

# Acrison®

## Batch/Dump Weighing Systems Model 403B(D) Series

*For Reliable and Accurate  
Batch Weighing Applications*



*Quality built, total performance products to satisfy our  
dry solids metering/handling needs.*

## Batch/Dump Weighing Systems Model 403B(D) Series

*with BATCH-LOK® for disturbance-free operation*

### Operation

Model 403(D) Batch/Dump Weighing Systems basically consist of a hopper (for dry solids) or a tank (for liquids) integrally mount onto an Acrison "Overhead" type weighing system (scale).

For dry solids applications, product is typically fed into the scale-mounted hopper (weigh hopper) by an Acrison Volumetric Feeder (see page 3). When more than one product will be batched into a weigh hopper, each material is individually (sequentially) batched, since only one ingredient can be weighed at a time.

Regardless of the physical handling characteristics of the dry solid ingredient, Acrison's in-depth experience in this very specialized industry, in combination with the totally digital system capability of the various Model 403B(D) Batch/Dump Weighing Systems, provides a truly viable solution for your batch weighing requirements.

Model 403B(D) Batch/Dump Weighing Systems are designed with rugged-duty, high resolution, non-load cell weighing mechanisms that are also permanently calibrated, adjustment-free, and unaffected by temperature extremes and typical in-plant vibrations. Please see page 4 for additional information.

The various Acrison controllers available for use with Model 403B(D) Batch/Dump Weighing Systems include a unique feature - **Batch-Lok** - that ensures accurate batch weighing should the weighing system detect an abnormal disturbance during the batch weighing cycle.

Also available is an assortment of control schemes - from a simple single ingredient batch weighing controller to a multi-ingredient batch weighing control system.

The many variations and overall capabilities of the various Model 403B(D) Batch Weighing Systems are too numerous to outline in a basic brochure. Let our staff of experienced application engineers recommend the equipment that will best satisfy your specific requirements.

Our award-winning, fully equipped Customer Demonstration Facilities are available to physically demonstrate our various batch weighing capabilities.



### Accuracy, Quality, Longevity and Value

- **Batch Size (weight):** 250 grams to tons.
- **Batch Accuracy:**  $\pm 0.1$  to 0.5 percent or better (error) at two sigma, based on a given number of consecutive batch weighments.
- **Batch Weight Range (standard):** 30:1 turn-down from the scale capacity.
- **Scale Resolution:** One part in 1,048,576 (unamplified).
- **Ambient Temperature Operation Range:** -10° to 140°F.
- **Scale Design:** Technologically advanced counterbalanced lever network utilizing frictionless stainless steel flexures for all pivotal connections. See page 4.
- **Batch Frequency:** Depends on application; consult Acrison.
- **Metering Mechanisms for feeding dry solids into a Model 403B(D) Weigh Hopper:** A wide range of feeder models is available; selection is dependent upon the physical handling characteristics of the product or products.

## A typical multi-ingredient Model 403B(D) "Batch/Dump" Weighing System utilizing Acrison volumetric feeders to meter different dry solid materials into the Weigh Hopper

### Selection

- **Batch/Dump** (single ingredient) - metering into a Model 403B(D) Weigh Hopper to a pre-set batch weight, and then discharge the contents on command.

