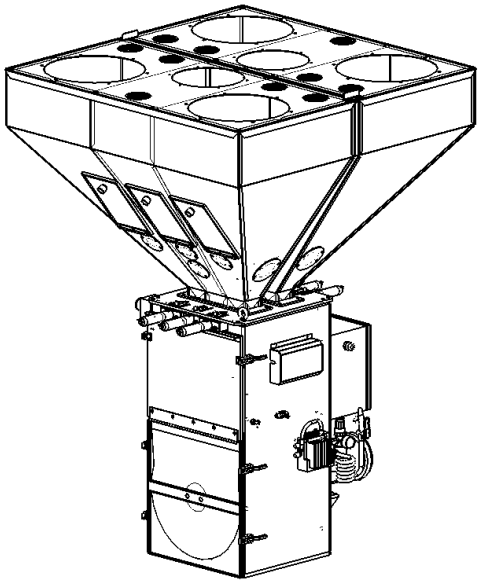
Gravimetric Slide Gate Auger Batch Blender
Red-Lion Display

Models: BD, CSG, SGBD



Part Number: 882.02148.00
Bulletin Number: BLN1-600A
Effective: February 1, 2013

Write Down Your Serial and Software Revision Numbers Here For Future Reference:

_____ _____

_____ _____

_____ _____

We are committed to a continuing program of product improvement.
Specifications, appearance, and dimensions described in this manual are subject to change without notice.

DCN No. _____

Shipping Info

Unpacking and Inspection

You should inspect your equipment for possible shipping damage.

Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware and mounting screws, etc.

In the Event of Shipping Damage

According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment.

Notify the transportation company's local agent if you discover damage.

Hold the damaged goods and packing material for the examining agent's inspection. **Do not return any goods before the transportation company's inspection and authorization.**

File a claim with the transportation company. Substantiate the claim by referring to the agent's report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.

Advise customer service regarding your wish for assistance and to obtain an RMA (return material authorization) number.

If the Shipment is Not Complete

Check the packing list as back-ordered items are noted on the packing list. In addition to the equipment itself, you should have:

- ☑ Bill of lading
- ☑ Packing list
- ☑ Operating and Installation packet
- ☑ Electrical schematic and panel layout drawings
- ☑ Component instruction manuals (if applicable)

Re-inspect the container and packing material to see if you missed any smaller items during unpacking.

If the Shipment is Not Correct

If the shipment is not what you ordered, **contact the shipping department immediately**. For immediate assistance, please contact the correct facility located in the technical assistance section of this manual. Have the order number and item number available. *Hold the items until you receive shipping instructions*.

Storage and Handling

Keep equipment in a clean, dry location when storing/handling. Environment should not exceed -25°C to 65°C (-13°F to 149°F) with no icing.

Returns

Do not return any damaged or incorrect items until you receive shipping instructions from the shipping department.

Credit Returns

Prior to the return of any material, **authorization** must be given by **the manufacturer.** A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

ALL returned material purchased from **the manufacturer** returned is subject to 15% ($75.00 minimum) restocking charge.

ALL returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

No credit will be issued for material that is not within the manufacturer's warranty period and/or in new and unused condition, suitable for resale.

Warranty Returns

Prior to the return of any material, authorization must be given by **the manufacturer.** A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

All returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

After inspecting the material, a replacement or credit will be given at **the manufacturer's** discretion. If the item is found to be defective in materials or workmanship, and it was manufactured by our company**,** purchased components are covered under their specific warranty terms.

Table of Contents

Chapter 1: Safety

1-1 How to Use This Manual

Use this manual as a guide and reference for installing, operating, and maintaining your blender. The purpose is to assist you in applying efficient, proven techniques that enhance equipment productivity.

This manual covers only light corrective maintenance. No other maintenance should be undertaken without first contacting a service engineer.

The Functional Description section outlines models covered, standard features, and safety features. Additional sections within the manual provide instructions for installation, pre-operational procedures, operation, preventive maintenance, and corrective maintenance.

The Installation chapter includes required data for receiving, unpacking, inspecting, and setup of the blender. We can also provide the assistance of a factory-trained technician to help train your operator(s) for a nominal charge. This section includes instructions, checks, and adjustments that should be followed before commencing with operation of the blender. These instructions are intended to supplement standard shop procedures performed at shift, daily, and weekly intervals.

The Operation chapter includes a description of electrical and mechanical controls, in addition to information for operating the blender safely and efficiently.

The Maintenance chapter is intended to serve as a source of detailed assembly and disassembly instructions for those areas of the equipment requiring service. Preventive maintenance sections are included to ensure that your blender provides excellent, long service.

The Troubleshooting chapter serves as a guide for identification of most common problems. Potential problems are listed, along with possible causes and related solutions.

The Appendix contains technical specifications, drawings, schematics, parts lists, and available options. Refer to this section for a listing of spare parts for purchase. Have your serial number and model number ready when ordering.

Safety Symbols Used in this Manual

The following safety alert symbols are used to alert you to potential personal injury hazards. Obey all safety messages that follow these symbols to avoid possible injury or death.

⚠DANGER — ***DANGER indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.***

⚠WARNING — ***WARNING indicates a potentially hazardous situation or practice that, if not avoided, could result in death or serious injury.***

⚠CAUTION — ***CAUTION indicates a potentially hazardous situation or practice that, if not avoided, may result in minor or moderate injury or in property damage.***

Figure 1: Safety Tags and Warning Labels

Hazard Alert Symbol	Description/Explanation	Preventative Maintenance
	Pinch point slide gate. Hands can become entangled or cut if they enter the danger zone of gears or cutting shears.	Every month inspect the shears/blades for any type of wear. For further information see the Maintenance Chapter in this manual.
	High voltage inside enclosure. The electrical enclosure is supplied with 3-phase electrical power. Use caution when using or maintaining this product.	Every six months inspect all electrical connections for secure attachment. For further information see the Maintenance Chapter in this manual.
	Shear point rotating mixer. Hands can become entangled or cut if they enter the danger zone of gears or cutting shears.	Every month inspect the shears/blades for any type of wear. For further information see the Maintenance Chapter in this manual.
	Shear hazard rotating auger. Hands can become entangled or cut if they enter the danger zone of gears or cutting shears.	Every month inspect the shears/blades for any type of wear. For further information see the Maintenance Chapter in this manual.

Mandatory Symbol	Description/Explanation
	Read Operators Manual. This equipment must be operated and maintained by properly trained personnel. The information contained within this manual must be read and understood prior to operating this equipment.
	Lifting point. Heavy load can fall and cause serious injury or possible death. Lift equipment at designated points.
	Disconnect before opening. Before servicing or maintaining the machine be sure to disconnect the power and/or compressed air source to avoid electrical shock and/or serious injury.
	Lock Out. This equipment is operated with 3-phase electrical power. Therefore, when performing any maintenance operations we recommend following the local standards for performing a lock-out/tag-out procedure.

1-2 Warnings and Precautions

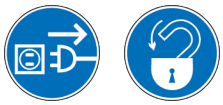
Our equipment is designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes. This may include, but is not limited to OSHA, NEC, CSA, SPI, and any other local, national and international regulations.

To avoid possible personal injury or equipment damage when installing, operating, or maintaining this equipment, use good judgment and follow these safe practices:

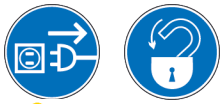
- ☑ **Read and follow these operation and installation instructions when installing, operating, and maintaining this equipment. If these instructions become damaged or unreadable, additional copies are available from the manufacturer.**
- ☑ Follow all **SAFETY CODES**.

- ☑ Keep fingers away from slide gates, augers, clean-outs, and calibration hatches. Automatic operation may start unexpectedly, **A PINCH HAZARD CAPABLE OF CAUSING BODILY INJURY EXISTS ANY TIME THE POWER IS ON.**

- ☑ Wear **SAFETY GLASSES** and **WORK GLOVES**.
- ☑ Work only with approved tools and devices.



- ☑ Disconnect and/or lock out power and compressed air before servicing or maintaining the equipment.
- ☑ Use care when **LOADING**, **UNLOADING**, **RIGGING**, or **MOVING** this equipment.
- ☑ Operate this equipment within design specifications.



- ☑ **OPEN**, **TAG**, and **LOCK ALL DISCONNECTS** before working on equipment. You should remove the fuses and carry them with you.

- ☑ **NEVER PUT FINGERS OR TOOLS IN AN AUGER OR SLIDE GATE AREA.**
- ☑ Make sure the equipment and components are properly **GROUNDED** before you switch on power.
- ☑ Do not restore power until you remove all tools, test equipment, etc., and the equipment and related components are fully reassembled.
- ☑ Only **PROPERLY TRAINED** personnel familiar with the information in this manual should work on this equipment.

We have long recognized the importance of safety and have designed and manufactured our equipment with operator safety as a prime consideration. We expect you, as a user, to abide by the foregoing recommendations in order to make operator safety a reality.

1-3 Responsibility

⚠CAUTION

These machines are constructed for maximum operator safety when used under standard operating conditions and when recommended instructions are followed in the maintenance and operation of the machine.

All personnel engaged in the use of the machine should become familiar with its operation as described in this manual.

Proper operation of the machine promotes safety for the operator and all workers in its vicinity.

Becoming familiar with materials, inspection, speed limitations, and guard maintenance and total user responsibility will assist you in learning potential areas in need of observation for danger.

Each individual must take responsibility for observing the prescribed safety rules as outlined. All caution, warning and danger signs must be observed and obeyed. All actual or potential danger areas must be reported to your immediate supervisor.

General Responsibility

No matter who you are, safety is important. Owners, operators and maintenance personnel must realize that every day, safety is a vital part of their jobs.

If your main concern is loss of productivity, remember that production is always affected in a negative way following an accident. The following are some of the ways that accidents can affect your production:

- Loss of a skilled operator (temporarily or permanently)
- Breakdown of shop morale
- Costly damage to equipment
- Downtime

An effective safety program is responsible and economically sound.

Organize a safety committee or group, and hold regular meetings. Promote this group from the management level. Through this group, the safety program can be continually reviewed, maintained, and improved. Keep minutes or a record of the meetings.

Hold daily equipment inspections in addition to regular maintenance checks. You will keep your equipment safe for production and exhibit your commitment to safety.

Please read and use this manual as a guide to equipment safety. This manual contains safety warnings throughout, specific to each function and point of operation.

Operator Responsibility

The operator's responsibility does not end with efficient production. The operator usually has the most daily contact with the equipment and intimately knows its capabilities and limitations.

Plant and personnel safety is sometimes forgotten in the desire to meet incentive rates, or through a casual attitude toward machinery formed over a period of months or years. Your employer probably has established a set of safety rules in your workplace. Those rules, this manual, or any other safety information will not keep you from being injured while operating your equipment.

Learn and always use safe operation. Cooperate with co-workers to promote safe practices. Immediately report any potentially dangerous situation to your supervisor or appropriate person.

REMEMBER:

- **NEVER** place your hands or any part of your body in any dangerous location.

⚠CAUTION

- **NEVER** operate, service, or adjust the blender without appropriate training and first reading and understanding this manual.
- **NEVER** try to pull material out of the blender with your hands while it is running!

Before you start the blender check the following:

- Remove all tools from the unit;
- Be sure no objects (tools, nuts, bolts, clamps, bars) are laying in the metering or If your blender has been inoperative or unattended, check all settings before starting the unit.
  - **At the beginning of your shift and after breaks, verify that the controls and other auxiliary equipment are functioning properly.**

⚠CAUTION

  - **Keep all safety guards in place and in good repair. NEVER attempt to bypass, modify, or remove safety guards. Such alteration is not only unsafe, but will void the warranty on your equipment.**
  - **When changing control settings to perform a different mode of operation, be sure selector switches are correctly positioned. Locking selector switches should only be adjusted by authorized personnel and the keys removed after setting.**

Report the following occurrences **IMMEDIATELY:**

- unsafe operation or condition
- unusual blender action
- leakage
- improper maintenance
  - **NEVER stand or sit where you could slip or stumble into the blender while working on it.**
  - **DO NOT wear loose clothing or jewelry, which can be caught while working on an blender. In addition, cover or tie back long hair.**

⚠CAUTION

  - **Clean the blender and surrounding area DAILY, and inspect the machine for loose, missing or broken parts.**
  - **Shut off power to the blender when it is not in use. Turn the switch to the OFF position, or unplug it from the power source.**

⚠CAUTION

Maintenance Responsibility

Proper maintenance is essential to safety. If you are a maintenance worker, you must make safety a priority to effectively repair and maintain equipment.

Before removing, adjusting, or replacing parts on a machine, remember to turn off all electric supplies and all accessory equipment at the machine, and disconnect and lockout electrical power. Attach warning tags to the disconnect switch.

When you need to perform maintenance or repair work on a blender above floor level, use a solid platform or a hydraulic elevator. If there is a permanently installed catwalk around your blender, use it. The work platform should have secure footing and a place for tools and parts. **DO NOT** climb on unit, machines, or work from ladders.

If you need to repair a large component, use appropriate handling equipment. Before you use handling equipment (portable "A" frames, electric boom trucks, fork trucks, overhead cranes) be sure the load does not exceed the capacity of the handling equipment or cause it to become unstable.

Carefully test the condition of lifting cables, chains, ropes, slings, and hooks before using them to lift a load.

Be sure that all non-current carrying parts are correctly connected to earth ground with an electrical conductor that complies with current codes. Install in accordance with national and local codes.

When you have completed the repair or maintenance procedure, check your work and remove your tools, rigging, and handling equipment.

Do not restore power to the blender until all persons are clear of the area. **DO NOT** start and run the unit until you are sure all parts are functioning correctly.

BEFORE you turn the blender over to the operator for production, verify all enclosure panels, guards and safety devices are in place and functioning properly.

Reporting a Safety Defect

If you believe that your equipment has a defect that could cause injury, you should immediately discontinue its use and inform the manufacturer.

The principle factors that can result in injury are failure to follow proper operating procedures (i.e. lockout/tagout), or failure to maintain a clean and safe working environment.

Chapter 2: Functional Description

2-1 Models Covered in This Manual

This manual provides operation, installation, and maintenance instructions for the BD, CSG, and SGBD Series slide gate blenders of various blending rates and specifications. See below for a list of available models.

- 150 lbs/hr Slide Gate Batch Blender with Allen-Bradley Controls
- 500 lbs/hr Slide Gate Batch Blender with Allen-Bradley Controls
- 900 lbs/hr Slide Gate Batch Blender with Allen-Bradley Controls
- 2500 lbs/hr Slide Gate Batch Blender with Allen-Bradley Controls
- 4000 lbs/hr Slide Gate Batch Blender with Allen-Bradley Controls
- 6000 lbs/hr Slide Gate Batch Blender with Allen-Bradley Controls

Model numbers are listed on the serial tag. Make sure you know the model and serial number of your equipment before contacting the manufacturer for parts or service.

Blending systems are as varied as the applications they service. All slide gate blenders are sized to meet the specific requirements stated by the Customer at the time of purchase.

2-2 General Description

All blenders are designed to blend plastic pellets and regrind, and supply the blended material to the processing machine. Standard equipment is not designed to blend powder or any other materials.

Accessories

The manufacturer offers a variety of standard options for blenders including floor stands, RAM feeders, loading equipment, etc. All accessories are designed and manufactured to ensure proper results for your application.

Customer Service

The intent of this manual is to familiarize the operator and maintenance personnel with these blenders and help your organization get the maximum service from your equipment. If you have any questions regarding installation, service, repair, custom equipment, or applications, please do not hesitate to contact us for the information required. Prices for additional equipment, accessories, or repair parts will be furnished promptly upon request.

- **If you desire to use a blender for an application other than that for which it was purchased, please contact your sales representative or our factory to verify compatibility of the equipment with the new process. Misapplication of the equipment could result in injury to the operator or damage to the equipment.**

Figure 2: Equipment Specifications

Dimensions and Specifications		150 (*1)	500	900	2500	4000	6000
Maximum Blending Rate, lbs/hr (kgs/hr) (*4)		150 (68)	500 (227)	900 (410)	2500 (1135)	4000 (1815)	6000 (2725)
Number of Materials to be Blended		2 to 4	2 to 6	2 to 8			
Slide Gate Size - Majors, in. (mm)		2.0 (50)	2.0 (50)		2.5 (63)	4.0 (100)	
Slide Gate Size - Minors, in. (mm)		1.5 (38)	1.5 (38)		2.0 (50)	3.0 (75)	
Supply Hopper Capacity - Majors, cu.ft. (l.) (*2)		0.7 (20)	1.4 (40)		3.0 (85)	7.5 (212)	
Supply Hopper Capacity - Minors, cu.ft. (l.) (*2)		0.2 (5)	1.0 (28)		2.7 (77)	6.0 (170)	
Weigh Hopper Capacity, cu.ft. (l.)		0.07 (20)	0.18 (50)	0.38 (11)	0.82 (23)	1.23 (34)	2.17 (61)
Typical Batch Size, lbs. (kgs)		1.5 (0.7)	4 (1.8)	8 (3.6)	25 (11.3)	35 (15.8)	45 (20.4)
Load Cell Capacity, kgs		1 @ 5 kg	2 @ 3 kg	2 @ 5kg	2 @ 10 kg	2 @ 15 kg	2 @ 20 kg
Mixer Capacity, cu.ft. (l.)		0.18 (5)	0.25 (7)	0.56 (16)	1.1 (31)	2.72 (77)	
Mixer Motor Size, HP (kw)		1/8 (0.09)	1/6 (0.124)		1/3 (0.249)	1 (0.75)	
Mixer RPM		42	21		22		
Blended Material Discharge Opening, in. (mm)		2.5 (63)	3.0 (76.2)		4.0 (102)		
Weight of Machine (approx.), lbs. (kgs)		250 (115)	375 (170)	450 (205)	650 (295)	1100 (500)	
Shipping Weight (approx.), lbs. (kgs)		350 (160)	425 (190)	550 (250)	800 (360)	1300 (590)	
Approximate Dimensions, in. (mm)	Height (*3)	34.5 (875)	51.5 (1308)	56.5 (1435)	69.5 (1765)	85.5 (2172)	89.5 (2337)
	Width (*3)	26.0 (650)	37.5 (952)	37.0 (940)	45.5 (1156)	57.5 (1461)	
	Depth (*3)	22.0 (560)	37.0 (940)	40.0 (1016)	46.5 (1181)	57.0 (1448)	

(*1) Compressed air loaders CANNOT be used to load 150 # blenders.

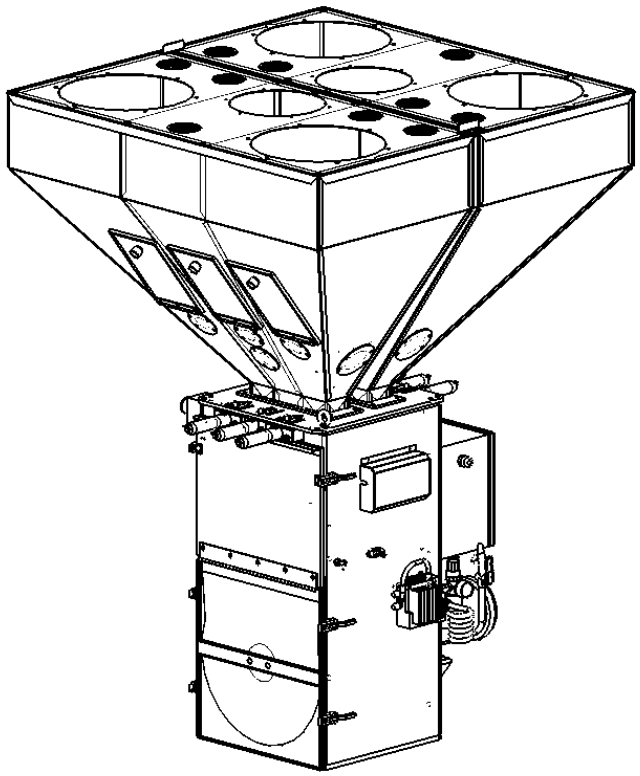
(*2) Hopper capacity measured excludes straight wall section and is based on vacuum receiver use. Approximate value.

(*3) Measurements describe standard unit without feeder or RAM hoppers.

(*4) See page 75 for important rate information concerning each model's maximum blending rate.

Note: Blender models with 7th and 8th component metering include Allen Bradley 10 inch color touch screen standard.

Figure 3: Typical Blender Assembly



2-3 Typical Features and Components

Mechanical Features

- Exclusive diamond design slide gate metering assemblies meter a large range for free-flowing pellet materials
- Adjustable slide gate stroke limiting restrictors provided for accurate metering of minor ingredients (not available on 150 models, or removable hopper components)
- Removable stainless steel weigh hopper and mixing components
- Powder coated mild steel material supply hoppers with machined polycarbonate clean-out doors and optional material drains (stainless steel hoppers on 150 models)
- Precision 0.02% span accurate cantilever load cell weighing system
- Interlocked safety system shuts off compressed air **and** electricity if mixer is opened
- Compressed air hose with nozzle provided as a convenience for clean-out

Figure 4: Typical Red Lion Touch Screen Display

- **Your touch-screen panel may differ slightly from shown.**

Controller Features

- LCD touch-screen interface display operator control panel with 8’ cable
- Target vs. actual set point verification
- Inventory accumulation for all ingredients
- Audible and visual alarms
- Auxiliary alarm contact

- 100 recipe storage book
- Three (3) types of recipe entry procedures available:
    - **"EZ Recipe" mode** (up to 8-component) recipe entry. Color and additives are metered as a percentage of the virgin material.
    - **Percentage mode** recipe entry. Ingredients are metered as a percentage of the overall batch.
    - **Parts mode** recipe entry (i.e. 500:1) Ingredients are metered as a ratio to each other within the batch
- Full control diagnostics
- Serial printer and communications ports

System Component Description

This section describes the various components of the blending system.

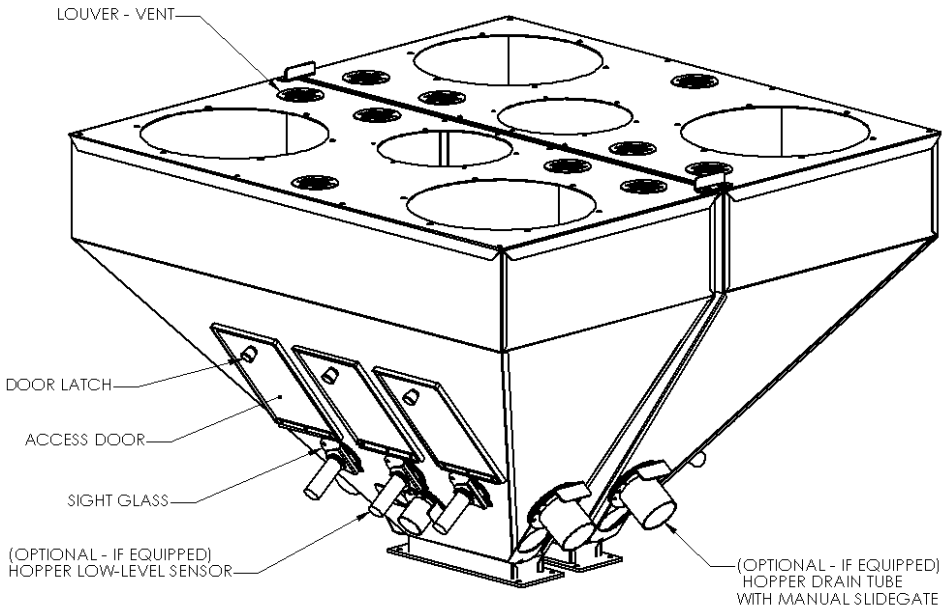
Supply Hoppers

The material supply hoppers are located on top of the blender frame. These hoppers store a supply of material for the individual metering devices. They are sized based on the total throughput of the blender.

The blending system does not include any level indication devices on the unit. Optional low-level sensors are available. The blender controller will alarm if it runs out of material while trying to make a batch, but low-level sensors will alert floor personnel to the problem sooner.

Many hoppers are equipped with a sight glass and/or access door.

Figure 5: Typical Hopper Assembly



Slide Gates

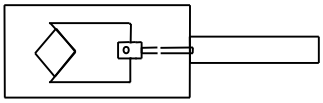
Air operated slide gates are provided to meter the majority of pellet ingredients on Slide Gate blenders.

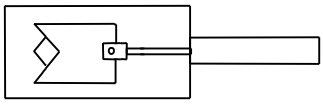
- **The metering range assumes 1/8” diameter free-flowing plastic pellets weighing approximately 35 lbs./cu. ft. This is meant to be an approximate sizing recommendation and can vary with different bulk density resins, pellet configuration, etc.**

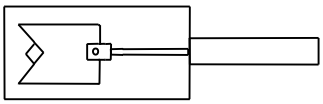
A stroke limiter (included) can be installed on the metering gates to limit their travel. This device decreases the stroke of the gate and reduces the metering orifice of the valve. The unique diamond gate provides a square opening at any stroke length, providing more consistent flow from smaller valve openings than conventional slide gates. This stroke limiter may be necessary to accurately meter low percentage ingredients.

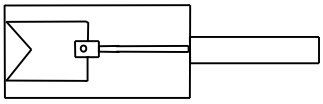
The air cylinders operating the slide gate are rugged, stainless steel cylinders designed for industrial use.

- **The unique diamond gate provides a constant aspect opening that remains square regardless of the stroke length of the cylinder. This design provides a wider cross sectional opening when approaching a closed position, and provides better flow of plastic pellets out of the opening.**


DIAMOND GATE OPEN


DIAMOND GATE 1/2 CLOSED

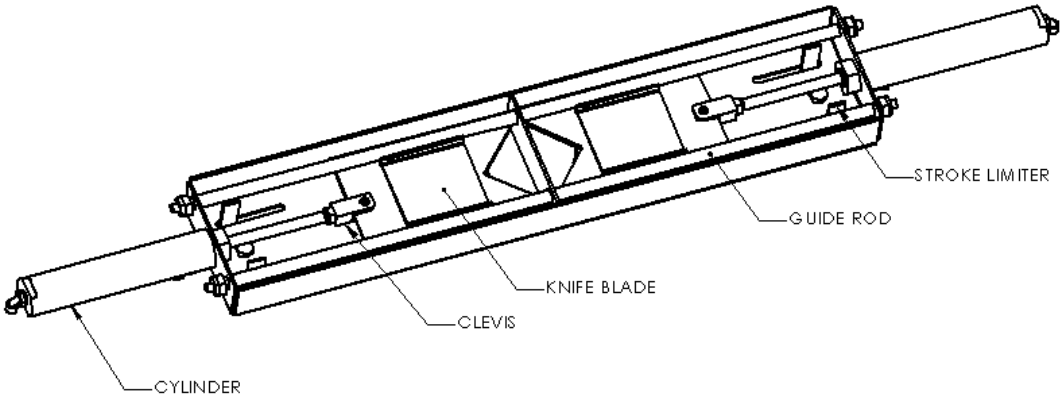

DIAMOND GATE 3/4 CLOSED


DIAMOND GATE CLOSED

⚠WARNING ***Slide gates create a pinch-point hazard.***

⚠WARNING ***Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing or cleaning any blender, including all Batch models. Failure to do so may result in serious injury.***

Figure 6: Typical Slide Gate Assembly



Each of the diamond gate air cylinders is actuated by a solenoid valve, which are controlled by the blender PLC.

When the solenoid valve is energized, it opens the metering valve cylinder. When the solenoid valve is de-energized, it closes the metering valve cylinder.

If the power is interrupted to the blender, the metering valves will return to the closed position, to prevent material from over-filling the weigh hopper/mix chamber.

⚠CAUTION

- **If the blender is in metering mode with one of the slide gates open, do not open the front door of the blender!**
- **The safety switch shuts off the air supply to the blender. An open feeder slide gate stays open, and an overflow of the weigh hopper can occur!**

Weigh Hopper

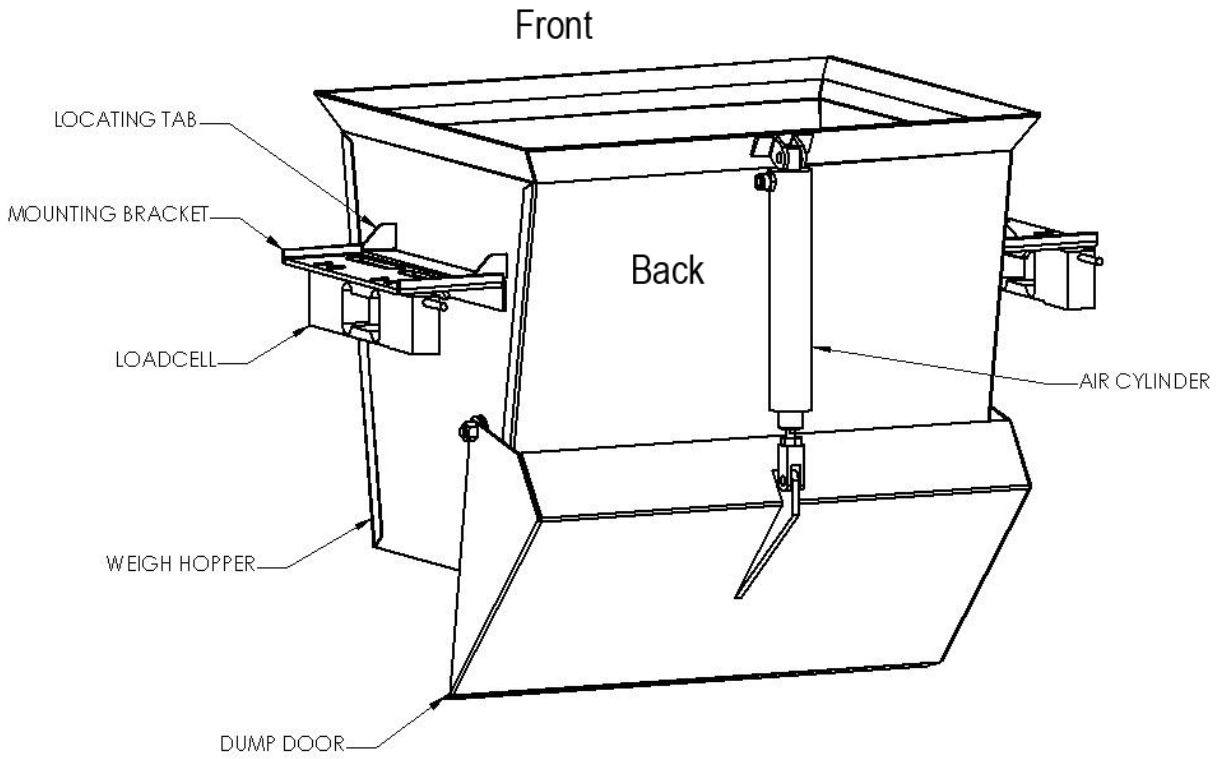
On a Slide Gate blender, the weigh hopper rests on each side on a precision cantilever load cell. To remove the weigh hopper, disconnect air line then lift the hopper from the bottom, hold the dump door closed, and slide it out once clear of the locating tab on the bracket above the load cell.

Once the hopper has been cleaned, reposition it onto the load cell brackets, using care not to damage the load cells. Position the hopper as close to the center position between the load cells as possible.

⚠CAUTION

- **Use care when replacing the weigh hopper, since the load cells are delicate weighing instruments and can be easily damaged. Do not use force to push in the weigh hopper. If it is positioned properly, it will slide in very easily.**
- **Load cells, if damaged, will have to be sent back to the manufacturer for testing and evaluation.**

Figure 7: Typical Weigh Hopper Assembly



The weigh hopper dump door holds the material until it is dumped into the mixing section. The cylinder is actuated by a solenoid in the valve stack on the side of the blender.

In looking at the pneumatic circuit, you can see that the air regulator controls the flow of air to the valve stack. When the weigh hopper discharge cylinder solenoid valve is not electrically energized, it will provide air pressure to the air cylinder and hold the shaft in an extended position, holding the dump valve closed.

When the air cylinder is actuated, the air pressure to the dump valve will be removed, causing it to open.

The air cylinder on the weigh hopper includes a spring return to allow the cylinder to retract in the absence of air pressure on the cylinder. This will cause the dump valve to open.

⚠CAUTION

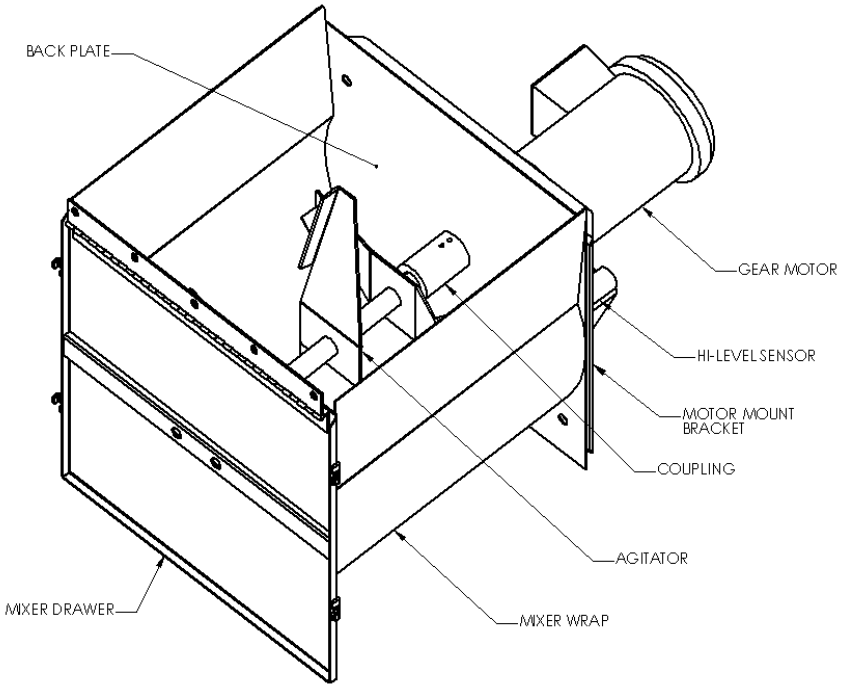
The pneumatic system used on the Slide Gate blender, like all pneumatic systems, is highly sensitive to oily, dirty, wet or contaminated air. If oil, dirt, water, or any other air-borne contaminates enter the system, the components could be damaged and injury to the operator could result. A proper air supply must be supplied to the blender.

When the safety circuit is disabled, the air pressure to the cylinder will drop off by shutting off all the air supply to the valve stack with the pilot operated master air valve. This will also cause the weigh hopper discharge door to open.

Mix Chamber

All of the batch blenders are equipped with an integral mix chamber. The mix chamber holds multiple batches of material so any variations in a batch are averaged over time.

Figure 8: Typical Mixer Assembly



The mixer is designed to provide bi-directional mixing action and can be easily taken apart for cleaning. This design is standard on all Slide Gate blenders.

⚠ DANGER

Blades may be sharp!

