



## Thermo Scientific Bulk Weighing and Monitoring Solutions

**Instrumentation and Automation  
for the Process Industries**

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## Instrumentation and Automation for the Process Industries

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## About Thermo Scientific Bulk Weighing and Monitoring Products

The Thermo Scientific line of industrial in-motion weighing, inspection, monitoring and control equipment is used for process control, production monitoring and automation. Our products are marketed worldwide to the coal and minerals mining, cement, construction, aggregates, electric utilities, chemical processing, plastics and food industries, among others.

Our bulk weighing and monitoring product line includes conveyor belt scales, weighbelt feeders, tramp metal detectors, coal and mineral sampling systems, level indicators, conveyor safety switches and a variety of other specialty process control instruments. All products are ISO 9001 certified.

### Commitment to Quality

We strive to provide competitively priced, defect-free products and services that meet our customers' requirements by the promised delivery date.

### Customer Satisfaction

We are dedicated to the highest level of customer satisfaction. Our pledge is to work with you, the customer, to provide customized solutions to your specifications and needs.



# Conveyor Belt Scale Systems

We are one of the world's largest providers of conveyor belt scales and electronic integrators. The rugged construction and leading edge designs of our belt scale systems have ensured reliable performance and provided unmatched versatility for over 50 years. All of our belt scale systems let you monitor production output and inventory, or regulate product loadout, while providing vital information for the effective management and efficient operation of your business.



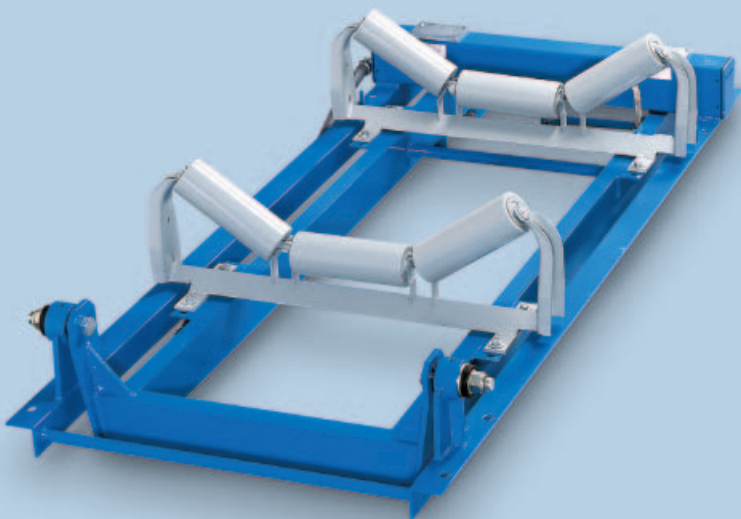
## Thermo Scientific Ramsey IDEA

This belt scale system provides basic rate information and totalization functions in processes involving non-critical or lower value materials with an accuracy of  $\pm 1\%$ . It is available in either single or dual module configurations and its highly compact design makes it ideal for operations where economy and ease of installation are important considerations.



