

User Guide

Gravimetric Blenders

**GB and WSB models
with 12-component control**

Installation

Maintenance

Operation

Troubleshooting



WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon. Contact Conair at info@conairgroup.com or 1-800-654-6661 for more current information, warnings, and materials about more recent product manuals containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

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UGB007/1103

Please record your equipment's model and serial number(s) and the date you received it in the spaces provided.

It's a good idea to record the model and serial number(s) of your equipment and the date you received it in the User Guide. Our service department uses this information, along with the manual number, to provide help for the specific equipment you installed.

Please keep this User Guide and all manuals, engineering prints and parts lists together for documentation of your equipment.

Date:
Manual Number: UGB007/1103
Serial number(s):
Model number(s):

Mrev: 1/17/2003

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TWELVE COMPONENT SOFTWARE
GB and WSB Model Blenders
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GETTING STARTED, READ THIS PAGE.

THE NEXT 13 PAGES OF THIS MANUAL WILL GUIDE YOU, STEP BY STEP, TO A SUCCESSFUL STARTUP.

IT WON'T TAKE LONG; SO.... PLEASE, DON'T SKIP AHEAD.

HERE ARE THE STEPS YOU WILL FOLLOW.

- SAFETY HAZARDS: TWO HAZARDS exist on this unit: MIX BLADES and SLIDE VALVES. Read this short sensible page so no one gets hurt.
Page 4
- ASSEMBLY INSTRUCTIONS: Very little assembly is required. But you might as well get it right the first time. ALSO: Pay attention to the section on WIRING.
Page 6
- CHECK OUT PROCEDURE: This is to see if you did it right. It also will tell if anything was damaged in shipping.
Page 11
- LOAD CELL CALIBRATION: We already did this. But shipping or rough handling during assembly sometimes creates load cell problems. If weight readings are not correct, you MUST recalibrate the load cells.
Page 15
- TURNING ON OUTPUTS and SETTING MATERIAL TYPES: To "TURN ON" a component, it must be designated as to TYPE, either REGRIND, NATURAL, or ADDITIVE. Each is handled differently by the MATH routines. The controller MUST know the material TYPE to know what the setting means. This is IMPORTANT. Be SURE you UNDERSTAND this section before trying to operate your system.
Page 16
- RATE CALIBRATION: This is NOT really necessary. But if your system uses non-standard equipment, you MAY want to do this.
Page 19
- SETTINGS and NORMAL OPERATION: From this point forward, operating your system is a snap. This section tells you just how simple it is and exactly what to expect under normal operating conditions.
Page 20
- SPECIAL FEATURES: Your system can do much more than you may know. This page reviews briefly some of the added features that are available to you and where in this manual you can find them.
Page 23

PROCEED TO: SAFETY HAZARDS NEXT PAGE
Page 3

SAFETY HAZARDS

MIX BLADES

Mix blades are driven with substantial torque.

NEVER place your hand in the mix chamber while blades are turning.

SERIOUS INJURY will result.

ADDITIONAL MIX BLADE HAZARD

Over time, mix blades may become RAZOR SHARP.

Always be careful when TOUCHING or CLEANING these blades.
Check for sharp edges frequently.
Replace blade if a hazard exists.

SLIDE VALVES

Slide valves in hoppers SLAM CLOSED without warning.
They WILL injure your fingers.

ALWAYS keep fingers clear of slide gate openings.
NEVER use your fingers to clear an obstruction.
NEVER use your fingers to move a sticking slide gate.

SAFETY FEATURES

SAFETY INTERLOCK SWITCH

The ACCESS DOOR is equipped with a safety interlock switch that prevents the mix motor from running and the slide valves from opening.

DO NOT defeat this safety switch.

HOPPER FINGER GUARDS

Finger guards are fitted into each hopper compartment.
DO NOT reach through these guards.
DO NOT use your fingers to clear an obstruction below these guards.

DO NOT remove these guards.

PROCEED TO: ASSEMBLY NEXT PAGE

DISCLAIMERS

PRODUCTION of FAULTY PRODUCT

Processing conditions and materials vary widely from customer to customer and from product to product. It is IMPOSSIBLE for us to anticipate ALL processing conditions and requirements, or to be certain that our equipment will perform properly in all instances. You, the customer, must observe and verify the performance level of our equipment in your plant as part of your overall manufacturing process. You must verify to your own satisfaction that this level of performance meets your requirements. We CAN NOT be responsible for losses due to product that is blended incorrectly, even when due to equipment malfunction or design incorrect for your requirements; and/or for any consequential losses due to our equipment not blending to your requirements.

We will only be responsible to correct, repair, replace, or accept return for full refund if our equipment fails to perform as designed, or we have inadvertently misrepresented our equipment for your application.

ACCURACY of THIS MANUAL

We make every effort to keep this manual as correct and current as possible. However, technology and product changes occur more rapidly than the reprinting of this manual. Generally, modifications made to the design of the blender or to the operation of the software are not reflected in the manual for 3 to 6 months. We always reserve the right to make these changes without notice, and we do not guarantee the manual to be entirely accurate. If you question any information in this manual, or find errors, please let us know so that we may make the required corrections. We will gladly provide you with updated manuals.

PART I - ASSEMBLY

ASSEMBLY and INSTALLATION INSTRUCTIONS

CAUTION: LOAD CELLS ARE EASILY DAMAGED.
If the FRAME is dropped from TWO FEET, the load cells WILL BE DAMAGED.
THE WARRANTY DOES NOT COVER DAMAGED LOAD CELLS.

The following items have been shipped to you:

1. FRAME and HOPPER assembly: (bolted to skid)
2. CONTROLLER BOX: with the instruction manual.
3. FEEDER BOX: contains a COLOR or ADDITIVE feeder: optional.
4. FLOW CONTROL ASSEMBLY: optional
5. FLOOR STAND or VACUUM TAKEOFF ASSEMBLY: optional

RED INSTRUCTION STICKERS will assist you during assembly.

LIFT HANGERS are available to allow lifting the blender with a strap or chain. Call us if you require them.

1A. If your unit is to be MACHINE mounted:

For GB/WSB GBM, 100, 200, and 400 series models:

Two ways to do this are suggested ON THE NEXT PAGE: (4a)

The LEFT diagram shows the FRAME and SLIDE GATE both drilled with the proper bolt pattern for your machine and THROUGH-BOLTED to your press.

The RIGHT diagram shows only the 10 x 10 steel slide-gate plate drilled for your bolt pattern and bolted to your press. The FRAME is then bolted to it using the existing 8 x 8 inch bolt pattern holes and bolts provided. With this method, bolt head clearance holes are required in the poly-pro slide gate plate. This mounting works well on smaller machines.

For GB/WSB 900 and 1800 series models:

An additional machine mount adaptor plate may be required. If you have ANY DOUBT about the STABILITY of the unit when bolted directly to your machine throat, please call us for advice.

NOTE: When choosing proper orientation, be sure to retain access to the controller and weigh chamber, clearance for hinged doors, and access to removable feeder hoppers.

1B. If your unit is STAND mounted:

A stand is provided and your unit will bolt directly to it. An assembly DIAGRAM is provided on the following pages.

An air operated FLOW CONTROL ASSEMBLY is provided for dispensing into a container. The purpose of this unit is to allow time for mixing to occur after each dispense. This flow valve keeps the mix chamber full to just below the sensor. This assembly bolts directly to the bottom of the Blender frame.

2. Slide the WEIGH BIN into position. It rests behind the clear hinged access window. Install with the air cylinder toward you. If bin is already in place, remove any shipping materials, packing tape or string.
3. Hang the Color and Additive Feeders:
 - a. Lift side latches and fully extend slide assembly. Remove the hopper. Leave slide extended.
 - b. Tilting the entire slide assembly, motor end up, insert one corner of hanger cross bar behind frame corner post.
 - c. Rotate assembly into place so both ends of cross bar are behind corner posts.
 - d. Lower into place, bottom edge resting on frame and cross bar properly positioned behind corner posts.
 - e. Re-install hopper. Slide motor forward until latches engage.
4. Place the controller on the support tray and plug in all cords:
 - a. Air solenoid 8 or 14 pin plug into the matching receptacle.
 - b. Auger feeder drive motors into duplex receptacle.
 - c. Mixer motor into right side of controller.
 - d. Sensor cord plug into right side of controller.
 - e. Load Cell plug into port on left side of controller.
5. Plug the CONTROLLER into the receptacle located under the controller tray.

IMPORTANT: Do NOT plug the controller into a separate power source. The controller ground path **MUST** be the same as the blender frame ground path. If your system has the controller located in a remote location, **MAKE CERTAIN** that the power to the controller comes from the receptacle mounted on the Blender frame.

6. Plug the power cord coming from this box into a 110 volt power source (220 volt outside U.S.). This cord **MUST** provide the **ONLY** power source for the entire system, including the controller. See: **WIRING CONSIDERATIONS**, next page. 1800 series blenders also require a 240 volt power source for the mix motors.
7. Connect air pressure to the unit. About 80 psi (5.5 bar) is recommended (40 psi for the Micro Blender). Lubricated air is **NOT** recommended.

NOTE: GBM Micro Blenders should be set to 40 psi (2.7 bar). The Vertical Valves used in removable hoppers on Micro Blenders, 100, and 200 series blenders are more accurate at the lower 40 psi pressure setting.

8. Remove all protective paper from the plastic windows.

WIRING CONSIDERATIONS

The wiring of your blender is very important to its proper operation. Electronics are very susceptible to voltage spikes and static charges, both of which are very common in plastics factories.

To MINIMIZE these things, consider the following.

1. The power supply should be solid; a strong supply, not limited by a "just adequate" control transformer. A source of voltage that comes from a large transformer that supplies a large portion of the plant is better than a small power supply transformer that is intended to supply only this device. Power supplies, even though they may be "isolation" transformers, will still pass all voltage spikes right through. Their small size limits their ability to dampen RF (Radio Frequency) noise that is often induced into the system from outside sources. This proves worse than connection to larger central transformers.
2. Avoid running the power supply line along side any heavy power lines. An unshielded power supply in a raceway along side other heavy power lines will pick up induced RF noise and transfer it into the GB/WSB steel enclosure causing computer trouble.
3. Long extension cords should be avoided. They also reduce the ability to provide a dampening effect on spikes and static. The further the equipment is from a substantial power source, the more susceptible it is to spikes.
4. The CONTROLLER and the GB/WSB frame MUST share the same GROUND PATH. This is why you MUST plug the controller into the OUTLET that is provided ON THE FRAME.
5. REMOTE SYSTEMS. If you have your controller mounted in a remote location, you will have a number of power and signal cords running between the frame and the controller. BE SURE that the LOW VOLTAGE lines are NOT BUNDLED to the HIGH VOLTAGE lines and keep them away from other nearby electrical lines.

LOW VOLTAGE lines are: Load Cell cable, Level Sensor cord, Air Solenoid cable, and Printer and Computer cables.

HIGH VOLTAGE lines are: Mixer motor cable, Feeder motors, and MAIN POWER line.

Keep these sets of cables SEPARATED.

6. VACUUM LOADER CONVEYING LINES. Keep them away from all electrical lines, particularly the Load Cell lines. Conveying plastic produces extreme static sources. A power supply line, even in conduit, that runs next to a vacuum line, can introduce extreme static pulses into the processor. Keep conveying lines SEPARATED from electrical supply lines.
7. We use many internal tooth "STAR" washers in assembling the GB/WSB to ensure good ground between painted parts. Do not remove them.

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+-----+
| PROCEED TO:    CHECK OUT PROCEDURE    NEXT PAGE |
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CHECK OUT PROCEDURE

As you go through this procedure, if WHAT SHOULD HAPPEN, doesn't happen, see next section, DIAGNOSTICS, for what to check.

NOTE: 100/200 series models (3K load cells), display all weights in 1/10 grams (x.x). 400/900/1800 series models (10K load cells) display weights in FULL grams, NO decimal point. On this page we show all weights with NO decimal point.

Start with NO MATERIAL in any hoppers.

Be sure an AIR SUPPLY is connected.

Place ALL switches DOWN; POWER (on front); STOP and PAUSE (on left).

PROCEDURE:	WHAT SHOULD HAPPEN:
PLUG IN CONTROLLER.	Nothing should happen. Air pressure should be holding ALL valves CLOSED. This means all air cylinders are extended. If any slide gate or flap is open, air lines are reversed. If a FLOW CONTROL valve is installed, check it.
TURN POWER ON.	Display should say (TWELVE), followed by version date (V=xxxxxT), followed by the check sum number (CKS=xxxx), followed by (ROM OK), followed by (RAM = 8K), followed by model number (MODEL220) or the model you have (GBM, 140, 14R, 220, 240, 24R, 420, 440, 44R, 940, 184), followed by (0), then the actual weight of material in the bin. This number should be zero, plus or minus several grams (20) to (-20).
AT THIS POINT:	Be sure the model number that was displayed matches your blender model number (first digit only). If this is not the case see two sections ahead, SELECTING CORRECT MODEL.
TOUCH WEIGH BIN VERY LIGHTLY.	Display should update the weight every second reflecting the light pressure that you are exerting on the bin.
PRESS "*" KEY	Display will say (PASSWORD)
PRESS "22222" (2 key five times) (entering the PROGRAM mode).	2's will be displayed as you enter them. Display will show (P x) when done.
PRESS "OPER" KEY	Display will say (OPERATE)
PRESS "1" KEY	Device number 1 will operate. LED # 1 will light. Press "1" repeatedly to observe operation.
PRESS "2" KEY	Device number 2 will operate.

LED # 2 will light.
Press "2" repeatedly to observe operation.

REPEAT THIS SEQUENCE for each dispense valve on your WEIGH SCALE BLENDER. Up to 12 outputs are possible numbered 1 through 9, A, B, and C. Only those connected to devices will operate.

AT THIS POINT: NOTE which component NUMBER is assigned to each hopper. You will want to know each hopper's correct component number.

FACING THE CONTROLLER SIDE OF THE BLENDER:

On 9000 and 18000 gram, FOUR hopper compartment systems:
Device 1 is the NEAR hopper, 2 the FAR hopper, 3 the LEFT CENTER, and 4 the RIGHT CENTER hopper.

On 1000, 2000, and 4000 gram, FOUR hopper systems, devices 1, 2, 3, and 4 are counter-clockwise starting with far left corner hopper.

On 9000 and 18000 gram SIX hopper systems, devices 1, 2, 3, 4, 7, and 8 are counter-clockwise starting with far left corner hopper.

ALL MODELS:

Device 5 is the LEFT Panel-front OUTLET.
Device 6 is the RIGHT Panel-front OUTLET.

PRESS "DUMP" KEY The weigh bin air solenoid will operate.
LED # 13 will light.
The weigh bin dump valve will open.
Press "DUMP" repeatedly to observe operation.

PRESS "MIX" KEY This key controls the mix motor outlet on the side of the controller. The mixer motor will run.
LED # 14 will light.
(Mix blade turns CCW facing the motor shaft.)
(Mixer switch must be down; timed position.)

PRESS "HOLD" KEY The Flow Control Valve will operate.
(Under the mix chamber) (This device is optional)
LED # 15 will light.

PRESS "ALARM" KEY The Strobe light and Beeper will operate.
LED # 16 will light.

PRESS "EXIT" KEY Press twice, to return to normal mode.
Verify normal mode by observing that there is NO letter P in the display (x).

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+-----+
|           If you have made it this far, congratulations.           |
|                               You have done well.                   |
| The load cells and controller are functioning properly.             |
+-----+
+-----+
| PROCEED TO:   LOAD CELL CALIBRATION           SKIP 2 PAGES   |
+-----+
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DIAGNOSTICS - for the CHECK OUT PROCEDURE

- If display fails to come on at all:
check for power at outlet.
Check the 1/2 amp panel front fuse.
- If first display says (FOUR), then this is NOT the correct manual
for this software. Obtain and use a FOUR software manual.
- Possible model numbers are:
GBM, 140, 14R, 220, 240, 24R, 420, 440, 44R, 940, 184.
If model number is not correct for you unit:
see the next page, SELECTING CORRECT MODEL.
- If display shows randomly drifting numbers:
check to see load cells are plugged in.
- If display shows about (- 1250.0) or (-4500):
check that the weigh bin is in place properly.
- If display is steady but not near zero:
An over stressed load cell will display a permanently high
or low reading. Recalibrate load cells; next section.
- If there is no response from the display when the bin is touched:
check for damaged wires to load cells.
check that load cell plug screws are secure.
- If response is not sensitive or does not return to its start point:
check for interference around weigh bin.
- If pressing * does not display (PASSWORD):
you are not in the normal power-up mode or the keypad
doesn't work. Normal mode is indicated by the ABSENCE of
the letter M or P at the left of the display.
- If display says INVALID after entering the password number:
you pressed the wrong keys or the password number has been
changed and it is no longer 22222. Call us for help.
- If an air solenoid does not operate:
check the 1/2 amp fuse.
check solenoid cable connected properly and fully seated.
check mix chamber door closed, safety interlock engaged.
- If a slide or dump valve does not open:
check the air supply and regulator adjustment:
(minimum 20 psi, 80 psi (5.5 bar) recommended).
check for proper air line connection to cylinder.
- If an auger feeder motor does not run:
check the 3 amp fuse.
check that the motor is plugged into the proper outlet.
check for faulty motor by plugging it into a known source of
110 volt A.C. power (240 volt outside U.S.).

SELECTING CORRECT MODEL

Controllers are programmed to control all sizes of Autoweigh Blenders. The MODEL number that your unit is set for will be displayed during the start up sequence every time power is turned on.

The possible models are:

MODEL	BATCH WT (GRAMS)	valves	WEIGH BIN DIMENSIONS	LOAD CELL RATING
GBM	400	4	5 x 5 x 5 high	1 @ 3 K
140/14R	1000	4	10 x 6 x 6 high	1 @ 3 K
220	2000	2	10 x 10 x 7 high	2 @ 3 K
240/24R	2000	4	10 x 10 x 7 high	2 @ 3 K
420	4000	2	10 x 10 x 10 high	2 @ 10 K
440/44R	4000	4	10 x 10 x 10 high	2 @ 10 K
940	9000	4	16 x 16 x 12 high	2 @ 10 K
184	18000	4	16 x 16 x 17 high	2 @ 20 K

("R" models have 2 removable hoppers)

The addition of feeders will change the last digit of the model number. This digit can be ignored for selecting the correct Model.

400, 1000 and 2000 gram systems with 3 kg. load cells; weights are displayed in tenths of grams (xxxx.x).

4000, 9000, and 18000 gram systems with 10 or 20 kg. load cells; weights are displayed in full grams (xxxxx).

If your unit is NOT set correctly to match the hardware you have, you must change it. To do so:

Turn power on. From the NORMAL mode:

```
+-----+
| Press: *      Display will say: (PASSWORD) |
| Press: 97531  Display will say: (MODEL220) |
|              or whatever model it is     |
|              currently set for.         |
| Press: *      To walk through all model sizes. |
|              When the model you want is displayed, |
|              then:                             |
| Press: EXIT   Wait a few seconds.           |
|              Unit will reset and restart     |
|              as the system you have selected. |
+-----+
```

When switching models, all parameter table information is lost and the new "default" information for this model is loaded from ROM.

PART II - OPERATION

LOAD CELL CALIBRATION

NOTE: Displays shown here are in full grams. 100 and 200 series models are in 1/10 grams, with a decimal.

If your load cells already display a weight close to zero, plus or minus 10 grams, you may skip this section and go directly to:

TURNING ON OUTPUTS (next page).

If your unit DOES NOT display an acceptable weight, you should recalibrate them, that is reset your ZERO weight, at this time.

To do so:

BE SURE the weigh bin is EMPTY.
BE SURE the load cell plug is plugged into the side of the controller.
BE SURE the weigh bin is resting on the load cells freely.
BE SURE the air line to the dump valve is connected as it would be during normal operation. A disconnected air line adds weight.
BE SURE The load cells and bin are not jammed in any way. To test for this see that a light touch on the bin causes the display to change. When the pressure is removed the display must return to exactly where it was, plus or minus 1 gram.

If this does not happen, something is touching something and the bin is not entirely free to move. Check EVERYTHING around the bin.

LOAD CELL CALIBRATION:

The sequence of keystrokes is as follows:

Press: *	Display will say: (PASSWORD)
Press: 22222	Display will say: (P x)
Press: *99	Display will say: (CAL OFF)
Press: *	Display will say: (CAL ON)
Press: EXIT	Display will say: (P x)
Press: ZERO	Display will say: (--WAIT--)
	followed by: (P 0)
Press: EXIT	Display will say: (x)

The ZERO point of the load cells is now set properly. FULL weight calibration may also be done at this time, however, it probably is NOT NECESSARY. When load cell readings shift due to rough handling, the entire range of readings from ZERO to FULL shift together. The ZERO weight calibration routine resets the full range of the cells and, therefore, corrects FULL weight readings as well. For information on FULL weight calibration, see RECALIBRATION OF LOAD CELLS.

| PROCEED TO: TURNING ON OUTPUTS |
and MATERIAL TYPES NEXT PAGE

TURNING ON OUTPUTS - MATERIAL TYPES

This controller can control up to TWELVE (12) components; 1 through 9 and A, B, and C.

You must "TURN ON" the COMPONENT outputs that you are going to use.

Components that are TURNED OFF are not part of ANY routines.
A component becomes TURNED ON when it is set to a MATERIAL TYPE.

Material TYPES are REGRIND, NATURAL, and ADDITIVE.

The AUTOWEIGH BLENDER handles each TYPE DIFFERENTLY. Settings have different meanings for each TYPE.

To enter SETTINGS correctly, you MUST UNDERSTAND how different materials are handled based on their TYPE.

So PLEASE read this page CAREFULLY.

Material TYPES are explained here.
How to set them is explained on the next page.

REGRIND (PERCENT OF MIX)

Components designated REGRIND will be added as a PERCENT of the ENTIRE MIX of material. For example, If component 1 is designated as REGRIND and is set for 20.0 percent, then for every 100 pounds of blend, 20 pounds will be this component.

NATURAL (RATIO TO EACH OTHER)

Components designated NATURAL will be added in the proportion that you specify them to each other. Their actual percentage of the mix will depend on how much Regrind is specified and how much Additive is specified. For example, if components 2 and 3 are both designated NATURAL and are set for 10 and 40 respectively, then the RATIO of component 2 to component 3 will always be 10 to 40 or 1 to 4.

If no Regrind or Additives are specified, the mix will be:
component 2, NATURAL, SET= 10, 20.0 percent of mix,
component 3, NATURAL, SET= 40, 80.0 percent of mix.

The RATIO of 1 to 4 is maintained.

If component 1 is specified as REGRIND at 20 percent, The mix is then
component 1, REGRIND, SET=20.0, 20 percent of mix,
component 2, NATURAL, SET= 10, 16.0 percent of mix,
component 3, NATURAL, SET= 40, 64.0 percent of mix.

Components 2 and 3 are still held at a 1 to 4 ratio.

ADDITIVE (PERCENT OF ALL NATURALS)

Components designated ADDITIVE will be added as a percentage of all the NATURALS added together. For example: If component 5 is an ADDITIVE at 5 percent, Then the above example now looks like this:

component 1, REGRIND, SET=20.0, 20 percent,
component 2, NATURAL, SET= 10, 15.2 percent,
component 3, NATURAL, SET= 40, 61.0 percent,
component 4, ADDITIVE, SET=05.0, 3.8 percent.

The REGRIND is still 20 percent of the MIX.
The NATURALS are still at a RATIO of 1 to 4, although they have been reduced to make room for the Additive.
The ADDITIVE is 5 percent of the NATURALS added together (5% of 76.2).

WHY do we do it this way? Because this is how most plastic processors think of these components. REGRIND is generally only added when available, and then as a limited percentage of the entire mix. NATURALS are generally blended at a RATIO to one another. ADDITIVES are most often only intended to be added to the entire NATURAL portion of the mix, because regrind generally already contains these additives.

ON THE OTHER HAND:

If you prefer to think of your mix as a RATIO OF WEIGHTS, for example, components 1, 2, 3, 4, and 5 are to be mixed at 100, 50, 5, 20 and 7 pounds respectively, then you may wish to specify ALL components as NATURALS. In this way these weights may be entered just as listed here. Components will be dispensed to maintain each at the proper specified RATIO to the other components.

If you wish to think of all components as PERCENTAGES of THE MIX, percents that always add up to 100, specify ALL components as REGRIND and enter the exact percent for each. When ALL components are REGRINDS, ALL settings must add up to 99 or 100 percent. If they do not, an error message (REG >100) or (REG <100) will appear.

BUT... WE RECOMMEND that you do it this way:

REGRIND. Use this for all materials that DO NOT require the addition of the ADDITIVES. For example, your Regrind scrap.

NATURAL. Use this for all materials that are the bulk of the mix. These will be RATIOED to each other and will automatically constitute the ENTIRE mix except for the space needed for Regrind and Additives. A blend of ABS Homo-polymer and Co-polymer or a blend of Styrene Hi Impact and Crystal are examples of NATURALS ratioed together.

ADDITIVES. Use this for all materials that are added to the NATURALS only. For example; color, stabilizer, slip agent, etc.

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+-----+  
| PROCEED TO: SET MATERIAL TYPES NEXT PAGE |  
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RATE CALIBRATION

YOU DON'T HAVE TO DO THIS.

Software is set to expect STANDARD hardware. If a device meters at a much lower feed rate than expected, the software will take 10 to 20 cycles to fully adjust. During this time cycles will take longer.

An example of this is a system using a 1/2" auger instead of 1".

If you don't mind letting the system SELF ADJUST, or your hardware is STANDARD, then:

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|       |
| PROCEED TO:   ENTERING SETTINGS   NEXT PAGE |
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```

To perform a RATE CALIBRATION:

Have the HOPPER LOADED with enough material to run for several cycles without running out.

Have the "OFF AT END OF CYCLE" and "PAUSE" switches DOWN.

Press: * Display will say: (PASSWORD)
Press: 22222 Display will say: (P x)

If you are calibrating an auger feeder, operate it briefly to ensure it is fully primed. To do so:

Press: OPER Display will say: (OPERATE)
Press: 5 (or 6) Run until auger is dispensing.
Press: DUMP This will empty the weigh bin.

Now you can CALIBRATE the material.
To do so:

Press: CAL Display will say: (CALIBRATE)
Press: 5 Component #5 will calibrate itself.
 (or whatever component you are calibrating)

Repeat this two key calibration routine for EACH material that you wish to calibrate. Only components that have a TYPE selected (not "OFF") will operate.

Each time a dispense will occur, followed by weighing, followed by a dump to empty the weigh bin.

Press: EXIT when all calibrations are done.

YOU ARE NOW READY FOR ACCURATE PRODUCTION BLENDING.

```
+-----+
|       |
| PROCEED TO:   ENTERING SETTINGS   NEXT PAGE |
|       |
+-----+
```


SELECTED MODELS - SPECIAL INSTRUCTIONS

This section relates SPECIAL information about a few selected models.

MICRO PULSE

Micro Pulse valves are available on models:

GB/WSB GBM (MICRO Blender) with micro pulse valves.
GB/WSB 122 with optional MICRO PULSE valves.
GB/WSB 131 with optional MICRO PULSE valves.
GB/WSB 140 with optional MICRO PULSE valves.
GB/WSB 240R with optional MICRO PULSE valves.
GB/WSB 440R with optional MICRO PULSE valves.

These models may use our "MICRO PULSE" metering system for Color and Additive components.

PULSED OUTPUT parameters control the on/off timing, or pulsing, of the valves. The controlling parameters are the "_PO" component parameters.

When set to 00000, normal slide gate operation occurs.

When set to a value, such as 03030, power will pulse ON then OFF, at 30 interrupt time intervals each way. This ON/OFF cycling will repeat for the entire dispense time.

When using a MICRO PULSE valve, you must set the related _PO parameter to 03030.

If overall blender throughput is too low, you may increase the metering rate of each Micro Pulse device by adjusting the cylinder air flow control valves for higher flow rate. This causes more rapid movement of the cylinder, ejecting more pellets per pulse. The drawback is noisy operation.

We recommend air flow be adjusted for quiet operation, but assuring full valve movement per on/off cycle. We have already done this. No further adjustment should be necessary.

The approximate correct air flow adjustments are:

At nose of cylinder, 1.5 full turns out from full closed.
At rear of cylinder, 2.5 full turns out from full closed.
MICRO BLENDER slant valves, adjust by sound.

On fixed hoppers with horizontal micro pulse valves, CLEAN OUT of the hopper can be accomplished by opening the "clean out" port provided under the valve. Turn to one side to allow material to drain.

MICRO PULSE - ACCURACY

All MICRO PULSE valves are more accurate if the associated PT parameter is set to 00090. Read PT parameter in the PARAMETER section.

```
+-----+
|       |
| PROCEED TO:    NORMAL OPERATION    NEXT PAGE       |
|       |
+-----+
```

INSTRUCTIONS FOR NORMAL OPERATION

OPERATION:very simple.

1. Fill HOPPERS.
2. Turn POWER ON. Verify correct settings.
3. On Controller, set STOP and PAUSE switches UP.
Turn MIXER motor switch DOWN to run for a timed period.

Unit will now operate automatically to maintain a level of material high enough to cover the sensor.

Use the STOP or PAUSE switches to stop the blender.
Turn POWER off only on final shutdown.

AFTER SEVERAL DAYS OF PROPER OPERATION:

Save all parameter information to the EEPROM for future retrieval just in case software problems develop later.

To SAVE all parameter information to the EEPROM:

```
+-----+
| Press:  *           Display will say:  (PASSWORD) |
| Press: 22222        Display will say:  (P      x) |
| Press:  *           Display will say:  (INSTR --) |
| Press:  23          Display will say:  (SAVING  ) |
| Wait:  when done,  Display will say:  (P      x) |
| Press:  EXIT        Display will say:  (      x) |
+-----+
```

If software related problems develop later, RETRIEVE this correct copy of the parameters from the EEPROM. This clears corrupted data from RAM and corrects most software problems.

To Retrieve:

```
+-----+
| Switch:  POWER OFF. |
| Hold:    the "CE" key down. |
| Switch:  POWER ON. |
| Release: the "CE" key. |
|           Display will say ( CLEAR  ) |
|           If you do not see ( CLEAR  ) |
|           on the display, do it again. |
+-----+
```

NORMAL OPERATING SEQUENCE - EACH CYCLE

As the sensor is uncovered, the cycle begins. The target weight of a complete batch is 18000, 9000, 4000, 2000, 1000, or 400 grams.

REGRINDS are dispensed first, in their order of size, largest dispense first. After all the Regrind dispenses, the space remaining in the weigh bin is determined.

NATURALS are dispensed second, in their order of size, each at the correct ratio to the others. These dispenses are calculated to fill the bin leaving just enough space for the Additive dispenses. After all Natural dispenses are complete the exact weight of all of the NATURALS is determined and, based on this actual dispense weight, the Additive dispenses are now calculated.

ADDITIVES are dispensed last. These dispenses are calculated as a percentage of all the NATURAL components only.

If any dispense fails to reach the requested weight, the process does NOT CONTINUE. The ALARM Strobe light flashes, the Beeper sounds, and the system continues to retry the dispense until the problem is remedied.

The total batch is then dropped into the mixing chamber for blending before entering the throat of the process machine.

SPECIAL FEATURES

To use one of these SPECIAL FEATURES, read about it first. The KEYSTROKE sequence required is given at the end of this section.

To TAG all material usage data with Work Order or Employee numbers for better tracking of material used, read:

KEYPAD, TAG key, and set 2nd digit in the FLG parameter to 1.

To store RECIPES using the RECIPE storage feature, read:

KEYPAD, RECIPE key, and set 3rd digit in the FLG parameter to 1.

To increase throughput, using the FAST key, read:

KEYPAD, FAST key, and set 4th digit in the FLG parameter to 1.

To blend a preset BATCH amount of material and then stop, read:

KEYPAD, BATCH key, and set 5th digit in the FLG parameter to 1.

BATCH, RECIPE, FAST, and TAG keys REQUIRE that you read:

PARAMETERS, FLG parameter.

To use a lower percentage than 00.1 percent, read:

PARAMETERS, _XT parameter.

To change the MIXER RUN TIME, read:

PARAMETERS, MIX Parameter.

To place UPPER LIMITS on settings, read:

PARAMETERS, _SE Parameter.

To LOCK OUT others from changing the settings, read:
PARAMETERS, (*78) - Changing the Password.

To VERIFY ACCURACY of the entire system, read:
PRINTER OUTPUT and TROUBLESHOOTING sections.

To TRACK MATERIAL usage, read:
KEYPAD, VIEW DATA, and PARAMETERS, PRT Parameter.

To configure TWELVE software to look and act like FOUR software, See:
KEYPAD, STAR FUNCTIONS (*04) - Configuration to FOUR software.

READ the rest of the manual at your leisure to learn more about how
your AUTOWEIGH BLENDER works and what else it can do.

KEYSTROKE SEQUENCE for these or other SPECIAL FEATURES

With STOP END OF CYCLE switch DOWN,
Turn POWER ON. Wait 5 seconds, until display says (x)
Press: * Display will say: (PASSWORD)
Press: 22222 Display will say: (P x)
 This is the PROGRAM MODE

To alter a PARAMETER; press: PARA key
Press repeatedly until the parameter you want is displayed.
If you accidentally pass it, use the * key to back up.
With the proper parameter displayed, enter the NEW number.
Enter 5 digits; use leading zeros if necessary.
For correct entries, follow specific directions given in the
PARAMETER section.

Press: EXIT when correct parameter has been entered.

To make a (*XX) entry:

Be in the PROGRAM mode, the same as above.
 Display will say (P x)
Press: * Display will say (INSTR --)
Enter the 2 digit code.
For correct entries, follow specific directions given in the
KEYPAD section, STAR FUNCTIONS.

Press: EXIT when correct information has been entered.

When finished, press EXIT again to exit the PROGRAM MODE.

CONTROLS and OUTPUTS

1. POWER ON switch.

Controls all power to the controller and all outputs. When power is switched off, battery backed-up RAM preserves all internal totals and parameters. All other functions are reset for normal start-up when power is restored.

2. STOP END OF CYCLE / CONTINUE switch

This is the switch that you should use to STOP the system. This switch is wired in series with the level sensor. Turning it off breaks the signal to the computer the same as covering the level sensor with material. This stops the process at the end of a full cycle.

3. IMMEDIATE PAUSE / CONTINUE switch

Causes a computer-controlled immediate pause during a cycle. Dispenses will stop in mid-dispense if necessary. When switched back to CONTINUE, the process continues without any error in amounts dispensed.

