

FORMPAK INC

500 FL INSTALLATION AND OPERATION MANUAL 2021 EDITION

The IOM covers the following:

- Technical Data Sheet on 500 FL
110-TDS-500-FL
- Modular Unloader IOM
111-CM-MU



FormPak, Inc. 355 Paul Avenue St. Louis, MO 63135 314.475.3200 800.936.7672

DISCLAIMERS:

NOT ALL ITEMS IN THIS MANUAL ARE ON EVERY SYSTEM.

SYSTEM CONFIGURATIONS VARY PER CUSTOMER ORDERS & SPECS.

ANY MODIFICATIONS TO THE EQUIPMENT WITHOUT APPROVAL OF FORMPAK ENGINEERING WILL RESULT IN VOIDING ANY WARRANTY.

Operation Hours

Monday – Friday 8:00AM-5:00PM CST

Contacts at FormPak

Mike Owens Ext 402
Sales / General Questions
Email: mike@formpakinc.com

Larry Markos, P.E. Ext 403
Engineering / Technical Support / Maintenance
Email: larry@formpakinc.com

Robert Contreras Ext 405
Operations Manager Email:
Email: robert@formpakinc.com

Joseph Beckerman Ext 414
Electrical / Controls Email:
Email: josephb@formpakinc.com

Brian Beirne Ext 412
Purchasing / Parts Email:
Email: brianb@formpakinc.com

Fax: 314-475-3201

Meeting Your Dry Material Handling & Packaging Needs Since 1968

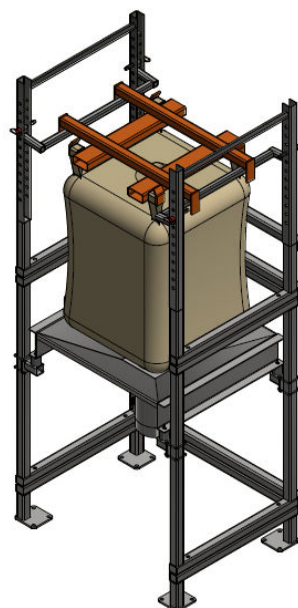
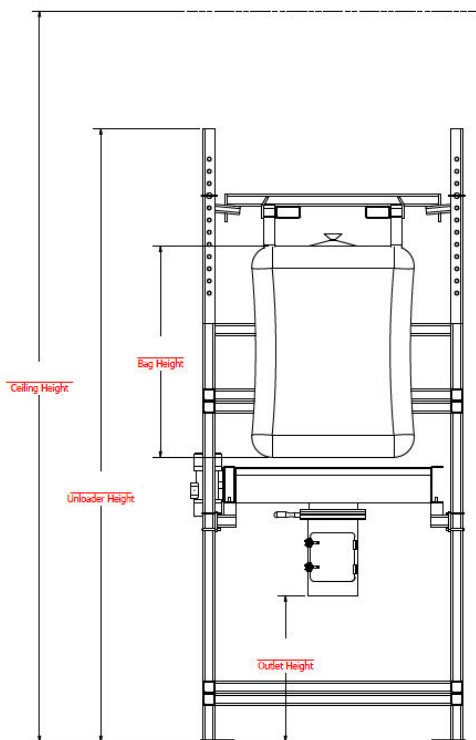
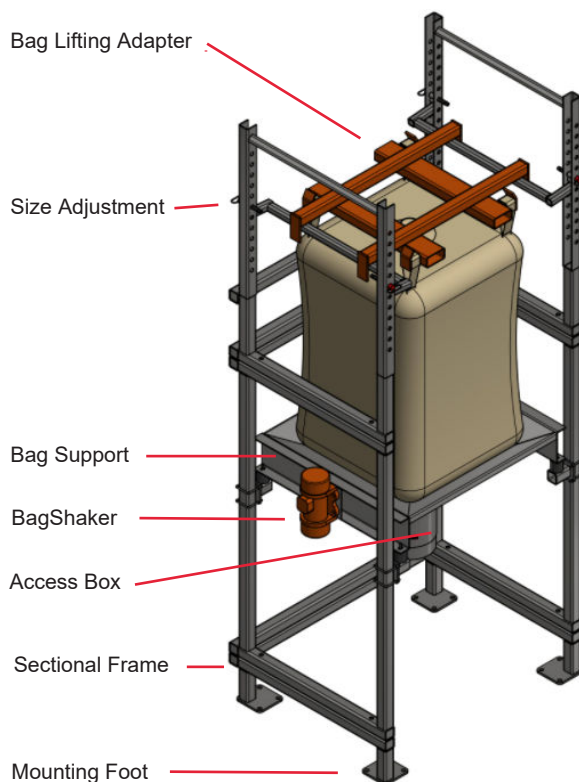
Approved By:	Approved By:	Document Name:	Rev:
Lucas Pulley	Amanda Michaels	111-CM-CP	-----

