



# VIBRA SCREW INC.

The most trusted name in dry solids processing.

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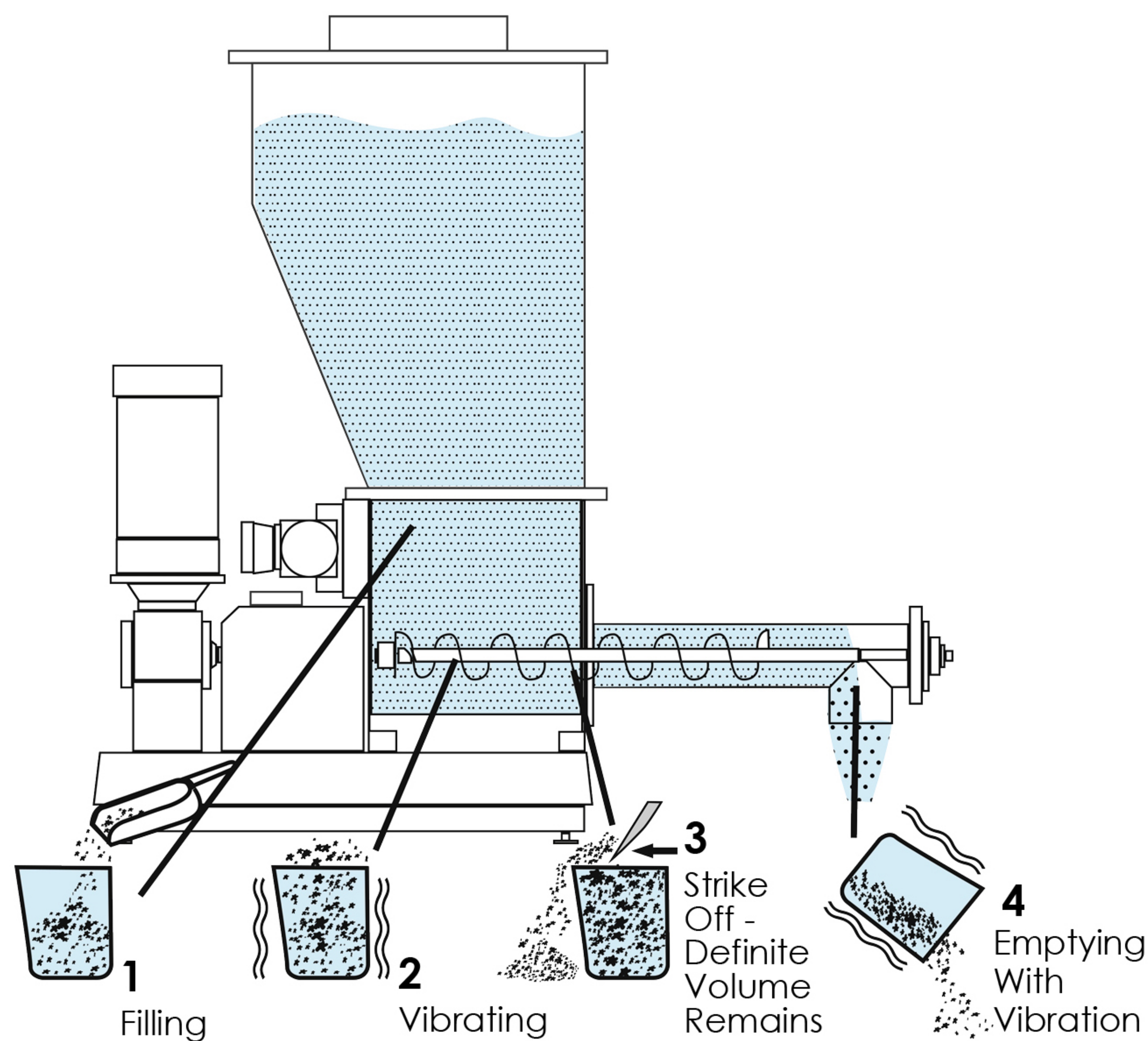
LIW-14

## LOSS-IN-WEIGHT AND BATCH WEIGHING SYSTEMS

*For Solids and Liquids*



### To Fill a Volume



### THE VIBRA SCREW GUARANTEE

If your Vibra Screw equipment doesn't perform in the service for which it was sold, we'll refund your money. Ask any other equipment manufacturer to put that in writing.

