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USERGUIDE
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Gravicon

Gravimetric Blender

VFD Software Version 3.06

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

This manual is out-of-date and is provided only for its technical information, data and capacities.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containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

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FUNCTIONAL DESCRIPTION

The Gravicon is a microprocessor controlled, CIM compatible, up to four-component Gravimetric Blender designed for central material blending. This blender is extremely easy to set up and offers reliable inventory management while accurately maintaining your material blend.

Gravicon features include:

An easy-to-operate control with a 2x20 character display that guides the operator through all the blending functions.

Continuous blending...Unlike batch-type blenders, the Gravicon automatically adjusts the throughput of all ingredients to match and maintain the rate of material usage.

Material Usage Totals...The Gravicon makes inventory control simple and reliable by providing a running total of material usage for each ingredient as well as the total blender throughput.

APPLICABLE MATERIALS

1. Powders (PVC, PP, PE, ABS)
2. Granular (LLDPE)
3. Pelletized Resins
4. Regrinds
5. Additives (Pelletized/free flowing powders)
   a. Color concentrate (no dry color)
   b. Fire retardants
   c. U/V inhibitors
   d. Stabilizers
   e. Processing/Flow Aids

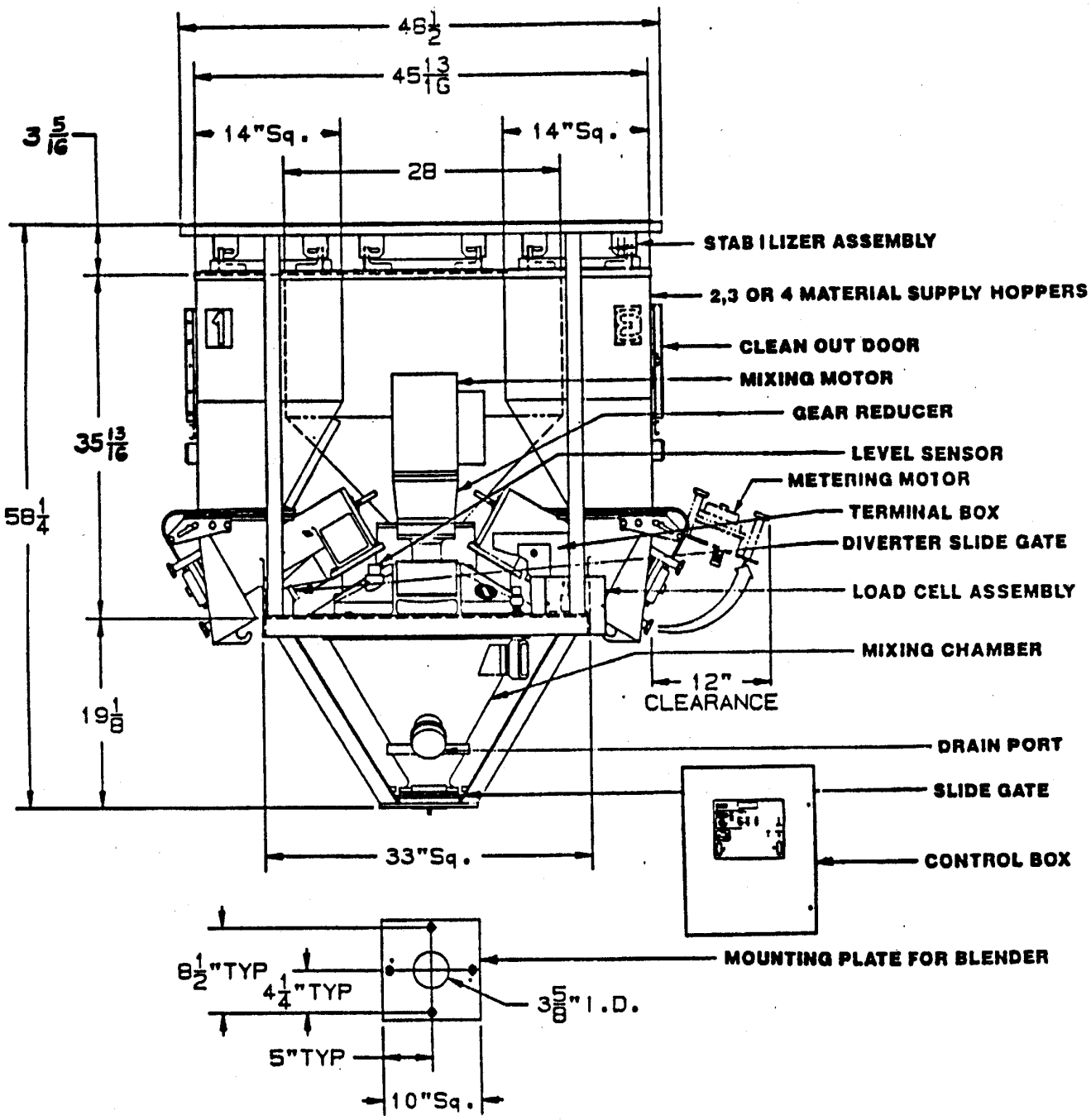


Figure 1 - THE BLENDER ASSEMBLY

BLENDER SPECIFICATIONS

Voltage:	115 VAC, Single Phase supply @ 15 Amps
Mixer Motor:	1/2 HP TEFC, 115 VAC, 1 ϕ, 8.2 Full Load Amps, 1750 RPM
Mixer Gear Reducer:	35:1 Ratio, 50 RPM Output
Metering Auger Motors:	0-24 VDC, 45 Watts, 1/15 HP, 2.8 Amps, 0-120 RPM Output
Supply Hopper Capacity:	2 cu ft (Std.), 3 cu ft (Opt.)
Mixing Chamber Capacity:	1.5 cu ft
Shipping Weight:	800 Lbs.
Compressed Air Supply:	80 PSI (We suggest using a minimum 3/4" pipe supply line with 3/8" ID flexible hose to individual connections)
Load Cells:	75 Kg, 100 Kg
Metering Auger Selection Table:	See *Chapter 3 - Selecting Auger Sizes*

BLENDER FEATURES

The Gravicon is designed to allow for easy setup as well as easy cleaning and maintenance. The following are some of the convenient standard features you'll find built into this blender.

Interchangeable Auger/Sleeve Combinations

Auger/Sleeve Combinations are located in the auger housings (See Figure 2).

The sleeve slides into the auger housing from the bearing cap end and is locked into position by tightening the thumbscrew located on the side of the auger housing.

The auger is installed through the sleeve center bore and should engage the drive coupling at the end of the auger housing.

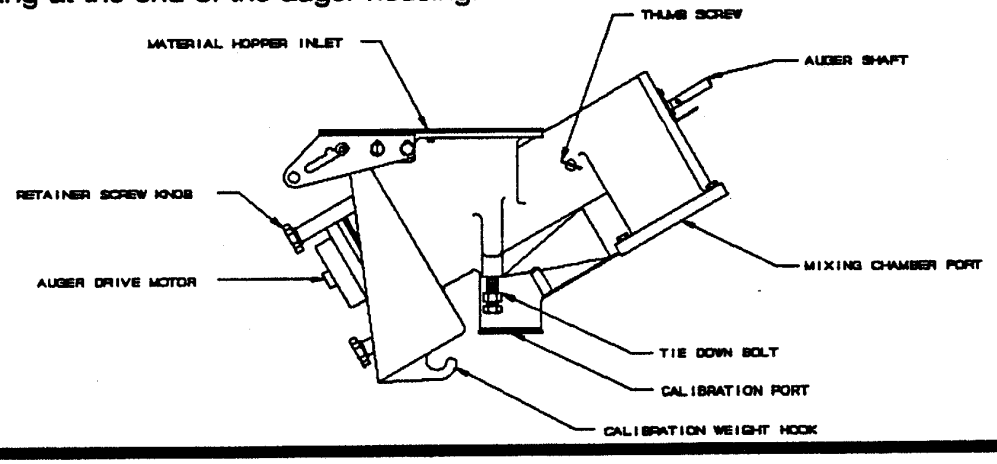


Figure 2 - AUGER HOUSING

Each auger should be installed with a properly sized sleeve. As a general rule of thumb,

PELLETS require a 3/8" clearance
POWDERS require a 1/8" clearance

where CLEARANCE is measured as (sleeve ID) minus (auger OD).

Auger sizes vary to cover a wide range of throughput rates. See *Chapter 3 - Selecting Auger Sizes* for available auger sizes and their maximum rates.

For proper removal and installation procedures, please see *Chapter 3 - Auger/Sleeve Removal and Replacement*.

BLENDER FEATURES (cont.)

The Calibration Sample Chute

Each auger housing on your blender is equipped with an internal calibration slide gate that can be used to divert your auger fed material away from the mixing chamber and to the calibration sample chute.

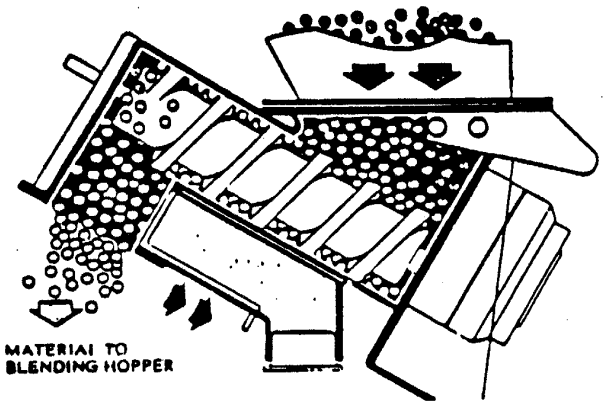
The calibration slide gate is used when performing a volumetric calibration of each auger position needed for a recipe. During the calibration, materials metered through the calibration sample chute can be individually collected by the operator, and returned to the storage containers for later use.

The calibration slide gate has two functional positions, both shown in Figure 3.

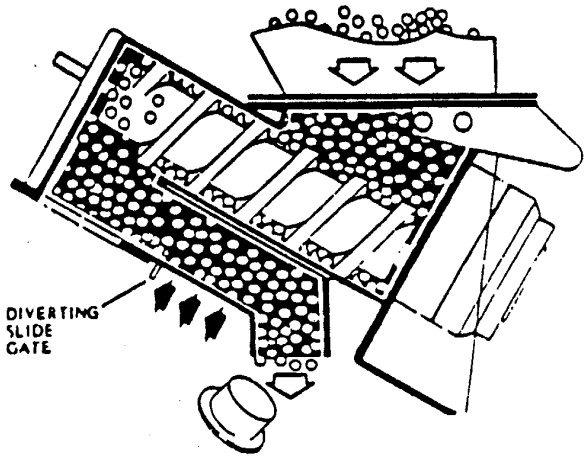
The RUN POSITION allows material to fall directly from the auger into the mixing chamber. Select the Run Position by pulling the slide gate tabs until the slide gate reaches its fully downward position.

The CALIBRATE POSITION diverts material away from the mixing chamber and through the calibration sample chute. Select the Calibrate Position by pushing the slide gate tabs until the slide gate reaches its fully upward position.

NOTE: If your blender is equipped with plastic plugs in the calibration sample ports, you must remove them before running the blender with the calibration slide gate in the Calibrate Position.



NORMAL METERING CONFIGURATION
RUN POSITION



MATERIAL DIVERTED FOR CALIBRATION
CALIBRATE POSITION

Figure 3 - CALIBRATION DIVERTER CHUTE

BLENDER FEATURES (cont.)

Hopper Clean-Out Doors

Before opening the supply hopper clean-out doors, check that the Power and Mixer Motor On/Off Rocker Switches are in the OFF position, and that the power is disconnected from the control box. As a safety feature, there is a magnetic interlock for each clean out door which prevents the blender from running when any door is open.

If a door is open while the control is "ON", the control will alarm "Interlock Open".

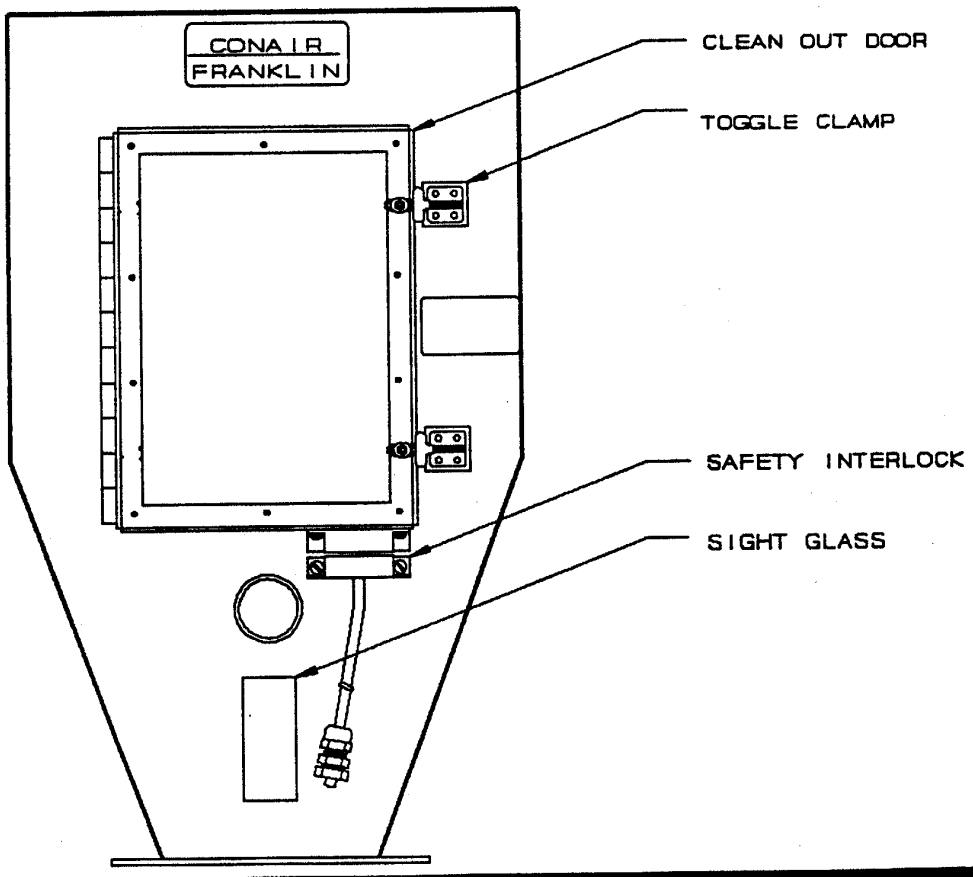


Figure 4 - HOPPER CLEAN-OUT DOOR

BLENDER FEATURES (CONT.)

Removable Mixing Chamber

1. Disconnect power to mixer motor.
2. Remove small lower band clamp (A)
3. Tighten two thumb screws (B) - this will lower the seal plate (C)
4. Aluminum cast slide gate (D) can now be removed.
5. Remove large upper band clamp.
6. Lower the mixing chamber to allow access to the agitator.
7. Turn agitator counter-clockwise (as loosening a bolt)
8. Remove agitator and then mixing chamber.

To assemble, reverse above procedure.

CAUTION: NEVER open the mixing chamber door without first pushing the Mixer Motor rocker switch on the Blender Control Box to the "OFF" position.

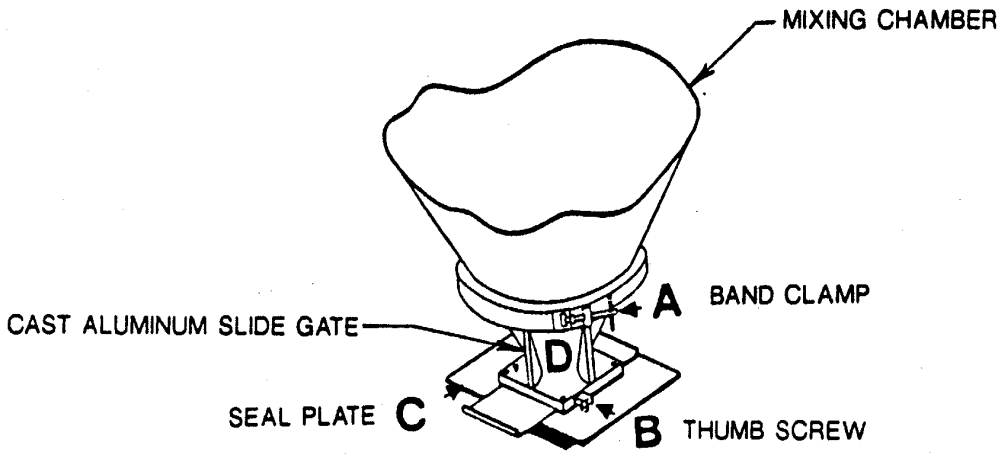


Figure 5 - MIXING CHAMBER BOTTOM

INSTALLATION

- Machine Mounting
- Central Blending Mounting
- Control Box Mounting/Electrical
- Loader Installation
  - -Mounting
  - -Wiring
  - -Air Requirements
- Load Cell Precautions
- Shipping Support

This section will describe the installation procedure for the blender as well as for its integral parts.

MACHINING MOUNTING

This blender is designed for mounting directly to the throat of the injection molding machine or extruder. The mounting plate has four holes for 1/2 " socket head or hex bolts An adapter plate with holes matching the blender and your processing machine should be fabricated. This plate should be .625 thick or greater and should be bolted to the machine throat before mounting the blender. The blender mounting plate bolt hole pattern is square, so the blender can be rotated as needed to position the mixing chamber drain port to the desired location.

Lifting straps may be used to lower the blender onto the processing machine. Be sure to avoid wires and hoses when slinging the blender for movement. Use the lower section of the metering housings as a grip point for the straps.

If extreme machine vibration or screw break action occurs in your process, it may be necessary to stabilize the blender with auxiliary bracing. You, the customer, are responsible for the integrity of the final installation.

CENTRAL BLENDING MOUNTING

For central blending applications, the blender is mounted on a fill stand or surge bin. To provide for adequate residence time within the mixing chamber, the blended material is metered from the blender through a discharge auger bolted between the receiving bin or stand and the blender. The location of the bin or gaylord fill stand should be central to your operation and provide optimum access for lift truck traffic (gaylord fill) or piping from the distribution box (surge bin).

When installing the system, first bolt the discharge auger assembly to the surge bin or fill stand. Then mount the blender directly to the discharge auger assembly. A matching bolt pattern is provided and no adapter plate is necessary. Be sure to carefully consider the orientation of all components for operation, cleanout, and service.

CONTROL BOX MOUNTING/ELECTRICAL

120 Volt/Single Phase/15 Amp grounded service is required. Be sure to follow all local and national electrical codes.

MACHINE MOUNTING - Mount the main control on the vibration-free surface at machine operator level. (Mounting the control on an injection machine or extruder is not recommended.) Fifteen feet of cable is provided with an amphenol connector on the control box. Circuit protection is provided in the main control enclosure by the two illuminated power switches labeled "Power On/Off" (15 amp), and "Mixer Motor On/Off" (12 amp).

CENTRAL BLENDING - Mount the additional rate auger control on a vibration-free surface within the 20-foot length of cables supplied with the discharge auger and bindicator(s). Close proximity to the main blender control is recommended.

LOADER INSTALLATION See Figure 6

Automatic Conveying Equipment can be used to convey and load pelletized materials, regrinds, and powders to the blender supply bins.

The blender control can operate two types of loaders: Selectronic and Integral Motor. The Selectronic loaders require a common vacuum source which can also be controlled by the blender.

MOUNTING - The loaders have a mounting flange that bolts to the loader mounting plate on the top of the blender frame. The loader should be oriented to allow for easy routing of the material lines. We strongly suggest using a flexible connection for the material and vacuum lines for ease of maintenance.

WIRING - The interconnecting wiring is accomplished easily through the blender's quick disconnect electrical fittings that mate to the loader's pre-wired terminal boxes, and a terminal strip in the blender control to signal the pump and dust collector.

AIR REQUIREMENTS - The air required (80 PSI) can be dropped to any one of the loaders' solenoid valves (located on the loader terminal boxes) then routed to the other loaders on the blender.

