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# **MAGUIRE**

## **Weigh Scale Blender With "Four" Component Software**

### **OPERATION MANUAL AND MAINTENANCE MANUAL**

June 12, 2001

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**Maguire Weigh Scale Blender  
4 Software Operation & Maintenance Manual**

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# EC Declaration of Conformity



Manufacturer: Maguire Products Inc.  
Address: 11, Crozerville Road, Media, Pennsylvania, 19014, USA

Declares the following range of equipment described;

Make: Maguire Weigh Scale Blender  
Model: WSB

Conforms to the following CE directives;

EEC 89/392 Machinery Directive  
EEC 89/336 Electromagnetic Compatibility

Using the following CE standard references:

|                  |                  |
|------------------|------------------|
| CEI EN 50081-1/2 | CEI EN 55022     |
| CEI EN 55082-2   | CEI EN 61000-4-2 |
| CEI EN 61000-4-3 | CEI EN 61000-4-4 |
| CEI EN 61000-4-5 | CEI EN 61000-4-6 |
| CEI EN 60204-1   |                  |

And complies with the relevant Health and Safety requirements.

Responsible Person: Steve Maguire  
President, Maguire Products, Inc.

Please Note: All Maguire blenders shipped within Europe have a CE Certificate with the shipping documentation, which is specific to the model and serial number of the Maguire WSB blender shipped. Please refer to your shipping documentation for further information.

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# SECTION 1 – BLENDER STARTUP

## 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:

- Page 4 SAFETY HAZARDS**..... TWO HAZARDS exist on this unit: MIX BLADES and SLIDE VALVES. Read this short sensible page so no one gets hurt.
- Page 6 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 11 CHECK OUT PROCEDURE**..... This is to see if you did it right. It also will tell if anything was damaged in shipping.
- Page 15 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 19 RATE CALIBRATION**..... This is NOT really necessary. But if your system uses non-standard equipment, you MAY want to do this.
- Page 20 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 22 SPECIAL FEATURES**..... Your system can do much more then 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.

PROCEED TO: **SAFETY HAZARDS** NEXT PAGE

## Safety Hazards



### MIX BLADE HAZARD

Mix Blades are driven with substantial Torque.

Never place your hand in the Mix Chamber while the 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 Blades 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.

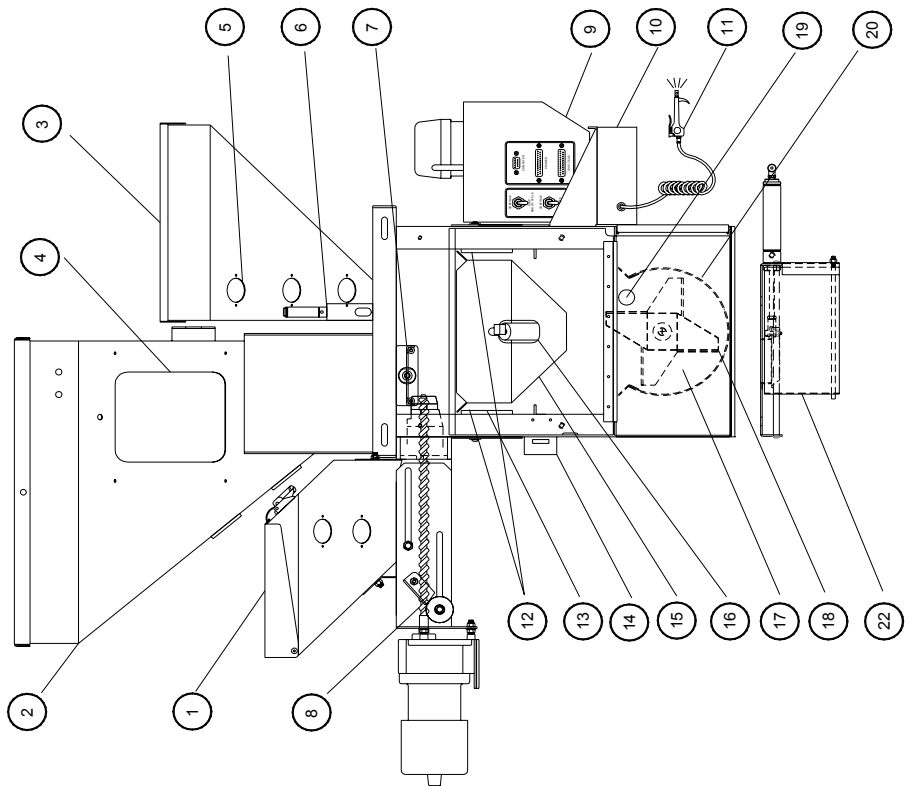
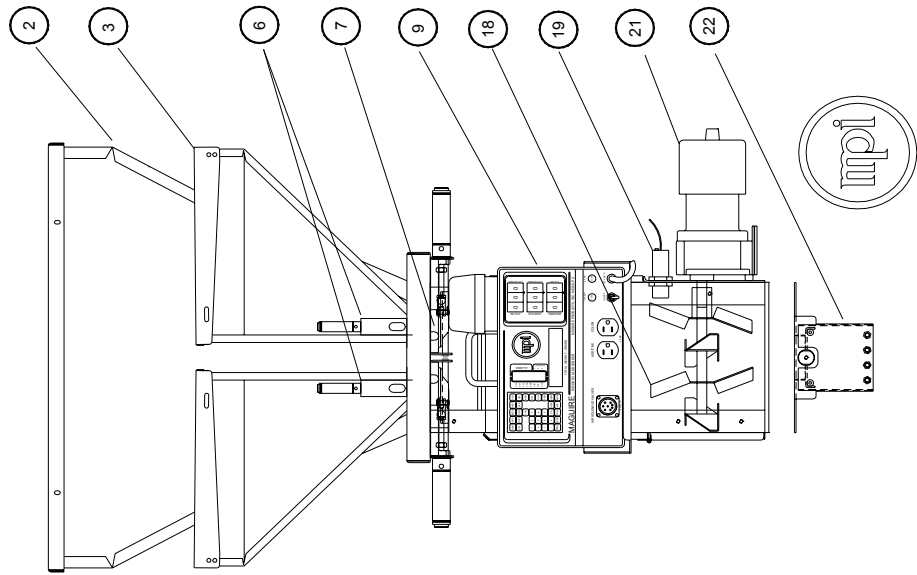
**DO NOT** defeat this safety switch.



### HOPPER FINGER GUARDS

Finger Guards are fitted into each Material 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.



# Blender Parts Key

1. Auger Feeder – Screw Feeder for feeding in small percentage materials such as Colors and Additives
2. Fixed Material Hopper – Material Hopper for main materials to be dosed by the slide gates
3. Removable Hopper – Removable Material hopper for small percentage materials such as Colors and Additives
4. Hopper Access Door – Door to access inside of hopper for quick cleaning and materials changes
5. Sight Glass – Means to view current material level inside the hopper
6. Vertical Valve – Dispense Device mounted inside removable hopper for small percentages up to 10%
7. Slide Gate – Dispense Device mounted below fixed hoppers to dispense large percentages
8. Auger Screw – Dispense Device mounted inside removable hopper for small percentages up to 10%
9. Controller – Central Controller for all settings on the blender
10. Air Assembly & Solenoids – Pneumatic assembly for activating pneumatic parts automatically and manually
11. Cleaning Airline – Airline for quick and easy cleaning of blender during materials changes
12. Load Cells – Load Cells monitor continuously the weight in the Weigh Bin
13. Load Cell Bracket – Load Cell Bracket for mounting Weigh Bin onto the Load Cells
14. Safety Interlock – Pneumatic and Electrical Safety interlock – stops blender operating if door is opened
15. Weigh Bin – Weigh Bin holds materials as materials are dispensed during a batch and weighed
16. Dump Valve – Pneumatic Valve and Flap to release materials from Weigh Bin when a batch is complete
17. Mix Chamber – Area where materials are blended together after being weighed
18. Mix Blades – Removable Mix Blades to fold the materials together to achieve an effective blend
19. Level Sensor – Sensor to monitor material level in the Mix Chamber, pauses blender when covered and mix chamber is full, once uncovered signals Controller to begin a new batch of material.
20. Mix Chamber Insert – Stainless Steel removable insert to assist in quick materials cleaning and changes
21. Mix Motor – Electric Motor to drive Mix Blades – Note on WSB MB and WSB 100 Series blenders this motor is a pneumatic Mix Motor
22. Flow Control Valve – (Optional) – Additional pneumatic slide gate with finger guards to be used when blender is not mounted directly on the throat of a machine but instead a stand or surge hopper. The Flow Control Valve ensures material remains inside the Mix Chamber long enough to be mixed efficiently. Automatically controlled by the blender Controller.





# Controller Parts Key

## 1. Front Panel

- 1.1 Keypad
- 1.2 LED Status Display
- 1.3 Main Display
- 1.4 Alarm Beacon
- 1.5 Materials Thumbwheels
- 1.6 Fuses
- 1.7 Power Cord
- 1.8 On / Off Switch
- 1.9 Outputs for additional Feeders  
(**NOTE – Feeder Outputs** – These 2 outputs are not available on WSB MB and WSB 100 Series Blenders.)
- 1.10 Options - High Sensor Mount or Remote Alarm Output
- 1.11 Air Solenoid Connection
- 1.12 Optional – Low Sensor Mount

## 2. Left Side Panel

- 2.1 Stop End of Cycle / Continue Switch
- 2.2 Computer Serial Connection / Optional Fieldbus Connection
- 2.3 Printer Parallel Output
- 2.4 Load Cell Port Input
- 2.5 Optional – Extrusion Control 2 Way Interface
- 2.6 Immediate Pause / Continue Switch

## 3. Right Side Panel

- 3.1 Silence Alarm Press Down Button
- 3.2 Electrical Mix Motor Operation Switch – Timed (Default), On or Off
- 3.3 Electrical Mixer Output Fuse
- 3.4 Electrical Mix Motor Power Plug  
(**NOTE – Mixing Controls** – These 3 features not available on WSB MB and WSB 100 Series Blenders – fitted instead with Pneumatic Mixers.)
- 3.5 Mix Chamber Level Sensor Input
- 3.6 Audible Alarm Loudspeaker

# 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. Contact Maguire if you require them.

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

*For WSB MB, 100, 200, and 400 series models:*

Two ways to do this are suggested ON THE NEXT PAGE:

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 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:

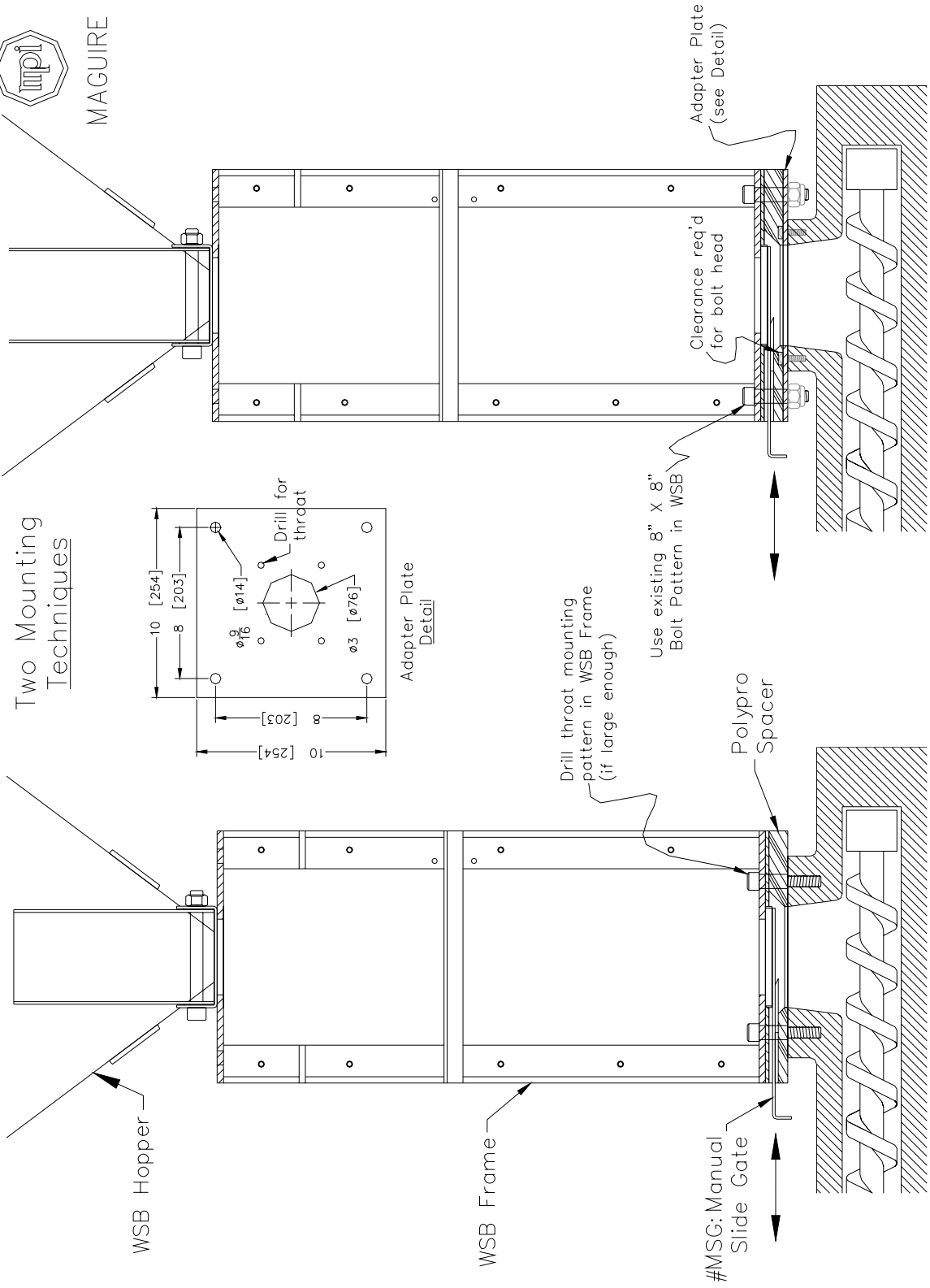
A stand is provided and your unit will bolt directly to it. An assembly DIAGRAM is provided on the following pages.