**No time limits. No conditions.**

## Weigh Feeding

### The Controlled Vibration Difference

Vibra Screw is the only Weigh Feeder equipment supplier to offer a controlled vibration Feeder design. This means minimal loss of accuracy during the volumetric refill cycle and unprecedented accuracy in the gravimetric mode. This makes our Feeders much more accurate than competitive designs.

Thousands of Vibra Screw Feeders have proven over the years that gentle vibration to assist flow provides extremely accurate and repeatable feed of even the most difficult dry bulk materials. There is no need for paddles or internal agitators that are less effective, complicate the design, and degrade the product.

### How Controlled Vibration Improves Your Operation

The operating principle of a vibrating Screw Feeder can be compared with the repetitive filling and emptying of cups. Most accurate filling occurs when the cup is filled with material (1), vibrated to obtain uniform density (2), and the excess struck off (3). On emptying (4), vibrating the cup also ensures complete release of the material.

In our vibrating Screw Feeders, the same process occurs. Material fills the screw flights in the trough area (1), is vibrated to a uniform density (2), and is struck off (3) as it enters the metering tube. Vibration of the metering tube and screw (4) ensures complete release of material at the discharge end.

Successive weighing of material samples will show volumetric accuracies of  $\pm 1\%$ . The Loss-In-Weight controller easily refines this; providing gravimetric accuracies as great as  $\pm 1/4\%$ .

In Batch Weighing, vibration also greatly reduces feed pulsation. At discharge, it produces a precise cutoff of flow at the end of the batch cycle without material overrun. Irregular free-fall of material overrun is the greatest source of batching error. The controlled vibrating Feeder eliminates this error and greatly enhances accuracy.



