

**Ramsey Bulk
Material Handling
Products**



**Instrumentation and Automation
for the Process Industries**

Analyze • Detect • Measure • Control™

Thermo
ELECTRON CORPORATION

Ramsey Bulk Material Handling Products

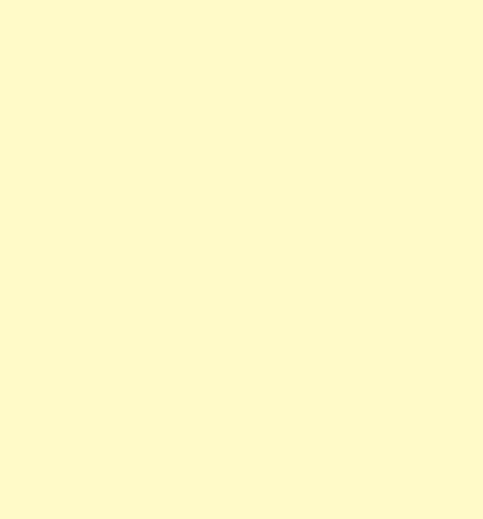
Instrumentation and Automation for the Process Industries

Contents

About Ramsey Products	1
Ramsey Belt Conveyor Scale Systems	2
Ramsey Weighbelt Feeders	4
Ramsey Impact Weighers	5
Ramsey Loss-In-Weight Feeders	5
Ramsey Granuflow Flow/No-Flow Detectors	6
Ramsey Granucor Solids Flow Measurement System	6
Ramsey Conveyor Monitoring and Safety Products	7
Ramsey Continuous Level Measurement	8
Ramsey Point Level Measurement	9
Ramsey Automatic Sampling Systems	10
Ramsey Oretronic III Tramp Metal Detector	11
Spectra-Quad™ Online Moisture and Constituent Analyzer	11
About Thermo	12

www.thermo.com/bulk-handling





About Ramsey Products

The Ramsey product line of Thermo Electron Corporation's Process Instruments Division is a specialty line of industrial in-motion weighing, inspection, monitoring and control equipment. These products are used for process control, production monitoring and automation. They are marketed worldwide to the coal and minerals mining, cement, construction, aggregates, electric utilities, chemical processing, plastics and food industries, among others.

The Ramsey product line consists of belt conveyor 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 Ramsey 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.

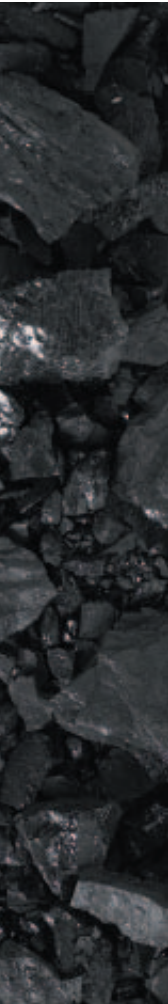
Customer Satisfaction

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.



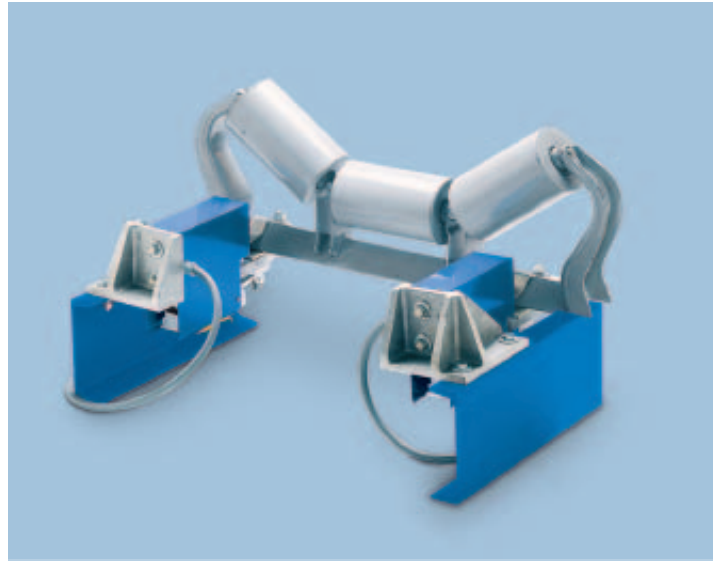
Ramsey Belt Conveyor Scale Systems

Thermo is one of the world's largest providers of belt conveyor scales and electronic integrators. The rugged construction and leading edge designs of the Ramsey 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.