Operator Control Panel Display

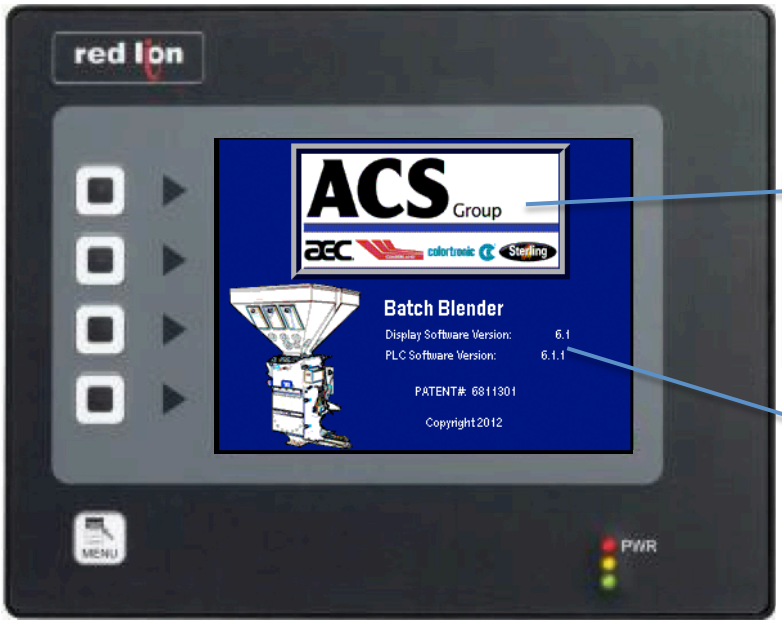
The operator control panel includes an 8 foot (2.4 m) cable and can be remote mounted (not recommended) adjacent to the blender. The panel can be unplugged and removed if necessary.

A programmable logic controller (PLC) controls the blender operation. This design provides excellent blender performance along with an easily replaceable control panel in the unlikely failure of any computer or electronic part.

The display menu format is very simple. After installation and setup, simply enter in the recipe and start the blender. See the following pages for controller pushbutton & touchscreen tags along with typical operator screens.

If it is desired to have a local display and control of the blender closer to a remote operator station, an optional remote mount operator panel is available.

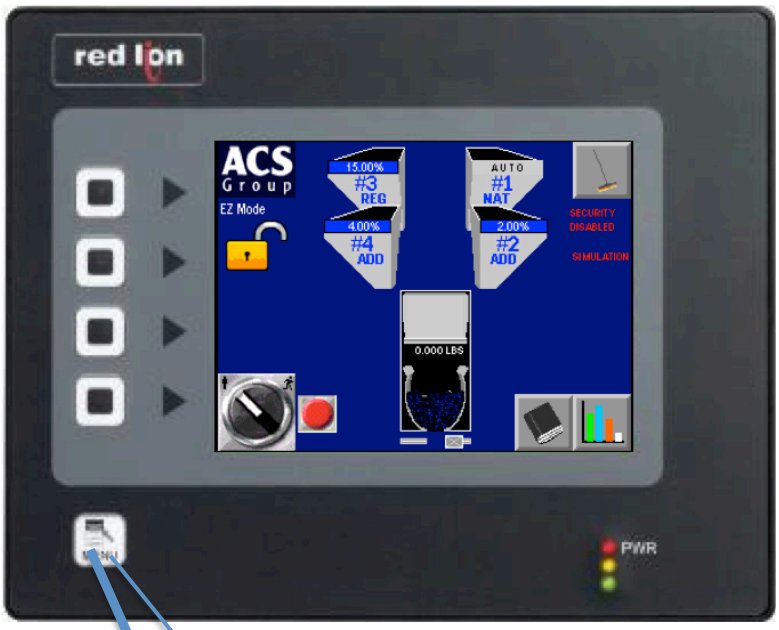
STARTUP SCREEN



The recipe screen will automatically be shown in 5 seconds. Touch here to bypass startup delay

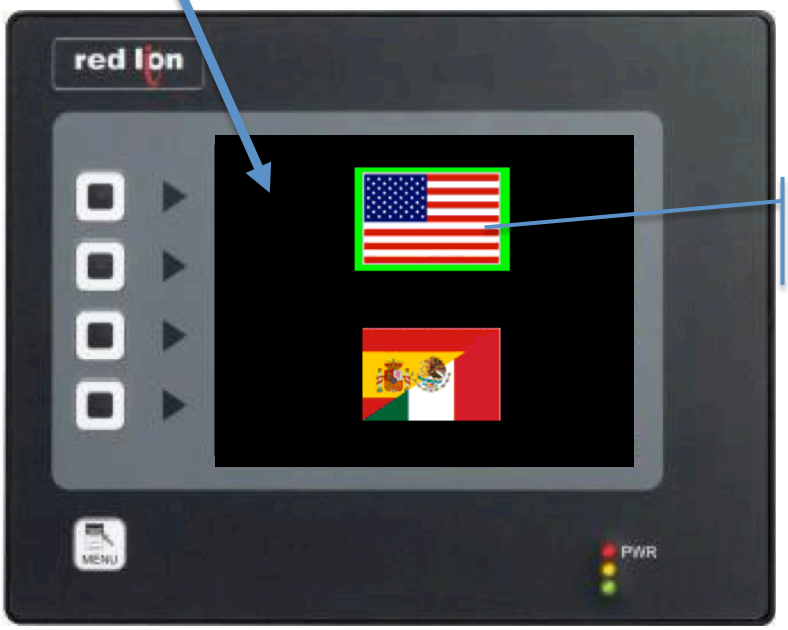
Display & PLC Software versions shown. The first 2 digits should be the same.

Changing the Language



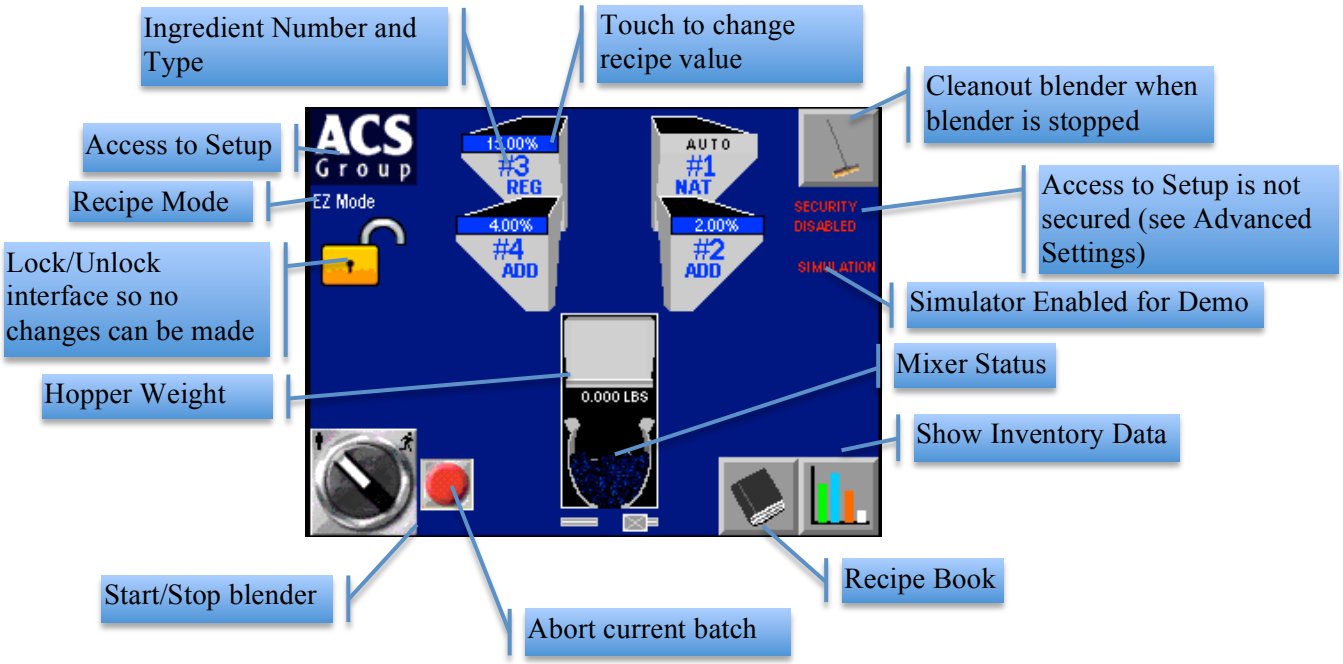
Touch here to bring up Language Selection Page

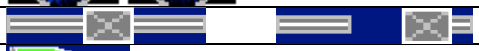
Language Selection Page



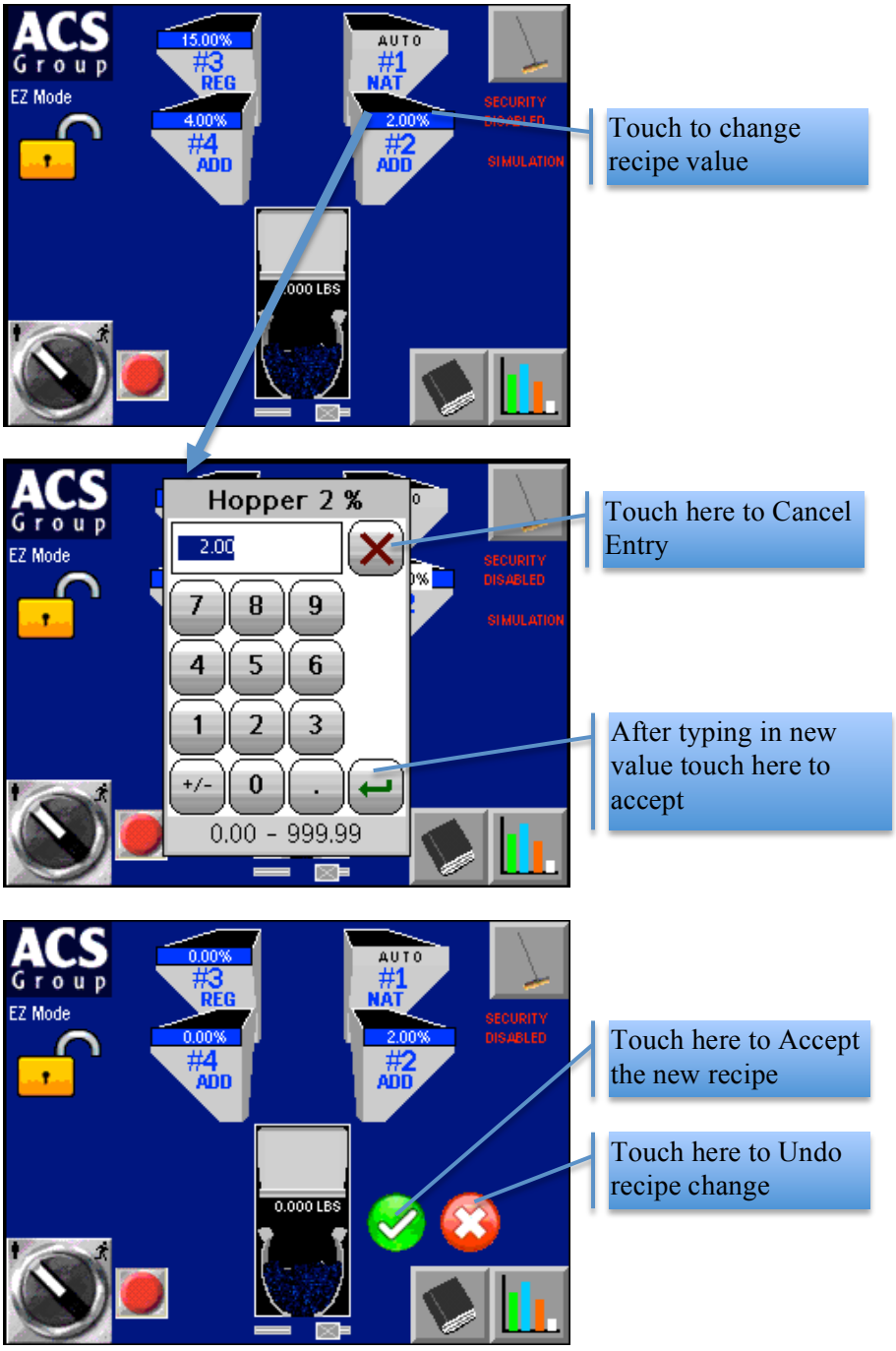
Touch the Flag of your Country to change the language

Recipe Page



	Touch screen interface is unlocked. To lock touch the lock icon and enter in the password.
	Touch screen interface is locked. This prevents someone from starting/stopping the blender or changing the recipe. To unlock touch the lock icon and enter in the password.
	Blender is not running. Touch to start blender.
	Blender is running. Touch to stop blender. The blender will then stop after it has completed the current batch.
	Weigh hopper closed / Weigh hopper open
	Mixer not full / Mixer Full
	Mixer Knife Gate Closed / Open
	Ingredient Feeding
	Ingredient Alarming
	Accept / Undo Recipe Change

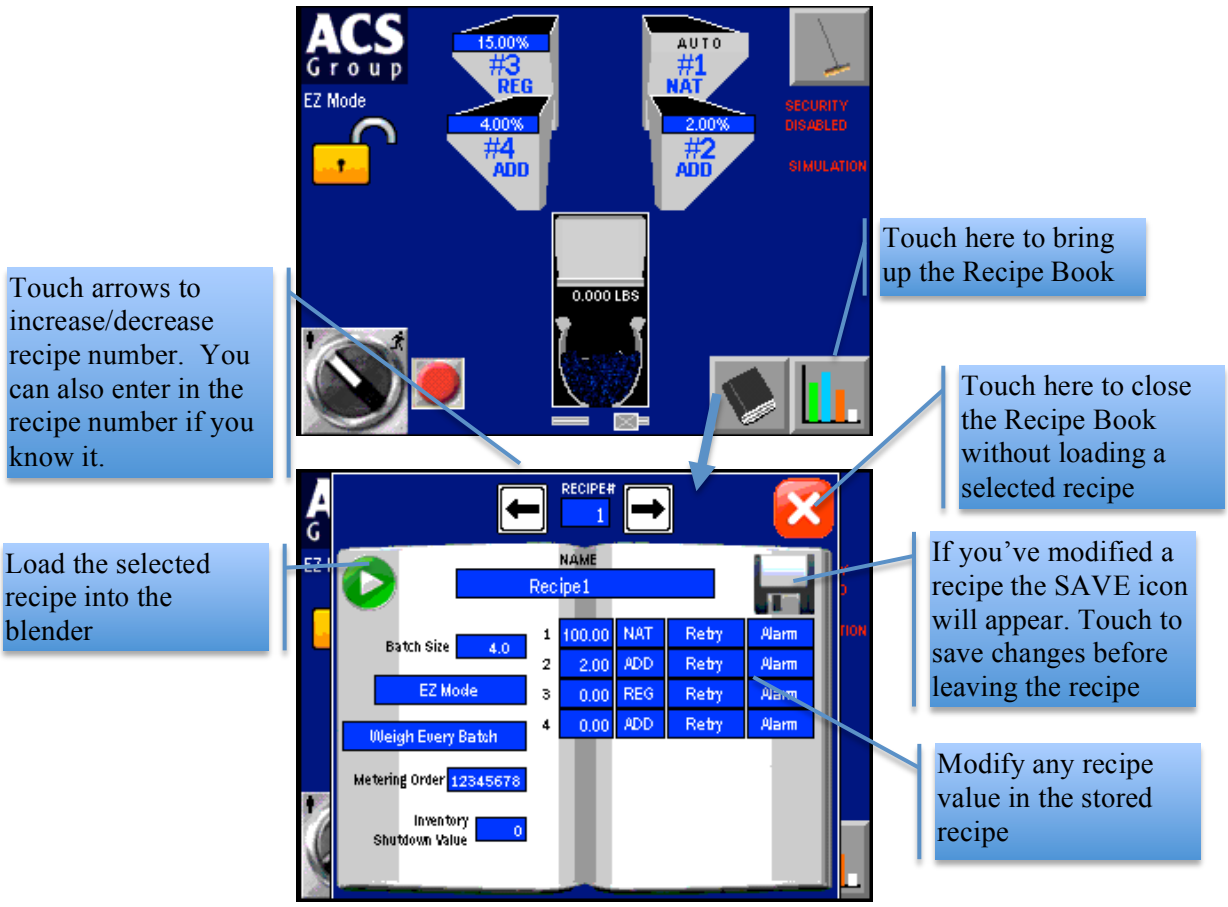
Entering a Recipe



REQUIREMENTS FOR A VALID RECIPE

EZ Mode	Regrind hopper cannot be over 100%. Multiple Virgin hoppers must total 100%.
Percentage Mode	Recipe Total must add to 100%.
Parts Mode	All entries are valid.

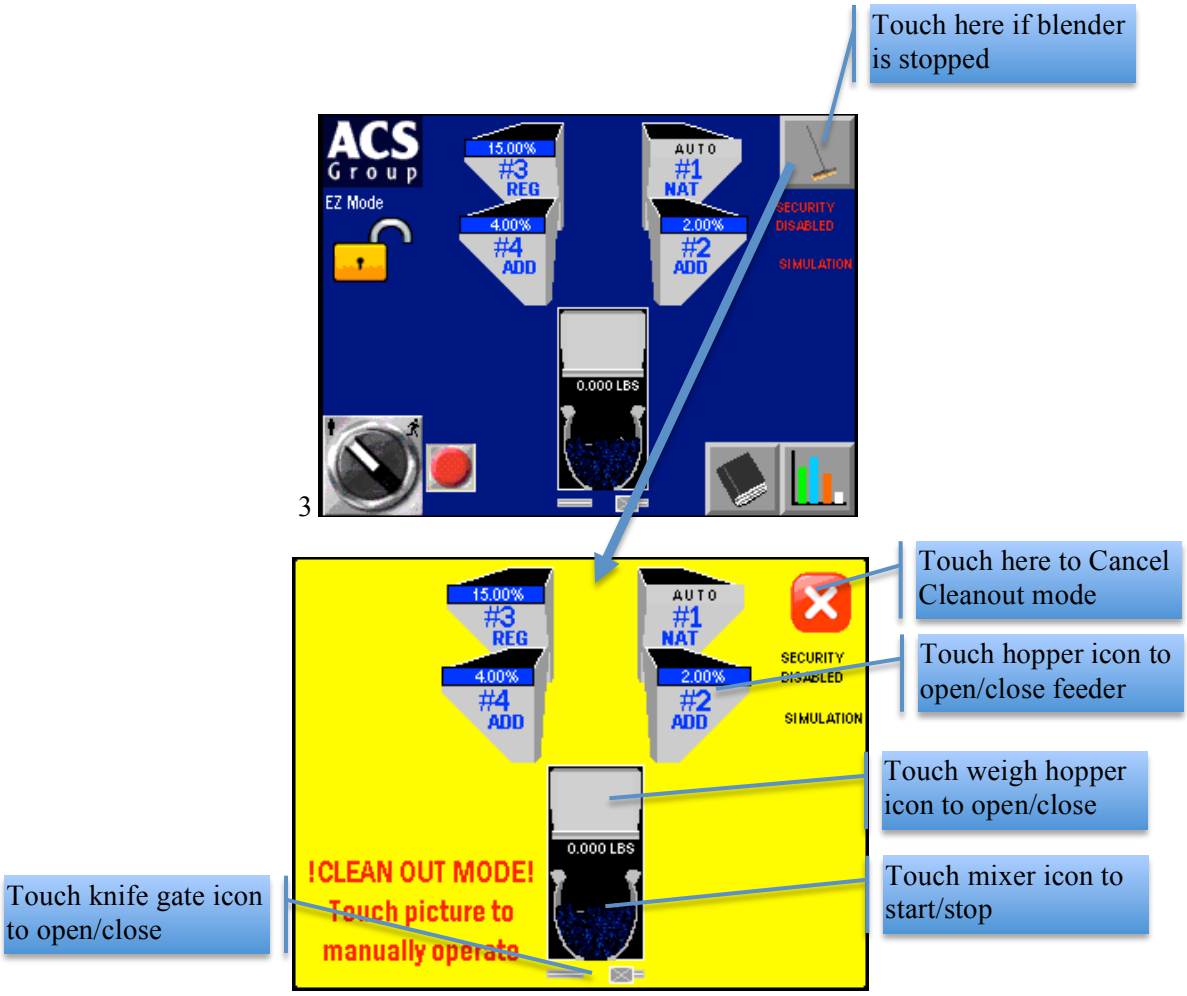
Recipe Book



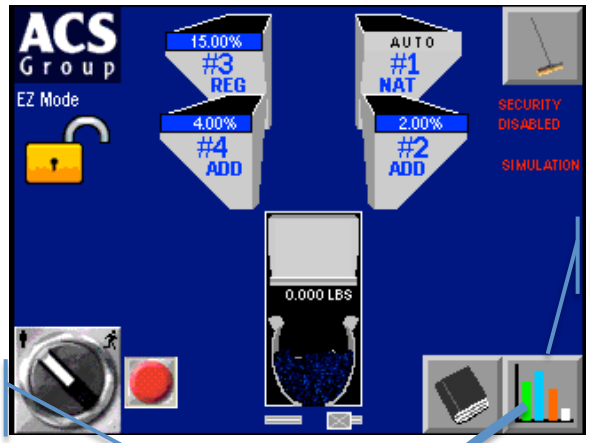
REQUIREMENTS FOR A VALID RECIPE

EZ Mode	Regrind hopper cannot be over 100%. Multiple Virgin hoppers must total 100%.
Percentage Mode	Recipe Total must add to 100%.
Parts Mode	All entries are valid.

Cleanout Mode

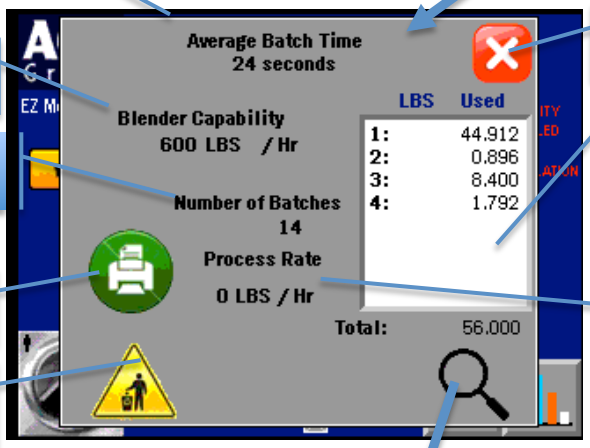


Inventory Page



Touch here to bring up the Inventory Page

Average Batch time in seconds



Touch here to close the Inventory Page

Max Blender rate with current recipe

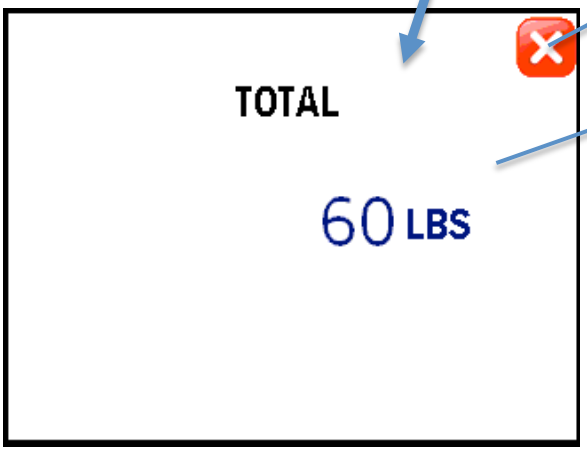
Batches counted in Total Inventory

Material weight that has been weighed and dispensed through the weigh hopper

Print Inventory

Consumption rate of process

Clear Inventory. You will have to enter your password and confirm.

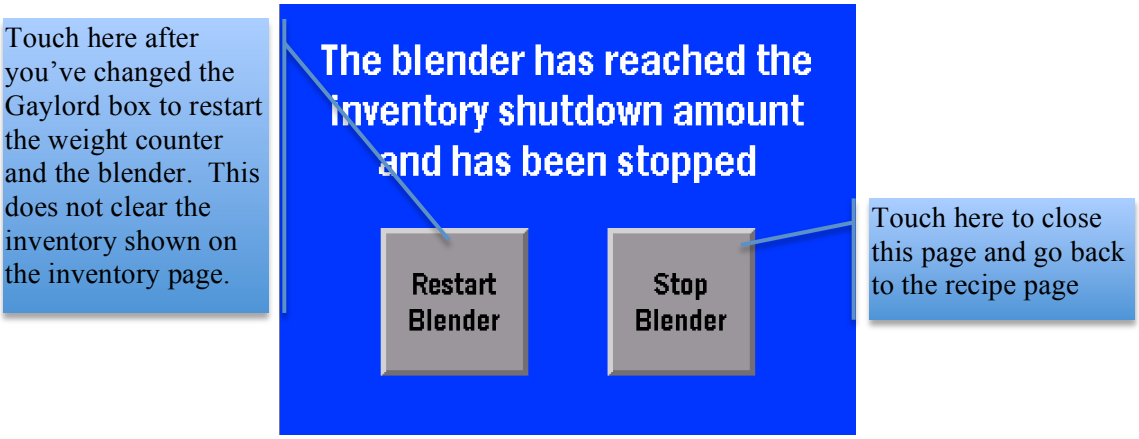


Touch here to close Magnified View

Magnified TOTAL INVENTORY page for long distance viewing on OI units

Inventory Shutdown Event

The blender has a feature called “inventory shutdown”. This is typically used to fill gaylords without the need of a “full” prox for the bin. The blender can be configured to perform this feature by entering in an “inventory shutdown value” under “Recipe Format” found under “Setup” (see setup section for more details). Once a recipe with an inventory shutdown value is started the blender will continue to make batches until the inventory shutdown value has been reached. This is checked after the batch dumps, so you can end up with a value that is nearly 1 batch greater in weight than the programmed inventory shutdown value. Once the inventory shutdown value is reached the blender stops making batches, the alarm horn/flasher is energized, and the page below is shown.



2-4 Optional Components

The following is a list of options, which your blender may have been equipped with:

Pneumatic Slide Gate below Mixer

The Batch blending system can be equipped with an optional pneumatic slide gate below the mixing chamber. The gate is used in applications when the blender is mounted above a large hopper, or for gaylord filling, etc. This gate holds the material in the mixing section, to ensure that it is properly mixed. Control of the mixer function is described below, and is determined by the position of the "knife gate switch" located on the side of the back control panel.

Slide gates create a pinch-point hazard

Figure 13: Mixer Slide Gate Switch Positions

Position	Description
AUTO	Slide gate functions are automatically controlled by the blender controller
OPEN	Slide gate open all the time
CLOSE	Slide gate closed all the time

Low Level Sensors

Detect material supply problems before blender supply hoppers are empty.

Remote Touch Screen

This section describes the optional Remote Touch Screen. It is useful in situations when the access to the control panel is difficult or limited. This remote control panel may be located up to 50 cable feet away from the blender control panel. (Note: a signal amplifier may be required for long distances. Consult factory with actual application.)

- **The Remote Touch Screen option provides a second operator control.**

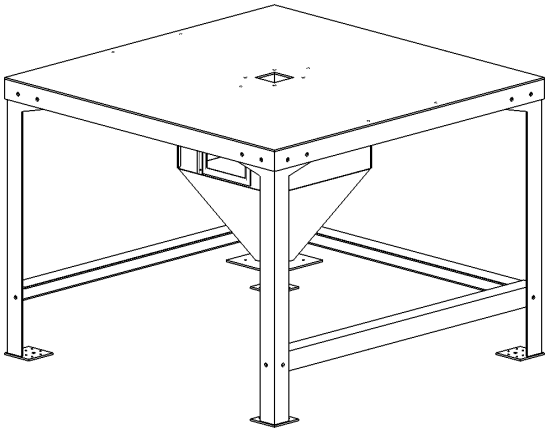
The remote interface provides the operator with all the functions of the standard Batch blender control panel. The keypad and display are identical to the blender panel.

Every Batch blender panel includes a remote interface connection, and simply plugs into the appropriate connector. The remote touch screen is an option and is not included with the standard blender.

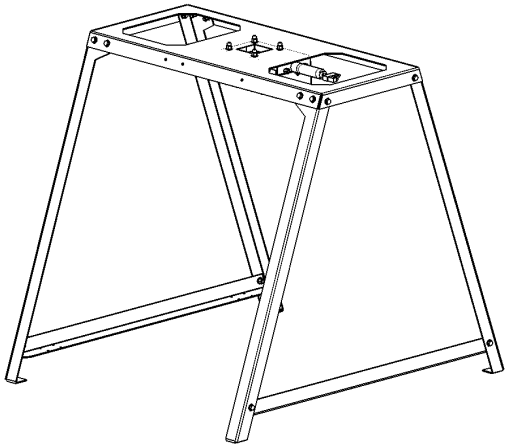
Mezzanine and Floor Stands

Supports blenders in mezzanine mount and freestanding applications.

Figure 14: Typical Floor Stands (Surge Hopper Stand & Gaylord Fill Stand)



HD—“Heavy Duty”

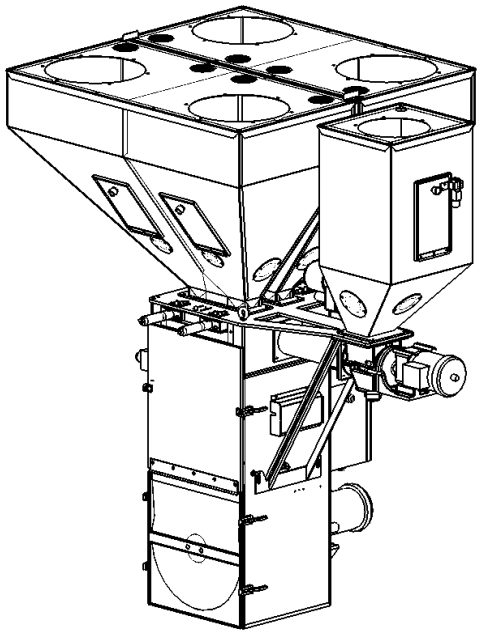


RD—“Regular Duty”
(Some assembly may be required.)

Regrind Auger Metering (R.A.M.) Hopper

Used for feeding difficult regrind materials.

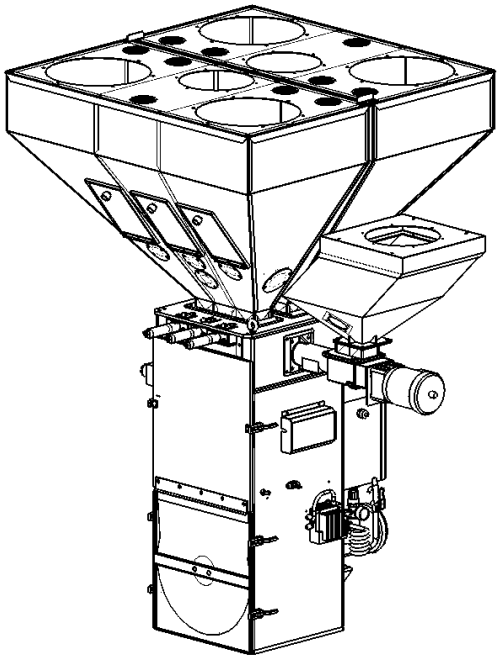
Figure 15: Typical R.A.M. Hopper Blender Configuration



Additive Feeder Hopper

Used for feeding pelletized additive, typically used on blenders with more than six components.

Figure 16: Typical Additive Feeder Configuration



Take-off Compartments

Allows material to be metered into a vacuum conveying system.

2-5 Safety Features

This section includes information on safety devices and procedures that are inherent to the Gravimetric Batch Blender. This manual is not intended to supersede or alter safety standards established by the user of this equipment. Instead, the material contained in this section is

recommended to supplement these procedures in order to provide a safer working environment.

At the completion of this section, the operator and maintenance personnel will be able to do the following:

- Identify and locate specific safety devices.
- Understand the proper use of the safety devices provided.
- Describe the function of the safety device.

Safety Circuit Standards

Safety circuits used in industrial systems protect the operator and maintenance personnel from dangerous energy. They also provide a means of locking out or isolating the energy for servicing equipment.

Various agencies have contributed to the establishment of safety standards that apply to the design and manufacture of automated equipment. The Occupational Safety and Health Administration (OSHA) article 1910.147 and NFPA 70 and 79 are just a few of the organizations that have joined with the plastics industry to develop safety standards.

Every effort has been made to incorporate these standards into the design of the Batch Blender; however, it is the responsibility of the personnel operating and maintaining the equipment to familiarize themselves with the safety procedures and the proper use of any safety devices.

Fail Safe Operation

If a safety device or circuit should fail, the design must be such that the failure causes a "Safe" condition. As an example, a safety switch must be a normally open switch. The switch must be held closed with the device it is to protect. If the switch fails, it will go to the open condition, tripping out the safety circuit.

At no time should the safety device fail and allow the operation to continue. For example, if a safety switch is guarding a motor, and the safety switch fails, the motor should not be able to run.

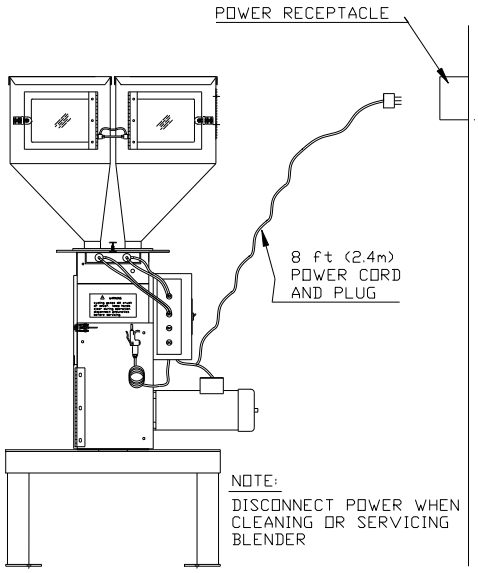
Safety Device Lock-Outs

Some safety devices disconnect electrical energy from a circuit. The safety devices that are used on the Batch Blenders are primarily concerned with pneumatic and electrical power disconnection and the disabling of moving parts that may need to be accessed during the normal operation of the machine.

Some of the safety devices utilize a manual activator. This is the method of initiating the safety lock out. This may be in the form of a plug, lever or a handle. Within this lockable handle, there may be a location for a padlock. Personnel servicing the equipment should place a padlock in the lockout handle.

In addition to the safety devices listed above, these blenders are equipped with a line cord plug (Shown in figures 17 and 18). This allows the operator or maintenance personnel to unplug the unit from its power source and tag it out. The plug can then be tagged with any number of approved electrical lockout tags available at most electrical supply stores.

Figure 17: Electrical Disconnect Plug



Twist Cap Plug Connected to Each Feeder Auger Motor

The cap plug must be turned counter-clockwise to loosen and the female end of the cord removed from the motor plug. This disables the motor from turning while the auger unit is being serviced or cleaned. The motor cords are cut to length so they must be disconnected before the auger can be removed from the housing. Disconnect plug before cleaning or servicing motors or augers.

Figure 18: Twist Cap Plug

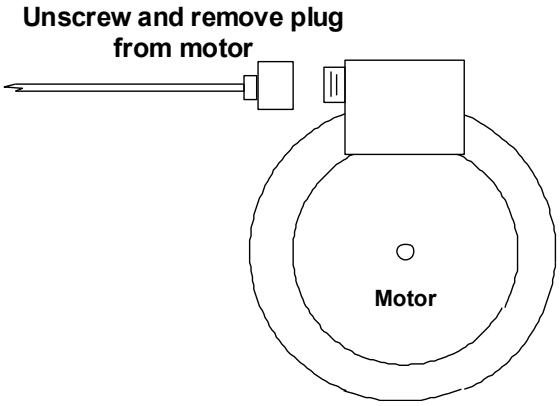
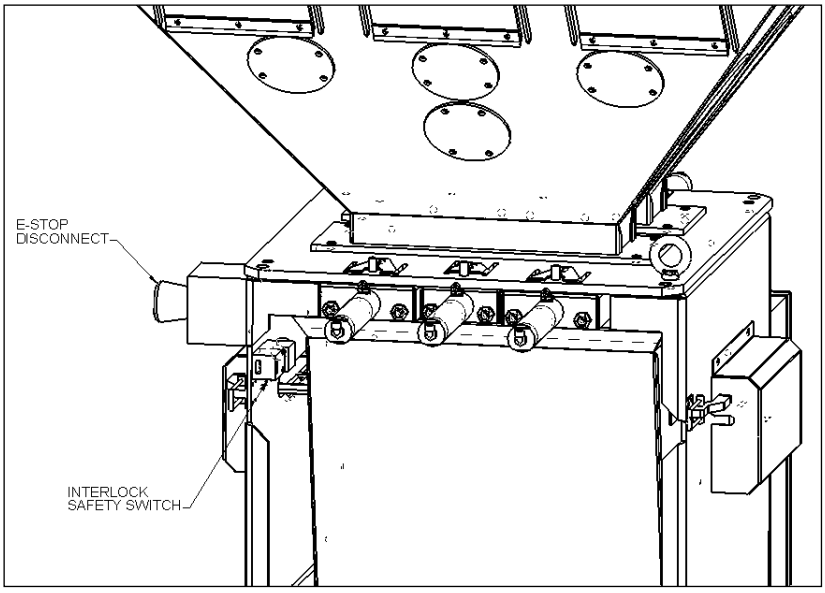


Figure 19: Electrical Safety Interlock Switch (Located on mixer door)



A unique electric safety switch is used to shut off power to the blender any time the mixer door is opened. Do not alter or tamper with this switch in any way.

Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing or cleaning the Batch Blender. Failure to do so may result in serious injury. No one but the person who installed the lockout may remove it.

Chapter 3: Installation

3-1 Uncrating the Equipment

Batch Blenders are shipped mounted on a skid, enclosed in a plastic wrapper, and contained in a crate.

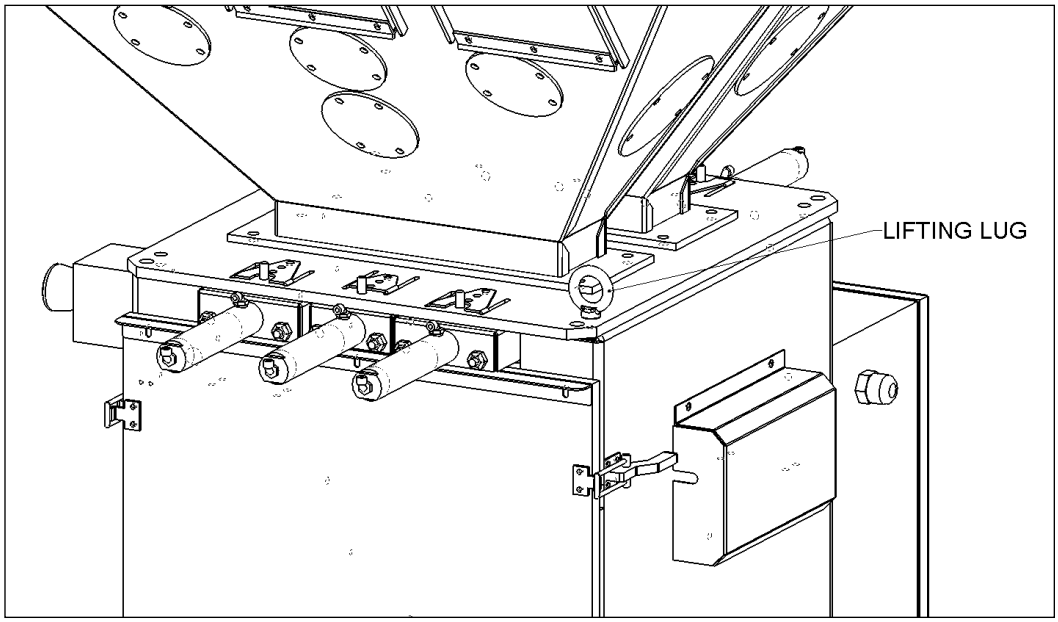
1. Remove crate from around blender.
2. Secure strap of proper lifting capacity to both lifting lugs (See Figure 20 below.).

⚠CAUTION

Use approved safety straps or chains to lift the blender at the marked lifting points.

3. Lift blender until strap is taut.
4. Remove bolts attaching bottom of blender to shipping skid, bolt located under mixer drawer.
5. Lower blender slowly.

Figure 20: Blender Lifting Lugs (1 on each side)



3-2 Mechanical Installation

It is the intent of this section to familiarize the reader with the proper site requirements and installation procedures of the Batch blending system. The information in this section is NOT meant to replace or supersede an established local or company implemented procedures. It is meant to enhance them.

The installation procedure should be used as a general guideline for the proper installation steps required to install the Batch blending system.

1. Lift blender and position over machine throat or floor stand.
2. Set in position and secure by tightening four grade 8 bolts. (Supplied by customer.)

3. Remove lifting strap.
4. If equipped; adjust the four leveling bolts on the floor stand blender support rails.
5. Mount the material conveying system receivers on the top of the blender supply hoppers.
6. Align the weigh hopper on the load cell brackets with air cylinder toward rear of blender. Carefully adjust the load cell brackets to ensure that the weigh hopper is centered on the brackets without rocking. If for some reason the locating tabs do not align with the weigh hopper, they can easily be loosened and adjusted.
    - **Use extreme care when tightening bolts on top of the load cells so you do not spring the load cells. The load cells are extremely delicate and should be treated with care!**
7. Check the slide gate metering assemblies to ensure they are not damaged, and will slide back and forth freely. These are the most important items on the blender, besides the load cell and weigh hopper assemblies.

Site Requirements

This section describes site requirements in detail. These requirements are broken down into mechanical mounting, electrical connections and pneumatic connections. Since the Slide Gate Blender is available in several different mounting arrangements, it is necessary for the reader to become familiar with the different arrangements.

Mounting Configurations

The Slide Gate Blending System is available in (3) three basic mounting arrangements. They are:

- Machine Mount
- Mezzanine Mount
- Floor Mount

Machine Mount

In a machine mounting application of the Slide Gate unit, there are a few items to review ***before*** placement and mounting of the blending system begins.

First, verify the machine flange dimensions match the Slide Gate blender flange (if the optional pre-drilled holes were ordered). The Slide Gate blender can also be equipped with an optional cast throat section with a drain port. This will bolt under the bottom plate of the blender.

Verify that the machine throat is physically capable of supporting the Slide Gate blending system with a full load of material and vacuum loading equipment installed.

⚠CAUTION

- **While in operation, the slide gate blender applies horizontal and vertical pressures to the mounting flange. If there is a question as to the mechanical stability of a mounting flange, contact the manufacturer's engineering department.**

Verify all clearances on the top and beside the processing machine. This is to insure that all motors, hoppers, control panels, etc. have adequate room for proper operation and servicing.

Refer to the assembly drawing with the unit for actual height and width dimensions.

- **Allow at least 36” clearance around blender to provide adequate room for cleaning, servicing, etc.**

Using proper lifting equipment, lift the blender, using the lifting lugs attached to the top plate of the blender. These lifting lugs can also be used to fasten horizontal or angled braces to the blender if more stability is needed.

- **Larger blenders need to be braced as part of the installation.** Take care to insure proper orientation with adequate access to operator controls, mix chamber, and metering units
- **Never weld on the blender, support stand, machine or mezzanine without first removing the control panel and verifying that the blender is properly grounded.**

Mezzanine Mount

In a mezzanine mount application, review the following items before installation begins. First, verify the Batch mounting locations match the mezzanine supports. Verify that the mezzanine is capable of supporting the blender with a full load of material and vacuum loading equipment installed.

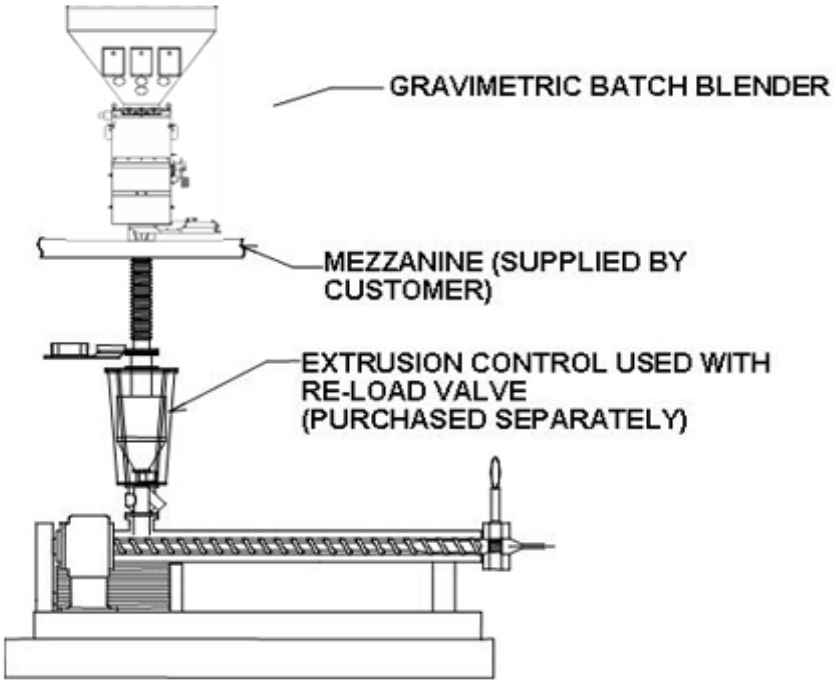
⚠CAUTION

- **While in operation, the batch blender applies horizontal and vertical pressures to the mounting flange. If there is a question as to the mechanical stability of a mounting flange, contact the manufacturer’s mechanical engineering department.**

Ensure that the gravity feed tube is installed in a vertical position, so that the materials will gravity flow to the extruder hopper. Use aluminum tubing or smooth wall flex hose.

Figure 21: Typical Mezzanine Mounted Batch Blender

If possible, use rigid tubing. Some flex hose will tend to sag and generate static that could cause de-mixing between the blender and the extruder.



Make sure that adequate space is around the blender (36” recommended) to allow proper cleaning, servicing, etc.

Floor Mount (Central Blender)

maintenance. The operator and maintenance personnel must have access to parts of the blender. If necessary, it is the customer’s responsibility to provide adequate, safe work platforms around the blender to meet state and local safety codes. Using proper lifting equipment, lift the Slide Gate blender into place.

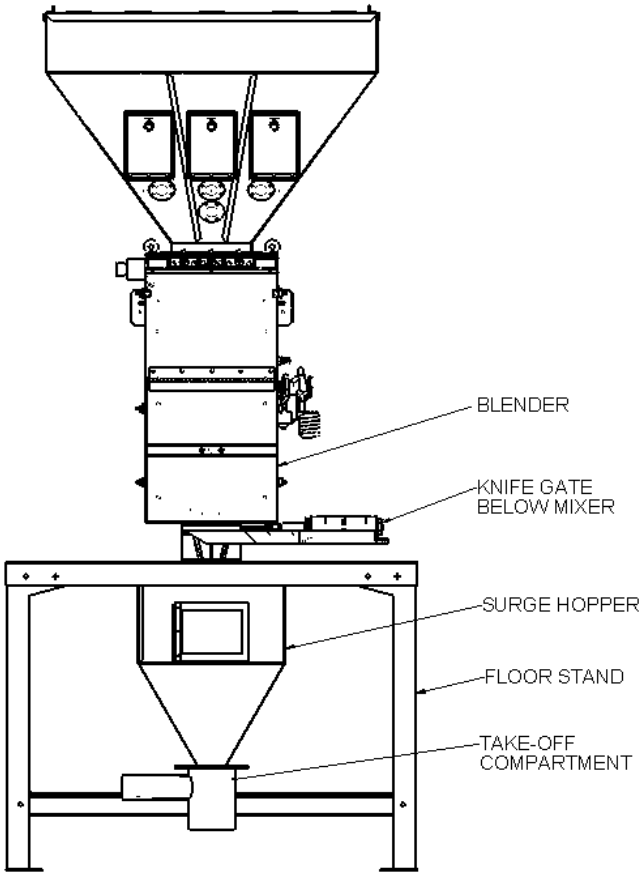
⚠CAUTION

- **The blender must be securely fastened to the floor before operating.**
- **Manufacturer assumes no responsibility for any damages resulting from improper installation or improper handling during installation.**

Make sure that the blender is **securely mounted to the floor** before installing loading equipment, loading with material, and starting.

Make sure that the blender location is adequately away from high traffic aisles, and that fork trucks, etc. cannot damage the blender. Ensure that normal day-to-day operations will not place the blending system at risk of damage.

Figure 22: Typical Floor Mount (Central) Blender Layout



3-3 Electrical Connections

The standard Batch blending system is designed to operate on 120-240/1/60 or 110-220/1/50 supply voltage. The current requirements vary with the blender’s size and throughput rating. For exact current requirements, check the blender serial number tag, located on the rear plate of the mixer section.

If a step down transformer was provided, it should never be used to power anything other than the blender. Loading equipment, etc. must be powered by another power source. As well as possibly overloading the transformer, the additional equipment may induce power line noise that may affect the operation of the blending system.

The transformer will be mounted and wired by the customer or your installer. If company or local codes require fusing or disconnects, these items must be supplied, wired, and mounted by the customer.

⚠CAUTION

1. **Provide a correctly sized and protected power supply to the unit.**
2. **If an electrical supply disconnect is not installed as a factory option, the customer is responsible to properly size and install a suitable disconnect.**
3. **Refer to National Electric Code (NEC) 430-24-26 for proper feed conductor and supply disconnect sizing.**
4. **Voltages must be within plus or minus ten percent (±10%) of the nameplate rating.**
5. **Maintain a safe ground and disconnect the power supply before servicing the unit (NFPA Article 250).**

A qualified electrician should make electrical connections and disconnect the electricity when service calls are needed.

⚠DANGER

Improper electrical connections can damage the unit and cause serious operator injury or death!

MAKE SURE THAT ALL ELECTRICAL CONNECTIONS ARE MADE BY A QUALIFIED ELECTRICIAN, AND THAT ALL CONNECTIONS ARE* TIGHT*.

- **Each blending system MUST be connected to a separate source of power. Do not connect other electrical equipment, especially self-contained hopper loaders, on the same line as the blending system.**

Ensure that the power entrance location on the blender panel remains unchanged. Make sure that the proper size wire and proper wire routing techniques are used when installing the

supply wiring to the control panel. Care must be taken to ensure that the supply wiring does not interfere with the low voltage DC wiring.

The blender is equipped with a plug that functions as the disconnect device (See Figure 11 on Page 27 for an example). The mating receptacle must be installed no higher than 5' feet (1.6 m) above the floor. Make sure your installation conforms to your regional electrical standards.

3-4 Pneumatic Connections

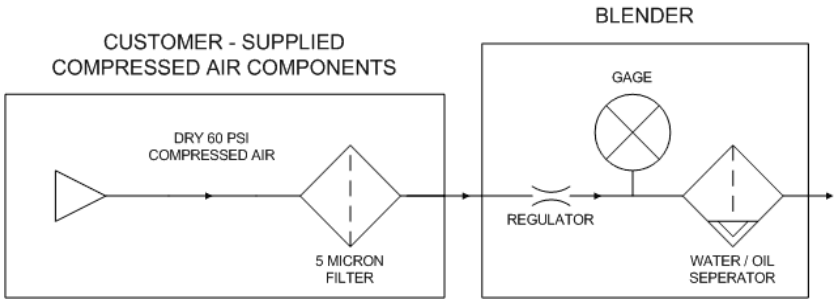
The Batch blending system uses plant-supplied compressed air to operate the metering and dump valves on the blender.

CLEAN AND DRY air must be supplied to the blender. The air supply should be filtered through a 5 micron air filter with a water separator. Oil should not be used unless air dryers are installed on the compressed air supply. In this situation, an oiler may be required on the blender to keep the air cylinder seals lubricated.

⚠CAUTION

- **As this blender uses air for blender metering functions, it is very important to supply clean, dry air to the blender. Dirty or oily air can affect blender accuracy; result in poor performance, and cause injury. Provide a 5-micron air filter on the air supply to the blender, and be sure excess oil is removed. Also, use a dedicated line to ensure proper air supply.**

Figure 23: Customer-Supplied Pneumatic Components



The manufacturer provides all pneumatic lines on the blender piped to a single ¼" NPT standard pipe thread fitting. The Batch blending system requires approximately 1 cfm (1.7 m^3/hr) @ 60 psi (4.14 bar) maximum air pressure for proper operation.

The working pressure of the blender cylinders is not to exceed 60 psi (4.14 bar). This is adjustable by the regulator supplied on the rear panel of the blender. It is important to prevent fluctuation in the air pressure to the blender by not installing the unit on an airline. If this is the case, an accumulator tank with a check valve may have to be provided by the customer to ensure the blender a steady air supply.

⚠CAUTION

To prevent damage to the equipment, do not exceed 60 psi (4.14 bar) air pressure.

Always disconnect the compressed air supply when working on any part of the blender.

3-5 Initial Set-up

This section will discuss the mechanical setup and control system setup of the Slide Gate blending system. After reading this section, you should be familiar with the mechanical setup and the electronic control setup of the blending system.

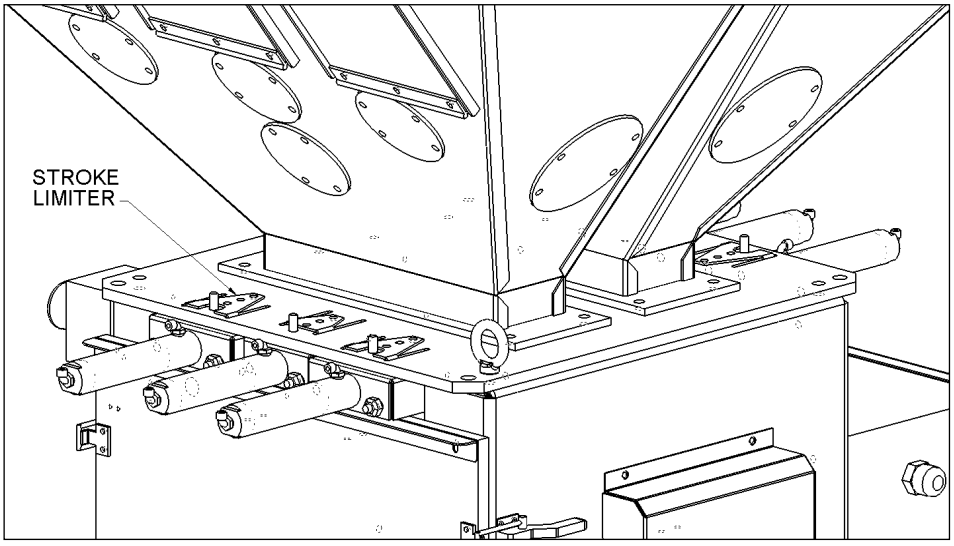
Stroke Limiters for Metering Gates

Stroke limiters are supplied on components 1 through 6 with all Slide Gate blenders to allow standard metering gates to meter small amounts of low percentage additive materials.

Generally, the stroke limiter is not required on major ingredients (usually number 1 and 3) and should be adjusted to the rear-most position. If they are used on components number 1 and 3 the throughput of the blender will be reduced.

To install the stroke limiter, drop it into the double slot on top of the gate assembly and secure it in place with the button head screw that is provided. Be sure to use the lock washer to prevent the stroke limiter from coming loose.

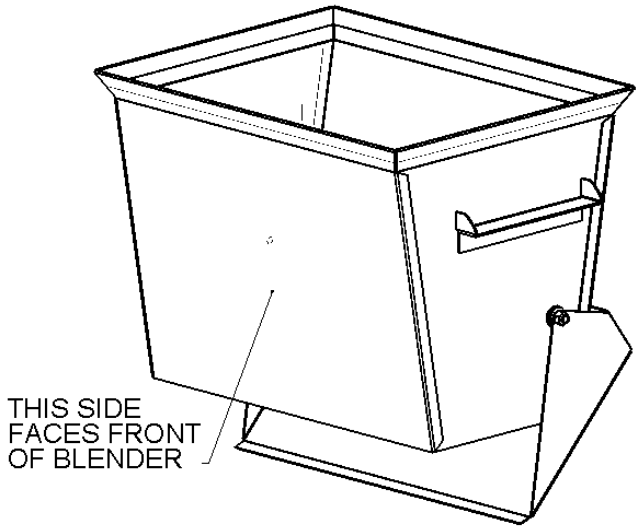
Figure 24: Stroke Limiters



Weigh Hopper Installation

Remove the weigh hopper from the shipping box and install it in the blender on the load cell brackets. Connect the airline and close the mixer door, securing the latch.

Figure 25: Weigh Hopper



- **THE WEIGH HOPPER ASSEMBLY MUST HANG FREELY AND BE FREE FROM FRICTION, WITH NO MECHANICAL OBSTRUCTIONS OTHER THAN THE LOAD CELL ITSELF.**

Final Connections

Connect the blender to the appropriate power source.

Connect the compressed air piping, ensuring that a 5-micron air filter is installed, along with the proper water trap, and lubrication unit, if required. Verify that 60 psi (4.14 bar) of clean, dry compressed air is supplied to the blender.

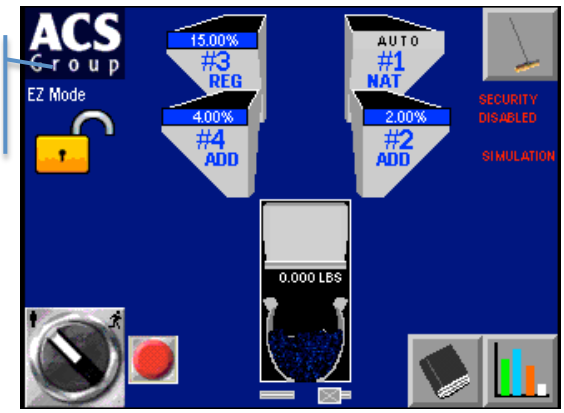
- **Again, make sure that proper air supply connections are made to the blender, as dirty, contaminated, wet air can damage blender components and can quickly cause poor performance and accuracy!**
- **Make sure that the blender is supplied with clean, dry, 60 psi (4.14 bar) compressed air.**

This section describes the proper setup of the batch blending system control parameters. These parameters are operator changeable; however, these items should only require setup during the initial installation. Only authorized personnel should change them. For security reasons, the menu that is used to access these parameters is password protected.

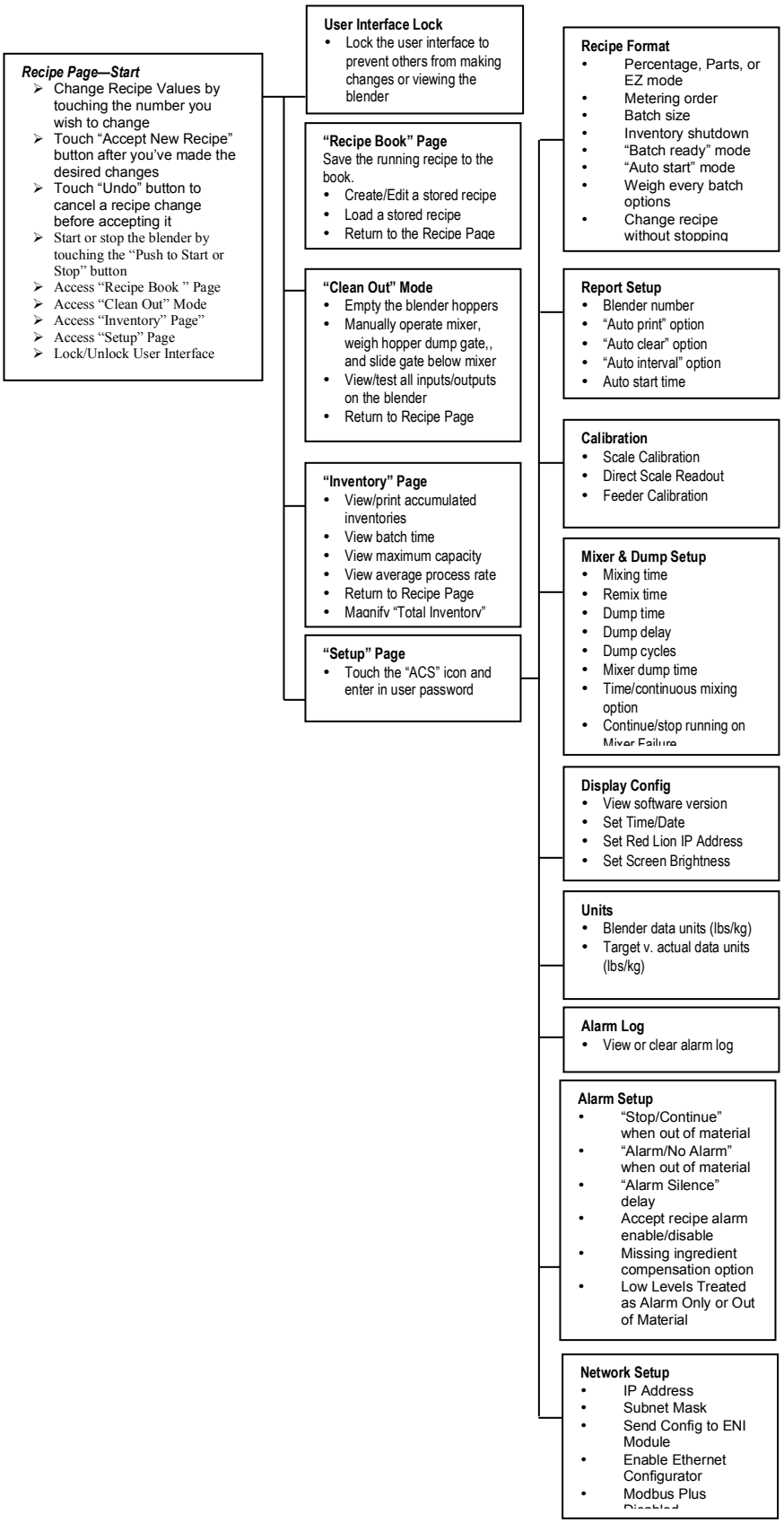
Many of the variables and setup parameters have been preset at the factory and do not need to be changed. However, this section of the manual will address all of the blender setup parameters that were available at the time of printing. The purpose of this is to familiarize the reader with all the setup parameters and their usage.

A complete listing of all default values is provided at the end of this manual.

Touch here and enter password (default is 5413) to access setup



Menu Structure for Batch Blenders



Blender Calibration

The load cells on the blender are FACTORY CALIBRATED. Since the load cells can be subject to shock loading during shipping, moving, etc., we recommend that they be recalibrated.

The load cells monitor the weight of each ingredient added to the blender weigh hopper. Since load cells are reading the actual material weight that is metered by the feeders, **the proper calibration of these load cells is essential for the correct operation of the blender**. **The load cells should be checked once a month with a calibration weight and if necessary recalibrated to ensure that they have not been damaged in the normal routine of removing and replacing the weigh hopper for cleaning, color changes, etc.**

The calibration of each load cell is accomplished by using two reference points on the output of the load cell scale. The first of these points is known as the "Tare Weight". This is the weight of the empty hopper assembly on the load cell. This is also known as the zero weight point (starting point) of the scale. This zero or starting point must be initialized with an empty weigh hopper. There must be no binding or leverage put on the load cell.

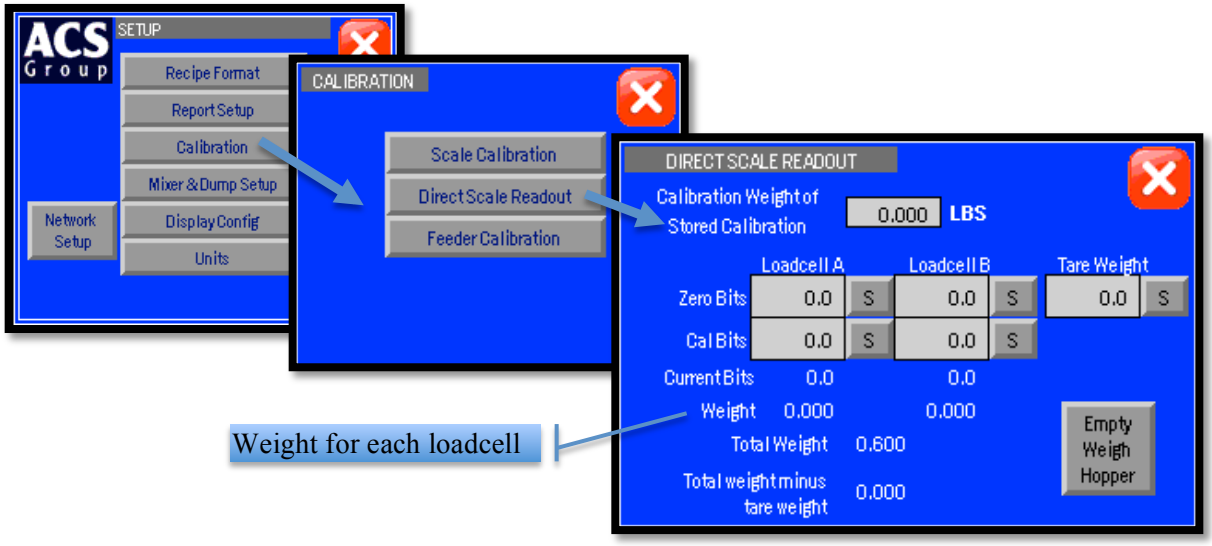
The second weight point used in the load cell calibration procedure is a known amount of weight for the weigh hopper. A calibration weight is provided with all Batch blending systems. The calibration weight is stamped with its actual weight on top. If this is not available, any object with a known weight accurate +/- 0.01 lbs. will suffice. (The weight should be as close as possible to the maximum batch size you plan to run.) The weight will be in pounds, unless the blender is provided for metric operation. In the case of a metric blender display, the weight to be used is calibrated in kilograms.

Given the two weight points on the load cell scale, the controller should determine any other weight on the load cell span. This is limited to the maximum capacity of the load cell. The standard load cell used on these blenders has a span accuracy of 0.02%.

The maximum capacity of each load cell is clearly marked on top of the load cell. This value will be indicated in kilograms (1 kg = 2.2 lbs.).

- **The weight scale on a new blender comes pre-calibrated, but it is recommended to periodically check the calibration to ensure that the reported inventory levels are accurate.**

Verify Weigh Hopper (Load Cell) Calibration

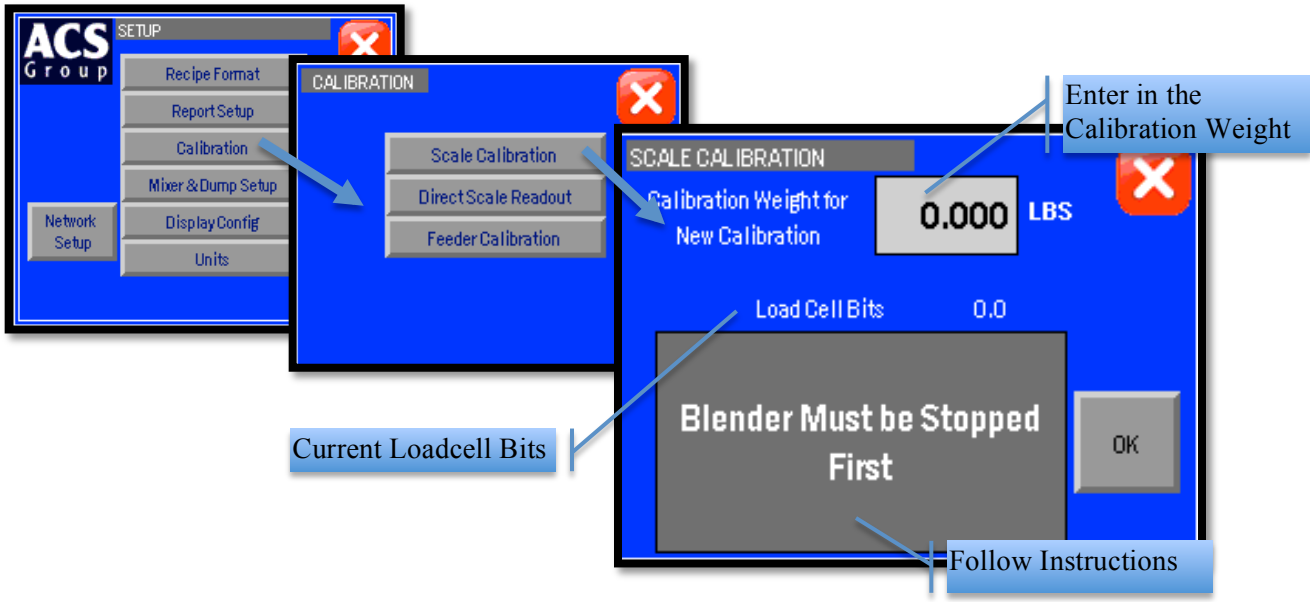


Verifying Calibration (Recommended on a periodic basis to ensure accuracy)

1. The blender must be stopped before this can be done.
2. From the Setup Menu touch “Calibration” and then “Direct Scale Readout”.
3. Remove the weigh hopper.
4. Locate the weight display for each of the two load cells. Write down the displayed value.
5. Add the calibration weight to each load cell mounting bracket and write down the value displayed in “weight”, as in step 4.
6. Subtract the values recorded in step 4 from step 5. This is the measured weight. If the measured weight is within a 0.003 pounds of the weight stamped on the calibration weight, then you are within spec. If not, follow the steps above to calibrate the blender. (If your blender is frequently out of calibration, verify the operator is being cautious removing the weigh hopper during clean out.)
7. Press “X” until you have reached the Recipe screen.

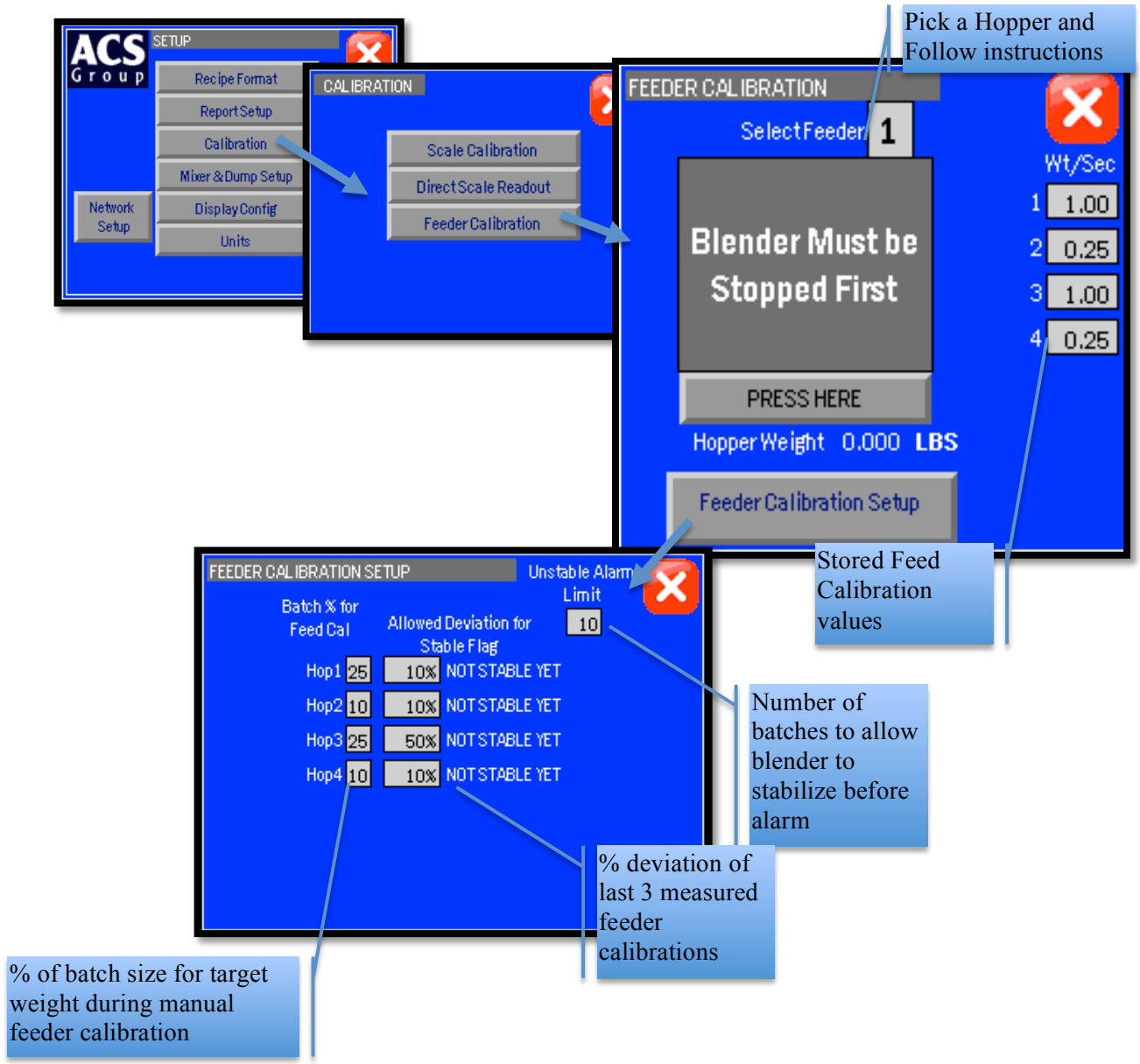
Weigh Hopper (Load Cell) Calibration

(Recommended only if the calibration is out of spec)



1. The blender must be stopped before this can be done.
2. From the Setup Menu touch “Calibration” and then “Scale Calibration”.
3. Enter in the scale calibration weight value stamped on the side of the weight.
4. The controller will prompt you to remove the weight hopper and press OK.
5. After touching OK, the controller will display “PLEASE WAIT...”
6. Next, the controller will ask you to hang the calibration weight on the right loadcell bracket (loadcell A) and press OK.
7. The controller will ask you to hang the calibration weight on the left loadcell bracket (loadcell B) and press OK. (Does not apply to the BD-150)
8. Finally, the controller will ask you to replace the weigh hopper in the blender and press OK to complete the calibration.
9. The controller will verify that the calibration was done correctly by showing “Calibration Successful.”
10. Press “X” until you have reached the Recipe screen.

