

Installation, Operation and Maintenance Instructions



**EASY-TO-CLEAN
MANUAL,
AUTOMATED AND
SELF CLEANING
GRATE-IN-
HOUSINGS**

ERIEZ WORLD 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 Easy-to-Clean Grate-In-Housing Family.

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 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.

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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Manual Units

Description

Eriez Easy-to-Clean Grates eliminate the costly shutdown of product lines typically required to remove, clean and reinstall the magnetic elements. Easier, more frequent cleaning prevents excessive iron contamination build-up on the magnets and assures maximum separating efficiency. The magnet grates are individually removed from the product stream to ensure constant protection. At a point outside the product flow, contamination is discharged. The entire cleaning operation takes place in seconds per bank.

Eriez Easy-to-Clean Grates remove minus 1/2" ferrous contamination from almost any dry, granular, free-flowing material including grains, feeds, spices, foods, sugar, powders, plastics, dry pulps, ceramic materials, chemicals and minerals. If ferrous contamination is larger than 1/2" size, a non Easy-to-Clean Grate-In-Housing should be used.

Easy-to-Clean Grates are available in both standard ceramic magnetic material and Eriez Rare Earth.

Installation

Select a location in the system where the product will free fall through the grate magnets, such as a section below a product shut off valve, delumper or other area where product will not backup into the grate. Standard unit height is 11-1/4" (286mm) flange to flange.

Installation is most desirable at chest height or approximately 4 or 5 feet (1200 to 1500mm) above the standing surface.

Installation must permit room for the magnet grate to extend fully and also permit 3 to 4 feet (900 to 1200mm) of room for the person doing the cleaning. The grate extension length of your particular size unit is given on the outline drawing or can simply be measured on the unit.

The grate housing is designed to be flange mounted to the pipe, chute or duct work. The unit must be rigidly attached, and supported if necessary.

Space must be provided so that iron discharge can clear the discharge chute and not back up into the unit. Continuation of the discharge chute to a collection point is the most common method of eliminating this waste. The unit is not designed to hold pressure or seal under any positive pressure.

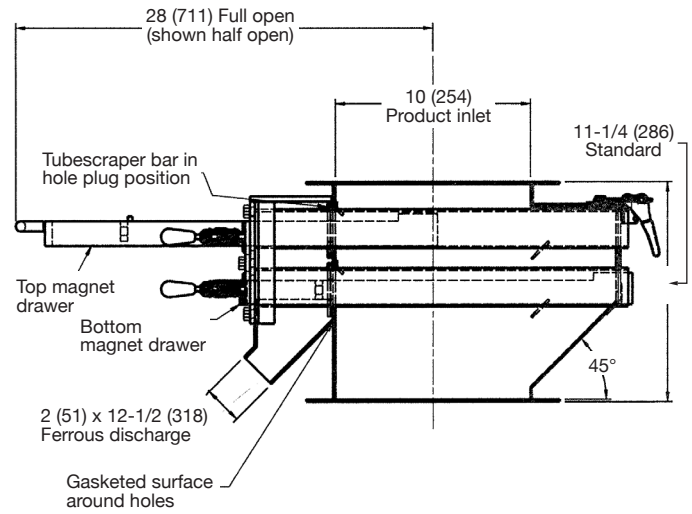


FIGURE 1

12-1/2" x 10" model shown

Operation

To clean ferrous material from the magnet tubes, simply release the quick release clamp on each side of the top grate handle during a product shutdown then pull out the magnet grate. Resistance of 15 to 40 lbs. (67 to 178N) should be expected depending on the amount of ferrous material collected on the magnet tubes.

Re-insert and relatch the top grate and then clean the second grate. By keeping one bank of magnets in the product flow at all times, the unit may be cleaned without shutting off the product flow. Note that the unit is not completely sealed, so dust may escape with dusty products.

Frequent cleaning will allow for easier grate retraction and optimum iron separation. Product testing or visual observation of magnet loading through the product access door will help determine your specific cleaning cycle. Overloaded magnets will have bands of iron particles built up from 1/8" to 1/4" (3 to 6mm) above the surface of the tube. It is not uncommon for some small amount of tramp metal to remain on the tubes after cleaning.



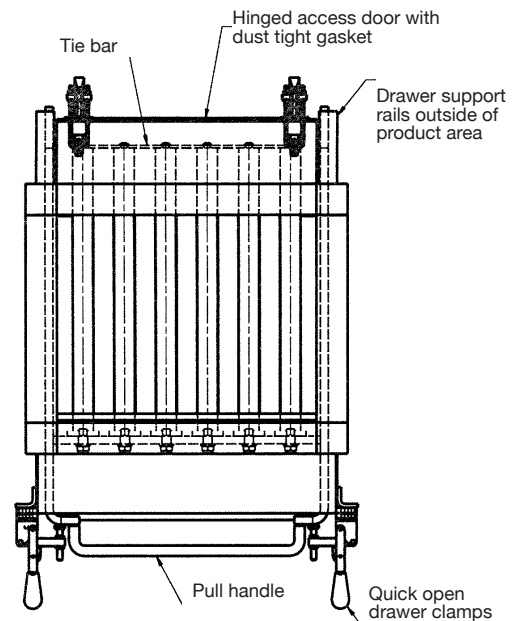
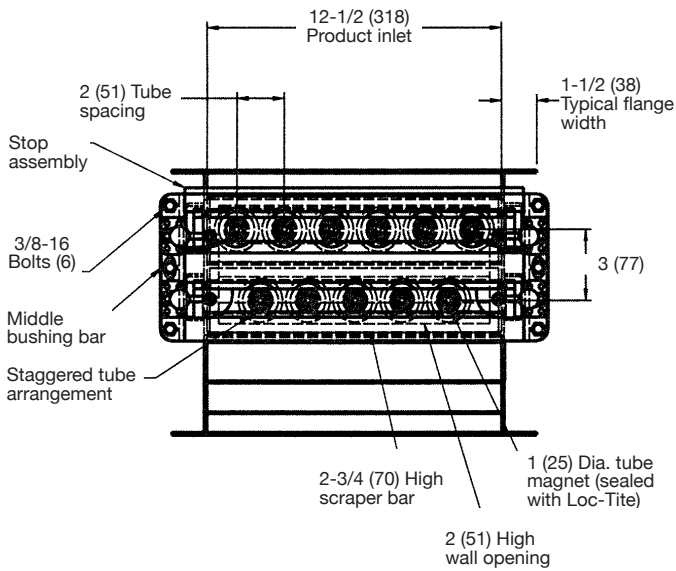


FIGURE 1 - CONTINUED
12-1/2" x 10" model shown

Maintenance

The Easy-to-Clean Grate requires no maintenance other than replacement of “wear” parts on a periodic basis. The replacement period will depend upon the abrasiveness of the product and the amount of ferrous material being removed from the product. The only recommended spare parts are the tubescrapers.

When an excess amount (1/32" to 1/16") (1 to 2mm) of ferrous metal remain on the tubes after cleaning, the tubescrapers should be replaced. Note that the tubescrapers clean on both the in and out strokes. Examine the tubes in the product area to determine if excess ferrous material is remaining on the tubes. After both strokes, a minor amount of ferrous pass-thru is expected and is easily secured by the magnets.

