

Maguire Products Inc
11 Crozerville Road
Aston, PA. 610-459-4300

WEIGH SCALE BLENDER

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TECHNICAL INFORMATION

SPECIFICATIONS

FEATURES

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FEATURES



TABLE OF CONTENTS

ANALYSIS OF COST SAVINGS _____	3
PRODUCTION OF FAULTY PRODUCT _____	3
MODELS _____	6
ADDITIONAL NOTES ON WSB CODING _____	7
HARDWARE SELECTION _____	8
SOFTWARE SELECTION (FOUR or TWELVE COMPONENT) _____	10
NORMAL OPERATING SEQUENCE _____	11
FEATURES _____	12
MATERIAL USAGE INFORMATION _____	13
PRINTER OUTPUT _____	13
COMPUTER COMMUNICATIONS _____	15
CALCULATE ACCURATE THROUGHPUT FORMULA FOR WSB RANGE _____	16
DOUBLING OF THROUGHPUT _____	19
ACCURACY _____	19
DUMP VALVE REPEATABILITY _____	22
AUGER FEEDER REPEATABILITY _____	23
HOW WE COMPARE TO LOSS-IN-WEIGHT SYSTEMS _____	23
HOW WE COMPARE TO GAIN-IN-WEIGHT COPIES _____	24
HOW WE COMPARE TO VOLUMETRIC SYSTEMS _____	25
RELIABILITY AND SERVICEABILITY _____	25
SYSTEM OPTIONS _____	26
WSB EXPLODED PARTS _____	27
BLENDER PARTS KEY _____	28
WSB EXPLODED VIEWS _____	29
5 YEAR WARRANTY _____	37

MAGUIRE PRODUCTS, INC.
11 Crozerville Road
Aston, Pennsylvania 19014
610-459-4300
FAX # 610-459-2700

Analysis of Cost Savings

Introduction

MAGUIRE PRODUCTS has sold color metering equipment for over 19 years. Color metering represents more than 90 percent of our business. We build the most accurate VOLUMETRIC metering systems, both liquid color and pelletized concentrate, available.

However, 20 years of actual observation in plants all over the country, has taught us one thing; no matter how accurate VOLUMETRIC equipment may be in a test lab, employees seldom obtain this accuracy on the plant floor.

The key to accuracy with VOLUMETRIC equipment is frequent CALIBRATION and CORRECTION of control settings. Unfortunately, the time required to do this is seldom available to personnel on the floor.

When color amount is too LOW, the error is visible and a correction to INCREASE color is always made. However, when color amount is too HIGH, the problem is not visible and adjustments are NOT made.

Only a CALIBRATION check will correct such a problem.

What happens is this: Settings are frequently INCREASED to maintain production of acceptable parts, but almost NEVER are settings REDUCED. This excess color usage is almost always a MINIMUM of 10 percent and usually much more. In fact, excess color usage of 50 to 100 percent is not uncommon.

A WEIGH SCALE BLENDER solves this problem. It AUTOMATES the job of CALIBRATION and CORRECTION. It checks and adjusts every cycle.

Production of Faulty Product

For an ANALYSIS OF SAVINGS for ONE molding press, we make the following assumptions:

Average part weight:	300 grams.
Average cycle time:	30 seconds.
Production rate:	20 hrs./day, 5 days/week, 50 weeks/yr.
Color usage:	4 parts color to 100 pounds natural.
Color cost:	\$4.00 per pound of masterbatch..

Based on these numbers, material usage is:

400,000 pounds per year. which breaks down to:	384,615 pounds of NATURAL
	15,385 pounds of COLOR
	Therefore cost of COLOR is:\$ 61,540

Assuming a minimum error of ONLY 10 percent, we see that COLOR COSTS will be \$ 6,154 too high.

That is over \$ 6,000 PROFIT LOST.

And that is at a MINIMUM error of only 10 percent!

To find out exactly what savings are possible for your company, we suggest that you check with your purchasing agent. He is usually most aware that the THEORETICAL amount of color required to do a job is NEVER enough.

Calculate the THEORETICAL COST of color for your operation and compare it to the ACTUAL DOLLARS SPENT. The difference is what a WEIGH SCALE BLENDER will save you.

Next to the cost of virgin resin, COLOR is the most expensive raw material in the production of parts. If you could buy virgin material for 1 cent less per pound, you would probably do it. Color represents a cost of about 16 cents per pound of finished product. With a Weigh Scale Blender you can probably save at least 1.6 cents, if not 3 or 4 cents per pound.

This is AUTOMATION with a REAL PAYOFF.

Other benefits come along for free:

- Material usage totals are available at each machine. These totals may be printed or ported to a computer.
- Access to color settings can be limited through password restriction.
- Regrind scrap can be added back into the process accurately.
- Regrind scrap is never colored twice for additional color savings of 10 to 20 percent.

A WEIGH SCALE BLENDER is AUTOMATION that WORKS. It pays for itself directly and indirectly over and over.

Will it really work for you:

Tests runs in a large Automotive plant show this.

Their current system of coloring uses volumetric feeders with motor speed control and timer control (not our feeders). Color metering is at the throat. Even though this plant has over two years experience with these feeders, color usage is consistently between 6 and 14 percent instead of the 4 percent that is desired. Our Model WSB 221 Weigh Scale Blender, right from the start, consistently delivered 4.00 to 4.02 percent color usage for a savings of about \$ 5,000 every month, on one machine alone.

The number of personnel who must understand and calibrate the color blending equipment in this plant is over 50. It is extremely difficult to train 50 employees to PROPERLY operate equipment that requires constant monitoring and calibration. Since the Weigh Scale Blender requires no checking or calibration, it does its job ACCURATELY, without a problem and without intervention from operators, saving money day after day, month after month.

The savings are very real.

MAGUIRE PRODUCTS is the leading manufacturer of gravimetric blenders for the plastic industry.

Since 1989
Over 20.000 blenders have been sold worldwide
Each carries a FIVE YEAR WARRANTY

Weigh Scale Blender - Sizes available

MODELS: are designated "WSB", followed by three digits, and option designators (except Micro Blender which is WSB-MB).

Example: Model WSB-242

1st digit	BATCH size in kilograms (1, 2, 4, 9, or 18)
2nd digit	NUMBER of DISPENSE valves and hopper compartments above blender (1 to 6)
3rd digit	NUMBER of add-on AUGER FEEDERS (up to 8) On MB and 100 series: no feeders On 200, and 400 series: - 2 with standard frame - 4 with E frame On 900 and 1800 series: up to 6

Other custom configurations available.

Additional designations:

E	Extender frame, allows 3 or 4 auger feeders to fit on 200 and 400 series
R	2 REMOVABLE hopper compartments, replaces 2 fixed, (available on 100, 200, and 400 series)
S	2 SMALLER removable hoppers, Micro Blender size, (available on 100, 200, and 400 series)
m1 to m4	hoppers fitted with Micro Pulse valves, up to 4 (for dispenses below 1% only) available on MB, 100, 200, and 400 series,
T	TWELVE component software - available on all models

Note: If the full model number designation exceeds 8 digits, the WSB prefix is shorted to W. (Example W-140Rm2)

Available systems

- 400 gram Micro Blenders rated up to 160 lbs/hr (40 kg/hr).
MB model has 4 removable hoppers with self contained dispense valves.
Micro-Pulse valves available.
- 1000 gram systems rated up to 400 lbs/hr. (180kg/hr)
"140" model has 4 compartment hopper, 4 dispense valves.
"160" model has 6 compartment hopper, 6 dispense valves.
"140R" model has 2 removable hoppers . Micro-Pulse valves available.
- 2000 gram systems rated up to 800 lbs/hr. (350kg/hr)
"220" model has 2 compartment hopper, 2 dispense valves.
"240" model has 4 compartment hopper, 4 dispense valves.
"260" model has 6 compartment hopper, 6 dispense valves.
"240R" model has 2 removable hoppers. Micro-Pulse valves available.
2 auger feeders may be added to standard model.
4 auger feeders may be added to E model
- 4000 gram systems rated up to 1600 lbs/hr. (600 kg/hr)
"420" model has 2 compartment hopper, 2 dispense valves.
"440" model has 4 compartment hopper, 4 dispense valves.
"460" model has 6 compartment hopper, 6 dispense valves.
"440R" model has 2 removable hoppers. Micro-Pulse valves available.
2 auger feeders may be added to standard model.
4 auger feeders may be added to E model
- 9000 gram systems rated over 3600 lbs/hr. (1500 kg/hr)
"940" model has 4 compartment hopper, 4 dispense valves.
"950" and "960" models have partitions added to the hopper compartments and additional dispense valves.
Up to 6 auger feeders may be added, depending on type of feeder and layout of slide gates.
- 18000 gram systems rated to 7200 lbs/hr. (2150 kg/hr)
"1840" model has 4 compartment hopper, 4 dispense valves.
"1850" and "1860" models have partitions added to the hopper compartments and additional dispense valves.
Up to 6 auger feeders may be added, depending on type of feeder and layout of slide gates.

Other model configurations not listed here are possible.

FEEDERS are available on 200 and larger series blenders. We use 1/2", 1", and 2" augers. 1/2" and 1" have stainless steel removable hoppers. 2" hopper is painted steel and is not removable, but a clean out chute is fitted.

1/2" augers meter about 1 gram/rev, 60 grams/min.

1" augers meter about 8 grams/rev, 1 pound/min.

2" augers meter about 40 grams/rev, 5 pounds/min.

MICRO PULSE feeders are available on MB, 100, 200, and 400 series blenders. Output is comparable to a 1/2 inch auger. Micro Pulse is recommended for very low usage components only, less then 10 grams per batch.

REMOVABLE hoppers, with VERTICAL valves, are standard on MB models and available on 100, 200, and 400 series blenders. VERTICAL valves offer feed rates of about 40 grams per second, suitable for low percentage dispenses. Clean out is easier then fixed hoppers, and they cost less then auger feeders. Today, most applications use standard vertical valves instead of feeders.

