

AKURATE DYNAMICS



USER TRAINING GUIDE

AkurateDynamics.com
7618 Bluff Point Drive | Houston, Texas | 77095
(832) 672-5665
info@akuratedynamics.com



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Main Concepts

1. Break the system down into chunks
 - Feed
 - Tanks/Tank Selection
 - Transfer Pumps
 - Wye Strainer
 - Inside the Proportioner
 - Heater
 - Proportioning Pumps
 - Hoses
2. Breakers, Breakers, Breakers and E-stop!
3. ISO is the Master, Resin is the Slave
 - Resin Motor speed reacts - best indicator of what's going on
4. Transfer pumps maintain 50 PSI Inlet Pressure to the proportioning pumps
5. Monitor with heater pressure in diagnostics
6. How heating works throughout the system
 - Warm-up vs. Run
 - Preheaters
 - Stepping Hose heat
7. Alarms that kick you out
 - Pressure Differential (600psi between each other)
 - High/Low Pressure (+/- 600psi from Setpoint for more than 5 seconds)
 - Off-Ratio (+/- 3% after 3 gallons sprayed)
 - Critical Temperature Alarms (Above 170 ° F)
 - Critical Pressure Alarm (Above 2000psi)
 - Sensor Failure
8. Check Valves don't simply "Go Bad"
 - If stuck open: Gun Pressure goes DOWN while Heater Pressure goes UP
 - Clean and replace – only swap with new if cleaning doesn't work!
9. Dialing in Chemical
 - RPM's – Preheater Temp
10. Watch out for overheating
 - Pressure – Hose Temp
11. Processing Emulsions



Proportioner Screen Snapshots

AKURATE DYNAMICS
The 16-Word-In-Two-Word

Job Status: Standby 06/11/18 13:17 Exit

Chemical: Chemical/Manufacturer Job #: 61181317

Standby Warm Up Run

Start Auto Pressure Phase

Dynamic ISO Gun Pressure Setpoint (PSI) RESIN Dynamic

893 PSI 900 901 PSI

Pump Speed (0%-100%)

162 RPM 35 162 RPM

100 Temperature Setpoint (F) 100

72 F Actual Temperature (F) 73 F

Gallons ISO: 0.0 Total Lbs: 0.0 Ratio %: 100.0

Gallons RESIN: 0.0

Time Occurred Mode Alarm Time Cleared

Diag Manage Chemical Job Status Logs Alarms

Job Setup

Back Save

Job Number: 61181317

Customer:

Address:

Chemical Used: Chemical/Manufacturer

Resin Batch Number: Ambient Temp (F): 0

Humidity (%RH): 0

ISO Batch Number: Wall Moisture (%): 0

ISO Date Code:

Applicator Name:

Chemical

Chemical/Manufacturer List Edit Add Delete

Standard Pressure (PSI): 900 Standard Motor Speed (0%-100%): 35

Standard ISO Temp (F): 100 Standard Resin Temp (F): 100

ISO Exchanger Temp (Deg): 80 Resin Exchanger Temp (Deg): 80

Gun 1 Resin Offset (RPM): 0 SET

Tank Level A (Gallons): 70 Tank Level B (Gallons): 71 Tank Level C (Gallons): 70 Iso Amount: 0.0 Resin Amount: 0.0 Ratio: 100.0

Tank Temp A: 83 Tank Temp B: 83 Tank Temp C: 83 Override

Save Settings Save Settings will write the gun pressure setpoint, pump speed, hose temps, and resin offset (ISO rpm - RESIN rpm) into your current chemical settings.

Tank B Selected

RAW INPUT REGISTER VALUES (0-1023)

Raw A 0	570	Raw A 12	568	Raw A 24	567	Raw A 36	0	Temp Section 2 Status: Inactive
Raw A 1	0	Raw A 13	566	Raw A 25	568	Raw A 37	0	
Raw A 2	0	Raw A 14	567	Raw A 26	3	Raw A 38	0	Temp Section 3 Status: Inactive
Raw A 3	565	Raw A 15	569	Raw A 27	3	Raw A 39	0	
Raw A 4	563	Raw A 16	567	Raw A 28	564	Raw A 40	0	List Hose Length
Raw A 5	0	Raw A 17	0	Raw A 29	575	Raw A 41	0	
Raw A 6	0	Raw A 18	0	Raw A 30	3	Raw A 42	0	
Raw A 7	567	Raw A 19	0	Raw A 31	3	Raw A 43	0	
Raw A 8	569	Raw A 20	0	Raw A 32	22	Raw A 44	0	Length Hose Purge
Raw A 9	565	Raw A 21	0	Raw A 33	0	Raw A 45	0	
Raw A 10	0	Raw A 22	567	Raw A 34	0	Raw A 46	0	H96 Version = 42
Raw A 11	562	Raw A 23	571	Raw A 35	0	Raw A 47	0	Control Board Version = 4.1

DIAGNOSTICS

Heat Gun 1

Exchanger Section 1 Section 2 Section 3 Section 4

HA Pressure: 88 HA Temp: 73 73 -102 -102 72

Gun Pressure: 891 Status: On On Inactive Inactive On

Reset Volume Reset Gun Offset BP None BP None BP None BP None

Gun Pressure: 901 HB Temp: 72 71 -102 -102 73

HB Pressure: 91 Status: On On Inactive Inactive On

Tank B Selected HC Temp: 73 BP None BP None BP None BP None

HC Pressure: 90 Status: Off

Composition Setup

ISO HOSE Warmup (%)

Sec 1 Sec 2 Sec 3 Sec 4

75 79 80 82 80 85 85 87

0 0 0 0 0 0 0 0

Run Offsets

10 5 0 0 6 3 0 0

90 95 100 100 94 97 100 100

Adaptive Setpoint Toggle On/Off On/Off Adaptive Setpoint Toggle On/Off On/Off

Adaptive Setpoint Absolute Max Adjustment: 7 7

ISO Heater On Time: 2

ISO Heater Duty Cycle(%): 50

Which heaters are being used? 1 HP 2 HP

How many pre-heaters are being used? TWO THREE

Tank Alarms OFF

Adaptive Setpoint Function ON

ISO HOSE Warmup (%)

Sec 1 Sec 2 Sec 3 Sec 4

75 79 80 82 80 85 85 87

0 0 0 0 0 0 0 0

Run Offsets

10 5 0 0 6 3 0 0

90 95 100 100 94 97 100 100

Adaptive Setpoint Toggle On/Off On/Off Adaptive Setpoint Toggle On/Off On/Off

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ISO HOSE Warmup (%)

Sec 1 Sec 2 Sec 3 Sec 4

75 79 80 82 80 85 85 87

0 0 0 0 0 0 0 0

Run Offsets

10 5 0 0 6 3 0 0

90 95 100 100 94 97 100 100

Adaptive Setpoint Toggle On/Off On/Off Adaptive Setpoint Toggle On/Off On/Off

Adaptive Setpoint Absolute Max Adjustment: 7 7

ISO Heater On Time: 2

ISO Heater Duty Cycle(%): 50

Which heaters are being used? 1 HP 2 HP

How many pre-heaters are being used? TWO THREE

Tank Alarms OFF

Adaptive Setpoint Function ON

Operating the Proportioner

Start Up/Main Screen

Upon start up, the following screen will be displayed on the HMI. From here you can cycle between the three different operation modes and control the main parameters: gun pressure (atomization pressure), pump speed, and operating temperature. Several key pieces of information can also be viewed here:

- Pressure reading at the gun
- Motor speed
- Chemical temperature
- Volume of chemical
- Ratio

From this screen, all other windows can be accessed using the buttons along the right side of the screen.

Manage Chemical

To open the Manage Chemical screen, select the “Manage Chemical” box located on the main screen.

Displayed in this window are the chemical settings being used, volume of chemical sprayed, ratio, and tank levels (if tank level sensors are installed). Multiple chemicals may be added to the system to expedite set-up when using various chemicals between jobs.