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 Weigh Scale Blender frame.



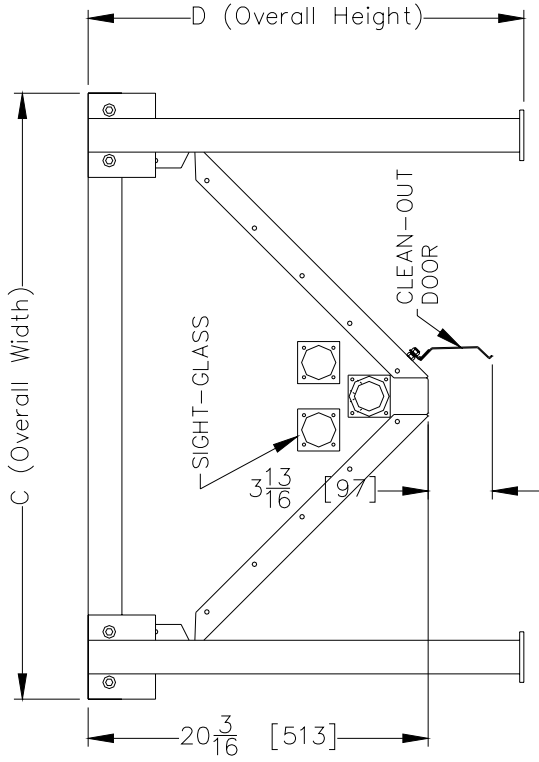
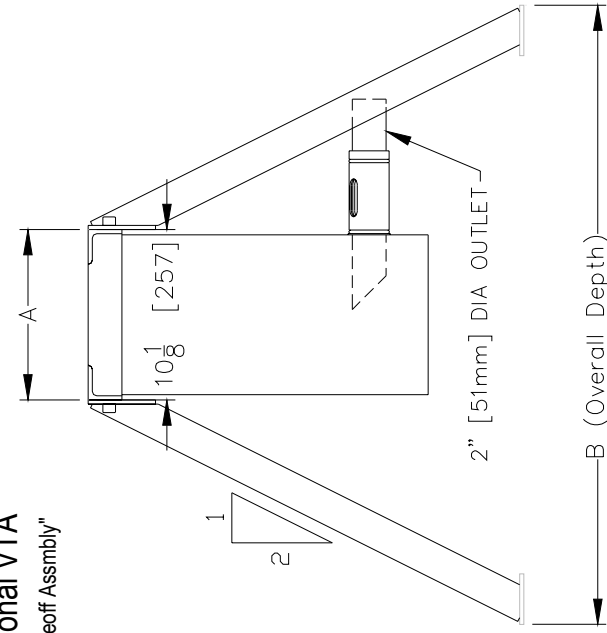
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### Two Mounting Techniques



**WSB STANDS**  
With Optional VTA  
"Vacuum Takeoff Assembly"

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**MAXIMUM CAPACITY:**

100/200/400: 2.2 cu. ft. [62 L]

900/1800: 3.6 cu. ft. [101 L]

**PRACTICAL CAPACITY:**

100/200/400: 1.4 cu. ft. [40 L]

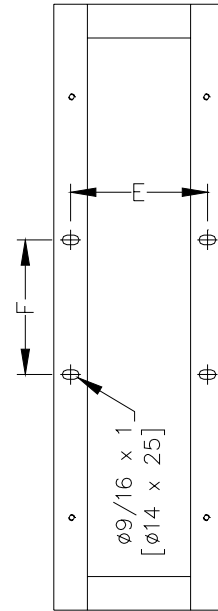
900/1800: 2.3 cu. ft. [65 L]

**NOTE:**  
WSB 100/200/400 VTA Stand shown to scale.

**STAND DIMENSIONS**

DIMS IN [ ] ARE mm.

|                 | A            | B             | C         | D             | E            | F        |
|-----------------|--------------|---------------|-----------|---------------|--------------|----------|
| WSB 100/200/400 |              |               |           |               |              |          |
| VTA             | 10-1/8 [257] | 37-1/4 [946]  | 36 [914]  | 25-7/8 [657]  | 8-1/8 [206]  | 8 [203]  |
| Barrel          | 10-1/8 [257] | 51-1/4 [1302] | 36 [914]  | 39-7/8 [1012] | 8-1/8 [206]  | 8 [203]  |
| Gaylord         | 10-1/8 [257] | 63-1/4 [1607] | 56 [1422] | 51-7/8 [1318] | 8-1/8 [206]  | 8 [203]  |
| WSB 900/1800    |              |               |           |               |              |          |
| VTA             | 16-1/8 [410] | 43-1/4 [1099] | 36 [914]  | 25-7/8 [657]  | 14-1/8 [359] | 15 [381] |
| Barrel          | 16-1/8 [410] | 57-1/4 [1454] | 36 [914]  | 39-7/8 [1012] | 14-1/8 [359] | 15 [381] |
| Gaylord         | 16-1/8 [410] | 69-1/4 [1759] | 56 [1422] | 51-7/8 [1318] | 14-1/8 [359] | 15 [381] |



**TOP-FRAME DETAIL**  
2 x 2 x 1/4 STEEL ANGLE

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: (Optional)
  - 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 USA).

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 Compressed Air to the unit.

About 80 psi (5.5 bar) is recommended (40 psi for the Micro Blender). Lubricated air is NOT recommended.  
**NOTE:** Micro Blenders should be set to 40 psi (2.7 bar). The Vertical Valves used in removable hoppers on 100, and 200 series blenders are more accurate at the lower 60 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:

- 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.
- 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 WSB steel enclosure causing computer trouble.
- 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.
- The CONTROLLER and the 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.

- 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.

- 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.
- We use many internal tooth "STAR" washers in assembling the WSB to ensure good ground between painted parts. Do not remove them.

# Check Out Procedure

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

**PLEASE NOTE:** 100/200 series models (3K load cells), display all weights in 1/10 grams (xxxx.x).  
400/900/1800 series models (10K load cells) display weights in FULL grams, NO decimal point (xxxxx).

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:

### 1. POWER UP CONTROLLER

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:  
(MB, 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.


### 2. OPERATE DISPENSE DEVICES

PRESS 


Display will say (PASSWORD)

PRESS 


Enters the PROGRAM mode. 2's will be displayed as you enter them.  
Display will show (P x) when done.

PRESS 

Display will say (OPERATE)

PRESS 

Regrind Slide Gate will operate.  
LED # 1 will light.  
Press "REG" repeatedly to observe operation.

PRESS 






Natural Slide Gate will operate.  
LED # 2 will light.  
Press "NAT" repeatedly to observe operation.

REPEAT THIS SEQUENCE

Repeat process with COL & ADD for each dispense valve on your WEIGH SCALE BLENDER. Only those connected to devices will operate.



### 3. OPERATE OTHER DEVICES

- PRESS  The weigh bin air solenoid will operate.  
LED # 5 will light.  
The weigh bin dump valve will open.  
Press, "DUMP" repeatedly to observe operation.
- PRESS  This key controls the mix motor outlet on the side of the controller.  
The mixer motor will run.  
LED # 7 will light.  
Mix blade turns clockwise facing the motor shaft or 270° on Pneumatic Mix Motors.  
Mixer switch must be down; timed position.
- PRESS  The Flow Control Valve will operate.  
(Under the mix chamber - this device is optional)  
LED # 8 will light.
- PRESS  The Strobe light and Beeper will operate.  
LED # 6 will light.
- PRESS  Press twice, to return to normal mode.  
Verify normal mode by observing that there is NO letter P in the display ( x).

If you have made it this far, congratulations.  
You have done well.  
The load cells and controller are functioning properly.



**LOAD CELL CALIBRATION – SKIP 2 PAGES**

# Check Out Procedure Diagnostics

## **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 (TWELVE):**

Then this is NOT the correct manual for this software. Obtain and use a TWELVE software manual.

## **Possible model numbers are:**

MB, 122, 131, 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 USA).

## Selecting the Correct Model

Controllers are programmed to control all sizes of Weigh Scale 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:

| Blender Model    | Blender Display Code | Batch Weight (Grams) | Weigh Bin Dimensions | Load Cell Rating |
|------------------|----------------------|----------------------|----------------------|------------------|
| MB               | MB                   | 400                  | 5" x 5" x 5" High    | 1 @ 3Kg          |
| 140 / 140R       | 140 / 14R            | 1000                 | 10" x 6" x 6" High   | 1 @ 3Kg          |
| 220              | 220                  | 2000                 | 10" x 10" x 7" High  | 2 @ 3 Kg         |
| 240 / 240R / 260 | 240/24R              | 2000                 | 10" x 10" x 7" High  | 2 @ 3 Kg         |
| 420              | 420                  | 4000                 | 10" x 10" x 10" High | 2 @ 10 Kg        |
| 440 / 440R / 460 | 440/44R              | 4000                 | 10" x 10" x 10" High | 2 @ 10 Kg        |
| 940 / 960        | 940                  | 9000                 | 16" x 16" x 12" High | 2 @ 10 Kg        |
| 1840 / 1860      | 1840                 | 18000                | 16" x 16" x 17" High | 2 @ 20 Kg        |

"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:

**Model Setup Keypad Sequence:**

Press  Display will say: (PASSWORD)

Press  Display will say: (MODEL 220)  
Or  
Whatever model it is currently set for.

Press  To scroll through all model sizes.  
When the model you want is displayed, then:

Press  Wait a few seconds.  
Controller 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.

If you should be in any doubt as to which is the correct model you should select please stop and contact your local Maguire representative who will inform you by return.

# SECTION 2 - OPERATION

## Load Cell Calibration

**NOTE:** Displays shown here are in full grams. MB, 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:

Materials Rate Calibration (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.


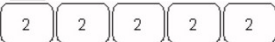





BE SURE the air line to the dump valve is connected, as it would be during normal operation. A disconnected air line adds weight.

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:

| Load Cell Zero Calibration Keypad Sequence: |                                                                                     |                                                      |
|---------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|
| Press                                       |  | Display will say: (PASSWORD)                         |
| Press                                       |  | Display will say: (P x)                              |
| Press                                       |  | Display will say: (CAL OFF)                          |
| Press                                       |  | Display will say: (CAL ON)                           |
| Press                                       |  | Display will say: (P x)                              |
| Press                                       |  | Display will say: (-- WAIT --)<br>Followed by: (P 0) |
| Press                                       |  | 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: **MATERIAL RATE CALIBRATION** NEXT PAGE

# Materials Rate Calibration

YOU DO NOT 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:


PROCEED TO: **ENTERING SETTINGS** NEXT PAGE






If you wish 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.



**Material Calibration Keypad Sequence:**


Press  Display will say: (PASSWORD)

Press      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  Display will say: (OPERATE)

Press  **or**  Run until Dispense Device is dispensing


Press  This will empty the Weigh Bin

Now you can CALIBRATE the material. To do so:

Press  Display will say: (CALIBRATE)

Press  COL will calibrate itself.

For each material, press CAL followed by the proper component key. Each time a dispense will occur, followed by weighing, followed by a dump to empty the weigh bin.

Press  Display will say: ( x)

YOU ARE NOW READY FOR ACCURATE PRODUCTION BLENDING.

PROCEED TO: **SPECIAL INSTRUCTIONS** NEXT PAGE

## Special Instructions for Selected Models

This section relates SPECIAL information about a few selected models.

### MICRO PULSE

Micro Pulse valves are available on models:

|                         |                                                  |
|-------------------------|--------------------------------------------------|
| WSB MB                  | with optional VERTICAL VALVE MICRO PULSE valves. |
| WSB 122 / WSB 140m2     | with optional SLIDE GATE MICRO PULSE valves.     |
| WSB 131 / WSB 140m1     | with optional SLIDE GATE MICRO PULSE valves.     |
| WSB 140Rm1 / WSB 140Rm2 | with optional VERTICAL VALVE MICRO PULSE valves. |
| WSB 240Rm1 / WSB 240Rm2 | with optional VERTICAL VALVE MICRO PULSE valves. |
| WSB 440Rm1 / WSB 440Rm2 | with optional VERTICAL VALVE 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 airflow 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 airflow 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.



[INSTRUCTIONS FOR NORMAL OPERATION](#)

# Instructions for Normal Operation

Operation is very simple.

