



AEROGAN™

INSTALLATION / OPERATION MANUAL
IMPORTANT USER INFORMATION

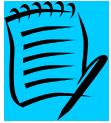
UNDERSTANDING THIS MANUAL

This equipment combines the use of solid state, electrical, and mechanical components. Because of the wide variety of uses for this piece of equipment, persons responsible for acquiring this equipment must satisfy themselves that it meets the requirements of the intended application.

The examples and diagrams in this manual are included solely for illustrative purpose. Because of the many variables and requirements associated with any particular installation, Eagle Engineering & Supply Company cannot assume responsibility or liability for actual use based on the examples and diagrams.

If viewing this manual on CD-ROM, it is possible to use the hyperlinks to move quickly to any area of the manual by double clicking on the appropriate link.

Throughout this manual notes are used to make the operator aware of safety considerations.



ALERTS OPERATOR FOR ONE OR MORE REASONS.



ALERTS THE OPERATOR FOR ONE OR MORE REASONS



ALERTS THE OPERATOR OF UNSAFE CONDITIONS CAUSED BY FAILING TO FOLLOW THE PRINTED INSTRUCTIONS, AND POSSIBLY RESULTING IN INJURY TO THE OPERATOR OR DAMAGE TO THE EQUIPMENT.

Eagle Engineering & Supply cannot accept responsibility for possible errors in this manual or any other information pertaining to the **AEROGRAN™** dispenser. Eagle Engineering & Supply reserves the right to alter its product and this manual without notice. This applies as well to equipment on order provided that purchase contract specifications are unaffected.

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SECTION II ABOUT THIS MANUAL

TYPES OF EQUIPMENT

This operator's manual describes the installation and operation of the **AEROGRAN** dispenser and its related equipment. Below is a list of **AEROGRAN** models covered in this manual:

PLC PROCESSOR FILE NAMES

The following files have a letter assigned to the end of the name to denote the current revision.

1. CGD120: One mixer, 120 Products, SLC503 processor.
2. CGD200: One mixer, 200 Products, SLC504 32k memory processor
3. CGD203: Three mixer, 200 Products, SLC504 32k memory processor
4. CGD253: Three mixer, 200 Products, 5 blends, SLC504 32k memory processor
5. CGD453: Three mixer, 450 Products, SLC504 64k memory processor

Related equipment:

1. R100™ Remote mounted user interface using RS232 communication standard. 100 feet maximum cable length.
2. DH+™ Allen-Bradley DH+ communications.
3. F200™ Upgrade from 120 products to 200 on a single mixer dispenser. Includes 5/04 processor.
4. F450™ Upgrade from 200 products to 450 on a three-mixer dispenser.
5. MDC-1000™ 1000 cfm mixer mounted particle collector.
6. R3000™ Remote mounted user interface using DH+ communication standard. Cabling up to 3000 feet. Requires F200™
7. CBS-1™ Removable hopper modification to **AEROGRAN**™ system.
8. C-X™ Spare removable hopper.
9. BH™ Bag rack and hanger.
10. MCV-II™ Manual crossover valve for feeding two mixers, one at a time.
11. MCV-III™ Manual crossover valve for feeding three mixers, one at a time.

TYPES OF EQUIPMENT

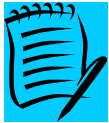
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Throughout this manual this icon and text appearing in **blue** will denote differences in models.



ALTHOUGH THERE ARE DIFFERENT MODELS OF THE **AEROGRAN™** DISPENSER, ALL MODELS USE THE SAME PRINCIPLES OF OPERATION. THE MAJOR DIFFERENCES ARE: NUMBER OF COLORS WEIGHED, NUMBER OF PRODUCTS STORED, NUMBER OF MIXERS FED, AND SOFTWARE ENHANCEMENTS.



THE TOUCH SCREEN DRAWINGS IN THIS MANUAL ARE FROM A THREE-MIXER, FIVE-COLOR, 200 PRODUCT DISPENSER. IF OPERATING A SINGLE-MIXER DISPENSER, THE SCREENS ARE VERY SIMILAR - DISREGARD INFORMATION IN THE DRAWINGS REFERRING TO MIXER-TWO AND MIXER-THREE. FIVE-BLEND SOFTWARE HAS THE APPROPRIATE ADDITIONS TO THE SCREENS.

WARRANTY INFORMATION

Warranty For Products

Seller warrants that the Products manufactured by it will conform to Seller's applicable specifications and be free from failure due to defects in workmanship and material for one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first. In the event any Product fails to comply with the foregoing warranty Seller will, at its option, either (a) repair or replace the defective Product, or defective part or component thereof, F.O.B. Seller's facility freight prepaid, or (b) credit Buyer for the purchase price of the Product. All warranty claims shall be made in writing. Seller requires all nonconforming Products be returned at Buyer's expense for evaluation unless specifically stated otherwise in writing by Seller. This warranty does not cover failure or damage due to storage, installation, operation or maintenance not in conformance with Seller's recommendations and industry standard practice or due to accident, misuse, abuse or negligence. This warranty does not cover reimbursement for labor, gaining access, removal, installation, temporary power or any other expenses which may be incurred in connection with repair or replacement. This warranty does not apply to equipment not manufactured by Seller. Seller limits itself to extending the same warranty it receives from the supplier.

Limitation on Warranties for Products

THE FOREGOING WARRANTIES ARE EXCLUSIVE EXCEPT FOR WARRANTIES OF TITLE AND AGAINST PATENT INFRINGEMENT. SELLER DISCLAIMS ALL OTHER WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. CORRECTION OF NON-CONFORMITIES IN THE MANNER AND FOR THE PERIOD OF TIME PROVIDED ABOVE SHALL CONSTITUTE SELLER'S SOLE LIABILITY AND BUYER'S EXCLUSIVE REMEDY FOR FAILURE OF SELLER TO MEET ITS WARRANTY OBLIGATIONS, WHETHER CLAIMS OF THE BUYER ARE BASED IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY), OR OTHERWISE.

Force Majeure

Seller shall not be liable for failure to perform or delay in performance due to fire, flood, strike or other labor difficulty, act of God, act of any governmental authority or of the Buyer, riot, embargo, fuel or energy shortage, car shortage, wrecks or delays in transportation, or due to any other cause beyond Seller's reasonable control. In the event of delay in performance due to any such cause, the date of delivery or time for completion will be extended by a period of time reasonably necessary to overcome the effect of such delay.

Liquidated Damages

Contracts which include liquidated damage clauses for failure to meet shipping or job completion promises are not acceptable or binding on Seller, unless such clauses are specifically accepted in writing by an authorized representative of the Seller at its headquarters office.

Limitation of Liability

THE REMEDIES OF THE BUYER SET FORTH IN THIS CONTRACT ARE EXCLUSIVE AND ARE ITS SOLE REMEDIES FOR ANY FAILURE OF SELLER TO COMPLY WITH ITS OBLIGATIONS HEREUNDER. NOTWITHSTANDING ANY PROVISION IN THIS CONTRACT TO THE CONTRARY, IN NO EVENT SHALL SELLER BE LIABLE IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE FOR DAMAGE TO PROPERTY OR EQUIPMENT OTHER THAN PRODUCTS SOLD HEREUNDER, LOSS OF PROFITS OR REVENUE, LOSS OF USE OF PRODUCTS, COST OF CAPITAL, CLAIMS OF CUSTOMERS OF THE BUYER OR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER.

THE TOTAL CUMULATIVE LIABILITY OF SELLER ARISING FROM OR RELATED TO THIS CONTRACT WHETHER THE CLAIMS ARE BASED IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, SHALL NOT EXCEED THE PRICE OF THE PRODUCT OR SERVICES ON WHICH SUCH LIABILITY IS BASED.

SECTION III INTRODUCTION

FEATURES

TOUCH VIEW SCREEN CONTROL

Most functions are accessed and performed simply by touching the face of the touch view screen. The touch view screen, like the rest of the dispenser, is built to rugged NEMA4/NEMA12 industrial standards.

FORMULA STORAGE (PRODUCT)

The dispenser will store 120 - 450 different products and their operating parameters, depending on the model. The operator can define the products. Each product consists of one to four blends and each blend consists of one to five base colors.

MULTIBLEND OPERATION (MARBLEIZING, MULTICOLOR)

Each MULTIBLEND finished product can have up to four different blends, which can be dispensed in rotating sequence or as signaled by the batching system.

AUTOMATIC / SEMIAUTOMATIC / MANUAL OPERATION

The host machine (batching system) normally controls all of the dispensing operations. However, the dispenser can also be operated in the semiautomatic mode, or the operator can have complete manual control of all dispenser functions.

ALARMS & SIGNALS

Various alarms alert the operator to unusual or out-of-tolerance conditions. The dispenser will accept a charge and discharge signal from the host machine, and will return a signal to the batching system when the charge and discharge portions of the cycle are complete.

INVENTORY CONTROL

The dispenser accumulates totals of all weights dispensed in the automatic mode. These total weights can be viewed, printed, or reset to zero when appropriate. A count of the batch number can also be viewed or reset when appropriate.

SILO SUPPLY LEVEL

The dispenser is equipped with software that monitors the color supply. An alarm will alert the operator before supply for a silo runs out.

FEATURES

(Continued)

BATCH RECORD / USAGE RECORD

A printer can be connected to the dispenser to print data from each batch produced in automatic mode. A batch number, product number, time, and date will identify each batch. A record of total color usage per silo can be printed with a touch of a screen button.



ON DISPENSERS MANUFACTURED AFTER JUNE 2000, TOUCHING THE PRINT SCREEN BUTTON ON THE EDIT PRODUCT SCREEN WILL PRINT A LIST OF PRODUCTS.

VIBRATORY FEEDER TUBES

The dispenser is equipped with vibratory feed tubes. Each feeder tube has a linear vibrator attached to the end of it to facilitate the movement of color to the weigh hopper.

SLOW FILL

The slow fill feature of the dispenser software allows control of weigh hopper filling within 1/100 of a pound, with repeatability of 2/100 of a pound.

SLOW FILL START

This software feature causes the dispenser to start filling in SLOW FILL mode when the required weight of a color is less than a user-defined value.

ACCURACY

Weighing accuracy is set for each color within each product.

COPY PRODUCT

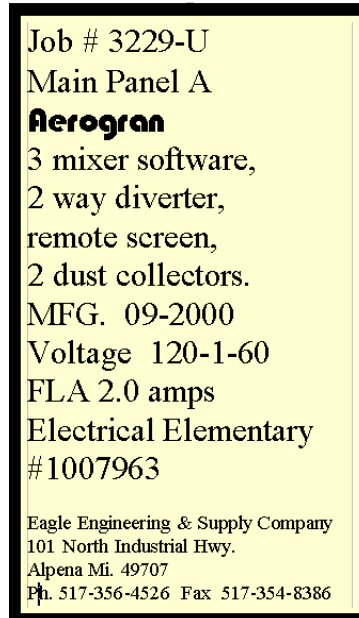
A new product can be created quickly and easily by copying and modifying an existing product.

SERIAL / MODEL NUMBER



The above nameplate will be attached to the control panel, remote panel, or frame, depending on the configuration of the dispenser.

A sticker like the one below is affixed to the **AEROGRAN™**. Please use this information when contacting EAGLE ENGINEERING.



SECTION IV INSTALLATION

UNPACKING AND INSTALLATION

1. The standard **AEROGRAN™** dispenser frame is shipped fully assembled on skids.
2. Lifting lugs are provided on top of the unit (painted yellow) to allow a forklift to unload the dispenser and move it into position.



3. Depending on the model of the dispenser, several components may be attached to the wooden skids. Big bag racks and removable hoppers have built-in forklift pockets. The discharge hose, particle collectors, and blowers will be on separate pallets.
4. DO NOT remove any of the shipping stabilizers until the frame is in operating position.

SPECIFICATIONS

ELECTRICAL:

CONTROL PANEL

120 volt AC 60 hertz, 20 amp service is required. A dedicated line is recommended.

PARTICLE COLLECTOR

208/3/50,60 – 230/3/50,60 – 440/3/50/60 – 575/3/50/60

5 horse power blower motor. Amperage dependent on voltage.



LEAVING POWER ON THE UNIT AT ALL TIMES GREATLY PROLONGS THE BATTERY LIFE OF THE COMPUTERS AND THE PROCESSORS.

AIR SUPPLY:

The **AEROGRAN™** requires “instrument quality air” (ANSI/ISA S7.0.01-1996). Instrument quality air is described as: CLEAN, DRY, OIL FREE AIR. Typical air consumption is approximately 800 liters (240 gallons) of air per cycle of the **AEROGRAN™** including cleaning of the particle collectors. The dispenser requires 100 PSI to operate the valves. The majority (95 %) of air consumption is at 30 PSI. Actual consumption varies depending on size of loading, vertical rise of discharge hose, and total length of discharge hose to mixer.

INSTALLATION **AEROGRAN**TM

PRE-INSTALLATION CHECKLIST

This is a set of tasks that the customer must perform before an Eagle Engineering technician arrives to set up the **AEROGRAN**TM dispenser and train the operator(s). These instructions cover single mixer, two mixer, and three mixer applications.

Upon delivery of the **AEROGRAN**TM, please inspect all packages thoroughly for damage. If any damage is found, please call the freight company that delivered the **AEROGRAN**TM immediately to notify them of the damage.



IMPORTANT

IMPORTANT NOTE!

PURCHASE COVERS EAGLE ENGINEERING'S COST TO SEND PERSONNEL TO THE CUSTOMER'S FACILITY FOR THREE (3) DAYS OF SETUP ASSISTANCE AND TRAINING.

IN ADDITION TO THE OPERATOR(S), THE CUSTOMER MUST HAVE PERSONNEL ON-SITE QUALIFIED TO SOLVE UNANTICIPATED PROBLEMS.

IN ORDER TO ASSURE THAT THE **AEROGRANTM DISPENSER FUNCTIONS PROPERLY, IT MUST BE OPERATED IN FULL PRODUCTION MODE, USING ALL OF THE MIXERS, FOR AT LEAST ONE DAY WHILE THE TECHNICIAN IS ON-SITE.**

EAGLE ENGINEERING WILL BE LIABLE FOR ADDITIONAL SETUP AND TRAINING COSTS DUE ONLY TO MALFUNCTION OF, OR DEFECT IN, ITS EQUIPMENT.

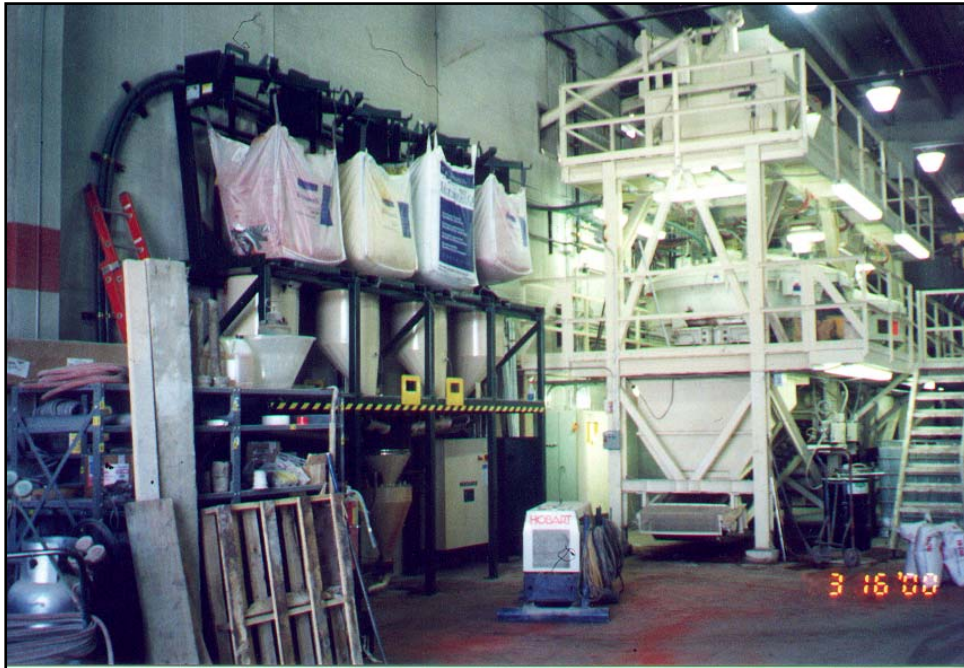
THE CUSTOMER WILL BE LIABLE FOR ADDITIONAL SETUP AND TRAINING COSTS DUE TO FAILURE TO PERFORM THE STATED PREPARATORY TASKS, OR TO PRODUCTION RELATED DELAYS. IN SUCH EVENT, THE SERVICES OF THE EAGLE ENGINEERING TECHNICIAN WILL BE CHARGED AT THE RATE OF \$600.00 U.S. PER DAY PLUS EXPENSES.

PRE-INSTALLATION CHECKLIST

(Continued)

PLACEMENT OF THE AEROGRAN™

1. Place the dispenser as close as possible to the mixer(s). Ideal placement provides for the shortest possible run of discharge hose to the mixer(s). The dispenser can be easily lifted and moved by forklift or crane using the yellow lifting lugs mounted at the center of the frame.
2. Remove the wooden skids from the bottom of the **AEROGRAN™** and level the frame.
3. Bolt the dispenser to the floor or attach it to a building wall or support member at the rear. The front must be left open for loading of the bag racks. If an overhead crane is used to load the big bags, a catwalk can be built in front of the dispenser. If a catwalk is built behind the dispenser, attaching the back edge of the catwalk to the building will add stability to the dispenser frame.



PRE-INSTALLATION CHECKLIST

(Continued)

Placement of the **AEROGRAN™**



PRE-INSTALLATION CHECKLIST

(Continued)

Placement of the AEROGRAN™



MINIMUM OVERHEAD CLEARANCE FOR THE AEROGRAN™ IS 16'-10". IF POSITIONED UNDER FEED CONVEYORS, OR IN ANY LOCATION POSING THE POSSIBILITY OF CONTAMINATION IN THE SURGE HOPPERS OR DAMAGE TO THE BIG BAGS, SHIELD THE DISPENSER AS REQUIRED.

DISCHARGE LINE (HOSE) MOUNTING

4. The discharge hose(s) are to be mounted in a manner similar to the mounting of a cement line. Attach the hose to the venturi at the bottom of the transfer vessel, or to the diverter valve outlets (when feeding multiple mixers). When looking at the discharge side of the diverter valve, the left connection is position number one, the center connection is position number two, and the right connection is position number three. The venturi at the bottom of the transfer vessel can be rotated any multiple of 45-degrees (one hole position) at the flange connection to allow the shortest possible length of the discharge hose to the mixer(s).
5. Connect the discharge hose to the **AEROGRAN™** using two clamps at each connection. Route the hose(s) straight up (material is more easily held in a vertical air stream) immediately outside the **AEROGRAN™** frame, using a 4 ft. bend radius. At a point several feet higher than the top of the target mixer, make another 4 ft. bend, pointing the hose slightly downhill (at least 5 degrees) toward the mixer. Turn the hose, again at a 4 ft. radius, to enter the top of the mixer.
6. Secure the hose vertically every five feet with hydraulic-type hose mounting clamps. Suspend the hose from the ceiling using chain or cable attached to the clamps. The hose must be able to flex between mounting points.

PRE-INSTALLATION CHECKLIST

Discharge Line (Hose) Mounting

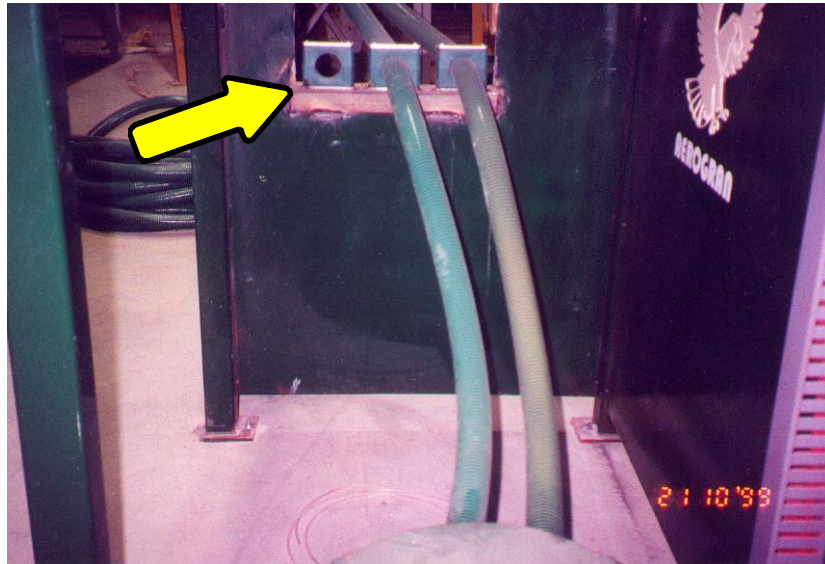
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DO NOT ATTEMPT TO ENCLOSE OR SUPPORT THE HOSE CONTINUOUSLY (FOR EXAMPLE, BY SECURING IT IN THE "V" OF A LENGTH OF ANGLE IRON). PROPER DISCHARGE AND CLEANING REQUIRES THAT IT BE ALLOWED TO MOVE LIKE A SNAKE. DO NOT RUN THE HOSE UPHILL AT AN ANGLE TO THE MIXER IF AT ALL POSSIBLE.

As the length of hose to the mixer increases, the mounting tips above become even more important to good discharge performance.

Eagle Engineering does not supply mounting clamps for the discharge hose. The hydraulic-type clamps pictured below work best for mounting the discharge hose.



PRE-INSTALLATION CHECKLIST

(Continued)

PARTICLE COLLECTOR MOUNTING

9. If possible, mount the particle collector directly above the mixer to allow a strictly vertical drop from the collector back into the mixer. Leave at least 4 ft. above the collector for filter replacement. The collector should be mounted as far as possible from cement and color discharge points to limit collection of color to fugitive dust, and to avoid collection of cement dust. Attach the 8" loose flange (supplied) to the mixer directly below the collector. Using the hose clamps supplied, attach one end of the 8" hose (supplied) to the collector flange. Attach the other end to the mixer flange, stretching the hose while tightening the clamp.



IF THE PARTICLE COLLECTOR CANNOT BE MOUNTED DIRECTLY ABOVE THE MIXER BECAUSE OF INTERFERENCE WITH EXISTING EQUIPMENT, MOUNT IT AS CLOSE AS POSSIBLE.

THE PARTICLE COLLECTOR CLEANS ITSELF AFTER EACH CYCLE AND THE COLLECTED MATERIAL DROPS BACK INTO THE MIXER. IF THE HOSE BETWEEN THE MIXER AND THE PARTICLE COLLECTOR RUNS AT ANGLE TOO SHALLOW, MATERIAL CAN BECOME LODGED IN THE HOSE DURING ONE CYCLE AND DROPPED INTO THE MIXER LATER, POSSIBLY CAUSING COLOR VARIATIONS.

IF NECESSARY, IN SUCH EVENT REPLACE THE FLEXIBLE HOSE WITH STEEL PIPE, USING SWEEPING ELBOWS. SOMETIMES THE USE OF A VIBRATOR ATTACHED TO THE STEEL PIPE WILL BE NECESSARY IF THE ANGLE IS TOO SHALLOW. CONSULT WITH EAGLE ENGINEERING ABOUT THE APPLICATION OF A VIBRATOR.

10. Mount the particle collector blower anywhere that allows connection of the flexible hose from the top of the collector to the blower intake flange. The hose can have bends, but not kinks. The combination starter mounted on the blower may be removed and mounted in a more accessible location. If so, it should be mounted within eyesight of the blower for safety and lockout reasons, and three phase wiring between the starter and the blower will be required.

PRE-INSTALLATION CHECKLIST

(Continued)

Particle Collector Mounting

(Continued)



In the photo above, the particle collector is mounted directly to the deck above the mixer. The combination starter is mounted to the blower assembly. The collector and blower are easily accessible for maintenance. There is ample headroom above the collector for filter replacement.

PRE-INSTALLATION CHECKLIST

(Continued)

ELECTRICAL CONNECTIONS



CONTROL PANEL SPECIFICATIONS:

120 VOLTS, SINGLE-PHASE

50/60 HZ

2.0 FULL LOAD AMPS

11. The last page of the electrical elementary for the dispenser shows conduit runs that may be required for installation. Please consult with Eagle Engineering if uncertain of requirements.

12. If mounting the touch screen remotely from the **AEROGRAN™**, run the RS232 communications cable (100 ft. maximum) separate from any control wires. If mounting the touch screen farther than 100 ft. from the dispenser, a special cable capable of communication on a DH+ highway network is required. This type of network requires a card to be installed in the touch screen control. Eagle Engineering does not supply the RS232 cable. The last page of the electrical elementary shows the wires required for the pushbuttons and lights that are used on the remote interface panel.

13. The most complicated part of the installation process is establishing the interface between the dispenser and the batching system. Eagle Engineering will try to identify the sequence of events, and program the required signals, before shipping the dispenser. Below is the basic sequence of events and signals that is required for the **AEROGRAN™** to work properly:



ALL CONNECTIONS ARE 120 VOLT AC AND REQUIRE THE USE OF INTERPOSING RELAYS. EAGLE ENGINEERING DOES NOT SUPPLY THE INTERPOSING RELAYS.

PRE-INSTALLATION CHECKLIST

(Continued)

Electrical Connections

(Continued)

The **AEROGRAN**[™] accepts five inputs per mixer. Four inputs are charge requests from the batching system corresponding to the four blends available in each product (formula). The dispenser can accept charge signals for any of the four blends randomly, or in rotation every time a signal for blend one is received. The fifth input is a signal to discharge each blend to the mixer. If using two-mixer or three-mixer software, there are the required inputs for each mixer. The **AEROGRAN**[™] can store signals for all three mixers and will create them in the order which the signal was received from the batching system.



THE **AEROGRAN**[™] WILL NOT ACCEPT A SECOND CHARGE REQUEST FOR THE SAME MIXER.

The **AEROGRAN**[™] has the following output signals to eliminate the possibility of a second charge request and the possibility of missed discharged signals:

MIXER #1 FILL COMPLETE
MIXER #1 DISCHARGE COMPLETE

MIXER #2 FILL COMPLETE
MIXER #2 DISCHARGE COMPLETE

MIXER #3 FILL COMPLETE
MIXER #3 DISCHARGE COMPLETE



READ THE FOLLOWING DESCRIPTION OF THE BASIC SEQUENCE OF OPERATIONS IN AN **AEROGRAN**[™] DISPENSING CYCLE TO LEARN THE IDENTITY AND FUNCTION OF SIGNALS REQUIRED FOR COMMUNICATION BETWEEN THE **AEROGRAN**[™] AND THE BATCHING SYSTEM.

PRE-INSTALLATION CHECKLIST

(Continued)

Electrical Connections

(Continued)

- STEP 1 The dispenser is sitting empty and waiting for a charge signal from the batching system. It is currently sending “Mixer-X Discharge Complete” to the batching system for each mixer. The **AEROGRAN™** is waiting for one of the following charge signals: Mixer-1 Blend-1, Mixer-1 Blend-2, Mixer-1 Blend-3, or Mixer-1 Blend-4, (or any of the same signals from Mixer-2 or Mixer-3). When the batching system sends a charge signal for a particular mixer to the **AEROGRAN™**, the “Mixer-X Discharge Complete” signal for that mixer is discontinued.



IF OPERATING TWO- OR THREE-MIXER SOFTWARE:

THE **AEROGRAN™** WILL STORE CHARGE SIGNALS FOR ALL MIXERS AT ONCE, BUT WILL EXECUTE THE CHARGE COMMANDS IN THE ORDER RECEIVED.

THE **AEROGRAN™** WILL NOT ACCEPT A SECOND CHARGE SIGNAL FOR A MIXER UNTIL THE BLEND FOR THAT MIXER HAS BEEN DISCHARGED.

- STEP 2: As soon as the **AEROGRAN™** has executed a charge command, it sends a “Mixer-X Fill Complete” signal to the batching system. The dispenser now waits for a discharge signal from the batching system to send color to the mixer. When the “Fill Complete” signal is sent, the **AEROGRAN™** opens a normally closed contact, thereby activating GATE INTERLOCK for the mixer, if implemented. Gate interlock is a feature of the dispenser that allows the cement discharge gate to be locked out, guaranteeing that color will be discharged into the mixer before cement.
- STEP 3: The **AEROGRAN™** receives a discharge signal from the batching system, and stops sending all signals to the batching system for the subject mixer. The **AEROGRAN™** will not accept a charge signal for a mixer that it is in the process of discharging color, and the gate interlock contact remains locked open for that mixer.

PRE-INSTALLATION CHECKLIST

(Continued)

Electrical Connections

(Continued)



THE **AEROGRAN**[™] WILL NOT ACCEPT A DISCHARGE SIGNAL FROM THE BATCHING SYSTEM UNTIL IT IS SENDING THE FILL COMPLETE SIGNAL FOR THE SUBJECT MIXER.

STEP 4: Discharge to the mixer is now complete. The gate interlock contact closes according to a user-defined time value. When the gate interlock times out, the **AEROGRAN**[™] sends the “Discharge Complete Mixer-1” (Mixer-2 or Mixer-3) signal and will now accept the next charge signal. For two- or three- mixer systems, the dispenser will execute charge commands in the order received.

In summary:

STEP 1: Batching system receives MIXER X DISCHARGE COMPLETE signal

Batching system sends MIXER X BLEND X charge signal

AEROGRAN[™] stops sending MIXER X DISCHARGE COMPLETE signal while filling

STEP 2: **AEROGRAN**[™] sends MIXER X FILL COMPLETE signal

STEP 3: Batching system sends MIXER X DISCHARGE signal

AEROGRAN[™] stops sending MIXER X FILL COMPLETE signal while discharging

STEP 4: **AEROGRAN**[™] sends MIXER X DISCHARGE COMPLETE signal

This sequence is repeated until the batching system stops sending signals.

14. The gate interlock feature of the **AEROGRAN**[™] consists of a normally closed contact that opens when a “Fill Complete” signal is sent to the batching system, and, thus, prevents opening of the cement discharge gate before color is added to the mixer. The contact closes when discharge of color to the mixer is complete and the user-adjustable timer that controls the contact times out. There is one gate interlock contact for each mixer.

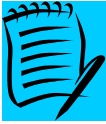
PRE-INSTALLATION CHECKLIST

(Continued)

Electrical Connections

(Continued)

15. In the event of a fault in operation of the **AEROGRAN™** a normally open contact in the control panel closes to activate a small alarm mounted on the panel. This contact can also be used to activate a plant wide alarm.