To replace the wear items, the six 3/8-16 bolts should be removed from the front face flanges. The clamp bar should also be removed. The magnet banks can now be pulled from the housing. The tubescraper bars can be changed by first removing the tie bar from the end of the magnet tubes and then simply sliding the bars off the ends.

To reassemble, reverse the process and ensure the metallic (or Teflon) rings are sandwiched between the white plastic bars with holes in them. **Note:** Although the magnet tubes are not considered a wear item, periodic examination is necessary especially with highly abrasive products. If a magnet tube should wear through, repair at our facility is necessary. Alteration and disassembly of the magnet would disturb a carefully engineered magnetic circuit, which could

only be restored by rebuilding and recharging. Repair, alteration or disassembly of this magnetic equipment in the field without written authorization and instruction by Eriez nullifies the responsibility and guarantee of the manufacturer.

Note: Eriez recommends evaluating and replacing worn Tube Scrapers every 3-6 months as necessary.

Quantities of replacement parts are as follows:

UNIT SIZE	TUBESCRAPERS/UNIT
6-1/2 x 4	2
8-1/2 x 6	2
10-1/2 x 8	2
12-1/2 x 10	2
14-1/2 x 12	2
16-1/2 x 14	4
18-1/2 x 16	4
20-1/2 x 18	4
22-1/2 x 20	4
24-1/2 x 22	4

TABLE 1

Automated Units

Description

Eriez Automated Easy-to-Clean Magnetic Grate-In-Housing (Auto ETC) is designed to remove fine particle ferrous contamination and tramp from a dry free-flowing product under gravity flow.

The Auto ETC consists of a dust-tight stainless steel product housing with a pneumatically operated cleaning drawer. During the cleaning cycle, the contaminants are discharged outside the product area. The discharge chute is located under the safety housing, which covers all moving parts.

Two air cylinders drive the drawer in and out. A filter/regulator controls the speed the drawer moves, and a double acting solenoid valve controls the direction of travel of the air cylinders and drawer. The unit requires a 60 to 80 psi air supply and a 120 / 60 VAC control to activate the double solenoid valve.

Installation

Receiving the Auto ETC

After carefully uncrating the unit, notice that there are two sections, the unit itself and the control panel. Two pneumatic hoses should connect them. The hoses were used to test the unit at our facility and can be used as-is or new hoses or piping can be used to locate the panel further from the unit. The push button station may also be remotely located.

Threaded lifting/mounting holes (3/8-16) are located on top of each cylinder-mounting block.

Flange Mounting

The grate housing is designed to be flange mounted to the pipe, chute or ductwork. The unit must be rigidly attached and supported to resist the 50 lb. weight shift of the magnet drawer from the product housing.

Mounting Location

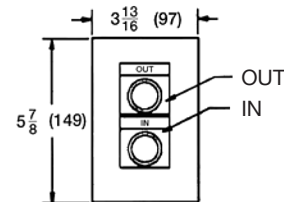
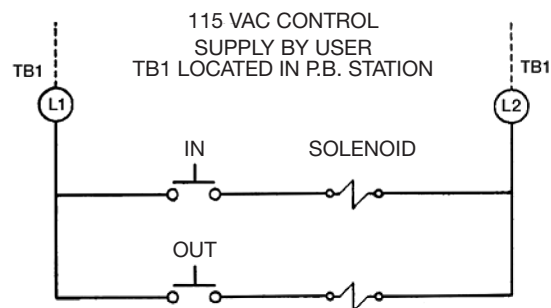
Select a location in the system where the product will free fall through the grate magnet, such as a section below a product shut off valve, delumper or other area where product will not back-up into the grate. Standard unit height is 11-1/4 inches (286mm) flange to flange.

Air Supply and Connections

A 60 to 80 psi air supply is required to the 3/8 NPT port connection at the filter regulator. Connect 3/8 tubing from the solenoid valve to the right angle connectors on the product housing. No specific tube to fitting connection is critical at this point because these connections can be easily reversed after wiring the control to the solenoids, if necessary.

Electrical Control to Solenoid Valve

This is a double solenoid valve, 120 / 60 VAC.



PUSH BUTTON STATION
NEMA -4/13, 3 1/4 (82) DEEP
ERIEZ NO. 2N-9900579

PUSH BUTTON CONTROL SCHEMATIC

A signal is required to each solenoid in turn to “spool” the valve in each direction. The solenoid requires a momentary signal and should not be continuously energized.

A certified electrician should complete this connection.



Ferrous Discharge Options

The ferrous scrap discharge area is located under the safety housing flange. Space must be provided so that scrap discharge can clear the safety housing and not back up into the unit. Continuation of the 45-degree angle deflectors to a collection point is the most common method of eliminating this waste. Typical scrap collection methods include:

- A tray or hopper. Analysis can be conducted on scrap amount and sources.
- A bucket, bag or barrel for periodic disposal.
- A conveying system for removal to a remote location.

Operation

! IMPORTANT: The product flow must be shut off before the cleaning cycle is activated.

The pressure regulator is pre-set at the factory to cycle the air cylinders smoothly. Adjust the air pressure based on your product and cycling load. A smooth, steady cycle is better than one that slams the drawer in each direction.

The processing steps are as follows:

1. Product shut off before cleaning cycle
2. Activate grates with push button marked "OUT"
3. Air cylinders push magnet grates out of product area
4. Tube scrapers follow tubes to scraping area
5. Tube scrapers stop and scrape metal off
6. Ferrous contamination falls off outside product area
7. Cleaning is finished in about 5 seconds
8. Push "IN" button to return magnet to product area

Each individual user can determine the cleaning cycle frequency. The factors that determine the time between cycles are the amount of ferrous contamination in the product and how magnetic the contamination is (how well it will be held by the magnet). The cleaner the magnet surface, the more efficient the magnet will be.

Between batch operations is an ideal time to clean the magnet. Connecting the control in conjunction with the shut off valve or other device upstream is ideal.

Visual Determination

To visually determine the cleaning cycle, an access door is located on the product housing opposite the safety housing. Two Destaco clamps hold the door closed.

After the product flow is stopped and before starting the cleaning cycle, examine the ferrous build-up on the magnet tubes. Open the door and blow the product from the tubes. The ferrous material will appear as rings around the magnet. The unit is ready to clean if the build-up is between 1/8 inch and 1/4 inch.

Cycle Time Adjustment

Contamination levels or convenient cycling times can also determine cleaning cycles.

For example:

Very light contamination	8 Hours (each shift)
Average contamination	2-3 Hours
Heavy contamination	30-60 Minutes

Note: Heavily burdened tube magnet saturation may cause a decrease in separation efficiency. However, cleaning too often might result in losing too much product scraped from the top of the tube magnets. Cleaning too often will also cause premature part wear.

Maintenance

Warning

This unit contains moving parts. Turn off and lock out electrical power and pneumatic supply before opening safety housing.

Examinations

If properly cared for, the permanent magnets should never lose strength and require no maintenance. They do require periodical visual examination, especially with highly abrasive products.

The air cylinders should be examined every month under normal operating conditions. No lubrication of the air cylinders or drawer is required.

Examine the product housing and ferrous discharge areas for product build up, as necessary based on your product. Product build up is the most likely cause of product leaking or the grate not completing the cycle.