# Loss-In-Weight Feeding...How Does It Work?

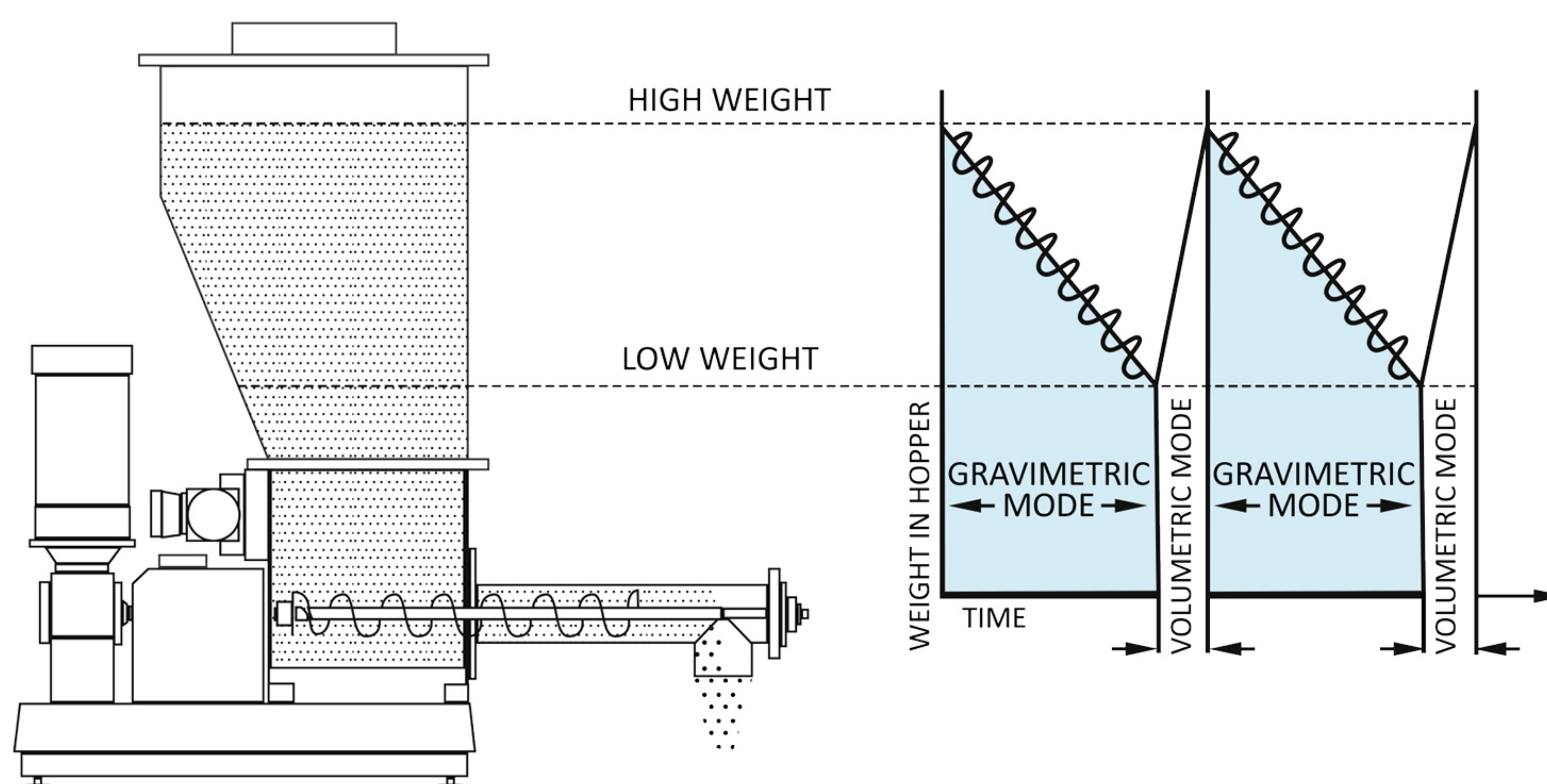
A Loss-In-Weight feeding system includes a supply hopper or tank, a metering feeder or pump, a supporting scale system, and a gravimetric closed-loop controller. The system electronically balances tare weight which enables the controller to sense only the weight of the material in the feed system.

The diagram below illustrates this operation. At time zero, the hopper is full (high weight), and the operator enters the desired feed rate (set point) into the controller.

As time and discharge advance, the actual "loss-in-weight" reading follows the decreasing scheduled weight ramp whose slope is a direct representation of the desired weight of delivered material per unit of time (set point). The controller continuously monitors actual rate vs. desired rate and continuously varies the feeder's output speed thus keeping it at the desired set point.

Once the system weight reaches the hopper refill level (low weight), the controller locks the feed system into volumetric control, the hopper is refilled, and the Loss-In-Weight cycle resumes.

The controller rate disturbance mode protects against any outside weight disturbance that might cause an upset and provides the unique ability to manually load the hopper at any time without disturbing the feed process.



## Advantages of Loss-In-Weight Feeding

- Handles floodable, hot, and difficult materials
- Unaffected by dust and material accumulation
- Operation not compromised at low feed rates
- No errors from belt tensioning or tracking - complete system is weighed
- Uses only one process input for reduced error in operation
- No transportation lag: entire weight is sensed at all times
- Feed accuracy can be continuously monitored during normal operation without the need for sampling

## System Specifications

### CONTACT MATERIALS

Carbon Steel  
304 stainless steel  
316 stainless steel  
Your Specifications

### Standard Internal:

Gray Enamel for carbon steel contact surfaces.  
Stainless and alloys, uncoated.

