

MAGUIRE PRODUCTS INC.

Weigh Scale Blender®

For Controller Model: WSB – 12 Software

WEIGH SCALE BLENDER®

with "TWELVE" COMPONENT SOFTWARE

INSTALLATION • OPERATION • MAINTENANCE

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To every person concerned with use and maintenance of the Maguire Weigh Scale Blender it is recommended to read thoroughly these operating instructions. Maguire Products Inc. accepts no responsibility or liability for damage or malfunction of the equipment arising from non-observance of these operating instructions.

To avoid errors and to ensure trouble-free operation, it is essential that these operating instructions are read and understood by all personnel who are to use the equipment.

Should you have problems or difficulties with the equipment, please contact Maguire Products Inc. or your local Maguire distributor.

These operating instructions only apply to the equipment described within this manual.

Manufacturer's Contact Information

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Maguire Weigh Scale Blender 12 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.

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 16 SETUP OUTPUTS & MATERIAL TYPES...	To "TURN ON" a component, it must be designated as to TYPE, either REGRIND, NATURAL, or ADDITIVE. Each is handled differently by the MATH routines. The controller MUST know the material TYPE to know what the setting means. This is IMPORTANT. Be SURE you UNDERSTAND this section before trying to operate your system.
Page 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 than you may know. This page reviews briefly some of the added features that are available to you and where in this manual you can find them.

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.

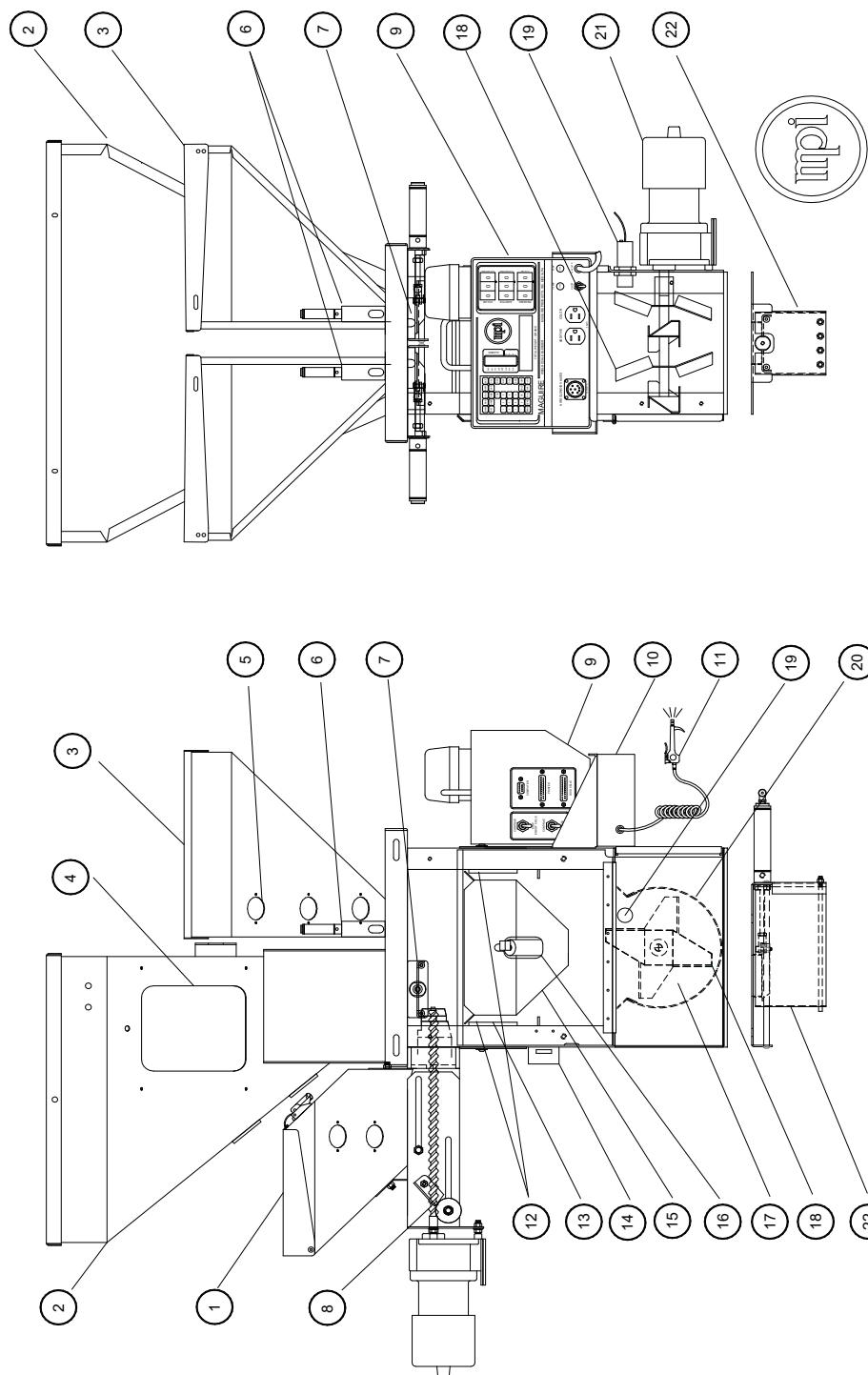
DO NOT defeat this safety switch.



HOPPER FINGER GUARDS

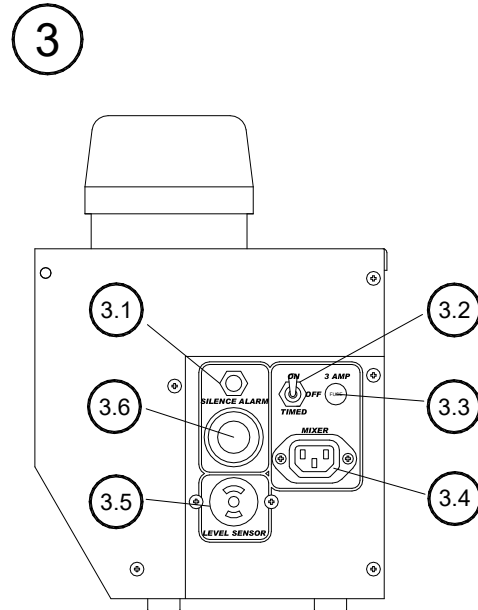
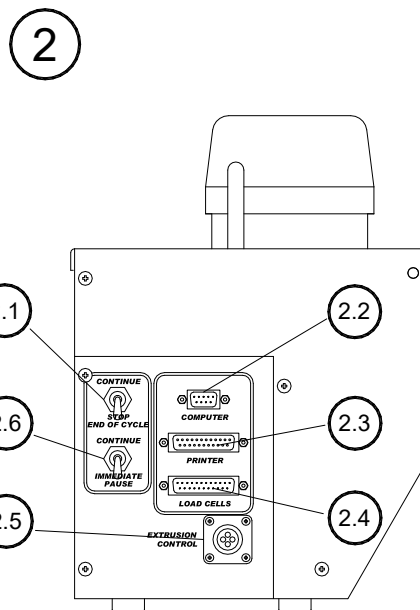
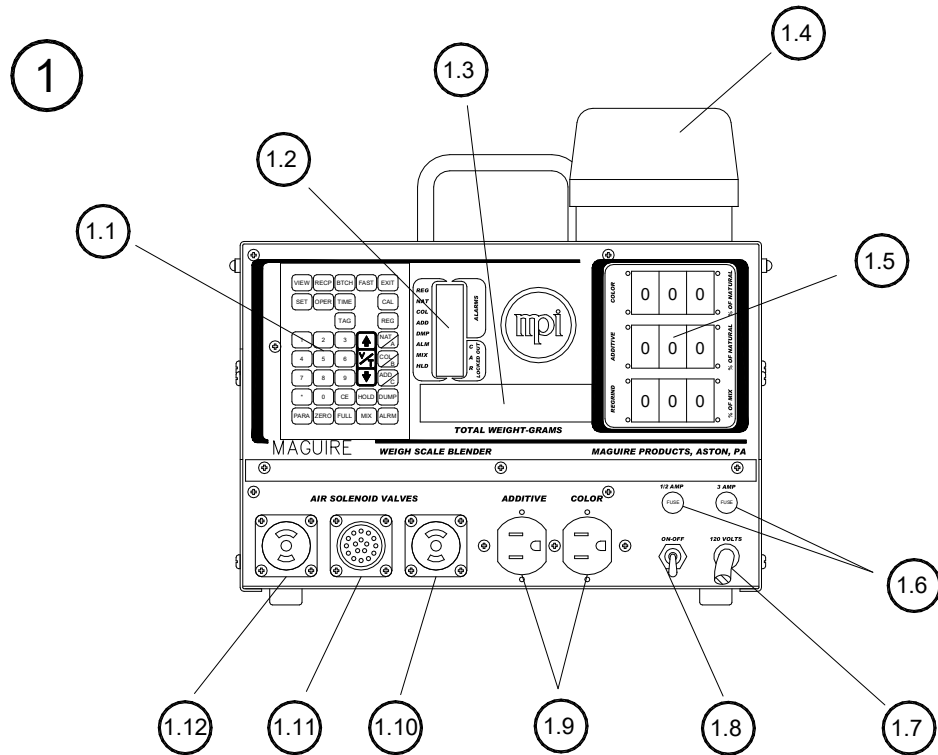
Finger Guards are fitted into each Material Hopper compartment.
DO NOT reach through these Guards.
DO NOT use your fingers to clear an obstruction below these Guards.

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.

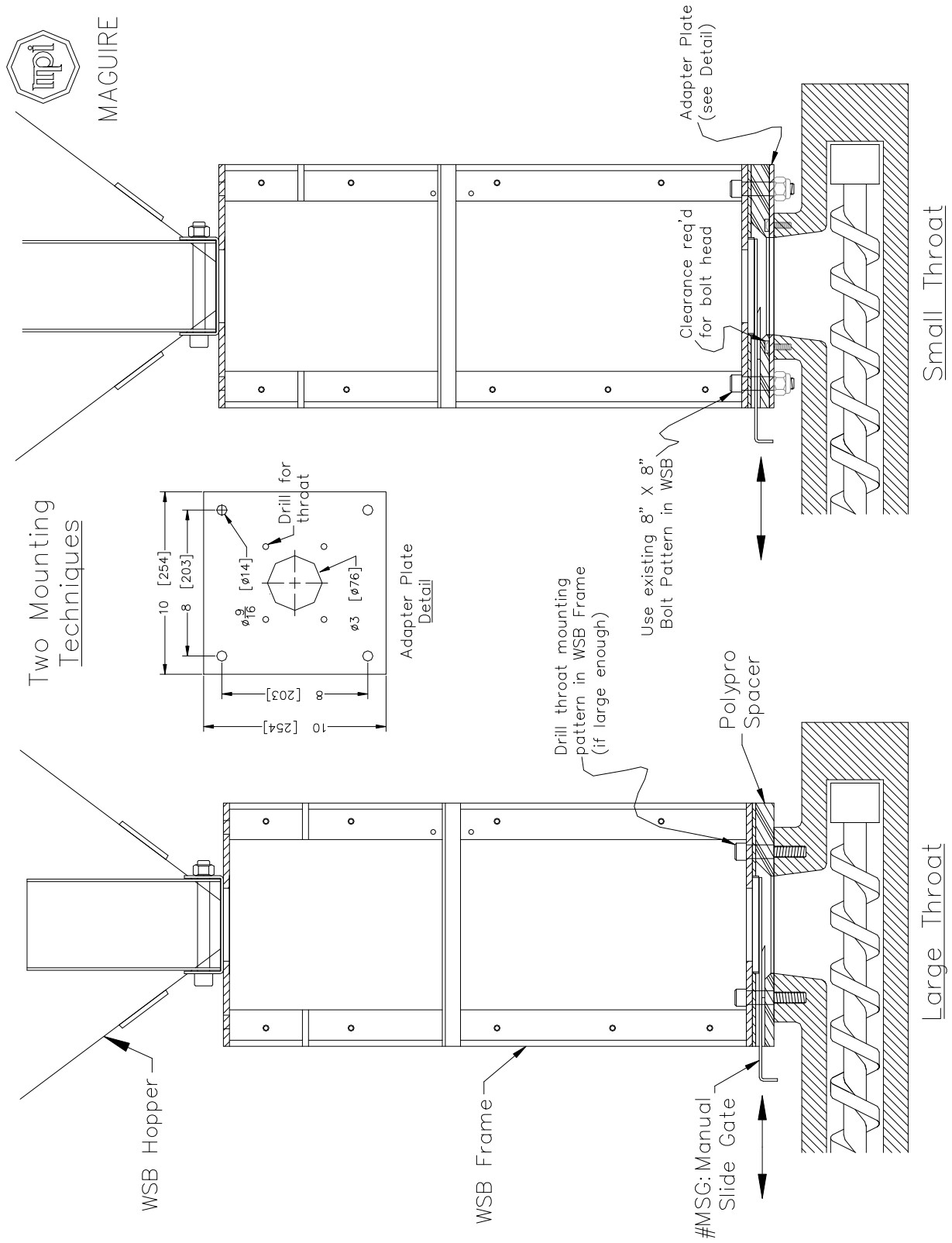


NOTE: When choosing proper orientation, be sure to retain access to the controller and weigh chamber, clearance for hinged doors, and access to removable feeder hoppers.

1B. If your unit is STAND mounted:

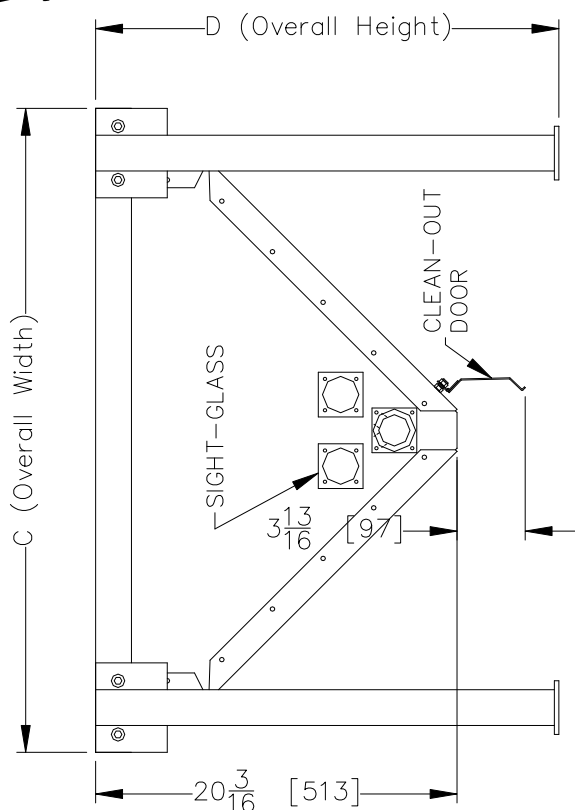
A stand is provided and your unit will bolt directly to it. An assembly DIAGRAM is provided on the following pages.

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.



WSB STANDS
With Optional VTA
"Vacuum Takeoff Assembly"

"Vacuum Takeoff Assmby"



MAXIMUM CAPACITY:

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

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

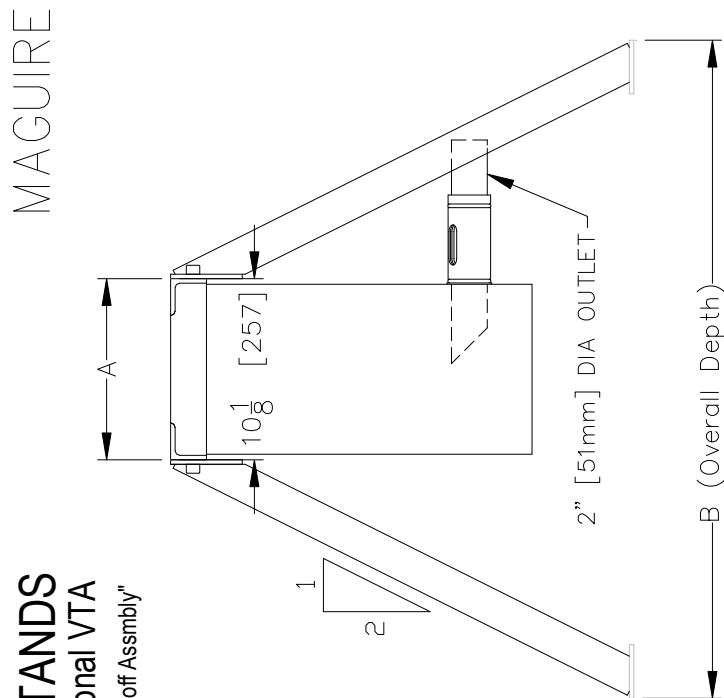
PRACTICAL CAPACITY:

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

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

NOTE:

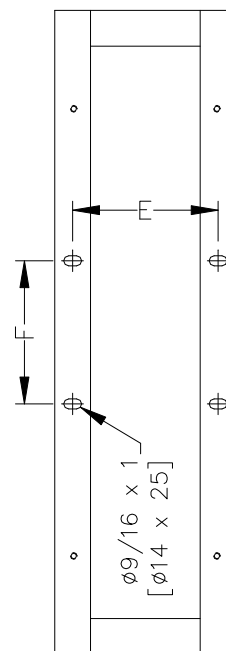
WSB 100/200/400 VTA Stand shown to scale.



STAND DIMENSIONS

DIMS IN [] ARE mm.

	A	B	C	D	E	F
WSB 100/200/400	10-1/8 [257]	37-1/4 [946]	36 [914]	25-7/8 [657]	8-1/8 [206]	8 [203]
VTA	10-1/8 [257]	51-1/4 [1302]	36 [914]	39-7/8 [1012]	8-1/8 [206]	8 [203]
Barrel	10-1/8 [257]	63-1/4 [1607]	56 [1422]	51-7/8 [1318]	8-1/8 [206]	8 [203]
Gaylord	10-1/8 [257]					
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!**

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**

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

8. **Remove all protective paper from the plastic windows.**

Wiring Considerations

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

- 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.