Gasket Replacement

If product escapes from the tube scraper area while the magnet drawer is in the product area, then examine the gasket around the magnet drawer opening.

To examine or replace:

1. Shut off product flow
2. Cycle drawer "OUT"
3. Lock out, tag out pneumatic and electrical supply
4. Remove top of safety housing, (4) screws
5. Locate magnet drawer stop assembly
6. Remove (6) 3/8-16 attached bolts
7. Slide stop assembly to far end of magnet tubes
8. Examine/replace gasket

Tube Scraper Bar Replacement

The other wear item is the tube scraper bar. Note that the tube scraper is not a tube wiper and that a cleaned tube will have a minor amount of product and ferrous remaining at the end of the cycle. When an excess amount (1/32 to 1/16 inch) of ferrous remains on the tubes, then the scrapers should be replaced.

To examine or replace:

1. Complete the (8) steps for replacing gasket and also replace gasket while in this process.
2. Remove the bar from the end of magnet tubes closest to the product housing. Each tube magnet has a socket hex screw.
3. Remove white plastic bar (on some units, this may be an aluminum bar).
4. Examine split rings. If they are still snug on the tube magnet, they are still good. (Note that the rings do the scraping. The white plastic bars that "sandwich" the split rings contain the product and isolate the ferrous material during cleaning.)
5. Remove split rings and examine second white plastic bar.
6. Replace components as necessary. Bars and split rings may be purchased separately, if required.
7. Reassemble the stop assembly. The bottom bar must be flush with the inside of the housing channels on each side. The top of the middle bar must be flush with the inside of the upper housing channels.

Note: Eriez recommends evaluating and replacing worn Tube Scrapers every 3-6 months as necessary.



Dust-tight, Sanitary, Convertible (DSC) Manual Units

Description

Eriez DSC Easy-to-Clean Grate-In-Housings eliminate the costly shutdown of product lines typically required to remove, clean and reinstall the magnetic elements. Easier, more frequent cleaning prevents excessive iron contamination build-up on the magnets and assures maximum separating efficiency. The magnet grates are individually removed from the product stream to ensure constant protection. At a point outside the product flow, contamination is discharged. The entire cleaning operation takes place in seconds per bank.

Eriez DSC Easy-to-Clean Grates remove minus 1/2" ferrous contamination from almost any dry, granular, free-flowing material including grains, feeds, spices, foods, sugar, powders, plastics, dry pulps, ceramic materials, chemicals and minerals. If ferrous contamination is larger than 1/2" size, a non DSC Easy-to-Clean Grate-In-Housing should be used.

DSC Easy-to-Clean Grates are available in both standard ceramic magnetic material and Eriez Rare Earth, the strongest permanent magnetic material on the market today.

Installation

Select a location in the system where the product will free fall through the grate magnets, such as a section below a product shut off valve, delumper or other area where product will not backup into the grate. Standard unit height is 12.25" (311mm) flange to flange.

Installation is most desirable at chest height or approximately 4 or 5 feet (1200 to 1500mm) above the standing surface.

Installation must permit room for the magnet grate to extend fully and also permit 3 to 4 feet (900 to 1200mm) of room for the person doing the cleaning. The grate extension length of your particular size unit is given on the outline drawing or can simply be measured on the unit.

The grate housing is designed to be flange mounted to the pipe, chute or ductwork. The unit must be rigidly attached, and supported if necessary. The horizontal pull force of the magnet grate will be 15 to 40 lbs. (67 to 178N) depending on the amount of ferrous material collected on the magnet tubes.



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

Operation

To clean ferrous material from the magnet tubes, simply release the quick release clamp on each side of the top grate handle then pull out the magnet grate. Resistance of 15 to 40 lbs. (67 to 178N) should be expected depending on the amount of ferrous material collected on the magnet tubes.

Re-insert and relatch the top grate and then clean the second grate. By keeping one bank of magnets in the product flow at all times, the unit may be cleaned without shutting off the product flow. Note that the unit is not completely sealed, so dust may escape with dusty products.

Frequent cleaning will allow for easier grate retraction and optimum iron separation. Product testing or visual observation of magnet loading through the product access door will help determine your specific cleaning cycle. Overloaded magnets will have bands of iron particles built up from 1/8" to 1/4" (3 to 6mm) above the surface of the tube. It is not uncommon for some small amount of tramp metal to remain on the tubes after cleaning.

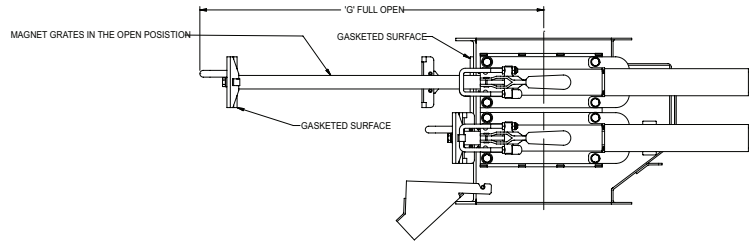
Maintenance

The DSC Easy-to-Clean Grate requires no maintenance other than replacement of “wear” parts on a periodic basis. The replacement period will depend upon the abrasiveness of the product and the amount of ferrous material being removed from the product. The only recommended spare parts are the tubescraper split rings.

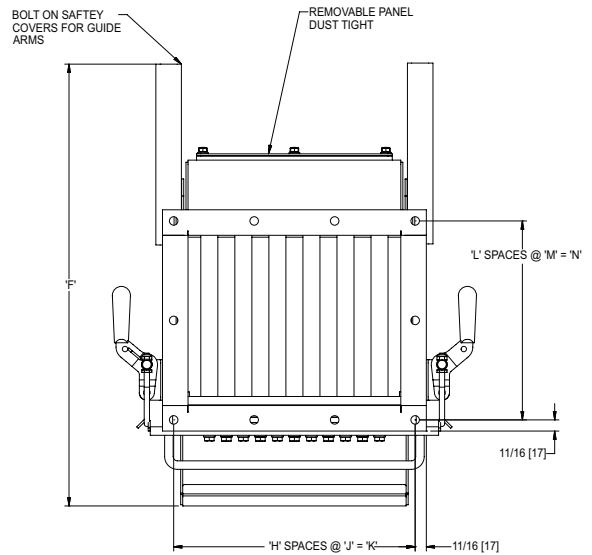
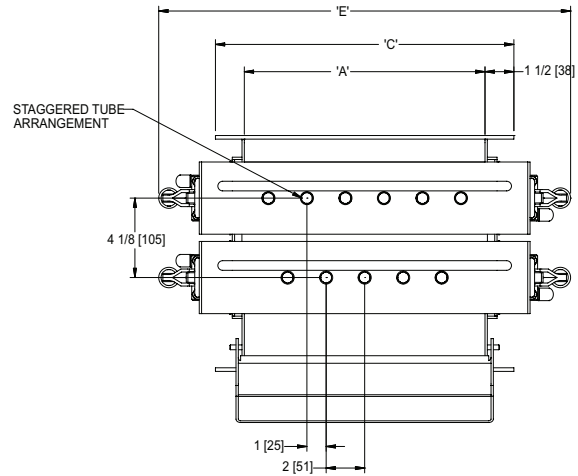
When an excess amount (1/32" to 1/16") (1 to 2mm) of ferrous metal remain on the tubes after cleaning, the tubescraper split rings should be replaced. Note that the tubescrapers clean on both the in and out strokes. Examine the tubes in the product area to determine if excess ferrous material is remaining on the tubes. After both strokes, a minor amount of ferrous pass-thru is expected and is easily secured by the magnets.

