

# Thermo Scientific Ramsey DE10 and DE20 Impact Weighers

In-line weighing of bulk materials

The Thermo Scientific™ Ramsey™ DE10 and DE20 impact weighers are unique devices designed to measure the mass flow rate and total mass of free-flowing particulate materials. They 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.



The Thermo Scientific Ramsey DE10 and DE20 impact weighers are designed to provide continuous mass flow measurement in mechanical conveying systems without interrupting the flow of material. They are ideal for applications in vertical flow streams where weighfeeders or conveyor scales will not fit or cannot be applied.

These systems are easy to install and maintain. They can be used with a variety of pre-feed devices, including screw or vibratory feeders, belt conveyors, drag conveyors, air slides or rotary valves.

With more than 7,000 impact weighing systems in operation around the world, we have dealt with a wide variety of materials. Some typical materials monitored include: fertilizer, cement, charcoal, mineral sands, woodchips, plastic pellets, grain, potato chips, rice and confectionary materials



**Thermo Scientific  
Ramsey Micro-Tech 9106  
Field Mount**

**Thermo Scientific  
Ramsey Micro-Tech 9106  
Panel Mount**



**Thermo Scientific  
Ramsey DE20**

**Thermo Scientific  
Ramsey DE10**

**Thermo**  
SCIENTIFIC

## Thermo Scientific Ramsey DE10 and DE20 Impact Weighers

### In-Line Weighing of Bulk Materials



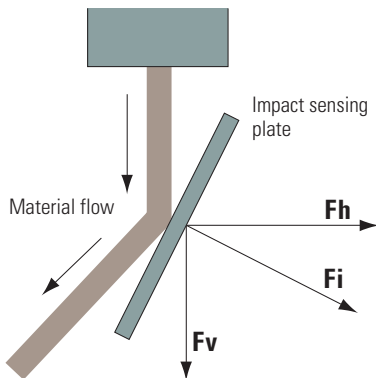
**Thermo Scientific Ramsey DE20 Impact Weigher**

**Thermo Scientific Ramsey DE10 Impact Weigher**

**Thermo Scientific Ramsey Micro-Tech 9106 Field Mount**

**Thermo Scientific Ramsey Micro-Tech 9106 Panel Mount**

### Principle of Operation



These impact weigher models are designed to measure the force generated by the impact of flowing material on a sensing plate. This force creates a mechanical deflection as it impacts the plate. This deflection is measured by a sensor and converted into an electrical signal.

That signal is then processed by the Thermo Scientific Ramsey Micro-Tech 9106 electronic controller, which displays the flow rate and total weight.

The impact weighers are designed so that the impact plate can only move horizontally. This means that from the total impact force “ $F_i$ ,” only the horizontal component “ $F_h$ ” is measured. Principle of Operations “ $F_v$ ” is ignored. This guarantees that changes in the weight of the sensing plate, due to material build-up or sensing plate wear, will not affect the zero or accuracy of the system.

### The Ramsey DE10 Impact Weigher

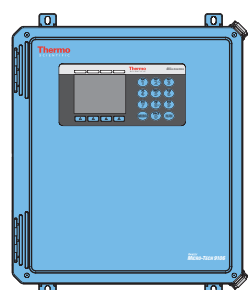
The Ramsey DE10 is designed to measure bulk solids flow rates from 4.54 t/h to 726 t/h (5.0 tn/h to 800 tn/h). With its support system and corrugated spring arrangement, movement of the sensing plate is restricted to the horizontal plane. This movement is

measured by a high-resolution sensor, which outputs a voltage that is converted into a noise-immune Pulse Frequency Modulation (PFM) digital signal.

