



OS/OA Series

Gravimetric Batch Blenders

With Allen-Bradley Controller (Standard & CE Models)

Operation, Installation and Service Manual



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Part No. A0553549

Bulletin No. HR1-605AB.3
11/29/02

	<u>Model #</u>	<u>Serial #</u>
<i>Write down your Blender</i>	_____	_____
<i>serial numbers here</i>	_____	_____
<i>for future reference</i>	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____

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

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Safety Considerations

AEC equipment is designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes.

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

- ☑ Follow all **SAFETY CODES**.
- ☑ Wear **SAFETY GLASSES** and **WORK GLOVES**.
- ☑ Disconnect and/or lock out power before servicing or maintaining the blender.
- ☑ Use care when **LOADING, UNLOADING, RIGGING, or MOVING** this equipment.
- ☑ Operate this equipment within design specifications.
- ☑ **UNPLUG OR OPEN, TAG, and LOCK ALL DISCONNECT DEVICES** before working on equipment. You should remove the fuses and carry them with you.
- ☑ **GROUND** your equipment properly before applying power.
- ☑ Use extreme caution when working with your equipment. Keep body parts, tools, clothing, and debris away from vacuum inlets and moving parts.
- ☑ Do not jump or bypass any electrical safety components.
- ☑ Do not restore power until you remove all tools, test equipment, etc., and the blender and related equipment are fully reassembled.
- ☑ Only **PROPERLY TRAINED** personnel familiar with the information in this manual should work on this equipment.

AEC

“OS-E” Series Blenders

This blender is manufactured by ACS, Inc. at the ACS-Wood Dale facility:

ACS, Inc.
801 AEC Drive
Wood Dale, IL 60191

Phone: 630.595.1060
Fax: 630.595.6641

The equipment is distributed in Europe by our European facility:

ACS-EUROPE
Daniels Industrial Estate
BATH ROAD
Stroud, Gloucestershire, England
GL5 3TJ

Phone: (44) 1453 768980
Fax: (44) 1453 768990

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 degrees Celsius – Maximum (104 degrees Fahrenheit)
3. Humidity range: 50% relative humidity
4. Altitude: 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 m³/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: 120/1/60 or 220/1/50/60 (Verify on serial number tag)
13. Earth ground type: TN (system has one point directly earthed through a protective conductor)
14. Power supply should include a neutral power connection.
15. Over-current protection is supplied in the blender, but additional protection should be supplied by the user.
16. The plug on the power cord serves as the electrical disconnect device.
17. Unit is not equipped with three-phase motors.
18. N/A
19. Blender is not equipped with local lighting.
20. Functional identification
21. Blender is equipped with a CE mark
22. Blender is supplied with an operating manual in the language of the destination country.
23. Cable support may be required for power cord, depending on final installation.
24. 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.
25. Doors can be opened with a screwdriver, but no keys are required.
26. Two-hand control is not required or provided.
27. All blenders should be moved around and set in a place with a lift truck or equivalent.
28. There are no frequent repetitive cycles that require manual control—repetitive functions are automatic while the blender is operating.
29. An inspection report detailing the functional test is included with the blender.
30. The machine is not equipped with cableless controls.
31. Color-coded (harmonized) power cord is sufficient for proper installation.

1-1 Introduction

We are pleased to supply AEC auxiliary equipment for your facility. We manufacture a complete line of auxiliary equipment to satisfy all of your material handling, process cooling, scrap reclaim, size reduction, and automation requirements. Please feel free to contact your sales representative or our office if you have any questions.

1-2 Equipment Function

All OS/OA 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.

1-3 Accessories

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

1-4 Customer Service

The intent of this manual is to familiarize the operator and maintenance personnel with this equipment 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.

NOTICE: 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.

1-5 Necessary Documents

The documents listed below are necessary for proper installation, operation and maintenance of OS/OA Series Gravimetric Batch Blenders. You can obtain additional copies from the AEC Service Department at AEC, Inc. or ACS Europe.

Make sure that appropriate personnel get familiar with these documents:

- This Operation, Installation, and Service manual
- Electrical schematic and connection diagrams
- Pneumatic circuit drawing
- Electric motor and controller information sheets (if equipped)
- Operation and Installation manuals for supplied options and accessories

1-6 System Capabilities

Blending systems are as varied as the applications that they service. This equipment is intended to blend the materials(s) specified at the time of purchase at specific rates.

1-7 Equipment Covered by this Manual

OS Blenders

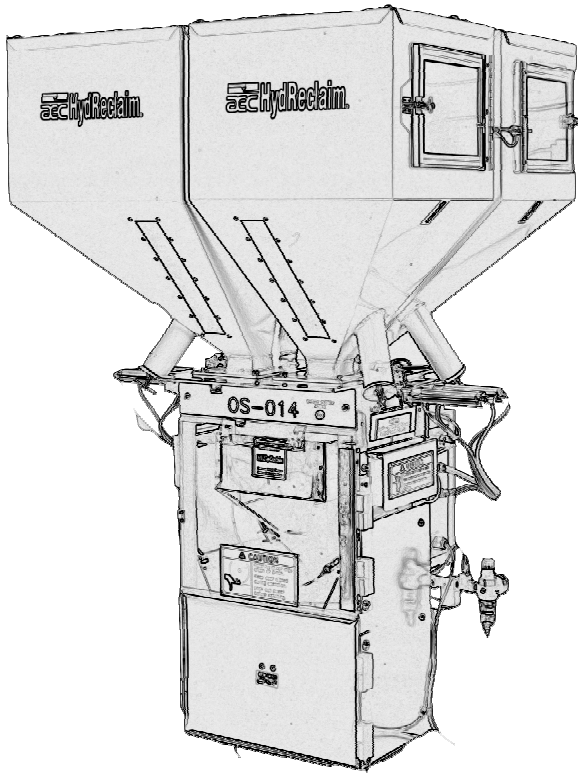
- OS-007(E)
- OS-014(E)
- OS-030(E)
- OS-070(E)
- OS-080(E)
- OS-100(E)

OA Blenders

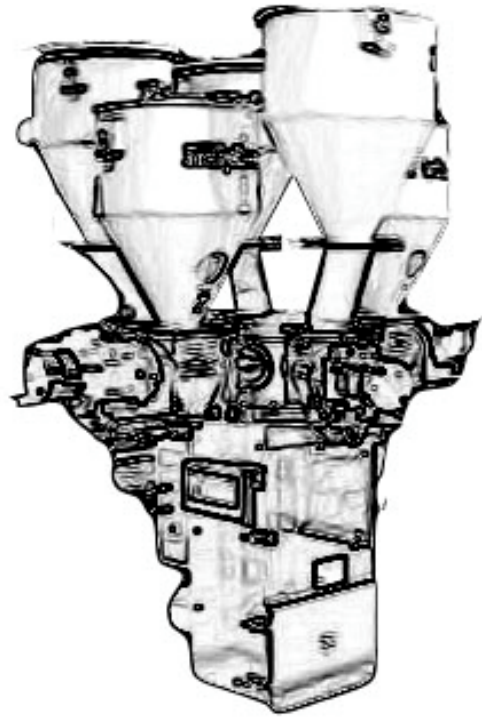
- OA-002(E)
- OA-012(E)
- OA-030(E)
- OA-060(E)

Note: (E) Denotes “CE” models, including 220/1/50 operation and CE mark

1-8 “OS” Series Weigh Blender Mechanical Features



OS Slide Gate Blender



OA Auger Blender

- Efficient Opti-Mixer® and “HC” mixer designs promote homogeneity
- Exclusive diamond design slide gate metering assemblies meter a large range for free flowing pellet materials (OS Series)
- Slide gate stroke limiting restrictors provided for accurate metering of minor ingredients (OS Series)
- Precision auger metering (standard on OA Series, optional on OS)
- Electro-polished 304 SS stainless steel weighing and blending components (OS Series)
- Precision 1/10% span accurate cantilever load cell weighing system
- Removable stainless steel weigh hopper (OS Series)
- Removable stainless steel mixer agitator and mixer wrap (Opti-Mixer® only)
- Mild steel material supply hoppers with clean-out doors and material drains
- Compressed air hose with nozzle for clean-out
- Safety-interlocked system shuts off compressed air and electricity if mixer is opened

1-9 “OS” Series Weigh Blender with *Allen-Bradley Touch-Screen Control 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
- 50 recipe storage book
- *Three (3) types of recipe entry procedures available:*
 - ✓ **EZ mode** (up to 6-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 RS-485 communications ports

1-10 OS (-E) Series Specifications

OS Series Specifications	OS-007	OS-014	OS-030	OS-070	OS-080	OS-100
Number of materials blended	4	2 to 6				2 to 5
Slide gate (adjustable, in (mm)) square	2 (50)		2.5 (63)	3 (76)		4 (101)
Supply hopper capacity, ft³ (l)	0.75 (21)	1 (28)	1.5 (42)	2 (56)		
Weigh hopper capacity ft³ (l)	0.12 (3.4)	0.4 (11)	0.65 (18)	1.4 (39)		
Typical batch size, lbs. (kg)	3 (1.3)	8 (3.6)	15 (6.8)	35 (16)		
Mixer capacity, lbs. (kg)	6 (2.7)	20 (9)	30 (13.6)	75 (34)		
Mixer motor size, HP (kW)	1/6 (.12)		1/2 (.37)			
Mixer speed, rpm	30	16	22			
Load cell capacity (2 per blender)	2 kg ea.	5 kg ea.	10 kg ea.	20 kg ea.		
Blended material discharge opening, in (mm)	3 (76)		4 (101)			
Maximum blending rate (approx.), lbs/hr (kg/hr) ①	350 (159)	700 (318)	1500(680)	3500 (1590)	4000 (1820)	5000 (2270)
Weight of machine (approx.), lbs (kg)	145 (66)	200 (91)	400 (185)	600 (275)		
Shipping weight (approx.), lbs (kg)	200 (91)	400 (185)	600 (275)	850 (390)		

① Based on 78% virgin, 20% regrind and 2% Color.

1-11 OA (-E) Series Specifications

OA Series Specifications	OA-002	OA-012	OA-030	OA-060
Number of materials blended	2 to 4	2 to 6		
Supply hopper capacity, ft ³ (l)	0.25 (7)	1.1 (31)	1.9 - 2.75 (54 – 77)	
Weigh hopper capacity, ft ³ (l)	0.08 (2.2)	0.14 (4)	0.6 (16)	1.4 (40)
Typical batch size, lbs (kg)	3 (1.3)	5 (2.3)	20 (9)	35 (16)
Mixer type	Opti-mixer	"HC"		
Mixer capacity, lbs (kg)	6 (2.7)	10 (4.5)	40 (18)	100 (45)
Mixer motor size, HP (kW)	1/6 (.12)	1/4 (.18)	1/2 (.37)	1 (.746)
Mixer speed, rpm	30	50		
Load cell capacity (1 per blender except OA-002)	2 @ 2 kg	5 kg	10 kg	20 kg
Blended material discharge opening	3 (76)			4 (101)
Maximum blending rate (approx.), lbs./hr. (kg/hr)	100 (45)	600 (270)	1500 (680)	3000 (1360)
Weight of machine (approx.), lbs (kg)	145 (7.0)	200 (91)	450 (205)	600 (275)
Shipping weight (approx.), lbs (kg)	200 (91)	400 (185)	650 (295)	850 (390)

Note: OS/OA features and specifications are subject to change without notice.

1-12 Model OS/OA Blender System Component Description

This section describes the various components of the blending system. The OS/OA blending system is made up of the following components:

1-12-1 Material Supply Hoppers

1-12-2 Slide Gate Metering Assemblies (OS Series)

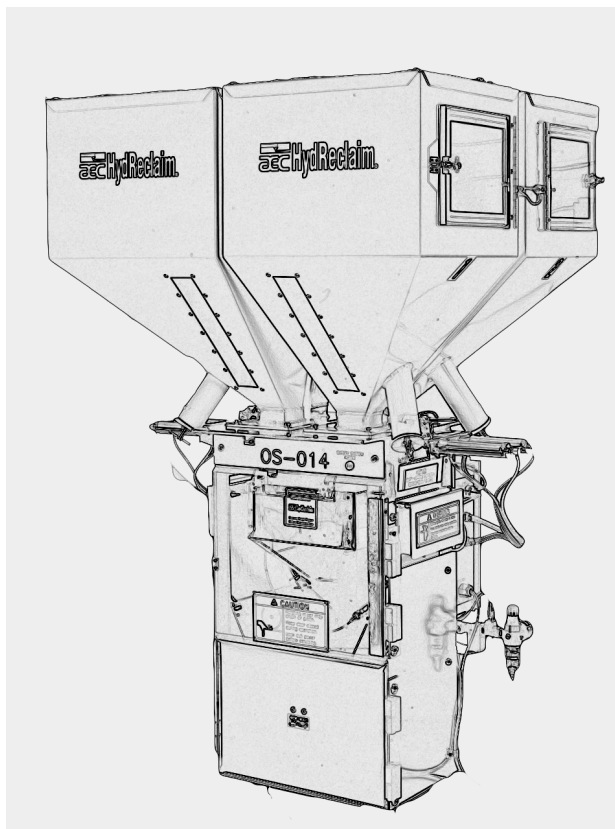
1-12-3 Auger Metering Assemblies (OA Series)

1-12-4 Weigh Hopper

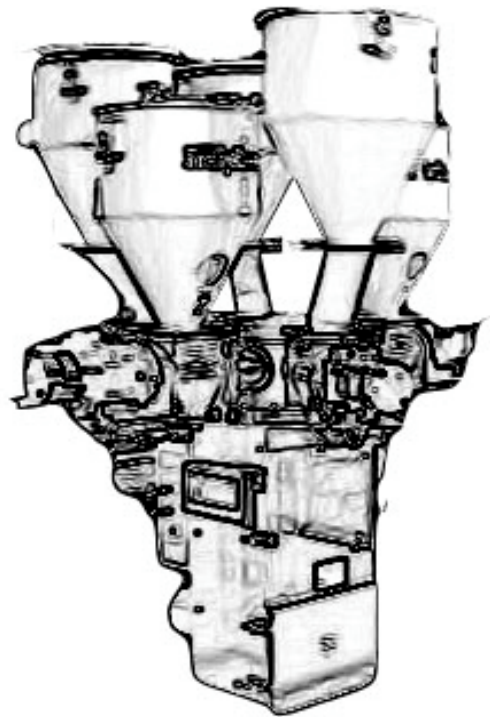
1-12-5 Weigh Hopper Dump Valve

1-12-6 Mix Chamber

1-12-7 Operator Control Panel



OS



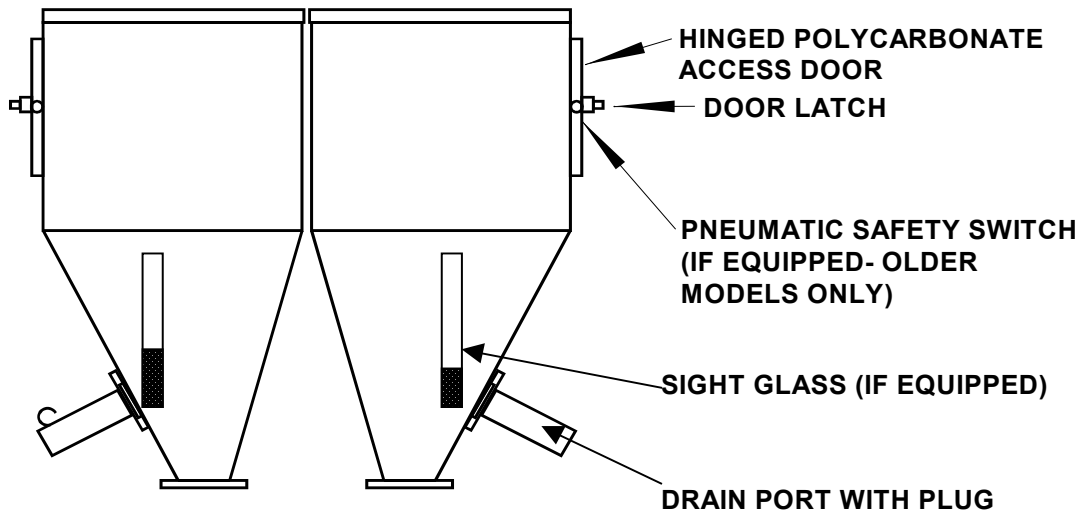
OA
(with optional Opti-Mixer™)

1-12-1 Material 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 OS/OA 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.

Each hopper is equipped with a sight glass and/or access door.



Typical Material Supply Hoppers

1-12-2 Slide Gate Metering Assemblies (OS Series)

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

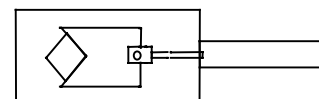
Important! The metering range assumes $\frac{1}{8}$ " diameter free-flowing plastic pellets weighing approximately 35 lbs./cu. ft. This is meant to be an approximate sizing recommendation and can vary with different bulk density resins, pellet configuration, etc.



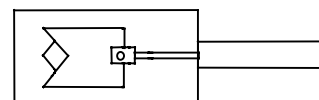
A stroke limiter (included) can be installed on the metering gates to limit their travel. This device decreases the stroke of the gate and reduces the metering orifice of the valve. The unique diamond gate provides a square opening at any stroke length, providing more consistent flow from smaller valve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

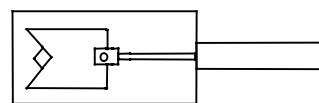
The unique AEC diamond gate provides a constant aspect opening that remains square regardless of the stroke length of the cylinder. This design provides a wider cross sectional opening when approaching a closed position, and provides better flow of plastic pellets out of the opening.



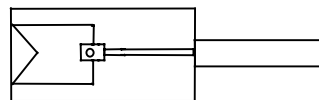
DIAMOND GATE OPEN



DIAMOND GATE 1/2 CLOSED



DIAMOND GATE 3/4 CLOSED



DIAMOND GATE CLOSED

WARNING!



Slide gates create a pinch-point hazard.



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

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

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.

Important! 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!***

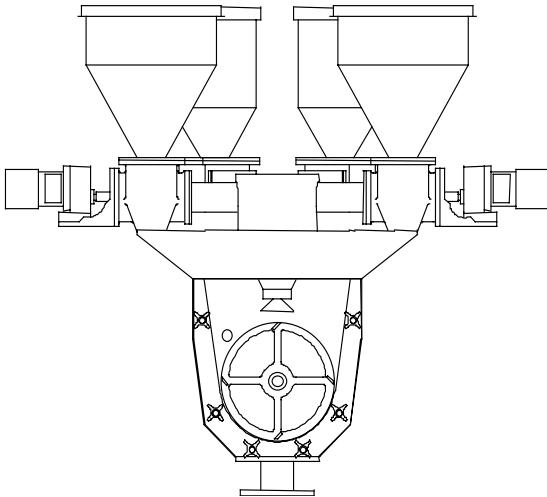
1-12-3 Auger Metering Assemblies (OA Series)

OA Series blenders are equipped with auger metering units, including the following components:

- Cast aluminum feeder bodies
- Cast aluminum motor mounts
- Heavy-duty AC gear motors (Optional DC drives are available)
- Drain spouts with slide gate shut-off
- Machined steel auger
- Cast aluminum auger housing
- Spun aluminum material supply hoppers
- Cover with cut-out for Whitlock SRC vacuum receivers

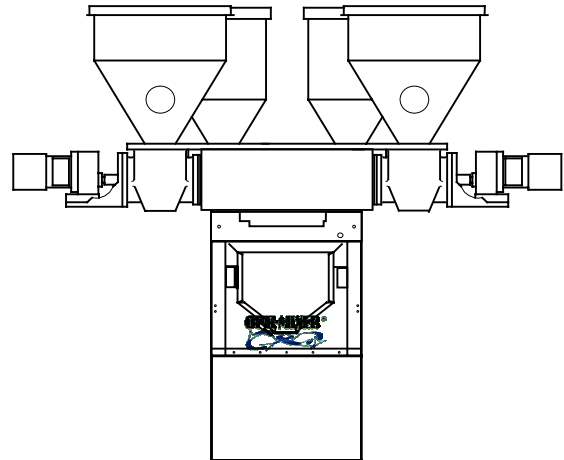
OA Series available with a Choice of Mixers

OA with standard “HC” mixer



**Multiple regrinds and
more difficult materials**

OA with optional Opti-Mixer®



**Pellets and one
free-flowing regrind**

1-12-4 Weigh Hopper

The weigh hopper on the OS/OA blender is used to weigh each batch of material, and includes an air-operated discharge valve. After the batch is weighed and the level sensor in the lower mix section is uncovered, the valve will open and discharge the batch into the mixer with the existing blended material. The discharge valve is also provided with a quick disconnect so the weigh hopper can be removed for cleaning.

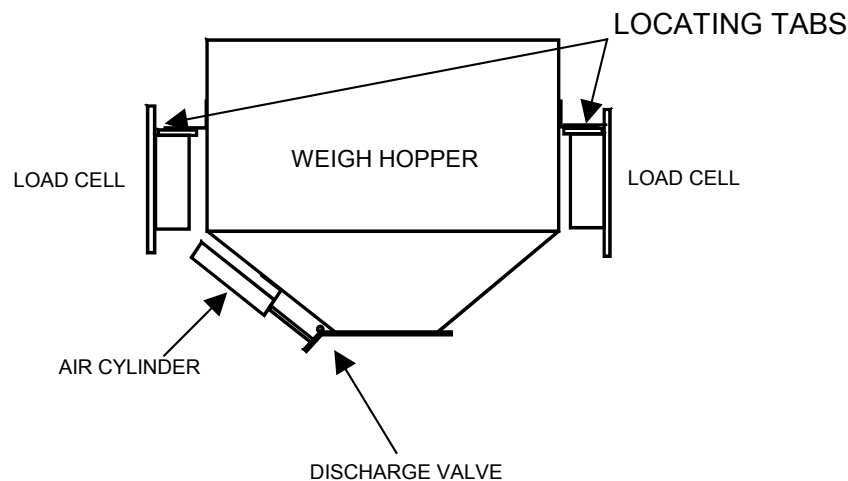
On an OS blender, the weigh hopper rests on each side on a precision cantilever load cell. To remove the weigh hopper, lift the hopper from the bottom, hold the discharge valve closed, and slide it out once clear of the locating tab on the bracket above the load cell.

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.

Important! 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.



The OA-HC style weigh hopper is bolted in place, and is generally not removed except for maintenance.

1-12-5 Weigh Hopper Discharge Valve

The weigh hopper discharge valve holds the material until it is dumped into the mixing section. The cylinder is actuated by a solenoid in the valve stack on the rear 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 OS/OA, 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.

1-12-6 Mix Chamber

All of the AEC 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.

1-12-6-1 Opti-Mixer™

The Opti-mixer™ is designed to provide bi-directional mixing action and can be easily taken apart for cleaning. This design is standard on all OS blenders, and is optional on all OA models.

