



*Weighing, Totalizing, Feeding and Controlling Flow in
Bulk Material Handling Processes*

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THAYER SCALE

PROCESS MEASUREMENT & CONTROL EQUIPMENT

*Precision measurement with consistent performance,
maximum efficiency and minimal maintenance are qualities
that our customers have come to expect and appreciate.*



AGGREGATE & MINING



COAL



STEEL



PET FOOD



FOREST PRODUCTS



TOBACCO



PLASTICS



CHEMICALS



PULP & PAPER



CEREAL



SNACK FOODS



ETHANOL



Founded in 1949, Thayer Scale is a pioneering developer of continuous weighing and feeding equipment for the dry solids conveying and processing industries. Our Conveyor Belt Scales and Weigh Feeders of both the Weigh Belt and Loss-In-Weight types, cover an extremely wide range of applications covering virtually all industries that involve dry solids conveying and processing. From Loss-In-Weight Feeders that feed vitamins into cereals at rates below 1 pound per hour to Conveyor Belt Scales weighing coal and iron ore at rates up to 10,000 tons per hour, there are more than 100 proven product variations available to suit most application requirements.

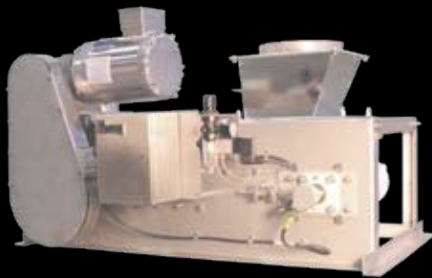
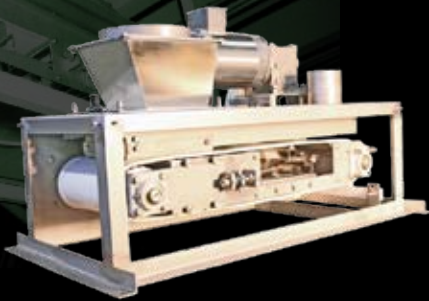
Each variation comprises a particular combination of proven THAYER mechanical and electronic platforms, chosen and configured to meet the unique needs of the particular application. These platforms, covering scale technology, instrumentation and materials handling elements, have emerged from ongoing research over many years, and are common to all THAYER branded equipment, regardless of type or size. They form the basis for Thayer Scale's unique reputation as a supplier of equipment that provides the rare combination of measurement precision and extreme robustness. Equipment installed more than 40 years ago continue to operate reliably and accurately.

LIGHT INDUSTRY WEIGH BELTS



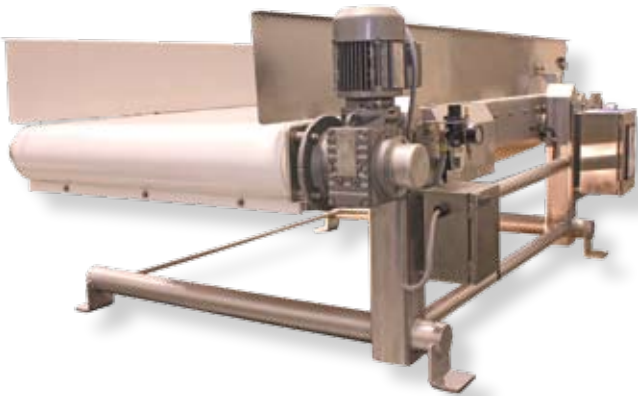
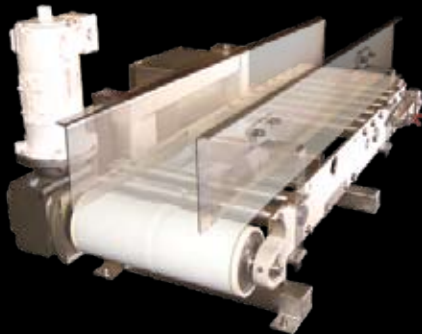
MODEL "MWF" WEIGH BELT

THAYER Model "MWF" weigh belt feeder is the smallest weigh belt Thayer Scale manufactures and it has been designed for high accuracy and long life. It is offered in a standard stainless steel package and is suitable for wash down environments. With applications ranging from grams per minute to tons per hour, and designs that handle dry particulate materials of all types and classifications.



MODEL "MWF-OS" SANITARY WEIGH BELT

Thayer Scales's new Model "MWF-OS" Sanitary Open Construction Weigh Belt Feeder is used for the processing of snack food, cereal, pasta, pet food or any other application where hygiene and ease of cleaning is important. The Model "MWF-OS" uses a rugged open frame construction, made from 304 or 316 stainless steel and is designed for "no-tools" disassembly. The Model "MWF-OS" can provide either "closed loop" gravimetric control of material feed rate or precise convey rate measurement and totalization of an uncontrolled or intermittent material supply.

