1. Start Up Guide

1.1 Blender Power Up

Connect power to the blender as per the electrical wiring diagrams (Please read the safety information in the introduction section for warnings and the maintenance

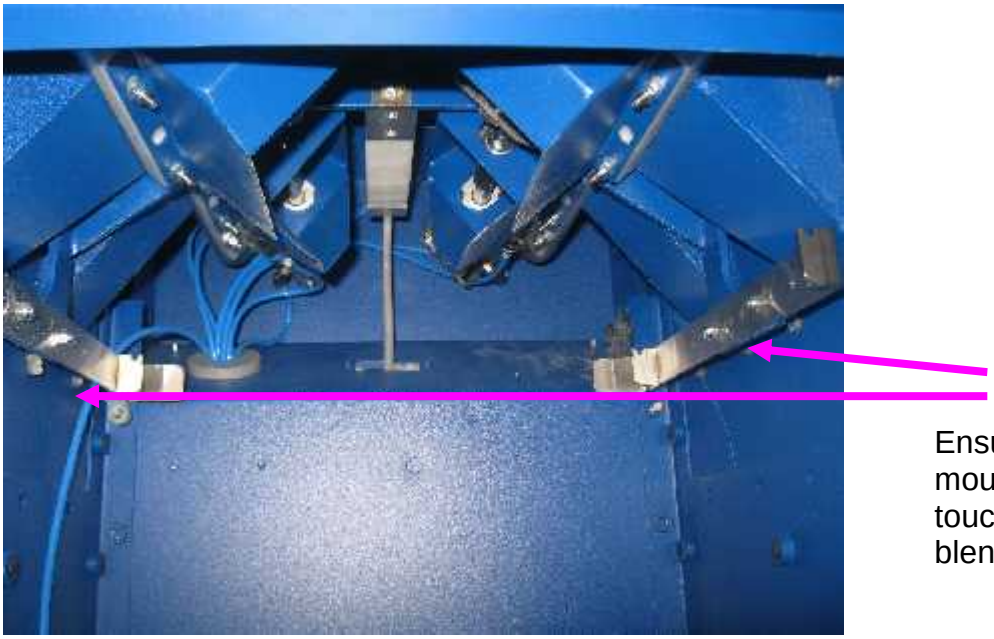
Check that the operator display is showing the home screen as shown in Fig 1.

The blender range is designed to allow easy operation for operators of all nationalities.

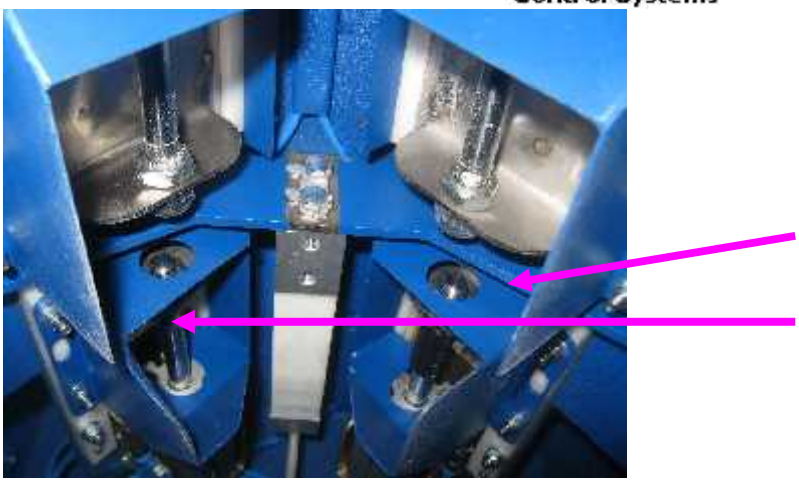
Fig 1 Production Summary

1.2 Weight hopper Calibration.

The most important factor regarding the blender is the weighing system. It is very important that the weighing is correctly calibrated and is operating correctly.
Firstly ensure that there is nothing touching the load cell bracket



Ensure that weigh hopper mounting bracket is not touching the frame of the blender.

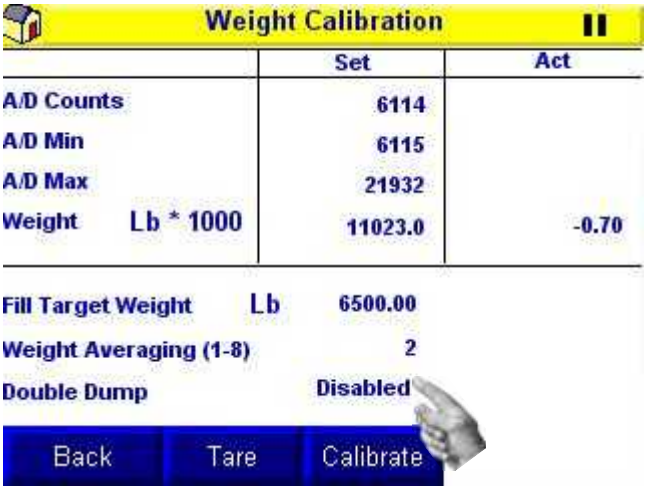


Ensure that the load cell bracket is not touching the guards on the slide valves

Ensure that the air is taken off the blender before doing the weight calibration.

- Touch 
- A keypad will pop up.
- Enter the supervisor password then return

(Factory default password is set to 5)



1.2.1 Taring the weight to zero

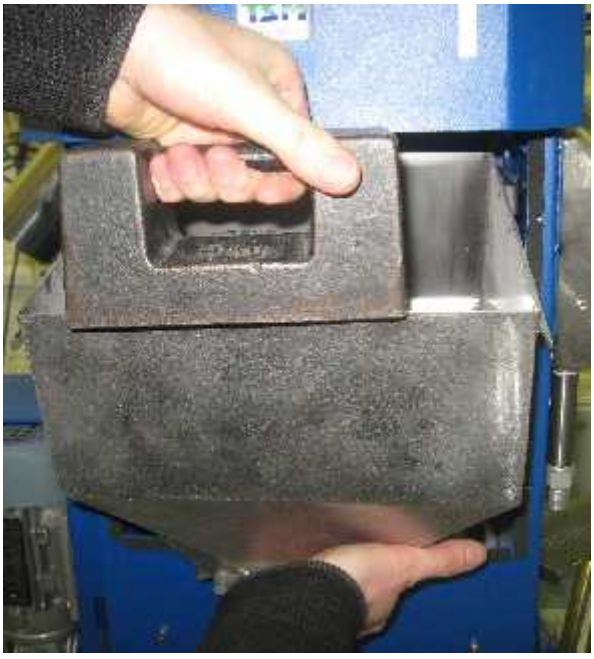
Ensure that the mixing chamber door is open and the weigh hopper is empty and there is nothing touching the weigh hopper before taring the load cell.

Press 

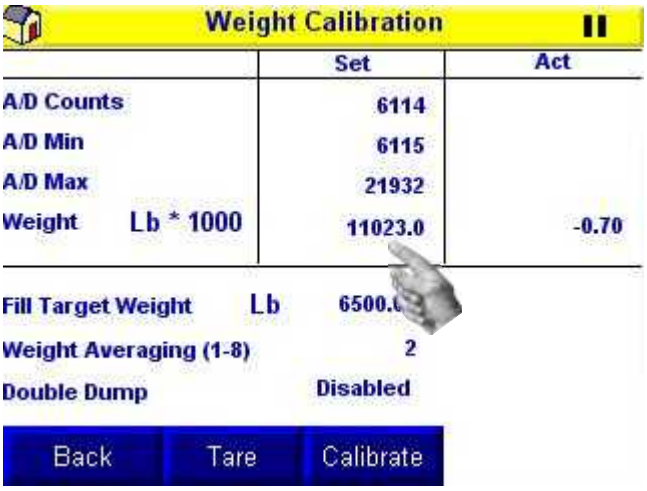
to set the weight to zero.

1.2.2 Weight Calibration.

Gently slide the weigh hopper out and place a known weight into it (use a weight close to the batch size



Touch the position marked opposite and if for example the calibration weight is 1lb, enter 1000.0 on the numeric keypad. The actual weight should show 1000.0 lbs. If it is required to calibrate again, this can be done by pressing Calibrate .Remove the weight from weigh hopper. The weight should now return to zero. If this does not return to zero, then this indicates a possible weighing problem. The fill target weight is the weight that the blender will fill the weigh hopper to when all components have been filled.



Checking load cell repeatability

Another check that can be done on the load cell is to observe the weight in on the screen. Press down on the weigh hopper as shown below. Then release the weigh hopper and check if the weight returns to the previous value. For example, if the weight used is 6 lbs, then it should read 6000 +/- 5 when released. If the reading sticks at 6100 for example, then this indicates that there is a problem in the weighing and the previous checks should be done again.This test verifies that nothing is restricting the operation of the load cell.