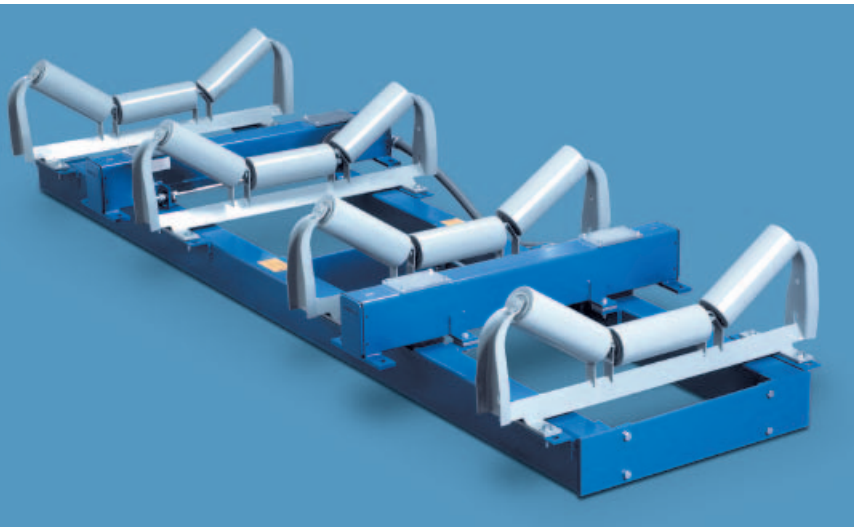
## Thermo Scientific Ramsey Series 20

This system monitors feed to crushers, mills, screens and other processes with an accuracy of  $\pm 0.5\%$ , even in the most demanding industrial applications. It is designed for general in-plant belt conveyor weighing and lets you monitor production output and inventory, or regulate product loadout.



## Thermo Scientific Ramsey Series 17

This belt scale system is specifically designed for plant and process operations that run at high rates of speed or require high accuracy. Its unitized multi-idler weighbridge permits more scale-borne time, which minimizes alignment errors, allowing this model to be offered as a highly accurate  $\pm 0.25\%$  scale system. This system is available in a two or four-idler version.



### Thermo Scientific Ramsey Series 14

This system is specifically designed for high accuracy or basis-of-payment applications requiring certification by government and regulatory agencies. It is extremely accurate to within 0.125% and is the most widely certified belt scale in the world. It has received its Certificate of Conformance in the United States as issued under the National Type Evaluation Program (NTEP) of the National Conference on Weights and Measures. Outside of the U.S., it is certified by OIML and EEC Class I standards. It represents the world standard of accuracy and performance for loadout, inventory monitoring and fee-holder type applications.

### Thermo Scientific Ramsey Micro-Tech 2000

This series of electronic integrators signifies a new approach to scale instrumentation, giving the user more flexibility and vastly increased upgrade capabilities. These instruments are suitable for applications utilizing: belt conveyor scales, weighbelt feeders, loss-in-weight feeders, impact flow meters and other dynamic weighing systems. Because all of the Thermo Scientific Ramsey Micro-Tech models use a common platform, the user only needs to become familiar with one basic interface. These integrators also have extraordinary communication capabilities that allow them to connect to intelligent peripheral equipment, such as computers, programmable logic controllers, printers and network systems.



### Thermo Scientific Ramsey Model 60-12

This sensor is the most reliable and accurate speed-sensing device ever developed for belt scale service. Direct-coupling the sensor to the conveyor tail pulley, snubbing roll or a large diameter return roller ensures accurate belt-travel readout. Its rugged, cast-aluminum housing makes it suitable for outdoor installations. It comes equipped with an AC pulse generator, so there are no brushes to adjust or replace.

## Weighbelt Feeders

Precise feeding of process materials is often critical to maintaining product quality. A feeder that weighs accurately and reliably can reduce material waste, help maintain blend consistency and increase profits. We have over 30 years of experience designing and manufacturing weighbelt feeders. Every feeder is designed to meet the specific needs of an application. We work closely with our customers to ensure that each system meets their expectations for performance and dependability.



### Thermo Scientific Ramsey Model 90.100A

This weighbelt feeder's heavy duty construction provides larger pulleys and a very sturdy, rugged frame for increased accuracy in high-rate, heavy duty applications. It accommodates flow rates up to 816 metric tons (900 tons) per hour, and belt loadings up to 447 kg/m (300 lb/ft). Its endless belt design allows the belt to be changed with minimum downtime.



### Thermo Scientific Ramsey Model 90.125A

This weighbelt feeder's unique cantilevered and formed channel frame design provides a strong and sturdy weigh structure and allows for quick and easy maintenance. It accommodates flow rates of approximately 0.5 metric tons (0.5 tons) per hour up to 91 metric tons (100 tons) per hour, and belt loadings of 15 kg/m (10 lb/ft) to 170 kg/m (72 lb/ft).



