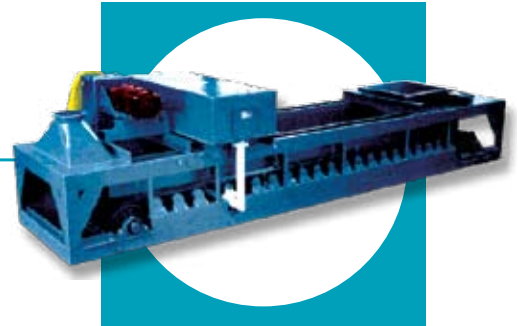


# THAYER SCALE

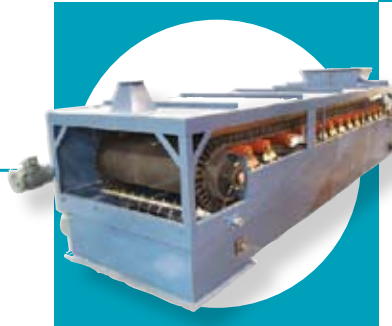
PROCESS MEASUREMENT & CONTROL EQUIPMENT

## Heavy Industry SERIES M Weigh Belts

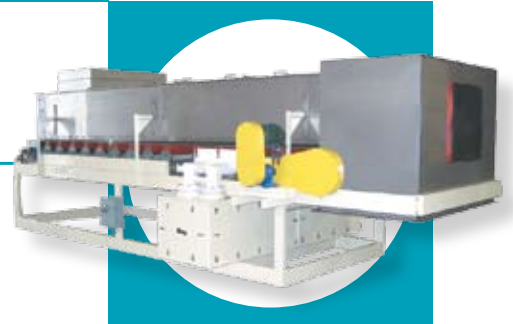
*MODEL MH*



*MODEL MDH*



*MODEL M LOW DENSITY*



*MODELS MD & MDL*



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

# MODEL MH

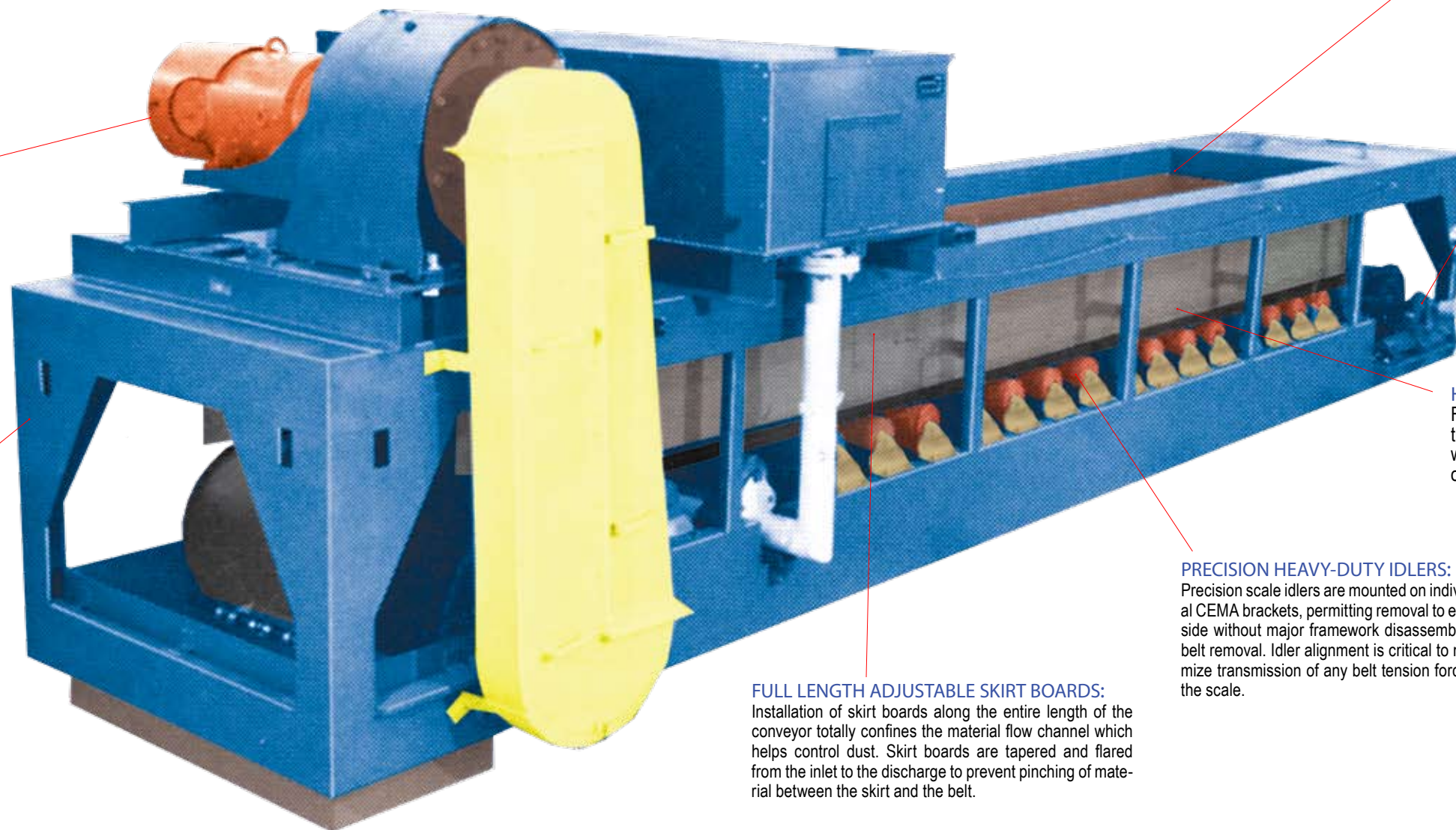
## HEAVY INDUSTRY THE WORLDS MOST RELIABLE WEIGH FEEDERS

First designed for steel mill service to feed flux materials (limestone, mill scale, dolomite, iron ore pellets, fluorspar and coke), the Model "MH" has been subjected to extreme environmental conditions-such as abrasive dusts, corrosive fumes, wide temperature fluctuations and vibrations-without any detrimental effects on performance or accuracy. Its rugged construction coupled with the most advanced electronic controls make it truly THE WORLDS MOST RELIABLE WEIGH FEEDER.

- Single or multiple vertically suspended weigh idler.
- Measures only vertical forces-therefore is not affected by changes in idler friction.
- Minimum area for material build-up.
- Force aligned to totally eliminate the effects or changes in belt tension caused by material head loading or belt tracking adjustments.
- Cantilever suspension system permits easy removal of the belt.
- Weight transducer is located out of material handling area and not affected by dust, corrosion or heat produced by the material.
- Weight sensing lever system is a summing lever so that the load (weight) is measured accurately, regardless of belt tracking or load position.
- Weight sensing system is totally enclosed and requires no maintenance.
- Weight sensing system has infinite over-load protection (mechanical stops) and weight sensor (LVDT) cannot be damaged by shock loads.
- Weight signal represents only material load; the dead load (belt & idler) is completely mass counter-balanced.

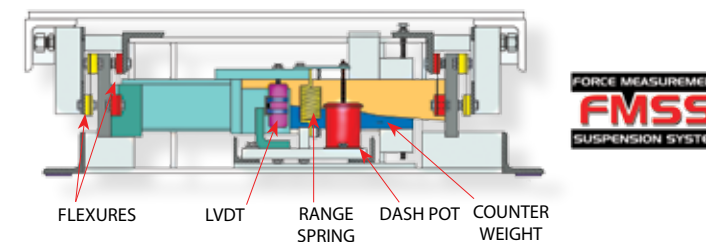
### DRIVE SYSTEM:

Horse power requirement calculations are performed by computer. Also computerized is the selection of shafts, drive chain, gear box and motor. Head and tail pulley are selected in accordance with CEMA standards, with lagging as required.