1.3 Entering Set points.

- Touch 

- Enter the password, the default password is 5.
- The recipe page is displayed as shown in Fig 3

Use  to move between recipes

To enter the recipe name, touch the Name section and enter the material name. Then touch the component setpoint percentages for the individial components and enter the set points for each component. Each time a keypad will pop up to allow the set points to be entered

1.3.1 Regrind entry (optional)

Press  to select page two of the recipe entry. This page allow the entry of a regrind component if regrind is being used. For example, if the regrind component is component 1, then 1 is entered for the Reg No. Note that the regrind component set % is entered on recipe page 1 and the % is outside the 100% calculation.

Now go back to the page 1 of the recipe and enter the regrind percentage. Note that the regrind % is entered
outside the 100%. for example
Comp 1 10% regrind component
Comp2 80%
Comp3 20%

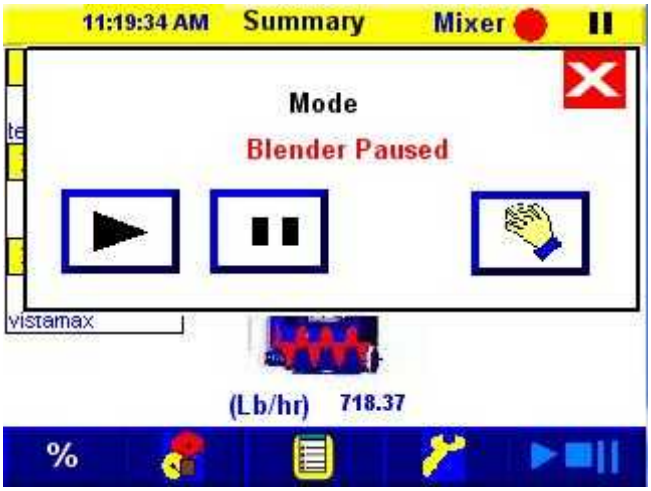
1.4 Starting the new order.

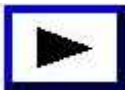
Press 

to start the new order and press  to confirm the new order transfer should take place.

1.5 Start the blender

if the blender is already paused,  will be displayed on the screen. To start the blender press  or  . The following screen is then displayed.



Press  to start the blender cycling. Now the blender should fill the component to the set component percentages as specified in the current order.

1.6 System alarms

If the alarm icon is present on the main summary screen, this indicates that an alarm is present on the system. Press  to show the alarms that are present on the system.

Table 1.0 is a summary of all alarms in the system.

	Description
Fill alarm	Component fill alarm: The required amount of material did not fall through the slide gate. The component number will also be displayed.
Non Conformance alarm	This alarm indicates that the batch was terminated due to the fact that the max batch size would be exceeded.
Over fill alarm	Blender dumped the batch due to the fact that it exceeded the maximum batch size when the components were filled. The batch is dumped in this case.
Material starvation	This indicates that the sensor in the mixing chamber was exposed before the blender was able to fill the weigh hopper with all component
Mixing screw trip	The mixing screw contactor has tripped due to over current.
Bypass alarm	Indicates that the bypass valve is being activated and the blender is being bypassed.

Table 1.0 Alarms description

1.7 Common Start-up Issues

The common start up issues are shown in Table 2.0

Problem	Action
The blender is not powering up correctly.	Check that the mains voltage and 3 phase voltage is present on the blender as per the electrical diagram. Check that the 24 volts is present in the blender junction box
Weight Measurement is not functioning properly	Check the operation of the load cell: Ensure that the weigh hopper is empty. (*It should display 0 kg/lb -if not, tared (zero) the hopper following directions on page **2** in this manual. (the front door must be open for the calibration)* Check that the hopper is centrally located in the blender and that nothing is touching the hopper. If the slide valves have been fitted with guards, check that there is nothing trapped between them and the load cell bracket. Now **GENTLY** place a weight in the hopper. The weight should be displayed on the Hopper Calibration page. If the displayed weight is correct: gently pull down on the hopper and release it. The weight reading should return to the correct reading. Repeat this process 2-3 times. Now remove the weight and allow the weigh hopper to go back to zero. If the reading does not go back to zero, there is a problem with the load cell. The AD readings from the load cell are displayed on the hopper calibration page. The tare ad readings are also displayed. When you tare the hopper the actual readings and the tare readings should remain within +/-5 counts of each other. If the ad readings drift more than this then the load cell is not working correctly. (check the items listed below)
Fluctuations in weight readings	Check that the hopper does not come in contact with the frame and that it is positioned properly on the bracket. Make sure the air pipe going to the hopper is free and has a gradual loop to the piston on the dump flap. If this pipe is too short it may affect the readings. (This can be verified by removing the pipe during calibration.) Check that the load cell mounting bolts are securely tightened. (*Two bolts mount the load cell to the block, which in turn mounts to the blender top plate).* Carefully check that the load cell cannot move from side to side on the mounting block. Check also that the bolts securing the weigh hopper mounting bracket to the load cell are tight. Check the load cell connection in the blender cabinet, to ensure that it is secured properly to the NBB electronics module. Check the wiring of the load cell connector for short-circuits; loose wires or an unconnected shield wire. Check that there are no granules/ pellets/angle hair trapped around the load cell. Blow out the area round the load cell with compressed air.

Problems with Fill Valves:	The material fill slide valves for each component are operated using solenoid valves located at the rear of the blender. Each valve has an led so that you can see if the valve is on. The solenoids for each valve are controlled by outputs located on the PLC. The procedure to check the valve is: Check the operator panel to ensure the software is opening the valve and that the blender is not in pause or stop mode (front door open).  will be displayed on the main screen is it is paused. Check the valve block LED's to see if the valve is switching on. Use the manual switch on the valve block to check the operation of the valve. Ensure that both of the air connectors are connected to each piston and that they are in the right orientation. Ensure the pipes are not kinked.
If the valve does not operate:	Check that air is applied to the blender. *(The air supply should read at least 6.0 bar on the pressure gauge)* Check that the pause/stop icon  is not displayed on the top right of the screen. Check that the LED on the solenoid is on and listen to hear if the solenoid valve activates. If you can hear the solenoid valve activate but the valve does not open, check the air pressure applied to the system. If the solenoid valve does not activate, check that the corresponding output from the PLC electronics module is operating.
If Touch Screen Panel is not working	Check that power is applied to the panel, check that the Ethernet connection back to the plc is in place.
If mixing motor is not rotating 	▪ The mixing motor will timeout after 30 minutes if the blender does not cycle. The motor will restart automatically when the level sensor becomes uncovered. ▪ Ensure that mixing chamber door is firmly closed ▪ Check if contactor in the control cabinet is on ▪ Check that the power lead going to the motor is plugged in and pushed in fully. ▪ It may be necessary to remove the mixing screw and check for objects jamming or screw misalignment.

1 User Guide

1.1 General Description

Operator touch panel.

Production Summary

Using the touch screen panel, the operator enters the recipe percentages.
The normal blender slide gate configuration is:
component 1 Large opening.
component 2 Large opening.
component 3 Medium opening.
component 4 Small opening.
The percentages entered should reflect the component slide gate size. I.E. component 1 should be used for larger percentages.
When the blender is powered on it will start the mixing motor, Close the weight hopper and open the slide gates in turn to dispense the correct percentages of each material one at a time. The blender will start by filling the largest component first. When the level sensor in the mixing chamber becomes uncovered the next batch will drop and the cycle will start again
If the blender encounters any problems the alarm icon will be displayed. The cause of the alarm can be determined by going to the alarm screen.

