Erie Technical Systems Inc.

DensiMAX™ Bulk Bag Filler
Product Specifications

Erie Technical Systems Inc.

Material Handling Equipment

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A. DensiMAX™ Bulk Bag Filler System Overview

The DensiMAX™ Bulk Bag Fillers from Erie Technical Systems are high-throughput machines designed to fill bulk bags quickly and accurately to the desired target weight. The main advantage of our DensiMAX™ systems is the product densification that can be achieved – packing more product in each container. Our Medium-frequency, high-amplitude vibration produces solid packed containers with the maximum amount of product per container. This lowers storage and transportation costs as well making the full bulk bags safer to transport.

These systems are ideal for production applications and allow our customers to package significantly more material per shift, without adding additional operators. Using a PLC and pre-programmed recipes, the DensiMAX™ fill station can be set up for multiple products, container types and target weights on a single frame with minimal setup.

DensiMAX™ Bulk Bag Filler Ranges:

- **Maximum Weight**

Standard: 2,205 lbs. (1,000 kg)
Optional: 4,410 lbs. (2,000 kg)

- **Minimum Bag Height**

Minimum: 30” (762mm
Maximum: 60” (1,524mm)

- **Bag Width/Depth**

Minimum: 35” (899mm) x 35” (899mm)
Maximum: 45” (1,066mm) x 45” (1,066mm)
Note: Dimensions assume standard 5” (127mm) tall pallet and standard 10” (254 mm) loops. System can accommodate larger bags on custom designs.

- **Pallet Dimensions**

Up to 48” x 48” (1,219 x 1,219 mm)

Figure 1 - DensiMAX Bulk Bag Filler with optional Vibratory Grid Deck, Docking Head Module, Hooks Extend/Retract, Bag Inflation Blower, and Hydraulic Lift Cylinder. Also includes additional CDLR Accumulation Conveyor and Pallet Dispenser.

Most of our DensiMAX™ systems are customized in some way to suit the application. This product specification details the base configuration and the most commonly purchased options.

For custom modifications to the standard unit, please contact us at 814-899-2103.

B. DensiMAX™ Bulk Bag Filler Standard Mechanical Features

- Carbon Steel construction with industrial polyurethane enamel paint in ETSI Blue
- Heavy-duty leveling base frame
- Load cell kit with weight transmitter
- Vibratory Flat deck with dual rotary electric vibrators with high force output generating a minimum 2.5 G's of force at 1200 RPM.
- Heavy-duty 2-post cantilevered upright frame for ease of access
- Manually adjustable glide arm frame, hook locations and bag arm locations
- 10-inch (254 mm) diameter fill spout with inflatable cuff, annular opening and 3" inch dust collection port.
- 12-inch OD fill spout with inflatable bladder for bulk bag fill spouts with an ID of 14" or less.
- Automatic-release bag hanging hooks with spring loaded bag stirrup retainer.
    - Hooks feature unique profile to release bag stirrups when open under full load conditions.
    - Pneumatic action of bag hooks with 1.5" diameter pneumatic cylinders and open/close limit switches.
- Air shut off valve, pressure regulators and solenoid valve bank
- PLC based control system with color touchscreen

Figure 2 - DensiMax Base System

C. DensiMAX™ Bulk Bag Filler Standard Electrical Features

The standard control system supplied with our DensiMAX™ fill stations is an Allen-Bradley PLC based system with color touchscreen for operator interface. It has been designed with pre-configurable recipes for filling and vibration to allow for a quick change between products. All scale and filling operations are handled automatically. Operator intervention is only required at the start and end of the fill cycle.