WHEN USING MULTIBLENDS, RANGES, ETC. (ONE BLEND IS DUMPED ON TOP OF ANOTHER BLEND IN A HOPPER), THE **AEROGRAN™** REQUIRES ONLY A CHARGE SIGNAL FOR BLEND 1 INPUT TO BEGIN ROTATION THROUGH THE BLENDS.

PARTICLE COLLECTOR WIRING

16. Particle collector blowers use 5-horsepower, 3-phase motors wired directly into the plant power supply. Run the correct size wire based on plant voltage.
17. Control wiring must be run from the **AEROGRAN™** control panel to the combination starter and air solenoids on each particle collector. Use 14-gauge or 16-gauge wire in all conduit runs. Each particle collector requires three inputs from the batching system to the **AEROGRAN™** control panel: Aggregate Gate Open, Cement Gate Open, and Adding Water To Mixer. The aggregate gate and cement gate inputs from a mixer starts the attached collector. When the water valve opens the collector blower stops to minimize entry of moisture into the collector filters, thereby extending cartridge life.

There are four outputs from the **AEROGRAN™** control panel to each particle collector: One to the combination starter coil (Start Particle Collector), and three to the pulse-air coils for filter cleaning. Common and ground connections are also required.



THERE ARE INPUTS TO START THE PARTICLE COLLECTOR WHEN THE AGGREGATE OR CEMENT ARE BEING ADDED TO THE MIXER. USING THE PARTICLE COLLECTOR DURING THIS TIME FRAME WILL DECREASE THE LIFE OF THE FILTERS IN THE COLLECTOR. IT IS IMPORTANT TO NOTE THAT THE PARTICLE COLECTOR IS DESIGNED TO COLLECT DUST PARTICLES FROM COLOR ONLY. IT HAS WORKED SUCSESSFULLY IN SOME APPLICATIONS FOR COLLECTING DUST FROM AGGREGATE AND CEMENT, HOWEVER IT IS NOT RECOMMENDED.

PRE-INSTALLATION CHECKLIST

(Continued)

AIR REQUIREMENTS & CONNECTIONS

18. The **AEROGRAN™** requires instrument quality air (ANSI/ISA S7.0.01-1996). Instrument quality air is described as CLEAN, DRY, OIL-FREE AIR. Typical air consumption by the **AEROGRAN™** is approximately 800 liters per cycle including the particle collector air requirement. The venturi on the bottom of the **AEROGRAN™** has a ½ inch inlet. Air pressure at this inlet is regulated @ 30 psi, and reaches a peak flow rate of 125 cfm at the end of the cycle.



FAILURE TO USE CLEAN, DRY, OIL FREE AIR WILL CAUSE COLOR TO STICK TO VALVES, CONVEYING VESSEL, INTERNAL VENTURI AND DISCHARGE HOSE SURFACES, AND PARTICLE COLLECTOR FILTERS.

19. Preferred piping of compressed air to the **AEROGRAN™** :
Run one-inch air line from the air compressor to an 800-liter (250 gallon) air storage tank. The storage tank should be placed close to the dispenser. Run one-inch air line from the storage tank to the air dryer. The air dryer should be rated at 100 cfm (minimum) and have a one-inch through flow. Run one-inch air line from the air dryer to the dispenser air manifold. Run 1/2-inch air line from the manifold to the particle collector(s).

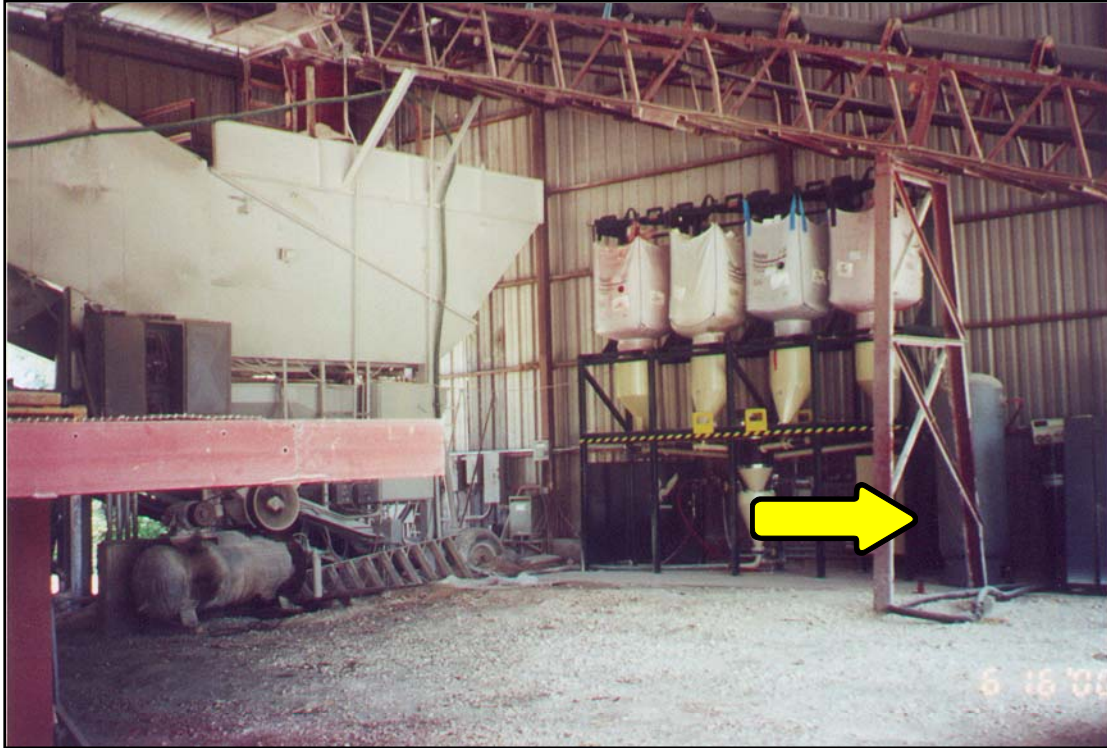
Optional piping of compressed air to the **AEROGRAN™** :

Run one-inch air line from the air compressor to a 50 CFM air dryer. Run one-inch air line from the air dryer to the 800-liter (250 gallon) air storage tank. The storage tank should be placed close to the dispenser. Run one-inch air line from the storage tank to the **AEROGRAN™** air manifold. Run 1/2-inch air line from the air dryer to the particle collector(s).

PRE-INSTALLATION CHECKLIST

(Continued)

AIR CONNECTIONS



The photo above points to a 250-gallon air storage tank next to a desiccant-type air dryer.

20. The **AEROGRAN™** dispenser requires air pressure of 100 psi. The particle collectors require maximum air pressure of 60 psi.

CAUTION

AIR PRESSURE ABOVE 60 PSI TO THE PARTICLE COLLECTOR CAN CAUSE DAMAGE TO THE FILTERS. INSTALLATION OF AN AIR PRESSURE REGULATOR (NOT SUPPLIED BY EAGLE ENGINEERING) IS REQUIRED.

THE AIR DRYER (NOT SUPPLIED), SHOULD BE SIZED ACCORDING TO AMBIENT AIR CONDITIONS. ITEMS 18 AND 19 ARE FOR USE BY A PLANT EQUIPMENT SUPPLIER IN SIZING THE AIR COMPRESSOR AND DRYER TO MEET THE REQUIREMENTS OF THE **AEROGRAN™.**

PRE-INSTALLATION CHECKLIST

(Continued)

Air Connections

(Continued)



IF THE STORAGE TANK IS INSTALLED BETWEEN THE AIR DRYER AND THE DISPENSER, AVOID AMBIENT AIR TEMPERATURE CHANGES THAT COULD CAUSE CONDENSATION INSIDE THE STORAGE TANK, SUCH AS MIGHT OCCUR UPON OPENING OF DOORS IN COLD WEATHER.

INSTALLATION OF AN AUTOMATIC AIR/WATER BLEEDER VALVE ON THE STORAGE TANK IS RECOMMENDED.

WASH THE INSIDE OF ALL NEW PIPES AND HOSES BEFORE FINAL CONNECTION TO PREVENT DAMAGE TO THE AEROGRAN™ BY DEBRIS LEFT FROM ASSEMBLY.

A HIGH QUALITY AIR FILTER SHOULD BE PLACED JUST AHEAD OF THE AEROGRAN™ AIR MANIFOLD TO INCREASE EQUIPMENT LIFE. THE FILTER SHOULD BE CAPABLE OF PASSING 125 CFM OF AIR.

AIR COMPRESSOR INFORMATION

The following pages contain general information about air compressors and air dryers for reference when selecting equipment. However, each application, environment, and system will require special consideration.

PRE-INSTALLATION CHECKLIST

(Continued)

Air Compressor Information

Handy Rules Of Thumb For Estimating

Air Compressors:

1. Air compressors are normally rated to deliver 4 to 5 cfm per hp at 100 PSIG discharge pressure.
2. Depending on the size of the system, compressed air costs about 25 to 42 cents per thousand cubic feet of intake (free) air, including operating and maintenance costs.
3. A 50 horsepower compressor radiates approximately 126,000 BTU per hour.
4. Motor amperage draw:
 - single-phase 115V - 10 amps per hp
 - 230V - 5 amps per hp
 - three-phase 230V - 2.50 amps per hp
 - 460V - 1.25 amps per hp

Air Receivers:

1. Air receiver tanks should hold approximately 1 gallon per cfm of compressor capacity.

Standard receiver tank sizes are listed below:

Gal.	Dimensions	Gal.	Dimensions
30	16" x 38"	400	36" x 96"
60	20" x 48"	660	42" x 117"
80	20" x 63"	1060	48" x 144"
120	24" x 68"	1600	54" x 170"
200	30" x 72"	220	60" x 190"
240	30" x 84"	2560	60" x 220"

2. Cubic Feet = Gallons x 0.13369

Water Content:

1. The water vapor content of saturated compressed air at 100¼ deg. F is about two gallons per hour per 100 CFM of compressor capacity.
2. At constant pressure, 50% of water vapor in saturated compressed air condenses to liquid for every 20¼ deg. F temperature drop.

PRE-INSTALLATION CHECKLIST

(Continued)

Air Compressor Information

(Continued)

Water-Cooled After coolers:

1. Most water-cooled after coolers require about 3 GPM per 100 cfm of compressed air at discharge air temperature and 100 psig.

Compressor Discharge Temperature (Before After cooling):

1. Approximate discharge temperatures (before after cooling) at 80¼ deg. F ambient:

<u>PRESSURE</u>	<u>100 PSIG</u>	<u>150 PSIG</u>	<u>200 PSIG</u>
Single-Stage	510	615	---
Two-Stage	325	365	395
Rotary (Oil-Cooled)	180 - 200	190 - 205	200 - 215

Horsepower & Power Cost:

1. Every 2-psi change in pressure equals 1% change in horsepower.
2. Most air motors require 30 cfm at 90 psig per horsepower.
3. 10¢/ kwh electric power rate = \$806/ Year for 1 hp/3 shift constant run.
4. kw = hp x 0.7457

Saturated Compressed Air

1. At 100 psig, every 20¼ deg. F increase in saturated air temperature doubles the amount of moisture in the air.

Ventilation Required

The following formula estimates the required ventilation air in cfm to adequately control ambient heat rejection from an air compressor. **BE SURE TO USE FULL ABSORBED HORSEPOWER!**

EXAMPLE:

When total bhp = 110, start temp. (T1) = 80 deg. F, max. allowable temp (T2) = 110 deg. F:

$$\text{cfm} = (110 \text{ hp} \times 2546) / (1.08 \times 20 \frac{1}{4} \text{ deg. F temp. rise}) = 280,060 / 21.87$$

$$= \underline{\underline{12,806 \text{ cfm vent. air required.}}}$$

$$\text{cfm} = \text{sensible heat (btu/hr.)} / [1.08 \times (T1-T2) \text{ temp. rise}]$$

PRE-INSTALLATION CHECKLIST

(Continued)

Air Compressor Information

(Continued)

Air Flow Through Orifices

Volume of free air in cfm that will flow thru round holes from a receiver into the atmosphere. Cubic feet of air per minute measured at absolute pressure of 14.7 psi and 70¼° F.

Air Flow Through Orifices

Dia. of Orifice (In.)	Gauge Pressure in Receiver – Pounds																		
	2	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	125	150	200
1/64	0.04	0.062	0.077	0.105	0.123	0.14	0.158	0.176	0.194	0.211	0.29	0.267	0.3	0.335	0.37	0.406	0.494	0.583	0.75
1/32	0.158	0.248	0.311	0.42	0.491	0.562	0.633	0.703	0.774	0.845	0.916	1.06	1.2	1.34	1.48	1.62	1.98	2.32	3.18
3/64	0.356	0.568	0.712	0.944	1.1	1.26	1.42	1.58	1.75	1.91	2.06	2.38	2.7	3	3.33	3.66	4.44	5.25	6.86
1/16	0.633	0.993	1.24	1.68	1.96	2.25	2.53	2.81	3.1	3.38	3.66	4.23	4.79	5.36	5.92	6.49	7.9	9.1	12.17
3/32	1.43	2.23	2.8	3.78	4.41	5.05	5.69	6.31	7	7.63	8.25	9.5	10.8	12	13.3	14.6	17.8	20.9	27.35
1/8	2.53	3.97	4.98	6.72	7.86	8.98	10.1	11.3	12.4	13.5	14.7	16.9	19.2	21.4	23.7	26	31.6	37.3	48.7
3/16	5.7	8.93	11.2	15.2	17.65	20.2	22.8	25.2	28	30.5	33	38	43.2	48.3	53.2	58.5	71	84	109.6
1/4	10.1	15.9	19.9	26.9	31.4	35.9	40.5	45	49.6	54.1	58.6	67.6	76.7	85.7	94.8	104	126	149.3	195
3/8	22.8	35.7	44.7	60.5	70.7	80.9	91.1	101	112	122	132	152	173	193	213	234	284	336	438
1/2	40.5	63.5	79.6	108	126	144	162	180	198	216	235	271	307	343	379	415	506	596	777
5/8	63.03	99.3	124.5	168	196	225	253	281	310	338	366	423	479	536	592	649	790	932	1216
3/4	91.2	143	179.2	242	283	323	365	405	446	487	528	609	690	771	853	934	1138	1340	1750
7/8	124	195	244.2	329	385	440	496	551	607	662	718	828	939	1050	1161	1272	1549	1825	2382
1	162	254	318.2	430	503	575	648	720	793	865	938	1082	1227	1371	1516	1661	2023	2385	3112
1 - 1/8	205	321	402.5	544	637	727	820	910	1004	1094	1187	1370	1552	1734	1918	2101	2560	3020	3940
1 - 1/4	253	397	498	672	784	900	1019	1124	1240	1352	1464	1693	1917	2144	2370	2596	3160	3725	4860
1 - 3/8	307	482	604	816	954	1091	1230	1367	1505	1643	1780	2054	2330	2607	2880	3153	3840	4525	5910
1-1/2	364	572	716	968	1132	1293	1460	1620	1783	1946	2112	2335	2760	3081	3412	3734	4550	5360	7000
1 - 3/4	496	780	972	1318	1540	1760	1985	2205	2429	2650	2875	3310	3755	4200	4645	5085	6195	7300	9530
2	648	1015	1274	1720	2120	2300	2594	2880	3173	3460	3752	4330	4915	5480	6070	6650	8100	9540	12450

Table is based on 100% coefficient of flow. For well-rounded entrance, multiply values by 0.97. For sharp edge orifices, a multiplier of 0.65 may be used. This table will give approximate results only. The formula $Q=14.5 PD^2$, where Q is CFM, P is absolute pressure and D is orifice diameter in inches, may be used for any points not given in table. (Applies only above 15 pounds gauge.)

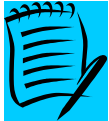
SECTION V THEORY OF OPERATION

THEORY OF OPERATION SOFTWARE

The **AEROGRAN** Dispenser is designed to perform accurate metering of C-GRADE granules, CG-GRADE granules, and G-GRADE granules over a wide range of operating conditions.

CAUTION

THE AEROGRAN™ WAS DESIGNED TO DISPENSE PIGMENT IN GRANULE FORM ONLY. POWDERED PIGMENT WILL PLUG THE DISPENSER BUT WILL NOT DAMAGE IT.



THE AEROGRAN™ SOFTWARE INCLUDES ALL OPTIONS THAT WERE AVAILABLE WHEN THE DISPENSER WAS SHIPPED. DIFFERENT MODELS ARE AVAILABLE FOR FEEDING ONE, TWO, OR THREE MIXERS. SOFTWARE ENHANCEMENT IS ONGOING. PLEASE CONTACT EAGLE ENGINEERING FOR MORE INFORMATION.

The **AEROGRAN™** has several built-in features to prevent inaccurate dispensing or actions that would cause damage to the dispenser. Many of the parameters controlling these functions can be changed from the CHANGE SETUP and EDIT PRODUCT screens.

Before the first color is added, weight on the scale is read to ensure that a batch is not already in process. It is normal to see a very small weight readout, positive or negative, before weighing begins. This is caused by accumulation or removal of dust or other foreign material on the scale, or by changes in hose stiffness. The setup parameter limiting this initial weight is called EMPTY TOLERANCE. EMPTY TOLERANCE should be set high enough for the dispenser to ignore these normal empty weight variations, yet low enough to prevent metering of a “double batch” into the Weigh Hopper or Conveying Vessel. EMPTY TOLERANCE setting should be 0.10 - 0.30 pounds.

The software also reads incoming air pressure, pressure in the Conveying Vessel, position of the Discharge Valve, position of the Diverter Valve (for multiple mixer models) and position of the Master Control Relay (MCR). If any of these are incorrect, an ALARM MESSAGE is displayed in the AUTO SCREEN on a red background. Alarms must be cleared before cycles can begin or continue.

THEORY OF OPERATION SOFTWARE

(Continued)



REFER TO THE TROUBLE SHOOTING SECTION FOR INSTRUCTIONS ON HOW TO CLEAR A SPECIFIC ALARM.

To achieve maximum production rates, the weigh hopper must be filled as rapidly as possible, while maintaining user-defined accuracies of blend component weights and total blend weight. To accomplish this, the **AEROGRAN™** is equipped with a “fast-slow fill” software feature. Most of a blend component is discharged into the weigh hopper at FAST FILL speed until a user-defined weight is reached. The balance is discharged at SLOW FILL speed until the final weight, within the user-defined ACCURACY setting, is reached.

The weights for this “fast-slow fill are entered in the EDIT PRODUCT TO RUN screen. Each Product has its own SLOW FILL, ACCURACY, and TOLERANCE settings.

THEORY OF OPERATION CHARGE CYCLE

FAST FILL

Before starting a new batch, the **AEROGRAN™** reads the level sensor in the surge hopper for the first color to ensure a sufficient supply. It then reads the weight of that color required for the blend. If the weight required is equal to or less than the SLOW FILL ONLY WEIGHT, it will start in SLOW FILL mode. Otherwise, it starts in FAST FILL mode.

The TUBE END GATE opens and the LINEAR VIBRATOR starts. Color then flows into the weigh hopper, the scale monitors the weight, and the control waits to read the weight value signaling it to switch into SLOW FILL mode.



In the photo above, the TUBE END GATE is fully open and the LINEAR VIBRATOR at the high end of the VIBRATION FEEDER TUBE is causing color to move through the tube in a pulsing manner. Color flows through the tube at 0.80 - 2.00 pounds per second, depending on the properties of the color.

THEORY OF OPERATION CHARGE CYCLE

(Continued)

SLOW FILL

When the SLOW FILL weight is reached, the TUBE END GATE closes and vibration stops. The cycle pauses until SETTLE TIME expires (SETTLE TIME timer typically set at 0.40 seconds). The **AEROGRAN™** then checks to find out if the total weight is within the ACCURACY setting (typically set at 0.02 pounds) of the DESIRED WEIGHT. If it is less than the DESIRED WEIGHT, the TUBE END GATE opens and the LINEAR VIBRATOR operates for the SLOW FILL OPEN TIME (typically set at 0.04 seconds).

This process is repeated until the total weight is within the ACCURACY and TOLERANCE set for the color.

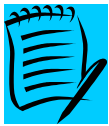


In the photo above, color granules are falling from the tube in SLOW FILL mode. The amount of color that falls each time the TUBE END GATE opens in SLOW FILL mode depends on the SLOW FILL OPEN TIME setting.

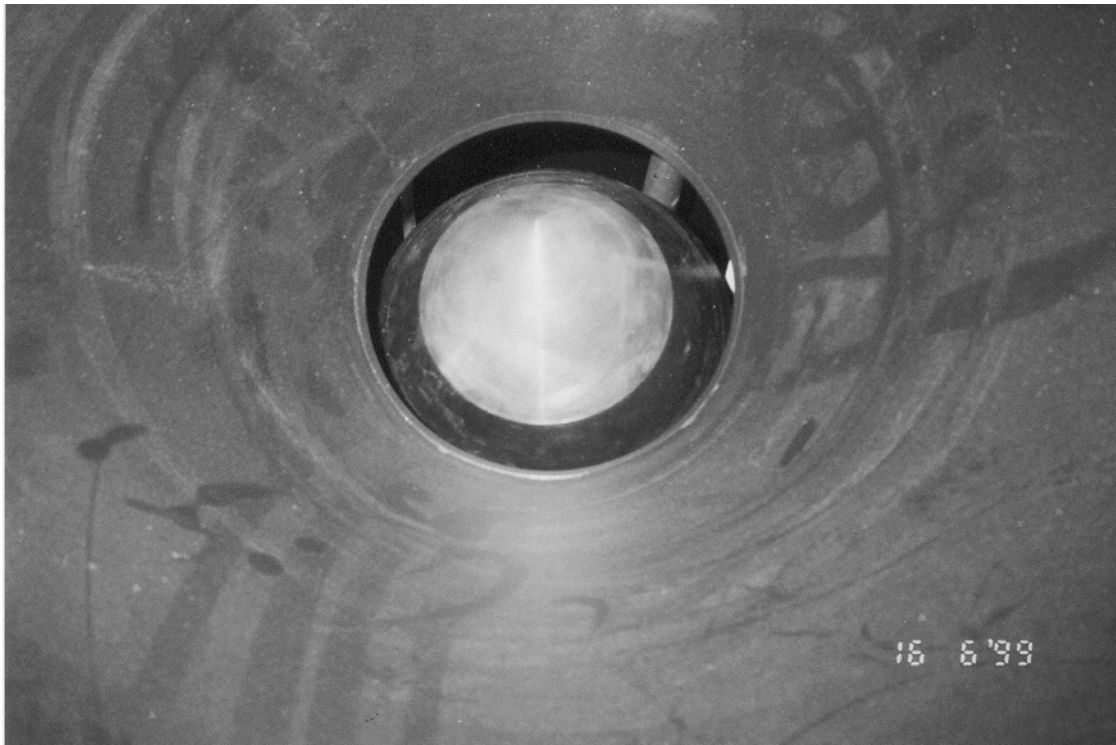
THEORY OF OPERATION

(Continued)

After each color has been weighed, the CONE VALVE opens for a user-defined time while the blend falls into the transfer vessel. In the CHANGE SETUP screen this is called CONE VALVE OPEN TIME and is set in seconds. In multiple mixer systems, this value is set independently for each mixer. While the cone valve is open, a vibrator on the weigh hopper ensures that its entire contents drop into the transfer vessel. After the cone valve closes the transfer vessel is pressurized and the dispenser waits for a signal from the batching system or the operator to send the color to the mixer. The operator sends this signal by touching the DISCHARGE button on the AUTO SCREEN.



FOR OPTIMAL PERFORMANCE IN MULTIPLE-MIXER SYSTEMS, THE **AEROGRAN™** ALLOWS TIME VALUES FOR SEVERAL OPERATING PARAMETERS TO BE SET DIFFERENTLY FOR EACH MIXER.



The photo above shows the cone valve in the open position.

THEORY OF OPERATION

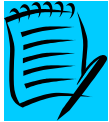
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DISCHARGE CYCLE

The finished color blend (or single color) is discharged upon the release of pressure from the transfer vessel and conveyed to the mixer by air injected into the discharge stream at the venturi. The rate of discharge is determined by the quantity of color and the length and vertical rise of the discharge hose to the mixer.

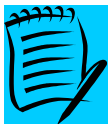
When the signal to discharge is received, the following occurs:

1. The conveying air and the particle collector start.
2. The discharge valve opens after a preset delay and discharge begins.
3. During discharge, the WIKA valve maintains pressure in the transfer vessel between preset limits. When pressure reaches the lower limit, the solenoid on the WIKA valve is energized to open the valve, allowing pressure to increase to the upper limit.



ONE OF THE FOLLOWING EVENTS WILL START THE CLEANING CYCLE, DEPENDING ON WHICH SOFTWARE VERSION IS INSTALLED:

4.
 - A. Low level in the transfer vessel results in a signal from the capacitive probe.
 - B. The DISCHARGE VALVE CLOSE DELAY times out.
 - C. The capacitive probe is turned off in the OPTION SELECT SCREEN, and the VESSEL EMPTY WEIGHT BEFORE CLEAN weight is reached.
5. The DISCHARGE VALVE closes for a set time (VESSEL PRESSURE BUILD TIME) to allow increase of pressure in the TRANSFER VESSEL to the maximum regulated value. The settings on the WIKA valve are disregarded at this time.
6. The DISCHARGE VALVE opens briefly (VESSEL PRESSURE RELEASE TIME), causing a pulse of air that works with the conveying air to blow residue out of the hose. The number of cleaning pulses (MIXER 1 CLEANING CYCLES) is set by the user.



IN MULTIPLE-MIXER SYSTEMS, THE NUMBER OF CLEANING CYCLES (PULSES) IS SET INDEPENDENTLY FOR EACH MIXER.

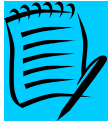
THEORY OF OPERATION

(Continued)

DISCHARGE CYCLE

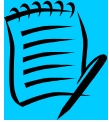
(Continued)

8. After the last cleaning pulse, the DISCHARGE LINE CLEAR timer starts and conveying air continues to flow until it times out, thus completing the cleaning process.



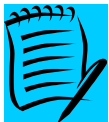
IN MULTIPLE-MIXER SYSTEMS, DISCHARGE LINE CLEAR TIME IS SET INDEPENDENTLY FOR EACH MIXER.

9. If any weight is left on the scale, an alarm sounds and a message is displayed on the AUTO SCREEN status line.
10. If using the MIXER GATE HOLD feature, the cement gate is held closed until MIXER GATE HOLD TIME has expired.



IN MULTIPLE-MIXER SYSTEMS, MIXER GATE HOLD TIME IS SET INDEPENDENTLY FOR EACH MIXER.

11. At the end of each discharge cycle, the particle collector stops after a user-set time (COLLECTOR RUN TIME) and cleans its filters by the reverse-air pulse method. Collected color drops back into the mixer.



IN MULTIPLE-MIXER SYSTEMS, COLLECTOR RUN TIME IS SET INDEPENDENTLY FOR EACH MIXER.

12. If a printer (optional) is connected to the control, a batch report will be printed showing batch number, time, date, and actual weight dispensed for each color.

THEORY OF OPERATION

(Continued)

TYPICAL UNIT SETTINGS

The following are typical values for the user-defined parameters set at startup of an **AEROGRAN™** dispenser. They will vary according to ambient air conditions, length and vertical rise of the discharge hose, manufacturer of the color, and accuracy and speed required by the application.

PRESSURE REGULATOR SETTINGS

INCOMING AIR PRESSURE	100 PSI
DISCHARGE AIR PRESSURE	30 PSI
WIKA GAUGE	LOW 6 PSI
OR	HIGH 11 PSI
DISCHARGE VESSEL PRESSURE	8 PSI
MINIMUM OPERATING AIR PRESSURE	60 PSI
MAXIMUM AIR PRESSURE IN CONVEYING VESSEL	4 PSI

CHANGE SET-UP TABLE PAGE 1

VESSEL EMPTY TOLERANCE	00.30 POUNDS
MAXIMUM VESSEL WEIGHT	66.0 POUNDS
SILO 1, 2, 3, 4, 5 SETTLE TIME	00.40 SECONDS
SILO 1, 2, 3, 4, 5 SLOW FILL OPEN TIME	00.06 SECONDS
HOPPER VIBRATION DELAY TIME	01.00 SECONDS
VESSEL PRESSURE BUILD TIME	02.00 SECONDS
VESSEL PRESSURE RELEASE TIME	02.00 SECONDS
DISCHARGE START TIME DELAY	01.00 SECONDS
DISCHARGE VALVE CLOSE DELAY	03.00 SECONDS

CHANGE SET-UP TABLE PAGE 2

MIXER 1, 2, 3 CONE VALE OPEN TIME	15.00 SECONDS
MIXER 1, 2, 3 DISCHARGE LINE CLEAR	10.00 SECONDS
MIXER 1, 2, 3 CLEANING CYCLES	2 CYCLES
MIXER 1, 2, 3 GATE HOLD TIME	00.01 SECONDS
MIXER 1, 2, 3 COLLECTOR RUN TIME	30 SECONDS

THEORY OF OPERATION

(Continued)

TYPICAL UNIT SETTINGS

(Continued)

OPTION SELECT SCREEN

CAPACITIVE PROBE	OFF
WEIGHT VIBRATOR	ON
VESSEL VIBRATOR	OFF

MULTI-BLEND SET-UP SCREEN

MIXER 1 MULTIBLEND STATUS	OFF
MIXER 1 NUMBER OF BLENDS	2,3,4
MIXER 2 MULTIBLEND STATUS	OFF
MIXER 2 NUMBER OF BLENDS	2,3,4
MIXER 3 MULTIBLEND STATUS	OFF
MIXER 3 NUMBER OF BLENDS	2,3,4

SCALE CALIBRATION SCREEN

CALIBRATION WEIGHT	100.00 POUNDS 045.36 KG
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HIDDEN SCREEN PARAMETERS PAGE 1

SILO 1, 2, 3, 4, 5 SLOW FILL ONLY WEIGHT	00.80 POUNDS
WEIGH HOPPER VIBRATION ON TIME	15.00 SECONDS
WEIGH HOPPER VIBRATION OFF TIME	01.00 SECONDS
DEFLATE SEAL ON DIVERTER TIME	01.50 SECONDS
DIVERTER FULLY SEATED TIME	01.50 SECONDS
VESSEL EMPTY WEIGHT BEFORE CLEAN	01.00 POUNDS

HIDDEN SCREEN PARAMETERS PAGE 2

MIXER 1, 2, 3 FAN STOP TIME	10.00 SECONDS
MIXER 1, 2, 3 FILTER 1 CLEAN TIME	00.75 SECONDS
MIXER 1, 2, 3 FILTER 1 SETTLE TIME	00.75 SECONDS
MIXER 1, 2, 3 FILTER 2 CLEAN TIME	00.75 SECONDS
MIXER 1, 2, 3 FILTER 2 SETTLE TIME	00.75 SECONDS
MIXER 1, 2, 3 FILTER 3 CLEAN TIME	00.75 SECONDS
MIXER 1, 2, 3 FILTER 3 SETTLE TIME	00.75 SECONDS

THEORY OF OPERATION

(Continued)

TYPICAL UNIT SETTINGS

(Continued)

EDIT PRODUCT SCREEN

	<u>SILO 1</u>	<u>SILO 2</u>	<u>SILO 3</u>	<u>SILO 4</u>	<u>SILO 5</u>
BLEND 1	0.00	0.00	0.00	0.00	0.00
BLEND 2	0.00	0.00	0.00	0.00	0.00
BLEND 3	0.00	0.00	0.00	0.00	0.00
BLEND 4	0.00	0.00	0.00	0.00	0.00
SLOW PRACT	0.80	0.80	0.80	0.80	0.80
ACCURACY	0.02	0.02	0.02	0.02	0.02
TOLERANCE	0.15	0.15	0.15	0.15	0.15



THE VALUES ABOVE ARE TO BE USED ONLY AS A STARTING POINT. IT WILL BE NECESSARY TO MODIFY THESE SETTINGS ACCORDING TO THE REQUIREMENTS OF THE APPLICATION.