### OPTIONS

Explosion proof, special TENV motors, etc.  
Various supply voltages.

### FOOD GRADE FINISH

**Standard:** All internal seams continuously welded. All welds ground smooth. Internal surfaces polished per customer requirements. Food grade gaskets and sleeves.

### EXTERNAL MATERIALS

Carbon Steel

### Optional Internal:

Epoxy Paints  
Polyurethane  
Customer Specifications

### CONTROLS

Vary by system application.  
Contact Factory

### COATINGS

#### Standard External:

Gray Enamel

### DRIVES

Variable Speed DC  
115/230/1/50 or 60  
Variable Speed AC  
230/460/3/50 or 60

### LOAD CELLS

Strain gauge type  
150% full scale overload  
Operating temperature:  
-40°F to +150°F  
(-22°C to +132°C)  
Repeatability; 0.02% full scale

### PRESSURE APPLICATIONS

Feeders can be constructed for pressure applications up to 15 psig.  
Contact Factory

#### Optional External:

Epoxy Paints  
Corrosion Resistance Paints  
Customer Specifications

### HIGH TEMPERATURE APPLICATIONS

Special construction of feeders permits use at temperatures up to 350°F (177°C)



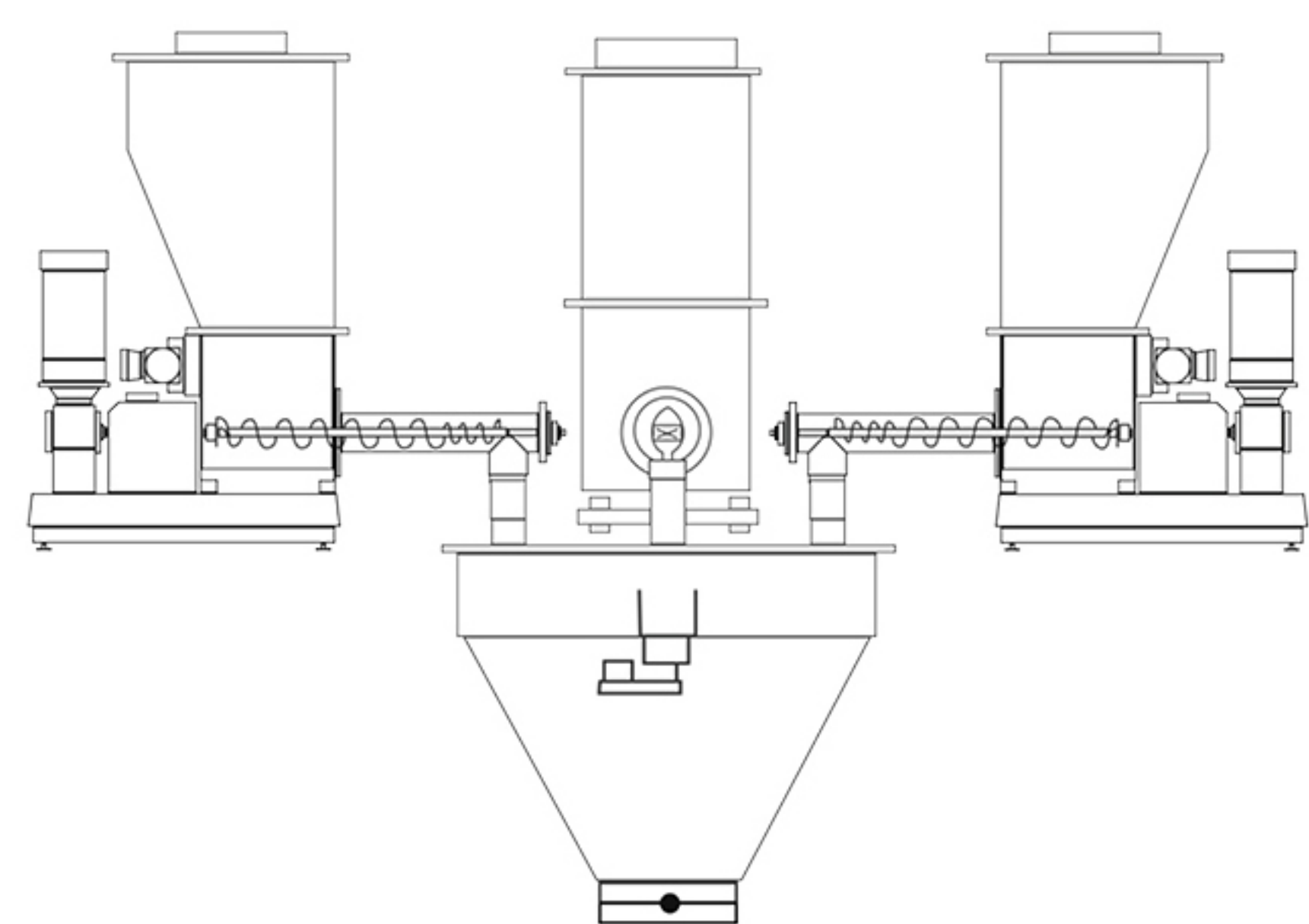
# Highest Accuracy In All Batching Operations