1-12-6-2 “HC” Mixer

The “HC” Mixer features an open wheel design and is best used for multiple regrind materials and rigid pellets. It is standard on all OA models.

WARNING!



Never reach into the mix section of the blender without disconnecting the power or air supply. Serious injury can result from getting your hand caught in the rotating mixer!

1-12-7 Operator Control Panel


The operator control panel includes a 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.

The controller includes an embedded computer. 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.

If it is desired to have a local display and control of the blender closer to a remote operator station, an optional RS485 remote control panel (RCP) is available.

Typical Setup Screens



Network Setup

Recipe Format

Report Setup

Calibration

Mixer and Dump Setup

Panel View Config

User Password

Units

ALARM LOG

Alarm Setup

Done

RECIPE FORMAT

EZ Mode

metering order #####

batch size ##### Lbs

inventory shutdown ##### Lbs

Batch Ready Enabled

AutoStart Enabled

REPORT SETUP

Blender Number ###

Auto Print Inventory Disabled

Auto Clear Inventory Enabled

Auto Print/Clear Interval (hours) ####

Mixer and Dump Setup

Mixing Time ### sec

Remix Time ### sec

Dump Time ### sec

Dump Delay ### sec

Dump Cycles #

Mixer Dump Time ### sec

Continuous Mixing

Done

PANEL VIEW CONFIG

PV Config Screen

Panel View Blender Version: Master 2.3

PLC Blender Version: #####

PLC Operating System Series: ##

PLC Operating System Firmware: #####

Done

MANUAL CONTROL

Press to CLOSE FEEDER #

Press to CLOSE WEIGHT HOPPER

Press to START MIXER

Press to CLOSE MIX GATE

Blender Must be stopped first

Empty Blender

Test Alarm Output

Hop Wt ###.### Lbs

Done

USER PASSWORD SETUP

Select Operator #####

NEW PASSWORD

VERIFY PASSWORD

Done

UNITS

Blender Data in Kgs.

Display Target/Actual in Lbs.

*NOTE: If "Blender Data" is changed from either KGS or LBS you must recalibrate the blender and reset the inventory totals. You must also check inventory shutdown levels and batchsize

Done

ALARM FLAGS & FEEDER SETUP

Select Feeder #

Continue if "Out of Material" Change

Alarm on "Out of Material" Change

Out of Material Alarm Silence Delay ### sec

Done

MM/DD/YY 1H:MM:SS PM Blender ###

POWER ON Day: ## Hour: ##

Clear Print

Done

ETHERNET SETUP

Disable if using BOOTP Servers or Mitsubishi Display

Ethernet Configurator Enabled

IP ADDRESS ### . ### . ### . ###

SUBNET MASK ### . ### . ### . ###

Send Ethernet Config to Module

You must send the data if you make changes before the change will take place

Done

CALIBRATION

Scale Calibration

Direct Scale Readout

Feeder Calibration

Done

SCALE CALIBRATION Calibration Weight for New Calibration: ##### Lbs Load Cell Bits: ##### Press to EMPTY Batch for scale calibration: [OK] Done		DIRECT SCALE READY Cal Weight used in stored calibration: ##### Lbs Loadcell A Loadcell B Zero Bits: ##### Cal Bits: ##### Current Bits: ##### Weight: ##### Lbs Total Weight: ##### Lbs Tare Weight: ##### Lbs Done		FEEDER CALIBRATION Select Feeder: # Press to Begin a New Calibration: [PRESS HERE] Hopper Weight: ##### Lbs Done	
				Hop1 wt/sec: ### Hop2 wt/sec: ### Hop3 wt/sec: ### Hop4 wt/sec: ### Hop5 wt/sec: ### Hop6 wt/sec: ###	

Typical Operator Screens



OS Blender
 version: Main 2.3
 Automa>
 PLC Version: ##### Copyright 2001

 The Operator Interface has been locked

[Unlock]

Recipe	Target Kgs.	Actual lbs.	CLEAN OUT
1: #####	#####	#####	← NAT
2: #####	#####	#####	← ADD
3: #####	#####	#####	← REG
4: #####	#####	#####	← ADD
5: #####	#####	#####	← ADD
6: #####	#####	#####	← ADD

Blender Stopped
 Push to Start or Stop
 About Accept New Recipe [RECIPE BOOK] Next

INVENTORY

Average Batch Time in secs	Kilograms Used
1: #####	0##
2: #####	0##
3: #####	0##
4: #####	0##
5: #####	0##
6: #####	0##
TOTAL	##### 0##

Print
 Clear Inventory
 Number of Batches: #####
 Process Rate in Lbs/Hr: #####
 Next

REC BOOK

Recipe #	Save Running Recipe	Delete	Erase Entire Book
Batch Size: ###			
Metering Order: #####			
Inventory Shutdown: #####			
[Recipe 2] Weigh every 5th batch			
1: #####	regrind/no retry/no alarm		
2: #####	regrind/no retry/no alarm		
3: #####	regrind/no retry/no alarm		
4: #####	regrind/no retry/no alarm		
5: #####	regrind/no retry/no alarm		
6: #####	regrind/no retry/no alarm		

Load
 Done

HOPPER 1
 Out of Material

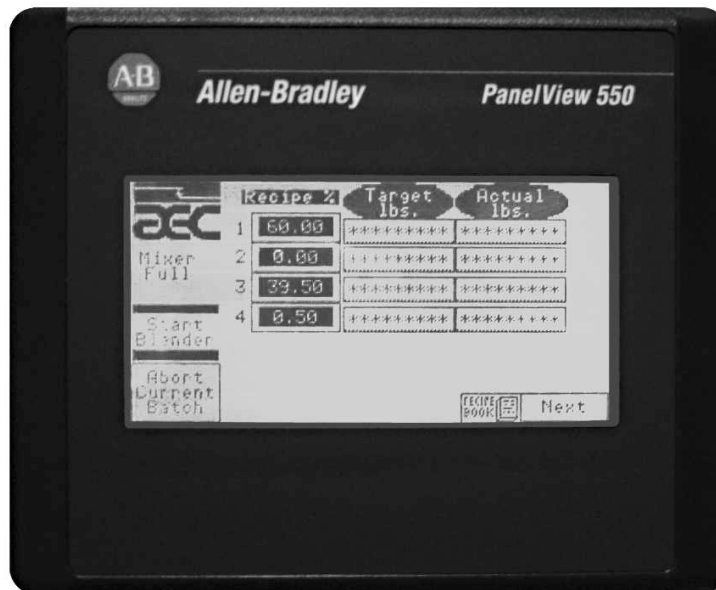
[OK]

HOPPER 1

Touch Here to CHANGE: #####

[DONE]

Note: The touch-screen panel display on your unit may be slightly different than shown.



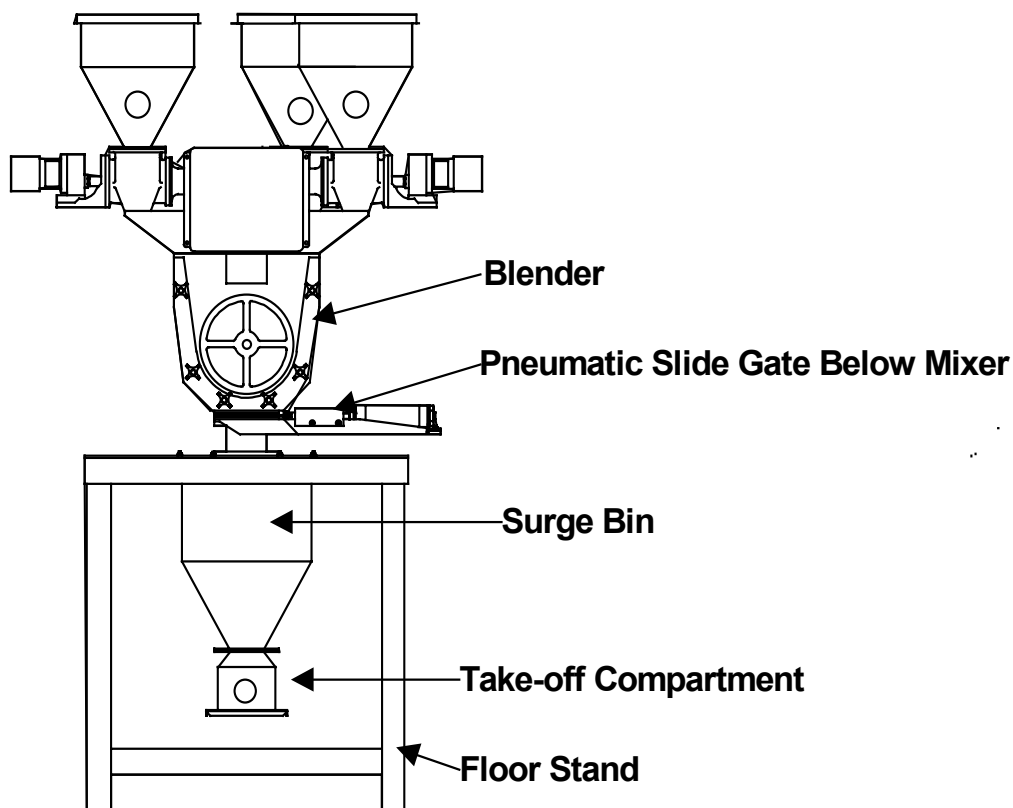
1-13 Pneumatic Slide Gate Below Mixer (Optional)

The OS/OA 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.

Mixer Slide Gate Switch Positions

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

TYPICAL CENTRAL BLENDER LAYOUT



2-1 Work Rules

Install, operate, and maintain this equipment according to applicable work and safety codes for your location. This includes OSHA, CE, NEC, CSA, SPI, and many other local, national, and international regulations. Obey these specific work rules:

- ☒ Read and follow the instructions in this manual before installing, operating, or maintaining any equipment. Additional copies are available from AEC, Inc.
- ☒ Only qualified persons should work on, or with, this equipment.
- ☒ Work only with approved tools and devices.
- ☒ Disconnect and lock out power while working on this equipment.

2-2 Tools and Equipment Needed

You'll need the following:

- Hand tools
- Fork lift or overhead lift
- Wire, conduit, and fittings for wiring runs (if receptacle is not already in place)
- Mounting bolts with nuts and washers
- Compressed air tubing and fittings

2-3 Mechanical Installation

Blenders may be mounted on the machine, a stand, or a mezzanine. Be sure it is securely attached and additional bracing is used if necessary. The sections on the following pages explain general installation rules.



Read manual thoroughly before installing blender.



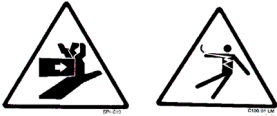
Use approved safety straps or chains to lift the blender at the marked lifting points.

2-4 Safety Considerations

The terms **NOTICE**, **CAUTION**, **WARNING**, and **DANGER** have specific meanings in this manual. **See Section 11 for a complete list of specific safety warning information.**

A **NOTICE** is used to indicate a statement of company policy directly or indirectly related to the safety of personnel or protection of property.

A **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



A **WARNING** indicates a potentially hazardous situation which, if not avoided could result in death or serious injury.

A **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This word will be limited to the most serious situation(s).



The term **IMPORTANT** emphasizes areas where equipment damage could result, or provides additional information to make a step or procedure easier to understand. Disregarding information marked **IMPORTANT** would not be likely to cause personal injury.

REPORTING A SAFETY DEFECT

NOTE: If you believe that your equipment has a defect which could cause injury, you should immediately discontinue its use and inform AEC, Inc., at our address listed in this manual.

The principle factors which can result in injury are:

1. Failure to follow proper operating and clean-out procedures, i.e. lockout/tagout.
2. Failure to maintain a clean and safe working environment.

2-5 General Responsibility

NO MATTER WHO YOU ARE...

Safety is important. Owners, operators, and maintenance personnel must realize that every day, safety is a vital aspect of their jobs.

If your main concern is loss of productivity, remember this: **Production is always affected in a negative way following an accident.** The following are some of the reasons, which can affect your production:

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

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.

2-6 Operator Responsibility

The operator's responsibility does not end with efficient production. The operator usually has the most daily contact with the blender 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.

ONLY YOU can make safety work for you by constantly thinking about what is safe and what is not. It is often the "just once" that an operator reaches into a blender to remove material and it results in serious injury.

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.
- **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 blender;
 - Be sure no objects (tools, nuts, bolts, clamps, bars) are laying in the metering or mixing area;
- 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.
- 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 a blender. In addition, cover or tie back long hair.
- 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.

2-7 Maintenance Responsibility

Safety is essential to the good health of both operator and machine. If you are a maintenance worker, you must make safety a priority in order to effectively repair and maintain equipment.

BEFORE REMOVING, ADJUSTING, OR REPLACING PARTS ON A MACHINE, REMEMBER TO DO THE FOLLOWING:

- **BLEED** all air pressure from system components (refer to the Maintenance Section of this manual.)
- **TURN OFF** all air and electric supplies and all accessory equipment at the machine.
- **DISCONNECT AND LOCK OUT** electrical and pneumatic power, and attach warning tags to the disconnect switch and air shutoff valve.

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 on your blender, use it. The work platform should have secure footing and a place for tools and parts. **DO NOT** climb on blenders, 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 of electrical apparatus, electrical component enclosures, and the blender frame are correctly connected to earth ground with an electrical conductor that complies with current codes. Install in accordance with national and local codes, which apply.

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

Do not restore power to the blender until all persons are clear of the area. Start and run the blender until you are sure all parts are functioning correctly.

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

2-8 Safety

2-8-1 Description and Objectives

This section includes information on safety devices and procedures that are inherent to the OS/OA blending system. 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:

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

2-8-2 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 the manufacture of automated equipment. The Occupational Safety and Health Administration (OSHA) and the Joint Industrial Council (JIC) 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 OS/OA blending system; 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.

2-8-3 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.

2-8-4 Safety Device Lock-Outs

Some safety devices disconnect electrical energy from a circuit. The safety devices that are utilized on OS/OA models are primarily concerned with the pneumatics 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, disconnect 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.

WARNING! Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing or cleaning any Blend and Reclaim blender, including all OS/OA units. Failure to do so may result in serious injury.



At no time must *anyone* remove the lockout or reconnect the twist plug, other than the person who installed the lockout or who unplugged the twist plug.

2-8-5 Lock-Outs, Plugs, and Other Safety Devices

The OS/OA blending system utilizes several types of safety devices.

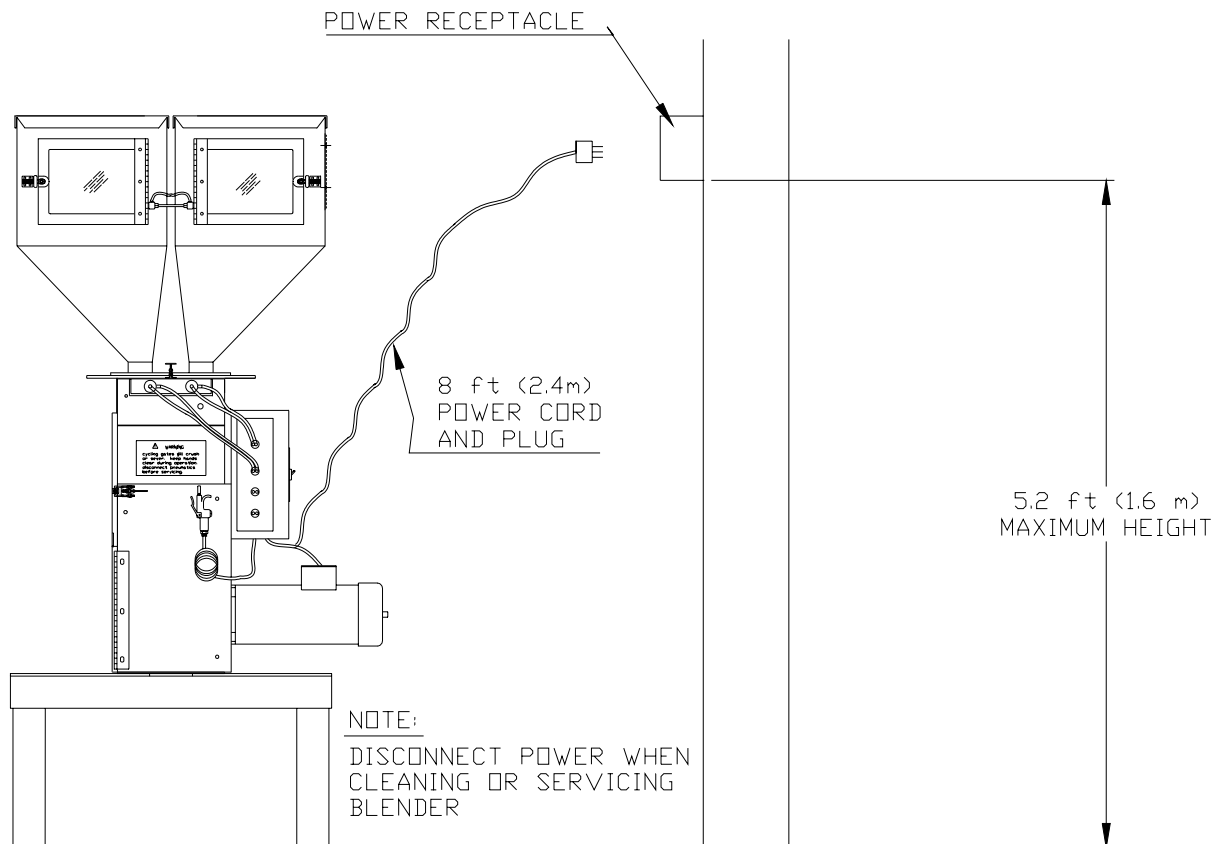
The Line Cord Plug

This line cord plug allows the operator or maintenance personnel to unplug the blending system from its power source and tag it out. This plug may be tagged with any number of approved electrical lockout tags. These tags are available at most electrical supply stores.

WARNING!



Disconnect both of these items to ensure optimum maintenance personnel safety when cleaning or servicing this equipment.

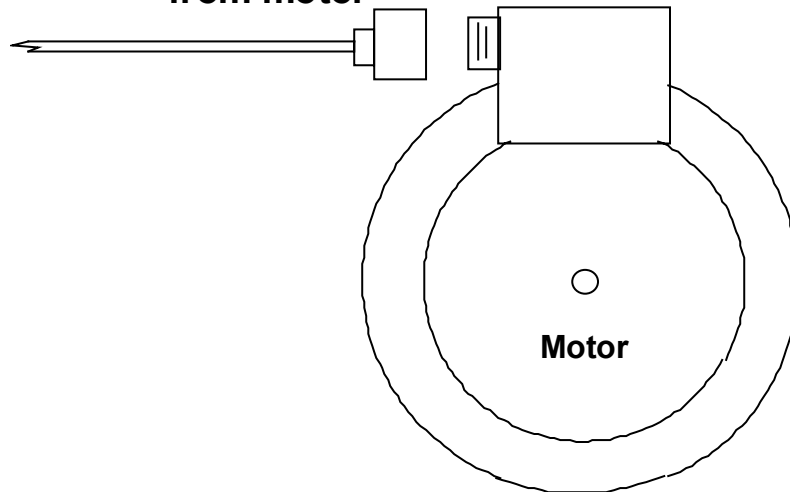


Electrical Disconnect Plug

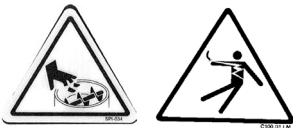
Twist Cap Plug Connected to Each Auger Motor (OA Blender only)

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.

**Unscrew and remove plug
from motor**



WARNING!



At no time must *anyone* remove the lockout or reconnect the twist plug, other than the person who installed the lockout or who unplugged the twist plug.

2-9 Electric Safety Interlock Switch (All Models)

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



Interlock Switch

Electrical safety interlock switch
(Located on mixer door)

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



3-1 Unpacking and Inspection

You should inspect your AEC batch blender components for possible shipping damage. If the container and packing materials are in re-usable condition, save them for reshipment if necessary.

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 case of breakage, damage, shortage, or incorrect shipment, refer to the following sections.

3-2 In the Event of Shipping Damages

Important!



According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment. The Carrier then assumes full responsibility of the 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 to AEC, Inc. before the transportation company inspection and authorization.**
- ☑ File a claim against 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 AEC, Inc. regarding your wish for replacement and to obtain an RMA (return material authorization) number.

Parcel Post Shipment

- ☒ Notify AEC, Inc. at once in writing, giving details of the loss or damage. This information is required for filing a claim with our insurance company.
- ☒ Hold the damaged goods with the container and packing materials for possible inspection by postal authorities.

United Parcel Service Shipment

- ☒ Contact your local UPS office regarding damage and insurance claims.
- ☒ Retain the container and packing.
- ☒ Notify AEC, Inc. at once.

3-3 If the Shipment is Not Complete

Check the packing list. The apparent shortage may be intentional. Back-ordered items are noted on the packing list. You should have:

- ☒ AEC OS/OA gravimetric batch blender components
- ☒ Bill of lading
- ☒ Packing list
- ☒ Operating and Installation packet
- ☒ Electrical schematic and panel layout drawings
- ☒ Component instruction manuals

Re-inspect the container and packing material to see if you missed any smaller items during unpacking. Determine that the item was not inadvertently taken from the area before you checked in the shipment. Notify AEC, Inc. immediately of the shortage.

3-4 If the Shipment is Not Correct

If the shipment is not what you ordered, **contact AEC, Inc. immediately.** For shipments in the United States and Canada, call 1 (630) 475-7061; for all other countries, call 001 (630) 475-7069. Include the order number and item. *Hold the items until you receive shipping instructions.*

3-5 Returns

Important!



Do not return any damaged or incorrect items until you receive shipping instructions from AEC, Inc.

- Notes -

4-1 Chapter Description and Objectives

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

4-2 Site Requirements

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

4-2-1 Mounting Configuration

The OS/OA System is available in (3) three basic mounting arrangements. They are:

- **Machine Mount**
- **Mezzanine Mount**
- **Floor Mount**

4-2-1-1 Machine Mount

In a machine mounting application of the OS/OA 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 OS flange (if the optional pre-drilled holes were ordered). The OS 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 OS/OA blending system with a full load of material and vacuum loading equipment installed.

Important!



While in operation, the OS/OA applies horizontal and vertical pressures to the mounting flange. If there is a question as to the mechanical stability of a mounting flange, contact AEC'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.

Note: 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.

Take care to insure proper orientation with adequate access to operator controls, mix chamber, and metering units.

Important!



Never weld on the blender, support stand, machine or mezzanine without first removing the control panel and verifying that the blender is properly grounded.