1. Fill HOPPERS: REGRIND, NATURAL, COLOUR, ADDITIVE in hoppers as labeled. If auger feeders are used COLOUR is the RIGHT side feeder and ADDITIVE is the LEFT side feeder.

2. Set THUMBWHEEL switches for percentage of materials desired:

|          |                                                                  |
|----------|------------------------------------------------------------------|
| REGRIND  | enter as a percentage of the entire mix – no decimal place (xx%) |
| COLOUR   | as a percentage of the Natural (xx.x%)                           |
| ADDITIVE | as a percentage of the NATURAL (xx.x%)                           |

3. On Controller, turn POWER ON, set STOP, and PAUSE switches UP. Switch MIXER motor DOWN to run for a timed period each cycle.

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 dispensing of material. Turn POWER off only on final shutdown. Battery-backed RAM ensures all information is retained even with power turned off.






The KEYPAD is only for: 1. MANUAL TESTING.  
2. ALTERATION of INTERNAL PARAMETERS

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:

**Save Parameters Keypad Sequence:**

|                                    |                                                                                     |                              |
|------------------------------------|-------------------------------------------------------------------------------------|------------------------------|
| Press                              |  | Display will say: (PASSWORD) |
| Press                              |  | Display will say: (P    x)   |
| Press                              |  | Display will say: (INSTR __) |
| Press                              |  | Display will say: (SAVING )  |
| Wait: when done, Display will say: | (P    x)                                                                            |                              |
| Press                              |  | 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:

**Retrieve Parameters (CLEAR) from EEPROM Keypad Sequence:**

|                                                          |                                                                                     |                             |
|----------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------|
| Switch                                                   |                                                                                     | Power Off to the Controller |
| Hold                                                     |  | Hold the "CE" Key down      |
| Switch                                                   |                                                                                     | Power on to the Controller  |
| 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 depends on model; 400, 1000, 2000, 4000, 9000, or 18000 grams.

REGRIND, if requested, will dispense first. After the Regrind dispense the space remaining in the weigh bin is calculated.

NATURAL will dispense second. This dispense is calculated to fill the bin leaving just enough space for the Color and Additive dispenses. After the Natural dispense is complete the exact weight of this dispense is calculated and, based on this actual dispense weight, the Color and Additive dispenses are now calculated.

COLOR and ADDITIVE are now dispensed one at a time as requested. These dispenses are a percentage of the Natural component only.





If the Natural, Color, or Additive components fail to reach the requested weight, the process does NOT CONTINUE. The **ALARM** Strobe light flashes and the system holds until the problem is remedied.

As each component is being dispensed and weighed, the corresponding letter (R, N, C, or A) is displayed. The total updated bin weight is displayed about 3 seconds AFTER each dispense.

Each dispense weight is checked and recorded. Rate recalibration takes place every cycle to ensure continuous process accuracy. The total batch is dropped into the mixing chamber and blended 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.

| Function:      | Key:                                                                                | Description:                                                                                                                                                                        |
|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TAG</b>     |  | To <b>TAG</b> 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. |
| <b>RECIPES</b> |  | To store <b>RECIPES</b> using the RECIPE storage feature, read: KEYPAD, RECIPE key, and set 3rd digit in the FLG parameter to 1.                                                    |
| <b>FAST</b>    |  | To increase throughput, using the <b>FAST</b> key, read: KEYPAD, FAST key, and set 4th digit in the FLG parameter to 1.                                                             |
| <b>BATCH</b>   |  | To blend a preset <b>BATCH</b> 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.

**SETTINGS** To use a lower percentage than 00.1 percent, read: PARAMETERS, \_XT parameter.

**MIXING** To change the **MIXER RUN TIME**, read: PARAMETERS, MIX Parameter.

**SETTINGS** To place **UPPER LIMITS** on settings, read: PARAMETERS, \_SE Parameter.

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

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

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

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



KEYSTROKE SEQUENCE for these or other SPECIAL FEATURES:

### Making Changes to Parameters - Keypad Sequence:


Switch the **STOP END OF CYCLE** switch **DOWN**:

Turn **POWER ON**. Wait 5 seconds, until display says ( x)

Press  Display will say: (PASSWORD)


Press  Display will say: (P x)  
This is the **PROGRAM MODE**

To alter a **PARAMETER**:

Press  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  Display will say: ( P x)

Press  Display will say: (SAVING )  
This saves the changes made

Press  Display will say: ( P x) when settings are complete.

### Making Changes to \* Functions - Keypad Sequence:

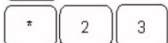
Press  Display will say: (PASSWORD)

Press  Display will say: (P x)  
This is the **PROGRAM MODE**

Press  Display will say: (INSTR \_\_)

Press **xx** Enter the 2-digit code.  
For correct entries, follow specific directions given in the **KEYPAD** section, **STAR FUNCTIONS**.

Press  Display will say: ( P x)

Press  Display will say: (SAVING )  
This saves the changes made

Press  Display will say: ( x) when settings are complete.

# Controller: 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. REGRIND thumbwheel switch (00 to 99)

This setting represents the PERCENT of the ENTIRE MIX that is to be REGRIND.

A lower limit of 5% (05) has been entered into the software. This limit may be altered using the keypad (see parameters, RLO). A setting of "99" causes the system to run 100 percent regrind. With this setting, no attempt is made to meter natural, color, or additive unless the regrind dispense fills less than 1/2 of the weigh bin.

## 5. COLOR thumbwheel switch (00.0 to 99.9)

This setting represents the PERCENT of the NATURAL PORTION that is to be COLOR. For example, if your COLOR to NATURAL mix ratio is 1:25 then "04.0" is the proper setting. (1 pound of color to 25 pounds of natural is  $1/25 = 4\%$ )

## 6. ADDITIVE thumbwheel switch (00.0 to 99.9)

This setting represents the PERCENT of the NATURAL PORTION that is to be ADDITIVE. For example, if your ADDITIVE to NATURAL mix ratio is 1:100 then "01.0" is the proper setting ( $1/100 = 1\%$ ).

## 7. ALL AIR SOLENOID outputs

This is a single 17 pin Amphanol plug located on the front of the control panel. This provides 24 volt power for the NATURAL, REGRIND, WEIGH BIN DUMP, and FLOW CONTROL (optional) air solenoids. On Models 140, 240, 440, 940, and 1840 (FOUR valve units), COLOR and ADDITIVE dispense valve solenoids are also powered. 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.

## 8. COLOR and ADDITIVE power outlets (certain models only)

Each outlet puts out 120 volts (220 volts outside U.S.A.) through internal plug-in solid state relays rated at 5 amps and fused at 3 amps. These relay outputs are designed to drive motors or other devices requiring power up to 3 amps each.

The COLOR outlet is driven based on the COLOR setting. The ADDITIVE outlet follows the ADDITIVE setting. COLOR dispense occurs first but has no effect on the ADDITIVE dispense. The amount of each dispense is calculated based on the NATURAL dispense that precedes them.

## 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.

|            |                                                                                                                                                                                                         |                                                                                                                                                                                                                                |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R, N, C, A | Indicates a material component being dispensed.                                                                                                                                                         |                                                                                                                                                                                                                                |
| INVALID    | Indicates:                                                                                                                                                                                              | <ol style="list-style-type: none"> <li>1. You pressed an incorrect key - or</li> <li>2. You pressed a key for a function that is not active - or</li> <li>3. You are not in the right mode for this key to operate.</li> </ol> |
| PASSWORD   | Password is displayed when you press the "*" key from the normal mode.<br>Enter "11111" for MANUAL mode or "22222" for PROGRAM mode - or<br>Enter your own password number if you have established one. |                                                                                                                                                                                                                                |
| INSTR --   | This is displayed when you press the "*" key from the PROGRAM mode.<br>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; REG, NAT, COL, ADD, 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:

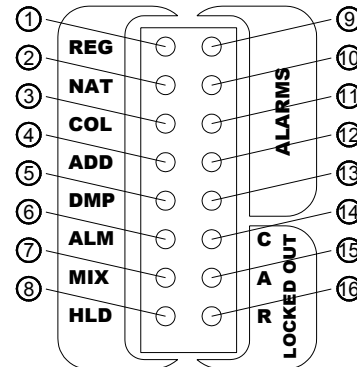
LEFT COLUMN:

1. REG Regrind dump solenoid operating.
2. NAT Natural dump solenoid operating.
3. COL Color drive relay operating.
4. ADD Additive drive relay operating.
5. DMP Dump valve solenoid operating.
6. ALM Alarm output operating.
7. MIX Mixer motor drive relay operating.
8. HLD Mixer flow valve is open (Optional).

RIGHT COLUMN:

ALARMS

9. Alarm is on because Regrind ran out.
10. Alarm is on because Natural ran out.
11. Alarm is on because Color ran out.
12. Alarm is on because Additive ran out.
13. Alarm is on because Weigh bin is not within limits.



14. C Color thumbwheel switches are locked out and the setting being used does not match the thumbwheel setting.
15. A Additive thumbwheel switches are locked out and the setting being used does not match the thumbwheel setting.
16. R Regrind thumbwheel switches are locked out and the setting being used does not match the thumbwheel setting.

## 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 continuously when the MIXER SWITCH is ON (up). In the TIMED position, it stays energized for a time period following the dump of the weigh bin. You may adjust this time in the parameter table (MIX 03015). 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.

## 12. MIXER MOTOR ON/OFF/TIMED SWITCH

The Mixer ON/OFF/TIMED switch is provided as an additional safety so that you may switch the mixer off when you wish to clean out the mix chamber. In the UP position (ON), the mixer runs continuously. In the middle position (OFF) the mixer is off. In the down position, the mixer will run for a timed period following the dump of the weigh bin. The TIMED position is generally the correct choice.

## 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

On systems with two load cells the leads 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 output 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 Weigh Scale Blender. This software allows downloading settings and retrieval of information and will produce 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 WSB controllers are fully programmed to communicate with your computer now or at a later date. For more information, request our "MLAN" (Maguire Local Area Network) or "G2" software manuals.

## 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**

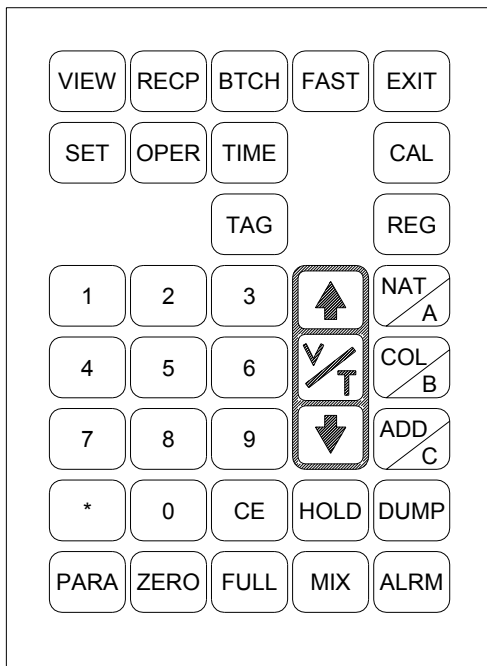
An in-line fuse is provided internally to protect the main 120-volt power cord supply (10) amps. If this fuses blow, an internal short circuit is indicated and we don't recommend that you try to fix it. Remember, this unit carries a five-year warranty; just send it back.

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

# Controller 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, and 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 OR PROGRAM 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 ONLY: 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.

# Controller 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 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 :       | (CY= #####) |
| Weight of REGRIND that has been dispensed : | (R = #####) |
| Weight of NATURAL :                         | (N = #####) |
| Weight of COLOR :                           | (C = #####) |
| Weight of ADDITIVE :                        | (A = #####) |
| 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 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



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

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.

## TAG

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 (x1xxx). 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 cannot 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; REG, NAT, COL, ADD, 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:

**SETTING** Press once followed by one of 3 keys: REG, COL, or ADD. The (SET)current thumbwheel setting is displayed. If, while in the program mode, the keypad was used to enter this setting then it will not match the thumbwheel setting.



EXIT will exit the sequence.

**OPERATE** Press once followed by one of 16 keys: 1 through REG, NAT, COL, ADD, 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 4 component keys. A time in 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 4 component keys. 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 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 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 WEIGH SCALE 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:



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.



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.