Feeder Calibration (AF & RAM Components)



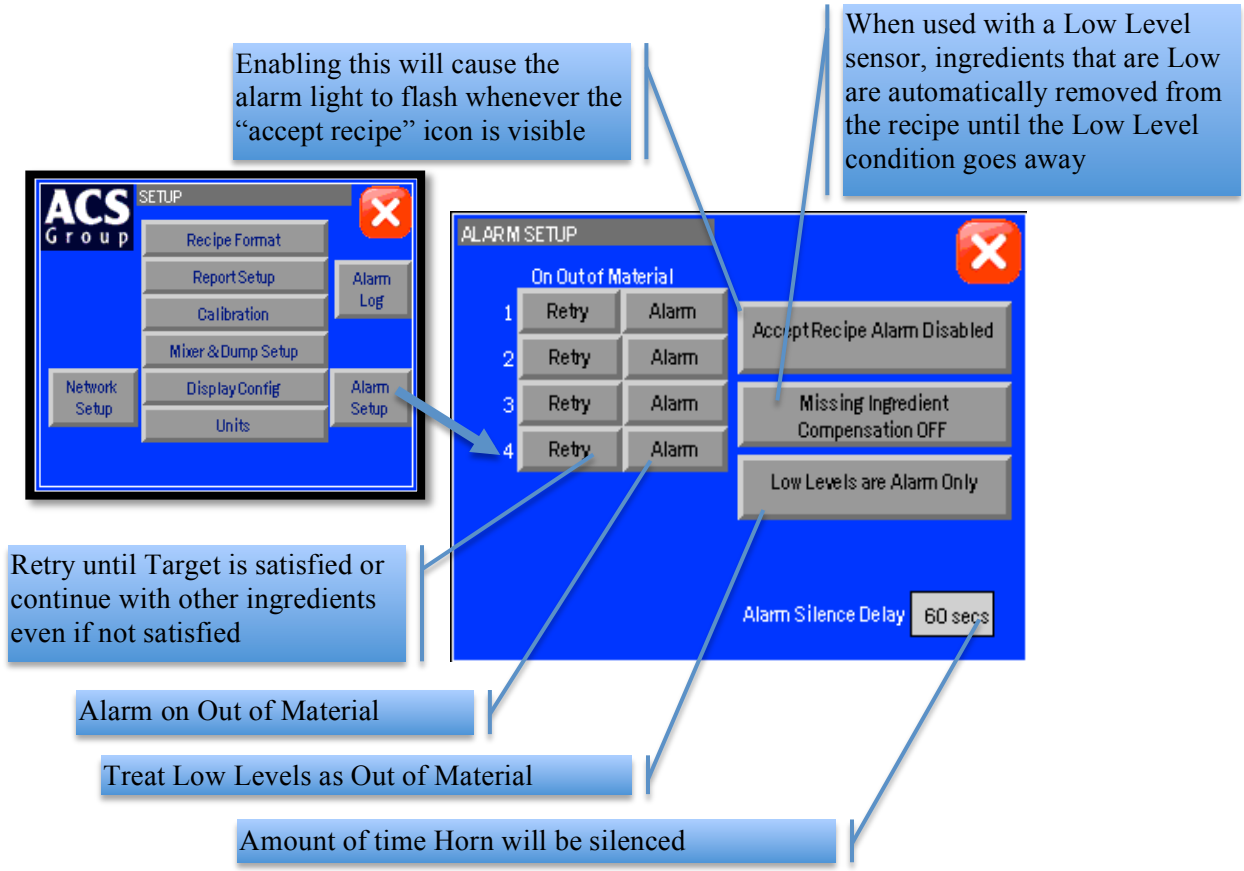
Feeder calibration should be done on all Auger components prior to start-up. This allows the blender to configure the parameters which will best suit the auger size and gearbox ratio of the feeder. To perform a feeder calibration, the operator must enter the "**Feeder Calibration"** screen (see menu structure), select a feeder number, then touch "**Press Here**." The feeder calibration will start automatically and will notify the operator when complete. If the operator so desires, they can repeat the process by entering in a new feeder number and touching the "**Press Here"** button.

If the blender does not see enough weight gain during the calibration process or if the weigh hopper reaches maximum weight, then an error is given and the calibration is a failure. Another useful feature on the **"Feeder Calibration"** screen is the ability to manually enter in the "weight per second" values. This increases the blender learning process and the values can be recorded for future blending.

Alarm Setup

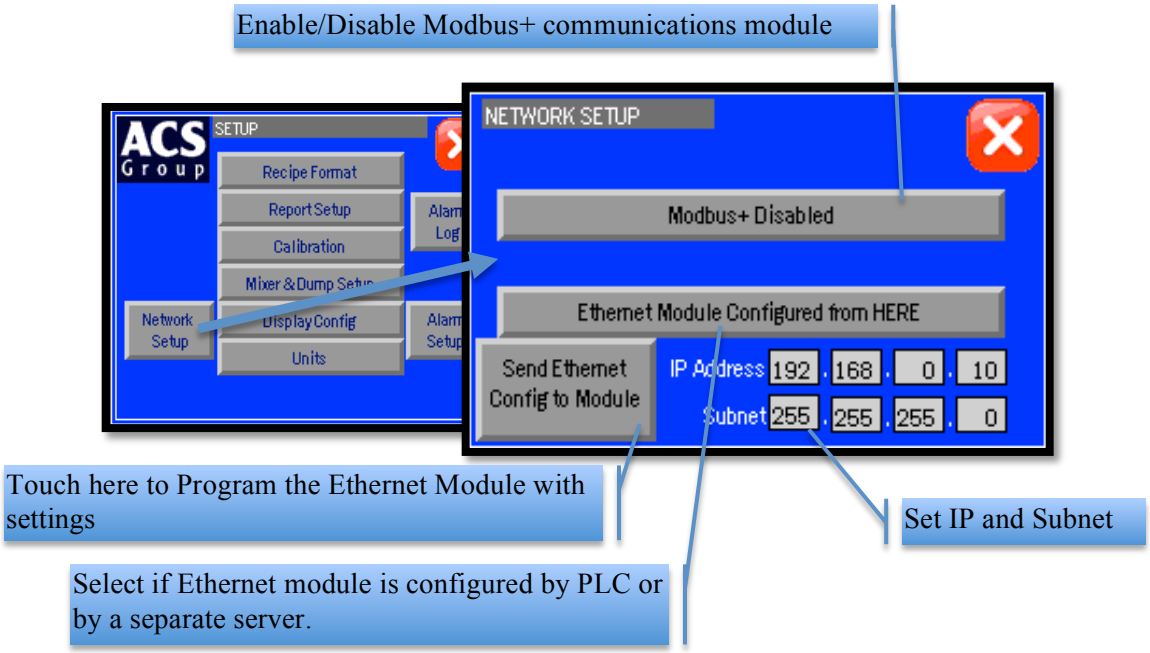
This screen allows the operator to configure the alarm settings for each individual feeder. It

can configure whether a feeder will retry during the metering of a batch, and enable or disable the "Out of Material" alarm for any feeder. If the alarm flag is set to "Retry", the blender will not continue until it has metered the correct amount of material. It continuously retries metering the ingredient until the target is satisfied. It will retry forever under this condition. The optional low level proximity switches have their own separate alarm. The alarm will sound, but does not stop the blender unless the low levels are configured as "Treat as Out of Material".



1. From the Setup Menu touch "Alarm Setup."
2. Making changes to the Retry/Alarm settings only affect the recipe after accepted by touching the accept recipe icon and being loaded after the current batch is complete. If you want to stop the current batch without waiting for it to complete you must hit the "abort" icon.
3. Press the "X" key at the bottom to exit this screen.

Network Setup



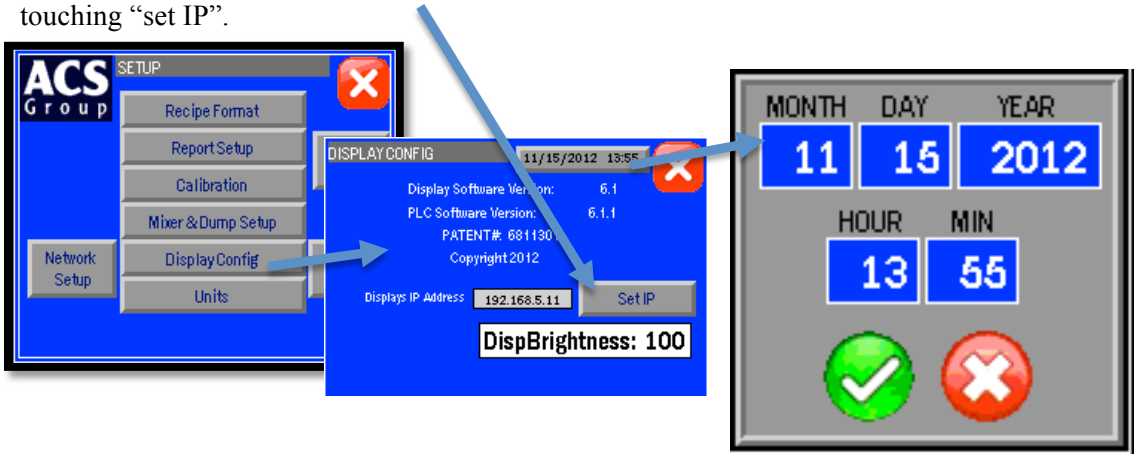
The blender IP is the address of this blender on a network. The batch blender is factory set up with an IP address of 192.168.0.10.

In order to change the values, enter the Setup menu, press the "Network Setup" button and change the values accordingly. You must touch "Send Ethernet Config to Module" before the change will take effect. After sending it to the module wait 1 minute to test communications.

Display IP Address and Setting the Time/Date

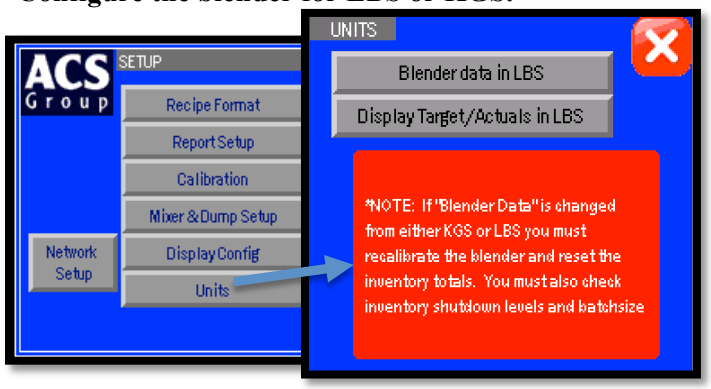
The Set Date & Time feature is located in the "Display Config" menu of the Setup Screen. The time is in Military Time.

The display has it's own Ethernet port and can be configured by entering in the IP and touching "set IP".

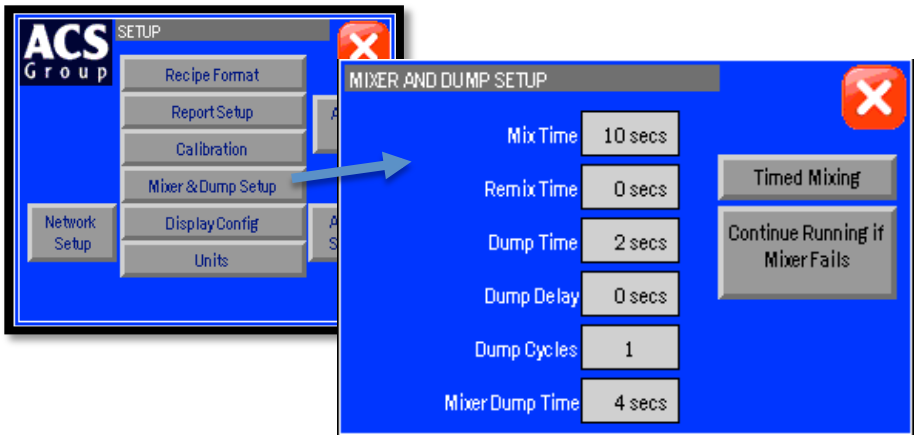


Units

Configure the blender for LBS or KGS.



Mixer and Dump Setup



The settings listed below are set at the factory and typically do not require any change.

1. From Setup touch “Mixer and Dump Setup”.
2. Enter a “Mixing Time”. This is the amount of time to run the mixer after a batch is dumped into the mixing chamber.
3. Use “Remix Time” to set “Re-mix” off time. If set to a non-zero value the mix cycle will be ran every “re-mix” seconds while the blender is at high level.
4. Use “Dump Time” to set the amount of time the weigh hopper will open while dumping. This should not be set too long or short.
5. Use “Dump Delay” line for the optional dump delay setting. This is the amount of time to start the mixer prior to dumping material into the mixing chamber. Set to “0” to disable this feature.
6. Use “Dump Cycles” to enter the number of times that material will be dumped from the weigh hopper. This allows the dump valve to open and shut repeatedly when the weigh hopper is empty to shake lose any sticking material. If this feature is set to “1” then the batch will dump normally. Normally this is not needed.
7. Use “Mixer Dump Time” to enter the amount of time the mixer knife gate will open to allow material to exit the mixer. The mixer will also run to assist during this time.
8. Press “X” to return to the “Setup” screen.

3-6 Initial Startup

The operator can start the blender by touching  on the Recipe Page.

The switch will show  when running. If the operator selects “Stop Blender” then the current batch in progress is first finished and then the blender will stop making new batches.

To immediately stop the blender, the operator can touch  on the Recipe Page. This will cause the blender to stop making the current batch immediately. If the blender is stopped in this method then the current batch will not be completed properly.

Chapter 4: Operation

4-1 Start-up

General Operation

The general operation of the Batch blending system is as follows: Once the system is properly installed and set up, the system will be ready for operation. Please see the Installation and Setup chapter in this manual for further information.

Once the batch blending system is powered on, the unit will display the recipe screen (the recipe format should be in “EZ Recipe” mode). Pressing the highlighted box on the feeder number, the operator can enter a valid recipe or use a previously stored recipe from the recipe book.

1. The blender is started by turning system on or material dropping below level switch in mix chamber.
2. Metering gates are opened (or auger motors are turned on) to meter material into the weigh hopper in the programmed order.
3. Each component is weighed, then the batch is dumped into the mix chamber (provided the mixer “High level” switch is not covered).
4. The material is mixed in the mix chamber and flows into the processing machine.
5. The optional slide gate below the mixer may control the flow of material to the molding machine or extruder.

Quick Start Procedure

New Recipes

1. Verify the weigh hopper calibration before running the blender (page 47)
2. Ensure that all ingredient supply hoppers to be used are filled with material. Virgin material should be loaded into hopper #1 and regrind into hopper #3.
   - **Hopper #3 on some models is equipped with an oversized square gate to assist in the feeding of the regrind material.**
3. Enter the recipe menu on the touch screen by turning on the touch screen controller (It will automatically default to this screen), and enter the blend recipe desired following the steps listed below:
   a. Touch the hopper and enter a new value (0 to 999.99), then hit the green arrow.
   b. After you have entering all values push the "Accept New Recipe" icon 
   - **The blender only shows the "accept new recipe" icon if the recipe is valid.**
   - **Recipes can also be changed while the blender is running. The new accepted recipe is loaded at the beginning of the next batch. This allows the operator to modify the new recipe without affecting the blender until they hit the "Accept New Recipe" button.**

Existing Recipes

The operator can load a previously stored recipe from the Recipe Book. The Recipe book also allows the operators to save the current running recipe. This can be done by performing the following steps:

1. Touch the Recipe Book icon located on the Recipe Screen. 
2. Select a stored recipe by changing the number next to "Recipe #"
3. Touch the "load recipe" icon 
4. Touch the "accept new recipe" icon 

To edit/save a recipe to the Recipe Book:

1. Go to the Recipe Book by touching the Recipe Book icon. 
2. Select a stored recipe by changing the number next to "Recipe #".
3. Make desired changes to the stored recipe.
4. Touch the "save" icon and wait for it to disappear. 

4-2 Operation Procedures

The objective of this section is to familiarize the reader with the Slide Gate blender recipe menus, run mode operation, run mode menus and displays. Upon the completion of this section, the reader will be familiar with the recipes and run mode displays that are available on one blender, including the recipe book and recipe storage facilities. Other items covered in this section are optional printer functions and report generation capabilities of the Batch blending system.

Topics covered in this section are:

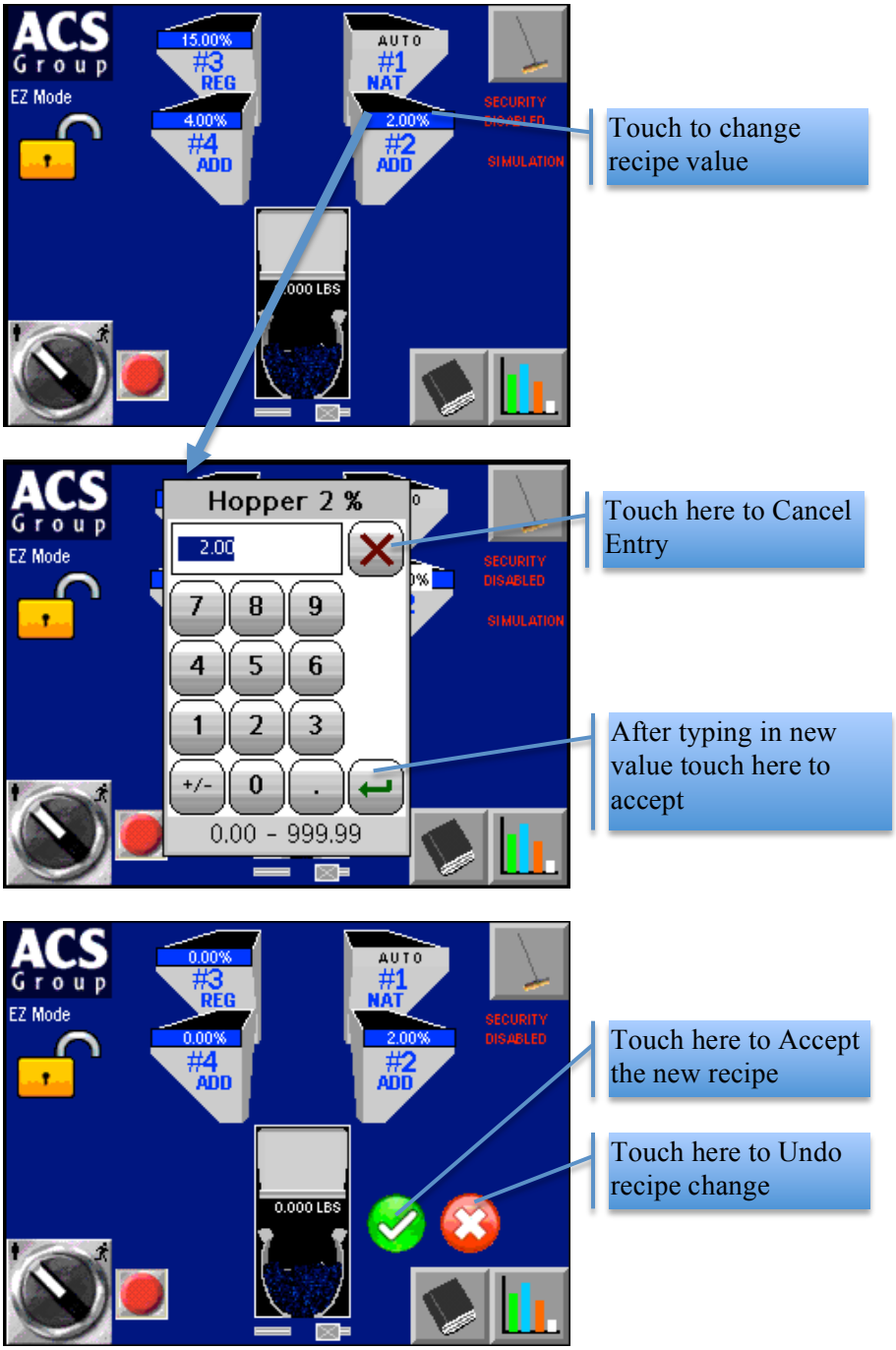
- General Operation
- Recipe Menu
- Recipe Book
- Cleanout Mode
- Inventory Page
- Inventory Shutdown Event
- Recipe Formats
- Optional Printer Menu

All personnel operating the Batch blending system should read this section of the manual ***before*** operating the blending system.

Operator Displays

The batch blending system utilizes a standardized menu format. Each screen was designed to be user-friendly and provide the operator with the necessary information to run the blender.

Entering a Recipe

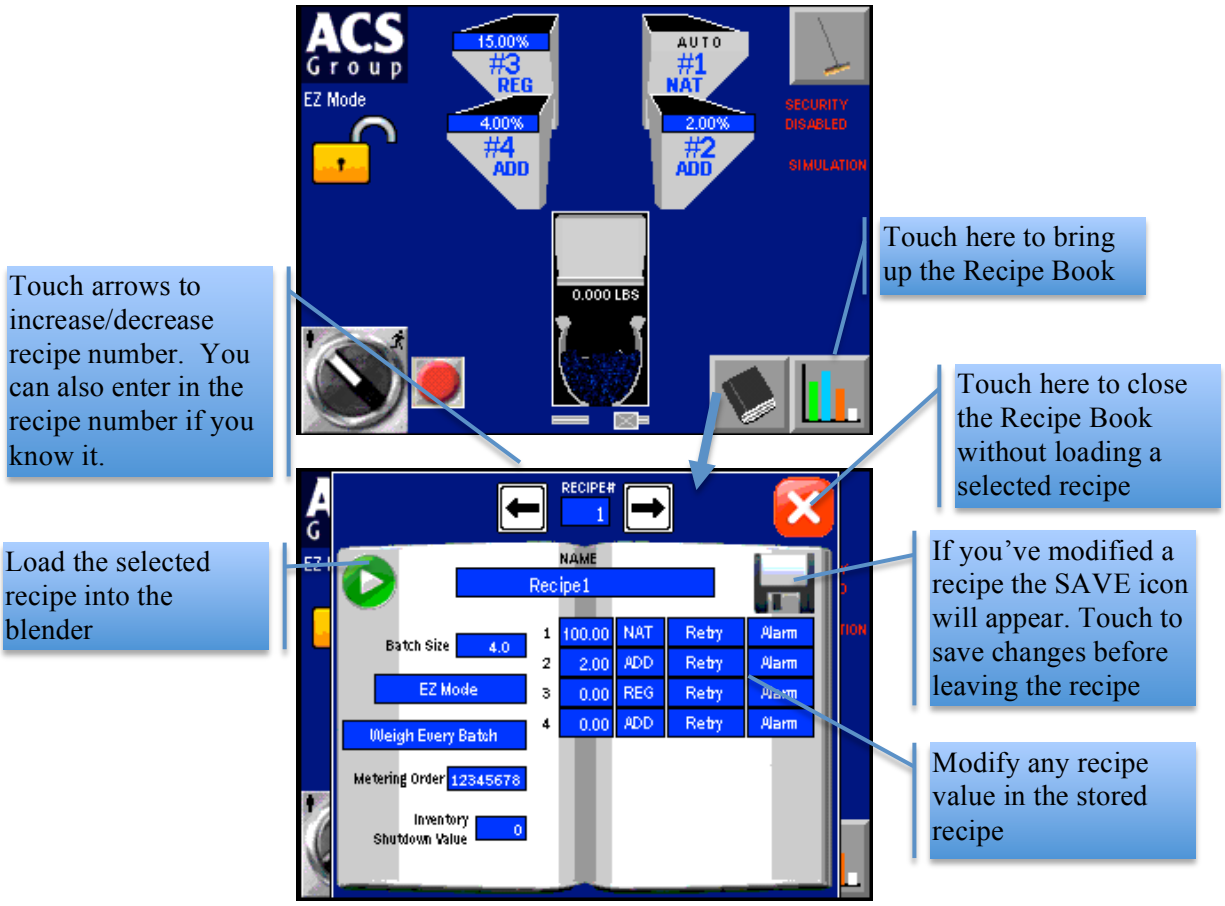


REQUIREMENTS FOR A VALID RECIPE

EZ Mode	Regrind hopper cannot be over 100%. Multiple Virgin hoppers must total 100%.
Percentage Mode	Recipe Total must add to 100%.
Parts Mode	All entries are valid.

Recipe Book

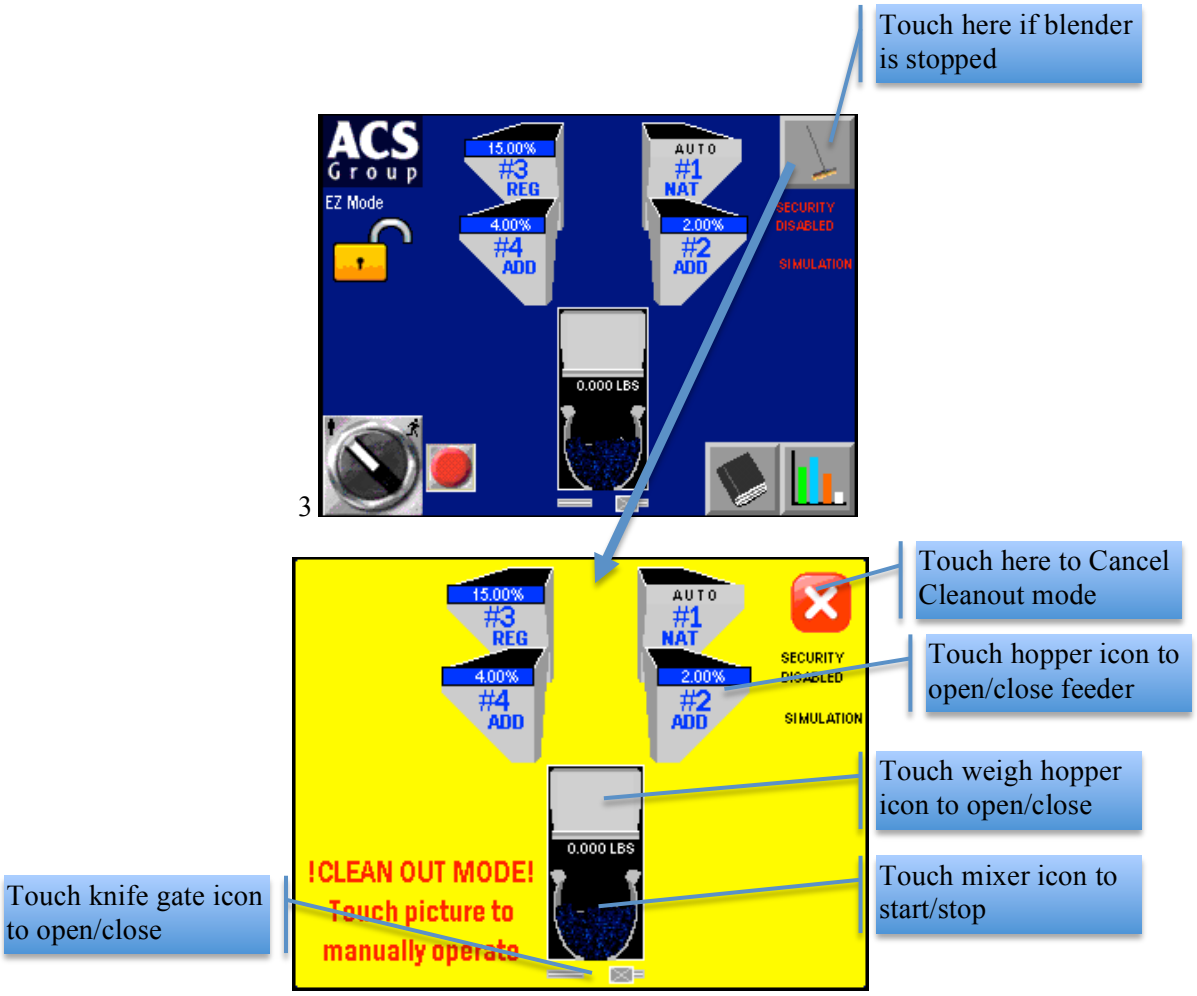
The blender comes standard with a built in recipe book that holds 100 recipes. These recipes are stored and synchronized with the displays CompactFlash card. You can remove the card and open the recipes.csv file using Excel. This file has a header row that explains each field. You can edit the entire recipe book from your computer and then return this CompactFlash to your blender to synchronize it with the blender's recipe book. The card must then remain installed. This would allow you to copy the same recipe books to all of your blenders. It is also possible to simply edit the stored recipes from the recipe book on each blender. If you have purchased the USB Jump Drive option then you can place the recipes.csv file you have modified onto any USB Jump Drive. Then that drive can be inserted into each blender and the recipe book on each blender will automatically be updated. This is the easiest way to perform a mass edit of all your blender's recipe book.



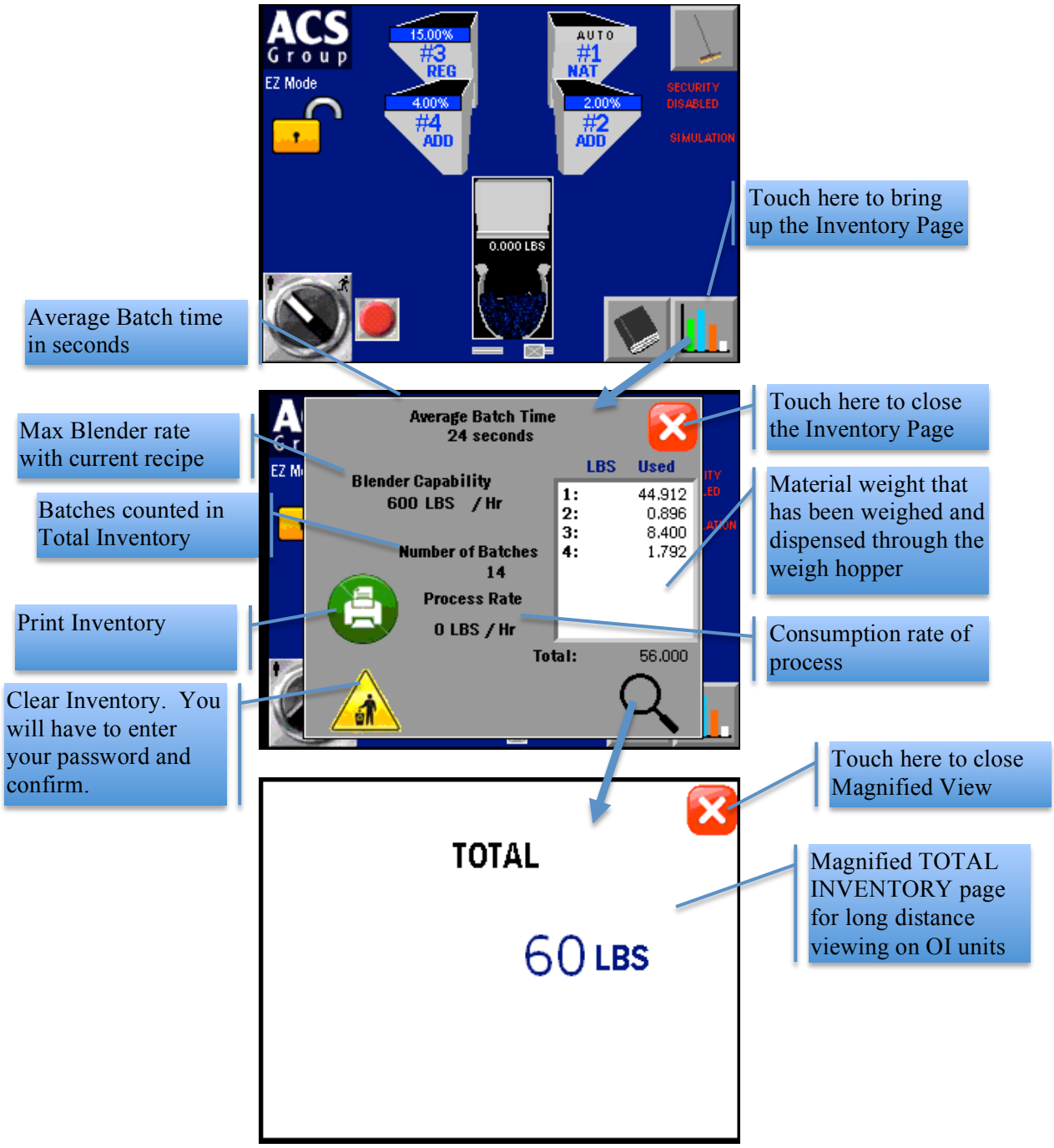
REQUIREMENTS FOR A VALID RECIPE

EZ Mode	Regrind hopper cannot be over 100%. Multiple Virgin hoppers must total 100%.
Percentage Mode	Recipe Total must add to 100%.
Parts Mode	All entries are valid.

Cleanout Mode



Inventory Page



Recipe Entry Formats

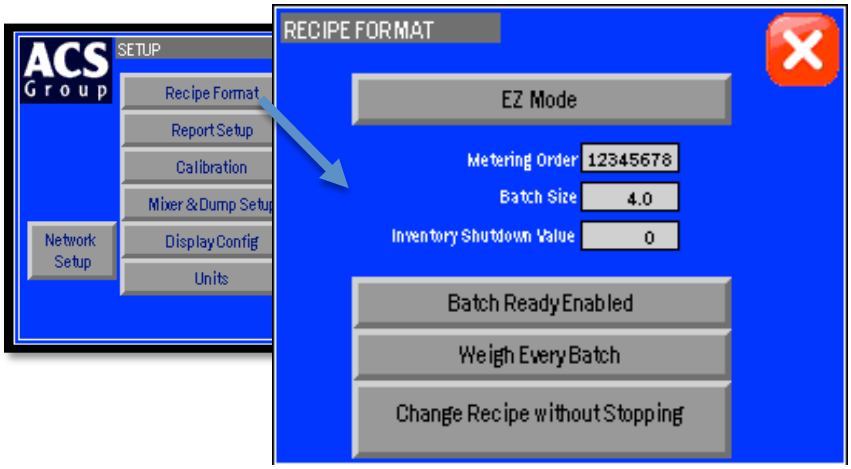
The Batch blending system contains several operator friendly recipe menus. This section of the manual lists these recipe menus:

- Recipe Page (Start/Setup)
- Recipe Book Page
- Recipe Format

Upon Start Up, the blender controller will default to the "Recipe" screen.