Operating the Proportioner

Add Chemical

Select the “Add” tab to add new chemical, which will pull up a keypad prompting for a code to do so (21 or 021 then click “set”). Select each field to input the required information. Once all fields have been filled, press save to add the new chemical to the system.

Chemical:		Manufacturer:	
Standard Pressure (PSI):	0	Standard Motor Speed (0%-100%):	0
Standard ISO Temp (F):	0	Standard Resin Temp (F):	0
ISO Exchanger Temp (Deg):	0	Resin Exchanger Temp (Deg):	0
Gun 1 Resin Offset (RPM):	0	SAVE	

CHEMICAL: Do not enter “\” here.

STANDARD PRESSURE (PSI): Atomization Pressure

STANDARD ISO TEMP (F): Operating Temp ISO

ISO EXCHANGER TEMP (DEG): Temperature setpoint for ISO in the heat exchanger. ~10% below operating temperature
Max value = 90 degrees Fahrenheit

GUN 1 RESIN OFFSET (RPM)

MANUFACTURER: Do not enter “\” here.

STANDARD MOTOR SPEED (0% - 100%)

STANDARD RESIN TEMP (F): Operating Temp Resin

RESIN EXCHANGER TEMP (DEG): Temperature setpoint for Resin in the heater exchanger. ~10% below operating temperature
Max value = 110 Degrees Fahrenheit



Operating the Proportioner

Edit Chemical

To edit an existing chemical in the system:

1. From the Manage Chemical window, use the dropdown arrow or press “List” to view all saved chemicals.
2. Select the chemical you would like to display.
3. Select “Edit”, which will pull up a keypad prompting for a code to do so (21 or 021 then click “set”).
4. Update the desired fields by selecting the appropriate box.
5. Once all desired changes are made, press “Save”.
6. Press “Back” to return to manage chemical window.

Selecting a Chemical

To update the systems settings for a particular chemical, follow the steps below:

Note: If the chemical being used has not been saved to the system, go to section 3.2.1 and follow the steps to add a new chemical.

1. From the Manage Chemical window, press the dropdown arrow or “List” to view saved chemicals.
2. Select the desired chemical from the menu.
3. Verify settings for each parameter.
 - If an undesired value is located in on of the fields, select “Edit” and follow steps in section 3.2.2
4. Press “Set” to update system to the chemicals settings.

Deleting a Chemical

To remove a chemical from the system, follow the steps below:

1. From the Manage Chemical window, press the dropdown arrow or “List” to view saved chemicals.
2. Select the chemical to be removed.
3. Press “Delete”, which will pull up a keypad prompting for a code to do so (21 or 021 then click “set”).
4. A new window will pop up to verify that the chemical is to be deleted. Select “Yes”



Operating the Proportioner

Job Setup

The Job Setup window can be used to input important information relating to the day's job. It is crucial to fill out this window in order to generate Job Reports, Summaries and Logs that contain the correct information pertaining to that particular job.

Back		Job Setup		Save	
Job Number:	<input type="text" value="611181317"/>				
Customer:	<input type="text"/>				
Address:	<input type="text"/>				
Chemical Used:	Chemical/Manufacturer				
Resin Batch Number:	<input type="text"/>	Ambient Temp (F):	<input type="text" value="0"/>		
Resin Date Code:	<input type="text"/>	Humidity (%RH):	<input type="text" value="0"/>		
ISO Batch Number:	<input type="text"/>	Wall Moisture (%):	<input type="text" value="0"/>		
ISO Date Code:	<input type="text"/>				
Applicator Name:	<input type="text"/>				

Job Setup should be completed each time a new job is started. Follow these steps:

Note: Verify that the correct chemical is selected in the Manage Chemical Window. If undesired chemical is displayed in the Manage Chemical window, follow steps in section 3.2.3 to update.

1. From the Main Screen press "Job Setup"
2. In the Job Setup window select each field to update it with the correct information

Required fields for Job Report and Summary include:

Job Number
Customer
Address

3. Applicator Name
4. Once all fields are populated, press "Save"



Operating the Proportioner

Operating Modes

Standby Mode (Default)

Standby Mode is the default when first powering up the Proportioner. In Standby Mode, the system will not send power to any of the equipment within the system. This is the desired mode when making any changes in the system or whenever there is a brief break during operations that does not require a full shutdown.

Warm-up Mode

Warm-up mode is used to begin heating the chemical to operating temperatures or to recirculate the chemical through the hoses. In this mode, chemical will heat to a percentage of set point to prevent overheating.

Also located in the Warm-Up screen is the Auto-pressure feature. Auto-pressure is used to pressure up the lines in preparation for spraying. By pressing this button, the iso side will pressure up independently first, followed by the resin side. It is important to make sure both recirc knobs on top of the proportioner are fully closed.

If an Auto-pressure error occurs, please see Troubleshooting section.

The screenshot shows the AKURATE DYNAMICS software interface in 'Warm Up' mode. The top status bar indicates 'Job Status: Warm Up' and the date '06/11/18 13:19'. The main control area features a 'Start' button, an 'Auto Pressure' button, and a 'Pause' button. Below these are two columns of controls for 'ISO' and 'RESIN'. The 'ISO' column includes 'Dynamic' and 'CAL 0' buttons, a pressure readout of '891 PSI', a '162 RPM' button, a '100' button, and a temperature readout of '72 F'. The 'RESIN' column includes 'Dynamic' and 'CAL 0' buttons, a pressure readout of '901 PSI', a '162 RPM' button, a '100' button, and a temperature readout of '73 F'. In the center, there are input fields for 'Gun Pressure Setpoint (PSI)' (900), 'Pump Speed (0%-100%)' (35), 'Temperature Setpoint (F)' (100), and 'Actual Temperature (F)'. At the bottom, there are readouts for 'Gallons ISO: 0.0', 'Gallons RESIN: 0.0', 'Total Lbs 0.00', and 'Ratio % 100.0'. A table at the very bottom has columns for 'Time Occurred', 'Mode', 'Alarm', and 'Time Cleared'. On the right side, there is a vertical menu with buttons for 'Exit', 'Diag', 'Manage Chemical', 'Job Status', 'Logs', and 'Alarms'.

The screenshot shows the AKURATE DYNAMICS software interface in 'Run' mode. The top status bar indicates 'Job Status: Running' and the date '06/11/18 13:19'. The main control area features a 'Start' button, an 'Auto Pressure' button, and a 'Pause' button. Below these are two columns of controls for 'ISO' and 'RESIN'. The 'ISO' column includes 'Dynamic' and 'CAL 0' buttons, a pressure readout of '891 PSI', a '162 RPM' button, a '100' button, and a temperature readout of '72 F'. The 'RESIN' column includes 'Dynamic' and 'CAL 0' buttons, a pressure readout of '901 PSI', a '162 RPM' button, a '100' button, and a temperature readout of '73 F'. In the center, there are input fields for 'Gun Pressure Setpoint (PSI)' (900), 'Pump Speed (0%-100%)' (35), 'Temperature Setpoint (F)' (100), and 'Actual Temperature (F)'. At the bottom, there are readouts for 'Gallons ISO: 0.0', 'Gallons RESIN: 0.0', 'Total Lbs 0.00', and 'Ratio % 100.0'. A table at the very bottom has columns for 'Time Occurred', 'Mode', 'Alarm', and 'Time Cleared'. On the right side, there is a vertical menu with buttons for 'Exit', 'Diag', 'Manage Chemical', 'Job Status', 'Logs', and 'Alarms'.

Run Mode

When ready to spray, select the "Run" button and press start. Once flow is detected, full power is given to the heating elements. It is important to note that when taking breaks, switch back into standby mode until ready to resume spraying. Once ready to spray, simply switch back into Run mode and press start.

Operating the Proportioner

Diagnostics Window

The Diagnostics Window contains several different measurements recorded throughout the system.

