# Thermo Scientific Volumetric and Loss-In-Weight Feeders

Accurate feeding of dry bulk materials

Accurate feeding of a dry bulk material is often critical to maintaining product quality. Thermo Scientific™ volumetric and loss-in-weight feeders maintain quality and weighing accuracy, reduce material waste and improve blend consistency for increased profits.

**Applications**

- Apple (frozen)
- Arabic gum
- Blueberry (frozen)
- Cereal
- Cocoa
- Coffee
- Enzymes
- Flour
- Hydrated lime
- Milk in powder
- Silica
- Soybean
- Spinach (powder)
- Sugar
- Vanilla extract
- Vanillin
- Water

*If your product is not listed please send us a sample; we will be glad to test it with our feeders and let you know which model is the best for your need.*

## Thermo Scientific Standard Modular Volumetric Feeder

Volumetric feeders are utilized in bulk material feeding applications when the feed rate and total weight measurements are not necessary and accuracy requirements of ±1-2% are permissible. Volumetric adjustments are accomplished through the use of an open loop variable speed control, which can be operated either locally or remotely.

The Thermo Scientific standard modular volumetric feeder is available in four sizes and provides accurate feeding up to 11000 dm3/h (388 ft3/h). The unit's design affords the ability of handling a broad range of bulk solid materials with various characteristics and may be equipped with an integral, free-flowing hopper, or an optional dust containment trough cover for use directly beneath a bulk material storage bin. The modular design of the volumetric feeder permits selection of the most economical design required for a specific application with the unparalleled ability to upgrade the design as materials and characteristics change.

Various system options may be added to allow the unit to adapt to a broad range of feeding applications and materials.

- A standard feeder with static hopper, trough and feed screw for free-flowing materials.
- An agitator conditioner feeder with a secondary trough conditioning screw for semi-flowing materials.
- A vibrated feeder using controlled vibration for non-free-flowing materials.

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## Thermo Scientific Ramsey Low Capacity Volumetric Feeder

This low capacity volumetric feeder is available in four different models depending on the product and application. With easy free-flowing product, the various systems are capable of the following maximum rates:

- Model LIW90D – maximum rate 90 dm3/h (3.18 ft3/h)
- Model LIW900D – maximum rate 900 dm3/h (31.78 ft3/h)
- Model LIW3000D – maximum rate 3000 dm3/h (105.94 ft3/h)
- Model LIW11000D – maximum rate 11000 dm3/h (388.46 ft3/h)

The unit's design addresses the issues associated with accurate, low-volume feeding, such as bridging, material build-up and stagnation. Its simple design, rugged construction and compact size make it readily adaptable to existing process lines. All gaskets are in food-grade material (U.S. FDA approved) and, where necessary, a stainless steel core is used for radial bracing. Single lip and double lip gaskets (up to 15 bar) are used. Motor transmission used for extraction screws and rack breaker device is controlled by a transmission chain and two independent gear reducer boxes. This allows one speed for the breaker device and one for the extraction screws avoiding problem of material build up and power consumption. Shafts of the screws are fixed on both sides in order to avoid oscillation. Seal of the screws is ensured with the bellows seals, the threaded solid box and the self-lubricant, FDA-approved radial bearings.

## Thermo Scientific Ramsey Loss-In-Weight Feeder

The continuous loss-in-weight principle involves weighing the entire feeding system (hopper, feeder, and bulk material) by means of a static-type scale system, and controlling the discharge feed rate of the bulk material by means of a variable speed motor.

Material is discharged from the system, via screw or vibratory tube or tray, with the measured "loss in weight" per unit time (dv/dt) compared to the desired (set) feed rate. The difference between the actual (measured) rate and the desired (set) rate produce a corrective action by the feed rate controller, the Thermo Scientific™ Ramsey™ Micro-Tech 9104, which automatically adjusts the feeder speed, thus maintaining accurate feed rates with no process lag.