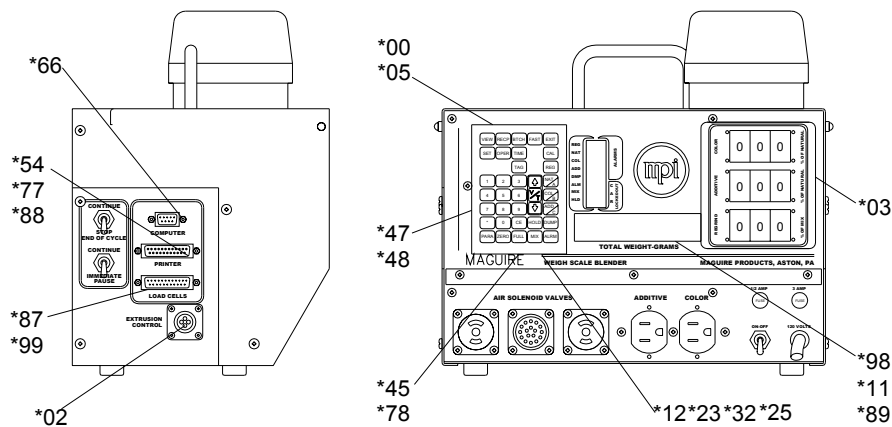
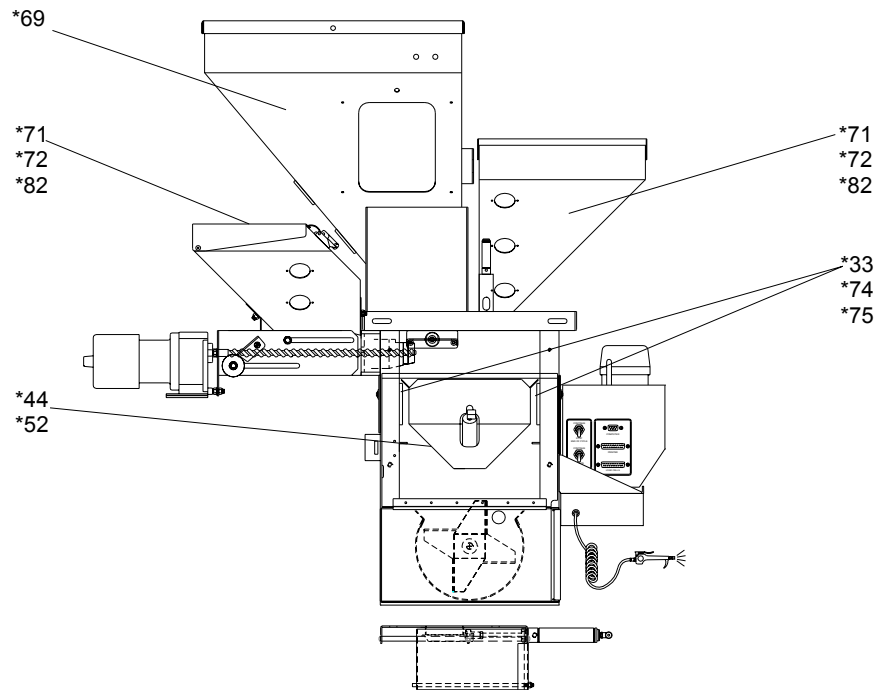
Just as with the MANUAL mode, you can enter this mode only when the controller is between cycles. The sensor must be covered or the STOP switch must be in the "STOP - END OF CYCLE" position. In the MANUAL mode, no automatic dispensing will occur.

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.

Press the PARA key to display the table of operating (PARA) parameters that reside in memory. There are more than 60 parameters, and each successive press of the key displays the next parameter in the table. Pressing the "\*" key allows you to back-up in the table. You may change a parameter by entering a new number over the old one. CE will cancel a number entry before the last digit is entered. All parameters are fully explained several pages forward in this manual. EXIT will exit the sequence.

## Star Functions - What they relate to:



|     |                                |     |                              |     |                              |
|-----|--------------------------------|-----|------------------------------|-----|------------------------------|
| *02 | Extrusion and Yield Control    | *05 | Inhibit Table Clearing       | *11 | Set Date and Time            |
| *12 | Move table from ROM to RAM     | *23 | Move from RAM to EEPROM      | *32 | Move from EEPROM to RAM      |
| *25 | ROM OK flag, "CE" to clear     | *33 | Special Alarms               | *44 | End cycle - bin full         |
| *45 | Change MANUAL mode password    | *47 | Totalizer flag               | *52 | Double dump weigh bin        |
| *54 | Print cycle information        | *57 | For Liquid Color PIAD system | *66 | 66 WSB I.D. number (1-255)   |
| *69 | Regrind as second natural      | *71 | 71 Color percent of blend    | *72 | 72 Additive percent of blend |
| *74 | 74 Stop, alarm MAX wt exceeded | *75 | 75 Alarm on weight drop      | *77 | Print parameters             |
| *78 | Change program mode password   | *82 | Precision Ratioing           | *87 | VOLUMETRIC operation         |
| *88 | Print display readout          | *89 | Select pounds, kilos         | *98 | Display raw weight number    |

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

# Star Functions

Star Functions are only available in PROGRAM mode:

\* 0 2

## 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.

\* 0 3

## 4 Digit Entry of Settings – xx.xx

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 xx.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.

\* 0 5

## Prevent Totals being Cleared

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).

\* 1 1

## Set System Date and Time

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.

\* 1 2

## Save System Settings from ROM to RAM

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.

\* 2 3

#### **Save System Settings from RAM to EEPROM**

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.

\* 3 2

#### **Save System Settings from EEPROM to RAM**

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.

\* 2 5

#### **ROM Check Flag**

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.

\* 3 3

#### **Batch Processing Alarm**

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.

\* 4 4

### End Cycle Full

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 instructions to do otherwise.

\* 4 5

### Change Manual Mode Password

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.

\* 4 7

### WSD Systems Only – Change Weight Dispense Range

Special function - WSD DISPENSE systems only.

This function alters the range of requested dispense weights. 00.1 to 99.9 is standard. 001 to 999 is optional using this function. Dispense systems are generally used for rotational molding.

\* 5 2

### Weigh Bin Double Dump

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.

\* 5 4

### Cycle-by-Cycle Printout

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.

\* 5 7

### For LIQUID COLOUR Applications only

This function operates in conjunction with an additional two air solenoids mounted on the blender frame.

Press (\*,5,7) to allow automatic switch over to a full drum when the current drum of color runs out. When function is off, display will say (COL= 4 ). Press \* to toggle to (COL= 4+7). When display says (COL= 4 ), the color setting applies to output 4 only, the standard COLOR output. When display says (COL= 4+7), this means that output 4 is the starting output, and when no weight is detected after a dispense, the output switches to output 7. The "7" is determined by the parameter (LIQ 00007). You can change the secondary output by changing the parameter.

If output 7 is also empty, the output switches back to 4.

\* 6 6

### Set Blender ID#

Press (\*,6,6) to enter an identification number for this particular weigh scale 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.



\* 6 9

### Switch "REGRIND" to operate as a second "NATURAL"

Press (\*,6,9) to set flag to treat the "REGRIND" dispense as a SECOND NATURAL material.

With the flag OFF, Natural is calculated to fill the space remaining in the weigh bin after a Regrind dispense has occurred. In other words, when a reduced amount of Regrind is dispensed, additional Natural is dispensed. Color and Additive dispenses are calculated as a percentage of this Natural dispense ONLY.

With the flag ON, Natural is calculated to maintain the proper RATIO between the two components (Natural and Regrind). Color and Additive dispenses are calculated to add to BOTH components at the requested ratios.

"Regrind", in the normal sense, is not added. Instead, this component is treated as another "Natural" material. If the ratio of the two naturals is not 50/50, place the HIGHER volume component in the "regrind" side. Set the "regrind" thumbwheel for the percentage that the "regrind" side is of the combined mix. For example; Naturals A and B are to be used at a 20/80 mix ratio; B is the greater at 80 percent. Put component B in the regrind side and set the regrind switch for 80 percent.

NOTE: The Regrind alarm parameter (RAL) is automatically set to a number that forces retries and stops the system when this component runs out. See PARAMETERS, RAL-00004.

Use the \* key to toggle flag ON or OFF. Press EXIT when desired flag status is displayed.

NOTE: Do not use these features in combination with \*82.

\* 7 1

### Special Applications Only – Additive Percent of Mix

Press (\*,7,1) to change the Color setting to be interpreted as percent of the entire MIX instead of percent of the Natural. Press (\*,7,2) to change the Additive setting in the same way.

The display will say (CPM -OFF) or (APM -OFF). Press "" to toggle flag to (CPM -ON) or (APM -ON). (CPM stands for Color Percent of Mix, APM for Additive Percent of Mix). These options has been added for a customer with a unique requirement.

Leave these flags OFF unless you have specific instructions to do otherwise.

CAUTION: With flags set, Color and Additive settings combined must NOT exceed 100 percent. From a practical standpoint, they should not exceed 20 percent combined.

\* 7 4

### MAX Weight Alarm

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.

\* 7 5

### Weight Reading Alarm

Press (\*,7,5) to set a flag to ALARM if the weigh bin weight drops more them 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.

\* 7 7

### Parameter Printout

Press (\*,7,7) to print a copy of all internal parameters. A printer must be connected and ready. Four columns will print since parameters reside in four different locations in memory: RAM; ROM, both WSB2 and WSB9 default listings; and EEPROM. Identifying headings print above each columns.

\* 7 8

### Change Program Mode Password

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.

\* 8 2

### Precision Ratioing - Additives

Press (\*,8,2) to produce a precision ratioing of either the Color or Additive. Press CE (previously \*) to toggle between (P/R OFF), (P/R COL) or (P/R ADD).

If precision ratioing is selected, the Color (or Additive) dispense occurs BEFORE the Natural, instead of after. Natural will dispense after the Color (or Additive) dispense and will be calculated to assure the most exact percentage ratio for the selected component. Because the Natural dispense is larger, this method allows for more exact ratioing of the one selected critical component.

NOTE: Do not use this feature in combination with \*69.

\* 8 7

### Volumetric Mode

Press (\*,8,7) to set flag for operation in a VOLUMETRIC mode. Use the \* key to toggle the 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.

\* 8 8

### Printout Display

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 ISO and other international quality program 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 different between the two weight printouts should equal the KNOWN CERTIFIED WEIGHT.

\* 8 9

### Select Weight Unit

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 are preferred for nearly all countries outside the U.S.A. GRAM or OUNCE readouts are appropriate only for very short runs or short demonstrations.

Use the \* key to toggle through the four possible selections.

Press EXIT when the weight unit you want is displayed.

\* 9 8

### Show Load Cell Raw Signal

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:

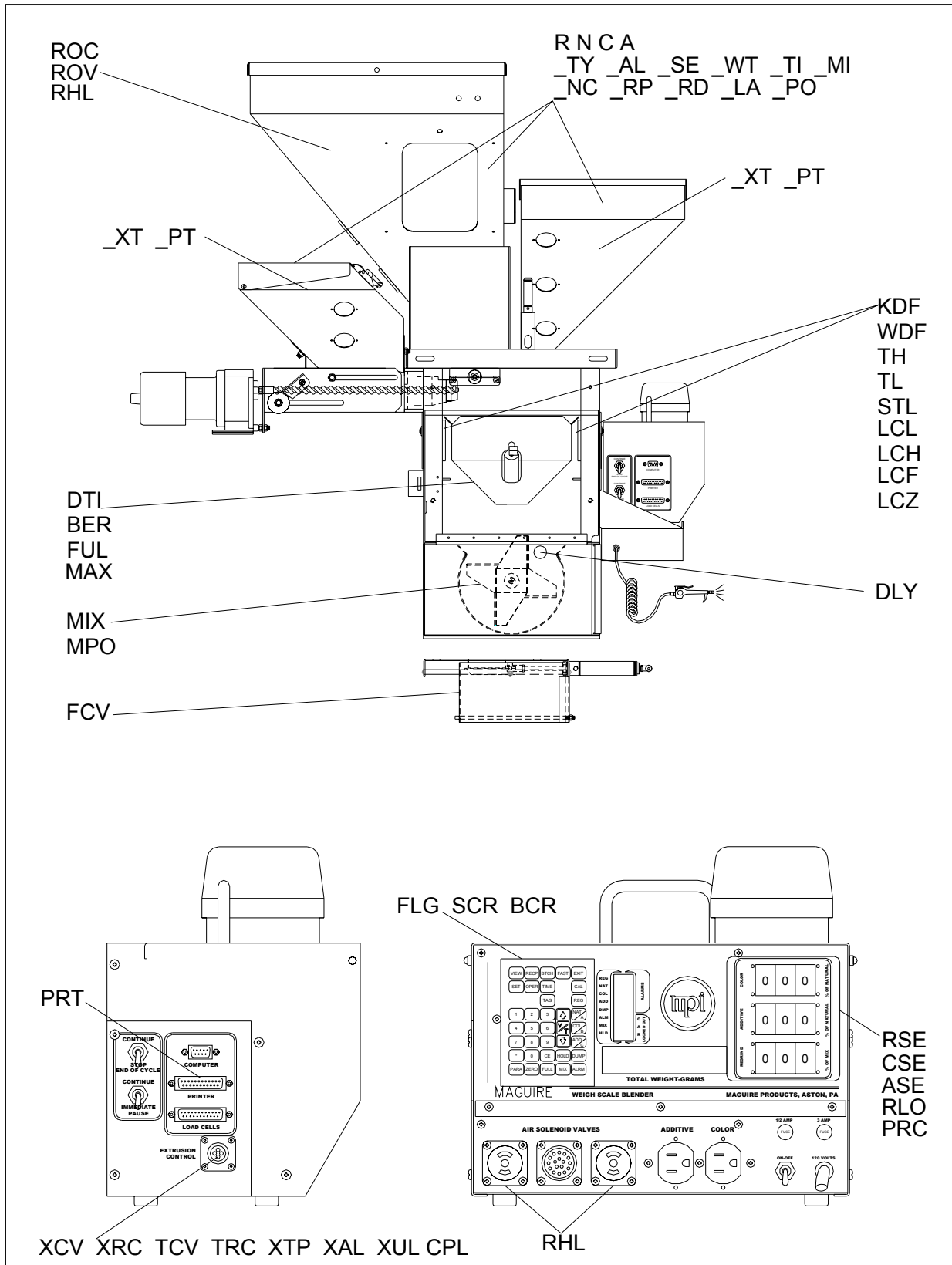


Press (\*,0,0) to CLEAR ALL DATA fields.