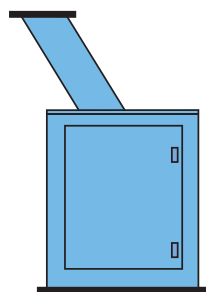
### Advantages

- Unique design allows installation even in the most difficult process environments
- Measurement is not affected by changing the impact point on the sensing plate
- Build-up on the sensing plate cannot influence the zero point
- High reliability and low maintenance
- Mechanical damping system absorbs shocks and damps vibration
- Sensor allows some overload without damage to the system
- Sensor is located in a dust-tight enclosure external to the process stream
- Operates accurately in pulsating or surging flows

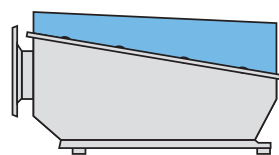
## The Complete Measuring System



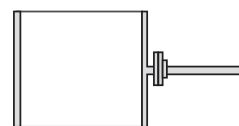
Micro-Tech 9106



DX11 Sensing Plate Housing



DE10 Sensor



DX10 Sensing Plate

## The Ramsey DE20 Impact Weigher

The Ramsey DE20 impact weigher is designed to measure bulk solids with flow rates from 0.27 t/h to 36 t/h (0.3 tn/h to 40 tn/h). The sensing plate is connected to a lever that is supported against a measuring spring. When bulk material hits the sensing plate, the force of impact can be measured by the displacement of the spring. A high-resolution sensor's output is converted into a noise-immune PFM digital signal to measure this displacement.

This impact weigher is designed to only measure the horizontal impact force. A special hydraulic dampening system reduces the effects of pulsating flows or surges, which ensures accurate flow indication. This Thermo Scientific system comes complete with the Ramsey DE20 impact sensor, Ramsey DX20 sensing plate, Ramsey DX21 sensing plate housing and the Ramsey Micro-Tech 9106 electronic controllers.

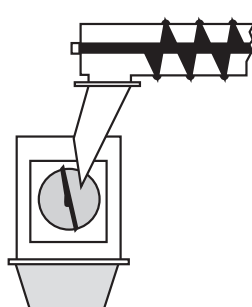
### Advantages

- Capable of accurately measuring very low flows
- Compact design fits easily into areas with limited room
- Easy to install flange-to-flange fitting
- Sensor located external to the process and protected by a dust-proof seal
- Easily retrofitted to existing conveying, batching or delivery systems

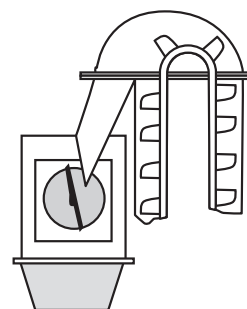
### Custom Housings

We also offer custom designed housings to fit specific applications. These housings are built to match up to existing flanges. In addition, they are easier to install, often require less space, and ensure that the impact weighers will perform optimally.