DIAGNOSTICS											
Heat Exchanger				Gun 1							
Heat Exchanger				Section 1		Section 2		Section 3		Section 4	
HA Pressure:	88	HA Temp:	73	73		-102		-102		72	
Gun Pressure:	891	Status:	On	On		Inactive		Inactive		On	
Reset Volume		Reset Gun Offset		BP	None	BP	None	BP	None	BP	None
Gun Pressure:	901	HB Temp:	72	71		-102		-102		73	
HB Pressure:	91	Status:	On	On		Inactive		Inactive		On	
Tank B Selected		HC Temp:		BP	None	BP	None	BP	None	BP	None
HC Pressure:	90	Status:	Off	BP	None	BP	None	BP	None	BP	None

ISO Heat Exchanger Pressure (88)

ISO Pressure at the gun (891)

ISO Heat Exchanger Temperature (73)

ISO Hose Temperature by Section (-102)

Resin Pressure at the gun (901)

C-Resin Heat Exchanger Pressure (91)

B-Resin Heat Exchanger Pressure (72)

C-Resin Heat Exchanger Temperature (71)

B-Resin Heat Exchanger Temperature (-102)

Resin Hose Temperature by Section (73)

Operating the Proportioner

Hose Temperature

Hose temperature is monitored and controlled in multiple sections throughout the hose (See “Identifying a Hose Section” to see each section and its corresponding sensor location). Each section can be observed in the diagnostics screen as shown above.

If an error occurs with a section while spraying, the Bypass feature can be used. By selecting the BP button underneath the section, a drop down menu appears and the temperature control can be bypassed to a separate section. It is recommended that the section prior be selected when use of this feature is required.

However, it is best practice to replace or resolve the sensor issue at earliest convenience.

Logs Window

The Logs Window is where copies of any required documentation can be obtained. A USB key will be required in order to pull the files from the system. Copies of the data logs, Certificate of Conformance, and Job Summary are obtained here.

The “Copy logs to USB” button is used simply to copy the entire existing logfile since the last time it was cleared to a USB drive. This log file details and timestamps all sensor data, flow counts, as well as various other key pieces of information. This button will make a copy and leave the log file in the systems memory, as well as eject the USB drive when complete. On the left side of this screen there are two entries, one for the Job #, and another for a date. So long as these values are both set to “0”, the copy logs feature will copy the

Reset Volume

Reset volume is used to clear the volume count displayed at the bottom of the Main Screen and in the Manage Chemical window.

Reset Gun Offset

Gun offset is defined by the difference between Iso motor speed and Resin motor speed and it can be both a positive or negative number. This offset is how the machine adjusts to maintain a 1-to-1 ratio. This offset can be used as a troubleshooting tool to identify potential issues that can occur due to lack of maintenance or an error with the system.

Whenever a large offset is noticed and causing issues, the Reset Gun Offset button (located in the diagnostics screen) is used to reset the Resin motors speed



Operating the Proportioner

entire log file. If there is a Job # entered, only the time stamped data for that job will be copied, which will result in a much more concise log file. If there is a date entered, it will only copy the data for that corresponding day. These features only apply to “Copy logs to USB” function.

The “Copy logs to USB and clear” button copies the log file to the USB drive, but will then clear that log file from the systems memory and create a new one. This button is not tied to the Job#/Date features on the left side of the screen.

The “Generate Job Report and copy to USB” button creates a Certificate of Conformance that details the job number, customer, address, chemical used (which will be automatically generated according to the currently selected chemical), applicator name, and average ratio. It will be dated and there will be an entry for the Field Supervisor to be able to sign off on

it. This document will be in the form of a PDF. In order to ensure that the function works properly, in the job setup screen the necessary fields that should be entered and saved include: job number, customer, address, and applicator name.

The “Generate Job Summary and copy to USB” button creates a document that details flow totals, as well as other sensor information for every day that the current job has been worked. For this function to work properly, the job setup entries that should be filled out every day include: job number, customer, address, and applicator name. These entries should be entered exactly as they were entered in the days prior*.

*Note: It is crucial that the operator does not reset their volume count at the end of the day, as it is the last entry in the log file (for that day) that will be used when generating a job summary.

Alarms Window

Alarms can be viewed in to separate places: the main screen and the alarm window. The main screen only shows the most recent alarms and is for display purposes only. In order to view and/or address any alarms that occur, the alarms window will need to be accessed.

Gallons ISO: Gallons RESIN:		0.0	Total Lbs 0.00	Ratio % 100.0
		0.0		
Time Occurred	Mode	Alarm		Time Cleared
13:20:35	82	Low 1A Temperature		13:20:41
13:20:35	82	Low 4A Temperature		13:20:41



Operating the Proportioner

Shutting Down

Before cutting power to the proportioner with the master power switch, be sure to shut down the HMI first. To do so, press the EXIT button in the upper right-hand corner of the main screen. The press SHUT DOWN in the pop-up window. Once the screen turns blue, the master power can be switched to OFF.

AKURATE DYNAMICS
The Science In Spray Foam

Job Status: Running

Chemical: Chemical/Manufacturer

Standby Warm Up

Start Auto Pressure Pause

Dynamic ISO Gun Pressure Setpoint (PSI) RESIN
CAL 0 893 PSI 900 903 PSI

Pump Speed (0%-100%) 35 162 RPM

Temperature Setpoint (F) 100
Actual Temperature (F) 73 F

Gallons ISO: 0.0 Total Lbs 0.00 Ratio % 100.0
Gallons RESIN: 0.0

Time Occurred Mode Alarm Time Cleared
13:20:35 82 Low 1A Temperature 13:20:41
13:20:35 82 Low 4A Temperature 13:20:41

