

# Installation, Operation and Maintenance Instructions



## **SELF CLEANING ROTA-GRATE<sup>®</sup> MAGNET**

**ERIEZ MAGNETICS** HEADQUARTERS: 2200 ASBURY ROAD, ERIE, PA 16506-1440 U.S.A.  
*WORLD AUTHORITY IN ADVANCED TECHNOLOGY FOR MAGNETIC, VIBRATORY and INSPECTION APPLICATIONS*

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# Introduction

This manual details the proper steps for installing, operating and maintaining the Eriez Self Cleaning Rota-Grate® Magnet.

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 Manufacturing at 814/835-6000 for Rota-Grate assistance.



## **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 "workpiece" being lifted.
- 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.

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## **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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# Description

The self cleaning Rota-Grate® magnetic separator uses tube magnets that rotate on a reel to keep difficult flowing products flowing freely. After each batch or after a specified time setting, the product flow is stopped and the cleaning cycle is activated.

During the cleaning cycle, the magnet tubes retract to a position outside the product area. While the tubes are retracting, the ferrous material is scraped from the magnets and discharged. In some models, vibration and/or an air blast are applied to the retracted magnets to assure complete removal of the ferrous material. The magnet tubes then return to the product area and product flow can resume.

Automatic self cleaning grates include a control so the cleaning cycle can be adjusted. The entire cleaning operation takes approximately ten seconds.

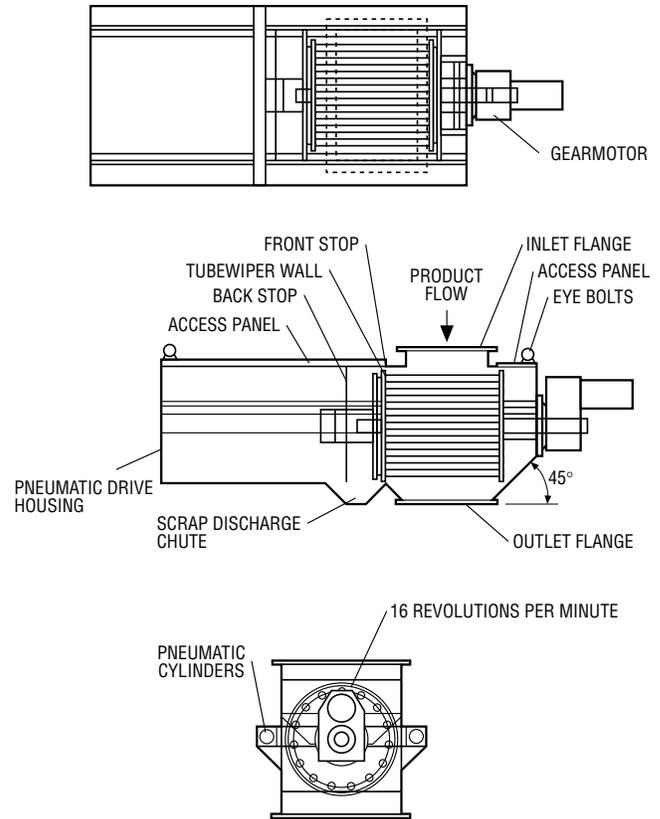
Self Cleaning Rota-Grates are designed for installations that require frequent cleaning in vertical closed chutes and ducts. They are also used for installations in hard-to-reach locations. The grate has a flanged inlet and outlet for easy installation.

There are three grate sizes available. The rotating reels are:

- 12" diameter (305 mm)
- 16" diameter (406 mm)
- 22" diameter (559 mm)

# Installation

Use care when uncrating and handling to prevent damage to the equipment, particularly the pneumatic drive housing (see Figure 1). Eye bolts are attached for lifting and for additional support when mounting the unit.



**FIGURE 1**

Install the self cleaning grate in the desired location in the vertical closed chute or duct. Installation is intended to be made by a flange attachment to the inlet and outlet flange of the grate housing. Hole size and spacing will be supplied to the customer's specification, or flanges will be furnished without holes if none are specified.