4. ALL AIR SOLENOID outputs

There is a single 8 pin or 14 pin (or 17 pin) Amphanol plug located on the front of the control panel. this provides output of all 120 volt (or 24 volt) signals to drive the air solenoids. These power sources are transistor driven and are protected by the 1/2 amp panel fuse. See the wiring diagram section for the correct wiring to each pin.

If more then 7 outputs are to be driven, a 14 pin connector is provided with outputs for components 8, 9, A, B, and C.

If 24 volt solenoids are used, a 17 pin connector is provided.

5. POWER OUTPUTS (receptacles on panel front)

Each outlet puts out 120 volts (240 outside USA) through internal plug-in solid state relays rated and fused at 3 amps. These relay outputs are designed to drive motors or other devices requiring power up to 3 amps each. The LEFT outlet is for component number 5, and the RIGHT outlet is for component number 6.

6. EIGHT CHARACTER DISPLAY

Displays the accumulated total bin weight, in grams, after each dispense. The display flashes when an inadequate dispense has occurred and the dispense is going to be retried. Other information displayed here includes material usage totals, internal parameters, component types and settings and various information prompts to assist the operator.

Numbers displayed are the total weight of material, in grams, in the bin at any time. The weight in the bin is updated only after an individual dispense is complete. During the dispense the displayed weight does not change.

P in the left most position indicates unit is in PROGRAM mode.

M indicates unit is in MANUAL mode.

1 R 20.0 indicates: Component 1, REGRIND, SETTING of 20 percent.

INVALID indicates:
1. you pressed an incorrect key,
2. you pressed a key for a function that is not active, or
3. you are not in the right mode for this key to operate.

PASSWORD is displayed when you press the "*" key from the normal mode.
Enter "11111" for MANUAL mode or "22222" for PROGRAM mode or
enter your own password number if you have established one.

INSTR -- is displayed when you press the "*" key from the PROGRAM mode.
Enter a 2 digit instruction number for special tasks.

SETTING, OPERATE, TIMED, and CALIBRATE are displayed when the
respective keys are pressed from the manual or program modes.
These displays are followed by pressing a device key; 1
through 9, A, B, C, DUMP, ALARM, MIX, or HOLD.

FLASHING means that retries are occurring because the first dispense
was not enough. Other error conditions also cause flashing.

ROM OK or ROM BAD indicates condition of ROM chip.
See KEYPAD, *25, for explanation.

7. LED LIGHTS

The LED lights in two rows of eight located above the 8 character
display indicate the following:

LEFT COLUMN from top:

1 through 8. Component 1 through 8 is operating.

RIGHT COLUMN from top:

1 through 4. Component 9, A, B, or C is operating.

5. Weigh bin dump valve operating.

6. Mixer motor drive relay operating.

7. Mixer flow control valve is open.

8. Alarm output operating.

NOTE: The silk screening on the panel front next to the leds is
correct for FOUR software but not for TWELVE software.

8. STROBE LIGHT AND BEEPER ALARMS

The Strobe light flashes and the Beeper sounds when a component fails
to meter properly. Alarms begin after a number of retries have
occurred, this number determined by the parameter table (see
Parameters, _AL). These alarms can also indicate an out-of-range TARE
weight. This range is set by the TL and TH parameters; above 100 or
below -50 grams.

9. ALARM SILENCE

This button stops the STROBE and BEEPER ALARMS. The continuation of
the cycle to its proper completion will also stop the alarm. When in
the BATCH mode, this button also serves to start the next batch.

10. LEVEL SENSOR input

The high level sensor in the mixing chamber plugs into this outlet and
signals the controller to start a dispense cycle when it is uncovered.
The sensor must be uncovered for at least 2 seconds before a cycle will
start (see DLY 00488 Parameter). Once a dispense cycle is started,
covering the sensor does not stop it. Operation continues until the
cycle is complete.

11. MIXER MOTOR OUTLET

This outlet is energized by the software for a time period following the dump of the weigh bin. You may adjust this time in the parameter table (MIX 00010). This time should be just long enough to provide adequate mixing. Mixing for a longer period may contribute to a static problem. Also, excessive mixing sometimes causes separation of pellets of different size and weight. (MIX 00099) will cause the motor to run for 360 seconds (6 minutes).

12. MIXER MOTOR ON/OFF/TIMED SWITCH

The Mixer ON/OFF/TIMED switch has been removed. To have the mixer operate continuously, the MIX parameter may be set to 00099. 99 will instruct the software to run the mixer for 6 minutes after the weigh bin has emptied at the end of each cycle. This is more than enough time. This limitation prevents accidentally running the mix motor for hours on end when the blender is not actually operating.

13. MIXER MOTOR FUSE - 3 amp

This fuse is rated at 3 amps and protects the mixer motor circuit separately from all other fuses. On 100, 200, and 400 series models, this fuse protects the mix motor directly. On 900 and 1800 series models, this circuit operates a 25 amp solid state relay in a separate box. The mix motor is protected by a "motor starter" switch with a "heater". This switch must be on for the motor to operate.

14. LOAD CELL input port

The system's two load cells are joined by a common connector that is plugged into this port.

15. PRINTER output

This is a parallel printer port. A printer plugged in here allows four types of information to be ported directly to a printer giving the benefit of a permanent printed record. They are:

1. The totals of the material usage data.
(press VIEW and "*" keys or use the PRT parameter to AUTOMATICALLY and periodically print these totals.)
2. A listing of the internal parameter table.
(press *77 in the PROGRAM mode.)
3. A printout of information after each cycle including actual dispensed weights and percentages for every cycle. (press *54 in the PROGRAM mode, use "*" to set printer flag ON.)
4. A printout of information after the TIME or CALIBRATE routines.
(*54 flag must be on)

Any common parallel printer that you would use with a small PC computer may be used. Connect using a standard parallel printer cable, (34 pin parallel Centronix connector to a DB25 IBM compatible connector), available from us or at any computer store. See: PRINTED OUTPUTS for a

detailed explanation of these printouts.

16. COMPUTER input / output

If you choose to gather material usage data automatically and continuously by computer, then this connector allows for connection to any IBM PC type computer operating under MS-DOS or WINDOWS.

The COMPUTER port is a DB9 (9 pin) male port. You will need a specially wired cable from us to connect to the serial port on your standard PC computer. Your computer operating system must be MS-DOS or WINDOWS. You will need software from us for communicating with your Autoweigh Blender. This software allows downloading settings and retrieval of information and produces reports for those customers who wish to take advantage of this feature. Either one or many Weigh Scale Blenders can be connected to one computer. For multiple Weigh Scale Blender systems, or communication over long distances, an additional piece of hardware is required. All GB/WSB controllers are fully programmed to communicate with your computer now or at a later date.

17. PANEL FUSE for duplex receptacle - 3 amp

Fuses the common power wire of the duplex receptacle (the color and additive outputs). Since these outlets are only turned on one at a time, each is protected to the full 3 amp rating of the fuse.

18. PANEL FUSE for processor - 1/2 amp

Fuses power to the circuit board power supply which includes all solenoid outputs and solid state relay outputs.

19. INTERNAL FUSES

An in-line fuse is provided internally to protect the main 120 volt power cord supply (10) amps. If this fuses blow, an internal short circuit is indicated and we don't recommend that you try to fix it. Remember, this unit carries a three year warranty; just send it back.

The MIX MOTOR timed power source and the AUGER FEEDER OUTLETS are driven by internal solid state plug-in relays. These relays are located on the circuit board mounted on the inside back surface of the controller enclosure. A small 5 amp glass fuse is located to the right of each relay. A spare fuse is also located on the board if replacement is necessary.

20. THUMBWHEEL SWITCHES

The three sets of THUMBWHEEL switches have no effect unless they are assigned to a particular output device. Entry of all SETTINGS is done by using the KEYPAD. However, if you prefer, you may assign up to three components to the Thumbwheel switches and then use these switches to set and alter their settings.

Since only three switch sets are available, only 3 components can be controlled in this manner. All others must use the keypad. See ENTERING SETTINGS for more information on how to do this.

21. KEYPAD: Explained in next section, next page.

KEYPAD - SUMMARY DESCRIPTION

Detailed explanations are given on the pages that follow.

AUTOMATIC OPERATION MODE: (normal operation on power up)

VIEW: View Data: date, time, cycles, and each component weight.
Press VIEW,* to print data.
RCP: Enter and retrieve stored RECIPES.
BTCH: View BATCH data: Target Weight, Current Portion, Accumulated
Total, and Batch Count. CE = clear displayed field.
FAST: Run rapid FAST cycles after a normal weighed cycle.
TAG: Tag Work Order and Operator numbers to all reports.
EXIT: Press to EXIT all sequences from ALL MODES.
SET: Press to review or change settings.
CE: Press to display "raw signal" weight readout for 3 seconds.

MANUAL MODE: Press: "*"; then (11111) or your own 5 digit password.

OPER: Operate all devices manually; open and close valves.
TIME: Operate devices for a selected time period.
CAL: Operate devices to learn rate.
Above keys use 1 through 9, A, B, C, DUMP, MIX, HOLD, ALARM.
ZERO: Zero the tare weight with the bin empty.
FULL: Using known weights, enter gram weight to calibrate load cells.

*00 Clear DATA fields.
*99 Set flag to enable weight calibration of load cells.

PROGRAM MODE: Press: "*"; then (22222) or your own password.

SET: Enter settings if access in Automatic mode has been locked out.
PARA: View or change system parameters. Press PARA for next in list,
"*" for previous, SET for next table, VIEW for previous table.

STAR FUNCTIONS: Press * and two numbers for the following functions:

*02 Extrusion and Yield Control.	*52 Double dump weigh bin.
*03 Four digit (xx.xx) settings.	*54 Print cycle information.
*04 Simulate FOUR software.	*66 GB/WSB I.D. number (1-255).
*05 Inhibit table clearing.	*69 Regrind as second natural.
*11 DATE - TIME, real-time clock.	*71 Color percent of blend.
*12 Move table from ROM to RAM.	*72 Additive percent of blend.
*23 Move from RAM to EEPROM.	*74 Stop, alarm MAX wt exceeded.
*32 Move from EEPROM to RAM.	*75 Alarm on weight drop.
*14 Set types: REG, NAT, ADD, OFF.	*77 Print parameters.
*25 ROM OK flag, "CE" to clear.	*78 Change program mode PASSWORD.
*33 Special Alarms.	*82 Precision Ratioing.
*44 End cycle - bin full.	*87 VOLUMETRIC operation.
*45 Change MANUAL mode password.	*88 Print display readout.
*47 Totalizer flag.	*89 Select pounds, kilos.
*48 Dispense range xx.x to xxx.	*98 Display raw weight number.

Use "*" key to select readout or toggle flags ON or OFF.

KEYPAD - DESCRIPTION OF FUNCTIONS

Three (3) operation Modes are available; AUTOMATIC, MANUAL, PROGRAM.

KEYPAD - AUTOMATIC OPERATION MODE

This is the NORMAL operating mode. When power is turned on, the unit is in this mode. Automatic dispensing occurs ONLY in this mode. The AUTOMATIC mode is indicated by the ABSENCE of the letter "P" or "M" at the left end of the display.

Only the VIEW, RECIPE, BATCH, FAST, TAG, CE and EXIT keys are available in this mode:

These keys operate only BETWEEN cycles or when the PAUSE switch is on. To stop between cycles, use the "STOP END OF CYCLE" switch.

VIEW DATA: Press to display the CURRENT Date and Time, LAST CLEARED (VIEW) date and time, and stored material usage data. Total CYCLES and Material totals are available: (in Pounds, Kilos, Grams, or Ounces)

Number of CYCLES that have occurred:	(D = #####)
TOTAL weight of each component (X):	(X = #####)
(only active components are displayed)	
Total weight of ALL materials:	(T = #####)

Each successive press of the VIEW key displays the next total. The last displayed line will say (00=CLEAR) for 5 seconds. During this time, you may press 0,0 to clear the data. Waiting 5 seconds or pressing any other key will exit the sequence. When the sequence is exited, normal automatic operation resumes. These totals may be displayed as pounds, grams, kilograms, or ounces by a selection procedure explained later (*89).

Press the VIEW key once followed by the "*" key to cause all information to be sent to the printer (if available). To then clear the data, press 00 within 5 seconds. Press any other key or, wait 5 seconds, to continue the process without clearing the totals.

RECIPE: This key allows you to GET, LOAD, and SAVE RECIPES. To (RCP) SAVE a recipe you must be in the PROGRAM mode. Recipes are thumbwheel switch settings. 50 recipes may be stored, numbered 00 to 50.

This key is NOT FUNCTIONAL unless the third digit in the "FLG" parameter is set to 1 (FLG xx1xx). To do this, see the MAINTENANCE section, PARAMETER TABLE, "FLG".

Assuming a proper FLG parameter is set:

In normal Automatic mode: Press RCP key. If a RECIPE is currently in use then display will flash through the current stored data:

(RCP --), (1R= xx), (2N= xx.x), etc., (CE=CLEAR)

Press CE to CLEAR CURRENT RECIPE and return settings to those previously set. Then press RCP to look at another

recipe. Display = (GET --).

If no RECIPE is currently in use, display says (GET --).
Enter 2 digits to retrieve one of 50 recipes.

Display will flash through this recipe data:

(RCP 01), (1R= xx), (2N= xx.x), etc., (* = LOAD)

Press "*" to LOAD this recipe into memory. Routine will exit automatically. Press RCP or EXIT to return to the display (GET --). Press RCP or EXIT again to exit.

To SAVE a RECIPE you must be in the PROGRAM mode.

If you press RCP key again after display of (GET --), display says (SAVE --). Enter 2 digits, display will say (SAVING). The current settings are saved into memory under the recipe number you have entered.

Routine will EXIT automatically.

EXIT will exit at any time.

To clear a recipe, set all component settings to zero and save these settings into the recipe location.

BATCH:
(BTCH)

This key allows you to blend a PRE-SELECTED WEIGHT of material, and then STOP running and sound the ALARM. The process may also be programmed to sound the alarm but continue running. Since each cycle will always blend a full weigh bin amount, the total amount blended may exceed the target batch weight by up to one cycle's blend weight.

This key is NOT FUNCTIONAL unless the last digit in the "FLG" parameter is set to 1 or 2. (xxxx1 or xxxx2). To do this, see the MAINTENANCE section, PARAMETER TABLE, "FLG".

The ALARM SILENCE button on the side of the controller, is the ONLY way to CONTINUE OPERATION after a BATCH amount has been run.

Assuming a proper "FLG" parameter is set:

Press the BTCH key once to view the desired BATCH WEIGHT.

Display will say (BW #####).

BATCH WEIGHT is the amount you wish to dispense before stopping and/or sounding the alarm.

Press again to view the CURRENT PORTION, of the batch, that has been dispensed.

Display will say (CP #####).

CURRENT PORTION shows how much of the Batch Weight you have blended so far.

Press again to view the ACCUMULATED TOTAL weight of all batches dispensed.

Display will say (AT #####).

ACCUMULATED TOTAL is the sum weight of all batches that have been blended. This number will continue to grow until it is manually cleared to zero, or it exceeds its maximum possible value.

Press again to view the total BATCH COUNT.

Display will say (BC #####).

BATCH COUNT is the total number of batches that have run. This number will continue to grow until it is manually cleared to zero, or it exceeds its maximum possible value.

Press again to return to normal operation.

When any of the above totals are being displayed, you may press the CE key to RESET that number to zero. While all four totals can be cleared to zero manually, only the BATCH WEIGHT number can be entered manually.

When the BATCH WEIGHT is being displayed, you may enter a NEW batch weight using the keypad. You must enter a 5 digit number with leading zeros, if necessary. Maximum number that can be entered is "59999".

The unit of weight that will be used is either POUNDS or KILOGRAMS as determined by the *89 option, explained later.

While in operation, when the total is reached, the system will alarm and stop blending if the FLG parameter is set to 00001. The system will alarm but CONTINUE running if the FLG parameter is set to 00002.

Use the ALARM SILENCE button (on the side of the controller) to silence the alarm. Pressing the BTCH key to view the information will also silence the alarm.

If the system is programmed to STOP at the end of a batch, the ALARM SILENCE button MUST be pressed to start blending the next batch. The First press of the ALARM SILENCE button will silence the alarm. The Second press will start the next batch.

NOTE: Fractional cycles are not blended. Total weight may be in over the target by as much as one cycle weight.

The EXIT key will exit the BTCH sequence at any point but will NOT cause the system to start a new batch.

If an additional 120 volt output is desired for an alarm, substitute a 4 or 7 for the 00001. 4 turns on the Additive outlet, 7 turns on component 7 output.

If you have a printer connected, totals will print automatically. (see VIEW, * for details).

FAST: This key will allow you to exceed the normal blending rate of your unit. Once your system has learned proper flow rates of each material, the timing of each component dispense is very consistent cycle to cycle. The FAST key allows one or more FAST REPEAT cycles to follow a normal calibrated cycle. In a FAST REPEAT cycle all components are dispensed simultaneously, without any weights being taken. Errors in dispense amounts will not be detected. These are, in fact, volumetric dispenses, not gravimetric. These

dispenses take much less time. Throughput is easily doubled in this manner.

This key is NOT FUNCTIONAL unless the 4th digit of the "FLG" parameter is set to 1 (xxx1x). To do this, see the SOFTWARE MAINTENANCE section, PARAMETER TABLE, "FLG".

The shorter mixing time may be a problem. So the number of FAST REPEAT cycles is kept as low as possible. Up to 4 repeats may occur.

Press the FAST key to toggle the FAST flag ON or OFF. When set to (FAST OFF) the FAST mode will not operate. When set to (FAST ON) every normal calibrated dispense will be followed by up to 4 FAST repeat dispenses.

This series of 4 dispenses is terminated as soon as the sensor is covered, which indicates the blender has "caught up". The next cycle will then be a weighed cycle, followed by the required series of fast cycles to catch up again.

Press * to toggle between (FAST ON) and (FAST OFF).
Press EXIT, to exit.

When the FAST mode is in operation, the display (FAST) will flash intermittently.

SETTING: Press once and the current setting of component 1 is
(SET) displayed. Display will say (1 X xx.x). X is material type, either R, (REGRIND); N, (NATURAL); or A, (ADDITIVE). xx.x is the current setting.

Press SET to step forward through all the settings.
Press * key to backup in the list.

NEW settings may be entered directly.

REGRIND and ADDITIVE settings are expressed as percents, up to 99.9 percent. NATURAL is any number you wish (usually weight). It is used to establish RATIOS with all other NATURAL entries. When only one material is designated as a NATURAL, the value of it's setting has no meaning, except that it must be set to some value to operate.

If you wish to restrict the entry of settings to the PROGRAM mode only, (password required), you may do so by altering the _SE parameter for each component that you wish to "lock out". See MAINTENANCE SECTION, PARAMETERS, _SE parameter.

TAG: This key allows two pieces of information to be "tagged" onto all data that is either printed or retrieved through the computer port. The items are WORK ORDER number and OPERATOR number.

This key is NOT FUNCTIONAL unless the 2nd digit of the "FLG" parameter is set to 1 (xlxxx). To do this, see the SOFTWARE MAINTENANCE section, PARAMETER TABLE, "FLG".

Press once to display the current Work Order number (WO-----). Press again to display the current Operator number (OPRTR---). Press again for the Recipe (RECP ---). You may enter or change the Work Order or Operator number, when each is displayed, but not the recipe number.

These numbers are for your TRACKING of information ONLY. They have NO EFFECT on the operation of the Weigh Scale Blender.

WORK ORDER number (6 digits) allows you to tag all information with an internal accounting number such as a job or purchase order number.

OPERATOR number (3 digits) allows you to track who is operating the equipment.

RECIPE number (3 digits) allows you to track what recipe you are using but you can not enter or change it here. The number will be a 2 digit number if a recipe is being run that resides in the controller RAM; one that was entered using the RECIPE key. If a recipe has been entered using our MLAN software, through the computer port, then a 3 digit number will be displayed. In either case, the number in this field will be displayed and "tagged" to all printouts and retrievals.

EXIT will exit the sequence at any point.

EXIT: This key is operational in ALL MODES.
Use the EXIT key to exit any and all keypad sequences.

CE: Press "CE" at any time to display raw data readout of the load cells for five seconds. This is helpful in diagnosing possible load cell problems and is explained in detail in the MAINTENANCE section.

"CE" is used frequently in connection with other keys, to clear or scan through selections.

KEYPAD - MANUAL MODE

In this mode, you may operate individual functions manually for test purposes. No totals are saved and automatic operation does not take place. The low level sensor has no control or effect over manual operation requests.

The Row of keys marked OPER, TIME, VER, and CAL operate in this mode coupled with all device keys; 1 through 9, A, B, C, DUMP, MIX, HOLD, and ALRM.

You can enter this mode only when the controller is between cycles. The sensor must be covered or the STOP switch must be in the "STOP -END OF CYCLE" position. When in this mode, no automatic dispensing occurs.

To enter this mode, press "*", then enter the correct password number. The password supplied with the unit is "11111." You may change this to

any other 5 digit number, if you wish, as explained later (*45). When in the MANUAL mode, the letter "M" shows at the left end of display.

The following manual functions are available in the MANUAL mode.

OPERATE: Press once followed by one of 16 keys: 1 through 9, A, B, (OPER) C, DUMP, ALRM, MIX, or HOLD. The selected output operates until the key is pressed again or another output is selected. Only 1 output will be active at a time. EXIT will exit the sequence and close all outputs.

TIMED: Press once followed by one of 12 component keys. A time in (TIME) interrupts is requested; (TIME ---). Three digits must be entered specifying a dispense time up to 999 interrupts (about 4 seconds maximum.) CE will cancel entry before last digit is entered. Following a full 3 digit time entry, the specified output is activated for the time requested. After the dispense is weighed, the dump valve automatically operates to empty the weigh bin. If a printer is on line and the Print flag is ON, then output information will be printed. EXIT will exit the sequence.

CALIBRATE: (RATE) Press once followed by one of the 12 component keys. (CAL) A dispense will occur for 2 seconds. If the amount dispensed is less than 50 grams, a second dispense will occur for 20 seconds. Using the resulting weight and time, the processor calculates a proper beginning point dump rate for the start of production blending. After each dispense is weighed, the weigh bin dump valve automatically operates to empty the weigh bin. If a printer is on line and the Print flag is ON (see KEYPAD *54), then output information will be printed. EXIT will exit the sequence.

If the display says (DO AGAIN), press any key to cause the process to repeat itself. If the display then says (NO GOOD), the dispense weight was below 2 grams, not enough for a valid calibration.

During initial operation, after each power up, the blender calibrates itself completely automatically, regardless of how far off the initial flow rate may be. This may take several cycles. During normal operation, calibration correction occurs continuously.

Since this unit adjusts flow rates automatically, manual Rate Calibration is not necessary for proper operation.

ZERO WT. THIS HAS BEEN DONE AT THE FACTORY. IT SHOULD NOT BE (ZERO) NECESSARY FOR YOU TO DO THIS AGAIN.

For this key to function, you must first set the weight calibration flag ON. Press *99 to observe flag status. Press * to toggle flag ON or OFF. With flag set ON, press EXIT. Power-off always resets this flag to OFF.

Press the ZERO key once to set the displayed gram weight of the empty bin to zero. BE SURE the load cells are plugged into the controller. Be sure the bin is properly in place

and EMPTY when this key is pressed.

Since the bin, even when empty, weighs about 1300 grams, it is necessary on initial setup of equipment to instruct the controller of the exact tare weight of the empty bin.

Slight drift in the tare or zero weight during day to day operation is normal. All weight calculations automatically compensate for this drift. However, when the bin is empty, if the weight displayed is more than 50 grams above or below zero, then you may wish to reset the electronics to display zero when the bin is empty.

If, when the bin is empty, the weight displayed is greater than 100, or less than -50, (Parameters TH and TL), the dispense cycle will not begin. Instead, the dump valve will repeatedly try to dump any material it thinks is in the bin or will sound the alarm if weight is below -50. If the load cell calibrations have drifted this far, it is absolutely necessary to reset empty bin weight to zero. These minimum and maximum tare weights are set by the TL and TH parameters. See PARAMETERS, TL and TH for more info.

Allow system to be on for at least 5 minutes to allow for warm up of certain components before setting ZERO or FULL weights.

Generally, when zero weight shifts, the full weight reading shifts the same amount. For this reason, resetting the ZERO WT automatically shifts the FULL WT readout by the same amount. Resetting the ZERO weight usually is all that is necessary to also calibrate the FULL weight.

FULL WT. THIS HAS BEEN DONE AT THE FACTORY. IT SHOULD NOT BE
(FULL) NECESSARY FOR YOU TO DO THIS AGAIN.

ZERO WT. must be entered before FULL WT. to achieve proper calibration. The FULL WT. key will not function until you have set ZERO WT. as described above.

If you wish to reset the controller for proper full-weight scale display, use any known weight as close to full bin weight as possible. Do not exceed 9999 grams. Place this weight in the bin and press the FULL WT. key. The display will show five dashes (FUL-----). Now enter the actual weight in grams of the item you are weighing.

AGAIN, both FULL WT. and ZERO WT. have been set at the factory. A drift of several grams from these settings is normal and should not be of any concern. Recalibration should be considered only if ZERO is more than 20 grams off or FULL WT. is more than 50 grams off. These errors do not prevent proper proportions from being dispensed. ZERO error is always "tared" for proper weighing of each component. FULL scale error will only cause accumulated totals to be off by the degree of this error. The primary function of the AUTOWEIGH BLENDER is to dispense materials in the proper ratios. Because all components are weighed by the

same load cells, the accuracy of these ratios is not affected by zero or full scale errors.

STAR FUNCTIONS available in the MANUAL mode:

00 Press (,0,0) to CLEAR ALL DATA fields. These are the material usage totals that are viewed with the VIEW key. If you are tracking material usage, you should record these numbers periodically but clearing these totals is entirely optional and not necessary.

After VIEWING the data or printing of data using the VIEW,* key sequence, a display of (00=CLEAR) will appear for 5 seconds. During this 5 seconds you may reset all data fields to zero by pressing 00. Pressing any other key or waiting 5 seconds will exit this sequence without clearing data.

99 Press (,9,9) to set flag to enable Weight Calibration of the Load Cells. Power On will always set this flag to OFF. This flag must be ON before the load cell weight calibration keys, ZERO and FULL WT, will function. With ON flag displayed, press EXIT.

KEYPAD - PROGRAM MODE

In this mode, you may perform ALL of the functions available in MANUAL mode, plus additional functions that alter the logic with which the controller operates.

The PARA key operates in this mode.

STAR FUNCTIONS are available by pressing the "*" key and two numbers.

Just as with the MANUAL mode, you can enter this mode only when the controller is between cycles. The sensor must be covered or the STOP switch must be in the "STOP - END OF CYCLE" position. In the MANUAL mode, no automatic dispensing will occur.

To enter this mode, press "*", then enter the correct password number. The correct password supplied with the unit is "22222". To change this to another 5 digit number of your choice, see (*78). When in the PROGRAM mode, the letter "P" shows at the left end of the display.

The following PROGRAM functions are available in the PROGRAM mode.

PARAMETERS: Press the PARA key to display the table of operating (PARA) parameters that reside in memory. There are 13 separate groups of parameters. The first group is the GENERAL group and contains 20 GENERAL parameters. The other 12 groups are the COMPONENT groups and contain 13 COMPONENT parameters each.

A FULL EXPLANATION of each PARAMETER can be found in the next section: EXPLANATION of PARAMETERS.

The PARAMETER LIST looks like this:

```
+-----+
|General | Component: 1 through 9, and A, B, and C: |
+-----+
|FLG      1TY   2TY   3TY                               CTY
|MIX      1CS   2CS   3CS   and so on up to:  CCS
|FCV      1AL   2AL   3AL                               CAL
|DTI      1XT   2XT   3XT                               CXT
|KDF      1SE   2SE   3SE                               CSE
|WDF      1WT   2WT   3WT                               CWT
|BER      1TI   2TI   3TI                               CTI
|ROC      1MI   2MI   3MI                               CMI
|ROV      1NC   2NC   3NC                               CNC
|RHL      1RP   2RP   3RP                               CRP
|FUL      1RD   2RD   3RD                               CRD
|MAX      1LA   2LA   3LA                               CLA
| TH      1PT   2PT   3PT                               CPT
| TI
| PRT
| DLY
| PRC
|...and so on down to:
| TRC
+-----+
```

Press: PARA to ENTER the list at the TOP LEFT (FLG).
Press: PARA to move DOWN a list.
Press: * to move UP
Press: SET to move RIGHT (1st time, goes to 1TY)
Press: VIEW to move LEFT
Press: EXIT when finished.

In the COMPONENT lists:

The TOP parameter (TYPE) is ALWAYS accessible.
The others are NOT accessible unless TYPE is set.

The First press of the PARA key will enter the GENERAL list at the top.

Then the first press of the SET key will move to top of the first component list. Press the PARA key to move down in any list.

While in one COMPONENT list, press the SET key to jump to the same relative position in the next list. This allows rapid scanning of like parameters in all component groups.

To change a displayed parameter enter a new number in place of the old one. CE will cancel a number entry before the last digit is entered. The purpose of each parameter is explained elsewhere in this manual.

In any component list, if TYPE is set to "OFF"; (_TY= OFF); other parameters in that list are not accessible. EXIT will exit the sequence at any time.

STAR FUNCTIONS available in this mode:

*02 This flag for EXTRUSION and YIELD control, and RATE display.

Press (*,0,2) to turn on Extrusion or Yield control.
The default display is (OFF).
Press * to toggle this flag to (RATE), (EXT CTRL), or
(YLD CTRL).

If you are using our EXTRUSION or YIELD control software to control your extruder, refer to our EXTRUSION CONTROL instruction booklet for complete information.

If you simply want to view throughput continuously on the blender display, set this option to (RATE). This will alter the display only. In all other respects, the blender will operate normally.

03 Press (,0,3) to allow four digit entry of settings in the format (xx.xx). This does not make the blender more accurate. It does allow easier setup for customers that have a mixture of setting requirements, that is x.xx entry requirements as well as the standard xx.x requirements. Normally the XT parameter would be manually adjusted to allow the decimal shift. If this four digit entry option is turned on, then all entries are in the format xx.xx. The software uses only the first three digits unless the first digit is a zero, in which case the last three digits are selected and the related XT parameter is set to 00010. See XT parameter for more information. Display will say (SET=XXX) or (SET=XXXX). Use * key to toggle.

04 Press (,0,4) to select from 4 standard software configurations. If you want your unit to look and act like it is running FOUR software, then this option will do this for you in one easy step.

Use the "*" key to toggle through all selections.
Select (KEYPAD) to exit without changing anything.
Select (R,N,C,A) for system to operate like FOUR software.
Select (N,N,C,A) to operate like FOUR software with the
"TWO NATURALS" flag on.
Select (N,N,N,A) to operate with three Naturals and an
additive.
Select (R,N,N,A) to operate with Regrind, two Naturals,
and an additive.

Component 2 is ALWAYS a NATURAL, and is never assigned a thumbwheel switch. Components 1, 3, and 4 are always assigned to thumbwheel switches.

If (R,N,C,A) is selected, component 2 is the ONLY natural and is set to 100.

If (N,N,C,A), (N,N,N,A), or (R,N,N,A) is selected, the first, third, and fourth components are assigned to switches 3, 1, and 2 respectively. Component 2 setting will be adjusted automatically at the start of each cycle to a

number that will make all natural settings add up to 1000. In this way each NATURAL setting will represent a percent of the total natural blend.

If the sum of natural settings exceeds 1000, component 2 will be set to 000, and the other naturals will be ratioed to each other.

The TY and CS parameters are the ones that are altered.

TY sets TYPE to Regrind, Natural or Additive. CS assigns the thumbwheel switches. If CS = 40000 the software knows to calculate a setting based on the other naturals such that all settings total 1000.

On 140, 240, 440 and 940 models:

If (R,N,C,A) is selected, PARAMETERS are set:

(1TY = REG) (2TY = NAT) (3TY = ADD) (4TY = ADD)
(1CS 30000) (2CS 00100) (3CS 10000) (4CS 20000)

If (N,N,C,A); same as above except:

(1TY = NAT) (2CS 40000)

If (N,N,N,A); same as the first except:

(1TY = NAT) (2CS 40000) (3TY = NAT)

If (R,N,N,A); same as the first except:

(2CS 40000) (3TY = NAT)

On 220 and 420 models:

Changes are the same as above except components 6 and 5 are altered instead of components 3 and 4.

If (R,N,C,A) is selected, PARAMETERS are set:

(1TY = REG) (2TY = NAT) (6TY = ADD) (5TY = ADD)
(1CS 30000) (2CS 00100) (6CS 10000) (5CS 20000)

If (N,N,C,A); same as above except:

(1TY = NAT) (2CS 40000)

If (N,N,N,A); same as the first except:

(1TY = NAT) (2CS 40000) (6TY = NAT)

If (R,N,N,A); same as the first except:

(2CS 40000) (6TY = NAT)

All other TYPE parameters are set to (_TY = OFF).

05 Press (,0,5) to inhibit the (00=CLEAR) display at the end of the VIEW sequence. Customers using MLAN or G2 software for retrieval of material usage information, may wish to restrict an operators ability to clear the material usage data at the controller. This option allows you to remove the floor operators ability to clear this data. Press * to toggle between (CLEAROFF) and (CLEAR ON).

11 Press (,1,1) to enter the correct date and time into the real-time clock. Correct date and time is helpful if you are retrieving information using a printer or are collecting data by computer. Six entries will be requested.

The first display will indicate USA or EUROPE date format. Use the CE key to toggle from one to the other.

USA will cause all dates to be displayed MONTH/DAY/YEAR.

EUROPE will cause all dates to display DAY/MONTH/YEAR.

The remaining five entries are two digits each;
MONTH __, DAY __, YEAR __, HOUR __, and MIN __.

Use the * key to step through all displays without change.
Enter new settings where required.

The correct date and time have been entered at the factory
and should never have to be reset. Of course you may be in
a different time zone.

*12

Press (*,1,2) to move the PARAMETER table from ROM to RAM.
This allows system to operate with the parameters that were
originally supplied as default numbers with the system.

EXPLANATION:

All PARAMETERS are stored in a table that resides in three
places: ROM, RAM, and EEPROM.

ROM (Read Only Memory) is the chip on the circuit board that
cannot be altered in any way except by physically replacing
the entire chip. It contains the program and the copy of
the parameter table that we supply as standard with all
controllers.

EEPROM (Electrically Erasable Programmable Read Only
Memory) is the portion of the processor that can be altered
by the computer by special request only; data stored here is
not lost even if the battery backed up RAM should loose
power. EEPROM contains all parameters and control numbers
that are unique to your system. It holds the information
that is automatically retrieved when the CLEAR procedure is
performed (see below). This information may be retrieved
for use only by special request from the keypad. At the
factory we have set what we believe to be the proper
parameters for your application into the EEPROM.