Additional Notes on WSB Coding

TWELVE COMPONENT SOFTWARE	indicates TWELVE component software. No "T" means standard FOUR component software. For controlling more than four components, add "T" to the model number. Controls five or more components.
FOUR COMPONENT SOFTWARE	is standard and controls up to 4 components. Some "4 valve" models may have 1 or 2 auger feeders added to accommodate low percentage components, thus making 5 or 6 hoppers available. Standard FOUR software will control only 4 components at one time.
STANDARD DISPENSE VALVES	are correct for components over 5 percent of the mix.
REMOVABLE HOPPERS	hoppers have VERTICAL dispense valves, correct for nearly all percentages from 1%. Removable hoppers are easier to clean than standard fixed hoppers.
AUGER FEEDERS	are correct for components being added at 4 percent or less. Since auger feeders add to the cycle time for each batch and REDUCE overall throughput rates, we recommend them for low percentage components only. Auger feeders have removable hoppers which are easier to clean than standard fixed hoppers
MICRO PULSE VALVES	Micropulse valves dispense about 1 gram per second, recommended for very small dispenses only, for example for dispenses below 1%
FOUR COMPONENT SOFTWARE	is standard and controls up to 4 components. Some "4 valve" models may have 1 or 2 auger feeders added to accommodate low percentage components, thus making 5 or 6 hoppers available. Standard FOUR software will control only 4 components at one time.

WSB - HARDWARE SELECTION

Selection is based on:

- 1st: BATCH SIZE
- 2nd: SLIDE GATE configuration for the MAJOR components
- 3rd: REMOVABLE HOPPERS or AUGER FEEDERS for the MINOR components

1st: Batch Size

All MAGUIRE Weigh Scale Blenders are BATCH blenders. They are sized first, according to the weight of the batch they blend. SIX batch sizes are available and each has an approximate upper limit in its throughput.

Based on three components, 4 percent color:

Model	Batch size in grams	approximate maximum throughput	
		in pounds	in kilos
MB	400	160	70
100	1000	500	225
200	2000	1000	450
400	4000	1600	720
900	9000	4500	2000
1800	18000	5500	2400

Based on four components, 6 percent total color and additive:

Model	Batch size in grams	approximate maximum throughput	
		in pounds	in kilos
MB	400	150	65
100	1000	480	210
200	2000	900	400
400	4000	1360	600
900	9000	3600	1600
1800	18000	4500	2000

Additional components lower output. Each application must be evaluated separately to determine actual through-put.

After you believe you have selected the correct system, check the THROUGHPUT section to verify blender rate.

2nd: Slide Gate configuration

400 gram Micro Blenders use FOUR vertical in-hopper valves. Micro-Pulse is available in any position as an option.

1000 gram fixed hopper systems have FOUR valves:

Two are slightly larger to accommodate higher percentage components. Two are smaller for color and additives.

Two Removable hoppers with Vertical valves can be fitted. Micro-Pulse is available in any position.

2000 and 4000 gram systems have TWO configurations:

TWO slide gates, or FOUR slide gates.

Two Removable hoppers with Vertical valves can be fitted. Micro-Pulse is available in any position.

9000 gram systems have TWO configurations:
FOUR slide gates standard, FIVE or SIX optional.

18000 gram systems have TWO configurations:
FOUR slide gates standard, FIVE or SIX optional.

Micro-Pulse valves can be fitted to replace standard valves. Removable hoppers have vertical valves.
Auger feeders generally provide additional components.

ALSO.... materials that do not flow well from a hopper, or tend to bridge, should be handled by
special feeders designed for powder.

3rd: Auger Feeder configuration

For each size batch and each slide gate configuration we can add a selected number of auger
feeders. The model numbers below specify batch size (first digit) and number of slide gates (second
digit).

Here is the maximum number of feeders that can be added to each model.

<u>BASE MODEL</u>		<u>MAXIMUM number of feeders.</u>
WSB 140 and MB	→	Auger feeders can not be added. Removable hoppers with vertical valves are used for low percentages.
WSB 220 and 420	→	TWO standard feeders.
WSB 220E and 420E	→	FOUR standard feeders.
WSB 240 and 440	→	TWO standard feeders.
WSB 940 and 1840	→	FOUR standard feeders.
WSB 960 and 1860	→	TWO standard feeders.

Powder feeders are interchangeable with Standard feeders.

WSB CONTROLLER - SOFTWARE SELECTION

Maguire WEIGH SCALE BLENDERS are available with TWO types of software: FOUR component software, and TWELVE component software.

FOUR component software is somewhat easier to learn and use. It is, however, limited to 4 components and these components are limited as to material type.

If your requirements are more complicated, TWELVE component software is the answer see below.

The added complexity of the **TWELVE** software is due only to its added versatility. Once it is set up for your particular application, it is very easy to use and does not require any special knowledge on the part of the operator.

You need TWELVE software if you are blending 5 or more components.

You need TWELVE software if you blend components that are not the standard mix of 1 regrind, 1 natural, and 2 additives.

EXPLANATION:

We consider all materials to be of one of three types:

1. REGRIND
2. NATURAL
3. ADDITIVE (this includes color)

SETTINGS for these are treated differently. The MATH routines in the blender controller are not the same for each type.

REGRIND settings are read as a PERCENTAGE of the ENTIRE MIX.

NATURAL settings are read as the RATIO of that Natural to the other Naturals.

ADDITIVE settings, (including COLOR), are read as PERCENTAGE of all the NATURALS added together.

FOUR software is designed for 1 Natural, 1 Regrind and 2 Additives, or for 2 Naturals and 2 Additives. No other combinations are possible.

TWELVE component software is much more versatile than FOUR software. Besides allowing up to 12 components, you may also specify each component as to type, either REGRIND, NATURAL, or ADDITIVE, depending on your requirements and how you like to read the settings.

In a FOUR system, three thumbwheel switches are sufficient to control all FOUR components. (NATURAL is calculated by default)

However, in a TWELVE system all settings are entered by KEYPAD. Switches can be assigned, if you want, to control any three of the components, the remaining components must use the keypad for setting entry.

NORMAL OPERATING SEQUENCE

The operation is very simple.

1. Load all hoppers with material.
2. Set THUMBWHEEL switches for percentages desired.
REGRIND, enter as a percent of the entire mix. (xx percent)
COLOR, as a percent of the NATURAL. (xx.x percent)
ADDITIVE, as a percent of the NATURAL. (xx.x percent)
3. Turn the unit on.

The system will operate automatically to maintain a level of material high enough to cover the sensor in the mix chamber.

NORMAL OPERATING SEQUENCE - EACH CYCLE

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

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

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

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

If the Natural, Color, or Additive components fail to reach the requested weight, the process does NOT CONTINUE. Instead, the dispense is retried, over and over. The ALARM Strobe light flashes and the system holds until the problem is remedied and the full dispense is obtained. (REGRIND may also be set to alarm)

As each component is being dispensed and weighed, the corresponding letter (R, N, C, or A) is displayed. The total updated bin weight is displayed about 2 seconds AFTER each dispense.

Each dispense weight is checked and recorded. Rate recalibration takes place every cycle to ensure continuous process accuracy. The total batch is then blended in the mixing chamber before entering the throat of the process machine. The capacity of the mix chamber is two to three batches. If the unit is mounted over a bin or gaylord, a flow control valve is added to hold the mix in the mix chamber to insure adequate blending.

WSB FEATURES

PASSWORD ACCESS

Two passwords allow limited access to two levels of keypad functions.

The first level, **Manual Mode**, allows an operator to manually test each dispense function and run Rate Calibration routines if necessary.

The second level, **Program Mode**, allows changing of internal operating parameters. You may also restrict the entry of settings to only those who know this password.

ALARMS

When any component fails to meter properly, the unit will sound an audible beeper and flash a strobe light. The blending process will hold at this point until the hopper that is low is refilled. Once the low condition is corrected, the blending continues automatically. All or selected components may be programmed to alarm.

RECIPES

There is provision for Recipe storage. However, the ease of setting the unit for the mix that you want generally makes recipe storage unnecessary.

99 recipes can be stored and retrieved directly using the keypad.

When connected to a computer, the number of recipes is unlimited.

Each recipe consists of the thumbwheel settings for each component. Retrieving a recipe will automatically load the proper settings and override the thumbwheel settings.

BATCH OPERATION

You can set the unit to mix and dispense a predetermined weight of material, for example to fill a Gaylord or barrel. When the preselected weight is reached, the unit will stop and sound the alarm.

VOLUMETRIC MODE

Should the load cells become damaged, the unit can be run in a volumetric mode until replacement load cells are available. This feature also allows dry run testing without material present.

UP TO TWELVE COMPONENTS

Software is available to control of up to twelve components. The modular hardware design of our system allows the addition of feeders and dump valves with minimum hardware modification.

Various hardware configurations are available to match your requirements, the most complex, at this time, being 6 dump valves and 4 feeders.

IMMUNE TO VIBRATION

Unlike competitive units, our system works accurately even when mounted directly to an injection molding press. Only extreme vibration and press movement effect accuracy.

MATERIAL USAGE / PRINTER OUTPUT / COMPUTER COMMUNICATIONS

See following pages.

There are MANY OTHER FEATURES built into the software. Request our complete operation manual to learn about all the features.

MATERIAL USAGE INFORMATION

Material Usage Information can be retrieved in THREE ways;

1. From the DISPLAY on the control panel,
2. From a PRINTER plugged directly into the controller,
3. From a COMPUTER that gathers data from one or many blenders and then produces reports summarizing this data.

Display

Pressing the VIEW key will allow you to see the current grand totals of all material that has passed through the system since the last time this information was cleared. This information is displayed one material at a time on the panel front display.

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.