Application

Bulk bag (Super Sack) unloading frame - Fork Truck Entry

Design

3" and 4" x 1/4" wall tubular steel frame with Bulk Bag Lifting Adapter, fully adjustable bag adapter receiver arms (for adjusting to multiple bag sizes in a 30" range at 1" increments), a full bag bottom support pan with agitated "BagShaker" (live bottom) material flow promotion system, an access box for easy and safe spout untying/opening, and heavy 1/2" x 8" square mounting feet with pre-drilled holes for secure anchoring.



3 Phase Voltage

☐ 230V - 240V

☐ 440V - 480V

Materials:

Product contact parts: Mild or Stainless Steel (304, 304L, 316, 316L, in mill, bead blasted, 2B, or custom finish)

Painting:

Standard is Enamel paint light grey RAL 7035
Optional Epoxy, Steel-It, and any custom color

Seals:

PTFE, Neoprene, Silicon

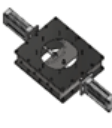
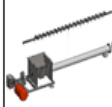
Temperature-Limits:

Ambient: 0° - 105°F (-20° - 40°C)

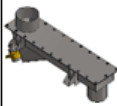
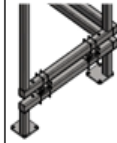
Explosion Proof (NEC) Options :

Standard Class II, Div II, Group F&G
Optional Class I, Div II, Group C&D
Class I, Div I, Group F&E

Options

Iris Valve	Iris valves allow for remote opening of bag spout after untying, metering of material into downstream process, or cutting off flow of material allowing for bag spout retie and bag removal	12" round with 304 stainless steel contacts and aluminum body are standard. 15" and 18" are also available as well as all 304 or 316 stainless steel construction.	
BagChoker Valve	The BagChoker system is an acutated cut off of the bag spout using (2) opposing air cylinder driven C-shaped bar assemblies that require (2) hand operation.	12" 304 stainless steel construction is standard	
Slide Gate Valve	Manual or Acutated Slide Gate Valves allow for metering material flow from system, or cutting off flow completely.	12" x 12" sqaure roller gate with 304 stainless blade and contacts, aluminum body is standard. 4"-20" square or round, in all 304 or 316 stainless steel are available. Typically supplied with support frame and transitions	
Rotary Valve	Motorized Rotary Valves allow for metering material flow from system, or cutting off flow completely. Often used to feed pnematic conveying systems	8" round or sqaure valve in cast steel or 304 stainless are most common, but 6" - 18" units in mild steel, 304 or 316 stainless steel and even CIP (Clean-In-Place) units are available. Typically supplied with support frame and transitions	
Flexible Screw Conveyor	Flexible Screw Conveyors allow for elevating and/or metering material into downstream processes. These include an infeed hopper, UHMW casing (tube), and discharge head with motor & geardrive assembly	4.5" diameter flat wire in 304 stainless steel is most common. Also available in 3" - 8" diameters with round, square, or beveled augurs up to 40' in length. Infeed hopper of 1-50 cubic feet (3.5 - 5 standard) and 3HP-15HP 3-phase drives (230-460/3/60). Mild steel, 304 or 316 stainless steel, and even CIP (Clean-In-Place) units are available	
Screw Feeder	Screw Feeders allow for presice metering of material into downstream processes that are typically at low elevation from grade. These include an infeed hopper, metal tube, screw, and motor & geardrive	2", 4", and 6" diameter flat wire in 304 stainless steel is most common. Also available with round, square, or beveled augurs with or without cores. 2HP-5HP 3-phase drives (230-460/3/60). Mild steel, 304 or 316 stainless steel units are available	