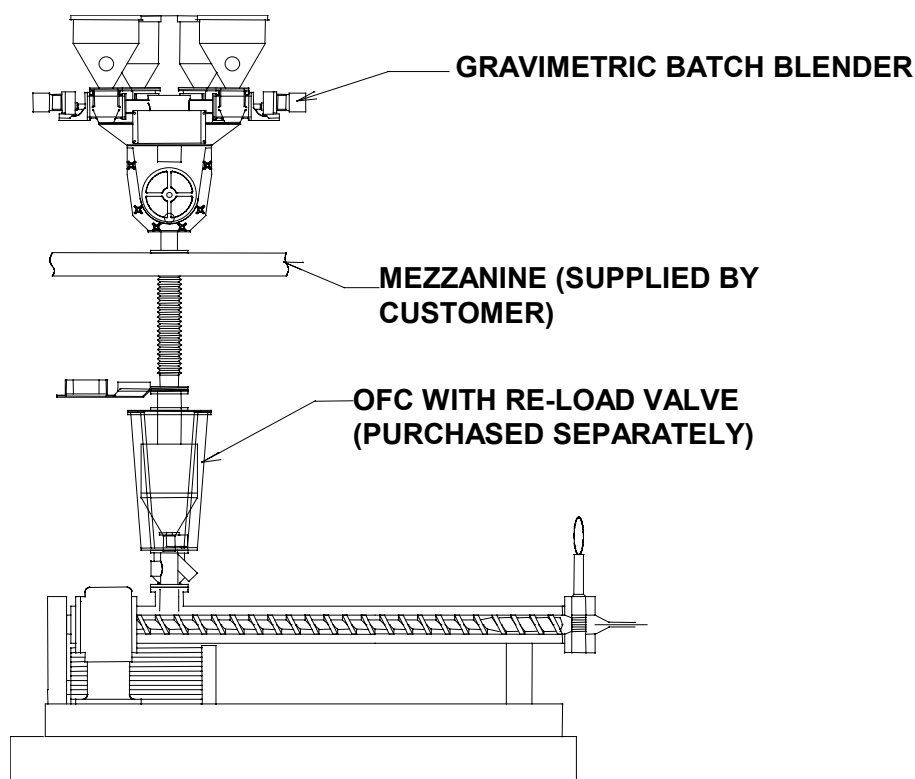
4-2-1-2 Mezzanine Mount

In a mezzanine mount application, review the following items before installation begins. First, verify the OS/OA 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.

Important! While in operation, the OS/OA applies horizontal and vertical pressures to the mounting flange. If there is a question as to the mechanical stability of a mounting flange, contact AEC'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.



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.

4-2-1-3 Floor Mount (Central Blender)

In a floor mounting application, ensure adequate clearance for all blender operations and 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 OS/OA in place.

Important! The blender must be securely fastened to the floor before operating.

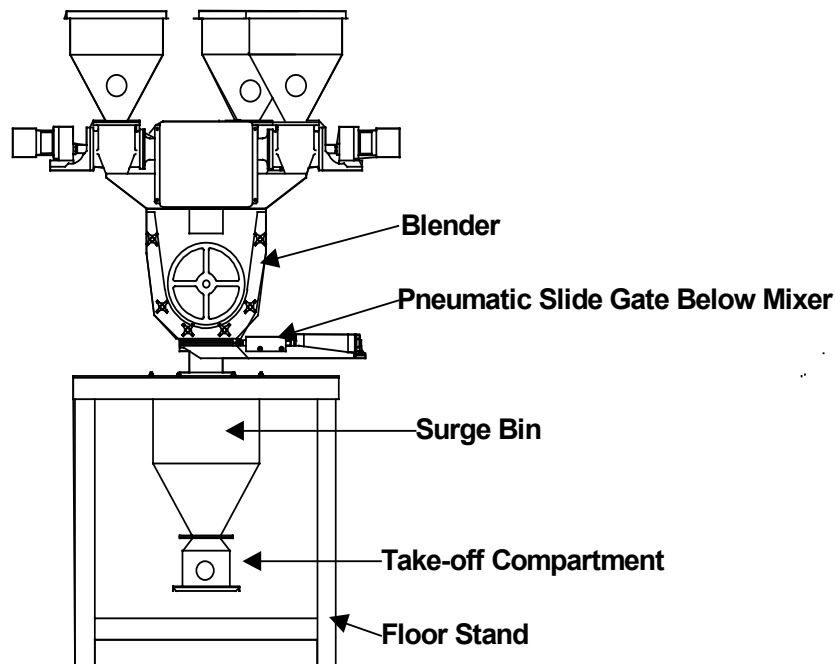


AEC assumes *no* responsibility for any damages resulting from improper installation or improper handling during installation.

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.

TYPICAL CENTRAL BLENDER LAYOUT



4-3 Installation Overview

This section will familiarize the reader with commonly used procedures for blender installation. After reading this chapter, the reader will be familiar with the installation requirements for all OS and OA blenders.

4-4 Mechanical Installation

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

1. Remove crate from around blender.
2. Secure strap of proper lifting capacity to both lifting lugs.
3. Lift blender until strap is taut.
4. Remove bolts attaching bottom of blender to shipping skid.
5. Lift blender and position over machine throat or floor stand.
6. Set in position and secure by tightening four bolts.
7. Remove lifting strap.

CAUTION!



Lifting Lug

Blender Lifting Lugs
(1 on each side)

8. Mount the material conveying system receivers on the top of the blender supply hoppers.
9. Align the weigh hopper on the load cell brackets. 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.

Important!



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!*

10. 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.

4-5 Electrical Installation

The standard OS/OA blending system is designed to operate on 120/1/60 supply voltage (220/1/50 CE models are also available). 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.

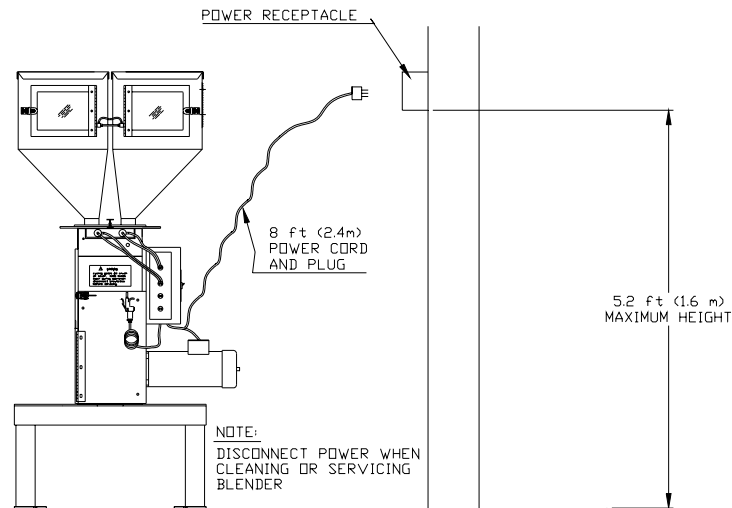
If a step down transformer was provided, it should never be used to power anything other than the blender. Loading equipment, etc. must be powered by another power source. As well as possibly overloading the transformer, the additional equipment may induce power line noise that may affect the operation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

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. 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.



Power Receptacle Installation

4-6 Pneumatic Installation

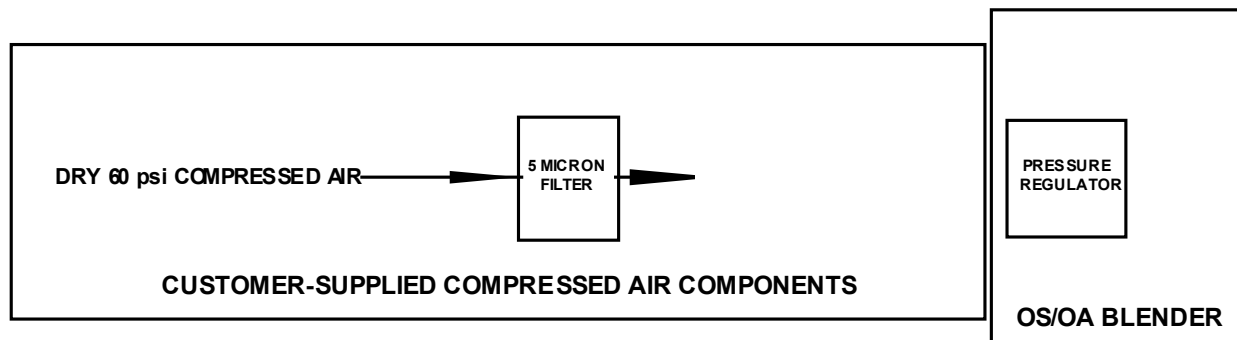
The OS/OA blending system uses plant-supplied compressed air to operate the metering and dump valves on the blender.

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.

Important!



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.



AEC provides all pneumatic lines on the blender piped to a single ¼" NPT standard pipe thread fitting. The OS/OA blending system requires approximately 1 cfm (1.7 m³/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.**

4-7 Blender Set-up

4-7-1 Description and Objectives

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

4-7-2 Weigh Hopper Installation (“OS” Models only)

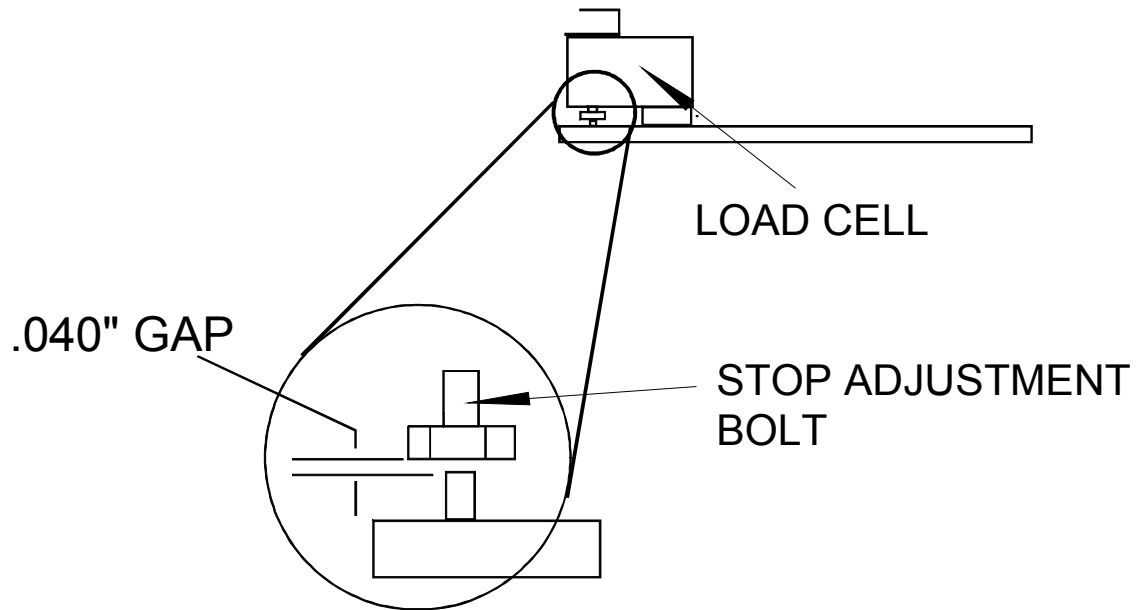
Remove the weigh hopper from the shipping box and install it in the blender on the load cell brackets. Connect the airline and close the mixer door, securing the latch.

4-7-3 Load Cell Adjustment

The mechanical setup of the OS/OA blending system involves the adjustment of the weigh hopper load cells (Please refer to the figure on the next page). This figure illustrates the proper adjustment of the load cell mechanical stop bolt. The setting for the positive stop is necessary to prevent the load cell from being “over-ranged” by excessive loading on the weigh hopper. The setting for the load cell stop is forty thousandths of an inch maximum (.040”). A feeler thickness gauge, with the weigh hopper empty, should be used to set this.

If a feeler gauge is not available, the weigh hopper should be filled with the material that is to be blended, and the stop adjusted so there is just a very small gap (a couple of sheets of notebook paper) between the load cell, and the blender base stop. This will allow the load cell to operate without mechanical restrictions and provide an overload safety. To adjust the stop, adjust the screw located on the bottom of the load cell. Adjust the screw up to increase the gap and down to decrease the gap.

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



Load Cell Mechanical Stop Adjustment

4-7-4 Final Setup

1. Connect the blender to the appropriate power source.
2. 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.

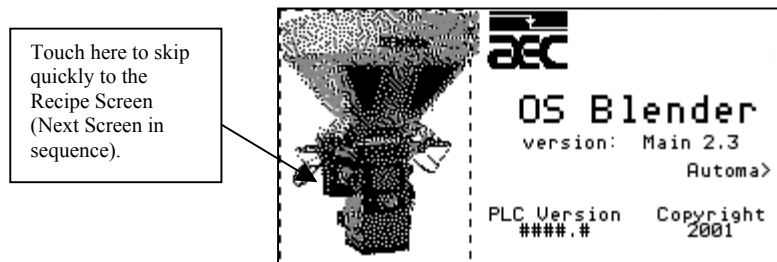
Important! Again, make sure that **proper air supply connections are made to the blender**, as dirty, contaminated, wet air can damage blender components **and can quickly cause poor performance and accuracy!**



Make sure that the blender is supplied with clean, dry, 60 psi (4.14 bar) compressed air.

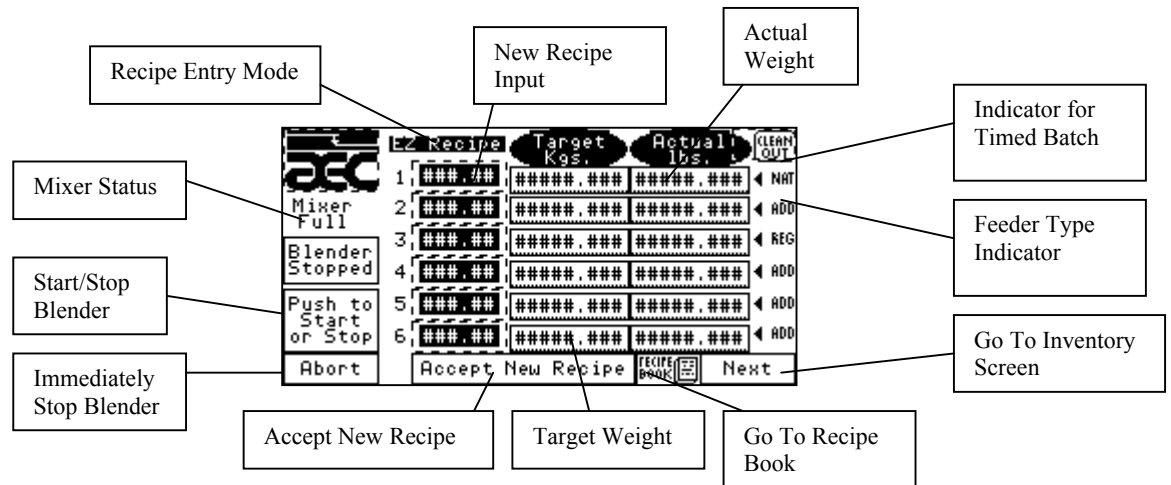
3. After powering up the blender the following screen will be shown:

Note: It may take 45-50 seconds for the screen to appear.



This screen displays the software version of both the PLC and the PanelView. The Controller will stay on this screen for about 10 seconds or you can touch the picture of the blender to quickly skip to the Recipe Screen (Next Screen in sequence). The software versions are also available on the Panel View Configuration Screen.

4. The screen shown below allows the operator to control the blender. The blender can be started or stopped, the recipe values can be changed, and the actual vs. target data can be viewed. Other data shown on this screen consists of the mixer status, recipe status, and feeder type data. The Recipe Screen should startup in the “EZ” recipe mode. If so, enter a valid recipe.



If not, the blender can be reconfigured for EZ Recipe, Percent, or Parts by entering the Setup menu and pressing the Recipe Format key. Then select the mode following the key prompt on the screen.

To access the Setup Menu to change the Recipe Mode and other controller features, refer to the Appendix in Section 12 of this manual.

5. The operator can startup the blender by selecting the button that says, “Push to Start or Stop” (startup) on the left side of the Recipe Screen, depending on whether the blender is currently running or is stopped. Simply touch the button to either start or stop the blender. 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 “Abort Current Batch.” This will cause the blender to stop making the current batch immediately. Obviously, if the blender is stopped in this method then the current batch will not be completed properly.

5-1 OS/OA Blender Sequence of Operation

1. 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.

5-2 Quick Start Procedure

1. Calibrate the weigh hopper before running the blender (This will improve inventory accuracy.).
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.

Note: Hopper #3 is equipped with an oversized square gate to assist in the feeding of the regrind material.

3. Enter the recipe menu on the LCD panel by turning on the Allen-Bradley PanelView controller (It will automatically default to this screen), and enter the blend recipe desired following the steps listed below:
 - Touch the box (labeled 1-6) that shows the hopper you want to change.
 - Touch the “Touch Here to CHANGE” button.
 - Enter in the new value (0 to 999.99) and hit the enter button (arrow).
 - Touch “Done”.
 - After you have entered the new values for all hoppers (1-6), then push the “Accept New Recipe” button and the recipe will be entered.

The blender monitors the operator’s entries and determines if the recipe entered is valid before allowing the operator to accept the new recipe. If there is an error (such as the recipe does not add up to 100% and the blender is in Percentage Mode) then a message is shown on the Recipe screen to alert the operator of the problem. The “Accept New Recipe” button is only shown if the recipe is valid and different from what is currently running on the blender.

Recipes can also be changed while the blender is running. The new accepted recipe is entered 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.

OR

4. 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:

- **Touch the Recipe Book icon located on the Recipe Screen.**
- **Select a stored recipe by changing the number next to “Recipe #”**
- **Touch “Load” and then “Done” (This will take you back to the Recipe Screen.).**
- **Touch “Accept New Recipe” to accept the loaded recipe into the blender.**

To Save a running recipe to the Recipe Book:

- **Go to the Recipe Book by touching the Recipe Book icon located on the Recipe Page.**
- **Select a stored recipe by changing the number next to “Recipe #”.**
- **Touch “Save Running Recipe” and then “Done”.**

5. Press “Push to Start or Stop” button to start blender.

5-3 Recipe Entry Formats

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 AEC 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 below:

5-3-1 “EZ” Mode

(Most common in injection molding)

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.

Important! 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.

Virgin material must be loaded into hopper #1 and regrind into hopper #3.

5-3-2 “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.

Important!



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

5-3-3 “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.

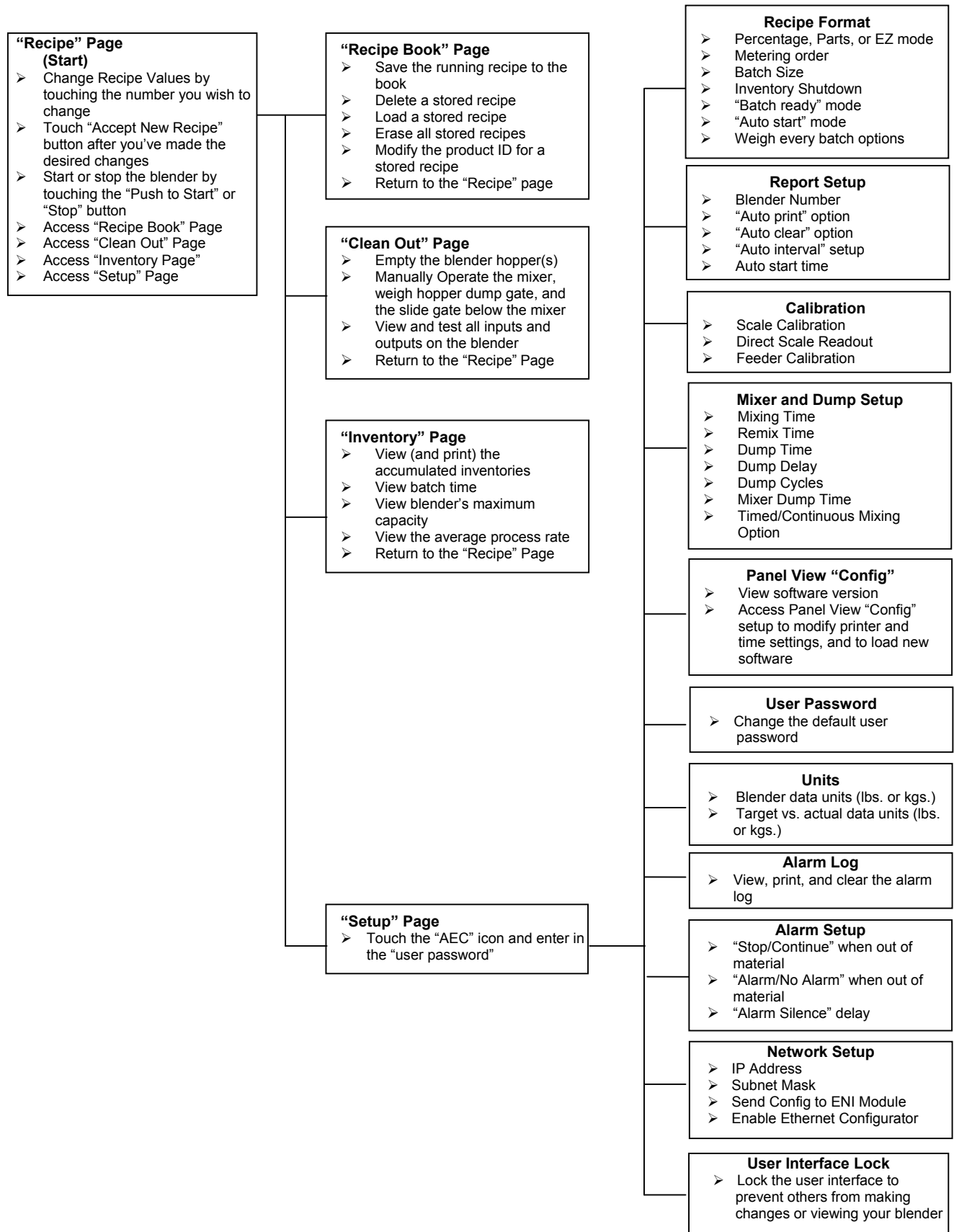
Example of a 5-component Blend in “Parts” Mode

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	

5-3-4 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.

5-4 OS & OA Series Control System Menu Structure



5-5 Blender Calibration

***NOTE:** *It is not necessary to calibrate the weight scale on a brand new blender, although it is recommended that the calibration be checked periodically to ensure that the reported inventory totals are accurate. Remember that in most cases a bad calibration is worse than no calibration.*

5-5-1 Standard Calibration on a blender equipped with an OptiMix style mixer (Recommended only if the calibration is out of spec)

1. From the "Recipe" Page, touch the "AEC" icon and enter "██████" then press the "↵" key.
2. Touch "Calibration" and then "Scale Calibration".
3. Remove the weigh hopper, clean it out and press "OK".
4. Verify that the calibration weights are not touching anything other than the load cell bracket.
5. Enter the number stamped on the calibration weight. Follow the on-screen instructions by touching "OK" and then follow the prompts.
6. The blender will evaluate the calibration and indicate if it is properly calibrated.
7. Press "Done" key three (3) times and you will return to the main menu.