The controller may be set to output information lines to the printer at the end of each cycle. The printout after a normal cycle looks like this:

```

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

Computer Communications

G2

OVERVIEW

The G2 is the name we give to the software written exclusively for all MAGUIRE Weigh Scale Blenders.

- G2 enables your computer to communicate with one, or many, WSB blenders.
- G2 provides TWO WAY COMMUNICATION; both DOWNLOADING and RETRIEVAL of information from WSB controllers for:
 1. EXACT WEIGHT of all MATERIALS processed,
 2. SETTINGS,
 3. RECIPES,
 4. WORK ORDER and OPERATOR numbers.
- G2 organizes and tracks your MATERIAL INVENTORY, allowing you to gather accurate material usage information based on:
 - a) TIME period, by day, or shift, or other time period.
 - b) MACHINE number,
 - c) WORK ORDER and OPERATOR numbers.
- G2 allows you to maintain a RAW MATERIAL database, and then build a RECIPE database from this list for all the products that you manufacture.

- G2 produces REPORTS to show totals for each MATERIAL used, between selected dates, broken down by Date, Time period, Machine number, Work Order number, and Operator number.

G2 programs are MENU driven, and very user friendly. The package is ready to go with very little training or start up time required.

For more information please visit www.maguire.com/g2

Calculate Accurate Throughput Formula for WSB Range

Maguire Weigh Scale Blenders blend material in batches of a pre-set weight. The size of the batch and the time required to blend each material determines the maximum throughput. This is the **CYCLE** time. Here is the list of operations that make up the cycle time.

The first event of each cycle is the **TARE** weight.

Tare weight requires a ½ second settle time and a 1-second weighing time;

Therefore total Tare time is 1.5 Seconds

Since most of the mix comes from slide valves we add time to fill the weigh bin from a slide valve.

Micro Blender Vertical Valves dispense about 40g/sec

100 Series Slide Gates dispense about 250g/sec

200 and 400 Series 3" round slide gates and 2" x 3" slide gates dispense about 650g/sec

900 and 18000 Series 3" x 6" slide gates dispense about 2500 g/sec

So...

To fill a 400g weigh bin takes approximately	10 Seconds
To fill a 1000g weigh bin takes approximately	4 Seconds
To fill a 2000g weigh bin takes approximately	3 Seconds
To fill a 4000g weigh bin takes approximately	6 Seconds
To fill a 9000g weigh bin takes approximately	4 Seconds
To fill a 18000g weigh bin takes approximately	8 Seconds

Each component requires an additional ½ second settle time and 1 second weighing time.

So, each component adds settle / weigh time of 1.5 Seconds

To empty the 400g weigh bin takes approximately	2 Seconds
To empty the 1000g weigh bin takes approximately	2 Seconds
To empty the 2000g weigh bin takes approximately	2 Seconds
To empty the 4000g weigh bin takes approximately	2 Seconds
To empty the 9000g weigh bin takes approximately	2 Seconds
To empty the 18000g weigh bin takes approximately	4 Seconds

Auger Feeders or Micro Pulse Valves, if used, add a lot of time.

Available are ½", 1", or 2" Auger Feeders, and Micro Pulse Valves are available as horizontal Slide Gates, or Vertical Valves in removable hoppers.

½" Auger	Dispenses approximately 1grams/sec
1" Auger (Standard)	Dispenses approximately 20 grams/sec
2" Auger	Dispenses approximately 50 grams/sec
Micro Pulse (Horizontal + Vertical)	Dispenses approximately 1 gram/sec

Vertical Valve (WSB MB, 100, 200, 400)

Dispenses approximately 40 grams/sec

On 9000 and 18000 gram systems, components 3 and 4 use smaller valves. To adjust for this we add 2 extra seconds for these components.

Use the formula on the next page to compute throughput.

First, compute **CYCLE** time.

Select from the correct column and add up the times that apply.

Batch Weight of System	400	1000	2000	4000	9000	18000
Base time (Seconds) (Tare + Dispense + Empty):	13.5	7.5	6.5	9.5	7.5	15.5
For each component add:	1.5	1.5	1.5	1.5	1.5	1.5
For each percent using:						
½ " Auger add:	-	-	20	40	-	-
Micro Pulse Valve add:	4	10	20	40	-	-
1" Auger add:	-	-	1	2.5	6	12
Vertical Valve add:	-	0.2	0.5	1	-	-
260 and 460 models add:	-	-	3	3	-	-
On 900 and 18000 Series:						
If component 3 is used:	-	-	-	-	2	4
If component 4 is used:	-	-	-	-	2	4
960 and 1860 models add:	-	-	-	-	8	16

Second, apply this formula to determine the maximum throughput;

Kilograms (Kg) / Hr = $3.6 \times (\text{Batch Weight of the system}) \div \text{total \# of seconds per cycle}$

Batch Weight of System	400	1000	2000	4000	9000	18000
Calculation	1440	3600	7200	14400	32400	64800

4 components, 4% colour, 2% additive, 2000g system;

6.5 Base time
+ 6 4 components (4 x 1.5)
+ 2 Vertical Valve at 4% (0.5 x 4)
+ 1 Vertical Valve at 2% (0.5 x 2)

= 15.5 Seconds

$3.6 \times 2000 = 7200 \div 15.5 =$ 464.5 Kg/Hr - Maximum Theoretical Rate
370 Kg/Hr - Recommended Rate to Specify (-20%)

This will give the **MAXIMUM** theoretical throughput rate. Allow some margin for times when the materials run out or other problems.

To ensure the correct specification is made every time, we recommend that once you have calculated the maximum theoretical rate, you then discount the total figure by 10% - 20% to act as a suitable **SAFETY MARGIN** to account for changes in production and material types.

Example..

Throughput improvement using enhanced software

Rates are based on the following criteria:

Posted rates are 90% of the maximum theoretical rate

100, 200, 400 series equipped with the standard vertical valves for colour and additive

200, 400 series equipped with the new fast emptying weigh bin

All models used enhanced software

Based on 3 components with Colour set to 4%:

Batch Size grams	Estimated Throughput in Kg/Hr
400	50
1000	280
2000	480
4000	800
9000	2300
18000	2700