ALL SETTINGS SHOULD BE RECORDED FOR RESTARTING IN THE EVENT OF SYSTEM FAILURE.

SECTION VI SEQUENCE OF EVENTS

SEQUENCE OF EVENTS

The following is a sequence of events that might occur in a typical operation. This example will be based on a batching system operating two mixers at the same time.

At Mixer 1, two hoppers each collect a different blend from which alternating batches are mixed and fed onto a metering belt, which, in turn, supplies a paver machine. Each hopper uses a capacitive probe to send its own charge signal to the batching system when its material supply is low.

At Mixer 2, one hopper collects and discharges, in succession, three different blends to mix into one batch for MARBLEIZEING, thus sending only one charge signal at a time to the dispenser when its color supply is low.

CAUTION

IN THIS EXAMPLE, THE BATCHING SYSTEM SENDS CONTINUOUS SIGNALS AS LONG AS ANY OF THE PROBES INDICATE LOW LEVEL.

POWERING UP THE DISPENSER

1. The dispenser is powered up in the morning.
2. The air compressor and air dryer are running.
3. The automatic air bleeder on the bottom of the 250-gallon air surge tank is operating.
4. The batching system is turned on and the color option for adding color to each mixer is enabled.



SOME BATCHING SYSTEMS DO NOT HAVE AN ON/OFF SWITCH FOR ADDING COLOR TO A MIXER. IN THIS CASE, USE THE AUTO BATCHING SWITCH ON THE DISPENSER FOR EACH MIXER.

5. The operator selects the PRODUCT for each mixer to run from the SELECT PRODUCT SCREEN TO RUN screen. This screen is accessed from the MAIN MENU screen.
6. In the SELECT PRODUCT TO RUN screen the operator touches the product number next to MIXER X RUNNING PRODUCT X. A numbered keypad appears. The operator touches the numbers on the screen and then touches ENTER.

SEQUENCE OF EVENTS

(Continued)

SELECT PRODUCT TO RUN

MIXER 1 RUNNING PRODUCT:	123	DESCRIPTION:	MessageMessageMessageM
MIXER 2 RUNNING PRODUCT:	123	DESCRIPTION:	MessageMessageMessageM
MIXER 3 RUNNING PRODUCT:	123	DESCRIPTION:	MessageMessageMessageM

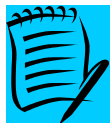
Prod #	Description	Prod #	Description
01	MessageMessageMessageM	11	MessageMessageMessageM
02	MessageMessageMessageM	12	MessageMessageMessageM
03	MessageMessageMessageM	13	MessageMessageMessageM
04	MessageMessageMessageM	14	MessageMessageMessageM
05	MessageMessageMessageM	15	MessageMessageMessageM
06	MessageMessageMessageM	16	MessageMessageMessageM
07	MessageMessageMessageM	17	MessageMessageMessageM
08	MessageMessageMessageM	18	MessageMessageMessageM
09	MessageMessageMessageM	19	MessageMessageMessageM
10	MessageMessageMessageM	20	MessageMessageMessageM

MAIN MENU

PREV PAGE

NEXT PAGE

EDIT PRODUCT



THE SCREEN ABOVE IS THE SELECT PRODUCT TO RUN SCREEN OF A THREE-MIXER DISPENSER. A SINGLE-MIXER WILL NOT HAVE MIXER-TWO AND MIXER-THREE ON THE SCREEN.

THE PRODUCT NUMBER WILL BE SHOWN IN THE BLUE BACKGROUND LIKE THE NUMBERS "123" ABOVE. TOUCH THIS AREA OF THE SCREEN TO CHANGE THE PRODUCT NUMBER. THE AREA IN BLACK WILL BE DESCRIPTIVE TEXT THE OPERATOR HAS ENTERED FOR EACH PRODUCT.

SEQUENCE OF EVENTS

(Continued)

7. By touching PREV PAGE or NEXT PAGE, the operator can see all the products that have been entered into the dispenser.



THE NUMBER OF PRODUCT FORMULAS WILL VARY FROM 120 TO 450 DEPENDING ON THE SOFTWARE VERSION.

TOUCHING THE EDIT PRODUCT BUTTON WILL ALLOW THE OPERATOR TO EDIT A PRODUCT FORMULA.



AT THIS POINT IN THE SEQUENCE THE OPERATOR SELECTS THE PRODUCTS TO RUN FOR MIXER-ONE AND MIXER-TWO. THE FORMULAS HAVE BEEN PREVIOUSLY ENTERED INTO THE DISPENSER.

FOR INFORMATION ON ADDING OR EDITING A PRODUCT, REFER TO THE EDIT PRODUCT SECTION .

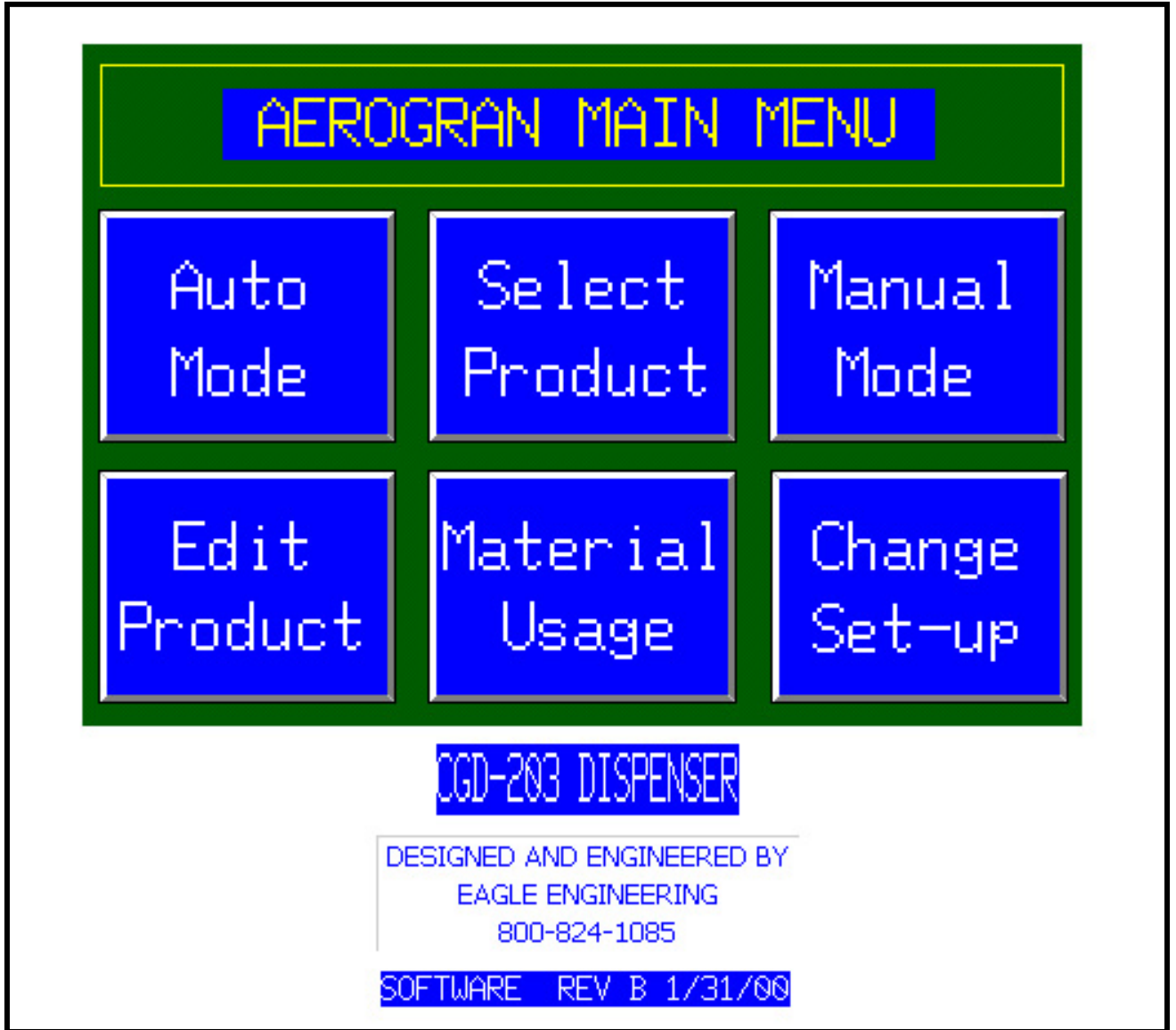
8. The operator has selected the products to run for each mixer next will turn on MULTI-COLOR for MIXER-TWO.



THE TERM "MULTI-COLOR" IS INTERCHANGABLE WITH ALL OF THE FOLLOWING: "RANGE", "STEPPING", "MULTI-BLEND", "STACKING", AND "MARBLEIZING".

SEQUENCE OF EVENTS

(Continued)



9. Return to the Main Menu and touch CHANGE SETUP.

SEQUENCE OF EVENTS

(Continued)

CHANGE SET-UP TABLE

PAGE 1

12.34	VESSEL EMPTY TOLERANCE	12.34	HOPPER VIBRATION DELAY TIME
123.4	MAXIMUM VESSEL WEIGHT	12.34	VESSEL PRESSURE BUILD TIME
12.34	SILO 1 SETTLE TIME	12.34	VESSEL PRESSURE RELEASE TIME
12.34	SILO 2 SETTLE TIME	12.34	DISCHARGE START TIME DELAY
12.34	SILO 3 SETTLE TIME	12.34	DISCHARGE VALVE CLOSE DELAY
12.34	SILO 4 SETTLE TIME	12.34	SPARE
12.34	SILO 5 SETTLE TIME	12.34	SPARE
12.34	SILO 1 SLOW FILL OPEN TIME	12345	SPARE
12.34	SILO 2 SLOW FILL OPEN TIME	12345	SPARE
12.34	SILO 3 SLOW FILL OPEN TIME		
12.34	SILO 4 SLOW FILL OPEN TIME		
12.34	SILO 5 SLOW FILL OPEN TIME		

Silo 1	MessageMes	MessageMes
Silo 2	MessageMes	MessageMes
Silo 3	MessageMes	MessageMes
Silo 4	MessageMes	MessageMes
Silo 5	MessageMes	MessageMes

OPTION
SELECT

MULTI-
BLEND

SCALE
CALIB.

MAIN
MENU

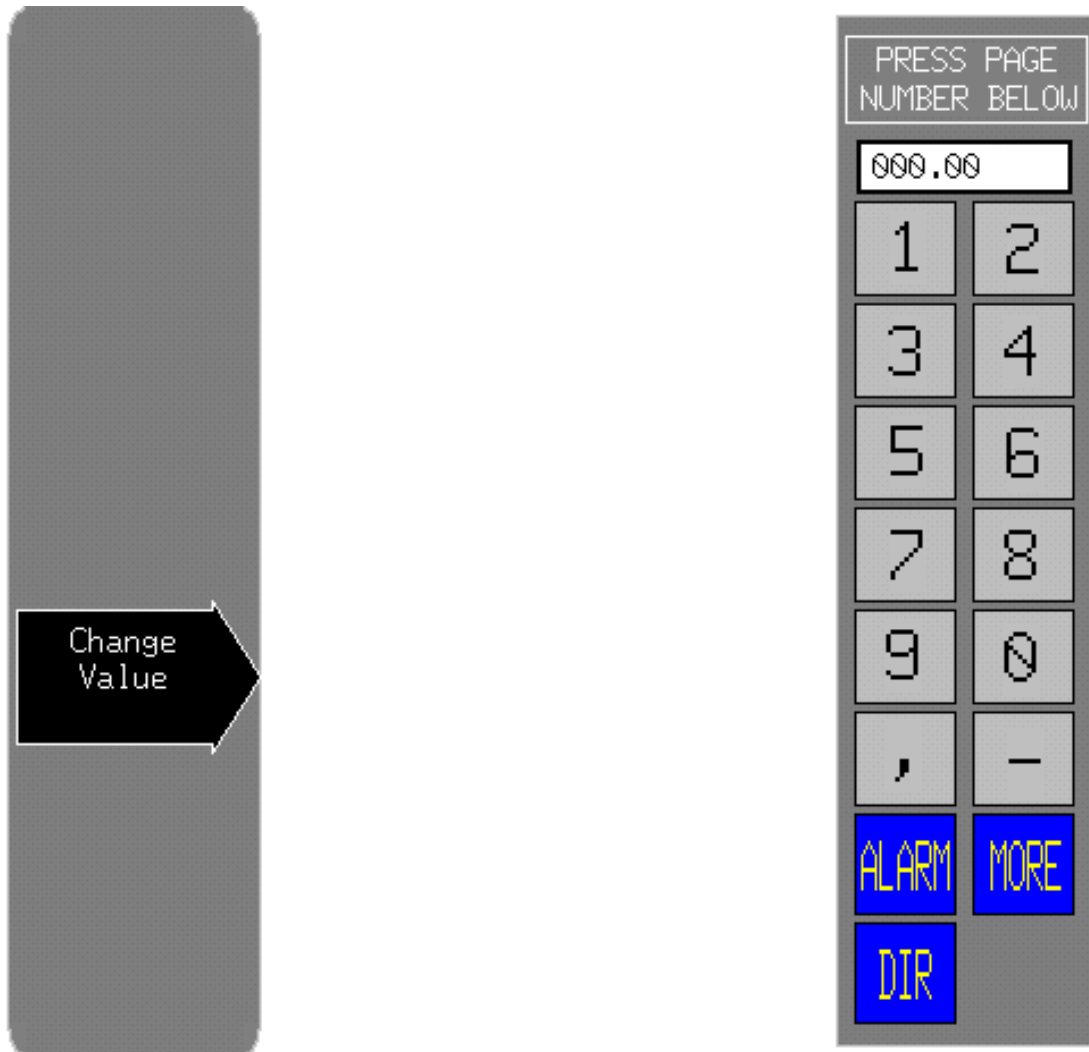
NEXT
PAGE

10. In the CHANGE SET-UP screen touch MULTI-BLEND.
11. In the MULTI-BLEND screen touch OFF for MIXER 2. The button now reads ON and is highlighted in green.
12. Touch the number in the blue box next to MIXER 2 BLENDING and a keypad will appear. Touch the number three and then ENTER. MIXER 2 to MULTICOLOR or rotate through 3 blends has been selected.
13. Touch PREVIOUS SCREEN to return to the CHANGE SET-UP screen.
14. Touch MAIN MENU to return to the MAIN MENU screen.

SEQUENCE OF EVENTS

(Continued)

Below is the keypad that will appear when changing a value. In some of the early versions of firmware in the PanelMate touch screen, a CHANGE VALUE screen will appear prompting the operator to change a value. Touch CHANGE VALUE, and a numerical keypad will appear.

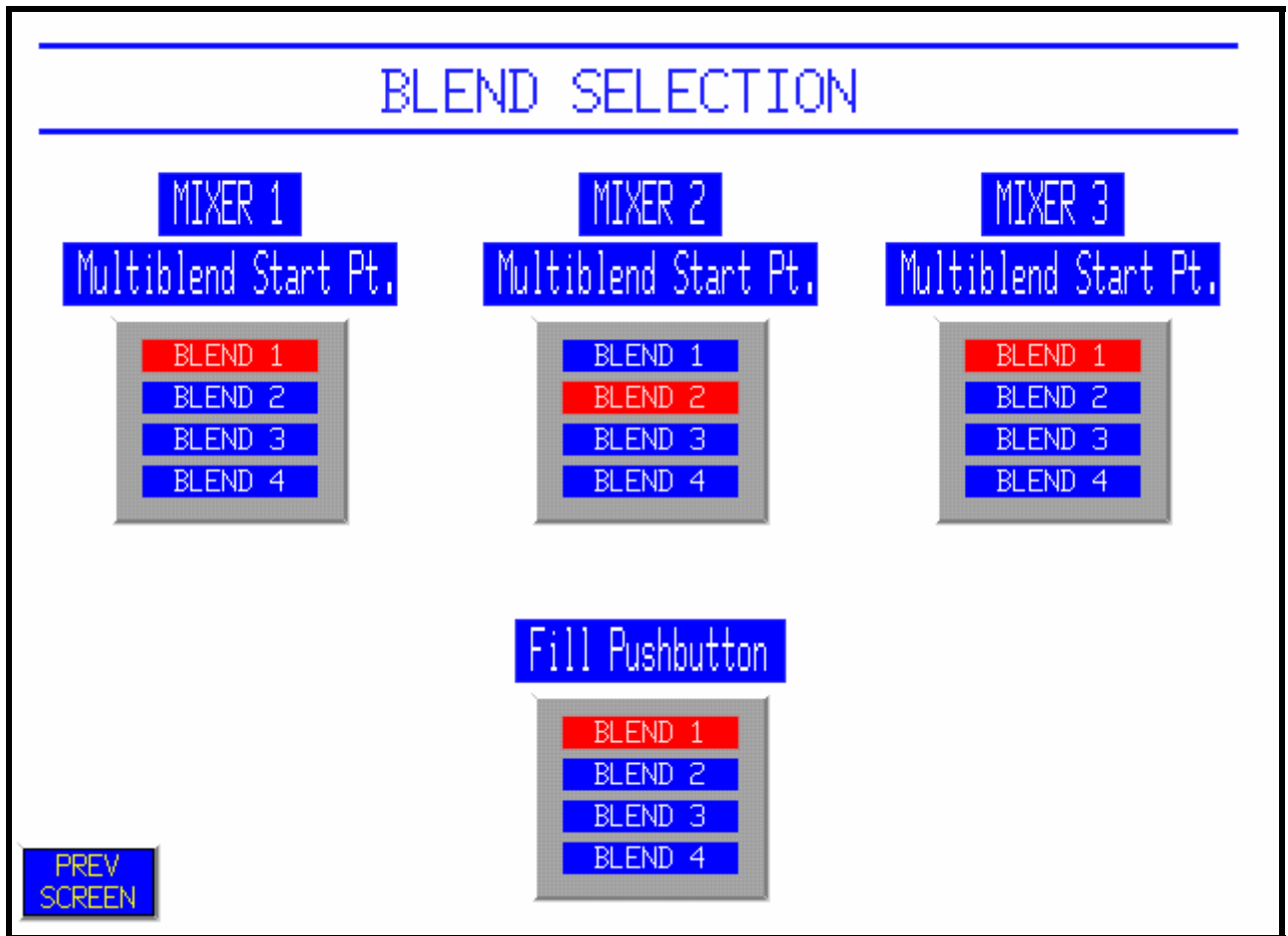


THE CHANGE VALUE PAD MAY OR MAY NOT APPEAR PRIOR TO THE KEYPAD WINDOW, DEPENDING ON THE SOFTWARE VERSION.

SEQUENCE OF EVENTS

(Continued)

15. Touch AUTO MODE on the MAIN MENU screen.
16. Touch BLEND SELECT on the AUTO screen.
17. One of the blends under MIXER 2 Multiblend Start Pt. Is displayed with a red background and the rest have blue backgrounds. When the first charge signal is sent from the batching system, the dispenser will create the blend with the red background.
18. Touch MIXER 2 once and the red highlighted background will move down to the next blend. Touch MIXER 2 until BLEND 1 is highlighted in red. This will be the first blend of the product to be made for MIXER 2.



SEQUENCE OF EVENTS

(Continued)

AUTO MIXER 1 RUNNING PRODUCT: 123 DESCRIPTION: MessageMessageMessageM
 MIXER 2 RUNNING PRODUCT: 123 DESCRIPTION: MessageMessageMessageM
 MIXER 3 RUNNING PRODUCT: 123 DESCRIPTION: MessageMessageMessageM

ERROR MESSAGE:

STATUS: MessageMessageMessageMessageMessageMessa

BLEND INFO: MessageMessageMessageMessageMe

BLEND WEIGHT: 1234.56 **BATCH NUMBER:** 1234 **BLENDING** 1 2 3

	Description	Desired Weight	Actual Weight
Silo 1	MessageMes MessageMes	123.45	123.45
Silo 2	MessageMes MessageMes	123.45	123.45
Silo 3	MessageMes MessageMes	123.45	123.45
Silo 4	MessageMes MessageMes	123.45	123.45
Silo 5	MessageMes MessageMes	123.45	123.45

MAIN MENU

SUPPLY LEVELS
 RESET
 MIXER 1 FILL
 MIXER 2 FILL
 MIXER 3 FILL
 DISCHARGE
 BLEND SELECT
 TOLERANCE ACCEPT
 PAUSE

19. Touch PREVIOUS SCREEN to return to the AUTO screen.
20. Notice that BLENDING 2 is flashing, indicating that blending is ON for MIXER 2.

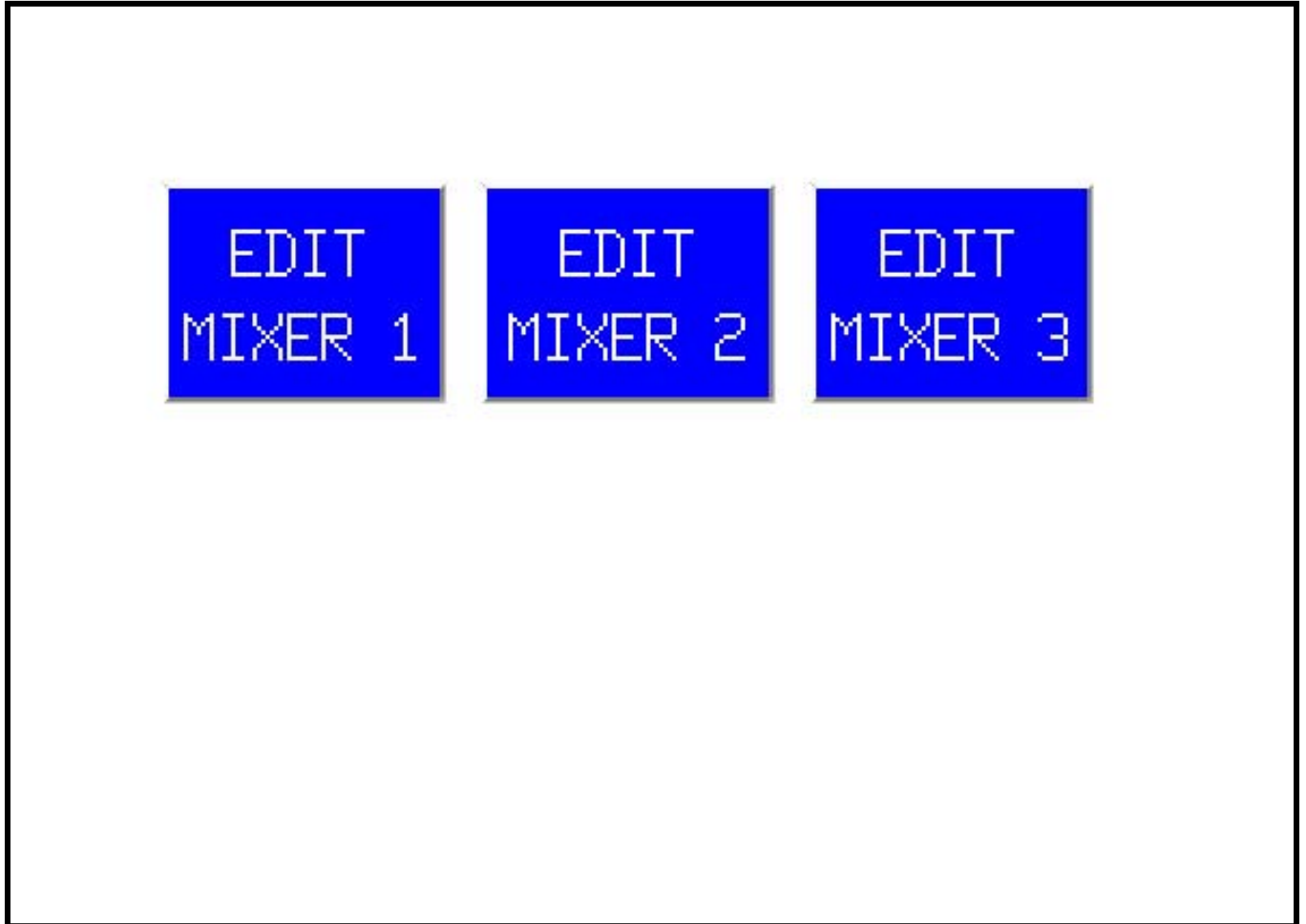


ON EARLY VERSIONS OF SOFTWARE THE BLENDING INDICATOR ON THE AUTO SCREEN IS ABSENT.

21. Touch MAIN MENU in the lower left corner.
22. Touch EDIT PRODUCT in the MAIN MENU screen. When running single-mixer software the EDIT PRODUCT screen and the values for the product selected to run will appear. In this example we are using three-mixer software and the following screen will appear:

SEQUENCE OF EVENTS

(Continued)

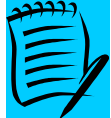


23. Touch EDIT MIXER 1 to move to the EDIT PRODUCT screen. The values in that screen will be the values entered for the PRODUCT selected to run in the SELECT PRODUCT TO RUN screen.

SEQUENCE OF EVENTS

(Continued)

24. Below is an example of the EDIT PRODUCT screen. This screen is the same for all models regardless of the number of mixers in the batching system.



ON DISPENSERS BUILT AFTER JULY 2000, THERE IS A PRINT SCREEN BUTTON IN THE EDIT PRODUCT SCREEN. IF A PRINTER IS CONNECTED TO THE TOUCH SCREEN, THE OPERATOR CAN TOUCH THE PRINT SCREEN BUTTON TO GENERATE A PAPER COPY OF THE PRODUCT DATA.

EDIT	EDIT PRODUCT: 123	DESCRIPTION: MessageMessageMessageM			
	SILO 1	SILO 2	SILO 3	SILO 4	SILO 5
	MessageMes	MessageMes	MessageMes	MessageMes	MessageMes
	MessageMes	MessageMes	MessageMes	MessageMes	MessageMes
Blend 1	123.45	123.45	123.45	123.45	123.45
Blend 2	123.45	123.45	123.45	123.45	123.45
Blend 3	123.45	123.45	123.45	123.45	123.45
Blend 4	123.45	123.45	123.45	123.45	123.45
Slow Preact	123.45	123.45	123.45	123.45	123.45
Accuracy	123.45	123.45	123.45	123.45	123.45
Tolerance	123.45	123.45	123.45	123.45	123.45
MAIN MENU					COPY PRODUCT

SEQUENCE OF EVENTS

(Continued)

25. Touch the number to the right of the EDIT PRODUCT: and the numbered keypad will appear. Enter a different PRODUCT number to view or edit another PRODUCT.



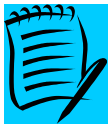
ONE PRODUCT CAN BE SELECTED FOR ALL THREE MIXERS AT ONCE BY ENTERING THE SAME NUMBER FOR ALL THREE MIXERS.



ANY CHANGE MADE TO A PRODUCT FOR ONE MIXER WILL CHANGE THE PRODUCT FOR ALL THE MIXERS.

START OF THE CHARGE SEQUENCE

26. Touch MAIN MENU to return to the MAIN MENU screen. The dispenser is ready to start to batch the products that are selected to run.
27. Touch AUTO MODE on the MAIN MENU screen.
28. Enable AUTO BATCHING for MIXER 1 and MIXER 2 using the selector switches on the control panel.
29. Pull out the EMERGENCY STOP button if depressed.
30. Push the yellow button on the control panel labeled MCR RESET.



AT THIS POINT, BECAUSE MCR IS RESET AND AUTO BATCHING IS ENABLED, THE DISPENSER IS SIGNALING THE BATCHING SYSTEM THAT IT IS EMPTY AND WAITING FOR A CHARGE SIGNAL FOR MIXER-ONE OR MIXER-TWO.



THE AEROGRAN™ WILL ACCEPT A CHARGE SIGNAL REGARDLESS OF WHAT SCREEN IS DISPLAYED WHENEVER MCR IS RESET AND AUTO BATCHING IS ENABLED. THE DISPENSER WILL START AS SOON AS THE OPERATOR ENTERS THE AUTO SCREEN.

SEQUENCE OF EVENTS

(Continued)

CHARGE SEQUENCE

(Continued)

31. The STATUS line on the AUTO screen reads:

RESET AND WAITING FOR FILL COMMAND



NOTICE THAT THE PRODUCT NUMBER AND NAME TO RUN ARE CORRECT BUT THE WEIGHT VALUES ARE INCORRECT.

THE VALUES SEEN ON THE SCREEN ARE FROM THE LAST BATCH THAT WAS MADE AND WILL BE UPDATED AS SOON AS A CHARGE SIGNAL IS SENT BY THE BATCHING SYSTEM.

32. The low level probe in one of hoppers at MIXER 1 sends a charge signal to the dispenser to make BLEND 2 of the PRODUCT.

The low level probe in a hopper at MIXER 2 sends a charge signal to the dispenser while it is making BLEND 1 for MIXER 1. This signal will be stored until the dispenser is finished creating MIXER 1 BLEND 1.

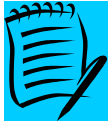
33. The **AEROGRAN**[™] stops sending all signals to the batching system while creating a blend for MIXER 1 and storing a charge signal for MIXER 2.
34. The dispenser starts filling the first color required for MIXER 1 BLEND 2 by performing the following sequence:
- 34A. Checks for MCR RESET.
 - 34B. Checks line air pressure to dispenser.
 - 34C. Shifts the diverter valve to MIXER 1 position.
 - 34D. Checks for confirmation of diverter position.
 - 34E. Checks the EMPTY VESSEL WEIGHT for tolerance.
 - 35F. Checks position of the CONE VALVE.
 - 36G. Checks position of the DISCHARGE VALVE.