### FEEDER FRAME DESIGN

- Heavy channel frame (12" stringer depth) provides rigid support for the material load, belt and idlers.
- Rigid box frame resists deflection and deformation.
- Easy to enclose with removable covers for access to conveyor section.
- Spill hoppers, chutes and scavengers are easily attached for dust removal.



### THAYER FLEXURE PLATE SUSPENSION SCALE Laboratory Accuracy in Industrial Environments

The Basic THAYER Flexure-Plate Suspension system utilizes a series of steel flexure plates to transmit gravimetric loads vertically from the load receiving element through levers to the specifically selected controls. The combination of mass counterbalancing against tare loads, frictionless flexure-mounted levers and a high resolution transducer produces a force measuring system beyond compare. Of significance is the fact that infinite weighments may be made without maintenance or calibration, regardless of atmospheric or factory conditions. In many instances, THAYER Flexure Plate Suspension Systems placed in operation in 1950 are still working without maintenance or adjustment.

### SCALE LOCATED OUTSIDE THE MATERIAL HANDLING AREA:

Thayer's scale is not mounted between the strands of the belt, but in a location outside of the material handling area such that the weigh idler(s) supporting the belt transmit the load to the scale. This design has several benefits. The scale is not prone to damage, is out of the way for cleaning, and is not subject to tare build-up that would change the weight, causing incorrect calibration. Thayer's scales can take high load direct overloads that are caused by operating personnel or by the occasional particle pinching that can occur between the conveyor and the side skirt.



### INLET CHUTE:

A major factor in achieving uniform withdrawal from storage bins. THAYER takes very carefully consideration of the inlet section design based on a given material density, particle size and handling characteristics. The correct design allows for maximum efficiency and low energy consumption.