PROCEED TO: CHECK OUT PROCEDURE NEXT PAGE
--

Check Out Procedure

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



NOTE

100/200 series models (3K load cells), display all weights in 1/10 grams (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



Device number 1 will operate.
LED # 1 will light.
Press "1" repeatedly to observe operation.

PRESS



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

REPEAT THIS SEQUENCE

For each dispense valve on your WEIGH SCALE BLENDER.

Up to 12 outputs are possible numbered 1 through to 9, A, B, and C.
Only those connected to devices will operate.

3. NOTE HOPPER NUMBERS

AT THIS POINT

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

FOR WSB 940 & WSB 1840 SERIES:

On 9000 and 18000 gram, FOUR hopper compartment systems, facing the Controller side of the blender:

Device 1 is the NEAR hopper, 2 the FAR hopper, 3 the LEFT CENTER, and 4 the RIGHT CENTER hopper.

FOR WSB 100, 200 & 400 SERIES:

On 1000, 2000, and 4000 gram, FOUR hopper systems facing the Controller side of the blender:

Devices 1, 2, 3, and 4 are counter-clockwise starting with far left corner hopper.

FOR WSB 200, 400, 900 & 1800 SERIES:

On 2000, 4000, 9000 and 18000 gram SIX hopper systems facing the Controller side of the blender:

Devices 1, 2, 3, 4, 7, and 8 are counter-clockwise starting with far left corner hopper.

FOR WSB 100, 200, 400, 900 & 1800 SERIES:

On the blender Controller:

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

4. OPERATE OTHER DEVICES

PRESS



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

PRESS



This key controls the mix motor outlet on the side of the controller.
The mixer motor will run. LED # 14 will light.
Mix blade turns 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. LED # 15 will light.
(Under the mix chamber - this device is optional)

PRESS



The Strobe light and Beeper will operate.
LED # 16 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 (FOUR), then:

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

Possible model numbers are:

MB, 140, 14R, 220, 240, 24R, 420, 440, 44R, 940, 184.
If model number is not correct for you unit:
see the next page, SELECTING CORRECT MODEL.

If display shows randomly drifting numbers:

check to see load cells are plugged in.

If display shows about (- 1250.0) or (-4500):

check that the weigh bin is in place properly.

If display is steady but not near zero:

An over stressed load cell will display a permanently high or low reading. Recalibrate load cells; next section.

If there is no response from the display when the bin is touched:

check for damaged wires to load cells.
check that load cell plug screws are secure.

If response is not sensitive or does not return to its start point:

check for interference around weigh bin.

If pressing * does not display (PASSWORD):

you are not in the normal power-up mode or the keypad doesn't work. Normal mode is indicated by the ABSENCE of the letter M or P at the left of the display.

If display says INVALID after entering the password number:

you pressed the wrong keys or the password number has been changed and it is no longer 22222. Call us for help.

If an air solenoid does not operate:

check the 1/2 amp fuse.
check solenoid cable connected properly and fully seated.
check mix chamber door closed, safety interlock engaged.

If a slide or dump valve does not open:

check the air supply and regulator adjustment:
(minimum 20 psi, 80 psi (5.5 bar) recommended).
check for proper air line connection to cylinder.

If an auger feeder motor does not run:

check the 3 amp fuse.
check that the motor is plugged into the proper outlet.
check for faulty motor by plugging it into a known source of 110 volt A.C. power (240 volt outside U.S.).

Selecting 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:

TURNING ON OUTPUTS (next page).

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

To do so:

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

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

LOAD CELL CALIBRATION:

The sequence of keystrokes is as follows:

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 WSB) Press * again for LIW CAL (later versions)
Press		Display will say: (P x)
Press		Display will say: (-- WAIT --)
Press		Followed by: (P 0) Display will say: (x)

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

PROCEED TO:

**TURNING ON OUTPUTS
and MATERIAL TYPES**

NEXT PAGE

Turning on Material Type Outputs

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

You must "TURN ON" the COMPONENT outputs that you are going to use. Components that are TURNED OFF are not part of ANY routines. A component becomes TURNED ON when it is set to a MATERIAL TYPE.

Material Type Definitions

Material **TYPES** are **REGRIND**, **NATURAL**, and **ADDITIVE**.

The WEIGH SCALE BLENDER handles each TYPE DIFFERENTLY. Settings have different meanings for each TYPE. To enter SETTINGS correctly, you MUST UNDERSTAND how different materials are handled based on their TYPE.

So PLEASE read this page CAREFULLY.

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

REGRIND (PERCENT OF MIX)

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

NATURAL (RATIO TO EACH OTHER)

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

If no Regrind or Additives are specified, the mix will be:

Component 2, NATURAL, SET= 10, 20.0 percent of mix,
Component 3, NATURAL, SET= 40, 80.0 percent of mix.

The RATIO of 1 to 4 is maintained.

If component 1 is specified as REGRIND at 20 percent, the mix is then

Component 1, REGRIND, SET= 20, 20 percent of mix,
Component 2, NATURAL, SET= 10, 16.0 percent of mix,
Component 3, NATURAL, SET= 40, 64.0 percent of mix.

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

ADDITIVE (PERCENT OF ALL NATURALS)

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

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

The REGRIND is still 20 percent of the MIX.

The NATURALS are still at a RATIO of 1 to 4, although they have been reduced to make room for the Additive.

The ADDITIVE is 5 percent of the NATURALS added together (5% of 76.2).

WHY do we do it this way? Because this is how most plastic processors think of these components. REGRIND is generally only added when available, and then as a limited percentage of the entire mix.

NATURALS are generally blended at a RATIO to one another. ADDITIVES are most often only intended to be added to the entire NATURAL portion of the mix, because regrind generally already contains these additives.

ON THE OTHER HAND:

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

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

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

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

NATURAL Use this for all materials that are the bulk of the mix.

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

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

Setting Material Types

The Keystroke sequence to set **MATERIAL TYPES** is:

Set Material Types Keypad Sequence:

Press		Display will say: (PASSWORD)
Press	    	Display will say: (P x)
Press		Display will say: (INSTR __)
Press	 	Display will say: (1TY = OFF) The "1" is the component (device) number. This is component 1. It will control Hopper 1.
Press		Press CE repeatedly to make selection: Display will say: (1TY = REG) REGRIND (1TY = NAT) NATURAL (1TY = ADD) ADDITIVE (1TY = OFF) OUTPUT TURNED OFF

When the selection you want is displayed, move on to **NEXT** component:

Press		Display will say: (2TY = OFF)
-------	---	-------------------------------

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

The * key will walk you through all components.

The CE key will change the **TYPE** for a component.

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

When complete:

Press		Display will say: (P x)
-------	---	------------------------------

Press		Display will say: (x)
-------	---	-----------------------------

After **EXIT**, if display says (NEED NAT) then you have specified an **ADDITIVE** without specifying a **NATURAL**. This is unacceptable.



FOUR dispense valve systems use components 1 through 4. TWO dispense valve systems use 1 and 2. SIX dispense valve systems use 1 through 4, then 7 and 8. Panel front **OUTLETS** are always components 5 and 6. Additional outlets are generally components 7 and 8.

Examples of Making Settings

Below are listed 4 different examples for possible settings users can make with the make with the Maguire blender.

Example 1:

Blender: WSB 100 Series with 1000g Batch

Materials: 30% Regrind
70% Natural
3% Color

Application: Regrind is recycled next to the machine and therefore already colored. Color only needs to be added to the Natural Material

Settings: Regrind R 30
Natural N No setting required in 4 software
N 100 in 12 software
Color A 3

Calculation:

- 30% Regrind is 300g or 30 parts in the 100 parts available
- 70% Natural and 3% Color are 73 parts in the remaining 70 parts available
- Therefore $70 / 73 = 0.9589$; $70 \times 0.9589 = 67.1$ parts; $3 \times 0.9589 = 2.9$ parts
- The blender is doing this calculation automatically for you!

Result:	1 Regrind	300.0g	30.0 parts
	2 Natural	671.2g	67.1 parts
	3 Color	28.8g	2.9 parts
	Batch Total	1000g	100 parts

Example 2:

Blender: WSB 100 Series with 1000g Batch

Materials: 30% Regrind
70% Natural
3% Color

Application: Regrind is purchased without any Color and therefore requires to be colored. Therefore Color needs to be added to both the Regrind and Natural materials.

Settings: Regrind R 30 + activate *69 to treat Regrind as a Natural
N 30 in 12 Software
Natural N No setting required in 4 software
N 70 in 12 software
Color A 3

Calculation:

- 70% virgin, 30% regrind and 3% Color are 103 parts of 100 parts available
- $100 / 103 = 0.97$; $70 \times 0.97 = 67.9$ parts; 30×0.97 ; $3 \times 0.9589 = 2.9$ parts
- The blender is doing this calculation automatically for you!

Result:	1 Regrind	291.3g	29.1 parts
	2 Natural	679.6g	68.0 parts
	3 Color	29.1g	2.9 parts
	Batch Total	1000g	100 parts

Example 3:

Blender: WSB 100 Series with 1000g Batch

Materials: 25% Regrind
65% Natural
4% Color
6% Additive

Application: Due to previous systems you are used to set all components as proportion.
The total should be always 100%.

Settings: Regrind R 25 + activate *69 to treat Regrind as a Natural
R 25 in 12 software
Natural N No setting required in 4 software
N 65 in 12 software
Color A 4 + activate *72 in 4 software
R 4 with 12 software
Additive A 6 + activate *71 in 4 software
R 6 with 12 software

Calculation: The blender is calculating only the set values in grams according the setting referring to the Batch weight.

Result:	1 Regrind	250.0g	25.0 parts
	2 Natural	650.0g	65.0 parts
	3 Color	60g	6.0 parts
	4 Additive	40g	4.0 parts
	Batch Total	1000g	100 parts

Example 4:

Blender: WSB 100 Series with 1000g Batch

Materials: 20% Regrind
50% Natural
30% Natural
4% Color
6% Additive

Application: Regrind is recycled next to the machine and therefore already has Color and Additive. Color and Additive only needs to be added to the 2 Natural materials. (Not possible to use 4 Software)

Settings: Regrind R 20
Natural N 50
Natural N 30
Color A 4
Color A 6

Calculation:

- 20% Regrind is 200g or 20 parts in the 100 parts available
- 50% Natural 1, 30% Natural 2, 4% Color and 6% Additive are 90 parts in the remaining 80 parts
- Therefore $80 / 90 = 0.89$; $50 \times 0.89 = 44.5$ parts; $30 \times 0.89 = 26.7$ parts; $4 \times 0.89 = 3.6$ parts; $6 \times 0.89 = 5.3$ parts;
- The blender is doing this calculation automatically for you!

Result:	1 Regrind	200.0g	20.0 parts
	2 Natural	444.5g	44.5 parts
	3 Natural	266.6g	26.7 parts
	4 Color	35.6g	3.5 parts
	5 Additive	53.3g	5.3 parts
	Batch Total	1000g	100 parts

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 then 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

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 Auger Feeder is dispensing

Press  This will empty the Weigh Bin

Now you can CALIBRATE the material. To do so:

Press  Display will say: (CALIBRATE)

Press  Component #5 will calibrate itself.

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

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

Press  Display will say: (x)

YOU ARE NOW READY FOR ACCURATE PRODUCTION BLENDING.

PROCEED TO:

ENTERING SETTINGS

NEXT PAGE

Entering Materials Settings

Material Settings Keypad Sequence:

Press:  Display will say (1 R xx.x) (Regrind)
 or (1 N xxx) (Natural)
 or (1 A xx.x) (Additive)

1 is Component number.
 R,N,A is Type.
 xx.x is Setting.

Enter a 3 digit setting:

Regrind settings = PERCENTAGE of the ENTIRE MIX
 Natural settings = RATIO to OTHER NATURAL SETTINGS
 Additive settings = PERCENTAGE of ALL the NATURALS

Press:  for the NEXT setting.
 Repeat this sequence for all components.

Press:  when finished.

When entering settings, remember:
 Panel front OUTLETS are always components 5 and 6; (left and right).
 If only one natural is present, any number will do for a setting.
 Any component set to zero will not dispense.

Assigning Material Settings to Thumbwheels

This is an optional Feature – it is not necessary for normal operation.
 You may assign a component to one of the three thumbwheel switches.
 You might do this for components that you wish to change settings frequently. This is ENTIRELY OPTIONAL.

TO DO SO:

Press:  Display will say: (1 R xx.x)
 Press: **A**  Display will say: (1 R TW 1) (Thumbwheel 1)
 or **B**  Display will say: (1 R TW 2) (Thumbwheel 2)
 or **C**  Display will say: (1 R TW 3) (Thumbwheel 3)

1 = TOP switches,
 2 = MIDDLE switches,
 3 = BOTTOM switches.

To RETURN component to KEYPAD entry of the setting:

Press:  Display will return to (1 R 00.0)

Press:  when finished.

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.

PROCEED TO:

NORMAL OPERATION

NEXT PAGE

Instructions for Normal Operation

Operation is very simple.

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

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

Use the STOP or PAUSE switches to stop the blender.

Turn POWER off only on final shutdown.

After several days of proper operation:

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

To SAVE all parameter information to the EEPROM:

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 batch is 18000, 9000, 4000, 2000, 1000, or 400 grams.

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

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

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

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

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

Special Features

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

Function:	Key:	Description:
TAG		To TAG all material usage data with Work Order or Employee numbers for better tracking of material used, read: KEYPAD, TAG key, and set 2nd digit in the FLG parameter to 1.
RECIPES		To store RECIPES using the RECIPE storage feature, read: KEYPAD, RECIPE key, and set 3rd digit in the FLG parameter to 1.
FAST		To increase throughput, using the FAST key, read: KEYPAD, FAST key, and set 4th digit in the FLG parameter to 1.
BATCH		To blend a preset BATCH amount of material and then stop, read: KEYPAD, BATCH key, and set 5th digit in the FLG parameter to 1.

BATCH, RECIPE, FAST, and TAG keys REQUIRE that you read: PARAMETERS, FLG parameter.

SETTINGS	To use a lower percentage then 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.
SOFTWARE	To configure TWELVE software to look and act like FOUR software, See: KEYPAD, STAR FUNCTIONS (*04) - Configuration to FOUR software.

READ the rest of the manual at your leisure to learn more about how your 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 (2-digit code)

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. ALL AIR SOLENOID outputs

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

If more than 7 outputs are to be driven, a 14 pin connector is provided with outputs for components 8, 9, A, B, and C. If 24-volt solenoids are used, a 17 pin connector is provided.

5. POWER OUTPUTS (receptacles on panel front)

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

6. EIGHT CHARACTER DISPLAY

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

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

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

M Indicates unit is in MANUAL mode.

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

INVALID Indicates:

1. You pressed an incorrect key - or
2. You pressed a key for a function that is not active - or
3. You are not in the right mode for this key to operate.

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

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

SETTING, OPERATE, TIMED, and CALIBRATE are displayed when the respective keys are pressed from the manual or program modes. These displays are followed by pressing a device key; 1 through 9, A, B, C, DUMP, ALARM, MIX, or HOLD. The word FLASHING on the display means that retries are occurring because the first dispense was not enough. Other error conditions also cause flashing.

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

7. LED LIGHTS

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

LEFT COLUMN from top:

1 to 8 - Component 1 through 8 is operating.

RIGHT COLUMN from top:

9 to 12 - Component 9, A, B, or C is operating.

13 - Weigh bin dump valve operating.

14 - Mixer motor drive relay operating.

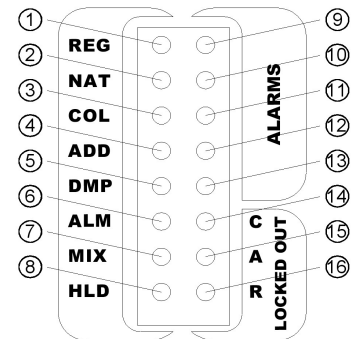
15 - Mixer flow control valve is open.

16 - Alarm output operating.



NOTE

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



8. STROBE LIGHT AND BEEPER ALARMS

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

9. ALARM SILENCE

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

10. LEVEL SENSOR input

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

11. MIXER MOTOR OUTLET

This outlet is energized 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 DOS compatible parallel printer that accepts ASCII characters and does not require a Windows driver may be used. Connect using a standard parallel printer connecting cable, (34 pin parallel connector to a DB25 IBM compatible connector), available from us or at any computer store.

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 or you may write your own software using the MLAN Protocol. Our software, The Gravimetric gateway Software (G2) allows downloading settings and retrieval of information and will produce reports for those customers who wish to take advantage of this feature. 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 "G2" software. Additionally you may write your own communication software by using the MLAN Protocol to send commands to the WSB controllers. For more information on the MLAN Protocol, read the MLAN Protocol Manual. The G2 Software and the MLAN Protocol Manual as well as other important documents are available on our website, www.maguire.com.

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. THUMBWHEEL SWITCHES

The three sets of THUMBWHEEL switches have no effect unless they are assigned to a particular output device. Entry of all SETTINGS is done by using the KEYPAD. However, if you prefer, you may assign up to three components to the Thumbwheel switches and then use these switches to set and alter their settings. Since only three switch sets are available, only 3 components can be controlled in this manner. All others must use the keypad. See ENTERING SETTINGS for more information on how to do this.

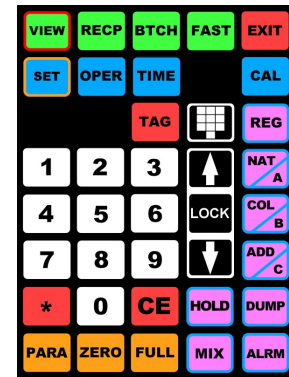
21. KEYPAD: Explained in next section, next page.