Figure 3 - Typical DensiMAX Control Panel

- NEMA 4/12 Standard
- Lockable through-the-door disconnect
- AB Compact Logix Series PLC Standard (Micro850 available depending on options chosen)
- Color touchscreen HMI
- Rice Lake SCT-20 weight transmitter with ethernet communications
- Relays provided for fast-fill and slow-fill outputs
- AB VFD with braking for vibrator control
- Wired per NFPA
- Pre-wired, programmed, and tested

Figure 4 – Remote Operator's HMI Pedestal

D. Densification

The heart of the DensiMAX™ system is the vibratory densification deck. The deck is supported on four (4) pneumatic air isolators. These isolators raise the product's densification platform away from the DensiMAX™ base frame to isolate 99% of the vibratory force, allowing the material to be packed without damage to the fill station. Two (2) rotary electric vibrators provide the vibratory force.

Features:

- Heavy duty structural steel construction
- Multiple pre-programmed vibration cycles to accomplish maximum densification
- Typical vibration cycle takes less than 10 seconds
- Dual rotary electric vibrators with adjustable eccentric weights
- 2.5 G's of combined force output
- VFD control with dynamic braking
- Deck up Proximity sensor prevents running vibrators without the pneumatic isolation.

The base system includes a vibratory flat deck. It is designed to operate as a platform loaded and unloaded from the front of the machine by forklift. A conveyor based vibratory grid deck is also available for higher throughput systems. See the options section for details.

Figure 5 - Vibratory Flat Deck (Standard) pictured with Hydraulic Lift Cylinder option

E. DensiMAX™ Custom Options

The options listed below will both make it easier for the operator to prepare and introduce the container as well as give them freedom to do other operations while the container is filling.

Figure 6 - Fill Head with Optional Hinged Bag Spout Pinch Ring

a. Hinged Bag Spout Pinch Ring (PR)

During filling, the inflatable bladder on the fill head will expand, creating a seal against fill spouts 14" in diameter or less. The hinged bag spout pinch ring option adds a quick opening band to the fill head, allowing the use of bags with larger than 14" bag necks up to full duffel top bags. The extra material is pinched between the inflatable bladder and the pinch ring before the bladder is inflated.

- Stainless Steel
- Quick opening latch

b. Automatic Product Valve Option (APV)

The automatic product valve option adds a 3-position large port orifice gate valve. The valve allows for full open, filling to near target weight and a second dribble feed position for final filling. This keeps cycle times low and filling accuracy high. The PLC automatically controls the valve.

- Pneumatic actuation
- Orifice type self-cleaning material isolation plate
- 304 SS product contact surfaces
- Rated for up to 15 PSI pressure differential
- 10" square standard, other sizes available
- Three position operation for open, closed, and dribble position
- Adjustable dribble position for optimization of the fill
- Electronic reed switches for position sensing

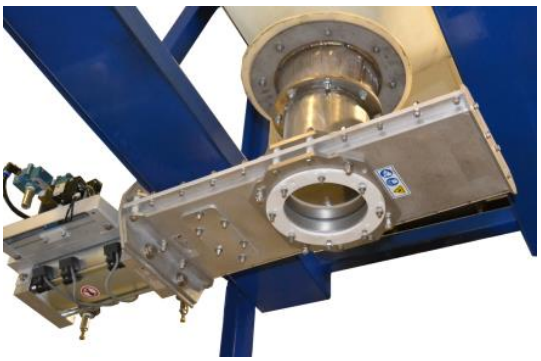

Figure 7 - Roller Gate Valve

Please note: The product fill valve must be attached to the customers hopper above the fill station and will be shipped loose. Alternatively, we can also provide custom hoppers and transition pieces for this application.

c. Hooks Extend-Retract Option (HER)

The hooks extend-retract upgrade helps reduce the time required to hang the bulk bag on the machine. As part of the automatic cycle, the rear hooks are moved toward the operator to allow for easy access. This option, in conjunction with the docking fill head option below, can significantly reduce cycle time and operator fatigue. The rear hooks are brought forward using two (2) pneumatically actuated rodless cylinders.

