

## Ramsey DE10 and DE20 Impact Weighers

Accurate In-Line Weighing of Bulk Materials

The 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.



### Ramsey DE10 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

### Ramsey DE20 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

The Ramsey DE10 and DE20 Impact Weighers from Thermo Electron Corporation 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, Thermo has 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.

### Principle of Operation

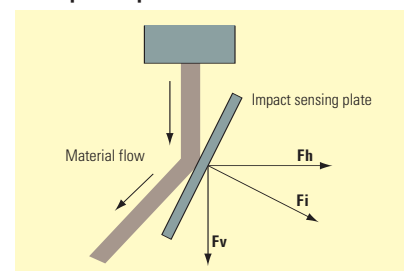
Both of the Ramsey impact weigher models are designed to measure the force generated by the impact of flowing material on a sensing plate. This force creates a mechanical deflection as it impacts the plate.

This deflection is measured by a sensor and converted into an electrical signal.

That signal is then processed by the Ramsey Micro-Tech 2106 or 3106 Electronic Controller, which displays the flow rate and total weight. For more information on the Ramsey Micro-Tech series of electronic instruments, please refer to catalog PI8011.0703.

The impact weighers are designed so that the impact plate can only move horizontally. This means that from the total impact force "Fi," only the horizontal component "Fh" is measured. Principle of Operations "Fv" 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.

### Principle of Operation



## Ramsey DE10 and DE 20 Impact Weighers

	Ramsey DE10 Impact Weigher	Ramsey DE20 Impact Weigher
Measuring Range	0-25 t/h to 0-800 t/h (0-27.5 tn/h to 0-882 tn/h)	0-300 kg/h to 0-40 t/h (0-661 lb/h to 0-44 tn/h)
Standard Temperature	+10°C to +80°C (+50°F to +180°F) (Lower and higher temperature configurations available)	+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)	+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 2106/3106 in safe area only	FM approved, Class I and II, Div. 1 and 2, Groups A-G, for use with Ramsey Micro-Tech 2106/3106 in safe area only
Deflection Measurement	By linear variable differential transformer	By linear variable differential transformer
Weight Without Sensing Plate	61 kg (135 lb)	30 kg (66 lb)
Dust-proofing	Completely sealed from the sensing plate housing	Completely sealed from the sensing plate housing

### The Ramsey DE10 Impact Weigher

The Ramsey DE10 is designed to measure bulk solids flow rates from 0.68 t/h to 726 t/h (0.75 tn/h to 800 tn/h). With its patented 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.

### The Ramsey DE20 Impact Weigher

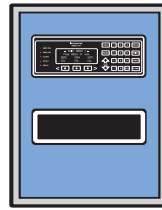
The Ramsey DE20 Impact Weigher is designed to measure bulk solids with flow rates from 0.27 t/h to 36 t/h (0.3 tn/h to 40 tn/h). The sensing plate is connected to a lever that is supported against a measuring spring. When bulk material hits the sensing plate, the force of impact can be measured by the 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. The system comes complete with the Ramsey DE20 Impact Sensor, Ramsey DX20 Sensing Plate, Ramsey DX21 Sensing Plate Housing, and the Ramsey Micro-Tech 2106 or 3106 Electronic Controllers.

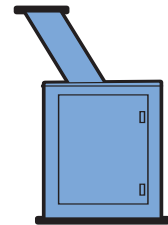
### Custom Housings

Thermo also offers 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.

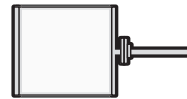
### The Complete Measuring System



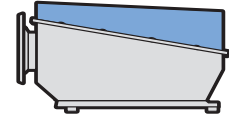
Ramsey Micro-Tech 2106/3106



Ramsey DX11 Sensing Plate Housing

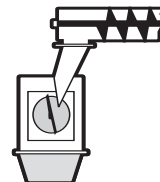


Ramsey DX10 Sensing Plate

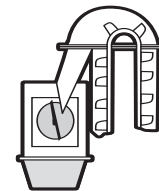


Ramsey DE10 Sensor

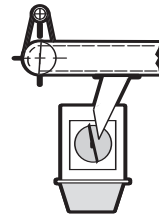
### Typical Pre-Feed Equipment



Screw Feeder



Bucket Elevator



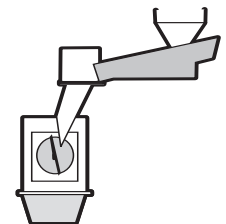
Drag Chain



Rotary Valve



Conveyor Belt



Vibrating Conveyor



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