Options - Continued

Vibratory Feeder	Vibratory feeders allow for precise metering of friable or difficult to handle materials into downstream processes.	12" wide x 24" long tray 304 stainless steel is most common. Also available in tube or enclosed trays as wide as 36" and as long as 20'. Magnetic drives or dual 1HP 3-phase (230-480/3/60) drives. Mild steel, 304 or 316 stainless steel units are available	
Scales	Scales (load cells) allow for weighing and batching of material from bags via metering devices such as slide gate valves, rotary valves, flexible screw conveyors, feeders, etc. and scale controls	(4) 2,500# pancake style load cell assemblies located between the lower sections of the bag unloader frame allow for weighing and gravimetric dispensing, while protecting them from errant fork truck tines	
Bag Break Integrated	Allows for small bags and other containers to be dumped into a shared hopper	5 cubic foot stand alone hopper with 1/2 hinged top with air shocks and offset bulk bag inlet is most common. Available in mild steel coated, or 304 or 316 stainless steel (mill, bead blasted, or 2B finish).	
Surge Hopper	Surge hoppers allow for accumulation of material to allow for changing empty to full bags without starving downstream process. These can also be fitted with a level sensor for low-bag alarm systems	2-50 cubic feet in stand-alone or U-bolted frame arrangements. Available in mild steel coated, or 304 or 316 stainless steel (mill, bead blasted, or 2B finish). Vibrators or agitators are also available	
Conveyors	A myriad of conveyor options exist to transfer material to downstream processes. Selection and integration of these depends widely on material characteristics, rate, density, and other application specific details	Pneumatic vacuum or pressure systems, bucket elevators, belt conveyors, tubular chain or cable-disc systems, drag-chain, and screw conveyors are common	
Control Systems	Control systems are available for integrating additional components (conveyors, feeders, scales, etc.) in a single panel.	NEMA 4 enclosure with E-Stop, component On/Off switches, RiceLake scale controls, Allen-Bradley Micro PLCs, and PowerFlex VFD drives are most common. NEMA 4X as well as air purged or NEMA 7/9 panels are also available	
Bag Piercing Device	Bag piercing device is mounted in receiver hopper of unloader and will pierce the bag open. Allowing the bag to discharge freely.	Heavy-duty angle iron (4) way piercing device with angled mounting feet (pre-drilled for bolt mounting or plain for welding into place)	

Caution: measurements are for general reference only. Please consult dimensional drawing for exact measurements

FORMPAK INC

MODULAR UNLOADER-IOM 2021 EDITION

The IOM covers the following:

- 500-HT
- 500-FL
- 500-HF

Approved By:	Approved By:	Document Name:	Rev:
Lucas Pulley	Amanda Michaels	111-CM-MU	



FormPak, Inc. 355 Paul Avenue St. Louis, MO 63135 314.475.3200 800.936.7672

DISCLAIMERS:

NOT ALL ITEMS IN THIS MANUAL ARE ON EVERY SYSTEM.

SYSTEM CONFIGURATIONS VARY PER CUSTOMER ORDERS & SPECS.

ANY MODIFICATIONS TO THE EQUIPMENT WITHOUT APPROVAL OF FORMPAK ENGINEERING WILL RESULT IN VOIDING ANY WARRANTY.

Operation Hours

Monday – Friday 8:00AM-5:00PM CST

Contacts at FormPak

Mike Owens Ext 402
Sales / General Questions
Email: mike@formpakinc.com

Larry Markos, P.E. Ext 403
Engineering / Technical Support / Maintenance
Email: larry@formpakinc.com

Robert Contreras Ext 405
Operations Manager Email:
Email: robert@formpakinc.com

Joseph Beckerman Ext 414
Electrical / Controls Email:
Email: josephb@formpakinc.com

Brian Beirne Ext 412
Purchasing / Parts Email:
Email: brianb@formpakinc.com

Fax: 314-475-3201

Meeting your material handling needs since 1968.