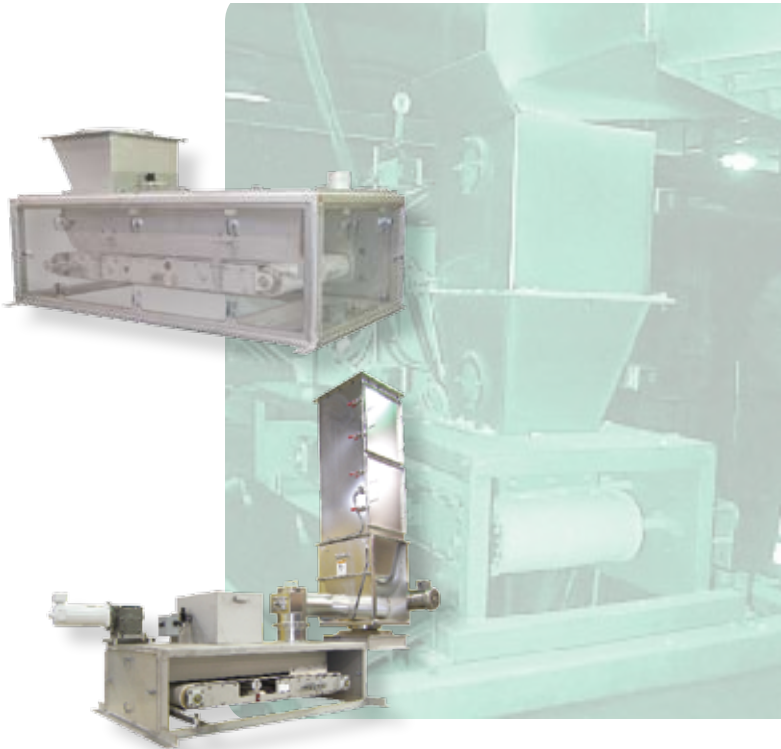


Model WB-SGSP-OS SANITARY Weigh Belt

Thayer Scale's sanitary Model **WB-SGSP-OS** is manufactured with all stainless steel and food grade components and is suitable for constant wash down environments. Its construction provides the food industry with a consistently accurate, low capacity weigh feeder that is easy to maintain with minimal downtime. Can be completely washed down with no tools needed for disassembly. All sensitive scale components are located outside the material handling area and are isolated by covers and other protective devices that guard against the often destructive forces generated from even normal cleaning practices.

Model "MXL" ENCLOSED Weigh Belt

The Model "MXL" is flexible and well suited to many applications. A full range of enclosures and scavenger systems for dusty materials is available. Multiple machine proportioning and blending systems are some of the common applications for the "MXL" type unit.



Model "MXL" LOW DENSITY Weigh Belt

THAYER Model "MXL-LD" is the only low capacity weigh feeder specifically designed to handle lightweight, low density products in the 1.0 to 5.0 lb/ft³ range while still delivering exceptional accuracy. The weight sensing system in every low density "MXL-LD" is designed to sense the net weight of the material being conveyed by the belt. Our Low Density "MXL-LD" is engineered exclusively for potato chips, textile fiber, tobacco and other very light weight products. Sanitary Model "MXL" is manufactured with all stainless steel and food grade components and is suitable for constant wash down environments. Its construction provides the food industry with a consistently accurate, low capacity weigh feeder that is easy to maintain with minimal downtime



• HEAVY INDUSTRY WEIGH BELTS

Thayer Scale's Models "M", "MH", "MDH", "MD", and "MDL" Weigh Belts are custom designed and built to meet the special requirements of heavy industry. First designed in 1964 for steel mill service to feed flux materials (limestone, mill scale, dolomite, iron ore pellets, fluorspar and coke), the Model "M" Series Weigh Belt has been subjected to the extremes of heavy duty industrial use; abrasive lumps, dust, corrosive fumes, wide temperature fluctuations, and vibration without any detrimental effects on accuracy, reliability and operation. Thayer Scale Model "M-LD" Weigh Belts are the standard for high volume, low density weighing such as wood fiber, rock wool, tobacco, foam rubber, as well as natural and synthetic textile fibers.