User Guide

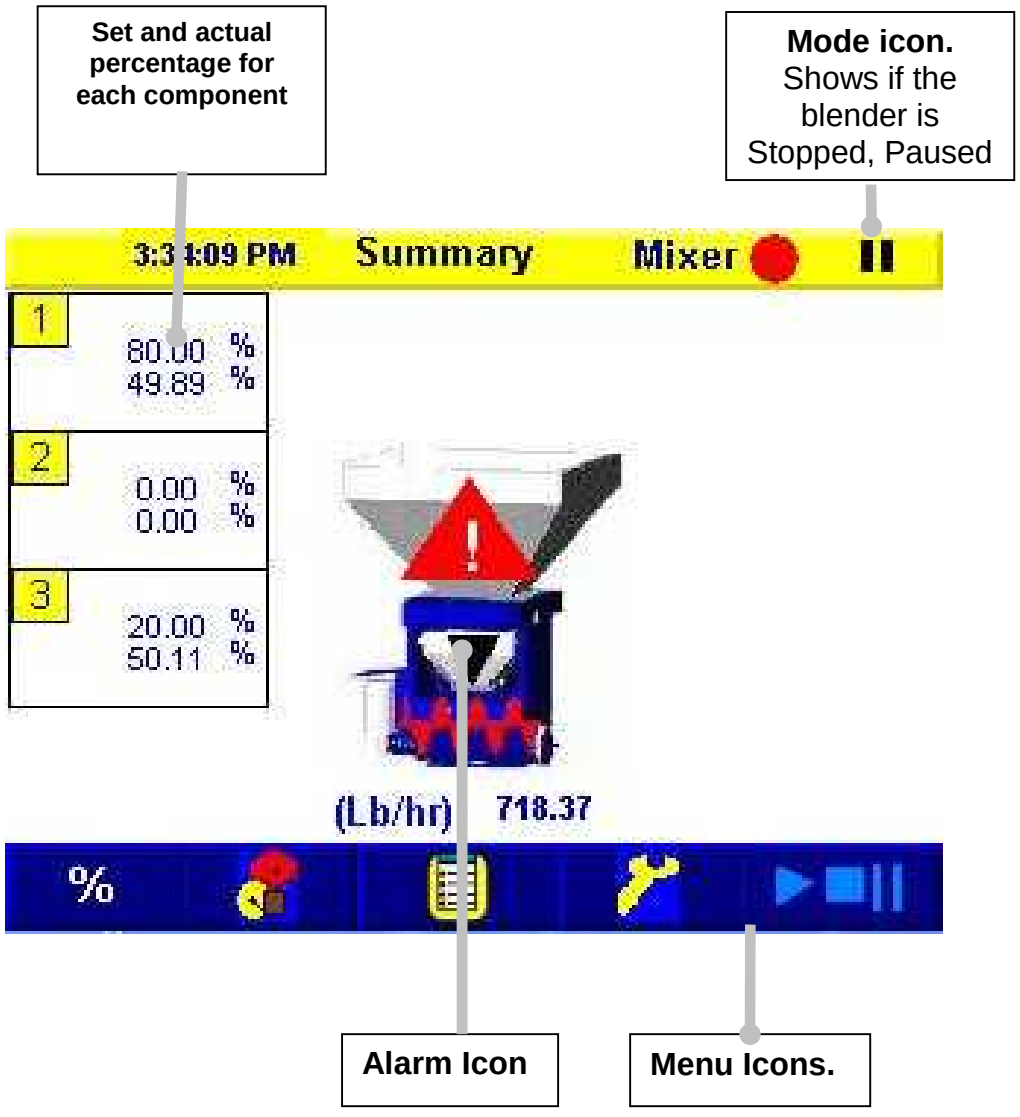
1.2 Menu Navigation

The blender operator panel may be used to:

- View production data,
- Calibrate the blender,
- Enter material recipes,
- View Alarms
- View reports.

1.2.1 Home screen - Production Summary

The production summary screen is shown below. This page shows the set and actual component percentages, the throughput and the menu buttons to allow menu navigation.



The **"Touch Screen"** operator panel provides easy access to all parts of the SigmaBatch Blender menu structure.

Touch to enter the current recipe consisting of the component percentages and material names

Displays the cause of an alarm and the time at which it occurred.

Displays various reports generated by the system.

This menu contains all the necessary blender calibration and configuration options.
It is password protected so only authorised personnel can access any of the calibration sub-menus.

From this menu it is possible to start, pause or halt the blending process.

1.2.2 Password Setting

All TSM blenders include 2 levels of password protection:

Engineer Password (Default 5). This allows access to the blender configuration/Calibration area.
Operator protection (Default 5). This allows the operator access to the recipe area.

1.3 Blender Operation checks.

Before operating, the blender should be configured and the calibration of the weigh hopper checked. (See the quick start guide in this manual for more details.)

- Check the correct materials are in the material bins.
- Verify that the air supply is connected.
- Switch Power on the blender using the switch located on the side of the blender.
- Enter the blend recipe setpoints.
- Check that the blender is not paused.

See quick start guide on how to enter production setpoints.

1.3.1 Recipe Entry

Press 

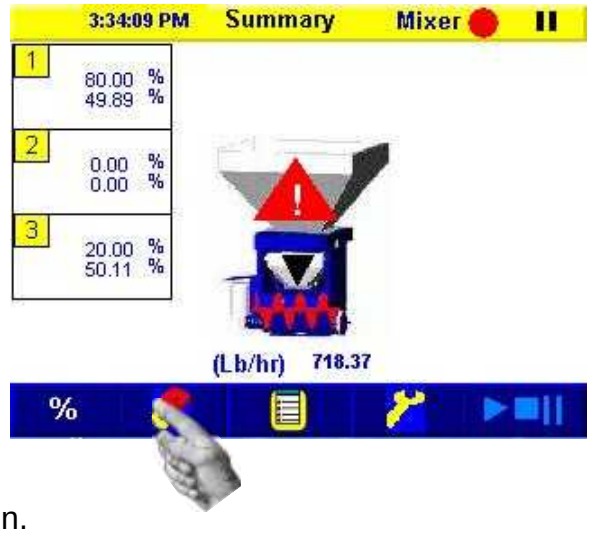
to select recipe entry. Please see the quick start section for recipe entry instructions.

1.3.1.1.1

1.3.2 Blender alarms

If an alarm occurs, an  icon will appear on the blender home screen as shown and the red beacon mounted on the blender frame will provide a visual warning.

To find the cause of an alarm touch the  alarm icon on the home screen.



This page displays any alarm that has occurred (or cleared), the time at which it happened and it's current status. To remove alarms touch the 

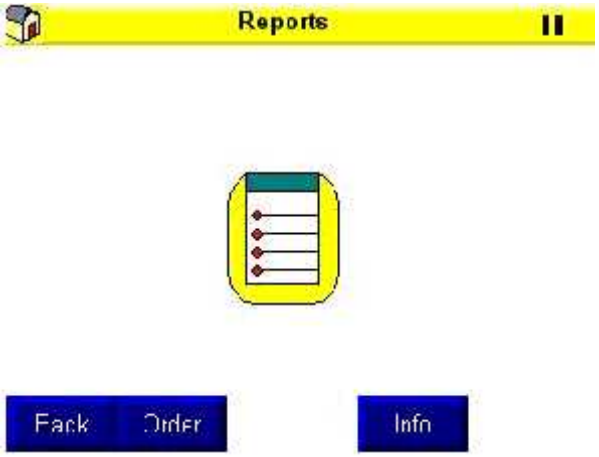
icon

Note: Alarm's clear every time the blender is powered off.

For the alarm description see the quick start section.

For more detailed information on what each alarm message means, and how to troubleshoot the alarm see the TROUBLESHOOTING section of this manual.

1.4 Reports



Press  to view the reports menu.
The **Reports** Menu allows you to view various reports generated by the blender including the order report and the blender information page.

Press  to see the order report

This current report shows the production in the current order. You can also reset the production order totals. Resetting order totals can be useful, (for example in the extrusion process) when you have to discard a start-up roll of scrap material that should not be included in the order total.

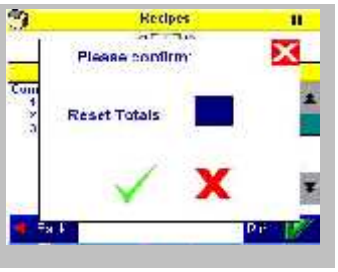
Touch  to set the order totals to zero.

Order Report

The report shows all of the values for the previously completed order

In order to use the order reports correctly the order totals should be reset when starting a new recipe.

To reset the totals tick this box. 

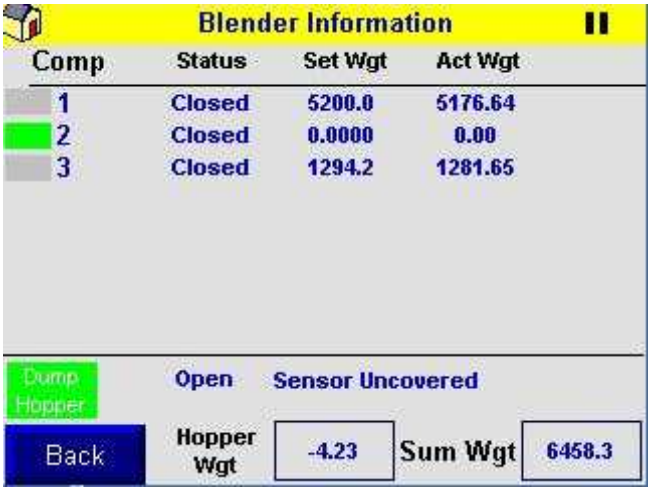


1.4.1 Blender information

Press 

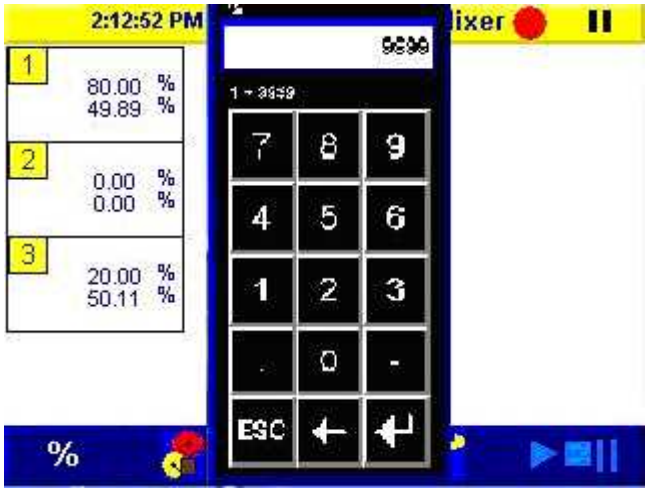
to blender information screen. This page shows the set and actual weights for all components to be viewed. Also the open / close status of the component can also be viewed.

The mixing chamber sensor and weigh hopper status can also be seen on this page.