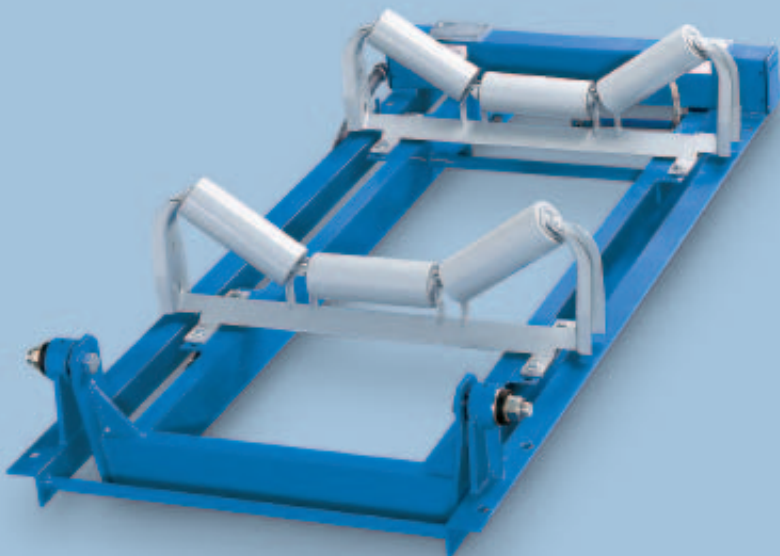
Ramsey IDEA Belt Scale System

This 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.



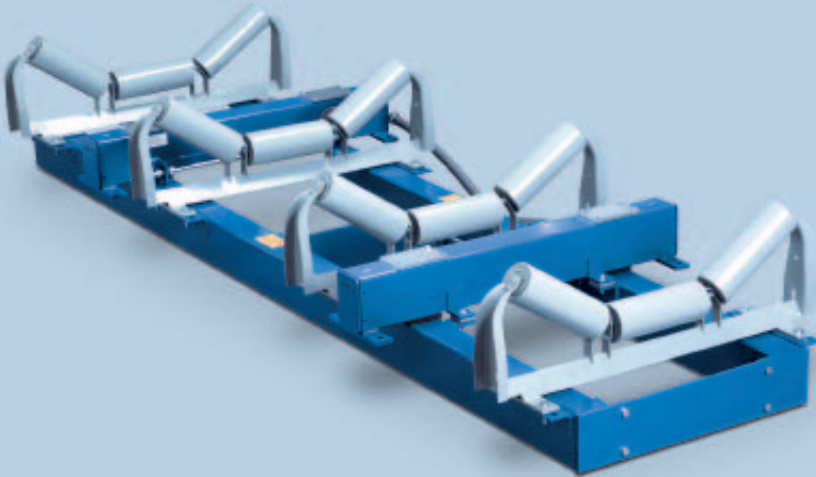
Ramsey Series 20 Belt Scale System

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.



Ramsey Series 17 Belt Scale System

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. The Ramsey Series 17 Belt Scale System is available in a two or four-idler version.



Ramsey Series 14 Belt Scale System

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.

Ramsey Micro-Tech 2000 Series of Electronic Integrators

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 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.



Ramsey Model 60-12 Speed Sensor

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.



Ramsey 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. Thermo has well 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.

Ramsey Model 90.100A Heavy Duty Weighbelt Feeder

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.



Ramsey Model 90.125A Mid-Range Weighbelt Feeder

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).



Ramsey Model 90.151 Low Capacity Weighbelt Feeder

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).

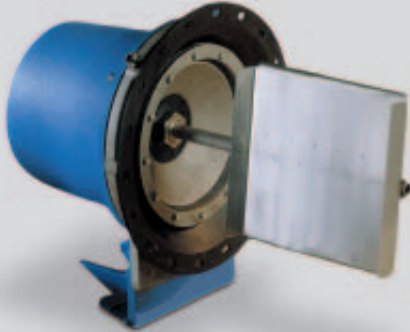


Ramsey Micro-Tech 2105 and 2205 Digital Feeder Controllers

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.



Ramsey DE20 Impact Weigher and DX20 Sensing Plate



Ramsey DE10 Impact Weigher and DX10 Sensing Plate

Ramsey 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.

Ramsey 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. The Ramsey DE10 and DE20 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 Ramsey Micro-Tech 2106 or the Ramsey Micro-Tech 2107 Impact Flow Meter Controllers.

Ramsey 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. Ramsey Loss-In-Weight Continuous or Batch Feeding Systems from Thermo 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.