To replace the split rings, open the rear access panel by removing the (6) 1/4-20 nuts. Remove the 3/8-16 bolts and the rear tie bar from the tubes. Pull magnet drawer completely out of housing. Remove (4) #8-32 Socket Cap screws from the side of the tubescraper assembly. Remove from housing. Remove the (6) 10-32 flat head screws from the tubescraper assembly. The Tivar portion of the tubescraper can now be removed and the split rings replaced. Inspect the Tivar portion of the tubescraper and replace as needed. While the drawer is removed inspect gasket on housing and drawer magnet, replace if necessary. Reassemble all components. Repeat same procedure for second bank of tubes.

Note: Although the magnet tubes are not considered a wear item, periodic examination is necessary especially with highly abrasive products. If a magnet tube should wear through, repair at our facility is necessary. Alteration and disassembly of the magnet would disturb a carefully engineered magnetic circuit, which could only be restored by rebuilding and recharging. Repair, alteration or disassembly of this magnetic equipment in the field without written authorization and instruction by Eriez Manufacturing Company nullifies the responsibility and guarantee of the manufacturer.



TOP MAGNET GRATE IN OPEN POSITION
SCALE 1 / 4



UNIT SIZE	MAGNET TUBE QTY.	ARRANGEMENT TOP/BOTTOM	A	B	C	E	F	G	H	J	K	L	M	N	WEIGHT LBS/KG
6-1/2 X 4	5	3/2	6-1/2 (165)	4 (102)	9-1/2 (242)	15-3/8 (391)	20 (508)	16-7/16 (418)	2	4-3/32	8-3/16	1	-	5-11/16	81/37
8-1/2 X 6	7	4/3	8-1/2 (165)	6 (152)	11-1/2 (292)	17-3/8 (441)	22 (558)	19-7/16 (483)	2	5-3/32	10-3/16	2	3-27/32	7-11/16	109/49
10-1/2 X 8	9	5/4	10-1/2 (267)	8 (203)	13-1/2 (343)	19-3/8 (482)	24 (610)	22-7/16 (570)	3	4-1/16	12-3/16	2	4-27/32	9-11/16	137/62
12-1/2 X 10	11	6/5	12-1/2 (318)	10 (254)	15-1/2 (394)	21-3/8 (543)	26 (660)	25-7/16 (645)	3	4-23/32	14-3/16	2	5-27/32	11-11/16	165/75
14-1/2 X 12	13	7/6	14-1/2 (368)	12 (305)	17-1/2 (445)	23-3/8 (594)	28 (711)	28-7/16 (721)	4	4-1/16	16-3/16	3	4-9/16	13-11/16	193/88
16-1/2 X 14	15	8/7	16-1/2 (418)	14 (356)	19-1/2 (496)	25-3/8 (645)	30 (762)	31-7/16 (797)	4	4-9/16	18-3/16	3	5-1/4	15-11/16	221/100
18-1/2 X 16	17	9/8	18-1/2 (470)	16 (406)	21-1/2 (546)	27-3/8 (695)	32 (813)	34-7/16 (874)	4	5-1/16	20-3/16	3	5-29/32	17-11/16	249/113



DSC Automated Units

Description

Eriez Automated DSC Easy to Clean Magnetic Grate-In-Housing (Auto DSC ETC) is designed to remove fine particle ferrous contamination and tramp from a dry free-flowing product under gravity flow.

The “Auto DSC ETC” consists of a dust-tight stainless steel product housing with a pneumatically operated cleaning drawer. During the cleaning cycle, the contaminants are discharged outside the product area. The discharge chute is located under the safety housing, which covers all moving parts.

Note: On the Automated version both grates are removed from the product flow simultaneously, therefore product flow needs to be shut off before cleaning.

“Ferrous” is iron containing material.

“Tramp” are particles up to 1/2 inch in any dimension.

Two air cylinders drive the drawer in and out. A filter/regulator controls the speed the drawer moves, and a double acting solenoid valve controls the direction of travel of the air cylinders and drawer. The unit requires a 60 to 80 psi air supply and a 120 / 60 VAC control to activate the double solenoid valve.

Installation

Receiving the Auto DSC ETC

After carefully uncrating the unit, notice that there are two sections, the unit itself and the control panel. Two pneumatic hoses should connect them. The hoses were used to test the unit at our facility and can be used as-is or new hoses or piping can be used to locate the panel further from the unit. The push button station may also be remotely located.

Threaded lifting/mounting holes (3/8-16) are located on top of each cylinder-mounting block.

Flange Mounting

The grate housing is designed to be flange mounted to the pipe, chute or ductwork. The unit must be rigidly attached and supported to resist the 50 lb. weight shift of the magnet drawer from the product housing.

Mounting Location

Select a location in the system where the product will free fall through the grate magnet, such as a section below a product shut off valve, delumper or other area where product will not back-up into the grate. Standard unit height is 11-1/4 inches (286mm) flange.

Air Supply and Connections

A 60 to 80 psi air supply is required to the 3/8 NPT port connection at the filter regulator. Connect 3/8 tubing from the solenoid valve to the right angle connectors on the product housing. No specific tube to fitting connection is critical at this point because these connections can be easily reversed after wiring the control to the solenoids, if necessary.

Electrical Control to Solenoid Valve

This is a double solenoid valve, 120 / 60 VAC.

A signal is required to each solenoid in turn to “spool” the valve in each direction. The solenoid requires a momentary signal and should not be continuously energized.

A certified electrician should complete this connection.

Ferrous Discharge Options

The ferrous (scrap) discharge area is located under the safety housing flange. Space must be provided so that scrap discharge can clear the safety housing and not back up into the unit. Continuation of the 45-degree angle deflectors to a collection point is the most common method of eliminating this waste. Typical scrap collection methods include:

- A tray or hopper. Analysis can be conducted on scrap amount and sources.
- A bucket, bag or barrel for periodic disposal.
- A conveying system for removal to a remote location.

Operation

IMPORTANT: The product flow must be shut off before the cleaning cycle is activated.