MODULAR UNLOADER INDEX

Subject	Page Number
• Installation	3-7
I. Mechanical	3-5
❖ Plotting Placement of Unit	3
❖ Erecting the Unloader	4
❖ Mechanical	5
II. Electrical	6-7
III. Pneumatic	7
• Operation & Explanation	8-11
I. Overview	8
II. Adapters	8-9
III. Bag Handling Components	10-11
❖ Iris Valve & Access Box	10-11
• Maintenance	12-14
I. Gyrator Force Adjustment	12-13
II. Replacement or Spare Parts	14
• Formpak Machinery Catalog	15

Installation of 500 HT/FL/HF

I.) Mechanical

The FormPak 500 series of Bulk Bag Unloaders are modular in design. This modular construction allows for easy shipping, assembly on site, and if required, reconfiguration for another application. Unloaders may have up to four sections, the base, the HT top section, or the FL top section, and two middle sections. The larger of the two middle sections holds the bag pan and access box typically. Finally, a base section for holding load cells, and mounting to the floor.

❖ Plotting Placement of the Unit

The end process will dictate the path of installation. Set the bulk bag unloader frame in place. Refer to the drawing above for the correct orientation. Once the center line is established, use the measurement on the drawing to set the distance from the bag break to the unloader frame. The base is set first once the exact location of the unloader is determined. The base needs to be as level as possible. A slightly uneven base, will tilt the whole unloader. Set the base on the floor and mark the anchor bolt 1in-hole locations through the foot plates. It may be easier to mark the holes, move the base to drill the holes in the floor, then set the base back into position. Most installations require shims to level the base. Use a level on the three horizontal legs and shim as needed to level. Once level, and bolted down, the rest of the unloader frame can be assembled. If your machine has load cells, they are attached to the base, but do not install them yet. Either let them lay on the floor, or bolt them in pointing to the inside. These cells are sensitive to impacts, and can easily be damaged during assembly. They will be installed as one of the last items. For placement of load cell packs refer to the Load cell IOM further down in this document. If the fork lift you are using has a high enough lift, the sections of the unloader can be assembled without climbing. You will most likely need fork extensions. Note the sections weights on the bill of materials.