THAYER Heavy Duty Weigh Belts provide:

- Long term accuracy and reliability with low cost of ownership.
- Load transducers are located external to material flow channel.
- Weigh bridge is insensitive to the accumulation of weight that accompanies tare build-up.
- Provides exceptional immunity to periodic overloads of uncertain magnitude that accompany particle jamming in the weighing region of the belt.
- Easily accommodates legs, and dust removal/scavenger systems.
- Accommodates a wide range of length and incline variation without significant changes in configuration.
- Individual carrying idlers can be repaired/replaced while the belt is in a fully loaded condition, without the need to remove skirt boards and/or de-tension the belt.
- Can be easily and economically adapted to support future capacity needs.

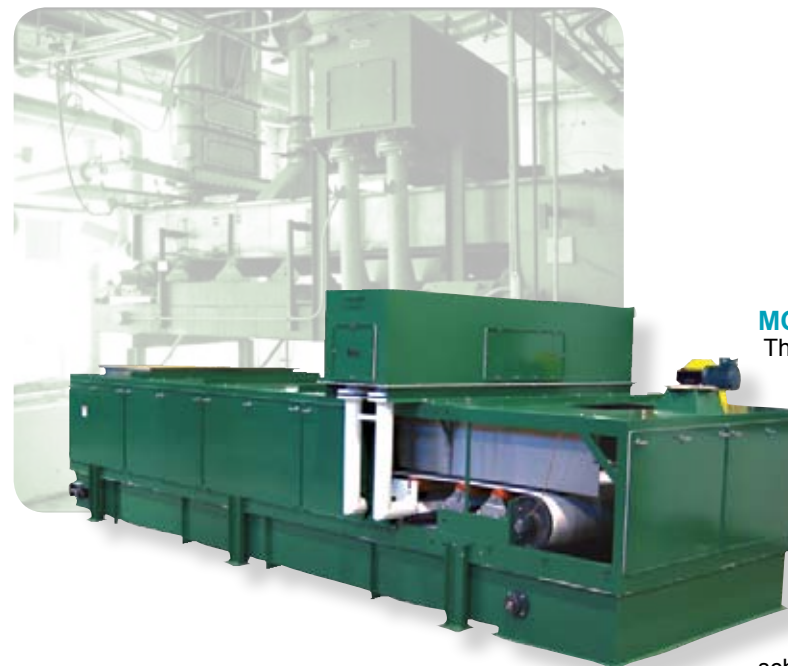
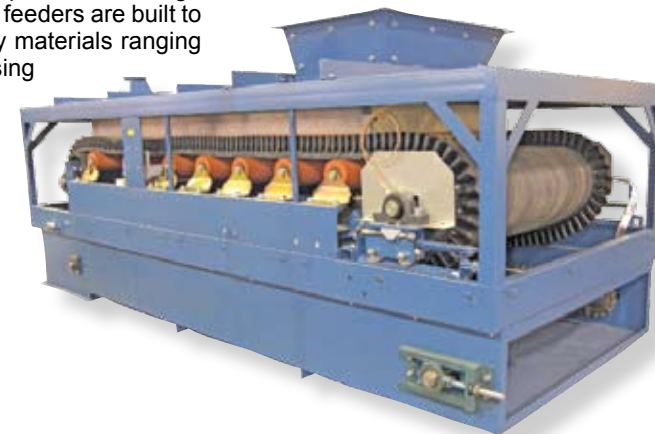
No other weigh belt design can provide an accuracy of $\pm 1/4\%$ over the wide application range THAYER heavy industry weigh belts serve. From wood fiber at 1.0-3.0 lb/ft³ to nickel shot at 150.0 lb/ft³. THAYER heavy industry weigh belts are truly "Built to Survive" providing long term accuracy and reliability.



MODEL MH WEIGH BELT

MODEL "MDH" WEIGH BELT

Originally designed for steel mill service, Thayer Scale's Weigh Belt Model "MDH" design benefits put it into a class by itself. The Model "MDH" offers an extremely robust design with an intense commitment to quality and attention to detail. With over 60 years of weigh belt experience THAYER produces a weigh belt that is highly accurate, rugged and dependable. THAYER feeders are built to endure the rigors of high capacity feeding and heavy density materials ranging in particle sizes from fines to 6" lumps. The bottom line of using a THAYER Model "MDH" in your process translates into reduced operating downtime, lower overall cost and quick return on your investment.



MODEL "M LD" WEIGH BELT

Thayer Scale's Model "M-LD" Low Density Feeder line has been specifically designed for weighing bulk materials having densities under 10 lb/ft³. These feeders find applications in tobacco, forest products (OSB & MDF), textiles, cereals and snacks (chips and flakes). Without question, Thayer Scale has more experience than any other manufacturer in weighing these low density materials. With an outstanding performance record in over 1,000 installations, the THAYER Model "M-LD" Low Density Weigh Belt Feeder represents the standard to which all others are compared. Many of these feeders have been in operation for more than 30 years with the only modifications being instrumentation upgrades to better suit the interconnection needs of modern-day automation schemes, or re-rating of either the load or speed sensing range to accommodate line capacity changes.