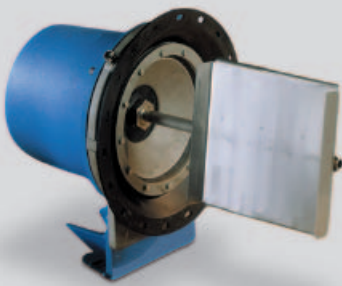
### Thermo Scientific Ramsey Model 90.151

This weighbelt feeder provides a consistent flow of material, offers increased sensitivity for more accurate weighing of the lightest materials, and permits quick and easy cleaning and maintenance. Its stainless steel construction provides improved corrosion resistance and washdown capabilities. It accommodates flow rates as low as 54 kg (120 lb) per hour up to 22,680 kg (50,000 lb) per hour, and belt loadings of 3 kg/m (2 lb/ft) to 30 kg/m (20 lb/ft).

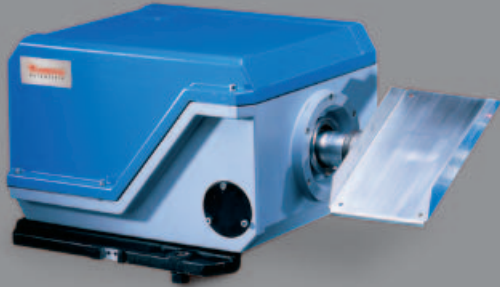


### Thermo Scientific Ramsey Micro-Tech 2105 and 2205

These specialized instruments are multi-functional digital control devices that incorporate all weighing, logic and control functions into a single dedicated package. They are ideal for blending and ratio control.



Thermo Scientific Ramsey DE20 Impact Weigher and DX20 Sensing Plate



Thermo Scientific Ramsey DE10 Impact Weigher and DX10 Sensing Plate

## Impact Weighers

These unique devices are designed to continuously measure the mass flow rate and total mass of free-flowing particulate materials in mechanical conveying systems without interrupting the flow of material.

Thermo Scientific impact weighers provide a low-cost, yet highly accurate, method of measuring the mass flow of dry solids and powders for inventory process control and can help you save thousands of dollars by reducing waste and improving product quality. They are ideal for applications in vertical flow streams where weighbelt feeders or belt conveyor scales will not fit or cannot be applied. These systems are easy to install and maintain. Our impact weighers can operate with a variety of pre-feed devices, including screw or vibratory feeders, belt conveyors, drag conveyors, air slides or rotary valves. Product weighing and totalization functions are performed with either the Thermo Scientific Ramsey Micro-Tech 2106 or the Thermo Scientific Ramsey Micro-Tech 2107 impact flow meter controllers.

## Loss-In-Weight Feeders

The accurate feeding of dry bulk material is often critical to maintaining product quality. A feeder that weighs accurately and reliably can reduce material waste, improve blend consistency and increase profits. Thermo Scientific loss-in-weight feeders measure the mass flow rate and total mass of various bulk materials, such as powders, pellets, flakes and granules.

We incorporate the standard, low capacity and sanitary versions of our volumetric feeders into a complete gravimetric feeding system, providing accuracies of  $\pm 0.25\%$  to  $1.00\%$  and more reliable process control over typical volumetric feeding systems.

There are many advantages to utilizing loss-in-weight feeders. They can handle hot, floodable and difficult materials; are unaffected by dust and material accumulation; and are well suited for low, feed-rate applications. The entire feeding system is weighed, so there are no errors caused by belt tensioning or tracking. No transportation lag time exists, ensuring precision second-to-second accuracy. Feed accuracy can always be checked during normal operation without the need for sampling.

The Thermo Scientific Ramsey Micro-Tech 2104 controller is specifically designed for continuous or batch loss-in-weight or gain-in-weight applications. It's easy to operate and calibrate with the aid of large easy-to-read displays; straightforward, tactile-touch keyboards; and software that prompts you through proper setup and operational procedures. A single Ramsey Micro-Tech 2104 is capable of operating two independent loss-in-weight systems, which ultimately contributes to cost savings. A UL-approved version is also available.



## Granuflow Flow/No-Flow Detectors

These sensors are low-cost, non-invasive, microwave-based instruments that detect and monitor flow/no-flow conditions of bulk solids in pipelines, ducts and air-slides, and at transfer points of chutes, conveyor belts and bucket elevators. This real-time flow information allows you to monitor processes closely and leads to increased reliability, higher quality end product, reduced downtime and fewer hazards to jeopardize operators and equipment.