RAM (Random Access Memory) is the chip on the circuit board
where the processor keeps track of and stores constantly
changing data. It is the area that would go blank if power
were removed from it. We have provided a battery back-up
for the RAM so this should never be a problem. On normal
power off and power on, the data and parameters that reside
in RAM are not lost. However, RAM is the portion of memory
most easily corrupted by the poor electrical environment of
a factory. Should something cause the data in RAM to be
lost or corrupted, a "CLEAR" procedure is provided that will
retrieve the parameter table stored in the EEPROM and copy
it into RAM memory for use. If you make changes to the
PARAMETER table, these changes reside only in RAM and may be
lost in the event of a computer malfunction. To insure that
your changes are saved for future runs, it is necessary to
move this information from RAM to the EEPROM (*23, next).

NOTE: The battery used for backup is a lithium battery that
is part of an I.C. chip on the board. It has an expected 10
year life and is not easily accessible for replacement.

Should it fail, we suggest that it be replaced at our factory.

23 Press (,2,3) to move the PARAMETER table from RAM to EEPROM. This information is then available for retrieval using the "CLEAR" routine or by using the *32 function described next.

32 Press (,3,2) to move EEPROM information to RAM. This is useful for retrieving special information tables that you may have stored earlier in the EEPROM. Also, if you have been making changes to RAM tables and now wish to restore all parameters to what they were at power up, this is the function to use.

NOTE: The three functions above, *12, *23, and *32, are easily remembered if you think of the 1, 2, 3 keys as ROM, RAM, EEPROM. The first digit selects the source, the second digit the destination.

14 Press (,1,4) to set components to one of four options. The display will look like this:

(1TY= REG), (1TY= NAT), (1TY= ADD), or (1TY= OFF).

This is the component number and the TYPE it is set to: REGRIND, NATURAL, ADDITIVE, or TURNED OFF.

Press the "CE" key repeatedly to scan the four options. When proper selection is displayed, move on to NEXT component by pressing the "*" key.

REPEAT the "*" CE" sequence for ALL components you use.

The * key will walk you through all components. The CE key will change the TYPE for a component.

Components NOT CONNECTED, or NEVER USED, set to OFF.

EXIT will exit the sequence at any time. After EXIT, if display says (NEED NAT) then you have specified an ADDITIVE without specifying a NATURAL. This is an unacceptable condition.

NOTE: FOUR dispense valve systems use components 1 to 4.
TWO dispense valve systems use 1 and 2.
SIX dispense valve systems use 1 to 4, then 7 and 8.
Panel front OUTLETS are always components 5 and 6.

25 Press (,2,5) to check the ROM-CHECK flag. Whenever your controller is on, the processor is continuously performing an integrity check of the ROM program chip supplied with the unit. Each complete scan of the program takes about one minute. If any single check reveals an incorrectly set bit, the ROM CHECK flag is turned on. This flag is checked every time you power up. If the flag has been set the display will say (ROM BAD), followed by the date and time of the last check that was found bad. If the flag has not been

set, (ROM OK) will be displayed. To turn the flag off, you must select this option, (*25), and, with (ROM BAD) displayed, press the "CE" key. This will clear the flag and it will remain off until another error is detected. The seriousness of the problem will be somewhat indicated by the date and time of the last bad check and how frequently you find it necessary to turn this flag off. Even with an error, your controller may still work perfectly. However, we suggest you request a new program chip from us as soon as possible.

- *33 Press (*,3,3,) to turn on a special alarm condition. Press * to toggle between (AL STD) and (AL-BATCH). If you are running using the BATCH key, and (AL-BATCH) is selected, then the ALARM will sound when a batch is completed.
- *44 This flag for SPECIAL APPLICATIONS ONLY.
- Press (*,4,4) to tell the controller to end a cycle when the weigh bin is FULL. Use the * key to toggle between (END EMTY) or (END FULL).
- Normal operation is to end the cycle EMPTY; (END EMTY). The (END FULL) option is only for special installations where the sensor has been relocated BELOW the mix chamber and the purpose of the unit is to calculate exact material usage rates in order to control an extruder.
- If you have a flow control valve fitted, this option will increase output of the blender by allowing a cycle to start even though the flow control valve is keeping the sensor covered for an additional 6 seconds.
- Leave this flag set to (END EMTY), unless you have specific instructions to do otherwise.
- *45 Press (*,4,5, followed by a 5 digit number) to change the PASSWORD number for entering the MANUAL mode. The system is supplied with the number "11111" as the password number. If you wish to restrict use of this mode to only yourself, you may make up your own number and enter it here.
- *47 Special function, DISPENSE systems only.
This function alters the range of requested dispense weights. 00.1 to 99.9 is standard. 001 to 999 and 0.01 to 9.99 are optional using this function. Dispense systems are generally used for rotational molding.
- *52 Press (*,5,2) to cause the weigh bin dump valve to operate two times. We call this a "double dump". If you have problems with material hanging up in the weigh pan, this may help shake it loose.
- Use the * key to toggle between (DBLD OFF) and (DBLD ON). Press EXIT when done.
- *54 Press (*,5,4) to set flag for a printout of data after each full dispense cycle. With this flag ON and with a printer

on line, four lines of information about the dispense cycle that just occurred will be sent to the printer. This information includes dispense weight and percentage of each component, the internal rate numbers used by the computer to determine dispense time, and the actual dispense time of each component. This is excellent information to track the accuracy of each dispense cycle and the accuracy of the entire system over an extended period of time.
See: PRINTER OUTPUT for a more detailed explanation.

- *66 Press (*,6,6) to enter an identification number for this particular Autoweigh Blender. This I.D. number will appear on all printed reports. If you have more than one unit, this helps to identify reports. If you are using a computer to automatically gather data, then each controller must have a unique address. Valid numbers are 000 to 255. When connected to a computer, do not use the number 000 for identification.
- *72 This flag for SPECIAL APPLICATIONS ONLY.
- Press (*,7,2) to change the Additive settings to be interpreted as percent of the entire MIX instead of percent of the Natural. The display will say (APM -OFF). Press "*" to toggle flag to (APM -ON). (APM stands for Additives Percent of Mix). This option has been added for a customer with a unique requirement.
- Leave this flag OFF, (APM- OFF), unless you have specific instructions to do otherwise.
- CAUTION: With this flag set, additive settings combined must NOT exceed 100 percent. From a practical standpoint, they should not exceed 10 percent combined.
- *74 Press (*,7,4) to set a flag that will cause the system to stop and the Alarm to activate when MAX weight is exceeded. This might occur if a valve sticks open or slightly open. Normally the system recovers automatically from such events with only the one batch blended incorrectly. Set the flag only if you want the system to stop and alarm.
- Press * key to toggle between (MAX OK) and (MAX ALARM). Press EXIT when done.
- *75 Press (*,7,5) to set a flag to ALARM if the weigh bin weight drops more than 20 grams during a cycle. This serves to detect and report a weigh bin problem, such as material leaking from the bottom of the bin.
- *77 Press (*,7,7) to print a copy of all internal parameters. A printer must be connected and ready. Up to 13 lists will print, a General list and 12 component lists. Only components that are turned "on" will print. Four columns will print, RAM; ROM; 200 and 900 series tables; and EEPROM. Identifying headings print above each column.
- *78 Press (*,7,8, followed by a 5 digit number) to change the

PASSWORD number for entering the PROGRAM mode. The system is supplied with the number "22222" as the password number. If you wish to restrict use of this mode to only yourself, you may make up your own number and enter it here.

If you forget your password number, call us. We can help.

- *82 Press (*,8,2) to produce a precision rationing of a selected Additive. Press CE to toggle between (P/R OFF), (P/R 1), (P/R 2), etc. Only those components already designated as an ADDITIVE will be displayed.

If precision rationing is selected, the specified additive (selected by the *82 function) will dispense BEFORE the Naturals, instead of after. Natural dispenses occur after the selected additive dispense and are calculated to assure the most exact percentage ratio for the selected component. Because the Natural dispenses are larger, this method allows for more exact rationing of the one selected critical component.

- *83 Press (*,8,3) to select "Progressive Metering" option. Progressive Metering allows for more accurate dispenses of selected components. However, cycle time will be extended by a few additional seconds.

In normal operation blenders target a dispense of the full requested amount in one try. This almost always works, and generally will fall within acceptable upper and lower error limits. Making the dispense in one try allows for high throughput rates while still achieving a level of accuracy acceptable for most processors. When the accuracy of one particular component is critical, or the process depends on maintaining a tighter tolerance of this component, customers may lengthen the blend cycle time slightly to achieve this higher level of accuracy.

The *83 function is used to turn on the progressive metering function for a selected component. This sets parameters which will cause the dispense to occur in several progressively smaller dispenses. This results in a more accurate dispense.

The first dispense targets only 85 percent (the default percentage) of the full required amount. After careful weighing, each successive dispense targets 50 percent of the remaining shortage. This continues until the amount reaches, or is within 1 percent of, the target. In this manner the software "sneaks up" on the target, providing the maximum achievable accuracy possible.

When a component is selected and turned ON, the corresponding PT and RP parameters are set to PT 00085 and RP 00001.

The keypad sequence:

Press *,8,3. Display will say (COL OFF).

Use the "*" key to walk through all the components.

Use the "CE" key to toggle a component ON or OFF.
When ON, Display will say (C=ON 85).
You may change the 85 by entering a different number.
Too low will just add time. Too high will cause occasional overshooting.
Press EXIT when done to save new settings.

86 Press (,8,6) to select a new "Back Door" password for your software. Display will say (BDP 00000). Enter 00001 up to 00009 to select one of nine new backdoor passwords. Contact us for the actual number. If you just want to kill the use of a backdoor password altogether, just enter a number from 1 to 9, and don't call us. Then no one in your plant will know the number. But we still will, just in case. Then your own selected regular password will work and as long as you don't forget it, your ok.

Blenders are pre-programmed with two normal passwords; (22222) is the default password for the PROGRAM mode, (11111) is the default password for the MANUAL mode. You can alter these passwords to any 5 digit number, but you must know the current PROGRAM password to change it. If for some reason the password has been altered and you can not remember it, we have a special "backdoor" password that will let you in no matter what. For obvious reasons, we do not provide that password in this manual. You must call us. However, there is a problem. If the wrong person in your factory obtains this password, then he will always have access to the Program mode of the blender no matter what.

Now, with this star function, you have the option to select from 10 different "backdoor" passwords. If your current "backdoor" password is known to the wrong person, you can call us for a new one. We will not give these backup passwords to just anyone. In fact, since only I know them, it is not that easy to obtain these numbers.

To activate a new "backdoor" password, you will enter a number from 00000 to 00009 using this star function. Each number activates a different password. Entering 0 activates the current backdoor password, the one we have used for over 10 years. For a new one, call us and talk with someone you know here in the office and they will supply a number from 1 to 9, and the associated new "backdoor" password.

After this new "backdoor" password is selected, you can safely change the regular password to one only you know, and use that in normal production. No one will be able to use the backdoor to get in. If you forget your regular password, and you also forget which backdoor password you selected, then we will help you go through the entire list to find the one that works.

87 Press (,8,7) to set flag for operation in a VOLUMETRIC mode. Use the * key to toggle flag ON or OFF. Press EXIT when done. When power is turned off this flag is always reset to OFF. With this flag ON (VOLUMETRIC mode), the load cells are completely ignored. Error correction and rate

recalibration does not take place. The unit functions like a volumetric feeder without checking or correcting for errors. Since load cell readings are ignored, this flag allows operation even if the load cells become damaged. Dispense times will be based entirely on the WT and TI parameters.

88 Press (,8,8) to force a printout of the display on the controller front. DATE, TIME, Machine number, and display will print:

```
Date:          11/09/93
Time:          17:22:01
Machine number: 002
Display Readout: P 500.0
```

This is useful for obtaining printed verification of load cell accuracy for ISO-9000 and British Standards rules.

The recommended procedure is:

1. Place the unit into the Program mode.
2. Press *88 for printout of empty bin TARE weight.
3. Place a KNOWN CERTIFIED WEIGHT into the weight bin.
4. Press *88 again for printout with the weight added.
5. The difference between the two weight printouts should equal the KNOWN CERTIFIED WEIGHT.

89 Press (,8,9) to select the desired weight unit (GRAMS, KILOGRAMS, OUNCES, POUNDS) for readout of data. For the U.S.A. systems are supplied with POUND readout selected. KILOGRAMS is preferred for nearly all countries outside the U.S.A. GRAM or OUNCE readout are appropriate only for very short runs or short demonstrations. Use the * key to walk through the four possible selections. Press EXIT when the weight unit you want is displayed.

98 Press (,9,8) to set flag for RAW-SIGNAL readout in place of gram readout of scale weight. Power-On will always set this flag to OFF. Use the * key to toggle flag ON or OFF. Press EXIT when done. A raw signal readout is useful to demonstrate the extreme sensitivity of the load cells. The raw signal readout bypasses the calibration math routine. Load cell function can be monitored without concern for any improper weight calibration that may have been done.

These functions were explained previously in the MANUAL MODE section:

00 Press (,0,0) to CLEAR ALL DATA fields.

99 Press (,9,9) to set flag to enable Weight Calibration of the Load Cells.

PARAMETERS

All AUTOWEIGH BLENDER controllers operate according to certain internal PARAMETERS. Because customer requirements vary widely, we have made over 160 parameters accessible for change through the keypad. There is one GENERAL group and twelve COMPONENT groups.

BRIEF explanations are given first. FULL information is given in the section that follows.

NOTE: Values shown here are initial ROM values of a model 940. Initial values for other models are listed at the end of this section.

Parameters are five digits, with leading zeros added.

TIMES are expressed as seconds, minutes, or interrupts.
(244 interrupts = 1 second).

WEIGHTS are always expressed as GRAMS.

100 and 200 models use tenths of grams: (xxxx.x). (00010 = 1 gram)
400, 900, and 1800 models; full grams: (xxxxx). (00050 = 50 grams)

PERCENTS are expressed in tenths for settings (0xxx.x),
and full percents for other percentage references (00xxx).

PARAMETER LIST - BRIEF EXPLANATIONS

GENERAL PARAMETERS (20 parameters) (900 series settings shown)

FLG 00000 turns on the RECIPE, BATCH, FAST, and TAG keys.

These four keys will NOT WORK unless you set this parameter.
The RECIPE key is for storing up to 99 recipes.
The BATCH key allows for filling a barrel or gaylor.
The FAST key allows a higher output mode.
The TAG key adds certain information to all printouts.

MIX 00010 MIX TIME

This parameter times how long the MIX motor runs. The default is set to 00010; 10 seconds of mix.

JOG 03030 JOGS, number and frequency.

This parameter specifies the number of jogs of the mix blade and how often they occur. The default is set to 03030; a jog every 30 seconds, 30 times.

FCV 00006 TIME the Flow Control valve delays before opening (sec.).

This parameter holds each batch in the mix chamber for a time to assure mixing. This is only for units equipped with the optional flow control valve under the mix chamber.

DTI 00004 Weigh bin dump TIME at end of cycle. (seconds)

This parameter times how long the weigh bin dump valve opens to empty. No change is required.

KDF 00002 Maximum variation in GRAMS between two consecutive weight
WDF 00002 readings for reading to be accepted. (x or x.x)

KDF controls sensitivity of weight readings during calibration of load cells. No change is required.

WDF controls the sensitivity of weight readings during normal operation. If excessive vibration interferes with weight readings you may have to increase this number.

BER 00200 Excess GRAM weight before dispense is aborted.

This parameter controls sensitivity of the emergency "bailout" routine that prevents overfilling of the weigh bin.
No change is required.

ROC 00000 These three parameters help control regrind usage.
ROV 00000
RHL 00000

ROC indicates the PERCENT of REGRIND that will be treated as natural when COLOR and ADDITIVE dispenses are calculated. This adds some color or additive to your regrind.

ROV is for closed loop fully automatic reprocessing of regrind scrap. This parameter will detect when more regrind is being produced than consumed, and override the current setting to use a higher amount. This helps prevent material backing up in your grinder.

RHL has effect only if level sensors are added to your unit to detect material level in the regrind hopper. These level sensors can alter regrind percent usage.

FUL 09000 Full batch weight, determined by weigh bin size.
MAX 13500 Maximum GRAM weight the software will target.

FUL is the target weight that is blended each cycle. Change only for extremely fluffy or very heavy material.

MAX prevents overflowing of the weigh bin. It is reset automatically if the FUL parameter is changed.

TH 01000 The highest and lowest acceptable TARE weights for
TL 00500 blend cycle to start. (full or tenth grams)

TL prevents starting with the weigh bin out of place. No change is required.

TH prevents starting with a full weigh bin. Change TH only if clumps of material hang up in the weigh bin.

PRT 00000 MINUTE interval between automatic print of TOTALS.

This parameter will cause your system to PRINT MATERIAL TOTALS automatically. A printer must be connected.

DLY 00488 Delay before cycle start. (interrupts)

This parameter is the time that the sensor must be uncovered before a cycle will begin.

PRC 00010 Maximum allowable PERCENT rate change per cycle.
This prevents excessive swings in flow rates by the software. Do not change.

STL 00122 Dispense settle TIME before a weight reading is taken.

The time (interrupts) allowed for material to SETTLE in the weigh bin before a weight is taken. Lengthen only to slow the next cycle start, thereby lowering the pile of material in the mix chamber, and, in some cases, improving mixing.

LCL 00080 LOAD CELL limits, low slope, high slope, frequency, zero.
LCH 00120 DO NOT CHANGE except for different weight load cells.
LCF 00079
LCZ 00583

The above 4 parameters relate to the characteristics of the LOAD CELLS on your blender. DO NOT CHANGE THEM.

DS1 00000 Thumbwheel switch override setting.
DS2 00000

The above 2 parameters allow external computer inputs to alter the thumbwheel switch settings. They are used on computer controlled dispense systems, using MLAN software.

XCV 00000 Extrusion control voltage output value
XRC 00001 Rate of change of above value
TCV 00000 Takeoff equipment voltage output value
TRC 00004 Rate of change of above value
XTP 50050 Trip point to force a correction
XAL 00005 Percentage adjustment limit
XUL 00200 Voltage adjustment limit

The above 7 parameters all relate to Extrusion Control Systems.

MPO 00010 For air drive reciprocating mix motor.

MCT 00000 Monitor Cycle Time

Alarms if normal cycle timing exceeds previous cycle time by a specified amount. Used to detect mechanical failures.

COMPONENT PARAMETERS (12 Groups of 13 parameters each)

The first digit is the component number. Component 1 is shown here. There are 11 more just like it.

1TY = OFF DESIGNATES MATERIAL TYPE for this component.

Material types are: REG, NAT, ADD, or OFF=NOT USED.
(0=OFF, 1=REG, 2=NAT, 3=ADD)

These MUST be set using the *14 function before the system will

operate. See: "TURNING ON OUTPUTS" to complete this.

1CS 00000 Thumbwheel assignment or current setting entry.

This parameter reflects the current setting or thumbwheel assignment for this component. No entry is required here.

1AL 00000 Last digit = number of retries before ALARM.
00001 to 00009 = sound alarm, hold process.
00011 to 00019 = sound alarm, continue process.

These parameters set ALARM functions.
When material runs out, or does not dispense fully, these flags instruct the controller what to do. Default settings shown are for Natural, Color, and Additive to alarm, but not Regrind.

1XT 00000 Move decimal left on setting.

These parameters allow entry of less than (00.1) percent for a selected component.
When set to "00010" settings are read as X.XX percent.
When set to "00100" settings are read as .XXX percent.

1SE 01000 Upper SETTING limits for thumbwheels (0xxx.x).
Settings greater than limit are held to limit.
(01000) = 100%

These parameters can SET UPPER LIMITS to the thumbwheels. For color and additive, lower settings may help ensure expensive material is not wasted.

1WT 24000 WT/TI = the rate that will be used for calculating the
1TI 01952 next dispense time.
WT = the Weight portion of the dispense rate, calculated such that WT/TI equals the average of the last two actual dispense rates.
TI = the TIME portion of the dispense rate. (interrupts)
These change AUTOMATICALLY during normal operation.
They are Weight and Time portions of the flow rate calibration.

1MI 00001 Minimum valid dump rate GRAMS/sec. (full or tenth grams)
Error correction is bypassed when dispense rate is lower.

On power up, these are always set to 1. After several consistent cycles, they are reset to 80 percent of actual flow rate. These prevent excessive swings in flow rate calculations if material is running out.

1NC 00001 Allowable GRAM error within which NO correction is made.

This is the acceptable error range for each component to prevent hunting. They adjust automatically over an extended time period to match the flow characteristics of each material.

1PT 00000 Reduce the target of the first try dispense.

1RP 00010 PERCENT shortage error that will force a retry.
1RD 00300 GRAM weight shortage error that will force a retry.

Retries occur until both conditions are met.

1LA 00020 Lag TIME before dispense ACTUALLY starts.
 (mechanical response time, interrupts)

These parameters state the lag time between when a device is signaled and when it actually begins to operate.
Change ONLY if you change to non-standard equipment.

1PO 00000 Pulse rate of "MICRO PULSE" valves.

PARAMETER LIST - FULL EXPLANATIONS

GENERAL PARAMETERS (20 parameters)

FLG (change to enable the RECIPE, BATCH, FAST, and TAG keys)

FLG is a SET of flags for turning on the RECIPE, BATCH, FAST and TAG keys. These four keys will NOT WORK and there associated functions are not available, unless this parameter is set properly.

When all digits are set to 0 (FLG 00000), all four functions are OFF.
The second digit set to 1 (FLG 01000), will turn the TAG key on.
The third digit set to 1 (FLG 00100), will turn the RECIPE key on.
The fourth digit set to 1 (FLG 00010), will turn the FAST key on.
The fifth digit set to 1 (FLG 00001), will turn the BATCH key on.

The TAG key is useful for entering information that you wish to be "tagged" to all printouts and computer retrievals. Work Order and Operator numbers may be entered and displayed. Any computer loaded recipe number may also be displayed.

The RECIPE key is useful for storing thumbwheel switch settings under a single numbered recipe. Up to 50 may be stored. To enable the RECIPE key, place a 1 in the 3rd position of the parameter.

The FAST key allows the unit to operate in a faster, higher output, mode. Output may be doubled in this way. To enable the FAST key, place a 1 in the 4th position of the parameter.

The BATCH key allows you to signal that you have processed a certain amount of material, or for filling a barrel or gaylord to the top without the need for a level sensor to stop the process. To enable the BATCH key, place a 1 or 2 in the 5th (last) position of the parameter.

Set to one (00001), the unit dispenses until the preset batch amount is reached and then stops and alarms. Set to two (00002), the unit alarms but continues running when the preset amount is reached.

See KEYPAD section, for full explanations of these 4 keys.

=====

MIX (change to run the mixer a longer timed period)

MIX indicates the TIME that the mixer will run after the weigh bin dump valve opens. The number is the mix time in seconds. Adequate mixing can be accomplished in a short time. Additional mixing may cause separation and may create a static problem with the material.

The default value is (00015), allowing an initial mix time of 15 seconds. A maximum setting of 29999 is possible, for a mix time of over 8 hours. Setting the mix time to 99 (MIX 00099) will cause the mixer to run 360 seconds (6 minutes).

=====

JOG

JOG indicates the number of times the blade will jog after initial mixing is ended, plus the time interval between these jogs.

After mix TIME is complete, the mix blade is jogged about 1 turn every 1/2 minute. These jogs serve to level the pile of material in the mix chamber, insuring that the sensor does not remain covered for too long. The first 3 digits (030xx) of the parameter indicate how many jogs will occur. The last two digits (xxx30) indicate the frequency (or interval) in seconds.

The default setting of (03030) produces a jog every 1/2 minute for up to 30 jogs. You may lengthen or shorten these numbers as required. A maximum setting of (29999) produces a maximum jog time of over 8 hours.

=====

FCV (Delays opening and closing of the flow control valve)

FCV controls three different items:

- 1) Digit 1 can reverse the output logic of the computer.
- 2) Digits 2 and 3 set the time delay before closing.
- 3) Digits 4 and 5 set the time delay before opening.

The most important and primary use of FCV is to set the TIME, in seconds, that the flow control valve delays before opening (4th and 5th digits (FCV 000xx). If your unit is equipped with a Flow Control Valve, under the mix chamber, it is programmed to open whenever the sensor is covered. It will close again immediately when the sensor is uncovered. This assures that material has time to mix before dropping into a bin below. When a batch is dropped into the mix chamber the sensor is covered. To prevent unmixed material from dropping immediately out the bottom, the mix valve is delayed for a time to allow mixing to occur first. This parameter controls the time that the Mix Chamber Valve remains closed after a batch has been dropped.

The primary function of the valve is to assure mixing. As such it seems best to keep as high a level as possible in the mix chamber. However, if the chamber gets too full (over the blades), mixing is not as good. To allow the chamber to empty to a lower level after the sensor is uncovered, we can also DELAY the CLOSING of the flow control valve. This is done by using the 2nd and 3rd digits (FCV 0xx00) to specify a delay time. (FCV 00206) delays closing by 2 seconds.

If the first digit is set to a 1 (FCV 10006), the signal output to the air solenoid is reversed. Normally, the computer puts out a

voltage to open the valve. With this flag set the computer puts out a voltage to close the valve. For this reverse logic to work correctly, you must reverse the air lines to the flow control valve air cylinder.

Normal power-off position for the valve is closed. Some customers prefer the valve open when all power is off. This option allows this reversed "power off" position. With power on, no difference is apparent.

=====

DTI (probably no need to ever change this)

DTI is the maximum TIME allowed for the weighing bin to dump at the end of the cycle. The software will close the bin earlier if it detects no weight change occurring. This time determines the maximum time that is allowed for the bin to empty. We set this maximum time limit according to the model and batch size.

=====

KDF, WDF (No change required)

KDF and WDF are the maximum acceptable variation in GRAMS between two consecutive weight readings. One weight reading requires 1 second of time. Two readings are always taken and they must be within KDF grams of each other to be accepted as valid. Readings are taken continuously until two consecutive readings meet the criteria. This prevents a single accidental bump of the scale from causing a grossly inaccurate reading. KDF is used for load cell calibration weights, WDF for starting tare weight and component dispense weights.

=====

BER (change only if severe vibration causes problems)

BER is the BAILOUT ERROR weight. Dispenses are controlled by very accurate timing. However, as a precaution, the weigh bin is constantly monitored during each dispense. If bin weight is found to exceed target weight during the dispense, then a BAILOUT occurs. This ends the dispense immediately just as if the end of the dispense time period had been reached. This in no way effects the accuracy of the remainder of the cycle. The dispense is checked and retries will occur if required.

A bailout does not occur unless target weight is exceeded by the weight given in the BAILOUT ERROR parameter. This is primarily to prevent vibration from causing a false bailout during very small dispenses. We set this parameter to a default of 00200 (20 grams or 200 grams). If vibration is causing false bailouts, then you may want to set a higher value in this parameter.

If the BER parameter has a 1 in the last position, (BER 00201), then a printout will occur of all cycle data anytime a bailout occurs for any single component. This is helpful if you want to be aware of occurrences where dispenses significantly exceed target. This will be the same information that you see when the PRINT flag is on (*54). A printer must be connected.

=====

ROC (Allows for adding some ADDITIVE to one of the REGRIND portions)

ROC indicates the PERCENT of one REGRIND that will be treated as natural when ADDITIVE dispenses are calculated. If you feel it is necessary to ADD (or subtract) color or additive to your regrind, this parameter will automatically see that this is accomplished.

The first digit is 0 to add, 1 to subtract.

The second digit is the REGRIND component number you will be making this adjustment for.

The last 3 digits indicate the percent of this Regrind component to add to, or subtract from, the Naturals when computing Additive dispenses.

EXAMPLE: ROC set to (ROC 01020).

The first 0 means add. The 1 is component 1.

The 20 means take 20 % of component 1 (a Regrind) and ADJUST the total of all NATURAL dispenses upward by this amount. Whatever amount of component 1, Regrind, is added, 20 percent of this amount will be added to the Natural amounts before a color calculation is made.

Regrind dispense = 600 grams, Natural portions = 1400 grams.

At 4 percent, if ROC=00000, Color would be 56 grams.

If ROC=01020; increase Natural by 20 % of 600, (120 grams).

Color is now 4 % of 1520 grams (1400+120), or 61 grams.

In some cases, the addition of pre-colored regrind tends to produce overall better coloring because of an initial more uniform dispersion of pigment. In this case you may want to add LESS color to the Natural portions when Regrind is present. Placing a 1 in the first digit of the ROC parameter (ROC 10000), will cause a portion of this Regrind component to be SUBTRACTED from the Natural portions, instead of added.

EXAMPLE: ROC set to (ROC 11020).

The first 1 means subtract. The second 1 selects component 1.

This means take 20 % of component 1, a Regrind, and reduce the NATURAL portions by this amount. Whatever amount of component 1 is added, 20 percent of this amount will be subtracted from the Natural amounts before a color calculation is made.

Component 1 dispense = 600 grams, Natural portions = 1400 grams.

At 4 percent, if ROC=00000, Color would be 56 grams.

If ROC=11020; reduce Naturals by 20 % of 600, (120 grams).

Color is now 4 % of 1280 grams (1400-120), or 51 grams.

=====

ROV

ROV and RHL parameters work together. Their combined purpose is to allow the adjustment of one Regrind component up or down based on input from one or two lever sensors.

LEVEL SENSORS are required for this parameter to work.

Both ROV and RHL must be set for these parameters to have any effect.

NOTE: The component being controlled is ALWAYS automatically assigned to the bottom set of thumbwheel switches.

The first digit of the ROV parameter indicates which component is controlled by the adjustment routine. Only components 1 through 9 may be controlled.

The last digit determines the adjustment rate. Zero in the last position means make the full adjustment immediately. Any value from 1 to 9 indicates the percentage adjustment that will be made each cycle when the level sensor condition changes.

See RHL below for examples.

=====
RHL (LEVEL SENSORS are required for this parameter to work)
(Use only if you have regrind level sensors fitted)

RHL instructs the controller to change the regrind setting of one selected regrind component if optional level sensors in the regrind hopper indicate high or low conditions. The component to be changed is determined by the first digit of the ROV parameter above.

NOTE: The component being controlled is ALWAYS automatically assigned to the bottom set of thumbwheel switches.

If set to all zeros (RHL 00000), then this parameter is ignored. ROV alters the way RHL is interpreted.

If the last digit of ROV = 0, (ROV x0000), then RHL numbers indicate NEW settings that are to be run when regrind level is high or low.

If the last digit of ROV = 1 to 9 (ROV x0001) to (ROV x0009), then RHL indicates upper and lower regrind usage limits only, and regrind usage will be adjusted slowly, to these limits, based on the ROV number. IF ROV equals zero (ROV 10000):

In this (and all) examples, ROV is selecting component 1 as the controlled component. (ROV 10000)

If RHL is set to any value, the first 3 digits of the parameter indicate a new Regrind setting to use when the material level is ABOVE the HIGH level sensor; (sensor is covered). The last 2 digits indicate a new setting to use if material level is BELOW the LOW sensor; (both High and Low sensors are uncovered).

In other words, RHL allows the selection of a percentage that is HIGHER than normal, and a percentage that is LOWER than normal. NORMAL is what you put on the bottom thumbwheel switch.

Sensors are assumed to be covered when NO signal is returned. If a sensor is unplugged from the controller, it is read as "covered".

If you only have ONE SENSOR, it must be used as a HIGH level sensor. The absence of a sensor is read as a covered sensor; so the absence of the high sensor would signal the system to run at the high setting all the time. This would not be acceptable. The absence of the LOW sensor simple prevents the system from ever thinking it is very low. This is acceptable.

With a high level sensor only, the system switches between the NORMAL thumbwheel setting and the HIGH setting indicated by the first 3 digits of the parameter. The last 2 digits have no effect, since a LOW condition is never detected.

Sensors that we supply are wired correctly for this logic. If a "Bindicator" or similar device is used, with a micro-switch dry contact closure signal, then wire to the normally CLOSED contact so that the signal OPENS when regrind covers the bindicator paddle.

The circuit board "pin outs" for each sensor are positive, ground, and signal. If you are wiring using a dry contact closure, only the positive and signal lines are used. When the contact is open, the signal is pulled to ground internally through a resistor.

Example: RHL is set to 90 and 10 percent (RHL 09010).
ROV last digit is set to zero, (ROV 10000).
The "Regrind" thumbwheel switch is set to 25 percent (025).

The Software logic is as follows:

If material level is high, above the high sensor,
the HIGH sensor is COVERED, (returns NO signal);
Regrind runs at the HIGH setting; 90 percent.

If material level is in the middle, between sensors,
the High sensor is NOT covered, (returns a signal),
the LOW sensor IS covered, (returns NO signal),
Regrind runs at the THUMBWHEEL SETTING; 25 percent.

If material level is low, below the low sensor,
BOTH sensors are NOT covered, (both return a signal),
Regrind runs at the LOW setting; 10 percent.

IF ROV equals 1 to 9 (ROV 10001 to ROV 10009):

All the same rules given above apply, except that the thumbwheel switch regrind setting does not jump in one step to a new setting, but, instead, moves slowly to the new setting which acts as a limit. The usage adjustment is made each cycle by the amount specified by the ROV parameter.

Example: RHL is set to 10 and 90 percent (RHL 09010).
ROV last digit is set to 3 (ROV 10003).
The "Regrind" thumbwheel switch is set to 25 percent (025).

The Software logic is as follows:

If material level rises, goes above the high sensor,
the HIGH sensor is COVERED,
Regrind usage will increase 3 percent each cycle up to a high limit of 90 percent.

If material level is in the middle, between sensors,
the HIGH sensor is NOT covered,
the LOW sensor IS covered,
Regrind usage will change 3 percent each cycle, moving back toward the THUMBWHEEL SETTING of 25 percent.

If material level drops below the low sensor,
BOTH sensors are NOT covered,
Regrind usage will decrease 3 percent each cycle down to a low limit of 10 percent.

=====

FUL (Change only for extremely fluffy or heavy material)

FUL is the full batch weight in GRAMS set at the factory to 1000, 2000, 4000, 9000, or 18000 grams, depending on model. The criteria for this number is to not exceed the volume capacity of the weigh bin and to not exceed the load cell capacity. On a 9000 gram system, load cells are rated for 10,000 grams each. Total load capacity is 20,000 grams. The weigh bin, when empty, weighs about 2400 grams, leaving a net capacity of 17,600 grams for weighing material. However, a dispense over 13,000 grams probably would exceed the volume capacity of the bin. We have set the full batch weight to 9000 grams which we considered a conservative full batch weight. Higher batch weights will increase maximum throughput rates.