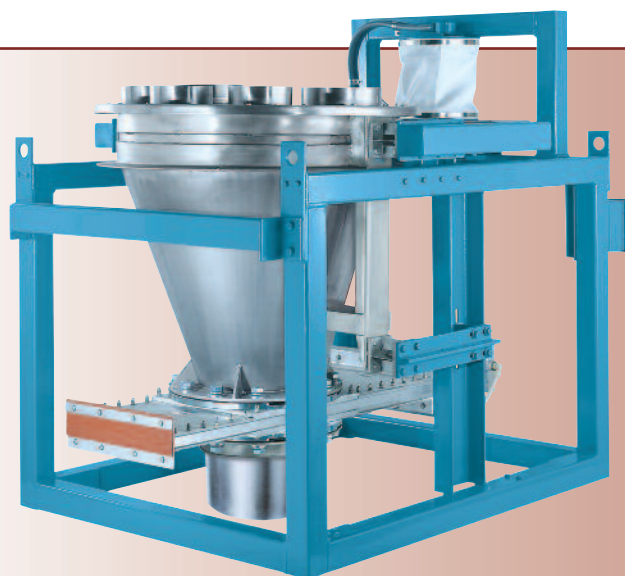
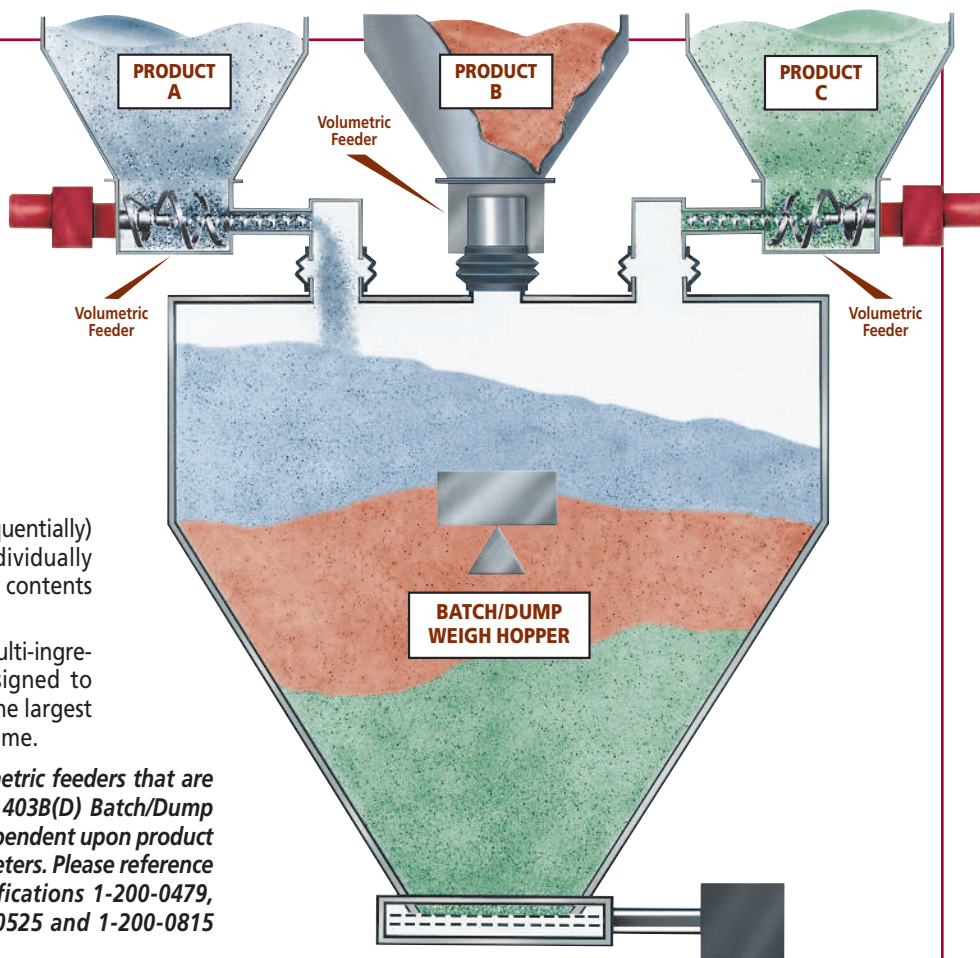
Batch/Dump Weigh Hoppers designed for single ingredient batch weighing applications are normally sized to hold the largest required batch in terms of both volume and weight. However, it's also possible to configure Acrison Batch/Dump Weigh Hoppers for multiple batches, which will reduce the size of a given Weigh Hopper, assuming application parameters so permit.

- **Batch/Dump** (multi-ingredient) - metering (sequentially) into a Model 403B(D) Weigh Hopper to individually preset batch weights and then discharge the contents on command.

Batch/Dump Weigh Hoppers configured for multi-ingredient batch weighing applications are designed to hold all of the required batches in terms of the largest individual batch weights and their total volume.

*Acrison manufactures a broad range of volumetric feeders that are available for use in conjunction with Model 403B(D) Batch/Dump Weighing Systems, the selection of which is dependent upon product handling characteristics and application parameters. Please reference Bulletins 270 and 712, and Equipment Specifications 1-200-0479, 1-200-0480, 1-200-0481, 1-200-0482, 1-200-0525 and 1-200-0815 for detailed information.*

**NOTE:** For a liquid batching system, the dry solids weigh hopper is replaced with a weigh tank and the dry solids feeders (metering into the Batch/Dump Hopper) are replaced with either valves or pumps.