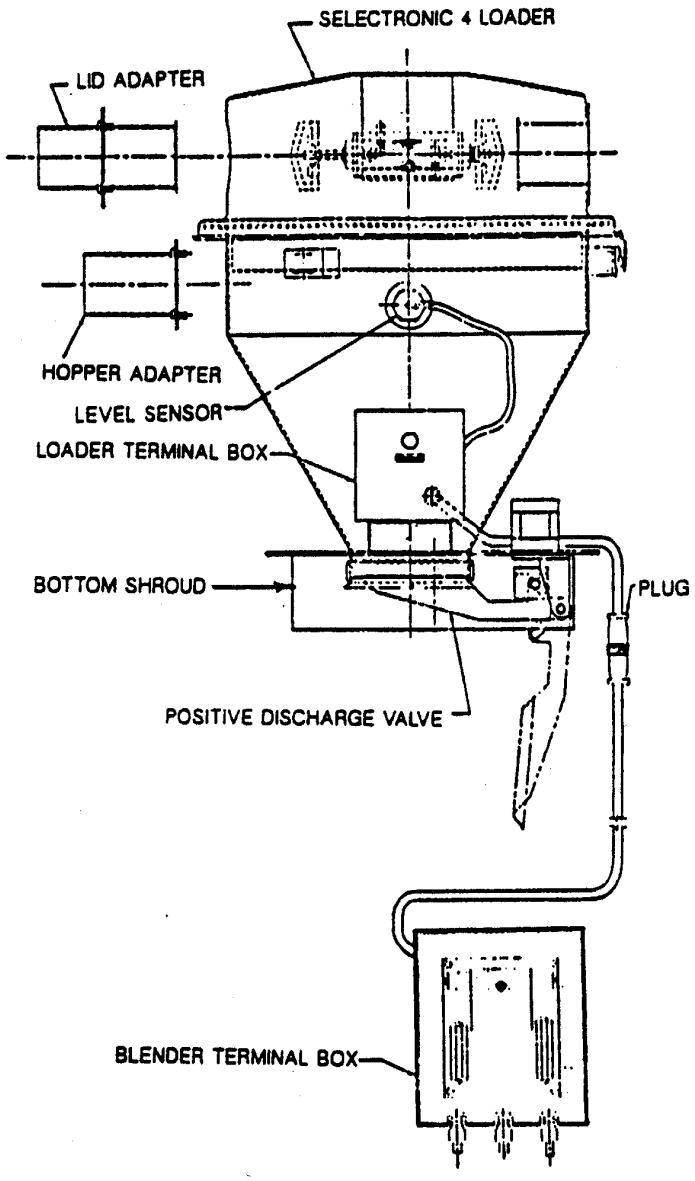


Figure 6 - LOADER

LOAD CELL PRECAUTIONS

The load cell is a precise electrical component that can be damaged by electrical noise. Therefore, it is recommended that no welding be done on or near the blender (common ground) without first removing the load cells from the blender.

Also, the load cells can be overloaded by as much as 300% without damage, but cannot be subjected to mechanical shocks or impacts. Care should be exercised as an impact vibration can travel from the source to the load cell through the mechanical contact points of the frame and auger housing.

Care should be taken with the load cell wires. They should be routed in a manner to prevent electrical noise or mechanical damage.

Also, the use of chemical cleaners is not recommended around the load cells as the chemicals can migrate into the protective coatings covering the load cell's electrical components and cause faulty electrical signals.

SHIPPING SUPPORT

During shipping, the blender supply hopper assemblies are supported both at the bottom, by a tie down bolt, and at the top, by the hopper guide rods and stabilizer assembly.

The tie down bolt is installed into the mixing chamber top plate and through the auger housing mounting plate as shown in FIGURE 7A.

The hopper guide rods are located on the top of the hopper assembly and extend through clearance holes in the stabilizer assembly as shown in FIGURE 7B.

The tie down bolt must be removed and reinstalled with a .020 overstop gap as shown in FIGURE 7A before operating the blender. For further information on hopper positioning and its importance to proper blender operation, see *Chapter 3 - Load Cell Mount & Stabilizer Assembly*.

When the blender is moved or shipped to another location, the tie down bolts must be removed and reinstalled into the mixing chamber top plate during relocation or shipment. If the load cells are still attached to their mount, the tie down bolts must be reinstalled finger tight to protect the load cells, which have a maximum vertical travel of .016" or approximately 1/8 of turn on the tie down bolt. If the load cells are removed from the mount, the tie down bolts can be tightened with a wrench. (See FIGURE 7A)

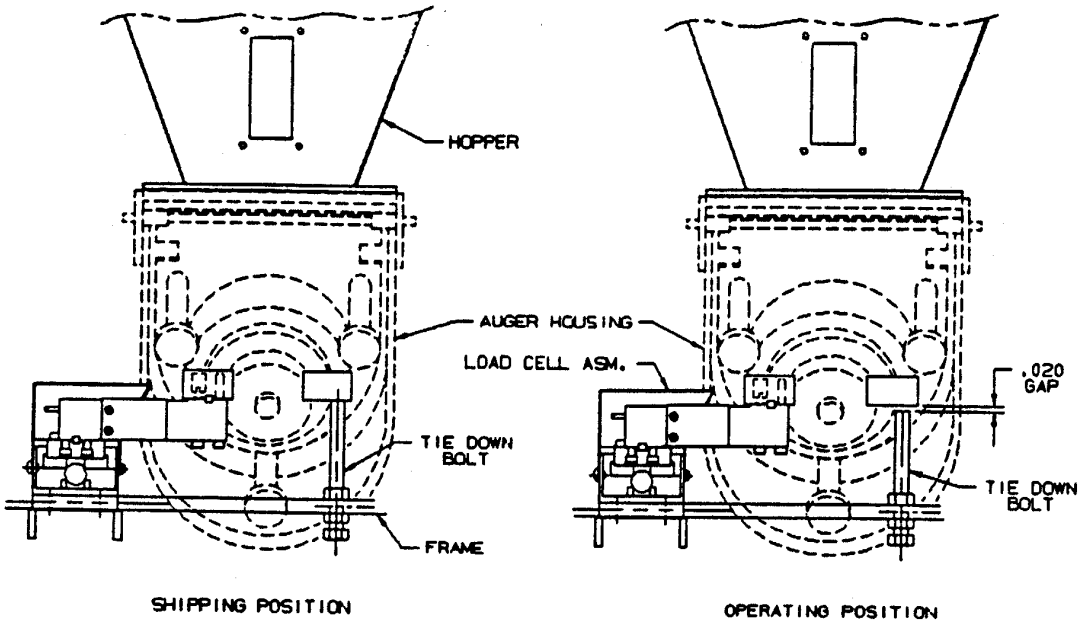


FIGURE 7A

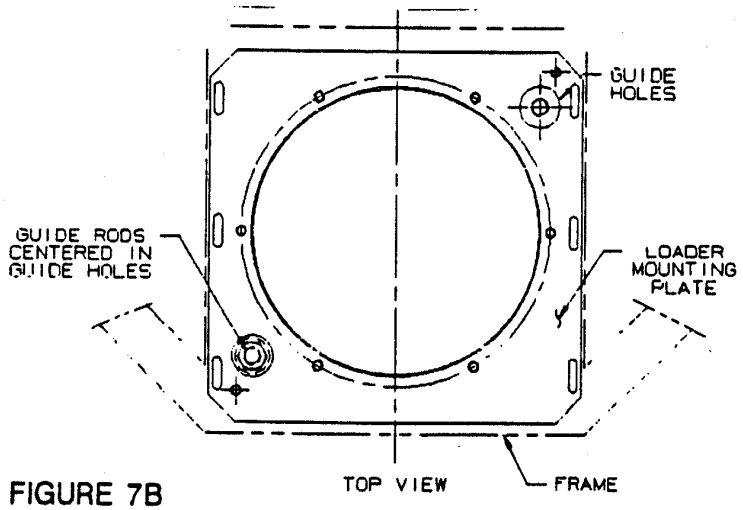


FIGURE 7B

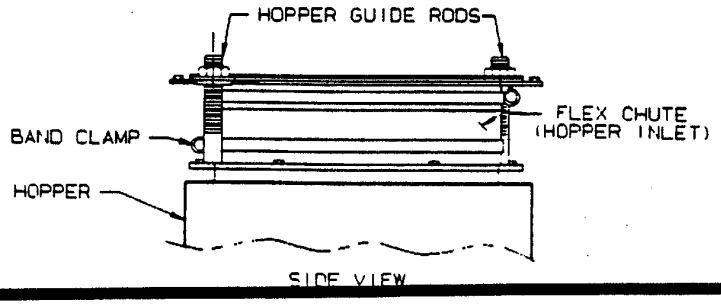


Figure 7

BLENDER SETUP

Auxiliary Alarm Hook-Up
Level Sensor Adjustment
Selecting Auger Sizes
Auger/Sleeve Removal and Replacement
Load Cell Mount & Stabilizer Assembly

AUXILIARY ALARM HOOK-UP

In addition to the audible and visual alarm signals provided with the Control Box, all Gravicon blenders are equipped with 115 VAC triac driven auxiliary alarm output for driving an external warning light, horn, or siren. The external alarm can be wired to the blender control box as follows:

Terminal #	Description
22	Alarm Signal (115 VAC)
2	Neutral
G	Earth Ground

NOTE: Alarm output is rated at 0.25 Amps maximum.

LEVEL SENSOR ADJUSTMENT (See Figure 8)

The blender mixing chamber can contain up to two capacitive proximity sensors located in the mixer top plate. These sensor(s) provide signals that enable the blender control to maintain a full level of material in the mixing chamber, independently of time or rate.

Before running any material through the mixing chamber:

1. Check the sensor's mounting and position - The mixer sensor(s) should be positioned so that its top is flush with its mounting hole as shown in FIGURE 8.

2. Adjust the sensor's sensitivity - Turn the trimpot clockwise until the LED energizes. Slowly turn the trimpot counterclockwise until the LED de-energizes. Turn the trimpot an additional 1/2 turn counterclockwise. Be sure to adjust both mixing chamber sensors.

3. Check the adjustment - To check the sensor adjustment, first hold your hand approximately 1/2" from the sensor tip and the LED should energize. Next, reinstall the mixing chamber door and turn the mixer motor on to make certain the sensor is not energized by the rotating agitator.

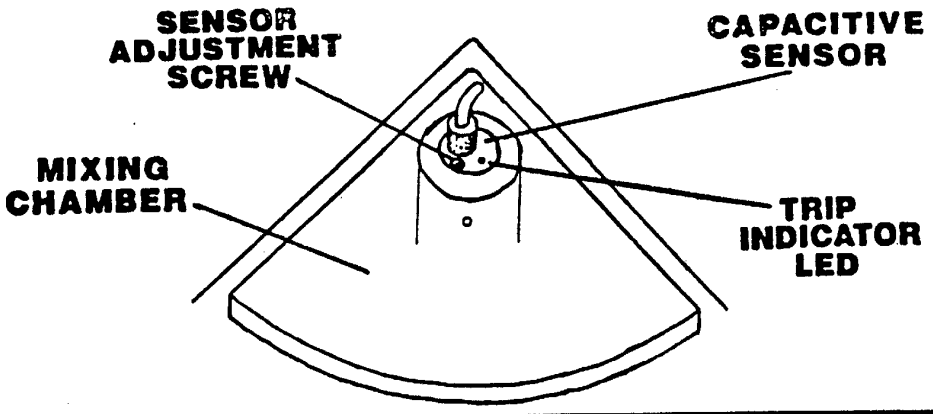


Figure 8 - THE MIXER LEVEL SENSOR

SELECTING AUGER SIZES

The smallest augers capable of maintaining the maximum expected rate of material usage for the given recipe should be selected. TABLE 1 lists the maximum throughput rates of all standard augers. In most cases, the augers supplied have been sized at CONAIR to maintain the application specified by our customer. For highest accuracy, an auger should be sized to maintain a minimum of 20% motor speed.

TABLE 1 - METERING AUGERS

SIZE	RATE (#/hr) BASED ON AUGER SPEED = 120 RPM BULK DENSITY = 35 #/CuFt
1/2"OD x 1/2"PITCH	7.5 #/hr
3/4"OD x 3/4"PITCH	29 #/hr
1"OD x 1"PITCH	72 #/hr
1-1/2"OD x 1-1/2"PITCH	266 #/hr
2"OD x 2"PITCH	644 #/hr
2-1/2"OD x 2-1/2"PITCH	1275#/hr
3"OD x 3"PITCH	2662 #/hr

NOTE:
1. All augers are stainless steel with welded flighting.
2. Each auger should be installed with a sleeve whose ID is 1/8" to 3/8" larger than the auger's OD. (1/8" clearance is for powders; 3/8" clearance is for pellets and regrind)

AUGER/SLEEVE REMOVAL AND REPLACEMENT

1. Remove material and metering auger from supply hopper as follows:
   - Set container/drum under drain spout below metering motor
   - Loosen the three motor plate mounting knobs
   - **Hold exposed auger shaft at upper end by knurled grip**
   - Pull auger drive motor out from auger
   - Swing motor up and lock in position (A)
   - Remove auger (B)
2. **Before removing the sleeve**, carefully wipe the inside of the auger housing to remove any pellets remaining from emptying the hopper. This prevents material from becoming wedged between the auger housing and sleeve and trapping the sleeve inside the auger housing.
3. Loosen set screw on side of cast housing (C)
4. Slide out aluminum sleeve (D). Clean auger housing thoroughly.
5. Install new sleeve and tighten thumbscrew.
6. Insert auger (knurled end) through bushing in upper end of auger housing as far as possible. Drive end of shaft should point toward motor (E).
7. Swing motor mounting plate down and fasten in place.
8. Grasping the knurled end of the auger shaft, rotate and push until the auger drive tabs are seated in the motor drive ball coupling.

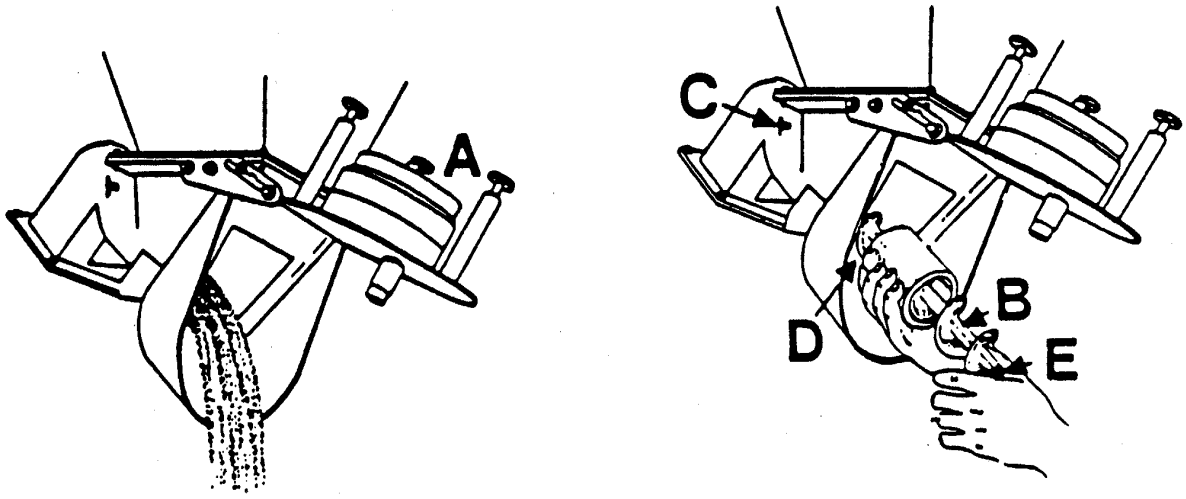


Figure 9 - AUGER/SLEEVE REMOVAL

LOAD CELL MOUNT & STABILIZER ASSEMBLY

The supply hopper assembly must be supported totally by the load cell. The load cell mount assembly and the hopper guide rods must be adjusted to maintain clearances between hopper guide rods and the stabilizer assembly's loader mounting plate guide holes.

The load cell is fastened to the auger housing and mounted on a moveable plate to allow adjustment in all directions. The load cell is mounted on both ends with socket head cap screws and keyways which allow it to be removed from the auger housing for shipment and re-assembled without need for re-adjustment (Figure 7A, Chapter 2).

After the auger housings are bolted to the load cell, the clearance of the guide rods needs to be checked (FIGURE 7B, Chapter 2).

The correct position of the hopper guide rods in relationship to the stabilizer guide holes is to have equal clearance all around the guide rod, and the welded nuts that thread to the guide rods should be backed off of the stabilizer bracket. DO NOT REMOVE the nuts as they will act as a "catch" in the unlikely event of the load cell becoming detached (FIGURE 7B, Chapter 2).

The over travel stop of the load cell should be adjusted to approximately .020 gap to prevent over-stressing the load cell (FIGURE 7A, Chapter 2).

To check that all of the weight of the weigh hopper is being supported by the load cell, give the hopper a small push with your hand. The guide rods should be free to travel approximately 3/8" at the top of the hopper without touching the stabilizer guide holes, and the overtravel stop should not be exceeded at the bottom of the hopper. Also check for binding on the flexible nylon inlet and outlet chutes. They should fit loosely, not taut. If they are stretched or twisted, loosen clamps and adjust. If there are any mechanical interferences, the load cell will only be partially supporting the weight of the hopper, which will result in an incorrect mix or an alarm. Also note that "house keeping" is important since a stray pellet sometimes can position itself to impair the load cell movement.

CONTROL PANEL

Layout
Functions

Control Layout

Please see CONTROL FUNCTIONS section for an explanation of the panel layout.

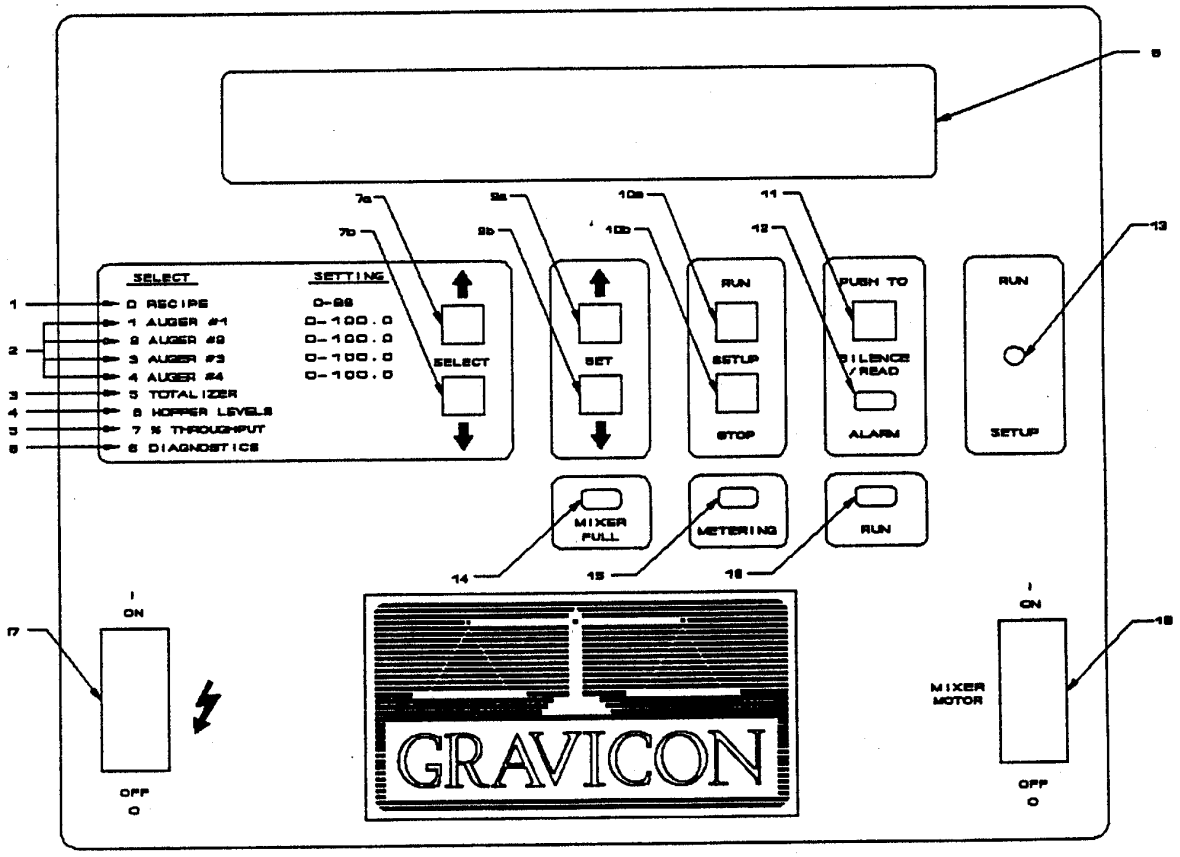


Figure 10 - CONTROL PANEL LAYOUT

CONTROL FUNCTIONS

Listed below are explanations for each area of the control label (refer to Figure 10).