5-5-2 Standard Calibration on a blender with an HC style mixer (Recommended only if calibration is out of spec)

1. From the "Recipe" Page, touch the "AEC" icon and enter "██████" then press the "↵" key.
2. Touch "Calibration" and then "Scale Calibration".
3. Empty the hopper and press "OK".
4. Place the test weight on the hopper and press "OK".
5. The controller will communicate whether the calibration was successful.

5-5-3 Additional settings that usually do not have to be changed:

1. From the "Recipe" Page, touch the "AEC" icon and enter "██████" then press the "↵" key.

****NOTE:** *If the controller is set to Continuous Mixing, then the blender will run continuously while the blender is operating. If it is set to "Timed Mixing" then the mixer will run for the "Mixing Time" setting when a batch is dumped into the mixer.*

2. Touch the “Mixer and Dump Setup” key to enter the amount of time the mixer will mix or the batch is dumped.
3. Enter a “Mixing Time” by pressing the number next to “sec”, this is the amount of time to run the mixer after a batch is dumped into the mixing chamber. Remember that if the mix time is too long you may get material separation.
4. Press the number next to “sec” on the “Remix Time” to set “Re-mix” off time. This allows the mixer to come on between batches if the blender cycle time is very slow, i.e. if you want the mixer to come on every minute, set this to 60 seconds. If you don’t want to use this function, set the time to “0”.
5. Press the number next to “sec” on the “Dump Time” to set your dump time (A value between “1” and “999” will need to be entered.). This feature is the amount of time required to empty the batch hopper. (Set the time so that all the material in the weigh hopper has a chance to be evacuated.)
6. Press the number next to “sec” on the “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.
7. Press the number next to “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.
8. Press the number next to “sec” on the “Mixer Dump Time” to enter the amount of time that the mixer will run while dumping material out of the knife gate below the mixer. This feature assists in cleaning out the mixer.
9. Press “Done” to return to the “Setup” screen.
10. Press “Alarm Setup” on the “Setup” screen to look at the “Alarm Flags & Feeder Setup screen.”
11. This screen allows you to change the way alarms on each feeder function. Enter the feeder you wish to configure by pressing the corresponding feeder number under “Select Feeder”. You can select “Stop if “Out of Material” which means if there is any kind of alarm on this feeder, the blender process will stop (i.e. The feeder supply hopper is out of material.) You can also set it to “Continue if “Out of Material.” This mode will alarm but let the blender continue to operate or you can set it to “No Alarm on Out of Material” mode. “No Alarm” mode does not set off any alarms. In addition, an “Out of Material Alarm Silence Delay” specifies the amount of time before an alarm will be set off.
12. Press “Done” to return to the “Setup” screen.

5-5-3 Verifying Calibration (Recommended on a periodic basis to ensure accuracy)

1. From the "Recipe" Page, touch the "AEC" icon and enter "██████" then press the "↵" key.
2. Touch "Calibration" and then "Direct Scale Readout".
3. Remove the weigh hopper.
4. Locate the weight display for each of the two load cells (or one load cell in the case of an OA blender with an "HC" style mixer), directly below "Current Bits." 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 for clean out.)
7. Press "Done" until you have reached the Recipe screen.

Anything in the Diagnostics Menu that is not covered here is in the Detailed Controller Setup Section

5-6 Controller Mode Setup

Setting up a recipe

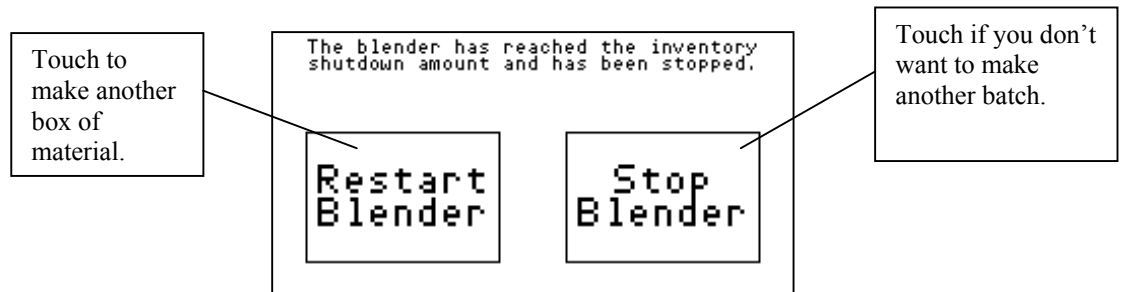
1. From the "Recipe" Page, touch the "AEC" icon and enter "██████" then press the "↵" key.
2. Press "Recipe Format" and toggle through the EZ, Percentage or Parts Modes.
3. While in the "Recipe Format" screen, the following areas will need to be configured:

Metering Order: This option allows the operator to change the feed order that the blender uses when making a batch. A Metering Order of "123456" means that the blender will feed hopper 1 first and hopper 6 last. This order can be changed while the blender is making a batch without affecting the current running batch. If the order is changed, then you will need to touch "Accept New Recipe" on the Recipe screen before the change takes place.

Batch Size: This 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.

Inventory Shutdown: This feature allows the blender to make a certain amount of material at a time. If this feature is set to “0” then the feature will be disabled. If this option is used, the blender will make the set amount of material and will then shutdown and wait for the operator to restart the blender. This feature is useful when filling gaylord boxes. You no longer have to be troubled by a proximity switch that hangs in the box to sense when it is full. The following screen is shown when the blender reaches the Inventory Shutdown weight:



The Inventory Shutdown can also be configured while the blender is making a batch. If the Inventory Shutdown is changed, then you need to touch the “Accept New Recipe” on the Recipe Screen before the change happens. This allows the 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.

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.

AutoStart 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 Batch: 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”, or “Weigh Every Fifth Batch.” 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.

Weigh Every Batch

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

Every Second Batch

In the every second batch mode, the OS/OA blending system will weigh each component of the batch during one cycle and then run all components simultaneously the next cycle on a time basis that was learned during the weigh cycle. After an initial learn cycle, the blender will weigh every other batch and then run volumetrically timed metering every other batch. This allows for greater throughput of the blender.

Running in every other batch mode normally does not affect the accuracy of the blender to any great degree on consistent bulk density materials.

Every Third Batch

In the every third batch mode, the OS/OA blending system will weigh each component of the very first batch. The second and third batches will be metered using time. The augers / gates are timed while weighing the first batch. The second and third batch will use the time measured on the first batch. This sequence will continue as long as the blender is running in this mode.

This allows for greater throughput of the blender, as the blender is running all the metering devices simultaneously. Accuracy in this mode is not as good as weighing every batch, but will be satisfactory in most applications.

Every Fourth Batch

In the every fourth batch mode, the OS/OA blending system will weigh each component of the very first batch. The second, third and fourth batches will be metered using time. The augers / gates are timed while weighing the first batch. The second, third and fourth batch will use the time measured on the first batch. This sequence will continue as long as the blender is running in this mode.

This allows for greater throughput of the blender, as the blender is running all the metering devices simultaneously. Accuracy is not as good as weighing every batch but will be satisfactory in most applications.

*****Note: This feature sacrifices blender weighing accuracy for blender maximum rate and is only recommended under special circumstances.***

4. Press the “Done” key two (2) times until you return to the “Recipe” page.
5. When you are in the “Recipe” screen, touch the hopper (1-6) that you want to change.
6. Touch the button that states: “Touch Here to Change.”
7. Enter in the new value (0-999.99) and hit the enter button (arrow)
8. Touch “Done” to return to the “Recipe” screen.
9. After you have entered the values for all of the hoppers, then hit “Accept New Recipe” and the recipe will be entered.

*****Note: The blender monitors the operator’s entries and determines if the recipe is valid before accepting the new recipe. If there is an error (such as the recipe does not add up to 100% and the blender is in Percentage Mode.) then a message is shown on the Recipe screen to alert the operator of the problem. The “Accept New Recipe” button is only shown if the recipe is valid and different from what is currently running on the blender.***

Recipes can also be changed while the blender is running. The new accepted recipe is entered 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.

10. Recipe entry is complete.
11. To start the blender press “Push to Start or Stop” button.

******Other questions regarding features are answered in the Detailed Control Setup Section******

5-7 Color Change

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

Note: 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 blender where there are moving parts.

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

Important!



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.

5. 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.

6. 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.
7. 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.

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

8. Clean the weigh hopper and mixer assemblies on the blender using a vacuum cleaner. The mixer agitator is removable for cleaning if desired.
9. Reinstall any metering units that were removed from the blender during clean out.
10. Reinstall the weigh hopper using care to center the hopper on the load cells on the weigh hopper bracket.
11. Load the blender with new material.
12. 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 AEC product, including all OS/OA Series blending systems. Failure to do so may result in serious injury or death.

5-8 Additional Operation Features

5-8-1 Why Blender Calibration is Necessary (on the OA blender)

The load cells on the OA 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 heart of the OA blending system is the **load cell** with the supply calibration weight. They 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**. This calibration must be performed upon initial installation and startup of the blender. **They should also 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 OS/OA 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 to the nearest 1/100th of a pound, in the 2 - 10 lb. range, proportional to your size blender, 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 1/10%.

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.).

5-8-2 Display Description (LCD)

The OS/OA 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.



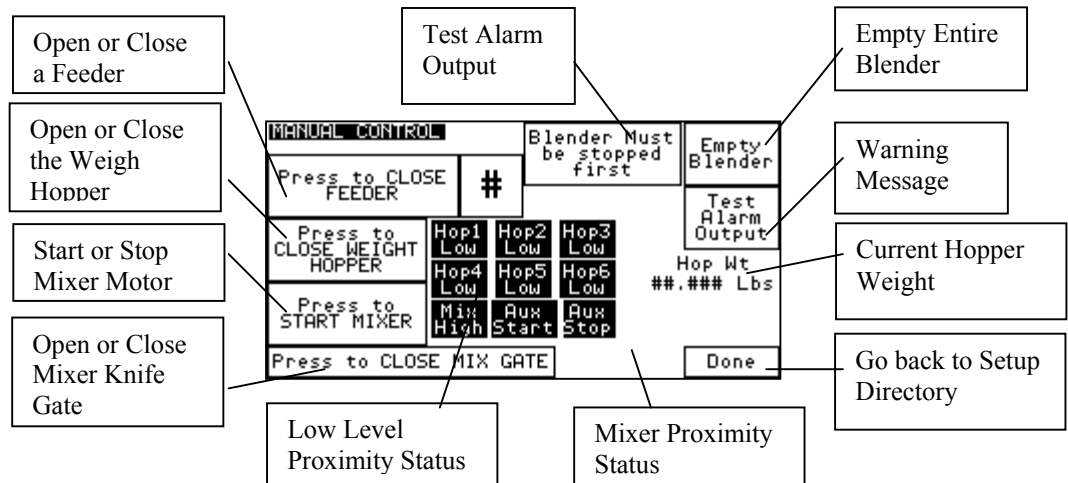
A typical menu is shown in the figure above. This display, which is defaulted to when the controller is turned on, provides the operator with the following information and options:

- The ability to change Recipe Values
- Accept a newly entered Recipe
- Start or Stop the blender
- Access to the Recipe Book
- Access to the Clean-out Screen
- Access to the Inventory Screen
- Access to the Controller Setup Screen

Please refer to the OS/OA menu structure in Section 5-4.

The menu tree shows the structure for a standard OS/OA blender.

When the unit is initially installed the Manual Control menu will be used. This screen is primarily used for trouble shooting the blender. All outputs can be controlled manually and all digital inputs from the proximity switches can be viewed. Pressing the “Manual Control” key when in the “Setup” menu accesses this screen. To gain access to the “Setup” menu, a password will be requested.

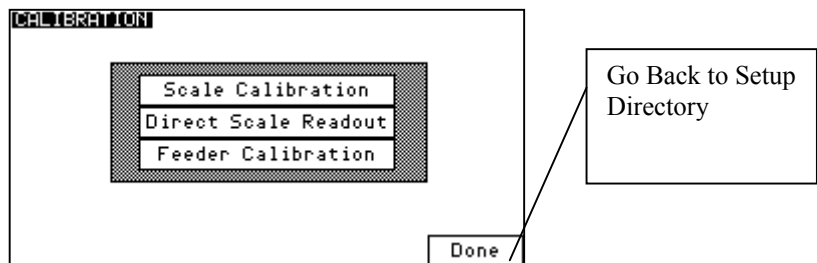


5-8-3 Weigh Hopper (Load Cell) Calibration on blenders equipped with an OptiMix mixer

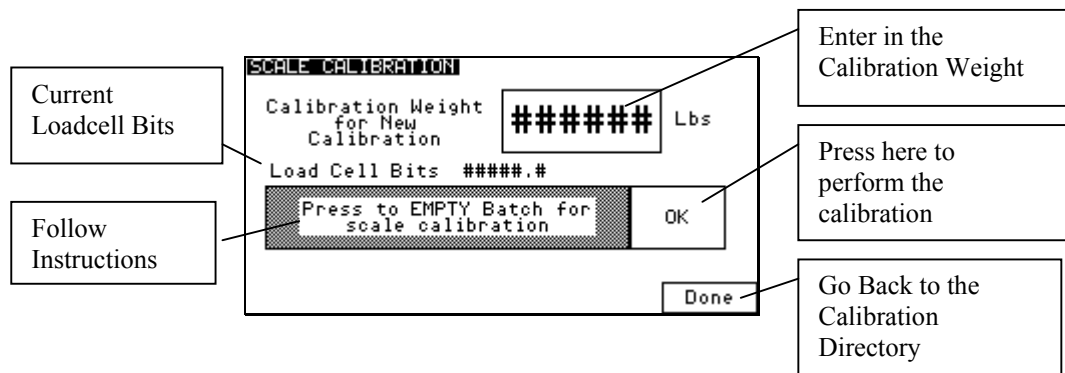
Enter the Setup menu as described previously. See Section 5-3 for menu tree.

The factory pre-calibrates the weigh hopper on the OS/OA blenders.

Button #3 on the Setup Menu is “Calibration”. Press it to enter the screen (shown below) which will prompt you to enter the Calibration area. Press the button marked “Scale Calibration” to enter the scale calibration menu.



- 1.) Once in “Scale Calibration”, enter in the scale calibration weight value stamped on the side of the weight.
- 2.) The controller will prompt you to remove the weight hopper and press OK.
- 3.) After touching OK, the controller will display “PLEASE WAIT...”
- 4.) Next, the controller will ask you to hang the calibration weight on the right loadcell bracket (loadcell A) and press OK.
- 5.) The controller will ask you to hang the calibration weight on the left loadcell bracket (loadcell B) and press OK.
- 6.) Finally, the controller will ask you to replace the weigh hopper in the blender and press OK to complete the calibration.
- 7.) The controller will verify that the calibration was done correctly by showing “**Calibration Successful.**”



5-8-4 Weigh Hopper (Load Cell) Calibration on blenders equipped with an HC style mixer

Enter the Setup menu as described previously. **See Section 5-3 for menu tree.**

The factory pre-calibrates the weigh hopper on the OS/OA blenders.

Button #3 on the Setup Menu is “Calibration”. Press it to enter the scale calibration menu.

- 1.) Once in “Scale Calibration”, enter in the scale calibration weight value stamped on the side of the weight.
- 2.) Clean out the weigh hopper and press OK.
- 3.) Place the calibration weight on top of the weigh hopper and press OK.
- 4.) Remove the calibration weight when prompted.
- 5.) The controller will verify that the calibration was done correctly by displaying “**Calibration Successful.**”

Important! It is *imperative* at this time that there is no mechanical binding of any kind on the weigh hopper. Adjust the load cell stops as described on page 46.



5-8-5 Feeder Calibration

Feeder calibration should be done on all OA blenders 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.

5-8-6 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 OS/OA 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.”

Mixer and Dump Setup	
Mixing Time	### sec
Remix Time	### sec
Dump Time	### sec
Dump Delay	### sec
Dump Cycles	# sec
Mixer Dump Time	### sec
<input type="checkbox"/> Continuous Mixing	
<input type="button" value="Done"/>	

Go Back to Setup Directory

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.

The mix timer is set to a default time of 10 seconds. This time can be adjusted up or down depending on the amount of mixing needed for the materials being blended.

It is recommended that the mix time be held to the minimum, as segregation can occur from over-mixing if the material bulk density and pellet configuration varies with materials in the particular blend being processed.

5-8-7 Re-Mix Timer

In some applications, the OS/OA 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.

5-8-8 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.

5-8-9 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 dump timer on the dump valve has a default time of eight (8) seconds. This time can be adjusted to optimize the blender cycle time.

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.

5-8-10 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.

5-8-11 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.

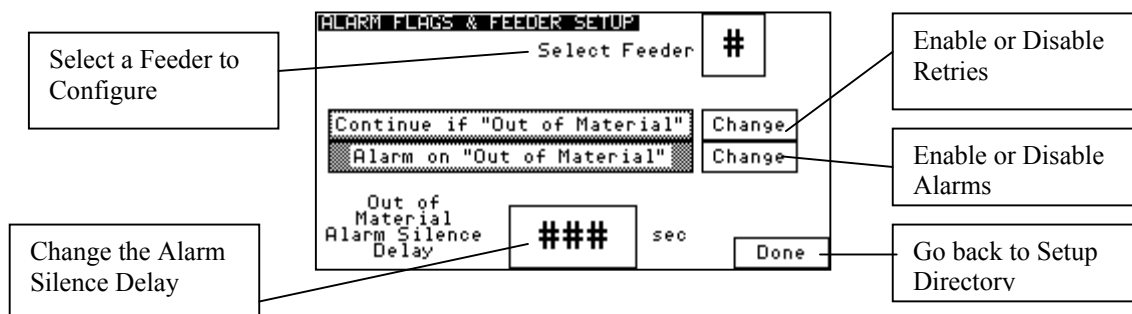
To enter the dump cycle menu, first enter the Setup menu by pressing the “AEC” icon from the main menu. Enter the password and press enter. Next, press the button marked “Mixer and Dump Setup”. The display will show the “Mixer and Dump Setup” menu. Press the “Dump Cycle” key to enter a dump cycle value and press enter. Please refer to the menu structure tree shown on page 53.

5-8-12 Feeder Alarm Setup & Flags

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 “Stop”, the blender will not

continue. It stops on that component continuing to try and meter. The optional low level proximity switches have their own separate alarm. The alarm will sound, but does not stop the blender. To configure each hopper do the following:

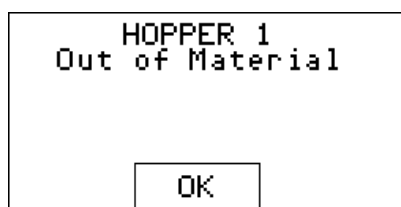
- 1.) Enter the Setup Menu.
- 2.) Once in the Setup menu, press “Alarm Setup.” This will take you to the “Alarm Flags & Feeder Setup” screen.



- 3.) Select a feeder (1-6) by touching the “Select Feeder” box.
- 4.) The current settings for the hopper that you have chosen will now be shown on the screen.
- 5.) Make the necessary adjustments to the “Stop/Continue if “Out of Material,” Alarm/No Alarm on “Out of Material,” and Out of Material Alarm Silence Delay (0-60 seconds) settings.” Once the settings for these features have been set on the displayed feeder, select a new feeder to configure as desired.
- 6.) Press the “Done” key at the bottom to exit this screen.

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. 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 will reappear after a short delay. During an alarm condition, not only will a visual alarm show up on the screen but also an audible alarm will sound. The audible alarm will sound for 10 seconds and reappear every 30 seconds until the cause of the alarm is resolved. The following is a list of all alarm names and descriptions:

- **Hopper 1-6 Out of Material:** This alarm indicates that a hopper is out of material and signals the operator that they should check the resin system.



- **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 is not effected as long as the blender is configured for "AutoStart." The blender will finish the last batch accurately even if the material was dumped into the mixer when the power was turned off.



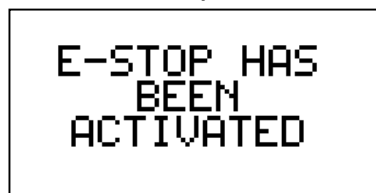
- **PLC Battery Low:** PLC battery is low and may cause the blender to lose both the program and the blender configuration. Notify Maintenance immediately.



- **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.



- **Blender Powered On/Off:** These are only logged in the Alarm Log and does not cause a pop-up message or audible alarm. Each time the blender is powered on or off, the time and day is logged to the Alarm Log.
- **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 E-stop switch that removes the power from all mechanical outputs. The E-Stop Screen appears along with an audible alarm whenever the E-Stop is activated. The operator can not access any screens until E-Stop is deactivated. The Panel View will then put the screen back to the display that the operator was on prior to hitting the E-Stop.



5-8-13 Feeder Metering Order

The OS/OA 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 53). 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 “123456” means that the blender will feed hopper 1 first and hopper 6 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 654321 and press the enter (“↵”) key. Once the desired metering order is displayed, simply press the “Done” key to save the information and exit from the menu back to the Setup Menu. **If the order is changed, then you will need to touch “Accept New Recipe” 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.

Important!: All feeders *must* be in the metering order. Do not have the same metering order number assigned to two feeders at the same time as the control will not accept the settings.



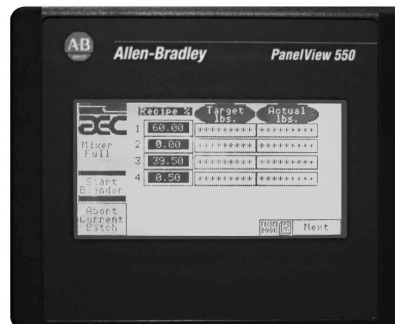
5-8-14 Remote Touch Screen

Note: The Remote Touch Screen option provides a second operator control.

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

Every OS/OA 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.



5-8-15 Network Communications Baud Rate & I.D. Settings

The blenders baud rate is the speed at which data is transferred to and from the blender's communication port. The blender IP is the address of this blender on a network. The OS/OA is factory set up at 192 baud, with an IP address of 01.

In order to change the values, enter the Setup menu, press the "Network Setup" button and change the values accordingly. Baud rates available are 120, 240, 480, 960, 192. Blender ID's can range from 1 through 255.

Enable or Disable the Ethernet Module Configurator

ETHERNET SETUP

Disable if using BOOTP Servers or Mitsubishi Display

Ethernet Configurator Enabled

IP ADDRESS	###	.	###	.	###	.	###
SUBNET MASK	###	.	###	.	###	.	###

Send Ethernet Config to Module

You must send the data if you make changes before the change will take place

Done

Change Blender's IP Address and Subnet Mask

Go back to Setup Directory

5-8-16 Additional Control Functions

The objective of this section is to familiarize the reader with the OS/OA 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 chapter are optional printer functions and report generation capabilities of the OS/OA blending system.