When the measured weight in the hopper reaches the hopper low (refill) level, the controller affixes the feed system into volumetric control. The hopper is then quickly recharged (manually or automatically), and the loss-in-weight control action repeats.

In a batch loss-in-weight system, the design is similar to a continuous loss-in-weight system. However, the accuracy of the final weight at the end of the feed (batch) cycle is typically more critical than the actual feed rate control.

The Ramsey™ Micro-Tech 9104 controller accomplishes this by providing a high feed rate signal to the variable speed drive for quick filling and then switching to a low feed rate control signal for precise, fine control at the end of the batch.

## Thermo Scientific Ramsey Micro-Tech 9104 Loss-In-Weight Feeder Controller

These controllers are specifically designed for continuous or batch loss-in-weight or gain-in-weight applications. The Ramsey Micro-Tech 9104 provides easy operation and calibration with large easy-to-read displays, straight forward, tactile-touch keyboards and software that prompts you step-by-step through the proper set-up and operational procedures.


**Thermo Scientific Ramsey Loss-In-Weight Feeder**

**Thermo Scientific Ramsey Micro-Tech 9104**

### Ramsey Micro-Tech 9104 Advantages

- Capable of operating two independent loss-in-weight systems.
- Common operator interface for setup and calibration reduces operator training.
- Digital electronics provide accurate, drift-free performance.
- Auto-Zero automatically computes and installs a new zero.
- Auto-Span automatically computes and installs a new span based on electronic calibration, static weights or material load.
- Numerous programmable features let the user customize the electronics to fit individual needs.
- Communication and fieldbus capabilities.
- Multi-level password protection provides varying levels of security for operator access.
- LEDs provide visual indication of control status: Remote control, Automatic control, Alarm, Batch, and Ready.
- Refill capabilities include automatically adjusting the volumetric constants according to the net weight. Therefore, if the density of the material is significantly different between a high level hopper and a low level hopper, affecting the flow rate, the controller will automatically adjust the output at the end of the refill cycle.
- Batch capabilities allow the user to control flow rate and required quantity, and switch to a lower rate set point for a fine batching end.

### Features & Benefits

- Low capacity and sanitary versions available
- Double screw design, well-suited for a variety of applications
- Handles hot, floodable and difficult materials
- Unaffected by dust and material accumulation
- All parts in touch with the products' stainless steel AISI304 construction (optional AISI316)
- Rack breaker device to maintain a constant density and a regular and constant flow
- Variety of helix and screw sizes available to meet a broad range of applications
- Parts are easily accessible and detachable for cleaning and maintenance
- Particular design reduces contact between material and gaskets (both screws and vertical agitator); this increases working life of bearings and gaskets (especially with abrasive materials) and prevents infiltration (and consequently stagnation and contamination) of product in the bearing itself.
- Loss-in-weight system capable of ±0.5% accuracy

### Available Options

- Vibrator on hopper/feeder trough
- Agitator conditioner feeder with secondary trough conditioning screw
- Hopper cover with inlet opening and vent
- Flushed seals
- Versions available with ratings to meet hazardous/dangerous area applications






## Service

When you invest in Thermo Scientific products, you're also buying our commitment to service. Our pledge is to work with you, the customer, to continuously apply new technology and offer real solutions to your specific needs. We will work with you to answer your application requirement and service questions, to service your equipment, and to support and assist you every step of the way. No matter what your location, no matter what your need, you can count on Thermo Fisher Scientific service representatives. Our service and fast, parts turnaround time are just two of the attributes that set us apart from other vendors.