Figure 8 - Hooks Extend / Retract Option, shown in the 'Retract' position (Docking Head and Pinch Ring options also shown)

Features:

- Operated with pneumatic rodless cylinders
- Simple, easy-to-maintain design
- Position detection switches ensure hooks reach the extended or retracted position.
- Adjustable to accommodate varying bag sizes

d. Docking Head Option (DH)

The docking head option adds pneumatic cylinders to disengage the product fill head and bring it towards the operator. This allows easier access to attach the bulk bag fill spout.

Figure 9 - Docking Head and Hooks Extend/Retract Options, shown in the 'Extend' position. Pinch Ring Option also shown.

- Fill Spout disengaged with two (2) pneumatic non-rotating cylinders including guide rods and precision bearings.
- Fill spout traverses with two (2) pneumatic rodless cylinders.
- Gasketed connection between the fixed spout top and the lower indexing fill spout
- All cylinders have position sensors to verify location of all moving parts

e. Hydraulic Lifting Cylinder Option (HL)

The hydraulic lifting cylinder option upgrades the manually adjustable standard bag hanging frame. With this option, the operator can use pushbuttons in the control system to raise and lower the bag hanging frame to adjust for different height containers. The operator raises the frame, repositions the stop pins manually and then lowers the frame onto the stop pins.

Figure 10 - Hydraulic Lifting Cylinder Option

- 2-1/2" diameter x 30" stroke hydraulic cylinder
- Pin locations varying 5" to adjust for multiple container sizes
- Requires manual pin stop insertion when adjusting

f. Vibratory Grid Deck Option (GD)

The grid deck option upgrades the standard vibratory flat deck for even higher throughput by bringing the pallets into and out of the fill area on a conveyor. The vibrating surface is made up of a series of grids that pass between the rollers on the conveyor and are raised using the air mounts. In the up position, the vibratory deck can pack the material in a bulk bag. In the down position, the roller conveyor can move the filled container out of the fill station.

Features:

- Integrated roller conveyor to tie into existing or new ETSI-provided conveyor lines
- Container positioning polarized retro-reflective photo eye sensor
- Adjustable container guides

Figure 11 - Vibratory Grid Deck Upgrade

g. Bag Inflation Blower with Isolation Valve Option

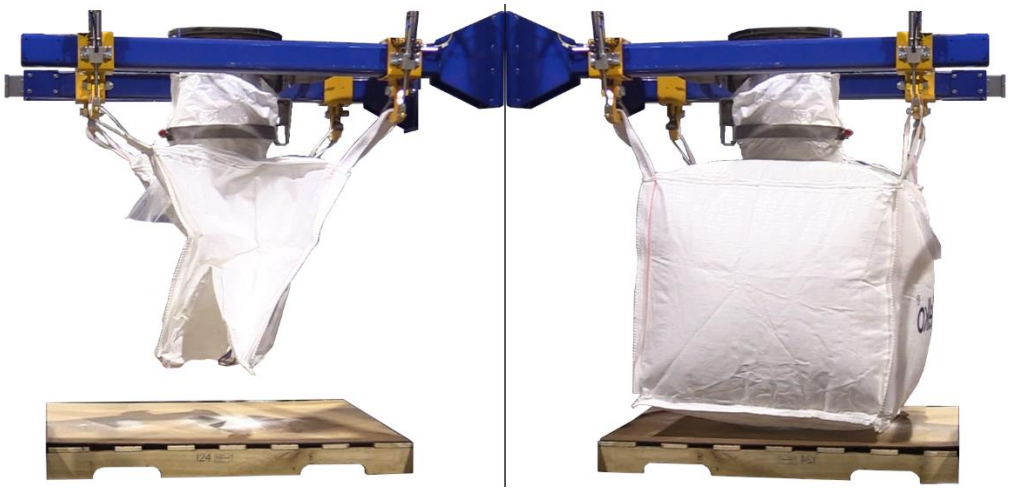

Figure 12 - Bag Inflation Blower Option - Uninflated Bag (Left) vs Inflated Bag (Right)

The bag inflation blower is used to pre-inflate the bag prior to starting the filling process. By inflating the bag, it will have pre-formed itself and eliminated any creases that may be in the bag while also reducing the amount of time that the operator spends staging the bag for filling. If the bag has a liner, it will form the liner to the bag.