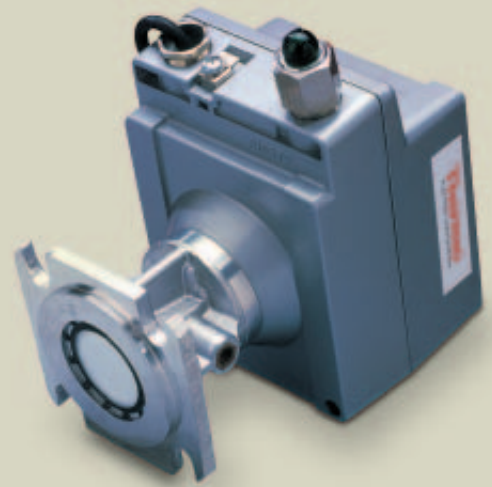
The Ramsey Micro-Tech 2104 Loss-In-Weight Feeder Controller is specifically designed for continuous or batch loss-in-weight or gain-in-weight applications. It's easy to operate and calibrate with the aid of large easy-to-read displays; straightforward, tactile-touch keyboards; and software that prompts you through proper set-up 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.



Ramsey 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 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.



Ramsey Granuflow DTR 131 Flow/No-Flow Detector



Ramsey Granuflow GTR 130 Flow/No-Flow Detector



Ramsey Granucor Solids Flow Measurement System

The in-line measurement of bulk solids flow is important for product quality, process efficiency and system safety. The Ramsey Granucor Solids Flow Measurement System provides continuous, real-time flow measurement of free-falling materials or dense phase, pneumatically conveyed bulk solids. Its non-intrusive design and patented software can be used to monitor and control the flow in pipes or the flow distribution through pipe networks.

Ramsey Conveyor Monitoring and Safety Products

Thermo offers 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.

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.

Ramsey Safety Cable Pull Switch

A safety pull cable is attached to the actuating arm of the Ramsey Safety Cable Pull 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.



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.

Ramsey 60-200 Motion Monitoring 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 Ramsey 60-200 Programmable Motion Monitor Control can be used with any Ramsey sensor and, in some cases, with compatible pulse output sensors from other sources.



Ramsey Continuous Level Measurement



Ramsey BOB II Inventory Management System

The Ramsey BOB II 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 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.



Ramsey SonaTech Sonic Level Indicator

The Ramsey SonaTech Sonic Level Indicator uses sound waves to accurately determine the level of solids or liquids in any bin, tank, silo or other type of container. It utilizes frequencies lower than competitive models in order to more effectively penetrate dust, steam, vapors and other harsh environmental obstacles. This system provides precise and reliable readings from a bin in any situation. It is easy to install and operate, requiring a minimal amount of operator input to set up and calibrate.



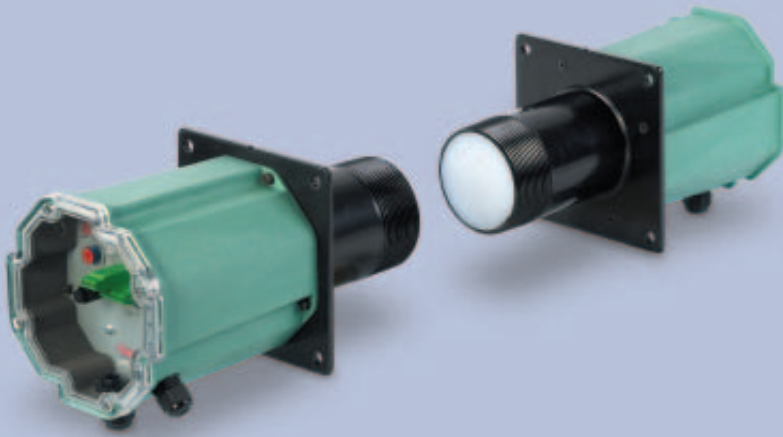
Ramsey C-Level Continuous Level Indicator

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 Ramsey C-Level is unaffected by corrosive or abrasive materials, uneven material discharge, build-up on sidewalls, bridging, ratholing or dusting.

Ramsey Tank Weighing Assemblies

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

Ramsey Point Level Measurement



Ramsey Microwave Plugged Chute 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. The Ramsey Microwave Plugged Chute Detector is a safe and environment-friendly replacement for nucleonic switches and is not restricted by OSHA or FCC regulations.



Ramsey RT Series Rotary Level Controls

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 Ramsey RT Series the most reliable rotary level controls on the market.



Ramsey CAP Series Capacitance Level Controls

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, Ramsey CAP Series probes operate below the RF level and are not subject to FCC regulation or interference from other RF-emitting devices.

Ramsey Tilt Switches and Control Units

The rugged, abrasion-resistant Ramsey 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.





Ramsey Automatic Sampling Systems

Thermo offers a complete line of Ramsey 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. Ramsey sampling machines and engineered sampling systems are designed to meet or exceed many international regulatory standards, including ASTM, ISO and JIS.



Ramsey Model SWAX-7000 Primary Sweep Type Sampling Machine

This 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.

Ramsey Oretronic III Tramp Metal Detector

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 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.