1. SELECT 0; indicates the recipe number from 0-99 and stores each recipe for access and repeatability without recalibrating. (When using same material but with different proportions; if material is changed, a new calibration must be performed or calibration data edited.)

2. SELECT 1 thru 4; indicates setpoint, lb./hr. & RPM of each auger. The setpoint is the proportion or % of each material.

3. Totalizer, SELECT 5; indicates the total, cumulative throughput of each auger for each recipe.

4. Hopper Levels, SELECT 6; indicates the on-hand material in each of the supply hoppers.

5. % Throughput, SELECT 7; indicates the % throughput of the total blended material with respect to maximum.

6. Diagnostics SELECT 8; for blender setup and calibration.

7. Select Buttons; select Up or Down the main program menu. Also used to access Diagnostic Screens.

8. Display Window; indicates user commands specified through the 'select' and 'set' buttons and prompts the user through the steps required for operation.

9. Set Buttons; for changing information in the display window and selecting the diagnostic screens.

10. Run/Stop Buttons; for control of the metering motors in the set-up mode.

11. Push-to-Silence/Read Alarm Button; for silencing the alarm condition and viewing associated alarm messages.

    NOTE: Referred to as "Alarm Button" throughout the manual.

12. Alarm Light; indication of low material supply, bad data, control or motor failure, an open safety switch, or other problem areas.

13. Run/Setup Switch; sets the blender control mode to either the Set-up (calibration) mode or the Run (operating) mode.

14. Mixer Full Light; indicates when the mixing chamber is full.

15. Metering Light; indicates the blender is metering material.

16. Run Light; indicates blender is in the Run mode.

17. On/Off Switch; combination switch and circuit breaker, 115 VAC control power.

18. Mixer Motor Switch; combination switch and circuit breaker; 115 VAC mixer motor power.

CONTROL OPERATION AND SETUP

- Start-Up
- Operating The Control
- Select (Main) Menu
  - Selecting A Recipe
  - Creating/Editing A Recipe
  - Monitoring Blender Performance
    - -Totalizer
    - -Hopper Levels
    - -% Total Throughput
  - Diagnostics

Now that you are familiar with the control features and their locations, you must enter your process parameters for the blender to operate properly.

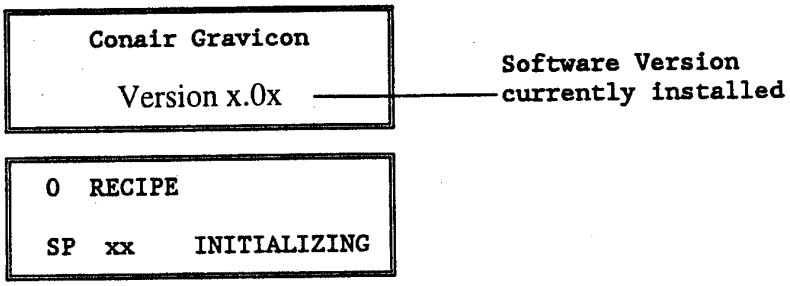
Please refer to the CONTROL LAYOUT Section in Chapter 4 for control panel references throughout this section and the remainder of the manual.

START-UP

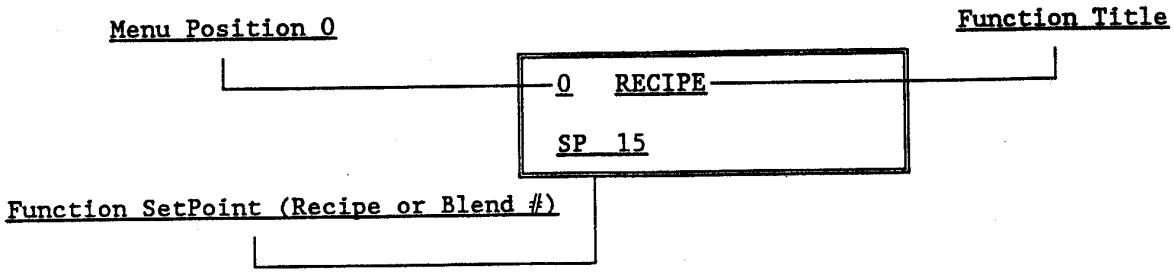
Before turning the power on, the RUN/SETUP switch should be in the SETUP position. This prevents the augers from starting after initialization.

Once power is turned on, the unit should be allowed to warm up for at least 30 minutes if it has not been run for an extended length of time (more than one hour). This is especially true if the unit is to be calibrated.

Push the Power Switch to the ON position. The display will execute the following routine:



This is the control "loading itself from memory" which lasts approximately ten seconds. After the control completes initialization, the display will read:



OPERATING THE CONTROL

Use the SET BUTTONS (9A and 9B) to change a SetPoint (SP).

UpSET increases the SP.
DnSET (down set) decreases the SP.

Please note that setpoints cannot be changed unless the RUN/SETUP switch (2) is in the SETUP position.

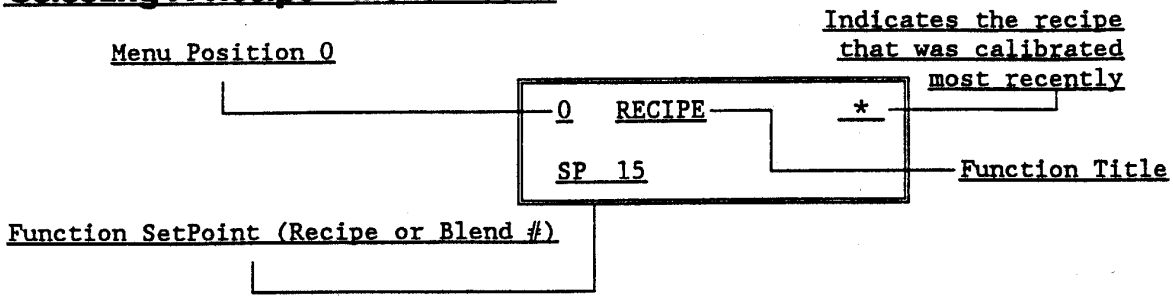
Use the SELECT Buttons (7A and 7B) to advance through the different screens in the program menu.

UpSELECT decreases Menu Position.
DnSELECT increases Menu Position.

SELECT (MAIN) MENU LISTING

Menu Position	Function Title	Function Settings
0	Recipe	S.P., 0 - 99
1	Auger #1	S.P., 0 - 100.0
2	Auger #2	S.P., 0 - 100.0
3	Auger #3	S.P., 0 - 100.0
4	Auger #4	S.P., 0 - 100.0
5	Totalizer	
6	Hopper Levels	
7	% Total Throughput	
8	Diagnostics	Access Code, 0 -999

Selecting A Recipe - Menu Pos. 0



This function designates the recipe number. Any data entered on subsequent screens is automatically stored under the SetPoint you chose here.

Setpoint Range = 0 - 99: Each SP can contain a set of proportions for the 4 auger positions that are safely stored in the control's memory.

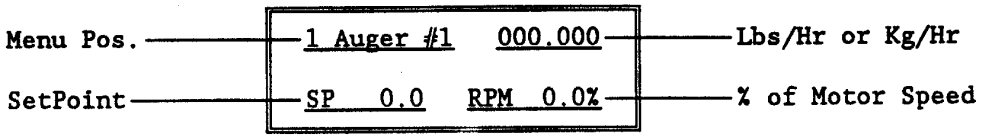
NOTE: When a recipe change includes a change in material or requires an auger change, please see "Editing Calibration Data" in Chapter 7.

Press the UpSET Button (9A) to increase the SP.
Press the DnSET Button (9B) to decrease the SP.

Creating/Editing A Recipe - Menu Pos. 1 through 4

To CREATE, VIEW, or EDIT a recipe, select the desired SetPoint as shown above, then press the SELECT Buttons (7A and 7B) to advance through Select Menu positions 1 through 4.

Menu Pos. 1 - Auger 1



SP Range = 0.0 - 100.0:SP represents the proportion of blend or mix; can be any unit of measure (parts, %, lbs, etc.) as long as the units are the same for all auger positions (1 - 4).

If this auger position is to be used, enter the correct setpoint using the SET BUTTONS (9A, 9B).

NOTE: S.P. = 0.0 will eliminate the auger position from the material blend by preventing the auger from metering material.

Next, enter the setpoint for auger position 2. Press the DnSELECT Button and the display will read:

Menu Pos. 2 - Auger 2

```
2 AUGER #2    000.000
SP   0.0   RPM  0.0%
```

Continue to press the DnSELECT Button (7A) to advance through Auger Position 4, stopping at each position to set the desired recipe.

Menu Pos. 4 - Auger 4

```
4  AUGER #4    000.000
SP   0.0   RPM   0.0%
```

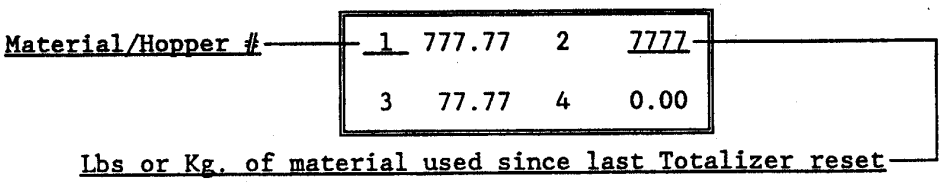
For each Menu/Auger Position, change the Recipe Setpoint as required using the SET BUTTONS (9A, 9B).

Monitoring Blender Performance - Menu Positions 5 through 7

The following menu positions display updated parameters highlighting the blender's performance. These screens provide information and require no user interaction.

Now that the blend proportions have been entered as outlined in the previous section, proceed to the next Menu Position using the SELECT Buttons (7A and 7B).

Menu Pos. 5 - Totalizer

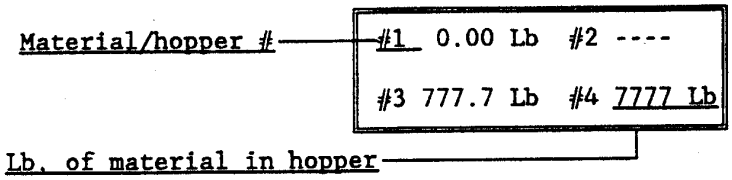


No setpoints can be changed in this position.

The totalizer records the total material metered by each auger position for each individual recipe in memory since that recipe's last totalizer reset.

Press the DnSELECT Button (7B) to proceed to the next Menu Position.

Menu Pos. 6 - Hopper Levels

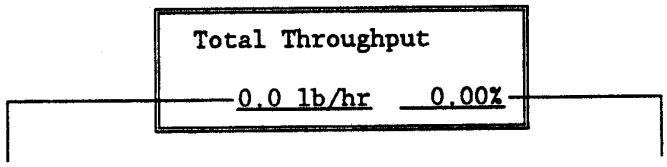


These weights will increase and decrease during operation as material is metered out of the hopper. The weights decrease until the loader refills the hopper, then the number will increase.

At this display, you can also check calibration by hanging a known weight and noting the change of weight for that position. **CAUTION**: Be careful not to hang weight on a full hopper and overload the cell. Also note that the display should be steady and not fluctuate if the augers are not turning. If the display "jumps" back and forth between weights, check for mechanical interference or severe vibrations. No setpoints can be changed in this position.

Press the DnSELECT Button (7B) to proceed to the next Menu Position.

Menu Pos. 7 - % Total Throughput



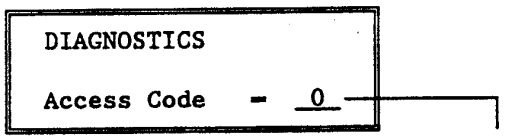
Total Lb/Hr metering through the blender, obtained by adding throughputs of auger positions 1, 2, 3 & 4.

Percent of maximum blender throughput capacity, based on the maximum throughput each auger position can achieve without affecting the blend proportions entered in the recipe.

Diagnostics

Advance to the last Position of the Select Menu using the DnSELECT Button (7B). The display will read:

Menu Pos. 8 - Diagnostics



Access Code (0-999) permits entry to a corresponding diagnostic function

The DIAGNOSTICS functions allow the user to set all necessary operating parameters for the blender.

Before the blender first begins metering material, we recommend checking parameters available in the DIAGNOSTICS menu to ensure proper blender setup.

See Chapter 6 for a complete listing and functional description of the Diagnostics Menu.

NOTE: The Blender Control also has a <SETUP> DIAGNOSTICS screen with its own set of control functions useful for troubleshooting. Please see Chapter 9 for details.

DIAGNOSTICS MENU AND FUNCTIONS

DIAGNOSTICS MENU LISTING

To monitor and change setpoints in diagnostics, you must first enter a correct access code. Listed below are the operator access codes available.

Operator Access Codes		Functions
1		Expected Rate
2		Analog Output Setpoint
3		Print Interval
4		Material Bulk Density
5		Machine Totalizer
6		Clear Totalizers
7		Alarm Mode
54	★	Screen Intensity
154	*	SPI Setup (Node and Baud Rate)
454		Load Times
455		Dump Timer
456		Loader Type
654		Real-Time clock
754		Weight Calibration
755		Volume Calibration
756		Edit Calibration Weights
757		Edit Calibration Times
854		Hopper Size
855		Mix Chamber Sensor
954		Watchdog Test
955		**Measurement System

✓ Used only in RS-232 applications

* Used only in SPI applications
** Available only with software version 2.05 and above

USING DIAGNOSTIC FUNCTIONS

Proceed to Diagnostics using the DnSELECT Button (7B).
The display will read:

```
DIAGNOSTICS

Access Code  -  0
```

Use the SET Buttons (9A and 9B) to change the ACCESS CODE.
Press the UpSET Button to increase the access code.
Press the DnSET Button to decrease the access code.

Use the SELECT Buttons (7A and 7B) to ENTER and EXIT a Diagnostic Function.
Press DnSELECT to enter a diagnostic function.
Press UpSELECT to exit a diagnostic function.
Press UpSELECT to exit the Diagnostic Menu when viewing the "Diagnostic Access Code" screen.

FUNCTION SUMMARIES AND USES

Access Code 1 - Expected Rate

```
DIAGNOSTICS

ACCESS CODE  -  1
```

Advance to Access Code 1 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
EXPECTED RATE

              0.0 lb/hr
```

The expected rate setpoint can now be changed using the SET BUTTONS (9A, 9B).

This setpoint does not have to be entered (it may be left at 0.0), but can be helpful if entered as slightly more than (approx. 2%) your expected process rate. With this

information, the control can alert you if the blender will not be able to achieve this rate even before any material is metered. This can save shutdowns, material loss, and many other problems caused by a lack of material supplied to the process equipment.

NOTE: If nuisance alarms occur during setup, leave setpoint at 0.0 Lb/Hr until setup is complete and the blender is ready to run.

Press the UpSELECT Button (7A) to exit this function.

Access Code 2 - Analog Output

```
DIAGNOSTICS

ACCESS CODE - 2
```

Advance to Access Code 2 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
ANALOG OUTPUT

SP    0%
```

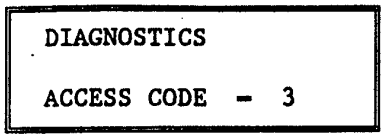
Control Summary:
Use the SET BUTTONS (9A, 9B) to change the setpoint.

Exit diagnostics position 2 by pressing the UpSELECT Button (7A).

Function Summary:
The analog output function provides a signal from the blender control that can be used to drive other equipment that must maintain a relationship to the blend. The provided output signal is 0 - 10VDC and is dependent on both the displayed SP and the total blender throughput percentage (i.e. 10VDC is provided when SP = 100% and the blender is running at 100% total throughput capacity).

The Analog Output source is provided from pins 1(-) and 2(+) of block J2 on the I/O PC Board (see Blender Control Box Schematic, Sheet 2, in the Appendix).

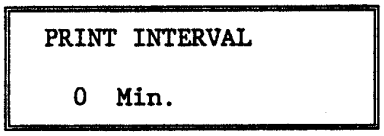
Access Code 3 - Print Interval



Advance to Access Code 3 using the SET Buttons (7A and 7B).
Press the DnSELECT Button (7B) and the display will read:

SPI Application

OR



RS232 Application

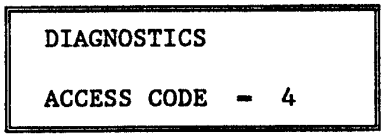
NOTE: For SPI Applications, this screen is de-activated

For RS232 Applications, use this screen to choose the time interval at which information will be sent to the printer port.

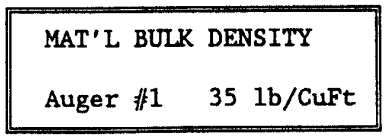
Use the SET BUTTONS (9a, 9B) to change the setpoint. [Print Interval = 0 - 60 Min.]
If Print Interval is set at 61, the printout is "Diagnostic."

Exit diagnostic function 3 by pressing the UpSELECT Button (7A).

Access Code 4 - Material Bulk Densities



Advance to Access Code 4 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:



The bulk density allows the blender control to estimate the amount of material that will fit in the hopper's volume. This prevents the hopper from being overfilled by volume.

Increase or decrease the material bulk density using the SET Buttons (9A and 9B).

Advance to different auger positions using the SELECT Buttons (7A and 7B).

After bulk densities for each auger position have been selected, exit this function by pressing the UpSELECT Button (9A) until the display returns to the "Diagnostic Access Code" screen.

Access Code 5 - Machine Totalizer

```
DIAGNOSTICS

ACCESS CODE  -  5
```

Advance to Access Code 5 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
MACHINE TOTALIZER

              7777 lb
```

This diagnostics position displays the total material metered for this recipe since the last Totalizer reset. (Totalizer range is 0 - 9,999,999 Lb.)

Exit diagnostic function 5 by pressing the UpSELECT Button (7A).

Access Code 6 - Clear Totalizers

```
DIAGNOSTICS

ACCESS CODE  -  6
```

Advance to Access Code 6 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
CLEAR TOTALIZER

Press UpSet to clear
```

This function will return the machine totalizers (See Chapter 5 - Totalizer) to zero to begin accumulating a new set of metered material weights through each auger position. The total material metered through the blender (See Diagnostics Access Code 5) is also reset to zero.

Press the UpSET Button (9A) to clear Totalizers if desired.

The display will then read:

```
CLEAR TOTALIZER

TOTALIZER CLEARED
```

Exit diagnostic function 6 by pressing the UpSELECT Button (7A).

Access Code 7 - Auger Alarm Mode

```
DIAGNOSTICS

ACCESS CODE - 7
```

Advance to Access Code 7 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
ALARM MODE

Auger #1: Shut-down
```

or

```
ALARM MODE

Auger #1: Alarm Only
```

The control gives the user the choice of either shutting down or alarming only if a hopper runs out of material.

If SHUT-DOWN is selected and that hopper runs out of material, the alarm will sound and all augers will shut down.

If ALARM ONLY is selected and that hopper runs out of material, the alarm will still sound but only the auger that has no material will stop, while the other auger(s) will continue to run. The typical use for this feature would be to keep a production line running, even if you run out of regrind, until more can be supplied.

CONTROL SUMMARY

Press the UpSET Button (9A) to activate the ALARM ONLY mode.
Press the DnSET Button (9B) to activate the SHUT-DOWN mode.
Use the SELECT Buttons (7A and 7B) to advance to each of the remaining Auger Positions.

After the ALARM MODE has been set for all of the positions, exit diagnostic Function 7 by pressing the UpSELECT Button until the display returns to the "Diagnostics Access Code" screen.

Access Code 54 - Screen Intensity

```
DIAGNOSTICS

ACCESS CODE - 54
```

Advance to Access Code 54 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
SCREEN INTENSITY

Press UpSet or DnSet
```

Use the SET BUTTONS (9A and 9B) to adjust the brightness of the display characters to 1 of 4 possible intensity levels to suit your specific requirements.