Exit

Reboot

Shutdown

Diag

Manage Chemical

Job Status

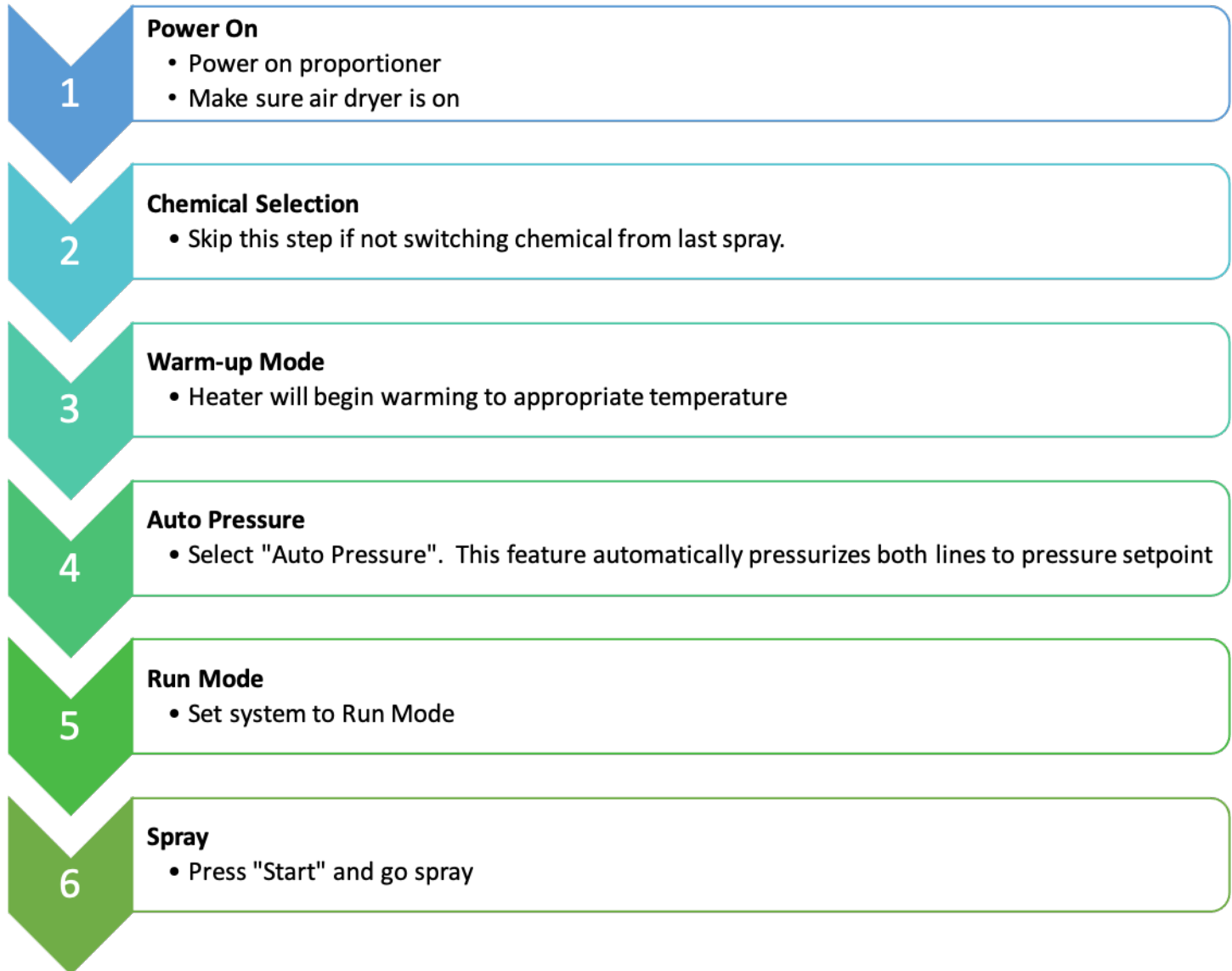
Logs

Alarms



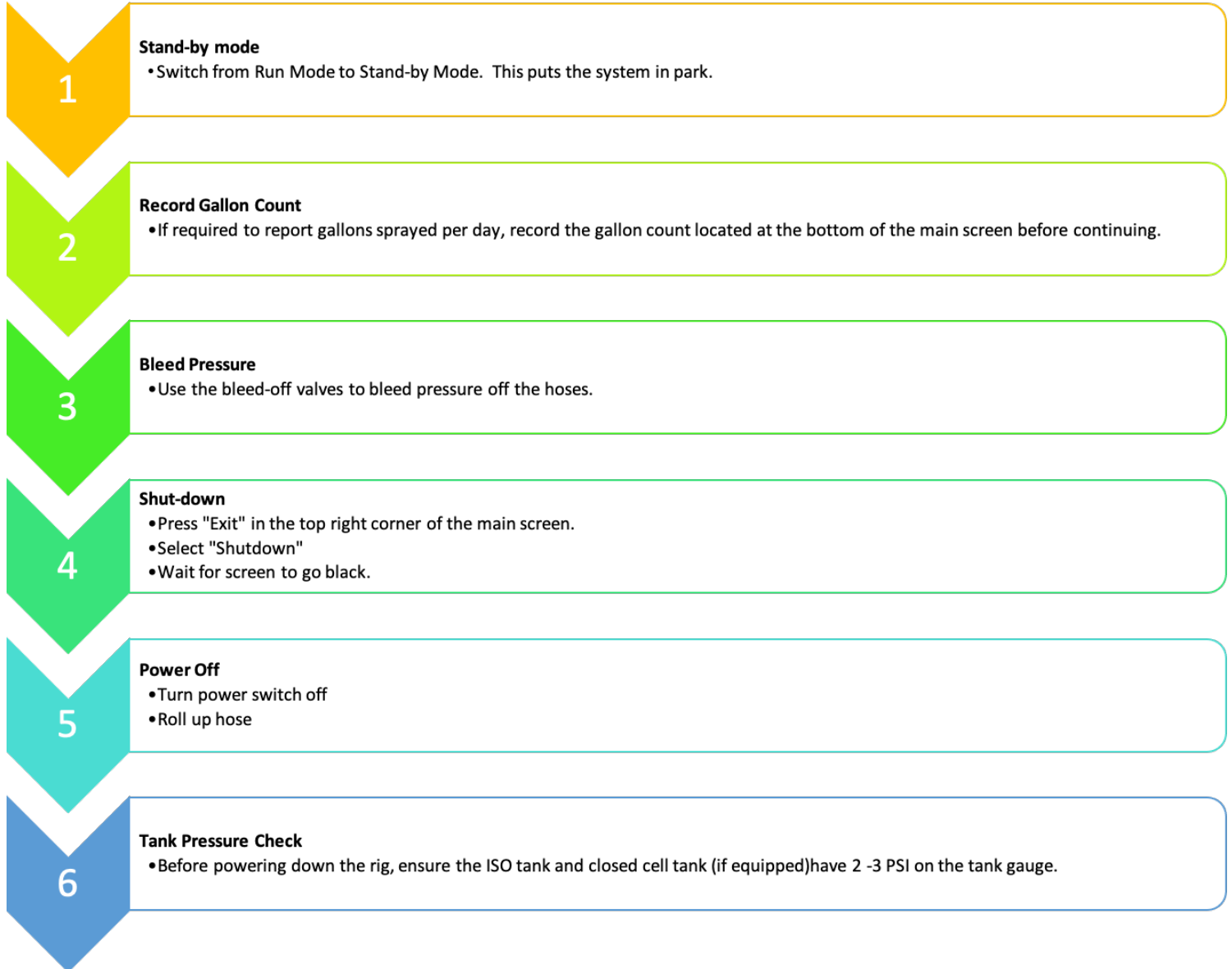
Operating the Proportioner

Start-up Guide



Operating the Proportioner

Shutdown Guide



Operating the Proportioner

Most Common Issues

Resin Pressure Will Not Build

- First Check:
 - Breakers are on
 - Resin Recirc Valve is closed
 - Is there an error on the drive?
 - Lift the enclosure. Check that the Resin Motor Drive displays a Number. If error message or any letters, reset the drive by pressing the reset button on the drive. If numbers are displayed, drive is operating fine.
- What is your Resin Motor Speed?
 - At start-up Resin motor speed should match Iso Motor speed. If value is significantly lower or Zero, A large offset may be stored. To check and fix:
 - Go to Manage Chemical, if Resin Offset is 0, then go to diagnostics screen, and press reset offset. Motor RPM's should then match.
 - If Value is stored in Resin Offset, you need to edit the chemical and change the value to 0. Then press save. Then press Set, and then go to Diagnostics Screen and Reset Gun Offset. RPM's should match.
- Is the transfer pump turning?
 - The transfer pump located under the tank should turn on to supply chemical to the system when Heater pressure is under 47 PSI. You can find heater pressure in the diagnostics screen. If transfer pump doesn't turn when in Run Mode and pressure in the heater is below 47, there is a problem with the transfer pump.

Iso Pressure Will Not Build

- First Check:
 - Breakers are On
 - Iso Recirc Valve is shut
 - Is there an error on the drive?
 - Lift the enclosure. Check that the Iso Motor Drive displays a Number. If error message or any letters, reset the drive by pressing the reset button on the drive.
- Iso Wye Strainer Clogged.
- Is the transfer pump turning?
 - The transfer pump located under the tank should turn on to supply chemical to the system when Heater pressure is under 47 PSI. You can find heater pressure in the diagnostics screen. If transfer pump doesn't turn when in Run Mode and pressure in the heater is below 47, there is a problem with the transfer pump.

Iso Pressure Builds but Keeps Falling Off

- Check Valve stuck open
 - Symptoms:
 - Iso Motor turning on and off while not spraying and resin pressure keeps climbing.
 - Build Iso to set point and press pause. Gun pressure keeps dropping and HA Pressure (Located In diagnostics screen) keeps rising.
 - To fix, bleed off all pressure and remove check valve. Clean out the check valve by washing in TSL, Mesimol, Gun Cleaner, or carburetor cleaner and blow out with air.



Most Common Issues

Replace check valve and see if pressure holds. If pressure falls off again, replace with new check valve.