Used for automation purposes, the Thermo Scientific Ramsey Granuflow DTR 131, DTR 231 and GTR 130 optimize the efficient use of machinery and energy by switching process equipment on or off as required. They have no moving mechanical parts, which eliminates wear and makes the instrument maintenance and trouble-free.



*Thermo Scientific Ramsey Granuflow DTR 131 Flow/No-Flow Detector*



*Thermo Scientific Ramsey Granuflow GTR 130 Flow/No-Flow Detector*



## Thermo Scientific Ramsey Granucor Solids Flow Measurement System

The in-line measurement of bulk solids flow is important for product quality, process efficiency and system safety. This system provides continuous, real-time flow measurement of free-falling materials or dense phase, pneumatically conveyed bulk solids.

The system consists of a DK13 velocity sensor which uses cross-correlation to measure material travel time between two points, a DC13 concentration sensor to measure the change in capacitance with material present versus an empty pipe, and a Ramsey Micro-Tech electronics which calculates the mass flow rate.

The Ramsey Granucor's non-intrusive design and software can be used to monitor and control the flow in pipes or the flow distribution through pipe networks.



## Conveyor Monitoring and Safety Products

We offer a variety of components for monitoring conveyors and other bulk material handling equipment. These devices monitor operating processes for potentially hazardous conditions and activate an alarm when they occur. This helps to keep your personnel safe, your equipment from being damaged, your time from being wasted, and your profits from becoming losses.

### Thermo Scientific Ramsey Belt Misalignment Switch

This switch is mounted on the top or bottom of conveyor stringers with its actuating arm adjusted to the outside edges of the belt. If the belt skews or misaligns, contacting the actuating arm and displacing it from its vertical position, a connection is made with one or more of the micro-switches. A 10° displacement of the actuating arm activates an alarm signal to warn of a potential shutdown, allowing the operator to make adjustments and realign the belt. A 20° displacement will activate a signal to shut down the process in order to prevent or minimize damage to the belt.

### Thermo Scientific Ramsey Safety Cable Pull Switch

A safety pull cable is attached to the actuating arm of the switch and terminated at fixed mounts at either end of a conveyor. Force applied to the pull cable at any position causes the actuating arm to move into a tripped-locked position and activates an alarm from one DPDT or two SPDT micro-switches, alerting equipment circuits of the stop condition. This will stay locked until manually reset by the reset lever.



### Thermo Scientific Ramsey Model 60-23P Under Speed Switch

This switch monitors the rotational velocity of a shaft or another type of rotating equipment. It may be used on conveyor belts, bucket elevators and other types of rotating equipment.



### Thermo Scientific Ramsey Motion Monitor System

This system offers a choice of versatile and reliable packages for monitoring under-speed, over-speed and zero-speed conditions on various types of machinery and systems by sensing the speed variations of rotating parts. Mechanically coupled (shaft-driven) or non-contacting proximity type sensors are available to suit particular application requirements and design preferences. The microprocessor-based Thermo Scientific Ramsey Model 60-200 programmable motion monitor control can be used with any Thermo Scientific sensor and, in some cases, with compatible pulse output sensors from other sources.



## Continuous Level Measurement



### Thermo Scientific Ramsey BOB II

This inventory management system provides rugged and dependable continuous level monitoring of solids, liquids and slurries in vessels, silos and tanks. Its mechanical system of captive pulleys, a cable brush cleaning system, and line tracking allow it to work where other technologies and competitive products fail. The Thermo Scientific Ramsey Bob II is immune to dust, vapors, steam and temperature fluctuations. The unit can be applied in both hazardous and non-hazardous locations. Its microprocessor monitors the distance traveled by the weighted bob in both the descend and retract modes. These distances are measured and compared to ensure accuracy and trouble-free operation. It gives you a wide variety of control and communication options and can be configured to meet your specific application requirements.