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.

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

*02	Extrusion and Yield Control.	*57	Alternate Liquid Color
*03	Four digit (xx.xx) settings.	*66	WSB I.D. number (1-255).
*04	Simulate FOUR software.	*69	Regrind as second natural.
*05	Inhibit totals clearing.	*71	Color percent of blend.
*11	DATE - TIME, real-time clock.	*72	Additive percent of blend.
*12	Move table from ROM to RAM.	*74	Stop, alarm MAX wt exceeded.
*14	Set types: REG, NAT, ADD, OFF.	*75	Alarm on weight drop.
*22	LIW Model Selection	*77	Print parameters.
*23	Move from RAM to EEPROM.	*78	Change program mode PASSWORD.
*25	ROM OK flag, "CE" to clear.	*82	Precision Ratioing.
*32	Move from EEPROM to RAM.	*83	Progressive Metering
*33	Special Alarms.	*86	Backdoor Password
*44	End cycle - bin full.	*87	VOLUMETRIC operation.
*45	Change MANUAL mode password.	*88	Print display readout.
*47	Totalizer flag.	*89	Select pounds, kilos.
*48	Dispense range xx.x to xxx.	*95	Select COM port Baud Rate
*52	Double dump weigh bin.	*98	Display raw weight number.
*54	Print cycle information.	*99	Enables Weight Calibration of the Load Cells

Controller Keypad – Description of Functions

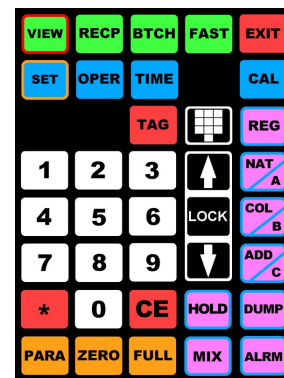
Three (3) operation Modes are available; **AUTOMATIC, MANUAL, PROGRAM.**

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, EXIT and SET 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: (D = #####)
TOTAL weight of each component (X): (X = #####)
(only active components are displayed)
Total weight of ALL materials: (T = #####)

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

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

RECIPE



This key allows you to GET, LOAD, and SAVE RECIPES. To 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

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

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

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

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

FAST

This key will allow you to exceed the normal blending rate of your unit. Once your system has learned proper flow rates of each material, the timing of each component dispense is very consistent cycle to cycle. The FAST key allows one or more FAST REPEAT cycles to follow a normal calibrated cycle. In a FAST

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

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

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

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

SETTING**SET**

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

Press SET to step forward through all the settings.
Press * key to backup in the list.
NEW settings may be entered directly.

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

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

TAG**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.

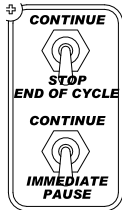
**CE**

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; 1 through 9, A, B, C, DUMP, MIX, HOLD, and ALRM.

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

To enter this mode, press "*", then enter the correct password number. The password supplied with the unit is "11111." You may change this to any other 5 digit number, if you wish, as explained later (*45). When in the MANUAL mode, the letter "M" shows at the left end of display.

The following manual functions are available in the MANUAL mode:

OPERATE

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



TIMED

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



CALIBRATE

(RATE) Press once followed by one of the 12 component keys. 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**Zero Weight Calibration****NOTE**

If you are collecting totals from the blender with software, a Zero Weight and Full Weight calibration should be done periodically, approx every 6 months, to assure accurate data in your totals reports.

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

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. In later model controllers you can specify WSB CAL or LIW CAL. Power On will always set this flag to OFF. This flag must be ON before the load cell weight calibration keys, ZERO and FULL WT, will function. With ON flag displayed, press EXIT.

KEYPAD - PROGRAM MODE

In this mode, you may perform ALL of the functions available in MANUAL mode, plus additional functions that alter the logic with which the controller operates. The PARA key operates in this mode. STAR FUNCTIONS are available by pressing the "*" key and two numbers.

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

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

The following PROGRAM functions are available in the PROGRAM mode.

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



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

The PARAMETER LIST looks like this:

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

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

In the COMPONENT lists:

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

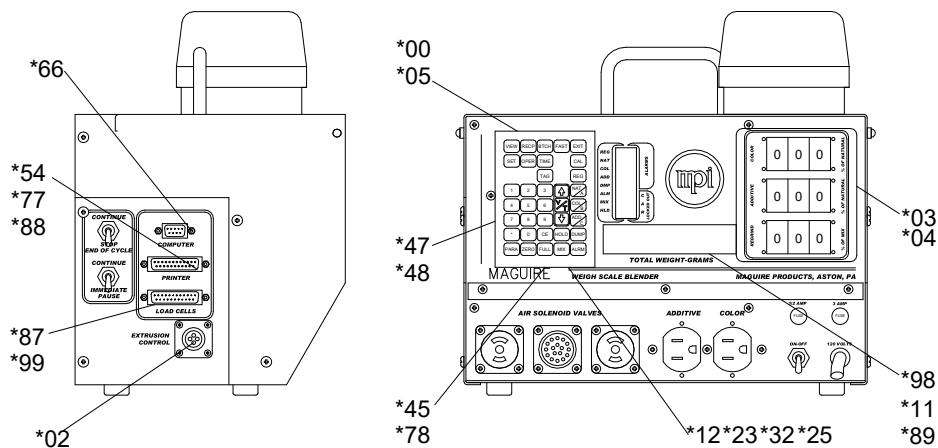
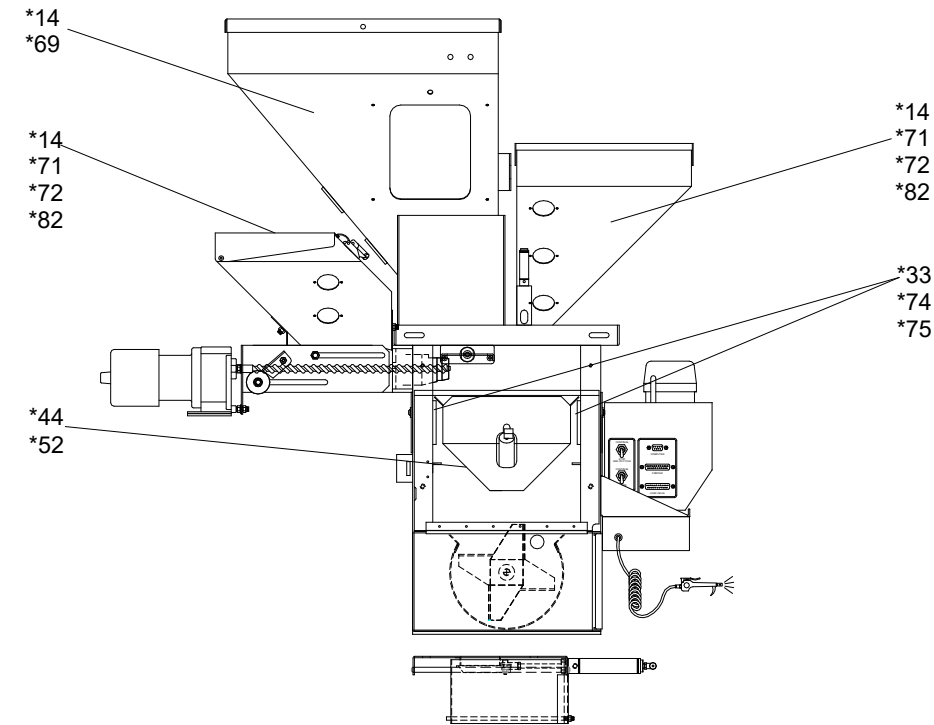
The First press of the PARA key will enter the GENERAL list at the top. Then the first press of the SET key will move to top of the first component list. Press the PARA key to move down in any list.

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

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

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

Star Functions - What they relate to:



*02	Extrusion and Yield Control	*03	Four digit (xx.xx) settings	*04	Simulate FOUR software
*05	Inhibit table clearing	*12	Move table from ROM to RAM	*23	Move from RAM to EEPROM
*32	Move from EEPROM to RAM	*14	Set types: REG, NAT, ADD, OFF	*25	ROM OK flag, "CE" to clear
*33	Special Alarms	*44	End cycle - bin full	*45	Change MANUAL mode password
*47	Totalizer flag	*48	Dispense range xx.x to xxx	*52	Double dump weigh bin
*54	Print cycle information	*66	66 WSB I.D. number (1-255)	*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**

EXTRUDER MODE - 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.

YLD-X – Extruder Control

YLD-T – Takeoff

YLD-D – Dual

*** 0 3**

INPUT FORMAT - 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 x.xx entry requirements as well as the standard xx.x requirements. Normally the XT parameter would be manually adjusted to allow the decimal shift. If this four-digit entry option is turned on, then all entries are in the format xx.xx. The software uses only the first three digits unless the first digit is a zero, in which case the last three digits are selected and the related XT parameter is set to 00010. See XT parameter for more information. Display will say (INPUT FORMAT 3 Digit (XX.X) or 4 Digit (XX.XX). Use * key to toggle.

*** 0 4**

4 Software Configurations

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

Use the "***" key to toggle through all selections:

Select (KEYPAD) to exit without changing anything.

Select (R,N,C,A) for system to operate like FOUR software.

Select (N,N,C,A) to operate like FOUR software with the "TWO NATURALS" flag on.

Select (N,N,N,A) to operate with three Naturals and an additive.

Select (R,N,N,A) to operate with Regrind, two Naturals, and an additive.

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

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

If (N,N,C,A), (N,N,N,A), or (R,N,N,A) is selected, the first, third, and forth components are assigned to switches 3, 1, and 2 respectively. Component 2 setting will be adjusted automatically at the start of each cycle to a number that will make all natural settings add up to 1000. In this way each NATURAL setting will represent a percent of the total natural blend.

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

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

On 140, 240, 440 and 940 models:

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

(1TY = REG) (2TY = NAT) (3TY = ADD) (4TY = ADD)

(1CS 30000) (2CS 00100) (3CS 10000) (4CS 20000)

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

(1TY = NAT) (2CS 40000)

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

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

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

(2CS 40000) (3TY = NAT)

On 220 and 420 models:

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

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

(1TY = REG) (2TY = NAT) (6TY = ADD) (5TY = ADD)

(1CS 30000) (2CS 00100) (6CS 10000) (5CS 20000)

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

(1TY = NAT) (2CS 40000)

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

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

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

(2CS 40000) (6TY = NAT)

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

CLEAR DATA PROMPT - Prevent Totals being Cleared

*** 0 5**

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 **CLEAR DATA PROMPT ENABLED** and **CLEAR DATA PROMPT DISABLED**.

SELECT DATE FORMAT - Sets System Date and Time

*** 1 1**

Press (*,1,1) to set the date format and 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.

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.

Press * to enter the current date and time. Enter the date and time using the keypad numbers. The date and time fields will advance as numbers are entered. After entering the year, the controller will exit to program mode.

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.

Save System Settings from ROM to RAM

*** 1 2**

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

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.



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.



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

NOTE: The three functions, *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.



LIW Model Selection

Press (*,2,2) to select the Loss-In-Weight model. Setting the LIW Model to one of the 4 options will also set the parameters LLF (Loss in Weight Low Level Fill in grams) and HLF (Loss in Weight High Level Fill in grams). LIW Model options are:

LIW05 (Sets LLF to 2500, HLF to 5000)
LIW10 (Sets LLF to 5000, HLF to 10000)
LIW25 (Sets LLF to 10000, HLF to 25000)
LIW40 (Sets LLF to 10000, HLF to 40000)



Set Material Types for each Hopper (12 Software Controllers Only)

Press (*,1,4) to set components to one of four options.

The display will look like this:

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

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

Press the "CE" key repeatedly to scan the four options.
 When proper selection is displayed, move on to NEXT component by pressing the "*" key.
 REPEAT the "*" CE" sequence for ALL components you use.
 The * key will walk you through all components.
 The CE key will change the TYPE for a component.

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

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

**NOTE**

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

*** 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 WITH: BIN EMPTY, BIN 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 **BIN EMPTY** or **BIN FULL**.

Normal operation is to end the cycle BIN EMPTY. The BIN 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**

SET 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**

PRINTED REPORTS - Cycle-by-Cycle Printout

Press (*,5,4) to set flag for a printout of data after each full dispense cycle. With this flag **ENABLED** and with a printer on line, four lines of information about the dispense cycle that just occurred will be sent to the printer. Press * to toggle between **ENABLED** and **DISABLED**. 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

Alternate Color (For Liquid Color PIAD system)

For LIQUID COLOR applications only. This function usually 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 **LIQ OFF**. Press * to toggle to **COL 10**. When display says **COL 10**, the color setting applies to output 10 only, the standard COLOR output. When display says **COL 10 → 11**, this means that output 10 is the starting output, and when no weight is detected after a dispense, the output switches to output 11. The "11" is determined by the parameter (LIQ 11011). You can change the secondary output by changing the parameter.

If output 11 is also empty, the output switches back to 10. See parameter (LIQ 11011) for more information.

If enabling *57 and component 10 is not set as an additive, the display will briefly show *** LIQ ERROR ***.

* 6 6

WSB COMMUNICATIONS – Sets the Blender ID number

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.

* 7 2

ADD & COL AS % MIX - Special Applications Only – Additive Percent of Mix

Press (*,7,2) to change the Additive settings to be interpreted as percent of the entire MIX instead of percent of the Natural. The display will say **ADD & COL AS % MIX ENABLED or DISABLED**. Press "" to toggle flag between **ENABLED** and **DISABLED**. This option has been added for customers with unique requirements.

Leave this flag OFF, (APM- OFF), unless you have specific instructions to do otherwise.

CAUTION: With this flag set, additive settings combined must NOT exceed 100 percent. From a practical standpoint, they should not exceed 10 percent combined.

* 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 **ENABLED** and **DISABLED**.
Press EXIT when done.

* 7 5

WEIGHT LOSS ALARM - Weight Reading Alarm

Press (*,7,5) to set a flag to ALARM if the weigh bin weight drops more than 20 grams during a cycle. This serves to detect and report a weigh bin problem, such as material leaking from the bottom of the bin. Press * key to toggle between **ENABLED** and **DISABLED**. Press EXIT when done.

* 7 7

Parameter Printout

Press (*,7,7) to print a copy of all internal parameters. A printer must be connected and ready. Up to 13 lists will print, a General list and 12 component lists. Only components that are turned "on" will print. Four columns will print, RAM; ROM; 200 and 900 series tables; and EEPROM. Identifying headings print above each column.

* 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.



Precision Ratioing - Additives

Press (*,8,2) to produce a precision ratioing of a selected Additive. Press CE to toggle between **PRECISION RATIOING DISABLED**, **PRECISION RATIOING COMPONENT: 1**, **PRECISION RATIOING COMPONENT: 2**, etc. Only those components already designated as an ADDITIVE will be displayed. If precision ratioing is selected, the specified additive (selected by the *82 function) will dispense BEFORE the Naturals, instead of after. Natural dispenses occur after the selected additive dispense and are calculated to assure the most exact percentage ratio for the selected component. Because the Natural dispenses are larger, this method allows for more exact ratioing of the one selected critical component.



Progressive Metering

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

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

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

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

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

The keypad sequence:

Press *,8,3. Display will say <instruction 83> COMP: 1T.

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

Use the "CE" key to toggle a component ON or OFF.

When ON, Display will say **COMP: # T: 85**

You may change the 85 by entering a different number. Too low a setting will just add time. Too high will cause occasional overshooting.

Press EXIT when done to save new settings.



Backdoor Password

Press (*,8,6) to select a new "Back Door" password for your software. Display will say **BACKDOOR PASSWORD Select (0-9): 00000**. Enter 00001 up to 00009 to select one of nine new backdoor passwords. Contact us for the actual number. If you just want to kill the use of a backdoor password altogether, just enter a number from 1 to 9, and don't call us. Then no one in your plant will know the number. But we still will, just in case. Then your own selected regular password will work and as long as you don't forget it, your ok.