### BELT TRAVEL PULSER:

Speed sensing is digital and accurate over an infinite speed range. Rugged speed sensor is coupled directly to the feeder tail pulley not the drive pulley and measures belt speed or belt travel.

### HEAVY DUTY BELT

Flat belt with 1" high side flanges for prevention of material spillage. Optional high side wall belts are available for use with floddable or dry, non-stick materials.

### PRECISION HEAVY-DUTY IDLERS:

Precision scale idlers are mounted on individual CEMA brackets, permitting removal to either side without major framework disassembly or belt removal. Idler alignment is critical to minimize transmission of any belt tension force to the scale.

### FULL LENGTH ADJUSTABLE SKIRT BOARDS:

Installation of skirt boards along the entire length of the conveyor totally confines the material flow channel which helps control dust. Skirt boards are tapered and flared from the inlet to the discharge to prevent pinching of material between the skirt and the belt.

# MODEL MDH HEAVY INDUSTRY WEIGH BELT FEEDER

Originally designed for steel mill service, Thayer's Weigh Belt Model MDH 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 50 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 particles 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.

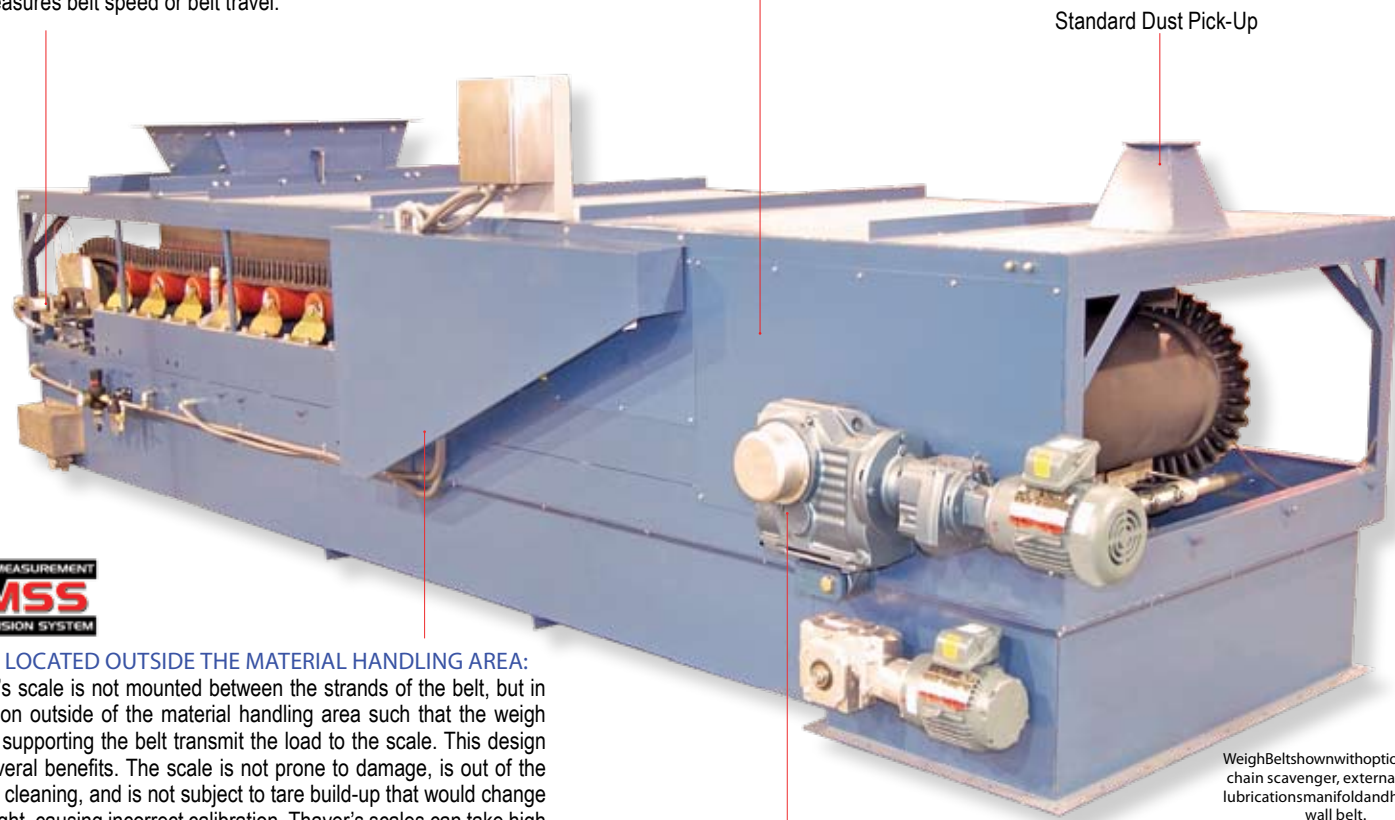


#### BELT TRAVEL PULSER:

Speed sensing is digital and accurate over an infinite speed range. Rugged speed sensor is coupled directly to the feeder tail pulley not the drive pulley and measures belt speed or belt travel.