Press UpSET (9A) to BRIGHTEN character intensity.
Press DnSET (9B) to DIM character intensity.

NOTE: We recommend using an intensity setting consistent with operating conditions, using dimmer settings where ambient lighting permits to maximize display screen life.

When the correct screen intensity has been chosen, exit diagnostic function 54 by pressing UpSELECT (7A).

Access Code 154 - SPI Setup

```
DIAGNOSTICS

ACCESS CODE - 154
```

Advance to Access Code 154 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
SPI SETUP

NODE ADDRESS - 32
```

Use the SET Buttons (9A and 9B) to change setpoint if required. Setpoint should be 32. (Setpoints of 33 through 64 are also available)

Next push DnSELECT Button (7B). Display will read:

```
SPI SETUP

BAUD RATE - 9600
```

Use the SET Buttons (9A and 9B) to change setpoint if required. Setpoint should be 9600. (Setpoints of 1200, 2400, 4800 & 9600 available)

Exit diagnostic function 154 by pressing the UpSELECT Button until the display returns to the Diagnostics Access Code screen.

Access Code 454 - Load Times

```
DIAGNOSTICS

ACCESS CODE - 454
```

Advance to Access Code 454 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
LOAD TIME

Auger #1:   10 Sec.
```

Load Time range:
2 - 99 Sec.

Control Summary:

Use the SET BUTTONS (9A and 9B) to increase or decrease the displayed Load Time SetPoint from 2 to 99 seconds.

Use the SELECT Buttons (7A and 7B) to advance through the different auger positions.

Exit the Load Time function by pressing the UpSELECT Button until the display returns to the Diagnostics Access Code screen. NOTE: Set the Load Time for each auger position.

Function Summary:

The Load Time is the maximum length of time the loader is permitted to "pull" material to the displayed position during a single load cycle.

Load Time will vary with material type, conveying distance, filter condition, temperature and other conditions.

Select an appropriate Load Time as follows:

1. Enter a time for each Auger Position that is longer than necessary to fill the loader (typically 40 sec.).

2. After the blender is in operation, measure the actual time required to fill the loader.

   The actual load time can be measured in 1 of 2 ways, depending on the type of loader pulling material.

   1. Loader w/Full Sensor - Begin timing when the loader begins pulling material and stop timing when the loader stops.

   2. Loader without Full Sensor - Begin timing when the loader begins pulling material and stop timing when the material line flow stops. If the material line flow to the loader cannot be observed, stop timing when a change in pitch, similar to blocking the inlet to a vacuum cleaner, is noticed during loader operation. This signifies the loader is full.

3. Increase the measured load time for each auger position by 5% and enter each value into the load time function.

   NOTE: Load Time for "auger / valve" applications is the amount of time that the control will energize an output (120VAC) to run an auger motor or valve solenoid.

Access Code 455 - Dump Times

```
DIAGNOSTICS

ACCESS CODE - 455
```

Advance to Access Code 455 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
DUMP TIME

Auger #1:   10 Sec.
```

Dump Time range:
1 - 99 Sec.

Control Summary:

Use the SET BUTTONS (9A and 9B) to increase or decrease the displayed Dump Time SetPoint from 1 to 99 seconds.

Use the SELECT Buttons (7A and 7B) to advance through the different auger positions.

Exit the DUMP Time function by pressing the UpSELECT Button until the display return to the "Diagnostics Access Code" screen. NOTE: Set the Dump Time for each auger position.

Function Summary:

The Dump Time is the time required for the loader to completely empty a full load of material

The Dump Time SetPoint represents the minimum time between load cycles during which a loader can discharge material. (For "Positive Discharge" Loaders, Dump Time represents the length of time the discharge valve remains open.)

The Dump Time required is affected by loader size, material flow properties, static, and other conditions. The Dump Time should always be set to allow the loader to empty completely to obtain maximum loader efficiency and, in turn, optimum blender performance.

Setting the Dump Time:

1. Enter a SetPoint greater than the time required to completely empty the loader (typically 10 seconds).

2. After the blender is in operation, measure the actual discharge time.

3. Add two seconds to the measured discharge time and enter value into the Dump Time function.

Repeat this process for each loader.

NOTE: If loader type selected is "auger / valve" , the dump time screen will be replaced with "Attempts." Attempts indicates how many times the control retried before an alarm.

Access Code 456 - Loader Type

```
DIAGNOSTICS

ACCESS CODE - 456
```

Advance to Access Code 456 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
LOADER TYPE

#1 : Selectronic
```

The "Loader Type" screen allows you to designate 1 of 3 possible methods of filling the blender material hoppers. These types include:

SELECTRONIC - The loader functions with a remotely mounted pump and is usually part of a system of loaders on the blender.

INTEGRAL MOTOR - The loader is self-contained and can load material at any time, based on hopper demand.

AUGER/VALVE - The loader is self-contained and can load material at any time, based on hopper demand. Unit sends a 120VAC signal for the duration of load time and repeats this response for the number of attempts set or until filled. Exhausting the attempts signals the unit that this hopper is out of material.

Choose a Loader Type using the SET BUTTONS (9A and 9B).

Use the SELECT Buttons (7A and 7B) to advance through the different auger positions.

Exit the Loader Type function by pressing the UpSELECT Button until the display returns to the Diagnostics Access Code screen. NOTE: Set the Loader Type for each auger position.

Access Code 654 - Real-Time Clock

```
DIAGNOSTICS

ACCESS CODE - 654
```

Advance to Access Code 654 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

```
REAL-TIME CLOCK

T HH:MM:SS D MM/DD/YY
```

DATE - Month/Day/Year

Time - Hours: Minutes: Seconds

To change or set the Real-Time Clock:

Press the Alarm Button (11) to enable the edit mode.
NOTE: The "hours" number pair will begin flashing.

Use the SET BUTTONS (9A and 9B) to increase or decrease the flashing number.

Press the DnSelect Button and the number pair to the right will begin flashing.

Press the UpSelect Button and the number pair to the left will begin flashing.

Press the Alarm Button (11) again when the correct time and date have been entered. This locks the displayed information and restarts the Real-Time Clock.

Exit Diagnostic Function 654 by pressing the UpSELECT Button(7A).

Access Code 754 - Weight Calibration
Access Code 755 - Volume Calibration
Access Code 756 - Edit Calibration Weights
Access Code 757 - Edit Calibration Times

SEE CHAPTER 7 - BLENDER CALIBRATION

Access Code 854 - Hopper Size

DIAGNO\STICS
ACCESS CODE - 854

Advance to Access Code 854 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

HOPPER SIZE
Hopper #1 : large

The "Hopper Size" screen allows you to designate 1 of 3 possible sizes for blender material hoppers. These types include:
1. MICRO
2. MEDIUM (std.)
3. LARGE (3 cu. ft.) for full size

Choose a Hopper Size using SET BUTTONS (9A and 9B). Use the SELECT Buttons (7A and 7B) to advance through the different hopper positions.

Exit the Hopper Size function by pressing the UpSELECT Button until the display returns to the "Diagnostics Access Code" screen. NOTE: Set the Hopper Size for each auger position.

Access Code 855 - Mixer Sensors

DIAGNOSTICS
ACCESS CODE - 855

Advance to Access Code 854 using the SET Buttons.
Pres the DnSelect Button (7B) and the display will read:

MIXER SENSORS
High Level Only

The "Mixer Sensor" screen allows you to designate 1 of 2 possible combinations of sensors. These include:
1. High Level Only
2. High & Low Level

Choose type using SET BUTTONS (9A and 9B).

Exit the Hopper Size function by pressing the UpSELECT Button until the display returns to the "Diagnostics Access Code" screen.

Access Code 954 - Watchdog Test

DIAGNOSTICS
ACCESS CODE - 954

Advance to Access Code 954 using the SET Buttons.
Pres the DnSelect Button (7B) and the display will read:

WATCHDOG TIMER TEST
Will Reset in 3 Sec

Exit the Hopper Size function by pressing the UpSelect Button until the display returns to the "Diagnostics Access Code" screen. Stay here and the watchdog will reset the CPU, display will show initiailization screen.

Access Code 954 - Watchdog Test

DIAGNOSTICS
ACCESS CODE - 954

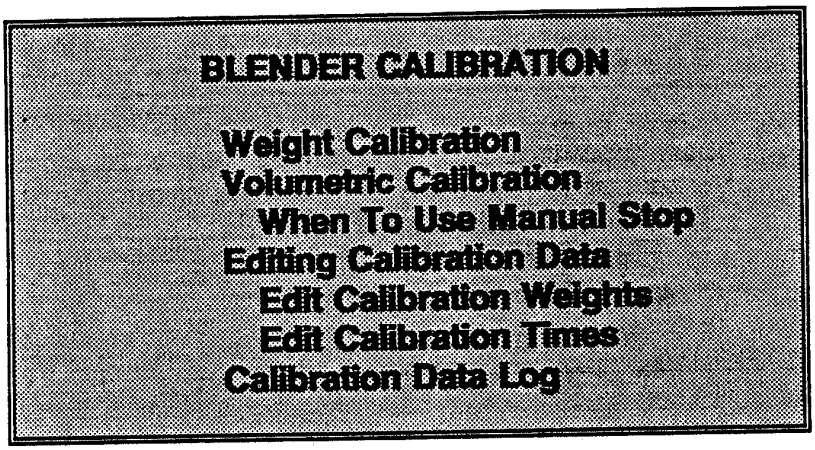
Advance to Access Code 955 using the SET Buttons.
Pres the DnSelect Button (7B) and the display will read:

MEASUREMENT SYSTEM
English

or

MEASUREMENT SYSTEM
Metric

Press the DnSET Button to select English. Press the UpSET button to select Metric. Exit Diagnostic Function 954 by pressing the UpSelect Button (7A).


BLENDER CALIBRATION
Weight Calibration
Volumetric Calibration
When To Use Manual Stop
Editing Calibration Data
Edit Calibration Weights
Edit Calibration Times
Calibration Data Log

ACCESS CODE 754 - WEIGHT CALIBRATION

The weight calibration gives the control a known value it can use to interpret and scale the load cell signal. Using a certified or very accurately measured weight during the Weight Calibration is extremely important since the accuracy of the blender is directly related to the accuracy of this portion of the calibration process.

NOTE: Always perform a new weight calibration when the auger/sleeve combination is changed.

Step 1 : Advance to the Diagnostics screen of the Select Menu using the Select Buttons (7A & 7B). The display will read:

```
DIAGNOSTICS

Access Code  -  0
```

Step 2 : Use the SET Buttons (9A and 9B) to advance to Access Code 754. The display will read:

```
DIAGNOSTICS

Access Code  -  754
```

Step 3 : Press the DnSELECT Button and the display will read:

```
Weight Calibration

Select Load Cell #1_
```

Increase or Decrease using the SET Buttons

Select the Load Cell you want to calibrate using the SET Buttons. For this example, we will use Load Cell #1.

NOTE: Before proceeding, check the following:

1. Check that the hopper is empty and all loose material is removed from the hopper and auger housing.
2. Check that the proper auger/sleeve combination is installed.
3. Check that the hopper and load cell mount are not obstructed in any way.

Step 4 : Press the RUN Button and the display will read:

```
Stand by: Calibrating

hopper tare.
```

Followed by:

```
Enter Calibration
Weight          50.0 lbs
```

Use the SET Buttons to enter the value of your calibration weight that will hang from the auger housing.

Step 5 : Press the RUN Button and the display will read:

```
Place Calibration
weight on Hopper #1
```

Hang your accurately measured weight from the hook provided on the auger housing. Before proceeding, check that the weight is hanging freely and is not moving.

Step 6 : Press the RUN Button and the display will execute the following sequence:

```
Stand by: Calibrating
hopper #1  Full Scale
```

```
Calibration Complete
Hopper Number 1
```

```
Weight Calibration
Select Load Cell #1
```

To Calibrate the other Load Cells being used, repeat Steps 3 through 6 for each Load Cell to be calibrated.

To check that the Weight Calibration was successful, go to the "Hopper Levels" screen (see MONITORING BLENDER PERFORMANCE-Chapter 5). The weights displayed for the calibrated hoppers should read zero without fluctuating when no weight is hanging from the auger housing. Hang the calibration weight used in Step 4 from a calibrated position and the corresponding displayed weight should read the same as the weight entered for that position in Step 4.

VOLUMETRIC CALIBRATION - ACCESS CODE 755

During this diagnostic function, material will be metered through auger positions you select at factory pre-set motor speeds.

During the metering portion of the calibration cycle, the control will monitor the metering time and metered material weight for each position. The control then uses this information to calculate the maximum throughput rates for each position.

Once the control records these individual throughput rates, the blender can calculate start-up rates for different recipes as well as alarm against rates or recipes that are not attainable with the existing setup.

Step 1 : Advance to the Diagnostics screen of the Select Menu using the Select Buttons (7A & 7B). The display will read:

```
DIAGNOSTICS

Access Code  =  0
```

Step 2 : Use the SET Buttons (9A and 9B) to advance to Access Code 755. The display will read:

```
DIAGNOSTICS

Access Code  =  755
```

Step 3 : Press the DnSELECT Button and the display will read:

```
CALIBRATE   *

Auger No(s) 1 2 3 4
```

This display gives you the choice of calibrating any auger independently and up to 4 augers simultaneously.

Use the SET Buttons (9A & 9B) to move the indicator asterisk above the Auger Number you would like to calibrate.

Press the ALARM Button (11) to select the Auger Number directly below the indicator asterisk. The selected auger number will begin flashing. You may select any or all of the hopper positions shown for a calibration run.

To CANCEL a selected Auger Number, move the indicator asterisk above the Auger Number to be canceled and press the ALARM Button. The Auger Number will stop flashing.

We will choose Auger #3 as the auger we want to calibrate first in this example. To select 3, use the DnSET Button to move the indicator asterisk until it is located above Auger Number "3". The display will read:

```
CALIBRATE        *

Auger No(s) 1 2 3 4
```

Push the Alarm Button to select Auger No. 3 for calibration and the number "3" will begin flashing.

Step 4 : Press the Run Button (10A) and the display will read:

```
Place buckets under

augers & press RUN
```

The "buckets" should be large enough to run slightly less than a full weighed hopper of material (approx. 50#). Also, the Calibration Diverter Chutes should be diverted to the Calibration position to avoid running the unmixed material into the mixing chamber/process machine.

Step 5 : Press the Run Button. If the hoppers need material the display will read:

```
Filling Hoppers

PLEASE WAIT
```

The loaders will now load material into the supply hopper(s) of the blender. When the hopper(s) is full, the display will read:

```
Hoppers full.  Press

RUN to flood augers
```

Press the Run Button and wait for material to flood the auger(s) (until material flows from the auger housing calibration chutes). The amount of time required for this is dependent upon the auger size and material and will range from approximately 2 to 10 seconds. The display now reads:

```
Press STOP when all

augers are flooded
```

Push the STOP Button. The auger motors will stop and the display will read:

```
Press RUN to start
Volume Calibration
```

Press the RUN button and selected auger(s) will rotate at a constant, pre-set speed (approximately 108 RPM). The display will momentarily read:

```
Calibration Started
PLEASE WAIT
```

Then automatically advance to:

```
INSTRUCTIONS ?
UpSet=Yes   DnSet=No
```

This display is asking the operator if further instructions would be helpful. If you answer Yes by pressing the UpSET Button, the display will read:

```
Press ALM SILENCE
 for instructions
```

Press the ALARM SILENCE Button and the display executes the following sequence describing the calibration manual stop feature:

```
Select augers to
stop by using...
```

Press ALARM Button and display reads:

```
UPSET & DNSET keys to
move arrow and...
```

Press ALARM Button and display reads:

```
ALARM SILENCE key to
make auger nos...
```

Press ALARM Button and display reads:

```
flash.
Flashing numbers...
```

Press ALARM Button and display reads:

indicate which auger (s) will...	Press ALARM Button and display reads:
stop when the STOP key is pressed.	Press ALARM Button and display reads:
Auger(s) will stop automatically...	Press ALARM Button and display reads:
when hoppers run out of material.	

The display then reads:

-1	OFF	2	OFF
3	56.7	4	OFF

NOTE: This screen would have been displayed immediately if "NO" (DnSET) was selected at the INSTRUCTIONS? screen on the previous page.

This screen displays the calibration status of each auger position. Each position will display 1 of the following 3 messages:

OFF	- Position not selected for calibration.
DONE	- Hopper empty, calibration complete.
xxx.x	- Weight remaining in the hopper.

When an individual hopper's material weight decreases to approximately 30% of full capacity, the control automatically stops its auger from turning.

Manual Stop Feature: To MANUALLY STOP an auger before it's hopper reaches 30% material capacity:

1. Choose the auger number to be stopped using the SET Buttons to move the indicator arrow to the desired auger number, then press the ALARM Button. The auger number will begin flashing. Any or all of the augers still metering may be selected.
2. CANCEL a selected auger number using the SET Buttons to move the indicator arrow to the desired auger number, then press the ALARM Button. The auger number will stop flashing.

3. STOP the selected auger(s) by pressing the STOP Button when the proper time has been satisfied (see "When to Use the Manual Stop Feature" at end of this section).

When all of the augers finish their calibrations and are stopped (either manually or automatically), the display will read:

```
CALIBRATION COMPLETE

Press Alarm Silence
```

Press the ALARM Button and the display will read:

```
STORING CALIBRATION

DATA...PLEASE WAIT
```

Followed immediately by:

```
DIAGNOSTICS

ACCESS CODE - 755
```

At this point, you can go back to step 3 and perform another volume calibration if required.

WHEN TO USE THE MANUAL STOP FEATURE

During a normal calibration run, the material level in a hopper decreases to the point where more material is required from the loader (approx. 30% full capacity). When this happens, the control will automatically stop the auger and complete the calibration.

The Manual Stop Feature is useful when calibrating an auger position with a low throughput. While the calibration will be more accurate if a longer sample is run, the time required to empty a full hopper of material at a low throughput might be too long to be practical. When using the Manual Stop Mode, follow the guidelines listed below to be sure your calibration is accurate.

THROUGHPUTS	CALIBRATION TIME (MINIMUM)
less than 200#/hr	15 minutes
less than 30#/hr	30 minutes

EDITING CALIBRATION DATA - ACCESS CODES 756 AND 757

The Edit Calibration Weight and Edit Calibration Time functions are useful when changing recipes in which materials and their bulk densities change, or when auger/sleeve combinations change, and a new Volumetric Calibration is not performed. **NOTE**: If the auger/sleeve combination is changed, you must also perform a new weight calibration.

When a recipe is recorded in the Calibration Data Log at the end of this section, that recipe should include the metering time and the weight of material metered for each material of a given recipe. Then when the recipe is recalled from the "Recipe Setpoint" screen (Select Menu - Chapter 5), the Calibration Data (both time and weight, since throughput rate is a function of both time and weight) must be edited as outlined in this section.

Calibration Weights - Access Code 756

Step 1 : Advance to the Diagnostics screen of the Select Menu using the Select Buttons (7A & 7B). The display will read:

```
DIAGNOSTICS

Access Code  =  0
```

Step 2 : Use the SET Buttons (9A and 9B) to advance to Access Code 756. The display will read:

```
DIAGNOSTICS

Access Code  =  756
```

Step 3: Press the DnSELECT Button and the display will read:

```
CALIBRATION DELTA WT.

Auger #1 =  7.2119  ——— Weight in Lbs.
```

Use the SET Buttons to increase or decrease the displayed Calibration Delta Weight. (Calibration Delta Weight is the weight of material metered from an auger position during calibration.)

Use the SELECT Buttons to advance through the different auger positions installed on the blender, changing the Calibration Delta Weight for each position in the new recipe where a change occurs.

Step 4: Exit the Calibration Delta Weight function by pressing the UpSELECT Button until the display returns to the "Diagnostics Access Code" screen.

Calibration Times - Access Code 757

Step 1 : Advance to the Diagnostics screen of the Select Menu using the Select Buttons (7A & 7B). The display will read:

```
DIAGNOSTICS

Access Code  -  0
```

Step 2 : Use the SET Buttons (9A and 9B) to advance to Access Code 757. The display will read:

```
DIAGNOSTICS

ACCESS CODE  -  757
```

Step 3: Press the DnSELECT Button and the display will read:

```
CALIBRATION TIME

Auger #1 -  266.841 ———— Time in seconds
```

Use the SET Buttons to increase or decrease the displayed Calibration Time. (Calibration Time is the time required for an auger to meter a valid amount of material during calibration - See "Volumetric Calibration Access Code 755 for further details.)