A Batch Weighing system is similar in design to a Continuous Loss-In-Weight system. Batch applications do not, however, require the material to be continuously fed with a high feed accuracy. Batch systems are designed to maximize the precision of the final batch weight.

Controlled discharge from storage and non-pulsating feeding of materials are critical for a successful Batching system. Vibra Screw's wide range of controlled vibration Feeders and material flow aid devices permit superior accuracy in both Loss-In-Weight and Gain-In-Weight batching over a wide range of capacities.

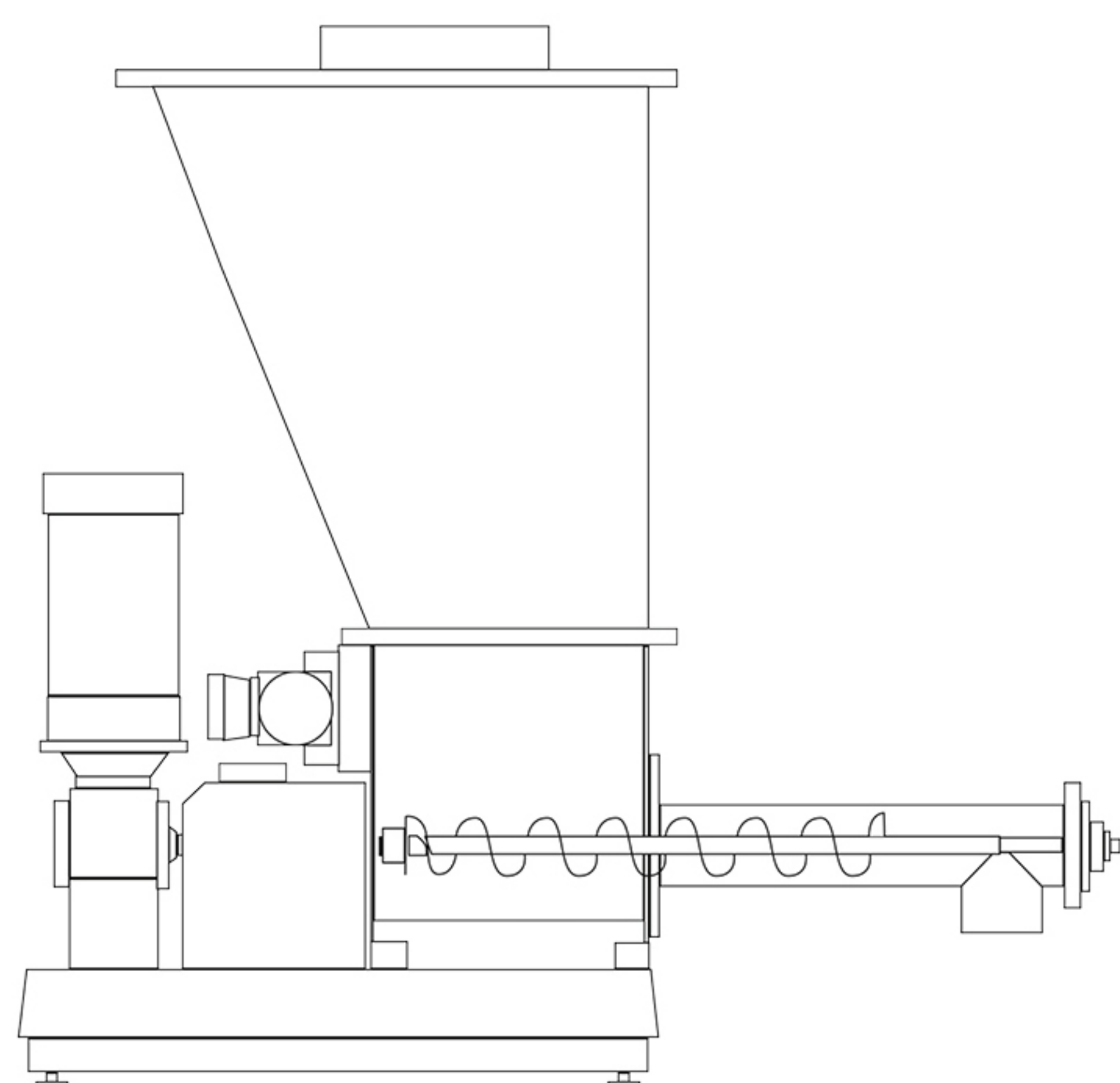
The selection of mechanical designs for a particular material is based on our historical database and when necessary, by actual testing in our Laboratory.