SEQUENCE OF EVENTS

(Continued)

CHARGE SEQUENCE

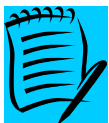
(Continued)



IF ERRORS OCCUR, THEY WILL BE DISPLAYED IN THE UPPER PORTION OF THE AUTO SCREEN. THE ALARM WILL SOUND AND THE OPERATOR MUST TAKE CORRECTIVE ACTION. UP TO FOUR ERRORS CAN BE DISPLAYED AT ONE TIME. ALL ERRORS ARE DISPLAYED IN

RED BACK GROUND WITH WHITE TEXT.

- 34H. Reads the weight required for the first color of MIXER 1 BLEND2.
- 34I. Compares the weight from 34H to the SLOW FILL ONLY WEIGHT in the HIDDEN SCREEN PARAMETERS.
- 34J. If a color requirement is equal to or less than the SLOW FILL ONLY WEIGHT the dispenser starts in SLOW FILL mode. Otherwise it starts in FAST FILL mode.
- 34K. Tares out the scale to 0.
- 34L. Starting in FAST FILL mode, the TUBE END GATE opens all the way, and the linear vibrator starts. [\(Refer to SECTION 4, PAGE 4 for more information.\)](#) The color flows freely into the weigh hopper until the SLOW PRACT weight is reached.



THE SLOW PRACT WEIGHT IS THE WEIGHT AT WHICH THE DISPENSER STARTS METERING COLOR IN SLOW FILL MODE TO REACH THE FINAL WEIGHT WITHIN THE USER-DEFINED TOLERANCE FOR THAT COLOR.

EXAMPLE: IF A COLOR REQUIREMENT IS 10.00 POUNDS AND THE SLOW PRACT WEIGHT IS SET AT 00.50 POUNDS, SLOW FILL BEGINS WHEN THE SCALE READS 9.50 POUNDS.

- 34M. Metering proceeds in SLOW FILL mode. The TUBE END GATE is opening and closing and the vibrator is starting and stopping based on the SLOW FILL OPEN TIME that the operator entered in the SET-UP screen for that color. This cycle repeats until the weight is within TOLERANCE. (Refer to SECTION 4, PAGE 5 for more information.)

SEQUENCE OF EVENTS

(Continued)

CHARGE SEQUENCE

(Continued)

- 34N. Once the first color weighs within tolerance, the scale is tared again. If the weight is out of tolerance an alarm will sound, the cycle will stop, and the operator must take corrective action.
- 34O. The sequence above is repeated for each color required in the blend.



IF THE MAXIMUM ALLOWABLE SCALE WEIGHT IS REACHED, THE DISPENSER WILL AUTOMATICALLY CLOSE ALL TUBE END GATES TO STOP FLOW INTO THE WEIGH HOPPER.

- 34P. All of the color required for this blend is now in the WEIGH HOPPER.
- 34Q. Air pressure in the TRANSFER VESSEL is checked by the pressure sensor. If the pressure is 3 psi or less, the CONE VALVE opens and the WEIGH HOPPER VIBRATOR operates for a user-defined time for MIXER 2. If pressure is over 3 psi, an alarm is sounded and the cycle is paused.

CAUTION

IF PRESSURE IN THE TRANSFER VESSEL IS MORE THAN 3 PSI, THE CONE VALVE MAY NOT OPEN. IF IT DOES, PRODUCT IN THE TRANSFER VESSEL WILL ENTER THE WEIGH HOPPER BREATHER AND ESCAPE THROUGH THE RUBBER HOOD, RESULTING IN WEIGHING ERRORS.



THE TIME REQUIRED FOR A BATCH TO FALL INTO THE TRANSFER VESSEL DEPENDS ON ITS SIZE. TO OPTIMIZE CYCLE TIMES, EACH BATCH HAS ITS OWN VALUE FOR CONE VALVE OPEN TIME.



EARLY MACHINES INCLUDED A CAPACITIVE PROBE THAT SENSES COLOR AT THE BOTTOM OF THE TRANSFER VESSEL. WHEN CAPACITIVE PROBE IS TOGGLED ON IN THE OPTION SELECT SCREEN AND THERE IS COLOR IN THE TRANSFER VESSEL, AN ALARM WILL SOUND AND THE CYCLE WILL PAUSE. TOGGLE OFF TO BYPASS FOR MANUAL OPERATION.

SEQUENCE OF EVENTS

(Continued)

CHARGE SEQUENCE

(Continued)

- 34R. The cone valve closes and the dispenser sends a constant signal to the batching system that it is ready for discharge to MIXER 1.
The STATUS line now reads: FILL COMPLETE, WAITING FOR DISCHARGE.
The BLEND INFO line reads: CREATING BLEND 1 MIXER 1



THE **AEROGRAN™** WILL NOT ACCEPT OR STORE A DISCHARGE SIGNAL WHILE IN THE FILL MODE. THIS IS NORMALLY NOT A PROBLEM BECAUSE THE FILL COMPLETE AND DISCHARGE COMPLETE SIGNALS WILL HAVE STOPPED THE HOST MACHINE FROM SENDING A DISCHARGE SIGNAL.

START OF THE DISCHARGE SEQUENCE

All of the color has been weighed and waits in the TRANSFER VESSEL to be sent to MIXER 1. The dispenser is sending a FILL COMPLETE signal to the batching system for MIXER 1, and the signal to make the blend for MIXER 2 is still stored in the control.

35. The signal to discharge the blend to MIXER 1 is received by the **AEROGRAN™**.
- 35A. The dispenser stops sending the FILL COMPLETE signal to the batching system.
- 35B. The particle collector begins its cycle for MIXER 1. (See PARTICLE COLLECTOR)
- 35C. The conveying air starts blowing to MIXER 1, and the DISCHARGE START TIME DELAY, starts.
- 35D. When the DISCHARGE START TIME DELAY expires, the discharge valve on the bottom of the TRANSFER VESSEL opens. At the same time, the TRANSFER VESSEL is pressurized to a predetermined setting. This pressure is controlled by one of the following two methods:
- Method 1. A combination valve-gauge with high and low limits maintains a pressure range in the TRANSFER VESSEL by opening and closing an air solenoid. This was used on **AEROGRAN™**'s shipped before November 2000.
- Method 2. A low-limit pressure regulator maintains a steady pressure in the TRANSFER VESSEL.

SEQUENCE OF EVENTS

(Continued)

DISCHARGE SEQUENCE

(Continued)

35E. Pressure in the TRANSFER VESSEL is pushing a steady flow of color into the air stream. When the amount of color in the TRANSFER VESSEL drops to a low level, the cleaning cycle starts. One of the following methods will trigger the cleaning cycle:

Method 1. A capacitive probe mounted in the bottom of the TRANSFER VESSEL senses color not present and signals the DISCHARGE VALVE CLOSE DELAY to start. This was used on **AEROGRAN™**s shipped before July 2000.

Method 2. The weight on the scale drops to the user-defined VESSEL EMPTY WEIGHT BEFORE CLEAN, set in the hidden screen, and signals the DISCHARGE VALVE CLOSE DELAY to start.

The DISCHARGE VALVE CLOSE DELAY allows the last of the color to exit the TRANSFER VESSEL before the cleaning cycle starts.

35F. The dispenser starts the cleaning cycle by closing the discharge valve on the bottom of the TRANSFER VESSEL for the user-defined VESSEL PRESSURE BUILD TIME. The TRANSFER VESSEL is pressurized to the discharge pressure regulator setting.

35G. When the VESSEL PRESSURE BUILD TIME expires, the discharge valve on the bottom of the TRANSFER VESSEL closes for the user-defined VESSEL PRESSURE RELEASE TIME.

35H. The build and release of pressure in the TRANSFER VESSEL is repeated based on the user-defined value MIXER 1 CLEANING CYCLES in the SET-UP screen.

This opening and closing of the discharge valve creates pulses of air that work with the conveying air to blow residue out of the hose.



EACH MIXER HAS ITS OWN SETTINGS IN A MULTIPLE-MIXER SOFTWARE PACKAGE.

SEQUENCE OF EVENTS

(Continued)

DISCHARGE SEQUENCE

(Continued)



THE **AEROGRAN**[™] SOFTWARE INCLUDES ALL OPTIONS THAT WERE AVAILABLE WHEN THE DISPENSER WAS SHIPPED. DIFFERENT MODELS ARE AVAILABLE FOR FEEDING ONE, TWO, OR THREE MIXERS. SOFTWARE ENHANCEMENT IS ONGOING. PLEASE CONTACT EAGLE ENGINEERING FOR MORE INFORMATION.

- 35I. When cleaning is completed the **AEROGRAN**[™] continues blowing air to the mixer for the user-defined MIXER 1 DISCHARGE LINE CLEAR time entered in the SET-UP screen.



THE TIME REQUIRED TO CLEAN A DISCHARGE LINE DEPENDS ON ITS LENGTH. TO OPTIMIZE CYCLE TIMES, EACH MIXER HAS ITS OWN VALUE FOR DISCHARGE LINE CLEAR TIME.

CAUTION

FAILURE TO USE CLEAN, DRY, OIL FREE AIR WILL CAUSE COLOR TO STICK TO VALVES, CONVEYING VESSEL, INTERNAL VENTURI AND DISCHARGE HOSE SURFACES, AND PARTICLE COLLECTOR FILTERS.

- 35J. When the discharge air stops blowing to the mixer, the MIXER 1 GATE HOLD TIME timer starts. This timer controls a relay contact in the **AEROGRAN**[™] control panel. This contact can be used to:
- A. Lock out the cement gate to insure that the color is added to the mixer prior to the addition of cement.
 - B. Lock out the mixer gate to insure that color has been added to the mixer before it is allowed to dump.
 - C. Guarantee a mix time for either A or B in the mixer.

SEQUENCE OF EVENTS

(Continued)

IMPORTANT

The Mixer Gate Interlock prohibits discharge of the gate any time after the fill cycle is complete.

An amber mixer gate interlock light on the face of the control panel is illuminated any time a mixer gate interlock is active.

CAUTION

THERE ARE SITUATIONS WHEN THE MIXER GATE INTERLOCK CAN CAUSE OPERATIONAL PROBLEMS IF NOT CONNECTED CAREFULLY. THIS IS ESPECIALLY IMPORTANT IN VERY FAST SYSTEMS WHERE TIME IS CRITICAL. TO DEACTIVATE THE MIXER GATE INTERLOCK, THE MIXER GATE DELAY MUST BE ALLOWED TO EXPIRE, OR THE SYSTEM MUST BE RESET BY PUSHING THE RESET BUTTON IN THE AUTO MODE SCREEN AND LETTING THE TIMER RUN OUT.

36. The particle collector stops after the user-defined time value in the SETUP screen. The blower coasts to a stop within the MIXER 1 FAN STOP TIME. Then each of the three filters in the collector are cleaned with a pulse of air. The amount of air per pulse, the time between pulses, and number of pulses are set in the HIDDEN SCREENS.

CAUTION

PULSE AIR PRESSURE OF MORE THAN 60 PSI CAN DAMAGE TO THE FILTERS. INSTALLATION OF AN AIR PRESSURE REGULATOR (NOT SUPPLIED) IS REQUIRED.

37. The **AEROGRAN**[™] dispenser has just finished a CHARGE and DISCHARGE cycle for MIXER 1 BLEND 2.
38. The dispenser starts metering the next blend stored in the control – that is, the charge cycle starts over, this time for MIXER 2.

At the same time, MIXER 1 is sending a charge signal for BLEND 1. This signal will be stored until the dispenser has finished creating MIXER 2 BLEND 1.

IMPORTANT

THE DISPENSER WILL ONLY STORE ONE CHARGE SIGNAL FOR EACH MIXER. THE BLENDS WILL BE CREATED IN THE ORDER THE SIGNALS WERE RECEIVED.

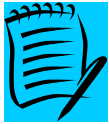
SEQUENCE OF EVENTS

(Continued)

39. As soon as the discharge signal for MIXER 2 BLEND 1 is sent, the control will “rotate” to the next blend for that mixer. At this point the SELECT BLEND screen will have BLEND 2 under MIXER 2 highlighted in red, signifying that the next CHARGE SIGNAL will create BLEND 2. Rotation through the blends will continue as long as blending is turned on in the OPTIONS screen for MIXER 2. The dispenser will continue to CHARGE and DISCHARGE color to the different mixers as long as it keeps receiving signals.



AFTER RECEIVING A DISCHARGE SIGNAL, THE CONTROL WILL “ROTATE” TO THE NEXT BLEND AND, WHEN THE NEXT CHARGE SIGNAL IS RECEIVED, THAT BLEND WILL BE CREATED. ROTATION WILL CONTINUE THROUGH ALL THE BLENDS SELECTED.

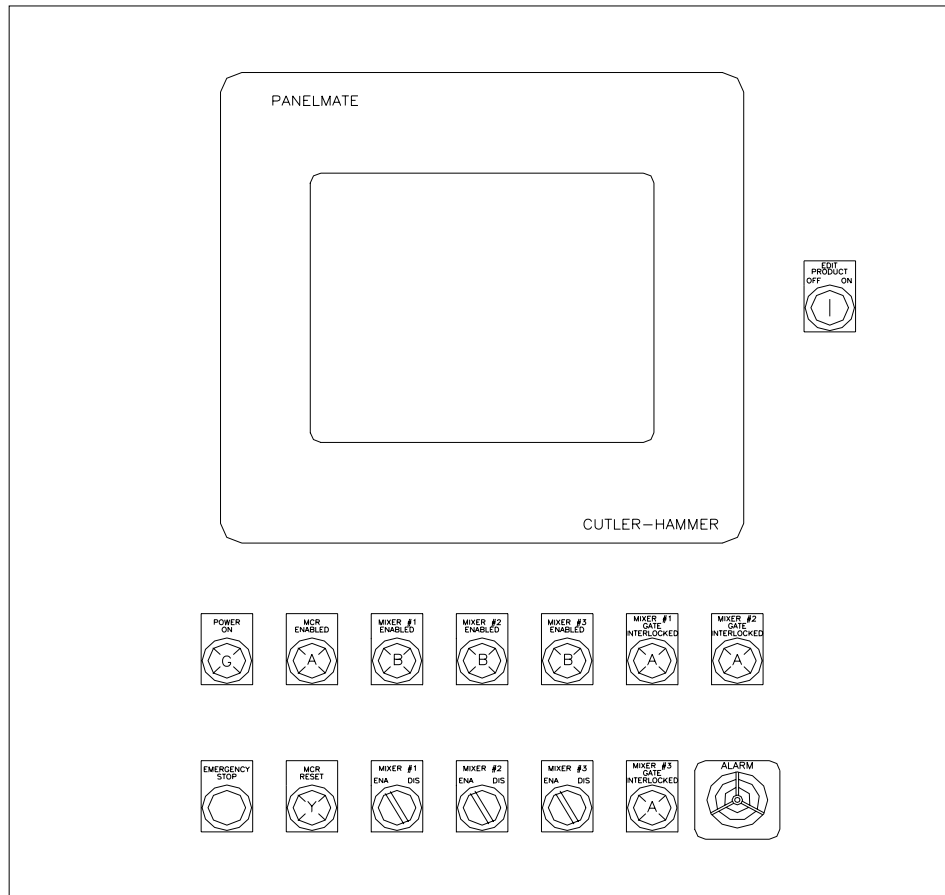


THIS EXAMPLE IS BASED ON A TWO-MIXER APPLICATION. A THREE-MIXER SYSTEM WORKS THE SAME WAY EXCEPT THAT ONE MORE SIGNAL IS STORED.

SINGLE-MIXER SOFTWARE OPERATES THE SAME WAY EXCEPT THAT NO SIGNALS ARE STORED AND A DIVERTER VALVE IS NOT USED.

SECTION VII OPERATING INSTRUCTIONS

CONTROL PANEL DOOR



The touch screen and control buttons for the dispenser are mounted on the control panel door or on a remote mounted interface panel. The drawing above is a representation of the controls. The controls may be laid out in a different manner.

POWER ON

Green light indicates power dispenser is on.

MIXER GATE INTERLOCK

Amber light on indicates the gate for the subject mixer is being held closed by the dispenser.

MCR RESET

A push button that energizes MCR and MCR ENABLED light.

MCR ENABLED

Amber light on indicates MCR reset push button has been pressed and the system is enabled.

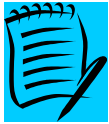
ALARM

A noise-emitting device that indicates a malfunction or out-of-tolerance condition in the dispensing system.

CONTROL PANEL DOOR

(Continued)

- EMERGENCY STOP** Locks in and disables all inputs and outputs on the PLC and drops out MCR relay when depressed.
- AUTO BATCHING** On/Off selector switch to enable inputs from the batching system.
- AUTO BATCHING ON** Amber light indicates AUTO BATCHING is on.



THE LOCATION OF THE CONTROLS FOR THE DISPENSER IS SPECIFICIED BY THE CUSTOMER. THE CONTROLS CAN BE MOUNTED ON THE MAIN PANEL OR IN A SEPARATE REMOTELY MOUNTED PANEL.

INSTRUCTIONS

A programmable logic controller (PLC) controls the **AEROGRAN™** dispenser and the color touch view screen operator interface. The control panel and the interface are NEMA 4 rated devices and thus can be periodically cleaned with water.

All operator controls and functions are accessed from the face of the touch view screen with a touch of a finger. A push-pull button below the touch screen labeled EMERGENCY STOP, when depressed, will halt operation of the dispenser by disabling all outputs. Pulling out the EMERGENCY STOP and pushing the MCR RESET button will restore system operation and allow an interrupted cycle to continue.



IF THE AMBER LIGHT (MCR RESET) IS NOT ON, THE SCREEN AND THE PLC ARE ACTIVATED BUT THE OUTPUTS ARE DISABLED

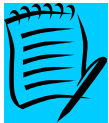
The PLC has an internal battery that allows memory backup in the event of power failure, to ensure retention of operating programs. The battery should be replaced every 24 months.



THE PLC CONTAINS A ROM CHIP THAT BACKS-UP PROGRAM MEMORY. AN EXTERNAL BATTERY BACK-UP DEVICE IS REQUIRED FOR THIS CHIP.

CAUTION

RECORD ALL DATA THAT HAS BEEN ENTERED INTO THE PLC ON EXTERNAL MEDIA AND STORE SECURELY TO ENSURE THAT IT WILL BE AVAILABLE FOR REENTRY IF IT IS LOST FOR ANY REASON.



THE FOLLOWING PAGE CONTAINS A SAMPLE BLANK DATA SHEET.

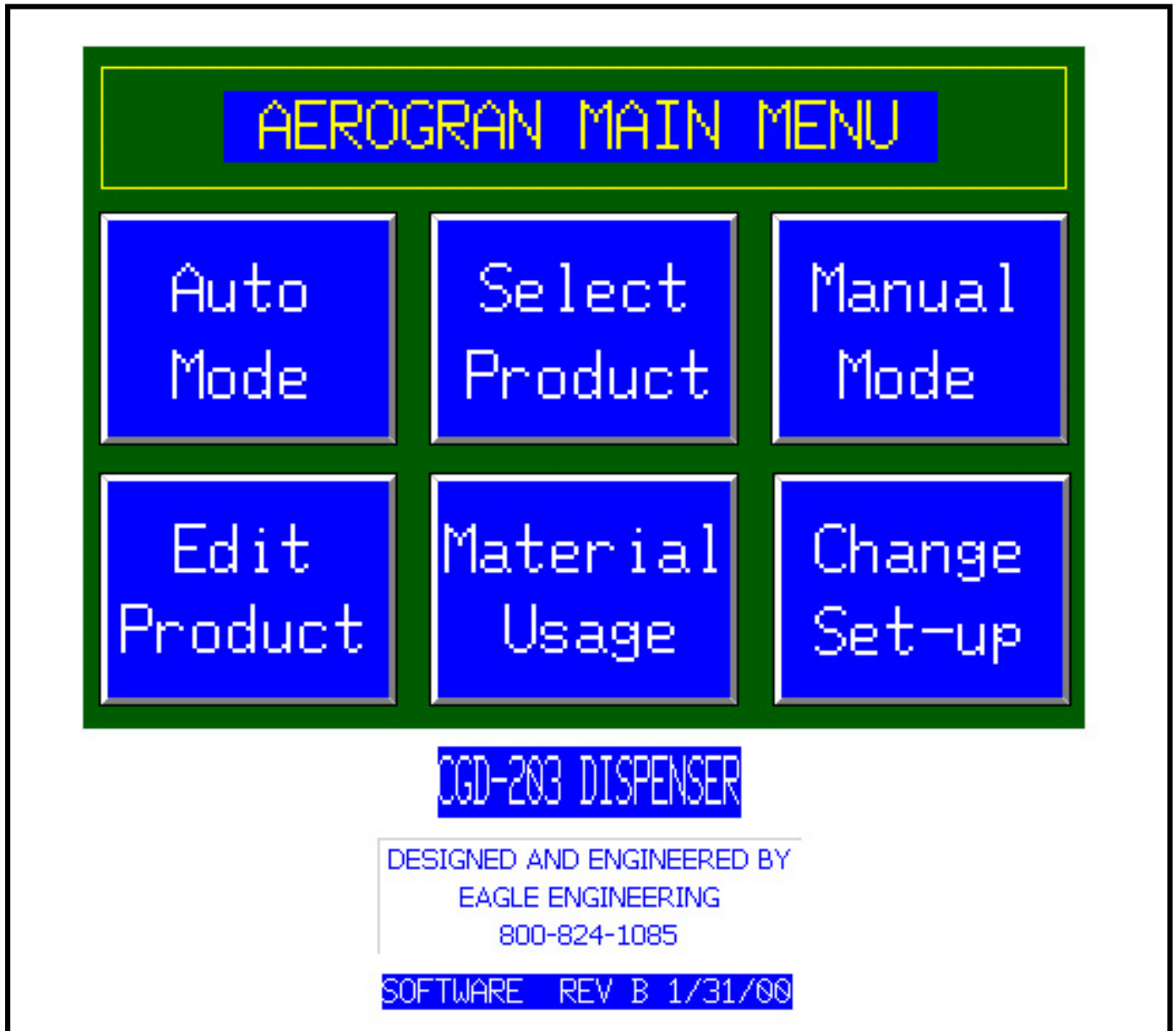
BLANK DATA SHEET

PRODUCT NUMBER _____ -

PRODUCT DESCRIPTION _____

	SILO 1	SILO 2	SILO 3	SILO 4	SILO 5
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
BLEND 1	_____	_____	_____	_____	_____
BLEND 2	_____	_____	_____	_____	_____
BLEND 3	_____	_____	_____	_____	_____
BLEND 4	_____	_____	_____	_____	_____
BLEND 5	_____	_____	_____	_____	_____
SLOW PRACT	_____	_____	_____	_____	_____
ACCURACY	_____	_____	_____	_____	_____
TOLERANCE	_____	_____	_____	_____	_____
SETTLE	_____	_____	_____	_____	_____
OPEN	_____	_____	_____	_____	_____

MAIN MENU



MANUAL MODE

MANUAL MODE allows complete manual control by the operator.

AUTO MODE

AUTO MODE enables the dispenser to charge and discharge a pre-selected product automatically, charge & discharge manually, select blends within a product, and check supply levels.

EDIT PRODUCT

EDIT PRODUCT allows the operator to modify the color quantities in a blend.

MAIN MENU

(Continued)

CHANGE SET-UP

CHANGE SET-UP allows the operator to view and change master values and multicolor options, and to calibrate the scale.

MATERIAL USAGE

MATERIAL USAGE displays quantities of color dispensed in AUTO MODE. The quantities can also be reset and printed from this screen.

SELECT PRODUCT

Allows the operator to select a product to produce in AUTO MODE.

Also on the MAIN MENU is the toll free number to Eagle Engineering for direct support. Touching the area of the phone number will give the operator access to HIDDEN SCREEN PARAMETERS and the PanelMate set-up screens.

CAUTION

WHEN VIEWING THE SET-UP SCREENS, DO NOT CHANGE ANY OF THE INTERNAL OPERATING PARAMETERS OF THE SCREEN FUNCTIONS.

TO EXIT THIS SCREEN, ENTER 01 ON THE KEYPAD THAT HAS APPEARED, THEN TOUCH ENTER AND THE MAIN MENU WILL REAPPEAR.

REFER TO HIDDEN SCREENS FOR MORE INFORMATION ON THIS SUBJECT.

SELECT PRODUCT TO RUN

SELECT PRODUCT TO RUN

MIXER 1 RUNNING PRODUCT: 123 DESCRIPTION: MessageMessageMessageM

MIXER 2 RUNNING PRODUCT: 123 DESCRIPTION: MessageMessageMessageM

MIXER 3 RUNNING PRODUCT: 123 DESCRIPTION: MessageMessageMessageM

Prod #	Description	Prod #	Description
01	MessageMessageMessageM	11	MessageMessageMessageM
02	MessageMessageMessageM	12	MessageMessageMessageM
03	MessageMessageMessageM	13	MessageMessageMessageM
04	MessageMessageMessageM	14	MessageMessageMessageM
05	MessageMessageMessageM	15	MessageMessageMessageM
06	MessageMessageMessageM	16	MessageMessageMessageM
07	MessageMessageMessageM	17	MessageMessageMessageM
08	MessageMessageMessageM	18	MessageMessageMessageM
09	MessageMessageMessageM	19	MessageMessageMessageM
10	MessageMessageMessageM	20	MessageMessageMessageM

MAIN
MENU

PREV
PAGE

NEXT
PAGE

EDIT
PRODUCT

The SELECT PRODUCT screen is accessed in the MAIN MENU. This screen allows the operator to select a PRODUCT to produce. The **AEROGRAN™** dispenser will store 120 - 450 products (formulas). The products can be viewed twenty (20) at a time on a screen. A product's formula may also be edited in this screen.

RUNNING PRODUCT Displays the product number that is currently selected to be produced in AUTO MODE.

DESCRIPTION Displays the current description of the PRODUCT NUMBER selected to be produced in AUTO MODE.

MAIN MENU Returns to MAIN MENU.

PREV PAGE Moves backward through the screens displaying the products.

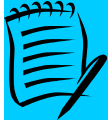
NEXT PAGE Moves forward through the screens displaying the products.

SELECT PRODUCT TO RUN

(Continued)

EDIT PRODUCT

Advances to the EDIT PRODUCT screen allowing editing of the PRODUCT that was selected in the SELECT PRODUCT screen. (See EDIT PRODUCT for more information)



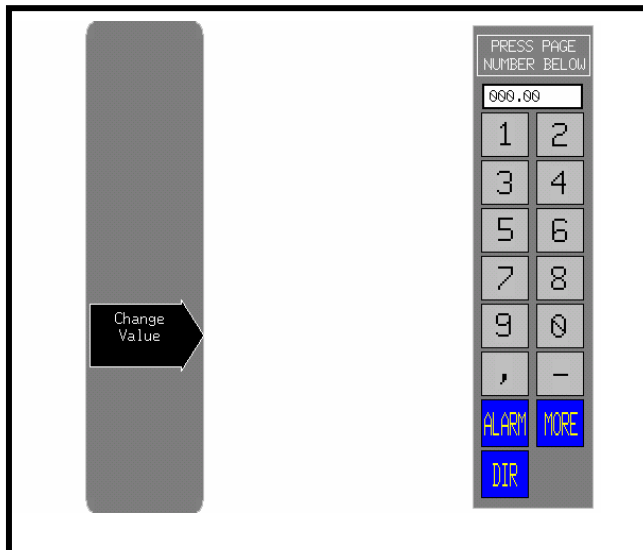
THE SCREEN PICTURED, ON THE PREVIOUS PAGE, IS FOR A THREE-MIXER SOFTWARE PACKAGE. A SINGLE-MIXER SCREEN IS SIMILAR EXCEPT THAT IT HAS ONLY ONE MIXER ON IT.

THE SOFTWARE FOR EACH DISPENSER MODEL HAS DIFFERENT CAPACITIES FOR STORING PRODUCTS.

REFER TO TYPES OF EQUIPMENT IN THIS MANUAL FOR MORE INFORMATION

TO SELECT A PRODUCT:

1. To select a different product number for a mixer, touch the number next to RUNNING PRODUCT with the **blue background**. At this time the operator has the option to change the value. Touch the change value button and a numerical keypad will appear.



SELECT PRODUCT TO RUN

(Continued)



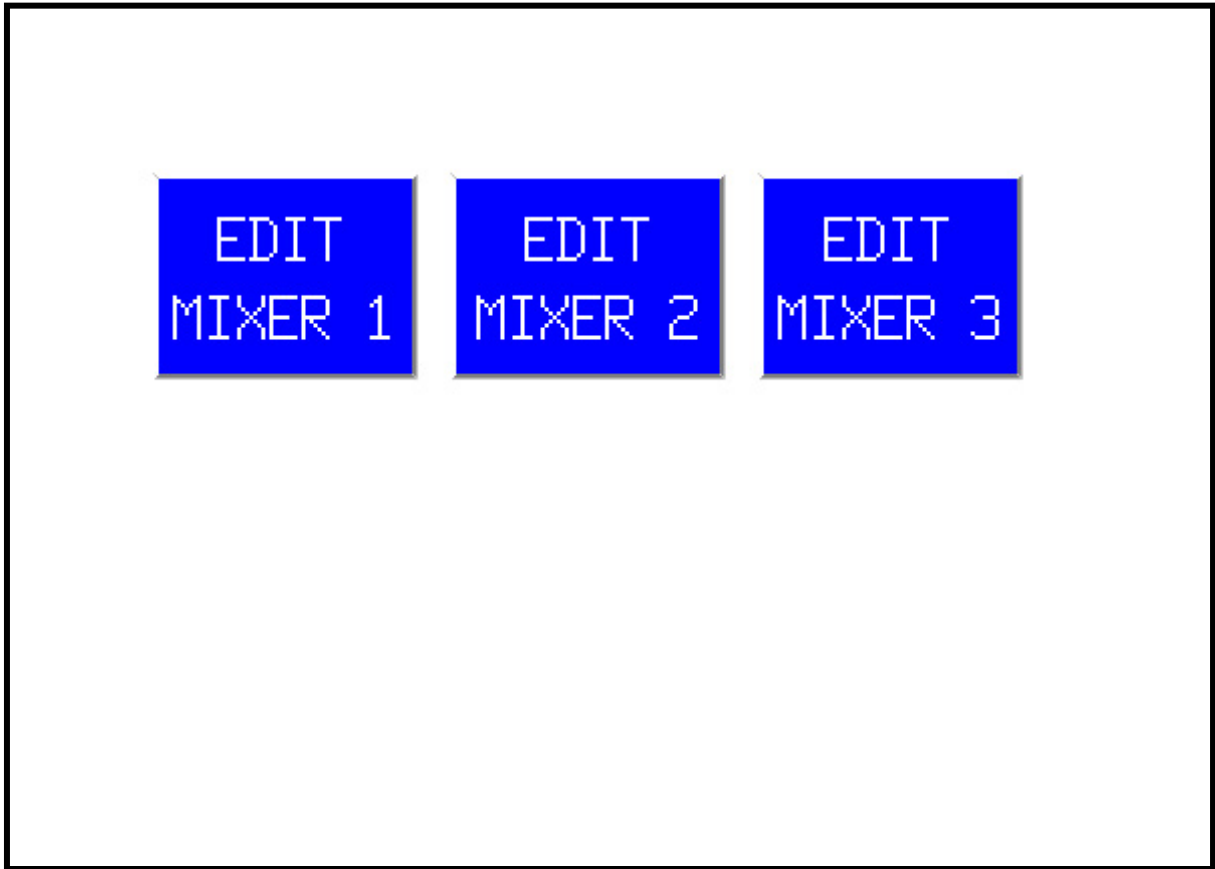
ON MOST DISPENSERS SHIPPED AFTER JANUARY 2000, THE CHANGE VALUE WINDOW IS ELIMINATED FROM THE PROGRAM.