- Clogged Wye Strainer
- Potential Hose Leak

Auto Pressure Error

- Check that both Recirc Valves are closed.
- Make sure Motor Breakers are on.
- Is there an error on the drive?
 - Lift the enclosure. Check that the Iso Motor Drive displays a Number. If error message or any letters, reset the drive by pressing the reset button on the drive.
- Make sure tank valves are open
- Is the transfer pump turning?
 - The transfer pump located under the tank should turn on to supply chemical to the system when Heater pressure is under 47 PSI. You can find heater pressure in the diagnostics screen. If transfer pump doesn't turn and pressure in the heater is below 47, there is a problem with the transfer pump.

Hose Temp not Rising

- Make sure all Hose breakers are on
- Ensure cables on left side of the machine are plugged in

Hose Section Temperature Error

- If hose section reads a negative value or above 210, the sensor is likely bad and needs to be replaced. See Replacing a Temp Sensor guide

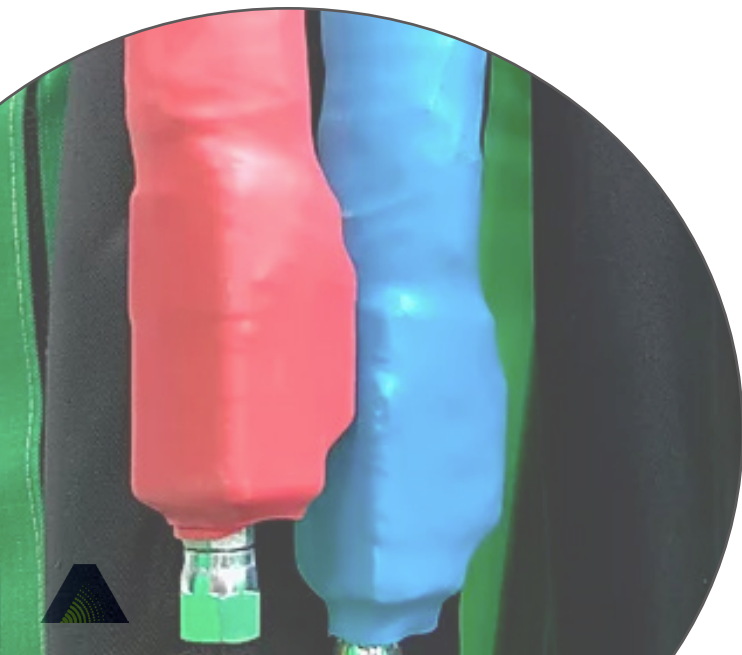
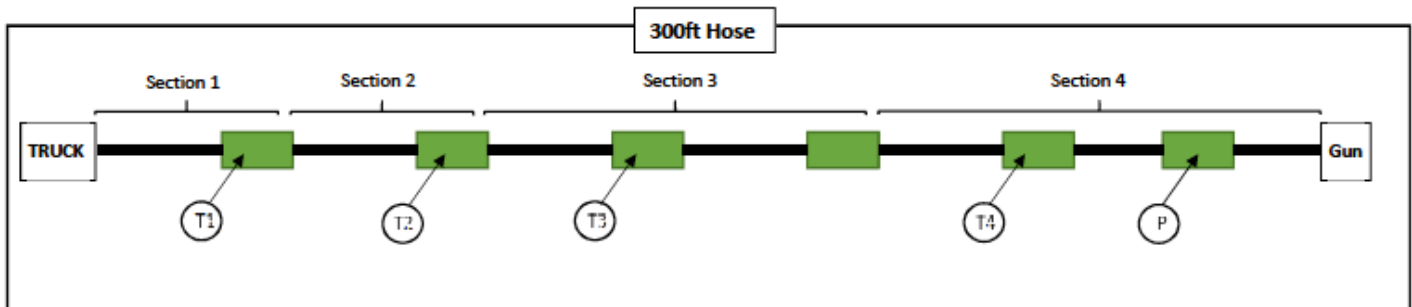
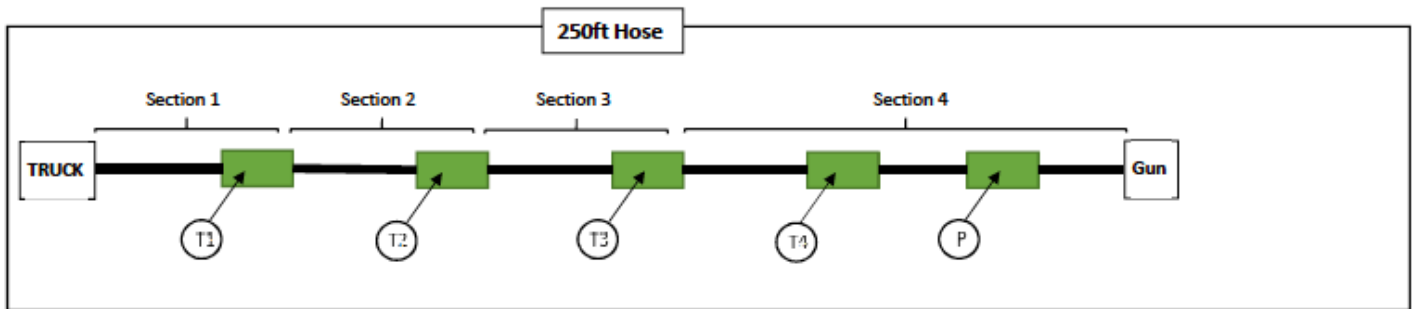
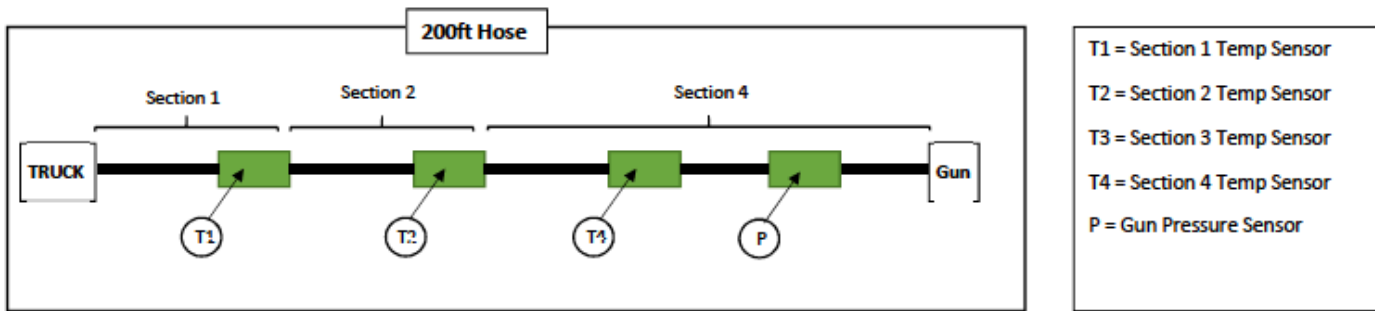
HMI (Screen) Not Coming On

- Pull out E-stop



Hose Guide

Hose Section Diagram

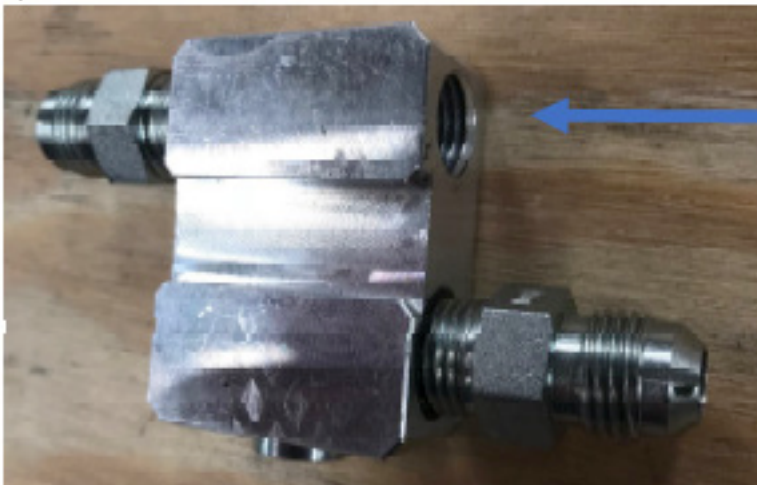


Hose Guide

New Hose Temp Sensor Change

1. Identify sensor with fault through the diagnostic screen. The sensor will read below 0° F or above 200° F.
2. At this point make sure to bleed down pressure before attempting to remove the temperature sensor.
3. Shutdown the system and turn power off.
4. Locate the section of green wrap on the hose that corresponds to that temperature sensor and peel it open.
5. Unplug the temperature sensor from the two pin connector. Make sure it corresponds to the right hose (Red = ISO, Blue = RESIN).
6. Unscrew the temperature sensor and replace with the new sensor. Remember to also plug in the two pin connector for the new temperature sensor to the two pin plug that the previous sensor was tied to.