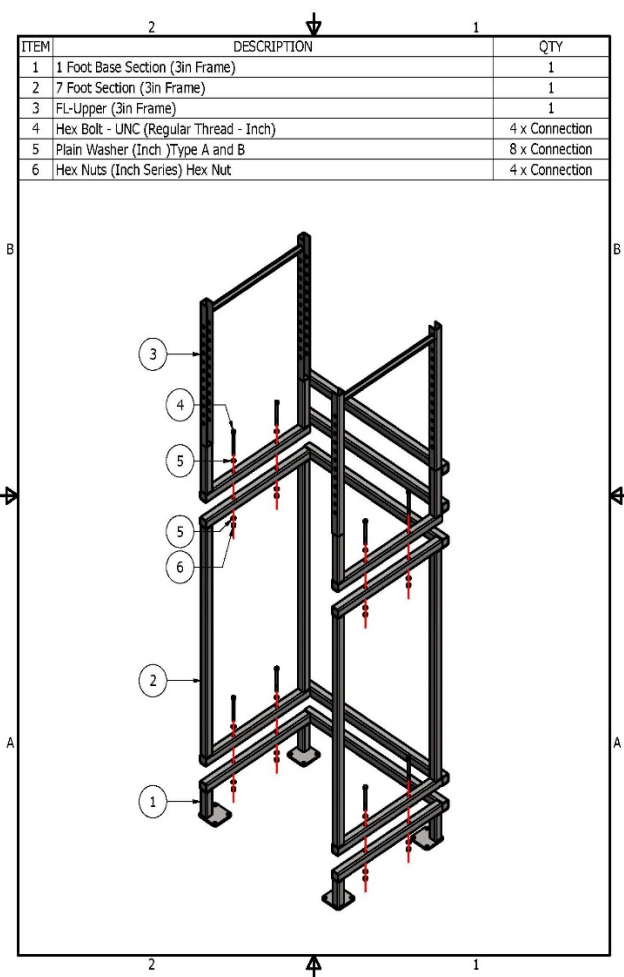
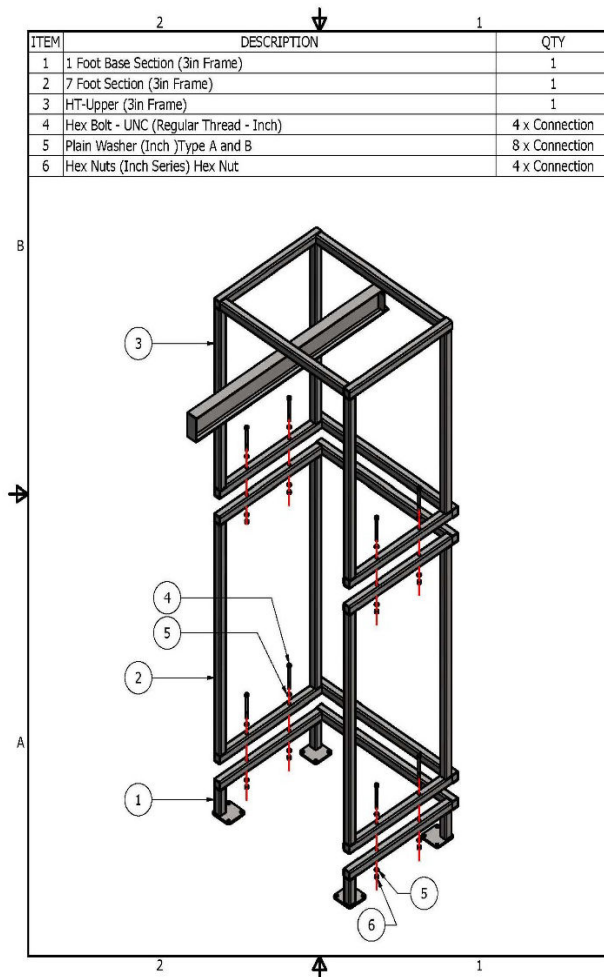
Installation of 500 HT/FL/HF

I.) Mechanical

❖ Erecting the Unloader

If we number the sections. The base is one, the top is four. The section with the bag pan and access box is two, and the short, remaining section is three. Pick up the top section, (four) and set it on section three. If an HT Model make sure the shipping bands are tight on the hoist, so the hoist does not shift during assembly. Securely bolt these two sections together. Now set section number two next to the unloader base. Set the assembly of sections four and three on top of section two, and bolt securely. Lift this assembly (carefully!) and set on the base and bolt together. If you don't have load cells, tighten these bolts. Loctite on all these frame bolts are recommended. If only three Sections follow the same steps but only merge the base and the middle section first. Then proceed with the upper section lastly. **Please watch the video for further explanation.**

This video provides an overview of how this is completed: <https://vimeo.com/396952126>



Installation of 500 HT/FL/HF

I.) Mechanical

Be sure to check your IOM's listed in the cover page to view all installation processes, Load Cells, FSC systems, etc.

Your unit may come with adjustable supports for the Bag Receiving Pan (BRP). The height of the BRP should already be set in its correct location based on customer approved drawing(s). VERIFY that the BRP is securely fastened prior to setting any bag of product into the BRP. If height adjustments are required, carefully hold the BRP with a forklift prior to loosening any of the U-bolts on the supports. Then the U-bolts can be loosened, the BRP raised or lowered, and the U-bolts securely re-fastened. Verify that all 4 supports are securely fastened prior to allowing the full weight of the BRP to rest on those supports.

SAFETY WARNING: YOU MUST CHECK these BRP supports on a daily basis to verify that the BRP is securely in place during use.



Installation of 500 HT/FL/HF

II.) Electrical

A qualified electrician must install the control panel or on/off box (if one is ordered). Three phase power, 230v or 460v, must be supplied to the control panel for the gyrator and/or other components (conveyor, feeder, valve, etc.) in most cases. Wire between components and to your source is not typically included.

For FL Compact units, keep in mind that the unit requires any electrical connection be set up so that the Upper frame can be removed from the lower frame. This can be done as a loose electrical drop, a coiled line, or a twist plug that is unconnected and reconnected for each use. These are decisions that will need to be made by your qualified electrician.