Based on 4 components, 6% Total of Colour and Additive:

Batch Size grams	Estimated Throughput in Kg/Hr
400	35
1000	240
2000	480
4000	600
9000	1850
18000	2190

Additional components reduce blender capacity; each application must be evaluated separately to determine actual throughput.

DOUBLING OF THROUGHPUT

The FAST (FAST REPEAT) key on your controller will allow rapid repeat cycles to occur that do not take the time to weigh each component. These are Volumetric dispenses and can occur up to four (4) times after each gravimetric dispense. The increased speed of these dispenses will generally DOUBLE the throughput.

Likewise Maguire can advise a range of other options available to increase throughput and remain in constant gravimetric operation.

ACCURACY

The question of accuracy comes up frequently. It is a confusing subject. There is no accepted standard in the plastics industry to express accuracy. It is common for this industry to express accuracy as simply plus or minus a percent, without telling us, or even knowing what this number means. When pressed for an explanation, it is rare that anyone knows the basis for their claim. I personally believe that marketing pressure requires that we all make claims at least equal to our competitors without really knowing how these numbers are derived.

Take, for example, the accuracy claim of plus or minus 1 percent.

We might ask:

Percent of what?

If we wanted to dispense 4 percent color, does plus or minus 1 percent mean a dispense range of 3 to 5 percent color is to be expected, (which is plus or minus 1 percent), or is it 3.96 to 4.04 (which is also plus or minus 1 percent).

How about sample size?

Is this accuracy achieved after a single dispense of 10 grams, or over a much longer run of say 100 pounds. One percent of 10 grams is about 4 pellets of color, not a realistic goal from an auger that dispenses about 360 pellets with each turn. In addition to the irregular shape and size of the pellets, augers have an unfortunate pulsating output due to auger flight interference. About 2/3 of the pellets (about 240 pellets) are dispensed in the first half of a turn, while the other 1/3 (120) are dispensed in the second half of the turn. How can you predict what degree of rotation will cause 4 pellets, or even 100 pellets, to fall since 180 degrees of rotation can dispense anywhere from 120 to 240 pellets.

100 pounds, plus or minus 1 percent, is, on the other hand, a very achievable accuracy goal despite the pulsating output of the auger. Even the irregular shape and size of the pellets will be averaged out over such a long run.

In our sales literature we claim for our blenders an accuracy of plus or minus 1/10 percent.

If you want 4 percent color, are we saying you will get 3.9 to 4.1, (which is plus or minus 1/10 percent), or do we mean you will get 3.996 to 4.004 percent color (also plus or minus 1/10 percent).

We actually do mean the second example that is 1/10 percent of requested target, the more difficult goal to achieve.

However we can achieve this goal only over time, only with pellets that are fairly uniform in shape and weight, only if the hopper material level is held steady (an aid to uniform metering), and only if internal parameters are set correctly.

When these conditions are met, it is not uncommon for the actual color quantity dispensed over 20 or 30 cycles to be within a few grams of the exact calculated target amount. As long as the requested target amount is large enough, say 4 percent, or 80 grams, per batch, and we run enough batches, say 30, then we can achieve our 1/10 percent accuracy claim.

A slide gate set to dispense 2000 grams per cycle, 10 cycles in a row, can achieve a total dispense weight within 10 grams of the 20,000 gram target. This also meets our claim of 1/10 percent accuracy.

But lets take an example under the worst conditions; blender batch size is 2000 grams, regrind usage is 50 percent, and you want to add ½ percent color to the natural portion. In this case you are looking to dispense 5 grams color each cycle. A one inch auger has a know predictable dispense error of 2 grams due to the pulsating output of the auger, something that is true of all augers. So you can expect, and you should expect errors of 2 grams batch to batch. Two grams is a FORTY percent error from the requested five gram target.

No one will publish such an error in their literature, but all of us, customers and suppliers alike, must deal with this reality.

This is not to say that it is impossible to get it exactly right if we had to. We could. But the time required to dispense slowly, a few grams at a time, followed by careful weighing and even smaller corrections, would consume valuable time. Process throughput rate would be far too low. Another way we could do it is with much more equipment, very expensive equipment, more complicated and probably less reliable equipment. If the industry absolutely required this, then this would be done.

But let's look at the reality of the process and the needs of the industry.

Even in our example above showing 40 percent error, we are only talking about a few grams. The batch that follows will most likely produce an equal error in the other direction. In fact, "pulsation" errors occur plus and minus equally. The blender mix chamber holds about 3 batches so there is averaging going on in the mix chamber. In addition, all plastic processing machines contain a barrel which holds up to 3 or 4 more blender batches and a screw which vigorously blends all these components together.

The blending action of the screw is what allows a single color pellet to typically color 25 times it's weight in Natural and do it very well. In fact, in a four inch extruder, 1 color pellet will disperse across a full pound of natural material, a blend of 1 part to about 15,000 parts. We see this when 1 stray color pellet, red for example, enters the flow of what is supposed to be a white product. About a pound of "light pink" material will be scrapped due to contamination from this single pellet.