#### WELDED FRAME, QUICK REMOVAL ACCESS PANELS:

THAYER weigh belts are of welded, not bolted, construction. A rigid, welded and box frame construction resists deflection and deformation under heavy loads. Frame distortion adversely affects scale measurement performance. Easy removable covers for access, designed to meet EPA and OSHA standards. Side panels, if included, are removed with quick-release fasteners (no tools required).



Standard Dust Pick-Up

Weigh Belt shown with optional drag chain scavenger, external pulley lubrications manifold and high side wall belt.

#### HEAD PULLEY DRIVE SYSTEM:

Horse power requirement calculations are performed by computer. Also computerized is the selection of shafts, drive chain, gear box and motor. Head and tail pulley are selected in accordance with CEMA standards, with lagging as required. Drive types varies depending on application. Direct shaft mount or chain drives are available. AC or DC motors.



#### OPTIONAL AUTOMATED TEST WEIGHT LIFTER:

Thayer's Automated Test Weight Lifter (ATWL) mechanism provides a means for applying a known test weight to allow completely automatic calibration. The calibration sequence can be initiated via the weigh belt instrument keypad or via a contact closure. A self-checking software algorithm in the weigh belt instrumentation prevents erroneous calibration. Test weight calibration eliminates the need for test chains.



#### SCALE LOCATED OUTSIDE THE MATERIAL HANDLING AREA:

Thayer's scale is not mounted between the strands of the belt, but in a location outside of the material handling area such that the weigh idler(s) supporting the belt transmit the load to the scale. This design has several benefits. The scale is not prone to damage, is out of the way for cleaning, and is not subject to tare build-up that would change the weight, causing incorrect calibration. Thayer's scales can take high load direct overloads that are caused by operating personnel or by the occasional particle pinching that can occur between the conveyor and the side skirt.

#### INLET CHUTE:

A major factor in achieving uniform withdrawal from storage bins. THAYER takes very carefully consideration of the inlet section design based on a given material density, particle size and handling characteristics. The correct design allows for maximum efficiency and low energy consumption. Shown with optional removable abrasion resistant liner.