If your Regrind is very fluffy and you use a lot of it, you may find 9000 grams to be too much volume for the bin. Select a lower total batch weight such as 7000 to ensure that the bin never overflows or fills completely to the dump valve.

DISPENSE STATION CONFIGURATION.

When this controller is used on a dispensing system (Model WSD; not a Autoweigh Blender) where you may wish to frequently change the dispense weight of each batch, this parameter acts as a flag to allow that mode of operation. When FUL is set to 00001, the controller will read the top thumbwheel switches as the full batch weight, in pounds from 00.1 to 99.9, and will target that weight for the batch. When set to 00002 it will read the switch as kilograms (00.1 to 99.9).

See "MAX", next, for more information.

=====

MAX (set automatically if FUL parameter is changed)

MAX is the maximum gram weight which the software will allow as a target for dispensing. The initial Full weight target is set by the FUL parameter. As dispenses progress, an over dispense of one component may cause a new target to be calculated for future dispenses in order to maintain proper requested ratios. A recalculated target is not allowed to exceed the value held in the MAX parameter. If you change the FUL parameter, the MAX parameter will automatically be set to a value 50 percent higher than the FUL setting.

DISPENSE STATION CONFIGURATION.

This controller can be configured to operate as a dispense station (model WSD). This is generally done when exact weights of material or blend are required to place into a process, such as rotational molding. In this configuration, the thumbwheel switches tell the controller how much weight to dispense in pounds (or kilos). The FUL parameter is set to 00001 or 00002 for direct reading of the top thumbwheel switch; or optionally, for recipe reading of the second thumbwheel switch.

When dispense weight you request exceeds the amount specified in the MAX parameter, the unit will automatically make multiple dispenses that will add up to the requested amount.

=====

TH AND TL (change only if material sticks in the weigh bin)

TH and TL are acceptable error limits for TARE WEIGHT. Before a dispense cycle begins, the software checks to see that the weigh bin is in place and that it is not already full of material. To do this it looks at the starting TARE weight.

If Tare weight is below the value of TL, (50 grams), the software assumes that the bin is either missing or hung up on something. In this case the ALARM sounds.

If Tare weight is above the value of TH (100 grams), the software assumes material is in the bin. In this case the ALARM sounds and the weight bin dump flap operates in an attempt to empty the weigh bin.

If you are processing a material that has a tendency to hang up in the corners of the bin, then you may wish to widen the range of acceptable starting tare weight. Since tare weight is always subtracted from dispense weights, these errors do not effect accuracy.

=====

PRT (change to get AUTOMATIC printing of material totals)

PRT, when set to any number other than zero, will cause the processor to output all current material usage totals, at regular time intervals, to the printer port. The number you enter will dictate the time interval in MINUTES. All timing starts from MIDNIGHT. for example, an entry of 00120 will cause totals to print at 2 AM, 4 AM, 6 AM, etc. Printing always waits until a cycle has just ended. A setting of 10000 is a special case. This will cause a printout after every cycle. A printer must be connected. If one is not, the routine will abort and blending will continue.

=====

DLY (consider changing if mixing is a problem)

DLY is the TIME the mix chamber level sensor must be uncovered before a cycle begins. The sensor must be uncovered without interruption for the full specified DELAY time. To prevent false starts from material movement caused by the mix blade, a minimum of 2 seconds (00488) is recommended.

Sometimes throughput is slow enough that each new batch buries the mix blade for a while. When this happens the material on top does not mix well. To reduce this, you can delay the start of a new batch by increasing the DLY parameter. The new batch is delayed and mix chamber level has time to fall before the next batch is added.

=====

PRC (no change required)

PRC is the maximum allowable PERCENT rate change per cycle. If a large dispense error occurs, flow rate corrections do not exceed this percent number. This prevents large swings in timing of dispenses and provides for stable dispense rates under difficult conditions. For example, when dispense quantities are very small (one or two grams),

overfeeding by several grams is a distinct possibility. This type of error represents a very large percentage error to the controller. However, a large correction would not be appropriate but, instead, would cause a "hunting" of dispense time that would result in further large errors. This parameter prevents this.

=====

STL (No change required)

STL is the TIME period allowed to pass after a dispense has occurred, but before a weight reading is taken. This settle time allows falling pellets to reach the bin and also prevents their impact with the bin from adding to the weight reading.

=====

LCL, LCH, LCF and LCZ (DO NOT CHANGE THESE)

These four parameters are set to match the characteristics of the type of load cells used in your system. DO NOT ALTER THEM. LCL and LCH are the acceptable LOW and HIGH limits of load cell output expressed as raw signal counts per gram of weight. LCF is the lowest acceptable FULL scale load cell output expressed as raw signal counts per second. LCZ is the highest acceptable ZERO scale output. LCF and LCZ values are multiplied by 256 before being used by the software.

=====

DS1 + DS2 Function in Dispenser mode only.
Override top and middle thumbwheel switch settings.

When the system is operating as a dispense system, (FUL 00001), the dispense weight is retrieved from the top thumbwheel switch or from the recipe file if the middle thumbwheel is set to a recipe number.

If either DS1 or DS2 is set to any value greater than zero:
substitute DS1 for the TOP switch settings, and
substitute DS2 for the MIDDLE switch settings.

These two parameters allow MLAN to download the dispense weight amount or recipe number. They also allow entry of a "locked in" amount or recipe.

If BOTH DS1 and DS2 are set to 00000, then nothing changes.

Note: The middle thumbwheel switch setting for a recipe will override the top switch setting. When loading a weight into DS1, load 00000 into DS2 to be sure DS1 will control.

=====

SCR Special Customer Request

If a customer has a special software requirement that has no benefit to anyone else, then this request is hidden in the software and activated by the appropriate code number being entered into this parameter. Believe me when I say that these requests are useless to anyone else.

=====

BCR Use only for blenders with BAR CODE reader input.

If you know ONE bar code input is required before a new cycle is initiated, set this parameter to 00001. The blender is then prevented from operating until one single valid input is received. If two inputs are expected, set this parameter to 00002, etc. When set to any value, the blender will not operate until the required number of scanned inputs are received.

=====
XCV + XRC For Extrusion Control Systems only.

XCV, "Extruder speed Control Voltage" is used in conjunction with our extrusion control software. This number can range from 0 to 1000 (XCV 00000) to XCV 01000), and determines the voltage outputed on pin S of the Amphonol connector. Pin R is the neutral or zero reference for this voltage output.

The voltage ranges from 0 to 10 volts. 01000 = 10.00 volts. This parameter can be set manually, however it is intended to be controlled by the extrusion control logic or by MLAN communications in conjunction with our extrusion control software.

Whenever the software control logic makes a change to this voltage, up or down, the controller display will say (RAMPING) during the time the voltage is being adjusted.

XRC, "Extruder speed Rate of Change", determines the ramp up or ramp down rate of the XCV parameter, above. It can range from 0 to 10 (XRC 00000) to (XRC 00010). Default setting is 00004.

When XCV changes, it does so gradually, making small incremental changes every 10 interrupts, or about 24 incremental changes per second. The XRC parameter determines the maximum value of each incremental change. For example, if XRC is set to 1 then the XCV number will increment by 1 count (0.01 volt) every 10 interrupts, for a rate change of 24 counts (0.24 volt) per second, which will produce a full range change from 0 to 10 volts over about 41 seconds.

=====
TCV + TRC For Extrusion Control Systems only.

These parameters control a second 0 to 10 volt voltage output on for controlling downstream equipment Takeoff speed. They operate the same as the XCV and XRC covered above except they move in the opposite direction, higher to reduce weight per foot, lower to increase weight per foot.

=====
XTP For Extrusion Control Systems only.

The LAST THREE digits of the XTP parameter specify the TRIP POINT when software will make an adjustment to the throughput rate number, which will then cause a change in extruder speed. Speed is held steady until there is significant indication that the throughput rate is incorrect. The software analyzes each batch watching for any meaningful deviation from current controlling rate. These last two digits of this parameter specify the accumulated error, indicated as a percent of full batch weight, required to trip a change. For example,

when set to 30 on a 200 series blender, this would indicate a 600 gram total error must accumulate before adjustment, 30 percent of the full batch weight of 2000 grams.

The FIRST TWO digits indicate how many cycles must run without a rate adjustment before the operator is permitted to switch from voltage (manual) control to Throughput (automatic) control. This is a factor during startup only. Larger numbers assure a very accurate rate has been learned. This is preferred if you like the way your extruder is running and do not want any further adjustment unless a real problem is detected. On the other hand, if you know that you want output to be a predetermined value, like 1000 pounds per hour, then switching sooner is better. In this way the operator can enter the rate he desires sooner, and the blender can immediately make any required adjustments required to target in on this rate. Too large a number causes delayed response, too small causes hunting. Larger is safer since you do not want "false" adjustments to occur.

This parameter starts at XTP 50030, 30 percent of full batch weight accumulated error and 5 cycles required without adjustment before your operator can switch to the Throughput mode. A "T" is displayed when the 5 cycle requirement is reached.

=====

XAL Extrusion Control Adjustment Limit

XAL limits the degree of change that the software can make in one adjustment cycle. Default setting is 00005, 5 percent. Operator entered rate changes are not limited.

=====

XUL Extrusion Control - Upper Adjustment Limit

XUL sets an upper limit to how far the software can adjust the extruder speed (control voltage). If this limit is exceeded, then the adjustment is NOT made, and the ALARM is turned on. Pressing the V/T key switches the control to Voltage Mode. When pressed again, the unit returns to Throughput Mode, and a new Limit is set. Further adjustments may now occur to the new limit.

Default is 00200, 2 volts. The idea is that once control is established, adjustments upward of more than 2 volts indicate conditions that should be attended to, a clogged screen pack for example. You may wish to reduce this number so that operators are warned well in advance of such conditions.

=====

CPL Yield Control - extrusion control.

Customers using Yield Control require a pulse generator, or shaft encoder, mounted on downstream takeoff equipment to signal the line speed to the blender. In operation the software displays GRAMS per unit length, which may be per foot, per yard, per meter, or whatever. For whichever unit length you select, enter the pulses per unit length in this parameter. In America, a typical shaft encoder delivers 600 or 1200 pulses per foot. Set the parameter to 600 or 1200. Everywhere else you are most likely concerned with meters. The proper setting for this parameter is the number of pulses per METER that the encoder

generates.

=====

MPO for Micro Blender air driven reciprocating mixer.

MPO sets the timing, in tenths of seconds the clockwise and counterclockwise timing of the mix blade. MPO 00010 is 1 second for each direction.

=====

LIQ For LIQUID COLOR applications using dual pumps / drums.

Liquid Color users generally want the current container of color to run completely out before switching to a new container. Switching early requires the transfer of the unused portion to the next container. This feature allows a standby container to be in place and ready, and instructs the blender to switch to the backup container as soon as the first container runs out, as detected by the lack of weight after a dispense. The default setting is LIQ 01011, which directs that component 10 is the normal output, and 11 is the component to switch to. Outputs 10 and 11 must first be prewired to an outlet that is added to the side plate of the controller. Two additional air solenoids are also added to drive liquid pumps that require air for operation.

When conventional pumps are used, two pumps must be present, each connected to a drum of color. Both would have to be plugged into the two outlets on the duplex receptacle on the front of the controller. The parameter would be set to LIQ 00506, which is to say that the "additive" outlet (output 6) is designated as the back up output for COLOR (which is output 5).

Other arrangements are possible, but require some wiring.

=====

MCT Monitor Cycle Time

This parameter acts as the ultimate fail safe precaution. When used, it monitors sequential cycle times, and alarms if a cycle time exceeds the previous cycle time by an amount that is not consistent with proper operation. This provides a means to detect mechanical failures such as a sticking valve or weigh bin gate.

When set to 00000, this parameter is not active.
When set to MCT 02060, an alarm will occur when either a cycle time is double (02xxx) the previous time, or exceeds it by 60 (xx060) seconds.

At power-on this alarm is always set off and disabled. Once smooth running is established, the alarm is enabled. Smooth operation is established using the same logic that Extrusion Control uses.

If the alarm is activated, the display will say (TIME OUT).

Press the alarm silence button to reset the alarm. A new cycle will also reset the alarm.

If another alarm is currently active (material not dispensing for example) then this Monitor alarm is ignored or reset.

=====

COMPONENT PARAMETERS (12 Groups of 13 parameters each)

_TY (Designates material type for this component)

_TY is the number that designates if this Component is used and what material TYPE it is.

Material TYPES are REGRIND, NATURAL, ADDITIVE, or NOT USED.

This parameter is stored as a 5 digit number but displayed as a three letter word:

OFF = Component NOT USED,
REG = REGRIND,
NAT = NATURAL,
ADD = ADDITIVE.

Use the "*" key to toggle through these four selections.

(All other parameters require input of a 5 digit number.)

The AUTOWEIGH BLENDER handles each DIFFERENTLY in the MATH routines.

REGRIND (PERCENT OF MIX)

Those components that you designate REGRIND will be added as a PERCENT of the ENTIRE MIX of material.

NATURAL (RATIO TO EACH OTHER)

Those components that you designate NATURAL will be added in the proportion that you specify them to each other. Their actual percentage of the mix will depend on how much Regrind is specified and how much Additive is specified.

ADDITIVE (PERCENT OF ALL NATURALS)

Each component designated ADDITIVE will be added as a percentage of all the NATURALS added together.

If you think of your mix as a RATIO OF WEIGHTS, for example, components 1, 2, 3, 4, and 5 are to be mixed at 100, 50, 5, 20 and 7 pounds respectively, then you may wish to specify ALL components as NATURALS. In this way weights may be entered just as listed. They need not add up to any particular number. Components will be dispensed to maintain the proper specified RATIO to each other component.

If you wish to think of ALL components as PERCENTAGES of THE MIX, percents that always add up to 100, then you can specify ALL components as REGRIND and enter the exact percent for each. If ALL components are specified as REGRIND, then all settings must add up to 100. If the total exceeds 100, an error message will appear.

However, we recommend that you specify materials this way:

REGRIND; all the materials that DO NOT require the addition of the ADDITIVES. Usually this is your Regrind scrap.

NATURAL; all the materials that are the bulk of the mix. These will be

RATIOED to each other and will constitute the ENTIRE mix except for space needed for Regrind and Additives.

ADDITIVE; all the materials that are added to the NATURALS only; color, stabilizer, slip agent, etc.

=====

_CS (Set AUTOMATICALLY when you enter settings)

_CS parameter stores the current setting that has been entered through the KEYPAD, "SET" function, for this component. You could change it here, but the SET routine is the proper way to alter this number.

This parameter can also be set to ASSIGN this component to one of the three THUMBWHEEL switches. This also is normally done in the SET routine by using the SET key followed by a letter key (A,B, or C).

When set to 10000, 20000, or 30000 the component will follow the TOP, MIDDLE, or BOTTOM thumbwheel switches respectively. The SET routine is the proper way to assign thumbwheels.

In the special case when there are four components, and two or more are naturals, then one NATURAL can have its setting calculated automatically, based on the other natural settings, so that all natural settings total 1000. This is done by setting the CS parameter to 40000. This allows four components to be controlled by only three thumbwheel switches, three assigned, and the fourth calculated automatically by default.

If this is a four (or less) component system, then you are using this software because your components are not NATURAL, REGRIND, COLOR and ADDITIVE. Our standard "FOUR" software handles that combination in a simpler, more straightforward way. See KEYPAD, STAR FUNCTIONS, *04 for a rapid way to set up your system for 4 or less components.

=====

_AL (Sets alarm functions)

_AL Alarm FLAGS. When material runs out, or for some other reason material does not dispense fully, these flags will instruct the controller what to do.

00000 = no alarm, no pause in process, no retries. This is sometimes useful for a Regrind dispense.

00001 to 00009 = sound alarm after specified number of retries and continue retries until successful. The process will not continue until the fault condition is corrected. The last digit determines the number of retries before sounding the alarm. This is appropriate for all important and necessary components.

00011 to 00019 = sound alarm after specified number of retries but then stop the retries and continue with the remainder of the cycle. The alarm will continue until the fault condition is corrected or until the next cycle begins. The last digit determines the number of retries before sounding the alarm. This would be appropriate if you wish to make several attempts at a dispense,

such as regrind, but you wish the process to continue even without the component.

00021 to 00029 = same as 1 to 9, Stop Process, Sound Alarm, but NO more retries. Just sound alarm and wait. Press the RESET button to clear alarm and start the retries again. Appropriate ONLY if you absolutely want operator intervention to occur when material runs low. In other words you do not want any automatic loading or other correction to allow the process to continue.

The first three digits of this parameter (_AL xxx00) may be used to STOP and ALARM the blender if an over dispense occurs by the number of grams specified. For example, CAL 02004 will cause the system to STOP and ALARM if the COLOR dispense is 20 grams over target. (C - OVER) will be displayed. Use PAUSE (or POWER OFF) to reset the Alarm condition. If a printer is connected, a standard cycle printout will occur.

=====

_XT (Allows a setting entry of less than 00.1)

_XT, is a number that will alter the value of the setting that you enter. The value of the XT parameter, is divided into the setting, thereby reducing the setting's value. The only valid entries are 10 and 100. When set to "00010" the decimal point is moved to the left one place and the setting is read as X.XX percent. When set to "00100" the decimal point is moved to the left two places and the setting is read as .XXX percent. This allows closer control where a requested dispense is less than 1 percent. When set to "00000", this parameter has no effect.

=====

_SE (Use to lock out high settings or limit access)

_SE is the upper SETTING limits for this component. This allows a reasonable cap to be set for each component so that an operator cannot accidentally set the controls to an excessively high setting. For additives, these limits will ensure that expensive material is not wasted. Settings that are greater than the limit are held to the limit.

EXAMPLE: If the highest color usage in your plant is 6%, then you can enter this upper limit in the parameter table. Since settings are stored as 1/10's of percent (##.#), the parameter would be:

_SE 00060

Any setting above 060 is held to 6 percent.

When a 1 is entered as the first digit of this parameter, (_SE lxxxx), setting entries can only be made from the program mode. In this way access is limited to only those who know the password.

=====

_WT and _TI (Set AUTOMATICALLY by the CALIBRATE routine)

_WT, and _TI parameters are related to the flow rate or dispense rate of each material. These can be changed manually, set by the RATE

CALIBRATION routine, or simply allowed to adjust automatically as necessary after each cycle.

_WT and _TI are WEIGHT and TIME numbers that, taken together, indicate a dispense rate for the specified material (WT/TI). This rate is used to calculate an exact time period to dispense the required quantity of material. Both of these numbers are adjusted by the computer logic after each cycle as a means of continuously calibrating the dispense times.

Since rate correction takes place continuously and the battery-backed RAM maintains the correct rate even when power has been turned off, these numbers will only be in error during the first several cycles after a flow rate has been considerably altered.

Should there be a change in auger size, drive motor RPM, or some other change that substantially alters the feed rate of one of the components, the _WT and _TI parameters can be adjusted using the RATE CALIBRATION routine to ensure that the feeders dispense properly right from the beginning without waiting for adjustments to occur.

These numbers are always kept at higher values. The computer will bump both numbers up in value by doubling them both until at least one number exceeds 16,000. The ratio (rate) is still the same but error correction routines work better with higher numbers.

=====

_MI (Set AUTOMATICALLY by the CALIBRATE routine and also reset 10 cycles after every power up)

_MI numbers are set to 80 percent of the amount of material, in grams, that can feed in one second based on normal valid dispense rates. A valid rate is considered the normal dispense rate that occurs under normal conditions with equipment functioning properly. When a rate lower than 80 percent of this actually occurs, it is assumed that an equipment malfunction or loss of material has occurred. Under these circumstances, normal rate correction routines are bypassed.

EXAMPLE: For a 1/2" auger feeder with a 60 RPM motor drive, the normal metering rate is about one gram per revolution or 1 gram per second. Since the _MI number is expressed as tenths of grams, 80 % of this is expressed as:

(_MI 00008)

It is safe to use a _MI number that is too low but NOT safe to use a number too high. Error correction routines will not work when this number is too high.

Power-up always resets _MI to 00001. After 10 cycles have occurred without retries, software will enter a corrected number. An exception to this is when the _AL (Alarm) parameter is set to 0, the MI parameter is left unchanged. RATE CALIBRATION also sets the _MI parameter.

=====

_NC (Changes itself automatically over time)

_NC is the allowable GRAM error within which NO flow rate

corrections are made by the software. Gram weight errors that are equal to, or less than, this number will be accepted and no error corrections will take place. Since no equipment is perfect, we must accept that a certain range of error is normal. To make corrections within this range only adds an additional error due to hunting, and broadens the error range. This parameter is adjusted automatically by the software according to the actual conditions of the metering.

This number has been set based on our experience with the dispense devices. If, over time, the computer finds that the number is too large or too small, it will automatically adjust it to match the actual conditions that exist with your equipment. These adjustments occur in increments of 1 or 1/10 gram and occur only once every 20 cycles. A change is made only if needed. Checking this number from time to time will indicate the normal error range that is occurring with each dispense device on your unit.

If you manually set this number to a very high value, you will effectively eliminate all error correction attempts for the component. Gradually, over several months, the software will adjust this number back down. If you wish to defeat a component's error correction routines permanently, you may set NC to (_NC 29999). The software recognizes this number as special and will not change it. This high setting eliminates error correction attempts for this component. The component is still weighed, and retries still occur if short, but the timing of each dispense is based only on previously learned rates and never adjusted from new experience. A very small dispense in a high vibration environment may actually be more consistently accurate if no adjusting occurs.

=====

_PT (for augers and micro pulse devices only)

The _PT parameters will cause the first try dispense to be a percentage of the full target weight. For example, with component 4 set to (4PT 00090), the first try will be 90 percent of the full target amount. Retries then occur, but each will target only 50 percent of the remaining requirement. A series of progressively shorter retries should be expected, until the retry parameters are satisfied (RP and RD). The _PT parameter is most effective for slow dispense devices, like augers. When setting _PT, also set the _RP parameter to 00001. This forces retries up to within 1 percent of target, instead of 10, improving accuracy.

=====

_RP and _RD (No change required)
(_RD is set AUTOMATICALLY by the CALIBRATE routine)

These two parameters determine the dispense shortage error that is be acceptable for each component.

_RP is the shortage expressed as a PERCENT of the target dispense weight and _RD is the shortage expressed in GRAMS. These parameters are used together, either one will force a "retry".

A "retry" is an additional dispense that is calculated to add the amount of material that is short. This comes into play only when the amount dispensed is less than expected.

Retries will occur until the difference between the required amount and the metered amount is equal to or less than the `_RP` percent difference AND the `_RD` weight difference.

These numbers dictate just how close to perfect the dispense has to be before going on. If the dispense overshoots the target, then the process continues. These parameters only control the degree of weight SHORTAGE that is acceptable.

The `_RP` parameter is important when SMALL DISPENSE requests for color or additive are made. Large PERCENT errors are more likely to occur when very small dispenses are requested.

The `_RD` parameter is important when LARGE DISPENSE requests for color or additive are made. Large GRAM weight errors are more likely to occur when very large dispense percentages are being requested.

Depending on the accuracy of the metering device, a certain amount of hunting is to be expected from one dispense to the next. Allowing the software to stop trying when it gets sufficiently close to the target results in more perfect average dispenses. The mix chamber and the barrel of your process machine average out the small errors that occur from cycle to cycle. If no shortage is ever to be allowed then these parameters can be set to prevent any shortage from occurring. This will, however, cause an overall error on the plus side.

NOTE: Remember that EITHER ONE of the two parameters listed here will cause retries to occur. BOTH parameter conditions must be met before the process will continue, with one exception: If the ALARM parameter (`_AL`) is set to 00000, indicated that you do not want the process to stop, then these two RE TRY parameters will have no effect. The first dispense will always be accepted and no retries will be made.

`_LA` (change if you change metering device)

`_LA` is the lag TIME before dumping actually starts. This lagtime is the time it takes for the dispense system to mechanically respond to the controller's signal to start. Lag time is automatically added to all dispense times.

Changing the means by which a device is operated such as using a different diameter air cylinder, or a different drive system for an auger feeder may require a change in this parameter.

These parameters represent the number of interrupts (time) that pass before the feeder or dispense system actually begins to dispense. There are 244 interrupts per second. To determine these times, use the TIME dispense function in the Manual mode (KEYPAD instructions).

Following the instructions given in the KEYPAD portion of the manual (TIME key), start with a dispense time of 1 (001). Try successively higher time numbers until some movement is noted in the mechanical device and a minimum amount of material IS dispensed on each try. This is the MINIMUM lag time number; the lowest number that DOES

cause some movement and DOES result in a minimum dispense. Add 5 to this time period and enter as the lag time. Lag times that are too short can cause problems. That is why the MINIMUM lag time determined above should be increased by 5 as a safety factor.

These numbers are preset at the factory for the equipment we have supplied. When a dispense of only a few grams is required, the `_LA` number is very important. Too small a lag time will result in no dispense at all because of inadequate time for the device to operate. Too large a number may result in over dispenses when very small amounts are called for. Since too small a number may stall the process, always add 5 to the minimum as a safety.

Typical LAG TIMES are: (minimum time plus five)

12 - for an AC motor being powered through a relay.

20 - for a 1" air cylinder sliding a dispense valve.

127 - for a automatic speed controller.

=====

`_PO` (for Micro Pulse devices only)

`_PO` sets the ON and OFF time of the specified device during the time period that the device is operated. This results in a "pulsed" output. This is used in combination with a "micro pulse" equipped slide gate. Set to 00000 for normal operation. Set to 00101 for pulsed operation. The first three digits (001xx) controls ON time in tenths of seconds. The last two digits (xxx01) controls OFF time. Larger numbers produce slower dispense rates without any increase in accuracy. Smaller numbers may not allow enough time for the slide to shift fully.

Pulsed Output may also assist in dispensing regrind and some powders when these materials tend to bridge. A parameter of 00501 will produce a 1/2 second open time (5/10 seconds), a long enough time to allow a significant dispense, followed by a 1/10 second close time, just enough to close the gate fully. The rapid gate movement may help in keeping material flowing.

=====

For the KEYSTROKE SEQUENCE to change PARAMETERS, see the last page of the PARAMETER section.

PARAMETER DEFAULT SETTINGS - TWELVE SOFTWARE

Here is a complete list of the "default" entries for all parameters as they are provided in the original program, and as they will appear after a CLEAR ALL or a model change.

The Model 200 list is the ORIGINAL BASE list.

Models 100, GBM, and 900 show only the changes from the 200 list.

Models 1800 and 400 show only further changes from the 900 list.

Component 1 is the base list for all components.

Other component lists show only the changes from list 1.

General list:

Base 3K				Base 10K		
Model:	220/240	140	GBM	940	1840	420/440
FLG	0					
MIX	15			30	99	15
JOG	3030					
FCV	06					
DTI	06	06	04	04	08	10
KDF	10			02	04	02
WDF	10			02	04	02
BER	1000			200		
ROC	0					
ROV	0					
RHL	0					
FUL	20000	10000	4000	9000	18000	4000
MAX	30000	15000	6000	13500	27000	6000
TH	1000			1000	1000	200
TL	500			500	500	100
PRT	0					
DLY	488					
PRC	10					
STL	122					
LCL	27			80	40	80
LCH	39			120	60	120
LCF	79					
LCZ	583					
DS1	0					
DS2	0					
XCV	0					
XRC	1					
TCV	0					
TRC	4					
XTP	5050					
XAL	00005					
XUL	00200					
CPL	0					
MPO	00122	00183				
SCR	0					
BCR	0					
LIQ	0					
MCT	0					

Component lists:

Base 3K			Base 10K		
Model:220/240	140	GBM	940	1840	420/440
(1 and 2)		(vv)	(2"x3" or 3"x6" valves)		
1TY	=	OFF			
1CS		0			
1AL		04			
1XT		0			
1SE		1000			
1WT	26000	18000	22400	24000	20800
1TI	976	976	15616	1952	7808
1MI		01			
1NC		10		01	
1PT		0			
1RP		10			
1RD	500			300	100
1LA		20			
1PO		0			
(3 and 4, and 7 and 8)		(vv)	(3"rd, 2"x3", or 1.5"x2" valves)		
3TY					
3CS					
3AL					
3XT					
3SE					
3WT	26000	128	22400	20800	
3TI	976	31232	15616	7808	
3MI		01			
3NC		10		01	
3PT					
3RP					
3RD	500		50	300	100
3LA		20	04		
3PO		0			
(5 and 6, and 9, A, B, and C)			(always 1" feeders)		
5TY					
5CS					
5AL					
5XT					
5SE					
5WT	20480			2048	
5TI	31232				
5MI					
5NC		10		01	
5PT					
5RP					
5RD	50			300	100
5LA		15			
5PO		0			

CHANGING PARAMETERS

To change a PARAMETER, the sequence of keystrokes is as follows:

```
+-----+
| Press:  *           Display will say:  (PASSWORD) |
| Press:  22222       Display will say:  (P   x.x)  |
| Press:  PARA        Display will say:  (FLGxxxxxx) |
| Press:  PARA        Press again to walk FORWARD through list. |
| Press:  *           to BACK UP in the list.      |
+-----+
```

When the PARAMETER you want is displayed, enter a new setting using the number keys. You must enter 5 digits. Use leading zeros.

```
Press:  EXIT           Display will say:  (P   x.x)
```

Additional information can be found in the KEYPAD section.

SAVING PARAMETERS in EEPROM

If the changes you have made are PERMANENT, SAVE them in EEPROM.

Sometimes during normal operation, electrical noise or RF (Radio Frequency) noise will corrupt the processor memory. It may be necessary to do a CLEAR to fix this problem.

A "CLEAR" will clear all data from memory and replace it with information stored in the EEPROM.

So it is a good idea to have an exact copy of RAM stored in the EEPROM for just such an emergency.

To copy ALL PARAMETERS into the EEPROM, the sequence of keystrokes is as follows:

```
+-----+
| Be in PROGRAM mode, first 2 steps above:          |
|           Display will say:  (P   x.x)           |
| Press:  *           Display will say:  (INSTR --) |
| Press:  23          Display will say:  (SAVING  ) |
| Wait:   when done, Display will say:  (P   x.x) |
|           |                                     |
| Press:  EXIT        Display will say:  (   x.x) |
+-----+
```

With this done, all correct Parameters may be restored from EEPROM to RAM at any time by doing a CLEAR.

To do a CLEAR, hold the "CE" key down when turning on power.

+-----+
 | PART III - PRINTED OUTPUTS |
 +-----+

MONITORING SYSTEM ACCURACY

*54 - CYCLE PRINTOUT INFORMATION

The best way to monitor system accuracy is to connect a printer to the printer port and turn the printer flag ON (KEYPAD section, *54). The printer will then automatically print full output information after every cycle.

When the printer flag is ON, the controller will output a single heading line at the top of each page and 4 information lines to the printer at the end of each cycle. This adds several seconds to each cycle time. To turn the printer flag on:

```

Press:  *           Display will say:  (PASSWORD)
Press:  22222       Display will say:  (P      x)
Press:  *54        Display will say:  (PRNT OFF)
Press:  *           Display will say:  (PRNT ON)
Press:  EXIT       Display will say:  (P      x)
Press:  EXIT       Display will say:  (      x)
  
```

Any common parallel printer that you would use with a small PC computer may be used. Connect using a standard parallel printer connecting cable, (34 pin parallel Centronix connector to a DB25 IBM compatible connector), available from us or at any computer store.

INTERPRETING the *54 CYCLE PRINTOUT

10 or 20 cycles of data can tell a lot about the performance of your blender. The following will help you interpret the data.

A single cycle printout looks like this:
 (dashes ---- added for clarity of spacing)

```

-----
**1 R 20.0**  **2 N 100**  **3 A 04.0**  **4 A 00.0**  TOTAL
* 11/10/97 *  * 16:17:53 *  RECIPE 0000  **ID# 051**  **WO 000000*  OPR000
FINAL: DISP,%    0.0    .0 1908.3          77.6 4.06    0.0 .00 2000.1
RATE: GR/TIME  18224   976 19993    488 12973 31232  10240 31232    9.9
1ST DISP,TIME   0.0    00 1908.3   469   77.6 1826    0.0   00    22
  
```

DEFINITION OF EACH LINE

The TOP-OF-PAGE heading:

```

-----
**1 R 20.0**  **2 N 100**  **3 A 04.0**  **4 A 00.0**  TOTAL
  
```

Prints as a heading to each page, or once every 10 cycles. This serves as a heading over four columns of material. Additional lines will

print for additional components as necessary, printing only those components turned on. Thumbwheel setting and material type is shown for each. If a thumbwheel setting is changed, a new header line will print.

In this example, component 1 is a REGRIND; component 2, a NATURAL; 3 and 4 are set up as ADDITIVES.

The CYCLE heading:

```

-----
* 11/10/97 * * 16:17:53 * RECIPE 0000 **ID# 051** **WO 000000* OPR000

```

DATE and TIME this blend cycle was completed. RECIPE, ID, Work Order, and Operator numbers have no bearing on blender operation but aid in identifying this particular blender, and what job was running.

DATA line 1:

```

-----
FINAL: DISP,%      0.0  .0  1908.3      77.6  4.06  0.0      .00  2000.1

```

For each material, each column shows the final dispensed weight of that material and its percentage of the blend.

In this example Natural dispensed 1908.3 grams. Color dispense is 77.6 grams, 4.06 percent of the natural dispense, slightly over the 4 percent requested.

The final number, 2000.1 is the total weight of the blend. It equals the sum of the component dispenses.

DATA line 2:

```

-----
RATE: GR/TIME  18224  976  19993  488  12973  31232  10240  31232  9.9

```

These numbers show the RATE of dispense for each material. These are the numbers that the software used to calculate how long to open the slide gate or run an auger, in order to dispense the required amount. This is GRAMS per Interrupts; 1822.4 grams dispensed in 976 interrupts, which is 4 seconds.

The final number, 9.9 grams, is the TEAR WEIGHT of the weigh bin displayed just before the cycle began.

DATA line 3:

```

-----
1ST DISP,TIME  0.0  00  1908.3  469  77.6  1826  0.0  00  22

```

This shows the first dispense in grams for each material and the timing of that dispense (in interrupts).

If the first dispense weight, (data line 3), matches the final dispense, (data line 1), then no "retries" occurred. In other words, the first try was accepted by the software. If they do not match, then the first try was short and one or more retries occurred. The second number is the dispense time that the software calculated to be a correct first try for the dispense.

The last number (22) is the CYCLE count, a convenient way to keep pages of data in order, like page numbers.