1.5 System menu

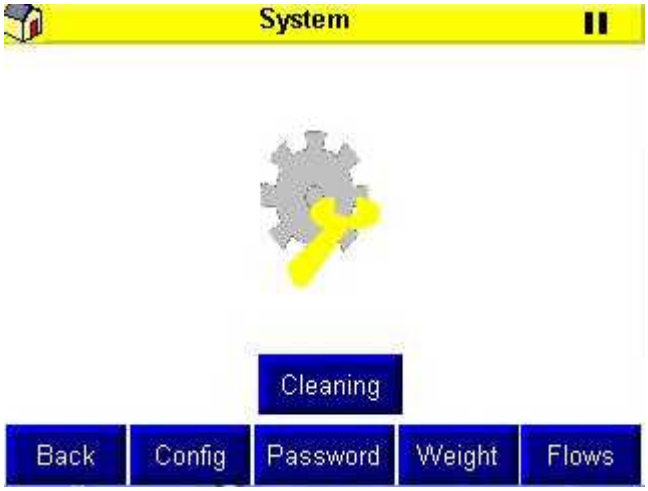
The system menu contains all the calibration and configuration options primarily used during initial setup and for normal operation. As all system parameters can be changed from this menu; a password is required for access from the Main Menu.



IMPORTANT: We recommend that you restrict access to the supervisor password to supervisor/management personnel and the Engineering password to technical personnel. (The Password are shown on page 2 of this section of the manual.)

From the System Menu, you can:

- Calibrate the weigh hopper.
- Set and change the blender password
- Edit the configuration
- Start the Cleaning (additional option)
- Set the max and min flow rates



1.5.1 Load Cell Calibration

Press 

to access the load cell calibration. This is show in the quick start guide

1.5.2 Passwords.

This screen can be used to change the operator and supervisor passwords.

1.5.3 Operator password

This allows the operator access into the recipe section.

1.5.4 Supervisor password

This allows the supervisor into the recipe section and also the system settings. 

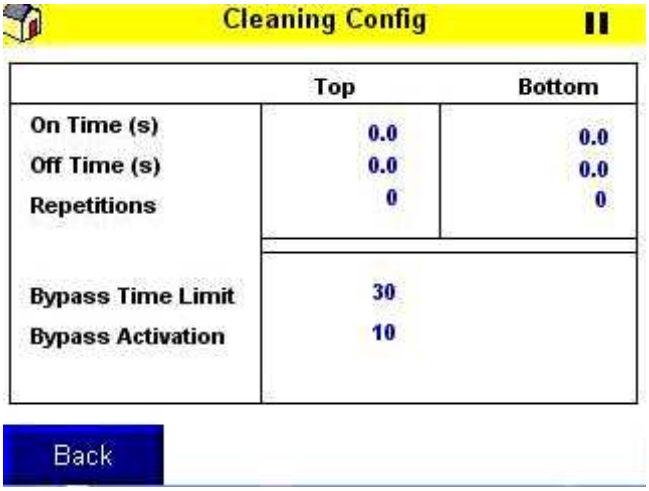
This password should be restricted to authorised personnel as it allows access to the blender calibration settings.

See the quick start section of this manual for the factory set passwords.

NOTE: It is important to make a note of the new passwords.

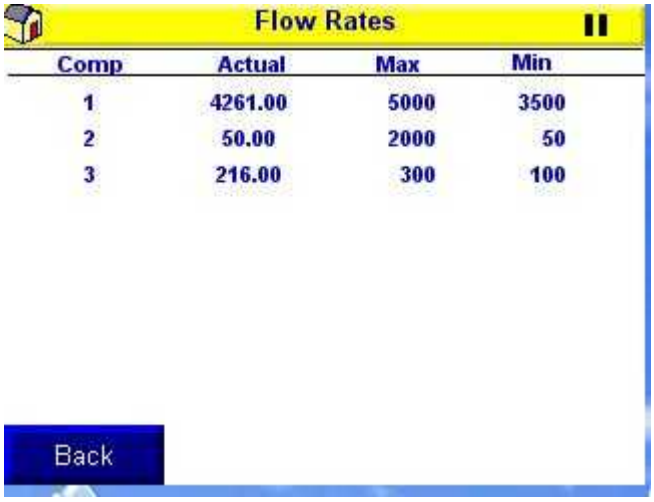
1.5.5 Cleaning

Cleaning is unused at the moment, the only parameter that needs to be set is Bypass Activation Delay (Secs)
This delay in seconds specifies the time after which the blender will open the bypass valve after the bypass sensor has become uncovered.



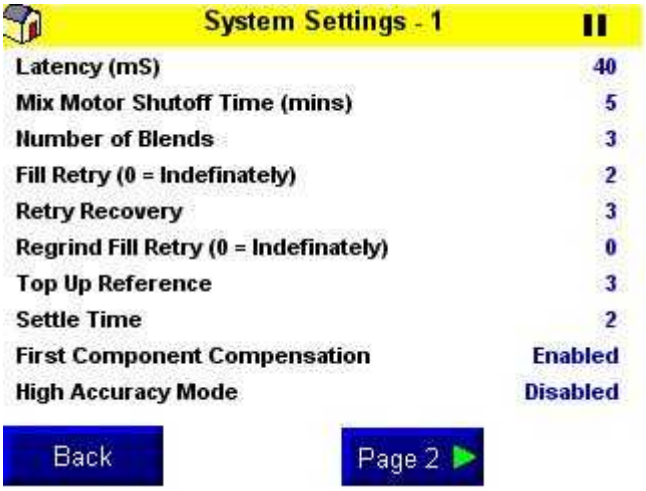
1.5.6 Maximum and minimum flow rates

Max min flow rates ensure that the blender cannot calculate an incorrect flow rate for a particular component. Press Flows to show the flow rate page. This page shows the max and min flow rates for each component. The user should enter the max and min flow rates that they are expecting for the material that they are currently using. If the system calculates a flow rate higher than the maximum, then the flow rate will be clamped at the maximum. If it calculates a flow rate that is lower than the minimum, then it will clamp the flow rate at the minimum flow rate.



1.5.7 Configuration.

The configuration allows the configuration for the blender to be set. Press Config to select page 1 of the system settings. The various parameters are now described



1.5.8 Screen 1

Latency (seconds)

This signifies the delay before the slide valve switches. This is normally set to 40 milliseconds.

Mixing Motor Shutoff (minutes)

This entry determines the time after which the mixing motor will turn off if the material is not taken away from the blender.
The mixing screw will also be switched off if the mixing screw has been running without material for this time.

Number of Blends

This is the number of components for which the blender has been configured.

Fill Retry (00 = always)
This value specifies the number of fill retries the blender will perform if the blender does not get material into the weigh hopper on a particular component. By setting this value to 00, the system will not proceed to the next component until it achieves its target weight for the current component. If set to 1, the system will perform one fill retry and then proceed to the next component. Similarly for two retries, three retries etc.

Retry Recovery.
Sometimes due to varying material feed rates, the blender can have a different flow rate to the actual material flow rate. This will cause the blender to continually retry. If the system retries repeatedly for a number of cycles, it is deemed that the flow rate is incorrect and the current flow will be accepted.

Top-Up Reference Component
This is the component that is used as the reference component for the top-up, e.g. component 4 may be used as the reference component.

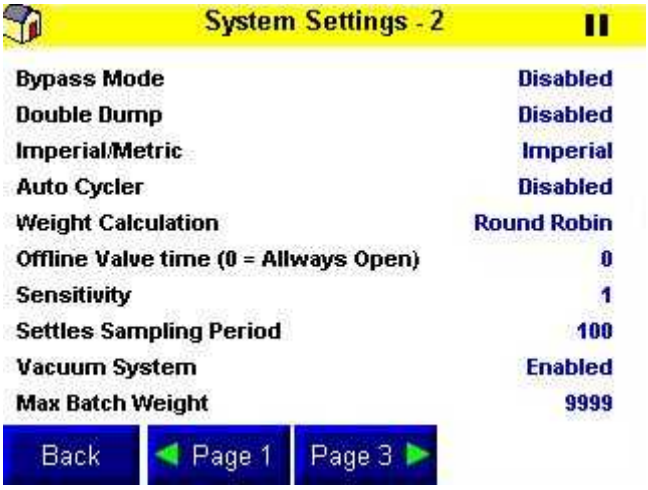
Settle time
This is the settling time in seconds that the system will wait after fill a component before the averaged weight is read.

First Component Compensation.
When enabled, the first component is used as a reference for all other components. If it under fills, the other components are adjusted to keep the first component % accurate.

High accuracy mode
The high accuracy mode ensures that the main component and the top up reference component ratio is kept very accurate.

1.5.9 Screen 2

Bypass mode
This mode if enabled will enable the bypass to be activated when the sensor in the next of the blender is uncovered for a period of time.



Double Dump
This option allows the blender to open and close the dump flap on the weigh hopper twice when dumping. This helps to dislodge any granules that have become stuck on the weigh hopper.

Production Summary Units
There are two options available: Metric or Imperial.

Auto cycler
This is a test mode only used for program testing and should not be switched into this mode at any time.