Figure 13 - DensiMAX Blower

- 1072 CFM inflation blower
- 1.5 HP drive premium efficiency motor
- Adjustable inflation timer within the control recipe
- Mounted with all connection hardware

Alongside the Bag Inflation Blower sits an isolation valve, added to the fill head on the dust collection port. It is used in conjunction with the bag inflation blower or plant air options for systems where bag inflation and dust collection are required.

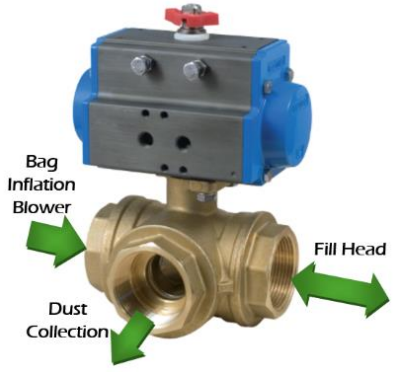

Figure 14 - Isolation Valve, 3" NPT

The valve is a 2-position, 3-port valve. In one position, the dust collection system is closed off and the optional bag inflation blower, or air amplifier, is ported into the fill head. In the second position, the blower is isolated and the dust collection system is connected to the product fill head.

- Air-operated, 304 Brass 3” NPT Ball Valve
- Position switches and visual indication
- Connects blower or dust collection directly to the annular opening in the fill spout

h. Extra Roller Conveyors

To further automate the filling process, inlet and outlet chain driven live roller (CDLR) conveyors can be provided. These are used with the Grid Deck option to allow skids to be brought into and out of the fill station as part of the automatic functions.

- 1 hp cast steel motor
- Cast iron gearbox
- Structural channel construction
- Adjustable levelling feet with jack screws
- Painted ETSI Blue polyurethane enamel
- Heavy duty #60 roller chain
- Hardened teeth on roller sprockets
- 2-1/2" Diameter rollers on 6" spacing
- 60" length x 50" effective width
- Adjustable pallet guides
- Polarized retro-reflective 24VDC Photo eye with guard and swivel mounting bracket

Figure 16 – Three (3) CDLR Conveyor Sections with Photoeye Position Sensors

i. Operator's Work Platform

Figure 17 - DensiMAX(TM) Operator's Work Platform with Remote HMI

The operator's work platform places the operator at a convenient height to attach the bulk bags to DensiMAX™ bulk bag fillers equipped with a roller conveyor. The operator's feet are at the same level as the top of roller height of the conveyor. The platform includes stairs, railings and space for the operator, the main control pedestal and room for a skid of bulk bags.

- Heavy duty structural steel construction
- Mild Steel, primed and painted
- Diamond-plate top
- Grated stair treads for traction

F. Custom Application

The process for material handling in a manufacturing environment can change drastically from one application to the next, and we at Erie Technical Systems are acutely aware of those challenges. Our team of mechanical, electrical, and sales engineers will work with you and your team to devise the perfect custom equipment for your application. With our in-house panel shop, we are able to provide custom-built control panels, as well!

Figure 18 - DensiMAX Fill Station fully integrated in a SystemMAX Application - Includes Operator's Work Platform, Pallet Dispenser, and Additional CDLR Conveyors.

Figure 19 - Custom Stainless Steel DensiMAX™ with Nema 4X Enclosure, 100% simple relay-based controls and digital weight indicator. Specifically designed for outdoor use in extreme weather conditions.

Figure 20 - DensiMAX Bulk Bag Fill Station with rotating chute to fill 4 drums on a pallet, fed by ETSI Spiral Elevator

Click below for more information on Erie Technical Systems Products that integrate with the DensiMAX™ Bulk Bag Fill Station!