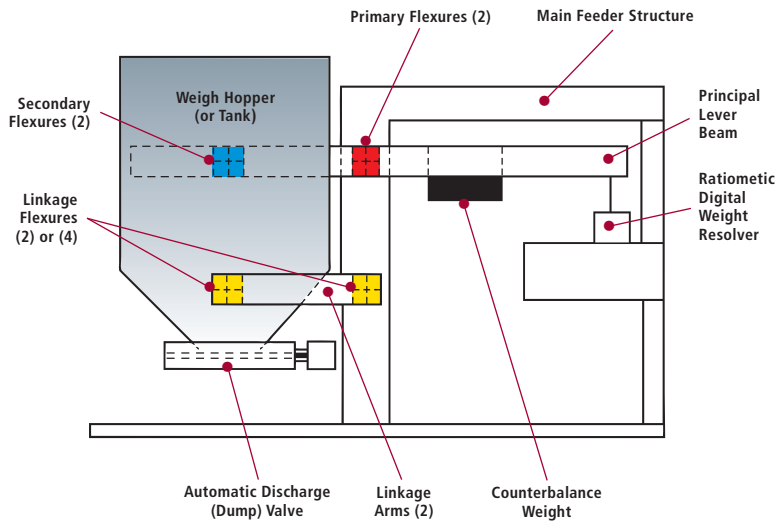
Model 403B(D)-10



Model 403B(D)-15

# Acrison's Model 403B(D) "Batch/Dump" Weighing Systems utilize Acrison's unique, high resolution, counterbalanced Weighing Mechanisms

## All-Flexure Weighing System with Acrison's exclusive Ratiometric® Digital Weight Resolver



**DRY SOLIDS SYSTEM ILLUSTRATED**

**NOTE:** For liquid units, the dry solids weigh hopper is replaced with a tank.

Acrison's "overhead" type weighing mechanism, used with Model 403B(D) Batch/Dump Weighing Systems, is a frictionless, mechanically counterbalanced, modified parallelogram type lever network (scale), utilizing Acrison designed and manufactured flexures for all connecting (pivotal) requirements. These novel, time-proven stainless steel flexures provide optimum structural rigidity of the lever network, both in the horizontal and vertical planes.

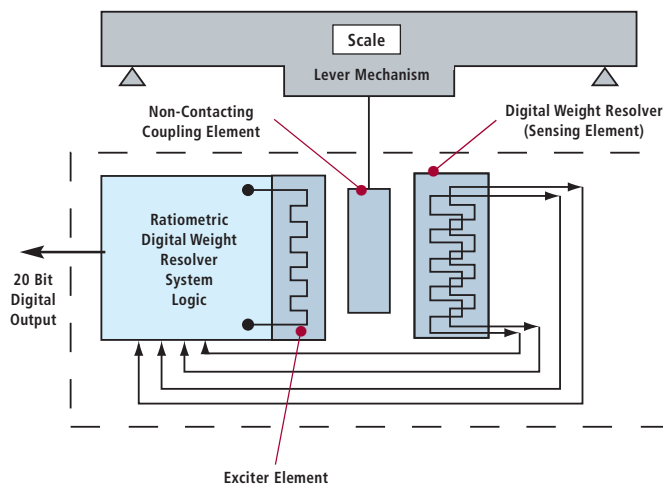
*As noted in the illustration,* two primary flexures connect the principal lever beam to the main support structure, with two secondary flexures connecting the actual weigh hopper (or tank) to the principal lever beam. A single or dual linkage assembly, utilizing either two or four flexures, connects the lower portion of the weigh hopper (or tank) to the main structure.

As weight is added to, or subtracted from the weigh hopper (or weigh tank), the lever network "moves" in an extremely precise relationship to that weight. In turn, this movement is sensed by Acrison's Ratiometric Digital Weight Resolver (RDWR), instantaneously converting this movement into an exceptionally precise, high resolution signal directly proportional to weight.

In differing from the common variety of load cell based batch weighing systems, the physical sensing element of Acrison's Ratiometric Weight Resolver does not attach to the lever (or scale) network and therefore, cannot be damaged by any amount of overload, shock and/or abuse that the weighing system may experience. In addition, Model 403B(D) Weighing Systems do not require calibration or adjustment; they are permanently calibrated and very durable.