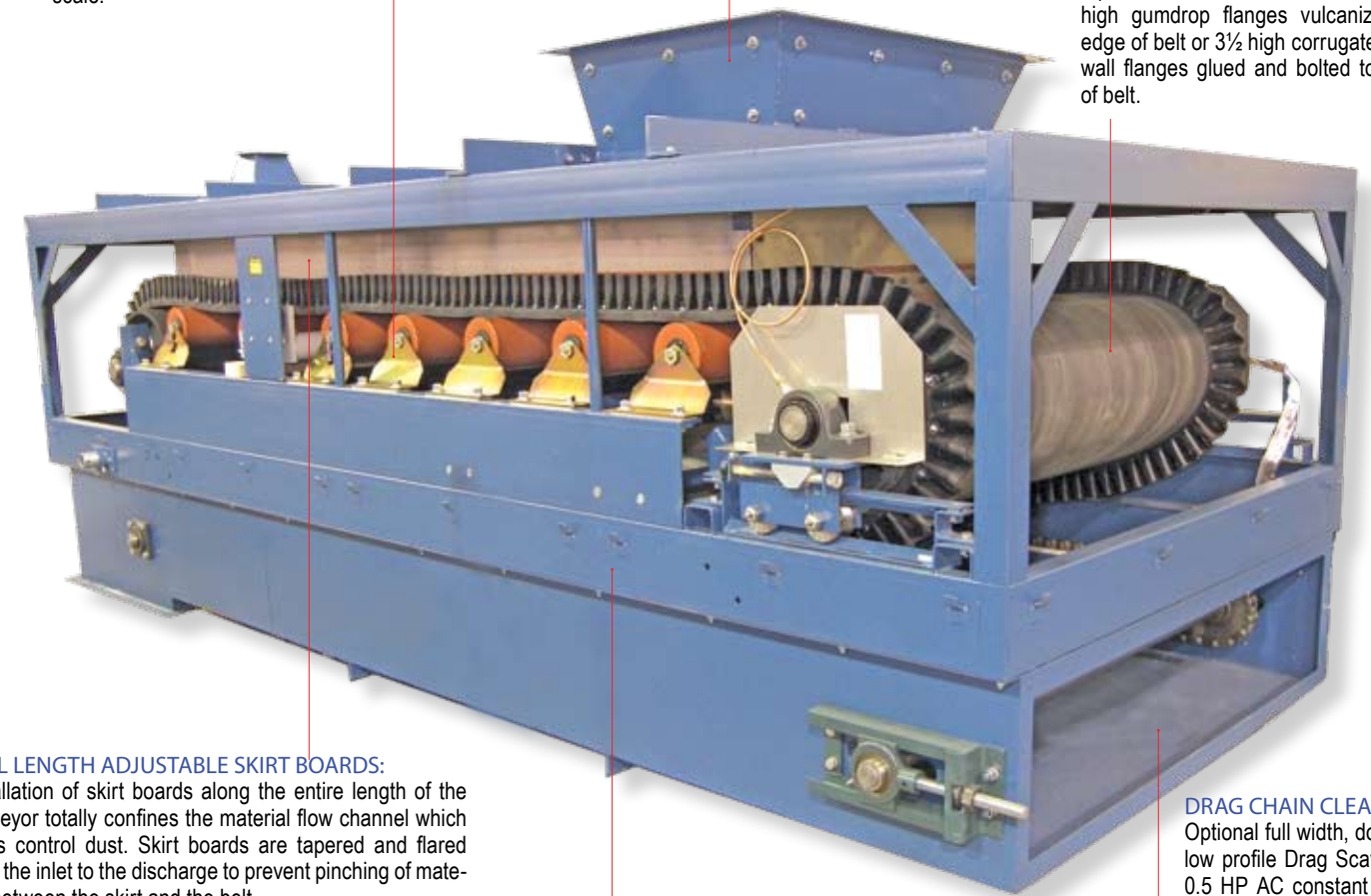


#### PRECISION HEAVY-DUTY IDLERS:

CEMA Class, flat precision idlers with maximum eccentricity of  $\pm 0.015$  TIR. Precision scale idlers are mounted on individual CEMA brackets, permitting removal to either side without major framework disassembly or belt removal. Idler alignment is critical to minimize transmission of any belt tension force to the scale.

#### BELT:

3-ply polyester endless belt with rated tensile strength of 330PIW complete with 1/4 inch top and 1/16 inch SBR covers and 1.0 inch high gumdrop flanges vulcanized to each edge of belt or 3 1/2 high corrugated Butyl side wall flanges glued and bolted to each edge of belt.



#### FULL LENGTH ADJUSTABLE SKIRT BOARDS:

Installation of skirt boards along the entire length of the conveyor totally confines the material flow channel which helps control dust. Skirt boards are tapered and flared from the inlet to the discharge to prevent pinching of material between the skirt and the belt.

#### DRAG CHAIN CLEANOUT

Optional full width, double chain, low profile Drag Scavenger with 0.5 HP AC constant speed motor prevents dust build up on bottom of enclosure. Equipped with removable dust-tight end panels with lift and turn fasteners.

#### FEEDER FRAME DESIGN

- Heavy channel frame (10" stringer depth) provides rigid support for the material load, belt and idlers.
- Rigid box frame resists deflection and deformation.
- Easy to enclose with removable covers for access to conveyor section.
- Spill hoppers, chutes and scavengers are easily attached for dust removal.



# MODEL M

## The Worlds Most Accurate Low Density Weigh Belt

One of Thayer Scale's specialty equipment lines is the Model "M" Low-Density Feeder line for weighing bulk materials having densities under 10 lb/ft<sup>3</sup>. 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 Low-Density 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.

### INLET CHUTE:

A major factor in achieving uniform withdrawal from storage bins. THAYER takes very carefully consideration of the inlet section design based on a given material density, particle size and handling characteristics. The correct design allows for maximum efficiency and low energy consumption.



### BELT TRAVEL PULSER:

Speed sensing is digital and accurate over an infinite speed range. Rugged speed sensor is coupled directly to the feeder tail pulley not the drive pulley and measures belt speed and belt travel.



Weigh Belt shown with optional drag chain scavenger and external idler and pulley lubrication manifold.

### PRECISION HEAVY-DUTY IDLERS:

Precision scale idlers are mounted on individual CEMA brackets, permitting removal to either side without major framework disassembly or belt removal. Idler alignment is critical to minimize transmission of any belt tension force to the scale.

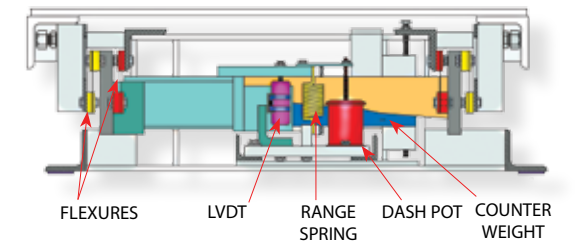


### SCALE LOCATED OUTSIDE THE MATERIAL HANDLING AREA:

Thayer's scale is not mounted between the strands of the belt, but in a location outside of the material handling area such that an idler supporting the belt (the weigh idler) transmits the load to the scale. This design has several benefits. The scale is not prone to damage, is out of the way for cleaning, and is not subject to tare build-up that would change the weight, causing incorrect calibration. Thayer's scales can take high load direct overloads that are caused by operating personnel or by the occasional particle pinching that can occur between the conveyor and the side skirt.