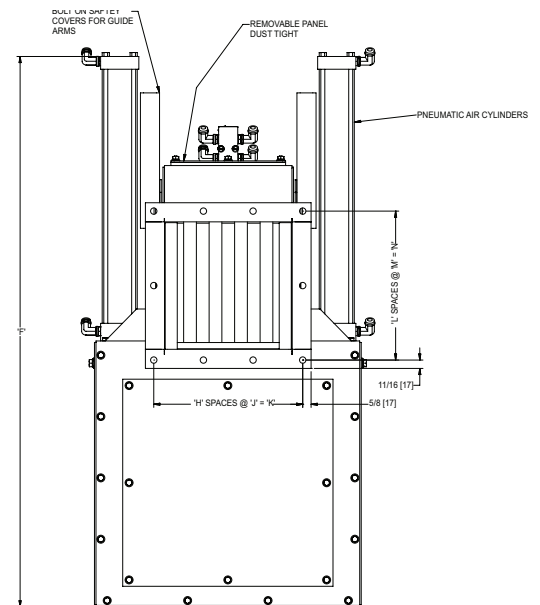
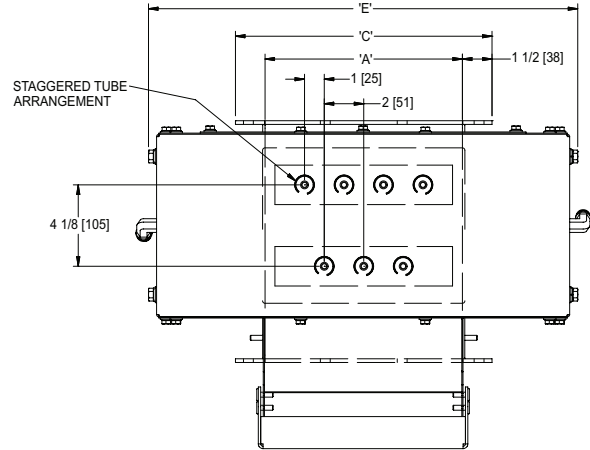
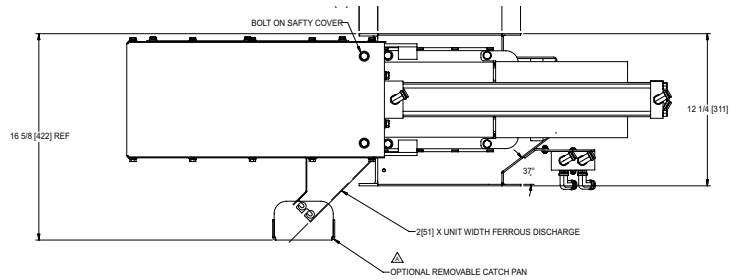
The pressure regulator is pre-set at the factory to cycle the air cylinders smoothly. Adjust the air pressure based on your product and cycling load. A smooth, steady cycle is better than one that slams the drawer in each direction.

The processing steps are as follows:

1. Product shut off before cleaning cycle
2. Activate grates with push button marked "OUT"
3. Air cylinders push magnet grates out of product area
4. Tube scrapers follow tubes to scraping area
5. Tube scrapers stop and scrape metal off
6. Ferrous contamination falls off outside product area
7. Cleaning is finished in about 5 seconds
8. Push "IN" button to return magnet to product area

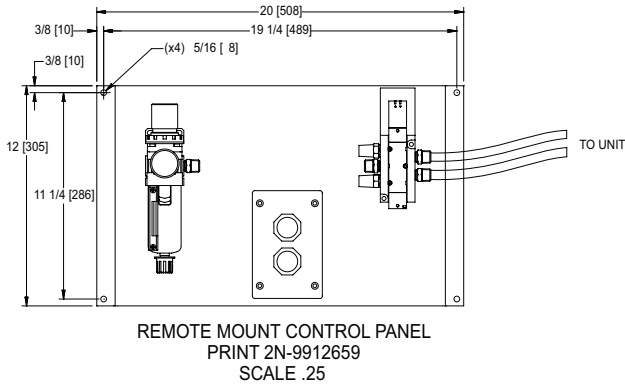
Each individual user can determine the cleaning cycle frequency. The factors that determine the time between cycles are the amount of ferrous contamination in the product and how magnetic the contamination is (how well it will be held by the magnet). The cleaner the magnet surface, the more efficient the magnet will be.

Between batch operations is an ideal time to clean the magnet. Connecting the control in conjunction with the shut off valve or other device upstream is ideal.



UNIT SIZE	MAGNET TUBE QTY.	ARRANGEMENT TOP/BOTTOM	A	B	C	E	F	H	J	K	L	M	N	WEIGHT LBS/KG
6 X 6	3	2/1	6 (152)	6 (152)	9 (229)	17-3/4 (460)	35-3/16 (894)	2	3-27/32	7-11/16	1	-	7-11/16	175/79
8 X 8	5	3/2	8 (203)	8 (203)	11 (279)	19-3/4 (501)	39-3/16 (996)	2	4-27/32	9-11/16	2	4-27/32	9-11/16	203/92
10 X 10	7	4/3	10 (254)	10 (254)	13 (330)	21-3/4 (552)	43-3/16 (1097)	3	3-29/32	11-11/16	2	5-27/32	11-11/16	231/105
12 X 12	9	5/4	12 (305)	12 (305)	15 (381)	23-3/4 (603)	47-3/16 (1199)	3	4-9/16	13-11/16	3	4-9/16	13-11/16	269/118
14 X 14	11	6/5	14 (356)	14 (356)	17 (432)	25-3/4 (654)	51-3/16 (1300)	3	5-7/32	15-11/16	3	5-7/32	15-11/16	287/131
16 X 16	13	7/6	16 (406)	16 (406)	19 (483)	27-3/4 (704)	55-3/16 (1402)	4	4-7/16	17-11/16	3	5-29/32	17-11/16	315/144
18 X 18	15	8/7	18 (457)	18 (457)	21 (533)	29-3/4 (755)	59-3/16 (1503)	4	4-15/16	19-11/16	4	4-15/16	19-11/16	343/157





Visual Determination

To visually determine the cleaning cycle, an access door is located on the product housing opposite the safety housing. This door is held closed by (6) 1/4-20 nuts.

After the product flow is stopped and before starting the cleaning cycle, examine the ferrous build-up on the magnet tubes. Open the door and blow the product from the tubes. The ferrous material will appear as rings around the magnet. The unit is ready to clean if the build-up is between 1/8 inch and 1/4 inch.

Cycle Time Adjustment

Contamination levels or convenient cycling times can also determine cleaning cycles.

For example:

Very light contamination	8 Hours (each shift)
Average contamination	2-3 Hours
Heavy contamination	30-60 Minutes

Note: Heavy burdened tube magnet saturation may cause a decrease in separation efficiency. On the flip-side, however, cleaning too often might result in losing too much product scraped from the top of the tube magnets. Cleaning too often will also cause premature part wear.

Maintenance

Warning

This unit contains moving parts. Turn off and lock out electrical power and pneumatic supply before opening safety housing.

Examinations

If properly cared for, the permanent magnets should never lose strength and require no maintenance. They do require periodical visual examination, necessary especially with highly abrasive products.

The air cylinders should be examined every month under normal operating conditions. No lubrication of the air cylinders or drawer is required.

Examine the product housing and ferrous discharge areas for product build up, as necessary based on your product. Product build up is the most likely cause of product leaking or the grate not completing the cycle.

To replace the split rings first remove the safety housing by removing the (4) 3/8 bolts. Open the rear access panel by removing the (6) 1/4-20 nuts. Remove the 3/8-16 bolts and both rear tie bars from the tubes. Pull magnet drawer completely out of housing. Set aside on non-magnetic surface. Remove (4) #8 screws from the side of the upper tubescraper assembly. Remove from housing. Remove the (6) 10-32 flat head screws from the tubescraper assembly. The Tivar portion of the tubescraper can now be removed and the split rights replaced. Inspect the Tivar portion of the tubescraper and replace as needed. Repeat this for the lower tubescraper assembly. While the drawer is removed inspect gasket on housing and drawer magnet, replace if necessary. Reassemble all components.

Note: Eriez recommends evaluating and replacing worn Tube Scrapers every 3-6 months as necessary.