The "Recipe Book" screen can be accessed in the "Recipe Page" and is useful in storing and retrieving recipes.

The Recipe format option can be accessed in the Setup screen and is used to select one of three available formats: "EZ Recipe" Mode, Percentage Mode or Parts Mode. ("EZ Recipe" mode is the default setting preset at the factory.)



Recipe Format Menu:

- "EZ Recipe", Percentage or Parts
- Metering Order (Always make sure all 8 hoppers are entered)
- Batch Size (only use batch sizes appropriate for your blender, too small will cause inaccurate blending)
- Inventory Shutdown (used to shut the blender down after making a certain amount)
- "Batch ready" mode (blender will hold a completed batch in the weigh hopper)
- Weigh every batch options (determines if every batch is weighed)
- Change recipe without Stopping (if set to "Stop Blender before Changing Recipe" then the operator does not need to touch the "accept recipe" icon after editing the recipe). The drawback is that the recipe cannot be changed on the fly.

The Recipe Format screen allows the user to change many parameters concerning the way that the recipe is entered by the operator. It is accessed by touching the manufacturer's icon on either the Recipe screen or the Inventory Screen. The user must enter in the User Password to gain access (see User Password Setup for details.). The following Recipe Modes are described on the next few pages.

"EZ Recipe" Mode (Most common in injection molding)

The "EZ Recipe" menu structure allows recipes to be entered and adjusted by touching the buttons on the panel face (for 1 to 6 components). In this mode, hopper #1 is configured as virgin, hopper #3 is configured as regrind, and the others are configured as additives, i.e. color. The operator enters in the percentage of regrind and additives, and the virgin percentage is automatically calculated. The regrind percentage represents a percentage of the total batch, and the additives are based on a percentage of the virgin weight. This is useful because the percentage of regrind can be changed without affecting the ratio of color or additive to the virgin weight. Each percentage can be up to 100%, but not greater. The virgin percentage is automatically calculated by the blender and the operator is not required to enter it.

The ingredient names selected will be displayed on the run mode display so the operator will know what material is being blended.

- **The #1 hopper ("NAT" - Virgin Material) recipe ingredient will not be shown on the recipe setup menu.**
- **ADD (Additive) designations will weigh the ingredient as a percentage of natural material only.**
- **RGD (Regrind) designations will weigh the ingredient as a percentage of the total batch. (It is assumed the regrind has been generated from pre-blended production and already contains the same color and/or additives.)**
- **Virgin material must be loaded into hopper #1 and regrind into hopper #3.**
- **Component #3 is designed to handle regrind and most models come equipped with a larger, square gate to reduce the likelihood of bridging. If regrind is being used, it should always be run through component #3. If you don't have regrind, another major ingredient can be run through component #3.**

Figure 36: Example Calculations of a 5-component blend in "EZ Recipe" mode

Virgin (NAT): ???
Additive1 (ADD): 5.00% - of virgin component
Regrind (RGD): 30.00% - of total batch
Additive2 (ADD): 2.00% - of virgin component
Additive3 (ADD): 1.00% - of virgin component

Batch Size: 10.00 lbs.
Total available: 100.00%
Regrind: 30.00%
Balance: 70.00%

Virgin + Additive 1 + Additive 2 + Additive 3 = 70.00%
Virgin + (5% of virgin) + (2% of virgin) + (1% of virgin) = 70.00%
Virgin + (5/100 x virgin) + (2/100 x virgin) + (1/100 x virgin) = 70/100
100 virgin + 5 virgin + 2 virgin + 1 virgin = 70
108 virgin = 70

Virgin = 70/108 = 64.81%

Virgin = 64.81% of batch
Additive1 = 5% of 64.81% = 3.24% of batch (5% of virgin)
Regrind = 30% of batch
Additive2 = 2% of 64.81% = 1.30% of batch (2% of virgin)
Additive3 = 1% of 64.81% = 0.65% of batch (1% of virgin)

Virgin + Additive 1 + Additive 2 + Additive 3 + Regrind = 100%
64.81% + 3.24% + 1.30% + 0.65% + 30.00% = 100%

"Percentage" Mode (Most common in extrusion and blow molding)

Extrusion processing often requires recipes in percentage format, especially if regrind is not involved, i.e. blown or cast film.

In this mode, operators enter in values for each hopper up to 100%. The total of all the hoppers must equal 100%. If they don't, an error message appears on the Recipe screen and prevents the recipe from being accepted. All hoppers are a percentage of the total batch size.

- **All ingredients are weighed as a percentage of the total batch.**

"Parts" Mode (Often used in Compounding Applications)

The "Parts" recipe entry mode lets the operator enter in values based on a parts ratio rather than a percentage. Each entry can be up to 999.99 and the total of all hoppers does not have to be 100. After all values are entered, the total parts are calculated. The individual hopper target is then calculated based on each hopper's entered parts. These parts represent ratios of the total batch. For instance: Hop 1=300 parts, Hop 2=100 parts, Hop 3=10 parts, Hop 4=5 parts. This would mean that if the batch was divided into 415 parts, then Hop 1 would make up 300 of those parts, Hop 2 would make up 100, Hop 3 10 parts, and Hop 4 5 parts.

- **The preset part will be divided by the total of all parts, with each part representing the calculated weight for ratio control.**

Figure 37: Example Calculations of a 4-component blend in "Parts" mode

Feeder Tag		Preset Part	Calculated Weight (Ratio Control)
Virgin	#1	7,200	7,200/10,000
Regrind	#2	2,000	2,000/10,000
Color	#3	500	500/10,000
Additive	#4	300	300/10,000
Total:		10,000	

Switching Modes

Recipe Modes can be switched while the blender is making a batch. At any time the operator can switch the recipe entry mode without affecting the current batch being made. The recipe mode is part of the "New Recipe" and is separate from the running recipe.

Recipe Setup

Metering Order

The Batch blender allows the operator to set the ingredient metering order when making a batch. In order to access the metering order menu, enter the Setup menu and press the "Recipe Format" button (refer to the menu structure on page 39). Once in the "Recipe Format" menu, view "Metering Order." This display will indicate the current order in which the ingredients are metered. A Metering Order of "12345678" means that the blender will feed hopper 1 first and hopper 8 last.

In order to change the metering order, simply press the "Metering Order" button. In the next screen, the operator must select a value from 1 to 87654321 and press the green enter key. Once the desired metering order is displayed, simply press the "X" exit. **If the order is changed, then you will need to touch "Accept New Recipe" icon on the Recipe Screen before the change takes effect.**

This order can be changed while the blender is making a batch without affecting the current running batch.

- **All feeders must be in the metering order. If you enter an invalid metering order then the blender will default back to its original setting of 12345678**

Batch Size

The Batch blending system is a gravimetric batching system. The blender will weigh a preprogrammed batch of material each cycle. This batch size is determined by the blender's weigh hopper size, the current recipe, and the bulk density of the ingredients.

Because the blending systems must handle a wide variety of materials, with varying bulk densities, the actual amount of weight of material the weigh hopper will hold can vary dramatically from application to application.

This feature allows the operator to change the size of the batch to be made. A value will need to be entered between 0.5 to 99.9. This can also be changed while making a batch without affecting the current running batch. If the size is changed then you will need to touch "Accept New Recipe" on the Recipe screen before the change takes place. This feature allows stored recipes with different batch sizes to easily be loaded without the operator having to reconfigure the blender every time they want to load a stored recipe.

The weigh hopper size selected should be one that approaches the maximum capacity of the load cells without over-filling the weigh hopper. During the initial setup of each blender, the weigh hopper size setting should be checked to ensure that the weigh hopper is not overfilling due to a large percentage of light weight regrind, etc. The batch size will vary from model to model. The bulk density of the material being blended will also affect the batch size.

- **If running a high percentage of lighter density regrind, set the batch size so that the mixer does not overfill, preventing the weigh hopper from fully dumping when operating in "Batch Ready Mode".**

Figure 38: Typical Batch Sizes

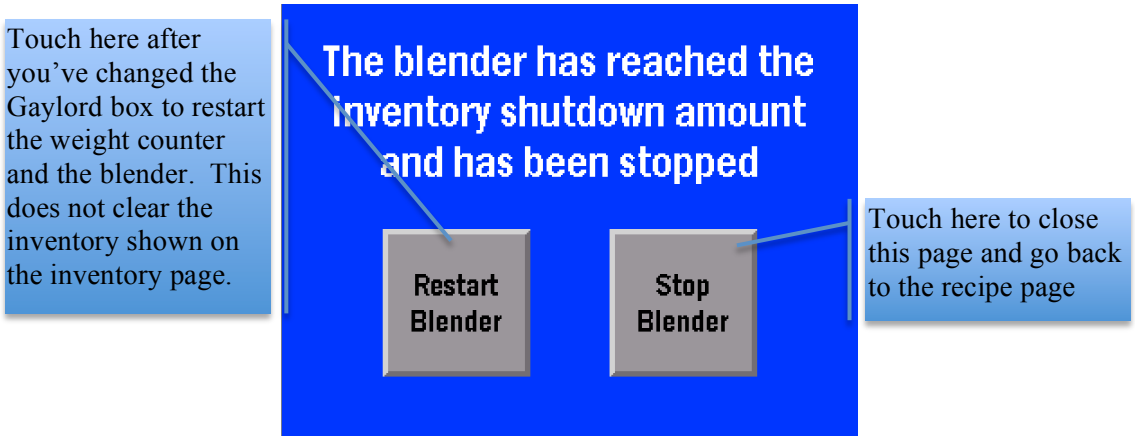
Blender	Batch Size (lbs.)
150	1.5
500	4.0
900	8.0
2500	25.0
4000	35.0
6000	45.0

Inventory Shutdown

In many applications, the user of the Batch blending system produces large runs of blended material on the same recipe during production. An example may be a 40,000-lb. run of a certain specification plastic extrusion. Others may wish to fill a 1,000-lb. gaylord box in a central blending application. In either case, the manufacturer has provided a means to automatically stop the blending system when the blended material has reached a preset total blended weight. This is known as Inventory Shutdown.

When the Inventory Shutdown value is reached, the blender will finish the current batch of material. It will then stop and display to the operator that the inventory value has been reached. Additionally, it will flash an alarm and wait for operator attention. An example of this screen is shown below:

Typical Inventory Shutdown User Prompt Operator Screen



To enable this feature, simply enter a desired shutdown weight value (from 1 to 999999999) into the Inventory Shutdown display line of the Recipe Format screen, under the Setup menu.

This feature can be configured while the blender is making a batch. If the Inventory Shutdown is changed, then you will need to touch "Accept New Recipe" on the Recipe screen before the change can take place. This allows stored recipes with different Inventory Shutdown settings to easily be loaded without the operator having to reconfigure the blender every time they want to load a stored recipe.

To disable this feature, simply enter a zero (0) value.

Batch Ready Mode

This enables the blender to have a batch already made in the weigh hopper while the mixer is full. Enabling this feature dramatically increases the maximum achievable blender rate.

Auto Start Feature

By enabling this feature, the blender accurately finishes a batch that was interrupted by loss of blender power. This option starts the blender if it was running prior to power loss. It does not turn on the blender if it was previously stopped prior to power loss.

Weigh Every Other Batch Feature

This setting allows the operator to only weigh selected batches. The operator can choose from the following: "Weigh Every Batch", "Weigh Every Other Batch", "Weigh Every Third Batch", "Weigh Every Fourth Batch", "Weigh Every Fifth Batch", and "Never Weigh". If a batch is timed instead of weighed then all components run concurrently instead of one at a time. This dramatically increases the maximum blender rate, but introduces error into the timed batches. Because the ingredients are not weighed, error is introduced into the Inventory Totals. Each timed batch is assumed to be "perfect" and these "perfect" dispensed amounts are added to the Inventory Totals.

Every Batch:

This mode of operation weighs every component of every batch that is metered by the Batch blending system.

Every Other Batch:

First batch weighed. Second batch is metered based on the metering times of the first batch.

Every Third Batch:

First batch weighed. Second and third batches are metered based on the metering times of the first batch.

Every Fourth Batch:

First batch weighed. Second, third, and fourth batches are metered based on the metering times of the first batch.

Every Fifth Batch:

First batch weighed. Second, third, fourth, and fifth batches are metered based on the metering times of the first batch.

Never Weigh:

Metering is based on Feed Calibration values only. Loadcells are not used. This is only used if you have a failed loadcell.

- **Not weighing every batch sacrifices blender weighing accuracy, but increases the blender's maximum rate.**

Mixer and Dump Setup

Mixer Options

Press the "Timed/Continuous Mixing" key (In the top right hand corner) when in "Mixer and Dump Setup" screen to set the following options:

Timed Mixing Option

This mode of operation turns the mixer on only during dumping and during the re-mix time set into the control to jog the mixer during high level mixer operation.

Continuous Mixing Option

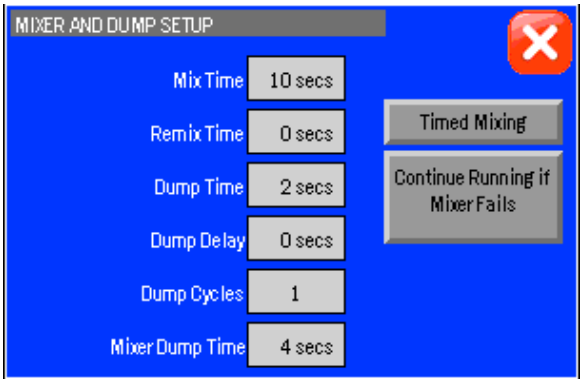
This mode of operation turns the mixer on after initial startup and will continue to run continuously, unless the remix time is set to jog the mixer during high level mixer operation. This option is used for sticky materials that tend to bridge and block off the mixer discharge to the processing machine.

Mix Timer

The mix timer is the amount of time that the mix motor will mix the material after it has entered the mixing section of the Batch blender. The timer has a range of 1 to 999 seconds.

To set the value of the mix timer, the user must gain access to the Setup Menu. After entering the Setup menu, the user must select "Mixer and Dump Setup."

Figure 40: Typical Mixer and Dump Setup Operator Screen



Selecting "Mixing Time" from the "Mixer and Dump Setup" menu will allow the operator to view the current time setting for the mix timer and to adjust it as needed.

Re-Mix Timer

In some applications, the Batch blender will require the use of the re-mix timer. Some materials tend to separate if they are mixed too long. This is possible when a processing machine is running at a rate significantly below the capacity of the blender.

With external vibration, the heavier pellets will tend to flow to the bottom of the mix chamber before the lighter material. This will occur even though the mixer is in a static mode. By re-mixing occasionally, this situation will be prevented.

The re-mix timer will start another mixing cycle if the blender has been idling long enough for the re-mix timer to time out. The re-mix timer may be set on the "Mixer and Dump Setup" screen from 1 to 999 seconds. Setting the re-mix timer to zero will disable this function.

If the re-mix timer is disabled, the controller will run only a single, timed mix cycle after each dump of the weigh hopper.

To view and change the value of the re-mix timer, refer to the “Mixer and Dump Setup” menu. All current values for Mixing and Remixing Times will be shown on this screen. The re-mix timer default value is factory preset at zero.

Weigh Hopper Dump Time

The weigh hopper dump time is the amount of time the weigh hopper’s dump valve remains open to allow weighed material to exit the hopper and enter the mixer.

To view and change the current weigh hopper dump time settings, enter the Setup menu and select the “Mixer and Dump Setup” screen. Press the field next to “Dump Time” to set the operation of the Dump Valve.

The timer should be set to close the dump valve shortly after the material has totally dumped from the weigh hopper. This time can vary due to material flow characteristics, and the size of the batch that is programmed into the blender control. Experimentation with this setting can allow the operator to determine the best cycle for the material being weighed.

Weigh Hopper Dump Delay Time

The dump delay time is the amount of time from the end of metering the last ingredient until the start of the actual dump cycle. The start of the dump cycle is marked by the opening of the weigh hopper dump valve. This value has a range from 1 second to 999 seconds. To view and change the current dump delay time, enter the Setup Menu, select “Mixer and Dump Setup” screen, and then select “Dump Delay”.

The default time is factory set at zero seconds. This delay time is used to start the mixer prior to dumping the material from the weigh hopper into the mix chamber of the blender.

Weigh Hopper Dump Cycle

The dump cycle allows the weigh hopper dump valve to cycle, or open and close, a number of times prior to commencing with the next batch cycle. The setting allows from 1 to 9 dump cycles between batches (open and closed cycles).

The normal and default factory setting is 1, meaning the weigh hopper dump valve will open at the end of the weighed batch and close after the batch is discharged into the mixer.

Setting the dump cycle to more than one cycle may be useful when blending high static, dusty material or those that have sticky tendencies. This will cycle the dump valve open and closed to allow any material that may cling to the dump valve.

To enter the dump cycle menu, first enter the Setup menu by pressing the Manufacturer’s icon from the main menu. Enter the password and press enter. Next, press the button marked “Mixer and Dump Setup”. The display will show the “Mixer and Dump Setup” menu. Press the “Dump Cycle” key to enter a dump cycle value and press enter. Please refer to the menu structure tree shown in section 3-5.

Mixer Dump Time

The mixer dump time is the amount of time the knife gate below mixer’s valve remains open to allow blended material to exit the blender.

To view and change the current mixer dump time settings, enter the Setup menu and select the “Mixer and Dump Setup” screen. Press the field next to “Mixer Dump Time” to set the operation of the Dump Valve.

The timer should be set to close the dump valve shortly after all material has been emptied from the mix chamber. This time can vary due to material flow characteristics, and the size of the batch that is programmed into the blender control. Experimentation with this setting can allow the operator to determine the best cycle for the material being mixed.

Continue/Stop Running if Mixer Fails

If the blender is configured with the "Mixer Failure Detection" option then the user can select if he wants the blender to alarm only or stop if the mixer movement is not detected during mixing.

Alarm Messages

An alarm message will be shown if any alarm condition occurs. A message will pop up on the screen until the alarm condition is resolved. During an alarm condition, not only will a visual alarm show up on the screen but also an audible alarm will sound. The operator can press "OK" on this pop-up to hide the screen temporarily, but if the alarm condition is still unresolved, then the message and horn will reappear after a short delay.

The blender will log when the alarm event occurred and when the condition went away.

The following is a list of all alarm names and descriptions:

Hopper 1-8 Out of Material: This alarm indicates that a hopper is out of material and signals the operator that they should check the resin system.

Hopper 1-8 Low Level: This alarm indicates that a hopper with a low level prox sensor is low.

Surge Hopper Empty: This alarm indicates that the surge hopper sensor is sensing a low level. This can be any surge hopper and not necessarily related to the blender. It is a customer specified alarm input.

Mixer Failure: This alarm indicates that mixer movement was not detected when it was suppose to be. This is only available if the Optional "Mixer Failure" feature has been added to the blender.

Unable to Make Rate: This alarm indicates that the blender has not hit high level in an appropriate amount of time.

Hopper 1-8 Unstable Alarm: This alarm indicates that a hopper has not stabilized. This is determined by examining the last 3 feed calibration measurements while the blender is running. If the 3 measurements are within a set deviation of each other than the hopper is "stable" and these measurements are used to average the feed calibration value. If not then a counter is increased every batch and the feed calibration value remains unchanged. After a set amount of batches that are not "stable" then an alarm is given.

Hopper 1-8 Overfeed Alarm: This alarm indicates that a hopper has put too much into the current batch.

Max Hopper Weight Exceeded, check batch size: This alarm indicates that the weight in the weigh hopper has exceeded the maximum allowed weight. This alarm can happen if the operator changes material density and does not perform a feeder calibration, but will usually be automatically fixed after the first batch. As long as this alarm doesn't continue to reappear, then the operator should not be concerned. If the alarm continues to occur, then the operator should have maintenance check the blender.

Calibration Error, Clean out hopper and check calibration: This alarm indicates that the maximum empty weight for the weigh hopper has been exceeded. The blender will automatically tare up to 0.25 lbs of material, but if this weight is exceeded, then an alarm will appear. This alarm is most commonly caused by a build up of sticky material in the weigh hopper and can be corrected by simply cleaning out the weigh hopper. If this does not correct the problem, then the scale calibration should be checked by maintenance.

Power Interruption while metering a Batch: This alarm indicates that the blender's power was turned off while the blender was making a batch. The batch accuracy would have been compromised since it did not finish the batch in progress.

PLC Battery Low: PLC battery is low and may cause the blender to lose both the program and the blender configuration. Notify Maintenance immediately.

PLC Module Loaded: This alarm occurs after a software upgrade to the PLC. The alarm instructs you to turn off power to the blender, remove the Memory Module, turn on power, and then reconfigure the blender parameters.

Inventory Cleared: This is only logged in the Alarm Log and does not cause a pop-up message or audible alarm. Each time the inventory is cleared, the time and date are logged to the Alarm Log. An alarm will sound and a screen will pop up when Auto. Inventory Shutdown has been reached.

E-Stop Screen: The blender is equipped with an System-stop switch that removes the power from all mechanical outputs. The System-stop Screen appears along with an audible alarm whenever the System-stop is activated. The operator can not access any screens until System-stop is deactivated. The Panel View will then put the screen back to the display that the operator was on prior to hitting the System-stop. The System-stop does not provide a category 0 or 1 stop. It is recommended that the System-stop be moved closer to the power input so as to disconnect all power when the System-stop is pushed.

BLENDING MODE SEQUENCE

- **Before starting Batch blending systems, each ingredient hopper in the current recipe must contain material! Virgin material must be loaded in hopper #1 and hopper #3 should only be used for regrind!!**

Once the operator initiates the run mode of operation, the blending system controller will begin monitoring the mixer high-level switch. Nothing will happen until the mixer high-level switch is uncovered. This tells the controller that the mixing chamber is capable of holding another batch of material.

Once the mixer high-level switch is uncovered, and the weigh hopper has dumped, the system will meter the ingredients from the supply hoppers, through the metering units, into the weigh hopper. Each component will be metered individually to allow accurate weighing of the material.

Each component is metered in the order specified by the "Metering Order" setup. See the Installation & Setup chapter for further details.

Once the final ingredient specified in the recipe has been metered into the weigh hopper, the controller will take a final weight reading of the weigh hopper. This will start the "Dump Delay" timer. (See Page 58). Once the dump delay timer has timed out, the controller will activate the weigh hopper dump valve, initiating the weigh hopper dump cycle.

The open weigh hopper dump door will allow the material to drop into the mixer section of the blender. If the dump delay is set, the mixer will start before the weigh hopper dump will open for the selected time.

The blender will sit at rest until the high-level sensor in the mixing chamber is uncovered to start another weigh cycle. (Unless the Re-Mix timer is set to a value other than 0 and times out to restart the mixer to run for another mix cycle.)

The level sensor is located on the back wall of the mixer chamber. If the sensor is covered with material, the indicator light on the back of the sensor will be lit.

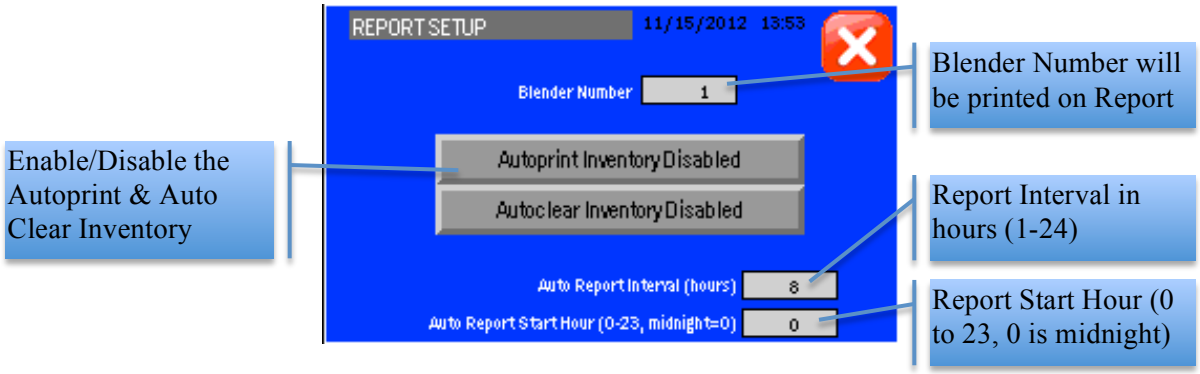
Once this sensor is uncovered, the indicator lamp on the back of the level sensor will go out. This level sensor must be uncovered for approximately 1 - 2 seconds to indicate to the controller that there is room in the mixing section to accept a batch of material.

When the controller has determined that the mixer is ready for an additional batch of material, the controller will begin metering material into the weigh hopper assembly.

Printer Features

The Batch blending system may be equipped with a printer, so a printer menu is available to the operator. This menu is displayed in the "Report Setup" area of the Setup screen. The printer menu is accessed by pressing "Report Setup" from the Setup menu.

Figure 50: Typical Report Setup Operator Screen



The blender can be configured to automatically print and clear inventory on a selected interval. To automatically print or clear reports perform the following:

1. Enter in the Report Interval in hours (1-24).
2. Enter in the Report Start Hour (0-23, 0 is midnight).
3. Enable "Auto Print Inventory" and "Auto Clear Inventory."

The user can select to only print the inventory on an interval if so desired by not enabling the "Auto Clear Inventory" feature. The user should also enter in the blender number which will identify the blender that the printout came from.

The printed inventory might not match the percentage shown, as the percentage shown is the actual blender percentage running the current recipe. The inventory, depending on when it was manually cleared, may or may not reflect the current recipe inventory. Some customers like to run an accumulated inventory on ingredients coming from silos, etc., even though several different recipes have been run on the blender. Others like to clear the inventory every time the recipe is changed. The blender gives the operator the choice of either method.

The Report Setup Printer Menu contains four (4) options:

- Batch Interval
- Print Inventory
- Clear Inventory
- Display Time & Date

Batch Interval or Timed Interval Printout

The Batch Interval item under the Recipe menu works in conjunction with the Auto Print Interval to set the number of batches between printouts or on a timed interval between printouts.

Timed Printout

When entering the Report Setup menu, the operator will have to decide whether the printout should be timed and by the number of batches between each printout. The operator will have to toggle between the "Recipe Format" and the "Report Setup" screens to configure the settings properly.

If you want to print out on a time format, press the button next to the "Auto Print/Clear Interval" key. The screen will then prompt the operator to set the time interval in hours (1 to 24).

If you want to change the hours between printouts, press the "Auto Print/Clear Interval" key again to change the value to the desired time.

The operator will then need to program in when they want to begin the timed printouts. Simply select the time (0-23, {midnight =0} on a 24-hour clock) and press the "Done" key to retain the current settings in the "Report Setup" screen.

Batch Printout

The target vs actual weight data for every batch can also be printed. See "Advanced Weight Options" to turn this on/off. This feature uses an excessive amount of paper and should only be used for trouble shooting.

Print Inventory

The print inventory menu item is used to produce on demand, inventory printouts. Before selecting this item, be sure that the printer is properly connected and ready. This function will generate an inventory printout with the current date and time information.

Display Time and Date

The display Time and Date item in the upper right corner of the "Report Setup" menu is used to verify the current time and date information.

Color Changes

The color change procedure is meant for use with the basic Batch Blender. This procedure assumes that the color component of the blend is in an additive ingredient hopper (#2, #4, #5, or #6).

- **The blender must be stopped to make color changes. The processing machine can operate on virgin material only during this procedure with an optional quick color change bypass tube that can be installed to bypass the blender. Contact the factory for details.**

1. Disable and clean any color loading equipment. Please refer to the loading equipment manual for any clean up recommendations.
2. Using the blender "Abort" or "Push to Start or Stop" key, put the blender in stop mode. After the cycle has completed, switch "OFF" the main power switch and unplug the blender power supply.
3. Open the upper mixer access door. This shuts off air to the blender circuit by deactivating the master air valve. Then unplug the quick disconnect from the air

supply hose to the blender to further ensure that no air pressure is supplied to the blender.

⚠WARNING

Always unplug the main power cord.

Always disconnect the air supply to the blender.

Prior to performing any operations inside any access areas of the blende where there are moving parts.

6. Remove the weigh hopper by unplugging the air line disconnect fitting, holding the dump door closed, lifting the hopper to clear the load cell brackets, and gently pulling the weigh hopper out of the blender.

⚠WARNING

To reduce the chance for damage to delicate load cells, use care when lifting the weigh hopper off load cell locating tabs and when reinstalling the weigh hopper on load cell brackets.

7. If you want to catch the color, use a small plastic pail or chute to collect the material from the slide gate assembly. Reach up inside the blender to the color slide gate and push it open. At this point, there should be no air pressure on the blender, and the slide gate should move easily. Drain the color out in the bucket. Blend and Reclaim normally provides a JIT (Just in time) approach to the minor ingredients, so that a minimum amount of material is held in the blender so that color changes can be made easily.

8. If any other ingredients need to be changed for the next recipe, simply drain the larger hoppers with the drain tubes provided on the side of the hoppers. When the material level is below the drain tube, open the slide gate manually to dump the rest of the material. If you wish to speed the emptying process, material can be manually drained out of the slide gate assembly into a dump chute or bucket, while draining from the drain tube.

9. Using a vacuum cleaner or air hose, clean out all the hoppers that have been emptied. Always start at the uppermost part of the blender and work downward to prevent dust and pellets from falling into an already cleaned area.

⚠WARNING

The auger metering assemblies on Auger blenders can be removed after the hoppers above them have been drained.

10. Clean the weigh hopper and mixer assemblies on the blender using a vacuum cleaner. The mixer agitator is removable for cleaning if desired.
11. Reinstall any metering units that were removed from the blender during clean out.
12. Reinstall the weigh hopper using care to center the hopper on the load cells on the weigh hopper bracket.
13. Load the blender with new material.
14. Restart the unit with the new recipe.

⚠WARNING

Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing or cleaning any product, including all Batch blending systems. Failure to do so may result in serious injury or death.

4-3 Shut-down

The Slide Gate Gravimetric Blender can be stopped in one of two ways:

1.  To immediately stop the blender, the operator can touch "Abort Current Batch" icon. This will cause the blender to stop making the current batch immediately. If the blender is stopped in this method then the current batch will not be completed properly.

2.  If the operator desires to complete the current batch of material, then he can stop the blender using the selector switch icon. The blender will finish the current batch of material before stopping.

Chapter 5: Maintenance

5-1 Preventative Maintenance Schedule

The mechanical design of the blender is very simple and very little maintenance is required. The only moving parts are the metering gates, weigh hopper dump valve, and mixer agitator. The checklist below contains a list of items which should be inspected and/or replaced to keep your blender operating at peak efficiency. Perform each inspection at the regular intervals listed below.

Figure 52: Sample Preventative Maintenance Schedule

System model #	Serial #

Daily	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By
Inspect blender for any loose parts- tighten them immediately.													
Verify quality of compressed air supply.													
Verify mixer door is properly latched.													

Every week	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By
Inspect metering gates for proper operation.													
Check to make sure that all hose connections are air tight.													

Every month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Inspect air regulator and air safety circuits, if equipped.												
Recalibrate blender only If necessary.												

Photocopy this page for your maintenance records

5-2 Preventative Maintenance

Our blenders need periodic maintenance to provide long dependable service. Check these elements regularly:

- Check functionality of safety circuit daily.
- Maintain proper air pressure and drain water from trap assembly on regulator – as required.
- Periodically lubricate slide gate rails.

Always remove plug and disconnect power before servicing blender.

Always read operating manual before operating or servicing blender.

For gear boxes on BD, SGBD, CSG-4000/6000 and RAM units with right angle gear boxes:

- Change oil after initial break-in period of 250 hours of operation and at 2500 hours of operation or 6 month intervals after break-in period.
- Recommended oil is Mobil SHC 634 Synthetic oil. 5 gal P/N: OIL0041

Part Description	Part Number	Oil Capacity (Fluid Ounces)
4000/6000 Right Angle Reducer	51415	13
	160.00280.00	11
RAM	51183	4

5-3 Corrective Maintenance

Electrical

This section is designed to give the operator an overview of the electrical system that controls the Batch blending system. Since the blender's control panel is a self-contained pluggable item, seldom will a maintenance person be required to enter the control panel. For purposes of understanding the system, it is advisable that the maintenance personnel be familiar with not only the internal workings of the control panel, but also with the input and output signals to the Batch blender.

This section includes the following:

- Internal components of the control panel
- Input signal to the control panel
- Output signals from the control panel

Internal Components of the Control Panel

- **See Installation Packet supplied with unit for complete electrical schematics.**

This section describes the internal components of the Batch blending system control panel. It is not the intent of this section to completely familiarize the reader with the details on industrial control panel construction or standards, but simply to familiarize the reader with the major components inside the control panel.

The customer must supply 120-240/1/60 or 110-220/1/50 voltage via wires L1 & L2 (N). Please insure that the earth ground connection is properly connected to an established earth ground.

- "Power on" is indicated by a lighted on/off selector switch.
- "Slide gate below mixer" switch controls position of **optional** slide gate.
- "Safety Active" light displays status of safety interlock circuit.
- Audible alarm horn alerts operator to blender fault.

Input Signals to Programmable Controller

The Batch blending system has two main input signals that it uses from the blending process: the mix hopper high level signal and the weigh hopper load cells. This, of course, does not include the operator touchscreen input.

The mix hopper high level signal is generated by a proximity level sensor located in the right hand portion of the mixer chamber (viewing from the mixer door).

Load cells require +10 volts DC to operate. This is known as the load cell's excitation voltage.

Output Signals from Programmable Controller

The Batch blending system uses several output control signals to control the process. All of these are very similar in nature, the first of which is the mixer motor control.

The mixer motor is controlled by a PLC output.

The weigh hopper dump valve output functions similar to the mix motor output. Please refer back to the wiring diagram. The origin of the weigh hopper dump signal is a PLC output.

The auger motor outputs are driven from a control output from the PLC.

Each blending system includes an auxiliary customer alarm output. This dry contact can be used to switch a remote alarm signal.

The customer alarm output is provided to actuate or energize a variety of alarm horns, buzzers, strobe lights, and beacons. **These are normally provided by the customer, and care will have to be exercised not to exceed the maximum current draw (3 amp maximum).** The contacts will close whenever the control detects a fault that will somehow inhibit the blending system from properly blending the material.

NOTICE

- **The customer alarm contact is open if the panel control power is turned off.**
- **This contact is for use with a customer supplied alarm device as described above.**
- **The alarm contact has a maximum load of 3 amps.**

Chapter 6: Troubleshooting

6-1 Introduction

The utmost in safety precautions should be observed at all times when working on or around the machine and the electrical components. All normal trouble-shooting must be accomplished with the power off, line fuses removed, and with the machine tagged as out of service.

The use of good quality test equipment cannot be over-emphasized when troubleshooting is indicated. Use a ammeter that can measure at least twice the AC and DC current that can be encountered for the machine. Be sure that the voltmeter has at least minimum impedance of 5,000 OHMS-per-volt on AC and 20,000 OHMS-per-volt on DC scales. Popular combination meters, VOM and VTVM can be selected to provide the necessary functions.

Before making haphazard substitutions and repairs when defective electrical components are malfunctioning, we recommend that you check the associated circuitry and assemblies for other defective devices. It is common to replace the obviously damaged component without actually locating the real cause of the trouble. Such hasty substitutions will only destroy the new component. Refer to wiring diagrams and schematics.