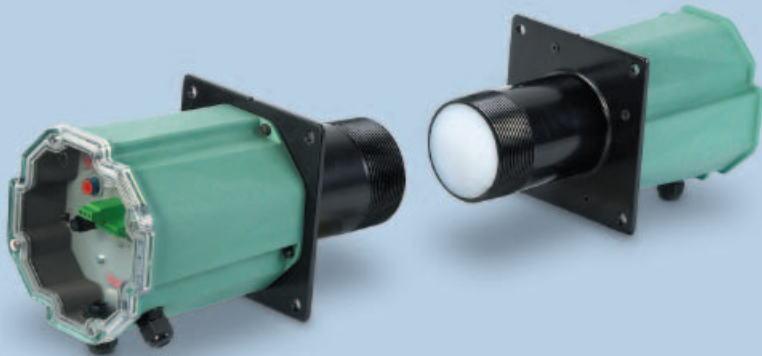
### Thermo Scientific Ramsey C-Level

This indicator is ideally suited for inventory monitoring and process control during the load-out or filling of bins and vessels containing bulk solids or liquids. Because its unique, precision strain-gauge sensors are press-fit into the vessel's support structure, the system can operate without concern for failure or maintenance issues caused by the monitored material or process environment. This distinctive design also compensates for temperature changes that can affect the accuracy of "bolt-on" strain sensors. Accurate to within  $\pm 2\%$ , the Thermo Scientific Ramsey C-Level is unaffected by corrosive or abrasive materials, uneven material discharge, build-up on sidewalls, bridging, ratholing or dusting.

### Thermo Scientific Tank Weighing Assemblies

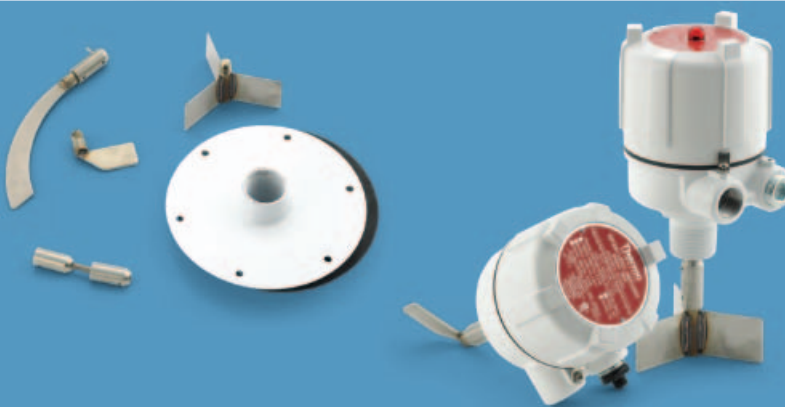
Compression tank weighing assemblies are provided as an option with the Thermo Scientific Ramsey C-Level strain sensors. They are meant for use on smaller bins and in applications requiring higher accuracy.

## Point Level Measurement



### Thermo Scientific Ramsey Microwave Point Level Detector

This totally non-contacting detector provides high- and low-point level detection and can see through non-metallic wall build-up to detect the presence or absence of any material. It can be used in pressurized coal down comers; electrostatic precipitator hoppers; fly ash, clinker and coal transfer chutes; and other industrial applications. By sensing the conditions in chutes, it alerts the user of any problems or disruptions in the process. This detector is a safe and environment-friendly replacement for nucleonic switches and is not restricted by OSHA or FCC regulations.



### Thermo Scientific Ramsey TRX Series

These indicators are designed for point level monitoring of solids in bins, vessels and chutes. Their unique de-energizing motor design reduces wear, lowers operating temperature and extends the motor's life. Three SS drive shaft bearings and a sealed, lubricated, all-metal gear assembly augment its other features to make the Thermo Scientific Ramsey TRX Series the most reliable rotary level controls on the market.



### Thermo Scientific Ramsey CAP Series

These sensors are designed for point level monitoring of solids, liquids and slurries in bins, vessels and chutes. These controls detect the presence or absence of material by sensing a change in capacitance caused by the difference between the dielectric constant of the material and that of the air. Unlike other capacitance sensors, Thermo Scientific Ramsey CAP Series probes operate below the RF level and are not subject to FCC regulation or interference from other RF-emitting devices.