DSC Self Cleaning Units

Description

Eriez Self Cleaning DSC Easy to Clean Magnetic Gate-In-Housing is designed to remove fine particle ferrous contamination and tramp from a dry free-flowing product under gravity flow.

The “Self Cleaning DSC ETC” consists of a dust-tight stainless steel product housing with separate pneumatically operated cleaning drawers. During the cleaning cycle, the contaminants are discharged outside the product area. The discharge chute is located under the safety housing, which covers all moving parts.

Note: On the Self Cleaning version, the drawer grates act independently. One bank can be kept in product flow at all times, therefore the unit may be cleaned without shutting off the product flow. Note that the unit is not completely sealed so dust may escape with dusty products.

“Ferrous” is iron containing material.

“Tramp” are particles up to 1/2 inch in any dimension.

Two air cylinders drive each drawer in and out. A filter/regulator controls the speed the drawer moves, and a double acting solenoid valve controls the direction of travel of the air cylinders and drawer, one solenoid for each drawer. The unit requires a 60 to 80 psi air supply and a 120 / 60 VAC control to activate the double solenoid valve.

Installation

Receiving the Auto DSC ETC

After carefully uncrating the unit, notice that there are two sections, the unit itself and the control panel. Four pneumatic hoses should connect them. The hoses were used to test the unit at our facility and can be used as-is or new hoses or piping can be used to locate the panel further from the unit. The push button station may also be remotely located.

Threaded lifting/mounting holes (3/8-16) are located on top of each cylinder-mounting block.

Flange Mounting

The grate housing is designed to be flange mounted to the pipe, chute or ductwork. The unit must be rigidly attached and supported to resist the 50 lb. weight shift of the magnet drawer from the product housing.

Mounting Location

Select a location in the system where the product will free fall through the grate magnet, such as a section below a product shut off valve, delumper or other area where product will not back-up into the grate. Standard unit height is 11-1/4 inches (286mm) flange.

Air Supply and Connections

A 60 to 80 psi air supply is required to the 3/8 NPT port connection at the filter regulator. Connect 3/8 tubing from the solenoid valve to the right angle connectors on the product housing. No specific tube to fitting connection is critical at this point because these connections can be easily reversed after wiring the control to the solenoids, if necessary. The connection of the air tubing will determine which bank each push button station controls.

Electrical Control to Solenoid Valve

This is a double solenoid valve, 120 / 60 VAC.

A signal is required to each solenoid in turn to “spool” the valve in each direction. The solenoid requires a momentary signal and should not be continuously energized.

A certified electrician should complete this connection.

Ferrous Discharge Options

The ferrous (scrap) discharge area is located under the safety housing flange. Space must be provided so that scrap discharge can clear the safety housing and not back up into the unit. Continuation of the 45-degree angle deflectors to a collection point is the most common method of eliminating this waste. Typical scrap collection methods include:

- A tray or hopper. Analysis can be conducted on scrap amount and sources.
- A bucket, bag or barrel for periodic disposal.
- A conveying system for removal to a remote location.



Operation

IMPORTANT: The product flow must be shut off before the cleaning cycle is activated.

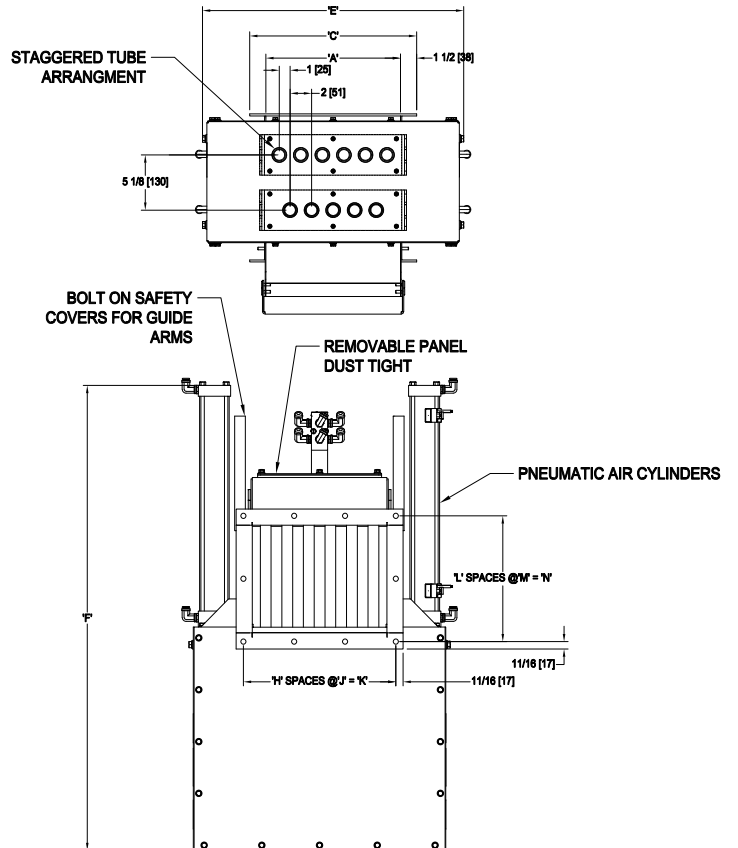
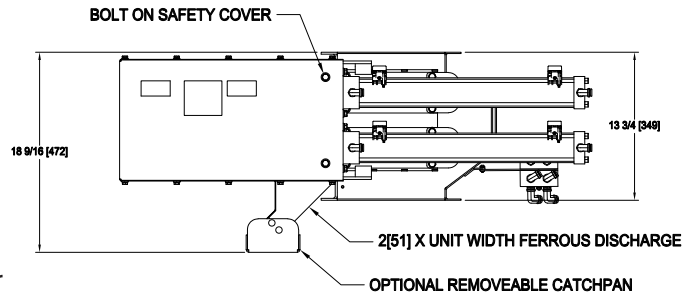
The pressure regulator is pre-set at the factory to cycle the air cylinders smoothly. Adjust the air pressure based on your product and cycling load. A smooth, steady cycle is better than one that slams the drawer in each direction.

The processing steps are as follows:

1. Activate top grate with push button marked “OUT” on the top push button bank
2. Air cylinders push magnet grate out of product area
3. Tube scrapers follow tubes to scraping area
4. Tube scrapers stop and scrape metal off
5. Ferrous contamination falls off outside product area
6. Cleaning is finished in about 5 seconds
7. Push “IN” button on top push button bank to return top magnet to product area
8. Repeat steps 3-9 for bottom grate

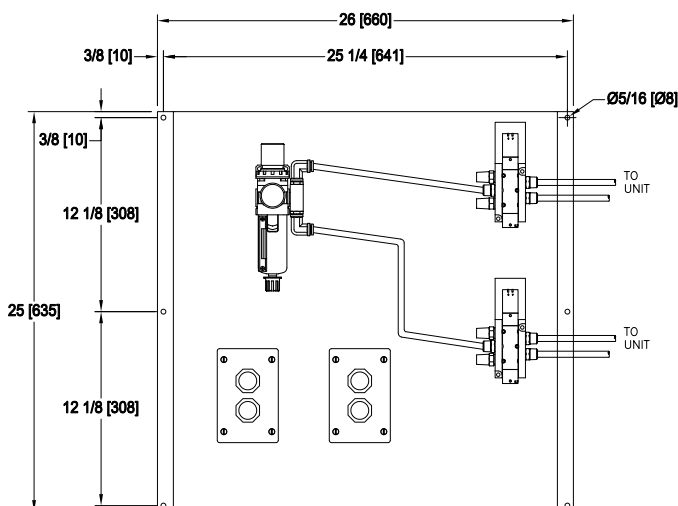
Each individual user can determine the cleaning cycle frequency. The factors that determine the time between cycles are the amount of ferrous contamination in the product and how magnetic the contamination is (how well it will be held by the magnet). The cleaner the magnet surface, the more efficient the magnet will be.