### THAYER FLEXURE PLATE SUSPENSION SCALE Laboratory Accuracy in Industrial Environments

The Basic THAYER Flexure-Plate Suspension system utilizes a series of steel flexure plates to transmit gravimetric loads vertically from the load receiving element through levers to the specifically selected controls. The combination of mass counterbalancing against tare loads, frictionless flexure-mounted levers and a high resolution transducer produces a force measuring system beyond compare. Of significance is the fact that infinite weighments may be made without maintenance or calibration, regardless of atmospheric or factory conditions. In many instances, THAYER Flexure Plate Suspension Systems placed in operation in 1950 are still working without maintenance or adjustment.



### Standard Dust Pick-Up

### DRIVE SYSTEM:

Horse power requirement calculations are performed by computer. Also computerized is the selection of shafts, drive chain, gear box and motor. Head and tail pulley are selected in accordance with CEMA standards, with lagging as required.

### WELDED FRAME, QUICK REMOVAL ACCESS PANELS:

THAYER weigh belts are of welded, not bolted, construction. A rigid, welded and box frame construction resists deflection and deformation under heavy loads. Frame distortion adversely affects scale measurement performance.

Easy removable covers for access, designed to meet EPA and OSHA standards. Side panels, if included, are removed with quick-release fasteners (no tools required).

### FULL LENGTH ADJUSTABLE SKIRT BOARDS:

Installation of skirt boards along the entire length of the conveyor totally confines the material flow channel which helps control dust. Skirt boards are tapered and flared from the inlet to the discharge to prevent pinching of material between the skirt and the belt.

### BELT SCRAPER ASSEMBLY

Cantilevered design, 304 stainless steel support arm with dual adjustable spring tensioners, Replaceable, dual, staggered scraper blades made of long wearing engineered plastic and held in place with full length adjustable 304 stainless steel clamping plates.

# MODELS MD MDL

## HEAVY INDUSTRY WEIGH BELT FEEDERS

### THAYER SCALE MODELS MD and MDL WEIGH BELTS

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 belt drive to gravimetrically totalize and measure the flow of material, or with closed 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't 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 STPH). The Model MDL is as ruggedly built as our capacity weigh feeders, to withstand abrasive materials, but is designed to operate at flow rates just beyond the limits of our 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 when medium to high feed rates are required, handling high bulk density and small through large particle size materials. 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.

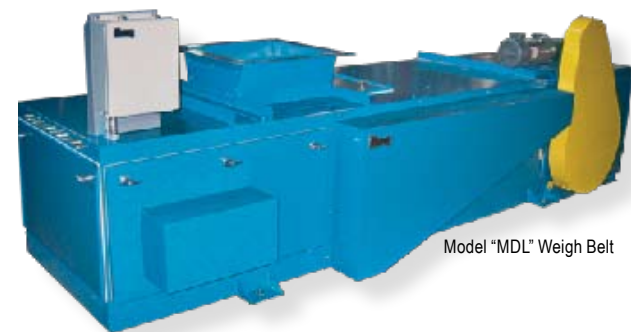
Unlike conventional weight sensing systems wherein the weigh idler is directly coupled to a series of load cells, the Model MD and MDL weigh belts incorporate a unique Force Measurement Suspension System (FMSS) interposed between the weigh idler and a single load transducer. The FMSS is a NET weighing system that counter-balances dead load so that the entire range of the load transducer is available for weighing the material. The FMSS also prevents erroneous horizontal force vectors from being interpreted as changes in weight for unsurpassed resolution and weight measurement repeatability.

When connected to the THAYER family of instrumentation, the MD and MDL Weigh Belts can be consistently and accurately calibrated and the measurements can be presented to operators and supervisory controls in a variety of data handling methods.

The instrumentation can control the flow of material as a master feeder or as a slave proportioning its feed rate to some other master signal.

#### ADVANTAGES

- Long term accuracy and repeatability with low cost of ownership.
- Load transducer located external to the material flow channel.
- Weigh bridge is insensitive to the accumulation of weight that accompanies tare build-up.
- Heavy duty, welded boxed frame construction easily accommodates legs and dust removal/scavenger systems as well as length and incline variation without significant changes in configuration.
- Can be easily and economically adapted to support future capacity needs.



Model "MDL" Weigh Belt



#### INLET CHUTE:

A major factor in achieving uniform withdrawal from storage bins. THAYER takes very carefully consideration of the inlet section design based on a given material density, particle size and handling characteristics. The correct design allows for maximum efficiency and low energy consumption.

#### FULL LENGTH ADJUSTABLE SKIRT BOARDS:

Installation of skirt boards along the entire length of the conveyor totally confines the material flow channel which helps control dust. Skirt boards are tapered and flared from the inlet to the discharge to prevent pinching of material between the skirt and the belt.