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

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

To activate a new "backdoor" password, you will enter a number from 00000 to 00009 using this star

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

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

*** 8 7**

Volumetric Mode

Press (*,8,7) to set flag for operation in a VOLUMETRIC mode. Use the * key to toggle the flag ENABLED or DISABLED. Press EXIT when done. When power is turned off this flag is always reset to OFF. With this flag ENABLED (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 5**

SELECT COMM. SPEED (Set Baud Rate)

Press (*,9,5) to set the baud rate of the COM port. Options are 1200 baud or 2400 baud. Note: The default baud rate is 1200. If the baud rate is set to 2400, the G2-SA (if in use will also have to be set to 2400 baud by installing a jumper pin on an internal board. If you wish to do this, contact Maguire Products and request the document regarding the G2-SA baud rate. Document is also available online: www.maguire.com

*** 9 8**

Display Load Cell Raw Signal (counts)

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 ENABLE or DISABLE. 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:

*** 0 0**

CLEAR ALL DATA

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

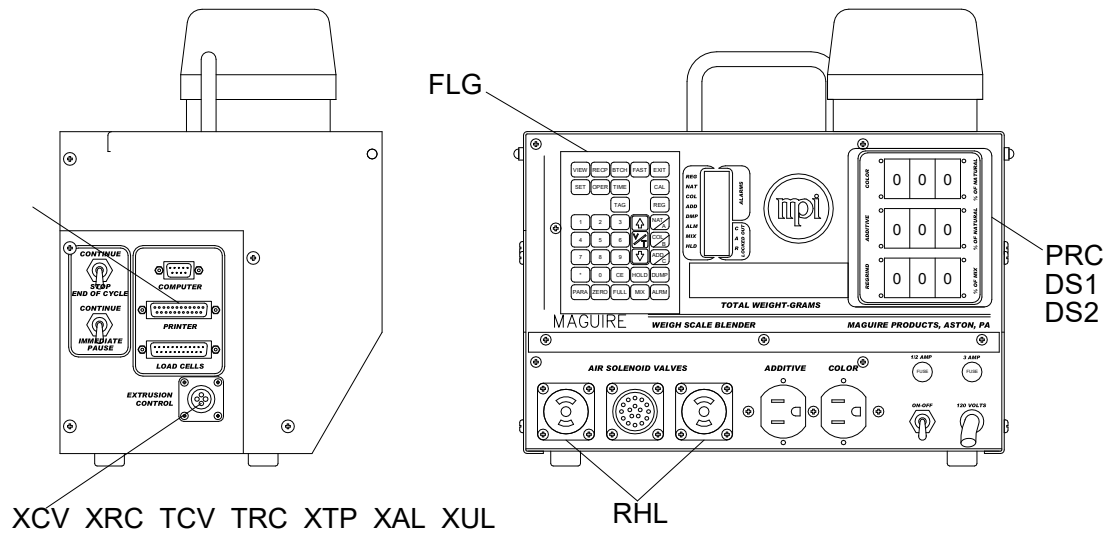
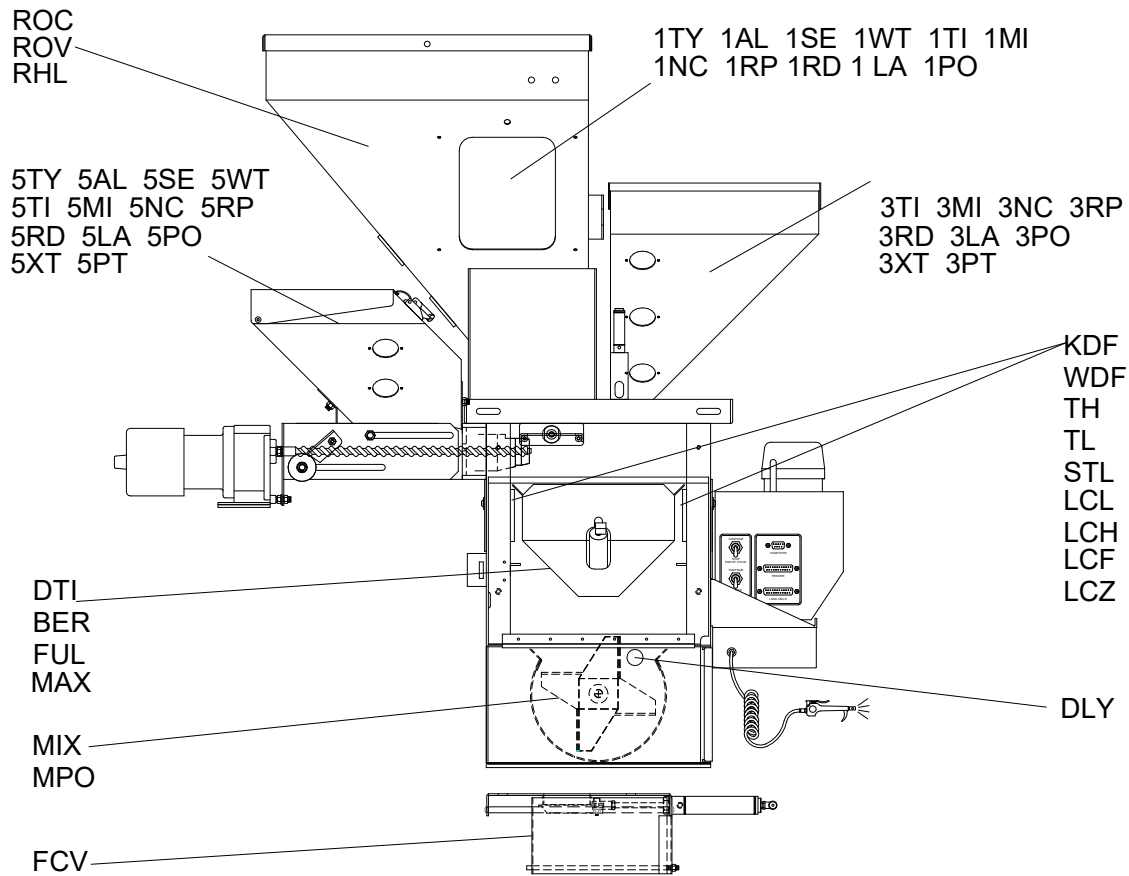
After VIEWING the data or printing of data using the VIEW,* key sequence, a display of (00=0) will appear for 5 seconds. During this 5 seconds you may reset all data fields to zero by pressing 00. Pressing any other key or waiting 5 seconds will exit this sequence without clearing data.

*** 9 9**

Enable Weight Calibration of the Load Cells

Press (*,9,9) to set flag to enable Weight Calibration of the Load Cells. In later model controllers you can specify WSB CAL or LIW CAL. 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.

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 160 parameters accessible for change through the keypad. There is one GENERAL group and twelve COMPONENT groups.

BRIEF explanations are given first.

FULL information is given in the section that follows.



NOTE

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

Parameters are five digits, with leading zeros added.

TIMES	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) 400/900/1800/3000 models; full grams: (xxxxx). (00010 = 10 grams)
PERCENTS	are expressed in tenths for settings (0xxx.x), and full percents for other percentage references (00xxx).

Navigating Parameters

In the COMPONENT lists:

The TOP parameter (TYPE) is ALWAYS accessible.

The others are NOT accessible unless TYPE is set onto a setting.

The First press of the PARA key will enter the GENERAL list at the top. Then the first press of the SET key will move to top of the first component list. Press the PARA key to move down in any list.

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

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

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

Navigating Parameters Quickly - Keypad Sequence:

Press		To ENTER the list at the TOP LEFT (FLG)
Press		To move DOWN a list
Press		To move UP
Press		To move RIGHT (1st time, goes to 1TY)
Press		To move LEFT
Press		When finished EXIT will take you out of Parameters

Parameter List - Explanations

General Parameters

(20 parameters) (900 series settings shown as example settings)

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.
MIX 00015	MIX TIME This parameter times how long the MIX motor runs.
JOG 03030	JOG COUNTS and TIME JOG indicates the number of times the blade will jog after initial mixing is ended, plus the time interval between these jogs.
FCV 00006	TIME the Flow Control valve delays before opening (Seconds). 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 times how long the weigh bin dump valve opens to empty. No change is required.
KDF 00010 WDF 10010	Maximum variation in GRAMS between two consecutive weight 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 01000	Excess GRAM weight before dispense is aborted. This parameter controls sensitivity of the emergency "bailout" routine that prevents overfilling of the weigh bin. No change is required.
ROC 00000	These next three parameters, ROC, ROV, and RHL help control regrind usage. 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 00000	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 00000	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 MAX 30000	Full batch weight, determined by weigh bin size. 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 TL 00500	The highest and lowest acceptable TARE weights for Blend cycle to start. (full or tenth grams) TL prevents starting with the weigh bin out of place. No change is required. TH prevents starting with a full weigh bin. Change TH only if clumps of material hang up in the weigh bin.
PRT 00000	MINUTE interval between automatic print of TOTALS. This parameter will cause your system to PRINT MATERIAL TOTALS automatically. A printer must be connected.
DLY 00488	Delay before cycle start. (Interrupts) This parameter is the time that the sensor must be uncovered before a cycle will begin.

PRC 00010	Maximum allowable PERCENT rate change per cycle. This prevents excessive swings in flow rates by the software. Do not change.
STL 00122	Dispense settle TIME before a weight reading is taken. The time (interrupts) allowed for material to SETTLE in the weigh bin before a weight is taken. Lengthen only to slow the next cycle start, thereby lowering the pile of material in the mix chamber, and, in some cases, improving mixing.
LCL 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	The above 4 parameters relate to the characteristics of the LOAD CELLS on your blender. DO NOT CHANGE THEM.
DS1 00000	Thumbwheel switch override setting.
DS2 00000	
DS3 00000	The above 3 parameters allow external computer inputs to alter the thumbwheel switch settings. They are used on computer controlled dispense systems, using MLAN software.
XCV 00000	Extrusion control voltage output value
XRC 00040	Rate of change of above value
TCV 00000	Takeoff control voltage output value
TRC 00040	Rate of change of above value
XTP 05020	Trip point to force a correction
XAL 00005	Percentage adjustment limit
XUL 00200	Voltage adjustment limit The above 7 parameters all relate to Extrusion Control Systems.
MPO 00000	For air drive reciprocating mix motor
SCR 00000	Special Customer Request
BCR 00000	Barcode Reader
CPL 00000	Yield Control - Counts Per Linear unit of measure
PTD 00020	Pulse Train Delta
MCT 00000	Monitor Cycle Time
LIQ 11011	Liquid Additive - Pump in a Drum (components 10, 11 ... one minute retries then switch 10 to 11)
G2F 00000	Alarm status for G2 communications (offline alarm)
XMO 00000	Maximum Extruder Output
LTP 00005	Loss in Weight Trip Point in percent of Batch
LLF 10000	Loss in Weight Low Level Fill
HLF 40000	Loss in Weight High Level Fill (LLF and HLF are set by *22, LIW Model selection)
RLO 00050	Lowest Dump Rate (Grams/Second)
LT1 00000	Loader Timeout #1
LT2 00000	Loader Timeout #2

Component Parameters

(12 Groups of 14 parameters each)

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

1TY = OFF	DESIGNATES MATERIAL TYPE for this component. Material types are: REG, NAT, ADD, or OFF=NOT USED. (0=OFF, 1=REG, 2=NAT, 3=ADD)
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These **MUST** be set using the *14 function before the system will operate. See: "TURNING ON OUTPUTS" to complete this.

1CS 00000 Thumbwheel assignment or current setting entry.

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

1AL 00000 Last digit = number of retries before ALARM.

00001 to 00009 = sound alarm, hold process.
00011 to 00019 = sound alarm, continue process.

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

1XT 00000 Move decimal left on color and additive settings.

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.

1SE 01000 Upper SETTING limits for thumbwheels (0xxx.x).

Settings greater than limit are held to limit. (01000) = 100%

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

1WT 24000 WT/TI = the rate that will be used for calculating the next dispense time.
1TI 01952

WT = the Weight portion of the dispense rate, calculated such that WT/TI equals the average of the last two actual dispense rates.

TI = the TIME portion of the dispense rate. (Interrupts)
These change AUTOMATICALLY during normal operation.
They are Weight and Time portions of the flow rate calibration.

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

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

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

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

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

1RP 00010 PERCENT shortage error that will force a retry.

1RD 00300 GRAM weight shortage error that will force a retry.
Retries occur until both conditions are met.

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

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

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

Parameter List – Full Explanations

GENERAL PARAMETERS

FLG **Change this to enable the RECIPE, BATCH, FAST, and TAG keys**

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

When all digits are set to 0 (FLG 00000), all four functions are OFF.

The second digit set to 1 (FLG 01000), will turn the TAG key on.

The third digit set to 1 (FLG 00100), will turn the RECIPE key on.

The fourth digit set to 1 (FLG 00010), will turn the FAST key on.

The fifth digit set to 1 (FLG 00001), will turn the BATCH key on.

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

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

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

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

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

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

MIX **Change this to run the mixer for a longer timed period**

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

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

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

After mix TIME is complete, the mix blade is jogged about 1 turn every 1/2 minute. These jogs serve to level the pile of material in the mix chamber, insuring that the sensor does

not remain covered for too long. The first 3 digits (030xx) of the parameter indicate how many jogs will occur. The last two digits (xxx30) indicate the frequency (or interval) in seconds.

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

FCV Delays opening and closing of the flow control valve

FCV controls three different items:

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

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

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

If the first digit is set to a 1 (FCV 10006), the signal output to the air solenoid is reversed. Normally, the computer puts out a voltage to open the valve. With this flag set the computer puts out a voltage to close the valve. For this reverse logic to work correctly, you must reverse the air lines to the flow control valve air cylinder.

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

DTI Probably no need to ever change this

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

KDF WDF Typically No change required - Change only if you have an extreme vibration problem

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

WDF also allows the first digit to determine how long a reading is taken. A 1 in the first position indicates ½ second per reading. 2 means 1 second, 3 means 1.5 seconds, up to 5 which is 2.5 seconds. The higher this number the slower the blend rate, but the more reliable the readings.

KDF is used for load cell calibration weights, WDF for starting tare weight and component dispense weights.

BER Change only if severe vibration causes problems

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

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

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

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

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

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

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

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

EXAMPLE: ROC set to (ROC 01020).

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

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

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

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

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

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

In some cases, the addition of pre-colored regrind tends to produce overall better coloring

because of an initial more uniform dispersion of pigment. In this case you may want to add LESS color to the Natural portions when Re grind is present. Placing a 1 in the first digit of the ROC parameter (ROC 10000), will cause a portion of this Re grind component to be SUBTRACTED from the Natural portions, instead of added.

EXAMPLE: ROC set to (ROC 11020).

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

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

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

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

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

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

ROV

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

LEVEL SENSORS are required for this parameter to work.

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



NOTE

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

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

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

RHL

LEVEL SENSORS are required for this parameter to work
Use only if you have re grind level sensors fitted

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

If set to all zeros (RHL 00000), then this parameter is ignored.

ROV alters the way RHL is interpreted.

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

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

IF ROV equals zero (ROV 10000):

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

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

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

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

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

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

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

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

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

The Software logic is as follows:

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

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

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

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

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

by the ROV parameter.

Example: RHL is set to 10 and 90 percent (RHL 09010).

ROV last digit is set to 3 (ROV 10003).

The "Regrind" thumbwheel switch is set to 25 percent (025).

The Software logic is as follows:

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

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

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

FUL Change only for extremely fluffy or heavy material

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

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

DISPENSE STATION CONFIGURATION.

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

See "MAX", next, for more information.

MAX Set automatically if FUL parameter is changed

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

If you change the FUL parameter, the MAX parameter will automatically be set to a value 50 percent higher than the FUL setting.

DISPENSE STATION CONFIGURATION.

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

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

TH Change only if material sticks in the weigh bin

TL

TH and TL are acceptable error limits for TARE WEIGHT.

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

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

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

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

PRT Change to get AUTOMATIC printing of material totals

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

DLY Consider changing if mixing is a problem

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

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

PRC No change required

PRC is the maximum allowable PERCENT rate change per cycle. If a large dispense error

occurs, flow rate corrections do not exceed this percent number. This prevents large swings in timing of dispenses and provides for stable dispense rates under difficult conditions. For example, when dispense quantities are very small (one or two grams), overfeeding by several grams is a distinct possibility. This type of error represents a very large percentage error to the controller.

However, a large correction would not be appropriate but, instead, would cause a "hunting" of dispense time that would result in further large errors. This parameter prevents this.

STL No change required

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

LCL DO NOT CHANGE THESE

LCH

LCF

LCZ

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

DS1 Function in Dispenser mode only.

DS2

DS3

Override top, middle and bottom thumbwheel switch settings.

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

If either DS1, DS2 or DS3 is set to any value greater than zero:

Substitute DS1 for the TOP switch settings,

Substitute DS2 for the MIDDLE switch settings, and

Substitute DS3 for the BOTTOM switch settings

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

If BOTH DS1, DS2 and DS3 are set to 00000, then nothing changes.



NOTE

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

SCR Special Customer Request

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

BCR Use only for blenders with BAR CODE reader input.

If you know ONE bar code input is required before a new cycle is initiated, set this parameter to 00001. The blender is then prevented from operating until one single valid

input is received. If two inputs are expected, set this parameter to 00002, etc. When set to any value, the blender will not operate until the required number of scanned inputs are received.

XCV **Extrusion Control Voltage** **XRC** (For Extrusion Control Systems only)

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

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

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

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

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

TCV **Takeoff Control Voltage** **TRC** (For Extrusion Control Systems only)

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

XTP **Extrusion Control Trip Point** (For Extrusion Control Systems only)

The LAST THREE digits of the XTP parameter specify the TRIP POINT when software will make an adjustment to the throughput rate number, which will then cause a change in extruder speed. Speed is held steady until there is significant indication that the throughput rate is incorrect. The software analyzes each batch watching for any meaningful deviation from current controlling rate. These last three digits of this parameter specify the accumulated error, indicated as a percent of full batch weight, required to trip a change. For example, when set to 30 on a 200 series blender, this would indicate a 600 gram total error must accumulate before adjustment, 30 percent of the full batch weight of 2000 grams.

The FIRST TWO digits indicate how many cycles must run without a rate adjustment before the operator is permitted to switch from voltage (manual) control to Throughput (automatic) control. This is a factor during startup only. Larger numbers assure a very accurate rate has been learned. This is preferred if you like the way your extruder is

running and do not want any further adjustment unless a real problem is detected. On the other hand, if you know that you want output to be a predetermined value, like 1000 pounds per hour, then switching sooner is better. In this way the operator can enter the rate he desires sooner, and the blender can immediately make any required adjustments required to target in on this rate. Too large a number causes delayed response, too small causes hunting. Larger is safer since you do not want "false" adjustments to occur.

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

XAL Extrusion Control Adjustment Limit

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

XUL Extrusion Control - Upper Adjustment Limit

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

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

CPL Yield Control - Counts Per Linear unit of measure

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

PTD Yield Control - Pulse Train Delta, trip point

This allows some error in the pulse train rate. For example, if the pulses are being generated at a rate of 6030 per minute, which is 100.5 per second, and we count pulses every second, then we will count 100 for one second, 101 for the next, then 100, then 101 and so on. This "error" could cause adjustments to occur when no adjustment is warranted. The PTD parameter specifies how many over or under pulses have to accumulate before adjustment occurs. In the above example, if 6030 per minute was what we wanted, but counts came in at 101 per second, then an error of 30 would accumulate in 1 minute. The PTD parameter set to 00030 would cause a correction to occur at this level of error. The default value of this parameter is 00060 (20).