Optional "BAILOUT" line:

232

A 4th data line (not shown in the beginning example) will print if any single dispense goes past its target weight by a certain value, this value set by the BER parameter, normally 200 grams. The example line shown here would indicate component 3 overshoot the target weight after dispensing for only 232 interrupts.

Bailouts are designed to prevent overflows of material when initial software settings, at start up, are entirely inappropriate for the metering device. A larger than normal error correction will occur after a bailout.

Bailouts errors at any time other than startup, usually indicate either very poor flowing material, or excessive vibration. When a bailout occurs the dispense stops immediately for a weight reading. Using this information, the cycle then continues normally.

WHAT TO CHECK FOR.

TOTAL BATCH WEIGHT: (DATA line 1)

Check the TOTAL batch weight, (DATA line 3), to confirm the blender model. 2000 grams indicates 200 series model. 400, 1000, and 2000 gram totals indicate models that use 3 K load cells, which means output information is in 1/10's of grams. 4000, 9000, and 18000 gram totals indicate larger blenders that report information in full grams. Since some numbers in the printout do not include the decimal point, you will want to know if you are reading full grams or tenths of grams.

TARE WEIGHT. (DATA line 2)

In DATA line 2, tare weights should be consistently within a few grams of each other from cycle to cycle. Large variations in the tare weight numbers may indicate excessive vibration, some mechanical interference with the weigh bin, or a faulty circuit board. Tare weights above or below zero are not a problem as long as they are consistently similar from cycle to cycle. When problems are present, tare numbers may vary by up to 50 grams. Variations of 2 or 3 grams are not a problem.

RETRIES: (DATA line 3 and 1, FIRST and FINAL dispense)

When FIRST time dispense, (DATA line 3), does not equal FINAL dispense, (DATA line 1), one or more retries have occurred. Retries are evidence of a problem that will also cause percentage errors.

Retries may indicate possible problems; perhaps the hopper ran out of material, or the flow rate is so erratic that the first dispense was short for no good reason. Parameters `_RT` and `_RP` determine what shortage error is necessary to force a retry.

FLOW RATE NUMBERS: (DATA line 2)

Check the RATE numbers, (DATA line 2), to determine each dispense device.

In the example above:

In the component 1 column, 18224 and 976 translates to 1822.4 grams in 4 seconds (244 interrupts = 1 sec). This is 455.6 grams per second, typical for a regrind flowing through 3" round or 2"x3" dispense valves.

In the component 2 column, 19993 and 488 indicate 1999.3 grams in 2 seconds, or 999.6 grams per second flow rate. This is a heavy natural material, not polyethylene. Perhaps lexan or a glass filled material.

In the component 3 column, 12973 and 31232 indicate 1297.3 grams per 31232 interrupts, or 128 seconds, for a flow rate of 9.99 grams per second. This is a 1 inch auger feeder, from which we would typically expect about 8 grams per second. More recent auger feeders use faster motors delivering about 16 grams per second.

In the component 4 column, 10240 and 31232 indicate a flow rate of 8 grams per second EXACTLY. Since it is exact, and since these two numbers are, in fact, the "default" settings from when the blender was first installed, we know that "component 4" has never been run on this blender, or at least not since the last "CLEAR ALL" was performed.

DATA line 3 dispense weight of 0.0 for component 4, and the TOP-OF-PAGE heading showing component 4 set to 00.0 percent also confirm that component 4 is not being run.

The following information will help you determine what devices are in place on a blender.

Device:	Approximate grams per second:
1/2 inch augers, micro pulse valves	1/2 to 2
1 inch augers, 60 RPM motors	6 to 10
1 inch augers, 120 RPM motors	12 to 20
100 series valves dispense	250 to 450
3" round and 2x3 inch valves	500 to 900
900 and 1800 series large 3x6 valves	3000 to 5000
3" round and 2x3 valves with flow restrictors	50 to 100

Regrinds are always lower than naturals. Bulk density will also cause wide variations in flow rates.

ERROR CORRECTIONS: RATE NUMBERS. (DATA line 2)

The RATE numbers are used by the software, each cycle, to calculate material dispense times. They are adjusted every cycle until flow rates stabilize. When a significant error is detected, the software adjusts the RATE numbers.

The GRAM number is adjusted first. The TIME number (interrupts) is changed only if the GRAM number goes below 16,000 or above 32,000 (approximately). In this event both GRAM and TIME numbers are doubled or halved to bring the GRAM number back to between 16,000 and 32,000.

This serves to keep all numbers as large as possible allowing for the most accurate math, but not so large as to overflow the registers.

Only the GRAM number changes from cycle to cycle, except under the conditions noted above.

Check the GRAM number for a series of consecutive cycles. If it remains unchanged, then the dispenses are accurate enough to not trigger error corrections. Another possibility is that the parameters (MI and NC) that determine when error corrections occur are somehow out of range preventing corrections that should be occurring.

The PRC parameter limits adjustments to 10 percent. Do not expect any single GRAM number change larger than 10 percent.

A gradual decrease in the GRAM number indicates a slowing rate, a hopper that is becoming empty for example. A jump in rate (increased GRAM number) occurs when the hopper is refilled.

If Errors are occurring, but the GRAM number is NOT adjusting, check the NC parameter and the MI parameter. These control whether or not error corrections occur. Both are set and adjusted automatically by the software. MI is set after each start up, after 10 cycles have run without retries. MI will be set to indicate 50 percent of normal dispense rate expressed as grams per second.

NC adjusts slowly over extended periods of running. NC indicates, in grams, the upper limit of the error in 60 percent of the dispenses. A high number usually indicates poor flowing material. Vibration or drifting load cells are other possibilities.

DISPENSE TIMING: (DATA line 3)

The second number is the number of interrupts calculated to dispense the material. If these times are consistent but the weight of the first dispense varies, then the material does not flow well, or consistently. Another possibility is excessive vibration or interference with the weigh bin.

Excess vibration, particularly on small dispenses, may cause incorrect weight readings even though the weight dispensed was, in fact, correct.

If the timing number is very small, 10, 20, 30 interrupts, perhaps this is asking too much from a slide valve. Very short times mean you want

small amounts, but are using a high rate dispense valve to do the job. An auger, a vertical valve, a horizontal valve with a flow restrictor, or a smaller valve would help to improve accuracy and control.

If the timing number is below 5, you are operating in a range where it is difficult for the blender to perform well.

The LAG time parameter adds time to every dispense. This is to compensate for the time at the beginning of a dispense when the solenoid valve shifts and air pressure builds, before the valve starts to move. LAG times are always set slightly longer than the necessary minimum. If a calculated dispense time is very short, the Lag time that is added, while small, may interfere with accuracy, and cause an over dispense.

PERCENTAGE ERRORS: (DATA line 1)

When looking at errors of percentage of color or additive dispensed, look further.

1. First, look for indications of "retries". Retries are evidence of a problem that will also cause percentage errors.

When FIRST time dispense, (DATA line 3), does not equal FINAL dispense, (DATA line 1), one or more retries have occurred. This means the hopper ran out of material, or the flow rate is so erratic that the first dispense was short for no good reason. Parameters `_RT` and `_RP` determine what shortage error is necessary to force a retry.

Inconsistent loading resulting in large variations in hopper material level can cause retries.

Excessive vibration can also cause bad weight readings, which can cause unwarranted retries. If the BAILOUT line is printing occasionally, then vibration is most likely causing this. Increasing the BAILOUT parameter should fix this.

A LAG time set too high may cause retries to overshoot their mark resulting in over dispensing.

2. Second, look at ACTUAL weight dispensed (DATA line 1).

Color, for example, is a percentage of the natural. In the example above, Natural is 1908.3 grams, so color, at 4 percent of Natural, is targeted to be 76.3 grams. In fact, 77.6 was dispensed. The error is 1.3 grams, well within the expected accuracy of a 1 inch auger feeder.

The actual GRAM error of a dispense is more meaningful than the percentage error. Mechanical devices are not perfect. The most we can expect from them is to operate within a reasonable range of accuracy. This range is better defined by an error expressed in grams, rather than percentage.

3. Third, look at the dispense TIME (DATA line 3).

Very short times (10, 20, 30 interrupts) indicate dispense devices not well matched to the task. Accuracy on a percentage basis, cycle to cycle, will suffer. This may very well be acceptable as long as overall usage percentages are still accurate.

BAILOUT: (line 4)

If bailouts occur, vibration is usually the cause and these bailouts may be causing other problems. Raise the value of the BAL parameter to 200 or 300 grams to reduce or eliminate unnecessary bailouts.

Vibration may also cause throughput rates to suffer due to the added time requiring to obtain acceptable weight readings. Increase the WDF parameter to 2 or 3 grams, (WDF 00003) or (WDF 00030), or more if necessary.

SPECIAL TESTS Using the *54 flag

If you are running these special tests in the MANUAL or PROGRAM mode, a printout will automatically occur after each test provided the PRINT flag (*54) is turned on.

Special tests that produce printouts are TIME or CALIBRATE.

TIME (See KEYPAD, TIME; and PARAMETERS, _LA, for more information)

The TIME function is to determine lag times of different metering devices. It also allows testing of device repeatability. The single line printout looks like this:

```
TIME      COMP   1   123   2749
```

key: ^component number
 ^dispense time (in interrupts; 244 = 1 sec.)
 ^weight dispensed

CALIBRATE (See KEYPAD, CALIBRATE for more information)

The CALIBRATE function allows the controller to rapidly learn the flow rate of the device. It automatically sets the WEIGHT and TIME parameters that determine metering rate, and the MINIMUM RATE parameter. For more information see PARAMETERS, _RA, _TI, and _MI. The single line printout looks like this:

```
CALIBRATE COMP   1  732   8795   15   3465
```

key: ^component number
 ^dispense time
 ^weight dispensed
 ^lag time used
 ^min rate

MATERIAL USAGE INFORMATION

Pressing the VIEW key followed by the * key will cause all material usage totals to be printed. The (*54) flag need not be on. These totals are since the last time printed, and since the last time cleared.

This same information may be periodically, and automatically, printed by setting the PRT parameter to a time interval number. (See PARAMETER, PRT)

The printout looks like this:

	DATE	TIME		
CURRENT	6/20/91	13:40:14		
LAST PRINTED	6/20/91	13:35:11		
LAST CLEARED	6/19/91	20:02:36		
TOTALS:	GRAND	PCT	CURRENT	PCT
CYCLES	11		7	
COMP 1 R 05.0	2.4	4.8	1.5	5.0
COMP 2 N 100	47.4	100.0	28.6	100.0
COMP 5 N 00.5	.4	.99	.2	.99
COMP 6 N 00.5 .4	.94		.2	.91
TOTAL	50.8	30.7		
WEIGH SCALE ID#	120			
TOTALS ARE IN POUNDS				
POUNDS PER HOUR	365.3			

The Totals may be in POUNDS or KILOS depending on your selection of weight unit. See: PROGRAM mode, (*89).

A line is printed for each active component. Each line shows component number, type, setting, grand and current totals.

The GRAND totals will continue to grow until they are intentionally cleared. This is done by the *00 routine, or pressing 00 within 5 seconds after printing these totals.

The CURRENT totals are since the last time totals were printed. The date and times are given for LAST CLEARED and for LAST PRINTED.

The percentages given for "R" types (REGRIND) are percentages of the total mix. Percentages given for "A" types (ADDITIVES) are percentages of all the "N" types added together. Percentages given for "N" types (NATURALS) are each component's percentage of all the "N" types added together.

The POUNDS PER HOUR is calculated using the total material dispensed from the CURRENT column, and the time difference between the CURRENT time and the LAST PRINTED time. Cycle time variations will cause this number to not be exact. The longer the time period, the more correct the rate.

WHAT TO DO

If you are reading this section, you are having problems. To locate and correct the problem we suggest that you take the following steps:

1. Start by reading the WIRING CONSIDERATIONS section.
Even if the system worked well for a time, dry weather or increased plant electrical noise can cause new problems.
2. Then follow the CHECKOUT procedure in the front of this manual.
If anything does not work right, read the diagnostics section that follows it.
3. Read the section on NORMAL OPERATING SEQUENCE to be sure you understand what it is supposed to be doing. If you are still unsure as to how the software logic works, call us.
4. Read the list of TYPICAL PROBLEMS that follows on the next page.
5. Read the section on VERIFYING LOAD CELL function to be sure that the load cells are operating correctly.
6. For difficult problems we can provide the most help if we have a printout of the PARAMETER table (KEYPAD, *77) and a cycle by cycle printout (KEYPAD, *54). (See PRINTED OUTPUTS section)

To print the PARAMETER table:

Press: *	Display will say: (PASSWORD)
Press: 22222	Display will say: (P x)
Press: *77	Display will say: (INSTR 77)
	Parameter table will print.

To print cycle information while the unit is running:

Press: *	Display will say: (PASSWORD)
Press: 22222	Display will say: (P x)
Press: *54	Display will say: (PRNT OFF)
Press: *	Display will say: (PRNT ON)
Press: EXIT	2 times.

7. Try a CLEAR.
Turn power off. Hold the "CE" key down and turn power ON. Display will say (CLEAR).
8. As a last resort, do a CLEARALL, (see CLEAR ALL section)

A list of TYPICAL PROBLEMS follows on the next page.

TYPICAL PROBLEMS:

These problems are based on phone calls that we have received from Autoweigh Blender users.

The display does not read close to zero when power is turned on, bin empty (plus or minus 10 grams).

- * The load cells are not plugged in.
- * The weigh bin is not resting properly and freely in its platform or the platform is not resting properly on the bolts that protrude from the load cell enclosures.
- * The controller was never calibrated for these load cells or you just did a CLEAR ALL. In this case it will most likely be off by several hundred grams. See LOAD CELL CALIBRATION.
- * The load cells are damaged. See CHECKING THE LOAD CELLS

The Controller "RESETS" itself for no reason. This indicates electrical noise or voltage spikes disrupting the processor.

- * See WIRING CONSIDERATIONS, ASSEMBLY section.

The ALARM is flashing and the display shows a weight above 100 or below -50 grams. If above 100, the Weigh bin dump valve keeps opening and closing every 6 or 7 seconds.

- * There is material in the weigh bin that will not dump out.
- * The dump flap may be stuck.
- * The load cells are hung up or obstructed.
- * The load cells are out of calibration.
- * Incorrect grounding is causing wide load cell readouts.

The VERY FIRST DISPENSE does NOT take place. After a few seconds the ALARM begins to flash. The display says (N x.x) and is flashing.

- * The air supply is not connected or the pressure is set too low.
- * The Natural solenoid is not connected properly.
- * The 1/2 amp panel front fuse is blown.
- * The NATURAL slide gate is jammed. The cylinder mount may be bent.

The NATURAL dispense valve continues to dump repeatedly even though the weigh bin has filled to overflowing. The weight reading is still below 2000.0 grams.

- * The weigh bin is not free to move.
- * The load cells are jammed.
- * The load cells are damaged. See CHECKING THE LOAD CELLS

The system operates but always needs MANY RETRIES to complete a dispense and never seems to "learn" the proper dispense rate.

- * Vibration is causing frequent "bailouts" causing large swings in rate adjustment. Increase the BER parameter.

The THUMBWHEEL SWITCHES do not seem to be controlling output. One or more LEDs (bottom row) are on all the time.

- * Someone has LOCKED IN a setting using the keypad. See KEYPAD, PROGRAM MODE, SETTING.
- * The _SE parameter is LIMITING the thumbwheel switch setting. See KEYPAD, PROGRAM MODE, and PARAMETERS, _SE.

Occasionally, the system gets STUCK doing retries of a component but the retry time is so short that nothing gets dispensed.

- * The LAG TIME parameter is set for too short a time. See KEYPAD, TIME, and PARAMETER, _LA.
- * A valve is sticking closed. Check for free operation when air pressure is removed.

The system USED TO WORK but now it does unexplainable things.

- * Static or a voltage surge has altered RAM memory. Do a CLEAR or CLEAR ALL. See "CLEAR" RESTART or "CLEAR ALL" RESTART. Then do a LOAD CELL CALIBRATION, and RATE CALIBRATION for ALL materials.

The Display reads 3100.0 even with the bin empty. This is the upper limit load cell readout.

- * The Load Cells are not plugged in and the circuitry has drifted to the top limit.
- * The load cells have been overloaded way beyond their limit and are now permanently deflected.

Dispenses from a slide gate are not as consistent as they should be. * The slide gate is sticking slightly. With the hopper empty, move the slide manually to see that it moves freely. Press up or down on the air cylinder to adjust for proper alignment.

- * The material does not flow very well. A bridge breaker adaptor may be required.

Load Cell weight readings are not holding steady. They vary as much as 100 grams from second to second.

- * This is static and improper grounding. See WIRING CONSIDERATIONS
- * If readings drift slowly in one direction, requiring frequent recalibration, a component on the circuit board is most likely faulty. Call us.
- * If TARE weights are not steady, something may be physically interfering with free movement of the cells.

At the end of each cycle the MIX MOTOR runs for a fraction of a second only.

- * The MIX MOTOR pulls a heavy amp load on start up. If the power supply is not adequate (like when using an extension cord), the voltage will drop so low that the computer will reset and the mix motor signal will shut off. The display will show this by restarting as if power was just turned on. Provide a better supply of power; remove extension cord or use larger gage wire.

NORMAL OPERATING SEQUENCE

This section tells you how the system is supposed to work. If your system is not operating correctly, this description may help you spot exactly where the system is failing, providing a clue to the problem.

Turn POWER ON:

The current program version date (V=xxxxxT) is displayed for 1 second, followed by the check sum number (CKS xxxx), followed by a ROM check (ROM OK), followed by a display of (0). The weight in the weight bin is now displayed. It should be 0 plus or minus several grams. During the first few minutes of operation, the displayed weight readings may drift slightly as the circuitry warms up.

BEGIN operation:

The unit will begin to operate if both switches on the left side are UP in the CONTINUE position and the SENSOR in the mix chamber is UNCOVERED. The sensor must be plugged into the right side of the controller. If it is not, this has the same effect as the sensor being covered; the unit will not run.

If the WEIGH BIN DUMP Flap opens and closes repeatedly:

If initial empty bin TARE weight is 100 grams or more, the weigh bin dump valve will operate in an attempt to empty the bin and bring the starting weight closer to zero. If the bin is empty but the weight reading is greater than 100 grams then something is wrong. See TESTING the LOAD CELLS and LOAD CELL CALIBRATION.

If the ALARM flashes:

If the initial TARE weight is below -50 grams the Alarm will flash and the unit will not operate. Go to TESTING of LOAD CELLS and LOAD CELL CALIBRATION.

The DISPENSE sequence begins:

If initial tare weight is within limits, between -50 and +100, the sequence will begin.

DISPLAY during dispenses:

During all dispenses, the component number and Type letter (R,N,A) will be displayed indicating which component is being dispensed. The INITIAL display is the tare weight of the bin. This will not change during the first dispense. After each dispense, the new total weight of the material in the bin is updated and displayed.

REGRINDS first:

If REGRIND is part of the blend, REGRIND dispenses will occur first in order of size, from the largest to the smallest. The letter "R" will appear in the display. After these dispenses an exact weight is taken to determine the space remaining in the weigh bin for the remaining dispenses. The total bin weight will appear in the display 2 seconds AFTER each dispense has ended.

NATURALS second:

The NATURAL dispenses occur next in the sequence. They will be dispensed in order of size, largest to smallest. The letter "N" will appear in the display. The exact weight of all NATURAL dispensed is now determined for calculating the ADDITIVE dispenses.

ADDITIVES third:

The ADDITIVE dispenses occur last in the sequence. Each dispense must meet requirements set by internal parameters or RETRIES will occur and the sequence will not continue.

MATERIAL RUNS OUT:

If any material runs out or is not enough to meet criteria set by parameters then the process will NOT CONTINUE past this component. RETRIES of this dispense will occur indefinitely until the full dispense occurs or power is turned off. The display will FLASH. The ALARM will sound after 4 retries. This number of retries before alarm is based on the ALARM (_AL) parameters. REGRIND may, or may not, be set to cause an alarm when it runs out. See PARAMETERS, _AL, for how to set the ALARM parameters.

If ALARM flashes:

More than four retries of any single component will cause the strobe light ALARM to begin flashing. The component that is causing the alarm will continue to retry the dispense. The display will blink and the first digit in the display will signify which component is causing the problem. To continue with the dispense sequence, you must satisfy the requirements of the dispense or turn power off.

WEIGH BIN dump:

After all dispenses the weigh bin is emptied by the final dump of the weigh bin into the mixing chamber. The dump valve remains open for four seconds. (DTI parameter)

SENSOR covered:

While the sensor is covered, the dump valve remains open to ensure the weigh bin empties completely. Dispensing stops. The dump valve will remain open for as long as the sensor is covered. This will be until the next cycle begins.

FLOW CONTROL Valve: (optional)

The Flow Control Valve under the mix chamber will stay closed for 6 seconds (FCV parameter) immediately following a dispense into the mix chamber. The rest of the time it opens when the sensor is covered, and closes when the sensor has been uncovered for at least two full seconds (based on DLY parameter).

VERIFYING LOAD CELL FUNCTION

Most Problems are related to LOAD CELL function.

There are several ways to VERIFY that the load cells are functioning properly. The slightest touch on the weigh bin should result in a change in the readout. If this is not the case, something is wrong. When the light touch is removed, the display should return to its starting point. If this does not happen, something is interfering with free movement of the cell or the bin. Make a careful inspection of EVERYTHING around the load cells, the hanger bolts, the weigh bin tray and the weigh bin. NOTHING should interfere with free movement.

NOTE: It is normal for load cell readout to drift several grams over time and with different temperatures. Since all the component dispenses are weighed by a single set of load cells, this drift will affect all components equally and, therefore, the ratio of the components will remain accurate. Empty weight is always TARED so each dispense is accurately measured.

The following observations will verify proper load cell operation:

When the bin is empty, between cycles, the display should read near zero. An error of several grams is not important since this empty weight reading is "tared" from all dispense readings. The "empty weight" readings should be consistently within 1 or 2 grams of each other.

The addition of several pellets to the weigh bin should result in a change in the readout. 1 gram is about 40 pellets.

Most load cell problems are caused by interference to the movement of the load cell. The load cell must be free to respond to the weight of a single pellet as well as free to move far enough to record a full 20,000 gram weight deflection. (10,000 grams per cell - 10K cells)

If weight readout is very erratic check for damage to the load cell wires. Check for a pinched wire in the connector.

An over stressed load cell will read high. The top limit is (3100.0) for a 200 series or (31000) for a 400 or 900 series. A load cell that was forced or pried upward too far will read (0.0).

We supply and replace load cells in matched sets and we always include the mounting enclosures. You may remove the back plate from the enclosure for visual inspection. It is not safe to remove the load cell itself from the enclosure. To do so may stress the cell itself.

To OPERATE with DAMAGED load cells in a VOLUMETRIC mode, see KEYPAD, *87, Volumetric mode.

To RECALIBRATE the LOAD CELLS, see the HARDWARE MAINTENANCE section.

If you suspect load cell damage or failure, see:
LOAD CELL RAW SIGNAL READOUT, next page, and
LOAD CELL - WEIGH BIN TEST, the following page.

LOAD CELL RAW SIGNAL READOUT

Press "CE" key to check this RAW number for several seconds.

Load cells put out a very small voltage that varies slightly as the load cell is deflected. This voltage is converted, on the circuit board, to a pulse train and these pulses are counted for 1 full second to determine a weight load. The software can handle a range of counts from 0 to approximately 249,850.

A properly operating set of 3 K cells will range from about 55,000 to 120,000; a span of about 65,000 from empty weight (weigh bin in place), to a full bin weight of 2000 grams. (10 K load cells range about 90,000 from empty to a full 9000 grams). The system will work correctly as long as the empty bin weight readout is between 1 and 149,248. 149,248 is the highest number that the software will accept for zero weight calibration (see parameters, LCZ). If the number is over this when you press the ZERO weight key, the display will say (ZERO LOW).

This RAW COUNT number is converted to the proper gram readout, by the software, based on load cell calibration information.

The RAW COUNT numbers are more useful in diagnosing load cell problems because they bypass the calibration math and, therefore, bypass any calibration errors that might have occurred.

Press "CE" key to display this RAW number for several seconds.

To observe this number continuously, use the *98 function in the PROGRAM mode.

Press:	*	Display will say:	(PASSWORD)
Press:	22222	Display will say:	(P x)
Press:	*	Display will say:	(INSTR --)
Press:	98	Display will say:	(CNT OFF)
Press:	*	Display will say:	(CNT ON)
Press:	EXIT	Display will say:	(P xxxxx)

A floating, drifting number usually indicates the load cells are not plugged in.

A readout of 0 indicates an open circuit, a damaged wire or cell.
A full scale readout of 249,850 indicates a damaged wire or cell.

A set of 3 K load cells will put out about 33 more counts for every gram of weight that is added. A test of sensitivity is to add a small weight to the bin. The RAW WEIGHT count should increase by about 33 counts for each gram added. (10 counts per gram for 10K load cells.)

If you call us for help in solving a load cell problem, it is helpful if you can tell us what the RAW COUNT number is with the bin empty, and with a known weight in it. Pressing the CE key at any time will display the RAW COUNT number for the current weight.

To OPERATE with DAMAGED load cells in a VOLUMETRIC mode, see KEYPAD, *87, Volumetric mode.

LOAD CELL - WEIGH BIN TEST
To verify correct operation

This test is to help you determine if the load cells are working correctly, and if the weigh bin and weigh bin hanger are moving freely and registering weight correctly.

Have a pad and pencil ready to write down the weight readings that appear on the display, both before and after each dispense. If you prefer, you can use a printer to record all test data. Have the printer flag (*54) set to ON.

Be in the PROGRAM mode. (*22222).

1. Start with an empty weigh bin.
2. Dispense a very small amount, using the TIMED DISPENSE function:
Record the weight display.
Press: TIME, NAT, 040
Wait for dispense then record the new weight.

Wait for test to finish, about 10 seconds. At the end of this test the bin will automatically empty. This is OK.

3. Now, manually add enough pellets to bring bin weight up to the approximate full batch weight. Do this by pressing on the small air solenoid operator pin for NATURAL. Drop in enough pellets to be close to a normal full batch weight, like 2000 or 4000 grams. Exact weight does not matter. We just want to place approximate full batch weight on the load cells.
4. Repeat step 2, recording the weight readings.
5. Do this entire test 3 more times.
From the weight readings, calculate the weight of each dispense from each test.

RESULTS TO EXPECT:

In each test, the first timed dispense, when the bin is empty, should be very close or equal to the second dispense, when the bin is full. Results from all 4 tests should be very similar.

If the second dispense is always less than the first, the load cells are suspect. The enclosures may be full of pellets. Weigh bin interference is also possible. If all dispenses vary widely with no pattern, this is most likely caused by weigh bin interference. Weigh Bin interference is usually visible with close inspection.

"CLEAR" ROUTINE

A "CLEAR" routine is available that will clear all data, flags, and all other current information from memory. Since MEMORY is battery backed up, turning power off does not clear all fields. A great deal of information is intentionally held for later use. A "CLEAR" routine will clear all RAM data and start with the information stored in the EEPROM. This is the same data that existed when new or data that you may have intentionally saved earlier. All current rate calibration numbers that the unit has "learned" will be overwritten.

To execute a "CLEAR", hold down the "CE" key while turning POWER ON, then release. When done correctly, the display will say (CLEAR).

CLEAR does not clear EEPROM information but instead loads EEPROM into RAM. Load Cell weight calibration numbers are NOT lost.

(To load EEPROM with correct RAM information, see KEYPAD, *23)

CLEAR ALL - RESTART

The same as the CLEAR, above, but EEPROM information is also cleared. There are only TWO times when you want to do a CLEAR ALL.

1. When a NEW PROGRAM CHIP has been installed.
New chips often have different PARAMETER table layouts. Information may reside in memory locations that do not match the new program. CLEAR ALL - RESTART fixes this.
2. When all else fails.
CLEAR ALL - RESTART will sometimes fix problems that the simple CLEAR routine misses.

The keys to press on power up are VIEW, BTCH, and EXIT (Top row: left, center, and right). Hold all three down as power is turned on, then release. When done correctly the display will say (CLEARALL).

LOAD CELL calibration WILL be lost. You will have to follow the Load Cell calibration procedure given in this manual.

Since parameter table information is lost, you will want to reenter parameters that were previously modified. See BRIEF EXPLANATION of PARAMETERS for a quick review of which ones might have been changed.

Be certain that your unit displays the proper MODEL number when you turn on power. If not, see SELECTING CORRECT MODEL, next page.

CORE DUMP

During production or between cycles, the controller can be forced to print a CORE DUMP of Memory. This is helpful to us when elusive problems are occurring related to non predictable environmental problems. If you are having reoccurring problems, we may ask you to use this routine during production to help us diagnose the problem.

To obtain a MEMORY CORE DUMP, have a printer connected. Press three keys at the same time; the PARA, FULL, and ALRM keys; bottom row: left center and right.

HARDWARE ADJUSTMENTS

AIR PRESSURE

Set AIR PRESSURE to about 80 PSI for best accuracy. However, lower pressures will work. If you plant air fluctuates, set the regulator to the low end so that the dispense valves always see a consistent pressure. Lubricated air is NOT recommended. GBM Micro Blenders should be set to 40 PSI (2.7 bar). Vertical Valves used in removable hoppers on GBM Micro Blenders, and 100 and 200 series blenders, are more accurate at 60 PSI pressure setting.

LEVEL SENSOR

Sensor position; 200 and 400 series models only:

The sensor should protrude into the mix chamber about 1/4 inch past the inside surface of the stainless mounting plate. If it does not protrude far enough, it will sense the mounting plate itself. If it protrudes too far, it will sense the mix blade.

Adjusting sensor sensitivity:

1. The adjustment screw is located at the rear of the sensor.
It may be protected by a small plastic screw like cover. You will need a very small screwdriver to adjust it.
2. Fill the mix chamber until the sensor is about 3/4 covered.
3. Turn screw counter-clockwise until the LED goes OFF.
4. Then turn clockwise until the LED just goes ON.
5. Empty the chamber and check to be sure the sensor LED does not go on when the mix blade passes near it.

NOTE: 18 mm sensors, LED logic is reversed, ON when UNCOVERED.

WEIGH BIN DUMP VALVE

The WEIGH BIN DUMP VALVE should be adjusted to close softly. A needle valve is installed next to the quick disconnect so that air flow to the flap air cylinder may be restricted. Adjust as required for a soft close.

SLIDE VALVES

Slide valves must move very freely. If they seem to jam slightly as they reach the full extended position (closed), this may be due to the air cylinder mount being slightly bent. If someone has pulled down or pushed up on the air cylinder, they may have bent the cylinder mount. You can correct this by pressing up or down on the cylinder as required to correct the problem.

If you process very hard pellets (polycarbonate and glass filled resins), your slide gate dispense valves may stick closed occasionally. We provide spacers that limit the full stroke of the air cylinder. This stops the slide from going any further than the just closed position and prevents jamming. Call us for information.

INTERNAL MIX MOTOR and AUGER FEEDER FUSES

The MIX MOTOR timed power source and the AUGER FEEDER OUTLETS are driven by internal solid state plug-in relays. A small 5 amp glass fuse is located to the right of each relay. A spare fuse is also located on the board if replacement is necessary.

MIX PROBLEMS

Customers with mix problems have several options available.

1. Decrease the batch size by lowering the FUL parameter value. This does two things. First, it causes the components to be dispensed in smaller, more frequent batches which places more and smaller layers of material into the mix chamber. Second, it lowers the level of material in the mix chamber immediately after a dispense. It is critical to proper mixing that the mix blades reach up through the top of the material in the mix chamber during mix time. Dispensing a large batch may bury these blades, particularly when the process is not running at full blender capacity. A smaller batch size, while reducing throughput rate, will help prevent the mix blades being covered during mix time.
2. Be sure level sensor is mounted in its lowest position, and increase sensitivity as much as possible. Both serve to keep a batch from being dispensed so early as to cover the mix blades.
3. On units without flow control valves (FCA), increase the DLY parameter to as number as high as 50 percent of the time between cycles. DLY is the time delay (in interrupts) from the sensor being uncovered until we begin the batch. Increasing DLY allows the mix chamber to empty somewhat before the next batch drops. The maximum possible value for DLY is 29999 or 122 seconds.
4. You may increase the mix time at the end of each batch by changing the last two digits of the MIX parameter. If throughput is very high it may be better to run the mixer continuously. However, added mix time sometimes causes separation after an initial mixing. Different bulk densities and static electricity both aggravate this potential for separation from excessive mixing.
5. If a blender is mounted on a stand over a surge hopper, there should be a FCA, automatic flow control valve, fitted to the bottom of the blender. This valve must be plumbed so that it is closed when the level sensor is uncovered. When the sensor is covered the valve opens to release material. The purpose of this valve is to ensure mixing. The FCV parameter delays the opening of this valve for 6 seconds. You can increase this delay time if you feel additional mixing is required before release.
6. On model GB/WSB-940, be sure the weigh bin has two baffles installed. These ensure horizontal layering (as opposed to side by side layering) of materials prior to dropping into the mix chamber.
7. Bulk density and pellet shape differences, specifically smooth virgin pellets mixed with square higher density color pellets, can separate when dropped onto a sloping pile, as exists in a hopper, Gaylord, or surge bin. The light round pellets flow like water to the edges, while the heavier square color pellets stay put. This is difficult to correct. It is best not to drop these kinds of blends into large containers.
8. Vacuum conveying can also separate materials of different bulk densities. Maintain high air velocity to minimize this.

9. Models GB/WSB-GBM, 100 series, and some 200 series units use an air drive for the mix blade, instead of an electric motor.

Air drives have these advantages:

- a) Improved mixing due to back and forth motion of the blades.
- b) No EMF (Electro Magnetic Force) feedback to the processor from electrical demands of the motor resulting, the results in less processor problems.
- c) Less electronic parts on the board, parts that are vulnerable to failure from in-plant voltage spikes, from storms and power failures, parts that can represent a percentage of failures over the lifetime of the blender.
- d) Inherent safety for plant personnel due to the more controlled, more limited torque of an air drive compared to an electric motor drive. A correctly sized electric motor can deliver 10 times the normal design and operating torque when stalled. In spite of interlocks, this presents a potential safety hazard.

If you are having mix problems with air drives, be sure the blades moves a full 270 degrees (3/4 turn) with each sweep. If they do not, try the following:

- a) Increase the air pressure. If the gauge pressure drops more than 5 pounds during operation of the blades, the air supply line is too small.
- b) Lower the pile in the mix chamber to reduce torque requirements on the mix blade. This is explained above.
- c) Increase the MPO parameter from 122 (1/2 second) to 183 (3/4 second) or 244 (1 full second). This allows more time for a full mix blade sweep to occur. You may also want to increase mix time from 10 seconds to 15 or 20 seconds so that, in spite of slower mix blade speed, the same amount of mixing occurs.