Topics covered in this section are:

- ***General Operation***
- ***Recipe Menu***
- ***Optional Printer Menu***

All personnel operating the OS/OA blending system should read this section of the manual **before** operating the blending system.

5-8-17 General Operation

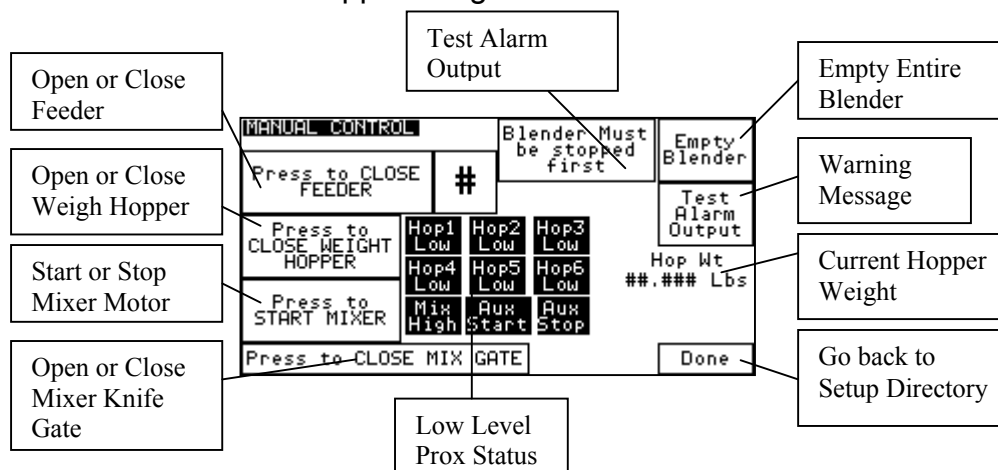
The general operation of the OS/OA blending system is as follows: Once the system is properly installed and set up, the system will be ready for operation. Please see the Installation and Setup chapter in this manual for further information.

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

5-8-18 Feeder Clean Out

Any feeder in the OS/OA blending system can be emptied and refilled with a different material. To do a feeder clean out, the operator has to press the “Clean Out” icon key from the recipe screen (the first screen that appears on power up).

This screen will allow you to Open or Close the Feeder, Weigh Hopper, Mixer Knife Gate, Empty the Entire Blender, Start or Stop the Mixer Motor, Test the Alarm Output, Find out the Mixer Proximity Status and monitor the Current Hopper Weight.



The dump valve opens as soon as the “Press to Open Feeder” key is pressed. This easy feeder clean out option also serves as a means for emptying a batch that is held in the weigh hopper if the “Press to Open Weigh Hopper” key is pressed when the blender is stopped. To open/close feeder numbers 2, 3, 4, 5 & 6 press the number next to “Press to Open Feeder” to select the feeder you desire to empty and the “Press to Close Feeder” key to close the dump valve. Touch the “Done” key to return to the recipe menu. After entering a recipe, the operator will restart the blending system, putting it back in normal operation.

Important!



Before starting OS/OA 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 Section 5-8-9). 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.

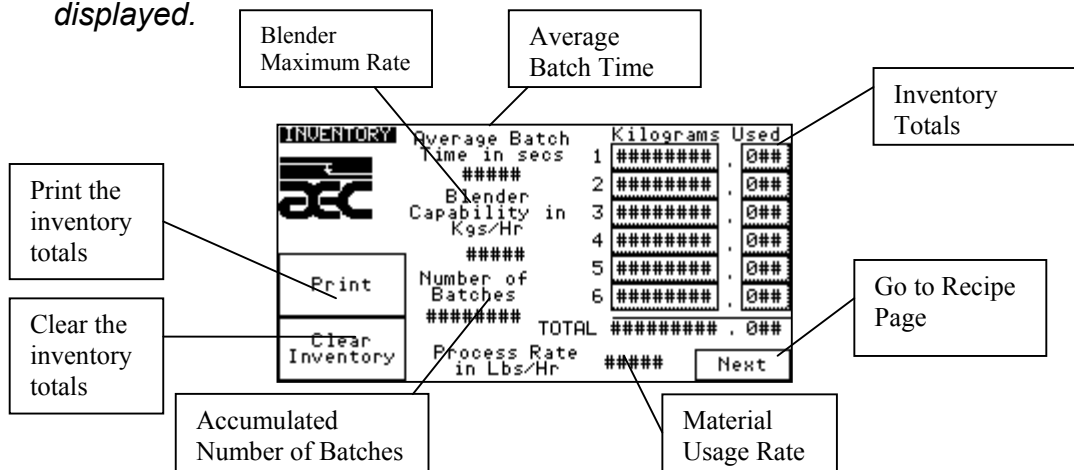
When the controller has determined that the mixer is ready for an additional batch of material, the controller will begin metering material into the weigh hopper assembly.

5-8-19 Standard Run Time Displays

While the blending system is in operation, there are a couple of displays available to the operator. These displays are selected simply by pressing the “NEXT” key when the unit is running. The default display shown when the blender is in run mode is the Recipe Screen.

The Recipe Screen indicates by feeder number, the amount of material metered into the weigh hopper assembly by that particular feeder. This display is updated after each component dispenses its specified amount. The ingredient weights (Unit Values) are in pounds, unless the metric display is selected.

Pressing the “NEXT” key when in the default recipe mode display will toggle to the next screen, which is the Inventory Display. *This can be done at any time, but if the blender is in a critical mode such as dumping, and updating inventory, etc., it may ignore the keystroke. Simply press the “NEXT” key again, the Inventory screen will be displayed.*



This display indicates the amount of material in pounds that has been used by each feeder of the recipe. It is important to note that the weights are rounded off to the closest pound. On minor ingredients, several cycles may have to occur to show an inventory number.

In addition to showing the amount of material that has been used for each feeder, this screen is also a summary display that shows the total inventory, the time for the last batch, and the average rate of the blender.

If the blender is run in “Percentage Mode” instead of “EZ” Mode during operation, the “Percentage Mode” will use the blender inventory numbers shown on the Inventory screen to calculate the percentages for each ingredient. It is important to zero the inventories when a recipe is changed to have this screen accurately reflect the current percentages of the recipe in-process.

Note: Blender inventories must be cleared when the current recipe is started to show accurate percentages for the current recipe.

To clear inventories, press the “Clear Inventory” key on the “Inventory” print screen.

5-8-20 Recipe Menu

Note: Refer to the menu structure in section 5-4 for more information.

The OS/OA 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 Menu” 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” Mode, Percentage Mode or Parts Mode. (“EZ” mode is the default setting preset at the factory.) In addition, every feeder in the blending system does not need to have values entered (Percentage or Parts recipe formats), or a material type (REGRIND, NATURAL, or ADDITIVE) in “EZ” Mode recipe format.

Recipe Format Menu:

- “EZ” Recipe, Percentage or Parts
- Metering Order
- Batch Size
- Inventory Shutdown
- “Batch ready” mode
- “Auto start” mode
- Weigh every batch options

5-8-21 Current Recipe Menu

Throughout the menu structure, the top left corner of the display will list the name of the current screen that you are in. Each individual button will indicate instructions for keystrokes. In the Recipe Format menu shown on the previous page, pressing on the mode button displayed at the top of the screen will show the Current Recipe menu.

Note: *The blender will always run the percentages shown in the Current Recipe menu display.*

5-8-22 “EZ” Recipe Menu

The “EZ” menu structure allows recipes to be entered and adjusted by touching the buttons on the panel face (for 1 to 6 components). This is convenient for use in the injection molding industry.

After an “EZ” mode is selected, the screen will display the label on the Recipe screen.

The first (component #1) material hopper on the blender is always designated “NAT” for natural (virgin) and cannot be changed. The other ingredient labels can be scrolled by pressing the hopper number. They can be scrolled to read “NAT” (natural), “RGD” (regrind), or “ADD” (additive). The selected label will be displayed for the ingredient hopper with an arrow next to the abbreviation.

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.

The ingredient labels (names) selected will be displayed on the recipe menu so the operators will know what material is being blended. The natural or virgin (component #1) ingredient will not be shown on the recipe menu.

If additive is designated, the weighed ingredient will be metered as a percentage of the natural or virgin.

If regrind is designated (component #3), the ingredient will be metered 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.

Please see next page for example calculations (setup).

Example calculations of a five (5) -component blend in “EZ” 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)

<p>Virgin + Additive 1 + Additive 2 + Additive 3 + Regrind = 100% 64.81% + 3.24% + 1.30% + 0.65% + 30.00% = 100%</p>
--

Typical Batch Size

OS-007	3 lbs.
OS-014	8 lbs.
OS-070/080/100	35 lbs.

5-8-23 Batch Size Menu

The OS/OA 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.

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.

Important! *If running a high percentage of lighter density regrind.*

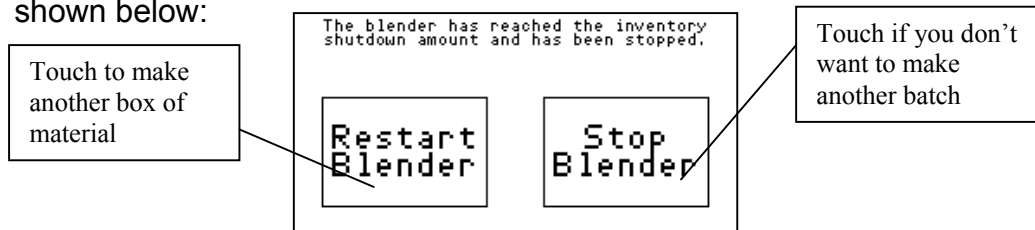


Set the batch size so that the mixer does not overfill, preventing the weigh hopper from fully dumping when operating in "Batch Ready Mode".

5-8-24 Inventory Shutdown

In many applications, the user of the OS/OA 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, Blend and Reclaim 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:



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.

5-8-25 Recipe Book (Storage) Menus

In many applications, it is favorable to hold several recipes in the memory of the blending system. The OS/OA has provided for this by incorporating Blend and Reclaim’s recipe book software.

The recipe book is capable of holding 50 different recipes. These may be stored and recalled by number. ***During this section of the manual, the operator may wish to revert to the Menu Tree Diagram on page 53 of this manual.***

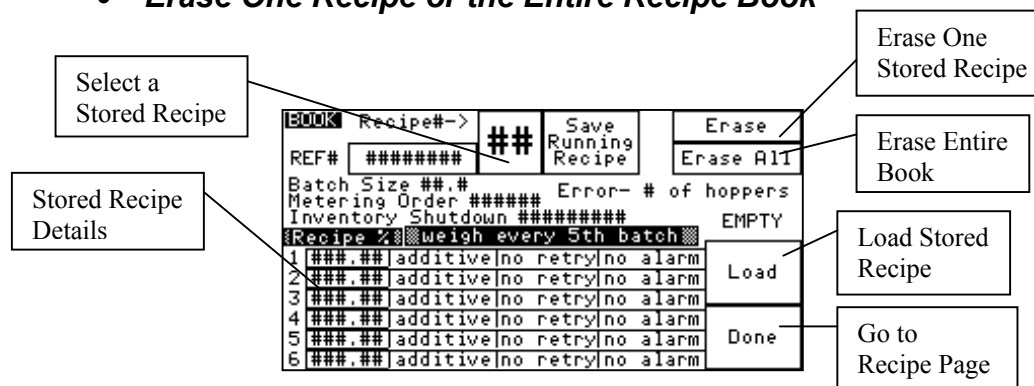
It is important to note that the recipe book only stores and recalls recipes. **The blender will operate on the current recipe only**, so a recipe must be recalled from the book to the current recipe for it to be active.

Each recipe stored in the recipe book may be displayed and/or modified. Only the current recipe will be blended.

Always verify that the Current Recipe is showing what you want to run, and that the correct recipe has been downloaded from the book.

The recipe book section contains the following Items:

- ***Save Running Recipe to the Book***
- ***Load a Stored Recipe from the Book***
- ***Display a Stored Recipe***
- ***Erase One Recipe or the Entire Recipe Book***



5-8-25-1 Save Running Recipe to the Book

The save current recipe to book function allows the operator to save the contents of the current recipe to the recipe book under a desired number.

Upon selecting this function, the operator will be prompted for a reference recipe number. This may be any number from 1 to 50.

The assigned recipe number will be used for all further references to this recipe until deleted. The operator should be familiar with the recipe numbers used. We suggest keeping a loose-leaf notebook with 50 tabbed pages as a reference to what is kept in the blender so this can be the standard for all blenders in the plant, etc. To save a running recipe to the Recipe Book perform the following steps:

1. Enter the Recipe Book by touching the Recipe Book icon located on the Recipe Screen.
2. Select a stored recipe by changing the number next to "Recipe #."
3. Touch "Save Running Recipe" and then "Done".

5-8-25-2 Load a Saved Recipe from the Book

The load from book function allows the operator to retrieve a previously stored recipe from the recipe book and install it into the current recipe menu. This will overwrite the current recipe, so make sure that it has been saved to the book before installing a new recipe in its place. To load a previously stored recipe from the Recipe Book:

1. Enter the Recipe Book by touching the Recipe Book icon located on the Recipe Screen.
2. Select a stored recipe by changing the number next to "Recipe #."
3. Touch "Load" and then "Done" (this takes you back to the Recipe Screen).
4. Touch "Accept New Recipe" to accept the loaded recipe into the blender.

Note: If replacing the current recipe with one that is downloaded from the Recipe Book, *make sure that the previous recipe has been saved*, as it will be overwritten by the new downloaded recipe.

5-8-25-3 Display Recipe Contents

The display recipe function is used to verify the contents of a recipe number before it is loaded from the recipe book. In order to view the desired recipe, the operator must enter the number which contains the recipe he wishes to view. Once a valid recipe number is entered, the display will indicate the contents of the stored recipe in percentages.

5-8-25-4 Erase Recipe or Entire Book

The Erase Recipe or Entire Book function is used to eliminate old or outdated recipes from the recipe book. If the operator only wants to delete one recipe, the configuration for that recipe should be currently displayed on the screen. The controller will only prompt the operator if they want to erase the entire book when that key is pressed. Once a recipe number is deleted, the contents of that recipe are lost. The recipe number may be used again in the future for new recipes.

5-8-26 Printer Features

The OS/OA 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.

The screenshot shows the 'REPORT SETUP' screen with the following fields and callouts:

- Blender Number** (###): Callout: "Blender Number Information will be printed for."
- Auto Print Inventory** (Disabled): Callout: "Enable or Disable the Auto Print & Auto Clear Inventory"
- Auto Clear Inventory** (Enabled): Callout: "Enable or Disable the Auto Print & Auto Clear Inventory"
- Auto Print/Clear Interval (hours)** (####): Callout: "Report Interval in hours (1-24)"
- Start Hour (0-23, midnight=0)** (##): Callout: "Report Start Hour (0 to 23, 0 is midnight)"
- Done**: Callout: "Go to back Recipe Page"

The printer is used to obtain batch ticket and inventory information. A batch ticket contains the time and date, the actual blend percentages and the accumulated inventory numbers for all networked blenders (1 to 999).

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***

5-8-26-1 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.

Time 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

If you wish to print out the inventory information on a batch interval basis, then simply enter in the desired batch interval under the Recipe Format screen and the printouts will occur each time that the number of batches programmed is produced. To set the batch interval, press the bottom button “Weigh Every Batch”, “Weigh Every Other Batch,” etc. to change this setting, keep pressing this button until the desired option is reached. Once you have chosen the number of batches that will be produced between printouts, press the “Done” key to return to the Setup screen. **If the “Auto Print Inventory” feature has been enabled in the “Report Setup” screen, then the printer will produce printouts according to the settings instructed above.**

5-8-26-2 Print Inventory

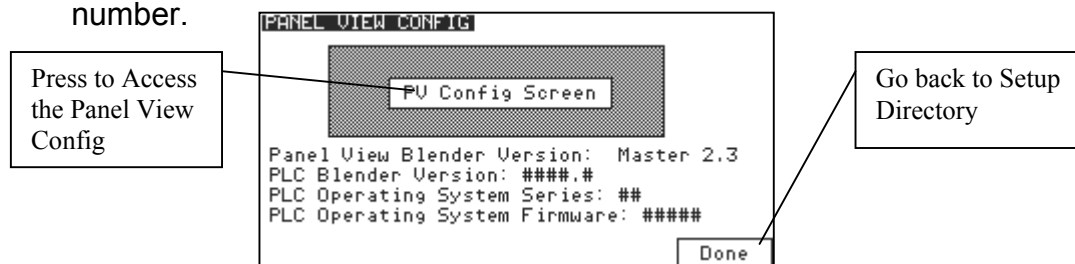
The print inventory menu item is used to produce on demand, inventory printouts. Before selecting this item, be sure that the printer is properly connected and ready. This function will generate an inventory printout with the current date and time information.

5-8-26-3 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.

5-8-26-4 Setting Date & Time

The Set Date & Time feature is located in the “Panel View Config” menu of the Setup Screen. This feature allows the operator to set the OS/OA’s internal time clock and date. The clock data must be entered in the traditional Hours, Minutes, and seconds. The date must be entered in Years, Months, and Days. All values in this screen can be entered by pressing on the related button and choosing the correct number.



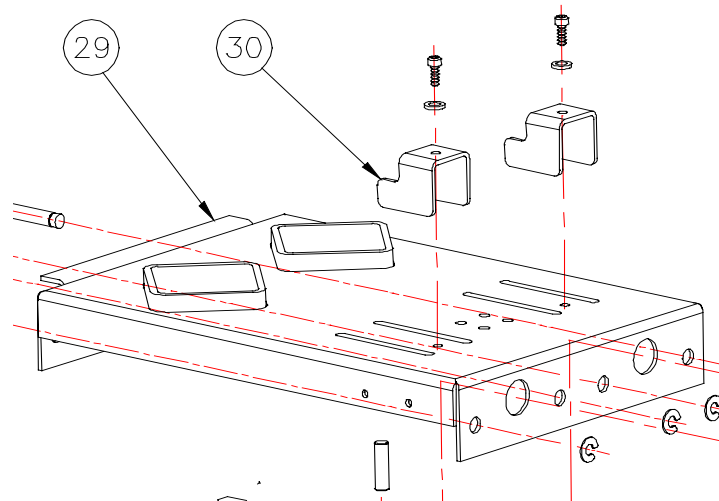
5-9 Stroke Limiters for Metering Gates

Stroke limiters are supplied on components 1 through 4 with all OS blenders to allow standard metering gates to meter small amounts of low percentage additive materials.

Generally, the stroke limiter (Item 30) is not required on major ingredients (usually number 1 and 3) and should be removed. If they are left in place, 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 socket head screw that is provided. Be sure to use the lock washer to prevent the stroke limiter from coming loose.

Stroke Limiter



6-1 Work Rules

The installation, operation, and maintenance of this equipment must follow all applicable work and safety codes for the location where it is used. This may include, but is not limited to, OSHA, CSA, NEC, SPI, and other local, national, and international regulations. In addition, you must observe the following specific rules:

- ☑ Read and follow these instructions when installing, operating, and maintaining your equipment. If the instructions become damaged or unreadable, you can obtain additional copies from the Service Department at AEC, Inc.
- ☑ Only qualified people may work on or with this equipment.
- ☑ Work only with approved tools and devices.
- ☑ Turn off and lock out the power switch when maintaining or servicing your blender system.
- ☑ Disconnect and lock out main power before servicing electrical equipment.

6-2 Maintaining Blenders

AEC 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.

WARNING!



Always remove plug and disconnect power before servicing blender.



Always read operating manual before operating or servicing blender.

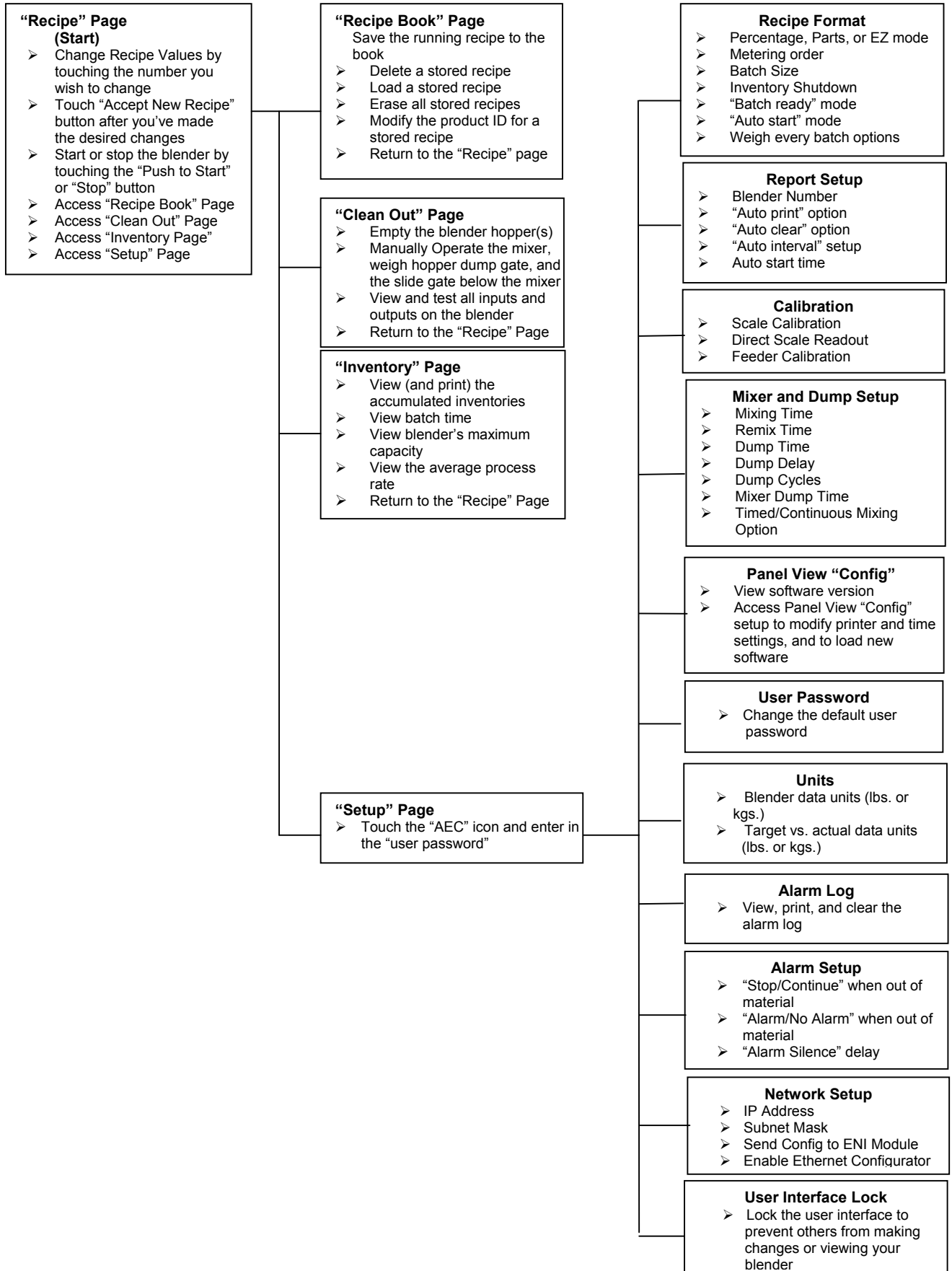
6-3 Controller Setup

This section describes the proper setup of the OS/OA 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 OS/OA 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.