Locating mechanical problems, should they occur, is relatively straightforward. When necessary, refer to the parts catalog section.

Figure 53: Typical Troubleshooting Problems and Suggested Corrective Actions

Problem	Corrective action
Nothing happens when I push "Start Blender"	Check to make sure that air is hooked up and the regulator gauge reads at precisely 60 PSI.
	Check that the access door to the mixer is shut properly.
	Look on the Recipe Screen. If you see "Mixer Full", then check the mixer. If the mixer is not full, then check that the mixer prox is adjusted properly (small screw on back).
"E-STOP has been Activated" is shown	Check the E-stop located on the front of the blender panel.
 "Interface Locked" icon is shown	Click "Unlock" and enter in your User Password.
I've forgotten my User Password	Contact the Service Department.
POWER INTERRUPTION ALARM	Power was lost during a batch. Check your power source unless you intentionally killed the power during the batch.
PLC Battery Low	Change out the PLC with your spare and reprogram new unit. Send old PLC back to Manufacturer for repair.

Problem	Corrective action
PLC Module Loaded	Normal after a software upgrade. Follow on-screen instructions.
	Check the input power. Verify that 110 volts (or 220 volts) are ±10%. This voltage must remain constant with all the motors starting and stopping. Insure that the blender is on a "clean" circuit that does not have other equipment on it. If the power is known to be intermittent and have problems, set up the unit to run in "AutoStart" mode. See the factory setup sheet at the end of this manual. In this mode, if a short power interruption occurs, the blender will automatically restart.
	Check the power supply. Make sure that it has +5 VDC output to the CPU board. Adjust to +5 VDC, ±0.1 volt.
	Check the display ribbon cable connection to the CPU board and the display. See the electrical chapter for more information.
	Check the contrast adjustment located on the display board.
	Check keyboard ribbon cable connections.
	Check the CPU board for "lockup". To do so, reset the CPU board by cycling the power off and on at the motor control panel.
Weigh hopper occasionally overfills.	Check batch weight setting in the recipe menu. See the setup chapter for more information.
	Check the load cells and weigh hopper mounting for binding, etc.
	Check to see that a pellet has not lodged under a load cell.
	Check the ingredient supply hoppers to verify proper ventilation. If a vacuum receiver has a leaking flapper valve and the supply hopper is not vented, the blender computer can learn inaccurately and cause an overfill condition on the next few cycles.
	Check the load cell connections to the panel.
Material sticks to the flapper of the weigh hopper and is not dumped.	Increase the Dump Cycles setting in Mixer and Dump Setup.
Too much material remains in the mixer.	Increase the Mixer Dump Time in Mixer and Dump Setup.
The material is not being mixed thoroughly.	Increase the Mixing Time in Mixer and Dump Setup.

Problem	Corrective action
Recorded Inventory Totals don't match what I've actually used	Check the blender's scale calibration and verify that the batch hopper is not overfilling. If the hopper is overfilling, adjust your batch size. If this is correct, then you are probably not accounting for material scrap or other items in your process.
	Some error can be introduced by not weighing every batch. Check the Recipe Page.
Max Hopper Weight Exceeded Alarm continues to re-occur.	Stop the Blender and the Start it again. This causes the blender to perform an automatic feeder calibration. If this doesn't fix it, then manually perform feeder calibrations and retest.
Printer did not print	Check that the printer is a SERIAL printer. If not, then you will need to either get a SERIAL printer or purchase a SERIAL to PARALLEL converter.
	Check printer communication settings under Panel View Config.
I'm missing an Automatic Inventory Report	Check that the date and time are set correctly on the Panel View Config Page.
Blender occasionally dumps an incorrect batch.	The blender intermittently dumps a batch of material with one or more of the components incomplete.
	Check the recipe information; ensure that both the percentages and batch size are set properly.
	Check the status of the alarm flags & Feeder Setup to ensure that all of the feeders are set to Retry. In addition, if the blender is configured for timed batches then this can cause error.
	Check supply hopper ventilation to prevent problem associated with leaky vacuum receiver flappers.
Blender keeps dumping after mixer is full.	Check the mixer high-level switch sensitivity. When the sensor is covered by material, the indicator lamp on the back of the switch should be lit. To adjust the sensitivity, use the small adjustment screwdriver that was provided with the blender. The adjustment pot is located on the back of the sensor. Rotate clockwise to increase the sensitivity (less material in front of the switch to actuate it). Rotate counter clockwise to decrease the sensitivity (more material covering the switch).
	Check the mixer high-level sensor connection to the control panel.
Blender will not batch with empty mixer.	Check the mixer high-level switch sensitivity. Fines may have coated the level switch; it needs readjustment.
	Check the proximity switch connection.
	Make sure that the recipe is correct.
	Check batch size.

Problem	Corrective action
Mixer won't shut off and runs continuously.	Check the Mixer and Dump Setup to see if the mixer is configured for "Continuous Mixing". Set it to "Timed Mixing".
	Check the value of the mixer timer setting.
	Check the value of the dump delay timer.
	Check the mixer motor fuse. This is located in the control panel on the SSR for the mixer motor. If the unit has two (2) power inlets with a separate power inlet for the mix motor the overload fuse will be located in the rear junction box on the blender frame.
	Check the power source to the blender.
	Check the load cell in diagnostics under direct scale readout. Place a calibration weight on the weigh hopper; determine if the weight corresponds.
	Check the load cells to make sure that a pellet has not jammed under a load cell.
	Check the load cell connections to the control panel
	Check the power supply voltage and readjust as necessary as described earlier.
Out of Material Alarm or Low Level is displayed, but there is material in the hopper.	Go to the Manual Control Page and check to see if "Hop Low" equals "1". If it does, then adjust the low-level prox until the value reads "0".
	Ensure that the material hopper is properly vented. If the vacuum receiver is leaky, then this will cause the problem. To test this, fill up the hopper and turn the loader off to prevent leaking. If this isn't the problem, then increase the "Out of Material Retry Limit" found under Feed Algorithm Options (see manual).
I'm not getting Out of Material Alarms	Check the Alarm Flags & Feeder Setup to see if the feeder is configured to give you an alarm.
Calibration Weight Exceeded	Clean out the hopper and retest. If this doesn't fix the problem, then perform a scale calibration. Also, check to sure that the Dump Time is not set extremely low. If all else fails, check the value set for the Max Empty Weight. This might need to be increased.
The feeder calibration values are moving too much.	First, check that the displayed actual dispensed weight is accurate. If this is OK, then check to see if the hopper is properly vented. To do this, fill hopper and turn off the loader and retest.

Problem	Corrective action
I can't calibrate the Scale without an error message.	This Is caused by the difference in bits not being large enough. Using the Direct Scale Readout, examine current loadcell bits with and without the calibration weight. If the bits do not change significantly, then check for pellets jamming the loadcells and check the loadcell circuit. You might have a bad loadcell.
I can't calibrate the feeder without an error message.	Do other feeders calibrate correctly? Is the feeder I'm trying to calibrate a large gate? If these are true, then lower the Batch % for Feeder Cal setting under Feed Calibration Options. This can be observed by looking at the Hopper Weight display.
	None of the feeders calibrate? Check the Scale Calibration. If this is correct, then lower the Batch% for Feeder Cal setting under Feed Calibration Options for each feeder. This can be observed by looking at the Hopper Weight display.
Weigh hopper does not empty completely.	Check the dump time setting. It may be set too short. If this does not correct the problem, clean the weigh hopper and recheck the scale diagnostics readout. If not showing (0) zero when empty, re-calibrate the scale.
Blender does not make rate.	Verify application is not exceeding blender capacity. Verify additive percentage is not higher than designed, resulting in excessive dispense time. Verify all materials are feeding freely through the metering gates or augers.
I have changed the recipe entry mode, metering order, batch size, inventory shutdown, weigh every batch mode, or feeder type and alarm flags, but the change hasn't taken place.	All of these settings are part of the current running recipe. This makes it easy for the operator to load a stored recipe without having to reconfigure all of these parameters for the new recipe. All you have to do is touch "Accept New Recipe" to load these values into the running recipe.
A feeder always puts too much material in the batch.	Check that the Gate Cycle Time is set correctly. Try lowering this value. If it is then lower the Initial % of Target to Meter. These are found under Feed Algorithm Options. Make small adjustments and retest.
A feeder is retrying more than 2-4 times.	Increase the Gate Cycle Time. This is found under Feed Algorithm Options. Make small adjustments and retest.
	Increase the Allowed Underfeed value under Feed Algorithm Options.
	Decrease the Retries before Double Gate Time.

- **Other service problems or questions can be answered by contacting the Service Department.**

Chapter 7: Appendix

Annex B Information

The following design information is provided for your reference:

1. No modifications are allowed to this equipment that could alter the CE compliance
2. Ambient temperature: 40°C – Maximum (104°F)
3. Humidity range: 50% relative humidity
4. Altitude: Up to 1000m above sea level
5. Environment: Clean, dust-free and non-explosive
6. Radiation: None
7. Vibration: Minimal, i.e. machine mounting
8. Special installation requirements: Clean, dry compressed air 1 cfm @ 60 psi (1.7 m^3/hr @ 4.14 bar)
9. Allowable voltage fluctuation: +/- 10%
10. Allowable frequency fluctuation: Continuous +/- 1%
    Intermittent +/- 2%
11. The addition of an auger feeder (RAM option) for regrind will increase the electrical supply requirements of a standard blender.
12. Nominal supply voltage: 120-240/1/60 or 110-220/1/50/60 (serial number tag)
13. Earth ground type: TN (system has one point directly earthed through a protective conductor)
14. Power source should include a neutral power connection.
15. Over-current protection is supplied in the blender, but additional protection should be supplied by the user. NFPA 70 article 430.24 to 430.26.
16. The plug on the power cord serves as the electrical disconnect device (located 0.6m to 1.9m above floor).
17. Unit is not equipped with three-phase motors.
18. Blender is not equipped with local lighting.
19. Functional identification
20. Blender is equipped with an optional CE mark or UL label.
21. Blender is supplied with an operating manual in the language of the destination country.
22. Cable support may be required for power cord, depending on final installation.
23. No one is required to be in the interior of the electrical enclosure during the normal operation of the unit. Only skilled electricians should be inside the enclosure for maintenance.
24. Doors can be opened with a screwdriver.
25. Two-hand control is not required or provided.
26. All blenders should be moved around and set in a place with a lift truck or equivalent.
27. There are no frequent repetitive cycles that require manual control—repetitive functions are automatic while the blender is operating.
28. An inspection report detailing the functional test is included with the blender.
29. The machine is not equipped with cableless controls.
30. Color-coded (harmonized) power cord is sufficient for proper installation.

7-1 Drawings and Diagrams

Final Assembly

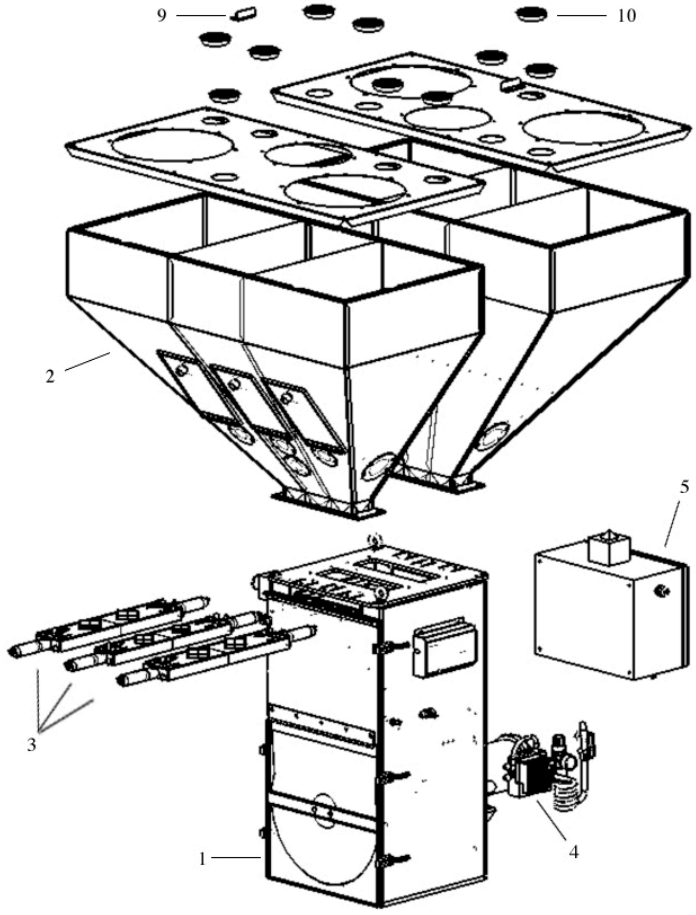


Figure 55: Typical Final Assembly Parts List

#	Description	150	500	900	2500	4000	6000
1	Mixer Assembly	A0771710	A0771711	A0771715	A0771719	A0771723	A0771727
2	2-Component Hopper Assembly: DM/DM	N/A	892.03269.00		892.03020.00	892.04553.00	
	2-Component Hopper Assembly: DM/SQ	N/A	892.03270.00		892.04621.00	N/A	
	2-Component Hopper Assembly: SQ/SQ	N/A				A0771699	
	3-Component Hopper Assembly: DM/DM/DM	N/A	892.03271.00		892.03021.00	892.04554.00	
	3-Component Hopper Assembly: DM/DM/SQ	N/A	892.03272.00		892.04622.00	N/A	
	3-Component Hopper Assembly: SQ/DM/SQ	N/A				892.03275.00	
	Removable Hopper Small	892.02239.00	N/A				
	Removable Hopper Large	892.02411.00	N/A				
3	Slide Gate Assembly – Major: DM/DM	N/A	A0771661		A0771660	A0771708	
	Slide Gate Assembly – Minor: DM/DM	N/A	A0771680		A0771661	A0771708	
	Slide Gate Assembly – Major: DM/SQ	N/A	A0771669		892.01510.00	A0771701	
	Slide Gate Assembly –Major: Single DM	N/A	A0569161		A0569160	A0771709	
	Slide Gate Assembly – Minor: Single DM	N/A	A0771681		A0569161	A0771709	
	Slide Gate Assembly – Major: Single SQ	N/A	A0771670		892.01513.00	A0771702	
4	Valve Stack Assembly 4-Comp	N/A	A0771740			A0771868	
	Valve Stack Assembly 6-Comp	N/A	A0771741			A0771869	
5	Main Controller	892.01809.00			892.1810.00	892.01811.00	
6	Main Display (Not Shown)	892.00694.00					
7	Main Display Cable 8 ft (Not Shown)	A0565856					
8	Calibration Weight (Not Shown)	822.00334.00	822.00151.00	822.00152.00	A0571769	822.00153.00	
9	Hopper Support Straps	N/A			A0569157	872.00246.00	
10	Louvers – Hopper Covers	N/A	A0567625				

DM: Diamond SQ: Square

Mixer Sub-Assembly

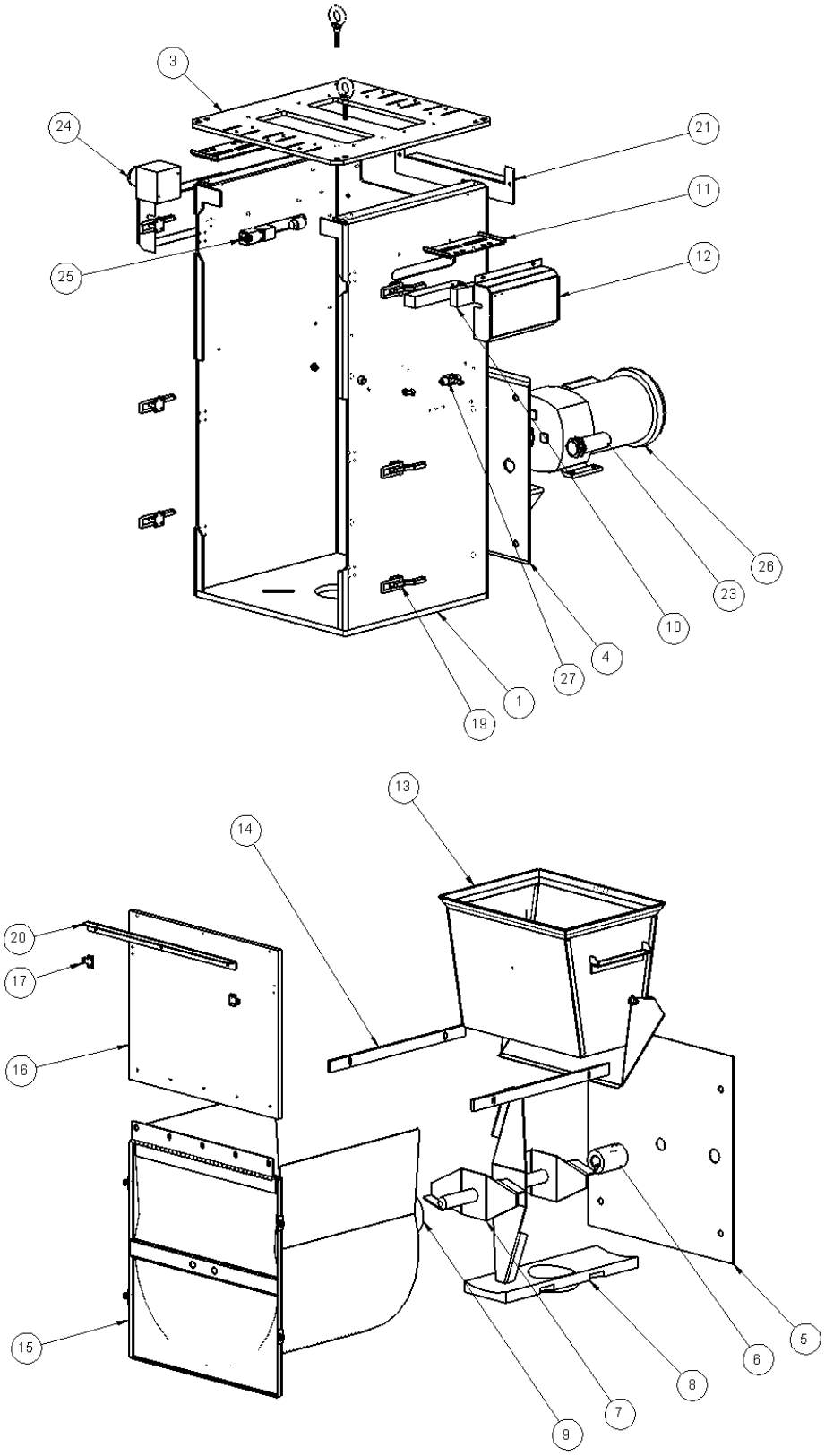


Figure 56: Typical Mixer Assembly Parts List

#	DESCRIPTION		500	900	2500	4000	6000
1	FRAME		872.00093.00	872.00094.00	A0770301	872.00224.00	
2	FRAME EXTENSION (NOT SHOWN)		872.00208.00	N/A			872.00225.00
3	TOP PLATE		872.00095.00	872.00096.00	A0770300	872.00226.00	
4	MOUNTING BRACKET – MIXER MOTOR		872.00097.00	872.00098.00	A0770316	872.01318.00	
5	MIX CHAMBER BACK PLATE		872.00099.00	872.00100.00	A0770333	872.00227.00	
6	COUPLING – AGITATOR DRIVE		832.00010.00		832.0003.00	832.00181.00	
7	AGITATOR – MIXING		872.00101.00	872.00102.00	872.01716.00	872.01470.00	
8	DRAWER SUPPORT		832.00011.00		A0770320	832.00034.00	
9	BUSHING – AGITATOR		832.00012.00		A0770319	832.00238.00	
10	LOADCELL (TWO)		724.00767.00	724.00768.00	724.00770.00	724.00771.00	724.00771.00
11	MOUNTING BRACKET – WEIGH HOPPPER	Right	872.01774.00			872.00519.00	
		Left	872.01280.00				
12	COVER GUARD – LOADCELL		A0770322			872.00521.00	
13	WEIGH HOPPER		A0771684	A0771685	A0771662	A0771704	A0771705
14	STOP RAIL – MIXER DRAWER		872.00105.00	872.00106.00	A0770314	872.00231.00	
15	MIXER DRAWER		872.00107.00	872.00108.00	A0770315	872.00232.00	
16	ACCESS DOOR – MIXER		832.00013.00	832.00014.00	A0770303	832.00035.00	832.00036.00
17	DOOR CLIPS		09990				
18	SAFETY COVER – MIXER FRONT (NOT SHOWN)		872.00109.00	N/A			
19	DOOR LATCH		35454				
20	SUPPORT BRACE – MIXER DOOR		N/A	872.00110.00	A0770332	872.00233.00	
21	SAFETY COVER – MIXER BACK		872.00111.00	872.00112.00	A0770302	872.00234.00	
22	MOUNTING BRACKET – CONTROL PANEL (NOT SHOWN)		872.00124.00		N/A		
23	PROXIMITY SENSOR – MIXER HIGH-LEVEL		A0556548				
24	SYSTEM-STOP SAFETY DISCONNECT SWITCH		721.01058.02				
25	SAFETY DISCONNECT SWITCH – MIXER DOOR		717.00078.00				
26	GEAR MOTOR	Motor	720.00001.00		720.00002.00	51354	
		Reducer	N/A			160.00280.00	
		Right angle reducer				51415	
27	FLOW VALVE 1/4" TUBING		A0770190				

Hopper Sub-assembly

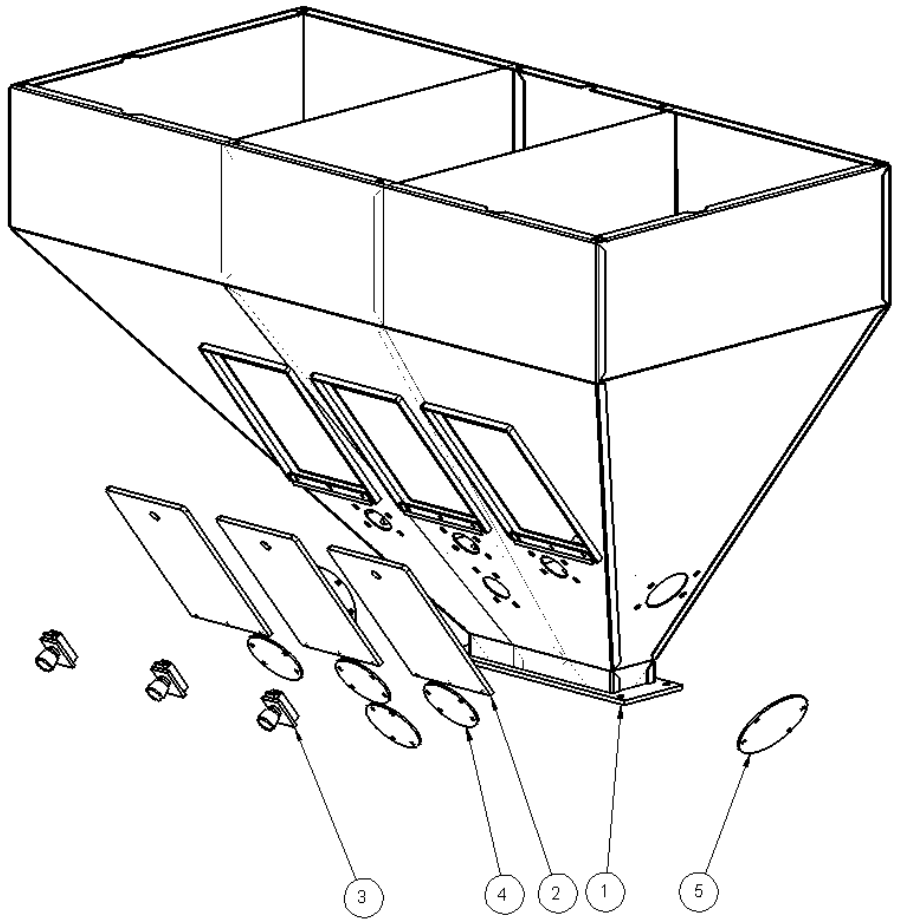


Figure 57: Typical Hopper Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	2-COMPONENT HOPPER	Consult Factory				
	3-COMPONENT HOPPER					
2	LEXAN DOOR	A0770286				
3	DOOR LATCH	A0770076				
4	3.5” SIGHT GLASS	832.00096.00			N/A	
5	4.5” SIGHT GLASS	N/A		832.00095.00		
6	(OPTIONAL) 2” DRAIN W/ MANUAL GATE (NOT SHOWN)	A05771782			N/A	
	(OPTIONAL) 3” DRAIN W/ MANUAL GATE (NOT SHOWN)	N/A		A0771783		
7	(OPTIONAL) BRACKET - LOW-LEVEL SENSOR (NOT SHOWN)	A0569155				
8	(OPTIONAL) PROXIMITY SENSOR LOW-LEVEL (NOT SHOWN)	A0556548			730.00024.00	

Hopper R.A.M. (Regrind Auger Metering) Sub-Assembly (Optional)

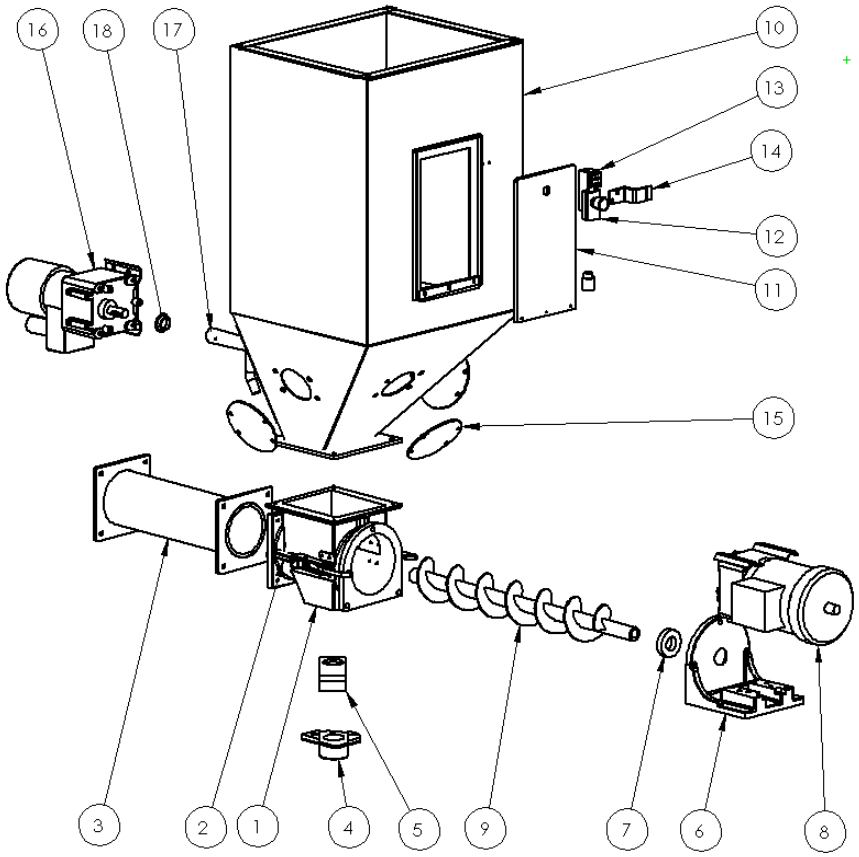


Figure 58: Typical R.A.M. Hopper Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	THROAT	N/A	07822-1			
2	CLAMP		A0548808			
3	FEEDER TUBE		872.00506.00	872.00426.00	872.00699.00	
4	DRAIN HOUSING		08806A-HYD			
5	DRAIN SLIDE GATE		08806B			
6	MOTOR MOUNT BRACKET		08451			
7	SEAL – AUGER - TEFLON		55372			
8	MOTOR - AUGER		720.00004.00		720.00028.00	
9	AUGER		872.00507.00	872.00421.00	872.00698.00	
10	HOPPER 2.0 CU.FT.		872.00417.00		N/A	
	HOPPER 7.0 CU.FT.		N/A		872.00418.00	
11	DOOR		A0770286			
12	LATCH		A0770076			
13	SAFETY INTERLOCK SWITCH		717.00078.00			
14	BRACKET – SAFETY SWITCH		872.00431.00			
15	SIGHTGLASS 4.5”		832.00095.00			
16	MOTOR – AGITATOR		51489			
17	AGITATOR		10637			
18	SEAL – AGITATOR - RUBBER		15286			
19	RECEPTACLE – 3-PIN FEMALE		63119			
20	CORD 3-PIN MALE 6 FT LONG		55196			
21	STEADY STATE RELAY – 10 AMP		729.00183.00			
22	GLASS FUSE – 3.0 AMP (115V UNIT)		A0542207			
	GLASS FUSE – 1.5 AMP (230V UNIT)		725.00885.00			

Hopper Additive Feeder Sub-Assembly (Optional)

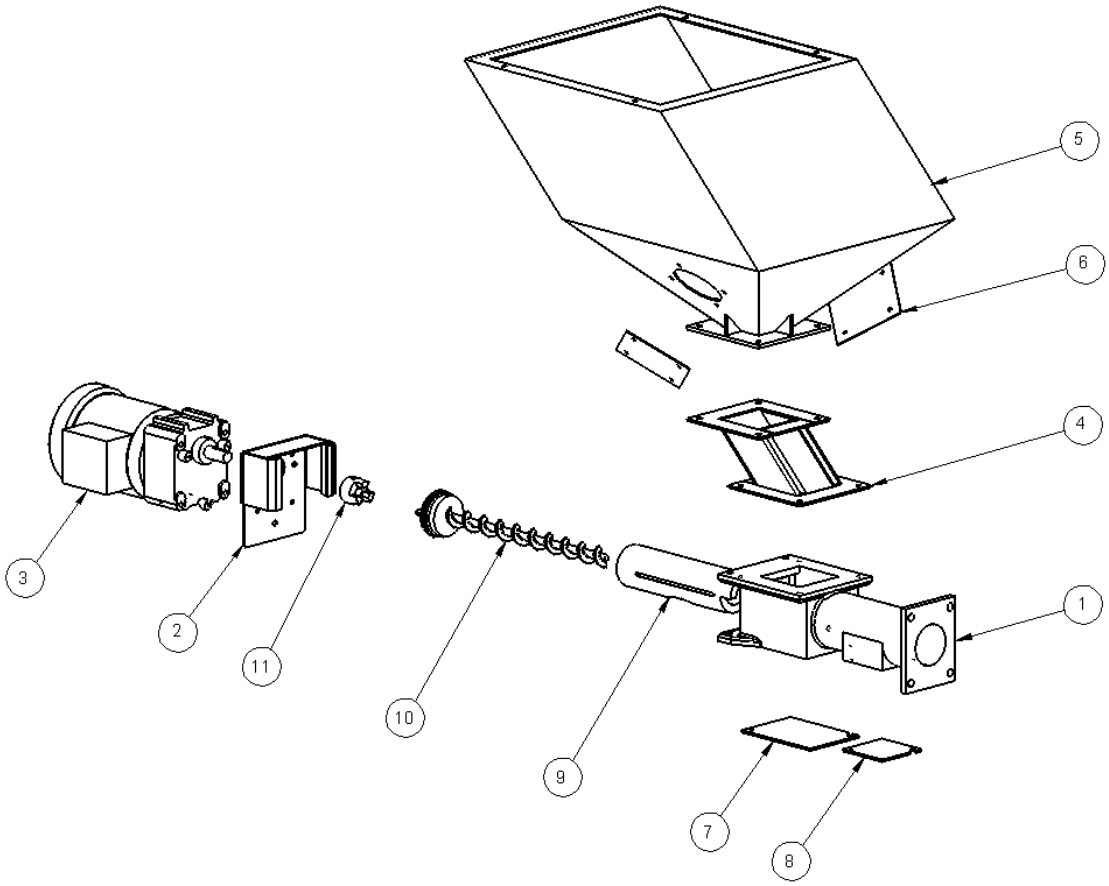


Figure 59: Typical Additive Feeder Hopper Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	THROAT	N/A	A0541201			
2	MOTOR MOUNT BRACKET		A0541229			
3	MOTOR – AUGER		51450G			
4	THROAT ADAPTER – 2" RISER		872.00537.00			
5	HOPPER 1.0 CU.FT.		A0541207		N/A	
	HOPPER 2.0 CU.FT.		N/A		A0541208	
6	SIGHTGLASS – AF		A0541206			
7	COVER PLATE – HOPPER CLEANOUT		A0541215			
8	COVER PLATE – SAMPLE PORT		A0541216			
9	TRANSFER TUBE – 1" AUGER		A0541211			
10	AUGER ASSEMBLY – 1" AUGER		A0541294			
11	COUPLING – MOTOR/AUGER		A0541282			
12	PIN – MOTOR MOUNT (NOT SHOWN)		A0541277			
13	RECEPTACLE – 3-PIN FEMALE (NOT SHOWN)		63119			
14	CORD 3-PIN MALE 6 FT LONG (NOT SHOWN)		55196			
15	STEADY STATE RELAY – 10 AMP (NOT SHOWN)		729.00183.00			
16	GLASS FUSE – 3.0 AMP (115V UNIT) (NOT SHOWN)		A0542207			
	GLASS FUSE – 1.5 AMP (230V UNIT) (NOT SHOWN)		723.00885.00			

Weigh Hopper Sub-assembly

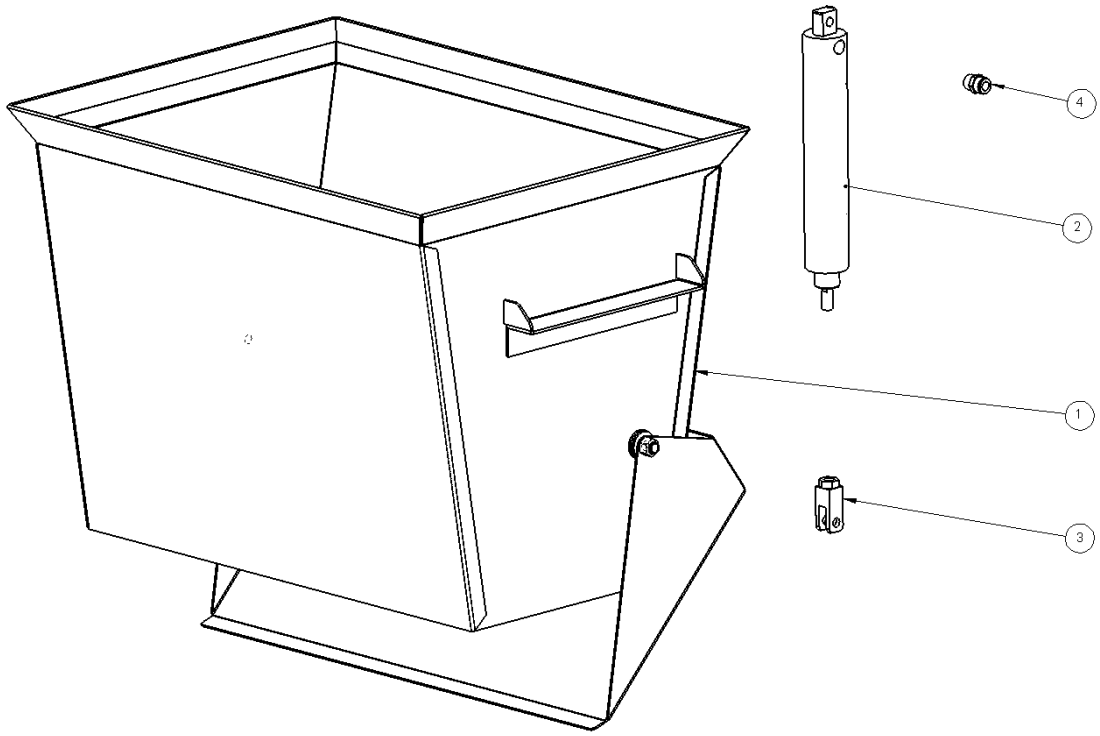


Figure 60: Typical Weigh Hopper Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	WEIGH HOPPER	872.00103.00	872.00104.00	A0770312	872.00229.00	872.00230.00
2	AIR CYLINDER	245.00003.00		A0770248		
3	CLEVIS – AIR CYLINDER	35460		35449		
4	FITTING – AIR TUBING	A0770126		35085K		
5	AIR TUBING (NOT SHOWN)	A0770139		207.00021.00		