Sensor Block



This is where the temperature sensor is located.



Replacing a RESIN Hose Section

Do not turn on the system until instructed

1. Turn off all hose breakers inside the enclosure.
2. Disconnect Power and Sensor (for whips there are no sensors, just disconnect power cable) connections from section being replaced.
3. Remove bad section from the hose.
4. Install the new section to the hose.
5. Reconnect all power and sensor connections
6. Power on the unit.
7. Check the diagnostics screen to ensure the temp sensors are getting good values. If values are good, proceed to the next step. If values are bad, check to make sure the connections are good at the section you just replaced.
8. Turn off the A side Motor Breaker.
9. Set Pressure setpoint to 300 psi and motor speed to 15%.
10. Open the Resin valve at the gun manifold and be ready to bleed chemical into a bucket.
11. Go into Warm-up mode, Recirc, and press start. This will turn on the Resin motor and begin filling the lines on the Resin side.
12. Bleed chemical into bucket until you no longer see air coming out of the manifold.
13. Go into Standby mode and close the Resin valve on the Gun manifold.
14. The lines are now full of chemical and you can turn the breakers back into the on position.
15. Select Warm-up mode and make sure all sections heat up properly. Remember, in Warm-up the temperature will not reach the setpoint. It will shut off at ~85% of the setpoint. Make sure that all sections do not continue to heat up more than 10°F past the point where the hose heat shuts off.
16. If hoses heat up properly, you should then go and secure the power and sensor wires with tape to the hoses and wrap the hoses back up.
17. Once completed, you can resume normal operation.



Replacing an ISO Hose Section

Do not turn on the system until instructed

1. Turn off all hose breakers inside the enclosure
2. Disconnect Power and Sensor connections from each end of section being replaced
3. Remove bad section from the hose
4. Install the new section to the hose
5. Reconnect all power and sensor connections
6. Power on the unit
7. Check the diagnostics screen to ensure the temp sensors are getting good values. If values are good, proceed to the next step. If values are bad, check to make sure the connections are good at the section you just replaced.
8. Turn off the B side Motor Breaker
9. Set Pressure setpoint to 300 psi and motor speed to 10%
10. Open the Iso side valve at the gun manifold and be ready to bleed chemical into a bucket
11. Go into Warm-up mode, Recirc, and press start. This will turn on the Iso motor and begin filling the lines on the Iso side.
12. Bleed chemical into bucket until you start seeing air coming out of the manifold. Bump motor speed up to about 15% and continue purging the line of air until you no longer see air coming out.
13. Go into Standby mode and close the Iso valve on the Gun manifold.
14. The lines are now full of chemical and you can turn the breakers back into the on position.
15. Select Warm-up mode and make sure all sections heat up properly. Remember, in Warm-up the temperature will not reach the setpoint. It will shut off at ~85% of the setpoint. Make sure that all sections do not continue to heat up more than 10°F past the point where the hose heat shuts off.
16. If hoses heat up properly, you should then go and secure the power and sensor wires with tape to the hoses and wrap the hoses back up.
17. Once completed, you can resume normal operation.



Trouble Shooting Guide

LOSING PRESSURE WHILE SPRAYING (ISO, RESIN)

If losing pressure while spraying resulting in the system going into stand-by, it is often due to one of the issue listed below. The three most common issues are listed first and should always be checked before considering something else. Also, it is many times the result of one of the other issues outlined in this guide. It is hard to tell which one while spraying if no one is watching the proportioner, therefore when pressure is lost, it is best to go back to the system and try pressuring up normally and monitoring for some other issue during this process.

- Gun Blockage
- Check Valve issue
- Clogged Wye Strainer
- Chemical overheating inside heaters
- Transfer pump issue
- Air trapped on inlet side of pump
- Motor binding
- Pump seal failure

PRESSURE STARTS TO BUILD BUT CAN'T REACH PRESSURE SETPOINT (ISO, RESIN)

Recirc valve stuck open

- Ensure recirc valve has not been left open. May need to tighten set screw on valve handle if knob seems loose.

Wye strainer clogged

- Bleed pressure off the side in struggling to build pressure. Begin trying to build pressure again. Go directly to Diagnostics screen and monitor the heater pressure value, if struggling to reach/maintain 50 psi, or failing to reach 50 psi, the wye strainer is likely clogged.
- Corrective Action: Close valve on bottom

of tank and chemical inlet valve inside proportioner. Remove screen from wye strainer. Clean and replace. Open tank valve and chemical inlet valve.

Chemical heaters are too hot

Indicators

- Motors constantly turning but stays between 500-700 psi
- Actual temps significantly greater than the setpoint
- Setpoint higher than _ on Iso Heater and _ on Resin Heater

Resolution

- Bring heaters down and wait a few minutes before trying to pressure back up and resume normal operation.

Air trapped on inlet side of pump - Iso

Indicator:

- Pressure started to build but immediately fell off Clicking sound coming from pump (cavitation)
- Resin Motor Speed rapidly slows down
- Iso gallon count not increasing when motor is turning

Corrective Action

- Turn off Resin Motor Breaker, open Recirc Valve completely on Iso side. In Warm-up Recirc Mode, Set motor speed to 55% and run the motors for approximately 10 sec. Go to Standby, turn the Resin Motor Breaker back on, and try to build pressure normally. If problem repeats itself, repeat the steps outlined above.
- Alternate method to bleed air: Loosen the fitting on the inlet side of the pump, have a funnel or pan underneath the fitting as you will bleed out a decent amount of chemical. Go into run mode, this will allow the transfer pump to push any air out of the inlet side through the



Trouble Shooting Guide

fitting. Once confident all air is out, tighten fitting and go into Standby Mode.

Significant Leak

Start looking around and inside the proportioner and if leak not found, begin looking at hoses.

Valve shut on tank or chemical inlet to proportioner

Check that valve is open at bottom of chemical tanks.

ISO SIDE CAN'T HOLD PRESSURE AT PRESSURE SETPOINT

Check valve stuck open

Indicator:

- Both motors rapidly turning off and on for short intervals
- Resin Pressure continues to climb, and Iso Pressure hangs around setpoint
- Once close to setpoint, pause the system and monitor heat exchanger pressure in diagnostics screen. If this number slowly rises as gun pressure slowly falls, you can confirm that it is the check valve.

Corrective Action:

- Remove Check Valve with 7/8" wrench. Blow out and remove anything caught in the check valve. Replace. If same symptoms repeat, replace with a new check valve.

Hose leak

Indicator:

- Slow decrease in pressure
- Pooling of chemical in hoses

Corrective Action:

- Start looking at each hose connection

for any leaks

Recirc valve slightly cracked

Ensure Recirc Valve is firmly tightened.

May require tightening of set screw on valve knob

Air trapped in the hose

Indicator:

- Pressure bounces around versus steadily declining

Corrective Action:

- Spray through it

RESIN SIDE CAN'T HOLD PRESSURE AT PRESSURE SETPOINT

Resin check valve stuck open

Indicator:

- Iso Pressure holds at setpoint, and resin pressure steadily falls below setpoint
- Once close to setpoint, pause the system and monitor Resin Heat Exchanger Pressure in Diagnostics screen. If this number slowly rises as Resin gun pressure slowly falls, you can confirm that it is the check valve.