*The entire weighing mechanism, including the weight sensing system, is guaranteed for five years.*

## Ratiometric® Digital Weight Resolver System (RDWR)



Acrison's exclusive Ratiometric Digital Weight Resolver (RDWR) System, used with all Acrison weighing systems, computes the linear movement of the lever mechanism (scale) into an unamplified, serially transmitted data stream having a discrete resolution of 20 bits (or the ability to sense 1 part in 1,048,576). This highly advanced electronic displacement measuring technique basically consists of a sensing element and its computational logic.

The physical sensing component is composed of a series of windings collated on a common element that are equally affected by environmental changes and therefore, self-compensating. In addition, because the computational logic of the RDWR System compares relative measurements, rather than absolute values, its input power source can vary up to  $\pm 30\%$  without affecting the output. Also, all non-weight data, both cyclic and random in nature that may be superimposed on the actual data, are cancelled-out.

The RDWR System is linear to within 0.01 percent, repeatable to 0.005 percent, possesses long term stability of 0.005 percent (10,000 hours) and carries a 40,000 hour MTBF.

Acrison's RDWR System is FM (Factory Mutual) Approved and Listed for operation in hazardous environments... Classes I, II and III; Divisions 1 and 2; Groups C, D, E, F and G. This weight sensing system also complies with European hazardous area classifications Ex II 2D Ex tb IIIC T85 deg.C Db and Ex II 3D Ex tD A20 IP66 T85 deg.C.

# Batch/Dump Controllers and Control Systems

*For use with Acrison Volumetric Feeders metering into Acrison Batch/Dump Weigh Hoppers*

Acrison Batch Weighing Controllers and Control Systems are universally recognized for their operational superiority, unparalleled versatility, ease-of-use and reliability. From basic batching controllers to multi-unit control systems, the technologically advanced designs of these devices, including their cutting-edge software routines, provide users with unexcelled batch weighing performance to satisfy the most demanding requirements across a broad spectrum of applications. With a wide range of options, accessories and interfacing capabilities, these controllers and control systems are also available in a number of different packaging configurations.

Acrison's SBC-2000 Family of Controllers encompass the latest technologies and functional algorithms, providing users with an unprecedented number of standard and optional features, including native Ethernet and Profibus connectivity. In particular, these controllers are ideally suited for those applications that require central computer control with minimal hardware. A variety of keyboard/display options is also available to suit specific user requirements.

## Basic Single Ingredient Batch Weighing

### Acrison Models SBC-2000 DSP and SBC-2000 DSP/C Controllers

The Models SBC-2000 DSP and SBC-2000 DSP/C Controllers have been designed for applications that require a local operator interface. These Controllers both have alphanumeric keypads with either monochrome (DSP) or color (DSP/C) graphical displays. They can be easily configured for operating a *single feeder* batching into a Model 403B(D) Weigh Hopper, and can also be configured to weigh and then dump multiple batches for a higher total weight, avoiding the need for a larger Weigh Hopper. *Please reference Design Specifications 1-200-0601 for details.*



All Acrison controllers are certified to UL, CSA and EC specifications.

# Batch/Dump Controllers and Control Systems

## Model 740 Batch/Dump Weighing Control System

For applications that require batching a number of ingredients into a Model 403B(D) Batch/Dump Weigh Hopper, Acrison can provide its Model 740 Batch Weighing Control System, which is a software package designed to operate with a PC. The PC can either be provided by Acrison (usually a panel mount touchscreen type), or by the user. In operation, the Batch Weighing Control System directs each of the feeders to sequentially meter product into the Weigh Hopper until each of the individually selected batch weights have been precisely attained.

The Model 740 Control System communicates serially with each of the motor controllers operating the various feeders metering product into the Weigh Hopper. Up to 20 feeders can be controlled in conjunction with a single Weigh Hopper in any desirable sequence or configuration, including repetitive batching and pausing between batches. When all of the desired batches have been completed, and upon command (programmable), the Control System will 'Dump' the contents of the Model 403B(D) Weigh Hopper.

Numerous digital inputs and outputs are provided via an Expansion I/O Module to interlock with the Model 403B(D) Weigh Hopper, and to interface with the user's process, if required. The Expansion I/O Module and the individual variable speed feeder motor controllers communicate as a network, utilizing the Serial Communication Port of the PC.