Slide Gate Sub-assembly

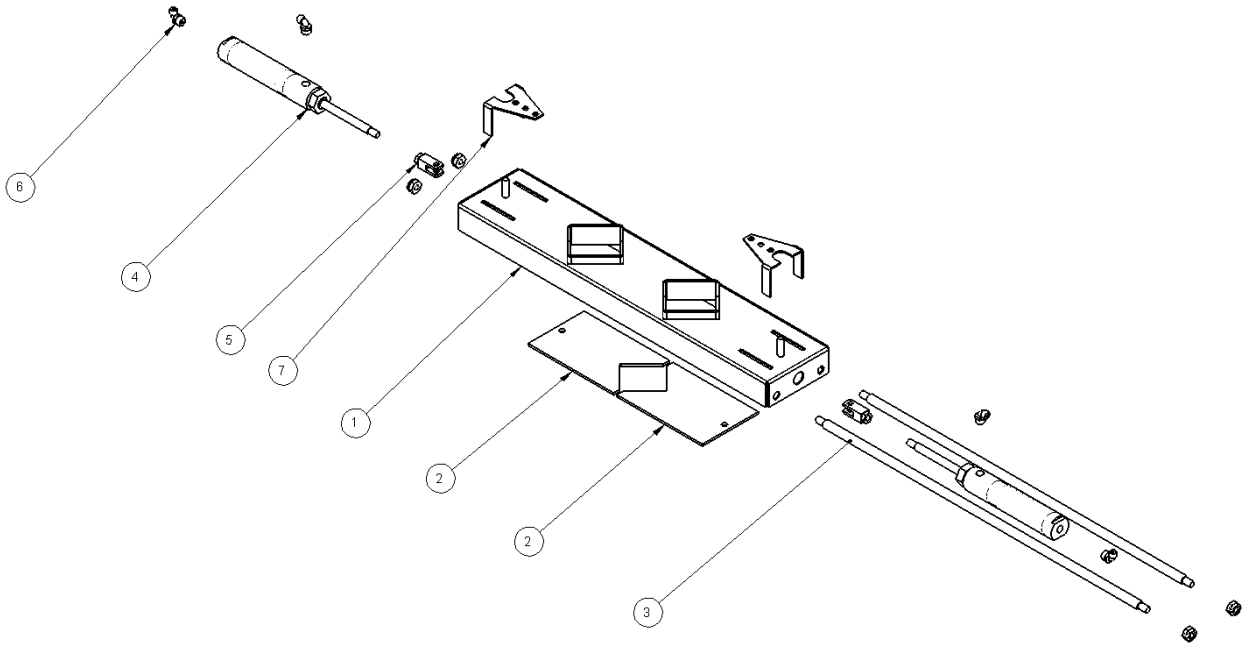


Figure 61: Typical Slidegate Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	HOUSING (DOUBLE DIAMOND) (#1-4) HOUSING (SQUARE / DIAMOND) (#1-4) HOUSING (DOUBLE DIAMOND) (#5-6)	Consult Factory				
2	GATE – DIAMOND (#1-4)	A0770309		A0770305	872.00237.00	
	GATE – SQUARE (#1-4) (NOT SHOWN)	872.00116.00		872.00763.00	872.00236.00	
	GATE – DIAMOND (#5-6)	872.00115.00		A0770309	872.00237.00	
3	GUIDE ROD (#1-4)	A0770311		A0770307	832.00037.00	
	GUIDE ROD (#5-6)	832.00015.00		A0770311		
4	AIR CYLINDER (#1-4)	35448		35448	245.00016.00	
	AIR CYLINDER (#5-6)	245.00006.00				
5	CLEVIS – AIR CYLINDER (#1-4)	35449		35449	A0770296	
	CLEVIS – AIR CYLINDER (#5-6)	35460				
6	FITTINGS – AIR CYLINDER	A0770136			35086K	
7	STROKE LIMITER (#1-4)	822.00966.00		A0770306	822.00997.00	
	STROKE LIMITER (#5-6)	822.00946.00		A0770310		

Knife Gate Sub-assembly HD (Optional)

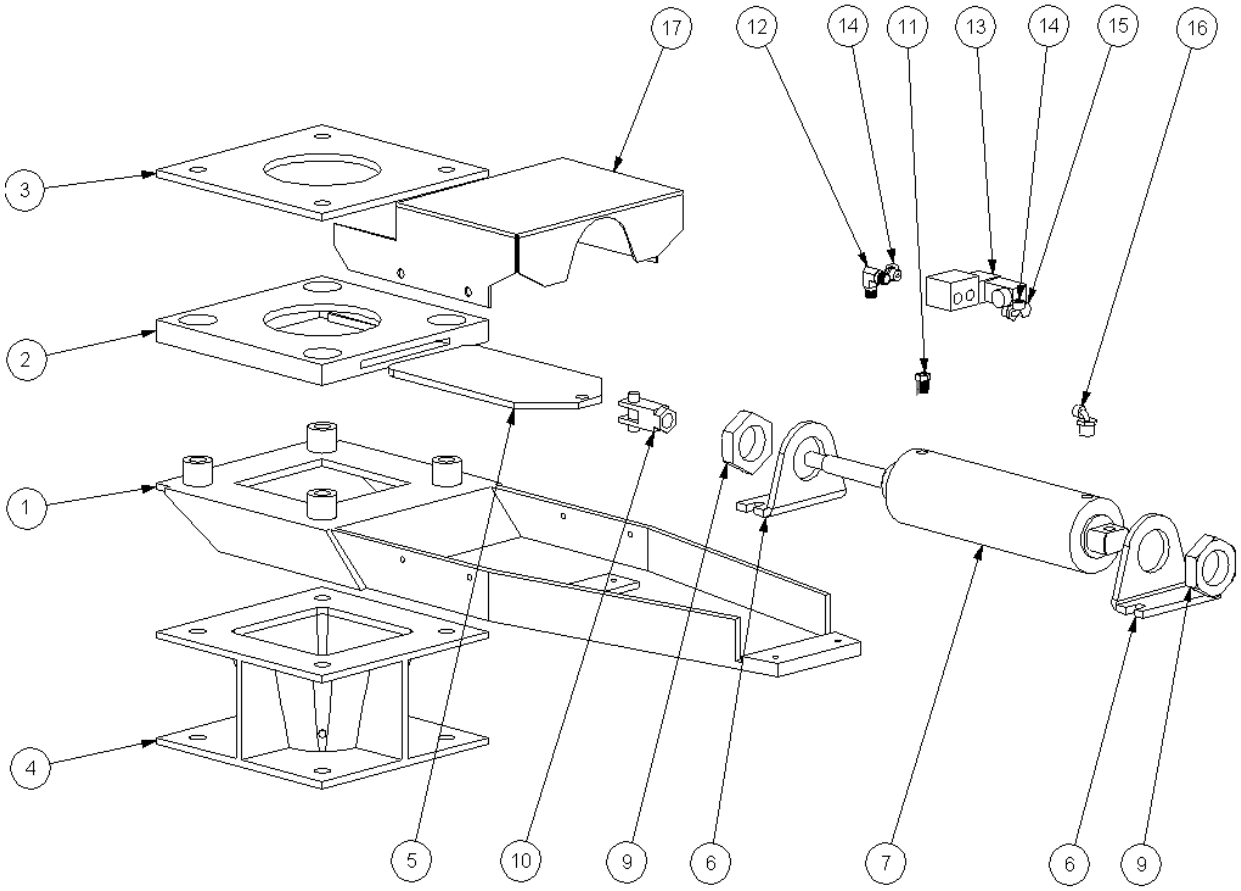


Figure 62: Typical Slide Gate (below mixer) Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	BASE FRAME	07990				
2	MOLDED THROAT	53413				
3	SPACER PLATE	08286				
4	FLANGE ADAPTER	08292				
5	KNIFE BLADE	10644				
6	MOUNTING BRACKET – AIR CYLINDER	33088				
7	AIR CYLINDER	33091				
8	-	-				
9	MOUNTING NUT – AIR CYLINDER	A0553239				
10	CLEVIS – AIR CYLINDER	33090				
11	BUSHING 1/4 - 1/8 NPT	35014				
12	ELBOW 1/8 NPT	35118				
13	SOLENOID 4-WAY 24VDC	33128				
14	FITTING – 1/8 NPT X 1/4 TUBE	35086K				
15	MUFFLER 1/8 NPT FLUSH	35157				
16	FITTING – 1/4 NPT X 1/4 TUBE	35154				
17	SAFETY SHIELD	A0770362	A0770363	A0770364	A0770365	
18	STROKE LIMITER PIPE (NOT SHOWN)	07990B				

Knife Gate Sub-assembly RD (Optional)

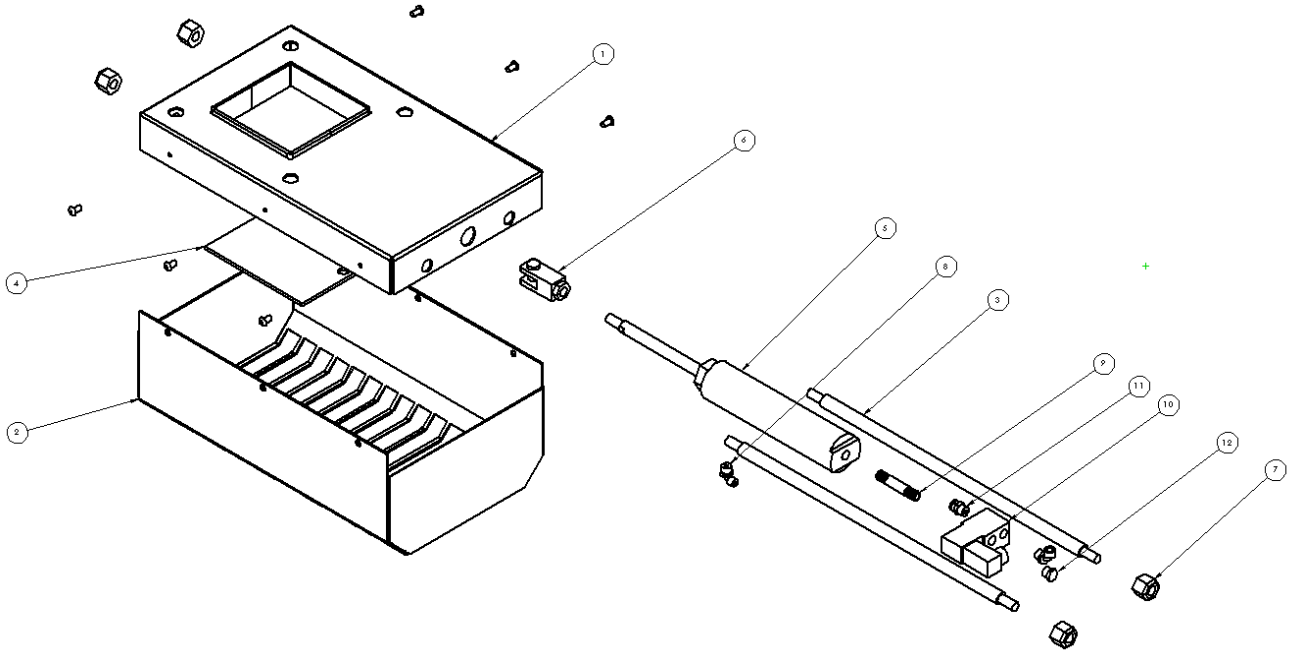


Figure 63: Typical Slide Gate (floor stand) Assembly Parts List

#	DESCRIPTION	All Models
1	HOUSING FRAME	872.00297.00
2	GUARD SAFETY COVER	872.00298.00
3	ROD GUIDE	832.00049.00
4	GATE – SLIDE BLADE	872.00236.00
5	AIR CYLINDER	245.00016.00
6	CLEVIS – AIR CYLINDER	A0770296
7	NUT – LOCKING	A0533862
8	FITTING ELBOW 1/8 NPT X 1/4 TUBE	35086K
9	NIPPLE 1/8 NPT	025.01020.00
10	SOLENOID 4-WAY 24VDC	33128
11	FITTING STRAIGHT 1/8 NPT X 1/4 TUBE	35085K
12	FITTING MUFFLER STONE 1/8 NPT	35157

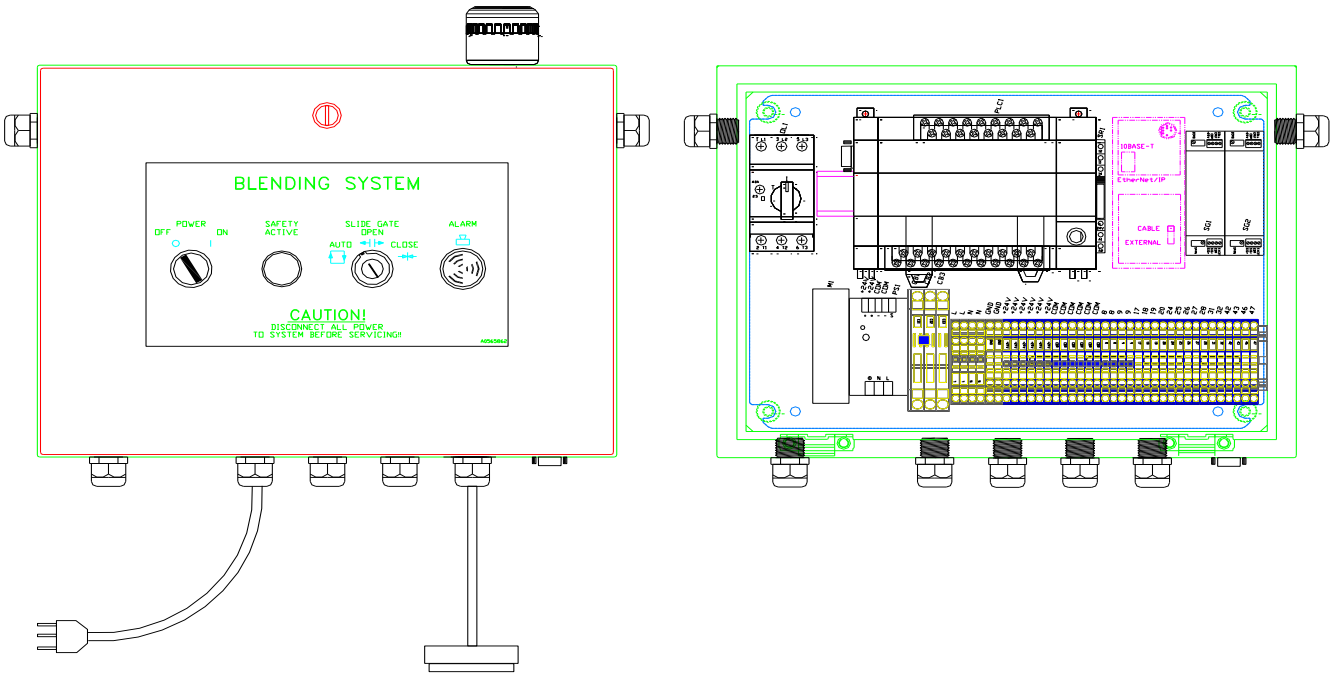


Figure 64: Typical Allen-Bradley Controller Main Parts List*

#	Description	150	500	900	2500	4000	6000
1	Allen-Bradley PLC MicroLogix 1500	891.00024.00					
2	Allen-Bradley PLC Base Unit	891.00744.00					
3	24 vdc Power Supply	A0563932					
4	Calex Module – Load Cell Amplifier	724.00117.00					
5	Alarm Light Red Beacon 24 vdc	736.00063.00					
6	Alarm Horn 95db 24vdc	736.00059.00					
7	Motor Contactor	729.00202.02					
8	Motor Overload – MCP (115v unit)	A0558252			A0558255	A0558256	
	Motor Overload – MCP (230v unit)	A0558251			A0568738	A0558255	
9	Power Switch (115v unit)	717.01040.02					
	Power Switch (230v unit)						
10	Safety Active 24vdc						

Figure 65: Typical RED LION Display Main Parts List

#	Description		150	500	900	2500	4000	6000
1	Red Lion G306A Touchscreen Display	6” Main	744.00325.00					
		6” Remote	744.00325.00					
2	Enclosure Mounting Feet		A0567132					
3	Display – 8 ft Connection Cable		A0565856					
	Display – 50 ft Connection Cable		A0565899					

*** Parts list for current blender software (Rev 4.X or higher). Consult factory for Pre 4.X software blender.**

PORTANT INFORMATION CONCERNING MAX. BLENDING RATE LISTED:

- The standard maximum blending rate is based on a 3-component blend running 80% virgin, 18% regrind (free-flowing) and 2% pelletized color. Each additional component reduces the overall maximum rate by 20% per component.
- Recipes with more than 50% regrind will significantly reduce the throughput, and minor ingredient accuracy, of the blender. Consult the factory for achievable rates.
- Two component recipes may REDUCE overall blender throughput due to reduced available weigh hopper capacity. Consult the factory for achievable rates.
- Rates are based on dry, free-flowing virgin pellets with a bulk density of 35 lbs./ft^3. Rates will vary as a result of the number of blender components, the materials, and the recipe(s) used. Consult the factory for guaranteed rates.
- Material samples are required for testing prior to shipment for guaranteed rates. Consult the AEC Sales Department for shipping instructions and for the amounts of each material to send for testing. A test request form must be submitted,

Component Watt Rating

<table>
<tr><th>120/24 VDC Supply</th><th>AB/Mitsubishi PLC</th><th colspan="2">IEC Contactors</th><th>Relays</th><th>Solenoids</th><th>Lamps</th></tr>
<tr><td rowspan="2">.6A 24W</td><td rowspan="2">Allen Bradley 88</td><td>CO9-30 8/70VA</td><td>C37 9/80VA</td><td rowspan="2">4PDT 1.2VA</td><td rowspan="2">¼" 16/30VA</td><td rowspan="2">Full Volt 3W</td></tr>
<tr><td>C43 10/130VA</td><td>C60-85 16/200VA</td></tr>
<tr><td>2.1A 50W</td><td>Mitsubishi 50W</td><td>D110 37/370VA</td><td>D180 37/370VA</td><td>2DPT 1.2VA</td><td>½" 16/30VA</td><td>Transformer 1.5W</td></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td colspan="2">D250, D300 37/370VA</td><td></td><td></td><td></td></tr>
<tr><td>D400 37/370VA</td><td>D600 37/370VA</td><td>Machine Tool 19/138VA</td><td>¾", 1" 6.1W</td><td>IDI INCAND .5W</td></tr>
</table>

Mixer Motor Amp Rating

Part Number	HP	FLA @ 230VAC	FLA @ 115VAC	Starting Current @ 230VAC	Starting Current @ 115VAC
720.00001.00	1/6	1.0 AMP	2.1 AMP	2.5 AMP	5 AMP
720.00002.00	1/3	3.3 AMP	6.6 AMP	18 AMP	36 AMP
720.00030.00	1/2	N/A	7.8 AMP	24 AMP	48 AMP
51354	1	7.0 AMP	14.0 AMP	21 AMP	41 AMP

7-3 Spare Parts Kits *

Figure 66: Blender Spare Parts Listing

Spare Parts Kits	BD; CSG; SGBD					
	150	**500**	**900**	**2500**	**4000**	**6000**
"A" Kit - Consumables	**A0574120**	**A0574134**	**A0574137**	**A0574125**	**A0574140**	**A0574143**
Load cell assembly	#	724.00767.00	724.00768.00	724.00770.00	724.00771.00	724.00772.00
Mixer high-level sensor	#	A0556548				
"B" Kit - Minimal Downtime	**A0574121**	**A0574135**	**A0574138**	**A0574126**	**A0574141**	**A0574144**
All "A" kit parts	A0574120	A0574134	A0574137	A0574125	A0574140	A0574143
Slide Gate Air Cylinder -Majors	#	35448			245.00016.00	
Slide Gate Air Cylinder -Minors	#	245.00006.00		35448	245.00016.00	
Weigh Hopper Air cylinder	#	245.00003.00		A0770248		
Contactor - mixer motor	729.00202.02					
Power supply – 24 vdc	A0563932					
Mixer Door Safety Switch	#	717.00078.00				
Circuit Breaker (2 amp) x 2	727.00207.00					
Circuit Breaker (3 amp) x 2	727.00208.00					
"C" Kit (24/7 Operation or International)	**A0574122**	**A0574136**	**A0574139**	**A0574127**	**A0574142**	**A0574145**
All "A" and "B" Kit Parts	A0574121	A0574135	A0574138	A0574126	A0574141	A0574144
Second Load Cell Assembly w/o plug	#	724.00767.00	724.00768.00	724.00770.00	724.00771.00	724.00772.00
Mixer Motor Protector (overload)	A0558252			A0558255		
Calex Module	724.00117.00					
Other Recommended Parts	**150**	**500**	**900**	**2500**	**4000**	**6000**
Mixer gear motor	CTH002553	720.00001.00		720.00002.00	720.51354.00	
Reducer	N/A				160.00280.00	
Right Angle Reducer					51415	
Mixer agitator	#	872.00101.00	872.00102.00	872.01716.00	872.01470.00	
Mixer coupling	#	832.00010.00		832.00030.00		
Weigh hopper assembly	#	A0771684	A0771685	A0771662	A0771704	A0771705
4-component SMC valve stack assembly	CF	A0771740			A0771868	
6-component SMC valve stack assembly	N/A	A0771741			A0771869	
A-B PLC Micrologix CPU	891.00024.00					
Allen-Bradley PLC flash memory card	891.00008.00					
Red Lion Touch Screen	744.00325.00					

*** Parts list for current blender software (Rev 6.1 or higher). Consult factory for Pre 6.1 software blender.**

7-4 Addendum (Service Supervisor Information)

- **This section of the manual should not be used by untrained personnel – blender controller and/or program can be compromised!**
- **Hidden, programmable features and hidden menu pages should not be made available to floor operators. These pages include the Service Supervisor Information addendum located in this section. Unauthorized changes to these factory settings by inexperienced operators may prevent the unit from operating properly, and may void part or all of the warranty.**

⚠CAUTION

After all selections are made: Keep pressing the  ***button until the unit returns to the Recipe menu.***

- **Programmable features should not be accessed by inexperienced operators or inexperienced plant personnel. Unauthorized changes may prevent the blender from operating properly and may void part or all of the warranty.**
- **Call the Service Department for assistance or for further explanation of these or any other programmable features, which may or may not be shown in this manual.**
- **Information included in this manual is subject to change without notice.**

Passwords

- User Password “5413”
- Maintenance Password “3145348”

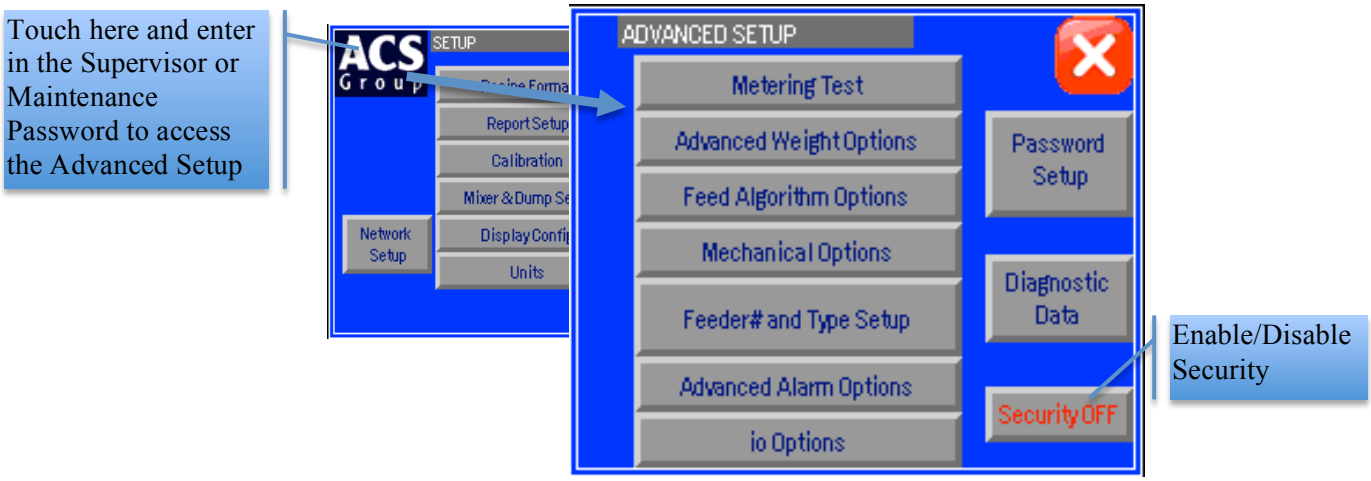
⚠CAUTION

Maintenance password should only be supplied to qualified personnel! The program can be compromised.

Programmable Settings

The Batch blender software program has been designed to allow some customizing to achieve certain desired operating parameters. The following is a listing of the selections that are "field" programmable, followed by the procedure for doing so.

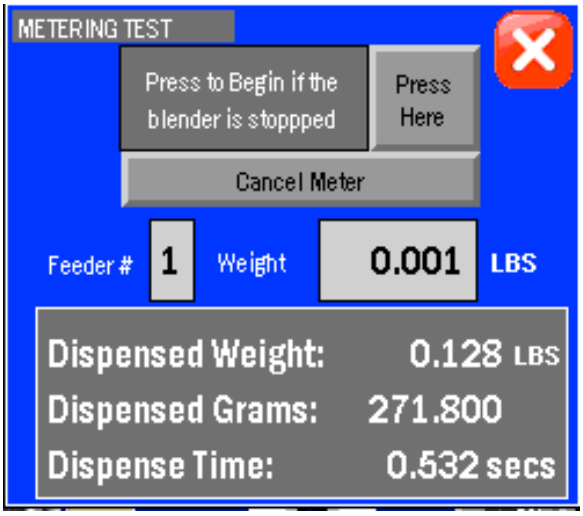
This menu is accessed by pressing the manufacturer's icon when in the "Setup" Directory Screen menu.



Enter the long password "3145348" and press "Enter".

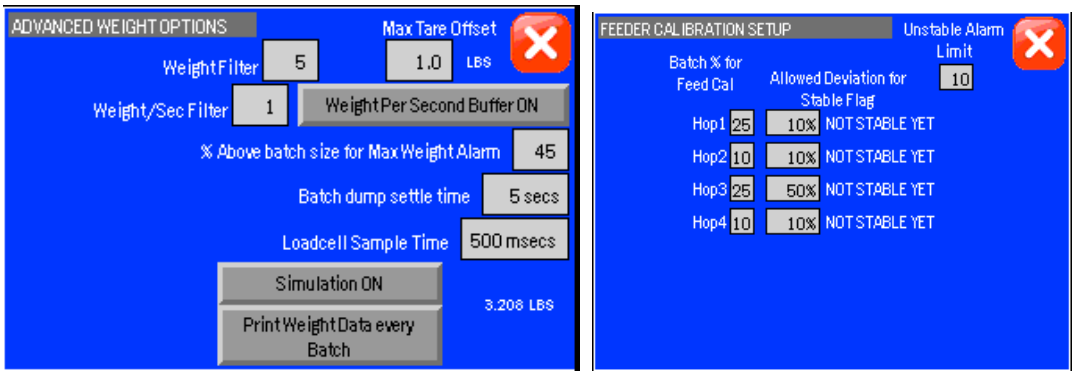
Advanced Setup Menu

Metering Test Screen



This screen is useful when testing the metering performance of each feeder. The user can perform test to evaluate the mechanical standard deviation of the gate or auger. This test meters for the calculated time based off the target weight entered on this screen. The blender does not retry or adjust the time of the meter to reach the target. This allows you to open the gate for several feeds using the same time. You can then record the Dispensed Grams and plot the standard deviation of the gate. The other purpose of this screen is to verify that the dispensed weight displayed is correct. You can perform a meter and then pull the weigh hopper to weigh the material on a gram scale. Refer to the Troubleshooting Section of this manual for additional details.

Advanced Weight Options Screen and Feeder Calibration Setup



WEIGHT FILTER: The number of loadcell samples to be averaged when determining weight.

MAX TARE OFFSET: Maximum allowed weight remaining in weigh hopper after dumping before "Calibration Error Alarm".

WEIGHT/SEC FILTER: This is only used if the "Weight Per Second Buffer" is off. This is a weighted median filter that will dampen changes to the Weight /Sec value of each feeder. Increasing this will dampen the change.

WEIGHT PER SECOND BUFFER: When enabled the blender analyzes 3 consecutive batches "Weight/Sec" measured values. If these 3 are within the "Allowed Deviation for Stable Flag" ("Feeder Calibration Setup Page") then the measurements are considered stable. If the blender has went through a certain number of batches without stabilizing ("Unstable Alarm Limit" on "Feeder Calibration Setup Page") then an "Unstable Alarm" will occur for that feeder. The 3 measurements are averaged to come up with the "Wt/Sec" value ("Feeder Calibration Page"). This is then used when calculating the metering time for that ingredient. When this feature is disabled then every feed calculates a new Wt/Sec value that is then weighted using the Weight/Sec Filter in order to smooth out changes.

% ABOVE BATCH SIZE FOR MAX WEIGHT ALARM: This is the trigger point above the batch size that will initiate a "Hopper Over Max Alarm". This is designed to prevent the weigh hopper from being overfilled volume wise. Care should be taken when adjusting the batch size of this parameter to make sure that they are appropriate.

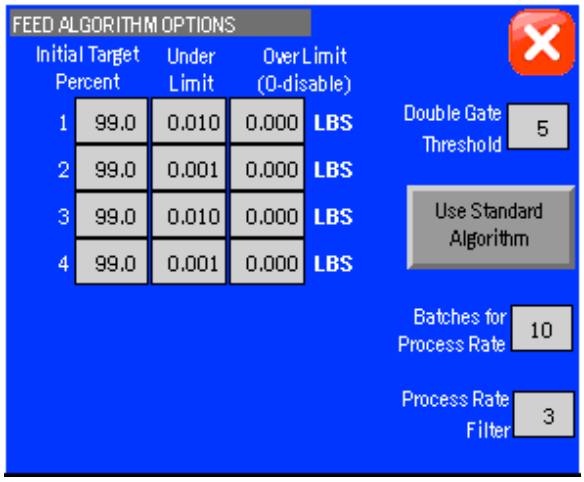
BATCH DUMP SETTLE TIME: Amount of time to weight after batch door is closed before taking weight snapshot.

LOADCELL SAMPLE TIME: The sample time for each weight snapshot. It is important that the mechanical settle time for each feeder be longer than WEIGHT FILTER * LOADCELL SAMPLE TIME. For instance if the defaults are used then you end up with 5 * .5 seconds = 2.5 seconds. Therefore 3 seconds is the absolute shortest settle time you can have for each feeder (under MECHANICAL OPTIONS).

SIMULATION: Simulation is only used for Demo purposes and should not be turned on for normal blender operation. When enabled this allows a user to practice using the controller as if it were attached to an actual blender. A PLC is required for this simulation.

PRINT WEIGHT DATA EVERY BATCH: The blender's touch screen has a serial printer port that you can connect a serial ASCII printer to. The data that is dumped to a printer is the same data shown on the Recipe Screen. No averaging is done with the data shown to the Customer. Targets vs. Actual are actually what is in the batch.

Feed Algorithm Options Screen



INITIAL TARGET PERCENT: This is the % of target that the feeder will use to calculate the initial meter time of each batch for that feeder. After the feeder has metered initially for a particular batch then this value is not used.

UNDER LIMIT: Allowed underfeed of target weight for that feeder. After the meter has completed the weight is observed. If the weight is within the target by this amount then that feeder has completed metering and the blender moves to the next ingredient. If it is not satisfied than the blender will repeat metering until this amount is reached. The blender will retry forever or until the operator hits  on the recipe page.

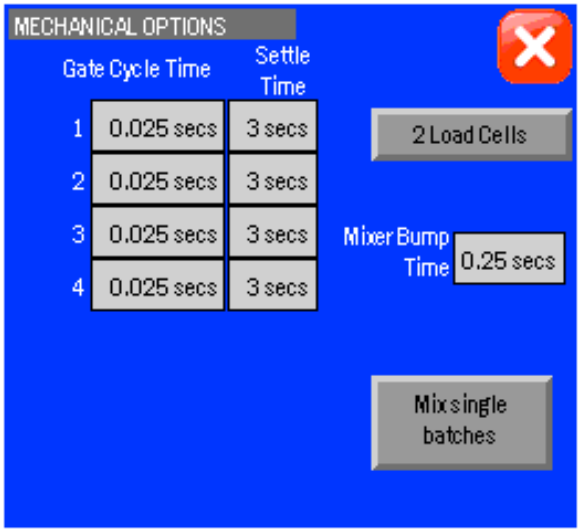
OVER LIMIT: If after metering it is determined that a feeder has metered a value greater than the target + Over Limit weight then a counter is incremented. If this counter reaches the OVERFEED COUNT LIMIT (Advanced Alarm Options Page) then a "OVERFEED ALARM" will occur.

DOUBLE GATE THRESHOLD: After a feeder has retried for this many retries then the GATE CYCLE TIME is temporarily doubled until the target is reached. This is used as a preventative measure in the case the user has set the GATE CYCLE TIME too low for that feeder (Mechanical Options Page).

BATCHES FOR PROCESS RATE: The process rate on the Inventory Screen is the rate at which the customer is using the blend. Since a batch blender does not have a loss in weight hopper to measure this take-away rate then the process rate is only an estimate. This value helps to improve that value. This is the number of batches required before calculating the process rate. The blender must hit high level at least twice and have made this number of batches before a rate will be calculated. The error is always +/- 1 batch. If you set this value to "10" then that means the process rate error will be +/- 10%. If you want to improve the error increase this value, but this will delay getting a process rate number. If set to 100 then the error would be +/- 1%.

STANDARD VS ADVANCED ALGORITHM: The blender should be set to Standard for most cases. However, if enabled you can meter in the first ingredient and then all other ingredients will be recalculated based on the actual meter of the first ingredient. To do this you will need to lower the batch size by the % you expect the first ingredient to be in error. You must also increase the % ABOVE BATCH SIZE FOR MAX WEIGHT ALARM by the same amount. Doing this will lower your overall throughput capability of the blender, but will increase accuracy by about a factor of 10.

Mechanical Options Screen



GATE CYCLE TIME: The gate cycle time has been measured and set at the factory, but might need to be adjusted if we change the mechanical design of the gate, solenoids, or air cylinders. This setting will vary depending on whether you are using a gate or an auger. Essentially it is the amount of time required to open/close or start/stop the feeding device.

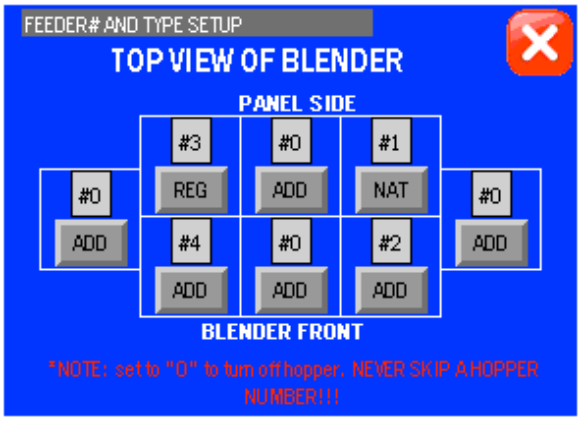
SETTLE TIME: The amount of time to settle the weigh hopper after the feeder has metered before determining final weight. Be sure that this is set to a value greater than WEIGHT FILTER * LOADCELL SAMPLETIME (both on "Advanced Weight Options Page"). Never set less than 3 seconds.