Between batch operations is an ideal time to clean the magnet. Connecting the control in conjunction with the shut off valve or other device upstream is ideal.



UNIT SIZE	MAGNET TUBE QTY.	ARRANGEMENT TOP/BOTTOM	A	B	C	E	F	G	H	J	K	L	M	N	WEIGHT LBS/KG
6-1/2 X 4	5	3/2	6-1/2 (165)	4 (102)	9-1/2 (242)	18-1/4 (464)	31-3/16 (792)	16-7/16 (418)	2	4-3/32	8-3/16	1	-	5-11/16	149/68
8-1/2 X 6	7	4/3	8-1/2 (165)	6 (152)	11-1/2 (292)	20-1/4 (514)	35-3/16 (894)	19-7/16 (483)	2	5-3/32	10-3/16	2	3-27/32	7-11/16	201/91
10-1/2 X 8	9	5/4	10-1/2 (267)	8 (203)	13-1/2 (343)	22-1/4 (565)	39-3/16 (995)	22-7/16 (570)	3	4-1/16	12-3/16	2	4-27/32	9-11/16	252/114
12-1/2 X 10	11	6/5	12-1/2 (318)	10 (254)	15-1/2 (394)	24-1/4 (616)	43-3/16 (1,097)	25-7/16 (645)	3	4-23/32	14-3/16	2	5-27/32	11-11/16	303/137
14-1/2 X 12	13	7/6	14-1/2 (368)	12 (305)	17-1/2 (445)	26-1/4 (667)	47-3/16 (1,199)	28-7/16 (721)	4	4-1/16	16-3/16	3	4-9/16	13-11/16	355/161
16-1/2 X 14	15	8/7	16-1/2 (418)	14 (356)	19-1/2 (496)	28-1/4 (718)	51-3/16 (1,300)	31-7/16 (797)	4	4-9/16	18-3/16	3	5-1/4	15-11/16	407/185
18-1/2 X 16	17	9/8	18-1/2 (470)	16 (406)	21-1/2 (546)	30-1/4 (768)	55-3/16 (1,402)	34-7/16 (874)	4	5-1/16	20-3/16	3	5-29/32	17-11/16	458/208





Maintenance

Warning

This unit contains moving parts. Turn off and lock out electrical power and pneumatic supply before opening safety housing.

Examinations

If properly cared for, the permanent magnets should never lose strength and require no maintenance. They do require periodical visual examination, necessary especially with highly abrasive products.

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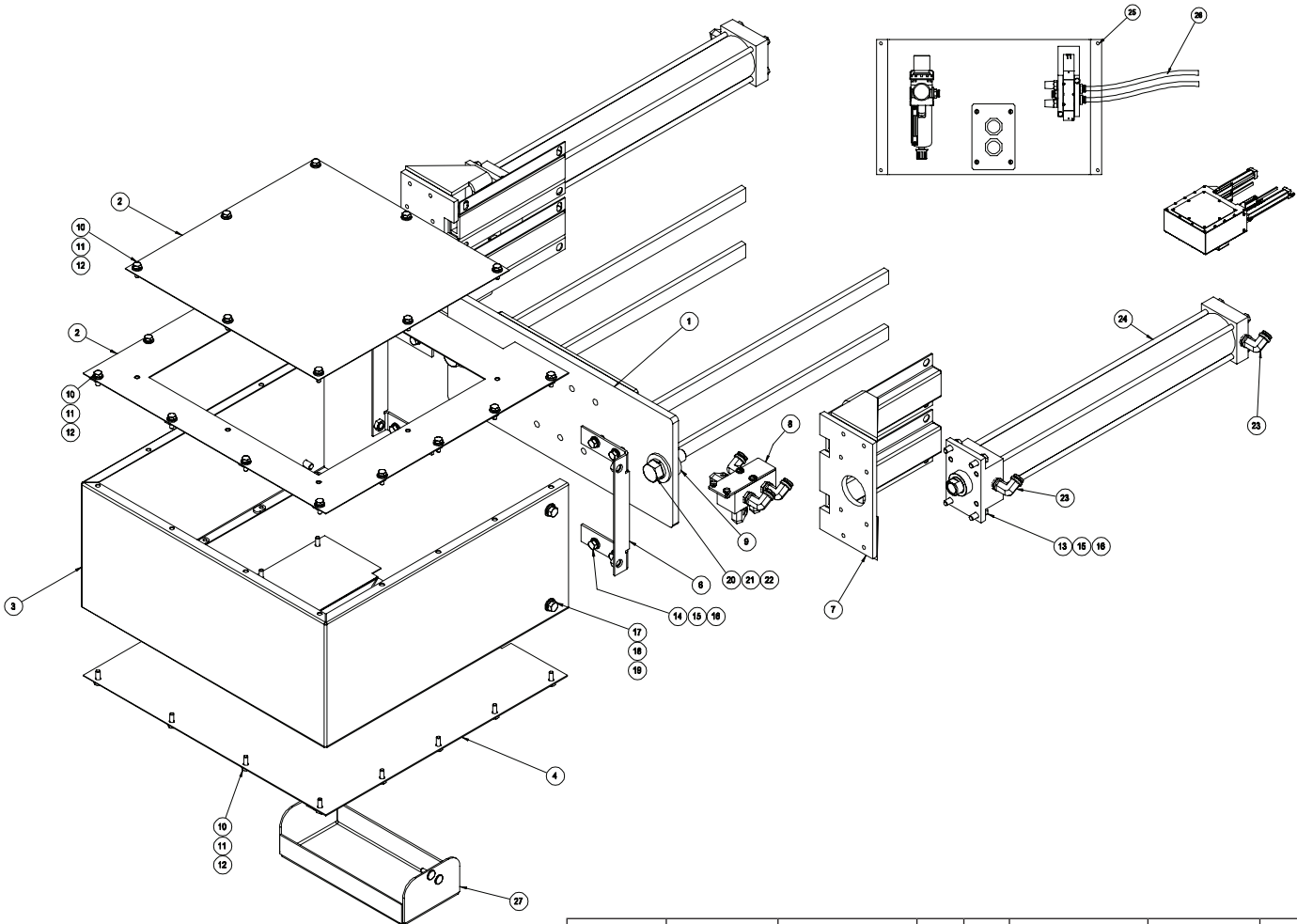
For example:

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Heavy contamination	30-60 Minutes

Note: Heavy burdened tube magnet saturation may cause a decrease in separation efficiency. On the flip-side, however, cleaning too often might result in losing too much product scraped from the top of the tube magnets. Cleaning too often will also cause premature part wear.