Figures 1-3 illustrate three typical batch weighing configurations.



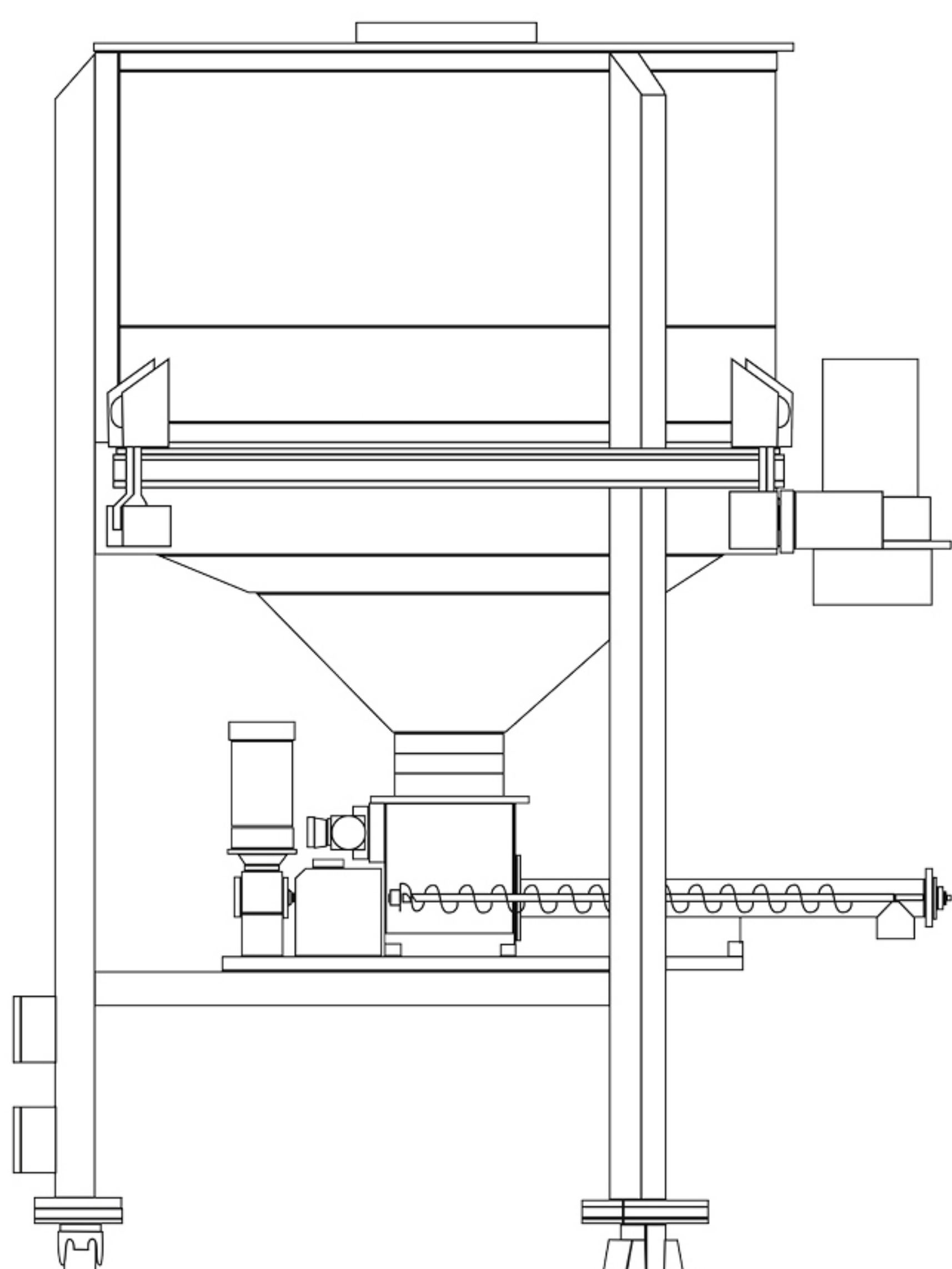
## Low-Capacity Gain-In-Weight Batching

**Fig. 1** - Vibra Screw Batch Weighing Systems may be employed on batches as low as one pound. Here, live load to tare weight ratio is kept at a minimum to ensure maximum accuracy vs load cell resolution.



## Mid-Capacity Batching

**Fig. 2** - These systems may be designed around Loss-In-Weight or Gain-In-Weight feeding for batches up to several hundred pounds. System configuration is determined based on batch size, material characteristics, and desired accuracy.