Control panel installation:

Overview: The control panel will require 460-480 volts three phase power Service amps required. Internally, that will be converted to 24vdc control voltage and 120vac power for the scale controller. Field connections must be made to the load cell summing box, four motors, the access box door sensor, and the dust collector cleaner on the small bag break.



Installation of 500 HT/FL/HF

II.) Electrical (Cont.)

Polarity on the connection from the summing box to the controller is critical. There are plus and minus excitation wires, and plus and minus signal wires, as well as the ground. These wires need to run to the back of the scale controller.

Refer to the Electrical drawing for the motor starter numbers. The VFD is connected to the Flexible Screw conveyor (M2). Direction of rotation of the Rotary Valve, the Blower, and the VFD is critical. Be sure those rotations are correct. The Gyrator can run either direction.

The parameters on the VFD have been preset, but they are on the electrical drawing if required.

III.) Pneumatic

If you have an unloader with an air gyrator, 65 cfm at 80 psi must be supplied for the unit to reach its full energy. Attach to the air inlet provided (may be a regulator, manual valve, automatic valve, solenoid in the control panel, or the inlet of the gyrator itself). It is recommended that an air dryer and oiler be installed on this line, as they will greatly increase the life of the air motor. On FL split frame units, this connection will need to be loose or a chuck style system to accommodate the movement necessary for the Upper frame and lower frame separation during bag loading.



Operation & Explanation

I.) Overview

No matter if the unit is a 500 HT (Hoist & Trolly), 500 FL (Fork Lift) or 500 HF (Half Frame) unit, each machine can have very similar functions. The main and really only difference between these machines is how the bulk bag is lifted into the correct position. These are of course self-explanatory; however, each machine creates options they may be better suited to the customer. HT units are valued more often than not due to most of the work can safely be done by an operator. FL units is a more cost savings unit, but requires more hands on with a fork lift for operation of setting up the bag into the proper position. Lastly HF units, these units are more or less optimal for adding a Formpak touch to your already present machinery. That being said these three units are fully capable of adapting to the customer's needs due to the high amounts of customization available.

II.) Adapters Explanation

When it comes to adapters for our bulk bags it comes down to two paths, FA (Forklift Adapters) & CA (Crane Adapters). Down below is a list of variable adapters one may use with their unloader machine.

100 CA	Basic Crane Adapter
100 CA-LH	Low Head Crane Adapter meant for limited space
100 CA-SLH	Super Low Head Crane Adapter for maximum space
500 FA	Basic Forklift Adapter
500 FA-LH	Low Head Forklift Adapter
100 FA	Safety Forklift Adapter with hitch pins as an extra measure
Dual CA/FA	Ability to be used by both Forklifts and Hoist & Trolly Systems



Crane style adapter



Forklift style adapter

Operation & Explanation

II.) Adapters Overview

Position a bulk bag onto the hooks of bag lifting adapter. After confirming that all four bag loops are secure, the adapter and bag can be lifted into place on the bag receiver hopper. For FL compact units, the upper frame can be lifted onto the lower frame after the adapter and bag are in place.

NEVER STAND UNDER A FULL BULK BAG FOR ANY REASON!

Step by Step 100-CA Operation



Lower the chain / hook of the hoist to a few feet off the floor, being sure not to run all of the chain out of the bag or you risk it not feeding back into the bag properly. If this occurs, someone will have to feed it back into the bag manually.

Raise the bag lifting adapter up with a forklift to fasten the clevis hook to the adapter, making sure the safety latch of the hook is in its proper position.



Lift the adapter with the hoist and position a bag of product under the adapter.

Slip the bag straps (loops) onto the bag lifting adapter making sure they are into the loop slots completely. Raise the adapter slightly to place a little tension on the loops prior to actually lifting the loaded bag. Check that the loops are securely in place before proceeding with any lifting. You may now start lifting the bag.

As the bag is being raised, it may start to turn slightly. The operator may have to guide it so that the adapter does not catch on the receiving hopper of the machine.