All this is to make one simple point: The very substantial mixing that occurs before the final product is produced assures us that one or two grams of color error per cycle has no impact on the quality of the final product. In fact, blending is so complete that even in careful lab analysis, these errors are not detectable.

Blender design is geared to deliver exactly what the plastics processor needs, consistent accuracy over time, with batch to batch errors low enough so that the blending of the process makes these errors undetectable in the final product.

This we do!

HERE ARE SOME OF THE DETAILS AS TO HOW WE DO IT...

Load cell resolution is 1/40 of a gram (about 1 pellet).

This means that in the "raw signal" readout mode, the addition of 1 pellet to the weigh bin will cause the output reading to increment by 1. This is what the circuitry can detect.

Software resolution is 1/10 of a gram (about 4 pellets).

All weights that are taken and recorded by the software are in tenths of grams (full grams for larger models). This is what the software records.

Over an extended time period the system is extremely accurate. Every batch is followed by an error correction routine that assures that the next batch "learns" from any significant error that might have occurred. In this way the system continuously, but cautiously, hunts toward perfect average dispense weight.

Accuracy of the dispense of any one component in any single batch depends on the repeatability of the dispense device.

For example, augers are known to have a slightly pulsating output. Our one-inch auger dispenses about 9 grams per full revolution, but half of this revolution puts out about 1/3 of the 9 grams while the other half puts out 2/3. This 1/3 difference (about 3 grams) will produce, under the right circumstances, a variation from batch to batch of 3 grams.

Air operated dispense valves, for Natural and Re grind, are accurate to plus or minus about 5 grams on average and can vary by as much as 20 grams or more depending on the free flow characteristics of the material. Most dispenses will fall between plus or minus 10 grams with an average error of 5 grams.

Since color and additive are added last and are added based on the actual weight of natural dispensed, only the color and additive dispenses are critical to the accuracy of the blend. The accuracy from one cycle to the next is the same as the repeatability of the metering device when it is bench tested in a lab. The great advantage of a weigh scale blender is that every cycle is weighed and followed by any necessary corrections if the error is significant enough to dictate such a correction.

"Loss in Weight" systems have the same limitation in that accuracy can be no better than the device that is doing the metering. In addition, they have the added problem that since all components are metering simultaneously, color may drift one way while natural drifts the other way. The result is a larger potential for error. There is no quick way to detect or track these errors in "loss in weight" systems. The load cells of these system support heavier loads and can not detect single gram weight changes.

Volumetric systems also drift with no provision to detect the drift other than an operator periodically weighing the outputs.

In our system each component of each batch is weighed to a 1/10 gram (or 1 gram depending on model) and any error for that batch is detected. If the error is significant, that is greater than normal unavoidable variation, a correction in flow rate is computed and used for the next batch. Since 2 to 3 batches are in the mix chamber at any one time, batch errors are averaged for a more uniform blend.

In addition, the blending that takes place in the screw of your process machine further evens out small batch to batch errors. What is important is that overall, batch to batch errors are not significant enough to be detectable in the finished product.

By using a printer connected to the controller you can track dispense weights of each component for each batch and follow exactly how well your system is performing from batch to batch and over an extended time.

When a significant dispense error does occur in a single batch, we can always add a little more if the dispense was short, but we can do nothing about a dispense that has put in too much. However, the chance of an over dispense is slight since most dispense problems relate to an inadequate flow of material for one reason or another. The decision of whether or not to add more after a "short" dispense is based on parameters that you can set yourself.

We are able to produce accuracies of 1/10 of one percent of expected output. This is based on a long run where each dispense may be over or under the exact target weight but the long term total dispense is nearly exactly on target.

The batch to batch accuracy of our dispense valves and auger feeders depends, to a great extent, on the consistency of the pellets and their uniform size and bulk density. If these factors are good, batch to batch dispenses of sufficient size will vary no more than one percent up or down.

REMEMBER:

More important than batch to batch accuracy, the problem in most plants is that operators do not have time to calibrate equipment frequently and consequently never achieve full rated accuracy. Our system checks and calibrates itself every cycle thus automating this job.

The results, both lower color costs and lower scrap rates, are dramatic.

DUMP VALVE REPEATABILITY

Tests show that our slide gate style dispense valves are very, very accurate. In fact, they are just as accurate as auger feeders when dispensing large quantities.