RECALIBRATION OF LOAD CELLS

This unit was properly calibrated at the factory to match the load cells that were supplied with it. If you are going to recalibrate, note the following.

Recalibration can not be done until the Recalibration flag is turned ON. The proper sequence of keystrokes is given below.

BE SURE the load cell plug is plugged into the side of the controller.
BE SURE the weigh bin is hanging from the load cells freely.
BE SURE the air line to the dump valve is connected as it would be during normal operation. (A disconnected air line adds weight.)
Air pressure to the line is not necessary.
BE SURE there is nothing touching the weigh bin or air line.
BE SURE the bin is EMPTY when ZEROING the load cells,

ZERO WT. must be done before FULL WT. Since changes in ZERO WT will also shift the FULL WT scale by the same amount, it may not be necessary to go any farther than this.

When SETTING FULL WEIGHT, BE SURE you know the exact weight (in GRAMS) that you are adding to the bin. Place this weight in the bin and then press the FULL WT. key. Five dashes (FUL-----) will be displayed. Enter the EXACT weight in GRAMS that you have placed in the bin. The weight should be close to the designed full bin weight; (400, 1000, 2000, 4000, 9000, or 18000). The example below uses 2000.

When done, there is no need to turn the Calibration Flag off. The next time power is turned off this flag will be reset to OFF.

The sequence of keystrokes is as follows:

Press: *	Display will say: (PASSWORD)
Press: 22222	Display will say: (P x)
Press: *99	Display will say: (CAL OFF)
Press: *	Display will say: (CAL ON)
Press: EXIT	Display will say: (P x)
Press: ZERO	Display will say: (--WAIT--)
	followed by: (P 0)

Place a 2000 (or 1000, 4000 or 9000) Gram weight in the bin.

Press: FULL	Display will say: (FUL-----)
Press: 2000	Display will say: (--WAIT--)
	followed by: (P 2000.0)
	If YOUR weight is not exactly 2000 grams, then enter the ACTUAL weight that YOU use.

Press: EXIT	Display will say: (2000.0)
Remove weights:	Display will say: (x.x)

Actual displayed weights may be plus or minus a few grams.

After FULL weight calibration, if the display says (BAD CELL), the weight you are using does not match the weight you entered, the weigh bin is not free to move, OR the load cells are bad.

BLENDER PREVENTIVE MAINTENANCE

There are no components of your blender that require periodic maintenance. However, over the years, blenders may be subjected to abuse or difficult conditions, and accuracy can suffer. To maintain control over the cost of expensive color and additives, you must maintain accuracy. We recommend that blenders be examined once a year, and all necessary repairs be made to insure continued accuracy.

DISPENSE GATES

To be accurate, gates must open and close freely, quickly, and completely. Check for wear on the slide gate guide rods. Check cylinder clevis adjustment for correct closing of the gate. A gate should close just enough to block the hole, but no further. It is best if they do not pass over the far edge of the opening as this might catch and jam on a pellet. Check that the clevis pin connecting the air cylinder is intact, not broken or worn through. Check for correct air pressure, tight fittings, and no damaged or crimped air lines.

LOAD CELLS

It is a good idea to remove the load cells, remove the back cover off each enclosure, and inspect for contamination that might have entered and built up over time. Do not remove the load cell from its mounting. Just blow out any contaminants. Load cell enclosure design has evolved over the years. If you find significant contamination, request new enclosures from us. GBM and 100 series have recently improved enclosures, since 2000. Other models had improvements made before 1997. We will provide these parts for free if you need them.

WEIGH BINS

Check for smooth correct operation of the dump flap. Hinge points should not be worn. Gate should overlap the forward edge enough to prevent dribble when closed, even when closed against pellets. Space at the rear of the flap should allow for static build up of pellets on the rear edge of the dump flap without interfering with the closing of the flap. Again, if you see evidence of these problems, newer design parts are available to solve these problems. Check that the flap closes fully, and closes softly. The soft close is adjustable.

CLEARANCES - FREE MOVEMENT OF WEIGH BIN.

Carefully examine all the parts of the weigh bin and the bin hanging bracket to be sure that nothing touches any fixed parts. A quarter (1/4) inch of space should exist on all sides of the weigh bin. Over the years, windows and guards have been added, and this has required that the weigh bin size be reduced to maintain 1/4 inch clearance per side. Be sure you do not have an older larger bin installed where windows have been added.

A light touch of the bin should show a change in the weight readout. Remove the touch and the display should return to exactly the same number, plus or minus 1 or 1/10 gram depending on model. Only the last digit should drift, or vary, and by no more than one count. If ANY interference is detected, it MUST be fixed.

MIX CHAMBER

No bent blades. No SHARP blades. Bent blades might brake off and severally damage your process screw. Sharp blades are a safety hazard. Replace if mix blades are not perfect.

The blade assembly should slip on and off the motor shaft easily. The need to use excessive force to remove the mixer assembly may bend the blades and they may eventually break off. Correct this if it is a problem.

***77 and *54 PRINTOUTS**

After you have fixed any problems, use the *77 and *54 functions to obtain printouts and fax them to us for evaluation.

COMPUTER OUTPUTS - WIRING SUPPLEMENT

17 pin connector

This computer output;

```
|      drives this device on the board;
|      |      that goes to the outside world through this connector;
|      |      |      to drive this external device.
|      |      |      |      wire color
|      |      |      |      |
```

formerly optical coupler outputs
| 17 pin amphonal connector
|

1	1	pin A	weigh bin dump air solenoid	brown
2	2	pin B	component 1 air solenoid	orange
3	3	pin C	component 2 air solenoid	blue
4	4	pin D	component 3 air solenoid	gray
5	5	pin E	component 4 air solenoid	purple
6	6	pin M	flow control air solenoid	yellow
7	7	pin F	component 7 air solenoid	red

solid state plug-in relays (4) on separate board

```
|
8      1      comp. 5 - color auger motor outlet, panel front
9      2      comp. 6 - additive auger motor outlet, panel front
10     3      strobe and beeper + opt. alarm relay output
11     4      mix motor outlet, panel side

12     5      pin G      comp. 8 - external SS relay      wt./red
13     6      pin H      comp. 9 - external SS relay      wt./yellow
14     7      pin J      comp. 10 - external SS relay     wt./green
15     8      pin K      comp. 11 - external SS relay     wt./blue

      pin L      alarm
      pin N      common line, all outputs.      white
      pin P      comp. 12 - ext. relay (also air drive mixer)

      pin R      neutral to 10 volt signals (S,T)
      pin S      0-10 volt extruder control signal
      pin T      0-10 volt line speed control signal
```

External SS relays are optional.

External SS relays and air solenoids may be exchanged.

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

WE'RE HERE TO HELP

To contact Customer Service personnel, call:



From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

HOW TO CONTACT CUSTOMER SERVICE

If you do have a problem, please complete the following checklist before calling Conair:

- Make sure you have all model, serial and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- Make sure power is supplied to the equipment.
- Make sure that all connectors and wires within and between control systems and related components have been installed correctly.
- Check the troubleshooting guide of this manual for a solution.
- Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- Check that the equipment has been operated as described in this manual.
- Check accompanying schematic drawings for information on special considerations.

BEFORE YOU CALL ...

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

EQUIPMENT GUARANTEE

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

PERFORMANCE WARRANTY

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

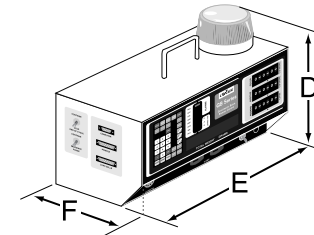
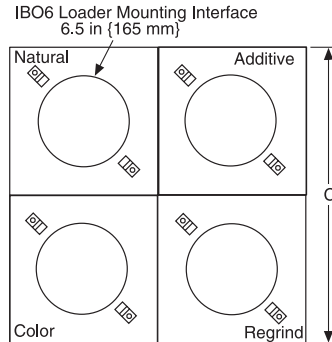
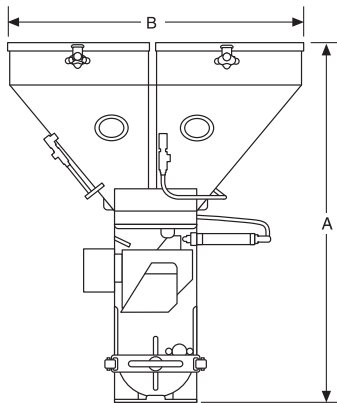
Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

WARRANTY LIMITATIONS

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

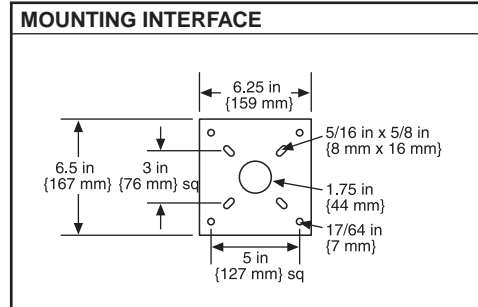
SPECIFICATIONS

GRAVIMETRIC BATCH BLENDERS Autoweigh GBM Series Models



CONTROL (REMOTE MOUNTED)

MODELS	GBM22	GBM31	GBM40
Performance characteristics			
Batch size lbs {g}	.882 {400}	.882 {400}	.882 {400}
Maximum throughput lbs/hr {kg/hr}*	97 {44}	111 {50}	132 {60}
Bin capacity - large bins ft ³ {liter}	0.4 {11.3}	0.4 {11.3}	0.4 {11.3}
Maximum number of materials	4	4	4
Number of standard dispensing valves†	2	3	4
Number of micro dispensing valves	2	1	0
Control software (# of components)	4 or 12	4 or 12	4 or 12
Dimensions inches {mm}			
A - Height above mounting plate	27.25 {693}	27.25 {693}	27.25 {693}
B - Width	21.75 {552.4}	21.75 {552.4}	21.75 {552.4}
C - Depth	21.75 {552.4}	21.75 {552.4}	21.75 {552.4}
D - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
E - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
F - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}			
Installed	70 {32}	70 {32}	70 {32}
Shipping	90 {41}	90 {41}	90 {41}
Voltage Running load amps			
120V/1 phase 50/60 hz	1.0	1.0	1.0
220V/1 phase 50/60 hz	0.5	0.5	0.5
Compressed air requirements			
	40 psi @ 1 ft ³ /min { 2.8 bars @ 0.47 liters/sec} 1/4 in. NPT fitting		
Material filling options			
Self-contained vacuum loader	ML8 or Z2HL		
Central vacuum receiver	DL8		
Hand-fill	flat lid		



SPECIFICATION NOTES:

* Maximum throughput rates are based on using all dispense valves and dispensing no more than 1.0% colorant and/or additive per each micropulsing valve. Refer to the selection guide for more specific throughput information.

† The Regrind position features a 1.5-inch diameter valve to ensure flow of irregularly shaped material.

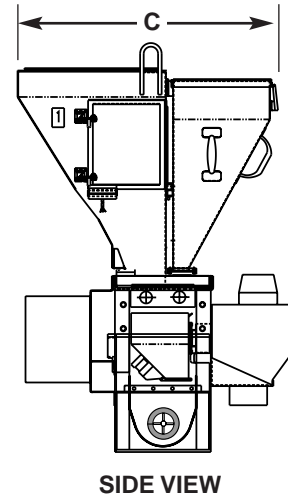
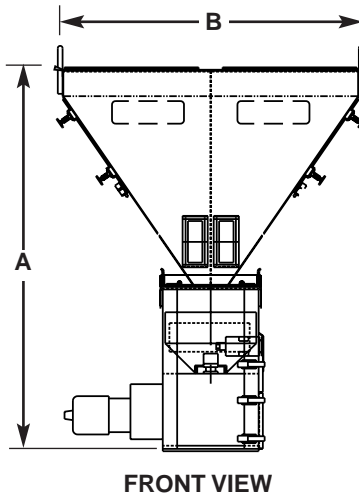
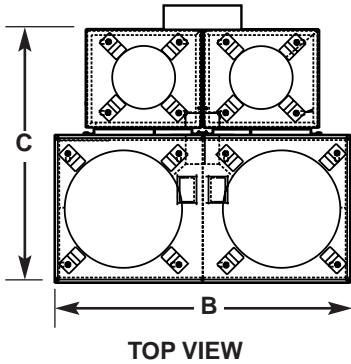
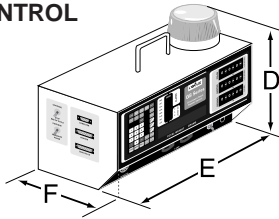
If you will be using this blender for central blending applications, it will be necessary to use a flow control valve with an air solenoid.



SPECIFICATIONS

GRAVIMETRIC BATCH BLENDERS
AutoWeigh GB100 Series Models

CONTROL



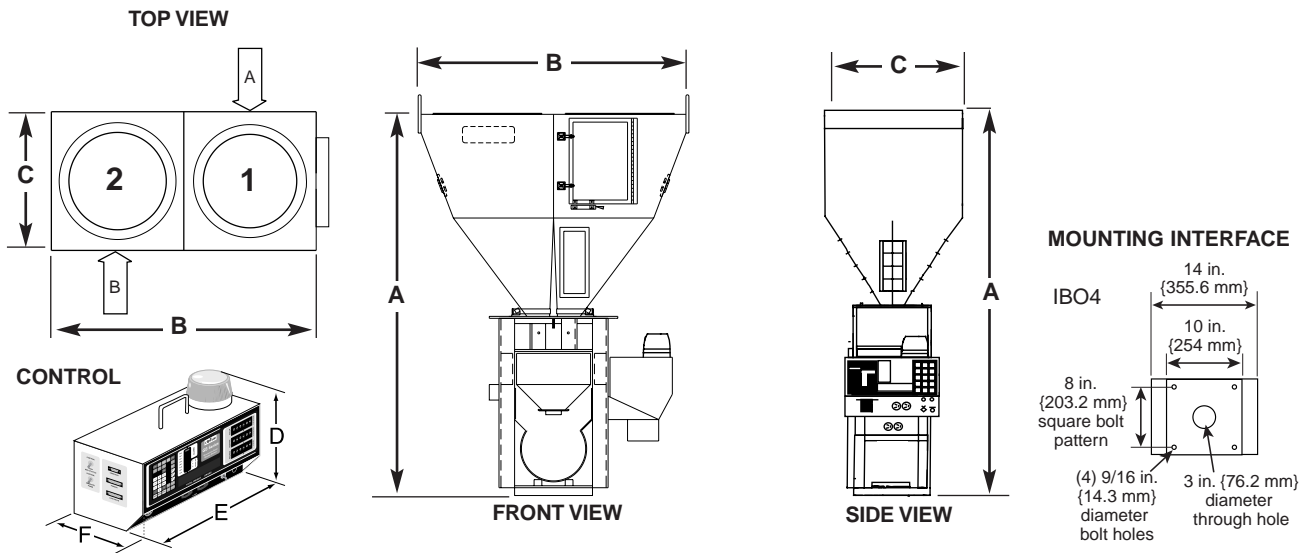
MODELS	GB122	GB131	GB140
Performance characteristics			
Batch size lbs {g}	2.2 {1000}	2.2 {1000}	2.2 {1000}
Maximum throughput lbs/hr {kg/hr}*	200 {90}	280 {128}	450 {204}
Bin capacity - main ingredient ft ³ {liter}	1.0 {28.32}	1.0 {28.32}	1.0 {28.32}
Bin capacity - minor ingredient ft ³ {liter}	0.5 {14.16}	0.5 {14.16}	0.5 {14.16}
Maximum number of materials	4	4	4
Number of discharge valves	2	3	4
Number of micro pulsing valves	2	1	0
Control software (# of components)	4 or 12	4 or 12	4 or 12
Dimensions inches {mm}			
A - Height above mounting plate†	38.9 {989.6}	38.9 {989.6}	38.9 {989.6}
B - Width	33.2 {843.3}	33.2 {843.3}	33.2 {843.3}
C - Depth	31.4 {797.6}	31.4 {797.6}	31.4 {797.6}
D - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
E - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
F - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}			
Installed	200 {90.7}	200 {90.7}	200 {90.7}
Shipping	300 {136.1}	300 {136.1}	300 {136.1}
Voltage Total amps			
120V/1 phase/50-60 hz	2.0	2.0	2.0
240V/1 phase/50-60 hz	1.0	1.0	1.0
Compressed air requirements			
Discharge valves	80 psi @ 0.2 ft ³ /min {5.5 bars @ 0.09 liters/sec}; 1/4 in. NPT fitting		
Micro pulsing valves	40 psi @ 0.2 ft ³ /min {2.8 bars @ 0.09 liters/sec}; 1/4 in. NPT fitting		

MOUNTING INTERFACE	
IB04	<p>10 in. {254 mm} square</p> <p>8 in. {203.2 mm} square bolt pattern</p> <p>(4) 9/16 in. {14.3 mm} diameter bolt holes</p> <p>3 in. {76.2 mm} diameter through hole</p>
SPECIFICATION NOTES:	
<p>Each stationary bin compartment can support a 12-inch loader or vacuum receiver. Removable bins can support a maximum of an 8-inch loader.</p> <p>* Throughput rates are based on bins with each micro-pulsing valve dispensing no more than 1% colorant and/or additive material and using a material with a bulk density of 35 lb/ft³.</p> <p>† The optional flow control valve adds 6.5 in. {165 mm} to total height.</p>	



SPECIFICATIONS

**GRAVIMETRIC BATCH BLENDERS
GB 220 and 420 Models**



MODELS	GB220	GB221	GB222	GB420	GB421	GB422
Performance characteristics						
Batch size lbs {g}	4.4 {2000}	4.4 {2000}	4.4 {2000}	8.8 {4000}	8.8 {4000}	8.8 {4000}
Maximum throughput lbs/hr {kg/hr}*	1239 {562}	575 {261}	540 {245}	1966 {892}	700 {318}	680 {308}
Bin capacity - each ft ³ {liter}	2.2 {62.3}	2.2 {62.3}	2.2 {62.3}	2.2 {62.3}	2.2 {62.3}	2.2 {62.3}
Maximum number of materials	2	3	4	2	3	4
Number of discharge valves	2	2	2	2	2	2
Number of additive feeders	0	1	2	0	1	2
Control software (# of components)	4 or 12	4 or 12	4 or 12	4 or 12	4 or 12	4 or 12
Dimensions inches {mm}						
A - Height above mounting plate†	48 {1217.9}	48 {1217.9}	48 {1217.9}	54 {1370.3}	54 {1370.3}	54 {1370.3}
B - Width ‡	34 {863.6}	34 {863.6}	34 {863.6}	34 {863.6}	34 {863.6}	34 {863.6}
C - Depth‡	17.5 {444.5}	17.5 {444.5}	17.5 {444.5}	17.5 {444.5}	17.5 {444.5}	17.5 {444.5}
D - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
E - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
F - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}						
Installed	220 {100}	260 {118}	300 {136}	245 {111}	285 {129}	325 {147}
Shipping	325 {147}	265 {120}	405 {183}	350 {159}	390 {177}	430 {195}
Voltage Total amps						
120V/1 phase/50-60 Hz	4.8	5.8	6.8	4.8	5.8	6.8
240V/1 phase/50-60 Hz	2.5	3.0	3.5	2.5	3.0	3.5
Compressed air requirements						
Discharge valves	80 psi @ 0.2 ft ³ /min. {5.5 bars @0.09 liters/sec}, 1/4 in. NPT fitting					
Compressed air feeder	40 psi @ 2 ft ³ /min. {2.8 bars @0.94 liters/sec}, 1/4 in. NPT fitting					

SPECIFICATION NOTES:

Each bin compartment will support a 12-inch to 15-inch loader or vacuum receiver.

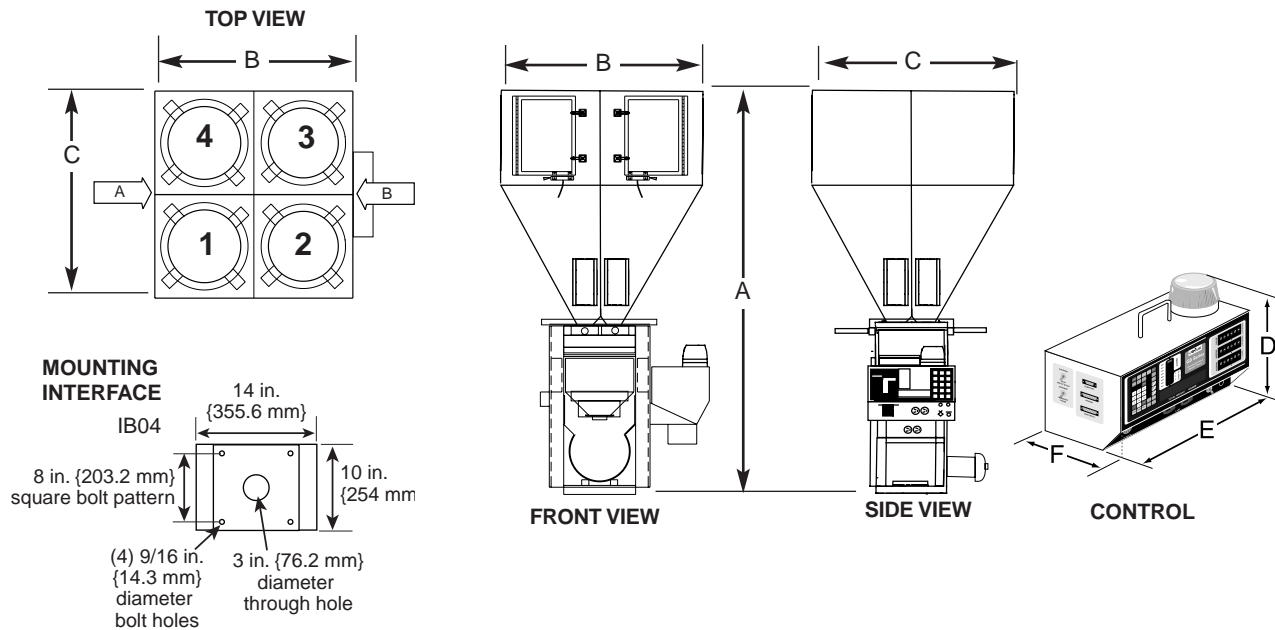
* Throughput rates are based on using no more than 5% additive or colorant material total in either the CAF3 compressed air or F03 auger feeder. Always refer to the selection guide for specific throughput information.

† The optional flow control valve adds 6.5 in. {165 mm} to the total height. We recommend using the flow control valve when mounting the blender to a stand, surge bin or hopper.

‡ Feeders will increase width and depth dimensions. Please refer to feeder specifications.

SPECIFICATIONS

**GRAVIMETRIC BATCH BLENDERS
AutoWeigh GB240 and GB440 Models**



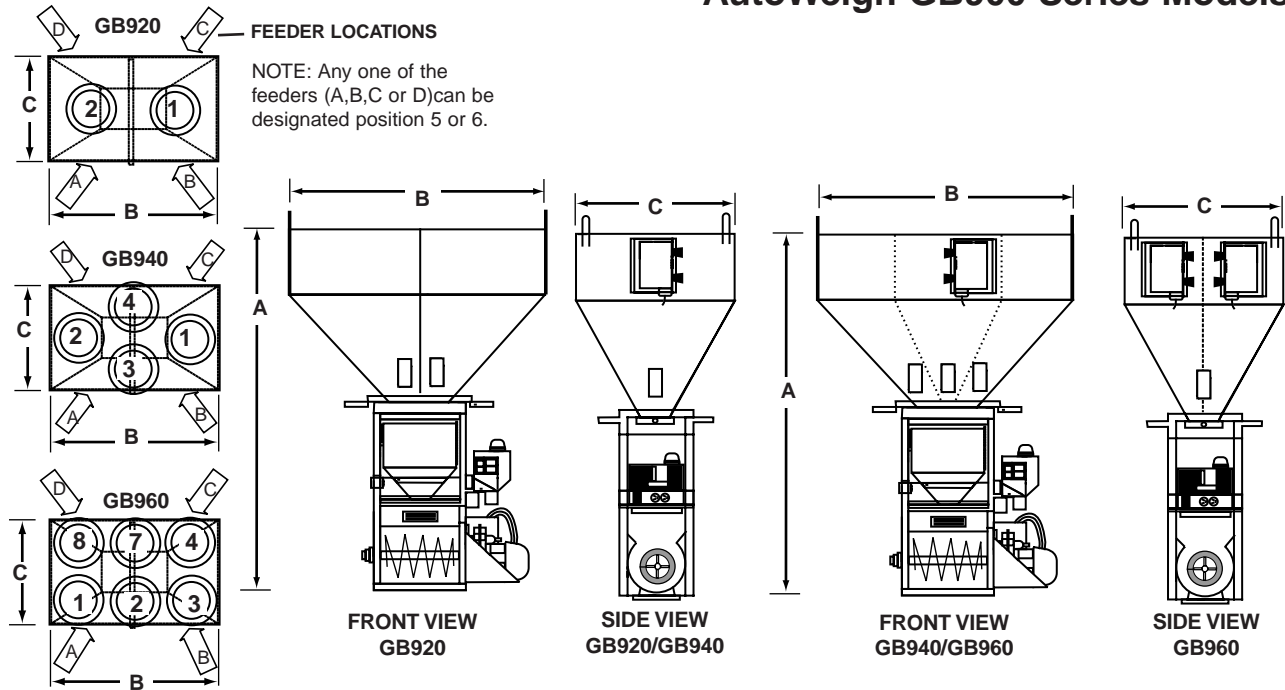
MODELS	GB240	GB241	GB242	GB440	GB441	GB442
Performance characteristics						
Batch size lbs {g}	4.4 {2000}	4.4 {2000}	4.4 {2000}	8.8 {4000}	8.8 {4000}	8.8 {4000}
Maximum throughput lbs/hr {kg/hr}*	993 {451}	678 {308}	518 {235}	1645 {748}	983 {446}	704 {319}
Bin capacity - main ingredient ft ³ {liter}	3.5 {99.12}	3.5 {99.12}	3.5 {99.12}	3.5 {99.12}	3.5 {99.12}	3.5 {99.12}
Bin capacity - minor ingredient ft ³ {liter}	NA	0.5 {14.16}	0.5 {14.16}	NA	0.5 {14.16}	0.5 {14.16}
Maximum number of materials	4	5	6	4	5	6
Number of discharge valves	4	4	4	4	4	4
Number of additive feeders	0	1	2	0	1	2
Control software (# of components)	4 or 12	12	12	4 or 12	12	12
Dimensions inches {mm}						
A - Height above mounting plate†	59.75 {1517.5}	59.75 {1517.5}	59.75 {1517.5}	65.75 {1669.9}	65.75 {1669.9}	65.75 {1669.9}
B - Width ‡	34 {863.6}	34 {863.6}	34 {863.6}	34 {863.6}	34 {863.6}	34 {863.6}
C - Depth‡	34 {863.6}	34 {863.6}	34 {863.6}	34 {863.6}	34 {863.6}	34 {863.6}
D - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
E - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
F - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}						
Installed	230 {104}	270 {122}	310 {140}	255 {116}	295 {134}	335 {152}
Shipping	335 {152}	375 {170}	415 {188}	360 {163}	400 {181}	440 {200}
Voltage Total amps						
120V/1 phase/50-60 Hz	4.8	5.8	6.8	4.8	5.8	6.8
240V/1 phase/50-60 Hz	2.5	3.0	3.5	2.5	3.0	3.5
Compressed air requirements						
Discharge valves	80 psi @ 0.2 ft ³ /min. {5.5bars @ 0.09 liters/sec}, 1/4 in. NPT fitting					
Compressed air feeder	40 psi @ 2 ft ³ /min. {2.8bars @ 0.94 liters/sec}, 1/4 in. NPT fitting					

SPECIFICATION NOTES:
 Each bin compartment can support a 12-inch to 15-inch loader or vacuum receiver.
 * Throughput rates are based on using no more than 2% additive or colorant material total in either the CAF3 compressed air or F03 auger feeder. Always refer to the selection guide for specific throughput information.
 † The optional flow control valve adds 6.5 in. {165 mm} to the total height. We recommend using the flow control valve when mounting the blender to a stand, surge bin or hopper.
 ‡ Feeders will increase width and depth dimensions. Please refer to feeder specifications.



SPECIFICATIONS

GRAVIMETRIC BATCH BLENDERS
AutoWeigh GB900 Series Models



MODELS	GB920	GB940	GB960
Performance characteristics			
Batch size lbs {g}	19.8 {9000}	19.8 {9000}	19.8 {9000}
Maximum throughput lbs/hr {kg/hr}*	5200 {2359}	3300 {1497}	2124 {965}
Bin capacity - main ingredient ft ³ {liter}	8.5 {240.7}	6.7 {189.7}	3.6 {102.9}
Bin capacity - minor ingredient ft ³ {liter}	NA	3.6 {107.6}	3.6 {107.6}
Maximum number of materials	6	8	10
Number of discharge valves	2	4	6
Number of additive feeders	up to 4	up to 4	up to 4
Control software (# of components)	4 or 12	4 or 12	12
Dimensions inches {mm}			
A - Height above mounting plate†	74 {1880.7}	74 {1880.7}	74 {1880.7}
B - Width‡	56 {1421.4}	56 {1421.4}	56 {1421.4}
C - Depth‡	34 {863.6}	34 {863.6}	34 {863.6}
D - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
E - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
F - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}			
Installed	480 {218}	480 {218}	480 {218}
Shipping	600 {272.2}	600 {272.2}	600 {272.2}
Voltage Running load amps§			
120V/1 phase/60 hz (control and mixer)	8.5	8.5	8.5
220V/1 phase/60 hz (control and mixer)	4.25	4.25	4.25
220V/1 phase/50 hz (control)	0.15	0.15	0.15
220V/3 phase/50 hz (mixer)	2.2	2.2	2.2
400V/3 phase/50 hz (mixer)	1.1	1.1	1.1
Compressed air requirements			
Discharge valves	80 psi @ 0.2 ft ³ /min {5.5 bars @ 0.09 liters/sec}; 1/4 in. NPT fitting		
Compressed air feeder	40 psi @ 2.0 ft ³ /min {2.8 bars @ 0.94 liters/sec}; 1/4 in. NPT fitting		
Maximum loader sizes**			
Number of 20 inch loaders	2	2	3
Number of 15 inch loaders	2	4	6

CONTROL

MOUNTING INTERFACE

IBO4 (4) 9/16 in. {14.3 mm} diameter bolt holes

4 in. {101.6 mm} diameter through hole

8 in. {203.2 mm} square bolt pattern

14.5 in. {368.3 mm}

16 in. {406.4 mm}

15 in. {381 mm}

20 in. {508 mm}

SPECIFICATION NOTES:

* Maximum throughput rates are based on 35 lbft³ pelletized material and using all dispense valves. Use of feeders for minor ingredients will reduce this rate. Refer to the selection guide for more specific throughput information.

† The optional flow control valve will add 6.5 in. {165 mm} to the total height. We recommend using the flow control valve when mounting the blender to a stand, surge bin or hopper.

‡ Feeders will increase depth dimensions. Please refer to feeder specification.

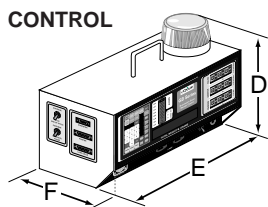
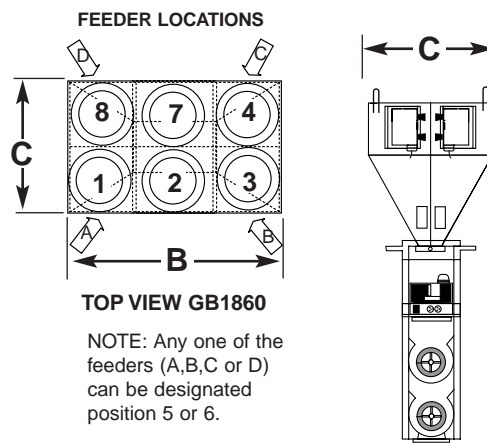
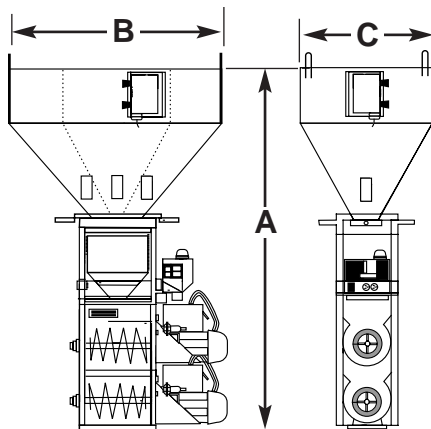
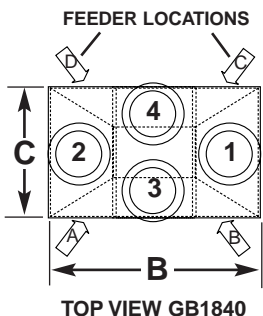
§ Each auger feeder requires an additional 1 amp @ 120V or 0.5 amp @ 240V.

** Maximum loader sizes may be used only when the loader is adjacent to loaders of a smaller diameter.



SPECIFICATIONS

GRAVIMETRIC BATCH BLENDERS
AutoWeigh GB1840 and 1860 Models



SIDE VIEW GB1860

MODELS	GB1840	GB1860
Performance characteristics		
Batch size lbs {g}	39.7 {18000}	39.7 {18000}
Maximum throughput lbs/hr {kg/hr}*	4114 {1870}	2566 {1166}
Bin Capacity - Main Ingredient ft ³ {liter}	6.7 {189.7}	3.8 {107.6}
Bin Capacity - Minor Capacity ft ³ {liter}	3.8 {107.6}	3.8 {107.6}
Maximum number of materials	8	10
Number of discharge valves	4	6
Number of additive feeders	up to 4	up to 4
Control software (# of components)	4 or 12	12
Dimensions inches {mm}		
A - Height above mounting plate	93 {2362.2}	93 {2362.2}
B - Width†	56 {1421.4}	56 {1421.4}
C - Depth†	34 {863.6}	34 {863.6}
D - Controller height	11.25 {285.75}	11.25 {285.75}
E - Controller width	12.25 {311.15}	12.25 {311.15}
F - Controller depth	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}		
Installed	730 {331}	730 {331}
Shipping	850 {385.5}	850 {385.5}
Voltage Running load amps‡		
110V/1 phase/60hz (control)	0.3	0.3
220V/1 phase/60hz (mixer)	8.2	8.2
220V/1 phase/60hz (control)	0.2	0.2
220V/1 phase/60hz (mixer)	8.2	8.2
220V/1 phase/50hz (control)	0.2	0.2
220V/3 phase/50hz (mixer)	4.4	4.4
400V/3 phase/50hz (mixer)	2.2	2.2
Compressed air requirements		
Discharge valves	80 psi @ 0.2 ft ³ /min {5.5 bars @ 0.09 liters/sec} 1/4 in. NPT fitting	
Maximum loader sizes §		
Number of 20 inch loaders	2	3
Number of 15 inch loaders	4	6

MOUNTING INTERFACE

SPECIFICATION NOTES

* Maximum throughput rates are based on 35 lb/ft³ pelletized material and using all dispense valves. Use of feeders for minor ingredients will reduce this rate. Refer to the selection guide for more specific throughput information.