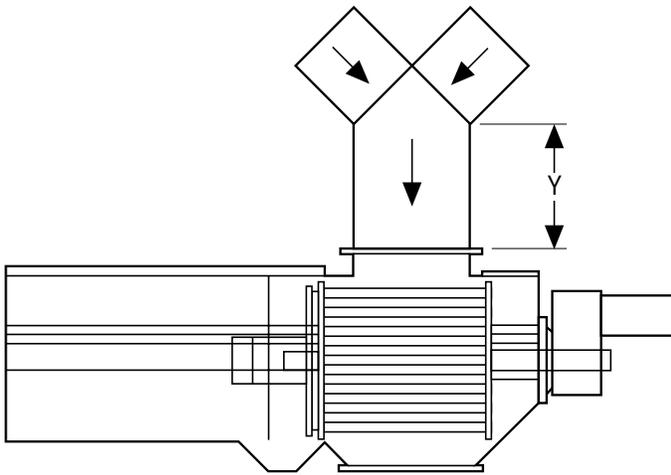
Locate the unit between the flanges of the chute work, and transfer holes from the flanges of the chute work onto the flanges of the self cleaning grate. Install a gasket between each pair of mating flanges to insure a dust-tight seal.

## GRATE POSITION

The Self Cleaning Rota-Grate is designed for installation in vertical or inclined flow systems, but the unit itself must be installed horizontally, as shown. For optimum iron separation a vertical section at least as high as the dimension listed in Table 1, should be used above the inlet of the grate housing (see Figure 2 and Table 1).

**TABLE 1**

GRATE SIZE		HEIGHT (Y) MINIMUM	
IN	MM	IN	MM
12 Dia. x 14	305 x 356	14	356
16 Dia. x 18	406 x 457	18	457
22 Dia. x 24	559 x 610	24	610



**FIGURE 2**

The Self Cleaning Rota-Grate is designed for a free falling product. A product shut off valve should be located upstream from the Rota-Grate to prevent potentially destructive material backup.

## DISCHARGE CHUTE

Space must be provided so that iron discharge can fall clear of the discharge chute and not back up into the unit. Continuation of the 45 degree discharge chute to a collection point is the most common method of eliminating this waste.

## PNEUMATIC HOOK-UP

An 80 psi (5.3 bar) air supply is required to operate the pneumatic Self Cleaning Rota-Grate. Connect the air supply to the inlet of the air preparation unit.

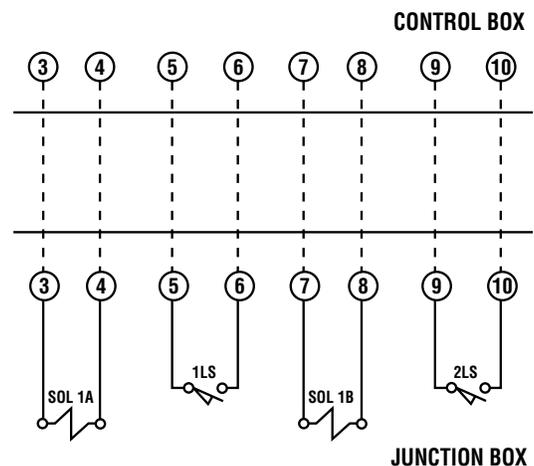
## WIRING

See Figure 3 for wiring the Eriez automatic, Self Cleaning Rota-Grate. Also refer to the electrical outlet and schematic drawing, 4N-9608105, packed with the unit.

Connect the two AC leads from the AC power source to terminals 1 and 2 in the control box. Make all corresponding connections between the control box location and the junction box on the Self Cleaning Rota-Grate, as shown in Figure 3.

## MOTOR WIRING

Connect three-phase power supply so rotation of the magnet reel corresponds to the direction arrow on housing.



**FIGURE 3**

# Operation

1. Be sure the Self Cleaning Rota-Grate is rigidly attached to mating flanges in the vertical closed system.
2. Before separating material, turn on the control box power supply and cycle the unit using the manual switch. (Allow ten seconds for the unit to complete the cycle).
3. Continue to cycle three or four times to become familiar with operating the unit.
4. On the control box, set the automatic cycle time as desired. Timer unit can be changed to hours or minutes by removing the timer face and setting lever on the desired increment. A lever behind the face will also set the decimal point. **NOTE:** For optimum iron separation, cycle the unit frequently. Cycle times of fifteen minutes to one hour are standard, but product testing or observation of magnet loading, through the product area access door, will help determine your specific requirement. Fully loaded magnets will have bands of iron particles that are built up from 1/8 to 1/4-inch (3 to 6 mm) above the surface of the tube. Cycle times less than ten minutes are not recommended. Consider adding additional units if extremely short cycle times are required to remove excessive iron buildup.
5. Regulator pressure has been preset at the factory. However, there may be conditions during material separation (sticky or wet material, heavy tramp iron load) that will prevent the magnetic tubes from moving out of product flow for automatic cleaning. If the self cleaning Grate experiences slow operation, adjust the regulator to increase the air pressure. Increase air pressure in increments of 10 psi (.7 bar), until the unit operates fully, without hang-ups. **DO NOT LUBRICATE MAGNET TUBES.**