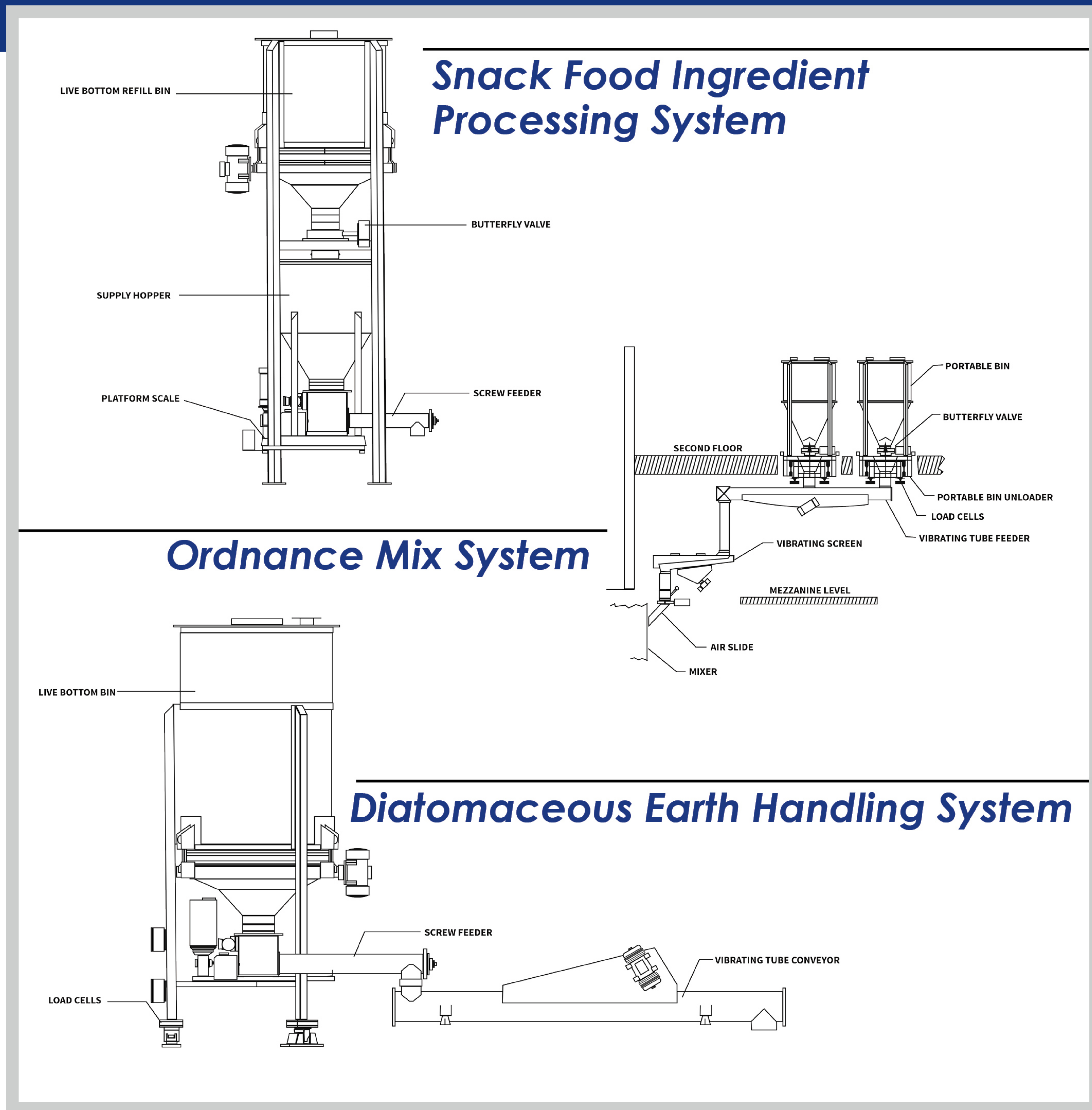
## High-Capacity Batching

**Fig. 3** - Vibra Screw regularly designs and ships Batching systems for batch sizes in excess of several thousand pounds. Systems often include load cell-mounted bulk bins and feeders.



## Typical Vibra Screw

# LOSS-IN-WEIGHT CONTINUOUS WEIGH FEEDING AND BATCH WEIGHING SYSTEMS



## Your Loss-In-Weight or Batching System

The Vibra Screw approach to weighing systems combines the latest in electronics technology with 60 years of experience in handling bulk materials. The result is a carefully engineered total solution for your particular needs, backed by a performance guarantee to ensure your complete satisfaction.

Proper weighing demands a full understanding of the physical properties of materials and their characteristics in motion. Too often, suppliers are skilled only in the electronics aspect of the system and neglect the material handling consideration or leave it to others. Vibra Screw is unique in the Industry; combining its own mechanical and electrical designs.

## Electronic Controls Boost Accuracy

To keep up with the rapidly expanding microelectronic technology, Vibra Screw equips its Loss-In-Weight and Batching Systems with appropriate, state-of-the-art controllers from several high visibility U.S. manufacturers. All controllers supplied incorporate user-friendly menu-driven software. Membrane keypads and easy-to-read displays support a revolutionary concept of deciphering actual weight from plant electrical noise.



Controllers provide continuous rate control for both solids and liquids with up to four load cells. And, all controllers meet world-wide metrology standards.