† Feeders will increase width dimensions. Please refer to feeder specification.

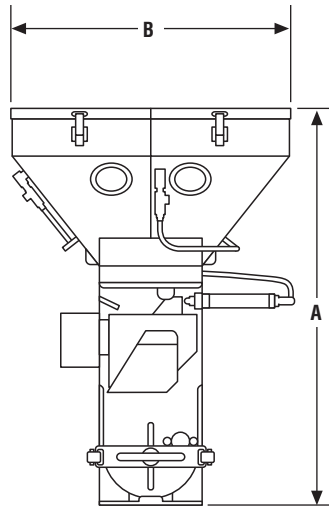
‡ Each auger feeder requires an additional 1 amp @ 120V or 0.5 amp @ 240V.

§ Maximum loader sizes may be used only when the loader is adjacent to loaders of a smaller diameter.

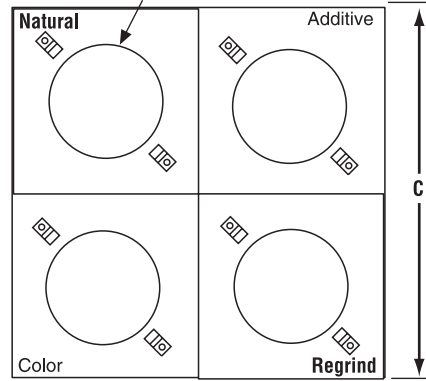


SPECIFICATIONS

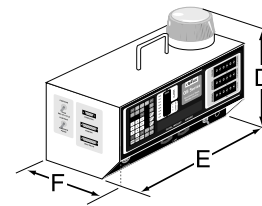
**GRAVIMETRIC BATCH BLENDERS
WSBM Series models**



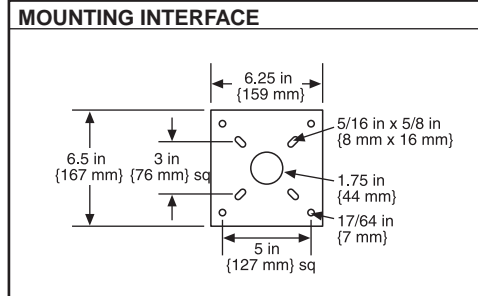
**IB06 Loader Mounting Interface
6.5in (165 mm)**



CONTROL (REMOTE MOUNTED)



MODELS	WSBM22	WSBM131	WSBM140
Performance characteristics			
Batch size lbs {g}	0.882 {400}	0.882 {400}	0.882 {400}
Maximum throughput lbs/hr {kg/hr}*	97 {44}	111 {50}	132 {60}
Bin capacity - standard bins ft ³ {liter}	0.4 {5.7}	0.4 {5.7}	0.4 {5.7}
Maximum number of materials	4	4	4
Number of standard dispensing valves	2	3	4
Number of micro dispensing valves	2	1	0
Control software (# of components)	4 or 12	4 or 12	4 or 12
Dimensions inches {mm}			
A - Height above mounting plate	27.25 {693}	27.25 {693}	27.25 {693}
B - Width	21.75 {552.4}	21.75 {552.4}	21.75 {552.4}
C - Depth	21.75 {552.4}	21.75 {552.4}	21.75 {552.4}
D - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
E - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
F - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}			
Installed	60 {27}	60 {27}	60 {27}
Shipping	80 {36.3}	80 {36.3}	80 {36.3}
Voltage Running load amps			
120V/1 phase 50/60 hz	1.0	1.0	1.0
220V/1 phase 50/60 hz	0.5	0.5	0.5
Compressed air requirements			
	40 psi @ 1 ft ³ /min { bars @ 0.47 liters/sec} 1/4 in. NPT fitting		
Material filling options			
Self-contained vacuum loader	ML8		
Central vacuum receiver	DL8		
Hand-fill	flat lid		



SPECIFICATION NOTES:

* Maximum throughput rates are based on using all dispense valves dispensing no more than 1.0% colorant or additive per each micropulsing valve. Refer to the selection guide for more specific throughput information.

APPLICATION NOTE:

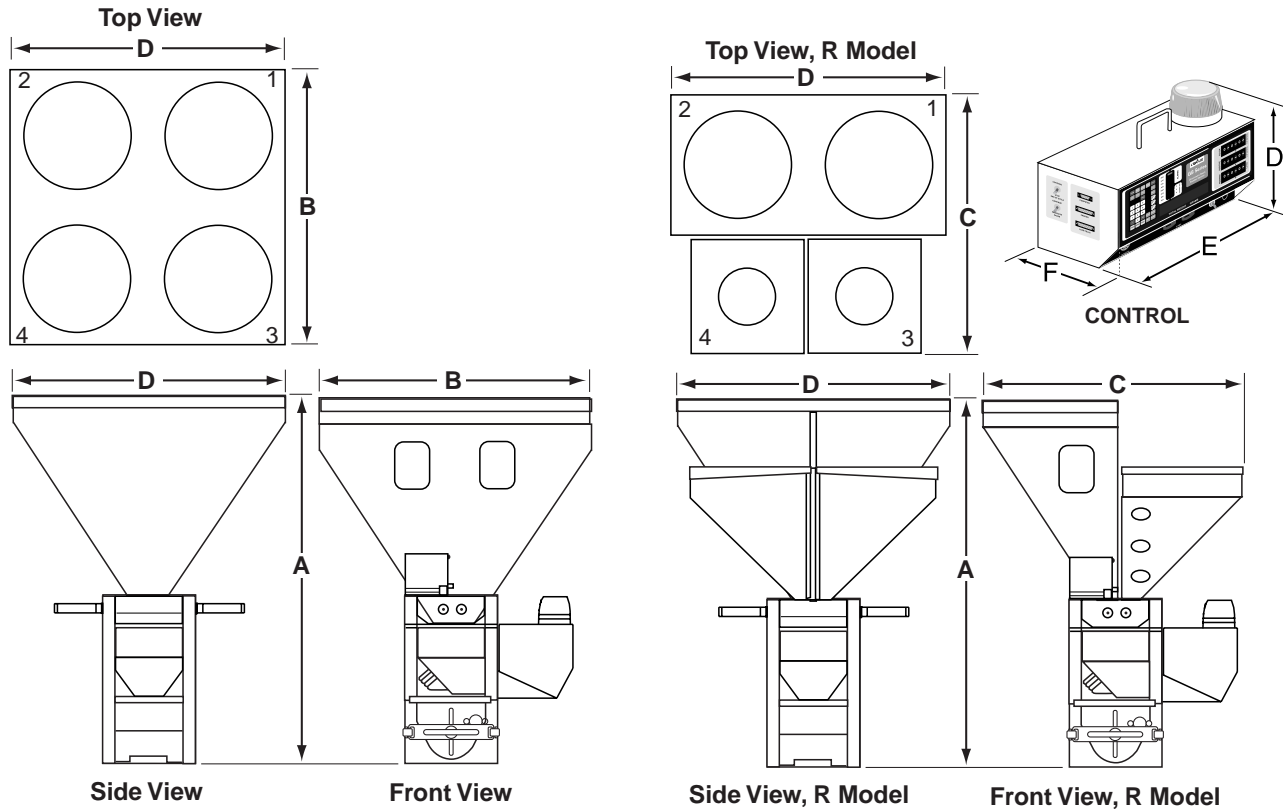
Handfill unless otherwise specified.

If you will be using this blender for central blending applications, it will be necessary to use a flow control valve with an air solenoid.

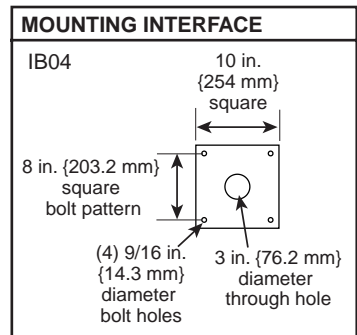


SPECIFICATIONS

**GRAVIMETRIC BATCH BLENDERS
WSB 100 and 100R Models**



MODELS	WSB122	WSB131	WSB140
Performance characteristics			
Batch size lbs {g}	2.2 {1000}	2.2 {1000}	2.2 {1000}
Maximum throughput lbs/hr {kg/hr}*	200 {91}	280 {128}	450 {204}
Bin capacity - main ingredient ft ³ {liter}	1.0 {28.3}	1.0 {28.3}	1.0 {28.3}
Bin capacity - minor ingredient ft ³ {liter}	1.0 {28.3}	1.0 {28.3}	1.0 {28.3}
Maximum number of materials	4	4	4
Number of discharge valves	2	3	4
Number of micro pulsing valves	2	1	0
Control software (# of components)	4 or 12	4 or 12	4 or 12
Dimensions inches {mm}			
A - Height above mounting plate†	38.9 {989.6}	38.9 {989.6}	38.9 {989.6}
B - Width	33.2 {843.3}	33.2 {843.3}	33.2 {843.3}
C - Width R (removable bins)	30.2 {766.3}	30.2 {766.3}	30.2 {766.3}
D - Depth	31.4 {797.6}	31.4 {797.6}	31.4 {797.6}
E - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
F - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
G - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}			
Installed	200 {90.7}	200 {90.7}	200 {90.7}
Shipping	300 {136.1}	300 {136.1}	300 {136.1}
Voltage Total amps			
120V/1 phase/50-60 hz	2.0	2.0	2.0
240V/1 phase/50-60 hz	1.0	1.0	1.0
Compressed air requirements			
Discharge valves	60 psi @ 0.2 ft ³ /min { 4.1 bars @ 0.09 liters/sec}; 1/4 in. NPT fitting		
Micro pulsing valves	60 psi @ 0.2 ft ³ /min { 4.1 bars @ 0.09 liters/sec}; 1/4 in. NPT fitting		



SPECIFICATION NOTES:

R model has removable bins with vertical valves. Removable bins can support an 8-inch loader or vacuum receiver. Stationary bins can support a 12-inch loader or vacuum receiver. Maximum throughput for a 140R model is 437 lb/hr {198.2 kg/hr}. Minor ingredient bin capacity is 0.7 ft³ {19.8 liter}.

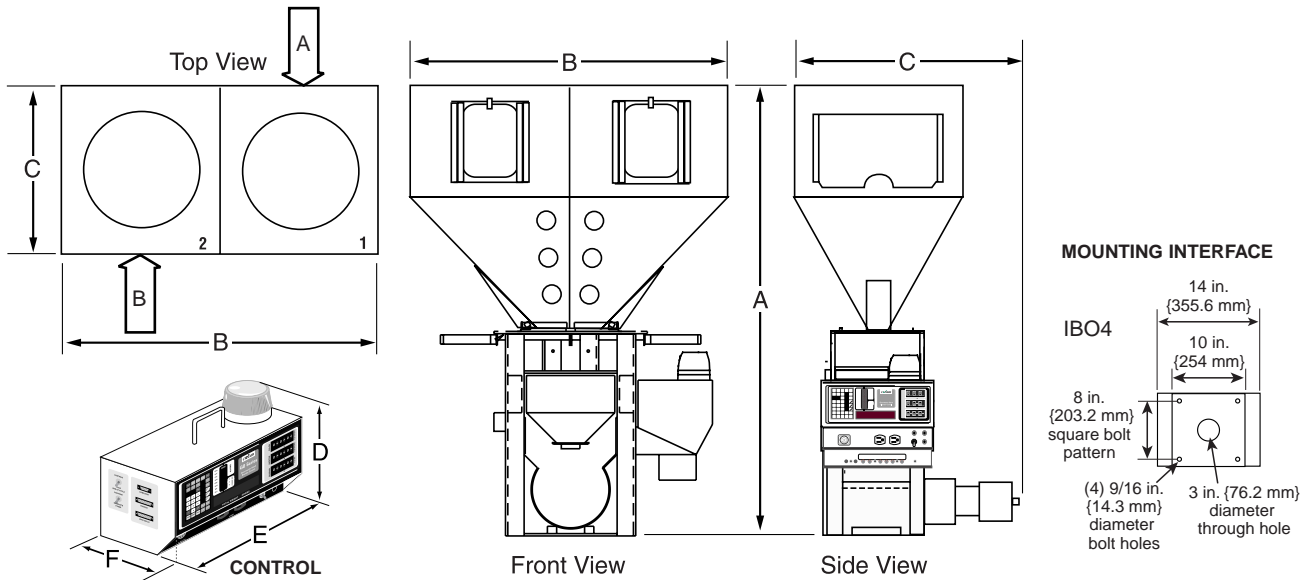
* Throughput rates are based on bins with each micropulsing valve dispensing no more than 1% colorant and/or additive material.

† The optional flow control valve adds 3.5 in. {88.9 mm} to total height.



SPECIFICATIONS

**GRAVIMETRIC BATCH BLENDERS
WSB 220 and 420 Models**



MODELS	WSB220	WSB221	WSB222	WSB420	WSB421	WSB422
Performance characteristics						
Batch size lbs {g}	4.4 {2000}	4.4 {2000}	4.4 {2000}	8.8 {4000}	8.8 {4000}	8.8 {4000}
Maximum throughput lbs/hr {kg/hr}*	1239 {562}	575 {261}	540 {245}	1966 {892}	700 {318}	680 {308}
Bin capacity - each ft ³ {liter}	2.0 {56.6}	2.0 {56.6}	2.0 {56.6}	2.0 {56.6}	2.0 {56.6}	2.0 {56.6}
Maximum number of materials	2	3	4	2	3	4
Number of discharge valves	2	2	2	2	2	2
Number of additive feeders	0	1	2	0	1	2
Control software (# of components)	4 or 12	4 or 12	4 or 12	4 or 12	4 or 12	4 or 12
Dimensions inches (mm)						
A - Height above mounting plate†	48 {1217.9}	48 {1217.9}	48 {1217.9}	54 {1370.3}	54 {1370.3}	54 {1370.3}
B - Width ‡	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}
C - Depth‡	24.75 {628.6}	24.75 {628.6}	24.75 {628.6}	24.4 {619.8}	24.4 {619.8}	24.4 {619.8}
D - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
E - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
F - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs (kg)						
Installed	220 {100}	260 {118}	300 {136}	245 {111}	285 {129}	325 {147}
Shipping	325 {147}	265 {120}	405 {183}	350 {159}	390 {177}	430 {195}
Voltage Total amps§						
120V/1 phase/50-60 Hz	4.8	4.8	4.8	4.8	4.8	4.8
240V/1 phase/50-60 Hz	2.5	2.5	2.5	2.5	2.5	2.5
Compressed air requirements						
Discharge valves	80 psi @ 0.2 ft ³ /min. {5.5 bars @0.09 liters/sec}, 1/4 in. NPT fitting					
Compressed air feeder	40 psi @ 2 ft ³ /min. {2.8 bars @0.94 liters/sec}, 1/4 in. NPT fitting					

SPECIFICATION NOTES:

Each bin compartment will support a 12-inch to 15-inch loader or vacuum receiver.

* Throughput rates are based on using no more than 5% additive or colorant material total in either the CAF3 compressed air or F03 auger feeder. Always refer to the selection guide for specific throughput information.

† The optional butterfly control flow control valve adds 3.5 in. {88.9 mm} to the total height. We recommend using the flow control valve when mounting the blender to a stand, surge bin or hopper.

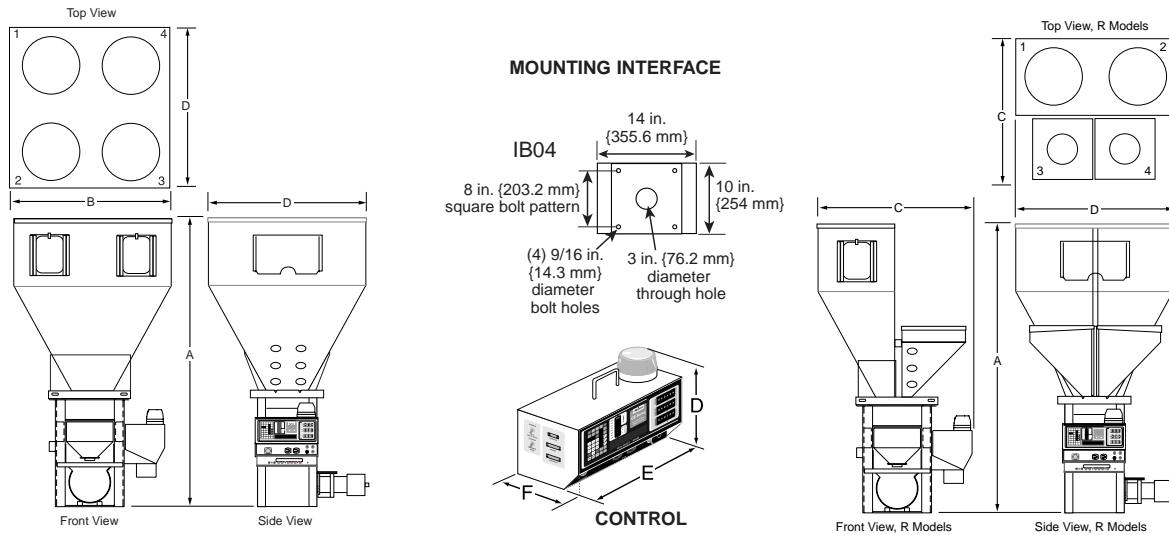
‡ Feeders will increase width and depth dimensions. Please refer to feeder specifications.

§ Each additional auger feeder requires an additional 1 amp @ 120V or 0.5 amps @ 240V.



SPECIFICATIONS

GRAVIMETRIC BATCH BLENDERS WSB 240/440 and 240/440R Models



MODELS	WSB240	WSB241	WSB242	WSB440	WSB441	WSB442
Performance characteristics						
Batch size lbs {g}	4.4 {2000}	4.4 {2000}	4.4 {2000}	8.8 {4000}	8.8 {4000}	8.8 {4000}
Maximum throughput lbs/hr {kg/hr}*	993 {451}	678 {308}	518 {235}	1645 {748}	983{446}	704 {319}
Bin capacity - main ingredient ft ³ {liter}	3.5 {99.12}	3.5 {99.12}	3.5 {99.12}	3.5 {99.12}	3.5 {99.12}	3.5 {99.12}
Bin capacity - minor ingredient ft ³ {liter}	NA	0.5 {14.16}	0.5 {14.16}	NA	0.5 {14.16}	0.5 {14.16}
Maximum number of materials	4	5	6	4	5	6
Number of discharge valves	4	4	4	4	4	4
Number of additive feeders	0	1	2	0	1	2
Control software (# of components)	4 or 12	12	12	4 or 12	12	12
Dimensions inches {mm}						
A - Height above mounting plate†	59.75 {1517.5}	59.75 {1517.5}	59.75 {1517.5}	65.75 {1669.9}	65.75 {1669.9}	65.75 {1669.9}
B - Width ‡	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}
C - Width R (removable bins)‡	32.2 {817.9}	32.2 {817.9}	32.2 {817.9}	32.2 {817.9}	32.2 {817.9}	32.2 {817.9}
D - Depth‡	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}
E - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
F - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
G - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}						
Installed	230 {104}	270 {122}	310 {140}	255 {116}	295 {134}	335 {152}
Shipping	335 {152}	375 {170}	415 {188}	360 {163}	400 {181}	440 {200}
Voltage Total amps §						
120V/1 phase/50-60 Hz	4.8	4.8	4.8	4.8	4.8	4.8
240V/1 phase/50-60 Hz	2.5	2.5	2.5	2.5	2.5	2.5
Compressed air requirements						
Discharge valves	80 psi @ 0.2 ft ³ /min. {5.5bars @ 0.09 liters/sec}, 1/4 in. NPT fitting					
Compressed air feeder	40 psi @ 2 ft ³ /min. {2.8bars @ 0.94 liters/sec}, 1/4 in. NPT fitting					

SPECIFICATION NOTES:

R models have removable bins. The removable bins can support 8-inch loaders. Stationary bin compartments can support 12-inch to 15-inch loaders.

* Throughput rates are based on using the F03 auger feeder dispensing no more than 2% per additive or colorant. Maximum throughput rates for R models are: WSB240R with no feeders 864 lb/hr; with one feeder 619 lb/hr; with two feeders 483 lb/hr. For WSB440R model with no feeder 1326 lb/hr; with one feeder, 864 lb/hr; with two feeders 640 lb/hr.

† The optional butterfly flow control valve adds 3.5 in. {88.9 mm} to the total height. We recommend using the flow control valve when mounting the blender to a stand, surge bin or hopper.

‡ Feeders will increase width and depth dimensions. Please refer to feeder specifications.

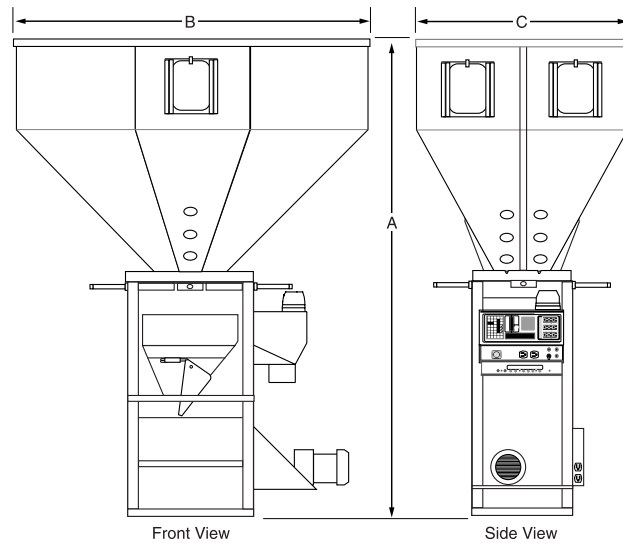
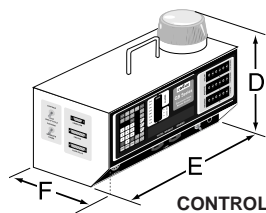
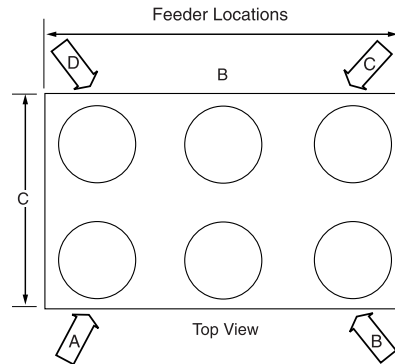
§ Each auger feeder requires an additional 1 amp @ 120V or 0.5 amp @ 240V.



SPECIFICATIONS

**GRAVIMETRIC BATCH BLENDERS
WSB 920, 940, 950 and 960 Models**

NOTE: Loader configuration is the same for all models.



MODELS	WSB920	WSB940	WSB950	WSB960
Performance characteristics				
Batch size lbs {g}	19.8 {9000}	19.8 {9000}	19.8 {9000}	19.8 {9000}
Maximum throughput lbs/hr {kg/hr}*	5200 {2359}	3300 {1487}	2492 {1132}	2124 {965}
Bin capacity - main ingredient ft ³ {liter}	6.7 {189.7}	6.7 {189.7}	6.7 {189.7}	NA
Bin capacity - minor ingredient ft ³ {liter}	NA	3.8 {107.6}	3.8 {107.6}	3.8 {107.6}
Maximum number of materials	6	8	9	10
Number of discharge valves	2	4	5	6
Number of additive feeders	up to 4	up to 4	up to 4	up to 4
Control software (# of components)	4 or 12	4 or 12	12	12
Dimensions inches {mm}				
A - Height above mounting plate	74 {1880.7}	74 {1880.7}	74 {1880.7}	74 {1880.7}
B - Width†	56 {1421.4}	56 {1421.4}	56 {1421.4}	56 {1421.4}
C - Depth†	34.4 {875.3}	34.4 {875.3}	34.4 {875.3}	34.4 {875.3}
D - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
E - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
F - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}				
Installed	480 {218}	480 {218}	480 {218}	480 {218}
Shipping	600 {272.2}	600 {272.2}	600 {272.2}	600 {272.2}
Voltage Running load amps ‡				
120V/1 phase/60 hz (control and mixer)	8.5	8.5	8.5	8.5
220V/1 phase/60 hz (control and mixer)	4.3	4.3	4.3	4.3
220V/1 phase/50 hz (control)	0.15	0.15	0.15	0.15
220V/3 phase/50 hz (mixer)	2.2	2.2	2.2	2.2
400V/3 phase/50 hz (mixer)	1.1	1.1	1.1	1.1
Compressed air requirements				
Discharge valves	80 psi @ 0.2 ft ³ /min {5.5 bars @ 0.09 liters/sec}; 1/4 in. NPT fitting			
Compressed air feeder	40 psi @ 2.0 ft ³ /min {2.8 bars @ 0.94 liters/sec}; 1/4 in. NPT fitting			
Maximum loader sizes§				
Number of 20 inch loaders	2	2	2	3
Number of 15 inch loaders	2	4	5	6

MOUNTING INTERFACE

SPECIFICATION NOTES:

- * Maximum throughput rates are based on using all dispense valves. Use of feeders for minor ingredients will reduce this rate.
- † Feeders will increase width and depth dimensions. Please refer to feeder specification.
- ‡ Each auger feeder requires an additional 1 amp @ 120V or 0.5 amp @ 240V.
- § Maximum loader sizes may be used only when the loader is adjacent to loaders of a smaller size.

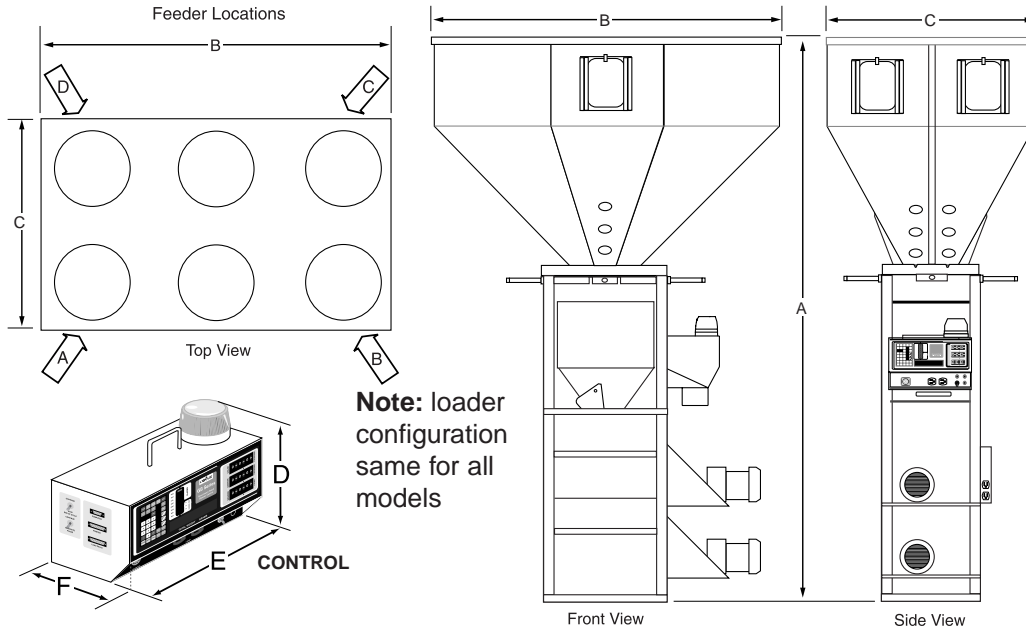
APPLICATION NOTE:

We recommend using a flow control valve when mounting the blender to a stand, surge bin or hopper.



SPECIFICATIONS

**GRAVIMETRIC BATCH BLENDERS
WSB 1840, 1850 and 1860 Models**



MODELS	WSB1840	WSB1850	WSB1860
Performance characteristics			
Batch size lbs (g)	39.7 {18000}	39.7 {18000}	39.7 {18000}
Maximum throughput lbs/hr {kg/hr}*	4114 {1866}	3160 {1433}	2566 {1164}
Bin Capacity - Main Ingredient ft ³ {liter}	6.7 {189.7}	6.7 {189.7}	3.8 {107.6}
Bin Capacity - Minor Capacity ft ³ {liter}	3.8 {107.6}	3.8 {107.6}	3.8 {107.6}
Maximum number of materials	8	9	10
Number of discharge valves	4	5	6
Number of additive feeders	up to 4	up to 4	up to 4
Control Software (# of components)	4 or 12	12	12
Dimensions inches {mm}			
A - Height above mounting plate	93 {2362.2}	93 {2362.2}	93 {2362.2}
B - Width†	56.25 {1428.8}	56.25 {1428.8}	56.25 {1428.8}
C - Depth†	34.4 {873.8}	34.4 {873.8}	34.4 {873.8}
D - Controller height	11.25 {285.75}	11.25 {285.75}	11.25 {285.75}
E - Controller width	12.25 {311.15}	12.25 {311.15}	12.25 {311.15}
F - Controller depth	8.19 {208.03}	8.19 {208.03}	8.19 {208.03}
Weight lbs {kg}			
Installed	730 {331}	730 {331}	730 {331}
Shipping	850 {385.5}	850 {385.5}	850 {385.5}
Voltage Running load amps‡			
110V/1 phase/60hz (control)	0.3	0.3	0.3
220V/1 phase/60hz (mixer)	8.2	8.2	8.2
220V/1 phase/60hz (control)	0.2	0.2	0.2
220V/1 phase/60hz (mixer)	8.2	8.2	8.2
220V/1 phase/50hz (control)	0.2	0.2	0.2
220V/3 phase/50hz (mixer)	4.4	4.4	4.4
400V/3 phase/50hz (mixer)	2.2	2.2	2.2
Compressed air requirements			
Discharge valves	80 psi @ 0.2 ft ³ /min {5.5 bars @ 0.09 liters/sec} 1/4 in. NPT fitting		
Maximum loader sizes §			
Number of 20 inch loaders	2	2	3
Number of 15 inch loaders	4	5	6

MOUNTING INTERFACE

IB04 (4) 9/16 in. {14.3 mm} diameter bolt holes

4 in. {101.6 mm} diameter through hole 8 in. {203.2 mm} square bolt pattern

SPECIFICATION NOTES:

* Maximum throughput rates are based on using all dispense valves and 35 lb/ft³ pelletized material. Use of feeders will reduce this rate.

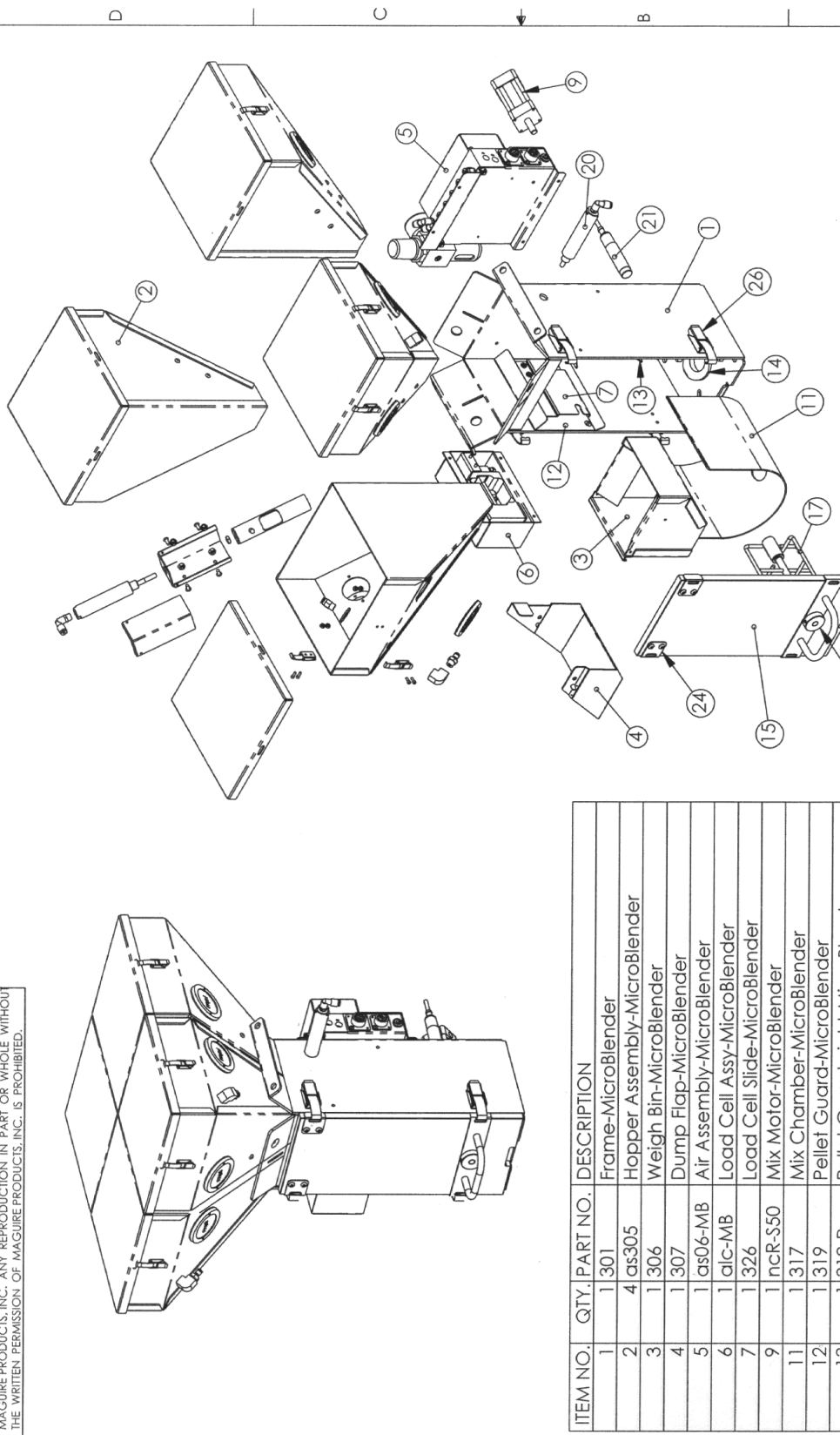
† Feeders will increase width and depth dimensions. Please refer to feeder specifications.