### General

Developed to provide the means for supervising and sequentially controlling up to 20 individual Acrison volumetric feeders metering dry solid ingredients into a common Model 403B(D) Batch/Dump Weigh Hopper, the Model 740 Batch Weighing Control System is a Microsoft Windows Program that provides all of the necessary functionality for accurate batch weighing, with complete data reporting. The Model 740 Control System software may be used on virtually all vintage 2007 and later Window PCs running Windows XP, Vista, 7 and 8.

### Main Screen

The Main Screen is the primary display screen, providing a view of all the feeders in the batching system. From this user-configured screen, the operator has the ability to:

- Create a batching sequence.
- Create/save/load unlimited batch recipes.
- Run/stop/pause/abort the batch sequences.
- Access other system and controller functions.

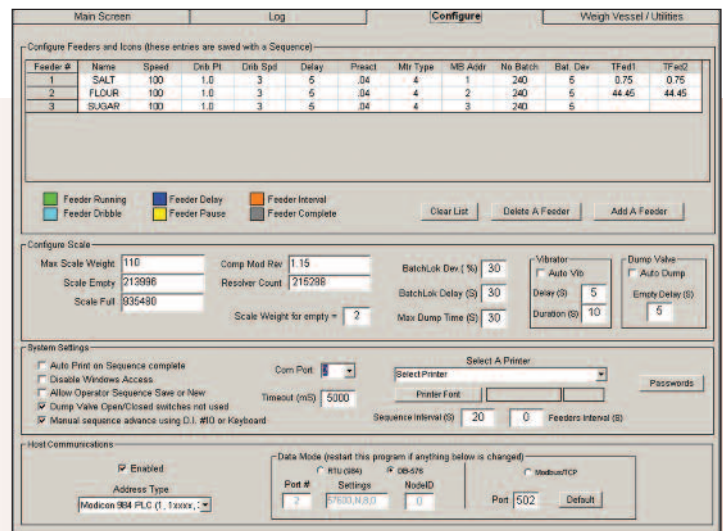
Icons provide important operational data such as batch weight selection, batch weight, volumetric feeder motor speed, motor current, system batch status and others.



Typical Main Screen

### Configure Screen

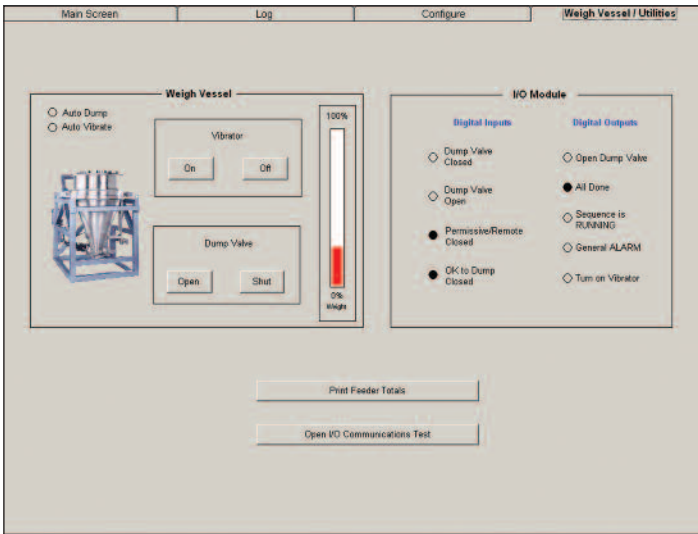
The Configure Screen allows the operator to define such parameters as feeder ID, feeder fast and dribble speeds, scale parameters, host communication, and to print batch reports.



Typical Configure Screen

## Batch/Dump Weigh Hopper - Utilities

The Model 403B(D) Batch/Dump Weigh Hopper Utilities Screen displays the status of the Weigh Hopper.

