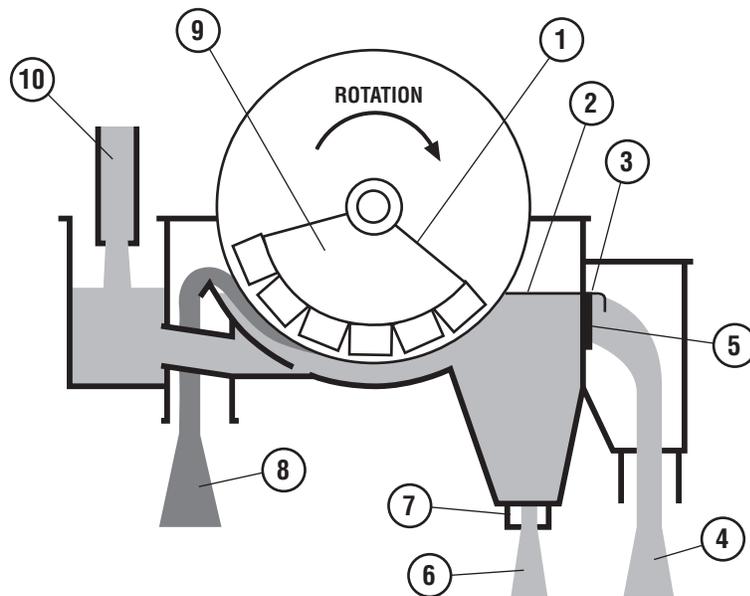
The drum with its internal magnet assembly is mounted on a tank (U.S. Patent No. 4921597) designed to take advantage of the wide angle magnet

assembly. The design allows for the control of both submergence level and magnetic concentrates discharge. The drum, tank and drive assembly are supported by a rugged steel frame.

TANK STYLE - COUNTER ROTATION

(SEE FIGURE 1)

This separator is used where magnetic material losses are to be held to a minimum and when high magnetic 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 tailings must flow under the magnetic arc of the drum surface before discharging, losses are held to a minimum. The low velocity at the overflow zone facilitates the recovery of fine magnetic particles.



- | | |
|---|--|
| 1. Additional arc for magnets | 6. Underflow product to tailings (approximately 50% - 75%) |
| 2. Submergence level | 7. Orifice to control underflow |
| 3. Overflow | 8. Magnetic concentrates |
| 4. Overflow product to tailings (approximately 25% - 50%) | 9. High efficiency magnetic design |
| 5. Overflow weir | 10. Feed |

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.

ELECTRICAL MOTOR

Instructions for electrical connections, maintenance, etc. supplied by the motor manufacturer, which are included with this IOM, should be followed.

WATER CONNECTIONS

Repulping connections should be made with a minimum pressure of ten pounds per square inch (10 psi) or 22 feet head. Prior to start-up water leaks should be checked and eliminated.

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 repositioned.

Note that the magnet position is indicated by a scribed and painted mark on the shaft end. The magnet position may also be felt by means of a nail or other 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.

PRIOR TO START-UP

Be sure that there are no foreign objects in the tank, especially in the gap between the tank and the drum. A good way of checking is to use a piece of rubber hose approximately 1" (25 mm) in diameter and move this piece of hose from one end of the drum to the other.

The element adjustment shaft (opposite the drive motor) should be properly secured.

START-UP

Rotate drum. Check RPM by means of a tachometer or manual timing. The 36 inch diameter drum should turn at 7 to 8 rpm while the 30 inch diameter drum between 8.5 to 9.5 rpm.

Turn on injector water and check for free flowing water over tailings discharge. Turn on water to header and process water to feed box. Water rates must be set either by the use of gauges or manual sampling.

SHUTDOWN

When shutdown of a drum is required for maintenance, etc., it is recommended that the feed be cut off first and then allow the water to wash away whatever solids are left in the tank. The injector water should be turned off last, after insuring that no solids will move back into the injector and plug the lines.