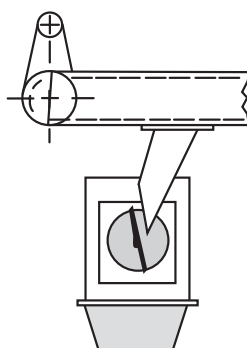
## Typical Pre-Feed Equipment



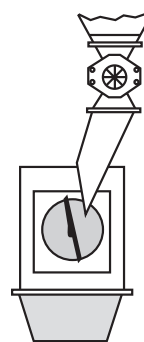
Screw Feeder



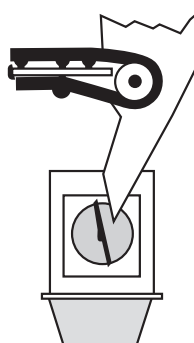
Bucket Elevator



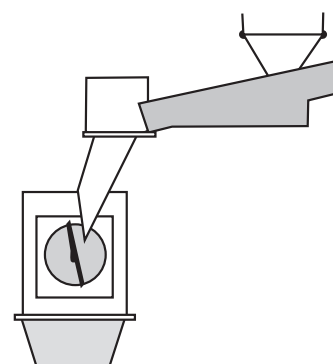
Drag Chain



Rotary Valve



Conveyor Belt



Vibrating Conveyor

## Thermo Scientific Ramsey DE10 and DE20 Impact Weighers

### Ramsey DE10 Impact Weigher Specifications

Measuring Range	4.54 t/h to 726 t/h (5.0 tn/h to 800 tn/h)
Standard Temperature	+10°C to +80°C (+50°F to +180°F) (Lower and higher temperature configurations available)
Material Temperature	+10°C to +180°C (+50°F to +350°F)
Approvals (optional)	FM approved, Class I and II, Div. 1 and 2, Groups A-G, for use with Ramsey Micro-Tech 9106 in safe area only
Deflection Measurement	By linear variable differential transformer
Weight Without Sensing Plate	61 kg (135 lb)
Dust-proofing	Completely sealed from the sensing plate housing

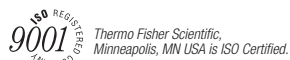
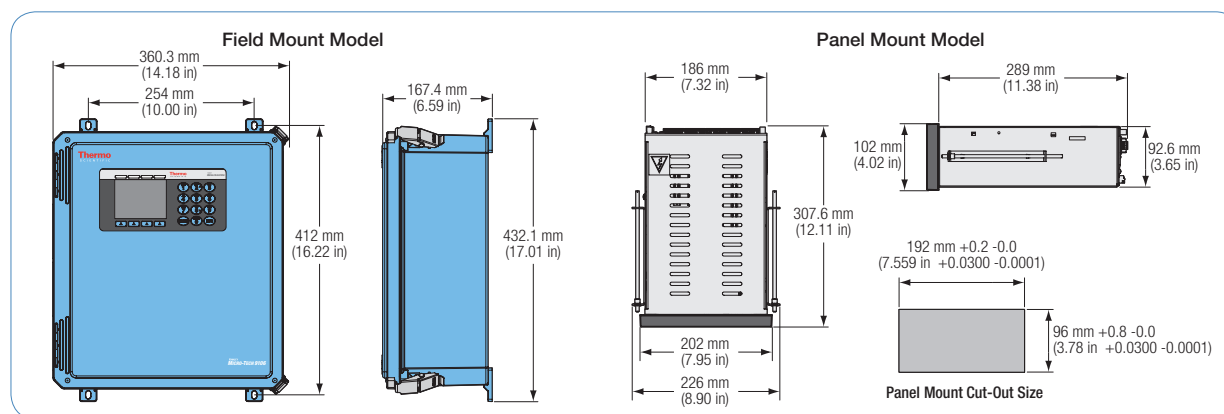
### Ramsey DE20 Impact Weigher Specifications

Measuring Range	0.27 t/h to 36 t/h (0.3 tn/h to 40 tn/h)
Standard Temperature	+10°C to +80°C (+50°F to +180°F) (Lower and higher temperature configurations available)
Material Temperature	+10°C to +180°C (+50°F to +350°F)
Approvals (optional)	FM approved, Class I and II, Div. 1 and 2, Groups A-G, for use with Ramsey Micro-Tech 9106 in safe area only
Deflection Measurement	By linear variable differential transformer
Weight Without Sensing Plate	30 kg (66 lb)
Dust-proofing	Completely sealed from the sensing plate housing

### Micro-Tech 9106 Impact Weigher Electronics Specifications

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) Panel mount, chromate mid steel chassis, front panel IP65, DIN 43700, 308 mm (12 in) x 102 mm (4 in) x 202 mm (7.9 in)
Temperature	Operating: -20°C to +60°C (-4°F to +140°F) Storage: -30°C to +70°C (-22°F to +158°F)
Power Requirements	Field mount 100-240 VAC, 50/60 Hz 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 backlight for ease of viewing indoors and outdoors, available menu languages include English, German, Italian and Spanish
Load Cell Excitation	5 VDC +/-10%, 90 mA
Outputs	Includes 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 (5)	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

### Ramsey Micro-Tech 9106 Impact Weigher Electronics



[thermoscientific.com/bulkweighing](http://thermoscientific.com/bulkweighing)

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