MODELS "MD" and "MDL" WEIGH BELT

Thayer Scale's Models "MD" and "MDL" Weigh Belts are widely recognized mainline industrial continuous weigh belt feeders. They can be used with an open loop system to gravimetrically totalize and measure the flow of material, or with closed loop control as a feeder and regulate the flow to a constant or varying set point.

The Model "MDL" bridges the gap between standard low capacity and high capacity weigh feeders. Some materials are too abrasive for standard low capacity feeders, lump sizes can be too large or flow rates slightly exceed specified limits, resulting in low accuracy and constant maintenance problems. These applications often can not be reliably handled by larger, high capacity weigh feeders because the relatively low flow rates fall below specified limits. (for example: feeding 1.5" lumps of coal @ 2.0 STPH). The Model "MDL" is as ruggedly built as our higher capacity weigh feeders, to withstand abrasive materials, but is designed to operate at flow rates just beyond the limits of our light industry, low capacity feeders.

The Model "MD" is an extremely rugged weigh feeder that was originally designed for the harsh environment of the cement industry but can be used in a wide variety of applications. The Model "MD" is the ideal weigh feeder for medium to high feed rates of high bulk density materials across a broad range of particle sizes. The Model "MD" can be subjected to extreme environmental conditions such as abrasive dusts, corrosive fumes, wide temperature fluctuations and vibrations without any detrimental effects on performance or accuracy.





• LOSS-IN-WEIGHT FEEDERS

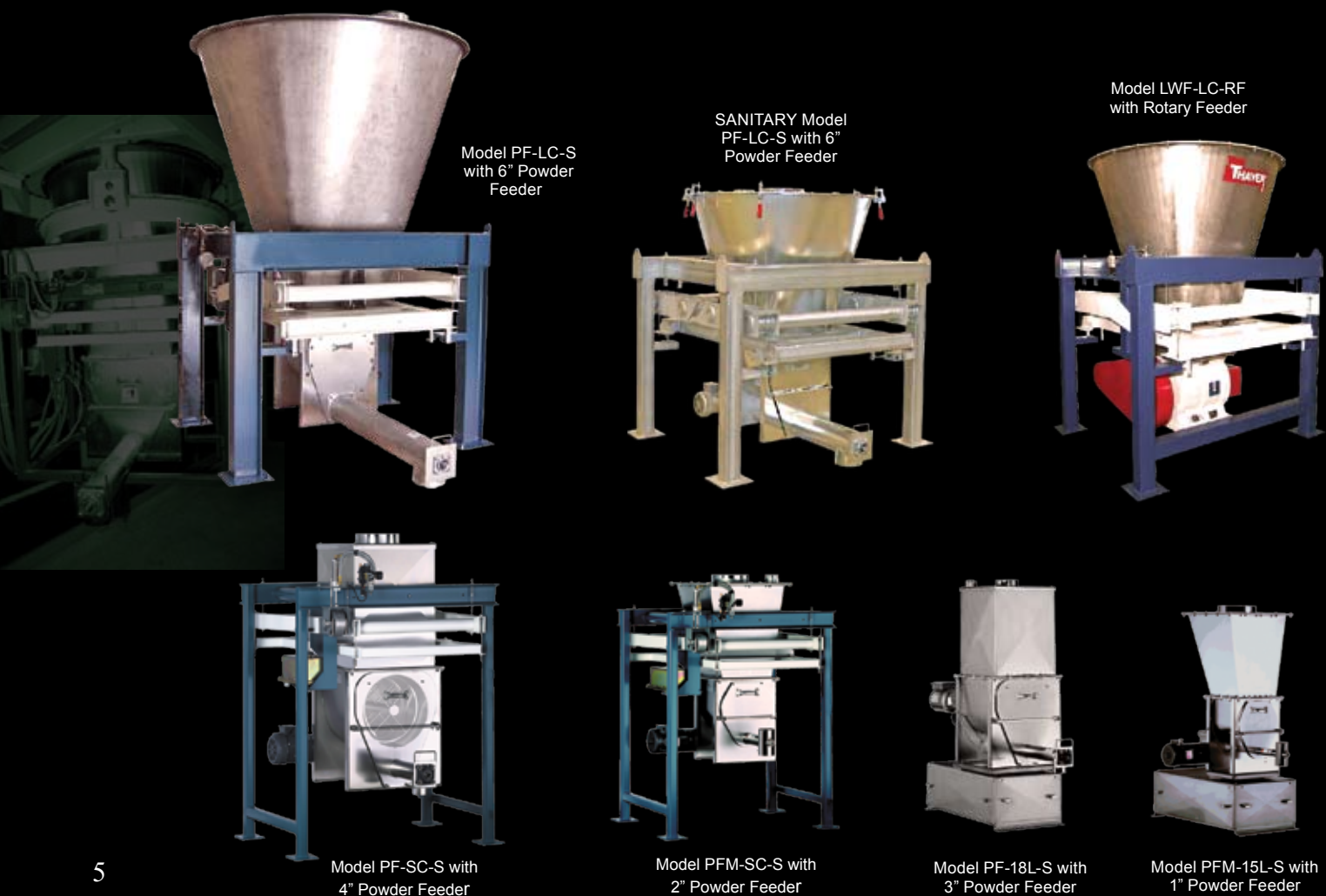
THAYER Loss-In-Weight feeders come in a variety of sizes and shapes, and can incorporate various volumetric devices, depending on the material, handling characteristics and flow rates to be encountered. Flow rates may be as low as 2 grams/min. to over 100,000 lb/hr. The most versatile feeders include the screw feeder and the vibratory pan feeder.