6-4 OS & OA Series Blender Menu Structure



6-5 Mechanical

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 following maintenance is suggested:

Daily

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

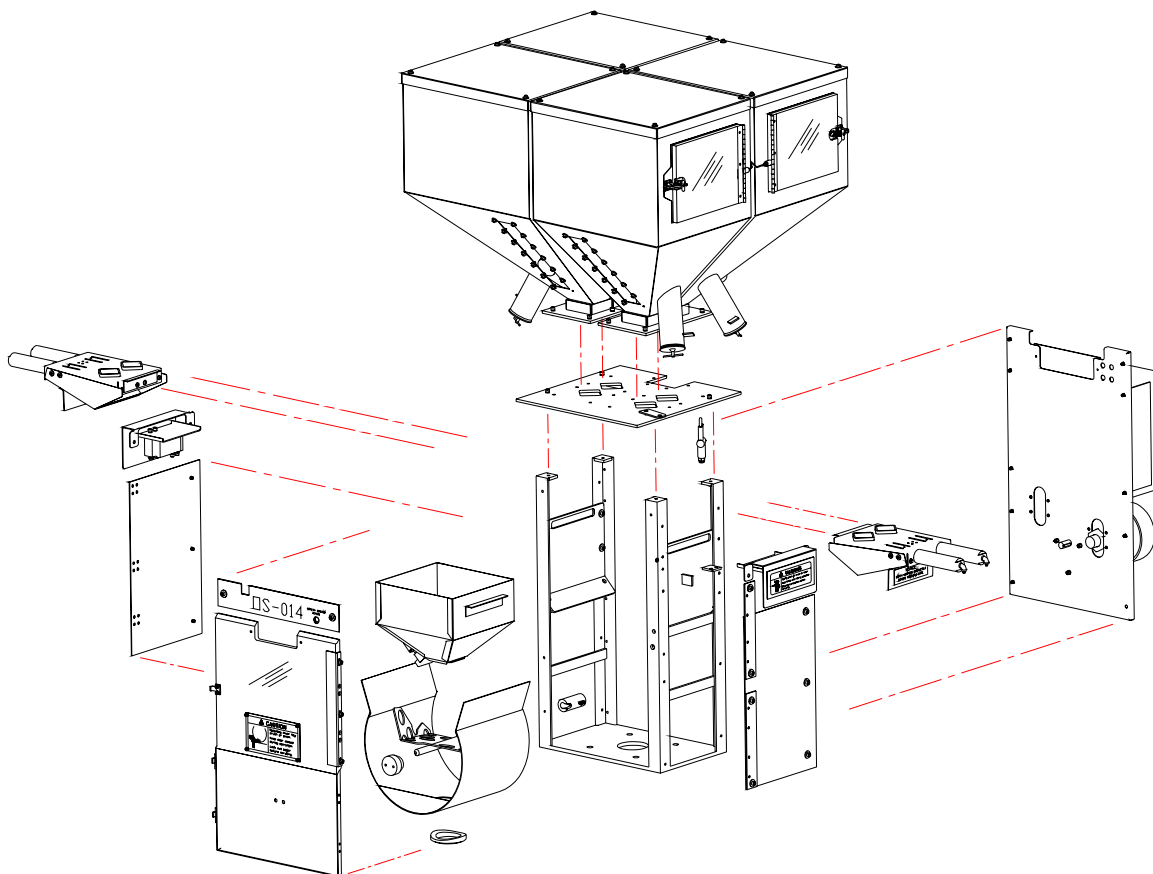
Weekly

- Inspect metering gates for proper operation.

Monthly

- Inspect air regulator and air safety circuits, if equipped.
- Recalibrate blender only if necessary.

Typical Model OS Assembly Overview



6-6 Electrical

6-6-1 Description and Objectives

This section is designed to give the operator an overview of the electrical system that controls the OS/OA blending system. Since the OS/OA'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 OS/OA unit.

This section includes the following:

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

6-6-2 Internal Components of the Control Panel

Note: See Section 12-2 for complete electrical schematics.

This section describes the internal components of the OS/OA 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 OS/OA control panel.

The customer must supply 120/1/50 or 60 (or 220/1/50 or 60) 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 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.

6-6-3 Input Signals to Programmable Controller

The OS/OA 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.

6-6-4 Output Signals from Programmable Controller

The OS/OA 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 OS/OA 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.

Note: 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.

6-7 Pneumatic System Maintenance

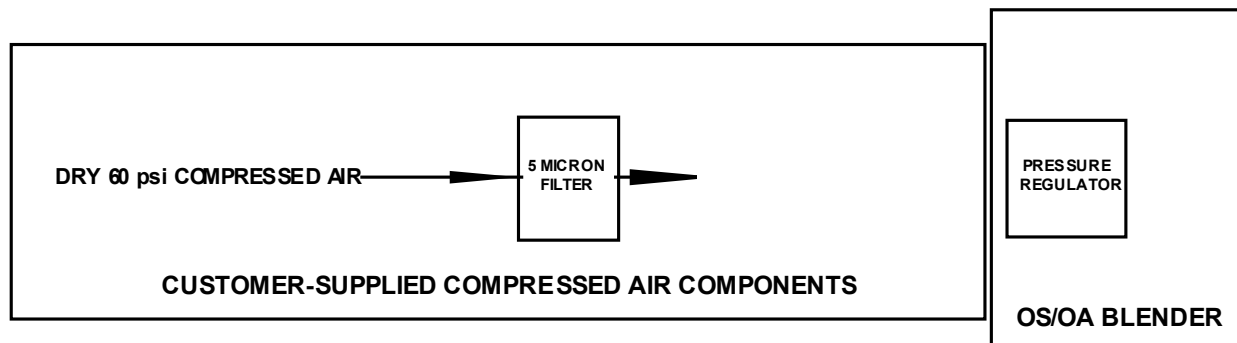
The OS/OA blending system uses plant-supplied compressed air to operate the metering and dump valves on the blender.

It is the user's responsibility to provide CLEAN AND DRY air for the blender to be connected to. The air supply should be filtered through a 5 micron air filter and have a water separator installed. Oil should not be used unless air dryers are installed on the compressed air supply. In this case, an oiler may be required on the blender to keep the air cylinder seals lubricated.

Important!



As this blender uses air for blender metering functions, it is very important to supply clean, dry air to the blender. Dirty 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.*



AEC provides all pneumatic lines on the blender piped to a single ¼" NPT standard pipe thread fitting. The OS/OA blending system requires approximately 1 cfm @ 60 psi (1.7 m³/hr @ 4.14 bar) air pressure for proper operation.

The working pressure of the blender cylinders is 60 psi. This is adjustable by the regulator supplied on the rear panel of the blender. (It is important that the air pressure to the blender is not fluctuating by installing the unit on an air line with other equipment using large volumes of air. 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.)

WARNING!



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

7-1 Description and Objectives

This section provides basic troubleshooting procedures to common OS/OA blending system problems. Any problem encountered that is not listed should be discussed with an AEC service technician.

Problem	Possible solution
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 has been Locked" is shown	Click "Unlock" and enter in your User Password.
I've forgotten my User Password	Contact AEC 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 Allen-Bradley for repair.
PLC Module Loaded	Normal after a software upgrade. Follow on-screen instructions.
	Check the input power. Verify that 110 volts (or 220 volts) are $\pm 10\%$. 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.

Problem	Possible solution
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 overflow condition on the next few cycles.
	Check the load cell connections to the panel.
Material tends to separate in the mixing chamber.	Check the mix timer setting. This problem is normally due to over mixing. See the mix timer section in the setup chapter. Reduce the time until the problem is corrected.
	Check the mixer drive to ensure that the agitator is turning properly.
	Check the high level switch in the mixer to lower the level slightly.
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. Actually if you over mix material, you can have the same problem. If you have the blender set for "Continuous Mixing" then change it to "Timed Mixing" and adjust the Mixing Time appropriately.
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 the blender's Alarm Log to determine if the blender was powered up during the print time. The blender keeps track of Power On and Off conditions.
	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.

Problem	Possible solution
Blender keeps dumping after mixer is full.	<p>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).</p> <p>Check the mixer high-level sensor connection to the control panel.</p>
Blender will not batch with empty mixer.	<p>Check the mixer high-level switch sensitivity. Fines may have coated the level switch; it needs readjustment.</p> <p>Check the proximity switch connection.</p> <p>Make sure that the recipe is correct.</p> <p>Check batch size.</p>
Mixer won't shut off and runs continuously.	<p>Check the Mixer and Dump Setup to see if the mixer is configured for "Continuous Mixing". Set it to "Timed Mixing".</p> <p>Check the value of the mixer timer setting.</p> <p>Check the value of the dump delay timer.</p> <p>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.</p> <p>Check the power source to the blender.</p> <p>Check the load cell in diagnostics under direct scale readout. Place a calibration weight on the weigh hopper; determine if the weight corresponds.</p> <p>Check the load cells to make sure that a pellet has not jammed under a load cell.</p> <p>Check the load cell connections to the control panel</p> <p>Check the power supply voltage and readjust as necessary as described earlier.</p> <p>Check the memory battery voltage on the CPU board. If the battery is dead, the blender "forgets" settings when the power is off. Replace it with a new battery. Order a spare CPU board; send the replaced one back to the factory to have a new battery holder and battery installed. If this is done in the field, the controller warranty will be voided.</p>
Out of Material Alarm is displayed, but there is material in the hopper.	<p>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".</p> <p>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).</p>
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	Possible solution
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. 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 AEC Service Department.

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

Regrind Auger Metering (RAM)

Used for feeding difficult regrind materials.

Low Level Sensors

Detects material supply problems before blender runs out.

Remote Touch Screen Interface

Allows control of blender from a second location up to 50 feet (30 meters) away.

Mezzanine & Floor Stands

Supports blenders in mezzanine mount and freestanding applications.

Take-off Compartments

Allows material to be metered into a vacuum conveying system.

Slide Gate below Mixer

Ensures blend homogeneity.

CL-25 Pneumatic Loader for Additives

Compressed air loader to load low percentage additives into the blender.

9-1 Spare Parts List

OS Series Gravimetric Batch Blending Systems

✓ Please see Section 9-2 for parts identification and exploded views.

Model OS-007

Part No.	Description
53292	Air Cylinder (weigh hopper dump)
	2kg Load Cell
10220	Mixer Agitator (Opti-Mixer)
63881	Mixer High Level Sensor
35448	Slidegate Air Cylinder (3" stroke)
A0565882	Calex Module
A0565881	(PLC back base)
A0565885	Touch Screen Interface
A0542200	1.5 Amp Fuse
A0565892	3.0 Amp Fuse

Model OS-014

Part No.	Description
35450	Air Cylinder (weigh hopper dump)
	5kg Load Cell
10207	Mixer Agitator (Opti-Mixer)
63881	Mixer High Level Sensor
35448	Slidegate Air Cylinder (3" stroke)
A0565882	Calex Module
A0565881	(PLC back base)
A0565885	Touch Screen Interface
A0542200	1.5 Amp Fuse
A0565892	3.0 Amp Fuse

Model OS-070, OS-080 & OS-100

Part No.	Description
53243	Air Cylinder (weigh hopper dump)
	20kg Load Cell
10197	Mixer Agitator (Opti-Mixer)
63881	Mixer High Level Sensor
53266	Slidegate Air Cylinder (5" stroke) – OS-070 only
53280	Slidegate Air Cylinder (6" stroke) – OS-100 only 0801100
A0565882	Calex Module
A0565881	(PLC back base)
A0565885	Touch Screen Interface
A0542200	1.5 Amp Fuse
A0565892	3.0 Amp Fuse

OA Series Gravimetric Batch Blending Systems

Model OA-002 (with Opti-Mixer™)

Part No.	Description
53292	Air Cylinder (weigh hopper dump)
	2kg Load Cell
10220	Mixer Agitator (Opti-Mixer)
63881	Mixer High Level Sensor
15286	Auger Shaft Seal
11147AM	1" Feed Auger
11146AM	¾" Feed Auger
11145AM	½" Feed Auger
51444	71 RPM Feeder Gear Motor
51486	95 RPM Feeder Gear Motor
53404	240 RPM Feeder Gear Motor
A0565882	Calex Module
A0565881	(PLC back base)
A0565885	Touch Screen Interface
A0542200	1.5 Amp Fuse
A0565892	3.0 Amp Fuse

Model OA-012

OA-012 Opti-Mixer™

Part No.	Description
35450	dump cylinder
35463	valve stack (1)
	5kg Load Cell
35435	pressure indicator
35437	safety control valve
10207	mix agitator
63881	Mixer High Level Sensor
53361	1/6hp mix motor
55212	2-amp fuse
A0565882	Calex Module
A0565881	(PLC back base)
A0565885	Touch Screen Interface
A0542200	1.5 Amp Fuse
A0565892	3.0 Amp Fuse

OA-012 rotary (HC) mixer

33126	dump cylinder
33138	dump valve
	10 kg Load Cell
55347	safety switch assy
08841	mix agitator
55348	Mixer High Level Sensor
51253	mixer gear reducer
51353ME	1/2hp mix motor
61-3AB10	10-amp fuse
15370	dump cone
59643	25 amp relay
15286	mix motor shaft seal
15241	frame gasket
15239	wrap/door gasket
A0565882	Calex Module
A0565881	(PLC back base)
A0565885	Touch Screen Interface
A0542200	1.5 Amp Fuse
A0565892	3.0 Amp Fuse

OA 012 common feeder components

51450G	1/15hp 70rpm
51449G	1/15hp 97 rpm
51453G	1/15hp 139 rpm
08236-1	3/4" auger
08237-1	1" auger
08238-1	1-5/8" auger
08239-1	2" auger

Model OA-030

OA-030 Opti-Mixer™

Part No.	Description
53243	dump cylinder
35476	valve stack(5)
	20kg Load Cell
63881	Mixer High Level Sensor
53280	1/2hp mix motor
55216	10-amp fuse
59643	25 amp relay
A0565882	Calex Module
A0565881	(PLC back base)
A0565885	Touch Screen Interface
A0542200	1.5 Amp Fuse
A0565892	3.0 Amp Fuse

OA-030 rotary (HC) mixer

33126	dump cylinder
33138	dump valve
	20kg Load Cell
55347	safety switch assy
55348	Mixer High Level Sensor
51415	mixer gear reducer
51354	1hp mix motor
61-3AB10	10-amp fuse
15209	dump cone
59643	25 amp relay
15241	frame gasket
15239	wrap/door gasket
A0565882	Calex Module
A0565881	(PLC back base)
A0565885	Touch Screen Interface
A0542200	1.5 Amp Fuse
A0565892	3.0 Amp Fuse

OA 030 common feeder components

51450G	1/15hp 70rpm
51449G	1/15hp 97 rpm
51453G	1/15hp 139 rpm
08236-1	3/4" auger
08237-1	1" auger
08238-1	1-5/8" auger
08239-1	2" auger
51440G	1/6hp 156rpm
08317-1	3" auger
08318-2	3-1/2" auger

Model OA-060

OA-060 Opti-Mixer™

Part No.	Description
53243	dump cylinder
35476	valve stack(5)
	20kg Load Cell
35435	pressure indicator
63881	Mixer High Level Sensor
53280	1/2hp mix motor
55216	10-amp fuse
59643	25 amp relay
A0565882	Calex Module
A0565881	(PLC back base)
A0565885	Touch Screen Interface
A0542200	1.5 Amp Fuse
A0565892	3.0 Amp Fuse

OA-060 rotary (HC) mixer

33126	dump cylinder
33138	dump valve
	30kg Load Cell
55347	safety switch assy
55348	Mixer High Level Sensor
51415	mixer gear reducer
51354	1hp mix motor
61-3AB10	10-amp fuse
15209	dump cone
80151	power supply
59643 2	25 amp relay
61-DRIAC5	input module
61-DROAC5	output module
15286	mix motor shaft seal
A0565882	Calex Module
A0565881	(PLC back base)
A0565885	Touch Screen Interface
A0542200	1.5 Amp Fuse
A0565892	3.0 Amp Fuse

OA 060 common feeder components

51450G	1/15hp 70rpm
51449G	1/15hp 97 rpm
51453G	1/15hp 139 rpm
08236-1	3/4" auger
08237-1	1" auger
08238-1	1-5/8" auger
08239-1	2" auger
51440G	1/6hp 156rpm
08317-1	3" auger
08318-2	3-1/2" auger

9-2 Model OS/OA Blender System Component Description

This section describes the various components of the blending system. The OS/OA blending system is made up of the following components:

- *Ingredient Supply Hoppers*
- *Ingredient Weigh Hopper*
- *Ingredient Metering Slide Gate Assemblies (OS Series)*
- *Ingredient Metering Transport Auger Assemblies (OA Series)*
- *Rotary Mixer*
- *Computer Control Panel*

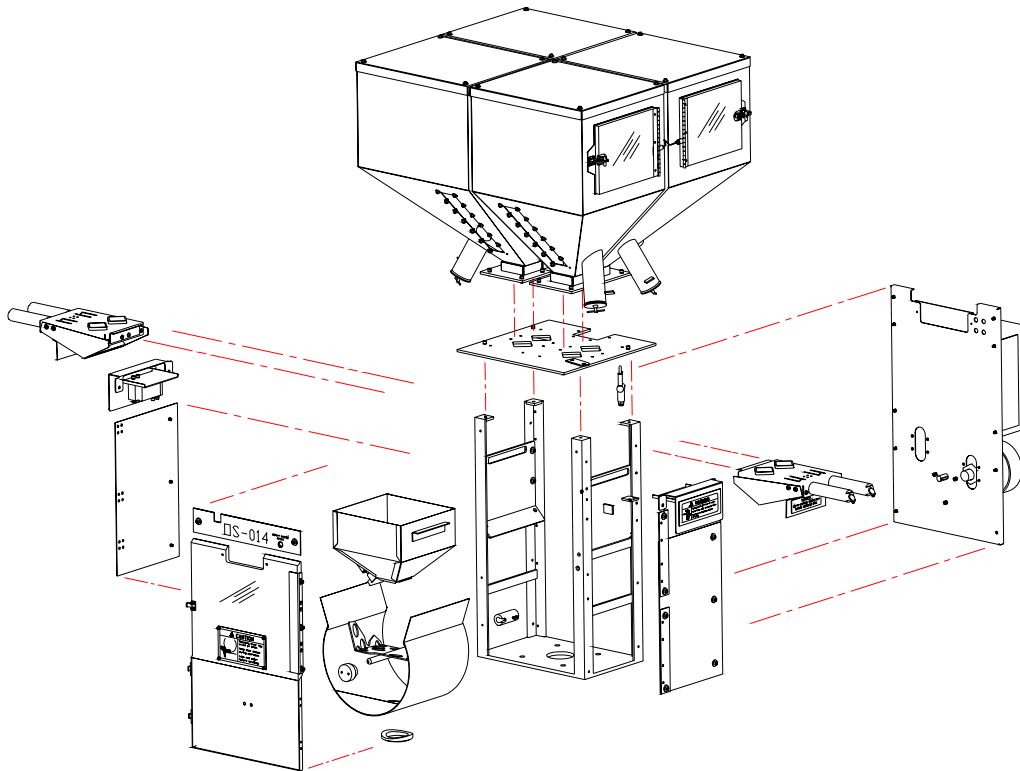
9-2-1 Overview

Component Identification and Location

This section will familiarize the reader with the components of the OS/OA blending system. After reading this section, the reader will be able to:

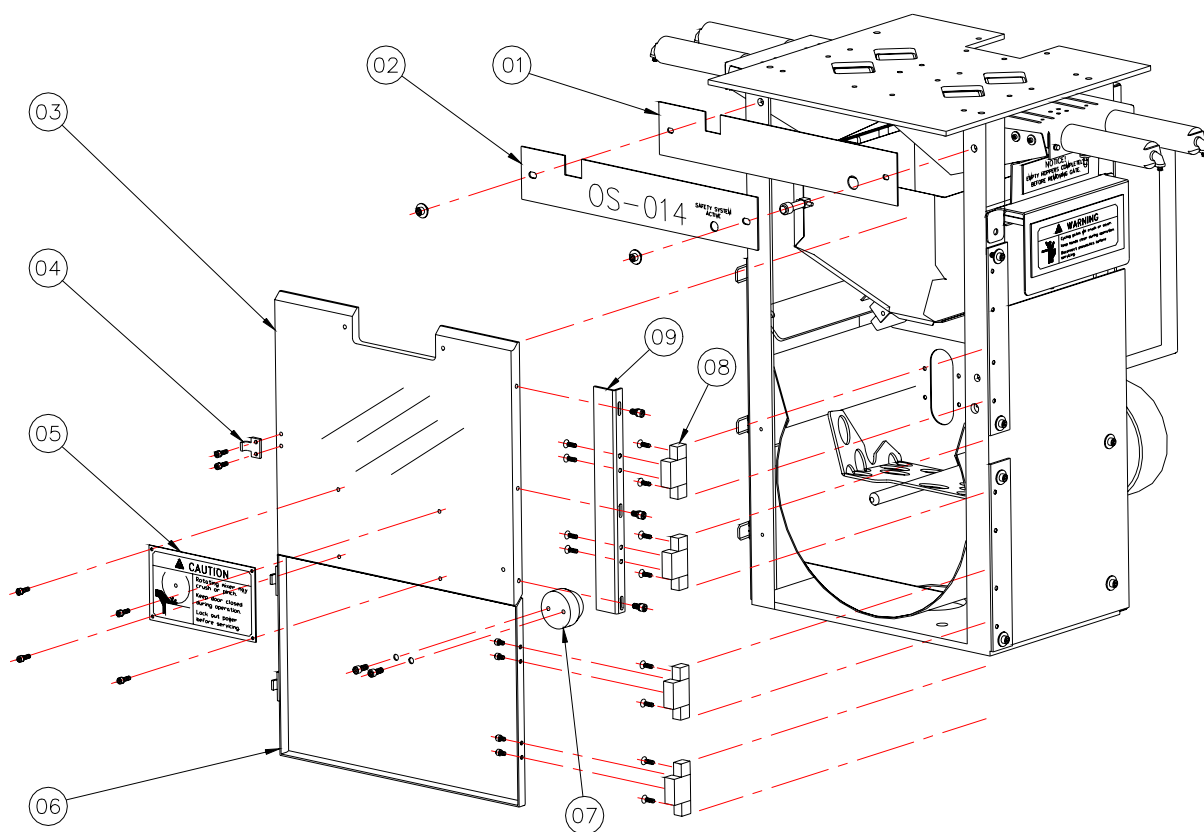
- *Identify the individual common components of the OS/OA blending system.*