Corrective Action:

- Remove Check Valve with 7/8" wrench. Blow out and remove anything caught in the check valve. Replace. If same symptoms repeat, replace with a new check valve.

Hose leak

Indicator:

- Slow decrease in pressure
- Pooling of chemical in hoses
- Corrective Action:
- Start looking at each hose connection for any leaks and fix if possible. If leak or puncture in hose lining, replace section.

Recirc valve slightly cracked

- Ensure Recirc Valve is firmly tightened

May require tightening of set screw on



Trouble Shooting Guide

valve knob

Air trapped in the hose

Indicator:

- Pressure bounces around versus steadily declining

Corrective Action:

Spray through it

RESIN PRESSURE WON'T BUILD AT ALL

Motor breaker off

- Ensure Motor Breaker is in the On Position

•

Large negative offset stored

Indicator

- Resin Motor Speed (RPM) at Zero

Corrective Action

- Go to Manage Chemical screen. You will notice a large negative value stored in Gun Offset. Press Edit, change the value to zero. Press Save then Set. Go to Diagnostics screen and Reset Volume and Reset Gun Offset. Motor speeds should now match on the main screen.

Drive Error

Indicator

- Resin motor not spinning while trying to build pressure
- Resin drive inside electrical enclosure displays error code (something other than just a number)

Corrective Action:

- Reset drive by holding down the two buttons on the left side of the drive until it resets.
- If error message occurs again when trying to pressure back up, Reboot the system
- If issue continues, contact technical support.

Wye strainer clogged

Indicator

- While motors are on in Run mode,

Resin Motor speed steadily climbs

- While motors are on, Resin Heater pressure in Diagnostics screen struggles to build to 50psi if at all.

Corrective Action:

- Close valve on bottom of tank and chemical inlet valve inside proportioner. Remove screen from wye strainer. Clean and replace. Open tank valve and chemical inlet valve.

Air trapped on inlet side of pump

Indicator

- Cavitation – Clicking noise coming from Resin Pump
- Resin Motor Speed rapidly increase
- Resin gallon count not increasing when motors are spinning
- Resin heater pressure not decreasing below 47 PSI while motor is spinning

Corrective Action

- Turn off Iso Motor Breaker, open Recirc Valve completely on Resin side. In Warm-up Recirc Mode, Set motor speed to 50% for 2HP Motors and 75% for 1HP Motors and run the motors for approximately 10 sec or until pressure starts to rapidly build. Go to Standby, turn the Iso Motor Breaker back on, and try to build pressure normally. If problem repeats itself, repeat the steps outlined above.
- Alternate method to bleed air: Loosen the fitting on the inlet side of the pump, have a funnel or pan underneath the fitting as you will bleed out a decent amount of chemical. Go into run mode, this will allow the transfer pump to push any air out of the inlet side through the fitting. Once confident all air is out, tighten fitting and go into Standby Mode.
- Once resolved, Reset Gun offset and Reset Volume



Trouble Shooting Guide

Transfer pump not turning

- See Section “Resin Transfer Pump not Turning”

Blockage in hose before pressure sensor Indicator:

- While pumps are on, pressure on the analog gauge increases with no increase in pressure at the gun.

Tank valve shut

- Ensure Valves are open

ISO PRESSURE WON'T BUILD AT ALL

Breakers off

- Ensure motor breaker is in the on position

Drive error

Indicator

- Iso motor not spinning while trying to build pressure
- Iso drive inside electrical enclosure displays error code (something other than just a number)

Corrective Action:

- Reset drive by holding down the two buttons on the left side of the drive until it resets.
- If error message occurs again when trying to pressure back up, Reboot the system
- If issue continues, contact technical support.

Wye strainer clogged

Indicator

- While motors are on in Run mode, Resin Motor speed steadily falls
- While motors are on, Iso Heater pressure in Diagnostics screen struggles or won't build to 50psi if at all.

Corrective Action

- Turn off system. Close valve on bottom of tank and chemical inlet valve inside proportioner. Remove screen from wye strainer. Clean and replace. Open tank valve and chemical inlet valve.

Air trapped on inlet side of pump Indicator

- Cavitation – Clicking noise coming from ISO Pump
- Iso heater pressure not decreasing below 47 PSI while motor is spinning
- Resin Motor Speed rapidly decreases
- Iso gallon count not increasing while motors are spinning

Corrective Action

- Turn off Resin Motor Breaker, open Recirc Valve completely on Iso side. In Warm-up Recirc Mode, Set motor speed to 50% for 2HP Motors and 75% for 1 HP Motors and run the motors for approximately 10 sec or until pressure starts to rapidly build. Go to Standby, turn the Resin Motor Breaker back on, and try to build pressure normally. If problem repeats itself, repeat the steps outlined above.
- If repeating the steps above doesn't work you will have to relieve the pressure manually: Loosen the fitting on the inlet side of the pump, have a funnel or pan underneath the fitting as you will bleed out a decent amount of chemical. Go into run mode, this will allow the transfer pump to push any air out of the inlet side through the fitting. Once confident all air is out, tighten fitting and go into Standby Mode.
- Once resolved, Reset Gun offset and Reset Volume

Recirc valve stuck open

- Ensure Recirc valve is closed when trying to build pressure



Trouble Shooting Guide

Transfer pump not turning

- See section for Iso Transfer Pump not Turning

Tank or Inlet Valves shut

- Ensure all valves are open leading from the tank to the proportioner

ISO MOTOR WON'T TURN

Breaker off

- Make sure Iso Motor Breaker is on

Drive error

Indicator

- Iso motor not spinning while trying to build pressure
- Iso drive inside electrical enclosure displays error code (something other than just a number)

Corrective Action:

- Reset drive by holding down the two buttons on the left side of the drive until it resets.
- If error message occurs again when trying to pressure back up, Reboot the system
- If issue continues, contact technical support.

Lost communication

RESIN MOTOR WON'T TURN

Breaker off

- Make sure Resin Motor Breaker is on

Drive error

Indicator

- Iso motor not spinning while trying to build pressure
- Iso drive inside electrical enclosure displays error code (something other than just a number)

Corrective Action

- Reset drive by holding down the two

buttons on the left side of the drive until it resets.

- If error message occurs again when trying to pressure back up, Reboot the system
- If issue continues, contact technical support.

Negative offset stored

Indicator

- Resin Motor Speed (RPM) at Zero

Corrective Action:

- Go to Manage Chemical screen. You will notice a large negative value stored in Gun Offset. Press Edit, change the value to zero. Press Save then Set. Go to Diagnostics screen and Reset Volume and Reset Gun Offset. Motor speeds should now match on the main screen.

Lost communication

RESIN TRANSFER PUMP WON'T TURN

The transfer pumps are designed to maintain 50psi while recirculating in Warm-up Mode or while in Run Mode. If heater displays 48psi or greater the transfer pump will not turn. If while in Run mode or trying to recirculate chemical in Warm-up mode the pressure inside the heater (value displayed in the Diagnostics Screen) falls below 48 psi and the motor doesn't turn on, then the following possible issues could be occurring.

Wrong Tank selected (Dual Resin Tanks)

- Ensure the correct Tank is selected in the Manage Chemical screen as well as the Control Switch box for the chemical tanks.

Electrical connection loose

- Ensure transfer pump cables are plugged in completely
- For Single Proportioner units:
 - locate the connection labeled



Trouble Shooting Guide

“Transfer Pump B” on the right side of the proportioner

- For Dual Proportioner units:
 - Check the connection labeled “Opto Out” on the right side of the proportioner.
 - Locate the electrical housing box on the wall that has labeled connections for each transfer pump. Check the transfer pump cable which corresponds to the tank you are using.

Vapor Locked

Lost communication (Electrical)

ISO TRANSFER PUMP WON'T TURN

The transfer pumps are designed to maintain 50psi while recirculating in Warm-up Mode or while in Run Mode. If heater displays 48psi or greater the transfer pump will not turn. If while in Run mode or trying to recirculate chemical in Warm-up mode the pressure inside the heater (value displayed in the Diagnostics Screen) falls below 48 psi and the motor doesn't turn on, then the following possible issues could be occurring.