Thayer Scale offers the broadest range of Loss-In-Weight feeders of any manufacturer. Each Loss-In-Weight feeder is designed to provide precision class accuracy and repeatability in the most demanding process environments.

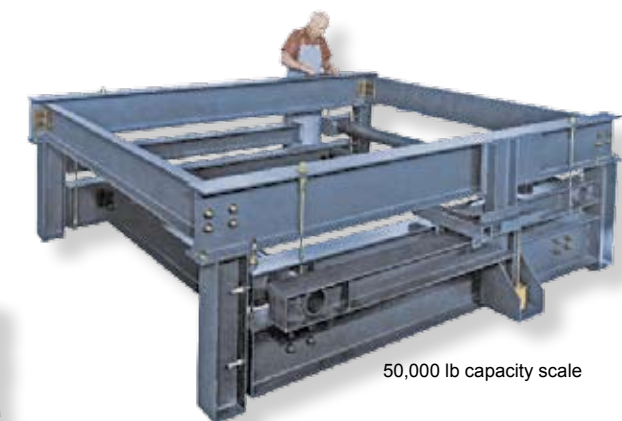
Thayer Scale offers a powerful set of proprietary add-on accessories that defeat the problematic flow issues encountered by industry; bridging, flushing, adhesion, and cohesion to name just a few. Comprehensive process solutions that can only come from a company with over sixty years experience.

- Extended operating range.
- Scales built to take abuse.
- Load cells can be accessed/replaced without feeder/weigh hopper removal.
- Flexible mounting options including floor mount, rotating base, stationary legs, wheel/caster, fork lift base, and/or "over process" suspension.
- Fast access for cleaning.
- No-Tools changeover.
- Self-emptying designs.
- Handles delicate and/or fragile materials without damage.

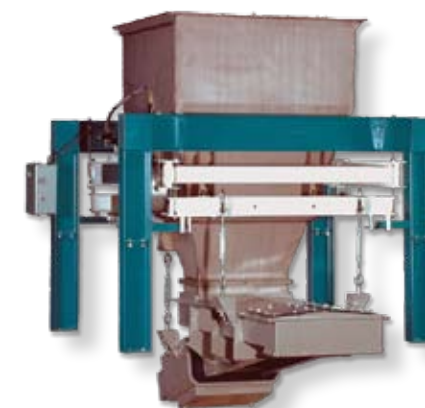
THAYER is proud of the fact that it has designed and manufactured some of the most accurate industrial weighing equipment in the world, based on its flexure plate and flexure cable *Force Measurement Suspension System* (FMSS). It has supplied defense agencies with equipment that weighs uranium ingots weighing as much as 600 kilograms to an accuracy of 1.0 gram. It has supplied Loss-In-Weight feeders for critical manufacturing of liquid and dry rocket propellants, feeding difficult components to accuracies no other manufacturer could achieve.



