Installation, Operation and Maintenance Instructions

ERIEZ®

MAGNETIC FLOCCULATORS

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

Magnetic flocculators designed and built by Eriez are of two basic types: "open" and "closed" circuit. When the application requirements are reviewed, a decision is made on which type will best fulfill the requirements of magnetic intensity, air gap length, flow volume, etc.

An open circuit unit is one that has two magnet poles, one on each side of the flow conductor, but without any means (other than air) to conduct magnetic lines of force between the two poles. Conversely, the closed circuit type has a magnetic conductor (usually a heavy mild steel plate) connecting each end of the two magnet poles. In operation the two types perform alike.

CAUTION - STRONG MAGNET

This equipment incorporates one or more exceptionally powerful magnetic circuits. Steel and iron tools and other objects may be attracted suddenly and strongly to the magnetic elements, creating the risk of serious pinch-type injuries. Keep all mild steel and iron tools and equipment well away from the magnetic elements at all times. Avoid situations in which hands, fingers, or other body parts could become trapped between a steel or iron object and the magnetic elements.

Personnel using heart pacemakers should not service or operate this equipment. Such personnel should remain at least 3 feet (1 meter) from the magnetic elements at all times.

Installation

Flocculators are shipped completely assembled ready for use except in cases where Eriez has supplied a long duct and/or transition section. Free-standing units may be installed on either vertical or horizontal pipe lines.

Open circuit flocculators should be supported on a non-magnetic ledge, foundation or platform, or suspended with hanger rods. Magnetic supports or flow conductors should not be used near any part of the unit. A good rule of thumb for a safe distance is the air gap length (distance between poles) plus 6" (150 mm). For example, an assembly that has an 8" (200 mm) air gap length should not have magnetic materials in the support structure or flow conductor closer than 14" (350 mm) to any part of either magnet pole. The same clearances should be observed when placing other objects or structure made of magnetic material in the vicinity of the flocculator.

A closed circuit unit will not be affected by magnetic structures, supports, or other objects in close proximity but the rule of thumb as previously stated applies to the flow conductor.

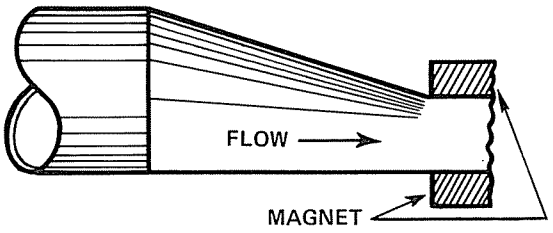
CAUTION

A flocculator should be installed without disassembly and the pipe or flow conductor should then be inserted into the opening between poles. Disassembly should not be considered except where it is absolutely impossible to make the installation in any other manner. **Disassembly is a high-risk operation** and the procedure should be discussed with Eriez' Engineering Department before any such operation is begun.

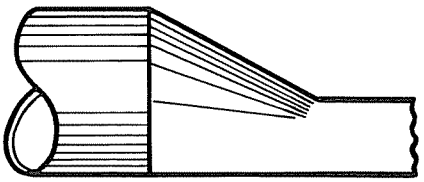
Ferrous particles in the slurry give it an abrasive quality so it is suggested that transitions or other duct work that changes flow direction be made of abrasion-resistant steel.

When duct work is fabricated on site or supplied by someone other than Eriez, consideration should be given to the design that will cause the least flow turbulence. Many flocculators are simply installed directly on a non-magnetic pipe segment matching the diameter of the user's main pipe circuit. Where transitions are used to reduce large diameter pipes to low profile rectangular conductors, it is good practice to have long transitions with minimum taper per unit length, as illustrated below.

ELEVATION

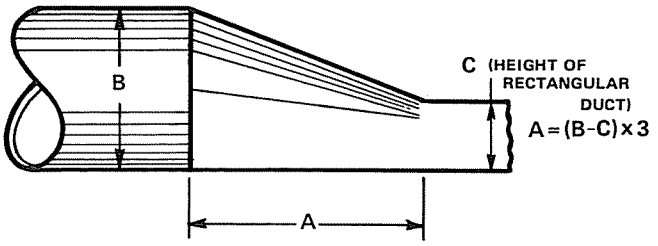


PREFERRED METHOD

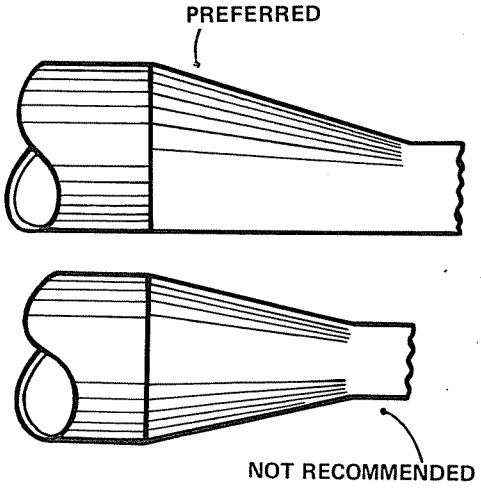


NOT RECOMMENDED

We recommend an empirical design range of 2½ to 3 inches (63 mm to 75 mm) of length for each inch (25 mm) of reduction in vertical dimension. The drawing below shows how length of the transition is determined.