Use the SELECT Buttons to advance through the different auger positions installed on the blender, changing the Calibration Time for each position in the new recipe where a change occurred.

Step 4: Exit the Calibration Time function by pressing the UpSELECT Button until the display returns to the "Diagnostics Access Code" screen.

CALIBRATION DATA LOG

RECIPE #	BIN #	MATERIAL			AUGER SIZE	CALIBRATION DATA	
		NAME	DESCRIPTION	BULK DENSITY		DELTA TIME	DELTA WEIGHT

BLENDER OPERATION -

Review Of Start-Up Procedures Accuracy And Taking Material Samples

REVIEW OF START-UP PROCEDURES

After having completed the blender setup and calibration sequences described earlier in this manual, you should review the following information as a "check list" when operating the blender.

1. Choose a recipe number (Chapter 5 - Selecting a Recipe).
2. Enter a recipe (Chapter 5 - Creating/Editing a Recipe).
3. Reset the totalizer (Chapter 6 - Function Summaries and Uses, Access Code 6).
4. Check that the material supply is sufficient.
5. Set the Calibration/Sample chutes to the Run position (Chapter 1 - Calibration Sample Chute).
6. Check that the rate auger (if used) is on and functioning properly at the correct speed.
7. Check that the mixing chamber agitator is on.

You are now ready to start the blender.

Push the Run/Setup toggle switch to "RUN". The blender augers will rotate at the highest speed possible while maintaining the proportions of the recipe (100% maximum throughput).

Because the initial input to the mixing chamber will be higher than the process take away rate, the mixing chamber will go from empty to full. This will signal the control that the metering augers can run at slower speeds while still maintaining the correct proportions. The control will correct the total rates of the metering augers to match the throughput of the rate auger or process rate. This is the ideal "RUN" condition, because the augers will run continuously and the residence time of the material in the mixing chamber will be constant.

Once the blender has been running and has "homed in" on the process rate, you can check its operation quickly and easily by doing the following:

Check the "totalizer" for confirmation of the mix (See Chapter 5 - Totalizer).

Monitor the change in weight of each position by viewing the "Hopper Levels" screen (Chapter 5 - Hopper Levels) to confirm proper blender operation.

ACCURACY AND TAKING MATERIAL SAMPLES

To confirm that the blend is consistent with the proportions of the recipe, you can collect material samples, weigh them and analyze the results. This section describes both how to properly collect material samples and how to interpret them to determine accuracy.

Example: Recipe #1 is
Auger 1 SP = 80% Virgin
Auger 2 SP = 10% Additive "A"
Auger 3 SP = 8% Additive "B"
Auger 4 SP = 2% Color

If the samples are taken before the blender has been run, the rate of the four metering augers will be the maximum that the blender can achieve while maintaining the recipe proportions, which will be above the process rate. While these samples will show the accuracy of the blender, they are not as relevant a test as samples collected while the metering augers were running at your actual process rate.

FOR SURGE BIN/GAYLORD FILL APPLICATIONS: To take samples at the process rate, the calibration diverter chute for position #1 (virgin) should be left in the run position so that the material will fill the mixing chamber and "Home In" on the rate of the rate auger. NOTE: Only virgin material will run into the surge bin below the blender, so the bin must be clean and empty for this test procedure. Also note the rate auger should be set at 80% of the expected rate for this recipe.

The diverter valves for positions 2, 3 and 4 should be in the calibrate position and the material diverter into "Buckets" (drums).

Now the blender should be run by setting the Run/Setup switch to the RUN position. This will start all augers turning and let the blender "Home In" on the rate auger. The "Home In" time or time required for the blender to match the process rate will depend on the difference in rate between auger #1 and the rate auger, as well as the volume of the mixing chamber. To check that the blender has homed in, monitor the motor speeds of the augers until they change by less than 3%. When the blender has homed in and is running at the process rate, move the Run/Setup toggle switch to SETUP. At this time, turn the rate auger motor speed up about 5%. Also at this time, empty the drums and make sure that the surge bin / gaylord is empty. Samples can now be collected at the process rate by restarting the blender using the RUN Button (10A).

FOR AT-THE-THROAT APPLICATIONS: Stop the blender by moving the Run/Setup toggle switch to the SETUP position while the blender is still "Homed In" on your process rate (when auger motor speed changes are less than 3%). The calibration diverter chutes should be changed to the calibrate position and containers positioned to catch material. You can now catch the samples at the process rate by pressing the RUN Button (10A).

In these setups, the mixing chamber will not fill up, so the blender will run at the rate it has previously homed in on and the only changes in motor speed will be those dictated by the load cells that are monitoring the loss in weight over time.

After an appropriate amount of material (drum full) has been metered, press the STOP Button (10B). The material samples can now be weighed and compared.

In our example, we will assume we collected 217.4 pounds of virgin, 27.3 pounds of additive "A", 21.8 pounds of additive "B", and 5.4 pounds of color.

First, total these actual weights

217.4
27.3
21.8
5.4
272.0 Pounds

Next, multiply the total weight by the setpoints in the recipe. This is the target weight.

272.0 x .80 = 217.60
272.0 x .10 = 27.20
272.0 x .08 = 21.76
272.0 x .02 = 5.44

Compare target weights to actual weights to find the deviation from the target weight.

217.4 actual - 217.60 target = -.2 pounds difference
27.3 actual - 27.20 target = +.1 pounds difference
21.9 actual - 21.76 target = +.14 pounds difference
5.4 actual - 5.45 target = -.04 pounds difference

Finally, use the deviation from the target weight to show variation from setpoint.

-.2 pounds difference / 217.60 target = 0.092% of virgin (light)

+.1 pound difference / 27.20 target = 0.368% of additive "A" (heavy)

+.14 pounds difference / 21.76 target = 0.643% of additive "B" (heavy)

-.04 pounds difference / 5.44 target = 0.735% of color (light)

As this example shows, an accurate scale is needed since only 0.04 pounds deviation from target was 0.7% of the collected sample of color, while .20 pounds was only 0.1% of the virgin. If we want to measure the accuracy to the tenth of a percent, we will need a scale with a resolution equal to 0.1% (.001) multiplied by sample weight (1000 pounds and above x .001 = 1 pound resolution). If the sample weight is less than 1000 pounds, the scale will have to have the capability to read to the nearest tenth (1/10) of a pound (100 x .001 = 0.1). For sample weights less than 100 pounds, the scale should be able to read to the nearest hundredth (1/100) of a pound (10 x .001 = 0.01).

This example illustrates that longer sample times will be more accurate.

The material used in this sample test will not be mixed and can be returned to the supply tank.

TROUBLESHOOTING

<SETUP> MODE

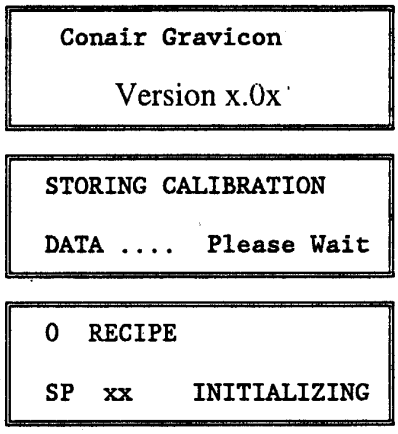
The blender <SETUP> Mode is identical to the standard operating mode with the exception of Diagnostics Functions.

The <SETUP> Access Codes are available only when the blender is in its <SETUP> mode, which is noted on the display window when viewing the "Recipe No." screen (Select Menu - Pos. 0).

The <SETUP> Access Codes are useful for initial blender setup and troubleshooting during installation, as well as any future troubleshooting that becomes necessary.

Entering the blender <SETUP> Mode as follows:

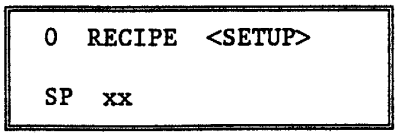
Push the Power Switch to the ON position. The display will execute the following routine:



This is the control "loading itself from memory" which lasts approximately ten seconds.

Press UpSELECT while the control is initializing (loading its data into memory). The word initializing will remain on the display for approx. 5 - 10 seconds. (You must press UpSELECT while "Initializing" is still displayed on the screen.)

The display will then read:



The word <SETUP> signifies the control will operate using the <SETUP> Access Codes outlined in this chapter. (As with the standard Diagnostics Menu, the functions accessed through the <SETUP> Diagnostics Menu are operational only when the Run/Setup Switch is in the SETUP position.)

<SETUP> DIAGNOSTICS MENU LISTING

This is a list of the functions that can be found in the <SETUP> Diagnostics Menu, along with their access codes and brief descriptions. Also included are the Standard Access Code equivalents for each <SETUP> Diagnostic Function.

<SETUP> ACCESS CODE	STD ACCESS CODE	FUNCTION NAME	No. OF SCREENS	DESCRIPTION
1	5	Machine Totalizer	1	Total of auger totalizers.
2	6	Clear Totalizer	1	Clear all auger totalizers.
3	1	Expected Rate	1	Program total machine rate.
4	2	Analog Output	1	Program auxiliary output set point.
✓ 5	3	Printer Interval	1	Program time interval between printouts.
* 6	154	SPI Setup	2	Set up Node, Address, and Baud Rate.
7	7	Auger Alarm Mode	4	Set alarm mode to shut down or alarm only.
8	4	Material Bulk Density	4	Set material bulk density for each position.
9	854	Hopper Capacity	4	Choose 1 or 3 hopper sizes.
10	456	Loader Type	4	Selectronic, Integral Motor or Auger/Valve.
11	454	Load times	4	Maximum loader "on" times.
12	455	Dump Times	4	Discharge valve open times.
13		Default Parameters	1	Forces all calibration and setup data to default values.
14		Mixer Reset Time	1	Time used by mixer level adjustment program.
** 15		Metering Mode	4	Not implemented.
16	754	Weight Calibration		Perform weight calibration.
17	755	Volume Calibration		Perform volume calibration.
18	756	Edit Cal. Weights	4	Edit calibration weights.
19	757	Edit Cal. Times	4	Edit calibration times.
20	54	Screen Intensity	1	Set VF display brightness.
** 21	955	English/Metric	2	Choose unit of measure.

<SETUP> ACCESS CODE	STD ACCESS CODE	FUNCTION NAME	No. OF SCREENS	DESCRIPTION
22	654	Real Time Clock		Set/view real time clock.
23		No Throughput Counters	1	Throuput diagnostic screen.
24		Cfactors	1	Cfactor diagnostic screen.
25		Mixer Info	1	Mixer/speed control diagnostic screen.
26	954	Watchdog Test	1	Watchdog test.
27		Motor Output Test	4	Perform motor output tests.
28	855	Mixer Sensors	1	Number of mixor sensors.

✓ Indicates functions used "only" in RS-232 applications.
*** Indicates functions used "only" in SPI applications.**
**** Indicates functions implemented on software Versions 2.05 and higher.**

USING <SETUP> DIAGNOSTICS FUNCTIONS

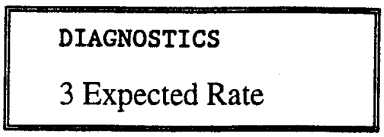
Enter the blender <SETUP> Mode as outlined inthe first section of this manual.

Press the DnSELECT Button to advance to the last Select Menu screen and the display will read:

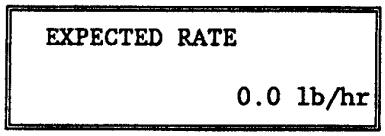
DIAGNOSTICS
Access Code = 0

<SETUP> Diagnostics Functions work the same as their equivalent standard diagnostics functions.

To see an example, press the DnSET Button and the display will read:



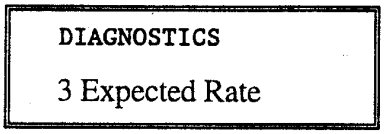
This is the same "Expected Rate" function described earlier in Chapter 6.
Press the DnSELECT Button and the display reads:



The expected rate setpoint can now be changed using the SET BUTTONS (9A, 9B).

Refer to Chapter 6, Access Code 1 for a full explanation of this function.

Press the UpSELECT Button to exit and return the display to:



Advance to another Access Code using the SET Buttons.

Exit Diagnostics by pressing the UpSELECT Button.

Control Summary:

1. Press the SET BUTTONS to advance to the desired access code:
   DnSET to increase access code.
   UpSET to decrease access code.

2. Press the DnSELECT Button to enter the displayed function.

3. Follow the directions for each function as outlined in the next section.

4. Press the UpSELECT Button as needed to exit the function and return to the <SETUP> Diagnostics Menu.

5. Repeat steps 1-4 or press the UpSELECT Button once more to exit Diagnostics and return to the Select Menu.

<SETUP> DIAGNOSTICS FUNCTION SUMMARIES

This section explains Diagnostic Functions not discussed in Chapter 6. Please refer to the <SETUP> Diagnostics Menu Listing earlier in this chapter for equivalent Standard Access Codes found in Chapter 6.

<SETUP> Access Code 13 - Use Default Data

DIAGNOSTICS
Press Up Set

Advance to <SETUP> Access Code 13 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

Press Up SET to Reset
Default Data

Press the UpSET Button and the display will read:

ALL DATA IS RESET TO
DEFAULT VALUES

Press the UpSELECT Button to exit function and return to <SEUP> Diagnostics Menu.
The display will momentarily read:

STORING ALL DATA
PLEASE WAIT

followed by:

DIAGNOSTICS
13 Force Parameters

<SETUP> Access Code 14 - Mixer Reset Time

DIAGNOSTICS
14 Mixer Reset Time

Advance to <SETUP> Access Code 14 using the SET Buttons. Press the DnSELECT Button (7B) and the display will read:

Mixer Reset Time
SP 400 SEC.

The Mixer Reset Time SP can be adjusted through a range of 400 - 900 seconds using the SET Buttons (9A and 9B). Normally this value should not be adjusted.

The function of this diagnostic position is to adjust the amount of time that is required before the blender algorithm, which is used to home in on process rate, changes from coarse speed adjustment to fine speed adjustment.

Example: If the material level in the mixing chamber is maintained between the two sensors longer than the set point (400-900 seconds) and then requires a rate change to maintain the material level, the rate adjustment will be minor (approximately 1 percent).

Exit this function by pressing the UpSELECT Button (7A).

<SETUP> Access Code 23 - No. Throughput Counters

DIAGNOSTICS
23 Thruput Counters

Advance to <SETUP> Access Code 23 using the SET Buttons. Press the DnSELECT Button (7B) and the display will read:

I = xxxS=xxxx E=xxxx
C=xxxx T=xxxx @ #1

Press the SET Buttons to set station number. This function is for Conair troubleshooting purposes only.

<SETUP> Access Codes 23 and 25 are very similar to 23. The are for Conair troubleshooting purposes only.

<SETUP> Access Code 27 - Motor Output Test

DIAGNOSTICS
27 Motor Output Test

Advance to <SETUP> Access Code 27 using the SET Buttons.
Press the DnSELECT Button (7B) and the display will read:

Motor Output Test
Motor No. = 1 #1

Use the SET key to seclect the desired motor. Then use the DnSELECT key to access the next screen.

Motor Output Test
Speed = xx %

Use the SET keys to select the desired motor rate of 0 to 100% maximum motor speed. Use the RUN/STOP keys to start or stop the motor. Use the UpSELECT key to leave this function.

<SETUP> Access Code 16: See Chapter 7.
<SETUP> Access Code 17: See Chapter 7.
<SETUP> Access Code 18: See Chapter 7.
<SETUP> Access Code 19: See Chapter 7.

ALARMS AND POSSIBLE CAUSES

The blender is programmed to give an alarm if any part of its system is not operating properly. The following is a list of possible alarms, their causes and solutions. When alarms occur, the Alarm Light and Horn will sound. Push the ALARM Button and the Horn will be silenced, then press the button again to display any associated alarm message(s).

Alarm #1 Mixing chamber empty - This alarm occurs when the blender is not able to supply enough material to keep the mixing chamber at its optimum level (when the material level in mixing chamber fails to reach the mixer full sensor after blender has run at 100% for 10 minutes). This alarm will occur if the augers are too small. Check the auger speeds for optimum metering. The augers should be sized so that they are all turning at 20% to 90%. Refer to Chapter 3 for proper auger/sleeve sizing and changing procedures. After an auger has been changed, the hopper must be recalibrated.

Alarm #2 No Material Hopper No. (1-4) - The No Material alarm occurs when the amount of material in a hopper drops to below 10% of the full hopper capacity. Check your loader and material supply to see why the hopper is not being filled.

Alarm #3 Auger No. (1-4) No Throughput - This alarm occurs when a metering auger tries to meter material but sees no change in hopper weight. Check hopper for bridging and similar obstruction or poor material flow.

Alarm #4 Ratio Error Auger No. (1-4) - A Ratio Error can result from a poor auger selection. Check the auger speeds. For optimum recipe accuracy, all auger speeds should be about equal. Increase or decrease auger sizes to improve auger speeds. (See Auger/Sleeve installation section). After changing an auger and sleeve, you must recalibrate that hopper position.

Alarm #5 Cannot Meet Expected Rate With This Setup - This alarm occurs immediately upon entering the RUN mode when the programmed recipe and setup parameters cannot keep up with the programmed expected rate setpoint. Increase the augers sizes and re-calibrate to increase the throughput rate or check setpoint of expected rate.

Alarm #6 No. x Load Cell Bad or Overloaded - Check the millivolt reading across terminals 4 and 6 of the load cell's terminal block located at the bottom of the Processor PC Board (See the Control Box Assembly and Wiring Diagram in the Appendix).

The load cell signal ranges from 0-20 mVDC, and should read between 10-12 mV for a properly calibrated, empty supply hopper. If your signal is outside these ranges, try the following:

1. Check for obstructions prohibiting free movement of the hopper - specifically check the hopper guide rods for full clearance through the loader mounting plates.

2. Check the load cell and mount for trapped pellets or other wedged material that could be hindering the freedom of movement of the load cell.

Alarm #7 Motor Overload Auger No. (1-4) - This alarm occurs when an auger motor overloads. The motor will overload if the auger jams with material. Check to see that material is not backed up into auger discharge chute. To solve this problem, remove the auger and sleeve and check for obstructions. Re-install the auger and sleeve or replace the auger if it is bent or damaged. If the auger is changed, the load cell must be recalibrated.

Turn the power off and back on to reset the motor overload.

Alarm #8 Mixer Interlock Open Check Mixer Cover - As a safety feature, the mixer door and metering hoppers have interlocks so that the blender cannot be run without the access doors being secured.

Alarm #9 Memory Failure Check Recipe Data or Check Setup Data or Recalibrate Machine - Data failed to pass integrity tests on power-up, indicating that data may have been corrupted or memory has failed. Cycle the power, then check setup parameters and calibration data. Recalibrate if necessary. If problem persists, consult Conair.

Alarm #10 Check Volume Calibration Auger No. x - Blender tried to adjust an auger's speed to greater than 100% while trying to obtain a throughput rate that should have been attainable based on its Volumetric Calibration Data. Could be caused by the following:

1. Changing an auger/sleeve combination without recalibrating (must recalibrate both gravimetrically and volumetrically or recalibrate gravimetrically and edit the volume calibrated data).