Model LWF-HC-V with 48" Vibratory Feeder



50,000 lb capacity scale

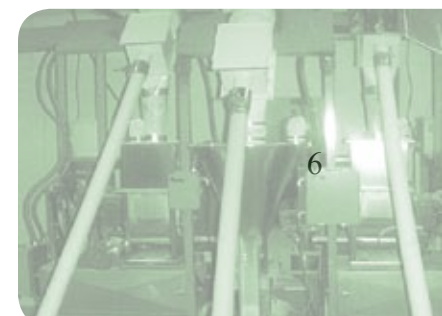


Model LWF-HC-V with 36" Vibratory Feeder

THAYER SCALE Loss-In-Weight Vibratory Feeder Special Features and Benefits

Thayer Scale has spent many years developing the Loss-In-Weight Feeder and control system for use with vibratory feeders. Since virtually all of the controllers on the market were originally designed for use with a screw feeder, it should not be surprising to find that very few of them have the versatility to cope with the special requirements of the vibratory feeder type. Without (certain) special control features, the vibratory feeder can not be controlled effectively in a volumetric mode, nor can it be controlled gravimetrically over a wide operating range without making controller adjustments to suit its non-linear characteristics.

With complete absence of motors, bearings, seals and lubricating fluids, along with the uncontested pulse free delivery "smoothness" at maximum turn down, the vibratory feeder has powerful advantages over the screw feeder in a great number of applications.





BELT SCALES & INSERTION WEIGHERS

Model 1RF "QUARRY KING" Belt Scale

Outdoor conveyor weighing of dusty fines and "stone like" aggregate materials where rugged construction and spill-proof/jam-proof suspension design are the most essential attribute. Teaming with Thayer Scale's proven "Rocking Flexure" fulcrum is a completely new "pipestem" single idler suspension system incorporating built-in storage means for its calibration weight (no test chains required). This combination of unique elements provides important advantages for neglected-maintenance operations where on-going dust build-up and spilled aggregates are known to foul conventional suspension designs. Applications include troughed belt conveyors of 14-48" widths (Series 1RF-3A for 14", 18", 24", 30"; Series 1RF-4A for 36", 42", 48") operating at speeds up to 600 fpm and inclines up to 18 degrees.