Spectra-Quad™ Online Moisture and Constituent Analyzer

Analytical tests that were once carried out in the lab can now become part of the online inspection process. This reduces the risk of producing out-of-specification product. The Spectra-Quad Online Moisture and Constituent Analyzer from Thermo provides continuous, accurate, real-time information about the concentration of key product components. Incorporating a patented, industry-proven optical system and other quality innovations, it is the standard for online process analysis.

Designed for long-term, uninterrupted duty in the most demanding process environments, this instrument will help you to optimize product quality and consistency, enhance productivity and process efficiency, minimize waste and use of raw materials, lower production costs and add to your bottom line.





The Ramsey product line is manufactured and based at this Thermo facility in suburban Minneapolis, Minnesota.

About Thermo

Thermo Electron Corporation is the world leader in analytical instruments. Our instrument solutions enable our customers to make the world a healthier, cleaner and safer place. Thermo's Life and Laboratory Sciences segment provides analytical instruments, scientific equipment, services and software solutions for life science, drug discovery, clinical, environmental and industrial laboratories. Thermo's Measurement and Control segment is dedicated to providing analytical instruments used in a variety of manufacturing processes and in-the-field applications, including those associated with safety and homeland security. Based near Boston, Massachusetts, Thermo has revenues of more than \$2 billion, and employs approximately 10,000 people in 30 countries. For more information, visit www.thermo.com.

Service and Support

Thermo offers 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. You also get unlimited priority support via the phone or by modem. From delivering integrated end-to-end solutions, to providing a full range of support options, we are focused on meeting your business objectives. 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 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. Our technicians are factory trained and certified, and use Thermo factory-approved parts to maintain the quality you expect and need.

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.

Visit us on the web at www.thermo.com/bulk-handling



Please send me more information on the following products:

- | | | |
|--|---|--|
| <input type="checkbox"/> Ramsey Belt Scale Handbook | <input type="checkbox"/> Ramsey Granuflow DTR 131 Flow/No-Flow Detector | <input type="checkbox"/> Ramsey C-Level Continuous Level Indicator |
| <input type="checkbox"/> Ramsey IDEA Belt Scale System | <input type="checkbox"/> Ramsey Granuflow GTR 130 Flow/No-Flow Detector | <input type="checkbox"/> Ramsey Microwave Plugged Chute Detector |
| <input type="checkbox"/> Ramsey Series 20 Belt Scale System | <input type="checkbox"/> Ramsey Granucor Solids Flow Measurement System | <input type="checkbox"/> Ramsey CAP Series Capacitance Level Controls |
| <input type="checkbox"/> Ramsey Series 17 Belt Scale System | <input type="checkbox"/> Ramsey Belt Misalignment Switch | <input type="checkbox"/> Ramsey RT Series Rotary Level Controls |
| <input type="checkbox"/> Ramsey Series 14 Belt Scale System | <input type="checkbox"/> Ramsey Safety Cable Pull Switch | <input type="checkbox"/> Ramsey Model SWAX-7000 Primary Sweep Sampler |
| <input type="checkbox"/> Ramsey Model 90.100A Heavy Duty Weighbelt Feeder | <input type="checkbox"/> Ramsey Model 60-23P Under Speed Switch | <input type="checkbox"/> Ramsey Sampling Handbook |
| <input type="checkbox"/> Ramsey Model 90.125A Mid-Range Weighbelt Feeder | <input type="checkbox"/> Ramsey 60-200 Motion Monitoring System | <input type="checkbox"/> Ramsey General Sampling Brochure |
| <input type="checkbox"/> Ramsey Model 90.151 Low Capacity Weighbelt Feeder | <input type="checkbox"/> Ramsey BOB II Inventory Management System | <input type="checkbox"/> Ramsey Oretronic III Tramp Metal Detector |
| <input type="checkbox"/> Ramsey DE10 & DE20 Impact Weighers | <input type="checkbox"/> Ramsey Inventory Management Software | <input type="checkbox"/> Spectra-Quad Online Moisture & Constituent Analyzer |
| <input type="checkbox"/> Ramsey Loss-In-Weight & Volumetric Feeders | <input type="checkbox"/> Ramsey SonaTech Sonic Level Indicator | <input type="checkbox"/> Ramsey Tilt Switches & Control Units |

Name _____ Title _____

Company _____

Address _____

City _____ State _____ ZIP/Postal Code _____

Country _____ E-mail _____

Phone _____ Fax _____



Thermo Electron Corporation
Process Instruments
501 90th Avenue NW
Minneapolis, MN 55433

sales.bulk-handling.us@thermo.com

+1 (800) 227-8891
+1 (763) 783-2525 fax

www.thermo.com/bulk-handling

Analyze • Detect • Measure • Control™

Thermo
ELECTRON CORPORATION