NUMBER OF LOADCELLS: based on your blender's configuration.

MIXER BUMP TIME: if the mixer is at high level it will bump the mixer on for this many seconds every 30 seconds. This helps prevent an issue where the high level prox is set incorrectly and picking up the mixer blade instead of actually being at high level.

MIX SINGLE BATCHES: Mixes single batches and then dumps them into the process. If set to "MIX TO FULL" then it will mix multiple batches together before dumping them into the process. This is useful when filling gaylords in order to achieve batch to batch averaging.

Feeder and Type Setup

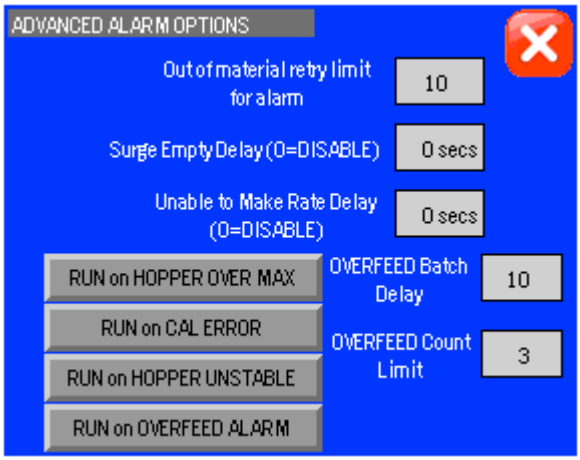


This page allows you to configure how many hoppers your unit has as well as the position of each feeder visually. You can make any hopper any number as long as you don't skip a number. For instance if you have a 4 component blender then you will need to make sure you have the numbers 1-4 configured into a hopper. Never assign the same number to multiple feeders. Set unused hoppers to "0" will hide them on the recipe page. You should configure the blender to match the actual physical location of each hopper to make it easier on the operator. However, this is only a visual issue and does not effect operation of the blender.

This screen also allows you to modify the type of each feeder. In most cases, the user will want to keep regrind on hopper 3 because that blender has been specifically designed to handle the regrind. These settings should only be modified under special circumstances.

If the blender is configured in "EZ Mode" then one hopper must be configured for Regrind and at least one hopper must be configured for Virgin material. If this is incorrect, a message will be given on the Recipe Screen. You can configure as many Regrind or Virgin hoppers as you want. Hopper Material Type tags are only used in EZ MODE.

Advanced Alarm Options



OUT OF MATERIAL RETRY LIMIT FOR ALARM: the number of retries before an out of material alarm is given. The blender also uses the gain in weight to determine this, but in the case where the weight change wasn't enough this is used to catch the Out of Material condition. Low Level prox switches can also be used to give the earliest indication.

SURGE EMPTY DELAY: the number of seconds before triggering a Surge Hopper Empty Alarm. This is an optional feature and doesn't necessarily represent the blender's surge hopper. Typically this can be used to indicate the take off box below the blender is empty.

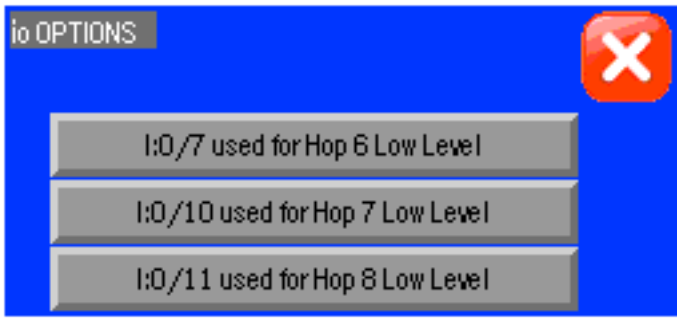
UNABLE TO MAKE RATE DELAY: if the high level prox hasn't been covered after this amount of time then an alarm is given indicating that the blender cannot keep up.

OVERFEED BATCH DELAY: the number of batches allowed upon starting the blender before examining for an overfeed condition.

OVERFEED COUNT LIMIT: the number of overfeeds that must occur before an alarm.

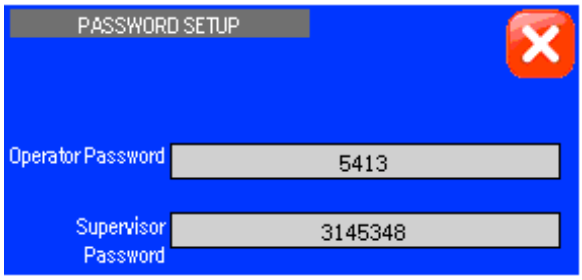
RUN/STOP ON ALARM BUTTONS: determines if the blender should continue running or should stop when these alarms occur. If the blender is stopped due to an alarm condition then the alarm will stay active until the operator silences it.

IO Options



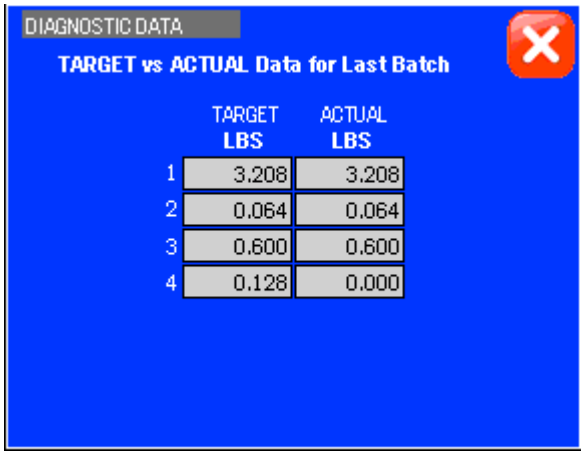
This page is used to configure optional alarm inputs. The options are HOP6 low level or Mixer instant close feature (used with metal separator). HOP7 low level or Surge Hopper Empty Feature (used to detect a low level anywhere). HOP8 low level or Mixer Failure Prox (used to detect a mixer that has stopped turning).

Password Setup



Use this page to configure all passwords.

Diagnostic Data



This page is used to monitor target vs. actual data for all feeders.

Factory Default Parameters

ACS Group	Blender Factory Default Setup Parameters												
	Last Modified: 2/1/13			Revision Level: F				Modified By: Keith Packard			A0770601		
Model Number	OS-007 SGB-450	OS-014 SGB-900	OS-070 SGB-3500	OS-100 SGB-5000	BD-150 SGDB-150 CSG-150	BD-500 SGBD-500 CSG-500	BD-900 SGBD-900 CSG-900	BD-2500 SGBD-2500 CSG-2500	BD-4000 SGBD-4000 CSG-4000	BD-6000 SGBD-6000 CSG-6000	OA-012 SGA-012	OA-030 SGA-030	OA-060 SGA-060
ALL WEIGHT VALUES RECORDED IN POUNDS (DIVIDE BY 2.20462 FOR KILOGRAMS)													
RECIPE FORMAT													
Recipe Entry Mode	"EZ" MODE / "QUICK SET" MODE										Percentage Mode		
Metering Order	12345678												
Batch Size (lbs)	3.5	7.0	35.0	35.0	2.0	4.0	8.0	25.0	35.0	45.0	7.0	20.0	35.0
Inventory Shutdown	0												
Batch Ready Mode	Enabled												
AutoStart Mode	Enabled												
Weighing mode	Every Batch												
Recipe Change	Change recipe without stopping												
REPORT SETUP													
Blender Number	1												
Auto Print Inventory	Disabled												
Auto Clear Inventory	Disabled												
Auto Print/Clear Interval	8												
Start Hour	0												
SCALE CALIBRATION													
	PERFORM A SCALE CALIBRATION ON ALL MANUFACTURED UNITS												
DIRECT SCALE READOUT													
	LOG THESE VALUES AFTER THE SCALE CAL WITH THE ORDER INFORMATION												
FEEDER CALIBRATION													
Hop1 wt/sec (lbs)	1.00	1.00	2.00	4.00	0.25	1.00		1.50	10.00		MUST CALIBRATE		
Hop2 wt/sec (lbs)	0.25	0.25	0.50	0.50	0.25				3.00		MUST CALIBRATE		
Hop3 wt/sec (with square gate) (lbs)	1.00	1.00	4.00	8.00	0.25	2.00		1.50	10.00		MUST CALIBRATE		
Hop4 wt/sec (lbs)	0.25	0.25	0.50	0.50	0.25				3.00		MUST CALIBRATE		
Hop5 wt/sec (lbs)	0.25								3.00		MUST CALIBRATE		
Hop6 wt/sec (lbs)	0.25								3.00		MUST CALIBRATE		
Hop7 wt/sec (lbs)	0.25								1.00		MUST CALIBRATE		
Hop8 wt/sec (lbs)	0.25								1.00		MUST CALIBRATE		
	"Feeder Calibration wt/sec" values assume stroke limiters installed in hoppers #2 & #4 & #5 thru #8												
FEED CAL OPTIONS													
Hop1 Batch % for feeder cal	25										Main = 25 -or- Additive = 10		
Hop2 Batch % for feeder cal	10										Main = 25 -or- Additive = 10		
Hop3 Batch % for feeder cal	25										Main = 25 -or- Additive = 10		
Hop4 Batch % for feeder cal	10										Main = 25 -or- Additive = 10		
Hop5 Batch % for feeder cal	10										Main = 25 -or- Additive = 10		
Hop6 Batch % for feeder cal	10										Main = 25 -or- Additive = 10		
Hop7 Batch % for feeder cal	10										Main = 25 -or- Additive = 10		
Hop8 Batch % for feeder cal	10										Main = 25 -or- Additive = 10		
Hop1 Allowed Deviation for Stable (%)	10												
Hop2 Allowed Deviation for Stable (%)	10												
Hop3 Allowed Deviation for Stable (%)	50												
Hop4 Allowed Deviation for Stable (%)	10												
Hop5 Allowed Deviation for Stable (%)	10												
Hop6 Allowed Deviation for Stable (%)	10												
Hop7 Allowed Deviation for Stable (%)	10												
Hop8 Allowed Deviation for Stable (%)	10												
Unstable Alarm Limit	10												
MIXER AND DUMP SETUP													
Mixing Time	10												
Remix Time	0												
Dump Time	4		6		1		2				6		
Dump Delay	0												
Dump Cycles	2						1						
Mixer Dump Time (w/o knifegate set to 0)	4		6			4			6		6		
Continuous/Timed Mixing	TIMED												
ALARM SETUP													
Hop1 Continue/Stop on Out of Material	STOP												
Hop2 Continue/Stop on Out of Material	STOP												
Hop3 Continue/Stop on Out of Material	STOP												
Hop4 Continue/Stop on Out of Material	STOP												
Hop5 Continue/Stop on Out of Material	STOP												
Hop6 Continue/Stop on Out of Material	STOP												
Hop7 Continue/Stop on Out of Material	STOP												
Hop8 Continue/Stop on Out of Material	STOP												
Hop1 Alarm/No Alarm on Out of Material	ALARM												
Hop2 Alarm/No Alarm on Out of Material	ALARM												
Hop3 Alarm/No Alarm on Out of Material	ALARM												

ACS Group	Blender Factory Default Setup Parameters												
	Last Modified: 2/1/13			Revision Level: F				Modified By: Keith Packard			A0770601		
Model Number	OS-007 SGB-450	OS-014 SGB-900	OS-070 SGB-3500	OS-100 SGB-5000	BD-150 SGDB-150 CSG-150	BD-500 SGBD-500 CSG-500	BD-900 SGBD-900 CSG-900	BD-2500 SGBD-2500 CSG-2500	BD-4000 SGBD-4000 CSG-4000	BD-6000 SGBD-6000 CSG-6000	OA-012 SGA-012	OA-030 SGA-030	OA-060 SGA-060
ALL WEIGHT VALUES RECORDED IN POUNDS (DIVIDE BY 2.20462 FOR KILOGRAMS)													

Hop4 Alarm/No Alarm on Out of Material	ALARM
Hop5 Alarm/No Alarm on Out of Material	ALARM
Hop6 Alarm/No Alarm on Out of Material	ALARM
Hop7 Alarm/No Alarm on Out of Material	ALARM
Hop8 Alarm/No Alarm on Out of Material	ALARM
Missing Ingredient Comp	Off
Accept Recipe Alarm	Off
Out of Material Alarm Silence Delay	60
NETWORK SETUP	
Ethernet Module Configured Here	YES
Modbus+ Enabled/Disabled	DISABLED
IP Address	192.168.0.10
Subnet Mask	255.255.255.0

ACS Group	Blender Factory Default Setup Parameters			A0770601
	Last Modified: 2/1/13	Revision Level: F	Modified By: Keith Packard	

Model Number	OS-007 / SGB-450	OS-014 / SGB-900	OS-070 / SGB-3500	OS-100 / SGB-5000	BD-150 / SGDB-150 / CSG-150	BD-500 / SGBD-500 / CSG-500	BD-900 / SGBD-900 / CSG-900	BD-2500 / SGBD-2500 / CSG-2500	BD-4000 / SGBD-4000 / CSG-4000	BD-6000 / SGBD-6000 / CSG-6000	OA-012 / SGA-012	OA-030 / SGA-030	OA-060 / SGA-060

ALL WEIGHT VALUES RECORDED IN POUNDS (DIVIDE BY 2.20462 FOR KILOGRAMS)

ADVANCED WEIGHT OPTIONS													
Weight Filter	5												
Max Tare Offset (lbs)	1				0.5				1				
Wt/Sec Filter	1												
Weight/sec Buffer	ON												
% Above batch size for max weight	45												
Time to settle hopper after batch dumped	5												
Loadcell Sample Time (ms)	500												
Simulator	Simulator off												
Weight Data Printing	Print Weight Data												
FEED ALGORITHM OPTIONS													
Hop1 Initial % of Target	98				99			98			100		
Hop2 Initial % of Target	99										100		
Hop3 Initial % of Target	98				99			98			100		
Hop4 Initial % of Target	99										100		
Hop5 Initial % of Target	99										100		
Hop6 Initial % of Target	99										100		
Hop7 Initial % of Target	99										100		
Hop8 Initial % of Target	99										100		
Hop1 Allowed Underfeed (lbs)	0.004				0.001			0.004			Main = 0.15 -or- Additive = 0.03		
Hop2 Allowed Underfeed (lbs)	0.001										Main = 0.15 -or- Additive = 0.03		
Hop3 Allowed Underfeed (lbs)	0.004				0.001			0.004			Main = 0.15 -or- Additive = 0.03		
Hop4 Allowed Underfeed (lbs)	0.001										Main = 0.15 -or- Additive = 0.03		
Hop5 Allowed Underfeed (lbs)	0.001										Main = 0.15 -or- Additive = 0.03		
Hop6 Allowed Underfeed (lbs)	0.001										Main = 0.15 -or- Additive = 0.03		
Hop7 Allowed Underfeed (lbs)	0.001										Main = 0.15 -or- Additive = 0.03		
Hop8 Allowed Underfeed (lbs)	0.001										Main = 0.15 -or- Additive = 0.03		
Double Gate Threshold	5												
Feed Algorithm	Use Standard Algorithm												
Batches for process rate	10												
Process Rate Filter	3												
	"Initial Target %" and "Allowed Underfeed" values assume stroke limiters installed in hoppers #2 & #4 & #5 thru #8												
MECHANICAL OPTIONS *"Gate Cycle Time" values assume stroke limiters installed in hoppers #2 & #4 & #5 thru #8*													
Hop1 Gate Cycle Time	0.025										0.05		
Hop2 Gate Cycle Time	0.025										0.05		
Hop3 Gate Cycle Time	0.05				0.025				0.05				
Hop4 Gate Cycle Time	0.025										0.05		
Hop5 Gate Cycle Time	0.025										0.05		
Hop6 Gate Cycle Time	0.025										0.05		
Hop7 Gate Cycle Time	0.025										0.05		
Hop8 Gate Cycle Time	0.025										0.05		
Hop1 Settle Time	3												
Hop2 Settle Time	3												
Hop3 Settle Time	3												
Hop4 Settle Time	3												
Hop5 Settle Time	4							3					
Hop6 Settle Time	4							3					
Hop7 Settle Time	5							3					
Hop8 Settle Time	5							3					
Loadcells	2 Loadcells				1 Loadcell			2 Loadcells			1 Loadcell		
Mixer Bump Time to Detect high level	0.25												
Batch Mixing	Mix Single Batches												
FEEDER AND TYPE SETUP **CONFIGURE APPROPRIATE HOPPER NUMBERS ACCORDING TO ORDER AND MECHANICAL LAYOUT*													
Hop1 Feeder Type	VIRGIN												
Hop2 Feeder Type	ADDITIVE												
Hop3 Feeder Type	REGRIND												
Hop4 Feeder Type	ADDITIVE												
Hop5 Feeder Type	ADDITIVE												
Hop6 Feeder Type	ADDITIVE												
Hop7 Feeder Type	ADDITIVE												
Hop8 Feeder Type	ADDITIVE												
ADVANCED ALARM SETUP													
Surge Hopper Empty Delay	0												
Out of Material Retry limit before alarm	10												
Unable to Make Rate Delay	0												
Overfeed Batch Delay	10												
Overfeed Count Limit	3												

ACS Group	Blender Factory Default Setup Parameters			A0770601
	Last Modified: 2/1/13	Revision Level: F	Modified By: Keith Packard	

Model Number	OS-007 / SGB-450	OS-014 / SGB-900	OS-070 / SGB-3500	OS-100 / SGB-5000	BD-150 / SGDB-150 / CSG-150	BD-500 / SGBD-500 / CSG-500	BD-900 / SGBD-900 / CSG-900	BD-2500 / SGBD-2500 / CSG-2500	BD-4000 / SGBD-4000 / CSG-4000	BD-6000 / SGBD-6000 / CSG-6000	OA-012 / SGA-012	OA-030 / SGA-030	OA-060 / SGA-060

ALL WEIGHT VALUES RECORDED IN POUNDS (DIVIDE BY 2.20462 FOR KILOGRAMS)

IO OPTIONS	
I:O/7 used for	Hop 6 Low Level
I:O/11 used for	Hop 8 Low Level
I:O/10 used for	Hop 7 Low Level
PASSWORDS	
User Password	5413
Maintenance Password	3145348
LOADCELL CALEX MODULE DIPSWITCH SETTINGS	
Switches set to "ON" position	#1 & #2
SPECIAL NOTES	
2 - Component Blenders with R.A.M. - Consult Engineering	

7-5 COMMUNICATIONS AND WEB SERVER

The Blender has a Red Lion touch screen that has a built in Ethernet port. This port's IP address can be configured via SETUP/DISPLAY CONFIG. Once configured you can connect the display to your plant's network. The display software has a built in webserver that will allow you to view and control your blender as if you were in front of it using any web enabled device or computer. If your facility has WiFi then the blender can be viewed controlled wirelessly via your smartphone.

Open your web browser and in the address bar enter the IP address for the blender's display. This will bring up a page where you can either view the blender's data logs or use the remote view feature.

AB COMMUNICATIONS INFORMATION

The AB blender uses a Micrologix 1500 LRP processor that communicates with the outside world using DF1 protocol with Ethernet hardware. Its Ethernet speed is 10/100 Mbits/second. The blender must be purchased from ACS with the Ethernet option. If this was not done at the time of purchase it can be added afterwards by consulting the factory. The blender has a programmable IP address and subnet mask that can be programmed from the Panel View that comes with the blender (refer to blender manual).

Ethernet is the standard that we support, but AB also supports Device Net, DF, and DH485 protocol to these PLCs. Refer to AB documentation.

The DF1 port is 19200 baud with no parity and a source ID of 1. This is usually not important since you will be communicating with the Ethernet module instead of directly with the DF1 port. Be sure that the DCOMM light is on by depressing the COMMS switch under the PLC front panel. After this light is on then you can touch the ACS icon and enter "5413", then select Ethernet Setup, program in you IP address, click "send config to module", and then wait about 45 seconds for it to program the new IP address. If you cannot ping the module then reboot the blender and try again 45 seconds after booting.

Below are the items that can be accessed for the blender:

- **ITEMS MARKED (R) ARE READ ONLY AND ITEMS MARKED (RW) ARE READ/WRITE**

GENERAL BLENDER INFO

1 (R) plc_version,n23:0 (xx.x)

2 (R) number_of_hoppers,n9:9 (number of hoppers on the blender)

3 (R) maximum_blender_throughput,L15:24,f39:1 (maximum rate blender can achieve)

4 (R) average_batch_time, n16:3 (average amount of time it takes to finish the batch)

5 (R) average_process_rate,L30:30,f39:2 (average rate at which the process is consuming blended material)

BLENDER STARTING AND STOPPING

1 (R) blender_started,b3:0/0

2 (RW) blender_start_request,b3:0/11 (toggle this to start or stop the blender, blender will switch it's current status, you must also reset this bit after completion)

3 (RW) abort_batch_request,b3:0/8 (toggle this to immediately stop the blender even if the batch is incomplete, you must also reset this bit after completion)

BLENDER ALARMS

1 (R) alarm_number,n11:74 (see below for description)

2 (R) hop1_out_of_material,b28:0/0

3 (R) hop2_out_of_material,b28:0/1

4 (R) hop3_out_of_material,b28:0/2

5 (R) hop4_out_of_material,b28:0/3

6 (R) hop5_out_of_material,b28:0/4

7 (R) hop6_out_of_material,b28:0/5

8 (R) hop7_out_of_material,b28:0/6

9 (R) hop8_out_of_material,b28:0/7

10 (R) hopper_over_max_alarm,b28:0/9

11 (R) empty_weight_exceeded,b28:0/10

12 (R) inventory_cleared,b28:0/11 (use this bit to record when an operator cleared the inventory at the blender)

13 (R) power_interruption,b28:0/15 (this alarm engages when the PLC loses power during a batch)

14 (R) hop1_low_level,b29:2/0 (this alarm is only available if the hoppers have low level prox switches)

15 (R) hop2_low_level,b29:2/1 (this alarm is only available if the hoppers have low level prox switches)

16 (R) hop3_low_level,b29:2/2 (this alarm is only available if the hoppers have low level prox switches)

17 (R) hop4_low_level,b29:2/3 (this alarm is only available if the hoppers have low level prox switches)

18 (R) hop5_low_level,b29:2/4 (this alarm is only available if the hoppers have low level prox switches)

19 (R) hop6_low_level,b29:2/5 (this alarm is only available if the hoppers have low level prox switches)

20 (R) hop7_low_level,b29:2/6 (this alarm is only available if the hoppers have low level prox switches)

21 (R) hop8_low_level,b29:2/7 (this alarm is only available if the hoppers have low level prox switches)

22 (R) plc_battery_low,s:5/11

23 (R) plc_memory_module_loaded,s:5/8 (this alarm only happens while upgrading the blender's software)

INVENTORY INFO

1 (RW) clear_inventory,b3:0/3 (toggle this to clear all inventory, you must also reset this bit after completion)

2 (RW) batch_counter,L30:31,f39:37 (number of batches made)

3 (R) hop1_inventory,L30:0 (this is the whole portion of the inventory) , f39:3 (entire number)

4 (R) hop2_inventory,L30:1 (this is the whole portion of the inventory) , f39:4 (entire number)

5 (R) hop3_inventory,L30:2 (this is the whole portion of the inventory) , f39:5 (entire number)

6 (R) hop4_inventory,L30:3 (this is the whole portion of the inventory) , f39:6 (entire number)

7 (R) hop5_inventory,L30:4 (this is the whole portion of the inventory) , f39:7 (entire number)

8 (R) hop6_inventory,L30:5 (this is the whole portion of the inventory) , f39:8 (entire number)

9 (R) hop7_inventory,L30:6 (this is the whole portion of the inventory) , f39:9 (entire number)

10 (R) hop8_inventory,L30:7 (this is the whole portion of the inventory) , f39:10 (entire number)

11 (R) batch_inventory,L30:35 (this is the whole portion of the inventory) , f39:11 (entire number)

12(R) hop1_fractional_inventory,L30:16 (this is the fractional part of the inventory .xxx)

13 (R) hop2_fractional_inventory,L30:17 (this is the fractional part of the inventory .xxx)

14 (R) hop3_fractional_inventory,L30:18 (this is the fractional part of the inventory .xxx)

15 (R) hop4_fractional_inventory,L30:19 (this is the fractional part of the inventory .xxx)

16 (R) hop5_fractional_inventory,L30:20 (this is the fractional part of the inventory .xxx)

17 (R) hop6_fractional_inventory,L30:21 (this is the fractional part of the inventory .xxx)

18 (R) hop7_fractional_inventory,L30:22 (this is the fractional part of the inventory .xxx)

19 (R) hop8_fractional_inventory,L30:23 (this is the fractional part of the inventory .xxx)

20 (R) batch_inventory_decimal_part,L30:39 (this is the fractional part of the inventory .xxx)

RECIPE INFO (THIS IS WHERE YOU RIGHT THE NEW RECIPE TO)

1 (RW) temp_recipe_entry_mode,n9:11 (0=percentage mode, 1=parts mode, 2=EZ mode)

2 (R) temp_batch_size_recipe_value,L21:53 (xxx.x lbs or kgs)

3 (RW) pv1_hop1_temp_recipe_value,L20:0 (xxx.xx, write your new recipe here)

4 (RW) pv1_hop2_temp_recipe_value,L20:1 (xxx.xx, write your new recipe here)

5 (RW) pv1_hop3_temp_recipe_value,L20:2 (xxx.xx, write your new recipe here)

6 (RW) pv1_hop4_temp_recipe_value,L20:3 (xxx.xx, write your new recipe here)

7 (RW) pv1_hop5_temp_recipe_value,L20:4 (xxx.xx, write your new recipe here)

8 (RW) pv1_hop6_temp_recipe_value,L20:5 (xxx.xx, write your new recipe here)

9 (RW) pv1_hop7_temp_recipe_value,L20:6 (xxx.xx, write your new recipe here)

10 (RW) pv1_hop8_temp_recipe_value,L20:7 (xxx.xx, write your new recipe here)

11 (R) pv1_recipe_error_message,n9:2 (1=total not 100%, 2=feeder type error, 3=entry over 100%)

12 (R) pv1_accept_recipe_enabled,b3:0/4 (this bit goes high if a new recipe is valid)

13 (RW) pv1_accept_recipe_requested,b3:0/6 (toggle this bit to accept a valid recipe, you must also reset this bit after completion)

CURRENT RECIPE INFO (THIS IS THE RECIPE THAT IS CURRENTLY BEING MADE)

1 (R) current_recipe_entry_mode,n9:1 (0=percentage mode, 1=parts mode, 2=EZ mode)

2 (R) current_batch_size_recipe_value,L21:20 (xxx.x lbs or kgs), f39:36

3 (R) current_hop1_recipe_value,L21:11 (xxx.xx, recipe value for running recipe), f39:12

4 (R) current_hop2_recipe_value,L21:12 (xxx.xx, recipe value for running recipe) , f39:13

5 (R) current_hop3_recipe_value,L21:13 (xxx.xx, recipe value for running recipe) , f39:14

6 (R) current_hop4_recipe_value,L21:14 (xxx.xx, recipe value for running recipe) , f39:15

7 (R) current_hop5_recipe_value,L21:15 (xxx.xx, recipe value for running recipe) , f39:16

8 (R) current_hop6_recipe_value,L21:16 (xxx.xx, recipe value for running recipe) , f39:17

9 (R) current_hop7_recipe_value,L21:17 (xxx.xx, recipe value for running recipe) , f39:18

10 (R) current_hop8_recipe_value,L21:18 (xxx.xx, recipe value for running recipe) , f39:19

HIDDEN RECIPE INFO (THIS IS THE RAW RECIPE THAT WILL BE LOADED AT NEXT BATCH)

1 (R) recipe_entry_mode,n9:0 (0=percentage mode, 1=parts mode, 2=EZ mode)

2 (R) batch_size_recipe_value,L21:9 (xxx.x lbs or kgs)

3 (R) hop1_recipe_value,L21:0 (xxx.xx, recipe value for running recipe)

4 (R) hop2_recipe_value,L21:1 (xxx.xx, recipe value for running recipe)

5 (R) hop3_recipe_value,L21:2 (xxx.xx, recipe value for running recipe)

6 (R) hop4_recipe_value,L21:3 (xxx.xx, recipe value for running recipe)

7 (R) hop5_recipe_value,L21:4 (xxx.xx, recipe value for running recipe)

8 (R) hop6_recipe_value,L21:5 (xxx.xx, recipe value for running recipe)

9 (R) hop7_recipe_value,L21:6 (xxx.xx, recipe value for running recipe)

10 (R) hop8_recipe_value,L21:7 (xxx.xx, recipe value for running recipe)

11 (R) recipe_target_total,L21:8 (xxx.xx, the is the total of hop1-hop8 from above, you must manually add this if you chose to skip the blenders error checking, you must also ensure that you are in the correct recipe_entry_mode! SEE BELOW FOR DETAILS)

TARGETS VS. ACTUAL WEIGHT INFO

1 (R) print_data_now,b3:1/11 (read this tag and when it goes high record the actual weights)

2 (R) hop1_displayed_target_weight,L18:0 (target meter weight for batch, xxx.xxx) , f39:20

3 (R) hop2_displayed_target_weight,L18:1 (target meter weight for batch, xxx.xxx) , f39:21

4 (R) hop3_displayed_target_weight,L18:2 (target meter weight for batch, xxx.xxx) , f39:22

5 (R) hop4_displayed_target_weight,L18:3 (target meter weight for batch, xxx.xxx) , f39:23

6 (R) hop5_displayed_target_weight,L18:4 (target meter weight for batch, xxx.xxx) , f39:24

7 (R) hop6_displayed_target_weight,L18:5 (target meter weight for batch, xxx.xxx) , f39:25

8 (R) hop7_displayed_target_weight,L18:6 (target meter weight for batch, xxx.xxx) , f39:26

9 (R) hop8_displayed_target_weight,L18:7 (target meter weight for batch, xxx.xxx) , f39:27

10 (R) hop1_displayed_actual_weight,L19:0 (actual metered weight in batch, xxx.xxx) , f39:28

11 (R) hop2_displayed_actual_weight,L19:1 (actual metered weight in batch, xxx.xxx) , f39:29

12 (R) hop3_displayed_actual_weight,L19:2 (actual metered weight in batch, xxx.xxx) , f39:30

13 (R) hop4_displayed_actual_weight,L19:3 (actual metered weight in batch, xxx.xxx) , f39:31

14 (R) hop5_displayed_actual_weight,L19:4 (actual metered weight in batch, xxx.xxx) , f39:32

15 (R) hop6_displayed_actual_weight,L19:5 (actual metered weight in batch, xxx.xxx) , f39:33

16 (R) hop7_displayed_actual_weight,L19:6 (actual metered weight in batch, xxx.xxx) , f39:34

17 (R) hop8_displayed_actual_weight,L19:7 (actual metered weight in batch, xxx.xxx) , f39:35

CUSTOMER FREE STORAGE SPOTS (use for anything)

1 (RW) customer_free_spot, f42:0

2 (RW) customer_free_spot, f42:1

Alarm Number Explanation:

The alarms are given in individual bits and are reflected in the alarm number. The alarm number is only used to drive a pop-up message and will probably not be very useful to you. If you decide to use the alarm number instead of reading the individual alarm bits then the related values are shown below:

N11:74 Value	Alarm Descriptions		
0=	NO ALARM		
1=	HOPPER 1	Out of Material	1
2=	HOPPER 2	Out of Material	2
3=	HOPPER 3	Out of Material	3
4=	HOPPER 4	Out of Material	4
5=	HOPPER 5	Out of Material	5
6=	HOPPER 6	Out of Material	6
7=	POWER INTERRUPTION while metering a Batch		
8=	PLC BATTER LOW	Check PLC and Configure the Blender	
9=	PLC MODULE LOADED Turn Off Unit,Remove Module, then Configure the Blender		
10=	MAX HOPPER WEIGHT EXCEEDED. CHECK BATCH SIZE		
11=	CALIBRATION ERROR. Clean out weigh hopper and check calibration		
15=	HOPPER 1	Low Level	
16=	HOPPER 2	Low Level	
17=	HOPPER 3	Low Level	
18=	HOPPER 4	Low Level	
19=	HOPPER 5	Low Level	
20=	HOPPER 6	Low Level	
21=	HOPPER 7	Low Level	
22=	HOPPER 8	Low Level	
23=	HOPPER 7	Out of Material	
24=	HOPPER 8	Out of Material	

FIXED DECIMAL EXPLANATION

All weight values and recipe values use fixed decimal. This must be taken into consideration when writing or reading values. If you see “xxx.xxx” above this means the data is in fixed decimal and must be scaled when reading or writing. A decimal is shown next to each item to represent the format.

WRITING RECIPE EXPLANATION

To write a recipe you must first write to the "temp recipe" value locations above. After this is complete you should read the "accept recipe enabled" and the "recipe error" values. If you have a recipe error then you should display the appropriate text. If the "accept recipe enabled" is high then show a button that will then write to "accept recipe" bit. This will load in the recipe. You do not need to check the sum of the recipe that they've entered. The blender will do that for you.

- **If you chose to write the recipe to the raw recipe locations you run the risk of inadvertently entering the incorrect recipe. This is not recommended because it will bypass all the checks that the blender makes before letting you hit "accept new recipe". Also if you chose to use the raw method then you must add up the totals for your recipe and write that at the exact same time that you write the other raw recipe values. You must also right the batch size and recipe entry information or the blender might not make a batch.**

RECORDING THE TARGETS VS. ACTUALS FOR EACH BATCH

The targets that are read are in lbs or kgs. When a batch is complete and dumped the blender will toggle high the "print data now" bit. At this time you should then read the "actual displayed weights" values and record them into a log or chart. If you are not getting the "print now" bit, then refer to the blender manual to configure "print batch data".

- **WHEN THE BLENDER IS NOT RUNNING THE "TARGET" VALUES GET SET TO "999999999" AND IN THE BEGINNING OF EACH BATCH ALL ACTUAL VALUES GET SET TO "999999999" UNTIL THE HOPPER FEEDS MATERIAL INTO THE NEW BATCH.**

INVENTORY EXPLANATION

In order to keep track of very large numbers while accurately keeping track of small increments the blender uses two numbers for each inventory value. One number is the "whole" portion of the inventory and the other is the "decimal" portion of the inventory in 3 decimal places. Most people choose to ignore the decimal portion, but it's there to provide additional accuracy. An example is given below:

Whole portion value: 12345

Decimal (or Fractional) portion value: 678

This would represent 12345.678 lbs or kgs.

7-6 Technical Assistance

Parts Department

The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

For immediate assistance, please contact:
North, Central and South America, 8am – 5pm CST +1 (800) 483-3919.
North America, emergencies after 5pm CST (847) 439-5855

Europe +48 22 390 9720

India/Middle East +91 21 35329112

Asia/Australia +86 512 8717 1919

Sales and Contracting Department

Our products are sold by a worldwide network of independent sales representatives. Contact our Sales Department for the name of the sales representative nearest you.

Let us install your system. The Contract Department offers any or all of these services: project planning; system packages including drawings; equipment, labor, and construction materials; and union or non-union installations.

For assistance with your sales or system contracting needs please Call:
North, Central and South America +1 (262) 641-8600 or +1 (847) 273-7700
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ACS offers facilities around the world to service you no matter where you are located. For more information visit us at www.acscorporate.com

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