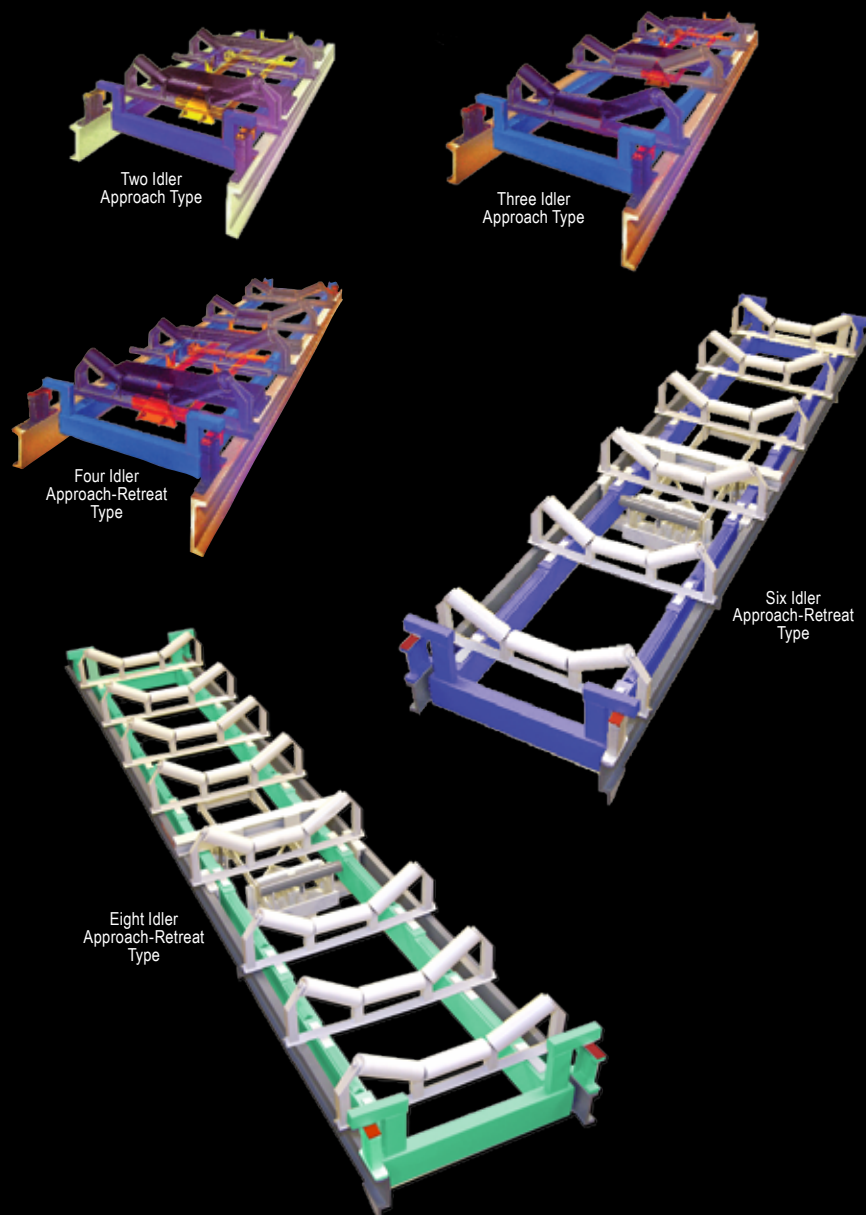
Model "RF" BELT SCALE CONFIGURATION

- There are two basic weighbridge configurations - **approach** and **approach-retreat**. The selection depends on a number of factors. Among them are space available, belt loading, idler spacing, belt tension, required accuracy and frequency of calibration.

- APPROACH TYPE:** An approach weigh bridge is suitable for most applications requiring an accuracy of 1/4% to 1% of full scale. It is available in one, two and three-idler designs.

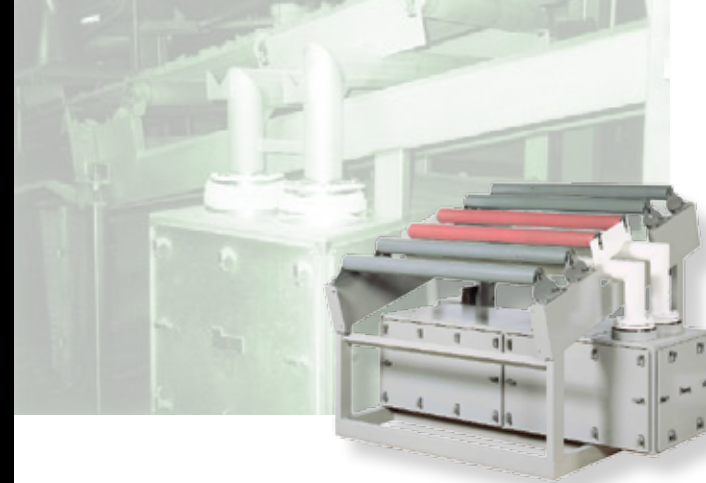
- APPROACH-RETREAT TYPE:** The approach-retreat weighbridge is designed principally for high accuracy applications normally requiring certification for commercial weighing and accuracy as high as 1/10%... available in four and six idler designs.

- The scale provides for complete mass counterbalancing of the dead load (idlers and belt) of the conveyor permitting the load sensor to react only to the net material load. This unique system is not affected by dirt, shocks or vibration, and can withstand overloads in excess of 1,000% of rated capacity without causing damage or affecting calibration. The highly advanced and extremely robust sensing technology is based on the marriage of the weight transducer, embedded temperature sensing and proprietary linearization and temperature compensating algorithms.



MODEL "NAR", NTEP CERTIFIED BELT SCALES

THAYER "NAR" Belt Scales are designed to deliver exceptional stability and accuracy for use in applications requiring verifiable weights. They are recommended for applications requiring commercial certification for billing purposes. These belts have been proven in service demanding $\pm 0.125\%$ accuracy through independent certification. The weigh bridge features exclusive rocking flexure suspension in the approach-retreat configuration. Measurement sensitivity is high, deflection is low, and the single load cell is isolated from the error-inducing effects of extraneous lateral forces, off-center loading, foundation distortion, inclination hold-back forces, and high sporadic shocks and overloads. Tare load is mass-counterbalanced to create superior signal to noise ratio in weight sensing, orders of magnitude better than belt scale designs supporting full tare load on the load sensors.



MODEL "FP" Belt Scale

Thayer Scale's Model "FP" is the low density Belt Scale of choice for many light duty weighing applications. Featuring a mass counterbalanced weigh bridge that allows the entire range of the load cell to be used for more accurate weighing of low density products, the Model "FP" is custom manufactured to fit into an existing conveyor. The Model "FP" is widely used in the cereal, tobacco and engineered composite wood panel industries providing all of the design benefits of the THAYER Low Density "M" Weigh Belt without the cost of a complete weigh belt system.

Insertion Weigh Belts

Unlike conventional weigh belts that feature a weigh bridge installed in the conveyor, THAYER specialized Insertion Weighers feature a weigh bridge that consists of a complete conveyor assembly directly coupled to a patented *Force Measurement Suspension System* (FMSS). This system provides for complete mass counterbalancing of the conveyor assembly, so that the load cell only reacts to the net material load. This unique system is not affected by dirt, shock or vibration and can withstand overloads in excess of 1,000% of rated scale capacity without damage or calibration drift.