Weight Calculation
This option allows the blender to run in Round Robin or volumetric mode.

Offline Mixing time
This is the time that the offline valve stays closed for after it drops the material from the weigh hopper into the mixing chamber. After the offline mixing time has elapsed the offline valve will open to release the material from the blender.

Sensitivity
This option is currently unused.

Settles sampling period
This should be set to 100

Vacuum System
This option enables the vacuum system and should be enabled if a vacuum system is being controlled from the touch panel.

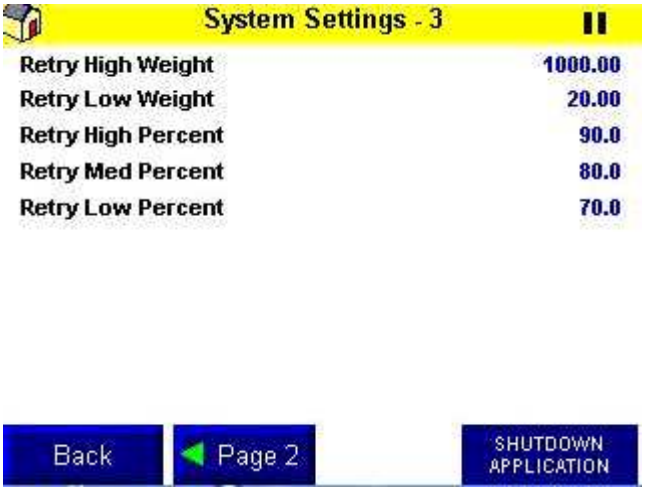
Max Batch Weight
This is the limit for the top-up mode. For example if the total batch size is set to 5kgs, the blender will not adjust component 1 in top up to exceed 5kgs.

Screen 3

This allows the extent of the accuracy when the blender is retrying.

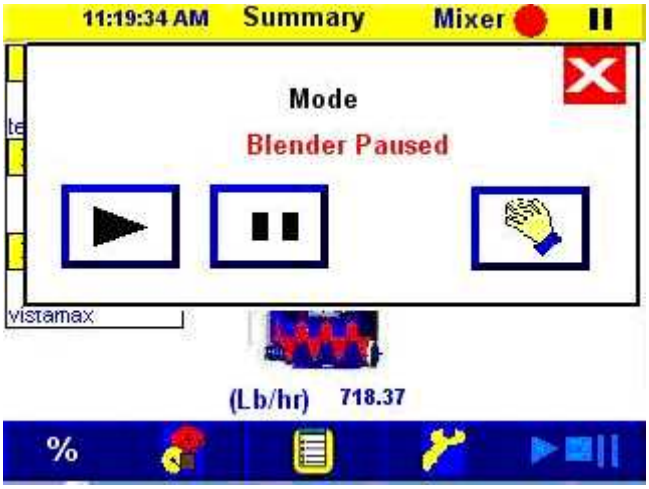
Regrind High Weight
Above this weight, the high percentage is used.

Regrind Low Weight
Below this weight the low percentage is used.
Between the high and the low weight, the Retry Med Percent is used.

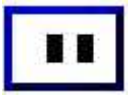


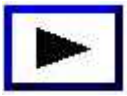
Touch as shown to set the network settings. 

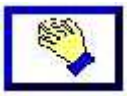
1.6 Pause and Restart Mode



Press  to select the mode page. The three options in the **"Mode"** menu, they can be used to:

 When this button is pressed, the blender is paused and willl stop operation when the current batch of material has been filled..

 Pressing this, will start the blender operating again. If the level sensor in the mixing chamber is uncovered, the weigh hopper will be tared to zero and will fill the specified components in sequence.

 This function is currently not being used at the moment

WARNING: The above options do not stop the mixing motor.

1 Maintenance

1.1 Safety Precautions

Safety is a very important as regards working with the blender. At no stage should safety interlocks be bypassed. Power should always be removed from the blender when working on the electrics and air should be removed when working on any pneumatic part of the system.

WARNING: Pinch and auger hazards.
This equipment is equipped with pneumatic slide gates beneath the material bins and may have a pneumatic slide gate beneath the rotating augers in the side feeders and mixing chamber. Always disconnect and lock out the incoming power source before cleaning the blender or feeder. Always disconnect the compressed air source before working near the slide gates. Failure to do so could result in serious injury

WARNING: Electrical shock hazard. Always disconnect and lock out the main power supply before opening the blender electrical enclosure. The solenoid valves are connected to the main voltage supply.
Procedures that require access to the electrical enclosure while power is on should be performed only by qualified electrical technicians who know how to use electrical testing equipment and understand the hazards involved.

1.1.1 How to use the lockout device.

Only qualified electrical personnel should attempt to carry out electrical maintenance on this product. Before performing maintenance or repairs on this product, you should disconnect and lock out electrical power sources to prevent injury from unexpected energisation or start-up.

Lockout is the preferred method of isolating machines or equipment from energy sources. Depending on the blender mode TSM three phase blenders have been equipped with the lockout device pictured below. To use the lockout device on

1.2 Resolving issues

Most problems can be avoided by following the recommended installation, operation and maintenance procedures outlined in this User Guide. If there is a problem, this section will help determine what caused it and how to fix it.

1.3 Maintenance checks

Weekly

1. Check air regulator filters for condensation or other signs of water. Purge and clean the filter bowl if necessary.

Monthly:

1. Inspect power cables, wires and electrical connections.
2. Check for loose or exposed wires, burned contacts, and signs of damaged wires.
3. Check exterior power cords to the main power source.
4. Inspect air connections, hoses, lines for wear or damage.
5. Tighten connections or replace damaged parts
6. Check for granules trapped between fixed parts and gravimetric weigh hopper and bracket.

Every two Monthly:

1. Check load cell calibration
2. Inspect the mix auger. Verify that the mix auger turns easily within the chamber. If the auger makes noise when rotating or does not turn easily, you may need to lubricate the ends of the auger with a commercial lubricant.
3. If the mix auger flights become sharp or damaged through wear, replace it.

1.4 Load cell calibration

Warning ! . The load cell is susceptible to damage if it is not handled with care. At no time should the blender be handled in such a way that the load cell could be damaged. This includes hammering the frame and exerting excessive force on the weigh hopper. At no time should the load cell be exposed to high temperature. The load cell calibration should be checked at every two months for correct operation or if the blender is not dispensing accurately at any time. Failure to do this could result in production errors or losses. Please refer to the quick start section of this manual on how to calibrate the load cell.

1.5 Cleaning blender during material change

To prevent contamination of subsequent batches, you should clean all bins and chambers thoroughly. Drain the material bins, weigh hopper and mix chamber. Remove any residual material. The mixing auger can also be easily removed.
If you are using feeders to add material or colorant, you need to clean these feeders before filling them with different materials. Drain the feeder bin, remove the auger and using compressed air, clean out any residual material.

CAUTION: Flying objects. This blender is equipped with a compressed-air gun that can be used for cleaning the bins and mix chamber. To avoid potential injury, you must observe all safety regulations that apply to the use of compressed air for cleaning equipment.

Adjust air pressure to no more than **7.5 Bar (100 PSI)** for auger mixing systems. Wear protective goggles and clothing to prevent injury from flying particles and objects. Note that the air pressure is very important, particularly for components that are dispensing small percentages.
At regular intervals, open the moisture trap to drain water that might have entered the air system.

When you change materials, you should clean all interior surfaces of the blender thoroughly using a clean cloth, vacuum or compressed air.
The procedure is as follows.
Stop the blender,

- Ensure that the air and electrical supply is removed from the blender.
- Remove / open the bin access doors and remove all material using compressed air or vacuum.
- Open the mixing chamber door and disconnect the weight hopper and remove same. Clean the weigh hopper.
- Empty residual material and clean the mixing chamber. You have the option of removing the mixing auger if necessary.
- Slide the weigh hopper back into the mix chamber, making sure that no obstructions prevent the hopper from resting evenly on the load cell bracket.
- Don't forget to put the air pipe back on the weigh hopper.
- Close the material bin doors and the mixing chamber door
- Apply air and power on the blender again.
- The blender is now ready to runr.

1.6 Troubleshooting procedure

- Refer to the wiring diagrams and other schematics that were shipped with your equipment. The diagrams should note any custom features, such as special wiring or control options, not covered in this User Guide.
- Verify that you have all instructional materials related to the TSM SigmaBatch blender, its control systems and its components. Additional details about troubleshooting and repairing specific components are in these manuals
- Verify that you have manuals for equipment located upstream and downstream from the blender. Solving problems related to material conveyed to the blender or to extrusion quality may require troubleshooting other equipment.

Word of Caution

WARNING: This machine should be adjusted and serviced only by qualified technical personnel only who are familiar with the construction and operation of this type of equipment.

DANGER: Voltage hazard. Always disconnect and lock out the main power supply before opening the blender electrical enclosure. Troubleshooting procedures that require access to the electrical enclosure while power is on should be performed only by qualified electrical technicians who know how to use electrical testing equipment and understand the hazards involved.

1.7 Determining the Cause of a Problem

Blender alarms should initially indicate where the problem is.