Typical Model OS Assembly Overview



9-2-2 Typical Mixer Section (Front)

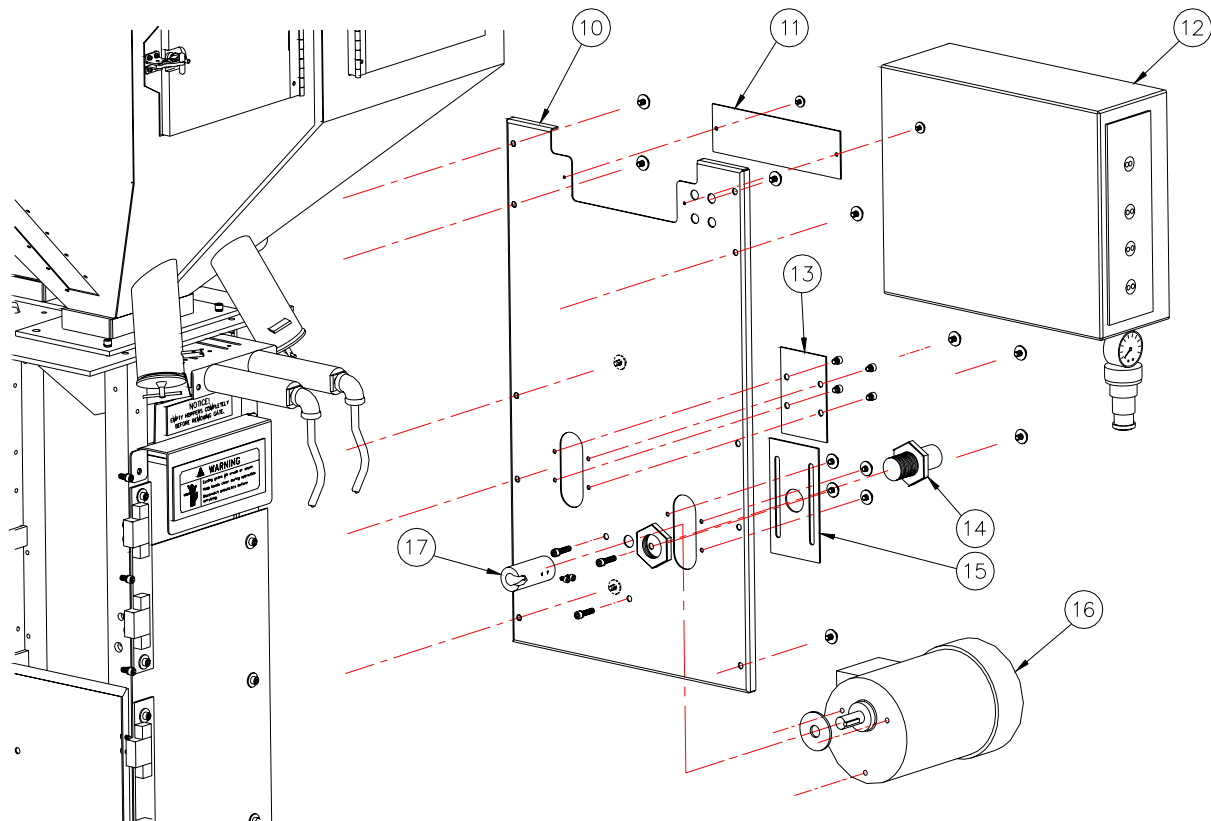
Typical Opti-Mixer™ - Front Assembly Detail



- 01 Nameplate and indicator mounting plate
- 02 Nameplate
- 03 Upper polycarbonate Opti-Mixer™ door
- 04 Door clamp
- 05 "Caution" label
- 06 Lower stainless steel Opti-Mixer™ door
- 07 Mixer agitator door bushing
- 08 Door hinge
- 09 Door hinge base

9-2-3 Typical Mixer Section (Rear)

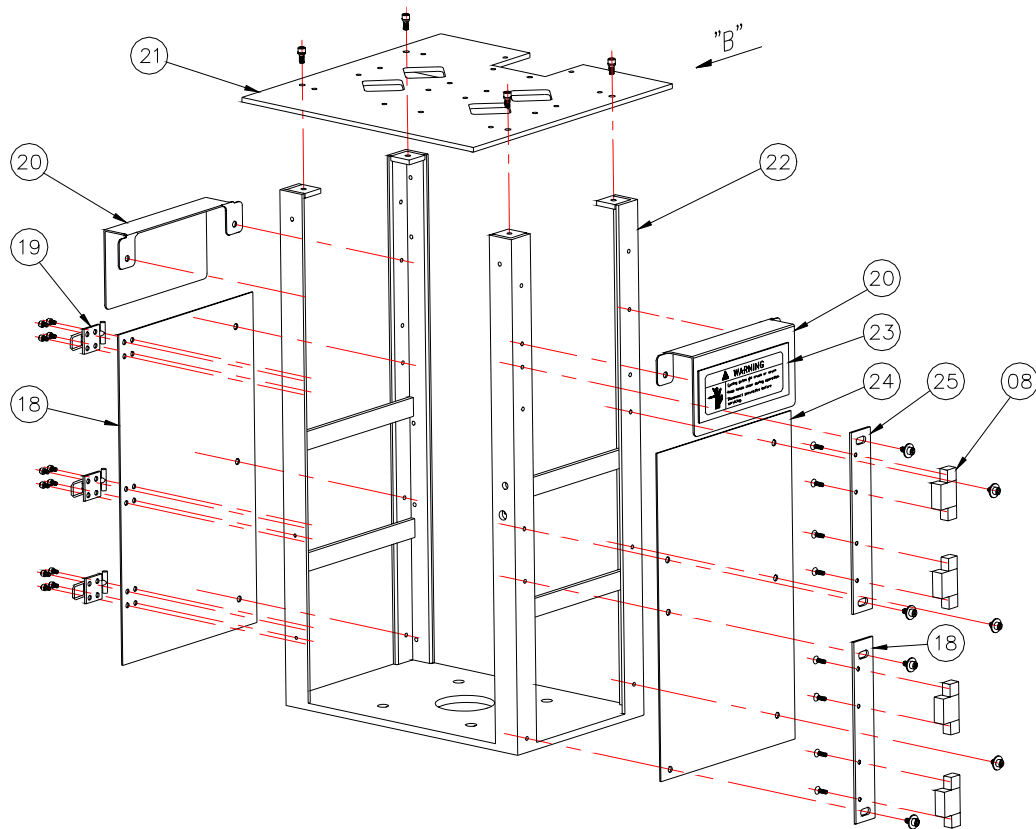
Typical Opti-Mixer™ - Rear Assembly Detail



- 10 Opti-Mixer™ back plate
- 11 Cover plate
- 12 Back control panel
- 13 Cover plate
- 14 Proximity sensor (Mixer “high” level)
- 15 Mixer proximity sensor mounting plate
- 16 Mixer gear motor
- 17 Mixer agitator shaft coupling

9-2-4 Typical Mixer Frame

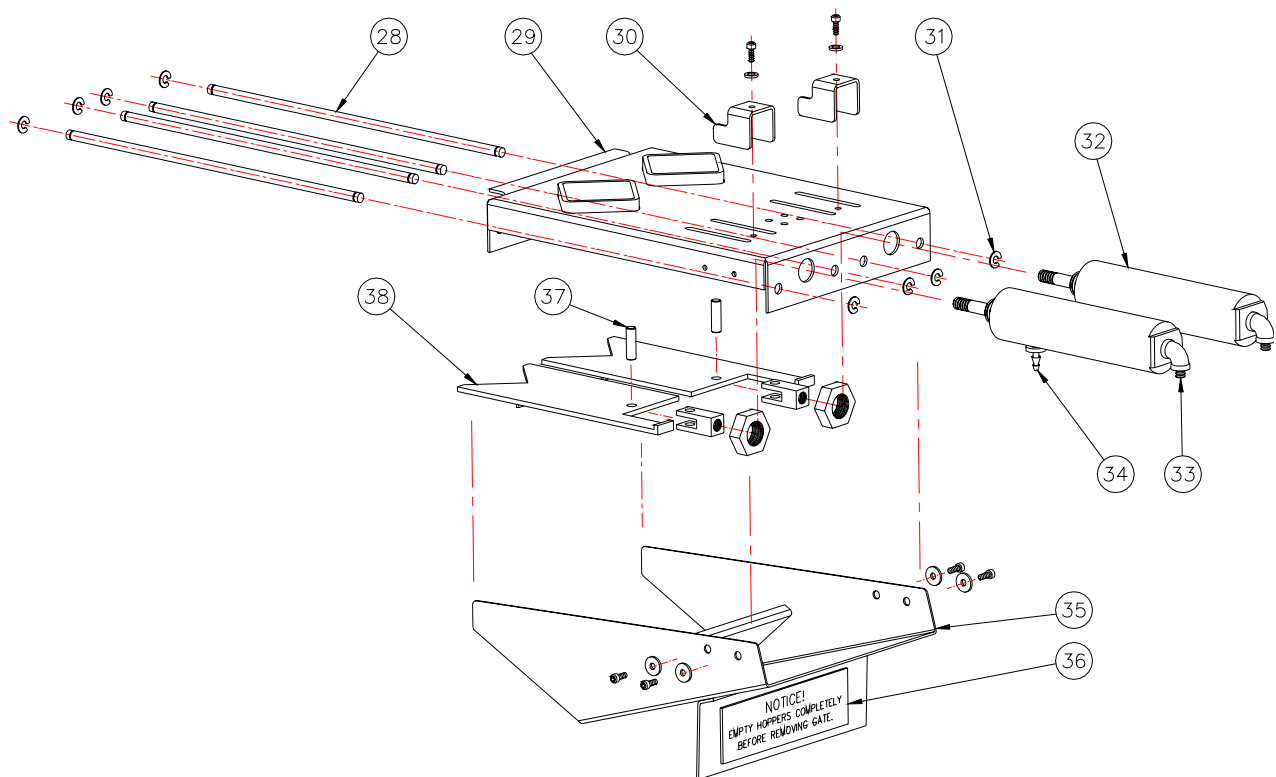
Typical Opti-Mixer™ Frame Assembly



- 18 Hinge mounting bracket
- 19 Mixer door clamp
- 20 Load cell cover
- 21 Opti-Mixer™ top plate
- 22 Opti-Mixer™ frame
- 23 Warning label
- 24 Opti-Mixer™ frame side panel
- 25 Hinge mounting bracket

9-2-5 Typical Gate Assembly

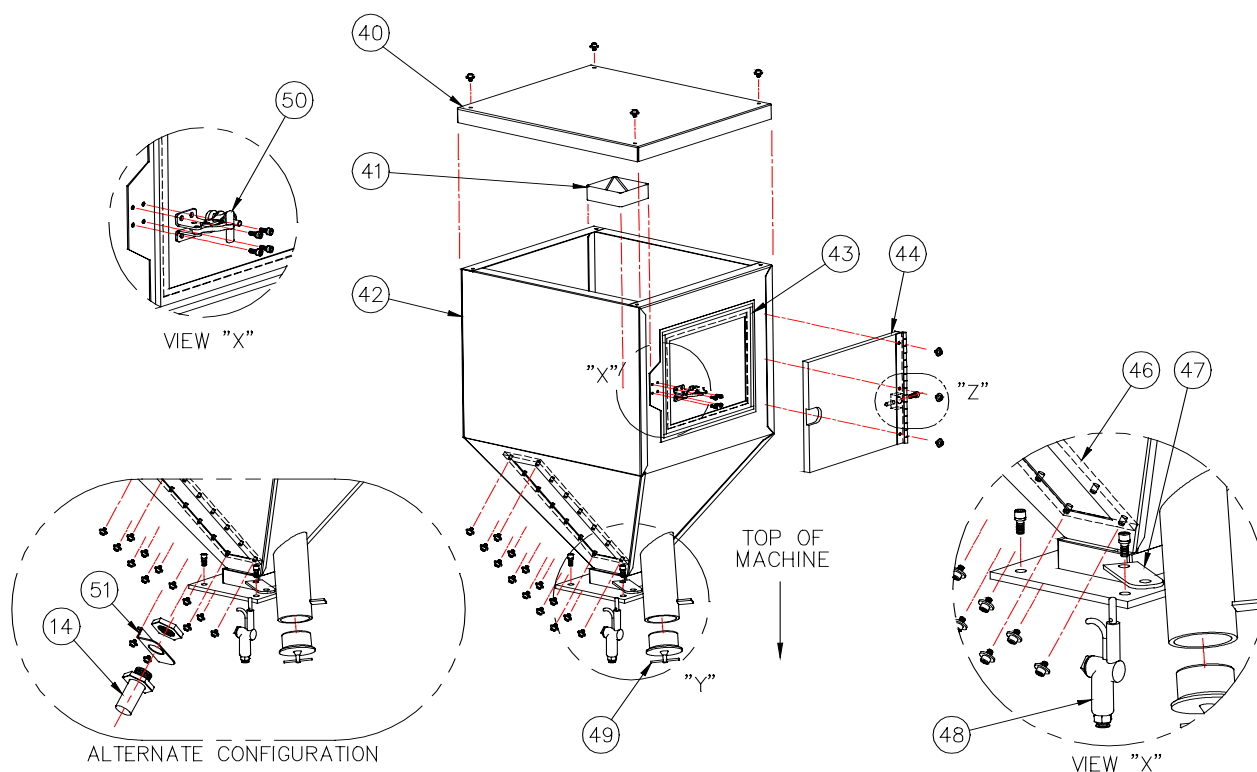
Typical OS Series Diamond Gate Assembly Detail



- 28 Slide gate guide rod
- 29 Stainless steel gate assembly base
- 30 Slide gate stop (stroke-limiter)
- 31 Retaining clip
- 32 Slide gate air cylinder
- 33 Slide gate air cylinder pneumatic connector fitting
- 34 Slide gate air cylinder pneumatic barb fitting
- 35 Slide gate assembly material chute (deflector)
- 36 Notice (warning) label
- 37 Pin
- 38 Diamond v-gate (metering slide gate)

9-2-6 Typical Supply Hopper

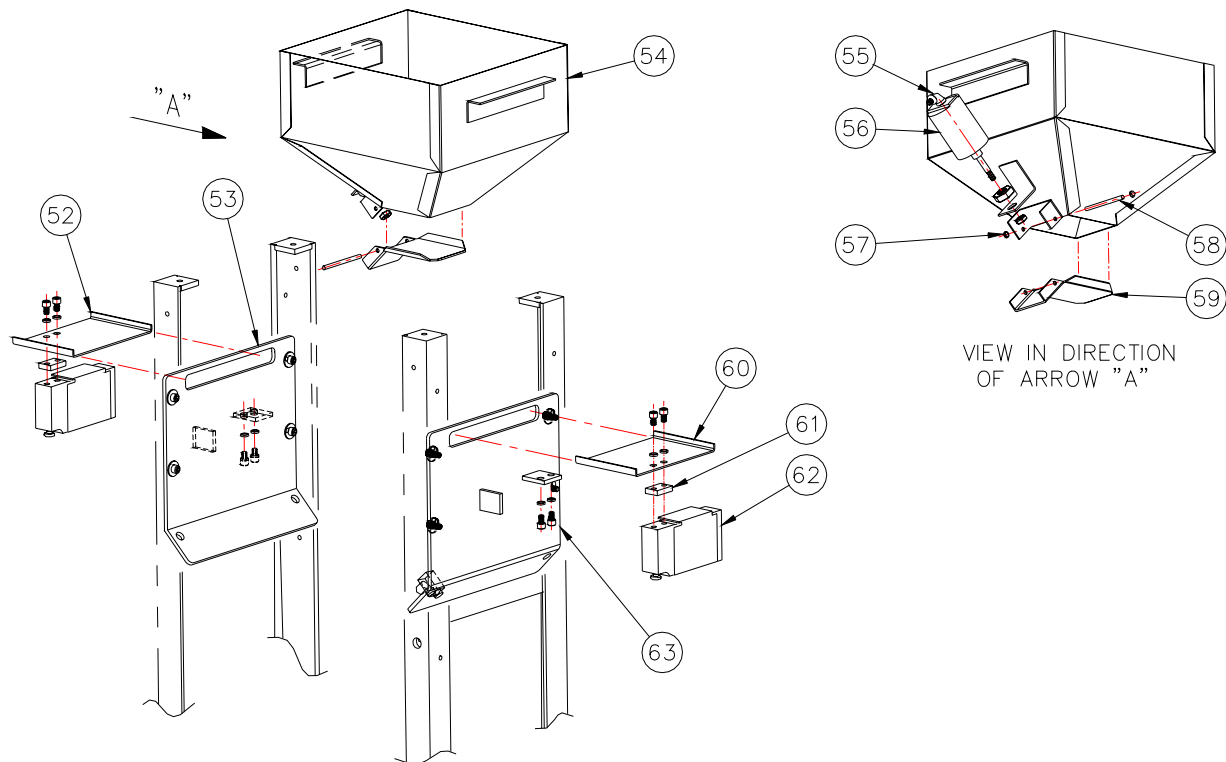
Typical OS-014 Series Hopper Assembly Detail



- 40 Mild steel hopper cover
- 41 Hopper insert (square to diamond-polyurethane)
- 42 Mild steel hopper
- 43 Gasketing
- 44 Polycarbonate access door
- 45 N/A
- 46 Polycarbonate hopper sight glass
- 47 Blow-off tool holder
- 48 Blow-off tool
- 49 Drain plug
- 50 Cleanout door clamp
- 51 Optional low level proximity sensor mount

9-2-7 Typical Weigh Hopper

Typical Weigh Hopper & Load Cell Detail



- 52 Left weigh hopper bracket
- 53 Inside mixer plate
- 54 Weigh Hopper
- 55 Weigh hopper discharge air cylinder pneumatic connector
- 56 Weigh hopper discharge air cylinder
- 57 Weigh hopper discharge air cylinder mounting bracket
- 58 Weigh hopper discharge hinge pin (bolt)
- 59 Weigh hopper discharge flapper
- 60 Right weigh hopper bracket
- 61 Spacer
- 62 Load cell(s)
- 63 Load cell mounting plate

10-1 Contact Information for Technical Assistance**Parts Department**

Call toll-free 8am-5pm CST [800] 423-3183

Parts shipped from the Wood Dale, IL facility available for Next Day Air shipment up to 4 pm EST.

The AEC Parts Department is ready to provide the parts to keep your systems up and running. OEM replacement parts ensure operation at design specifications. Please have the model and serial number of your equipment when you call. Consult the Recommended Spare Parts List, included in this manual, for replacement part numbers.

**Service Department**

Call toll-free 8am-5pm CST [800] 233-4819 or call [630] 595-1060

AEC has a qualified service department ready to help. Service contracts are available for most AEC products.

**Sales Department**

Call 8am-5pm EST [810] 720-7300

Call 8am-5pm CST [630] 595-1060

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

**Contract Department**

Call 8am-5pm CST [630] 350-7283

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



AEC, Inc.
801 AEC Drive
Wood Dale, IL. 60191-1198 USA
Hours: 8:00 am to 5:00 PM CST

10-2 Returned Material Policy

10-2-1 Credit Returns

1. Prior to the return of any material **authorization** must be given by **AEC, INC.** A RMA number will be assigned for the equipment to be returned.
2. Reason for requesting the return must be given.
3. ALL returned material purchased from **AEC, INC.** returned is subject to 15% (\$75.00 minimum) restocking charge.
4. ALL returns are to be shipped prepaid.
5. The invoice number and date or purchase order number and date must be supplied.
6. 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.

10-2-2 Warranty Returns

1. Prior to the return of any material, authorization must be given by **AEC, INC.** A RMA number will be assigned for the equipment to be returned.
2. Reason for requesting the return must be given.
3. All returns are to be shipped prepaid.
4. The invoice number and date or purchase order number and date must be supplied.
5. After inspecting the material, a replacement or credit will be given, at **AEC's** discretion. If the item is found to be defective in materials or workmanship, and it was manufactured by **AEC, INC.**, purchased components are covered under their specific warranty terms.

10-3 Warranty

AEC, Inc. warrants all equipment manufactured by it to be free from defects in workmanship and material when used under recommended conditions. The Company's obligation is limited to repair or replace FOB the factory any parts that are returned prepaid within one year of equipment shipment to the original purchaser, and which, in the Company's opinion, are defective. Any replacement part assumes the unused portion of this warranty.

This parts warranty does not cover any labor charges for replacement of parts, adjustment repairs, or any other work. This warranty does not apply to any equipment which, in the Company's opinion, has been subjected to misuse, negligence, or operation in excess of recommended limits, including freezing or which has been repaired or altered without the Company's express authorization. If the serial number has been defaced or removed from the component, the warranty on that component is void. Defective parts become the property of the warrantor and are to be returned.

The Company is not liable for any incidental, consequential, or special damages or expenses. The Company's obligation for parts not furnished as components of its manufactured equipment is limited to the warranty of the manufacturers of said parts.

Any sales, use, excise, or other tax incident to the replacement of parts under this warranty is the responsibility of the purchaser.

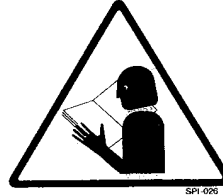
The company neither assumes nor authorizes any other persons to assume for it any liability in connection with the sale of its equipment not expressed in this warranty.

Many types of AEC, Inc. equipment carry an additional one-year service policy. Consult your AEC sales representative for specific details.

11-1 OS/OA Blender Safety Tags



**Pinch Point
Slide Gate**



**Read Operation
and Installation
Manual**



**Shear Point
Rotating Mixer**



Earth Ground



**High Voltage
Inside Enclosure**



**Protected Earth
Ground**









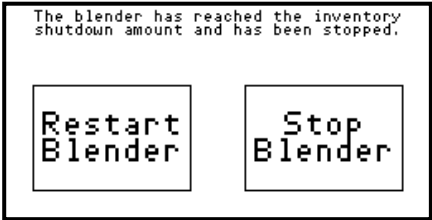


**Shear Hazard
Rotating Auger**



Lifting Point

11-2 Pushbutton and Touchscreen Tags

<u>Button</u>	<u>Function</u>
 Power On	Turns power on to the blender controller. (Found on back of controller.)
 Power Off	Turns power off to the blender controller. (Found on back of controller.)
 Abort	Stops blender & re-starts controller.
 Done	Press to move back one screen level in controller function.
 Next	Move forward one screen level in controller function.
 Push to Start or Stop	Start (or stop) blender with current program parameters.
 Erase	Can erase current settings for one recipe or all recipes.
 Erase All	
 The blender has reached the inventory shutdown amount and has been stopped. Restart Blender Stop Blender	Stops blender operation after current inventory shutdown (if used) is completed (This screen will be displayed.).