A series of 20 consecutive dispenses of natural material (high impact styrene pellets) produced the following results:

The target weight for each dispense was 2000 grams.

The total of all 20 dispenses was 40,038 grams for an average dispense of 2002 grams, 1/10th of a percent error.

The dispenses ranged from a low of 1982 grams, (9/10ths of a percent low), to a high of 2014 grams, (7/10ths of a percent high).

The average error, over or under, was 8 grams, 4/10ths of a percent average error per batch.

This is as good as, or better than, all other equipment on the market that we have seen. Material that does not flow smoothly or has varying bulk density will not perform this well.

These accuracies are obtainable as long as the amount dispensed is relatively large. Dispense accuracy is about plus or minus 10 grams at best regardless of the size of the dispense. For a 2000 gram dispense, this is extremely accurate, but for a 100 gram dispense, this is plus or minus 10 percent. For low volume dispenses such as color and other additives, an auger feeder is much better.

AUGER FEEDER REPEATABILITY

Using a 1" auger feeder, a test series of 4 dispenses produced the following results:

NATURAL	COLOR (set for 20%)				ADDITIVE (set for 20%)			
Actual dispense	Target (20%)	Actual disp.	Actual %	Gram error	Target (20%)	Actual disp.	Actual %	Gram error
361.6	72.32	72.7	20.10	0.38	72.32	72.3	19.99	-0.02
362.4	72.48	73.1	20.17	0.62	72.48	72.9	20.11	0.42
361.0	72.20	72.3	20.02	0.10	72.20	73.5	20.36	1.30
367.4	73.48	73.0	19.86	-0.48	73.48	72.8	19.81	-0.62

We see that color and additive errors vary from -.19 to +.36 percent.

These are weight errors from -.62 to +1.3 grams. These errors are to be expected from a one inch auger which has a potential pulsation error of at least 2 grams above or below target dispense.

Over a longer run we would expect occasional dispenses to display even greater errors. However, we would also expect plus errors to cancel minus errors and the total net error to approach zero.

HOW WE COMPARE TO OTHER "GRAVIMETRIC" SYSTEMS

There was a time when all of our gravimetric competitors were "loss-in-weight" systems. Today, our "gain in weight" technology, developed entirely by Maguire Products, dominates the blender market. We offer here a comparison first against "loss-in-weight" systems. Then we compare our Weigh Scale Blenders to the many attempted copies on the market today.

LOSS-IN-WEIGHT:

Four component Loss-in-Weight systems use from 8 to 12 load cells, with each component weighed by a separate set of two or three cells. A shift in the calibration of any one load cell will alter the mix ratio.

Recalibration, the only way to detect such a problem, is required to maintain mix ratio accuracy.

Our system uses only TWO LOAD CELLS, and these two cells are responsible for weighing ALL components. A shift in load cell calibration affects all components equally. Therefore, the MIX RATIO remains accurate. Recalibration is not required.

Only two load cells means lower initial cost, higher reliability and less maintenance.

Continuous LOSS IN WEIGHT metering requires variable speed D.C. motors driving augers, each with its own motor speed control circuitry. BATCH metering allows the use of single speed AC motors and timed dispense valves.

No D.C. motors and no D.C. motor controllers mean initial cost is lower, maintenance is reduced, and reliability is improved.

In a "loss in weight" system, where all components are metered simultaneously, the range of mix ratios available is limited by the adjustment range of the variable speed drive motors, generally a range of 20 to 1.

In our batch system the mix ratio can span the range from 1/100 of one percent up to 100 percent for a range of 10,000 to 1. Changing ratios is as simple as changing thumbwheel settings.

When components are metering one at a time instead of simultaneously, overall feed rate is lower. "Loss in weight" systems deliver rates of 4000 pounds per hour or more.

Since "loss in weight" metering requires load cells to support an entire hopper full of material, the load cells must be rated for hundreds of pounds. These high-load cells are not as sensitive to small metering errors as our load cells. Ours detect weights as low as 1/40 gram (1 pellet). Software resolution is in 1/10 grams, about four pellets.

Unlike other systems, machine mounting is possible. Our unique weighing technique makes our system virtually immune to VIBRATION.

GAIN-IN-WEIGHT copies:

The single most obvious advantage that we have over all our competitors' copies is the single fact that we have over 20000 units operating worldwide. That means 20000 units being tested every hour of every day, tested in real world environments, in all types of applications, under all types of adverse conditions, with all levels of operator expertise.

Our systems have been operating under these conditions for over nine years. When problems arose, design or software improvements were made. You, the customer, are the beneficiary of all this real time research and product improvement.

Specific advantages are:

- ➔ Our software uses advanced weighing techniques that make our systems immune to most vibration.
- ➔ Many unique design features of our hardware make us better than all others unless, of course, then have copied our designs exactly (which a few have). Our newest features are Patent Protected.
- ➔ Our software has dozens of advanced features, the result of years of meeting customers special needs, all of which are available should you have similar special requirements.
- ➔ Every Blender comes with a five year warranty, proof that we are entirely confident in the design and construction of our blender.
- ➔ Our reputation for quality is evident in our product from the day you first install it through the years that follow, as your blender continues to perform like new for many years to come.
