

GravMaster[®]

Low-Profile Pressurised Gravimetric Feeder

Low-maintenance, heavy duty, reversible,
gravimetric weigh feeder for coal
and biomass feed systems.



“Enhancing the performance of our
customers plant & equipment”

Greenbank

Low-Profile Pressurised Gravimetric Feeder

Product Overview

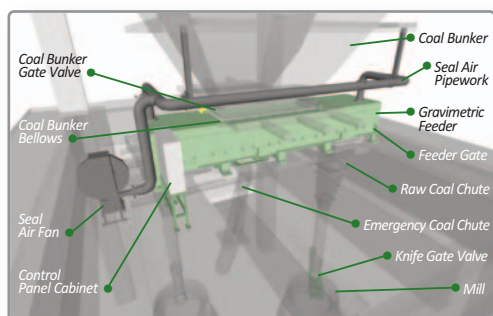
A Unique Low-Profile, Reversible, Pressurised Gravimetric Feeder

Greenbank's GravMaster® is a unique gravimetric feeder for use on large solid-fuel electricity-generating plants that will benefit from accurate, reliable and safe fuel feed systems.

The GravMaster® is designed to be robust, highly accurate and both operation and maintenance friendly. On demand, it will reliably dispense feedstock to pulverisers from bunkers with circular or rectangular outlets.

Having a large, lagged drive pulley and 3-ply belt provides the ability to overcome significant start-up loads, often seen with slotted bunkers, which can remove the need for automated bunker gates. Its slack belt design is unaffected by belt stretch which ensures its accuracy is maintained over time.

Unique features include a reversing facility to provide a feedstock bypass system, for emergency discharge, inspection or maintenance requirements. The use of readily available component parts and



Better by Design

- Low-profile compact design
- 4-sided access for ease of maintenance and bunker access
- Large, lagged head pulley and 3-ply belt ensuring reliable Start-up under full load
- 3-ply slack belt design improves on-going accuracy which is unaffected by belt stretch
- Standard components for readily available and low-cost spares
- Crowned self-cleaning head and tail pulleys for continual alignment and improved accuracy

having 4 sided access ensures the operation, maintenance and downtime costs are kept to an absolute minimum.

Pressurised using an air-seal fan, the system has the ability to improve both combustion performance and operational safety by keeping hot air in the pulveriser and avoids its escape.

The feeder body is designed to withstand 3.5 barg pressure containment in accordance with NFPA85 and general milling plant code of practice.

Calibration can be quickly and safely executed with minimum downtime and without exposing the feeder internals by using the unique Greenbank Easi-Cal® pneumatically operated calibration system.

Our GB446 controller interfaces with the plant control system or DCS and incorporates an array of optional user-defined controls and safety trips to enhance operation and plant safety, dependent on the user requirements.



Operational and Performance Benefits:

- Improves operational and plant safety
- Improves accuracy of feed delivery and removes volumetric error
- Reduces maintenance costs and downtime
- Improves mass flow, reduces or eliminates rat-holing and bunker blockages
- Replacing drag-chain feeders with the GravMaster® results in improved fuel balancing between pulverisers and consequential improvement in control of fuel/air ratios and combustion efficiency
- Better control of fuel feed along with good PA control can also improve performance of pulverising systems resulting in better fuel fineness

"It is our vision to excel and lead the world in our area of expertise"

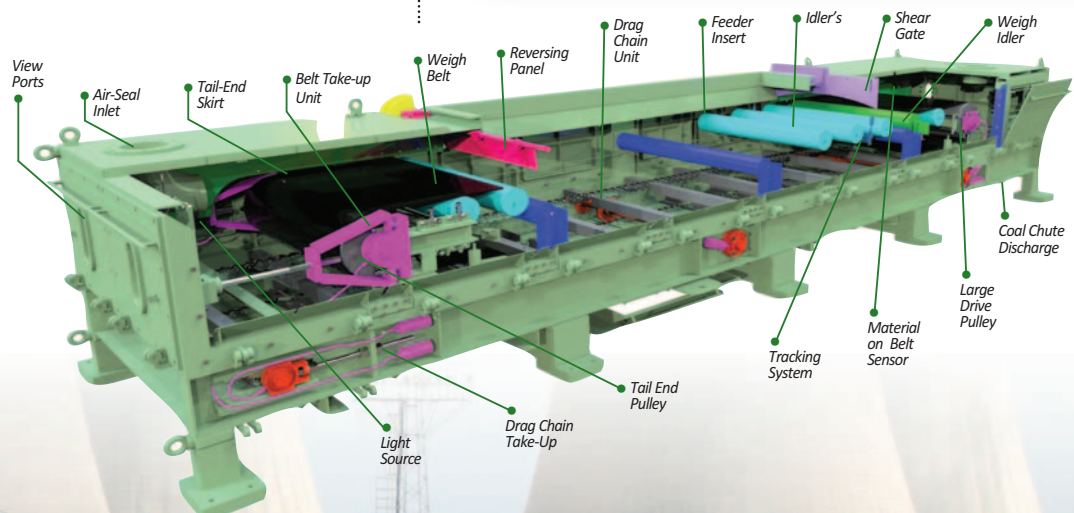
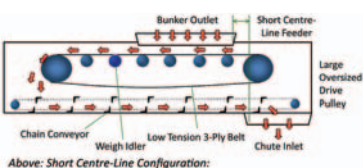
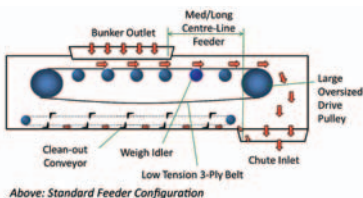
Design Philosophy

Unique, Innovative and State-of-the-Art Gravimetric Feed System

Greenbank with their H&H product portfolio, have used their extensive feeder experience and in-house engineering ability to design a robust, adaptable and easily maintained Gravimetric Feeder which has the unique ability to reverse for emergency bunker discharge.