### Thermo Scientific Ramsey Tilt Switches and Control Units

#### Now Available in a Mercury Free Version

The rugged, abrasion-resistant tilt switch is actuated when material rises to tilt the probe 15° or more from its vertical position. These switches are precisely positioned so that, regardless of the direction of tilt, its normally closed contacts will open. Various probe assemblies are available to suit applications utilizing an array of materials in a wide range of environmental conditions.



## Automatic Sampling Systems

We offer a complete line of Thermo Scientific sampling machines, accessories and engineered systems that are recognized worldwide as the finest available. These systems are designed to collect representative samples of coal, minerals or slurries for contract, process monitoring or internal quality control purposes. They are supplied for applications in mining, electric utilities and a variety of other process industries. Our sampling machines and engineered sampling systems are designed to meet or exceed many international regulatory standards, including ASTM, ISO and JIS.



### Thermo Scientific Ramsey Model SWAX-7000

This primary sweep sampling type machine offers an economical and simple means to procure a representative sample directly from material on a conveyor belt. With over 1,000 units in service worldwide, it has been subjected to rigorous in-the-field testing and meets ASTM and ISO specifications. This sampler can be used as a stand-alone sampling device or as a primary in a multi-stage mechanical sampling system. Direct increments are obtained from in-motion, horizontal or inclined conveyors. It is ideally suited for the sampling of coal, limestone, ferrous and non-ferrous ores, sand, crushed rock and gravel. In high tonnage applications, the cutter is counterbalanced to prevent excessive stress on the conveyor.

### Thermo Scientific Ramsey Oretronic III

This tramp metal detector minimizes lost production by providing an economical and reliable means to protect expensive crushers, conveyors and other process equipment from damage by tramp metal. It can detect all types of metallic scrap, including bucket teeth, manganese steel mantles, bore crowns, bar scrap chains, tools and more. Because the Thermo Scientific Ramsey Oretronic III is insensitive to materials with high magnetic permeability and electrical conductivity, it can be used in applications where conventional metal detectors produce an unacceptable false alarm rate. It is designed especially for belt conveyors moving coal, iron pellets, minerals, aggregates and other bulk materials.





## Service and Support

We offer a complete array of services designed to help you gain a competitive advantage. We provide premium, customized, around-the-clock support with guaranteed response time at a price that meets your budget. We appreciate your business and will help you obtain the maximum value of your technology investment.

We provide the training you need to get the most from our Thermo Scientific products and services. We offer certification training on our products, as well as custom training tailored to your operation's specific needs. We can also help you enhance your maintenance, troubleshooting and repair programs.

We are committed to developing new technologies and creating top-of-the-line parts, accessories and consumables that enable you to extend the capability of your products, ensure that they keep pace with advancing technology, and achieve the results you require. We can also retrofit your aging equipment to enhance its performance and functionality, eliminating the need to retrain personnel on new equipment.

The bottom line is that we are dedicated to the highest level of customer satisfaction. Our pledge is to work with you, the customer, to provide customized solutions to your specifications, needs and expectations.

## Service Agreement

Invest in peace of mind with a Thermo Scientific service agreement. Ensure minimum downtime, with known costs and priority response times, all tailored to your individual requirements.

### **Reduced Downtime**

Dramatically reduce production downtime and unnecessary product give-away through regular preventive maintenance and pre-scheduled calibration visits.

### **Flexible Coverage**

We understand that every customer has their own unique requirements. That is why we give a choice of service agreements, ranging from quick, convenient telephone support to unlimited on-site, round-the-clock coverage.

### **Priority Response**

Our contract customers receive priority response over non-contract customers.

### **Parts**

Your system is a sophisticated, precision instrument. To keep it operating at maximum productivity, we recommend that you only use original manufacturers certified parts. All our parts are guaranteed to perform to our instruments' rigorous design specifications.

### **Predictable Costs**

A service agreement provides on-site service for a specific instrument with the highest levels of response, at predictable costs allowing you to support your annual maintenance expenditure.



Our bulk weighing and monitoring product line is manufactured and based at our facility in suburban Minneapolis, Minnesota (pictured here) and at our Italian site in Rodano, Milan.

## Worldwide Locations

### **Australia**

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