# Maintenance

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## WARNING

Self Cleaning Rota-Grates have pinch points inside the grate and pneumatic drive housing. There are moving mechanical parts driven by the cylinders. Workers must be instructed not to perform maintenance on this equipment unless it is turned off and the air supply and electric power are locked out. Failure to observe this precaution may result in serious personal injury.

## WARNING

Tube magnets are very strong and will instantaneously attract to each other, any iron, steel railing, or beams in the cleaning area. The tube magnets in the Self Cleaning Rota-Grate are not intended to be removable. However, if removed from the rotor, the tubes must not be brought within 12" (300 mm) of any iron or steel structure or objects. Failure to observe this precaution may result in property damage, hand crushing or other serious personal injury.

## CAUTION

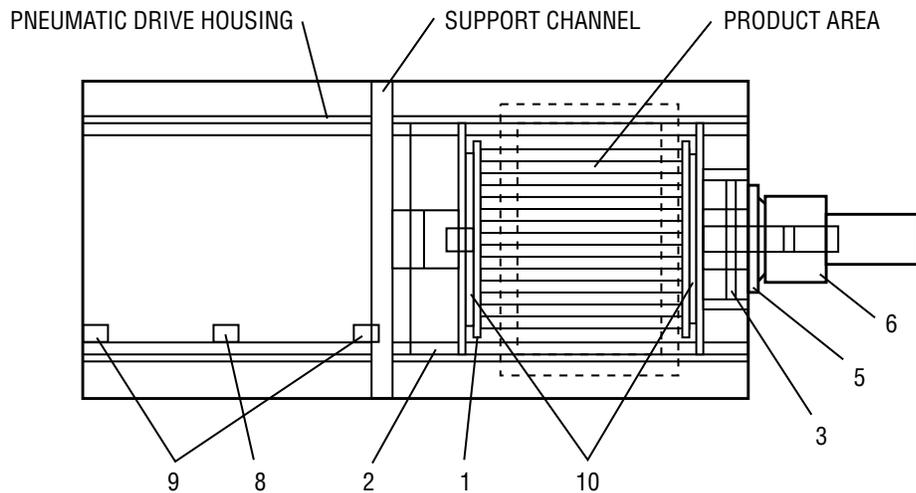
As with any equipment installed in contact with an abrasive product stream, magnetic grates should be inspected periodically to assure that excessive wear has not occurred on the product contact surfaces. Replace the grate if actual or impending perforation of the contact surfaces is noted. This will prevent loss of magnet material into the product stream, and/or degraded performance of your magnetic separator. For most applications a monthly visual inspection should be sufficient for this purpose, but this frequency should be adjusted depending on the abrasiveness of the product.

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1. For solenoid valves and air preparation unit maintenance, refer to the manufacturer's instructions packed with the shipment.
2. No adjustments should be made on the pneumatic cylinder take-up or flow valves. These items have been preset at the factory.

3. If the unit does not complete the cleaning cycle, check to see if the support channel is contacting the limit switch on each end of the stroke (refer to Figure 4). The limit switch arm can be adjusted (**Note pinch point warning above**). Move the limit switch roller arm on the grooved spline in the direction of the trip lever or adjust the roller arm length or both. Minor contact between the support channel and mechanical safety stop is normal.
4. **UNIT IS SELF CLEANING NOT SELF MAINTAINING.** Clean inside the pneumatic drive housing on a regular schedule, depending upon the environment and the material processed. It's important that no product be allowed to build up (caused by dusting or material passing through the tube wipers). Clean magnet tube and product area buildup as necessary.

## Replacement Parts



ITEM	DESCRIPTION	QUANTITY
1*	Tubescraper Disc	1
2*	Bearing Strips (UHMW)	2
3*	Clutch Plate	1
4	Air Cylinder	2
5	Oil Seal	1
6	Gearmotor	1
7	Exhaust Muffler	2
8	Air Control Valve	1
9	Limit Switch	2
10	Bearing	2

\*Recommended Spare Parts



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