- ➔ Only a customer's extreme loyalty to another supplier will cause us to lose a sale to a competitor. More often than not we are selected later, when the competitive product does not live up to its promised level of performance.
- ➔ Comments we hear most often are that our system is surprisingly easy to set up, works correctly right from the start, and is so easy to operate that everyone likes it. Even "old school", "just about to retire", maintenance guys say it just seems to make everyone's life easier, including theirs.
- ➔ Our years of factory experience with our electronics and software has allowed our equipment to evolve into an extremely reliable performer. Customers often tell us that their Maguire Blenders are their most dependable production equipment in their factory.
- ➔ G2, the unique data gathering software that only MAGUIRE offers, will take you into the 21st century with capabilities for comprehensive material usage information gathering and analysis. With a multitude of G2 packages installed to date, we can say with certainty that it really works. Our competitors can say what they want, but they have no installed base to back up their claims.

HOW WE COMPARE TO "VOLUMETRIC" SYSTEMS

Volumetric systems can be just as accurate as gravimetric systems, provided they are calibrated properly and frequently. After 16 years of observing the actual operation of color equipment in hundreds of plants, I can say that very seldom are they calibrated properly.

Regardless of how accurate the equipment is, the time required to achieve that accuracy is seldom available.

A WEIGH SCALE BLENDER solves this problem. Settings are simple; direct settings of the percent of color, additive, and regrind that you want. The system does the rest. It adjusts, checks itself, and re-adjusts as necessary to maintain accuracy all the time. No formulas to remember, no shot weights to remember, no metering rate to check, no sample dispenses or calibration checks are ever required.

All metering systems claim accuracies that have been achieved only in a lab. Our WEIGH SCALE BLENDER delivers it on the floor day after day, month after month, year after year, for different parts, different colors, different operators, different shifts, and all without operator intervention.

With our WEIGH SCALE BLENDER, you can LOCK IN a setting and LOCK OUT operator intervention, if you wish. In this way settings can be set and changed only when the proper "password" is used.

You may also lock in UPPER LIMITS to settings. This allows your operators some discretion in setting the thumbwheels but prevents excessively high settings.

If a material runs out, an ALARM sounds. The system will not continue if the correct blend is not achieved.

Continuous totaling of all components takes place as the unit operates. These totals are available for direct visual readout, output to a printer, or output to a computer for compiling and reports.

RELIABILITY and SERVICEABILITY

- The weigh bin slides out for cleanup, without tools.
- Clear hinged doors provide full access to the mix chamber.
- The Mix blade is removable for cleaning if necessary.
- All dispense and dump valves are simple in design. Their operation is visible through clear acrylic windows so you can observe the proper operation of the system at each step.
- Parts that contact the materials are stainless steel.
- The controller is completely portable; all external connections are plug-in. Should an electronic problem occur, it takes only a minute to exchange controllers.
- The load cells are rewired and sold in matched sets. Should they be damaged, only 4 bolts need be removed to install new load cells.
- Volumetric mode allows running even with damaged load cells.
- AC motors drive the feeders, and air solenoids control the dispense valves. Both are simple and reliable.

SYSTEM OPTIONS

STANDS

When WSBs are NOT machine mounted

AWS-2B and AWS-9B Barrel-style Stand 40" high by 36" wide; clearance 38" high by 29" wide.

AWS-2G and AWS-9G Gaylord-style Stand 48" high by 56" wide; clearance 46" high by 49" wide.

VTA-2 and VTA-9 Vacuum Takeoff Stand Assembly 27" high by 36" wide: holds, in reserve, 2 cubic feet for 2000 gram systems and 3 cu. ft. for 9000 gram systems.

All are available as PORTABLE with 6" wheels (2 fixed and 2 swivel).
1 material probe is included with a standard VTA.

Avp
ahm05

Additional Vacuum Probes
6" Wheels Add-On (Set of 4)

AUGER FEEDER Add-Ons - When purchased separately

AWF-4 1/2" Feeder Add-On

AWF-8 1" Feeder Add-On (standard)

AWF-16 2" Feeder Add-On

Feeder mounting bracket, required for 240, 440, 940

AWL Liquid color Pump

MATERIAL LOADERS

MLS Central Vacuum Systems, Up to 8 stations

ML Venturi Color Loader

ML-A Venturi Color Loader with Low Level Alarm

OTHER OPTIONS

FCA Material Flow Control Assembly (when unit is mounted over a bin or Vacuum Take Off Assembly)

Ala Lid adapted for Loader other than standard

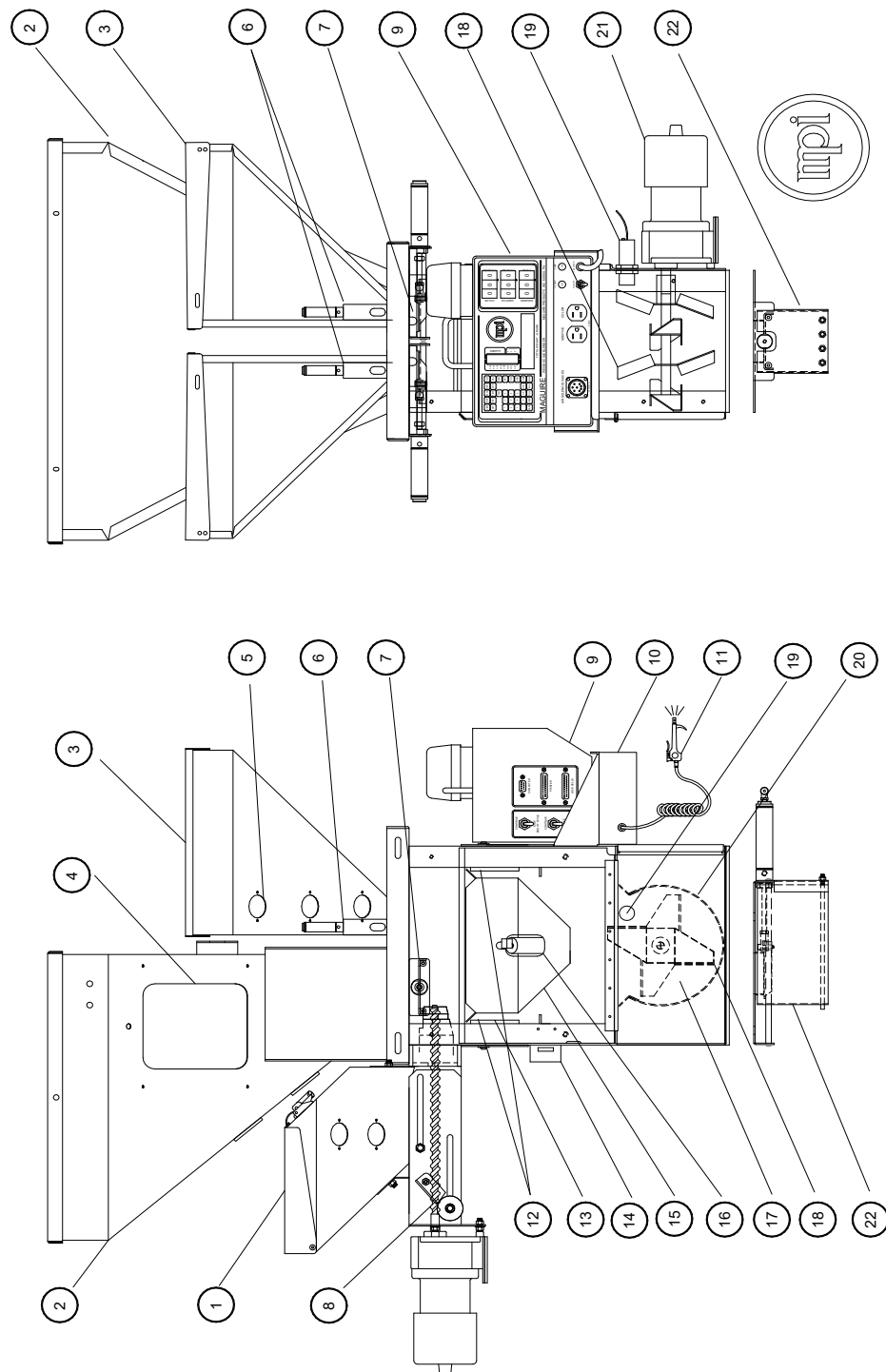
AEC-10 Remote Kit for WSB Controller (10' extension)

AEC-20 Remote Kit for WSB Controller (20' extension)

G2-S Software Package: Allows downloading and retrieval of information from a computer

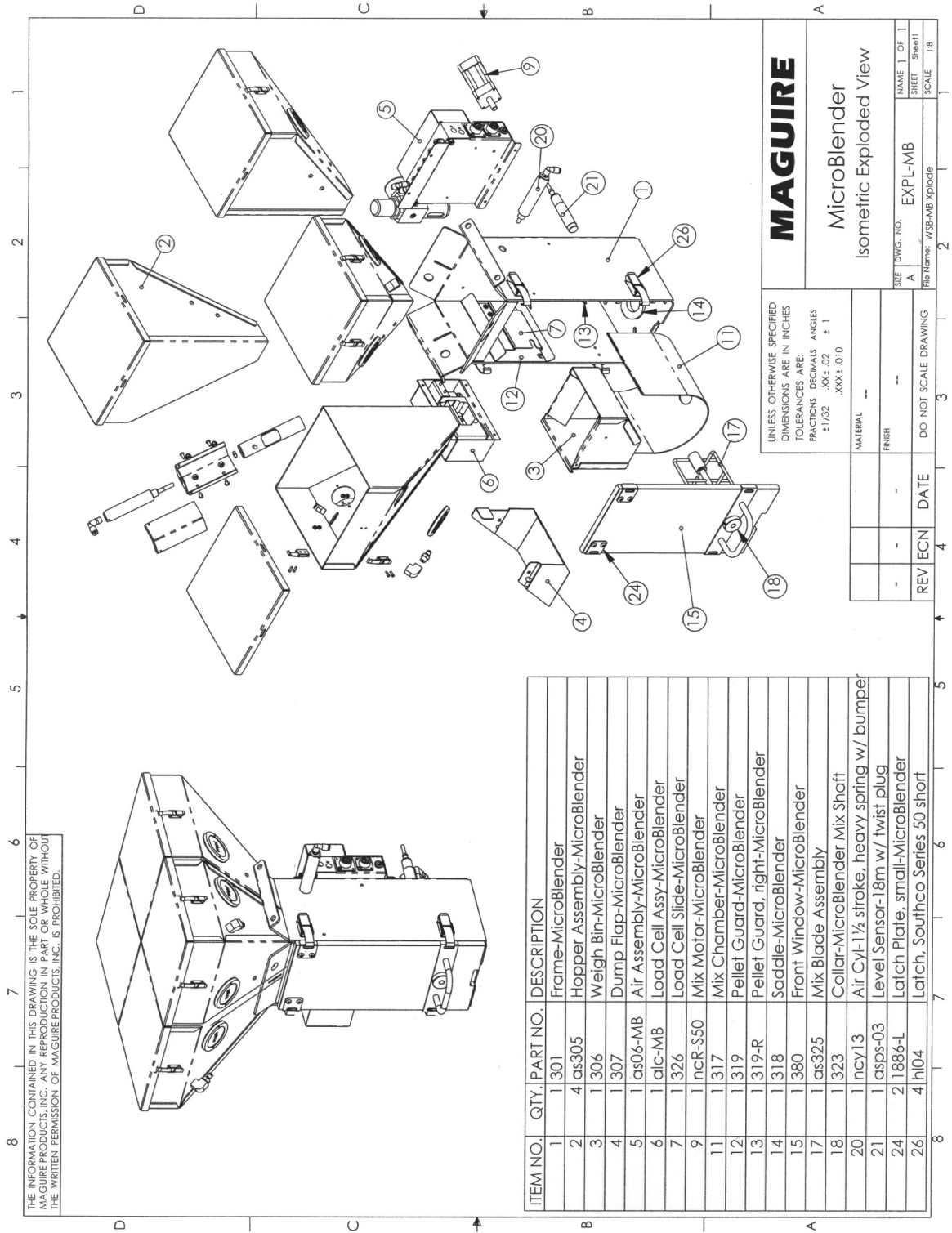
G2-C Cable and Connectors are computer communication.

XC allows your blender to control extruder output.

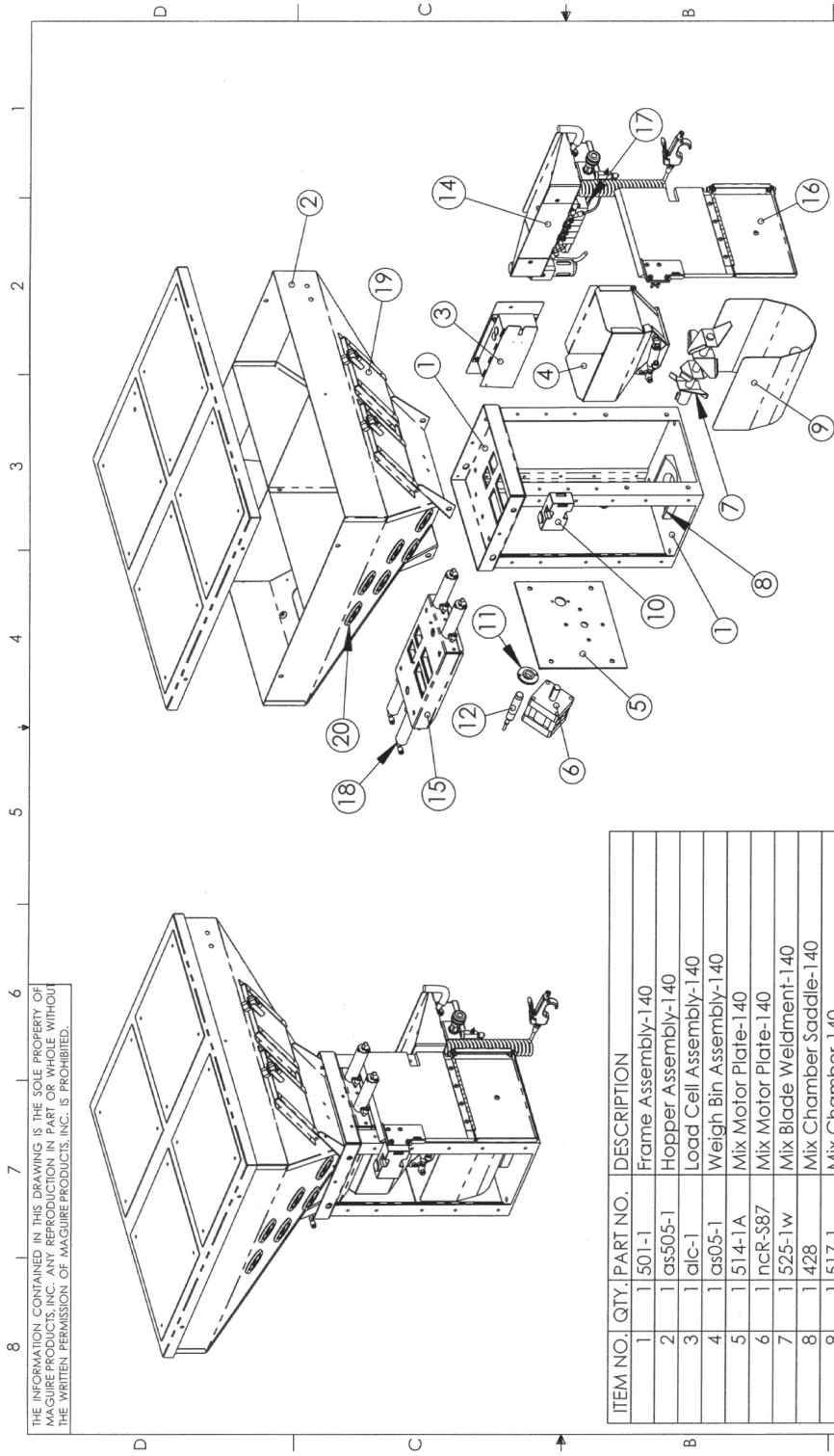


Blender Parts Key

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.



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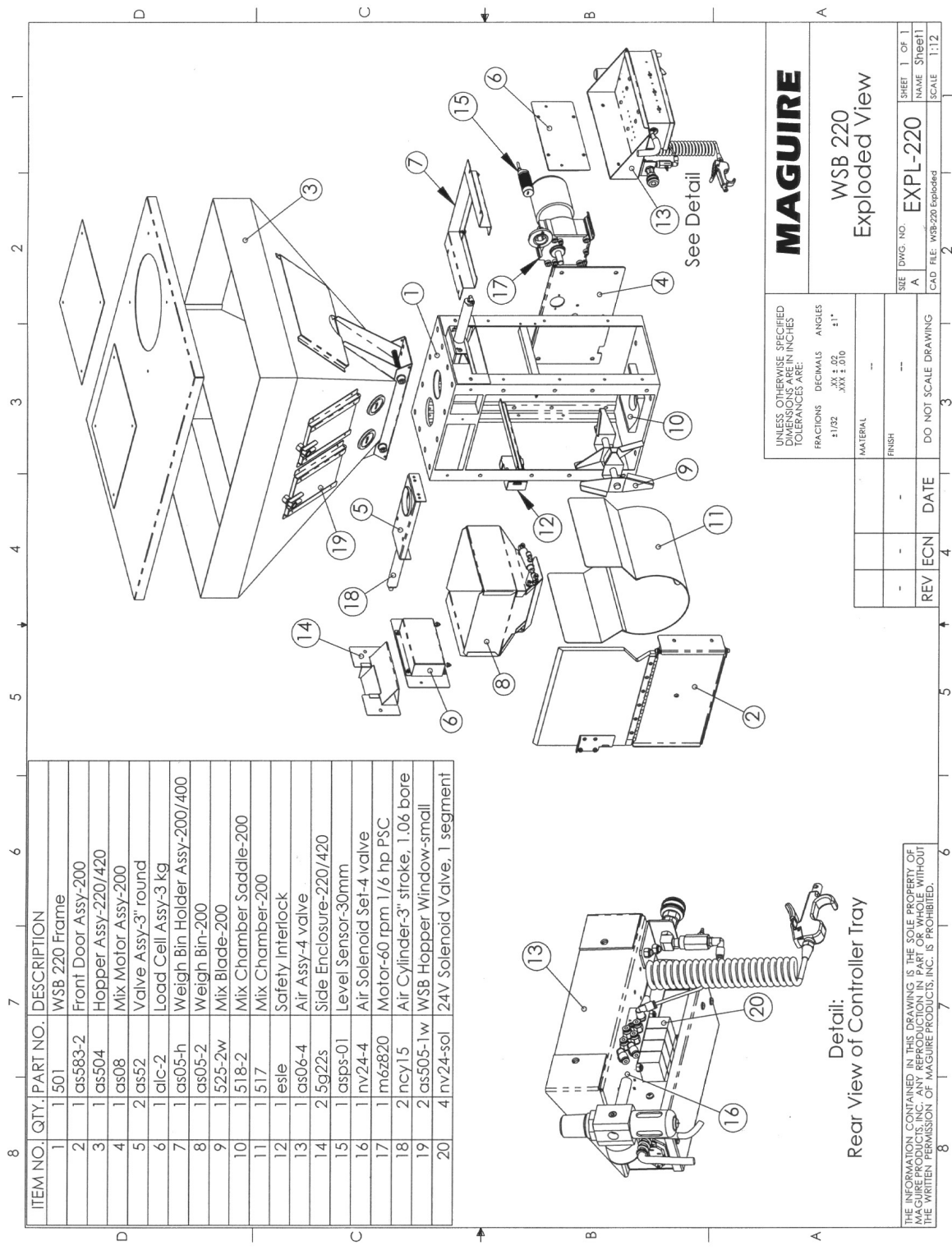


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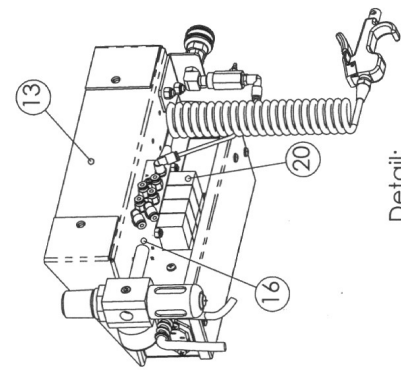
WSB 140 Exploded View

SIZE	DWG. NO.	SHEET	1 OF 1
A	EXPL-140	NAME	Sheet1
		SCALE	1:2

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	501-1	Frame Assembly-140
2	1	as505-1	Hopper Assembly-140
3	1	alc-1	Load Cell Assembly-140
4	1	as05-1	Weigh Bin Assembly-140
5	1	514-1A	Mix Motor Plate-140