MPO For Micro Blender air driven reciprocating mixer.

MPO sets the timing, in tenths of seconds the clockwise and counterclockwise timing of

the mix blade. MPO 00010 is 1 second for each direction.

LIQ For LIQUID COLOR applications using dual pumps / drums.

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

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

Other arrangements are possible, but require some wiring.

MCT Monitor Cycle Time – For Throat Mount Applications Only

This parameter acts as the ultimate fail-safe precaution. When used, it monitors sequential cycle times, and alarms if a cycle time exceeds the previous cycle time by an amount that is not consistent with proper operation. This provides a means to detect mechanical failures such as a sticking valve or weigh bin gate. When set to 00000, this parameter is not active. When set to MCT 02060, an alarm will occur when either a cycle time is double (02xxx) the previous time, or exceeds it by 60 (xx060) seconds. At power-on this alarm is always set off and disabled. Once smooth running is established, the alarm is enabled. Smooth operation is established using the same logic that Extrusion Control uses. If the alarm is activated, the display will say (TIME OUT). Press the alarm silence button to reset the alarm. A new cycle will also reset the alarm. If another alarm is currently active (material not dispensing for example) then this Monitor alarm is ignored or reset.

G2F G2 Totals Collection Alarm

The G2F parameter is used in conjunction with the G2 Software or the Get Totals command. The Get Totals MLAN command can be sent with either a command code of 16 or 17. If Get Totals used command code 16, an internal flag in the controller is set indicating the totals have been collected for this cycle. If the G2F Parameter is on, the blender will stop running cycles and alarm because the flag had not been set, indicating the totals had not been collected for the previous cycle. At that time the "Get Status" MLAN protocol command will return an alarm status of 26.

XMO Maximum Extruder Output (or MXO)

For Extrusion Control, this parameter stores the extruder throughput rate that can be expected when control voltage is set to it's maximum output of 10 volts. On start up, before the unit has time to learn the correct voltage/throughput relationship, this parameter is used as a starting point. Having this value allows the customer to switch to Throughput mode right away; no need to wait several cycles. XMO is adjusted and corrected frequently by the software to match your process. The only time it is zero is on the very first start up

of the system. XMO is the rate in pounds per hour, or kilos per hour.

LTP Loss In Weight Trip Point

For Extrusion Control, Yield Control, when a Loss In Weight station is part of the system, an adjustment "trip point" must be specified. This is the total accumulated error that is required to cause an adjustment to the learned rate. This is the equivalent to the XTP parameter, which is explained earlier. The last 3 digits are a percentage in tenths (xx.x) of the total batch that is being monitored. If the system is filling the Loss In Weight bin to a total weight of 10,00 grams, for example, and allowing it to drop to 4000 grams, for example, before refilling, then the batch is 6000 grams. If LTP is set to 00010, then this is 1 percent of 6000, or 60 gram trip point. See XTP for more explanation of trip point.

LLF Loss In Weight Low Level Fill

Value in grams that will cause the fill valve on the Loss In Weight system to open and begin to fill. This parameter is set automatically by the *22 LIW Model Selection.

HLF Loss In Weight High Level Fill

Value in grams that will cause the fill valve on the Loss In Weight system to close and stop the fill process. This parameter is set automatically by the *22 LIW Model Selection.

RLO Lowest Dump Rate (Grams/Second)

Lower SETTING limit for REGRIND (0xxx.x).

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

RLO sets a LOW limit of 5 percent to the REGRIND setting.

LT1 Loader Timeout #1

LT2 Loader Timeout #2

LT1 and LT2 (set ONLY if your controller is modified to control a loader)

The LT1 and LT2 parameters are normally set to all zeros, indicating that this feature is not present on your system.

If you have additional outputs on your WSB controller for driving a loading system, then this parameter should be set to some number indicating how many seconds you will attempt to load before sounding the ALARM. A sensor input to the controller tells the loader to load. When the sensor is covered the loader stops. If the sensor is not covered within the specified number of seconds, the strobe light and the beeper are activated and the display flashes (LOADER 1) or (LOADER 2), depending on which one has the problem.

The LT1 and LT2 parameters specify this delay time before alarm.

All circuit boards have provision for connecting level sensor inputs for 2 loaders. When this loader option is being used, uncovering level sensor 1 will cause pin G (7) of the eight pin Amphenol plug to be energized. This can be used, through a relay, to drive a loader.

COMPONENT PARAMETERS (12 Groups of 13 parameters each)**_TY Designates material type for this component**

_TY is the number that designates if this Component is used and what material TYPE it is. Material TYPES are REGRIND, NATURAL, ADDITIVE, or NOT USED. This parameter is stored as a 5 digit number but displayed as a three letter word:

OFF = Component NOT USED,

REG = REGRIND,

NAT = NATURAL,

ADD = ADDITIVE.

Use the * key to toggle through these four selections.
(All other parameters require input of a 5 digit number.)

The WEIGH SCALE BLENDER handles each DIFFERENTLY in the MATH routines.

REGRIND (PERCENT OF MIX)

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

NATURAL (RATIO TO EACH OTHER)

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

ADDITIVE (PERCENT OF ALL NATURALS)

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

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

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

However, we recommend that you specify materials this way:

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

NATURAL; all the materials that are the bulk of the mix. These will be RATIOED to each other and will constitute the ENTIRE mix except for space needed for Regrind and Additives.

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

_CS Set AUTOMATICALLY when you enter settings

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

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

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

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

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

_AL Sets alarm functions

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

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

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

00011 to 00019 = sound alarm after specified number of retries but then stop the retries and continue with the remainder of the cycle. The alarm will continue until the fault condition is corrected or until the next cycle begins. The last digit determines the number of retries before sounding the alarm. This would be appropriate if you wish to make several attempts at a dispense, such as regrind, but you wish the process to continue even without the component.

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

other correction to allow the process to continue.

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

`_XT` Allows a setting entry of less then 00.1

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

`_SE` Use to lock out high settings or limit access

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

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

`_SE 00060`

Any setting above 060 is held to 6 percent.

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

`_WT` `_TI` Set AUTOMATICALLY by the CALIBRATE routine

`_WT`, and `_TI` parameters are related to the flow rate or dispense rate of each material. These can be changed manually, set by the RATE CALIBRATION routine, or simply allowed to adjust automatically as necessary after each cycle.

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

Since rate correction takes place continuously and the battery-backed RAM

maintains the correct rate even when power has been turned off, these numbers will only be in error during the first several cycles after a flow rate has been considerably altered.

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

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

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

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

EXAMPLE: For a 1/2" auger feeder with a 60 RPM motor drive, the normal metering rate is about one gram per revolution or 1 gram per second. Since the `_MI` number is expressed as tenths of grams, 80 % of this is expressed as: (`_MI 00008`)

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

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

`_NC` Changes itself automatically over time

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

This number has been set based on our experience with the dispense devices. If, over time, the computer finds that the number is too large or too small, it will automatically adjust it to match the actual conditions that exist with your equipment.

These adjustments occur in increments of 1 or 1/10 gram and occur only once every 20 cycles. A change is made only if needed. Checking this number from time to time will indicate the normal error range that is occurring with each dispense device on your unit.

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

_PT For augers and micro pulse devices only

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

_RP No change required **_RD _RD is set AUTOMATICALLY by the CALIBRATE routine**

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

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

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

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

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

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

dispenses are requested.

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

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



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

`_LA` Change if you change metering device

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

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

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

Following the instructions given in the KEYPAD portion of the manual (TIME key), start with a dispense time of 1 (001). Try successively higher time numbers until some movement is noted in the mechanical device and a minimum amount of material IS dispensed on each try. This is the MINIMUM lag time number; the lowest number that DOES cause some movement and DOES result in a minimum dispense. Add 5 to this time period and enter as the lag time. Lag times that are too short can cause problems. That is why the MINIMUM lag time determined above should be increased by 5 as a safety factor.

These numbers are preset at the factory for the equipment we have supplied. When a dispense of only a few grams is required, the `_LA` number is very important. Too small a lag time will result in no dispense at all because of inadequate time for the

device to operate. Too large a number may result in over dispenses when very small amounts are called for. Since too small a number may stall the process, always add 5 to the minimum as a safety.

Typical LAG TIMES are: (minimum time plus five)
15 - for an AC motor being powered through a relay.
10 - for a 1" air cylinder sliding a dispense valve.
127 - for a MAGUIRE automatic speed controller.

_PO For Micro Pulse devices only

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

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

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

PARAMETER DEFAULT SETTINGS - TWELVE SOFTWARE

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

The General Parameter List:

	Micro	140	140R	220	240	240R	420	440	440R	940	1840	3000
FLG	0	0	0	0	0	0	0	0	0	0	0	0
MIX	15	15	15	15	15	15	30	30	15	30	99	99
JOG	3030	3030	3030	3030	3030	3030	3030	3030	3030	3030	3030	3030
FCV	6	6	6	6	6	6	6	6	6	6	6	6
DTI	6	6	6	6	6	6	10	10	10	4	8	8
KDF	10	10	10	10	10	10	2	2	2	2	4	4
WDF	10010	10010	10010	10010	10010	10010	10002	10002	10002	10002	10004	10020
BER	1000	1000	1000	1000	1000	1000	200	200	200	200	200	200
ROC	0	0	0	0	0	0	0	0	0	0	0	0
ROV	0	0	0	0	0	0	0	0	0	0	0	0
RHL	0	0	0	0	0	0	0	0	0	0	0	0
FUL	4000	10000	10000	20000	20000	20000	4000	4000	4000	9000	18000	30000
MAX	6000	15000	15000	30000	30000	30000	6000	6000	6000	13500	27000	45000
TH	1000	1000	1000	1000	1000	1000	200	200	200	1000	1000	1000
TL	500	500	500	500	500	500	100	100	100	500	500	500
PRT	0	0	0	0	0	0	0	0	0	0	0	0
DLY	732	488	488	488	488	488	488	488	488	488	488	488
PRC	10	10	10	10	10	10	10	10	10	10	10	10
STL	122	122	122	122	122	122	122	122	122	122	122	488
LCL	27	27	27	27	27	27	80	80	80	80	40	10
LCH	39	39	39	39	39	39	120	120	120	120	60	30
LCF	79	79	79	79	79	79	79	79	79	79	79	79
LCZ	583	583	583	583	583	583	583	583	583	583	583	583
DS1	0	0	0	0	0	0	0	0	0	0	0	0
DS2	0	0	0	0	0	0	0	0	0	0	0	0
XCV	0	0	0	0	0	0	0	0	0	0	0	0
XRC	40	40	40	40	40	40	40	40	40	40	40	40
TCV	0	0	0	0	0	0	0	0	0	0	0	0
TRC	40	40	40	40	40	40	40	40	40	40	40	40
XTP	5020	5020	5020	5020	5020	5020	5020	5020	5020	5020	5020	5020
MPO	10	10	10	0	0	0	0	0	0	0	0	0
SCR	0	0	0	0	0	0	0	0	0	0	0	0
XAL	5	5	5	5	5	5	5	5	5	5	5	5
XUL	200	200	200	200	200	200	200	200	200	200	200	200
BCR	0	0	0	0	0	0	0	0	0	0	0	0
CPL	0	0	0	0	0	0	0	0	0	0	0	0
PTD	60	60	60	60	60	60	60	60	60	60	60	60
MCT	0	0	0	0	0	0	0	0	0	0	0	0
DS3	0	0	0	0	0	0	0	0	0	0	0	0
LIQ	11011	11011	11011	11011	11011	11011	11011	11011	11011	11011	11011	11011
G2F	0	0	0	0	0	0	0	0	0	0	0	0
XMO	0	0	0	0	0	0	0	0	0	0	0	0
LTP	5	5	5	5	5	5	5	5	5	5	5	5
LLF	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
HLF	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
SBO	0	0	0	0	0	0	0	0	0	0	0	0

Component lists:

Component 1 is the base list for all components.

Other component lists show only the changes from list 1.

Component Parameters:	Blender Model:					
	3Kg Base Load Cells			10Kg Base Load Cells		
	220/240	140	MB	940	1840	420 / 440
	(1 & 2)		(VV)	(2"x3" or 3" x 6" Slide Gates)		
1TY	OFF			OFF		
1CS	00			00		
1AL	04			04		
1XT	00			00		
1SE	1000			1000		
1WT	26000	18000	22400	24000	24000	20800
1TI	976	976	15616	1952	1952	7808
1MI	01			01		
1NC	10			01		
1PT	00			00		
1RP	10			10		
1RD	500			300		100
1LA	10	10	04	10		
1PO	00			00		
	(3,4,7,8)		(VV)	(3" Rnd, 2"x3" or 3" x 6" Slide Gates)		
3TY	OFF			OFF		
3CS	00			00		
3AL	04			04		
3XT	00			00		
3SE	1000	128	22400	1000		
3WT	26000	31232	15616	20800		
3TI	976			7808		
3MI	01			01		
3NC	10			01		
3PT	00			00		
3RP	10			10		
3RD	500		50	300		100
3LA	10		04	10		
3PO	00			00		
	5,6,9,A,B & C Always Feeders			5,6,9,A,B & C Always Feeders		
5TY	OFF			OFF		
5CS	00			00		
5AL	04			04		
5XT	00			00		
5SE	1000			1000		
5WT	20480			20480		
5TI	31232			31232		
5MI	01			01		
5NC	10			01		
5PT	00			00		
5RP	10			10		
5RD	50			300		100
5LA	15			15		
5PO	00			00		

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 (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	*	Display will say: (PASSWORD)
Press	2 2 2 2 2	Display will say: (P x)
Press	*	Display will say: (INSTR __)
Press	5 4	Display will say: (PRNT OFF)
Press	*	Display will say: (PRNT ON)
Press	EXIT	Display will say: (P x)
Press	EXIT	Display will say: (x)

Any common parallel printer that can be printed to from DOS applications may be used. Connect using a standard parallel printer connecting cable, (34 pin parallel Centronix connector to a DB25 IBM compatible connector), available from us or at any computer store.

Interpreting the *54 Cycle Printout

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

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

```

-----
**1 R20.0**  **2 N 100**  **1 C 04.0**  **1 A 04.0**  TOTAL
* 11/10/01 *  *16:17:53 *  RECIPE 0000  **ID# 051**  **WO 00000*  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:

```

-----
**1R 20.0**  **2 N 100**  **1 C 04.0**  **1 A 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.