2. Using the keypad, enter the desired PRODUCT NUMBER.
3. Push ENTER on the keypad.
4. The new Product is now selected to be produced in AUTO MODE or may be edited by pressing EDIT PRODUCT. (See EDIT PRODUCT.)
5. Touching the screen any place but on the keypad causes the keypad to disappear.
6. Touch MAIN MENU and the screen returns to the MAIN MENU. The **AEROGRAN™** dispenser will now create the selected product in AUTO MODE.

CAUTION

IF A PRODUCT SELECTED TO RUN HAS NOT BEEN PROGRAMMED, THE OPERATOR MUST ENTER ITS FORMULA. IF A CHARGE SIGNAL IS SENT FROM THE BATCHING SYSTEM AND THE SILO WEIGHTS ARE ALL SET TO ZERO, THE DISPENSER WILL CYCLE THROUGH THE BLEND AND THEN LOCK OUT THE GATE IF CONNECTED. PUSH THE RESET BUTTON IN THE AUTO MODE RUN SCREEN TO CLEAR THIS FAULT.

SELECT MIXER TO EDIT



Touch the button of the mixer that is running the product to edit. If adding a new product, touch any mixer button to get to the EDIT PRODUCT screen.

This screen only appears in software for three-mixer systems. It appears when the EDIT PRODUCT button is touched in the MAIN MENU screen or the EDIT PRODUCT screen.

This screen allows the operator to edit the product that was selected for a given mixer.

CAUTION

ANY CHANGE MADE TO A PRODUCT FOR ONE MIXER WILL CHANGE THE PRODUCT FOR ALL THE MIXERS.

To exit the screen, select one of the mixers and return to the MAIN MENU from that screen.

EDIT PRODUCT

EDIT	EDIT PRODUCT: 123		DESCRIPTION: MessageMessageMessageM		
	SILO 1	SILO 2	SILO 3	SILO 4	SILO 5
[]	MessageMes	MessageMes	MessageMes	MessageMes	MessageMes
[]	MessageMes	MessageMes	MessageMes	MessageMes	MessageMes
Blend 1	123.45	123.45	123.45	123.45	123.45
Blend 2	123.45	123.45	123.45	123.45	123.45
Blend 3	123.45	123.45	123.45	123.45	123.45
Blend 4	123.45	123.45	123.45	123.45	123.45
Slow Preact	123.45	123.45	123.45	123.45	123.45
Accuracy	123.45	123.45	123.45	123.45	123.45
Tolerance	123.45	123.45	123.45	123.45	123.45
MAIN MENU					COPY PRODUCT

The operator can add or modify the selected product's silo name, product description, silo weights, SLOW PRACT weights, accuracy settings, and tolerances for the four blends.

MAIN MENU Returns to MAIN MENU.

COPY PRODUCT Sends user to a new screen that allows the user to completely copy data from one product to another.

PRINT DATA When a serial printer is connected to the PanelMate touch screen, all the values for the product displayed will be printed.



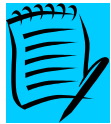
FOR DISPENSERS MANUFACTURED AFTER JUNE 2000, TOUCHING PRINT SCREEN IN THE EDIT PRODUCT SCREEN CAN PRINT THE PRODUCT DATA. SOME VERSIONS OF THREE-MIXER SOFTWARE ALLOWED THE PRINT FUNCTION FROM MIXER-ONE EDIT SCREEN ONLY.

EDIT PRODUCT

(Continued)

USING THE KEY PAD

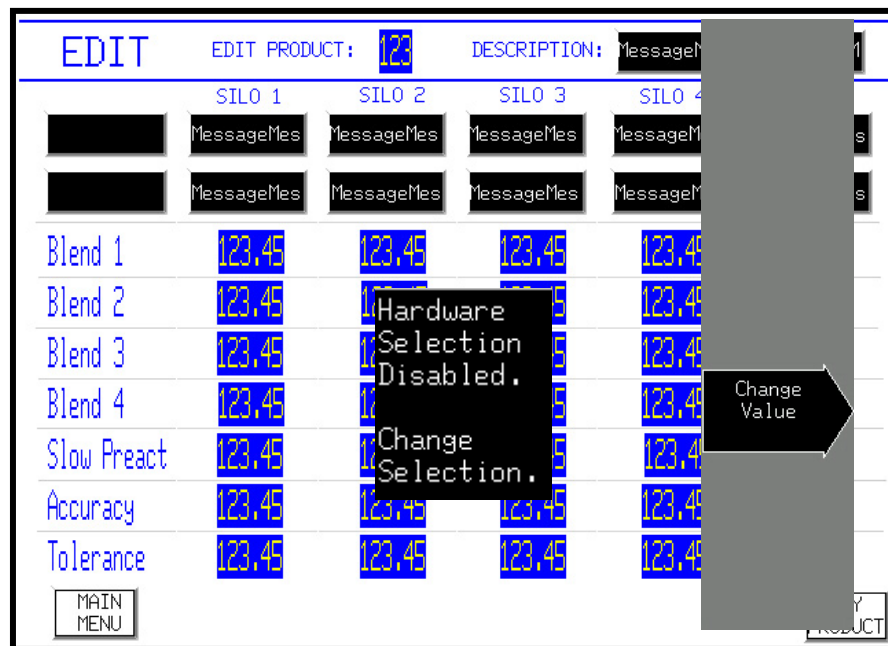
1. Enable the key lock on the control panel. Touch the PRODUCT number and the keypad CHANGE VALUE will appear.



ON MOST DISPENSERS SHIPPED AFTER JANUARY 2000, THE CHANGE VALUE WINDOW WAS ELIMINATED.



ON DISPENSERS SHIPPED AFTER JUNE 2000, A KEY LOCK WAS ADDED TO THE CONTROL PANEL TO LOCK OUT SELECTED VARIABLES IN CERTAIN SCREENS. THE KEY MUST BE IN THE ENABLE POSITION TO EDIT PRODUCT VARIABLES. IF THE KEY SWITCH IS DISABLED THE OPERATOR WILL SEE A MESSAGE ON THE SCREEN AS IN THE DRAWING BELOW.

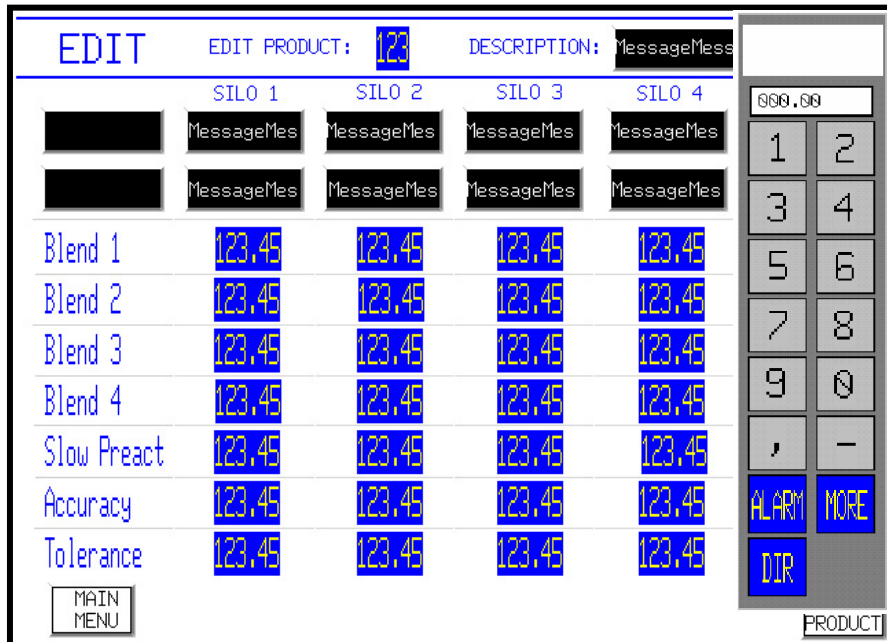


AT TIMES ONLY THE BLACK BOX WITHOUT THE TEXT WILL APPEAR DUE TO THE FIRMWARE THAT OPERATES THE TOUCH SCREEN.

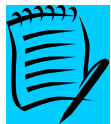
EDIT PRODUCT

(Continued)

2. Touch the CHANGE VALUE button and the keypad appears.



3. The screen now displays the keypad with the PRODUCT NUMBER in the window. Enter the number of the PRODUCT to edit or create using the keypad and touch ENTER when complete.
4. Touching the screen any place but on the keypad causes the keypad to disappear.
5. Follow the same procedure for changing all the values on the screen.



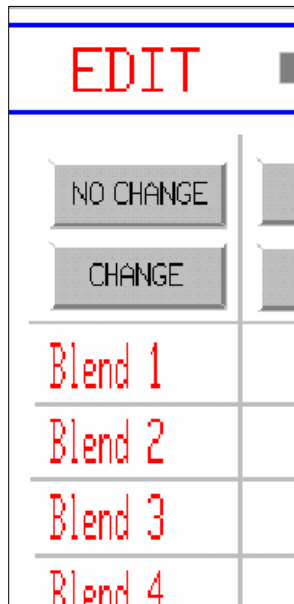
MOVE THE KEYPAD BY PLACING A FINGER AT THE TOP AND SLIDING TO THE DESIRED LOCATION.

CAUTION

ANY CHANGE MADE TO A PRODUCT FOR ONE MIXER WILL CHANGE THE PRODUCT FOR ALL THE MIXERS.

ADDING A NEW PRODUCT

1. From the MAIN MENU touch the SELECT PRODUCT button. The SELECT PRODUCT TO RUN screen appears.
2. Find a PRODUCT NUMBER that does not have a description next to it.
3. Touch product number after RUNNING PRODUCT.
4. The window CHANGE VALUE appears. Touch the CHANGE VALUE button and the keypad appears.
5. Enter the PRODUCT NUMBER that has been chosen from the list. For example, use the number 50.
6. On the keypad touch five, touch zero, and then press ENTER. Finally touch the screen off the keypad and the keypad disappears.
7. The screen changes to RUNNING PRODUCT 50.
8. Touch the EDIT PRODUCT button.
9. Touch the button to the right of DESCRIPTION. CHANGE and NO CHANGE appear in the upper left hand corner of the screen. NO CHANGE is flashing.



10. Touch CHANGE and the alphanumeric keyboard appears.

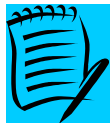
ADDING A NEW PRODUCT

(Continued)

TEXT KEYBOARD



11. Touch NO CHANGE and the display reverts back to the previous screen.
12. Enter the description using the keyboard.



PRODUCT DESCRIPTION IS LIMITED TO 22 CHARACTERS AND IS NOT REQUIRED FOR OPERATION OF THE DISPENSER.

13. Touch ENTER on the screen keyboard. The screen returns to the EDIT PRODUCT screen for PRODUCT NUMBER 50 and displays the new PRODUCT DESCRIPTION.
14. Touch the blank button under SILO 1 and CHANGE and NO CHANGE appear in the upper left hand corner of the screen.
15. Touch CHANGE and follow the same procedure as above. The operator can enter two lines of text for each SILO. Repeat this procedure for each SILO.

ADDING A NEW PRODUCT

(Continued)



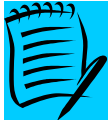
SILO DESCRIPTION IS LIMITED TO 10 CHARACTERS AND IS NOT REQUIRED FOR OPERATION OF THE DISPENSER.

16. Touch any of the numerical value buttons under the SILO names and the CHANGE VALUE window appears.
17. Touch CHANGE VALUE and the keypad appears.
18. Enter the weight for each SILO using the keypad. Be sure to enter the decimal point.

EXAMPLE:

TO ENTER 2.10 POUNDS:

TOUCH 2.10
TOUCH ENTER



THE PLC WILL SKIP ANY SILO AMOUNTS OF 000.00 AND CONTINUE WITH THE CHARGE CYCLE.



IF VALUES FOR ALL FIVE SILOS ARE 000.00 IN A BLEND SELECTED IN AUTO MODE OR BY THE BATCHING SYSTEM, THE PLC WILL CYCLE THROUGH THE BLEND, LOCK OUT THE MIXER GATE, AND WAIT FOR A DISCHARGE SIGNAL EVEN THOUGH THERE IS NOTHING IN THE TRANSFER VESSEL. TO CLEAR THIS FAULT, ENTER THE AUTO MODE SCREEN, TOUCH RESET, AND WAIT FOR THE MIXER GATE INTERLOCK TIMER TO EXPIRE.

ADDING A NEW PRODUCT

(Continued)



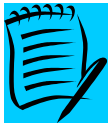
SLOW PRACT MUST BE SET TO A VALUE LESS THAN THE DESIRED WEIGHT FOR THE SILO. THE PLC WILL NOT ALLOW THE OPERATOR TO ENTER A VALUE GREATER THAN THE SILO WEIGHT.

19. Product 50 is now stored in the memory and can be selected to run in AUTO MODE. This product may be produced at any time by selecting PRODUCT NUMBER 50, or may be modified by repeating the previous steps.



RECORD ALL DATA THAT HAS BEEN ENTERED INTO THE PLC ON EXTERNAL MEDIA AND STORE SECURELY TO ENSURE THAT IT WILL BE AVAILABLE FOR REENTRY IF IT IS LOST FOR ANY REASON.

20. Touch MAIN MENU to return to the MAIN MENU screen.
21. Touch SELECT PRODUCT and NEXT PAGE twice to see that PRODUCT NUMBER 50 now has a description next to it.
22. Touch MAIN MENU to return to the MAIN MENU screen.
23. Touch AUTO MODE and notice that PRODUCT NUMBER 50 now has a description. SILO names and weights are also displayed.



THE WEIGHTS DISPLAYED ARE FROM THE PREVIOUS PRODUCT DISPENSED IN AUTO MODE. THE VALUES WILL BE UPDATED WHEN THE NEXT CHARGE CYCLE IS STARTED.

24. Touch MAIN MENU to return to the MAIN MENU.
25. Touch MANUAL MODE and notice that the SILO names are displayed above each silo.

ADDING A NEW PRODUCT

(Continued)

26. Touch MAIN MENU to return to the MAIN MENU.



THE OPERATOR CAN PROGRAM A DIFFERENT NAME FOR EACH SILO IN EACH PRODUCT NUMBER.

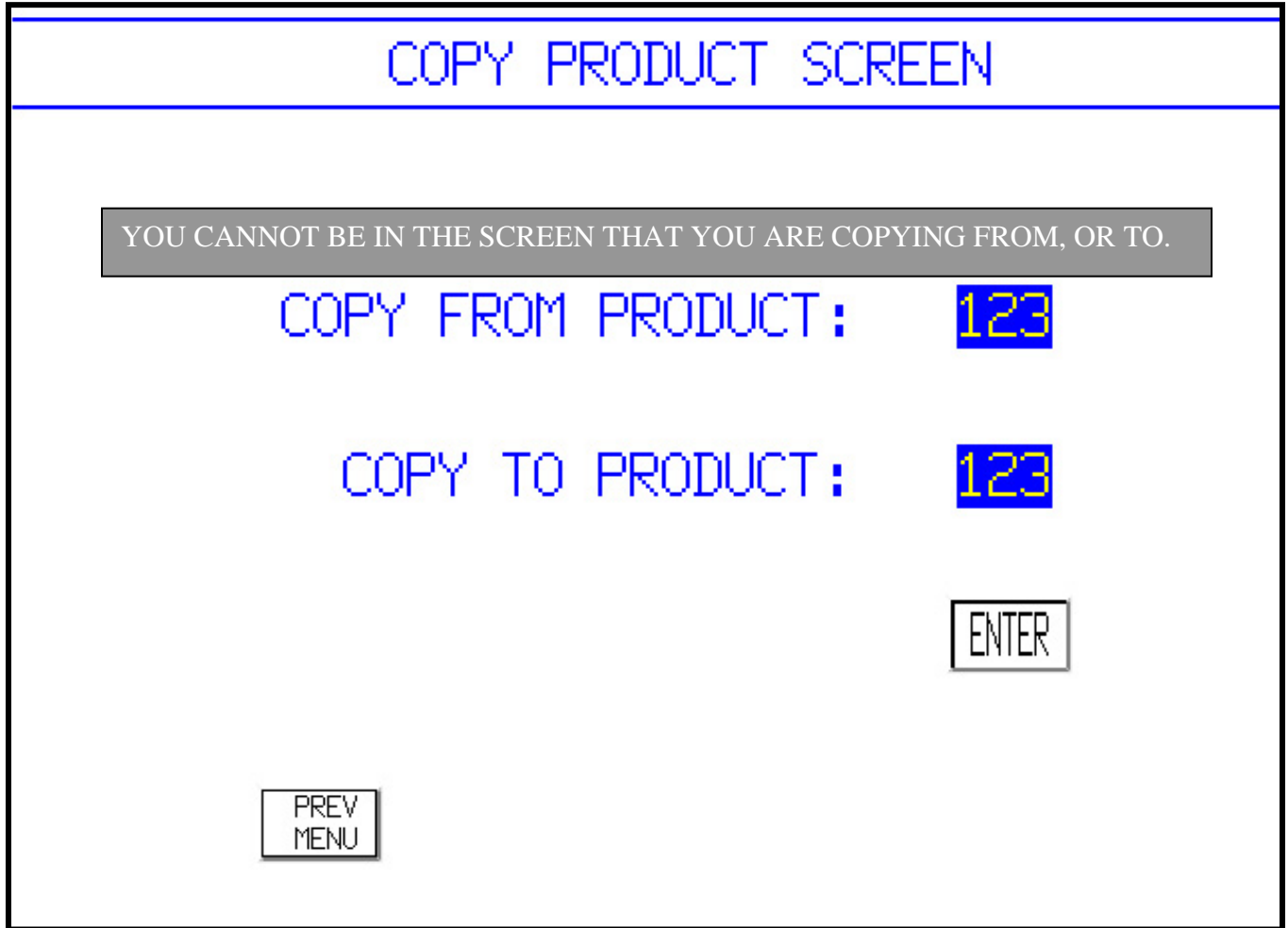
FOR EXAMPLE, WHEN REMOVABLE HOPPERS ARE USED, THE SILO NAME CAN BE CHANGED JUST FOR THE PRODUCT USING THE REMOVABLE HOPPER.

27. Deleting a product, or a blend within a product, is done in the same manner as adding a new product or blend. Simply enter all zeros and remove the descriptions one by one.



WHEN USING THE MULTIBLEND FEATURE OF THE **AEROGRAN™**, ENTER VALUES FOR BLENDS TWO, THREE, AND FOUR AS DESCRIBED ABOVE.

COPY PRODUCT



The COPY PRODUCT screen is accessed only from the EDIT PRODUCT screen. It will copy all the values from one product to another. It is very useful when adding new products, because it is quicker to edit weight values than to enter all the text for the SILO descriptions.

ENTER Touching ENTER copies the values from the PRODUCT numbers that are currently on the screen.

PREV MENU Returns to the previous screen.

TO COPY A PRODUCT

1. First determine which PRODUCT to copy and what number to store it under. Use the SELECT PRODUCT screen to find the products.

COPY PRODUCT

(Continued)



TO SAVE TIME, PICK A PRODUCT NUMBER (FOR EXAMPLE 100) AND FILL IN ALL THE SILO NAMES. USE THE SLOW PREACT, ACCURACY, AND TOLERANCE SETTINGS THAT WORK FOR THE OTHER PRODUCTS. THUS, ONLY DESCRIPTION AND SILO WEIGHTS NEED TO BE CHANGED.

2. Once the product numbers are known, change the PRODUCT number to a previously unused number. For example, to copy PRODUCT 12 to PRODUCT 114, touch COPY PRODUCT on the EDIT PRODUCT screen. PRODUCT 12 or 114 cannot be displayed.



THE PRODUCT BEING COPIED FROM OR COPIED TO CANNOT BE DISPLAYED ON THE SCREEN.

3. Touch COPY PRODUCT.
4. Touch the number next to COPY FROM PRODUCT and the KEYPAD appears on the screen. Enter the number twelve and touch ENTER on the keypad.
5. Touch the number next to COPY TO PRODUCT. Enter the number 114 and touch ENTER on the keypad.
6. Touch the screen anywhere except on the keypad and the keypad will disappear.
7. Now PRODUCT 12 and 114 are entered in the COPY PRODUCT screen.
8. Touch ENTER on the screen. Make sure that the button becomes highlighted when touched. Touching ENTER copies all the values in PRODUCT 12 to 114.
9. Touch PREV MENU to return to the EDIT PRODUCT screen. Go to PRODUCT 114 to edit the weight values and give it a description.

CHANGE SET-UP TABLE PAGE 1

CHANGE SET-UP TABLE

PAGE 1

12.34	VESSEL EMPTY TOLERANCE	12.34	HOPPER VIBRATION DELAY TIME
123.4	MAXIMUM VESSEL WEIGHT	12.34	VESSEL PRESSURE BUILD TIME
12.34	SILO 1 SETTLE TIME	12.34	VESSEL PRESSURE RELEASE TIME
12.34	SILO 2 SETTLE TIME	12.34	DISCHARGE START TIME DELAY
12.34	SILO 3 SETTLE TIME	12.34	DISCHARGE VALVE CLOSE DELAY
12.34	SILO 4 SETTLE TIME	12.34	SPARE
12.34	SILO 5 SETTLE TIME	12.34	SPARE
12.34	SILO 1 SLOW FILL OPEN TIME	12345	SPARE
12.34	SILO 2 SLOW FILL OPEN TIME	12345	SPARE
12.34	SILO 3 SLOW FILL OPEN TIME		
12.34	SILO 4 SLOW FILL OPEN TIME		
12.34	SILO 5 SLOW FILL OPEN TIME		

Silo 1	MessageMes	MessageMes		
Silo 2	MessageMes	MessageMes		
Silo 3	MessageMes	MessageMes		
Silo 4	MessageMes	MessageMes		
Silo 5	MessageMes	MessageMes		

MAIN MENU

NEXT PAGE

OPTION SELECT

MULTI-BLEND

SCALE CALIB.

The CHANGE SETUP TABLES are accessed from the MAIN MENU by touching CHANGE SET-UP.

The CHANGE SET-UP TABLE PAGE 1 & CHANGE SET-UP TABLE PAGE 2 contain system-wide operating parameters that function in all products and mixers.

IN SINGLE-MIXER SOFTWARE PACKAGES THERE IS ONLY ONE CHANGE SET-UP PAGE. ALL OF THE INFORMATION IS THE SAME EXCEPT THAT EACH MIXER HAS ITS OWN VALUES WHERE REQUIRED.

There are five touch screen buttons on this page that lead to different screens, along with 17 different weight or time values that are user-defined.

VII - 22

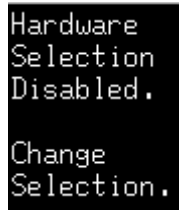
CHANGE SET-UP TABLE PAGE 1

(Continued)

<u>MAIN MENU</u>	Returns to the MAIN MENU.
<u>NEXT PAGE</u>	Displays CHANGE SET-UP TABLE PAGE 2.
<u>OPTION SELECT</u>	Displays a screen that allows the operator to turn options on or off.
<u>MULTI-BLEND</u>	Displays a screen that allows the operator to turn on or off the option to rotate through user-defined blends within a PRODUCT.



ON DISPENSERS SHIPPED AFTER JUNE 2000, A KEY LOCK WAS ADDED TO THE CONTROL PANEL TO LOCK OUT SELECTED VARIABLES IN CERTAIN SCREENS. THE KEY MUST BE IN THE ENABLE POSITION TO EDIT CERTAIN VARIABLES. IF THE KEY IS DISABLED THE OPERATOR WILL SEE A MESSAGE ON THE SCREEN AS SHOWN BELOW.



AT TIMES, ONLY THE BLACK BOX WITHOUT THE TEXT WILL APPEAR DUE TO THE FIRMWARE THAT OPERATES THE TOUCH SCREEN.

VESSEL EMPTY TOLERANCE

Weights limits, in hundredths of a pound, that define the maximum allowable deviation from zero read by the scale before filling begins.

MAXIMUM CHAMBER WEIGHT

The weight, in tenths of a pound, at which the dispenser will automatically stop filling the weigh chamber. This weight is based on the volume capacity of the WEIGH CHAMBER and TRANSFER VESSEL.

SILO SETTLE TIME

Time, in hundredths of a second, after the TUBE END GATE closes, that allows the color to finish falling onto the scale, and the scale to stabilize. Each silo has its own SILO SETTLE TIME.

CHANGE SET-UP TABLE PAGE 1

(Continued)

SILO SLOW FILL OPEN TIME

Time, in hundredths of a second, that the TUBE END GATE is open and the linear vibrator is on during the SLOW FILL stage of the CHARGE CYCLE. Each silo has its own SILO SLOW FILL OPEN TIME.

HOPPER VIBRATION DELAY TIME

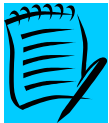
Time, in hundredths of a second, after the CONE VALVE opens, to drop color from the WEIGH HOPPER into the TRANSFER VESSEL, before the WEIGH HOPPER VIBRATOR turns on.

VESSEL PRESSURE BUILD TIME

Time, in hundredths of a second, that the DISCHARGE VALVE on the TRANSFER VESSEL is closed and the air solenoid is open to allow pressure buildup in the TRANSFER VESSEL during the cleaning cycle.

VESSEL PRESSURE RELEASE TIME

Time, in hundredths of a second, that the DISCHARGE VALVE on the TRANSFER VESSEL is open, allowing the built up pressure to pulse through the discharge hose during the cleaning cycle.



VESSEL PRESSURE BUILD TIME AND VESSEL PRESSURE RELEASE TIME CAN ALSO BE ADJUSTED FROM THE [HIDDEN SCREEN PAGE 1](#).

DISCHARGE START TIME DELAY

Time, in hundredths of a second, allowed to establish the stable flow of CONVEYING AIR through the discharge hose before injecting the color into the air stream.

DISCHARGE VALVE CLOSE DELAY

Time, in hundredths of a second, allowed for the color to vacate the TRANSFER VESSEL after it reaches the setting in the HIDDEN SCREEN for EMPTY WEIGHT BEFORE CLEAN TIME.



DISPENSERS SHIPPED BEFORE JUNE 2000 USED A LOW LEVEL CAPACITIVE PROBE IN THE TRANSFER VESSEL INSTEAD OF THE EMPTY WEIGHT BEFORE CLEAN TIME SETTING TO START THE DISCHARGE VALVE CLOSE DELAY TIMER.

CHANGE SET-UP TABLE PAGE 2

CHANGE SET-UP TABLE				PAGE 2
12.34	MIXER 1 CONE VALVE OPEN TIME	12345	MIXER 1 COLLECTOR RUN TIME	
12.34	MIXER 2 CONE VALVE OPEN TIME	12345	MIXER 2 COLLECTOR RUN TIME	
12.34	MIXER 3 CONE VALVE OPEN TIME	12345	MIXER 3 COLLECTOR RUN TIME	
12.34	MIXER 1 DISCHARGE LINE CLEAR	12.34	SPARE	
12.34	MIXER 2 DISCHARGE LINE CLEAR	12	SPARE	
12.34	MIXER 3 DISCHARGE LINE CLEAR	12.34	SPARE	
12	MIXER 1 CLEANING CYCLES	12.34	SPARE	
12	MIXER 2 CLEANING CYCLES	12345	SPARE	
12	MIXER 3 CLEANING CYCLES	12.34	SPARE	
12.34	MIXER 1 GATE HOLD TIME			
12.34	MIXER 2 GATE HOLD TIME			
12.34	MIXER 3 GATE HOLD TIME			

Silo 1	MessageMes	MessageMes	
Silo 2	MessageMes	MessageMes	
Silo 3	MessageMes	MessageMes	
Silo 4	MessageMes	MessageMes	
Silo 5	MessageMes	MessageMes	

MAIN
MENU

NEXT
PAGE

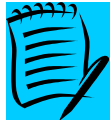
OPTION
SELECT

MULTI-
BLEND

SCALE
CALIB.

The CHANGE SET-UP TABLES are accessed from the MAIN MENU by touching CHANGE SET-UP.

CHANGE SET-UP TABLE PAGE 1 & CHANGE SET-UP TABLE PAGE 2 contain system-wide operating parameters that function in all products and mixers.



IN SINGLE-MIXER SOFTWARE PACKAGES THERE IS ONLY ONE CHANGE SET-UP PAGE. ALL OF THE INFORMATION IS THE SAME EXCEPT THAT EACH MIXER HAS ITS OWN VALUES WHERE REQUIRED.

There are five touch screen buttons on this page that will lead to different screens, along with 15 different time values that are user-defined.

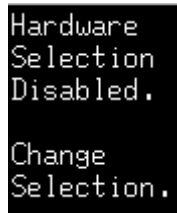
CHANGE SET-UP TABLE PAGE 2

(Continued)

<u>MAIN MENU</u>	Returns to the MAIN MENU.
<u>NEXT PAGE</u>	Displays CHANGE SET-UP TABLE PAGE 1.
<u>OPTION SELECT</u>	Displays a screen that allows the operator to turn options on or off.
<u>MULTI-BLEND</u>	Displays a screen enabling the operator to turn on or off the option to rotate through user-defined blends within a PRODUCT.