‡ Each auger feeder requires an additional 1 amp @ 120V or 0.5 amp @ 240V.

§ Maximum loader sizes may be used only when the loader is adjacent to loaders of a smaller diameter.



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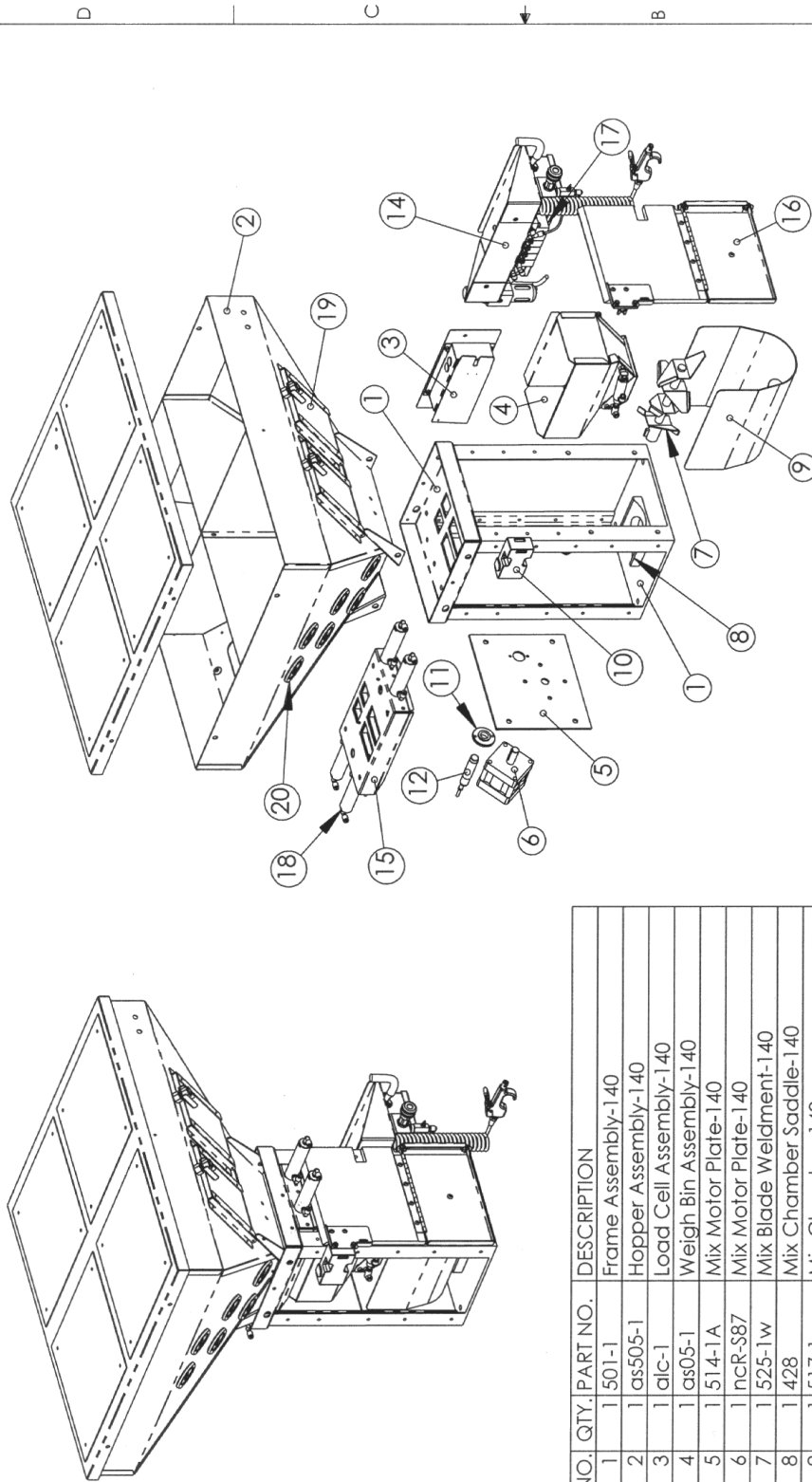
MicroBlender Isometric Exploded View

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
±1/32 .XX±.02 ±1
.XXX±.010

MATERIAL	---		
FINISH	---		
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-	-	-	-
SIZE	DWG. NO.	NAME	OF 1
A	EXPL-MB	SHEET	Sheet1
File Name:	WSB-MB Xplode	SCALE	1:8

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	301	Frame-MicroBlender
2	4	as305	Hopper Assembly-MicroBlender
3	1	306	Weigh Bin-MicroBlender
4	1	307	Dump Flap-MicroBlender
5	1	as06-MB	Air Assembly-MicroBlender
6	1	alc-MB	Load Cell Assy-MicroBlender
7	1	326	Load Cell Slide-MicroBlender
9	1	ncR-350	Mix Motor-MicroBlender
11	1	317	Mix Chamber-MicroBlender
12	1	319	Pellet Guard-MicroBlender
13	1	319-R	Pellet Guard, right-MicroBlender
14	1	318	Saddle-MicroBlender
15	1	380	Front Window-MicroBlender
17	1	as325	Mix Blade Assembly
18	1	323	Collar-MicroBlender Mix Shaft
20	1	ncv13	Air Cyl-1 1/2 stroke, heavy spring w/ bumper
21	1	asps-03	Level Sensor-18m w/ twist plug
24	2	1886-L	Latch Plate, small-MicroBlender
26	4	hl04	Latch, Southco Series 50 short

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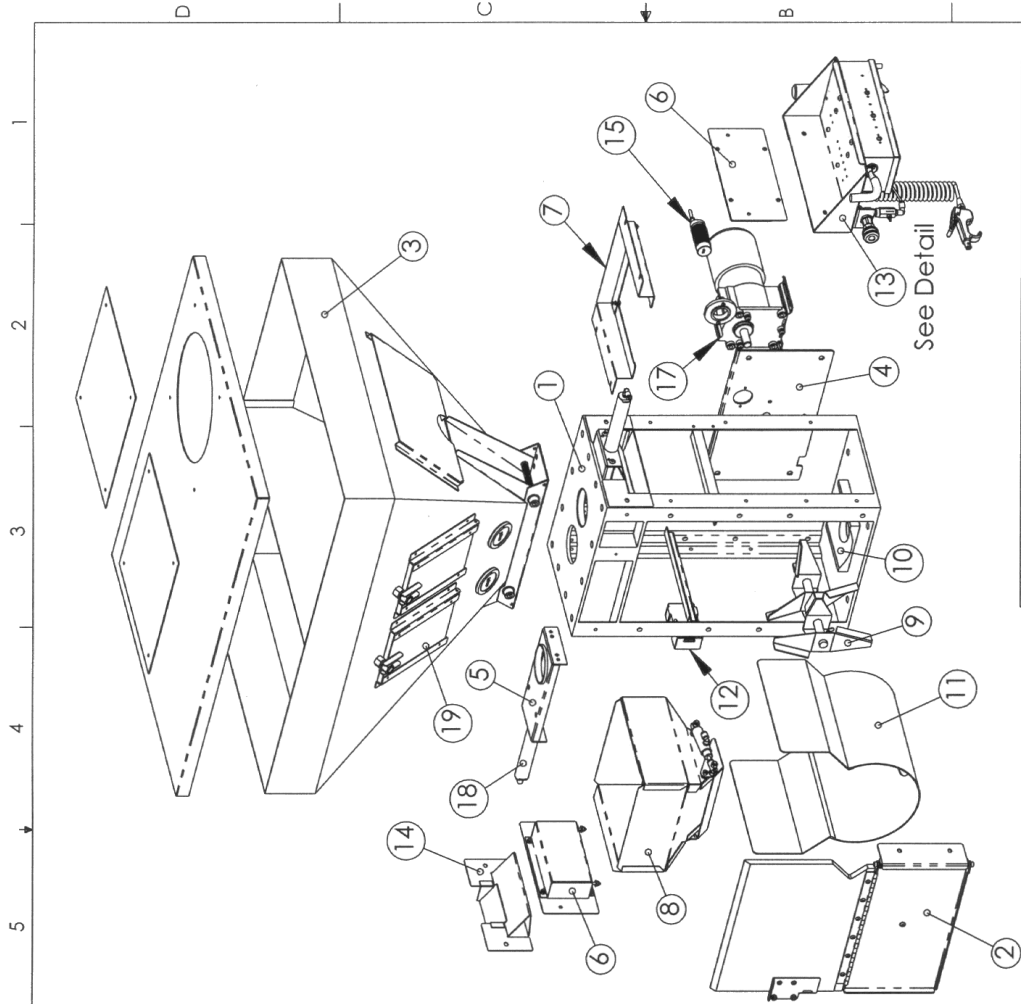


ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	501-1	Frame Assembly-140
2	1	as505-1	Hopper Assembly-140
3	1	aic-1	Load Cell Assembly-140
4	1	as05-1	Weigh Bin Assembly-140
5	1	514-1A	Mix Motor Plate-140
6	1	incR-S87	Mix Motor Plate-140
7	1	525-1w	Mix Blade Weldment-140
8	1	428	Mix Chamber Saddle-140
9	1	517-1	Mix Chamber-140
10	1	esle	Safety Interlock Switch
11	1	329	Mount-18mm Proximity Sensor
12	1	asps-02	Proximity Sensor
14	1	as06-7	Air Solenoid Set-7 valve
15	1	as539-1	Valve Assembly-140
16	1	as583-1	Front Door Assembly-140
17	1	inv24-7	Air Solenoid Set, 24V, 7 Valves
18	4	ncyl1.5	Air Cylinder, 1 1/2 Stroke, 1.06 Bore
19	4	as505-1W	WSB Hopper Window Assy-small
20	8	psa13	MPI Sight Glass

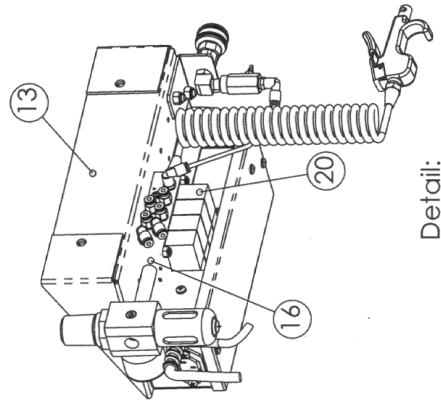
MAGUIRE

WSB 140
Exploded View

SIZE	DWG. NO.	SHEET	1 OF 1
A	EXPL-140	NAME	Sheet1
CAD FILE:	140 Exploded View	SCALE	1:2



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	1501	WSB 220 Frame
2	1	as583-2	Front Door Assy-200
3	1	as504	Hopper Assy-220/420
4	1	as08	Mix Motor Assy-200
5	2	as52	Valve Assy-3" round
6	1	alc-2	Load Cell Assy-3 kg
7	1	as05-h	Weigh Bin Holder Assy-200/400
8	1	as05-2	Weigh Bin-200
9	1	525-2w	Mix Blade-200
10	1	518-2	Mix Chamber Saddle-200
11	1	1517	Mix Chamber-200
12	1	1esle	Safety Interlock
13	1	as06-4	Air Assy-4 valve
14	2	5g22s	Side Enclosure-220/420
15	1	asps-01	Level Sensor-30mm
16	1	nv24-4	Air Solenoid Set-4 valve
17	1	mz820	Motor-60 rpm 1/6 hp PSC
18	2	ncyl5	Air Cylinder-3" stroke, 1.06 bore
19	2	as505-1w	WSB Hopper Window-small
20	4	nv24-sol	24V Solenoid Valve, 1 segment



Detail:
Rear View of Controller Tray

MAGUIRE

WSB 220
Exploded View

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:

FRACTIONS	DECIMALS	ANGLES
± 1/32	.XX ± .02	± 1°
	.XXX ± .010	

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FINISH: ---

DO NOT SCALE DRAWING

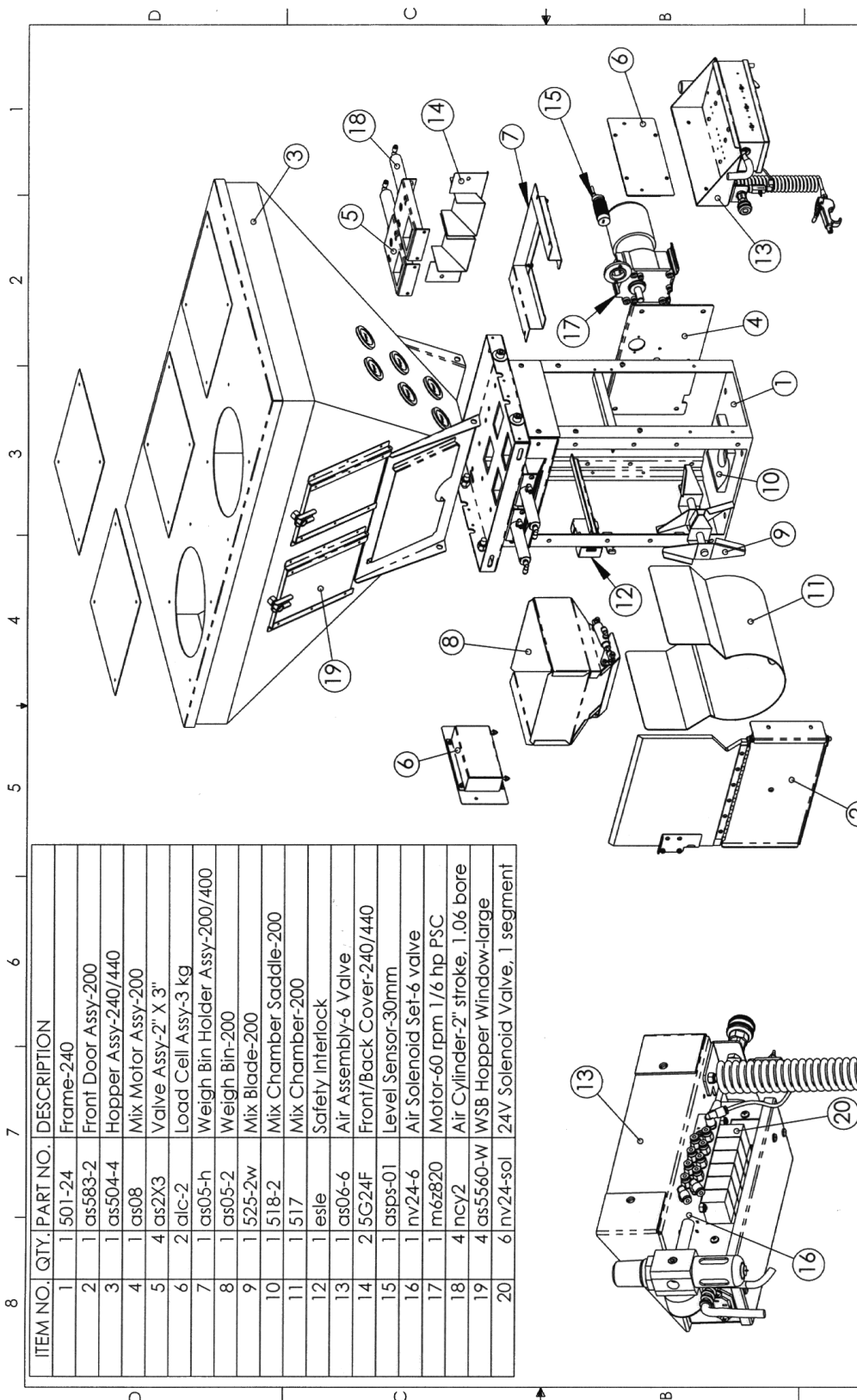
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CAD FILE: WSB-220 Exploded

NAME: Sheet
SCALE: 1:12

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ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	501-24	Frame-240
2	1	as583-2	Front Door Assy-200
3	1	as504-4	Hopper Assy-240/440
4	1	as08	Mix Motor Assy-200
5	4	as2X3	Valve Assy-2" X 3"
6	2	alc-2	Load Cell Assy-3 kg
7	1	as05-h	Weigh Bin Holder Assy-200/400
8	1	as05-2	Weigh Bin-200
9	1	525-2w	Mix Blade-200
10	1	518-2	Mix Chamber Saddle-200
11	1	517	Mix Chamber-200
12	1	esle	Safety Interlock
13	1	as06-6	Air Assembly-6 Valve
14	2	5G24F	Front/Back Cover-240/440
15	1	asps-01	Level Sensor-30mm
16	1	nv24-6	Air Solenoid Set-6 valve
17	1	m6z820	Motor-60 rpm 1/6 hp PSC
18	4	ncy2	Air Cylinder-2" stroke, 1.06 bore
19	4	as5560-W	WSB Hopper Window-large
20	6	nv24-sol	24V Solenoid Valve, 1 segment

MAGUIRE

WSB 240
Exploded View

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS	DECIMALS	ANGLES
± 1/32	.XX ± .02	± 1°
	.XXX ± .010	

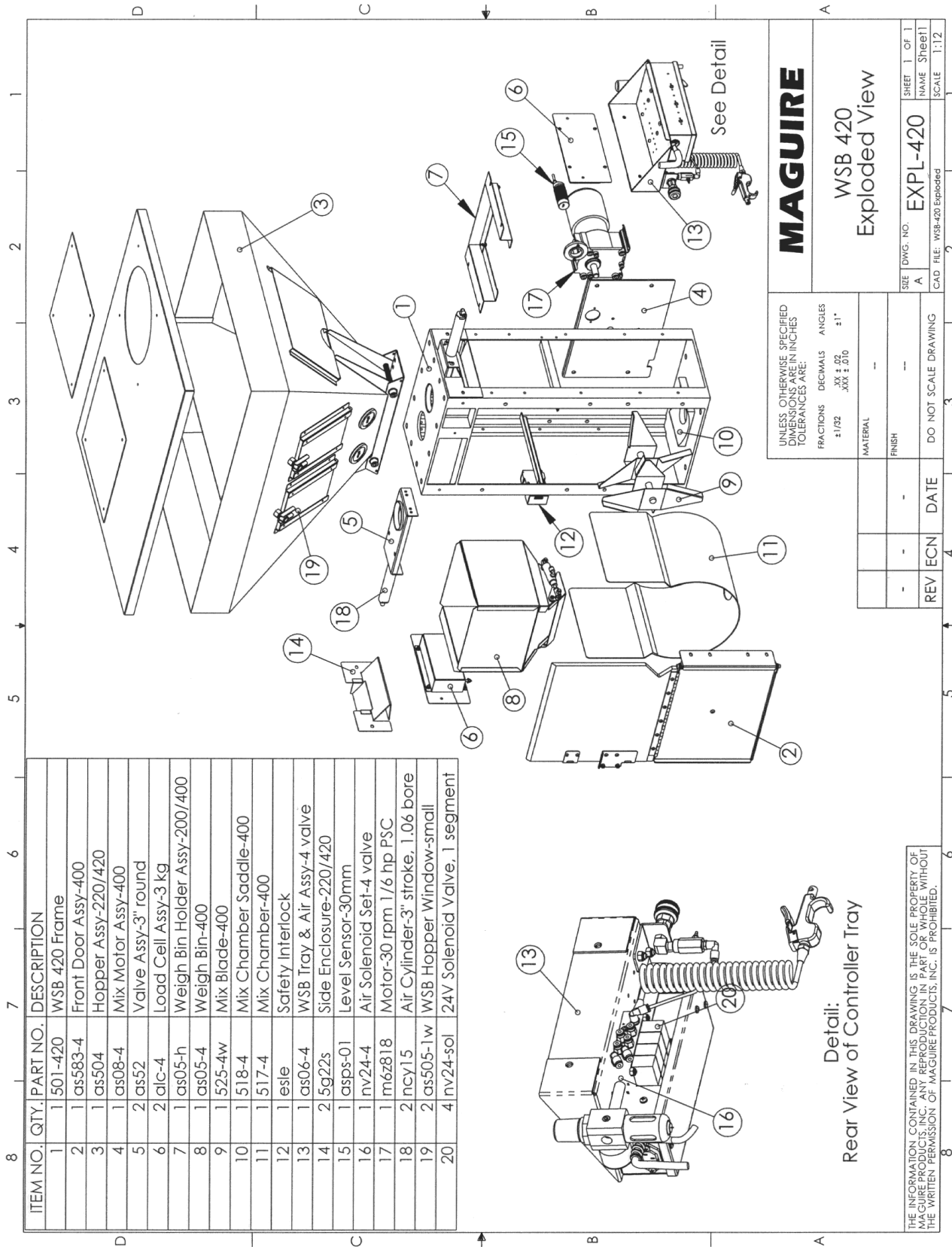
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NAME EXPL-240 SHEET 1
CAD FILE: WSB-240 Exploded SCALE 1:2

REV	ECN	DATE	DO NOT SCALE DRAWING
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Detail:
Rear View of Controller Tray

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WSB 420
Exploded View

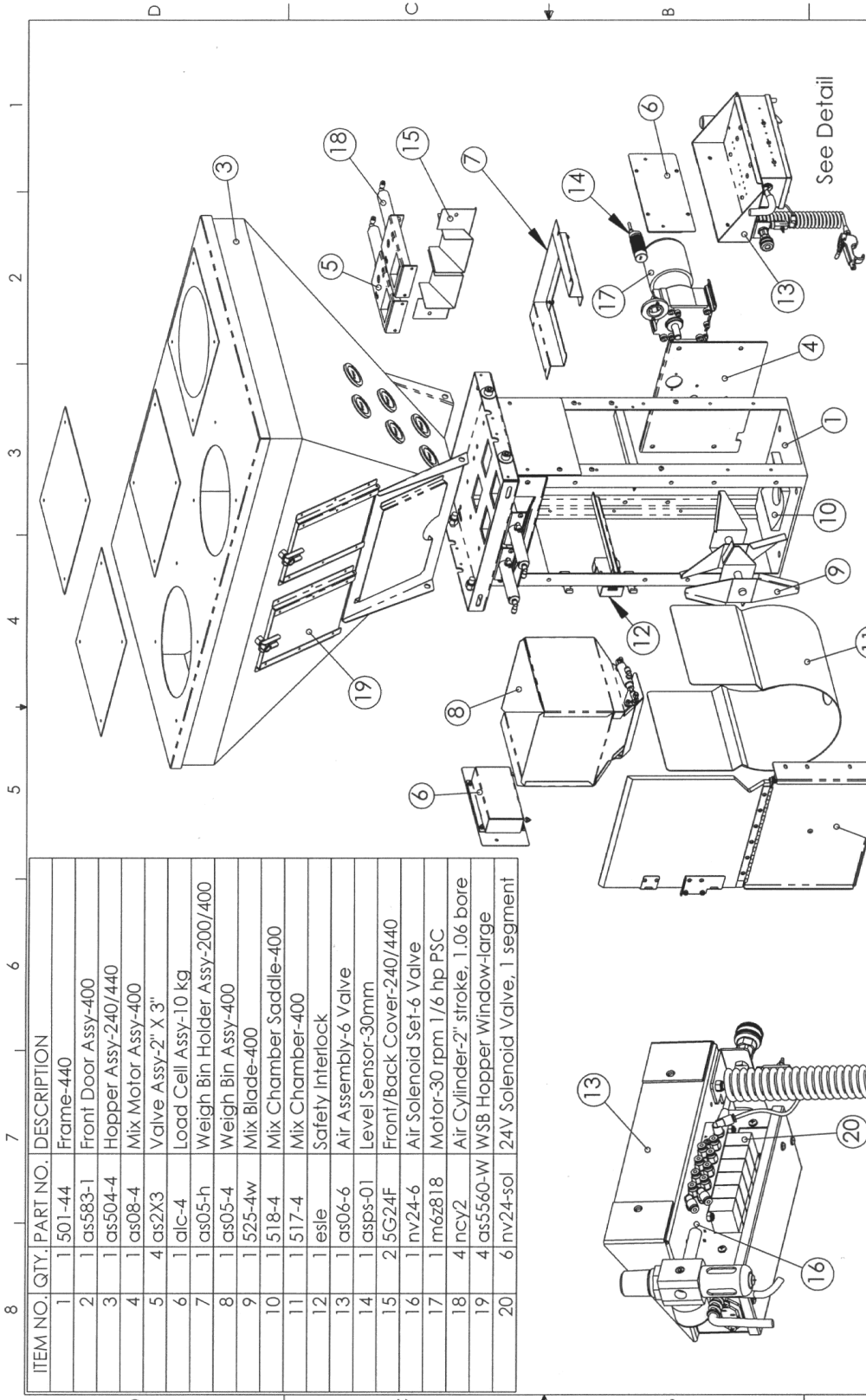
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TOLERANCES ARE:

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	XXX ± .005	

MATERIAL	---
FINISH	---

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ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	501-44	Frame-440
2	1	as583-1	Front Door Assy-400
3	1	as504-4	Hopper Assy-240/440
4	1	as08-4	Mix Motor Assy-400
5	4	as2X3	Valve Assy-2" X 3"
6	1	alc-4	Load Cell Assy-10 kg
7	1	as05-h	Weigh Bin Holder Assy-200/400
8	1	as05-4	Weigh Bin Assy-400
9	1	525-4w	Mix Blade-400
10	1	518-4	Mix Chamber Saddle-400
11	1	517-4	Mix Chamber-400
12	1	esle	Safety Interlock
13	1	as06-6	Air Assembly-6 Valve
14	1	asps-01	Level Sensor-30mm
15	2	5G24F	Front/Back Cover-240/440
16	1	nv24-6	Air Solenoid Set-6 Valve
17	1	m6z818	Motor-30 rpm 1/6 hp PSC
18	4	ncv2	Air Cylinder-2" stroke, 1.06 bore
19	4	as5560-W	WSB Hopper Window-large
20	6	nv24-sol	24V Solenoid Valve, 1 segment

MAGUIRE

WSB 440
Exploded View

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS	DECIMALS	ANGLES
± 1/32	.XX ± 0.0	± 1°
	.XXX ± 0.0	

MATERIAL: ---
FINISH: ---

DO NOT SCALE DRAWING

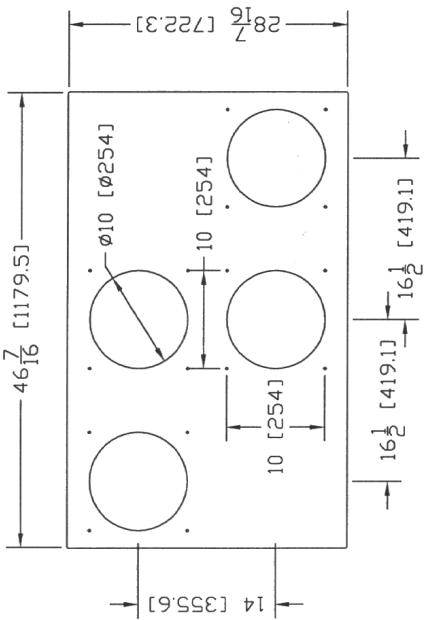
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Detail:
Rear View of Controller Tray

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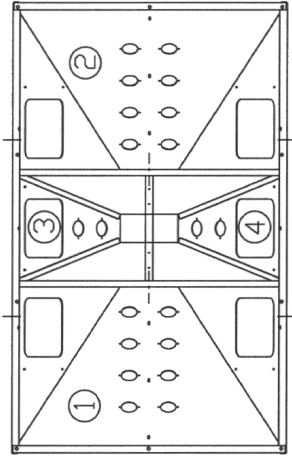
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WSB 940 HOPPER LID

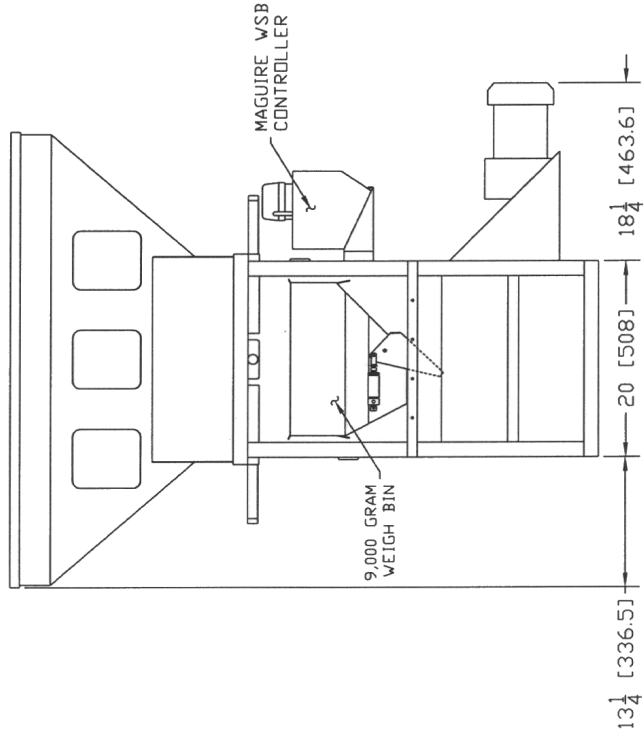


MODEL WSB-940
 * COMPARTMENTS 1 & 2 - 3.4 CU. FT. [96.3 LITRE]
 * COMPARTMENTS 3 & 4 - 1.2 CU. FT. [34 LITRE]

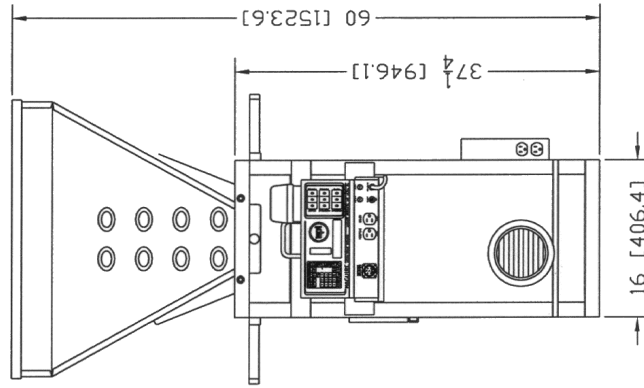
WSB 940 HOPPER-TOP VIEW



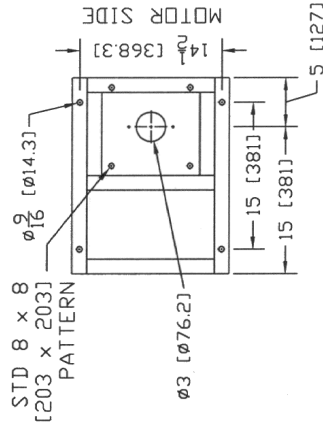
WSB 940 FRONT VIEW



WSB 940 SIDE VIEW



WSB-940 FOOTPRINT

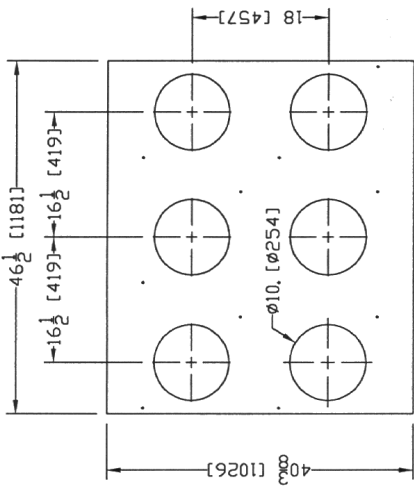


MAGUIRE WEIGH
 SCALE BLENDER
 MODEL WSB-940

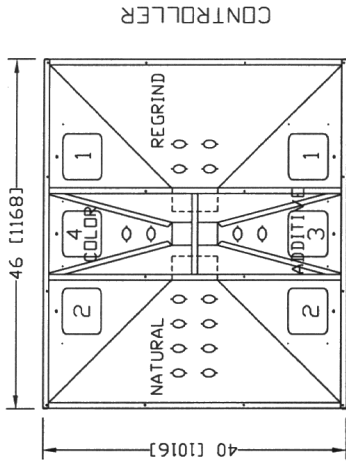
DRAWN BY:	CGC	DATE DRAWN:	11/15/94
SHEET:	1 OF 1	DATE CHANGED:	8/14/97

Maguire Products Inc
 Media, PA USA
 (610) 494-5353
 FAX: (610) 494-6194

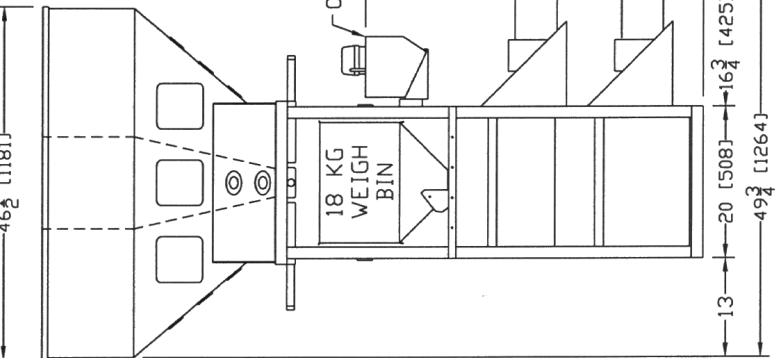
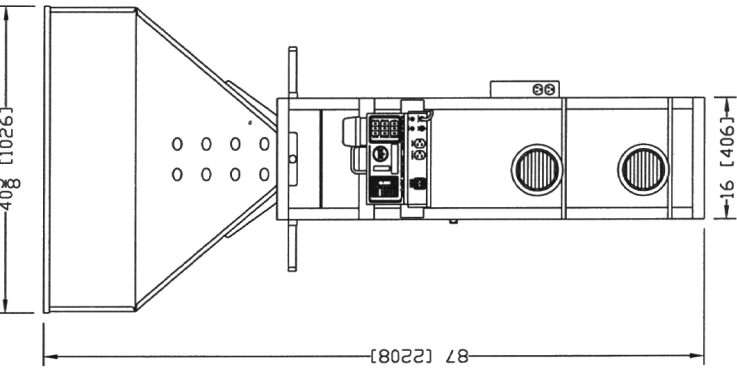
NOTE:
 COMPARTMENTS 1 & 2 ARE APPROX. 6.6CU FT [185 LITRE]
 COMPARTMENTS 3 & 4 ARE APPROX. 2.5 CU FT [70 LITRE]



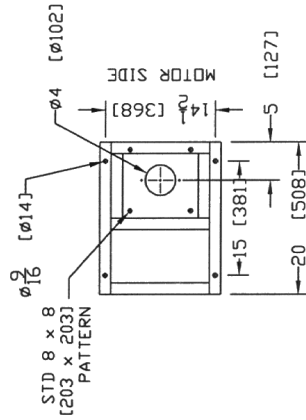
WSB-1840/1860 HOPPER LID



CONTROLLER



HOPPER ALSO AVAILABLE IN
 304 STAINLESS STEEL



WSB-1800 SERIES
 FOOTPRINT



WSB-1840
 PICTORIAL

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	SHEET:	1 OF 1	DATE CHANGED:	1/24/97

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