2. Switching to a material with a significant change in bulk density without recalibrating volumetrically.

3. Poor material flow in the material supply hopper.

CIRCUIT BOARD LED IDENTIFICATION

I/O PC Board

LOCATION #	LED #	Description
J3	LD1	Spare Sensor, Auger#1
J3	LD2	Spare Sensor, Auger#2
J3	LD3	Spare Sensor, Auger#3
J3	LD4	Spare Sensor, Auger#4
J6	LD5	Loader #1 Full (material in loader)
J6	LD6	Loader #2 Full (material in loader)
J6	LD7	Loader #3 Full (material in loader)
J6	LD8	Loader #4 Full (material in loader)
J5	LD9	Demand Out (to pump)
J5	LD10	Demand In (a loader needs material)
J5	LD11	Last Loader
J5	LD12	Next Loader
J4	LD15	Load #1 (loader popper valve)
J4	LD16	Load #2 (loader popper valve)
J4	LD17	Load #3 (loader popper valve)
J4	LD18	Load #4 (loader popper valve)
J4	LD13	Dump #1 (loader discharge valve)
J4	LD14	Dump #2 (loader discharge valve)
J4	LD19	Dump #3 (loader discharge valve)
J4	LD20	Dump #4 (loader discharge valve)
J4	LD22	Metering Light
J4	LD23	Alarm Horn
J11	LD43	Mixer Spare Input
J11	LD44	Mixer Empty Sensor
J11	LD45	Mixer Interlock Switch
J11	LD46	Mixer Full Sensor

PROCESSOR PC BOARD

LED #	Description
LD1	Receive Data
LD2	Transmit Data
LD3	Direction Pin
LD4	Auger motor #1 metering when lit
LD5	Auger motor #2 metering when lit
LD6	Auger motor #3 metering when lit
LD7	Auger motor #4 metering when lit
LD8	Power (yellow)
LD9	Power (red)
LD10	1 Second Timer

COMMUNICATIONS PC BOARD

LED#	Description
flt	Communication fault condition when lit
dir	Receive enabled when lit
txd	Transmit data when lit
rxd	Received data when lit

Warranty / Service Information
SPI Commands
Control Box Assembly
Control Box Wiring Diagram
Terminal Box
Terminal Box Wiring Diagram
RS-232 Sample Printout

We're Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our staff of service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

How to Contact Customer Service

To contact Customer Service personnel, call:

PARTS & SERVICE 800 458 1960
Instant Access CONAIR FRANKLIN

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

Before You Call ...

If you do have a problem, please complete the following checklist before calling Conair:

- ❒ Make sure you have all model, serial and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- ❒ Make sure power is supplied to the equipment.
- ❒ Make sure that all connectors and wires within and between control systems and related components have been installed correctly.
- ❒ Check the troubleshooting guide of this manual for a solution.
- ❒ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- ❒ Check that the equipment has been operated as described in this manual.
- ❒ Check accompanying schematic drawings for information on special considerations.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

EQUIPMENT GUARANTEE

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by use to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

PERFORMANCE WARRANTY

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer recipt and other evidence that a claim is being made.

WARRANTY LIMITATIONS

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

Supported SPI Commands

SUPPORTED SPI COMMANDS

Echo

POLL: 20 20
SELECT: 20 21
FORMAT: Open 4 bytes ASCII
UNITS: NA
REQUIRED: Yes
DESCRIPTION: Controller integrity command. Controller will accept and retain the data provided. The controller will provide the retained data in response to a poll inquiry.

Version

POLL: 20 22
SELECT:
FORMAT: Open 4 bytes ASCII
UNITS: NA
REQUIRED: Yes
DESCRIPTION: Controller version command. The controller will provide a version number according to the following format: AABB, where (AA = SPI version level, BB = Vender assigned version level).

Status, Process Summary

POLL: 20 40
SELECT:
FORMAT: 16 bit
UNITS: NA
REQUIRED: Yes
DESCRIPTION: This status word is a summary of all alarms or status conditions for the entire unit. See SPI manual for complete description of each bit.

Status, Process Hopper
POLL: 20 42
SELECT:
FORMAT: 16 bit
UNITS: NA
REQUIRED: No
DESCRIPTION: These status words describe conditions for each hopper. The status word for hopper A is received first. The lower 8 bits are a copy of the process summary status word. See SPI manual for complete description of each bit.

Status, Process Mode
POLL: 20 46
SELECT: 20 47
FORMAT: 16 bit
UNITS: NA
REQUIRED: No
DESCRIPTION: Used to zero totalizers. See SPI manual.

Mode Machine
POLL: 20 48
SELECT: 20 49
FORMAT: 16 bit
UNITS: NA
REQUIRED: No
DESCRIPTION: Used to start, stop, silence alarm. See SPI manual for complete description of each bit.

Setpoint, Ingredient Blend Percentages

POLL: 20 50
SELECT: 20 51
FORMAT: numeric 8 values
UNITS: parts/percent
REQUIRED: Yes
DESCRIPTION: The desired percentages by weight of the individual components. The percentage for hopper A is sent or received first. Hoppers not present or ingredients which should not be in the present blend should be set to 0.0.

Setpoint, Calibration Delta Weight

POLL: 20 54
SELECT: 20 55
FORMAT: numeric 8 values
UNITS: lbs
REQUIRED: No
DESCRIPTION: Used to read, write calibration delta weights. Hoppers not present should be set to 0.0.

Setpoint, Expected Rate

POLL: 20 56
SELECT: 20 57
FORMAT: numeric 1 value
UNITS: lbs/hr

REQUIRED: No
DESCRIPTION: The desired rate at which the blender delivers material.

Measured Rate

POLL: 20 62
SELECT:
FORMAT: numeric 8 value
UNITS: lbs/hr
REQUIRED: No
DESCRIPTION: Current thruput or if not running target rate.

Total Thruput

POLL: 20 64
SELECT:
FORMAT: numeric 1 value
UNITS: lbs/hr
REQUIRED: No
DESCRIPTION: The rate at which the blender is delivering material. Total thruput of machine.

Hopper Weight

POLL: 20 68
SELECT:
FORMAT: numeric
UNITS: NA
REQUIRED: Conair use only
DESCRIPTION: Level of material in each hopper

Hopper Totals

POLL: 20 6C
SELECT:
FORMAT: numeric 8 values
UNITS: lbs
REQUIRED: No
DESCRIPTION: The amount of material which each hopper has fed since the value was last cleared.

Machine Total

POLL: 6E
SELECT:
FORMAT: numeric 1 value
UNITS: lbs
REQUIRED: No
DESCRIPTION: Total amount of material which the blender has fed since the hopper totals were last cleared.

Auxiliary Analog Channel

POLL: 20 70
SELECT: 20 71
FORMAT: numeric 1 value

REQUIRED: Conair use only
DESCRIPTION: recipe last calibrated

Motor factor

POLL: 20 7E
SELECT:
FORMAT: numeric 1 value
UNITS: NA
REQUIRED: Conair use only
DESCRIPTION: View the m_factor variable.

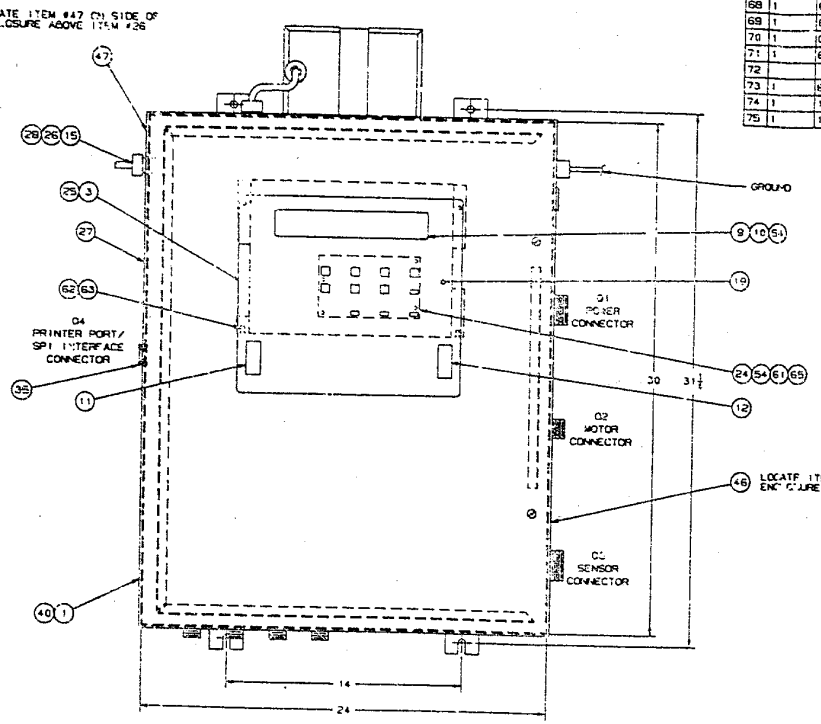
Real Speed

POLL: 20 80
SELECT:
FORMAT: numeric 8 value
UNITS: NA
REQUIRED: Conair use only
DESCRIPTION: View each auger motor output.

Blanket Poll

POLL: 20 E0
SELECT:
FORMAT:
UNITS:
REQUIRED:
DESCRIPTION: The following list contains the items included in the Blanket Poll:

PROC_STAT
PROC_HOP
MODE_PROC_RD
MODE_POLL
AUG_SP_RD
CAL_SP_RD
EXP_RATE_RD
MEAS_RATE
TOT_THRU
HOP_WGT
HOP_TOT
MACH_TOT



ITEM NO	NUMBER REQUIRED	PART NUMBER	DESCRIPTION
56	3	207-001-08	CORD GRIP
57	10 FT	205-002-05	SJ PORTABLE CORD 16-3
58	1	614-082-03	MOTOR BOARD SHIELD
59	1 FT	299-151-03	CONTINUOUS GROMMET
60	1	107-110-05	I/O BRD RIBBON CABLE ASSEMBLY
61	1	107-110-06	DISPLAY BRD RIBBON CABLE ASM.
62	1	614-082-05	SHIELD DISPLAY BOARDS
63	4	221-002-02	HEX NUT NO.8-32NC
64	1	614-193-03	LINE FILTER WIRING ASSY
65	2 FT	299-149-32	3/8" NEOPRENE STRIP X 1/2"WIDE
66	2	299-274-05-04	RUBBER BUMPER 3M NO.SJ-5523
67	1	209-636	GROUND BUS, WESTINGHOUSE GB10
68	1	614-193-04	SELECTRONIC WIRING ASSY
69	1	614-193-06	SENSOR WIRING ASSY
70	1	CHART	POWER WIRING ASSY
71	1	614-193-07	MOTOR BRD 24V AC WIRING ASSY
72			
73	1	614-193-09	SVDC POWER & PCB WIRING ASSY
74	1	108-145-02	FUSE (2A) LITTELFUSE
75	1	108-145-15	FUSE (15) LITTELFUSE

ITEM NO	NUMBER REQUIRED	PART NUMBER	DESCRIPTION
1	1	614-001-01	ENCLOSURE WELDMENT
2	1	614-082-01	PANEL DETAIL
3	1	299-215-71	LABEL
4	1	CHART	GRAVICON PROCESSOR P.C. BOARD
5	1	614-082-06	PROCESSOR BOARD LARGE SHIELD
6	1	614-085-21	I/O P.C. BOARD
7	1	614-058-01	PROCESSOR BOARD SMALL SHIELD
8	1	614-084-01	GRAVICON MOTOR P.C. BOARD
9	1	206-095-01	VACUUM FLUORESCENT DISPLAY
10	1	107-110-03	VACUUM FLUORESCENT CABLE ASSEM
11	1	CHART	CIRCUIT BREAKER SWITCH
12	1	CHART	CIRCUIT BREAKER SWITCH
13	1	209-089-03	AUDIO ALARM - BELL
14	1	209-431-13	POWER SUPPLY 6 AMP, SWITCHING
15	CHART	205-005-03	CORD SET 14-3 SJ
16	1	200-054-02	RELAY-DPST 10R
17	CHART	209-139-05	TRANSFORMER TA181213(220 TO 110)
18	1	209-456-02	TRANSFORMER - SIGNAL #DL-24-12
19	1	233-037-02	TOGGLE SWITCH
20	1	108-145-03	FUSE (3A) LITTELFUSE
21	3	219-022-17	FUSE HOLDER - LITTELFUSE #350329
22	1	200-007-10	RELAY - DPDT (TRACK MOUNTED) 2CR
23	1	219-066-05	TRACK MOUNT RELAY SOCKET
24	1	107-332-01	GRAVICON DISPLAY P.C. BOARD
25	CHART	CHART	LOGO LABEL
26	1	207-001-10	CORD GRIP
27	1	209-010-07	HOLE PLUG P-875
28	5	209-001-01	CONDUIT LOCKNUT
29	1	209-007-05	TERMINAL STRIP - 5 LUG
30	1	614-059	LABEL - TERMINAL STRIP
31	1	614-196-01	TERMINAL STRIP LABEL
32	CHART	614-193-01	LOAD CELL WIRING ASSY
33	8	210-004-02	#6-32NC X 5/16"LG RD HD MACH SCR
34	1	209-007-17	TERMINAL STRIP - 17 LUG
35	1	SEE CHART	COMMUNICATION CABLE ASSY
36	1	614-198-01	WATCHDOG TIMER BOARD
37	1	107-388-41	COMMUNICATION BOARD
38	4	209-543-03-02	SPACER,#6 X 1/2"LG
39	1	CHART	ISOLATION TRANSFORMER
40	9 FT	299-149-11	1/8 X 3/4 WEATHERSTRIP
41	1	614-193-02	MOTOR WIRING ASSY
42	25 FT	205-009-16-05	16 GA WIRE, GREEN
43	4	209-010-16	HOLE PLUG HEYCO #2693
44	2	207-018-10	90° CORD GRIP
45	1	166-406-05	POWER LINE FILTER WITH MOV'S
46	1	299-153-41-02	LABEL - CONNECTOR
47	1	CHART	LABEL - POWER
48	17	210-020-02	8-32NC X 3/8 RD HD MACH SCREW
49	4	210-099-02	1/4-28NF X 3/8 RD HD MACH SCREW
50	18	210-055-02	10-32NF X 3/8 RD HD MACH SCREW
51	6	221-009-02	3/8-16NC HEX NUT
52	5	210-149-02	4-40NC X 5/16 RD HD MACH SCREW
53	6	225-003-02	3/8 FLAT WASHER
54	19	210-005-02	6-32NC X 3/8 RD HD MACH SCREW

NOTES:

1. - FOR WIRING DIAGRAM SEE 614-197-01
2. - KEEP LOW VOLTAGE WIRING (BLUE) AWAY FROM 115 VOLT POWER WIRING. DO NOT TIE TOGETHER WITH WIRE TIES.
3. - USE LOCTITE #222 ON HARDWARE TO MOUNT P.C. BOARDS TO STANDOFFS.

SEE SHEET 2 OF 3 FOR PANEL LAYOUT
SEE SHEET 3 OF 3 FOR CHART

NO	DATE	REVISIONS	BY	CKD.	APP.
E	3-10-98	SEE ECN 195021	JULIN		
D	12-27-94	SEE ECN #94136	JULIN		

CONAIR FRANKLIN
FRANKLIN, PENNSYLVANIA 16323

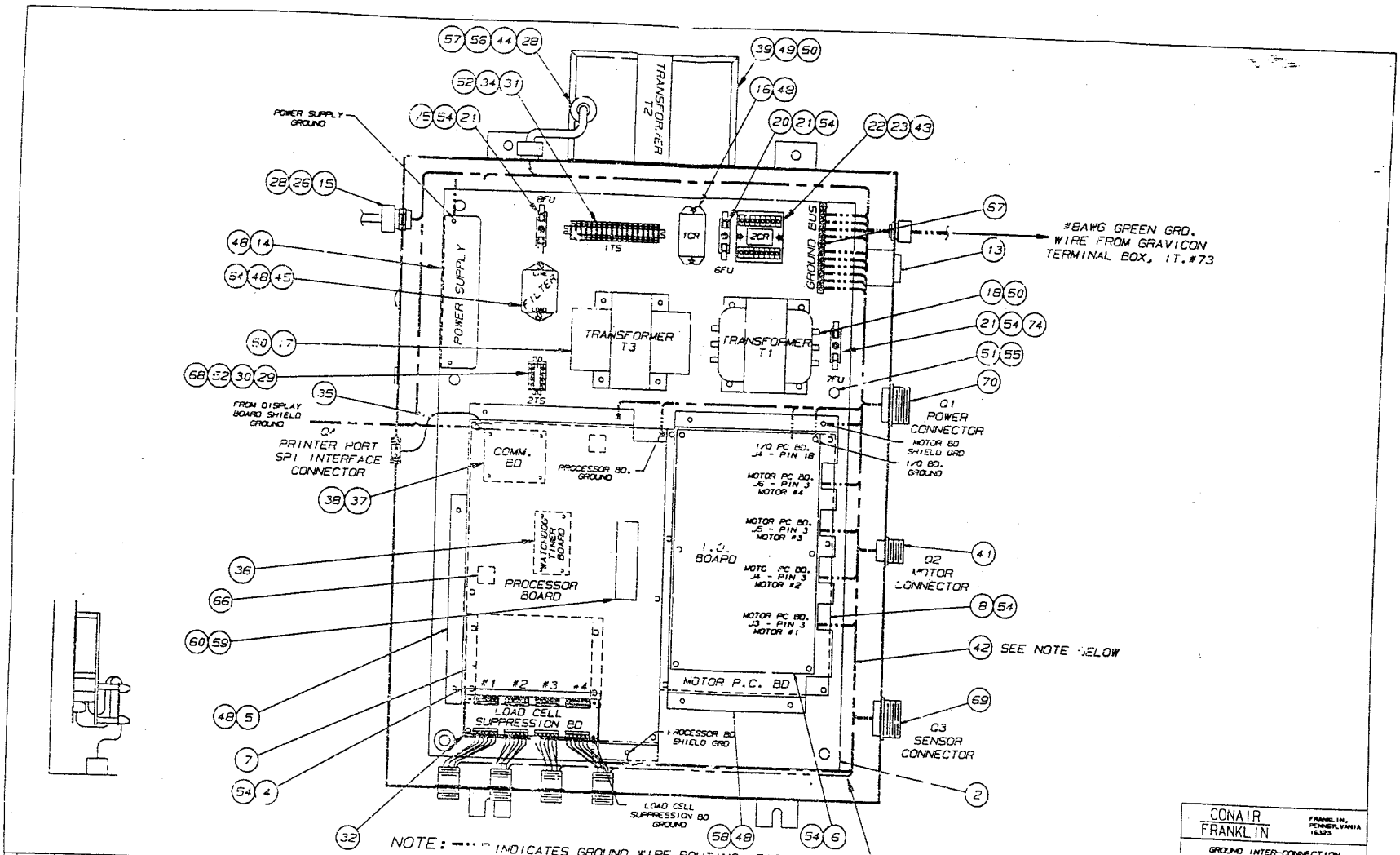
GRAVICON/CONOMIX CONTROL BOX ASSEMBLY VACUUM FLUORESCENT

TOLERANCE UNLESS OTHERWISE SPECIFIED
FRACTIONAL 1/64 DECIMAL .005 ANGULAR 1/2°

APPL. | CORRECTNY | CHD. | APP.
DATE 12-12-85 | DATE | DATE

SHT. 1 OF 3 SHTS. 614-186 E

ORIGINAL



NOTE: ---- INDICATES GROUND WIRE ROUTING. EACH GROUND POINT TO HAVE INDIVIDUAL #18AWG WIRE, UNLESS NOTED, ROUTED FROM COMMON GROUND (ITEM #67). ROUTE WIRES AS SHOWN IN SEPERATE HARNESS AWAY FROM AC AND DC WIRES.