ON DISPENSERS SHIPPED AFTER JUNE 2000, A KEY LOCK WAS ADDED TO THE CONTROL PANEL TO LOCK OUT SELECTED VARIABLES IN CERTAIN SCREENS. THE KEY MUST BE IN THE ENABLE POSITION TO EDIT CERTAIN VARIABLES. IF THE KEY IS DISABLED THE OPERATOR WILL SEE A MESSAGE ON THE SCREEN AS SHOWN BELOW.



AT TIMES, ONLY THE BLACK BOX WITHOUT THE TEXT WILL APPEAR DUE TO THE FIRMWARE THAT OPERATES THE TOUCH SCREEN.

MIXER X CONE VALVE OPEN TIME

Time, in hundredths of a second, that allows color to fall from the WEIGH HOPPER into the TRANSFER VESSEL. Each MIXER has its own time value.

MIXER X DISCHARGE LINE CLEAR

Time, in hundredths of a second, that air is blowing through the discharge hose to clear color from the line. Each MIXER has its own time value.

MIXER X CLEANING CYCLES

The number of times, in whole numbers, that the TRANSFER VESSEL is allowed to build and release pressure. Each MIXER has its own value.

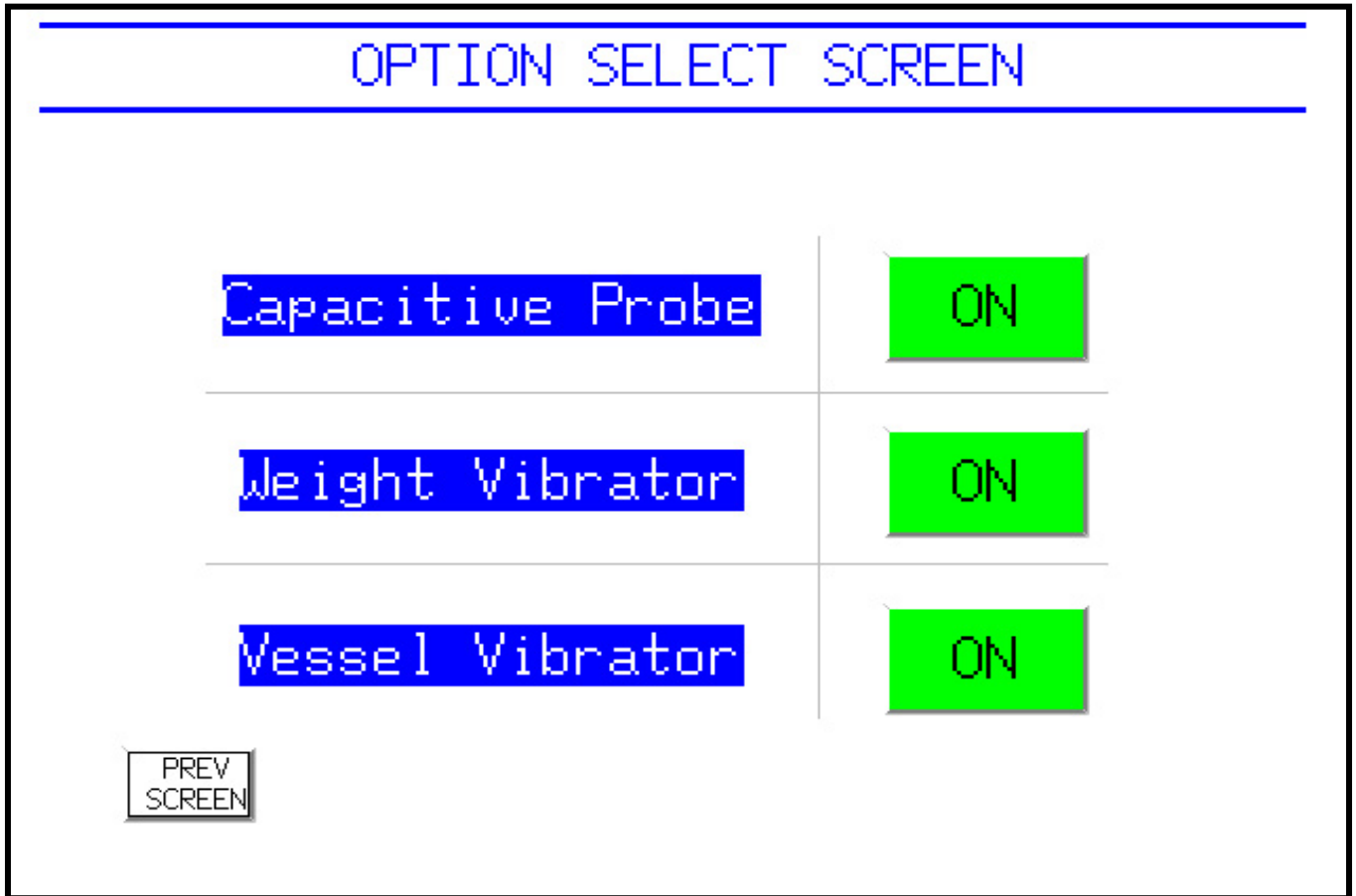
MIXER X GATE HOLD TIME

Time, in hundredths of a second, to hold either the cement gate or the mixer dump gate closed. It can also be used to add mixing time. Each MIXER has its own time value.

MIXER X COLLECTOR RUN TIME

Time, in hundredths of a second, for the PARTICLE COLLECTOR to run during the discharge cycle. Each MIXER has its own time value.

OPTION SELECT



The OPTION SELECT screen is accessed from the CHANGE SET-UP TABLE screen. A touch of the screen toggles each option between ON and OFF.



DISPENSERS SHIPPED AFTER OCTOBER 2000 DO NOT HAVE THE CAPACITIVE PROBE AND THE VESSEL VIBRATOR ON/OFF OPTIONS. THE EMPTY WEIGHT BEFORE CLEAN TIME SETTING REPLACES THE PROBE, AND THE VESSEL VIBRATOR PROVED UNNECESSARY.

CAPACITIVE PROBE

The capacitive probe senses for the absence of material at the bottom of the TRANSFER VESSEL. On early models of the **AEROGRAN™**, the probe is mounted on a pipe extending into the vessel from the top. On later models it is mounted in a cord grip at the base of the TRANSFER VESSEL. When the probe is **ON** it checks to see if the color has fallen into the TRANSFER VESSEL during the charge cycle. It also starts the cleaning cycle at the end of the discharge cycle if used.

OPTION SELECT

(Continued)

IMPORTANT

WHEN PRODUCING SMALL BATCHES OF COLOR (LESS THAN 1 POUND), TURN OFF THE PROBE. THE PROBE CANNOT READ SMALL AMOUNTS OF COLOR AND WILL SHOW A FAULT WHEN THE CONE VALVE OPENS. IT WILL INDICATE THAT COLOR IS STILL IN THE WEIGH HOPPER, AND PAUSE THE CYCLE.

IF THE PROBE WILL ALSO INDICATE ERRONEOUSLY AND CAUSE A FAULT IF IT IS MISADJUSTED.

THE PROBE IS NOT ADJUSTABLE ON EARLY MODELS.

WEIGH VIBRATOR

The WEIGH VIBRATOR is mounted on the WEIGH HOPPER to ensure complete transfer of color from the WEIGH HOPPER into the TRANSFER VESSEL. It is normally turned on and left on. The WEIGH VIBRATOR runs whenever the CONE VALVE is open in AUTO MODE.



THE SETTINGS THAT CONTROL THE WEIGH VIBRATOR ARE IN THE HIDDEN SCREENS. TESTS HAVE SHOWN THAT CHANGES TO THESE SETTINGS DO NOT MAKE A SIGNIFICANT DIFFERENCE IN THE SPEED AT WHICH COLOR FALLS FROM THE WEIGH HOPPER INTO THE TRANSFER VESSEL.

VESSEL VIBRATOR

Control of the VESSEL VIBRATOR was designed into the software, but was never required. The OPTION SELECT screen shows that the output is available, but it is not wired. There is not currently means to mount a vibrator on the TRANSFER VESSEL. It can be in the ON or OFF position.

CAUTION

DO NOT WELD ANYTHING TO THE WEIGH HOPPER OR CONVEYING VESSEL. WELDING WILL DAMAGE THE TEFLON COATING INSIDE, CAUSING COLOR TO STICK TO THE SURFACE.

SCALE CALIBRATE

SCALE CALIBRATION SCREEN	
Calibration Weight	123
Scale Weight	123.45
PREV SCREEN	ZERO SCALE

The SCALE CALIBRATION screen is accessed in the CHANGE SET-UP screen. This screen is used to tell the PLC the scale calibration weight, and to tare the scale base.

CALIBRATION WEIGHT

Calibration weight is the weight placed on the scale when it was calibrated. **This parameter cannot be changed unless the scale is calibrated to a new weight.** To change the CALIBRATION WEIGHT touch CALIBRATION WEIGHT on the screen and the keypad will appear. Enter the new weight and press ENTER on the keypad.

CAUTION

THE CALIBRATION WEIGHT VALUE CANNOT BE CHANGED UNLESS THE SP-100 A TO D INTERFACE CARD IS RECALIBRATED TO THE NEW SCALE WEIGHT. CHANGING THIS VALUE WITHOUT RECALIBRATING WILL CAUSE FALSE READINGS AND COULD CAUSE DAMAGE TO THE DISPENSER.

SCALE CALIBRATE

(Continued)

SCALE WEIGHT

SCALE WEIGHT is the actual weight on the scale after the scale is tared.

ZERO SCALE

Touching ZERO SCALE returns the scale to a zero pound reading, removing the weight of the weigh and transfer assembly from all PLC readings and calculations.

This button will be used by the operator as necessary to tare residual weight on the scale due to build up in the hoses, dirt on the chamber assembly, etc.



THE DISPENSER WAS CALIBRATED IN POUNDS. IT CAN BE CHANGED TO DISPLAY KILOGRAMS BY MULTIPLYING THE CURRENT SCALE CALIBRATION VALUE BY 2.2046. 100 POUNDS = 45.36 KG'S

SCALE CALIBRATION SP-100 A TO D CARD

1. Energize the dispenser for 45 minutes or more to allow the electronic circuits to stabilize.



MORE INFORMATION ABOUT SCALE CALIBRATION IS AVAILABLE IN THE YELLOW PACKET OF MANUFACTURERS' INFORMATION INSIDE THE ELECTRICAL ENCLOSURE.

ALL DISPENSERS ARE CALIBRATED BEFORE SHIPMENT. IF RECALIBRATION IS REQUIRED, PERFORM THE FOLLOWING PROCEDURE:

CAUTION

THIS CALIBRATION MUST BE PERFORMED USING OBJECTS WITH ACCURATELY KNOWN WEIGHTS.

SEVERAL SMALL WEIGHTS DISTRIBUTED AROUND THE TOP OF THE CONVEYING VESSEL SHOULD BE USED.

2. Remove all dust and dirt from the weigh and transfer assembly using clean dry air.



BE SURE THAT COLOR IS NOT BUILT UP INSIDE THE WEIGH HOPPER. CHECK THAT AIR LINES, HOSES, AND ELECTRICAL CONNECTIONS ARE NOT BINDING.

3. Connect a DC Volt Meter to the SP 100 board. Terminal 9 is equal to the DC +, terminal 10 is equal to the DC -.
4. Set the switch S3-1, -2, -3, and -4 to ON. This sets the dead load compensation.
5. Set the switch S1-1 and -6 to ON, and S1-2, -3, -4, -5, -7, and -8 to OFF. This sets the board to operate in a 0-10 volt DC span.

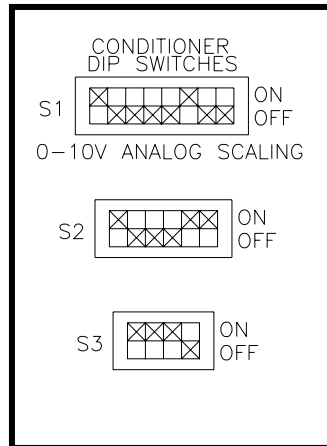
SCALE CALIBRATION SP-100 A to D CARD

(Continued)

- Set switch S2-1, -2, -3, -4, and -6 to ON, and S2-5 to OFF. This sets the coarse span. Adjust the R50 (coarse zero) and R24 (fine 0) pots just above the S3 switch so that the meter reads 0 volts. It may be necessary to change this switch to a different setting. Refer to the SP-100 manual.



THE SETTINGS FOR DIP SWITCH 2 AND 3 ARE TYPICAL. IT MAY BE NECESSARY TO CHANGE THESE SETTINGS TO COMPENSATE FOR OTHER FACTORS. REFER TO THE SP-100 INFORMATION SUPPLIED BY THE MANUFACTURER. LOOK ON THE FIRST PAGE OF THE ELECTRICAL ELEMENTARY FOR A REPRESENTATION OF THE 3 DIP SWITCH SETTINGS FOR THE DISPENSER.



- Apply a known weight to the scale - for example, five 10 lb. weights = 50 lb. - and adjust R17 (coarse span) and R18 (fine span) so that the meter reads 5 volts DC. Thus, voltage would be equal to the weight divided by 10.
- Remove weight and verify that the meter reads 0.000. If not, repeat previous steps.



THE LOAD CELL IS RATED TO ACCURATELY WEIGH 300 POUNDS. THE WEIGH HOPPER IS CAPABLE OF HOLDING ABOUT 65 POUNDS OF COLOR AND THE WEIGH AND TRANSFER ASSEMBLY AND LINES WEIGH ABOUT 150 POUNDS, FOR A TOTAL OF ABOUT 216 POUNDS.

SCALE CALIBRATION SP-100 A to D CARD

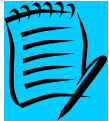
(Continued)

9. Touch CHANGE SET-UP on the MAIN MENU screen.
10. Touch SCALE CALIB.
11. Touch CALIBRATION WEIGHT. Enter 100 pounds. This sets up the analog card on the SLC 500 PLC. The screen the screen should now read 00.00 pounds.
12. Touch ZERO SCALE. This removes the weight of the discharge hose assembly and sets the display to read zero pounds (also known as tare weight).



**ONCE THE SCALE HAS BEEN CALIBRATED WITH A METER,
ZERO SCALE MAY BE PRESSED AT ANY TIME TO ZERO OUT THE
SCALE IF IT BECOMES NECESSARY.**

13. Touch PREV SCREEN to return to the CHANGE SET-UP SCREEN.
14. Touch MAXIMUM CHAMBER WEIGHT value and change it to 66 pounds, or the largest total weight of the blends.



**ALTHOUGH CALIBRATED FOR 100 POUNDS, THE ADDITIONAL 200 POUND
CAPACITY ALLOWS COMPENSATION FOR THE WEIGH AND TRANSFER
ASSEMBLY, HOSES, ETC. METERING OF COLOR STOPS WHEN THE
MAXIMUM CHAMBER WEIGHT IS REACHED.**

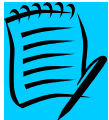
15. Calibration is complete.

MULTIBLEND

MULTIBLEND SET-UP SCREEN	
Mixer 1 Multiblend Status	OFF
Mixer 1 Number of Blends	1
Mixer 2 Multiblend Status	OFF
Mixer 2 Number of Blends	1
Mixer 3 Multiblend Status	OFF
Mixer 3 Number of Blends	1

PREV SCREEN

IN a process termed MULTIBLEND, marbleizing, range, or multicolor, the dispenser rotates through the different blends in a PRODUCT. This operation is used when the operator wants to create two, three, or four different BLENDS in sequence using the same SILO colors. Be sure to enter the values for blends 2, 3 & 4 prior to starting this process.



THE TOUCH SCREEN DRAWINGS IN THIS MANUAL ARE FROM A 3-MIXER, 5-COLOR, 200-PRODUCT DISPENSER. SINGLE-MIXER DISPENSER SCREENS ARE VERY SIMILAR. DISREGARD THE INFORMATION IN THE DRAWINGS REFERRING TO MIXER-TWO AND MIXER-THREE. FIVE-BLEND SOFTWARE HAS THE APPROPRIATE ADDITIONS TO THE SCREENS.

MULTIBLEND

(Continued)

TO START MULTIBLEND

1. Touch CHANGE SET-UP on the MAIN MENU.
2. Touch MULTIBLEND SET-UP on the CHANGE SET-UP TABLE screen.
3. Touch ON/OFF next to MIXER X MULTIBLEND STATUS to change the state of the button. Notice that the screen displays that MULTIBLEND: is ON. (Touch the button again to turn it off.)
4. Touch the number in the blue box next to MIXER X NUMBER OF BLENDS and the keypad appears. Touch the number of blends desired for rotation for MIXER X, then touch ENTER.



THE SOFTWARE WILL NOT ACCEPT ATTEMPTS TO ENTER ONLY ONE BLEND OR MORE THAN FOUR BLENDS (FIVE IN FIVE BLEND SOFTWARE).

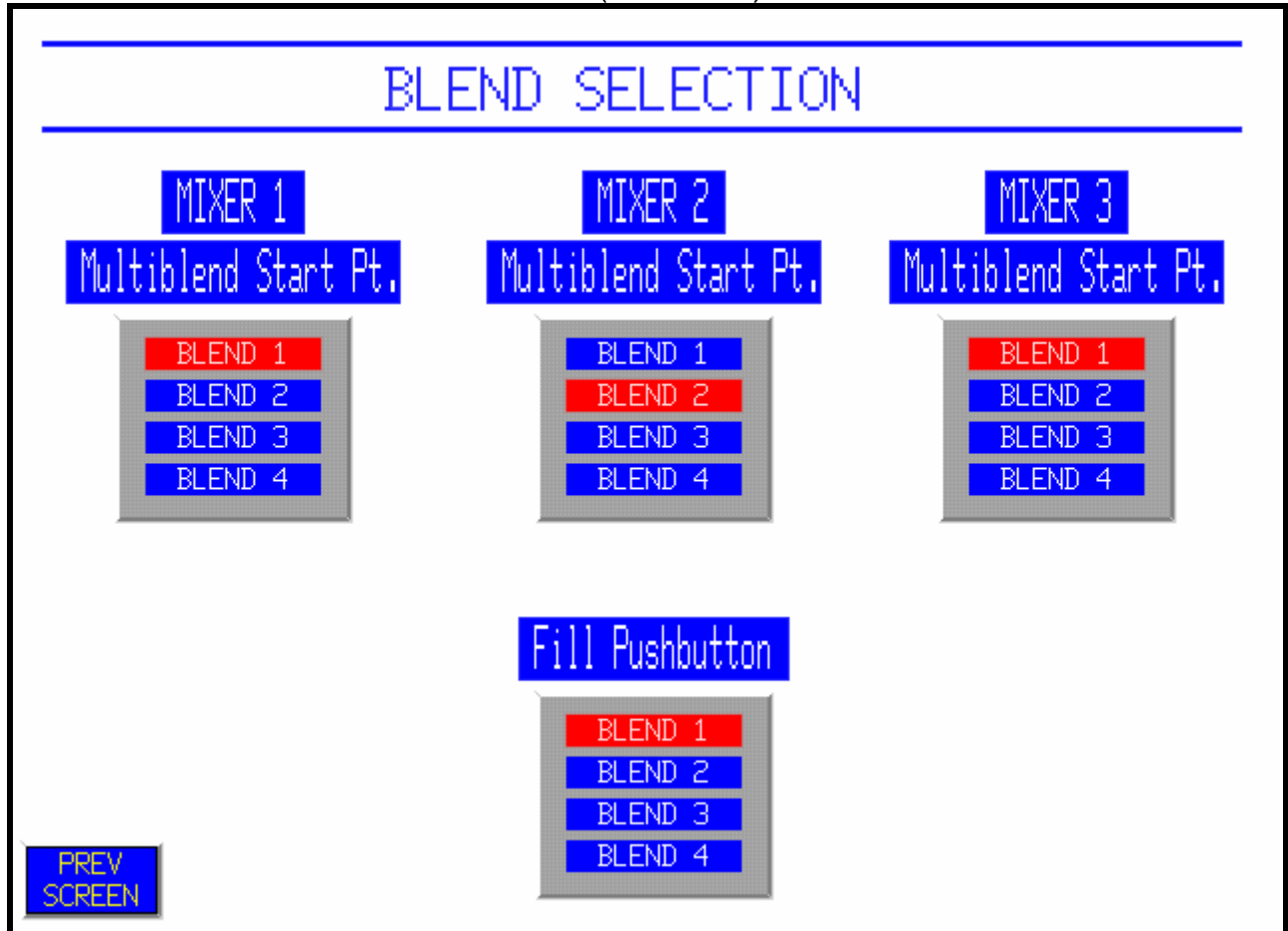


THE PRODUCT WILL ROTATE TO THE NEXT BLEND ONLY WHEN A CHARGE SIGNAL IS SENT FROM THE BATCHING SYSTEM TO MAKE BLEND 1 FOR THAT MIXER. IT WILL NOT ROTATE WHEN THE FILL BUTTON IN THE AUTO SCREEN IS USED TO START A BATCH.

5. Touch PREV SCREEN to return to the CHANGE SET-UP TABLE.
6. Touch MAIN MENU to return to the MAIN MENU.
7. Touch AUTO MODE on the MAIN MENU.
8. Touch BLEND SELECT on the AUTO MODE screen.

MULTIBLEND BLEND SELECT

(Continued)



10. Under MIXER X Multiblend Start Point, one of the blends is highlighted in red and the rest in blue. When the first charge signal is sent from the batching system, the dispenser will create the blend that is displayed with the red background.
11. Touch MIXER X BLEND once, and the blend that is red highlighting will move down to the next blend. This will be the first blend of the product to be made for that MIXER X.



IF ONLY THREE BLENDS HAVE BEEN SELECTED FOR ROTATION IN THE MULTIBLEND SCREEN, THE DISPENSER IS NOT ALLOWED TO START MULTIBLEND IN BLEND 4 OF A PRODUCT.

MULTIBLEND BLEND SELECT

(Continued)

12. Touch PREV SCREEN TO return to the AUTO SCREEN. Notice that BLENDING has a flashing “ON” next to it. This is to alert the operator that the MULTIBLEND process is now enabled. The dispenser is now waiting for a charge signal, and will start the process with the blend that the operator selected in the BLEND SELECTION screen. After receiving a discharge signal the dispenser will “rotate” to the next BLEND, and when the next charge signal is received that BLEND will be created. The dispenser will continue rotating through the number of blends selected.



AFTER RECEIVING A DISCHARGE SIGNAL THE DISPENSER WILL “ROTATE” TO THE NEXT BLEND, AND WHEN THE NEXT CHARGE SIGNAL IS RECEIVED THAT BLEND WILL BE CREATED. THE DISPENSER WILL CONTINUE ROTATING THROUGH THE NUMBER OF BLENDS SELECTED.

FILL BUTTON

The fill button in the AUTOSCREEN window allows the operator to choose which blend to create. The operator selects the blend by touching the blend button in the SELECT BLEND screen.



THE PRODUCT WILL ROTATE TO THE NEXT BLEND ONLY WHEN A CHARGE SIGNAL IS SENT FROM THE BATCHING SYSTEM TO MAKE BLEND 1 FOR THAT MIXER. IT WILL NOT ROTATE WHEN THE FILL BUTTON IN THE AUTO SCREEN IS USED TO START A BATCH.

AUTO MODE

AUTO

MIXER 1 RUNNING PRODUCT: 123 DESCRIPTION: MessageMessageMessageM
 MIXER 2 RUNNING PRODUCT: 123 DESCRIPTION: MessageMessageMessageM
 MIXER 3 RUNNING PRODUCT: 123 DESCRIPTION: MessageMessageMessageM

ERROR MESSAGE: **RED BACKGROUND WITH WHITE TEXT.**

STATUS: MessageMessageMessageMessageMessageMessa

BLEND INFO: MessageMessageMessageMessageMe

BLEND WEIGHT: 1234.56 BATCH NUMBER: 1234 BLENDING 1 2 3

	Description	Desired Weight	Actual Weight
Silo 1	MessageMes MessageMes	123.45	123.45
Silo 2	MessageMes MessageMes	123.45	123.45
Silo 3	MessageMes MessageMes	123.45	123.45
Silo 4	MessageMes MessageMes	123.45	123.45
Silo 5	MessageMes MessageMes	123.45	123.45

MAIN MENU

SUPPLY LEVELS
 RESET
 MIXER 1 FILL
 MIXER 2 FILL
 MIXER 3 FILL
 DISCHARGE
 BLEND SELECT
 TOLERANCE ACCEPT
 PAUSE

The AUTO MODE on the MAIN MENU displays the AUTO SCREEN and enables the dispenser to produce blends automatically when the batching system sends a signal.



REGARDLESS OF WHICH SCREEN IS DISPLAYED, IF THE AUTO BATCHING SELECTOR SWITCH IS ON, IT WILL ACCEPT AND STORE A CHARGE OR DISCHARGE SIGNAL. IF A SIGNAL IS SENT, THE DISPENSER WILL START AUTOMATICALLY WHEN THE OPERATOR RETURNS TO AUTO MODE.

IF THE OPERATOR EXITS THE AUTO SCREEN, THE CYCLE WILL STOP MOMENTARILY. WHEN AUTO MODE IS TOUCHED AGAIN, THE CYCLE WILL CONTINUE AUTOMATICALLY FROM THE POINT THE OPERATOR LEFT THE AUTO SCREEN.

IF POWER IS LOST DURING THE CYCLE, THE CYCLE WILL RESUME FROM THE POINT IT STOPPED AT WHEN THE OPERATOR RETURNS TO THE AUTO SCREEN.

AUTO MODE

(Continued)



THE TOUCH SCREEN DRAWINGS IN THIS MANUAL ARE FROM A 3-MIXER, 5-COLOR, 200-PRODUCT DISPENSER. SINGLE-MIXER DISPENSER SCREENS ARE VERY SIMILAR. DISREGARD THE INFORMATION IN THE DRAWINGS REFERRING TO MIXER-TWO AND MIXER-THREE. FIVE-BLEND SOFTWARE HAS THE APPROPRIATE ADDITIONS TO THE SCREENS.

RUNNING PRODUCT

Displays the PRODUCT NUMBER the operator has selected to produce. Each mixer has its own number.

DESCRIPTION

Displays the name that the operator has given to the PRODUCT. Each PRODUCT has its own description.



ONE PRODUCT CAN BE SELECTED TO RUN FOR ALL THREE MIXERS AT THE SAME TIME BY SELECTING THE PRODUCT NUMBER FOR ALL THREE MIXERS.

STATUS

Displays dispenser STATUS information along with any diagnostic information (errors). The STATUS line tells the operator what the **AEROGRAN™** dispenser is doing at the time – for example: RESET AND WAITING FOR FILL COMMAND, SILO 1 IS FILLING FAST, SILO 3 IS FILLING SLOW, WAITING FOR DISCHARGE SIGNAL, etc.



IF A PRINTER IS CONNECTED TO THE **AEROGRAN™, ALL ERRORS WILL BE PRINTED. PRINTING OF ERRORS CANNOT BE TURNED OFF.**

BLEND INFO

BLEND INFO displays the blend last created, and what will happen if the FILL button is touched.

BATCH NUMBER

BATCH NUMBER displays the amount of batches (blends) that have been dispensed . The batch number increments one count each time a blend is discharged from the dispenser. This number can be reset to zero in the MATERIAL USAGE screen .

AUTO MODE

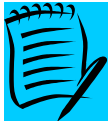
(Continued)



THE HIGHEST BATCH NUMBER IS 10,000. THE COUNTER THEN ROLLS OVER TO ZERO.

BLEND WEIGHT

Shows actual weight on the scale. Also displayed are the DESIRED WEIGHT and ACTUAL WEIGHT for the blend being produced. The ACTUAL WEIGHT of the colors may not add up to the BLEND WEIGHT on the scale. This is because the dispenser tares before filling each color. It is normal for the scale to read some residual weight after a discharge that may be positive or negative. This will not affect the accuracy of the dispenser. BLEND WEIGHT is not related to tare weight of any silo but is based on the calibrated value of zero pounds.



THE BLEND WEIGHT ON THE SCREEN MAY DIFFER FROM THE SUM OF THE ACTUAL WEIGHTS BECAUSE OF THE SMALL POSITIVE OR NEGATIVE WEIGHT THAT IS TARED BEFORE THE WEIGHING PROCESS BEGINS.

DESIRED WEIGHT

Shows the desired weight of the each color (silo) to the left.

ACTUAL WEIGHT

Shows the actual weight metered into the WEIGH HOPPER each color (silo) to the left.

BLENDING

Displays flashing ON when MULTIBLEND is turned on. Displays OFF if MULTIBLEND is turned off.



ON EARLY VERSIONS OF THREE-MIXER SOFTWARE THE BLENDING INDICATOR ON THE AUTO SCREEN IS OMITTED.

TOLERANCE ACCEPT

Touch this button to accept an over-tolerance or under-tolerance weight. It beeps when touched and continues the cycle.

SELECT BLEND

Touch SELECT BLEND to move to a new screen. This screen selects the blend to produce in the semiautomatic mode. This button works in conjunction with the FILL button. SEE BLEND SELECT and MULTIBLEND

AUTO MODE

(Continued)

PAUSE Touch this button to temporarily stop all dispensing operations. Touch it again to restart operations. It beeps and is highlighted when active.



WHEN AN ERROR OCCURS THE CYCLE STOPS AND THE PAUSE BUTTON TEXT CHANGES TO PAUSED AND IS HIGHLIGHTED.

MAIN MENU Touch MAIN MENU to return to the MAIN MENU.

MIXER X FILL Touch one of the MIXER X FILL buttons to start the cycle for that mixer and create the BLEND displayed in the BLEND INFO text line.



TOUCHING FILL FOR MIXER-ONE AND THEN FOR MIXER-TWO WILL STORE THE SIGNAL FOR MIXER-TWO AS IF IT WERE SENT BY A BATCHING SYSTEM.

DISCHARGE Touch DISCHARGE to start conveying the contents of the TRANSFER VESSEL to the mixer that the blend was created for. The BLEND INFO line displays the mixer number.

RESET Touch RESET to disable all functions and set the PLC back to the beginning of a FILL CYCLE.

SUPPLY LEVELS Touch SUPPLY LEVELS to move to a screen that displays the current supply levels. Turn the LOW LEVEL ALARM on or off and reset the values.

All diagnostic errors detected in AUTO MODE or MANUAL MODE will halt the dispenser. The automatic cycle is PAUSED, and the operator, through the MANUAL MODE screen, must manually perform corrective action. The operator must decide, if a blend is out of tolerance, whether to salvage the blend or discard it.

CAUTION

DO NOT TAMPER WITH PRESSURE RELIEF VALVES. BE SURE TO CHECK THE PRESSURE RELIEF VALVE AFTER ANY DISPENSER MALFUNCTION.