6	1	ncR-S87	Mix Motor Plate-140
7	1	525-1w	Mix Blade Weldment-140
8	1	428	Mix Chamber Saddle-140
9	1	517-1	Mix Chamber-140
10	1	esle	Safety Interlock Switch
11	1	329	Mount-18mm Proximity Sensor
12	1	asps-02	Proximity Sensor
14	1	as06-7	Air Solenoid Set-7 valve
15	1	as539-1	Valve Assembly-140
16	1	as583-1	Front Door Assembly-140
17	1	nv24-7	Air Solenoid Set, 24V, 7 Valves
18	4	ncyl.5	Air Cylinder, 1 1/2 Stroke, 1.06 Bore
19	4	as505-1w	WSB Hopper Window Assy-small
20	8	psal13	MPI Sight Glass



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	1501	WSB 220 Frame
2	1	as583-2	Front Door Assy-200
3	1	as504	Hopper Assy-220/420
4	1	as08	Mix Motor Assy-200
5	2	as52	Valve Assy-3" round
6	1	alc-2	Load Cell Assy-3 kg
7	1	as05-h	Weigh Bin Holder Assy-200/400
8	1	as05-2	Weigh Bin-200
9	1	525-2w	Mix Blade-200
10	1	518-2	Mix Chamber Saddle-200
11	1	517	Mix Chamber-200
12	1	esle	Safety Interlock
13	1	as06-4	Air Assy-4 valve
14	2	5g22s	Side Enclosure-220/420
15	1	asps-01	Level Sensor-30mm
16	1	nv24-4	Air Solenoid Set-4 valve
17	1	m6z820	Motor-60 rpm 1/6 hp PSC
18	2	ncyl15	Air Cylinder-3" stroke, 1.06 bore
19	2	as505-1w	WSB Hopper Window-small
20	4	nv24-sol	24V Solenoid Valve, 1 segment



Detail:
Rear View of Controller Tray

MAGUIRE

WSB 220
Exploded View

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS	DECIMALS	ANGLES
1/32	.XX ± .02	± 1°
	.XXX ± .010	

MATERIAL	FINISH
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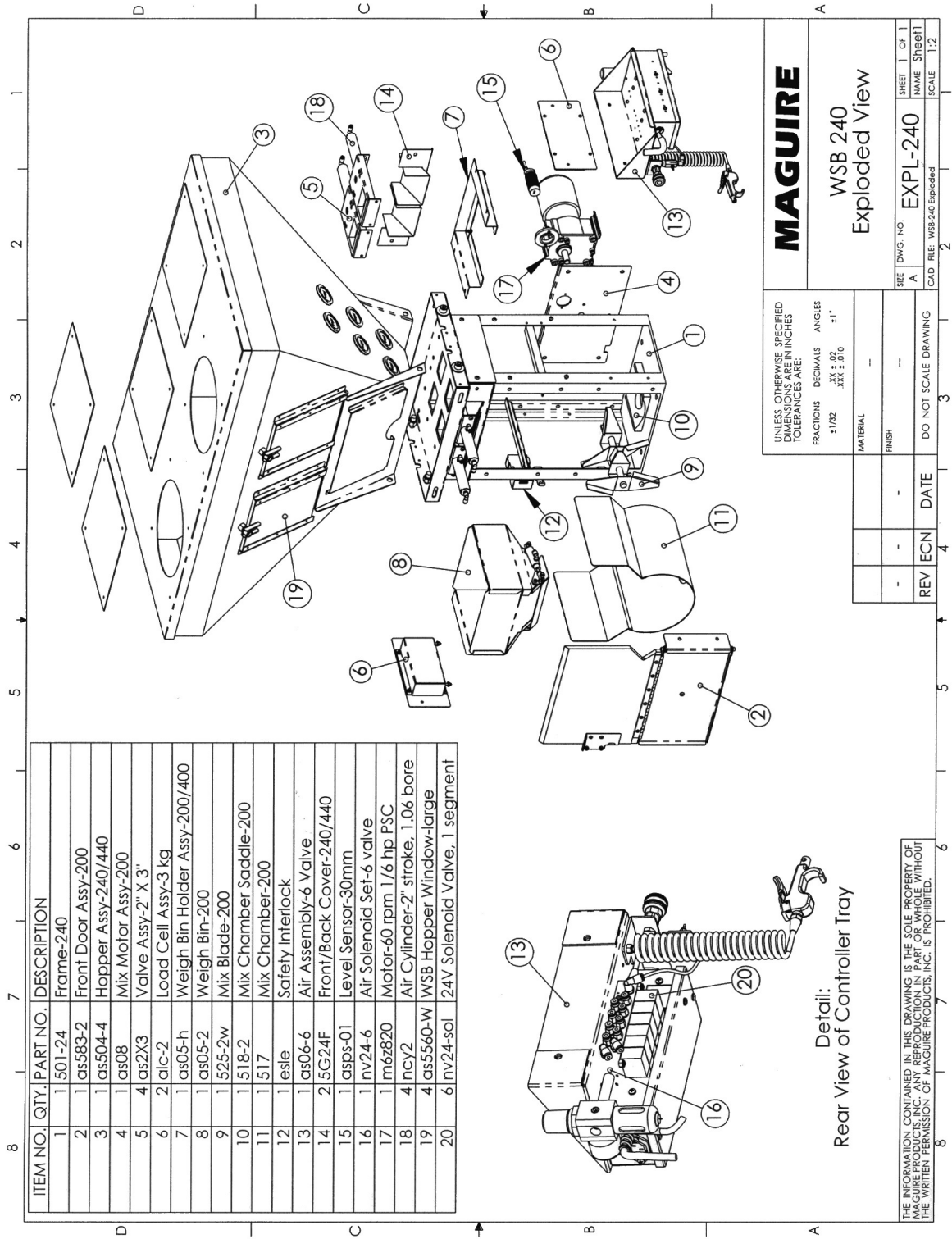
DO NOT SCALE	DRAWING
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REV	ECN	DATE
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SHEET	1 OF 1
NAME	Sheet
SCALE	1:12

DWG. NO.	EXP-220
CAD FILE	WSB-220 Exploded

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ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	501-24	Frame-240
2	1	as583-2	Front Door Assy-200
3	1	as504-4	Hopper Assy-240/440
4	1	as08	Mix Motor Assy-200
5	4	as2X3	Valve Assy-2" X 3"
6	2	alc-2	Load Cell Assy-3 kg
7	1	as05-h	Weigh Bin Holder Assy-200/400
8	1	as05-2	Weigh Bin-200
9	1	525-2w	Mix Blade-200
10	1	518-2	Mix Chamber Saddle-200
11	1	517	Mix Chamber-200
12	1	esle	Safety Interlock
13	1	as06-6	Air Assembly-6 Valve
14	2	5G24F	Front/Back Cover-240/440
15	1	asps-01	Level Sensor-30mm
16	1	nv24-6	Air Solenoid Set-6 valve
17	1	m6z820	Motor-60 rpm 1/6 hp PSC
18	4	ncy2	Air Cylinder-2" stroke, 1.06 bore
19	4	as5560-W	WSB Hopper Window-large
20	6	nv24-sol	24V Solenoid Valve, 1 segment

MAGUIRE

WSB 240
Exploded View

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

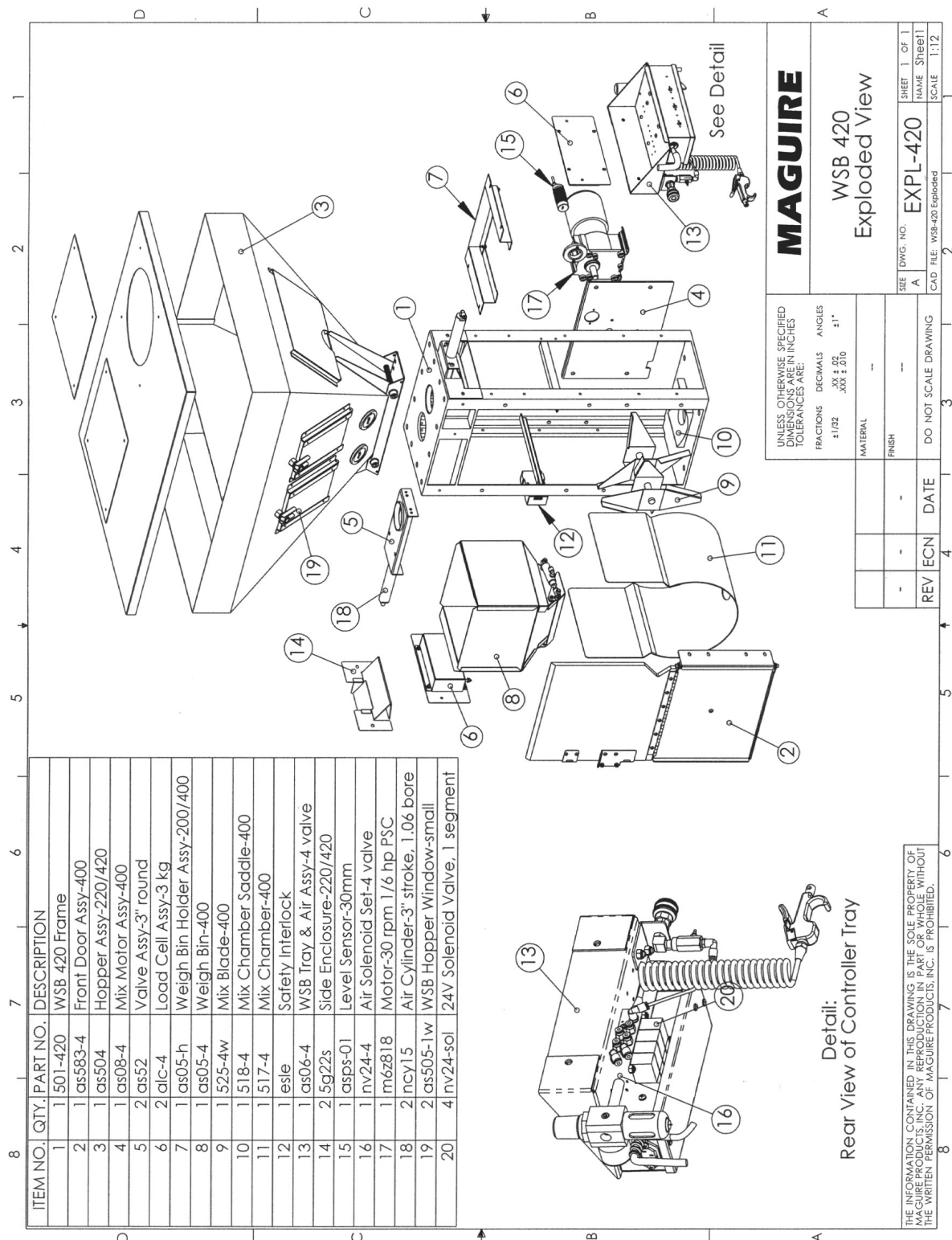
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MATERIAL		
FINISH		

SIZE	DWG. NO.	SHEET 1 OF 1
A	EXPL-240	NAME Sheet1
CAD FILE	WSB-240 Exploded	SCALE 1:1

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

Detail:
Rear View of Controller Tray

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THE WRITTEN PERMISSION OF MAGUIRE PRODUCTS, INC. IS PROHIBITED.



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	501-420	WSB 420 Frame
2	1	as583-4	Front Door Assy-400
3	1	as504	Hopper Assy-220/420
4	1	as08-4	Mix Motor Assy-400
5	2	as52	Valve Assy-3" round
6	2	alc-4	Load Cell Assy-3 kg
7	1	as05-h	Weigh Bin Holder Assy-200/400
8	1	as05-4	Weigh Bin-400
9	1	525-4w	Mix Blade-400
10	1	518-4	Mix Chamber Saddle-400
11	1	517-4	Mix Chamber-400
12	1	esle	Safety Interlock
13	1	as06-4	WSB Tray & Air Assy-4 valve
14	2	5g22s	Side Enclosure-220/420
15	1	asps-01	Level Sensor-30mm
16	1	nv24-4	Air Solenoid Set-4 valve
17	1	m6z818	Motor-30 rpm 1/6 hp PSC
18	2	ncyl15	Air Cylinder-3" stroke, 1.06 bore
19	2	as05-1w	WSB Hopper Window-small
20	4	nv24-sol	24V Solenoid Valve, 1 segment

MAGUIRE

WSB 420
Exploded View

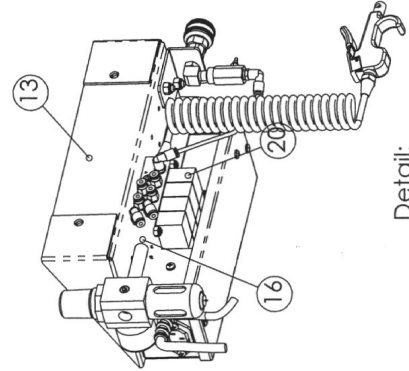
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS	DECIMALS	ANGLES
$\pm 1/32$	$\pm .010$	$\pm 1^\circ$

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FINISH: —

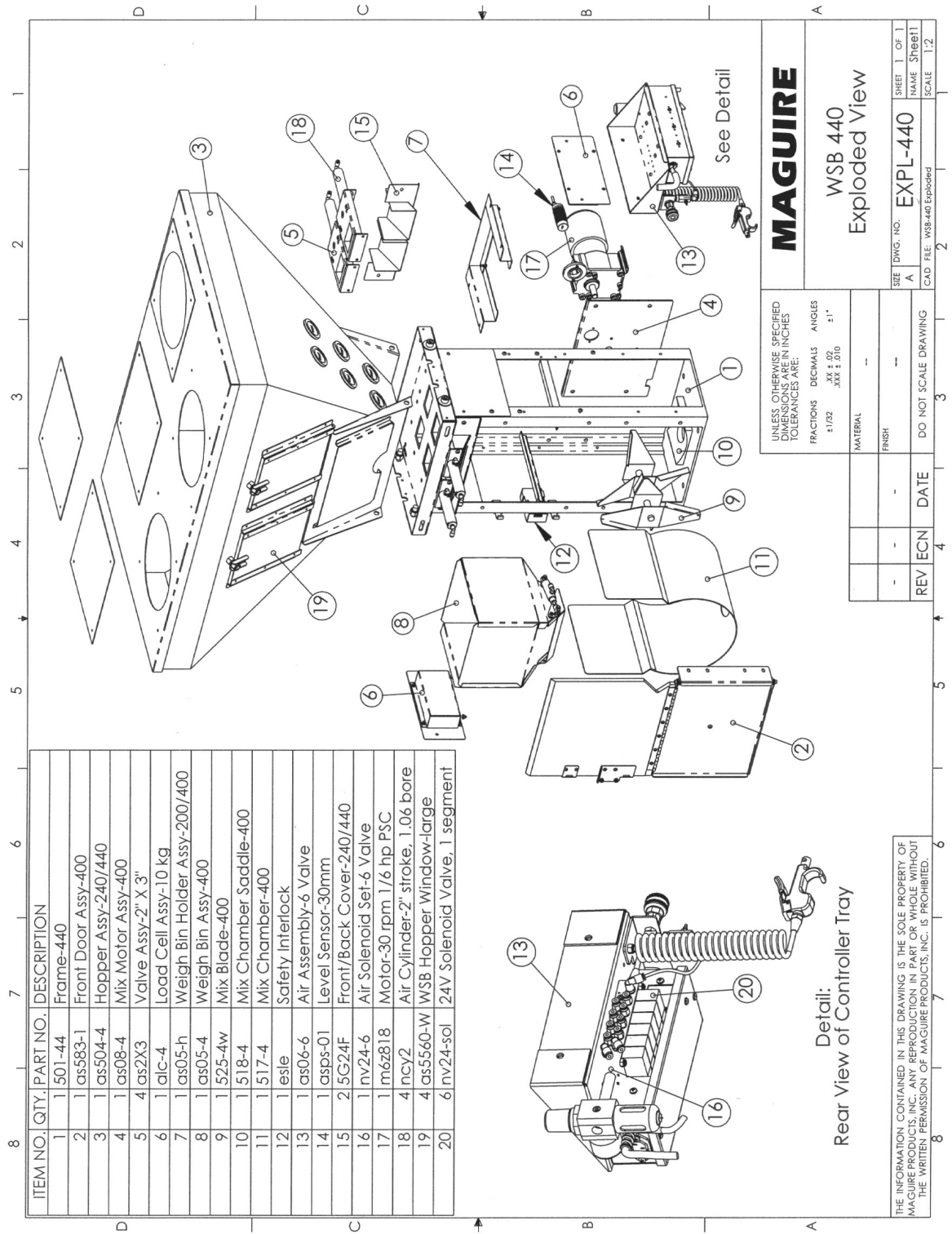
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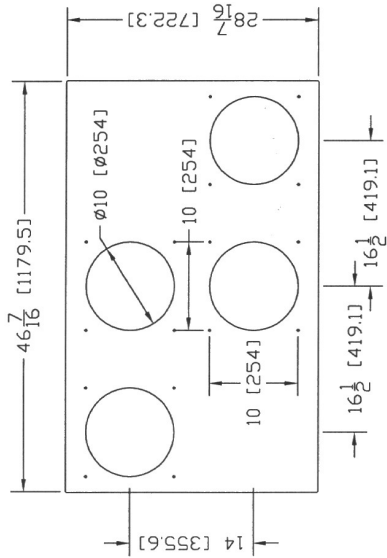


Detail:
Rear View of Controller Tray

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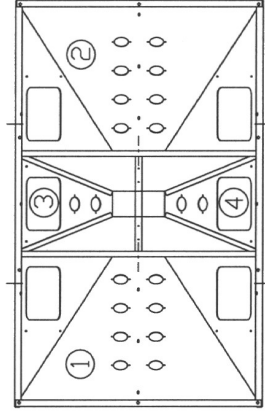


WSB 940 HOPPER LID

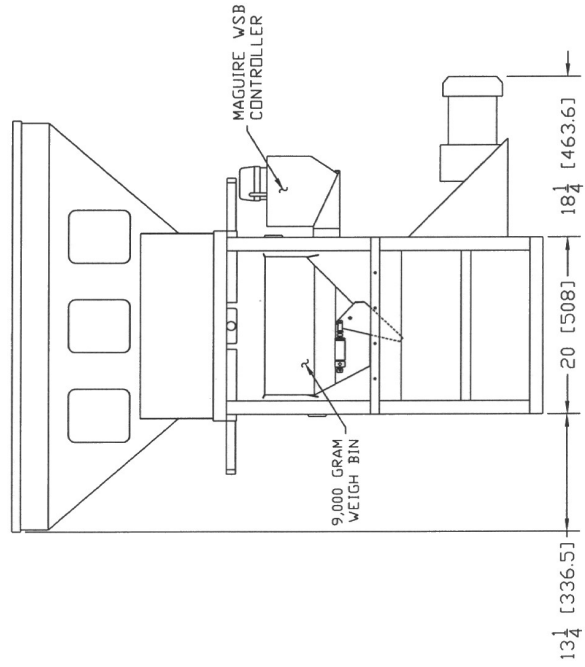


MODEL WSB-940
 * COMPARTMENTS 1 & 2 - 3.4 CU. FT. [96.3 LITRE]
 * COMPARTMENTS 3 & 4 - 1.2 CU. FT. [34 LITRE]

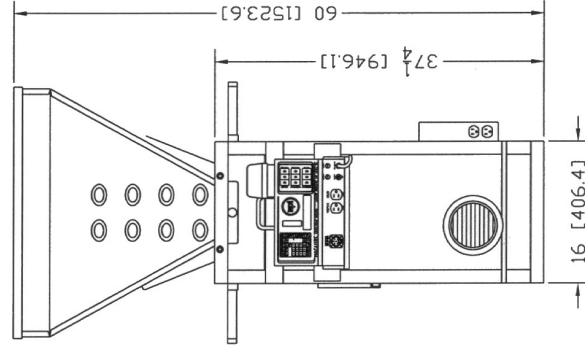
WSB 940 HOPPER-TOP VIEW



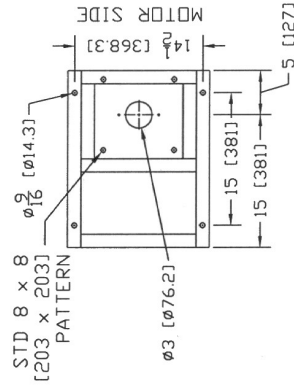
WSB 940 FRONT VIEW



WSB 940 SIDE VIEW



WSB-940
 FOOTPRINT

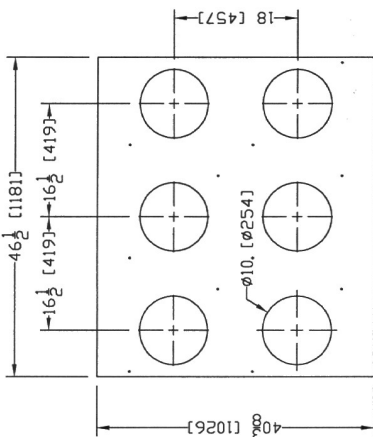


MAGUIRE WEIGH
 SCALE BLENDER
 MODEL WSB-940

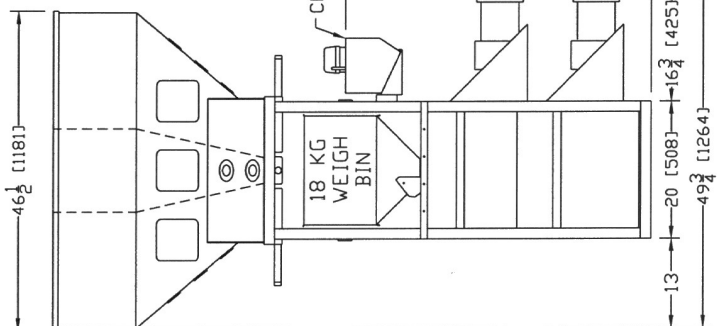


Maguire Products Inc.
 Media, PA USA
 (610) 494-5333
 FAX: (610) 494-6194

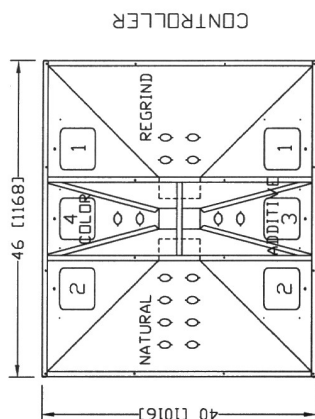
DATE DRAWN
 CGC 11/15/94
 DATE CHANGED
 1 OF 1 8/14/97



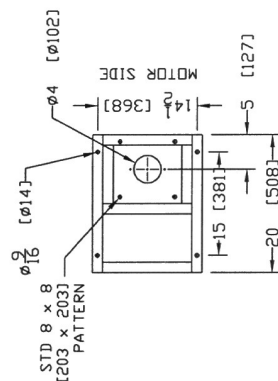
WSB-1840/1860 HOPPER LID



NOTE:
COMPARTMENTS 1 & 2 ARE APPROX. 6.6CU FT [185 LITRE]
COMPARTMENTS 3 & 4 ARE APPROX. 2.5 CU FT [70 LITRE]



HOPPER ALSO AVAILABLE IN
304 STAINLESS STEEL



WSB-1800 SERIES
FOOTPRINT



WSB-1840
PICTORIAL

Maguire Products Inc. Medio, PA USA (610) 459-4300 FAX: (610) 459-2700	DRAWN BY: CGC	DATE DRAWN: 9/15/94
	SHEET: 1 OF 1	DATE CHANGED: 1/24/97

WARRANTY

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

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

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

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

EXCLUDED ITEMS:

LOAD CELLS on our WEIGH SCALE BLENDER are covered as long as they have not been damaged from improper handling. MB, 100 and 200 series units use load cells rated for 6.6 pounds (3KG) maximum load. 400, 900 and 1800 series 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. 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 as a result of 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.