1.7.1 Blender alarms

Most problems will trigger one of the blender alarms.
The blender includes alarm checks for:

1. Individual components
2. Blender system alarms.

If an alarm occurs on the blender, a  Will appear on the blender bin and the red beacon mounted on the blender frame will provide a visual warning

- To find the cause of an alarm, go to the production summary screen and touch  . The cause of the alarm and the time that it occurred will be displayed on the Alarm Summary screen.
- Touch Ack to cancel an alarm.

For information on what each alarm icon means, refer to the diagnostic tables on the following pages.

1.8 Causes and resolution of alarms

Alarm message	Possible cause	Solution
1.8.1.1 1.8.1.2 1.8.1.3 Fill alarm on component x	Is there material in the hopper above the slide gate?	Verify that there is material in the bin or feed hopper and that the loading system supplies sufficient material. (The material may have arrived after the alarm occurred.)
	Does the recipe call for more material than the component valve or feeder can deliver?	Verify that the feeder or material slide valve opening is the correct size for this application. Trying to put too much material through a feed valve that has a flow reducer insert can cause this alarm
	Has material “bridged” over the bin discharge, blocking material flow?	Verify that material is free to flow into the weigh hopper by opening the door of the blender, remove the weight hopper and manually open the slide gate.
	Did the air-actuated slide valve for this component fail to open?	Verify that the valve is connected to compressed air supplying at least 6.0 bar (87 PSI). Verify that the solenoid and relay is working correctly.
Material starvation	The level sensor in the mixing chamber was uncovered before it finished filling the material into the weigh hopper	A component may not have filled correctly, causing the weigh hopper to delay dumping the next batch into the mix chamber. Verify that component bins and feeders have material, are operating correctly and that the loading system can maintain all components. This is an important alarm because it is possible that the extruder was starved of material.
	Is the level sensor in the mixing chamber functioning properly.	• Check the level of material in the mixing chamber. If material is covering the level sensor even though it failed to detect material: • Verify that the level sensor wire is securely connected to the correct terminal in the blender wiring

		cabinet. • Verify that the level sensor sensitivity setting is correct. There is an adjustment pot on the sensor.
Alarm message	Possible cause	Solution
Mixing motor trip alarm	Something has stopped the mixing screw causing the current trip to trip.	The current trip needs to be reset after checking that there is nothing stopping the mixing screw from turning. It may be necessary to remove the screw
Running component percentage not equal to 100%	The recipe has been entered incorrectly.	Recheck the recipe This alarm should not occur if you are using the auto recipe entry setting.
Blender overfill alarm	One or more components have over dispensed	Check that the max and min material flow rates are set correctly in the flows config. Check that material is being fed to the blender consistently.

1.9 Load Cell Checks and Calibration

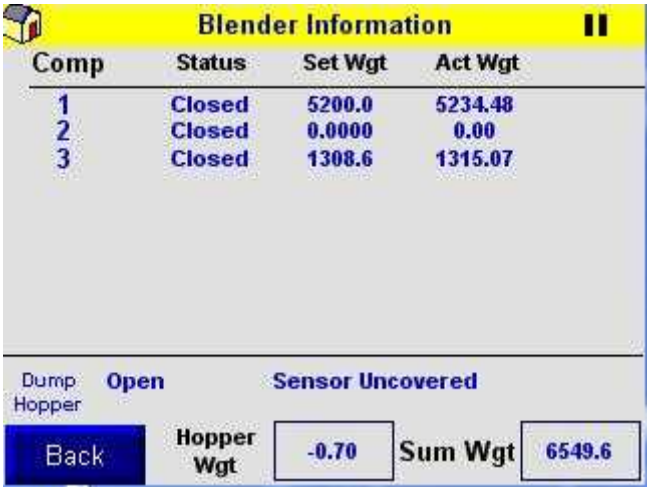
A malfunctioning load cell can lead to incorrect batch weights. The problem may be caused by material trapped around the load cell housing; a failure on the plc hardware, electrical noise or a damaged load cell. It is very important that the load cell is operating correctly.

To check the load cell:

- **Power up the blender** using the mains power switch located on the side of the blender. Ensure that the power is removed from the mixing motor and the air has been removed. Open the front door of the blender.
- **Clean the weigh hopper and load cell area.** Open the mixing chamber door and slide the weigh hopper out. Using the supplied air gun, clean the hopper and any dust that may be around the load cell. Ensure that there are no granules trapped around the load cell and ensure that the weigh hopper is not being obstructed.
- **Check the weigh hopper and load cell bracket position**. Ensure that the mounting bracket and weigh hopper are not touching the sides of the blender frame.
- **Check the mounting bolts for the load cell and bracket**. These bolts must be securely tightened. Two bolts mount the load cell to the block. Four bolts mount the block to the top plate of the blender chassis. Verify that the load cell cannot move from side to side on the mounting block. Also verify that the bolts securing the weigh hopper mounting bracket to the load cell are tight.
- **Check slide valve guards.** If the slide valves have been fitted with guards, check that there is adequate space between the guards and the load cell bracket.
- **Replace the weigh hopper** on the load cell.
- **Calibrate the Hopper.** See the quick start guide for information on how to do this.
- **Check stability of reading**. If the weight reading is not stable or if you have to carry out the calibration more than once a month, contact TSM Support Services for further instructions. Please note that a faulty load cell will still calibrate, so it is essential to check that the load cell is weighing correctly. See Quick Start Guide for information on checking load cell stability.

1.10 Checking Component Fill Valve operation

There is one air-operated slide valve associated with each compartment of the material bin. Solenoids located on the back of the blender control the slide valves. Solenoid source drivers in the plc control the solenoid for each valve. Diagnose the problem by following the steps below.



1. Ensure the blender is not in stop/pause mode. This mode will be displayed on the top right corner of the home screen.

1. Touching the  icon and then the 

icon will take you to the blender information page. On this page it is possible to see if the software is trying to open the slide valve. If the software is switching on the output but the slide valve is not opening then the next place to check is on the plc control module.

3. On the valve block there are LED's for each valve. If the LED on the control module is activating and the led on the valve block is not then check the connections between the control module and the valve block.

4. There is a blue manual activation switch on the valve block pushing it up should activate the valve.(remember there may be material in the hopper so be careful opening activating the valve for long periods.)

5. Check there are no bends or kinks in air lines running between the valve block and the slide gate/Micradose valve.

6. To check the slide valve, remove power and air from the blender. Empty the material hopper. Open the front door of the blender and remove the hopper. Manually move the slide valve to ensure it can move freely.

Wiring Considerations	
Blender is not powering up correctly.	Check the electrical main connections to the blender as per the electrical wiring diagram
Do NOT run TSM cables with high voltage cables.	The wires connecting the various elements of a TSM system are normally communications/ data lines and are low voltage. As such, care should be taken to keep them well removed from high voltage lines. DO NOT RUN HIGH AND LOW VOLTAGE LINES TOGETHER WITHIN THE SAME CONDUIT. Shielded cable must be used for communications lines. Although it is not strictly necessary to run communications wires from TSM equipment in conduit, it is advisable from a safety and aesthetic point of view.
Why is it necessary to keep communications cables and material conveying lines separate?	Moving plastic granules can produce extreme static charges. If pipes carrying the granules are not properly earthed, then the electrical energy will be discharged down through the system electronics causing possible malfunction and damage. Generally, static symptoms include the resetting of the Remote Display or granules sticking to the sides of the hopper or the mixing chamber. Therefore do not attach communications cables to material conveying lines or other conduit containing cables with high voltages or high currents. If possible, run the communications lines in armoured trunking, which is properly earthed/ grounded at one end only. All conveying lines MUST BE made of flexible tubing and fitted with a ground wire.

Loadcell / Weighing Accuracy Issues	
How do I clear a Tare alarm/ tare the blender hopper?	Tare the blender: (for more a more detailed explanation see the quick start section page 1,2) ▪ Ensure that mixing chamber door is open ▪ Touch the  button and enter the password ▪ Select  ▪ Tare the hopper by touching  ▪ This now becomes the zero reference point for the loadcell readings.
How do I know if the blender load cell is calibrated correctly?	▪ Place a known weight, e.g. 1kg/ (2 lbs) , in the weigh hopper ▪ The weight will be displayed on the hopper calibration page. (see above on how to get to this page.)
If weight calibration is incorrect - what do I do?	Calibrate the load cell – (for more a more detailed explanation see the quick start section.) ▪ Tare the hopper as above ▪ Place a known weight, e.g. 1kg, in the weigh hopper ▪ Enter the value of the known weight. The blender automatically recalibrates and the actual weight should now be displayed correctly. ▪ Touch  to exit to main page
If the Weight Measurement is not functioning properly, what should I do?	*Please check quick start guide FAQ section.*
I am having problems with the loadcell	*Please check quick start guide FAQ section.*