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

The **CYCLE** heading:

```
* 11/10/01 *      *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 component 1 column, 18224 and 976 translates to 1822.4 grams in 4 seconds (244 interrupts = 1 sec). This is 455.6 grams per second, typical for a regrind flowing through 3" round or 2"x3" dispense valves.

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

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

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

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

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

Material Dispense Device:

Approx. Grams per Second:

½" 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 10003) or (WDF 10030), 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. Up to 13 lists will print, a General list and 12 component lists. Only components that are turned "on" will print. Four columns will print, RAM; ROM; 200 and 900 series tables; and EEPROM. Identifying headings print above each column.

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 difference 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	1	123	2749
key:		component number		
			dispense time (in interrupts; 244 = 1 sec.)	
			weight dispensed	

CALIBRATE (See KEYPAD, CALIBRATE for more information)

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

CALIBRATE	COMP	1	732	8795	15	3465
key:		component number				
			dispense time			
				weight dispensed		
					lag time used	
						min rate

Material Usage 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		
COMP 1	R 05.0	2.4	4.8	1.5	5.0	
COMP 2	N 100	47.4	100.0	28.6	100.0	
COMP 5	N 00.5	.4	.99	.2	.99	
COMP 6	N 00.5	.4	.94	.2	.91	
TOTAL		50.8		30.7		
WEIGH SCALE ID#	120					
TOTALS ARE IN POUNDS						
POUNDS PER HOUR	365.3					

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

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

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

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

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

The POUNDS PER HOUR is calculated using the total material dispensed from the CURRENT column, and the time difference between the CURRENT time and the LAST PRINTED time.

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	2	2	2	2	2	Display will say: (P x)
Press	*					Display will say: (INSTR __)
Press	7	7				Display will say: (PRINTING)
Press	EXIT					Display will say: (P x)

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

Press	*			Display will say: (INSTR __)
Press	5	4		Display will say: (PRNT OFF)
Press	*			Display will say: (PRNT ON)
Press	EXIT			Display will say: (P x)
Press	EXIT			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.
4. **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.
5. **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
6. **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.

7. **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.
8. **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.
9. **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.
10. **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.
11. **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.
12. **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.
13. **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 series units use an air drive for the mix blade, instead of an electric motor.

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 than 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. Turn "FAST" on. This causes rapid volumetric "timed" dispenses to occur up to 4 times after each normal gravimetric dispense.
5. 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=xxxxxT) is displayed for 1 second, followed by the check sum number (CKS xxxx), followed by a ROM check (ROM OK), followed by a display of (0). The weight in the weight bin is now displayed. It should be 0 plus or minus several grams. During the first few minutes of operation, the displayed weight readings may drift slightly as the circuitry warms up.

BEGIN operation:

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

If the WEIGH BIN DUMP Flap opens and closes repeatedly:

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

If the ALARM flashes:

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

The DISPENSE sequence begins:

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

DISPLAY during dispenses:

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

REGRINDS first:

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

NATURALS second:

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

ADDITIVES third:

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

MATERIAL RUNS OUT:

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

If ALARM flashes:

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

WEIGH BIN dump:

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

SENSOR covered:

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

FLOW CONTROL Valve: (optional)

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

VERIFYING LOAD CELL FUNCTION

Most Problems are related to LOAD CELL function.

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

**NOTE**

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

The following observations will verify proper load cell operation:

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

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

Most load cell problems are caused by interference to the movement of the load cell. The load cell must be free to respond to the weight of a single pellet as well as free to move far enough to record a full 20,000 gram weight deflection. (10,000 grams per cell - 10K cells)

If weight readout is very erratic check for damage to the load cell wires. Check for a pinched wire in the connector.

An over stressed load cell will read high. The top limit is (3100.0) for a 200 series or (31000) for a 400 or 900 series. A load cell that was forced or pried upward too far will read (0.0).

We supply and replace load cells in matched sets and we always include the mounting enclosures. You may remove the back plate from the enclosure for visual inspection. It is not safe to remove the load cell itself from the enclosure. To do so may stress the cell itself.

To OPERATE with DAMAGED load cells in a VOLUMETRIC mode, see KEYPAD, *87, Volumetric mode.

To RECALIBRATE the LOAD CELLS, see the HARDWARE MAINTENANCE section.

If you suspect load cell damage or failure, see: LOAD CELL RAW SIGNAL READOUT.

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 60 PSI pressure setting.

LEVEL SENSOR

Sensor position; 200 and 400 series models only:

The sensor should protrude into the mix chamber about 1/4 inch past the inside surface of the stainless mounting plate. If it does not protrude far enough, it will sense the mounting plate itself. If it protrudes too far, it will sense the mix blade.

Adjusting sensor sensitivity:

1. The adjustment screw is located at the rear of the sensor. It may be protected by a small plastic screw like cover. You will need a very small screwdriver to adjust it.
2. Fill the mix chamber until the sensor is about 3/4 covered.
3. Turn screw counter-clockwise until the LED goes OFF.
4. Then turn clockwise until the LED just goes ON.
5. Empty the chamber and check to be sure the sensor LED does not go on when the mix blade passes near it.

WEIGH BIN DUMP VALVE

The WEIGH BIN DUMP VALVE should be adjusted to close softly. A needle valve is installed next to the quick disconnect so that air flow to the flap air cylinder may be restricted. Adjust as required for a soft close.

SLIDE VALVES

Slide valves must move very freely. If they seem to jam slightly as they reach the full extended position (closed), this may be due to the air cylinder mount being slightly bent. If someone has pulled down or pushed up on the air cylinder, they may have bent the cylinder mount. You can correct this by pressing up or down on the cylinder as required to correct the problem.

If you process very hard pellets (polycarbonate and glass filled resins), your slide gate dispense valves may stick closed occasionally. We provide spacers that limit the full stroke of the air cylinder. This stops the slide from going any further than the just closed position and prevents jamming. Call us for information.

INTERNAL MIX MOTOR and AUGER FEEDER FUSES

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

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 --) Followed by: (P 0)

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

Press		Display will say: (-- WAIT --) Followed by: (P 2000.0)
-------	---	---

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

Press		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.

BLENDER PREVENTIVE MAINTENANCE

There are no components of your blender that require periodic maintenance. However, over the years, blenders may be subjected to abuse or difficult conditions, and accuracy can suffer. To maintain control over the cost of expensive color and additives, you must maintain accuracy. We recommend that blenders be examined once a year, and all necessary repairs be made to insure continued accuracy.

DISPENSE GATES

To be accurate, gates must open and close freely, quickly, and completely. Check for wear on the slide gate guide rods. Check cylinder clevis adjustment for correct closing of the gate. A gate should close just enough to block the hole, but no further. It is best if they do not pass over the far edge of the opening as this might catch and jam on a pellet. Check that the clevis pin connecting the air cylinder is intact, not broken or worn through. Check for correct air pressure, tight fittings, and no damaged or crimped air lines.