DSC Manual to Automated Conversion Procedure Drawing



GR. NO.	UNIT SIZE	A	B	C	D	E	F
1	6 X 6	3N-201700936	1	1	2N-201703042	473189	1
2	6-1/2 X 4	3N-201702548	1	2	2N-201703073	473188	2
3	8 X 8	3N-201700936	2	3	2N-201703038	473190	3
4	8-1/2 X 6	3N-201702548	2	4	2N-201703072	473189	4
5	10 X 10	3N-201700936	3	5	2N-201702545	472919	5
6	10-1/2 X 8	3N-201702548	3	6	2N-201703070	473190	6
7	12 X 12	3N-201700936	4	7	2N-201703044	473191	7
8	12-1/2 X 10	3N-201702548	4	8	2N-201609425	472919	8
9	14 X 14	3N-201700936	5	9	2N-201703046	473192	9
10	14-1/2 X 12	3N-201702548	5	10	2N-201703068	473191	10
11	16 X 16	3N-201700936	6	11	2N-201703048	473156	11
12	16-1/2 X 14	3N-201702548	6	12	2N-201703067	473192	12
13	18 X 18	3N-201700936	7	13	2N-201703057	473193	13
14	18-1/2 X 16	3N-201702548	7	14	2N-201702550	473156	14

DSC Manual to Automated Conversion Parts List

REQD.	ITEM NO.	STOCK NO. DWG. NO.	GROUP NO.	DESCRIPTION OF PART
A/R	27	2N-201703501	F	DISCHARGE CATCH PAN AUTO
1	26	435806		AIR TUBING
1	25	2N-9912859		CONTROL PANEL
2	24	'E'		CYLINDER AIR TRD MFG-TA-MF1-2.5X____-HC-ST=2-OS-1-KK3
4	23	415999		FITTING ELLW189PL-6-6 3/8MPTX90 DEG PARKER
2	22	235949		WASHER LOCK SS 3/4-16 X 2-1/4
2	21	235906		WASHER FLAT SS 3/4 AXS
2	20	226376		BOLT HEX HD SS 3/4-16 X 2-1/4
4	19	235943		WASHER LOCK SS 3/8 AXS
4	18	235154		WASHER FLAT SS 3/8 AXS
4	17	235154		BOLT HEX HD SS 3/8-16 X 3/4 AXS
16	16	235944		WASHER LOCK SS 5/16 AXS
16	15	235904		WASHER FLAT SS 5/16 AXS
8	14	235141		BOLT HEX HD SS 5/16-16 X 3/4 AXS
8	13	235144		BOLT HEX HD SS 5/16-18 X 1 AXS
40	12	235945		WASHER LOCK SS 1/4 AXS
40	11	235905		WASHER FLAT SS 1/4 AXS
40	10	235113		BOLT HEX HD SS 1/4-20 X 3/4 AXS
2	9	1N-201601072		0.375 THK 0.75 SPACER WASHER
1	8	2N-201703315		PNEUMATIC MANIFOLD ASSY.
2	7	3N-201609387		CYLINDER MOUNT AND DRAWER GUIDE ASSY.
2	6	2N-201609423		FRONT COVER ANGLE
1	5	'D'		PROTECTIVE HOUSING TOP
1	4	2N-201609434	C	PROTECTIVE HOUSING BOTTOM ASSY.
1	3	3N-201609428	C	PROTECTIVE FRONT HOUSING WRAP
1	2	2N-201702549	C	PROTECTIVE HOUSING COVER
1	1	'A'	B	AUTOMATED MAG DRAWER

DSC Manual to Automated Conversion Procedure

- Approximately 2-3 hours of time
- A second person to help you is highly recommended although not required

Tools Required

- Non-magnetic workbench
- Crescent wrench
- Vice grips or channel lock
- 5/32" allen wrench
- 3/8" ratchet with the following sockets:
3/8", 7/16", 9/16", 1/2"
- UHMW Tube Guard (included in your conversion kit)
- 1/2" to 1" thick 12" x 12" board (to be used as a spacer for safety)



Instructions

1. Removal of carriages

- a. Remove the inspection panel on rear of unit
- b. With the 5/32" allen wrench, remove all of the 3/8" bolts from rear of tubes to remove the tie bar(s).
- c. Once tie bar(s) are removed, return to the front of the housing and carefully remove magnetic carriages one at a time from the tubescraper assemblies.
- d. Set magnetic carriages aside on non-magnetic surface for conversion to automated carriages with 1-foot of space (or more) between them.
- e. Now is a good time to inspect your magnetic tubes as well as the tubescrapers themselves and replace accordingly.

2. Magnetic Tube Swap Conversion of Carriages from Manual to Automated

- a. Start with bottom carriage from manual unit (fewer tubes). Using tube guard provided, place guard on 2nd tube from the left end of carriage and carefully remove bolt from first tube while holding it apart with other hand.
Place the tube on a non-magnetic surface separated by wood blocks (or other functional spacers like books or bricks even) while out of carriage.
- b. Move guard to next tube and repeat
- c. Repeat process 2a for top carriage
- d. To add tubes back to the automated carriage face, start with bottom row (fewer tubes) and bolt the first outer-most tube in place
- e. Cover the secured first tube with the tube guard and bolt the second tube in place
- f. Move tube guard to second tube and repeat until all bottom tubes are in place
- g. Before bolting top row in place, place wood board(s) on top of bottom tubes covering all magnetic sections of tubes - this will help you work safer around the magnets
- h. Repeat the process for top row using tube guard provided
- i. Set aside new carriage(s) on non-magnetic surface until ready for installation

3. Installing Automated Components to Housing

- a. Remove (8) 3/8 bolts from sides of housing to remove manual style slides, clamp assemblies, and guide guards
 - i. It is best to start with the bolts that are in the rear as they also hold on the slide guards coming off the rear of the unit
 - ii. Repeat for both sides
- b. Put new white sliders inside new side brackets and cylinder mounts, then bolt to side of housing with (8) 3/8" bolts
 - i. Remember to bolt side guards with rear bolts of side plates
 - ii. Repeat for both sides
- c. Mount air cylinders to brackets with (4) 5/16" bolts
 - i. Repeat for both sides
- d. Take air distribution block and bracket to mount to rear of housing underneath inspection door with elbow valves facing down using the included (4) 10-24 screws.
- e. Run supplied 3/8" air line(s), from front of each cylinder to the ports on block closest to housing, on each side. Rear air lines are run to rear ports on each side.
- f. On front of housing, bolt (2) safety housing brackets to face plates of cylinders with (4) 5/16" bolts per bracket.
- g. Install automated carriage by putting guide arms through slides and tubes through tubescraper assemblies and push all the way into housing
 - i. This is where a second person is most helpful so they can align the tubes through the tubescrapers while the other person helps support the assembly
- h. From rear of housing re-attach tie bars with 3/8" allen screws and Loctite - (Blue)
- i. Attach carriage to air cylinder with large bolts using spacers provided and a crescent wrench. Tighten down until cylinder arm spins. Using vice grips or channel locks, hold cylinder arm in place and use crescent wrench to screw down bolts to cylinders.
- j. Assemble safety housing top, bottom, and sides together
- k. Install assembled safety housing using (4) 3/8 bolts
- l. Bolt rear inspection door back on
- m. Cycle unit to ensure it operates properly. Your work is now complete.

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