Other Accuracy issues	
When feeding through the SLIDE VALVES My blender does not seem to be achieving the required accuracy	▪ When the TSM blender leaves the factory it is set to a standard slide valve configuration - unless specified otherwise by the customer. ▪ The slide valve size determines the minimum and maximum percentages that can be metered for each individual component. ▪ If a lower % is required for any component, the appropriate insert must be attached. ▪ See blender valve size configurations.
Operator Panel	
The Operator Panel is not working - what should I do?	• Please Check Quick Start Guide FAQ Section* • Page 7
Other hardware	
If the mixing motor is not rotating?	
The mixing motor does not seem to be rotating in the correct direction -	▪ The mixing auger should rotate in a clockwise direction, when looking at the shaft of the motor from the motor end - conveying material to the center of the chamber.

what should I do? (3 phase models only)	If the direction of the mixing auger is incorrect: ▪ Switch mains power switch to "off" and lock it out. ▪ Disconnect mains power supply externally to blender ▪ Swap any 2 phases (e.g. L1 & L2) going to the blender ▪ Reconnect mains power and turn mains power switch to “On”. ▪ Check that the rotation of the Mixing is correct. I.E. in a **clockwise direction, when looking at the shaft of the motor from the motor end - conveying material to the center of the chamber**.
If the Dump Flap/ Slide Gates are not operating?	▪ Check whether stop/pause icon is displayed on the top right of the home screen. ▪ Ensure that the door of the mixing chamber is properly closed. ▪ Check that the system is not in ‘PAUSE’ mode. ▪ Check that the plc is switched on and is operating. ▪ Ensure that the factory air supply is connected (TSM recommend air supply of 7.5 bar for optimum blender efficiency. An air supply pressure greater than 10-bar could damage the blender) The supply must be oil-free ▪ Check that air pressure on the pressure regulator gauge reads 7.5 Bar. This gauge is located at the side of blender control console.

Fill Valves	
I have problems with the fill valves	*Please check quick start guide FAQ section.*
If the slide valves are not operating?	*Please check quick start guide FAQ section.*
Other issues	
	▪
Accuracy Problems	▪ Sometimes a faulty load cell may affect accuracy, refer to page **2** in the Quick Start Guide to check the weight measurement. ▪ Running the blender automatic test routine may identify the source of the blender inaccuracies. ▪ TSM blenders incorporate and advanced vibration filtering system, however If there is excessive vibration on the blender and it is affecting accuracy, the blender may need to be isolated from the extruder.

1.11 Removing mixing screw

To remove mixing screw, do the following. (see Fig 1,2,3)

- Ensure that air and power is removed from the blender.
- Open the hex screws to remove the end plate

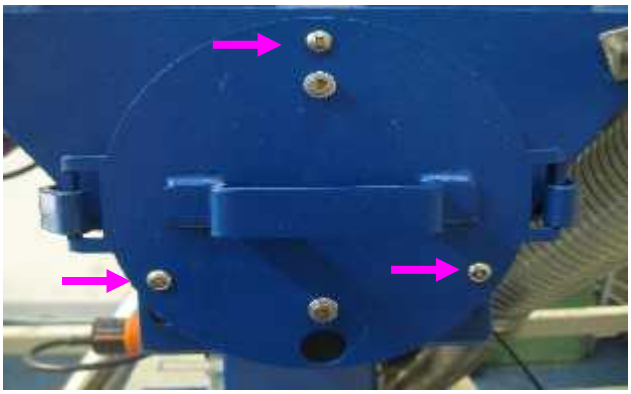


Fig 1. Removing end plate

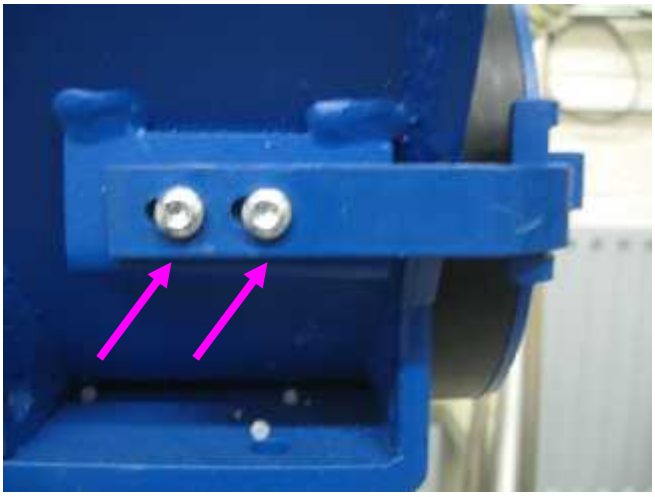


Fig 2 Removing screws on left hand side

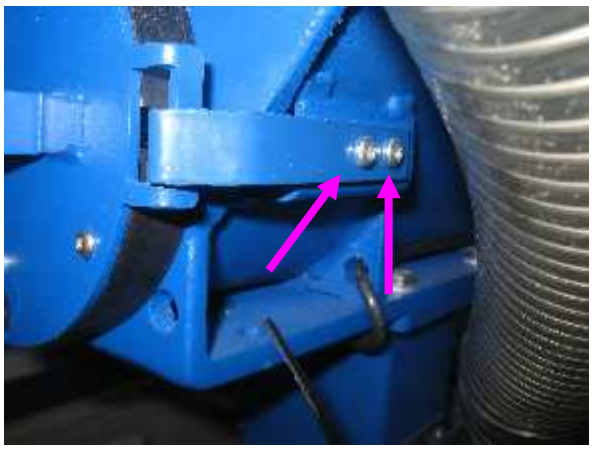


Fig 3 Remove screws on right hand side

When reinserting the screw, put the rubber coupling on the end of the screw shaft first.

2 Customer Support.

Our service experts are available to help with any problem you might have installing and operating your equipment.

TSM Control Systems also offer a comprehensive on site installation, training and preventative maintenance programme. You can contact our Customer Service Department by any of the following methods.

Tel : **+ 353 42 93 35 560**
Fax : **+ 353 42 93 34 422**
Email: **support@tsm-control.com**

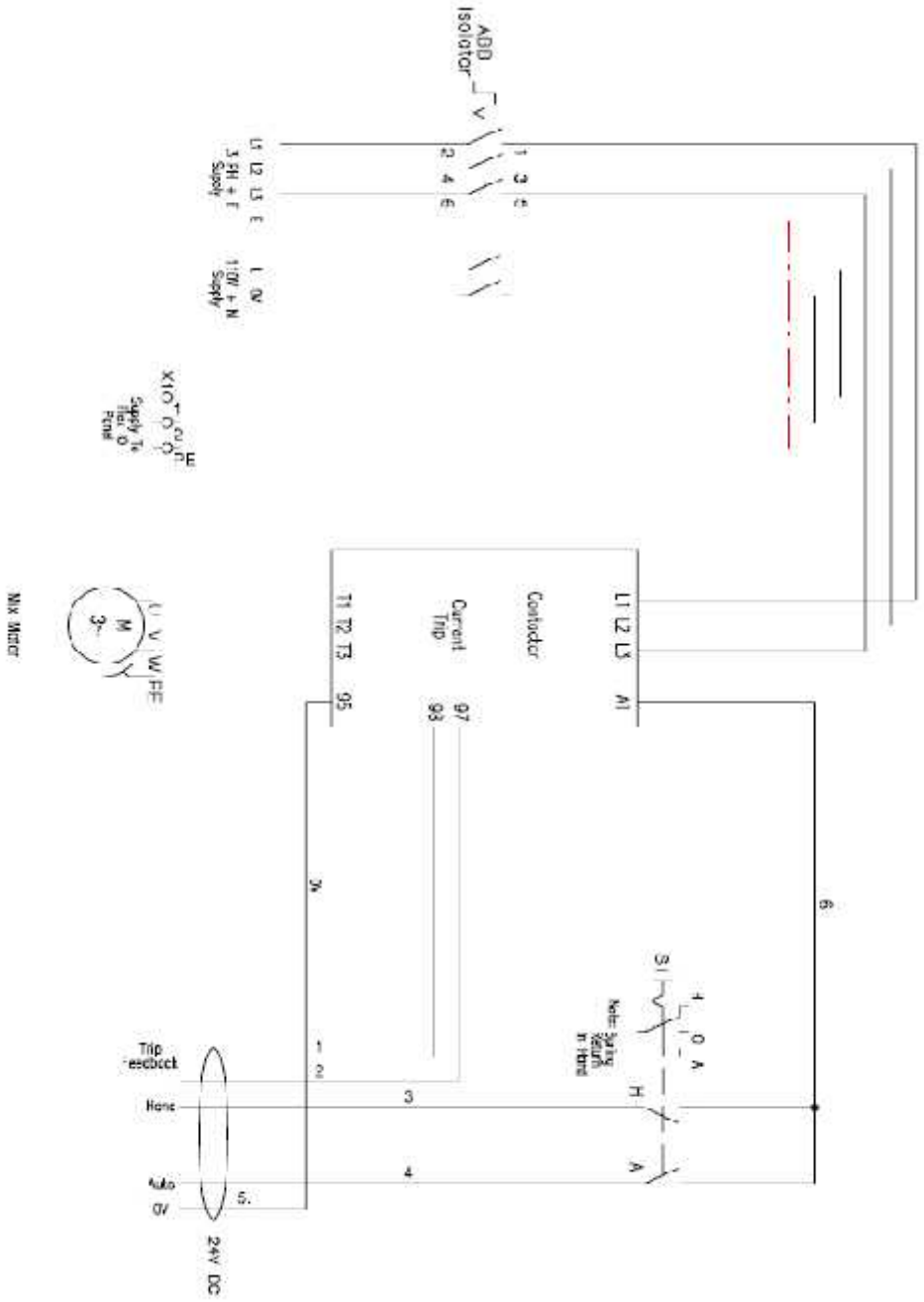
You can commission TSM Control Systems service personnel to provide on-site service by contacting the Customer Service Department.