#### AUTOMATED TEST WEIGHT LIFTER:

Thayer's Automated Test Weight Lifter (ATWL) mechanism provides a means for applying a known test weight to allow completely automatic calibration. The calibration sequence can be initiated via the weigh belt instrument keypad or via a contact closure. A self-checking software algorithm in the weigh belt instrumentation prevents erroneous calibration. Test weight calibration eliminates the need for test chains.



#### SCALE LOCATED OUTSIDE THE MATERIAL HANDLING AREA:

Thayer's scale is not mounted between the strands of the belt, but in a location outside of the material handling area such that an idler supporting the belt (the weigh idler) transmits the load to the scale. This design has several benefits. The scale is not prone to damage, is out of the way for cleaning, and is not subject to tare build-up that would change the weight, causing incorrect calibration. Thayer's scales can take high load direct overloads that are caused by operating personnel or by the occasional particle pinching that can occur between the conveyor and the side skirt.



#### Standard Dust Pick-Up

#### DRIVE SYSTEM:

Horse power requirement calculations are performed by computer. Also computerized is the selection of shafts, drive chain, gear box and motor. Head and tail pulley are selected in accordance with CEMA standards, with lagging as required.

#### BELT TRAVEL PULSER:

Speed sensing is digital and accurate over an infinite speed range. Rugged speed sensor is coupled directly to the feeder tail pulley not the drive pulley and measures belt speed or belt



#### SLACK BELT DESIGN:

Low belt tension increases belt life, produces more stable measurement and eliminates the need for belt tracking devices.

#### PRECISION HEAVY-DUTY IDLERS:

Precision scale idlers are mounted on individual CEMA brackets, permitting removal to either side without major framework disassembly or belt removal. Idler alignment is critical to minimize transmission of any belt tension force to the scale.



#### WELDED FRAME, QUICK REMOVAL ACCESS PANELS:

THAYER weigh belts are of welded, not bolted, construction. A rigid, welded and box frame construction resists deflection and deformation under heavy loads. Frame distortion adversely affects scale measurement performance. Easy removable covers for access, designed to meet EPA and OSHA standards. Side panels, if included, are removed with quick-release fasteners (no tools required).



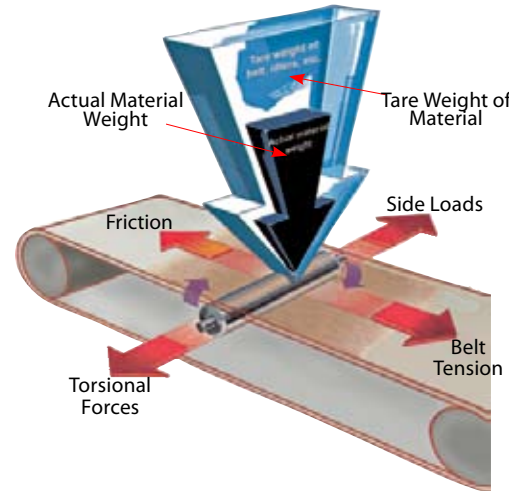
Weigh Belts shown with optional drag chain scavenger and external pulley lubrications manifold.

## "FMSS" FORCE MEASUREMENT SUSPENSION SYSTEM



Unique technology provides isolation from all force vectors except material weight.

- A load sensor cannot distinguish between the "meaningful" force of material weight and other forces. THAYER Weigh Feeders are engineered to isolate the load sensor from these other forces for highly accurate material weighing.
- Weight sensing system is totally enclosed and requires no maintenance.
- Weight sensing system has infinite over-load protection (mechanical stops) and weight sensor (LVDT) cannot be damaged by shock loads.
- Weight signal represents only material load; the dead load (belt & idler) is completely mass counter-balanced.
- Excessive belt tension forces are eliminated by our head pulley drive and low deflection scale. Friction is defeated by using precision rollers instead of slider decks. Torsional forces, caused by off center loading and side forces, are decoupled from the true force transmission by our weigh scale.
- Load Cell Utilization Factor >80%  
Because THAYER manufactures the load cell, we can provide a load cell with a capacity that is closely matched to the actual maximum material weight. The tare weight of the weigh idler and belt are mass counterbalanced. We design our scales such that the maximum material weight is always > 80% of scale capacity. This results in the best possible signal resolution. This flexibility is not possible with strain gauge load cells, which tend to be available in standard capacities of 10, 50, 100, 200, 500 lb., etc. Thayer's rugged load cell design assures reliable operation for the life of the weigh belt. Because our load cells never fail, they are not a recommended spare part. Unique technology provides isolation from all force vectors except material weight.
- Force vector isolation is a Thayer Scale technological advantage. It is one of the best reasons to buy from the weigh feeder experts at Thayer Scale.