WEIGH BINS

Check for smooth correct operation of the dump flap. Hinge points should not be worn. Gate should overlap the forward edge enough to prevent dribble when closed, even when closed against pellets. Space at the rear of the flap should allow for static build up of pellets on the rear edge of the dump flap without interfering with the closing of the flap. Again, if you see evidence of these problems, newer design parts are available to solve these problems. Check that the flap closes fully, and closes softly. The soft close is adjustable.

CLEARANCES - FREE MOVEMENT OF WEIGH BIN

Carefully examine all the parts of the weigh bin and the bin hanging bracket to be sure that nothing touches any fixed parts. A quarter (1/4) inch of space should exist on all sides of the weigh bin. Over the years, windows and guards have been added, and this has required that the weigh bin size be reduced to maintain 1/4 inch clearance per side. Be sure you do not have an older larger bin installed where windows have been added.

A light touch of the bin should show a change in the weight readout. Remove the touch and the display should return to exactly the same number, plus or minus 1 or 1/10 gram depending on model. Only the last digit should drift, or vary, and by no more than one count. If ANY interference is detected, it MUST be fixed.

MIX CHAMBER

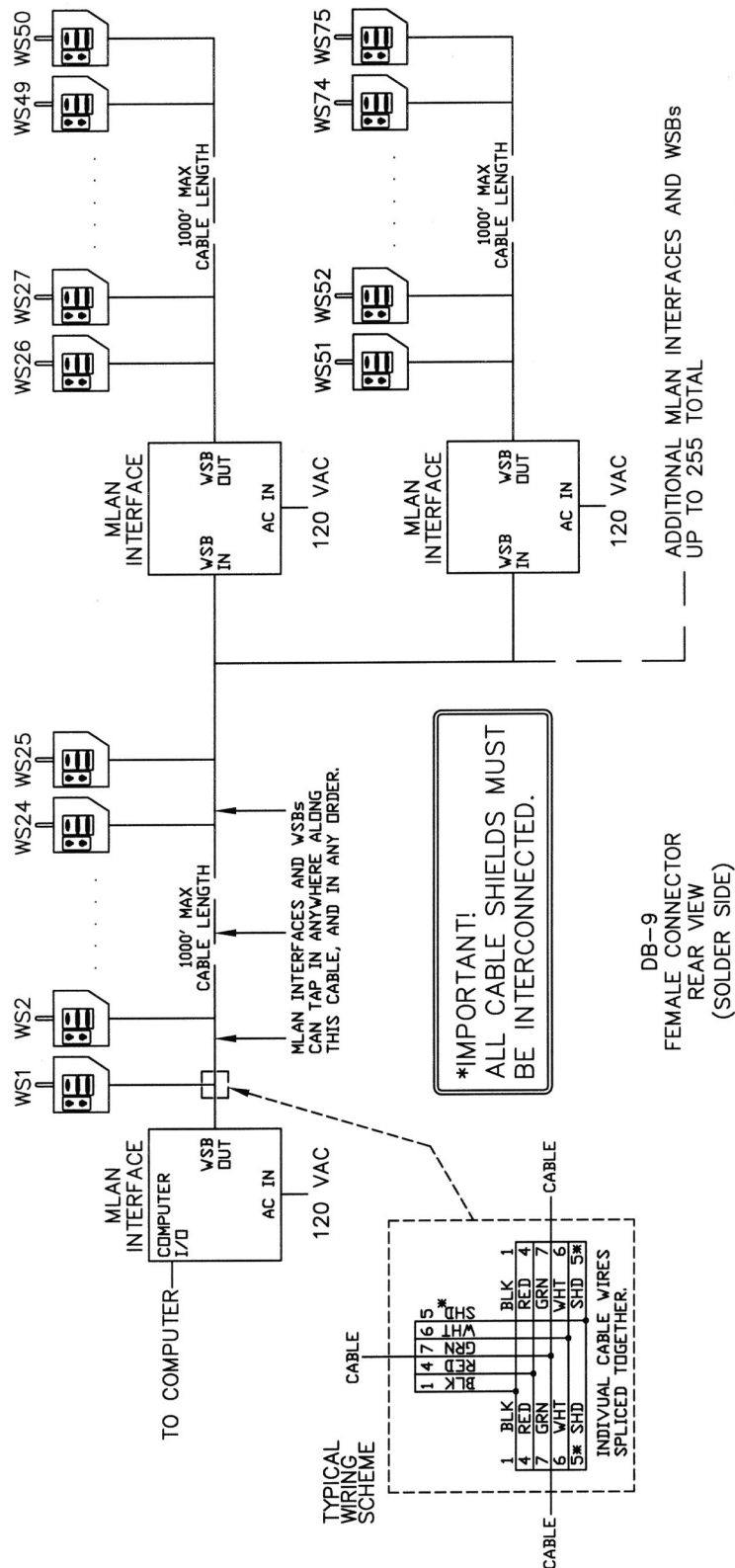
No bent blades. No SHARP blades. Bent blades might brake off and severally damage your process screw. Sharp blades are a safety hazard. Replace if mix blades are not perfect.

The blade assembly should slip on and off the motor shaft easily. The need to use excessive force to remove the mixer assembly may bend the blades and they may eventually break off. Correct this if it is a problem.

*77 and *54 PRINTOUTS

After you have fixed any problems, use the *77 and *54 functions to obtain printouts and fax them to us for evaluation.

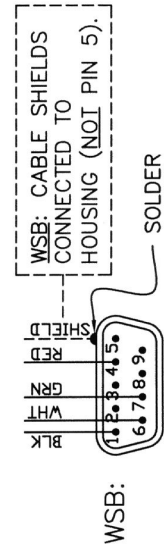
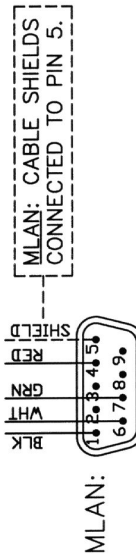
MLAN INTERFACE WIRING EXAMPLE



NOTE:

ALL BULKHEAD CONNECTORS ARE
MALE DB-9 ON BOTH MLAN
INTERFACE UNITS & VSBs.

ALL CABLE ENDS ARE FEMALE
DB-9 CONNECTORS.



DB-9 PIN#	CARD WIRE #C 2555	BELDEN WIRE #9402
1	BLACK	BLACK
4	RED	RED
7	GREEN	GREEN
6	NATURAL (WHITE)	WHITE
5*	SHIELD	SHIELD

IBM DB-25	MLAN DB-9	FUNCTION
3	2	MLAN OUT TO IBM
2	3	MLAN IN FROM IBM
1,7	5	GROUND



Maguire Products Inc.
Aston, PA
610-459-4300
FAX: 610-459-2700

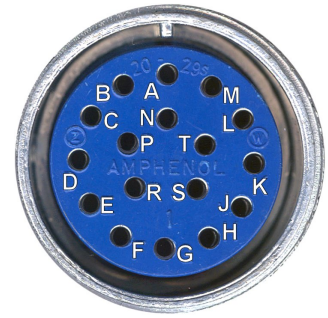
MLAN

INTERFACE
WIRING EXAMPLE

DRAWN BY:	JSH	DATE DRAWN:	5/17/95
SHEET:	1 OF 1	DATE CHANGED:	9/25/96

17 pin Amphenol connector Pin assignments

This table describes the pin assignment to device of the 17 pin Amphenol connector with factory wire color assignment.

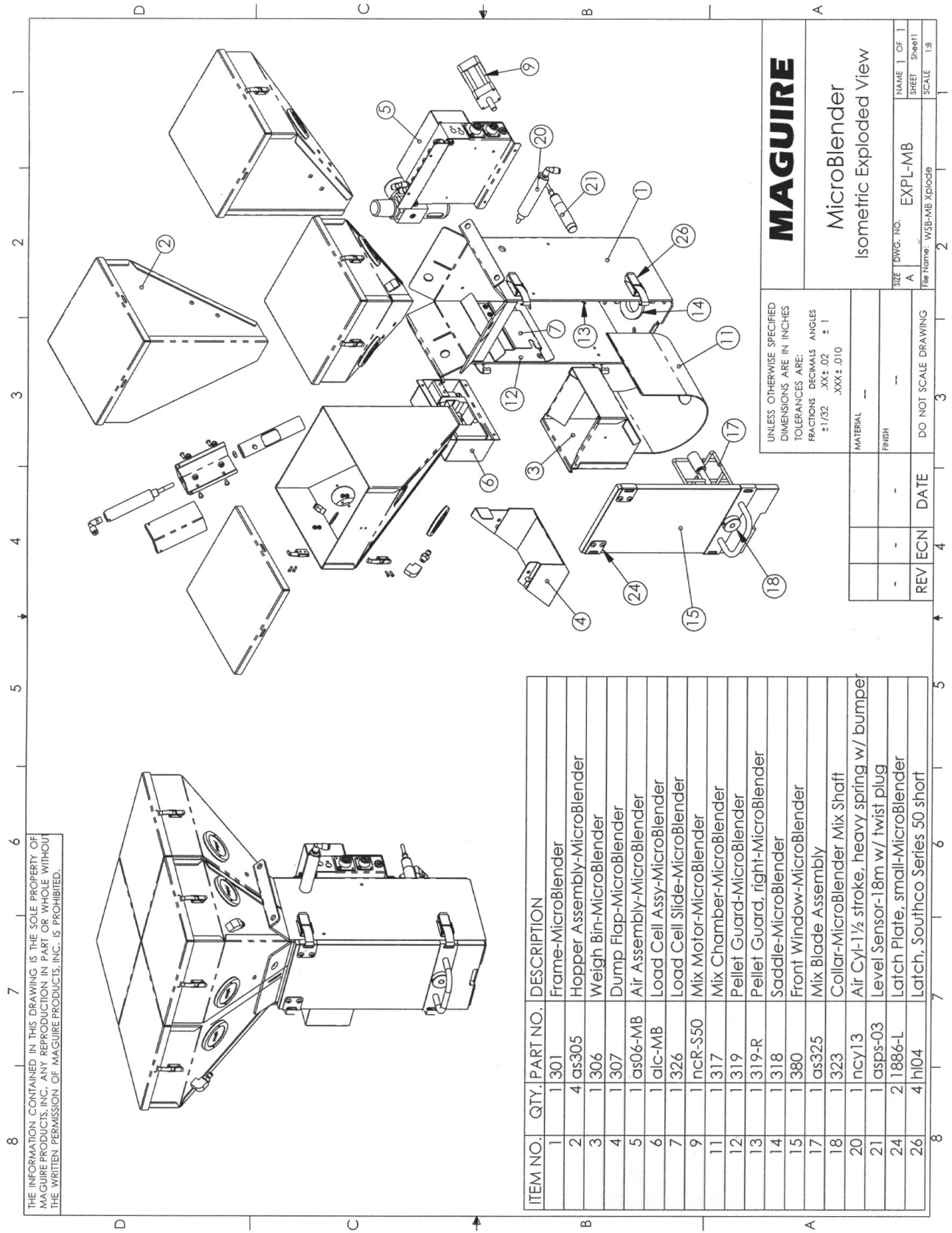


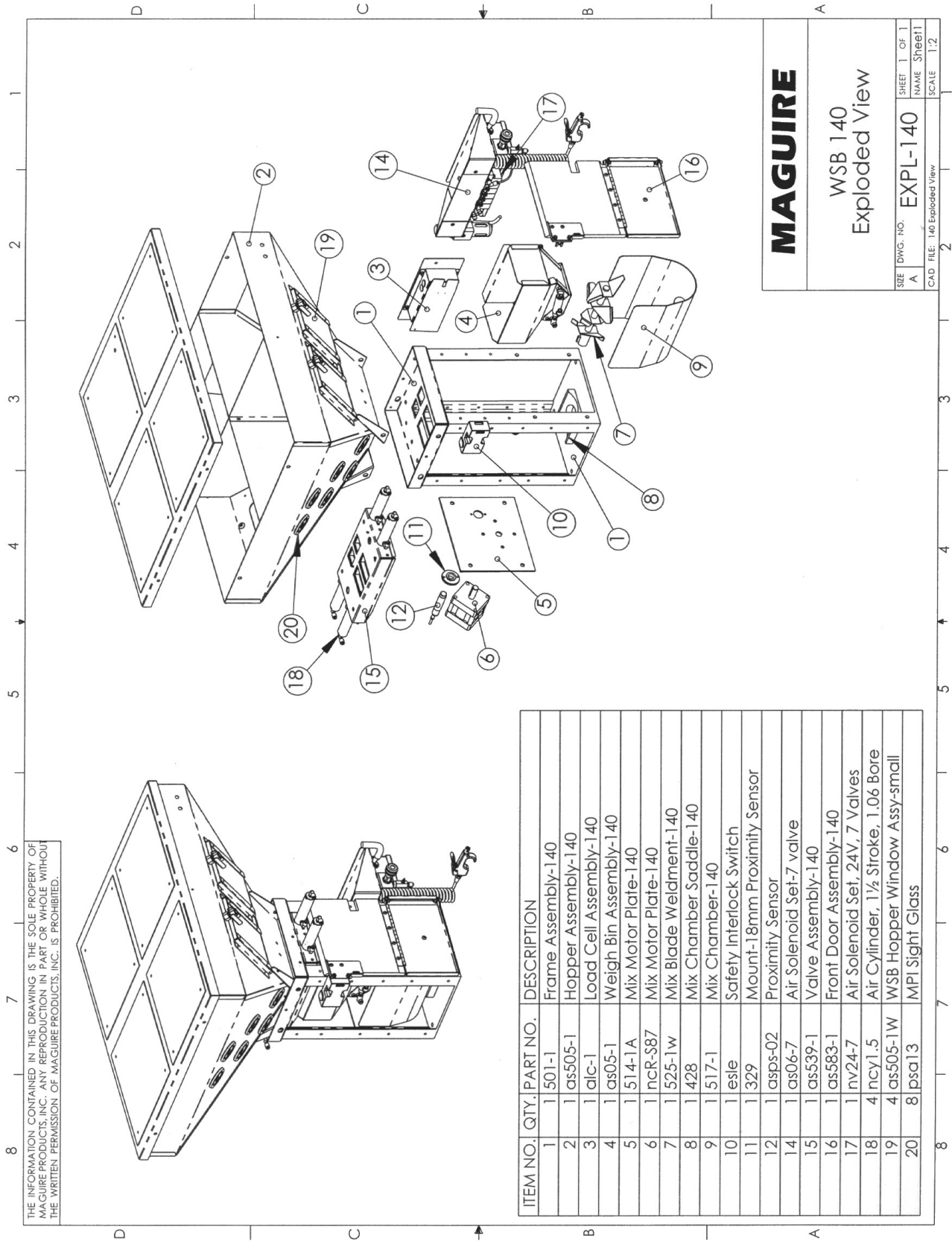
17 pin Amphenol connector

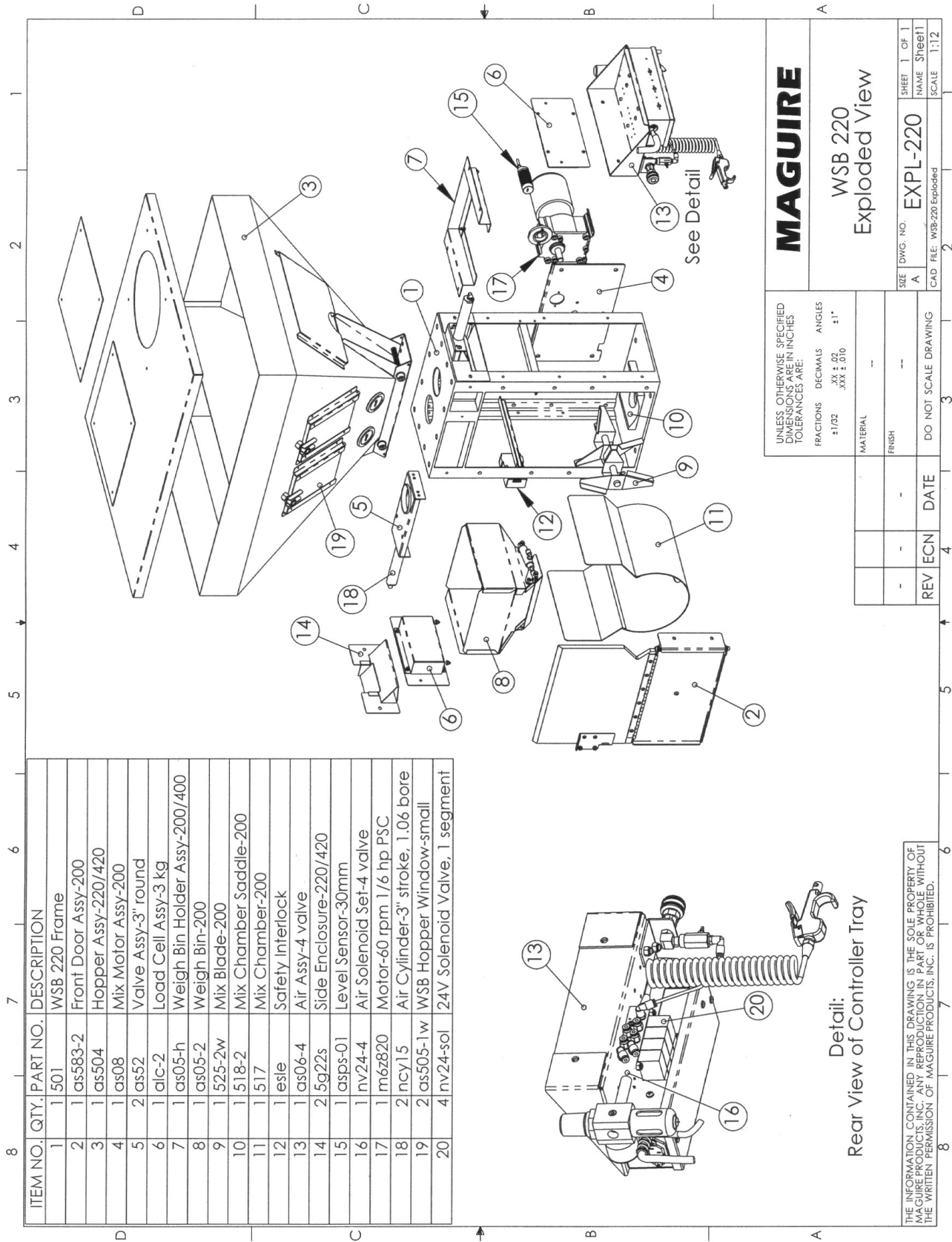
This pin goes to the outside world through this connector: 17 pin Amphenol connector	to drive this external device:	wire color
pin A	weigh bin dump air solenoid	brown
pin B	component 1 air solenoid	orange
pin C	component 2 air solenoid	blue
pin D	component 3 air solenoid	gray
pin E	component 4 air solenoid	purple
pin M	flow control air solenoid	yellow
pin F	component 7 air solenoid	red
comp. 5		
comp. 6		
strobe and beeper + opt. alarm relay output		
mix motor outlet, panel side		
pin G	comp. 8 - external SS relay	wt./red
pin H	comp. 9 - external SS relay	wt./yellow
pin J	comp. 10 - external SS relay	wt./green
pin K	comp. 11 - external SS relay	wt./blue
pin L	alarm	
pin N	common line, all outputs	white
pin P	comp. 12 - ext. relay (also air drive mixer)	
pin R	neutral to 10 volt signals (S,T)	
pin S	0-10 volt extruder control signal	
pin T	0-10 volt line speed control signal	

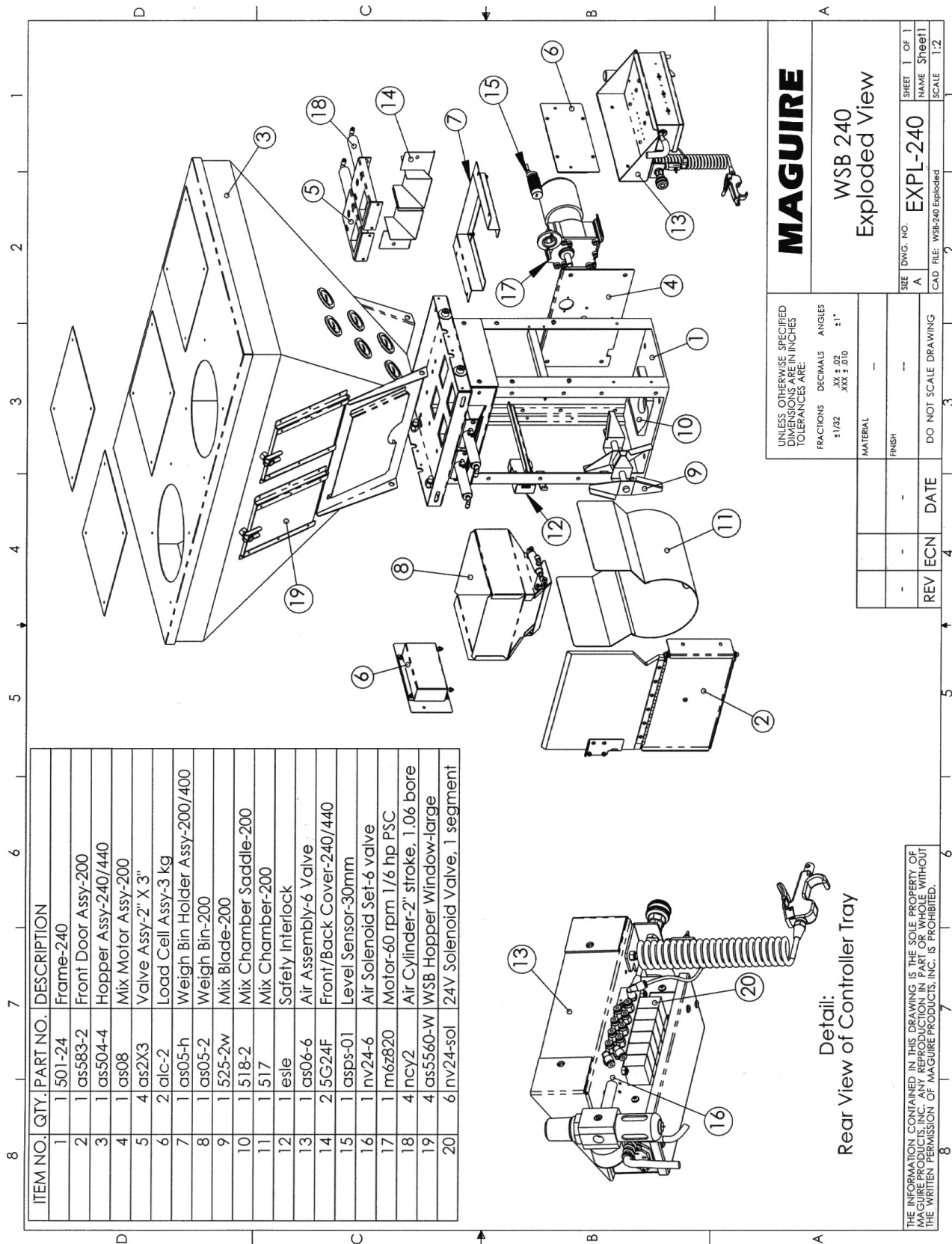
External SS relays are optional.

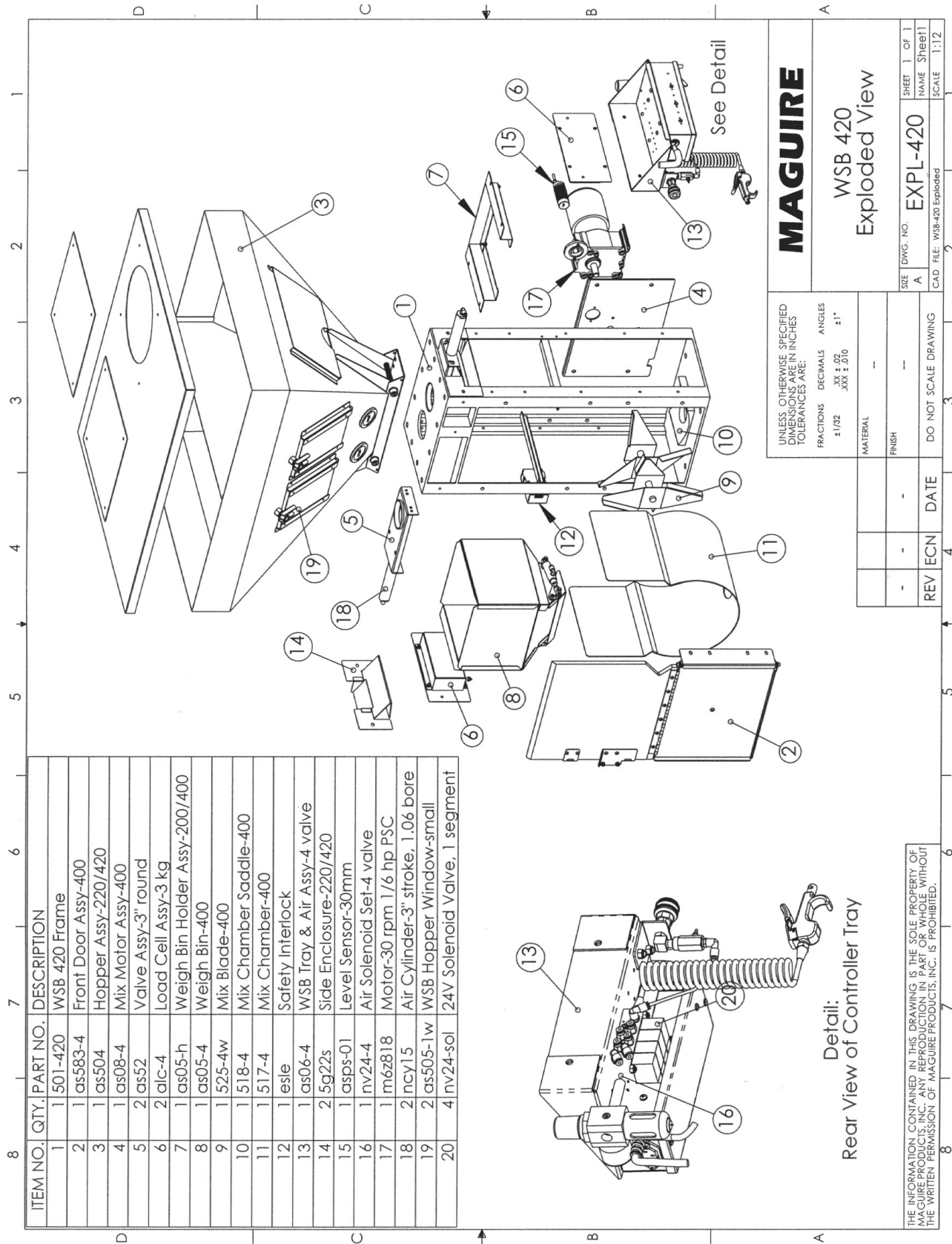
External SS relays and air solenoids may be exchanged.

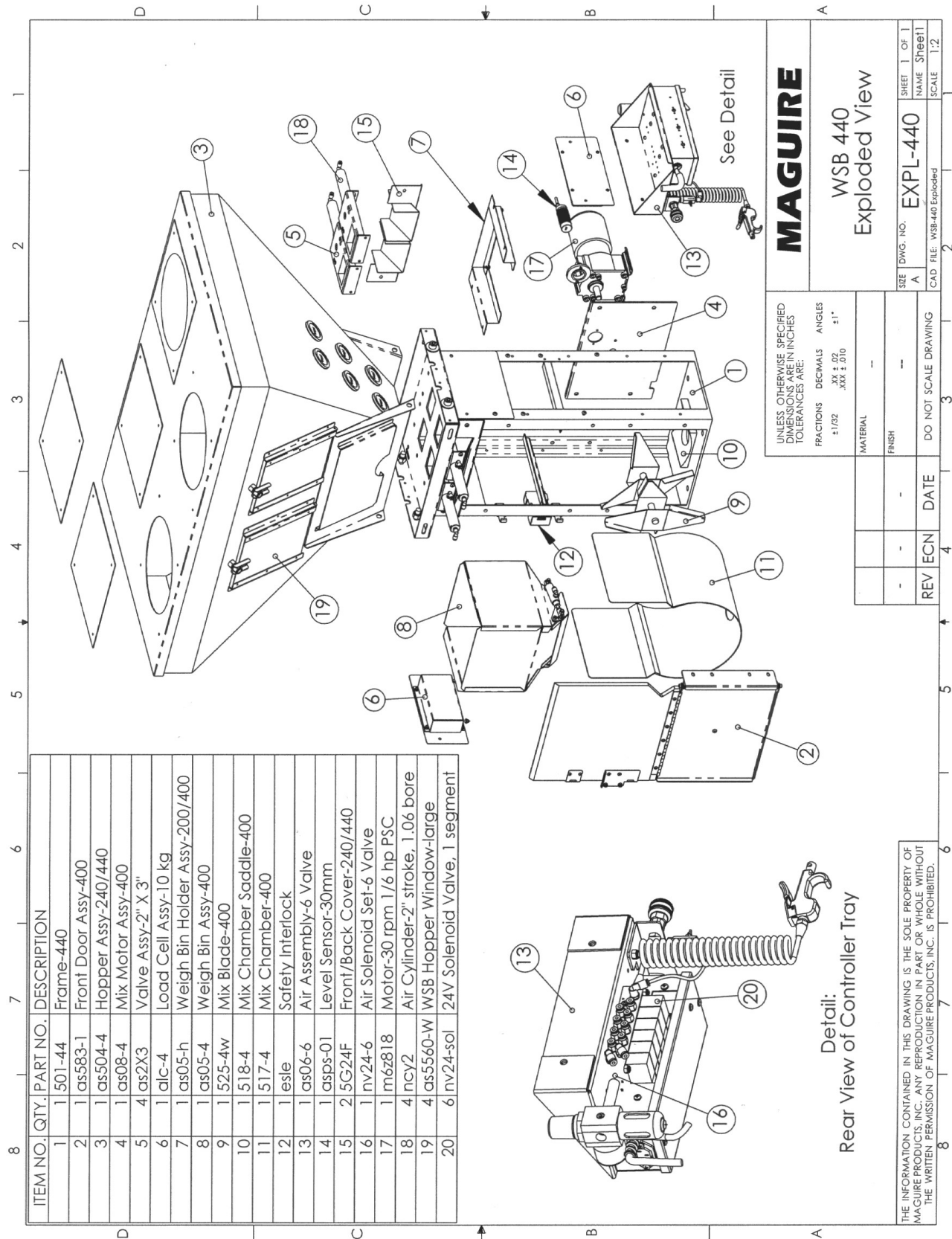


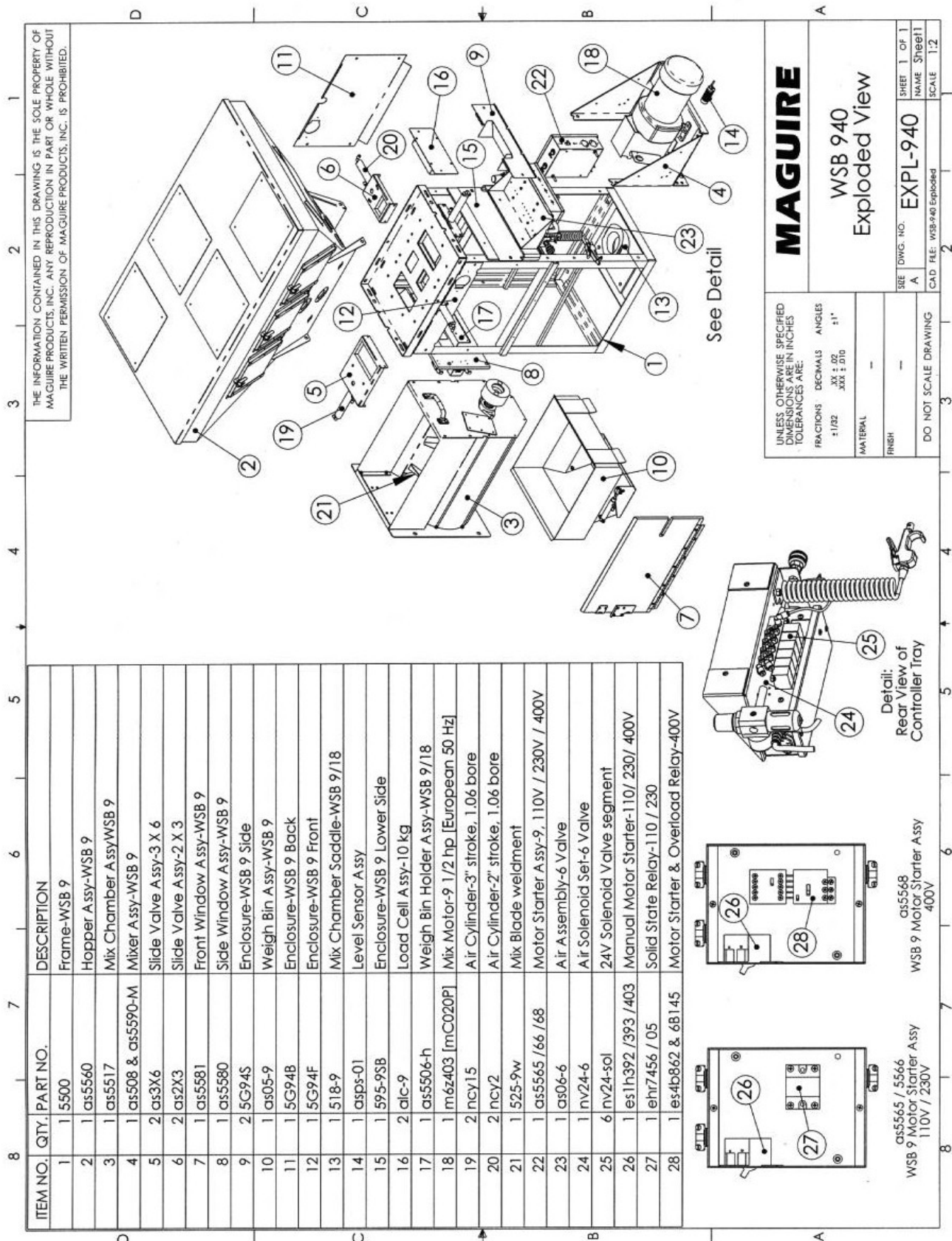


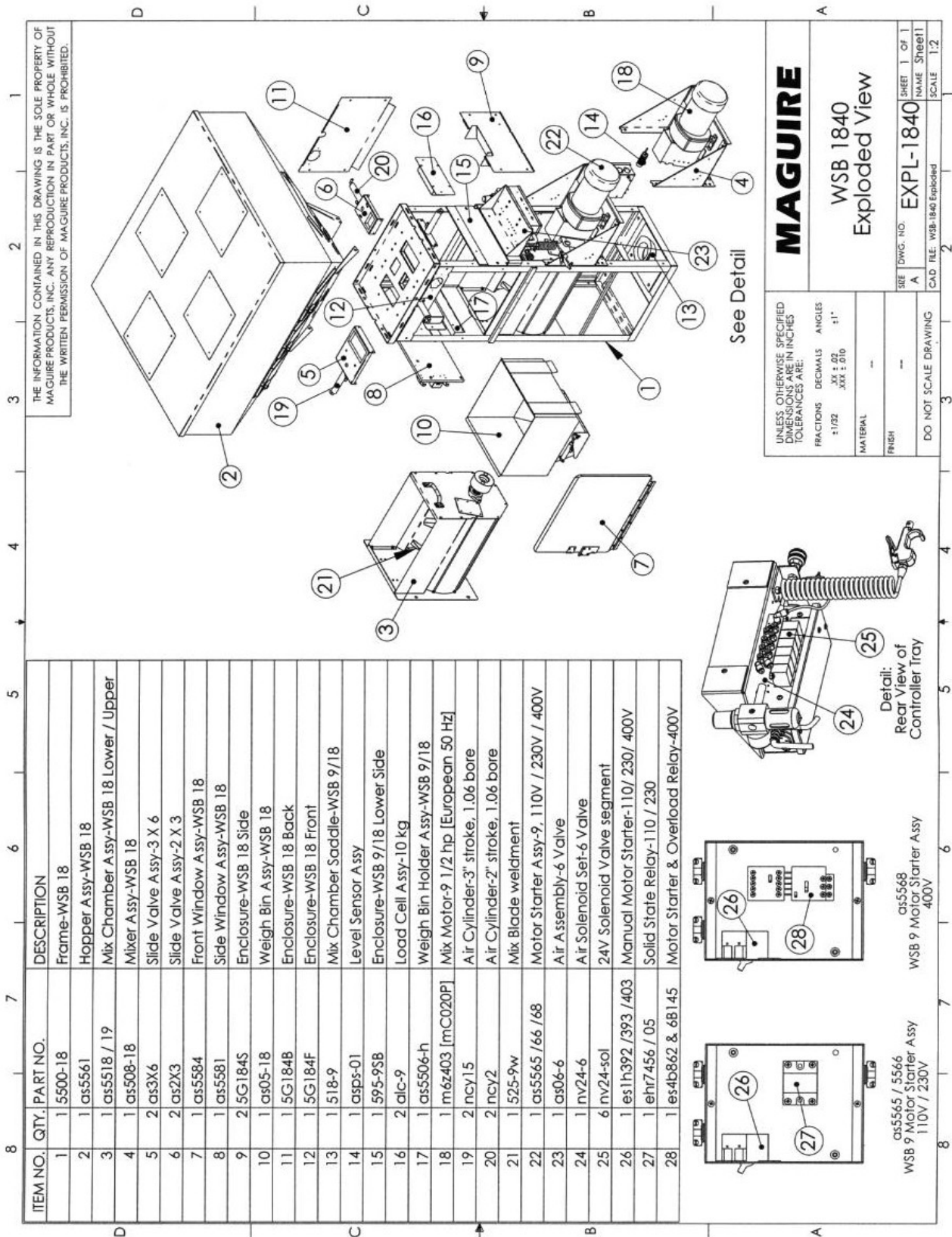


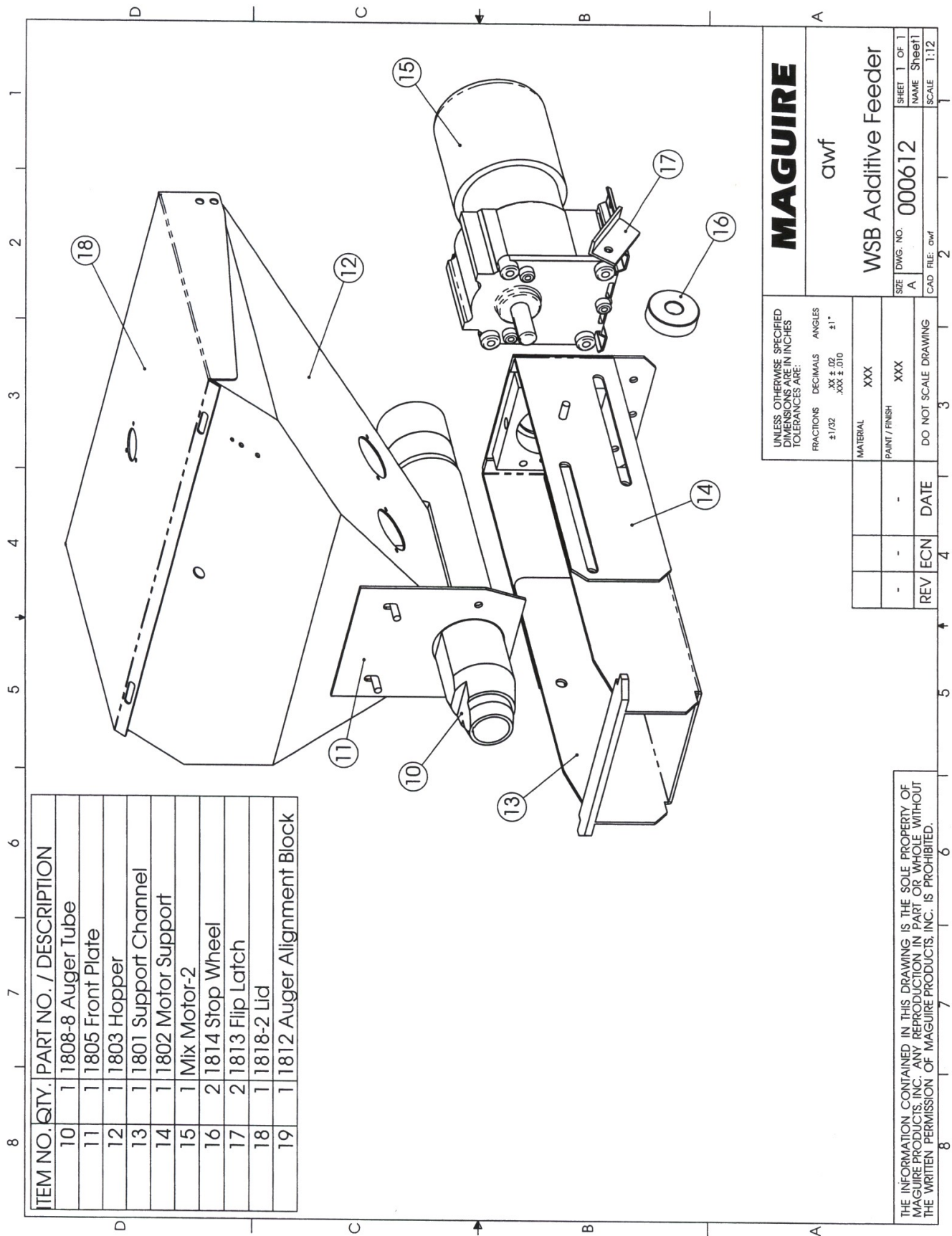


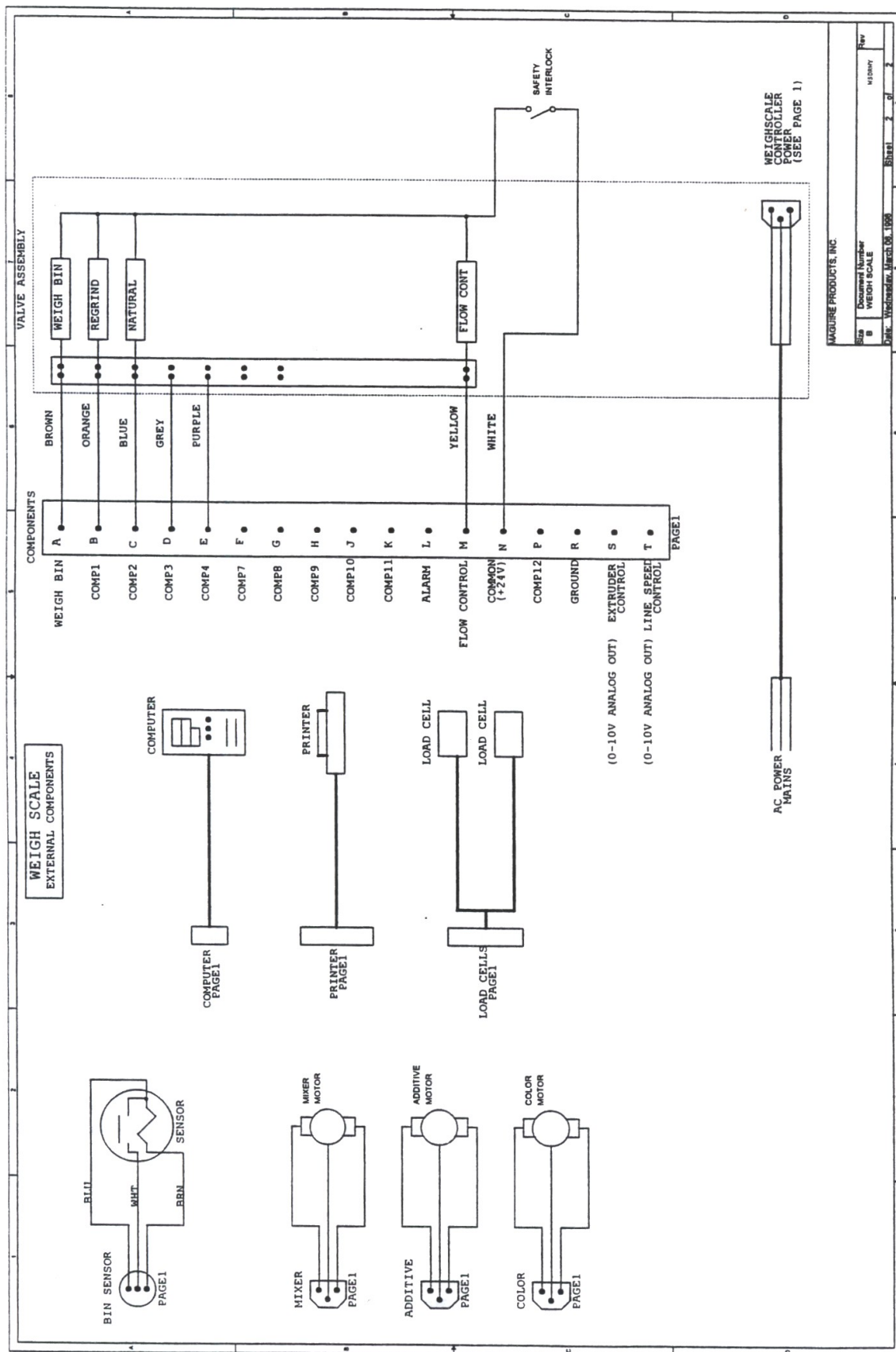


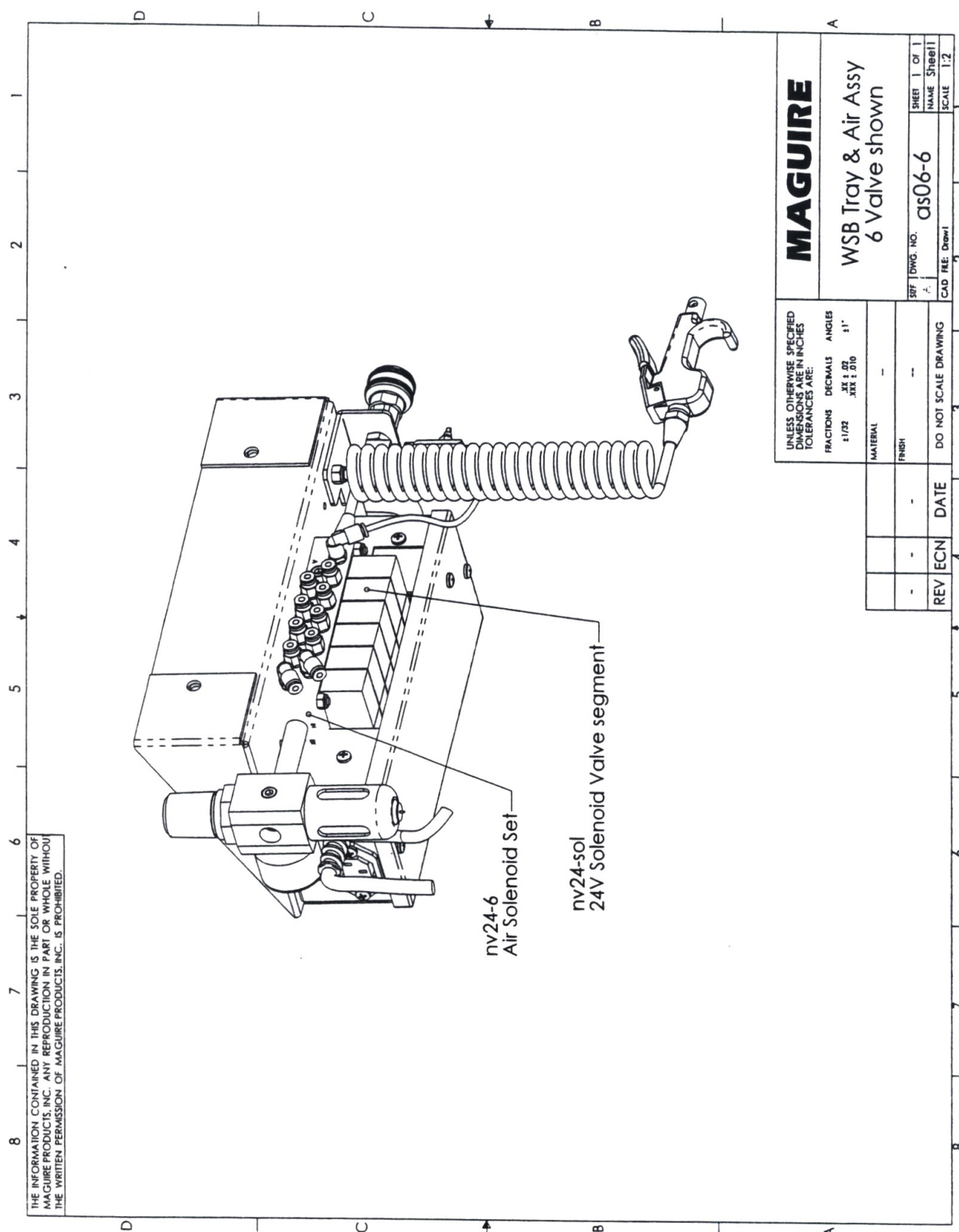










**MAGUIRE**WSB Tray & Air Assy
6 Valve shown

SHEET 1 OF 1	NAME Stiebel	SCALE 1:2
DWG. NO. 0506-6	CAD FILE: Draw1	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS	DECIMALS	ANGLES
1/32	.01	1°
.XX	.XX	.XX

MATERIAL	FINISH

DO NOT SCALE DRAWING

REV	ECN	DATE
-	-	-

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 – Exclusive 5-Year

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 Aston, 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.

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