MAXIMUM FILL TIME TO REACH THE WEIGHT OF A SINGLE COLOR IS 2 MINUTES. THIS IS USER-DEFINED IN THE HIDDEN SCREENS. IF EXCEEDED, MAXIMUM FILL TIME EXCEEDED WILL APPEAR AND THE CYCLE WILL PAUSE WHILE THE REASON FOR THE DELAY IS FOUND.

HIDDEN SCREEN PAGE 1

HIDDEN SCREEN PARAMETERS

PAGE 1

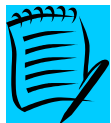
12.34	SILO 1 SLOW FILL ONLY WEIGHT	12.34	SPARE
12.34	SILO 2 SLOW FILL ONLY WEIGHT	12.34	SPARE
12.34	SILO 3 SLOW FILL ONLY WEIGHT	12.34	SPARE
12.34	SILO 4 SLOW FILL ONLY WEIGHT	12.34	SPARE
12.34	SILO 5 SLOW FILL ONLY WEIGHT	1	SPARE
12.34	WEIGH HOPPER VIB ON TIME	12.34	SPARE
12.34	WEIGH HOPPER VIB OFF TIME	12.34	SPARE
12.34	VESSEL PRESSURE BUILD TIME	12.34	SPARE
12.34	VESSEL PRESSURE RELEASE TIME	12.34	SPARE
12.34	DEFLATE SEAL ON DIVERTER TIME		
12.34	DIVERTER FULLY SEATED TIME		
12.34	VESSEL EMPTY WT BEFORE CLEAN		

MAIN MENU	NEXT PAGE
-----------	-----------

Silo 1	MessageMes	MessageMes
Silo 2	MessageMes	MessageMes
Silo 3	MessageMes	MessageMes
Silo 4	MessageMes	MessageMes
Silo 5	MessageMes	MessageMes

In MAIN MENU touch the white button with EAGLE ENGINEERING inside to access the HIDDEN SCREENS.

1. Touch the white button on the MAIN MENU with EAGLE ENGINEERING inside and the keypad appears.
2. Enter the value 31 (Page 31) using the keypad and touch ENTER. See the information on [USING THE KEYPAD](#) for help.



ENTER THE VALUE 01 (PAGE 1) AND RETURN TO THE MAIN MENU WHEN THE ENTER BUTTON IS TOUCHED.

ON SINGLE-MIXER SOFTWARE THERE IS ONLY ONE HIDDEN SCREEN PAGE.

HIDDEN SCREEN PAGE 1

(Continued)



WHEN VIEWING THE HIDDEN SCREENS, DO NOT CHANGE ANY OF THE INTERNAL OPERATING PARAMETERS OF THE SCREEN FUNCTIONS.

TO EXIT THIS SCREEN, ENTER 01 ON THE KEYPAD THAT HAS APPEARED, THEN TOUCH ENTER AND THE MAIN MENU WILL REAPPEAR.

The operator does not normally use this screen. It is a set of hidden parameters used in operation of the dispenser. Once set during the installation they normally do not need to be adjusted.

SLOW FILL WEIGHT ONLY

When the target weight of the blend is less than or equal to the SLOW FILL weight in the set up field, the FAST FILL portion of the cycle is skipped, and the dispenser starts in SLOW FILL to obtain better control. Each Silo has its own setting.

WEIGH HOPPER VIB ON TIME

This is a time value for the WEIGH HOPPER vibrator that determines how long the vibrator will run.

WEIGH HOPPER VIB OFF TIME

This is a time value for the WEIGH HOPPER vibrator that determines how long the vibrator will be off before turning on again.

VESSEL PRESSURE BUILD TIME

Time, in hundredths of a second, that the DISCHARGE VALVE on the TRANSFER VESSEL is closed and the air solenoid is open to allow pressure buildup in the TRANSFER VESSEL during the cleaning cycle.

VESSEL PRESSURE RELEASE TIME

Time, in hundredths of a second, that the DISCHARGE VALVE on the TRANSFER VESSEL is open, allowing the built up pressure to pulse through the discharge hose during the cleaning cycle.



VESSEL PRESSURE BUILD AND VESSEL PRESSURE RELEASE TIME VALUES CAN ALSO BE ADJUSTED FROM THE [CHANGE SET-UP TABLE PAGE 1 SCREEN](#).

HIDDEN SCREEN PAGE 1

(Continued)

DEFLATE SEAL ON DIVERTER TIME

On two-mixer and three-mixer dispensers, a DIVERTER is used to select which mixer the color from the TRANSFER VESSEL will be sent to. DEFLATE SEAL ON DIVERTER TIME, in hundredths of a second, allows pressure on the seals to be released so the diverter can be shifted to another position.



DEPENDING ON THE TYPE OF DIVERTER USED, DEFLATE SEAL ON DIVERTER TIME CONTROLS ONE OF TWO OPERATIONS:

- A. IT ALLOWS TIME TO DEFLATE A GROUP OF SEALS SO THAT THE HOSE CAN BE SHIFTED TO ANOTHER PORT ON THE DIVERTER.**
- B. IT PULLS BACK AN AIR CYLINDER SO THAT THE HOSE CAN BE SHIFTED TO ANOTHER PORT ON THE DIVERTER.**

GO TO THE SECTION ON DIVERTER VALVES FOR MORE INFORMATION.

VESSEL EMPTY WT BEFORE CLEAN

Starts the cleaning cycle at the end of the discharge cycle.

MAIN MENU

Returns to the MAIN MENU.

NEXT PAGE

Takes the operator to PAGE 2 of HIDDEN PARAMETERS. [HIDDEN SCREEN PAGE 2](#)

HIDDEN SCREEN PAGE 2

HIDDEN SCREEN PARAMETERS		PAGE 2	
12.34	MIXER 1 FAN STOP TIME	12.34	MIXER 2 FILTER 2 SETTLE TIME
12.34	MIXER 1 FILTER 1 CLEAN TIME	12.34	MIXER 2 FILTER 3 CLEAN TIME
12.34	MIXER 1 FILTER 1 SETTLE TIME	12.34	MIXER 2 FILTER 3 SETTLE TIME
12.34	MIXER 1 FILTER 2 CLEAN TIME	12	MIXER 2 FILTER CLEAN CYCLES
12.34	MIXER 1 FILTER 2 SETTLE TIME	12.34	MIXER 3 FAN STOP TIME
12.34	MIXER 1 FILTER 3 CLEAN TIME	12.34	MIXER 3 FILTER 1 CLEAN TIME
12.34	MIXER 1 FILTER 3 SETTLE TIME	12.34	MIXER 3 FILTER 1 SETTLE TIME
12	MIXER 1 FILTER CLEAN CYCLES	12.34	MIXER 3 FILTER 2 CLEAN TIME
12.34	MIXER 2 FAN STOP TIME	12.34	MIXER 3 FILTER 2 SETTLE TIME
12.34	MIXER 2 FILTER 1 CLEAN TIME	12.34	MIXER 3 FILTER 3 CLEAN TIME
12.34	MIXER 2 FILTER 1 SETTLE TIME	12.34	MIXER 3 FILTER 3 SETTLE TIME
12.34	MIXER 2 FILTER 2 CLEAN TIME	12	MIXER 3 FILTER CLEAN CYCLES

MAIN
MENU

NEXT
PAGE

The above screen sets up the time values on how the PARTICLE COLLECTORS are operated.

In MAIN MENU touch the white button with EAGLE ENGINEERING inside to access the HIDDEN SCREENS. HIDDEN SCREEN PAGE 2 can also be accessed from [HIDDEN SCREEN PAGE 1](#)

1. Touch the white button on the MAIN MENU with EAGLE ENGINEERING inside and the keypad appears.
2. Enter the value 31 (Page 31) using the keypad and touch ENTER. See the information on [USING THE KEYPAD](#) for help.



ENTER THE VALUE 01 (PAGE 1) AND RETURN TO THE MAIN MENU WHEN THE ENTER BUTTON IS TOUCHED.

ON SINGLE-MIXER SOFTWARE THERE IS ONLY ONE HIDDEN SCREEN PAGE.

HIDDEN SCREEN PAGE 2

(Continued)

MIXER X FAN STOP TIME

In the [CHANGE SETUP TABLE PAGE 2](#) of multiple-mixer software, or the SET-UP TABLE page of single-mixer software, the operator defines how long the particle collector will run. When the blower stops, the **MIXER X FAN STOP** timer starts, allowing the blower to slow down (coast) before starting to clean the filters. Each mixer has its own value.

MIXER X FILTER X CLEAN TIME

There are three filters in the PARTICLE COLLECTOR. Each filter is cleaned individually with a blast of air after every discharge cycle. MIXER X FILTER X CLEAN TIME is the length of the blast in hundredths of a second. Each filter has its own value.



FAILURE TO USE CLEAN, DRY, OIL FREE AIR WILL CAUSE COLOR TO STICK TO VALVES, CONVEYING VESSEL, INTERNAL VENTURI AND DISCHARGE HOSE SURFACES, AND PARTICLE COLLECTOR FILTERS.

MIXER X FILTER X SETTLE TIME

There are three filters in the PARTICLE COLLECTOR. Each filter is cleaned individually with a blast of air after every discharge cycle. MIXER X FILTER X SETTLE TIME is the time between air blasts in hundredths of a second. Each filter has its own value.

MIXER X FILTER CLEAN CYCLES

The number of times the three filters are cleaned.

MAIN MENU

Returns to the MAIN MENU.

NEXT PAGE

Takes the operator to PAGE 1 of HIDDEN PARAMETERS. [HIDDEN SCREEN PAGE 1](#)

MANUAL MODE

MANUAL MODE				
SILO 1	SILO 2	SILO 3	SILO 4	SILO 5
FAST FILL	FAST FILL	FAST FILL	FAST FILL	FAST FILL
SLOW FILL	SLOW FILL	SLOW FILL	SLOW FILL	SLOW FILL
WEIGHT VIBRATOR	MAXIMUM WEIGHT 123.45		MIXER 1 SELECTED	CONE VALVE CLOSED
CONV VESSEL LOW PRESSURE	VESSEL WEIGHT 123.45		MIXER 2 SELECTED	DISCHARGE VALVE CLOSED
MAIN MENU	MESSAGE AREA		MIXER 3 SELECTED	VESSEL PRESSURE
				CONVEYING AIR

MANUAL MODE allows the operator to control all dispenser functions manually. Touch the appropriate button to select a function or turn a device on or off. The name of the button will change to define the state of the device.



THE AEROGRAN™ DISPENSER WILL ACCEPT A CHARGE SIGNAL REGARDLESS OF THE SCREEN DISPLAYED WHEN THE MCR IS RESET AND AUTO BATCHING IS ENABLED. THE DISPENSER WILL START AS SOON AS THE OPERATOR ENTERS THE AUTO SCREEN.

MAIN MENU

Touch MAIN MENU to leave MANUAL MODE and return to the MAIN MENU. Touching MAIN MENU will turn off any components that may have been left on.

MANUAL MODE

(Continued)

MESSAGE AREA

In this area, the **AEROGRAN™** will display certain messages to inform the operator that something is preventing the system from operating in MANUAL MODE.

VESSEL WEIGHT

VESSEL WEIGHT is the actual weight on the scale.

MAXIMUM WEIGHT

The MAXIMUM WEIGHT the dispenser will hold is based on the settings in the SET-UP TABLE that is called MAXIMUM VESSEL WEIGHT. For more information see [CHANGE SET-UP TABLE PAGE 1](#)



THE DISPENSER CONTINUOUSLY MONITORS THE MAXIMUM ALLOWABLE VESSEL WEIGHT, AND WILL TURN OFF ALL VIBRATORS IF THE MAXIMUM WEIGHT IS REACHED.

SILO NAMES

Located above the FAST FILL buttons are the names and / or product numbers that the operator has programmed into the dispenser for the product that is currently selected to run.

FAST FILL

Touch any FAST FILL button to start the corresponding conveying tube on the left with SILO number 1. The button will highlight when it is on. For more information see [FAST FILL](#)

SLOW FILL

Pressing any of the SLOW FILL buttons will start the corresponding conveying tube starting on the left with SILO number 1. The button will be highlighted when it is on. For more information, see [SLOW FILL](#).



THE FAST FILL AND SLOW FILL BUTTONS CAN BE ON AT THE SAME TIME.

ALL SILOS MAY BE ON AT THE SAME TIME. HOWEVER, THE DISPENSER AIR TRAIN IS NOT DESIGNED TO SUPPLY THE AMOUNT OF AIR REQUIRED. THE SYSTEM WILL RUN SLOWER AS MORE COLORS ARE TURNED ON IN FAST FILL MODE.

MANUAL MODE

(Continued)



WEIGHT VIBRATOR

The WEIGH VIBRATOR is mounted on the WEIGH HOPPER to ensure complete transfer of color from the WEIGH HOPPER into the TRANSFER VESSEL. It is normally turned on and left on. The WEIGH VIBRATOR runs whenever the CONE VALVE is open in AUTO MODE. For more information see, [OPTION SELECT](#).

VESSEL VIBRATOR

Control of the VESSEL VIBRATOR was designed into the software, but was never required. The OPTION SELECT screen shows that the output is available, but it is not wired. There is not currently means to mount a vibrator on the TRANSFER VESSEL. It can be in the ON or OFF position.

ON DISPENSERS SHIPPED AFTER OCTOBER 2000, THE TRANSFER VESSEL VIBRATOR WAS REMOVED FROM THE SCREEN AND REPLACED WITH CONVEYING VESSEL LOW PRESSURE. FOR MORE INFORMATION SEE, [OPTION SELECT](#).

CONE VALVE CLOSED

When the button is touched the cone valve will move from closed to open, or open to closed, and the description on the button will change accordingly.



A SENSOR MOUNTED ON THE CONE VALVE AIR CYLINDER MONITORS THE POSITION OF THE VALVE IN AUTOMODE. THIS SENSOR IS NOT USED IN MANUAL MODE. EVEN WHEN THE DISPLAY SHOWS CLOSED, IT IS POSSIBLE THAT THE VALVE IS OPEN.

DISCHARGE VALVE CLOSED

Touch this button to open the DISCHARGE VALVE located on the bottom of the TRANSFER VESSEL. This allows the contents of the vessel to be blown into the mixer. This button is highlighted when it is on.

MANUAL MODE

(Continued)

VESSEL PRESSURE

Touch this button to open the air valve and pressurize the TRANSFER VESSEL. Pressure builds to the DISCHARGE AIR PRESSURE setting of the second regulator. This button is highlighted when it is on.

CONVEYING AIR

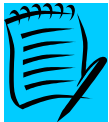
Touch this button to start flow of conveying air through the discharge hose to the mixer. It also starts the particle collector for the mixer that is selected. This button is highlighted when it is on.

An icon of a white document with a red diagonal line and the word "IMPORTANT" written in red, slanted text.

WHEN THE PARTICLE COLLECTOR IS STARTED, PRESSING THE EMERGENCY STOP BUTTON ON THE CONTROL PANEL OR DISCONNECTING POWER TO THE PARTICLE COLLECTOR ARE THE ONLY WAY ONLY TO STOP IT.

MIXER X SELECTED

These 3 buttons select what mixer the diverter valve is set to. That button will be highlighted. Touching a different MIXER X SELECT SELECTED button will select that mixer. For more information see, [HIDDEN SCREEN PAGE 1](#).



ON SINGLE-MIXER SOFTWARE PACKAGES THESE BUTTONS ARE NOT DISPLAYED ON THE SCREEN.

An icon of a white document with a red diagonal line and the word "IMPORTANT" written in red, slanted text.

DISPENSERS USING ONLY A TWO – WAY DIVERTER STILL HAVE THE OPTION OF GOING TO THE THIRD MIXER ON THE TOUCH SCREEN. IF MIXER-THREE IS SELECTED, THE DIVERTER WILL GO TO MIXER-TWO AND AN ERROR MESSAGE WILL APPEAR ON THE SCREEN AFTER 10 SECONDS STATING, DIVERTER NOT IN CORRECT POSITION. IN ORDER TO DISCHARGE, THE POSITION OF THE DIVERTER MUST BE SET BACK TO MIXER-ONE OR MIXER-TWO.

SILO MATERIAL USAGE

SILO	DESCRIPTION	WEIGHT DISPENSED	SILO RESET
Silo 1		12345.6	Reset
Silo 2		12345.6	Reset
Silo 3		12345.6	Reset
Silo 4		12345.6	Reset
Silo 5		12345.6	Reset
Batch Number		1234	Batch Reset

MAIN MENU

SUPPLY LEVELS

PRINT DATA

TOTAL WEIGHT DISPENSED: 12345678

The SILO MATERIAL USAGE screen is used for inventory purposes. It tracks all material dispensed in the AUTO MODE and displays it in the WEIGHT DISPENSED column.



THE SILO MATERIAL USAGE SCREEN DOES NOT TRACK THE USAGE OF COLOR DISPENSED IN THE MANUAL MODE.

MAIN MENU

Touch MAIN MENU to return to the MAIN MENU.

SUPPLY LEVELS

This button returns to the [SILO SUPPLY LEVELS](#) screen. This screen can also be accessed through the AUTO SCREEN.

SILO MATERIAL USAGE

(Continued)

BATCH NUMBER

States how many batches have been created in AUTO MODE since the BATCH RESET button was last touched.

TOTAL WEIGHT DISPENSED

Displays total pounds of material cycled through the dispenser in AUTO MODE. The operator cannot reset this number. It is used to determine when maintenance is to be performed.



THE TOTAL WEIGHT DISPENSED VALUE WAS ADDED TO ALL DISPENSER SOFTWARE PACKAGES SHIPPED AFTER JULY 2000.

PRINT DATA

Touching this button prints a report using the information from the screen. The report will also include time and date.

RESET

There is a reset button for each SILO. Pressing reset for any SILO will return its value to zero.

SILO SUPPLY LEVELS

SILO SUPPLY LEVELS

Maximum Weight: 3275.0

SILO	DESCRIPTION	FULL SUPPLY WEIGHT	CURRENT SUPPLY WEIGHT	LOW SUPPLY WEIGHT	SUPPLY WEIGHT RESET
Silo 1		1234.5	1234.5	1234.5	Reset
Silo 2		1234.5	1234.5	1234.5	Reset
Silo 3		1234.5	1234.5	1234.5	Reset
Silo 4		1234.5	1234.5	1234.5	Reset
Silo 5		1234.5	1234.5	1234.5	Reset

PREV SCREEN

LOW SUPPLY ALARM ON

The SILO SUPPLY LEVELS screen is accessed from the AUTO MODE screen or the MATERIAL USAGE screen by touching the SUPPLY LEVELS button. This screen allows the operator to enter a starting weight of color for each SILO bulk supply (up to 3275.0 pounds).

MAIN MENU Returns to the previous screen.

LOW SUPPLY OFF/ON Turns the circuitry that tracks the supply levels ON and OFF.

SUPPLY WEIGHT RESET: The operator can reset the alarm when it is sounding.

SILO SUPPLY LEVELS

(Continued)

FULL SUPPLY WEIGHT

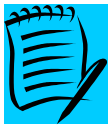
The capacity of the bulk storage container up to 3275.

CURRENT SUPPLY WEIGHT

The amount of material that is present in the bulk storage container.

LOW SUPPLY WEIGHT

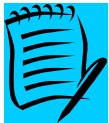
The amount of material that will be remaining in the bulk storage container when the alarm starts to sound.



THE BULK STORAGE CONTAINER REFERS TO THE BIG BAG, REMOVABLE HOPPER, SUPER SACK, OR SURGE HOPPERS ON THE **AEROGRAN™** FRAME.

OPERATION

This screen will track the bulk supply of material for each silo when it is turned on. As color is conveyed out of the storage container from each SILO in the AUTO MODE, the computer subtracts the CURRENT SUPPLY WEIGHT from the FULL SUPPLY WEIGHT. When the CURRENT SUPPLY WEIGHT equals the LOW SUPPLY ALARM WEIGHT, the alarm starts to sound an intermittent beep. In the AUTO SCREEN the status message will display which SILO has reached its low level value.



THIS SCREEN TRACKS ONLY THE WEIGHT IN AUTO MODE.

The alarm will continue to sound until the batch is discharged. The PAUSE button will engage and stop the next batch from starting. The status line will continue to blink a warning about the low silo. If the PAUSE button is touched the alarm will start to sound again, and the charge cycle will start even though the supply is low. This is done so that the operator can continue to run and use up the remaining material in the bulk storage container.

To reset the alarm, touch the SUPPLY LEVEL button on the AUTO SCREEN. This will move to the SILO SUPPLY LEVELS screen. Touch RESET on the right side of the screen for the SILO that is low. The alarm will now stop. Replace the bulk storage container with material. Verify that CURRENT SUPPLY WEIGHT is equal to the container weight, making changes as necessary.

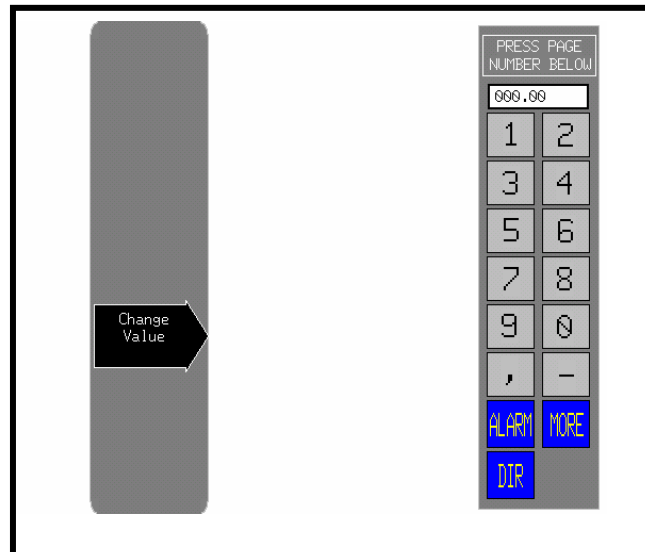
SILO SUPPLY LEVELS

(Continued)



TOUCHING THE OFF/ON BUTTON FOR THE SCREEN WILL NOT STOP THE ALARM FROM SOUNDING. THE RESET BUTTON FOR THE SILO THAT IS LOW MUST BE TOUCHED TO RESET THE ALARM.

1. To change the value of the parameters, touch any of the weight value buttons. A screen will appear asking you if you want to change the value. Touch the change value button and a numerical keypad will appear.



2. Using the keypad enter the weight.
3. Touch ENTER on the keypad.
4. The new weight is now stored.
5. Repeat the above steps until all weights have been entered.
6. Touch LOW SUPPLY ON/OFF to enable or disable this screen.
7. Touch PREV SCREEN to return to the previous screen.

PRINTER CONNECTION

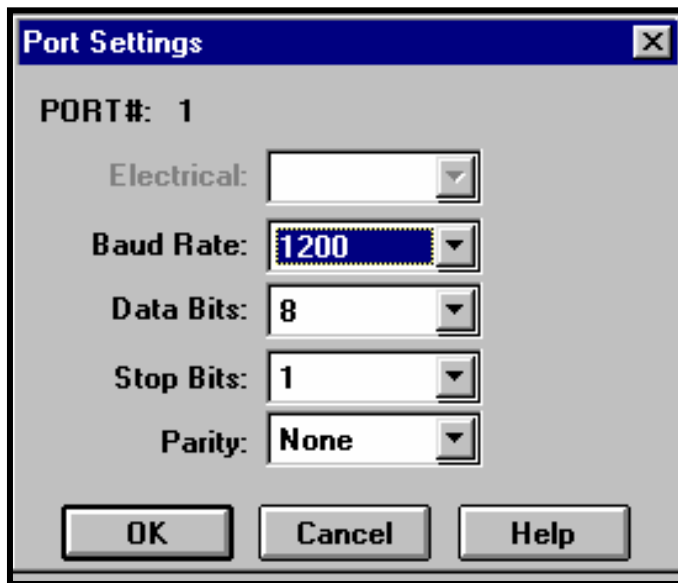
An optional printer may be connected to the **AEROGRAN™** dispenser to provide a record of each batch and color usage.

CONNECTION POINT

The printer connection is on the back of the TOUCH SCREEN labeled COM 1.

PRINTER TYPE

The output from COM 1 to the printer is a serial output, therefore requiring a serial printer. The port settings are in the picture below:



At the time this manual was printed there were two different PanelMate touch screens used on the **AEROGRAN™** dispensers.

The first style is labeled a **PanelMate Power Series**.
The second style is labeled a **PanelMate Power Pro**.



TO IDENTIFY THE TOUCH SCREEN, LOOK FOR THE LABEL POWER SERIES OR POWER PRO ON THE FACE AND REAR OF THE TOUCH SCREEN.

120-VOLT AC POWER OPERATES THE **POWER SERIES**.
THE **POWER PRO** IS OPERATED BY A 24 VOLT DC POWER SUPPLY.

PRINTER CONNECTION

(Continued)

On the **Power Series**, a serial converter **has** been successfully used to run a parallel printer.

Cutler Hammer support engineers have used: Black Box Serial to Parallel Converter. Part Number is PI015A. Other types are also known to work.

On the **Power Pro**, a serial converter **has not** functioned with a parallel printer. There are several manufacturers of converters and it is possible that one of them may work. It is recommended that a serial printer be used on this touch screen for printing.

HYPER TERMINAL

HyperTerminal is program in WINDOWS 95 or above that can be used in place of a printer to record reports. A computer with WINDOWS 95 or higher on it is needed to use this printing option.

CONNECTIONS FOR HYPER TERMINAL

Setup HyperTerminal as follows:

1. Select Start/Programs/Accessories/HyperTerminal.
2. Enter a name for the session then click OK.
3. Set the port for COM 1 (or COM 2, whichever is being used).
4. Set the COM parameters 1200, 8, N, 1, Hardware.
5. Connect the Panel Mate serial transfer cable to Panel Mate port 1 and PC com1 (or 2).



THE SERIAL TRANSFER CABLE CAN BE BUILT USING THE FOLLOWING PIN-OUTS: (THE SERIAL TRANSFER CABLE IS AVAILABLE THROUGH EAGLE ENGINEERING)

PRINTER CONNECTION CONNECTIONS FOR HYPER TERMINAL

(Continued)

Panel Mate Serial Transfer Cable Pin Outs. For use with Hyper Terminal.

9 PIN MALE to 9 PIN FEMALE

2 to 3

3 to 2

5 to 5

7 to 8

8 to 7

When connecting a serial cable from the Panel Mate to a serial printer, use the following information for building the cable and setting up the parameters for use with your printer.

Panel Mate Port 1 pins are as follows;

PIN		
1.	RS422 TD+	
2.	RS232 RD	
3.	RS232TD	
4.	RS422 RD+	
5.	Signal Ground	
6.	RS422 TD-	
7.	RS232 RTS	
8.	RS232 CTS	
9.	RS422 RD-	



IF INSTALLING THE PRINTER, BE SURE TO ROUTE THE CABLE SO THAT IT CANNOT INTERFERE WITH ANY OF THE COMPONENTS LOCATED ON THE BACK OF THE CONTROL PANEL. EXIT THE CONTROL PANEL WITH WATER TIGHT FITTINGS TO RETAIN THE NEMA 4/12 RATING OF THE ENCLOSURE.

PRINTER CONNECTION

(Continued)

REPORT EXAMPLES

MATERIAL USAGE REPORT

Material Usage Report	09/14/00	11:56:03
Silo 1 YELLOW QY 2087	0.0 Pounds	
Silo 2 LT RED QR2199	0.0 Pounds	
Silo 3 DK RED QR4097	0.0 Pounds	
Silo 4 BLACK QX5599	8.0 Pounds	
Silo 5 NOT USED NOT USED	0.0 Pounds	
Number of Batches: 1		

PRINTED ERROR MESSAGES

MCR IS NOT RESET	12:21:03 09/14/00 P22
MCR IS NOT RESET	Clrd 12:21:10 09/14/00 P22
SILO 1 LOW ON MATERIAL	12:26:54 09/14/00 P22
SILO 1 LOW ON MATERIAL	Clrd 12:27:52 09/14/00 P22
MATERIAL 1 WEIGHT ABOVE TOLERANCE	12:28:01 09/14/00 P22
MATERIAL 1 WEIGHT ABOVE TOLERANCE	Clrd 12:28:02 09/14/00 P22

BATCH REPORT

Granular Dispenser Batch Report	09/14/00	12:29:23
Batch Number: 2		
Product Number: 1 Product Description: CHARTAN		
Blend: 2		
Silo 1 YELLOW QY 2087	Desired Weight: 3.80	Actual Weight: 3.79
Silo 2 LT RED QR2199	Desired Weight: 4.30	Actual Weight: 4.30
Silo 3 DK RED QR4097	Desired Weight: 0.00	Actual Weight: 0.00
Silo 4 BLACK QX5599	Desired Weight: 2.40	Actual Weight: 2.40
Silo 5 NOT USED NOT USED	Desired Weight: 0.00	Actual Weight: 0.00



IN THE PRINTED ERROR MESSAGES ABOVE, THE **Clrd** IS SHORT FOR CLEARED. THIS SHOWS THE TIME WHEN THE ERROR WAS CLEARED.

SECTION VIII MAINTENANCE

ALARMS & MESSAGES

The following status and error messages will be displayed in the AUTO MODE SCREEN. Some of these messages will also be displayed in the MANUAL MODE SCREEN.

See TROUBLE SHOOTING section to correct these errors.

MESSAGES IN THE AUTO SCREEN

RESET AND WAITING FOR FILL COMMAND

MATERIAL X IS FILLING FAST

MATERIAL X IS FILLING SLOW

MATERIAL X SETTLE TIME

DUMPING BLEND TO CONVEYING VESSEL

FILL COMPLETE/WAITING FOR DISCHARGE

DISCHARGING BLEND TO MIXER

CLEANING CYCLE IN PROGRESS

CLEARING DISCHARGE LINE TO MIXER

CREATING MIXER X BLEND X

FILL PB WILL CREATE BLEND X

ALARM MESSAGES IN THE MANUAL SCREEN

SCALE WEIGHT OVER MAXIMUM

MCR NOT RESET

DIVERTER VALVE NOT IN CORRECT POSITION

ALARMS AND MESSAGES

(Continued)

ALARMS IN THE AUTO SCREEN

MCR IS NOT RESET

EMPTY VESSEL WEIGHT BELOW TOLERANCE

EMPTY VESSEL WEIGHT ABOVE TOLERANCE

DIVERTER VALVE NOT IN CORRECT POSITION

BLEND STUCK IN WEIGH HOPPER

BLEND STUCK IN CONVEYING VESSEL

VESSEL OVER MAX WEIGHT

PLANT AIR SUPPLY AIR PRESSURE LOW

MATERIAL X SUPPLY LOW

SILO X LOW ON MATERIAL

PARTICLE COLLECTOR NOT STARTED

CONE VALVE DID NOT CLOSE

DISCHARGE VALVE DID NOT CLOSE

MATERIAL X WEIGHT ABOVE TOLERANCE

MATERIAL X WEIGHT BELOW TOLERANCE

CONVEYING VESSEL – AIR PRESSURE IN

CONVEYING VESSEL – MATERIAL REMAINING

FILL TIME HAS BEEN EXCEEDED

PARTICLE COLLECTORS



All **AEROGAN™** dispensers include software for operation of a particle collector. A particle collector is required when blowing color directly into a mixer. The software in the dispenser can be used to control a particle collector manufactured by someone other than Eagle Engineering. The user setting up the timer values in the SET-UP TABLE screen, and the HIDDEN SCREEN defines the cycle of the collector.