NEVER STAND DIRECTLY UNDER A FULL BAG BEING LIFTED BY ANY MEANS

Operation & Explanation

III. Bag Handling Components

❖ Iris Valve & Access Box

The Iris Valve has two functions in a Bulk Bag Unloader. The main use is to assist in untying the bulk bag when loading a new bag. The other function is to close the spout on a partially used bulk bag.

Loading a Bulk Bag:

Properly using the iris valve will help your operators avoid exposure to the product in the bulk bag. The steps to use the iris valve are:

1. Set the bulk bag in place on the bag receiver pan with the hoist or forklift.
2. Open the access box door
3. Open the iris valve fully.
4. Untie the petal closure on the bulk bag to expose the discharge spout
5. Pull the discharge spout down and through the iris valve.
6. Close the iris valve tightly on the bulk bag discharge spout. Be sure the tie, on the discharge spout is visible, once the iris valve is closed.
7. Untie the discharge spout. Be sure the knot is completely untied.
8. Close and latch the access box door.
9. Open the iris valve. In most cases it should be open all the way.



Operation & Explanation

III. Bag Handling Components (Cont.)

❖ Iris Valve & Access Box

Removing a partially used Bulk Bag:

A partially used bulk bag can be removed from a bulk bag unloader, but some cautions must be observed.

1. The iris valve must be closed on the bag spout so that the bag spout can be retied. **MATERIAL MUST BE MOVING. IN ORDER TO CLOSE THE IRIS VALVE.** If the valve is forced, with no material movement, the cloth tube in the iris valve will slip, and the iris valve must be removed and re adjusted. If the iris valve handle is pushed to the fully closed position, but the iris does not close completely, it's very likely the handle has been forced, when no material was moving and the valve will need to be reset. To close this iris valve when material moving, lightly press on the handle to close it. As the material flows from the bag, the valve will close. The faster the material is moving, the faster the valve can be closed. Do not force the handle.
2. Once the handle is fully closed, the process making the material move should be stopped. Open the access box door, and look for the tie on the discharge spout. The tie for the discharge spout must be below the iris valve, to tie the bag closed. Wrap the tie around the bag discharge spout once or twice and tie off with a bow knot. If possible, retie the petal closure.
3. Close the access box door.
4. Open the iris valve
5. Remove the bulk bag with the hoist or forklift.

At this point if outside process options or the FSC option is used please reference those documents/IOMs, these IOMs will be listed in the first page of this entire IOM.

Maintenance

Gyrator Force Adjustment

Video Reference

https://www.youtube.com/watch?v=tkB0NYZSq0&feature=emb_logo



The pounds force provided by the Oli Gyrator is adjustable up to about 1500 lbs-force. To make these adjustments, the end caps must be removed from the gyrator.

Using the lowest setting that will let material flow or pack is always the best. Start with a low setting and adjust the force upward, until the desired flow or compaction is attained.

Remove the four cap screws from each end cap and remove the caps.

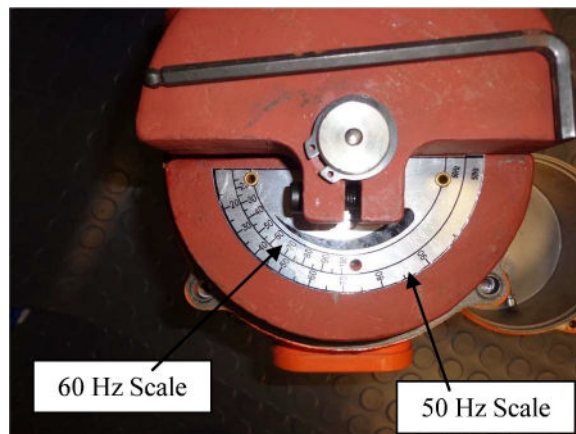


This is the Gyrator with both end caps removed. Remember to adjust both ends to the exact same weight offset.

Maintenance

Gyrator Force Adjustment

It is critical to adjust the weights on both ends of the gyrator to the exact same force. Failure to do so will cause premature failure of the bearings. Loosen the bolt that holds the counter weight in place, so the weight can be rotated to the correct position.