NO	DATE	REVISIONS	BY	CHD.	APP.
	09-10-03	SEE SHEET 1 OF 3	JLM		

CONAIR FRANKLIN

FRANKLIN, PENNSYLVANIA 16323

GROUND INTER-CONNECTION WIRING DIAGRAM

TOLERANCE UNLESS OTHERWISE SPECIFIED
FRACTIONAL ± 1/64 DECIMAL .XX ± .005 ANGULAR ± 1/2°

DRN. J. GUNDLACH DATE 12-19-03 CHD. DATE APP. DATE

SHT. 2 OF 3 SHTS. 614-186 E

ASSEMBLY PART NO.	DESCRIPTION	ITEM NO.4 PART NUMBER PROCESSOR BOARD	PART NUMBER DESC. ITEM NO.11 CIRCUIT BREAKER SWITCH	PART NUMBER DESC. ITEM NO.12 CIRCUIT BREAKER SWITCH	NO RECD. ITEM NO.15 CORD SET	NO RECD. ITEM NO.17 TRANSFORMER	PART NUMBER NC RECD. ITEM NO.25 LABEL OVERLAY	NO RECD. ITEM NO.32 LOAD CELL WIRING ASSY	ITEM NO.35 PART NUMBER COMM. CABLE ASSY	ITEM NO.39 PART NUMBER ISOLATION TRANSFORMER	ITEM NO.47 PART NUMBER POWER LABEL	ITEM NO.70 PART NUMBER AC POWER / SWITCH WIRING ASSY
614-186-24	MICRO CONOMIX,SPI 220V,60HZ	614-190-04	203-018-28	4 AMP	203-018-29	3 AMP	0	1	NA	0	0	614-192-02	209-634-02 SOLA #23-22-112-2	299-153-42-07	614-193-05-01
614-186-23	MICRO CONOMIX,RS-232 220V,60HZ	614-190-04	203-018-28	4 AMP	203-018-29	3 AMP	0	1	NA	0	0	614-192-01	209-634-02 SOLA #23-22-112-2	299-153-42-07	614-193-05-01
614-186-22	CONOMIX,SPI 220V,60HZ	614-190-04	203-018-19	8 AMP	203-018-25	6 AMP	0	1	299-153-85-01	1	0	614-192-02	209-634-02 SOLA #23-22-112-2	299-153-42-06	614-193-05-01
614-186-21	CONOMIX,RS-232 220V,60HZ	614-190-04	203-018-19	8 AMP	203-018-25	6 AMP	0	1	299-153-85-01	1	0	614-192-01	209-634-02 SOLA #23-22-112-2	299-153-42-06	614-193-05-01
614-186-20	MICRO GRAVICON,SPI 220V,60HZ	614-190-03	203-018-28	4 AMP	203-018-29	3 AMP	0	1	299-153-85-03	▷ 1	1	614-192-02	209-634-02 SOLA #23-22-112-2	299-153-42-07	614-193-05-01
614-186-19	MICRO GRAVICON,RS-232 220V,60HZ	614-190-03	203-018-28	4 AMP	203-018-29	3 AMP	0	1	299-153-85-03	▷ 1	1	614-192-01	209-634-02 SOLA #23-22-112-2	299-153-42-07	614-193-05-01
614-186-18	GRAVICON,SPI 220V,60HZ	614-190-03	203-018-19	8 AMP	203-018-25	6 AMP	0	1	299-153-85-03	1	1	614-192-02	209-634-02 SOLA #23-22-112-2	299-153-42-06	614-193-05-01
614-186-17	GRAVICON,RS-232 220V,60HZ	614-190-03	203-018-19	8 AMP	203-018-25	6 AMP	0	1	299-153-85-03	1	1	614-192-01	209-634-02 SOLA #23-22-112-2	299-153-42-06	614-193-05-01
614-186-16	MICRO CONOMIX,SPI 220V,50HZ	614-190-04	203-018-28	4 AMP	203-018-29	3 AMP	0	1	NA	0	0	614-192-02	209-634-03 SOLA #63-23-612-8	299-153-42-04	614-193-05-01
614-186-15	MICRO CONOMIX,RS-232 220V,50HZ	614-190-04	203-018-28	4 AMP	203-018-29	3 AMP	0	1	NA	0	0	614-192-01	209-634-03 SOLA #63-23-612-8	299-153-42-04	614-193-05-01
614-186-14	CONOMIX,SPI 220V,50HZ	614-190-04	203-018-19	8 AMP	203-018-25	6 AMP	0	1	299-153-85-01	1	0	614-192-02	209-634-03 SOLA #63-23-612-8	299-153-42-05	614-193-05-01
614-186-13	CONOMIX,RS-232 220V,50HZ	614-190-04	203-018-19	8 AMP	203-018-25	6 AMP	0	1	299-153-85-01	1	0	614-192-01	209-634-03 SOLA #63-23-612-8	299-153-42-05	614-193-05-01
614-186-12	MICRO GRAVICON,SPI 220V,50HZ	614-190-03	203-018-28	4 AMP	203-018-29	3 AMP	0	1	299-153-85-03	1	1	614-192-02	209-634-03 SOLA #63-23-612-8	299-153-42-04	614-193-05-01
614-186-11	MICRO GRAVICON,RS-232 220V,50HZ	614-190-03	203-018-28	4 AMP	203-018-29	3 AMP	0	1	299-153-85-03	1	1	614-192-01	209-634-03 SOLA #63-23-612-8	299-153-42-04	614-193-05-01
614-186-10	GRAVICON,SPI 220V,50HZ	614-190-03	203-018-19	8 AMP	203-018-25	6 AMP	0	1	299-153-85-03	1	1	614-192-02	209-634-03 SOLA #63-23-612-8	299-153-42-05	614-193-05-01
614-186-09	GRAVICON,RS-232 220V,50HZ	614-190-03	203-018-19	8 AMP	203-018-25	6 AMP	0	1	299-153-85-03	1	1	614-192-01	209-634-03 SOLA #63-23-612-8	299-153-42-05	614-193-05-01
614-186-08	MICRO CONOMIX,SPI 110V,60HZ	614-190-04	203-018-17	8 AMP	203-018-11	5 AMP	1	0	NA	0	0	614-192-02	209-634-02 SOLA #23-22-112-2	299-153-42-03	614-193-05
614-186-07	MICRO CONOMIX,RS-232 110V,60HZ	614-190-04	203-018-17	8 AMP	203-018-11	5 AMP	1	0	NA	0	0	614-192-01	209-634-02 SOLA #23-22-112-2	299-153-42-03	614-193-05
614-186-06	CONOMIX,SPI 110V,60HZ	614-190-04	203-018-05	15 AMP	203-018-09	12 AMP	1	0	299-153-85-01	1	0	614-192-02	209-634-02 SOLA #23-22-112-2	299-153-42-02	614-193-05
614-186-05	CONOMIX,RS-232 110V,60HZ	614-190-04	203-018-05	15 AMP	203-018-09	12 AMP	1	0	299-153-85-01	1	0	614-192-01	209-634-02 SOLA #23-22-112-2	299-153-42-02	614-193-05
614-186-04	MICRO GRAVICON,SPI 110V,60HZ	614-190-03	203-018-17	8 AMP	203-018-11	5 AMP	1	0	299-153-85-03	1	1	614-192-02	209-634-02 SOLA #23-22-112-2	299-153-42-03	614-193-05
614-186-03	MICRO GRAVICON,RS-232 110V,60HZ	614-190-03	203-018-17	8 AMP	203-018-11	5 AMP	1	0	299-153-85-03	1	1	614-192-01	209-634-02 SOLA #23-22-112-2	299-153-42-03	614-193-05
614-186-02	GRAVICON,SPI 110V,60HZ	614-190-03	203-018-05	15 AMP	203-018-09	12 AMP	1	0	299-153-85-03	1	1	614-192-02	209-634-02 SOLA #23-22-112-2	299-153-42-02	614-193-05
614-186-01	GRAVICON,RS-232 110V,60HZ	614-190-03	203-018-05	15 AMP	203-018-09	12 AMP	1	0	299-153-85-03	1	1	614-192-01	209-634-02 SOLA #23-22-112-2	299-153-42-02	614-193-05

NO.	DATE	REVISIONS	BY	CKD.	APP.
	9-19-94	SEE SHEET 1 OF 3	JULIN		

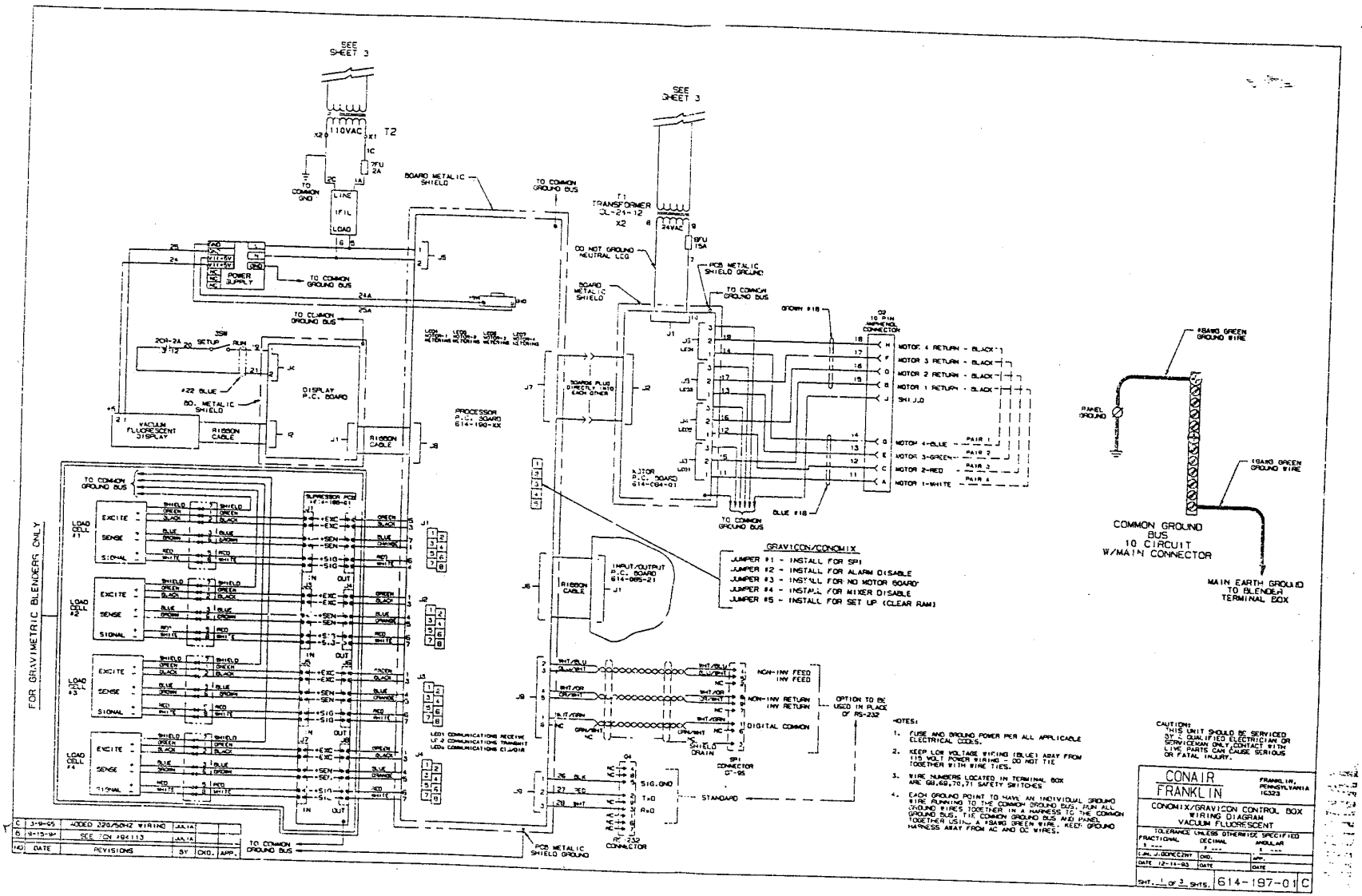
CONAIR FRANKLIN — FRANKLIN, PENNSYLVANIA 16323

GRAVICON/CONOMIX CONTROL BOX ASSY VACUUM FLUORESCENT 110V/1PH/60HZ-220V/1PH/50HZ & 60HZ

TOLERANCE UNLESS OTHERWISE SPECIFIED: FRACTIONAL ± 1/64, DECIMAL .005, ANGULAR ± 1/2°

DRN. J. DONECHNY 9-19-94 | CKD. | APP. | DATE

Sht. 1 OF 3 SHTS. | 614-186 | E



NOTES:

1. FUSE AND GROUND POWER PER ALL APPLICABLE ELECTRICAL CODES.
2. KEEP LOW VOLTAGE WIRING (BLUE) AWAY FROM 115 VOLT POWER WIRING. DO NOT TIE TOGETHER WITH WIRE TIES.
3. WIRE NUMBERS LOCATED IN TERMINAL BOX ARE 60,69,70,71 SAFETY SWITCHES
4. EACH GROUND POINT TO HAVE AN INDIVIDUAL GROUND WIRE RUNNING TO THE COMMON GROUND BUS. RUN ALL GROUND WIRES TOGETHER IN A HARNESS TO THE COMMON GROUND BUS. TIE COMMON GROUND BUS AND PANEL HARNESS AWAY FROM AC AND DC WIRES.

CAUTION: THIS UNIT SHOULD BE SERVICED BY QUALIFIED ELECTRICIAN OR SERVICEMAN ONLY. CONTACT WITH LIVE PARTS CAN CAUSE SERIOUS OR FATAL INJURY.

NO.	DATE	REVISIONS	BY	CHD.	APP.
C	3-9-95	ADDED 220/50HZ WIRING	JAJ/A		
B	9-15-94	SEE ECN #94113	JAJ/A		

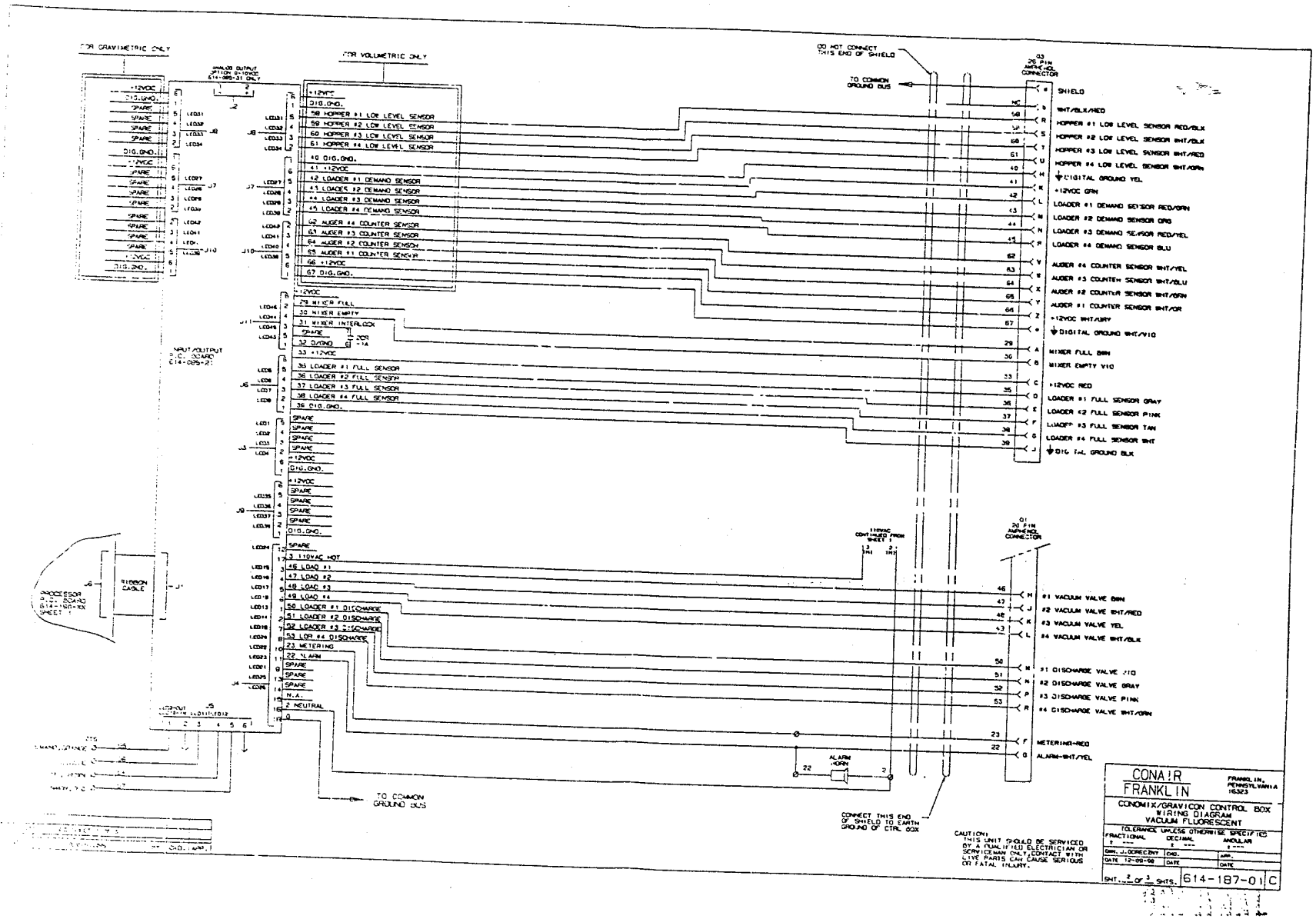
CONAIR FRANKLIN — FRANKLIN, PENNSYLVANIA 16323

