# Series 31-165 Digital Weighbelt Feeder

The Series 31-165 microprocessor controlled weighbelt feeder controls the feed rate of dry lime with an accuracy as low as 0.25% of set rate. Its accuracy and instantaneous response to feed rate changes and variations in lime density provide tight control of lime usages and minimize waste. The controller can provide information about lime application rate for record keeping or inventory control. The Series 31-165 weighbelt feeder is ideal for industrial and municipal water and wastewater treatment systems or for systems treating industrial process water.

## Features

**Microprocessor Controlled Gravimetric Feeding to 8,000 lb/hr or 133 ft3 /hr**
With gate adjustment and different gearboxes and driven sprockets, the feeder will provide a wide range of capacity selection and flexibility. Maximum rates cover virtually all water and wastewater chemical feed requirements.

**Instant Response, Accuracy of 1% of Rate**
The precision weigh-scale and microprocessor electronics provide exact control of lime addition in response to changing process requirements. Costly overfeeding is avoided.

**Simple, Straightforward Man-Machine Interface**
The feeder controls include a touch screen for entering commands and parameters. Its menu driven software provides information regarding status, operational parameters, and alarm conditions. Alarm conditions displayed include: low and high feed-rate, low and high belt load, low and high belt speed, setpoint and fault condition.

**Simple, Automatic Belt Tension and Tracking**
Constant and uniform tensioning of the weighbelt is achieved by the use of counterweights acting on the movable front (discharge) roll. An adjustable manual tensioning roller includes a belt tracking guide which, in conjunction with the movable front roller, directs the belt along a straight path. Both of these mechanisms function together to provide accurate and reliable feeder operation.

**Rugged Weighbar Weigh-Scale**
The weigh-scale utilizes a sensitive, yet rugged, weighbar to transmit the belt load force directly to a precision load cell. The bar is designed for minimum surface area contact with the weighbelt to reduce belt drag and prevent the belt from sticking to the weigh-scale. It also provides easy access for inspection and cleaning.

## *Key Benefits*

- *Accurate and reliable feeder operation*
- *Microprocessor controlled gravimetric feeding*
- *Accuracy of 1% of rate*
- *Simple, straight forward man-machine interface*
- *Easy to install and maintain*


**Easy to Install and Maintain**
All feeders are factory calibrated and tested prior to shipment. A simple field procedure confirms calibration after installation. The need for calculations by the operator and repetitive adjustments are eliminated. The feeder housing is dust-tight. Side and top covers are gasketed and easily removed. The product zone is easily accessible and can be air-cleaned. Sealed bearings are used throughout. Six scrapers spaced on both sides of the belt and on the rollers keep the belt transport free of product build up. The belt transport system is cantilevered for easy belt removal without tools.

## Operation

Lime is supplied to the belt feeder by gravity from an overhead storage bin or hopper. The lime is introduced to the belt through the inlet chute. As the belt moves, the lime is sheared by a manually adjusted vertical gate which sets the lime bed depth. As the lime passes over the highly sensitive weigh section, the belt load is transmitted to the precision load cell where a signal is generated proportional to the load. The signal is integrated by the digital controller with the belt speed signal from the VFD to yield a feed rate by weight. The calculated feed rate signal becomes the measured variable in a proprietary PID algorithm, and is compared to the setpoint. If a feed rate deviation exists, belt speed is adjusted by a control signal sent to the VFD. Belt speed is automatically increased or decreased until feeder output and set point are matched.

## Technical Data

**Speed of Response**
Instantaneous response to changes in feed rate and variations in lime density.

**Feed Rates and Operating Ranges**
- Maximum volumetric rate: 133 cubic feet per hour
- Maximum Gravimetric rate: 8,000 pounds per hour (for a lime density of 60 pounds per cubic foot)
- Maximum operating range: Belt speed of 20:1; Belt load of 3:1

**Lime Characteristics**
Per AWWA Standard B202-07 Quicklime and Hydrated Lime

**Inputs/Outputs**
Digital Inputs: Remote start/stop from a customer supplied contact closure.

Digital Outputs: Two relays provide unpowered NO & NC contacts for external indication of Feeder Running and Alarm Condition. A third relay provides unpowered NO contacts for Remote Totalization (250 millisecond duration, 2 Hz maximum rate recommended max. rate is 0.5 Hz with mechanical relay). Relay contacts are rated 10 amps at 28 VDC or 120 VAC with 80% power factor, or 6.7 amps at 240 VAC with 80% power factor.

Analog Inputs: Remote setpoint input via isolated 4-20 mA or 0-10...2- 10 VDC.

Analog Outputs: An isolated 0-20/4-20 mA output signal is proportional to feedrate; maximum allowable loop resistance is 500 ohms.

**Optional Communications Interface**
Ethernet IP

**Temperature Limits**
Ambient: 14 to 122° F (-10 to 50° C)
Lime: 14 to 195° F (-10 to 90° C) standard 0 to 338° F (-18 to 170° C) optional

**Electrical**
Power Requirements: 115 volts ±10%, 15 A, single phase, 60 Hz.
Belt Drive Motor: ½ hp, AC TE controlled by VFD.
Electrical Enclosures: Rated NEMA® 4X.
Maximum Distance (Controls to Feeder): 100 feet (30 meters).
Display Type: 10" 800x600 5VGA, 18-bit color graphics.

**Materials of Construction**
Materials in contact with the product flow include a 304ss, nickel plated steel, Buna N, and neoprene. The feeder enclosure is unpainted 304 stainless steel.

**Dimensions**
See WT.310.165.100 & WT.310.165.102

**Weight and Shipping Weight**
260 lbs., 300 lbs.

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