There are two force scales. One is for 60Hz the other is for 50Hz. Since the gyrator runs slightly slower at 50Hz, more off set weight is required to get the same pound force. Be sure you are using the correct scale for the voltage frequency. USA customers will always use the 60Hz scale.



This is the position for 100% of the full force from this gyrator when running at 60Hz. Running the gyrator at a higher force setting than this, will cause premature bearing failure. It is recommended that Loctite or some other thread locking compound be used to secure these counterweight bolts. If one comes loose, it will most likely cause a bearing failure. Once the weights on both ends are adjusted to the same pound force, replace the end caps.

Maintenance

Replacement or Spare Parts

Please contact us for lead time.

Unloader Parts list						
Description	Material	Formpak Number	Part Number/Drawing Number	Quantity	Price/ea.	Total
12in Rubber Gasket	Rubber	000531	16"OD x 12" ID	2	\$19.76	\$39.52
12in Boot	Rubber	2312-U	2312-U	1	\$149.95	\$149.95
3" Isolator (Large)	Rubber	000030	J-5425-1	2	\$66.92	\$133.84
Rice Lake Load cell 2.5k	Stainless Steel, 304	000010	RL-84354	2	\$990.00	\$1,980.00
Square Bend U-bolts	Stainless Steel, 304	HDW-3IN UBOLT-SS or HDW-4IN UBOLT-SS		4	\$40.00	\$160.00
Square Bend U-bolts	Carbon Steel	HDW-3IN UBOLT-CS or HDW-4IN UBOLT-CS		4	\$24.00	\$96.00
Vibration Motor (Electric)	Steel, Alloy	000004	MVE.1530/4	1	\$623.50	\$623.50
					Grand Total:	\$3,182.81

Not all of these parts will be used on every machine, please reference you approved mechanical drawings to verify these parts are used in your machine.

Formpak Machinery Catalog

BagPak Series (Bulk Bag Fillers)

- BagPak 1100-DT (Duffel Top Bag Filler)
- BagPak 2100-ST (Spout Top Bag Filler)
- BagPak 2100-SS (Spout Top, Scale Controlled Bag Filler)
- BagPak 4400-AD (Auto Discharge Bag Filler)

BagFlo/EasyFlo Series (Bulk Bag Dischargers)

- BagFlo 500-FL (Fork Loaded Bulk Bag Unloader)
- BagFlo 500-HT (Hoist & Trolley Loaded Bulk Bag Unloader)
- BagFlo 500-HF (Half Frame Bulk Bag Unloader)
- BagFlo 500-RK (Retrofit Kit)
- EasyFlo 500-FL (Free Flowing Bulk Bag Unloader)
- EasyFlo 500-HT (Free Flowing Bulk Bag Unloader)
- EasyFlo 500-HF
- BagFlo LIW (Loss-in-Weight Bulk Bag Unloader)
- BagFlo GC (Gantry Crane Bulk Bag Unloader)
- BagFlo SLH (Super Low Head)

Lifting Devices

- BagLift 100-CA (Bulk Bag Crane Adapter)
- BagLift 100-FA (Bulk Bag Fork Adapter)
- BagLift 100-FF (Flying Fork Adapter)
- BagLift 100-LH (Low Head)
- BagLift 200-HL (High Lift)

Small Bag Handling Equipment (Bag Break Stations)

- BagBreak 100-SH (Simple Bag Break Hopper)
- BagBreak 400-UC (Bag Break with Upper Cabinet)
- BagBreak 400-DF (Dual Filter Bag Break)

Other Products

- FlexFlo Flexible Screw Conveyors
- FeedFlo-VSF (Volumetric Screw Feeder)
- FeedFlo-VFV (Vibratory Volumetric Feeder)
- FeedFlo-SFS (Screw Feeder with Scale)
- FeedFlo-VFS (Vibratory Feeder with Scale)
- FeedFlo LIW (Loss-In-Weight) feeder
- GH-1000 (Gyrated Hopper)
- VM-4000 (Venturi Mixing System)
- MatFlo (Lump Breaker)
- BagBreaker (Bag Conditioner)
- Live Hoppers
- Eduction Systems
- Batching Systems