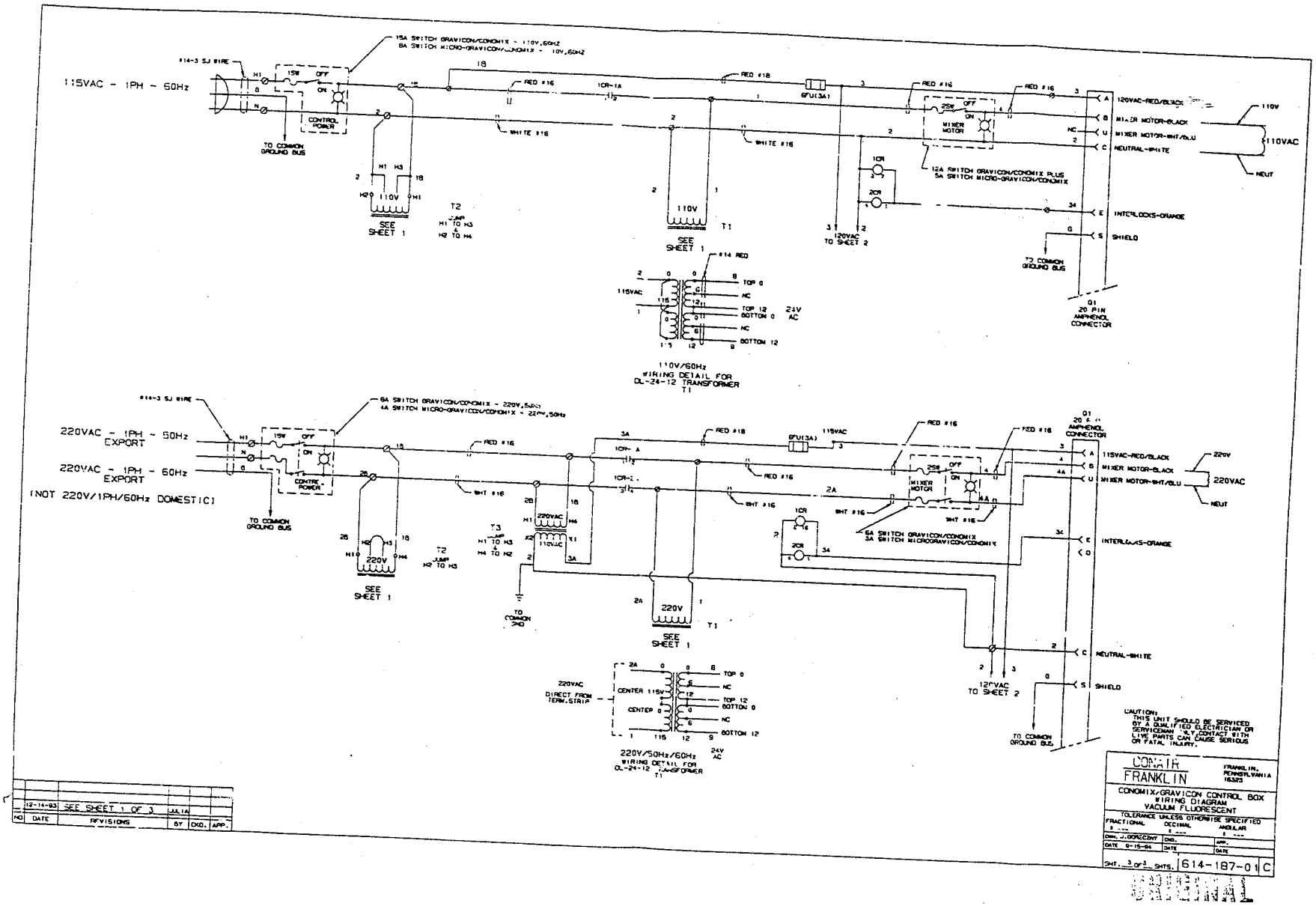
CONOMIX/GRAVICON CONTROL BOX WIRING DIAGRAM VACUUM FLUORESCENT

TOLERANCE UNLESS OTHERWISE SPECIFIED: FRACTIONAL ± ---, DECIMAL .X ± ---, .XX ± ---, ANGULAR ± ---

DRN. J.DOHERTY	DATE 12-14-93	CHD.	DATE
APP.	DATE		

SHT. 1 OF 2 SHTS. | 614-197-01 | C


FOR GRAVIMETRIC ONLY
FOR VOLUMETRIC ONLY
DO NOT CONNECT THIS END OF SHIELD
TO COMMON GROUND BUS
25 PIN AMPHENOL CONNECTOR
SHIELD
WHT/BLK/RED
HOPPER #1 LOW LEVEL SENSOR RED/BLK
HOPPER #2 LOW LEVEL SENSOR WHT/BLK
HOPPER #3 LOW LEVEL SENSOR WHT/RED
HOPPER #4 LOW LEVEL SENSOR WHT/GRN
DIGITAL GROUND YEL
+12VDC GRN
LOADER #1 DEMAND SENSOR RED/GRN
LOADER #2 DEMAND SENSOR ORG
LOADER #3 DEMAND SENSOR RED/YEL
LOADER #4 DEMAND SENSOR BLU
AUGER #4 COUNTER SENSOR WHT/YEL
AUGER #3 COUNTER SENSOR WHT/BLU
AUGER #2 COUNTER SENSOR WHT/GRN
AUGER #1 COUNTER SENSOR WHT/OR
+12VDC WHT/GRY
DIGITAL GROUND WHT/V10
MIXER FULL BRN
MIXER EMPTY V10
+12VDC RED
LOADER #1 FULL SENSOR GRAY
LOADER #2 FULL SENSOR PINK
LOADER #3 FULL SENSOR TAN
LOADER #4 FULL SENSOR WHT
DIG GND GROUND BLK
#1 VACUUM VALVE BRN
#2 VACUUM VALVE WHT/RED
#3 VACUUM VALVE YEL
#4 VACUUM VALVE WHT/BLK
#1 DISCHARGE VALVE V10
#2 DISCHARGE VALVE GRAY
#3 DISCHARGE VALVE PINK
#4 DISCHARGE VALVE WHT/GRN
METERING-RED
ALARM-WHT/YEL
ALARM HORN
RIBBON CABLE
TO COMMON GROUND BUS
CONNECT THIS END OF SHIELD TO EARTH GROUND OF CTRL BOX
CAUTION: THIS UNIT SHOULD BE SERVICED BY A QUALIFIED ELECTRICIAN OR SERVICEMAN ONLY. CONTACT WITH LIVE PARTS CAN CAUSE SERIOUS OR FATAL INJURY.
CONAIR FRANKLIN
FRANKLIN, PENNSYLVANIA 16323
CONOMIX/GRAVICON CONTROL BOX WIRING DIAGRAM VACUUM FLUORESCENT
TOLERANCE UNLESS OTHERWISE SPECIFIED
FRACTIONAL ± ---
DECIMAL ± ---
ANGULAR ± ---
DWN. J. CORECINY
DATE 12-09-98
CHD.
DATE
APP.
DATE
SHT. 2 OF 3 SHTS.
614-187-01 C



NO	DATE	REVISIONS	BY	CKD.	APP.
	12-14-93	SEE SHEET 1 OF 3	JAL/A		

CONAIR FRANKLIN
FRANKLIN, PENNSYLVANIA 16323

CONOMIX/GRAVICON CONTROL BOX WIRING DIAGRAM VACUUM FLUORESCENT

TOLERANCE UNLESS OTHERWISE SPECIFIED
FRACTIONAL ± .--- DECIMAL ± .--- ANGULAR ± --

DWN. J.GONZALEZ	CKD.	APP.	
DATE 9-15-94	DATE	DATE	

SHT. 3 OF 3 SHTS. 614-187-01 C

SENSOR CABLE

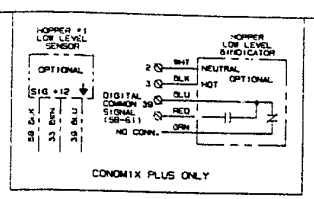
CONNECTOR LETTER	WIRE COLORS	TERM
A	BRN	29
B	VIO	30
C	RED	33
D	GRY	35
E	PINK	36
F	TAN	37
G	WHT	38
*	YEL	NC
J	BLK	39
*	ORN	NC
L	RED/BRN	42
M	ORG	43
N	RED/YEL	44
P	BLU	45
R	RED/BLK	58
S	WHT/BLK	60
T	WHT/RED	62
U	WHT/GRN	61
V	WHT/YEL	62
W	WHT/BLU	63
X	WHT/BRN	64
Y	WHT/ORG	65
*	WHT/GRY	NC
*	WHT/VIO	NC
*	WHT/BLK/RED	NC
d	SHIELD	NC

POWER CABLE

CONNECTOR LETTER	WIRE COLORS	TERM
A	RED/BLK	3
B	BLK	4
C	WHT	2
E	ORG	34
F	RED	23
G	WHT/YEL	22
H	BRN	46
J	WHT/RED	47
K	YEL	48
L	WHT/BL	49
M	VIO	50
N	GRAY	51
P	PINK	52
R	WHT/GRN	53
S	SHIELD	NC
U	WHT/BLU	4A

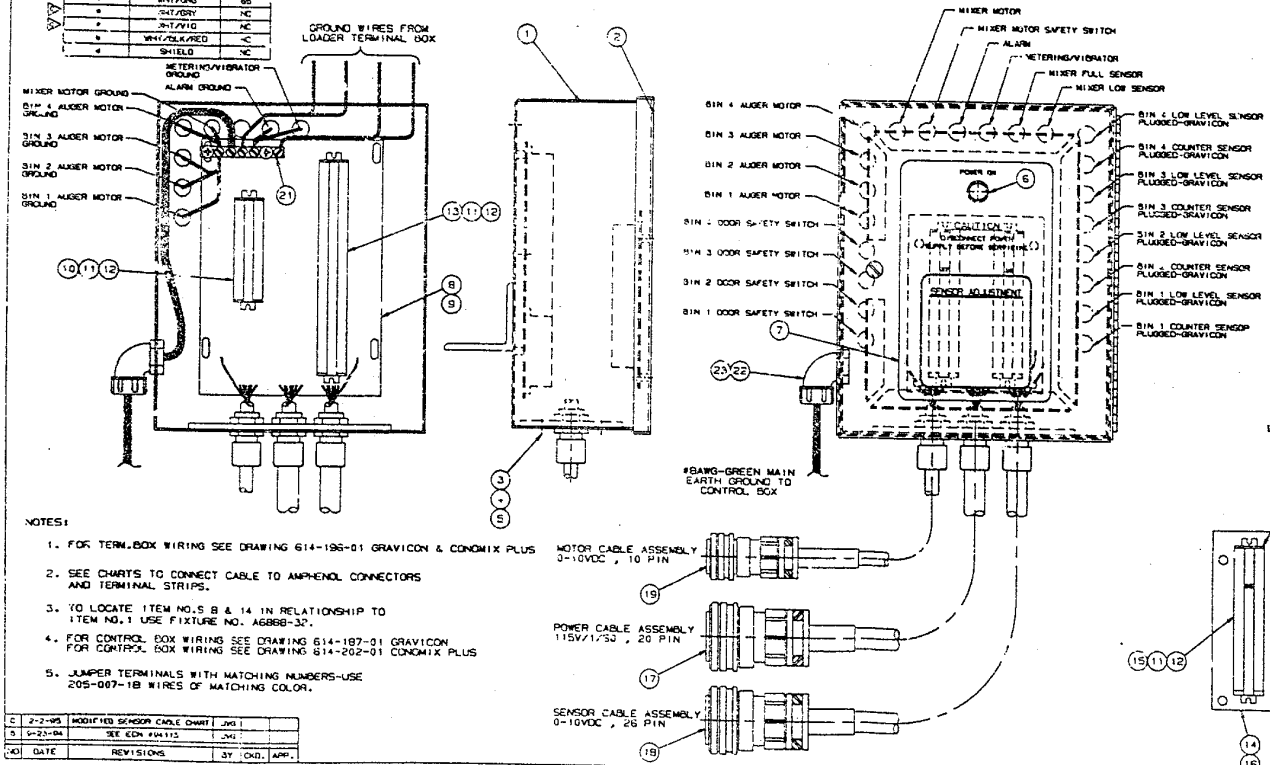
MOTOR CABLE

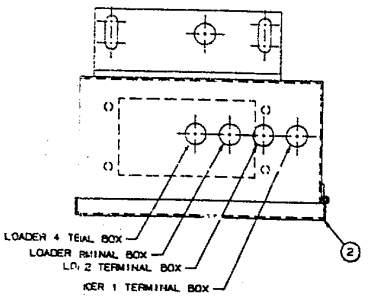
CONNECTOR LETTER	PAIR #	WIRE COLORS	TERM
A	1	WHT	11
B		BLK	15
C	2	RED	12
D		BLK	16
E	3	GRN	13
F		BLK	17
G	4	BLU	14
H		BLK	18
J		SHIELD	



NOTE: FOR APPLICATIONS WITHOUT CLEAN OUT DOORS OR LESS THAN (4) HOPPERS WITH SAFETY SWITCHES, THE OPEN SAFETY SWITCH TERMINALS SHOULD BE JUMPERED TO COMPLETE INTERLOCK CIRCUIT.

ITEM NO	QTY REQ'D	PART NUMBER	DESCRIPTION
1	1	119-01	TERMINAL BOX WELDMENT
2	3 FT	017-12-02	WEATHERSTRIP 1/8" X 3/4"
3	1	090-02	MOUNTING PLATE-CABLE ASSEMBLY
4	4	057-02	RD.HD.SCREW NO.10-32NF X 1/2"LG
5	4	003-02	NO.10 LOCKWASHER
6	1	014-03	NEON LIGHT - AMBER
7	1	216-74	POWER ON LABEL
8	1	118-01	TERMINAL STRIP PANEL
9	4	055-02	RD.HD.SCREW NO.10-32NF X 3/8"LG
*10	1	007-12	TERMINAL STRIP 12 LUG-MOTOR
11	11	150-02	RD.HD.SCREW NO.4-40NC X 3/8"LG
12	1	104-03	TERMINAL STRIP LABEL KIT
13	1	[illegible]	TERMINAL STRIP 25 LUG-POWER
14	1	118-02	TERMINAL STRIP PANEL - COVER
15	2	007-17	TERMINAL STRIP 17 LUG-SENSOR,34
16	4	005-02	RD.HD.SCREW NO.8-32NC X 3/8"LG
17	1	068-07	POWER CABLE ASSEMBLY
18	1	068-05	SENSOR CABLE ASSEMBLY
19	1	068-06	MOTOR CABLE ASSEMBLY
20	REF	010-[illegible]	HOLE PLUG HEYCO P-500
21	1	194	MODIFIED GROUND BAR - 5 LUG
22	1	005-09	90° CORD GRIP - SEAL-TITE
23	1	001-01	1/2" CONDUIT LOCKNUT
24	8	341-01	MOV G.E.#A135LA10A
25	30 FT	009-08-05	WIRE #8AWG THHN GREEN
26	2 FT	016-02	HEAT SHRINK TUBING





NOTES:

1. FOR TERM.BOX WIRING SEE DRAWING 614-196-01 GRAVICON & CONOMIX PLUS
2. SEE CHARTS TO CONNECT CABLE TO AMPHENOL CONNECTORS AND TERMINAL STRIPS.
3. TO LOCATE ITEM NO.S 8 & 14 IN RELATIONSHIP TO ITEM NO.1 USE FIXTURE NO. A6888-32.
4. FOR CONTROL BOX WIRING SEE DRAWING 614-187-01 GRAVICON FOR CONTROL BOX WIRING SEE DRAWING 614-202-01 CONOMIX PLUS
5. JUMPER TERMINALS WITH MATCHING NUMBERS-USE 20S-007-18 WIRES OF MATCHING COLOR.

NO	DATE	REVISIONS	BY	CKD.	APP.
C	2-2-95	MODIFIED SENSOR CABLE CHART	JWJ		
B	5-23-94	SEE ECN #14113	JWJ		

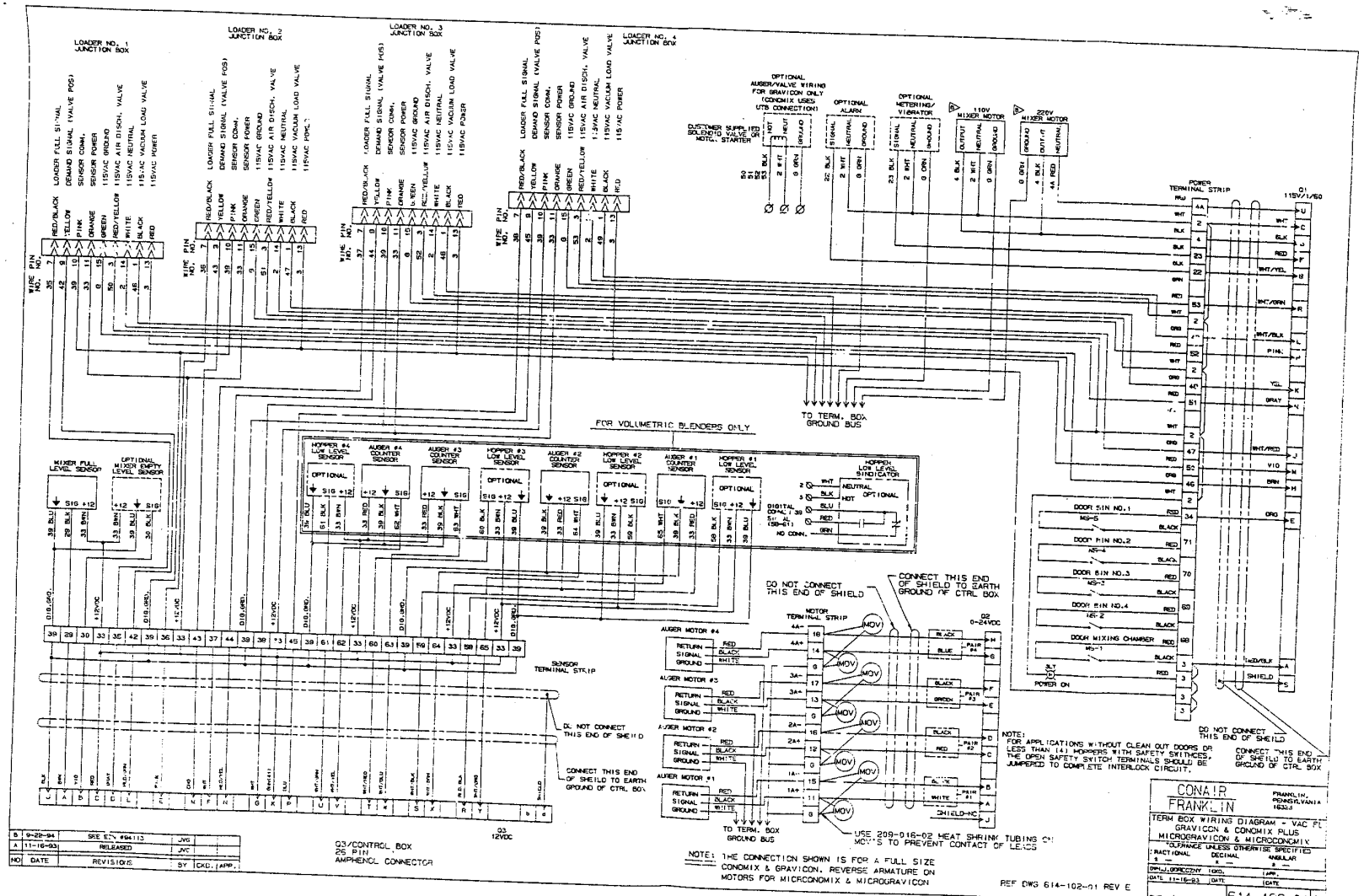
CONAIR FRANKLIN
FRANKLIN, PENNSYLVANIA 16323

TERMINAL BOX ASSEMBLY
CONOMIX PLUS/GRAVICON
VACUUM FLUORESCENT

TOLERANCE UNLESS OTHERWISE SPECIFIED
FRACTIONAL ± DECIMAL ANGULAR

DRAWN J. DORECZNY | CHK. | APP.
DATE 11-19-93 | DATE | DATE

SHT. 1 OF 1 SHTS. | 614-195-01 | C


LOADER NO. 1 JUNCTION BOX
LOADER NO. 2 JUNCTION BOX
LOADER NO. 3 JUNCTION BOX
LOADER NO. 4 JUNCTION BOX
LOADER FULL SIGNAL
DEMAND SIGNAL (VALVE POS)
SENSOR COM.
SENSOR POWER
115VAC GROUND
115VAC AIR DISCH. VALVE
115VAC NEUTRAL
115VAC VACUUM LOAD VALVE
115VAC POWER
OPTIONAL AUGER/VALVE WIRING FOR GRAVICON ONLY (CONOMIX USES UTS CONNECTION)
CUSTOMER SUPPLIED SOLENOID VALVE OR MOTOR STARTER
OPTIONAL ALARM
OPTIONAL METERING/ VIBRATOR
110V MIXER MOTOR
220V MIXER MOTOR
POWER TERMINAL STRIP
TO TERM. BOX GROUND BUS
FOR VOLUMETRIC BLENDERS ONLY
MIXER FULL LEVEL SENSOR
OPTIONAL MIXER EMPTY LEVEL SENSOR
HOPPER #4 LOW LEVEL SENSOR
AUGER #4 COUNTER SENSOR
AUGER #3 COUNTER SENSOR
HOPPER #3 LOW LEVEL SENSOR
AUGER #2 COUNTER SENSOR
HOPPER #2 LOW LEVEL SENSOR
AUGER #1 COUNTER SENSOR
HOPPER #1 LOW LEVEL SENSOR
HOPPER LOW LEVEL SYNDICATOR
DIGITAL 115VAC/12VDC (SN-61)
NO CONN.
SENSOR TERMINAL STRIP
DO NOT CONNECT THIS END OF SHIELD
CONNECT THIS END OF SHIELD TO EARTH GROUND OF CTRL BOX
MOTOR TERMINAL STRIP
AUGER MOTOR #4
AUGER MOTOR #3
AUGER MOTOR #2
AUGER MOTOR #1
RETURN SIGNAL GROUND
MOV
TO TERM. BOX GROUND BUS
SHIELD-NC
USE 209-016-02 HEAT SHRINK TUBING ON MOV'S TO PREVENT CONTACT OF LEADS
DOOR PIN NO.1 MS-5
DOOR PIN NO.2 MS-4
DOOR PIN NO.3 MS-3
DOOR PIN NO.4 MS-2
DOOR MIXING CHAMBER MS-1
POWER ON
SHIELD
NOTE: FOR APPLICATIONS WITHOUT CLEAN OUT DOORS OR LESS THAN (4) HOPPERS WITH SAFETY SWITCHES, THE OPEN SAFETY SWITCH TERMINALS SHOULD BE JUMPERED TO COMPLETE INTERLOCK CIRCUIT.
DO NOT CONNECT THIS END OF SHIELD
CONNECT THIS END OF SHIELD TO EARTH GROUND OF CTRL BOX
Q3/CONTROL BOX 26 PIN AMPHENOL CONNECTOR
Q3 12VDC
Q2 0-24VDC
Q1 115V/1/60
NOTE: THE CONNECTION SHOWN IS FOR A FULL SIZE CONOMIX & GRAVICON. REVERSE ARMATURE ON MOTORS FOR MICROCONOMIX & MICROGRAVICON
REF DWG 614-102-01 REV E
CONAIR FRANKLIN
FRANKLIN, PENNSYLVANIA 19239
TERM BOX WIRING DIAGRAM - VAC FL GRAVICON & CONOMIX PLUS MICROGRAVICON & MICROCONOMIX
TOLERANCE UNLESS OTHERWISE SPECIFIED: FRACTIONAL ± — DECIMAL ± — ANGULAR ± —
DRWN J.GORCZOW 10-15-93 CHKD. APP. DATE
SHT. 1 OF 1 SHTS. 614-196-01 B
B 9-28-94 SEE ECN #94113 JVG
A 11-16-93 RELEASED JVC
NO DATE REVISIONS BY CKD. APP.