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

# Parameters - What they relate to:



# Parameters Introduction

All WEIGH SCALE BLENDER controllers operate according to certain internal PARAMETERS. Because customer requirements vary widely, we have made over 60 parameters accessible for change through the keypad. 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 220 list is the ORIGINAL BASE list.

Models 240, 140, MB, and 940 show only changes from the 220 list. Models 1840, 420, and 440 show only further changes from the 940 list. Models 131, 122 show only changes from the 140 list.

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).

The PARAMETER LIST looks like this:

| Blender & Component Parameters |       |     |       |       |       |                        |       |       |      |      |
|--------------------------------|-------|-----|-------|-------|-------|------------------------|-------|-------|------|------|
| 3 Kg Load Cell System          |       |     |       |       |       | 10 Kg Load Cell System |       |       |      |      |
| Model                          | 220   | 240 | 140   | 131   | 122   | MB                     | 940   | 1840  | 420  | 440  |
| FLG                            | 00    |     |       |       |       |                        |       |       |      |      |
| RPO                            | 00    |     |       |       |       |                        |       |       |      |      |
| NPO                            | 00    |     |       |       |       |                        |       |       |      |      |
| CPO                            | 00    |     |       | 00101 | 00101 | 00101                  |       |       |      |      |
| APO                            | 00    |     |       |       | 00101 | 00101                  |       |       |      |      |
| MPO                            | 183   |     |       |       |       |                        |       |       |      |      |
|                                |       |     |       |       |       |                        |       |       |      |      |
| RAL                            | 00    |     |       |       |       |                        |       |       |      |      |
| NAL                            | 04    |     |       |       |       |                        |       |       |      |      |
| CAL                            | 04    |     |       |       |       |                        |       |       |      |      |
| AAL                            | 04    |     |       |       |       |                        |       |       |      |      |
|                                |       |     |       |       |       |                        |       |       |      |      |
| MIX                            | 3010  |     | 3015  | 3015  | 3015  | 3015                   | 3010  | 3030  | 3010 | 3010 |
| FCV                            | 05    |     |       |       |       |                        |       |       |      |      |
| DTI                            | 06    |     | 04    | 04    | 04    | 04                     | 06    | 08    | 10   | 10   |
|                                |       |     |       |       |       |                        |       |       |      |      |
| KDF                            | 10    |     |       |       |       |                        | 02    | 04    | 02   | 02   |
| WDF                            | 10    |     |       |       |       |                        | 02    | 04    | 02   | 02   |
| BER                            | 1000  |     |       |       |       |                        | 200   |       |      |      |
|                                |       |     |       |       |       |                        |       |       |      |      |
| CXT                            | 00    |     |       |       |       |                        |       |       |      |      |
| AXT                            | 00    |     |       |       |       |                        |       |       |      |      |
|                                |       |     |       |       |       |                        |       |       |      |      |
| ROC                            | 00    |     |       |       |       |                        |       |       |      |      |
| ROV                            | 00    |     |       |       |       |                        |       |       |      |      |
| RHL                            | 00    |     |       |       |       |                        |       |       |      |      |
|                                |       |     |       |       |       |                        |       |       |      |      |
| FUL                            | 20000 |     | 10000 |       |       | 04000                  | 9000  | 18000 | 4000 | 4000 |
| MAX                            | 30000 |     | 15000 |       |       | 06000                  | 13500 | 27000 | 6000 | 6000 |
| TH                             | 1000  |     |       |       |       |                        | 1000  | 1000  | 200  | 200  |
| TL                             | 500   |     |       |       |       |                        | 500   | 500   | 100  | 200  |
|                                |       |     |       |       |       |                        |       |       |      |      |
| PRT                            | 00    |     |       |       |       |                        |       |       |      |      |
|                                |       |     |       |       |       |                        |       |       |      |      |
| RSE                            | 11000 |     |       |       |       |                        |       |       |      |      |
| CSE                            | 11000 |     |       |       |       |                        |       |       |      |      |
| ASE                            | 11000 |     |       |       |       |                        |       |       |      |      |
| RLO                            | 50    |     |       |       |       |                        |       |       |      |      |

Blender & Component Parameters continued...

| Blender & Component Parameters continued... |       |       |       |     |     |       |                        |       |       |       |
|---------------------------------------------|-------|-------|-------|-----|-----|-------|------------------------|-------|-------|-------|
| 3 Kg Load Cell System                       |       |       |       |     |     |       | 10 Kg Load Cell System |       |       |       |
| Model                                       | 220   | 240   | 140   | 131 | 122 | MB    | 940                    | 1840  | 420   | 440   |
| CPT                                         | 00    |       |       |     |     |       |                        |       |       |       |
| APT                                         | 00    |       |       |     |     |       |                        |       |       |       |
|                                             |       |       |       |     |     |       |                        |       |       |       |
| RWT                                         | 26000 | 26000 | 18000 |     |     | 22400 | 30000                  | 30000 | 20800 | 20800 |
| RTI                                         | 976   | 976   | 976   |     |     | 15616 | 976                    | 976   | 7808  | 7808  |
| NWT                                         | 26000 | 26000 | 18000 |     |     | 22400 | 30000                  | 30000 | 20800 | 20800 |
| NTI                                         | 976   | 976   | 976   |     |     | 15616 | 976                    | 976   | 7808  | 7808  |
| CWT                                         | 20480 | 26000 | 1280  |     |     | 22400 | 20800                  | 20800 | 2048  | 20800 |
| CTI                                         | 31232 | 976   | 31232 |     |     | 15616 | 7808                   | 7808  | 31232 | 7808  |
| AWT                                         | 20480 | 26000 | 1280  |     |     | 22400 | 20800                  | 20800 | 2048  | 20800 |
| ATI                                         | 31232 | 976   | 31232 |     |     | 15616 | 7808                   | 7808  | 31232 | 7808  |
|                                             |       |       |       |     |     |       |                        |       |       |       |
| RMI                                         | 01    |       |       |     |     |       |                        |       |       |       |
| NMI                                         | 01    |       |       |     |     |       |                        |       |       |       |
| CMI                                         | 01    |       |       |     |     |       |                        |       |       |       |
| AMI                                         | 01    |       |       |     |     |       |                        |       |       |       |
|                                             |       |       |       |     |     |       |                        |       |       |       |
| RNC                                         | 10    |       |       |     |     |       | 01                     |       |       |       |
| NNC                                         | 10    |       |       |     |     |       | 01                     |       |       |       |
| CNC                                         | 10    |       |       |     |     |       | 01                     |       |       |       |
| ANC                                         | 10    |       |       |     |     |       | 01                     |       |       |       |
|                                             |       |       |       |     |     |       |                        |       |       |       |
| RRP                                         | 10    |       |       |     |     |       | 300                    | 300   | 100   | 100   |
| NRP                                         | 10    |       |       |     |     |       | 300                    | 300   | 100   | 100   |
| CRP                                         | 10    |       |       |     |     |       | 100                    | 100   | 05    | 100   |
| ARP                                         | 10    |       |       |     |     |       | 100                    | 100   | 05    | 100   |
|                                             |       |       |       |     |     |       |                        |       |       |       |
| RRD                                         | 500   |       |       |     |     |       |                        |       |       |       |
| NRD                                         | 500   |       |       |     |     |       |                        |       |       |       |
| CRD                                         | 50    |       |       |     |     |       |                        |       |       |       |
| ARD                                         | 50    |       |       |     |     |       |                        |       |       |       |
|                                             |       |       |       |     |     |       |                        |       |       |       |
| RLA                                         | 20    |       |       |     |     | 04    |                        |       |       |       |
| NLA                                         | 20    |       |       |     |     | 04    |                        |       |       |       |
| CLA                                         | 15    | 20    | 20    |     |     | 04    | 20                     | 20    | 15    |       |
| ALA                                         | 15    | 20    | 20    |     |     | 04    | 20                     | 20    | 15    |       |
|                                             |       |       |       |     |     |       |                        |       |       |       |
| PRC                                         | 10    |       |       |     |     |       |                        |       |       |       |
| STL                                         | 122   |       |       |     |     |       |                        |       |       |       |
| LCL                                         | 27    |       |       |     |     |       | 80                     | 40    | 80    | 80    |
| LCH                                         | 39    |       |       |     |     |       | 120                    | 60    | 120   | 120   |
| LCF                                         | 79    |       |       |     |     |       |                        |       |       |       |
| LCZ                                         | 583   |       |       |     |     |       |                        |       |       |       |
|                                             |       |       |       |     |     |       |                        |       |       |       |
| SCR                                         | 00    |       |       |     |     |       |                        |       |       |       |
| BCR                                         | 00    |       |       |     |     |       |                        |       |       |       |
| XCV                                         | 00    |       |       |     |     |       |                        |       |       |       |
| XRC                                         | 00    |       |       |     |     |       |                        |       |       |       |
| TCV                                         | 00    |       |       |     |     |       |                        |       |       |       |
| TCR                                         | 00    |       |       |     |     |       |                        |       |       |       |
| XTP                                         | 20020 |       |       |     |     |       |                        |       |       |       |
| XAL                                         | 05    |       |       |     |     |       |                        |       |       |       |
| XUL                                         | 200   |       |       |     |     |       |                        |       |       |       |
| CPL                                         | 00000 |       |       |     |     |       |                        |       |       |       |
| END                                         | 00000 |       |       |     |     |       |                        |       |       |       |

# Parameter List - Explanations

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

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

**RPO 00000** Pulsed Output, timing of ON/OFF pulses.  
**NPO 00000** (Reg, Nat, Col, Add).  
**CPO 00000** Set only for Micro Pulse equipped slide gates.  
**APO 00000**

**MPO 00007** Pulsed output to the mixer motor

**RAL 00000** Last digit = number of retries before ALARM.  
**NAL 00004** 00001 to 00009 = sound alarm, hold process.  
**CAL 00004** 00011 to 00019 = sound alarm, continue process.  
**AAL 00004**

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 Re grind.

**MIX 00010** MIX TIME

This parameter times how long the MIX motor runs in seconds.

**JOG 03020** Mix blade JOG count and interval

This parameter sets how many jogs will occur and how often.

**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 00006** Weigh bin dump TIME at end of cycle. (seconds)

This parameter sets the maximum open, or dump time for the weigh bin. No change is required.

**KDF 00010** Maximum variation in GRAMS between two consecutive weight  
**WDF 00010** 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.

**CXT 00000** Move decimal left on color and additive settings.  
**AXT 00000**

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

**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 20000** Full batch weight, determined by weigh bin size.  
**MAX 30000** 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.

**RSE 01000** Upper SETTING limits for thumbwheels (0xxx.x).  
**CSE 01000** Settings greater than limit are held to limit.  
**ASE 01000** "01000" = 100%.  
 \_SE parameters SET UPPER LIMITS to the thumbwheels. For color and additive, lower settings may help ensure expensive material is not wasted.

**RLO 00050** Lower SETTING limit for REGRIND (0xxx.x).  
 RLO sets a LOW limit of 5 percent to the REGRIND setting.

**DLY 00488** Delay before cycle start. (Interrupts)  
 This parameter is the time that the sensor must be uncovered before a cycle will begin.

**LT1 00000** Loader #1 time. (seconds)  
**LT2 00000** Loader #2 time.  
 These are timers for loaders. Since loader outputs are not yet available, leave them set to zero.

**RPT 00000** Percent of target to reduce first try dispense.  
**NPT 00000**  
**CPT 00000**  
**APT 00000**

These can increase the accuracy of slow dispense devices ONLY, like augers, and micro pulse valves.

**RWT 26000** WT/TI = the rate that will be used for calculating the  
**RTI 00976** next dispense time.  
**NWT 26000** WT = the Weight portion of the dispense rate, calculated  
**NTI 00976** such that WT/TI equals the average of the last two  
**CWT 10240** actual dispense rates.  
**CTI 31232** TI = the TIME portion of the dispense rate. (interrupts)  
**AWT 10240**  
**ATI 31232**

These change AUTOMATICALLY during normal operation.  
 They are Weight and Time portions of the flow rate calibration.

**RMI 00001** Minimum valid dump rate GRAMS/sec. (full or tenth grams)  
**NMI 00001** Error correction is bypassed when dispense rate is lower.  
**CMI 00001**  
**AMI 00001**

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.



**RNC 00050** Allowable GRAM error within which NO correction is made.  
**NNC 00050**  
**CNC 00010**  
**ANC 00010**

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.

**RRP 00010** PERCENT shortage error that will force a retry.  
**NRP 00010**  
**CRP 00010**  
**ARP 00010**  
**RRD 00500** GRAM weight shortage error that will force a retry.  
**NRD 00500**  
**CRD 00050**  
**ARD 00050**

Both RP and RD limits must be met before system will advance to the next component. Retries occur until both conditions are met.