It is important to have the bottoms of the inlet pipe and conductor through the flocculating area on the same plane; otherwise, a dead pocket will be created at the discharge end of the inlet pipe. In addition to contributing to sub-standard performance, this construction would be more costly.



The cross section area at any point should be at least equal to, and preferably slightly larger than, the cross section of the main line.

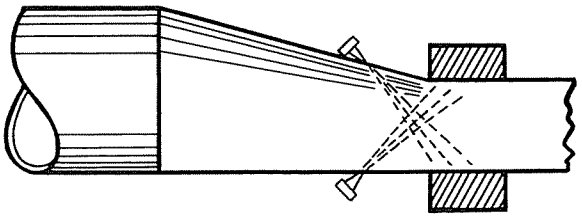
Wherever practical a flocculator should be located as near as possible to the point where slurry is discharged into a settling tank. Selection of such a location will avoid the necessity of providing a second transition section which not only adds to the cost but also creates turbulence that will tend to cancel some effect of flocculation. If discharge is made into a tank which is equipped with a skimmer, the flow conductor should be extended below water level to reduce surface turbulence which would detract from the efficiency of the skimmer.

Operation & Maintenance

Magnetic flocculators do not have any moving parts so they do not require fine tuning or adjustment for optimum performance. Any adjustment would, instead, be in the flow or consistency of slurry going through the unit. Any change in volume that would appreciably increase flow velocity could decrease efficiency of the flocculator.

Eriez units are designed to assure that solids are in the magnetic field for the time necessary to achieve good flocculation. This design is based on specifications furnished with the order. Lesser flow velocities can be tolerated but if they become extremely slow, frequent inspection should be made to be certain that magnetics are not building up on the magnet poles and tending to "choke" the line. Even under normal conditions, such inspections should be made at regular intervals.

A higher than normal (say above 5%) percentage of solids could cause a choking condition as described above. In such cases it may be advantageous to install sluicing nozzles on the upstream side of the magnet to permit periodic flushing of material "pile-up".

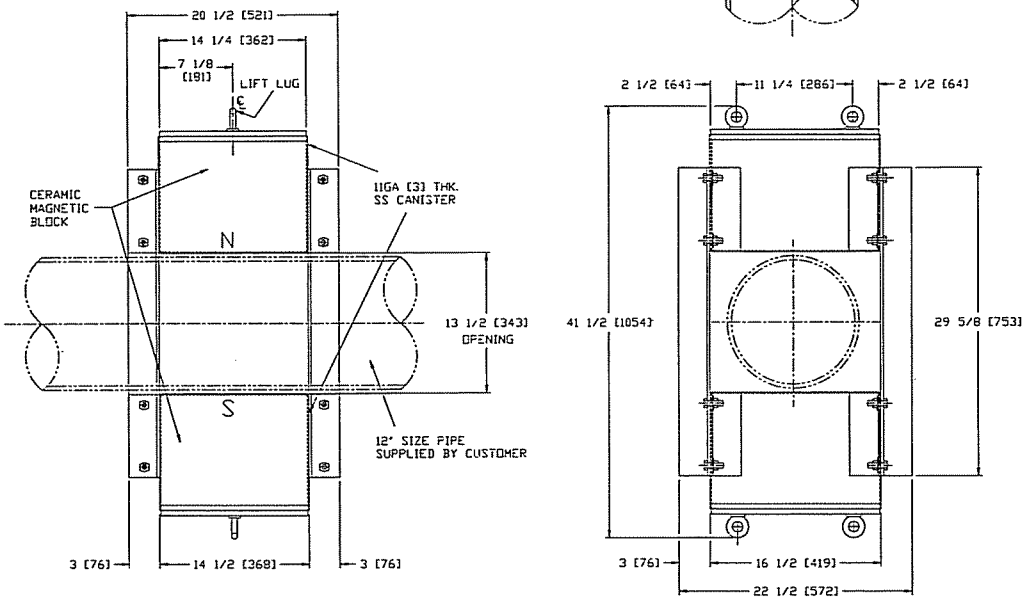


SLUICING NOZZLES CLEAR BUILT-UP MAGNETICS

Airborn ferrous contaminants may accumulate on the exterior surfaces of the flocculator. Heavy accumulations can detract from the magnet's performance so it is recommended that a regular inspection be made and the contaminants removed before they impair efficiency of the unit.

NOTES:
APPROXIMATE WEIGHT: 1100 LBS. [500 KGS.]
1000 GAUSS AT CENTERLINE OF OPENING

UNITS : INCHES [MILLIMETERS]



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