Each collector in multiple-mixer software packages has its own set of user-defined values. The descriptions for these values are listed below.

PARTICLE COLLECTOR

(Continued)

IMPORTANT

THERE ARE INPUTS TO START THE PARTICLE COLLECTOR WHEN THE AGGREGATE OR CEMENT ARE BEING ADDED TO THE MIXER. USING THE PARTICLE COLLECTOR DURING THIS TIME FRAME WILL DECREASE THE LIFE OF THE FILTERS IN THE COLLECTOR.

IT IS IMPORTANT TO NOTE THAT THE PARTICLE COLECTOR IS DESIGNED TO COLLECT PARTICLES FROM COLOR ONLY. IT HAS WORKED SUCESSFULLY IN SOME APPLICATIONS FOR COLLECTING DUST FROM AGGREGATE AND CEMENT, HOWEVER IT IS NOT RECOMMENDED.

MIXER X COLLECTOR RUN TIME

Time, in hundredths of a second, set by the operator, for the PARTICLE COLLECTOR to run during the discharge cycle. Each MIXER has its own time value. Set this time long enough for the all the color to be sent to the mixer. See SET-UP TABLE SCREEN



THIS TIMER IS RESTARTED EVERY TIME A DISCHARGE SIGNAL OR AGGREGATE /CEMENT GATE OPEN SIGNAL IS SENT FROM THE BATCHING SYSTEM.

EXAMPLE: IF THE TIMER IS SET FOR 30 SECONDS AND IS STARTED BY THE AGGREGATE GATE BUT IS ONLY AT 20 SECONDS WHEN THE COLOR DISCHARGE IS STARTED. THE TIMER IS RESET TO 30 SECONDS AGAIN.

MIXER X FAN STOP TIME

In the [CHANGE SETUP TABLE PAGE 2](#) of a multiple mixer software package or the SET-UP TABLE page on a single mixer software package the operator defines how long the particle collector will run. When the blower stops this timer starts, allowing the blower to slow down (coast) before starting to clean the filters. Each mixer has its own time value set in seconds. See HIDDEN SCREEN.

MIXER X FILTER X CLEAN TIME

There are 3 filters in a EAGLE PARTICLE COLLECTOR. Each filter of the collector is cleaned individually after every discharge cycle with a blast of air. This timer determines how long the air blast will be. This time value is set in hundredths of a second. Each filter has its own time value. See HIDDEN SCREEN

PARTICLE COLLECTOR

(Continued)



FAILURE TO USE CLEAN, DRY, OIL FREE AIR WILL CAUSE COLOR TO STICK TO VALVES, CONVEYING VESSEL, INTERNAL VENTURI AND DISCHARGE HOSE SURFACES, AND PARTICLE COLLECTOR FILTERS.

MIXER X FILTER X SETTLE TIME

There are three filters in a PARTICLE COLLECTOR. Each filter of the collector is cleaned individually after every discharge cycle with a blast of air. This timer determines how much time will elapse between air blast. This time value is set in hundredths of a second. Each filter has its own time value. See HIDDEN SCREEN

MIXER X FILTER CLEAN CYCLES

The number of times all three filters are cleaned.

The collector is designed to remove the fine residual color partials that can escape from openings in the mixer by pulling air across the inside, top portion of a mixer. Negative air pressure is the result. Adjustment of this negative pressure is done on the exhaust side of the blower.



THE MIXER SHOULD HAVE MINIMAL OPENINGS THAT DUST CAN ESCAPE FROM. THE BLOWER ON THE EAGLE PARTICLE COLLECTOR IS RATED AT 1000 CFM AND WILL NOT WORK PROPERLY WITH VERY LARGE OR VERY SMALL OPENINGS ON A MIXER.

The pressure is adjusted down by blocking off the discharge side of the blower slightly using the slide gate that is supplied. Adjust the blower down to pull only the amount of air through the filter that is needed to accomplish the job. The more air that is pulled through the filters the shorter the life will be.

The EAGLE ENGINEERING particle collector (MDC 1000) uses three cartridge type filters (part number 1007705). The filters are rated at 10 micron. Life of the filters varies from application to application.



THE PRIMARY REASON FOR PREMATURE FAILURE OF THE FILTER CARTRIDGE IS MOISTURE.

PARTICLE COLLECTOR

(Continued)

CYCLE OF OPERATION

1. The collector is started by one of 4 events.
 - A. The dispenser is running in AUTO and a discharge signal is sent from the batching system.
 - B. The dispenser is running in AUTO and the aggregate gate opens.
 - C. The dispenser is running in AUTO and the cement gate opens.
 - D. The dispenser in the MANUAL mode and the operator starts the CONVEYING AIR.



WHEN THE PARTICLE COLLECTOR IS STARTED, IT CAN ONLY BE STOPPED BY PRESSING THE EMERGENCY STOP BUTTON ON THE CONTROL PANEL, OR BY DISCONNECTING THE PARTICLE COLLECTOR.



THE PARTICLE COLLECTOR HAS TWO POWER SOURCES. CONTROL POWER (120 VOLT AC) IS SENT FROM THE DISPENSER CONTROL PANEL TO THE BLOWER STARTER PANEL AND TO THE AIR SOLENOIDS IN THE COLLECTOR HOOD.

THE BLOWER MOTOR RUNS ON THREE PHASE POWER FROM ANOTHER SOURCE IN THE BUILDING.

2. The collector runs until the **MIXER X COLLECTOR RUN TIME** expires or the water valve on the mixer is opened.

There is an input on the dispenser letting it know when water is being added to the mixer. This input turns off the blower on the collector to help slow the introduction of moisture to the filter cartridges.

3. When the blower stops, the **MIXER X FAN STOP TIME** timer starts. This is a time value for allowing the blower to coast down before cleaning the filters.

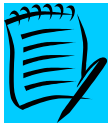
PARTICLE COLLECTOR

(Continued)

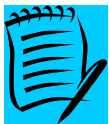
4. When the timer times out, the first filter cartridge is cleaned with a burst of air. The length of time that the air is blown into the first filter is based on the time value of **MIXER X FILTER X CLEAN TIME**
5. When that air valve turns off, the material is allowed to fall into the mixer before the next filter is cleaned. The time value for this is based on the **MIXER X FILTER X SETTLE TIME**.
6. When that timer times out, the second filter is cleaned. This cycle of cleaning all 3 filters in each particle collector is repeated based on the value in the **MIXER X FILTER CLEAN CYCLES**

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IF THE PARTICLE COLLECTOR IS STOPPED BECAUSE WATER IS BEING ADDED TO THE MIXER, THE CLEANING CYCLE OF THE FILTERS WILL ONLY HAPPEN ONCE REGARDLESS OF HOW MANY ARE LISTED IN THE HIDDEN SCREEN.



THE COLLECTOR SHOULD BE SET UP TO RUN ONLY LONG ENOUGH TO PULL ENOUGH AIR THROUGH THE FILTERS TO HELP KEEP THE DUST TO A MINIMUM.



IF THE FILTERS BECOME PLUGGED BECAUSE OF MOISTURE, THEY CAN BE DRIED AND CAREFULLY CLEANED. IT IS RECOMMENDED TO HAVE A SPARE SET OF FILTERS IN STOCK.

DIVERTER VALVE

On multiple mixer dispensers a diverter valve is used to divert the color to one of several mixers after it leaves the TRANSFER VESSEL.

Different types of diverters are used on the **AEROGRAN™** dispenser to accomplish this. The diverters look different in appearance and use different types of sealing methods when shifting between mixers however, they all require the same basic time values to perform correctly.

These time values can be found in the HIDDEN SCREEN.

For more information on the NUCON diverter look in the instruction manual from NUCON for adjustment of the valve.



ALL MULTIPLE-MIXER SOFTWARE PACKAGES INCLUDE SOFTWARE AND HARDWARE INPUTS/OUTPUTS FOR A THREE-WAY DIVERTER. IF ONLY USING A TWO-WAY DIVERTER, THE OPERATOR WILL SEE AN ERROR DISPLAYED ON THE SCREEN IF THE THIRD MIXER IS NOT USED.

A white rectangular sign with a red border and the word "IMPORTANT" written in black, slanted upwards to the right.

IMPORTANT

THE DIVERTER VALVE IS NORMALLY MOUNTED ON THE DISPENSER APPROXIMATELY THREE TO FIVE FEET FROM THE CONVEYING VESSEL. THIS IS DONE TO HELP ELIMINATE THE POSSIBILITY OF CROSS CONTAMINATION OF COLOR BETWEEN BATCHES IN THE DISCHARGE HOSE.

REMOVABLE HOPPER

As an option, a REMOVABLE HOPPER can be used in place of a BIG BAG holder.

This is used when the operator wants to use different colors in the same SILO at different times. The hopper holds the contents of one super sack. It is set in place of the big bag rack on top of the dispenser frame. The operator, using a selector switch, drops the color into the surge hopper. When the switch is manually turned on, a slide gate opens on the bottom of the hopper and a small vibrator starts to assist the dropping color. The operator has to be careful not to over fill the surge hopper.



THE OPERATOR SHOULD ONLY DROP ENOUGH COLOR INTO THE SURGE HOPPER FOR THE PRESENT BATCH. ANY EXCESS COLOR WILL HAVE TO BE REMOVED BY HAND, OR SENT THROUGH THE SYSTEM TO THE MIXER TO CLEAR THE SILO FOR THE NEXT COLOR.

BIG BAG RACKS

The big bag racks and hangers that were shipped with the dispenser were built to hold the size of big bag /super sack that color was shipped in when the dispenser was built. Color suppliers sometime change the size of the bags they ship. Eagle Engineering can assist in determining the correct frame and hanger that is required.

RECOMMENDED SPARE PARTS

The **AEROGRAN™** dispenser is designed to provide reliable performance for millions of pounds of production. It is, however, a mechanical piece of equipment that will eventually require some replacement of parts. Some components of the dispenser will wear out due to the abrasive properties of the color being used. It is for this reason that the following list of parts should be kept on hand.



EAGLE ENGINEERING NORMALLY STOCKS ALL CRITICAL COMPONENTS FOR THE DISPENSER AND CAN SHIP THEM OUT THE DAY THE ORDER IS PLACED.

The parts on the list on the following page are used on all dispensers. It is a general list and does not include parts for options such as diverter valves. Please call Eagle Engineering for assistance.

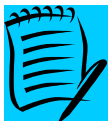
Please include the serial number and model number/job number when ordering parts. For information on how to find these numbers, refer to the [SERIAL / MODEL NUMBER](#) pages in this manual.



WHEN ORDERING PARTS, PLEASE INCLUDE THE TOTAL WEIGHT DISPENSED VALUE FROM THE MATERIAL USAGE SCREEN REGARDLESS IF IT IS UNDER WARRANTY OR NOT. SOME PARTS ARE CONSUMABLES, AND WILL BE REVIEWED PER OCCURRENCE.

TOTAL WEIGHT DISPENSED

Displays how many total pounds of material have been cycled through the dispenser in AUTO MODE. The operator cannot reset this number. It is used to determine when maintenance procedures are to be performed.



THE TOTAL WEIGHT DISPENSED VALUE WAS ADDED TO ALL DISPENSER SOFTWARE PACKAGES SHIPPED AFTER JULY 2000.

SPARE PARTS LIST

Description	Part Number		Quantity
SENSOR	1007733	RECOMMENDED	1
END GATE CYLINDER	1007847	RECOMMENDED	1
TRANSFER TUBE VIBRATOR	1007764	RECOMMENDED	1
VIBRATOR STRAP	1007760	RECOMMENDED	2
3/4" AIR SOLENOID	1008010	RECOMMENDED	1
1/8" AIR SOLENOID	1006783	RECOMMENDED	1
TRANSFER TUBE BOOT 3 1/2"	1008012	RECOMMENDED	1
PRESSURE SENSOR	1008011	RECOMMENDED	1
CONE VALVE SENSOR	1007877	RECOMMENDED	1
CONE VALVE CYLINDER	1007876	RECOMMENDED	1
1/8" AIR LINE TUBING	1006446	RECOMMENDED	25'
2" DISCHARGE HOSE "ARTRAC"	1008035	RECOMMENDED	100'
PARTICLE COLLECTOR FILTER	1007705	RECOMMENDED	3
WIKA PRESSURE CONTROL GAUGE	1008013	OPTIONAL	1
WEIGH HOPPER FILTER BREATHER	1008171	RECOMMENDED	1
A/B SCALE CARD	1006675	OPTIONAL	1
SCALE ASSEMBLY	1007990	OPTIONAL	1
ANALOG TO DIGITAL CARD	1006481	OPTIONAL	1
16 POINT INPUT CARD	1006553	OPTIONAL	1
8 POINT TRIAC OUTPUT	1006554	OPTIONAL	1
8 POINT RELAY OUTPUT	1006674	OPTIONAL	1

PREVENTIVE MAINTENANCE



REFERENCE TO THE AMOUNT OF COLOR IS MEANT TO BE A STARTING POINT. THE POINT AT WHICH PREVENTIVE MAINTENANCE MUST BE PERFORMED WILL VARY WITH PLANT CONDITIONS AND PRODUCTION REQUIREMENTS.

DAILY PM

1. Check air dryer for proper operation.
2. Inspect discharge hose at venturi outlet for interference with scale.
3. Visually inspect rubber boot between transfer tube and surge hopper for leakage.
4. Visually inspect rubber boot above weigh hopper and transfer vessel for signs of leakage.
5. Remove plant dust buildup on weigh hopper and transfer vessel assembly.

WEEKLY PM 10,000 pounds of color

1. Remove rubber boot above the weigh hopper.
2. Visually inspect the cone valve and the Teflon walls of the weigh hopper for build-up of color.
3. If color is present, turn off the pressure feeding the dispenser.
4. Go to the Manual Screen and open and close the cone valve until all the air is drained from the dispenser and the cone valve stays open.
5. Scrape off any build-up of color using a flexible piece of plastic.
6. The small amount of color will fall into the transfer vessel and can typically be sent to the mixer prior to cleaning of the mixer.
7. Replace the rubber boot and zero the scale prior to start of production.
8. Check particle collector for proper operation.

MONTHLY PM or EVERY 50,000 pounds of color.

1. Check and tighten all mounting bolts on the vibration straps and transfer tube vibrators.
2. Check TUBE END GATE air fittings for tightness. (The air fittings mount the cylinder to the transfer tube.) It is normal for there to be up to 1/4" of play in the mounting. In excess of 1/4", the tube should be replaced.
3. Remove the breather filter above the weigh hopper and clean it with dry air.
4. Check filters on particle collector and clean as needed.
5. Grease bearings on particle collector motor.

PREVENTIVE MAINTENANCE

(Continued)

YEARLY PM

1. Clean all vibration transfer tubes, weigh hopper, and transfer vessel.
 - A. Close off slide gate above transfer tube and surge hopper.
 - B. Remove air-lines from vibrator and tube end gate.
 - C. Remove the band clamp from the gum tubing at the point where it connects to the vibration tube. At this point color will fall out.
 - D. Remove mounting bolts holding the tube to the vibration straps.
 - E. Carefully slide the tube out of the rubber boot above the weigh hopper.
 - F. Hold the tube over a container and empty the color.
 - G. Attach a brush or a rag to a rod long enough to reach the end of the tube.
 - H. Clean out the inside of the tube using the rod. It maybe be necessary to tap the bottom side of the tube using a rubber mallet. Be careful not to dent the tube - this will affect the flow of the color when reassembled.
 - I. Clean out all the tubes.
2. Remove the weigh hopper/transfer vessel from the scale and disassemble. Clean Teflon coating with a flexible piece of plastic.
3. Inspect cone valve and cone valve cylinder for wear.
4. Inspect butterfly valve (discharge valve) seals for wear.
5. NUCON diverter valve.
 - A. As per the manual provided by NUCON, disassemble and check seals for wear or leakage.
6. Replace filters in particle collector.
7. Check calibration of scale.
8. Check air pressure sensors for proper calibration. (Plant air 60 psi, pressure in vessel, 3-4 psi.)

EVERY 2 YEARS PM

1. Replace the battery in the Allen Bradley SCL 500 processor.

ADJUSTING CAPACITIVE SENSORS

Remove the clear plastic screw on the end of the sensor. Using a small flat tip screwdriver turn the screw inside the hole clockwise to increase the sensitivity. The red led light will be on when material is present.

TROUBLE SHOOTING GUIDE

Problem	Solution
No Power at control Panel.	<ol style="list-style-type: none"> 1. Main 20 amp disconnect breaker. 2. 10 amp secondary breaker.
No Power at touch screen.	<ol style="list-style-type: none"> 1. Switch on back of 120-volt power screen. 2. Breaker feeding 24-volt dc power supply.
Touch screen has power, but has nothing on it.	<ol style="list-style-type: none"> 1. Watch screen on power up for error messages. Call supplier.
Red text message across bottom of touch screen.	<ol style="list-style-type: none"> 1. Cable between touch screen and PLC not connected. 2. PLC not operating
PLC not powered	<ol style="list-style-type: none"> 1. Fuse on PLC power supply.
Indicator light on individual PLC input / output not working.	<ol style="list-style-type: none"> 1. Loose wire. 2. Remove card and reseat in PLC rack. 3. MCR is not reset.
Touch screen has program running, but no data is shown in the blue boxes.	<ol style="list-style-type: none"> 1. PLC program in not running. 2. PLC program is missing.
Cannot enter values into touch screen.	<ol style="list-style-type: none"> 1. Enable key switch on control panel. 2. Key switch on 504 processor is in program position.
Program loses data values after dispenser is powered down.	<ol style="list-style-type: none"> 1. EPROM chip is in PLC. Remove chip.
When button on touch screen is pressed, nothing happens.	<ol style="list-style-type: none"> 1. MCR is not reset. 2. Screen calibration may be required, call supplier.
Pop up KEY PAD on touch screen in covering text.	<ol style="list-style-type: none"> 1. Touch white button on top of keypad and slide over on screen using a finger.

TROUBLE SHOOTING GUIDE

(Continued)

<p>Scale weight not responding on touch screen.</p>	<ol style="list-style-type: none"> 1. Inspect area around scale and under discharge hose for obstructions. 2. Inspect all scale connections in junction box, in the control panel, from SP100 A to D card to PLC input. 3. Fuse on SP100 card. 4. Insure that the 4 dipswitches located inside the PLC analog card are set to the off position. 5. Verify that dipswitches on SP100 board are set correctly. (See scale calibration in this manual) 6. Using a multi-meter check for DC voltage between 0 -10 volts at terminals 9 & 10 on SP100 board. 7. Using a multi-meter check for DC voltage between 0 -10 volts at terminals on PLC analog card.
<p>MCR IS NOT RESET or MCR WILL NOT RESET</p>	<ol style="list-style-type: none"> 1. The E-STOP on the control panel is depressed. 2. A second E-STOP is depressed.
<p>DIVERTER VALVE NOT IN CORRECT POSITION</p>	<ol style="list-style-type: none"> 1. Low air pressure to diverter. 2. Sensor out of adjustment 3. Diverter has material filling the area between plates. 4. Failed air inflated seal on diverter.
<p>Color is diverted to wrong mixer</p>	<ol style="list-style-type: none"> 1. Sensor on diverter valve is shorted and is sending a signal that the diverter is in both positions at the same time. 2. Discharge hose is connected to the wrong mixer. 3. Color was discharged in MANUAL MODE to the wrong mixer.
<p>BLEND STUCK IN WEIGH HOPPER</p> <p>Capacitive probe is turned on, and sensor in the bottom of CONVEYING VESSEL is looking for material to fall during the charge cycle.</p>	<ol style="list-style-type: none"> 1. Loading of color is less than the sensor will read. Turn off Capacitive Probe in OPTIONS screen. 2. Increase CONE VALVE OPEN TIME.

TROUBLE SHOOTING GUIDE

(Continued)

Problem	Solution
<p>Scale weight is erratic.</p>	<ol style="list-style-type: none"> 1. Inspect area around scale for obstructions. 2. Inspect all scale connections, in junction box, in panel, from SP100 A to D card to PLC input. 3. Fuse on SP100 card. 4. Insure that the 4 dipswitches located inside the PLC analog card are set to the off position. 5. Verify that dipswitches on SP100 board are set correctly. (See scale calibration in this manual) 6. Use a multi-meter to check the DC voltage between 0 -10 volts at terminals 9 & 10 on SP100 board. 7. Using a multi-meter check for DC voltage between 0 -10 volts at terminals on PLC analog card. 8. Insure that scale, and vessel assembly are level. 9. Insure that air-lines are not binding. 10. Insure that discharge hose is able to move freely. 11. Eliminate vibration as much as possible. 12. If vibration cannot be avoided, adjust the damping on the SP100 card. (See manufactures literature) 13. Increase the values for SLOW PREAMP. 14. Possible obstruction in linear vibration tube. Clean out tube. 15. Color is not consistent in size or weight, possibly has clumps in it. 16. Tube end gate for that tube has fallen off. 17. The breather filter on top of the WEIGHT HOPPER is plugged, creating a downward pressure on the scale. Clean or replace the filter cartridge.
<p>BLEND STUCK IN CONVEYING VESSEL</p> <p>Capacitive probe is turned on, and sensor in the bottom of CONVEYING VESSEL is looking for material at the end of the discharge cycle.</p>	<ol style="list-style-type: none"> 1. Increase discharge time. 2. Increase number of cleaning cycles. 3. Clean end of sensor.

TROUBLE SHOOTING GUIDE

(Continued)

Problem	Solution
<p>EMPTY VESSEL WEIGHT BELOW TOLERANCE</p>	<p>The scale is reading a negative because;</p> <ol style="list-style-type: none"> 1. Something is pushing up on the scale. 2. The CONVEYING VESSEL and WEIGH HOPPER were cleaned or adjusted. 3. The tension on the air-lines or discharge hose decreased. 4. The scale was tarred out in the SCALE CALIBRATION screen because the scale was OVER TOLERANCE on the previous batch.
<p>EMPTY VESSEL WEIGHT ABOVE TOLERANCE</p>	<ol style="list-style-type: none"> 1. Material is left in the WEIGH HOPPER or in the CONVEYING VESSEL from the previous batch. 2. The tension on the discharge hose or air-lines has increased. 3. Material is slowly building up by sticking to the sides of the WEIGH HOPPER. 4. Material is slowly building up by sticking to the sides of the CONVEYING VESSEL
<p>CONVEYING VESSEL – AIR PRESSURE IN</p> <p>Air pressure is present in the CONVEYING VESSEL.</p>	<ol style="list-style-type: none"> 1. Conveying vessel air pressure sensor is adjusted too low. (Should be at 3-5 psi.) 2. Air solenoid that pressurizes the vessel is leaking air.
<p>CONVEYING VESSEL – MATERIAL REMAINING</p> <p>The capacitive probe is turned on in the OPTIONS screen and is sensing material in the bottom of the CONVEYING VESSEL.</p>	<ol style="list-style-type: none"> 1. Increase discharge time. 2. Increase number of cleaning cycles. 3. Clean off build-up on end of sensor.
<p>VESSEL OVER MAX WEIGHT</p> <p>The combined weight of a product has reached the weight value set in the SET-UP table</p>	<ol style="list-style-type: none"> 1. Decrease the loading of the batch size.

TROUBLE SHOOTING GUIDE

(Continued)

Problem	Solution
<p>PLANT AIR SUPPLY AIR PRESSURE LOW</p> <p>The air supply pressure feeding the AEROGRAN™ is lower than what is required to run it properly.</p>	<ol style="list-style-type: none"> 1. Turn on air compressor. 2. Incoming air filter dirty. 3. Air line piping feeding the dispenser is too small. 4. Storage tank for dispenser is too small. 5. Air pressure sensor is set too low giving false error. 6. Air flow through air dryer is too small.
<p>MATERIAL <u>X</u> SUPPLY LOW</p> <p>The SILO SUPPLY LEVELS screen is turned on and is at minimum weight.</p>	<ol style="list-style-type: none"> 1. Go to the SILO SUPPLY LEVELS screen. Touch the RESET button on the right hand side of the screen for the SILO that is low. The alarm will now stop. Refill the storage container with material.
<p>SILO <u>X</u> LOW ON MATERIAL</p> <p>The sensor in the surge hopper is not sensing any material.</p>	<ol style="list-style-type: none"> 1. Refill the big bag supply. 2. Clean the end of a sensor if receiving a false signal.
<p>PARTICLE COLLECTOR NOT STARTED</p>	<ol style="list-style-type: none"> 1. Circuit breaker for particle collector. 2. Overload tripped. 3. No 3-phase power. 4. MCR is disabled.
<p>CONE VALVE DID NOT CLOSE</p>	<ol style="list-style-type: none"> 1. Look for obstruction of valve closing in the bottom of the weigh hopper. 2. Sensor has changed location on the Cone Valve air cylinder. 3. Bad sensor
<p>DISCHARGE VALVE DID NOT CLOSE</p>	<ol style="list-style-type: none"> 1. Look for obstruction of valve closing in the bottom of the conveying vessel. 2. Sensor out of adjustment. 3. Bad sensor.

TROUBLE SHOOTING GUIDE

(Continued)

Problem	Solution
<p>FILL TIME HAS BEEN EXCEEDED</p> <p>In the HIDDEN SCREEN a time valve to allow all the material for 1 silo to be weighed.</p>	<ol style="list-style-type: none"> 1. No material in surge hopper. 2. Level sensor in surge hopper for that silo is dirty. 3. Build up of material in LINEAR VIBRATION TUBE. 4. Linear vibrator running slowly. 5. Tube end gate (flapper valve) not opening all the way. 6. SLOW PRACT set too high. 7. SLOW FILL ONLY WEIGHT in HIDDEN SCREEN set too high. 8. Material is possibly damp, clumped, powdery. 9. Material is bridging in big bag, or surge hopper. 10. Incoming air pressure has decreased, slowing the speed of the linear vibrators.
<p>MATERIAL X WEIGHT ABOVE TOLERANCE</p> <p>The weight for the silo that is weighing is above the tolerance that was set for the PRODUCT.</p>	<ol style="list-style-type: none"> 1. SLOW FILL OPEN TIME in SET-UP TABLE screen for that silo is set too high. 2. SLOW FILL is starting too late. 3. Material is clumped. 4. SLOW FILL ONLY WEIGHT in HIDDEN SCREEN set too low. 5. Touch the TOLERANCE ACCEPT button on the AUTO screen and continue. 6. Increase the tolerance.
<p>MATERIAL X WEIGHT BELOW TOLERANCE</p> <p>The weight for the silo that is weighing is below the tolerance that was set for the PRODUCT .</p>	<ol style="list-style-type: none"> 1. The breather filter on top of the WEIGHT HOPPER is plugged, creating a downward pressure on the scale. Clean or replace the filter cartridge 2. Touch the TOLERANCE ACCEPT button on the AUTO screen and continue. 3. Increase the tolerance

TROUBLE SHOOTING GUIDE

(Continued)

Problem	Solution
Particles coming from weigh hopper while charging or discharging.	<ol style="list-style-type: none"> 1. Rubber boot or the seal material between the WEIGH HOPPER and the frame assembly is leaking. 2. The breather filter on top of the WEIGH HOPPER is plugged. 3. The cone valve is not sealing during the discharge cycle. 4. The air pressure coming in to the CONVEYING VESSEL is above 40 psi causing the pressure relief valve to open.
Excessive dust around mixer.	<ol style="list-style-type: none"> 1. Particle collector not running. 2. Particle collector filters plugged. 3. Material is built-up in the section of hose between the mixer and the collector. 4. The outlet of the collector is closed off too much. 5. The openings in the mixer are greater than the 1000 cfm blower is capable of overpowering. 6. The time that the collector is running is set too low in the SET-UP TABLE screen.
Excessive dust around diverter valve.	<ol style="list-style-type: none"> 1. Bad or worn seal. 2. Hole in discharge hose.
Particle collector filters plugging.	<ol style="list-style-type: none"> 1. Breakers feeding air solenoids tripped. 2. Filters being cleaned with wet air. 3. Air supply pressure not at 60 psi. 4. Particle collector mounted too close to water outlet, inside of mixer. 5. Input to dispenser when mixer water valve is coming on is not getting the signal. 6. Increase number of FILTER CLEAN CYCLES in the HIDDEN SCREEN. 7. Increase the FILTER CLEAN TIME for each filter.

TROUBLE SHOOTING GUIDE

(Continued)

Problem	Solution
Plugging of discharge hose.	<ol style="list-style-type: none"> 1. Low air pressure or low volume of stored air. 2. WIKA valve high limit set too high is used. 3. Vessel low-pressure regulator set too high. 4. Dirty air. 5. Length of discharge hose exceeds suggested limit. 6. Vertical height of discharge hose exceeds suggested limit. 7. Discharge hose has 90-degree radius of less than 4 feet. 8. Discharge air pressure regulator is set too low. 9. Discharge hose has a vertical rise other than 90 degrees. 10. Material being discharged has too many fines in it. (powder) 11. The point at which the hose is attached to the mixer is choked down because of a buildup of moist material. 12. Discharge time set too short. 13. Increase number of cleaning cycles. 14. Hose is fastened down in a manner that does not allow it to move like a snake.
Slow fill starts too early.	<ol style="list-style-type: none"> 1. The value for SLOW FILL ONLY WEIGHT in the HIDDEN SCREEN is set too high. 2. The breather filter on top of the WEIGHT HOPPER is plugged, creating a downward pressure on the scale. Clean or replace the filter cartridge.
The length of the discharge cycle has increased.	<ol style="list-style-type: none"> 1. The discharge air pressure is set too low. 2. Blockage in discharge hose. 3. The capacitive sensor in the conveying vessel has a build up on it. 4. There is a blockage in the conveying vessel. 5. The discharge valve is not opening all the way.

**SECTION IX
ENGINEERING DRAWINGS**

SECTION X

MANUFACTURERS INFORMATION