Should you encounter a problem commissioning or operating the blender please complete the following checklist before contacting TSM Control Systems:

- Ensure you have all model numbers and serial numbers for your equipment.
- Service personnel will need this information to assist you.
- Check that power is supplied to the equipment
- Check that all connectors and wires between the control console and related components have been installed correctly as per the wiring diagram in this manual..
- Please refer to the troubleshooting guide of this manual which may assist in solving the problems.
- Examine the instruction manual(s) carefully for associated equipment, especially controls. Each manual has its own troubleshooting guide to help you.
- Check that the equipment has been operated as described in this manual.
- Check that all connections comply completely with accompanying.

3 Appendix

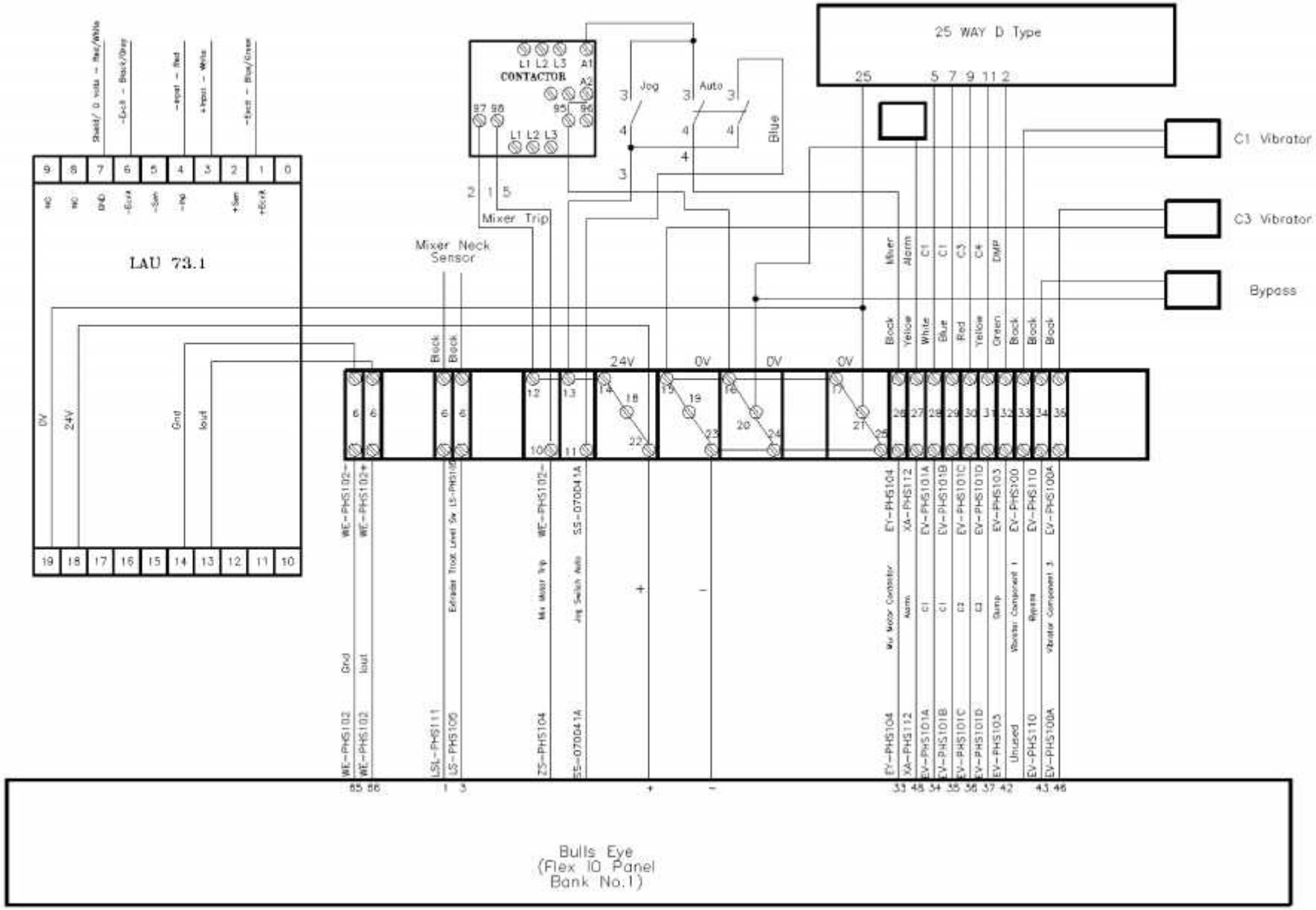
Blender electrical drawings



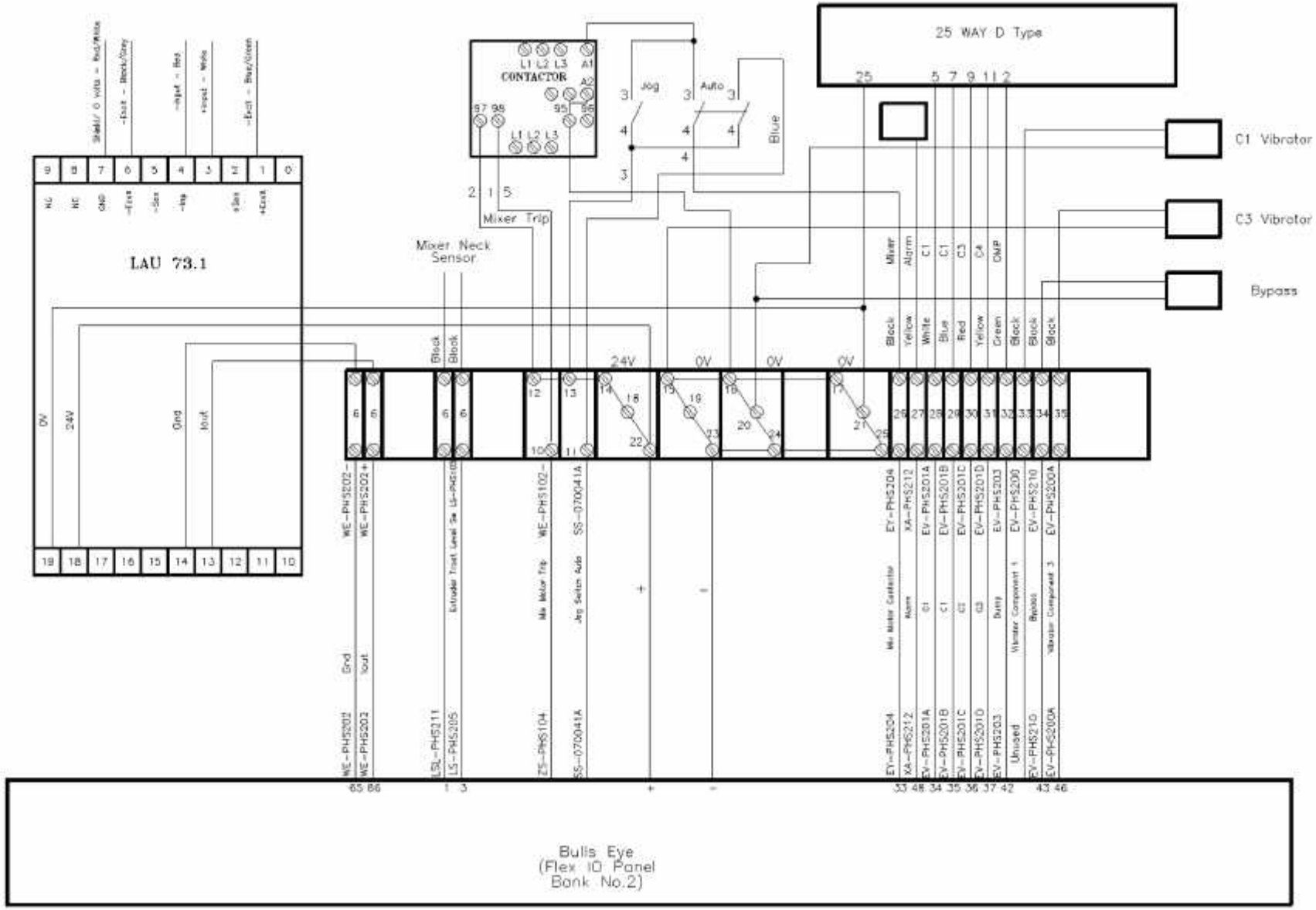
Blender Contactor Box

Appendix

Bulls Eye Blender 1 Junction Box wiring.



Bulls Eye Blender 2 Junction Box wiring.



Bulls Eye

Blender 3 Junction Box wiring.