## Thermo Scientific Volumetric and Loss-In-Weight Feeders

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| **Standard Volumetric Feeder Specifications** | |
| **Product Containment Trough** | |
| Surface Material | AISI 304 stainless steel (316 SS available as option) |
| Product Contact Surface Treatment | Mirror polish finish |
| External Surface Finish | Micro-shot blasting |
| **Product Contact Gaskets** | |
| Material | Food-grade white rubber, hardness 45ShA |
| **Material Extraction System** | |
| Type | Double screws |
| Dimensions | Defined according to product characteristics and rate |
| Pitch | Defined according to product characteristics and rate |
| **Feeder Reduction Gear** | |
| Type | Screw without aim with adapter |
| Lubrication | Synthetic oil CLP 680 |
| **Motorization Support Parts** | |
| Surface Material | Aluminum 6082 – UNI 9006/4 |
| Treatment | Natural grey anodized |
| **Nuts and Bolts** | |
| Material | AISI 304 stainless steel |
| **Ratings** | Optional version approved for installation in hazardous areas Class II, Division 1 & 2, Groups E, F & G; and dangerous areas Zone 2 / Zone 22 according to ATEX 1999/92/CE and 94/9/CE |
| **Micro-Tech 9104 Loss-in-Weight Controller** | |
| Enclosure | Field mount, NEMA-4X fiberglass, IP66, dust and watertight, 432 mm (17 in) x 360 mm (14 in) x 167 mm (6.6 in)<br>Panel mount, chromate mid steel chassis, front panel IP65, DIN 43700, 308 mm (12 in) x 102mm (4 in) x 202 mm (7.9 in) |
| Temperature | Operating: -20ºC to +60ºC (-4ºF to +140ºF)<br>Storage: -30ºC to +70ºC (-22ºF to +158ºF) |
| Power Requirements | Field mount 100-240 VAC, 50/60 Hz<br>Panel mount 24 VDC +10%, -15% (user supplied), 24 VDC only, optional AC module available |
| Display | 77 mm x 58 mm viewable LCD graphic display with status indicator lights for easy reading, continuous backlit for ease of viewing indoors and outdoors, available menu languages include English, German, Italian and Spanish |
| Load Cell Excitation | 5 VDC +/-10%, 90 mA |
| Inputs/Outputs | Includes one dual analog input/output board and one solid state DC pulse output open collector for pulse output (default) or alarms |
| Communication | Standard serial interface RS-232C provides support for modem, RS-485, 2- and 4- wire multi-drop |
| Communication Protocols | Modbus RTU, Allen Bradley DF-1, Siemens |
| Ethernet | Ethernet/IP and Modbus/TCP |
| Built-in USB Port | Configuration and data storage |
| Expansion Slots (4) | Optional boards include 4-20 mA output board, input/output expansion boards, digital or analog input/output boards, Profibus or Standard communication board |
| Ratings | cCSAus, CE |
| Pending Approvals | SIL-2, Tick Mark, GOST and other ATEX classifications |

*Thermo Fisher Scientific, Minneapolis, MN USA is ISO Certified.*

**thermoscientific.com/bulkweighing**



**Australia**
+61 (0) 8 8208 8200
+61 (0) 8 8234 3772 fax

**Brazil**
+55-11-2367-2192
+55-11-2367-2192 fax

**Chile**
+56 (0) 2 378 5080
+56 (0) 2 370 1082 fax

**China**
+86 (0) 80 0810 5118
+86 (0) 21 6445 1101 fax

**Germany**
+49 (0) 208-824930
+49 (0) 208-852310 fax

**India**
+91 (20) 6626 7000
+91 (20) 6626 7001 fax

**Italy**
+39 02-950590-55
+39 02-953200-15 fax

**Mexico**
+52 (55) 1253 9410
+52 (55) 1253 9424 fax

**South Africa**
+27 (0) 11-822-4120
+27 (0) 11-822-3982 fax

**Spain**
+34 (0) 91-484-5965
+34 (0) 91-484-3597 fax

**United Kingdom**
+44 (14) 4241 3700

**United States & Canada**
+1 (800) 445-3503
+1 (763) 783-2525 fax
+1 (763) 783-2500 direct

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