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 to enable the magnet position to be adjusted by means of a 1-1/4" (32 mm) diameter lever bar. The end of the shaft is marked to show the approximate position of the magnetic element. Using this as a guide, locate the last pole of the magnetic element by holding an iron nut loosely between the fingers until it is attracted to and held to 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 2).

The magnet setting as described above should result in a satisfactory point of discharge. Slight adjustment up or down can be made from the normal position to obtain optimum results.

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.

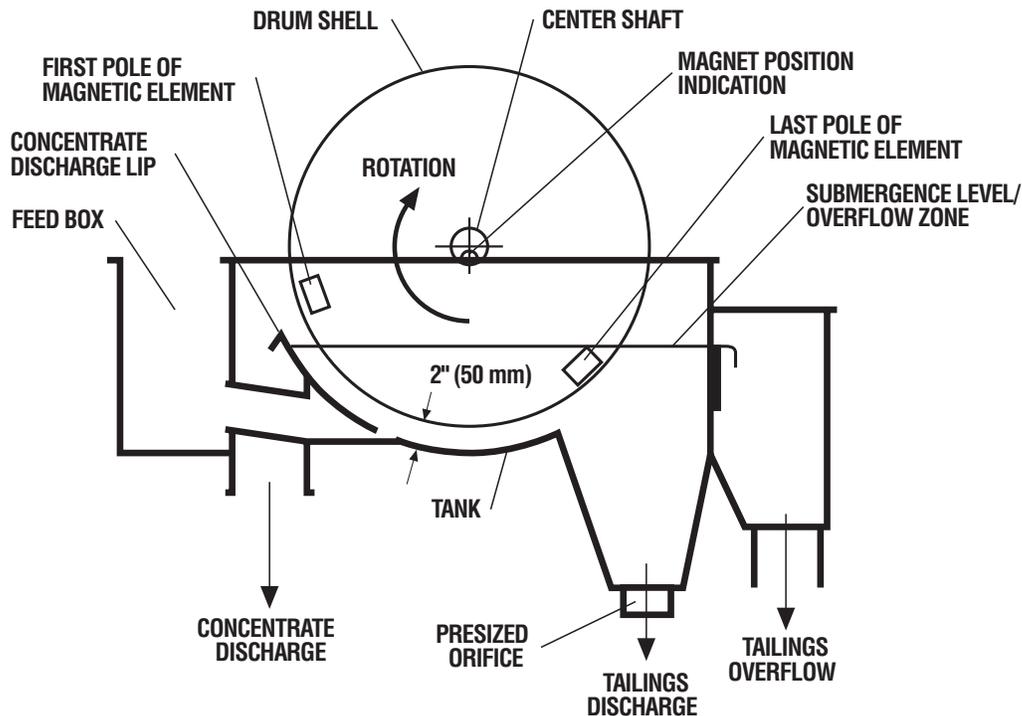


FIGURE 2

Operation (cont.)

WATER LEVEL AND OVERFLOW ADJUSTMENT

It is very important with this type of magnetic separator to maintain a proper water, or submergence level. The overflow should be approximately 25% of the total tailings flow.

The magnetic separator is supplied with two (2) different sized orifices for each underflow tailings outlet and overflow weir.

The submergence level is controlled as follows:

- a) Obtain overflow over the weir.
- b) Install the largest orifice provided.
- c) Adjust the feed to set the overflow level (Approximately 25% - 50% of total tailings).

NOTE: If unable to obtain a proper overflow level remove orifices and replace with smaller orifices, repeat until overflow level is achieved.

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. Operating the separator with damaged bearings may cause damage to the magnetic element.

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 connecting the drum shell to end flanges.

CHAIN AND CHAIN SPROCKETS

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

RECOMMENDED SPARE PARTS

Depending on the location of the installation and the severity of the application, all or part of the following are recommended as spare parts:

Motor	Set of Sprockets
Set of Bearings	Chain
Set of Seals	

Repair and Alteration

Repair, alteration or disassembly of this magnetic equipment in the field without written authorization and instructions by Eriez nullifies the responsibility and guarantee of the manufacturer.

If further information or advice is required, consult our sales representative in your territory who is an expert on magnets and their applications.

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