The cleverly designed belt-loading system ensures mass-flow from the feed-stock bunker which reduces or eliminates rat-holing and bunker blockages, a common occurrence with drag-chain feed systems. This feature significantly improves operational safety, particularly on plants using volatile fuels. The GravMaster® Pressurised Gravimetric Feeder has many other unique features which include:

- High-quality and readily available components
- Exterior belt tensioning and tracking adjustment facility
- Drag chain/clean-out conveyor with lined base
- A large, lagged, drive-pulley and 3-ply belt ensures reliable start-up even when exposed to full loads at slotted inlets
- A unique reversing facility for emergency bunker discharge, feedstock by-pass, inspection or maintenance requirements
- Access doors to all 4 elevations
- Visual inspection ports each having pneumatic cleaning and localised lighting.
- An easily maintainable and fully accessible system which minimises operational, downtime and running costs
- An auto-volumetric default mode
- A remote test-weight calibration option (Easi-cal)



GravMaster® Design Options

The GravMaster® design can be easily adapted for short, medium or long centreline installation capability and a reversible belt option for emergency discharge.

The standard feeder comes with an upper weigh belt conveyor and a lower clean-out chain conveyor which is sited in the base of the feeder.

The upper belt conveyor is fed via a circular chute or a Jenike and Johanson (J&J) style inlet to ensure mass flow. It is responsible for weighing and controlling the feed rate from the bunker outlet. The lower chain conveyor is responsible for ensuring overspill from general operation or maintenance is swiftly removed along to the feed-chute inlet and discharged.

Should a short centre-line feeder be required, or where the distance from the bunker outlet is too close to the feed-chute inlet, the upper belt weight system can be reversed and the tail end extended to suit the weigh belt's minimum requirements. The lower chain system acts as both a return and a cleanout conveyor. Under both options the system can be reversed and the bunker can be discharged utilising an emergency outlet rather than the feed chute inlet and as such the feed chute can be bypassed.

The system can be fully integrated with the user's control or DCS and have an array of optional programmable warnings and safety trips.

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Low-Profile Pressurised Gravimetric Feeder

General Specification

Performance

Accuracy (standard):

Totalised weight readings will be accurate to within $\pm 0.5\%$ of test weights.

Availability:

Greater than 98%.

Accuracy and Availability Enhancements:

Slack belt design unaffected by belt stretch over time.

Fuel media profiled to angle of repose directly onto the belt.

Incorporating tail-end pulley speed encoder giving true belt speed.

Each feeder has 2x hermetically sealed, high quality load cells direct on weigh idler.

Accurately machined weigh roller.

External Specification

Housing:

Designed for 50PSI NFPA85 [or GDCD215 200PSI] pressure containment requirements.

Welded joints with 100% MPI.

Access doors to 4 sides for quick, easy access and maintenance.

Windows:

Glass or polycarbonate windows at both ends of the feeder.

Illumination:

Exterior mounted lamps shining through windows at both ends of the feeder.

Finish:

Shotblast to SA2.5 then powder coated to 60-80 μ .

Colour Pale Green, RAL 6021.

Seal-Air Inlet Flanges:

200NB PN16, quantity and position to suit design.

Options

Calibration:

Easi-cal device c/w 2 off certified test weights.

Auto Tracking:

Bespoke auto-tracking device.

Endless Belt:

C frame option (for endless belt on feeders under 4m).

Internal Specification

Feeder Type:

Pressurised Gravimetric Belt Weigh Feeder.

Typical Capacity (<50mm coal):

0-100mTPH and up to 250mTPH on request.

Head Pulley:

Welded construction, crowned and ceramic lagged.

Tail Pulley:

Welded construction and crowned.

Rollers:

Belt Rollers: heavy duty complete with sealed-for-life bearings.

Weigh Rollers: heavy duty, complete with sealed-for-life bearings machined to a high tolerance.

Weight Belt:

High temperature, 3-ply.

Jointed using recessed clipped R5 fasteners with covers hot vulcanised over the clips.

Belt Scrapers:

Sprung, PU scraper mounted adjacent to the Head-Pulley.

V plough scraper mounted on the return belt.

Belt Take-Up and Alignment:

Screwed with adjustment external to feeder housing.

Belt Drive/Motor:

Shaft mounted geared motor with 10:1 turndown capability.

Drag Chain Conveyor:

Suitably sized Ewart Chain and flights.

Shaft-mounted geared motor.

Housing base surface lined with 25mm thick basalt (where required)

ATEX: ATEX 21 compliance.

Processor Cabinet

IP65 cabinet c/w feeder or floor-mounting availability.

GB466 controller.

PLC-based programmable control system.

VFD controller for belt feeder.

AC motor starter for chain feeder.

Isolations for the load cells and tachometers.