**RLA 00020** Lag TIME before dumping ACTUALLY starts.  
**NLA 00020** (mechanical response time, interrupts)  
**CLA 00012**  
**ALA 00012**

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.

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

**STL 00244** 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 00027** LOAD CELL limits, low slope, high slope, frequency, zero.  
**LCH 00039** DO NOT CHANGE except for different weight load cells.  
**LCF 00079**  
**LCZ 00583**

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

**SCR 00000** Special Customer Request function to be activated.  
**BCR 00000** For BAR CODE input equipped blenders.  
The following parameters are all related to EXTRUSION CONTROL only.

**XTP 00500** Extrusion Control - TRIP POINT for a Rate adjustment.  
As batch timing errors accumulate, this number determines how large the accumulated error must be to force an adjustment.

**XCV 00000** Extrusion Control - Extruder speed Control Voltage.  
**XRC 00004** Extrusion Control - Extruder speed Rate of Change.  
These two parameters control the voltage output to the extruder speed control, and its rate of change.

**TCV 00000** Extrusion Control - Takeoff speed control voltage.  
**TRC 00004** Extrusion Control - Takeoff speed Rate of Change.  
These two parameters control the voltage output to the downstream takeoff speed control, and its rate of change.

**XAL 00005** Extrusion Control - Single Adjustment Limit, percent.  
Single rate adjustments are limited to this percentage change.

**XUL 00200** Extrusion Control - Upper Adjustment Limit, volts  
Adjustments beyond this voltage change will sound the alarm.

**CPL** Yield Control - Counts per unit Length.  
Matches your down stream takeoff speed encoder to the software.

**LIQ 00000** For LIQUID COLOR applications using dual pumps.

Allows automatic switching when current container runs out.

**MCT 00000** Monitor Cycle Time  
Alarms if normal cycle timing exceeds previous cycle time by a specified amount. Used to detect mechanical failures.


## Changing Parameter Settings


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

**Making Changes to Parameters - Keypad Sequence:**


Switch the **STOP END OF CYCLE** switch **DOWN**:


Turn **POWER ON**. Wait 5 seconds, until display says ( P x)


Press  Display will say: (PASSWORD)


Press  Display will say: (P x)  
This is the **PROGRAM MODE**

To alter a PARAMETER:

Press  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  Display will say: ( P x)

Press  Display will say: (SAVING )  
This saves the changes made

Press  Display will say: ( P x) when settings are complete.

Additional information can be found in the KEYPAD section.

## Saving Parameters in the 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 and SAVE all system parameter information into the EEPROM, the sequence of keystrokes is as follows

**Save Parameters Keypad Sequence:**


Press  Display will say: (PASSWORD)

Press  Display will say: (P x)

Press  Display will say: (INSTR \_\_)

Press  Display will say: (SAVING )

Wait: when done, Display will say: ( P x)

Press  Display will say: ( x)

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

If software related problems should 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:

**Retrieve Parameters (CLEAR) from EEPROM Keypad Sequence:**

Switch Power Off to the Controller

Hold  Hold the "CE" Key down

Switch Power on to the Controller

Release  The "CE" Key

Display will say ( CLEAR )

If you do not see ( CLEAR ) on the display, do it again.

# SECTION 3 - 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:

**Turning on \*54 Cycle by Cycle Printing - Keypad Sequence:**

|       |                                                                                                                                                                      |                              |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Press | <input type="button" value="*"/>                                                                                                                                     | Display will say: (PASSWORD) |
| Press | <input type="button" value="2"/> <input type="button" value="2"/> <input type="button" value="2"/> <input type="button" value="2"/> <input type="button" value="2"/> | Display will say: (P x)      |
| Press | <input type="button" value="*"/>                                                                                                                                     | Display will say: (INSTR _)  |
| Press | <input type="button" value="5"/> <input type="button" value="4"/>                                                                                                    | Display will say: (PRNT OFF) |
| Press | <input type="button" value="*"/>                                                                                                                                     | Display will say: (PRNT ON)  |
| Press | <input type="button" value="EXIT"/>                                                                                                                                  | Display will say: (P x)      |
| Press | <input type="button" value="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)

```

-----
**REG20.0**  **NATURAL **  **COL 04.0**  **ADD 04.0**  TOTAL
* 11/10/01 *  *16:17:53 *  RECIPE 0000  **ID# 051**  **WO 0000*  OPR000
FINAL: DISP,%  0.0 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 0.0 1908.3 469 77.6 1826      0.0 .00      22
    
```

**DEFINITION OF EACH LINE**

The **TOP-OF-PAGE** heading:

```

-----
**REG20.0**  **NATURAL **  **COL 04.0**  **ADD 04.0**  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.

The **CYCLE** heading:

```
* 11/10/01 * *16:17:53* RECIPE 0000 **ID# 051** **WO 00000* 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  0.0  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  0.0  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 software accepted the first try. 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.

## Troubleshooting with the \*54 Printout

**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 REGRIND 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 NATURAL 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 COLOUR, 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" 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 ADDITIVE 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 ADDITIVE, 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.

| <b>Material Dispense Device:</b>                                   | <b>Approx. Grams per Second:</b> |
|--------------------------------------------------------------------|----------------------------------|
| 1/2" Auger Feeders, Micro Pulse Valves                             | 0.5 - 02                         |
| 1" Auger Feeders                                                   | 06 - 10                          |
| Vertical Valves                                                    | 20 - 40                          |
| WSB 100 - Slide Gates                                              | 250 - 450                        |
| WSB 220, 420 - 3" Round Slide Gates                                | 500 - 900                        |
| WSB 240, 260, 440, 460, 940, 960, 1840, 1860 - 2" x 3" Slide Gates | 500 - 900                        |
| WSB 240, 260, 440, 460, 940, 960, 1840, 1860 - 3" x 6" Slide Gates | 3000 - 5000                      |

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 were dispensed. The error is 1.3 grams, well within the expected accuracy of a 1" 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.

## Parameter Settings Printout

Press (\*,7,7) to print a copy of all internal parameters. A printer must be connected and ready. Four columns will print, RAM; ROM; 200 and 900 series tables; and EEPROM. Identifying headings print above each column.

## Load Cell Calibration - Printout Verification

Press (\*,8,8) in Program mode 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 and other international quality program 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 different between the two weight printouts should equal the KNOWN CERTIFIED WEIGHT.

## Special Tests - Printout Verification

Using the \*54 flag the following tests can be made:

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  REG  123  2749
```

```
Key:  REG = Component
      123 = Dispense time (in interrupts; 244 = 1 sec.)
      2749 = 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 REG 732 8795 15 3465
```

Key: REG = Component  
732 = Dispense time (in interrupts; 244 = 1 sec.)  
8795 = Weight dispensed  
15 = Lag time used  
3465 = Min rate

## Material Usage Printout

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.

Setting the PRT parameter to a time interval number may periodically, and automatically, print this same information. (See PARAMETER, PRT)

The printout looks like this:

|                       | DATE     | TIME     |       |         |       |  |
|-----------------------|----------|----------|-------|---------|-------|--|
| CURRENT               | 11/10/01 | 16:20:23 |       |         |       |  |
| LAST                  | 11/10/01 | 16:10:23 |       |         |       |  |
| PRINTED               |          |          |       |         |       |  |
| LAST                  | 09/10/01 | 09:00:04 |       |         |       |  |
| CLEARED               |          |          |       |         |       |  |
|                       | TOTALS:  | GRAND    | PCT   | CURRENT | PCT   |  |
| CYCLES                |          | 11       |       | 7       |       |  |
| REG                   | 05.0     | 2.4      | 4.8   | 1.5     | 5.0   |  |
| NAT                   | 100      | 47.4     | 100.0 | 28.6    | 100.0 |  |
| COL                   | 00.5     | .4       | .99   | .2      | .99   |  |
| ADD                   | 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.

# SECTION 4: TROUBLESHOOTING






## What To Do

1. If you are reading this section, you are having problems. To locate and correct the problem we suggest that you take the following steps:
2. 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.
3. Then follow the CHECKOUT procedure in the front of this manual. If anything does not work right, read the diagnostics section that follows it.
4. 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.
5. Read the list of TYPICAL PROBLEMS that follows on the next page.
6. Read the section on VERIFYING LOAD CELL function to be sure that the load cells are operating correctly.
7. For difficult problems we can provide the most help if we have a printout of the PARAMETER table (KEYPAD, \*77) and 2 pages of cycle-by-cycle printout (KEYPAD, \*54). (See PRINTED OUTPUTS section)

**To Print the PARAMETER Table - Keypad Sequence:**

|       |                                                                                     |                              |
|-------|-------------------------------------------------------------------------------------|------------------------------|
| Press |    | Display will say: (PASSWORD) |
| Press |   | Display will say: (P x)      |
| Press |  | Display will say: (INSTR __) |
| Press |  | Display will say: (PRINTING) |
| Press |  | Display will say: (P x)      |

**To Print the CYCLE BY CYCLE information during Operation - Keypad Sequence:**

|       |                                                                                     |                              |
|-------|-------------------------------------------------------------------------------------|------------------------------|
| Press |  | Display will say: (INSTR __) |
| Press |  | Display will say: (PRNT OFF) |
| Press |  | Display will say: (PRNT ON)  |
| Press |  | Display will say: (P x)      |
| Press |  | Display will say: ( x)       |

Now run the blender normally until you have collated 2 pages of Cycle-by-Cycle printout and then fax this with the PARAMETER Report directly to your local Maguire reseller with a short cover note explaining your process, how the blender is located, if any changes have been made recently and what problems you are experiencing now.

8. Try a CLEAR. Turn power off. Hold the "CE" key down and turn power ON. Display will say (CLEAR).
9. 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 Weigh Scale Blender users.

1. 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
2. The Controller "RESETS" itself for no reason. This indicates electrical noise or voltage spikes disrupting the processor.
  - See WIRING CONSIDERATIONS, ASSEMBLY section.
3. 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.
3. 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.
4. 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
5. 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.
6. 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.
7. 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.
8. 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.

9. 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.

10. 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.

11. 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.

12. 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.

## Mix Problems

Customers with mix problems have several options available.

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.

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.

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.

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.

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.

On model 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.

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.

Vacuum conveying can also separate materials of different bulk densities. Maintain high air velocity to minimize this.

Models WSB-MB, 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:

Improved mixing due to back and forth motion of the blades.

No EMF (Electro Magnetic Force) feedback to the processor from electrical demands of the motor resulting, the results in less processor problems.

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.

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:

Increase the air pressure. If the gauge pressure drops more then 5 pounds during operation of the blades, the air supply line is too small.

Lower the pile in the mix chamber to reduce torque requirements on the mix blade. This is explained above.

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.

## Increasing Throughput

A correctly sized blender should have throughput that always exceeds your process requirements. If, for some reason, your blender is not keeping up, here are a few ways to increase throughput.

1. If your blender is equipped with a flow control slide gate, under the blender, this will reduce throughput up to 25 percent. To counter this, set the "END FULL" flag on using the \*44 function explained earlier. In the END FULL mode, blending begins even while the sensor is still covered due to flow control valve operation.
2. If your process consumes a large batch of material all at once (such as during injection and screw return time), and material reserve is not adequate, you may "run out" of material for a few seconds while the Weigh Scale blender is making a new batch. The \*44, "END FULL" function will also correct this. Here, when the sensor is uncovered, a completed batch is immediately available to help refill the mix chamber, providing a larger reserve to the process.
3. Increase the FUL parameter. This sets the batch size. Larger batches increase throughput. Depending on the bulk density of your material, you may be able to increase batch size by 20 to 40 percent.
4. Reduce the DTI parameter. This is the number of seconds the weigh bin opens to empty each batch. Shorter DTI times will shorten the overall cycle time and increase throughput.
5. Turn "FAST" on. This causes rapid volumetric "timed" dispenses to occur up to 4 times after each normal gravimetric dispense.
6. Do not confuse "reserve" with "throughput". If your blender has a temporary problem which results in your process running out of material before you have time to remedy the problem, your "reserve" is inadequate. Add a surge hopper, or material level alarms on individual hoppers to prevent these types of problems.

## 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=xxxxT) 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.

REGRIND 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.

NATURAL second:

The Natural dispenses occur next in the sequence. They will appear 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.

COLOUR AND ADDITIVE next:

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.

## 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.

| Turning on *54 Cycle by Cycle Printing - Keypad Sequence: |           |                              |
|-----------------------------------------------------------|-----------|------------------------------|
| Press                                                     | *         | Display will say: (PASSWORD) |
| Press                                                     | 2 2 2 2 2 | Display will say: (P x)      |
| Press                                                     | *         | Display will say: (INSTR _)  |
| Press                                                     | 9 8       | Display will say: (CNT OFF ) |
| Press                                                     | *         | Display will say: (CNT ON )  |
| Press                                                     | EXIT      | Display will say: (P x )     |
| Press                                                     | EXIT      | Display will say: ( x )      |

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.





## 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.

**Retrieve Parameters (CLEAR) from EEPROM - Keypad Sequence:**

|         |                                                                                   |                             |
|---------|-----------------------------------------------------------------------------------|-----------------------------|
| Switch  |                                                                                   | Power Off to the Controller |
| Hold    |  | Hold the "CE" Key down      |
| Switch  |                                                                                   | Power on to the Controller  |
| Release |  | The "CE" Key                |

Display will say ( CLEAR )

If you do not see ( CLEAR ) on the display, do it again.

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 with Default System Settings - 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.

**Clear All - Keypad Sequence:**

|         |                                                                                                                                                                                                                                                             |                                     |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Switch  |                                                                                                                                                                                                                                                             | Power Off to the Controller         |
| Hold    |    | Hold these keys down simultaneously |
| Switch  |                                                                                                                                                                                                                                                             | Power on to the Controller          |
| Release |    | Release the keys                    |

When done correctly the display will say (CLEARALL).

If you do not see ( CLEARALL ) on the display, do it again.

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.

## 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.

# SECTION 5 - HARDWARE MAINTENANCE

## 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. Micro Blenders should be set to 40 PSI (2.7 bar). Vertical Valves used in removable hoppers on Micro Blenders, and 100 and 200 series blenders, are more accurate at the lower 40 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. A small plastic screw like cover may protect it. 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 are 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 airflow 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(PC or galls 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.

# Load Cell Recalibration

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 cannot 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.

**Load Cell Recalibration - Keypad Sequence:**


**NOTE** – This example is specific to a WSB 200 series with a 2000 gram weigh bin – please check your model to select correct FULL weight

|       |                                                                                     |                                                      |
|-------|-------------------------------------------------------------------------------------|------------------------------------------------------|
| Press |  | Display will say: (PASSWORD)                         |
| Press |  | Display will say: (P x)                              |
| Press |  | Display will say: (CAL OFF)                          |
| Press |  | Display will say: (CAL ON)                           |
| Press |  | Display will say: (P x)                              |
| Press |  | Display will say: (-- WAIT --)<br>Followed by: (P 0) |

Place a 2000 (or 400, 1000, 4000 or 9000) Gram weight in the bin.

|       |                                                                                     |                                                           |
|-------|-------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Press |  | Display will say: (-- WAIT --)<br>Followed by: (P 2000.0) |
|-------|-------------------------------------------------------------------------------------|-----------------------------------------------------------|

If YOUR weight is not exactly 2000 grams, then enter the ACTUAL weight that YOU use.

|       |                                                                                     |                             |
|-------|-------------------------------------------------------------------------------------|-----------------------------|
| Press |  | Display will say: ( 2000.0) |
|-------|-------------------------------------------------------------------------------------|-----------------------------|

Remove weights from Weigh Bin

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.

Replace this page with the WIRING DIAGRAM

## 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 amphenol 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

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.

# Blender Parts - Exploded Views

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| ITEM # | QTY. | PART #  | DESCRIPTION                          | SP | PRICE |
|--------|------|---------|--------------------------------------|----|-------|
| 1      | 1    | 301     | Frame, WSB-MB                        | 3  |       |
| 2      | 4    | as305   | 8x8 Hopper Assembly, WSB-MB          | 3  |       |
| 3      | 1    | 306     | Weigh Bin, WSB-MB                    | 1  |       |
| 4      | 1    | 307     | Dump Flap, WSB-MB                    | 2  |       |
| 5      | 1    | as06-MB | Air Assembly, WSB-MB                 | 1  |       |
| 6      | 1    | alc-MB  | Load Cell Assy, WSB-MB               | 1  |       |
| 7      | 1    | 326     | Load Cell Slide, WSB-MB              | 2  |       |
| 8      | 1    | ncR-S50 | Mix Motor, WSB-MB                    | 1  |       |
| 10     | 1    | 317     | Mix Chamber, WSB-MB                  | 2  |       |
| 11     | 1    | 319     | Pellet Guard-Left side, WSB-MB       | 3  |       |
| 12     | 1    | 319-R   | Pellet Guard-Right side, WSB-MB      | 3  |       |
| 13     | 1    | 318     | Saddle, WSB-MB                       | 3  |       |
| 14     | 1    | 390     | Front Window, WSB-MB                 | 3  |       |
| 16     | 1    | as325   | Mix Blade Assembly, WSB-MB           | 2  |       |
| 17     | 1    | 323     | Collar-Mix Shaft, WSB-MB             | 2  |       |
| 19     | 1    | ncy13   | Air Cyl-1 1/2 stroke, heavy spring   | 1  |       |
| 20     | 1    | asps-03 | Level Sensor-18m w/ twist plug       | 1  |       |