11-3 Blender Identification (Serial Number) Tag

(Located on back of mixing chamber)

	
	Series Blender
	Model Number OS-014E
	Max Blend Capacity 318 KG/HR
220V	Serial Number 060701R
1Ø	Date of Manufacture 06/2002
4.5A	
Over-current Protection Device (s) 4.5A Total	
Frequency 50/60Hz	
Compressed air supply 4.14 bar (60 psi)	
Mixer Speed 16 RPM	
Blender Mass 400 lbs/(180 KG)	
Electrical Diagrams & Pneumatic Diagram	
801 AEC Drive	Wood Dale, Illinois USA
(630) 595-1060	

Important!

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 OS/OA unit from operating properly, and may void part or all of the warranty.

12-1 Addendum Service Supervisor Information

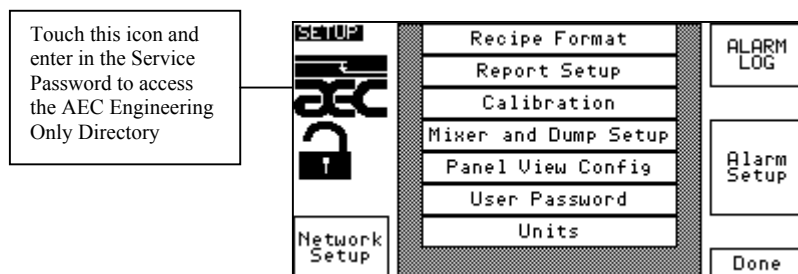
Note: Should not be used by untrained personnel – blender controller and/or program can be compromised!

12-1-1 Programmable Settings

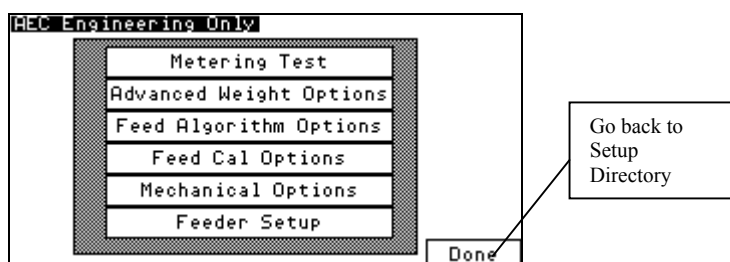
OS/OA

The OS/OA Series 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 AEC icon when in the “Setup” Directory Screen menu.



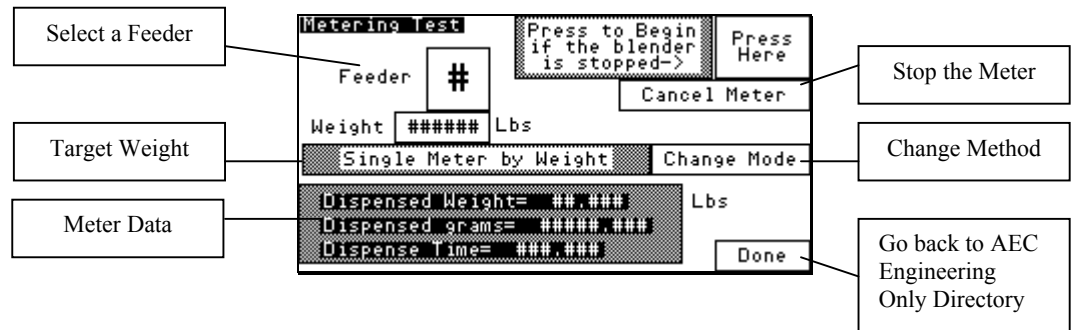
Enter the long password “XXXXXXXXXX” and press “Enter”. The factory setup section displays the “AEC Engineering Only” screen. The screen similar to that shown below should be displayed and use the keystrokes described herein to change or toggle the parameters.



12-1-2 Factory Setup Menu

Available Selections

Metering Test Screen This screen is useful in both R & D and development purposes when testing the metering performance of each feeder. The user can perform a “Single Meter by Weight” 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, but instead always meters for the same amount of time as long as the target weight has not been changed. This allows you to open the gate for several feeds using the same amount of 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. The value on the screen should match the measurement on the gram scale. If it does not, then either the weigh hopper is not balanced correctly or the scale calibration is not correct. Refer to the Troubleshooting Section of this manual for additional details.

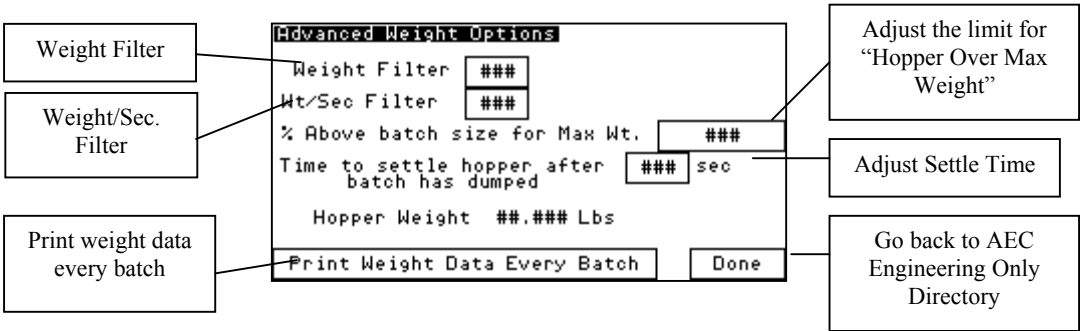


Advanced Weight Options Screen

This screen allows you to modify the weight filter, adjust the mechanical time to settle the weigh hopper after dumping, adjust the mechanical time to settle after a feeder has introduced material into the weigh hopper, adjust the Maximum Empty Weight of the hopper, and to enable the batch weight data to be dumped to a printer every batch for diagnostic purposes. The data that is dumped

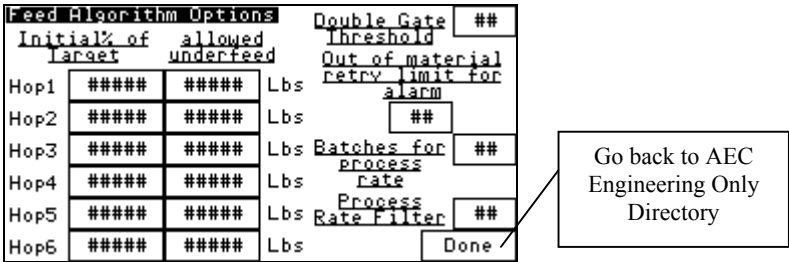
to a printer is the same data shown on the Recipe Screen. No averaging is done with the data shown to the Customer. Targets vs. Actual are actually what is in the batch without any “smoke and mirrors.”

The weight filter is the specialized filter algorithm that smoothes erroneous load cell readings. The signal will be filtered more if this value is increased and less if decreased. This setting should not be modified except by the developer except under unusual circumstances.



Feed Algorithm Options Screen

This screen allows the user to configure how the blender metering algorithm works. The user can adjust the Initial percentage of Target to Meter, the Allowed Underfeed value, the number of retries before Double Gate Time, the allowed Weight/Sec Drop, and the Out of Material retry limit.



**Feed Calibration
Options Screen**

This screen allows you to perform the feeder calibrations for each feeder (in weight per second). This is useful when the feed calibration is giving you an error message (most commonly caused by overfilling the hopper during the calibration). Select a feeder and then follow instructions. An error is shown if the current feeder calibration feed time was too short, the feed time was too long, or if the hopper weight exceeded 110% of the set batch weight. In the case that the feeder exceeded 110% (maximum hopper weight) due to a high rate hopper then the “Batch % for Feeder Cal” setting might be set too high. Consult AEC if this problem arises. The current feeder calibration values are also shown on this page. ***It is not necessary to perform feeder calibrations. The blender will automatically learn these values during the batch.***

Feed Calibration Options	
Batch % for Feeder Cal	
Hop1	##
Hop2	##
Hop3	##
Hop4	##
Hop5	##
Hop6	##
Done	

Go back to AEC Engineering Only Directory.

**Mechanical
Options Screen**

This screen allows the user to change the number of hoppers, the predetermined gate cycle time, and the mixer bump time for detecting high level. 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, and air cylinders. This setting will vary depending on whether you are using a gate or an auger.

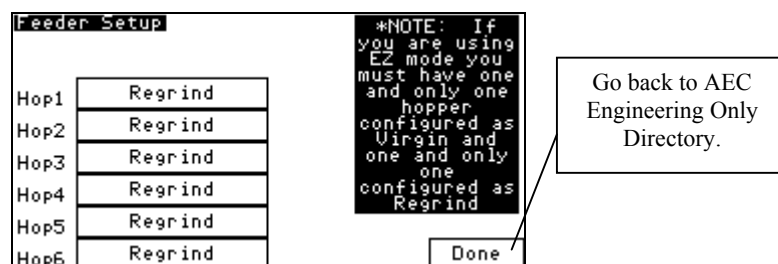
Mechanical Options			Optimix Mixer
Gate Cycle Time (secs)	Settle Time for Hopper	Mixer Bump Time to Detect High Level (secs)	
hop1	#####	###	sec
hop2	#####	###	sec
hop3	#####	###	sec
hop4	#####	###	sec
hop5	#####	###	sec
hop6	#####	###	sec
			# of Hoppers for Display
			Done

Go back to AEC Engineering Only Directory.

Feeder Setup

This screen 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 only one hopper must be configured for Virgin material. If this is incorrect, a message will be given on the Recipe Screen.

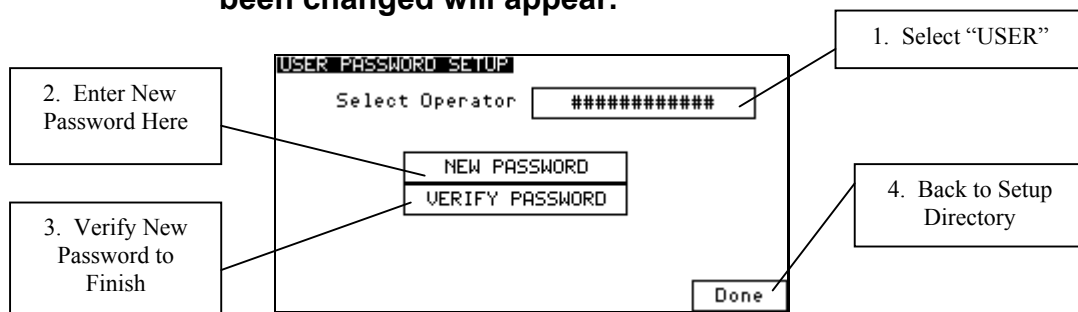


12-1-3 Customer Setup Menu

Password Protection

The Setup screen allows you to change the default User Password that the blender uses to lock out certain screens. **The password by default is “ ”**. To change the password, follow the steps listed below:

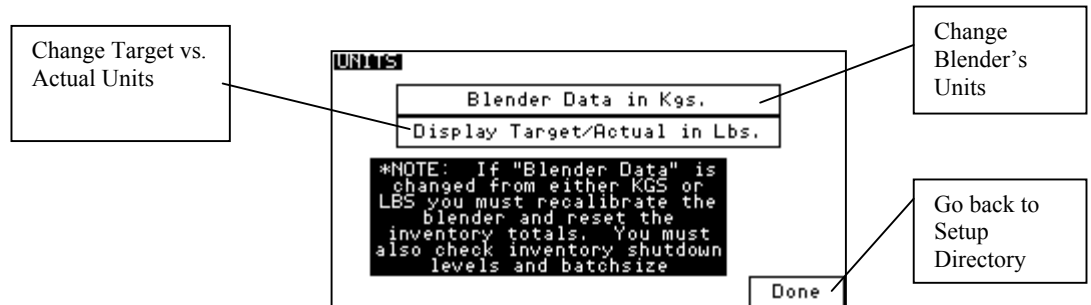
1. **Set the Selected Operator to “USER” by touching the box located next to “Select Operator”.**
2. **Touch “New Password” and enter in a new password.**
3. **Touch “Verify Password” and enter in the same password.**
4. **A message telling you that the password has been changed will appear.**



If the Customer locks themselves out of a blender they can contact AEC for a procedure that will let them back in. This password is used in several places throughout the blender, but can be bypassed

by entering in the AEC Service Password.

Units This screen allows the user to change the blender's unit of measurement. The entire blender can be configured in either Kgs. or Lbs., while the Target vs. Actual data can be configured for either regardless of the blender's units.



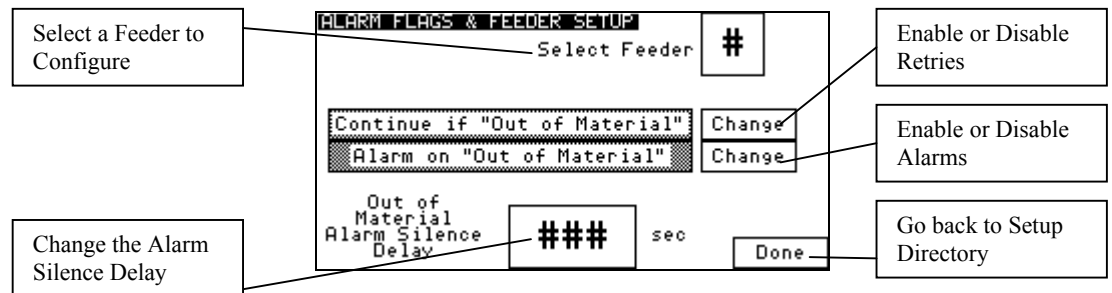
Network Setup This screen allows the blender to be configured for use with the Ethernet Option. The blender will automatically configure the Ethernet module's IP Address and Subnet Mask if the configurator is enabled. Whenever you modify the IP Address or subnet, you either need to reboot the PLC or touch "Send Ethernet Config to Module."



Alarm Setup

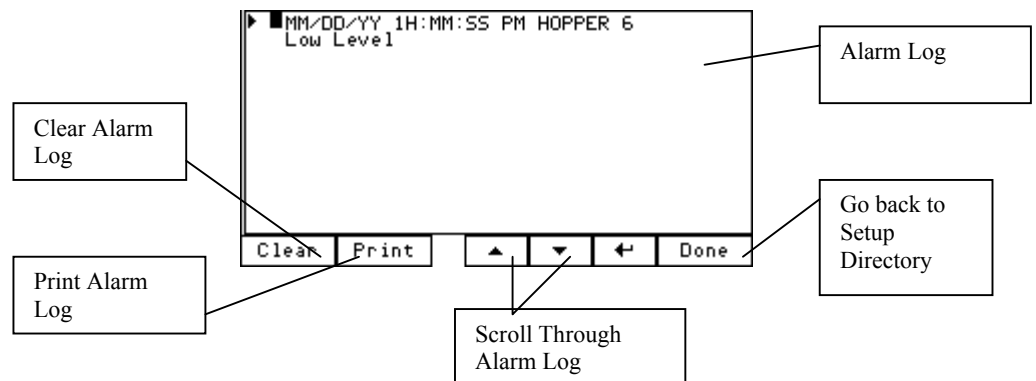
This screen allows the user to configure the feeder type for each feeder; configure whether a feeder will retry during the metering of a batch, and enable or disable the “Out of Material” alarm for any feeder. If a hopper is set to “No Retry” then the blender will continue to meter the rest of the batch even if this hopper runs out of material. No “Out of Material” alarm will be given regardless of how the alarm is configured unless the user has purchased and wired in the low level proximity switches in each hopper. To configure each hopper, perform the following steps:

1. Select a feeder by touching the “Select Feeder” box.
2. The current settings for that hopper will be shown.
3. Make the necessary adjustments and select a new feeder to configure if desired.
4. Hit “Done” to exit.



Alarm Log

This screen shows the last 100 stored alarms. The log can be viewed, printed and cleared.



Programmable Features (continued)

After all selections are made:

- Keep pressing the “Done” key until the unit returns to the Recipe menu.

Important!



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 AEC/Blend and Reclaim 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.

Remember: *Blender controller default password is ‘*



[illegible]

12-2 Passwords

User Password
Maintenance Password



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

12-3 Default Values (factory defaults shown):

OS/OA BLENDER CONFIGURATION PARAMETERS							
Model Number/Type	OS-007	OS-014	OS-070	OS-100 single	OS-100 double	OA-030	OA-060
RECIPE FORMAT							
Recipe Entry Mode	EZ MODE					Percentage Mode	
Metering Order	12345678						
Batch Size	3.5	7	35			20	35
Inventory Shutdown	0						
Batch Ready Mode	Enabled						
AutoStart Mode							
Weighing mode	Every Batch						
REPORT SETUP							
Blender Number	1						
Auto Print Inventory	Disabled						
Auto Clear Inventory							
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	1	2	9			MUST CALIBRATE	
Hop2 wt/sec (WITH STROKE LIMITER)	0.25	0.5	-	-			
Hop3 wt/sec (WITH SQUARE GATE)	1	4					
Hop4 wt/sec (WITH STROKE LIMITER)	0.25	0.5	4				
Hop5 wt/sec (WITH STROKE LIMITER)	0.25			1.2			
Hop6 wt/sec (WITH STROKE LIMITER)							
Hop7 wt/sec (WITH STROKE LIMITER)							
Hop8 wt/sec (WITH STROKE LIMITER)							

OS/OA BLENDER CONFIGURATION PARAMETERS Cont'd.							
Model Number/Type	OS-007	OS-014	OS-070	OS-100 single	OS-100 double	OA-030	OA-060
MIXER AND DUMP SETUP							
Mixing Time	4	6					
Remix Time	0						
Dump Time	4	6	5		6		
Dump Delay	0						
Dump Cycles	2	1					
Mixer Dump Time	4	6	5		6		
Continuous/Timed Mixing	TIMED						
USER PASSWORD							
User Password	[REDACTED]						
Maintenance Password	[REDACTED]						
ALARM SETUP							
Hop1 Continue/Stop on Out of Material	STOP						
Hop2 Continue/Stop on Out of Material							
Hop3 Continue/Stop on Out of Material							
Hop4 Continue/Stop on Out of Material							
Hop5 Continue/Stop on Out of Material							
Hop6 Continue/Stop on Out of Material							
Hop7 Continue/Stop on Out of Material							
Hop8 Continue/Stop on Out of Material							
Hop1 Alarm/No Alarm on Out of Material	ALARM						
Hop2 Alarm/No Alarm on Out of Material							
Hop3 Alarm/No Alarm on Out of Material							
Hop4 Alarm/No Alarm on Out of Material							
Hop5 Alarm/No Alarm on Out of Material							
Hop6 Alarm/No Alarm on Out of Material							
Hop7 Alarm/No Alarm on Out of Material							
Hop8 Alarm/No Alarm on Out of Material							
NETWORK SETUP							
Ethernet Configurator	ENABLED						
IP Address	0.0.0.0						
Subnet Mask							
ADVANCED WEIGHT OPTIONS							
Weight Filter	5						
Wt/Sec Filter	1						
% Above batch size for max weight	45						
Time to settle hopper after batch dumped	5						
Weight Data Printing							

OS/OA BLENDER CONFIGURATION PARAMETERS Cont'd.							
Model Number/Type	OS-007	OS-014	OS-070	OS-100 single	OS-100 double	OA-030	OA-060
FEED ALGORITHM OPTIONS							
Hop1 Initial % of Target	99		100				
Hop2 Initial % of Target	98			-	-	100	
Hop3 Initial % of Target	99		100				
Hop4 Initial % of Target	98					100	
Hop5 Initial % of Target	98	99					
Hop6 Initial % of Target							
Hop7 Initial % of Target							
Hop8 Initial % of Target							
Hop1 Allowed Underfeed	0.015		0.1			MAIN-.15 ADD-.03	
Hop2 Allowed Underfeed	0.004		0.008				
Hop3 Allowed Underfeed	0.015		0.1				
Hop4 Allowed Underfeed	0.004	0.008					
Hop5 Allowed Underfeed		0.004					
Hop6 Allowed Underfeed							
Hop7 Allowed Underfeed							
Hop8 Allowed Underfeed							
Double Gate Threshold	5						
Out of Material Retry limit before alarm	10						
Batches for process rate							
Process Rate Filter	3						
FEED CAL OPTIONS							
Hop1 Batch % for feeder cal	25					MAIN-25 ADD-10	
Hop2 Batch % for feeder cal	10	25					
Hop3 Batch % for feeder cal	10						
Hop4 Batch % for feeder cal	10	25					
Hop5 Batch % for feeder cal	10						
Hop6 Batch % for feeder cal							
Hop7 Batch % for feeder cal							
Hop8 Batch % for feeder cal							

OS/OA BLENDER CONFIGURATION PARAMETERS Cont'd.								
Model Number/Type	OS-007	OS-014	OS-070	OS-100 single	OS-100 double	OA-030	OA-060	
MECHANICAL OPTIONS								
Hop1 Gate Cycle Time	0.05	0.1	0.15	0.05				
Hop2 Gate Cycle Time	0.05	0.1	0.1					
Hop3 Gate Cycle Time	0.1	0.2	0.25					
Hop4 Gate Cycle Time	0.05		0.1					
Hop5 Gate Cycle Time								
Hop6 Gate Cycle Time								
Hop7 Gate Cycle Time								
Hop8 Gate Cycle Time								
Hop1 Settle Time	2				2			
Hop2 Settle Time								
Hop3 Settle Time								
Hop4 Settle Time								
Hop5 Settle Time	4							
Hop6 Settle Time								
Hop7 Settle Time								
Hop8 Settle Time								
Mixer Bump Time to Detect high level	0.25							
Number of Hoppers for display	SEE ORDER							
FEEDER SETUP								
Hop1 Feeder Type	VIRGIN							
Hop2 Feeder Type	ADDITIVE							
Hop3 Feeder Type	REGRIND							
Hop4 Feeder Type	ADDITIVE							
Hop5 Feeder Type								
Hop6 Feeder Type								
Hop7 Feeder Type								
Hop8 Feeder Type								

[illegible]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the paper.

Warranty

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801 AEC Drive • Wood Dale, Illinois 60191-1198 USA
Phone (630) 595-1060 • Fax (630) 595-6641
<http://www.aecinternet.com>



**MATERIAL
HANDLING**



HEAT & COOL



**BLEND &
RECLAIM**



GRANULATE



**DOWNSTREAM
EXTRUSION**



AUTOMATE



**SYSTEMS
CONTRACTING**



SERVICE

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