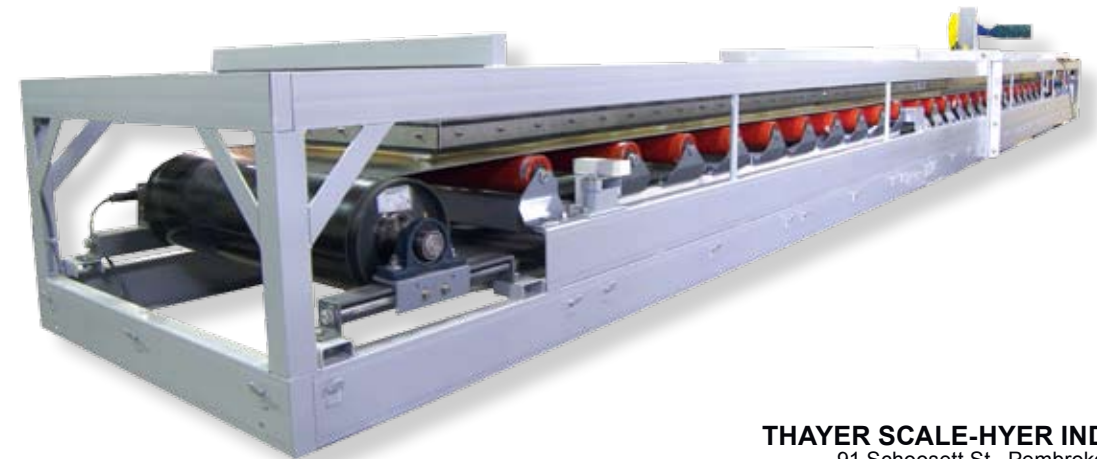
INDUSTRY	Application	Materials	Users	M Series Model In Use
CEMENT	Raw and finish mill proportioning systems	Limestone, Shale, Clay, Oyster Shells, Coral, Iron, Silica, Alumina, Fly Ash, Raw Meal, Clinker, Gypsum	Lone Star, ESSROC, Glens Falls Lehigh Cement, California Portland Cement, Apasco	MH, MD, MDL
STEEL	B.O.F. Flux Feeding, Sinter proportioning systems, Blast furnace charging, Coke battery proportioning systems.	Iron Ore Pellets, Limestone, Dolomite, Coke, Pulverized Coal, Fluorspar, Manganese, sinter Fines, Iron Ore Concentrate	U.S. Steel, Bethlehem Steel, Inland Steel, Mittal Steel, Timken Steel, Iron Dynamics, Kobe/US Steel	MH, MD, MDL
ETHANOL	Raw ingredient proportioning for Ethanol plants	Whole Corn, Ground Corn, Starch, Germ, Soy Bean	Proprietary	MDH, MD, MDL
TOBACCO	Leaf proportioning, Flavor additive systems, expanded stem	Turkish, Burley, Bright, Homogenized, Expanded Stem, Diet Tobacco	Phillip Morris, R.J. Reynolds, Brown & Williamson, Liggett, American Tobacco, Rothmans, Benson & Hedges	M Low Density
FOREST PRODUCTS	Particle Board, Aspen wafer board, MDF, OSB, OSL, Chip Blending	Wood Fiber, Wood Particles, Aspen Wafers, Pin Chips, Wood Chips, Saw Dust, Wood Dust	Louisiana Pacific, Martco Partnership, JM Huber Engineered wood, Weyerhaeuser, Georgia Pacific, Masonite, Potlatch, Norbord, Boise Cascade	M Low Density
POWER	Coal Blending, Fluidized bed Boiler feed systems, Sludge Weighing, Air Pollution Control	Coal, Gypsum, Limestone, FlyAsh	Tampa Electric, Duke Energy, Great River Energy, Alabama Power, Texas Industries	MD, MH, MD
MINING	Rod and Ball mill feed Systems, Ore Blending, Furnace feed systems	Iron Ore, Iron Ore Concentrate, Copper Ore, Copper Concentrate, Lead Ore, Lead Concentrate, Zinc Ore, Zinc Concentrate	Cleveland Cliffs Iron, Inland Steel, Phelps Dodge, Amax, Metso	M,H, MDH, MD
FERTILIZER	Raw material Inventory, Mill Feed Systems, Additive and Coating Proportioning Systems	Potash, Phosphate, Ammonium Nitrate Prills, Diamonium Phosphate	Scott's, DuPont, Monsanto, Mobil, Negev Phosphates	MD, MDL
ALUMINUM	Carbon Anode Coke Blending	Petroleum Coke, Bauxite, Alumina	Alcoa, Alumax	MD



### 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 PLC/PC communications drivers and 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.



THAYER® and the THAYER logo are Registered Trademarks of Hyer Industries, Inc.  
© Hyer Industries, Inc. 2004. All rights reserved.

**THAYER SCALE-HYER INDUSTRIES, INC.**  
91 Schoosett St., Pembroke, MA 02359  
Ph: 781-826-8101 Fax: 781-826-7944  
e-Mail: Sales@ThayerScale.com  
WEB: www.ThayerScale.com