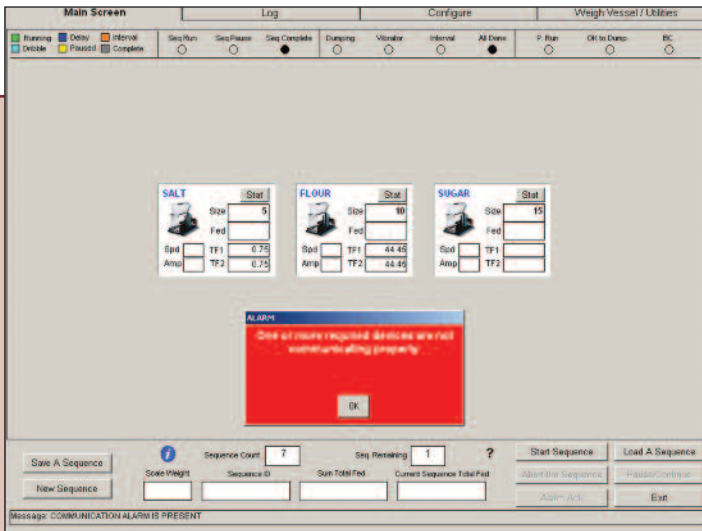


Typical Weigh Hopper Utilities Screen

## Alarm Event and Log Screens

The Alarm Event and Log Screens provide a comprehensive record of the alarm and sequence events encountered by the Model 740 System feeders. Each alarm and sequence event is described in a single line along with the date and time of the occurrence and the identity of the feeder. System log on and log off is also recorded, as is the starting and stopping of a batching application itself.

Alarms in the log appear in red and messages in yellow to permit quick identification. The log may be saved and/or printed and may be set-up to automatically save to a special location at a selected interval.



Typical Alarm Event - Main Screen

## Password Protection

Up to 10 passwords may be defined in the Model 740 Operating System. Three levels of access are provided as follows:

- **Monitor** - When the Model 740 Batching System is first started, or when an operator logs-off, the system is in the monitor mode. In this mode, the operator may only view screens and cannot change set points or activate any commands or functions.
- **User** - This mode requires a password to be entered and limits functions and access to those features that an operator would typically require. System recipes, for example, may be loaded but not created.
- **System** - This password protected mode permits full access to all functions and features.

## Hardware Requirements

The Model 740 Program may be run on a Microsoft Windows desktop, laptop, or on a panel-mount PC. Acrison recommends minimum hardware for best overall performance.

- **OS** - MS Windows 2000/XP/Vista, 7 and 8.
- **Processor** - Pentium class, 900 MHZ minimum.
- **Memory** - RAM - 512.

## Other Considerations

- For optimum performance when operating the Model 740 Batch Weighing Control System, Acrison recommends that it be run as a dedicated application.
- The Model 740 Batch Weighing Control System supports keyboard-less PC's by providing a selectable virtual keyboard function.
- The operating and instruction manual for the Model 740 Batch Weighing Control System is provided on a single CD ROM.
- The Model 740 Batch Weighing Control System is licensed for installation on a single PC.

## Discover the difference!

We cordially invite you to witness a test in Acrison's state-of-the-art Customer Demonstration Facilities handling your actual product(s) with the specific equipment we recommend for the application. Usually, there is no cost or obligation for this service.

Discover the difference in technology, quality and performance of Acrison equipment.



Empire Boulevard Facility  
Moonachie, NJ USA

## Acrison products...

- Models 101 and 130 Volumetric Feeder Series
- Models V-101 and V-130 Volumetric Feeders
- Model 1015 Volumetric Feeder Series
- Model 105 Volumetric Feeder Series
- Model W-105 Volumetric Feeder Series
- Model 120 Volumetric Feeder
- Model 140 Volumetric Feeder Series
- Model 170 Volumetric Feeder Series
- Model 905-14 Volumetric Feeder
- Bin Discharger Feeders
- Model 200 Series Weigh Belt Feeders
- Model 203B Series Weigh Auger Feeders
- Model 270 Series of In-Line Weigh Feeders
- Models 402, 404, 405, 406, 407 and 410 Series ("Weight-Loss-Differential") Weigh Feeders
- Model Series 403 ("Weight-Loss-Differential") Weigh Feeders
- Model 403B(D) Batch/Dump Weighing Systems
- Model 404BZ(BU) Bulk Bag Unloader Batch Weigher
- Models 350 and 301 Continuous Blenders and Blending Systems
- Multiple Auger Bin Dischargers and Multiple Auger Bin Discharger Hoppering Systems
- Vibratory Bin Discharger Hoppering Systems
- Model 170-BD-30 Bin Discharger
- Model 800 Series Bulk Bag Unloaders
- Model 500 Series Polyelectrolyte Preparation Systems
- Water and Waste Water Treatment Systems
- Volumetric and Gravimetric Feeder Controllers and Control Systems
- Silo Systems
- Accessory Equipment for Acrison Products
- Systems Engineering



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*"Visibly Different... Measurably Better"*

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