| 23     | 2    | 1886-LP | Latch Plate-small                    | 3  |       |
| 26     | 4    | h04     | Latch, Southco Series 50 short       | 3  |       |
| 27     | 1    | ng      | Air Pressure Gauge                   | 2  |       |
| 28     | 1    | nfr     | Air Filter/Regulator                 | 2  |       |
| 29     | 4    | fpaF    | Quick Disconnect-Female              | 1  |       |
| 30     | 4    | fpaM    | Quick Disconnect-Male                | 1  |       |
| 31     | 4    | as340rf | Retrofit 1" Vertical Valve (for 8x8) | 1  |       |
| 33     | 8    | psa13   | Sight Glass                          | 2  |       |
| 34     | 4    | 305-L   | Lid-8x8 Hopper                       | 2  |       |

Spare Priority (SP)  
 1 = Indispensible  
 2 = Advisible  
 3 = On request

**MAGUIRE**  
 MicroBlender  
 Isometric Exploded View

| REV | ECN | DATE | ISS | DWG. P.O. | NAME    | 1     | OF | 1 |
|-----|-----|------|-----|-----------|---------|-------|----|---|
| -   | -   | -    | A   | -         | EXPL-MB | SHEET | 1  | 1 |

DO NOT SCALE DRAWING  
 FILE Name: WSB-MB Xplode  
 SCALE: 1:1

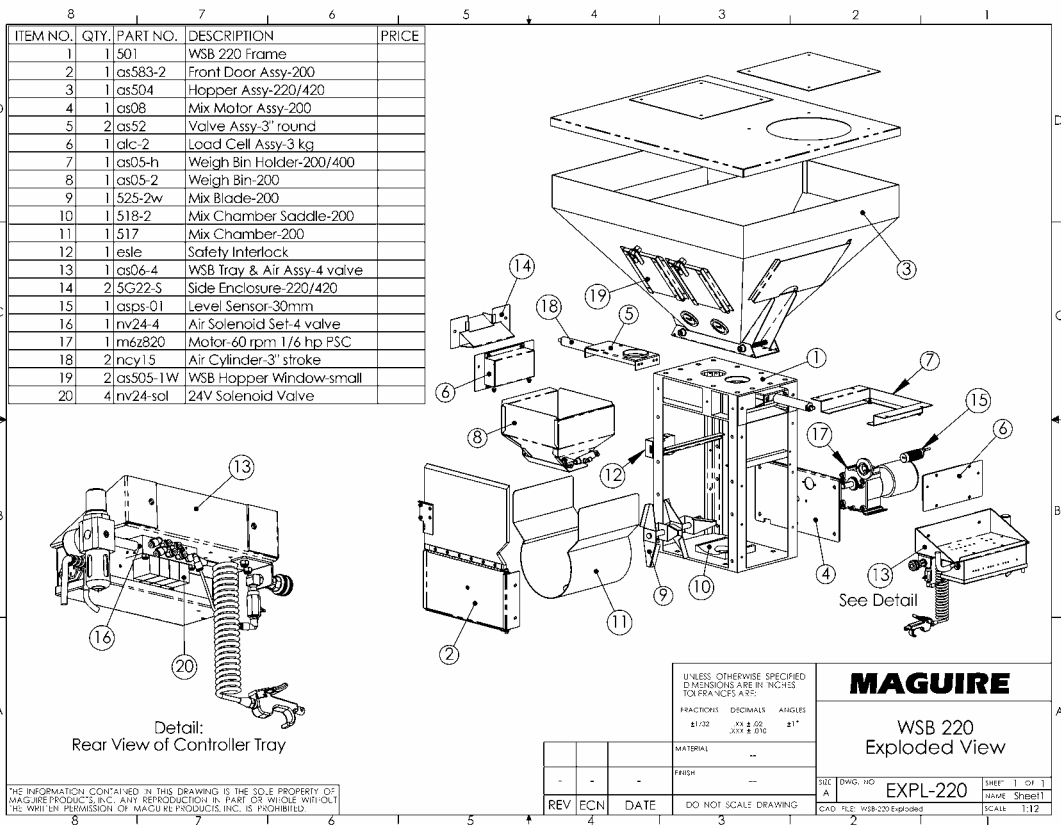
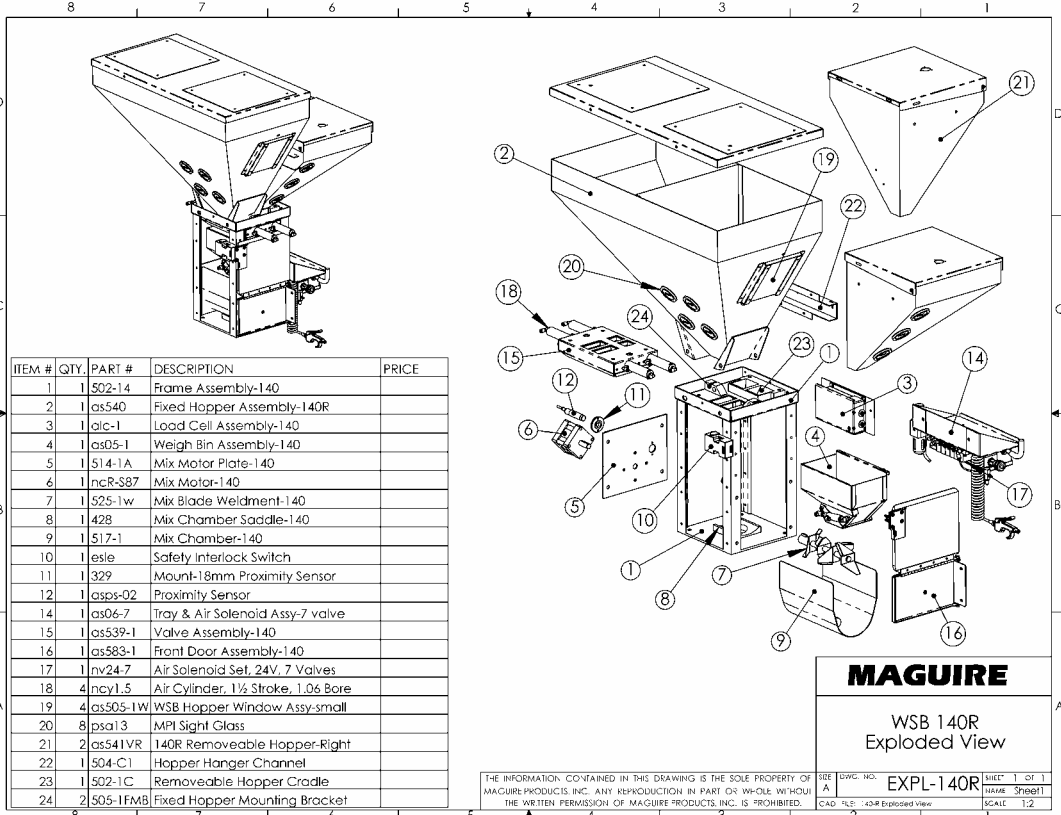
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| ITEM NO. | QTY. | PART NO. | DESCRIPTION                           | PRICE |
|----------|------|----------|---------------------------------------|-------|
| 1        | 1    | 502-14   | Frame Assembly-140                    |       |
| 2        | 1    | as505-1  | Hopper Assembly-140                   |       |
| 3        | 1    | alc-1    | Load Cell Assembly-140                |       |
| 4        | 1    | as05-1   | Weigh Bin Assembly-140                |       |
| 5        | 1    | 514-1A   | Mix Motor Plate-140                   |       |
| 6        | 1    | ncR-S87  | Mix Motor-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    | este     | Safety Interlock Switch               |       |
| 11       | 1    | 329      | Mount-18mm Proximity Sensor           |       |
| 12       | 1    | asps-02  | Proximity Sensor                      |       |
| 14       | 1    | as06-7   | Tray & Air Solenoid Assy-7 valve      |       |
| 15       | 1    | as539-1  | Valve Assembly-140                    |       |
| 16       | 1    | as583-1  | Front Door Assembly-140               |       |
| 17       | 1    | nv24-7   | Air Solenoid Set, 24V, 7 Valves       |       |
| 18       | 4    | ncy1.5   | 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

| REV | DWG. P.O. | NAME     | 1     | OF | 1 |
|-----|-----------|----------|-------|----|---|
| A   | -         | EXPL-140 | SHEET | 1  | 1 |

CAD FILE: 140 Exploded View  
 SCALE: 1:2





| ITEM NO. | QTY. | PART NO. | DESCRIPTION                   | PRICE |
|----------|------|----------|-------------------------------|-------|
| 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    | este     | Safety Interlock              |       |
| 13       | 1    | as06-6   | WSB Tray & Air Assy-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    | m62820   | Motor-60 rpm 1/6 hp PSC       |       |
| 18       | 4    | ncy2     | Air Cylinder-2" stroke        |       |
| 19       | 4    | as5560-W | WSB Hopper Window-large       |       |
| 20       | 6    | nv24-sol | 24V Solenoid Valve            |       |

Detail:  
Rear View of Controller Tray

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCES ARE:

| FRACTIONS | DECIMALS    | ANGLES |
|-----------|-------------|--------|
| ±1/32"    | .005 & .010 | ±1°    |

**MAGUIRE**

WSB 240  
Exploded View

| REV | ECN | DATE | DO NOT SCALE DRAWING |
|-----|-----|------|----------------------|
| -   | -   | -    | -                    |

| SIZE | DWG. NO. | SHEET | OF |
|------|----------|-------|----|
| A    | EXPL-240 | 1     | 1  |

CAD FILE: WSB-240 Exploded

NAME: Sheet1  
SCALE: 1:2

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| ITEM # | QTY. | PART #   | DESCRIPTION                   | PRICE |
|--------|------|----------|-------------------------------|-------|
| 1      | 1    | 501-42   | WSB 420 Frame                 |       |
| 2      | 1    | as583-4  | Front Door Assy-400           |       |
| 3      | 1    | as504    | Hopper Assy-220/420           |       |
| 4      | 1    | as08-4   | Mix Motor Assy-400            |       |
| 5      | 2    | as52     | Valve Assy-3" round           |       |
| 6      | 2    | alc-4    | Load Cell Assy-10 kg          |       |
| 7      | 1    | as05-h   | Weigh Bin Holder Assy-200/400 |       |
| 8      | 1    | as05-4   | Weigh Bin-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    | este     | Safety Interlock              |       |
| 13     | 1    | as06-4   | WSB Tray & Air Assy-4 valve   |       |
| 14     | 2    | 5G22-S   | Side Enclosure-220/420        |       |
| 15     | 1    | asps-01  | Level Sensor-30mm             |       |
| 16     | 1    | nv24-4   | Air Solenoid Set-4 valve      |       |
| 17     | 1    | m62818   | Motor-30 rpm 1/6 hp PSC       |       |
| 18     | 2    | ncy15    | Air Cylinder-3" stroke        |       |
| 19     | 2    | as505-1w | WSB Hopper Window-small       |       |
| 20     | 4    | nv24-sol | 24V Solenoid Valve            |       |

Detail:  
Rear View of Controller Tray

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCES ARE:

| FRACTIONS | DECIMALS    | ANGLES |
|-----------|-------------|--------|
| ±1/32"    | .005 & .010 | ±1°    |

**MAGUIRE**

WSB 420  
Exploded View

| REV | ECN | DATE | DO NOT SCALE DRAWING |
|-----|-----|------|----------------------|
| -   | -   | -    | -                    |

| SIZE | DWG. NO. | SHEET | OF |
|------|----------|-------|----|
| A    | EXPL-420 | 1     | 1  |

CAD FILE: WSB-420 Exploded

NAME: Sheet1  
SCALE: 1:2

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| ITEM # | QTY. | PART #   | DESCRIPTION                   | PRICE |
|--------|------|----------|-------------------------------|-------|
| 1      | 1    | 501-44   | Frame-440                     |       |
| 2      | 1    | as583-4  | 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    | ncy2     | Air Cylinder-2" stroke        |       |
| 19     | 4    | as5560-W | WSB Hopper Window-large       |       |
| 20     | 6    | nv24-sol | 24V Solenoid Valve            |       |

Detail:  
Rear View of Controller Tray

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCES ARE:

|           |             |        |
|-----------|-------------|--------|
| FRACTIONS | DECIMALS    | ANGLES |
| ±.020     | .XX ± .02   | ±1°    |
|           | .XXX ± .010 |        |

**MAGUIRE**

WSB 440  
Exploded View

|     |     |      |                      |
|-----|-----|------|----------------------|
| REV | ECN | DATE | DO NOT SCALE DRAWING |
| -   | -   | -    | -                    |

|                            |          |       |        |       |     |
|----------------------------|----------|-------|--------|-------|-----|
| SIZE                       | DWG. NO. | SHEET | 1      | OF    | 1   |
| A                          | EXPL-440 | NAME  | Sheet1 | SCALE | 1:2 |
| CAD FILE: WSB-440 Expl-94d |          |       |        |       |     |

| ITEM # | QTY. | PART #              | DESCRIPTION                          | PRICE |
|--------|------|---------------------|--------------------------------------|-------|
| 1      | 1    | 5500                | Frame-WSB 9                          |       |
| 2      | 1    | as5560              | Hopper Assy-WSB 9                    |       |
| 3      | 1    | as5517              | Mix Chamber Assy-WSB 9               |       |
| 4      | 1    | as508 & as5590-M    | Mixer Assy-WSB 9                     |       |
| 5      | 2    | as3X6               | Slide Valve Assy-3 X 6               |       |
| 6      | 2    | as2X3               | Slide Valve Assy-2 X 3               |       |
| 7      | 1    | as5581              | Front Window Assy-WSB 9              |       |
| 8      | 1    | as5580              | Side Window Assy-WSB 9               |       |
| 9      | 2    | 5G94S               | Enclosure-WSB 9 Side                 |       |
| 10     | 1    | as05-9              | Weigh Bin Assy-WSB 9                 |       |
| 11     | 1    | 5G94B               | Enclosure-WSB 9 Back                 |       |
| 12     | 1    | 5G94F               | Enclosure-WSB 9 Front                |       |
| 13     | 1    | 518-9               | Mix Chamber Saddle-WSB 9/18          |       |
| 14     | 1    | asps-01             | Level Sensor Assy                    |       |
| 15     | 1    | 595-9SB             | Enclosure-WSB 9 Lower Side           |       |
| 16     | 2    | alc-9               | Load Cell Assy-10 kg                 |       |
| 17     | 1    | as5506-h            | Weigh Bin Holder Assy-WSB 9/18       |       |
| 18     | 1    | m62403 [mC020P]     | Mix Motor-9 1/2 hp [European 50 Hz]  |       |
| 19     | 2    | ncyl15              | Air Cylinder-3" stroke, 1.06 bore    |       |
| 20     | 2    | ncy2                | Air Cylinder-2" stroke, 1.06 bore    |       |
| 21     | 1    | 525-9w              | Mix Blade weldment                   |       |
| 22     | 1    | as5565 / 66 / 68    | Motor Starter Assy-9, 110V/230V/400V |       |
| 23     | 1    | as06-6              | Air Assembly-6 Valve                 |       |
| 24     | 1    | nv24-6              | Air Solenoid Set-6 Valve             |       |
| 25     | 6    | nv24-sol            | 24V Solenoid Valve segment           |       |
| 26     | 1    | es1h392 / 393 / 403 | Manual Motor Starter-110/230/400V    |       |
| 27     | 1    | ehr7456 / 05        | Solid State Relay-110/230            |       |
| 28     | 1    | es4b862 & 6B145     | Motor Starter & Overload Relay-400V  |       |

Detail:  
Rear View of Controller Tray

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCES ARE:

|           |             |        |
|-----------|-------------|--------|
| FRACTIONS | DECIMALS    | ANGLES |
| ±.020     | .XX ± .02   | ±1°    |
|           | .XXX ± .010 |        |

**MAGUIRE**

WSB 940  
Exploded View

|     |     |      |                      |
|-----|-----|------|----------------------|
| REV | ECN | DATE | DO NOT SCALE DRAWING |
| -   | -   | -    | -                    |

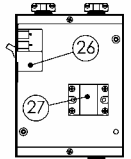
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|----------------------------|----------|-------|--------|-------|-----|
| SIZE                       | DWG. NO. | SHEET | 1      | OF    | 1   |
| A                          | EXPL-940 | NAME  | Sheet1 | SCALE | 1:2 |
| CAD FILE: WSB-940 Expl-94d |          |       |        |       |     |

as5565 / 5566  
WSB 9 Motor Starter Assy  
110V / 230V

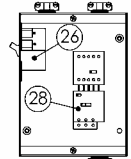
as5568  
WSB 9 Motor Starter Assy  
400V

| ITEM # | QTY | PART #              | DESCRIPTION                          | PRICE |  |
|--------|-----|---------------------|--------------------------------------|-------|--|
| 1      | 1   | 5500-18             | Frame-WSB 18                         |       |  |
| 2      | 1   | as5561              | Hopper Assy-WSB 18                   |       |  |
| 3      | 1   | as5518 / 19         | Mix Chamber Assy-WSB 18 Lower/Upper  |       |  |
| 4      | 1   | as508-18            | Mixer Assy-WSB 18                    |       |  |
| 5      | 2   | as3X6               | Slide Valve Assy-3 X 6               |       |  |
| 6      | 2   | as2X3               | Slide Valve Assy-2 X 3               |       |  |
| 7      | 1   | as5584              | Front Window Assy-WSB 18             |       |  |
| 8      | 1   | as5581              | Side Window Assy-WSB 18              |       |  |
| 9      | 2   | 5G184S              | Enclosure-WSB 18 Side                |       |  |
| 10     | 1   | as05-18             | Weigh Bin Assy-WSB 18                |       |  |
| 11     | 1   | 5G184B              | Enclosure-WSB 18 Back                |       |  |
| 12     | 1   | 5G184F              | Enclosure-WSB 18 Front               |       |  |
| 13     | 1   | 518-9               | Mix Chamber Saddle-WSB 9/18          |       |  |
| 14     | 1   | asps-01             | Level Sensor Assy                    |       |  |
| 15     | 1   | 595-95B             | Enclosure-WSB 9/18 Lower Side        |       |  |
| 16     | 2   | alc-9               | Load Cell Assy-10 kg                 |       |  |
| 17     | 1   | as5506-h            | Weigh Bin Holder Assy-WSB 9/18       |       |  |
| 18     | 1   | m62403 [mC020P]     | Mix Motor-9 1/2 hp [European 50 Hz]  |       |  |
| 19     | 2   | ncy15               | Air Cylinder-3" stroke, 1.06 bore    |       |  |
| 20     | 2   | ncy2                | Air Cylinder-2" stroke, 1.06 bore    |       |  |
| 21     | 1   | 525-9w              | Mix Blade weldment                   |       |  |
| 22     | 1   | as5565 / 66 / 68    | Motor Starter Assy-9, 110V/230V/400V |       |  |
| 23     | 1   | as06-6              | Air Assembly-6 Valve                 |       |  |
| 24     | 1   | nv24-6              | Air Solenoid Set-6 Valve             |       |  |
| 25     | 6   | nv24-sol            | 24V Solenoid Valve segment           |       |  |
| 26     | 1   | es1h392 / 393 / 403 | Manual Motor Starter-110/230/400V    |       |  |
| 27     | 1   | ehr7456 / 05        | Solid State Relay-110/230            |       |  |
| 28     | 1   | es4b862 & 6B145     | Motor Starter & Overload Relay-400V  |       |  |

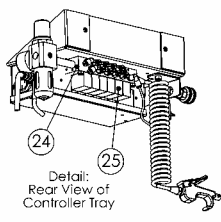
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as5565 / 66 / 68  
WSB 9 Motor Starter Assy  
110V / 230V



as5568  
WSB 9 Motor Starter Assy  
400V



Detail:  
Rear View of  
Controller Tray

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCES ARE:  
FRACTIONS    DECIMALS    ANGLES  
#1/32    .XX # .02    #1°  
#1/64    .XXX # .010

MATERIAL: ---  
FINISH: ---

DO NOT SCALE DRAWING

**MAGUIRE**

WSB 1840  
Exploded View

SHEET 1 OF 1  
NAME SHEET  
DWG NO: EXPL-1840  
SCALE: 1:2  
CADD FILE: WSB-1840 Exploded

## 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.

### Warranty

MAGUIRE PRODUCTS offers THE MOST COMPREHENSIVE WARRANTY in the plastics equipment industry. We warrant each Weigh Scale Blender manufactured by us to be free from defects in material and workmanship under normal use and service; excluding only those items listed below as 'excluded items'; our obligation under this warranty being limited to making good at our factory any Weigh Scale Blender which shall within FIVE (5) YEARS after delivery to the original purchaser be RETURNED intact to us, transportation charges PREPAID, and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on our part, and MAGUIRE PRODUCTS neither assumes nor authorizes any other persons to assume for it any other liability in connection with the sale of its Weigh Scale Blenders.

This warranty shall not apply to any Weigh Scale Blender which shall have been repaired or altered outside MAGUIRE PRODUCTS factory, unless such repair or alteration was, in our judgment, not responsible for the failure; nor which has been subject to misuse, negligence or accident, incorrect wiring by others, or installation or use not in accord with instructions furnished by Maguire Products.

Our liability under this warranty will extend ONLY to equipment that is returned to our factory in Media, Pennsylvania, PREPAID.

Please note that we always strive to satisfy our customers in whatever manner is deemed most expedient to overcome any problems they may have in connection with our equipment.

#### EXCLUDED ITEMS:

LOAD CELLS on our WEIGH SCALE BLENDER are covered as long as they have not been damaged from improper handling. MB, 100, and 200 series units use load cells rated for 6.6 pounds (3KG) maximum load. Larger units use load cells rated for 22 pounds (10KG). DO NOT press on them manually. DO NOT disassemble them from their mounting enclosures. Do not DROP them. Do not drop the frame to which they are mounted. If the frame is dropped from a height of two feet, the load cells will most likely be damaged.

#### DISCLAIMER:

Processing conditions and materials vary widely from customer to customer and from product to product. Please be aware that 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 we have inadvertently misrepresented our equipment for your application.