The highly advanced and extremely robust sensing technology is based on the marriage of the LVDT, embedded temperature sensing and proprietary linearization and temperature compensating algorithms.

This unique measurement system is not affected by belt tension and allows heavy and/or specialized belts that, although suitable for the material handling needs of the application, may not provide sufficient flexibility for use in conventional weigh belts, to be used in the Model "S" or "SB" without concern for accuracy compromise.

MODEL "SI" Weigh Belt

Thayer Scale's specialized Model "SI" Insertion Weighers provide accurate and repeatable rate measurement in tight process areas. When used with a variety of pre-feed devices, the Insertion Weigher can be used to control and/or batch dry bulk solids in areas that do not have the space to support a weigh belt feeder. Totally wash down and impervious to caustic sanitizing solutions, the "SI" is a perfect fit for many food applications.



MODEL "SB" Weigh Belt

The type "SB" unit adapts well to existing vibratory, screw or belt conveyor installations where it has been determined that weight measurement and/or flow control is desired. Also on new installations, the combination of a suitable pre-feeder and Model "SB" unit often proves the best approach considering both cost and material handling requirements.





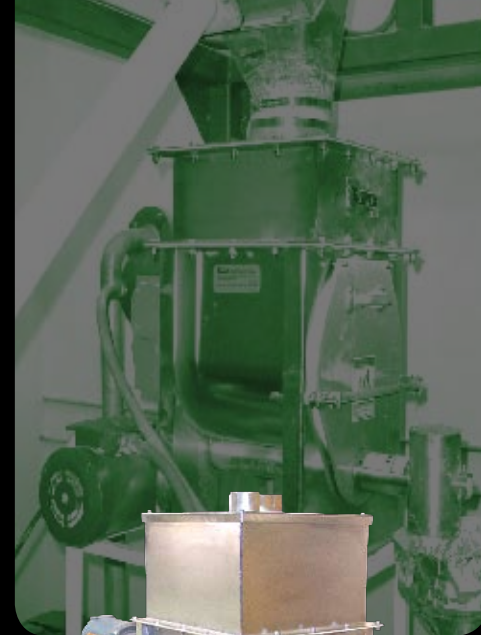
VOLUMETRIC FEEDERS

Proven ability to feed difficult powders the Models "PF" and "PFM" Volumetric Powder Feeder controls both flooding and clogging problems associated with difficult-to-handle powders.

Unique feeder trough effectively de-aerates and confines the powder at the initial fill cycle to prevent flooding.

Independently driven agitator maintains optimum material conditioning while screw speed can vary to control flow rate.

Feeder disassembles easily for total cleaning, eliminating contamination problems when changing materials.



LIQUID METERING



Thayer Scale Model "MFLI" Mass Flow Liquid Injection systems accurately feed a wide range of viscosities at high temperatures and pressures. No intermediate weigh hopper is required. Our system may be directly coupled to the upstream and downstream process.



Liquid batch feeders utilize many of the same features as our dry powder Loss-In-Weight Feeders. Thayer Scale's patented FMSS technology scales are used to assure high accuracy and repeatable batching of liquids regardless of viscosity, pressure or temperature.

INSTRUMENTATION



Thayer Scale manufactures a wide range of instrumentation products that can be configured to operate either a single or multi-feeder operation in either batch or continuous mode. Features include programmable analog and discrete I/O, multi-level password protection, RS232 and RS485 serial communications and a wide range of device level interfaces including DeviceNet, Profibus-DP, and Ethernet /IP.

High quality, professionally fabricated, custom packaging is available including feeder systems for use in hazardous areas, free standing control cabinets and fully integrated weigh feeder/PLC control systems.



Allen-Bradley



Modbus®



MATERIAL FLOW AIDS

Bridge Breaker® Flow Aids, both custom designed and universal models for installation in existing bins, chutes or hoppers to reliably discharge materials which have a tendency to bridge, arch, or rat-hole.



SERVICE

Thayer Scale designs and manufactures equipment that is BUILT TO SURVIVE and provide long lasting operation in industrial environments. As with all precision weighing equipment, your Thayer Scale equipment will function best when start-up, routine service and repairs are done by a factory-trained service representative.

Start-Up Service:

Factory-trained service representatives are strategically placed around the United States. Our service department has an outstanding record of longevity, experience and achievement. THAYER technicians are available for start-up support, inspection, diagnosis and repair services, routine maintenance and calibration services, material testing, and are available for emergency, scheduled contract, and routine/preventative maintenance.