Electrical connection loose

- Ensure transfer pump cables are plugged in completely
- For Single Proportioner System, look for the plugins labeled “Transfer Pump A” for Iso Transfer pump

Heater pressure sensor cables are crossed at the sensor connections

- Check that pressure sensors are plugged in to the correct cables

Lost communication (Electrical)

Vapor locked

TRANSFER PUMP CONSTANTLY SPINNING

Heater pressure sensor cables are crossed at the sensor connections

- Check that pressure sensors are plugged in to the correct cables

Tank valve or inlet valves shut

- Make sure all valves leading from the tank to the proportioner are open

Wye strainer clogged

Indicator

- Pressure not building in the corresponding heater

Corrective Action

- Turn off system. Close valve on bottom of tank and chemical inlet valve inside proportioner. Remove screen from wye strainer. Clean and replace. Open tank valve and chemical inlet valve.

Lost communication

TRANSFER PUMP TURNING ON AND OFF CONSTANTLY WHILE IN RUN MODE AND NOT SPRAYING

Check Valve stuck open

Indicator

- Pump constantly turning on and off
- In Diagnostics screen, heater pressure is building up and falling off while the proportioner is not on.

Corrective Action

- Take a mallet and beat on the black check valve a few times to see if the problem stops
- If problem persists, remove check valve to either clean or replace.



Trouble Shooting Guide

Major leak

- Make sure no major leakage is occurring inside the Proportioner or on the chemical feed lines to the system

I HAVE A -102 TEMP VALUE

Bad temp sensor

Sensor/Cable Disconnected

Corrective Action

- Identify section that the “bad” temp sensor is located. If having trouble identifying the correct section and temp sensor location, see Identifying Hose Sections and Sensors. First check to see if disconnected or making bad contact. If plugging the temp sensor back in or securing the connector doesn't fix the problem, replace the temp sensor and plug back in. See Changing a Temp Sensor.
- If problem continues, check the connection on the side of the proportioner for the corresponding section. If securing this connection doesn't work, contact technical support.

HOSE SECTION READING 212°

Bad Sensor

- If in the middle of the job you can bypass the section to the next section in front of it to finish the job before replacing the sensor. This can be done in the Diagnostics Screen using the dropdown menu underneath the corresponding hose section labeled Bypass. Once back at the shop, replace the temp sensor. See Changing a Temp Sensor.

I HAVE A -492 GUN PRESSURE VALUE

Bad Sensor

Sensor/Cable Disconnected

Corrective Action

- Open the pressure section of the cable (25 feet back from the gun) and check to see if pressure sensor has become disconnected or if the connection is loose. If plugging the pressure sensor back in or securing the connector doesn't fix the problem, replace the pressure sensor and plug back in.
- If problem continues, check that the pressure cable on the left side of the proportioner is secured. If securing the section doesn't fix the problem, contact technical support.

HEATER PRESSURE SENSOR FAILURE

Pressure sensor disconnected or gone bad

Corrective Action:

- Identify heater with the pressure sensor issue. Open the door on the proportioner and identify the pressure sensor on corresponding heater.
- Check if the connection has come loose on the pressure sensor. If cable is secured and problem persists, replace the pressure sensor. See Replacing a Heater Pressure Sensor.
- If problem continues contact technical support

MY ANALOG GAUGE WON'T BLEED ALL THE WAY TO ZERO

Bad Gauge

- Ensure that the pressure on the hose is able to bleed all the way down to zero. If
- hose pressure does bleed to zero, the gauge is bad and needs to be replaced.

Blockage in Recirc Line to tank or in pressure manifold

- If the hose pressure stops somewhere close to the analog gauge reading when bleeding pressure, there is likely a blockage somewhere in the recirc line or pressure manifold



Trouble Shooting Guide

MY HEATERS ARE OVERHEATING SIGNIFICANTLY (>30F ABOVE SETPOINT)

Relay stuck closed

MY HEATERS AREN'T HEATING UP

Chemical settings aren't correct

- Check that the correct chemical is selected and that the settings assigned to that chemical are correctly entered in the Manage Chemical Screen.

Bad Relay

Breakers off

- Ensure that the heater breakers are in the on position

Poor electrical connection

For Proportioners with heat exchangers:

- Heaters do not turn on until motors are spinning.

A SECTION OR SECTIONS OF HOSE AREN'T HEATING UP

- Bad connection
- Breakers off
- Wire sheared off on hose

MY RESIN PRESSURE COMES UP EXTREMELY SLOW

Check that the resin motor speed is equal to the Iso motor speed. If value is much lower, reset the Gun Offset in the Diagnostics Screen. If this doesn't make them equal, there is a negative offset stored in the Manage Chemical Screen. Edit the chemical, change the gun offset

to 0, press Save, then Back, then Set, and reset the Gun Offset in the Diagnostics Screen.

TOUCH SCREEN ISN'T RESPONDING

Lost communication with control board
Corrective Action

- Watch the main screen for a few seconds. Are any of the values changing on the main screen?
- If yes, communication is good. And proceed to next possible issue.
- If no, communication has been lost, see section Reestablishing Communication between Raspberry Pi and Control Board.

Poor cable connection on LVDS board
Corrective Action

- Unplug the connection shown in the picture (See LVDS Board on Page 29) and make sure the cable and plug are clean of any debris. Plug the connection back in. If this doesn't work, try moving the cable around and see if the touch screen begins responding again. If this doesn't work, contact technical support

MAIN SCREEN DOESN'T OPEN UPON SYSTEM STARTUP

First make sure all breakers are on in the main breaker box. Then check if the E-stop is engaged. If breakers are on and E-stop is not engaged, power off and power on the system again. If the unit still doesn't turn on, contact technical support.

A SECTION OR SECTIONS OF HOSE ARE OVERHEATING SIGNIFICANTLY

Electrical



Trouble Shooting Guide

LDVS Board

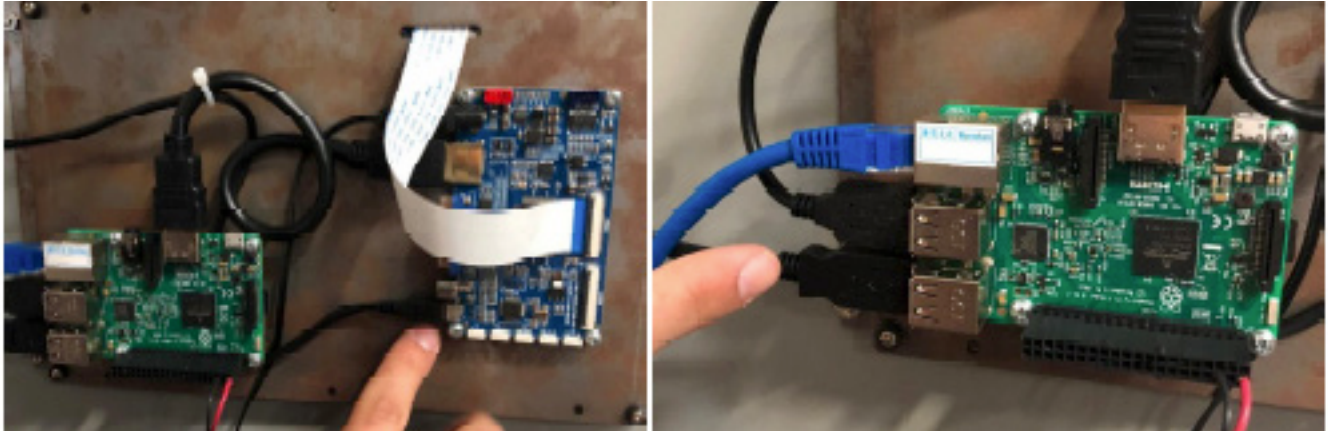
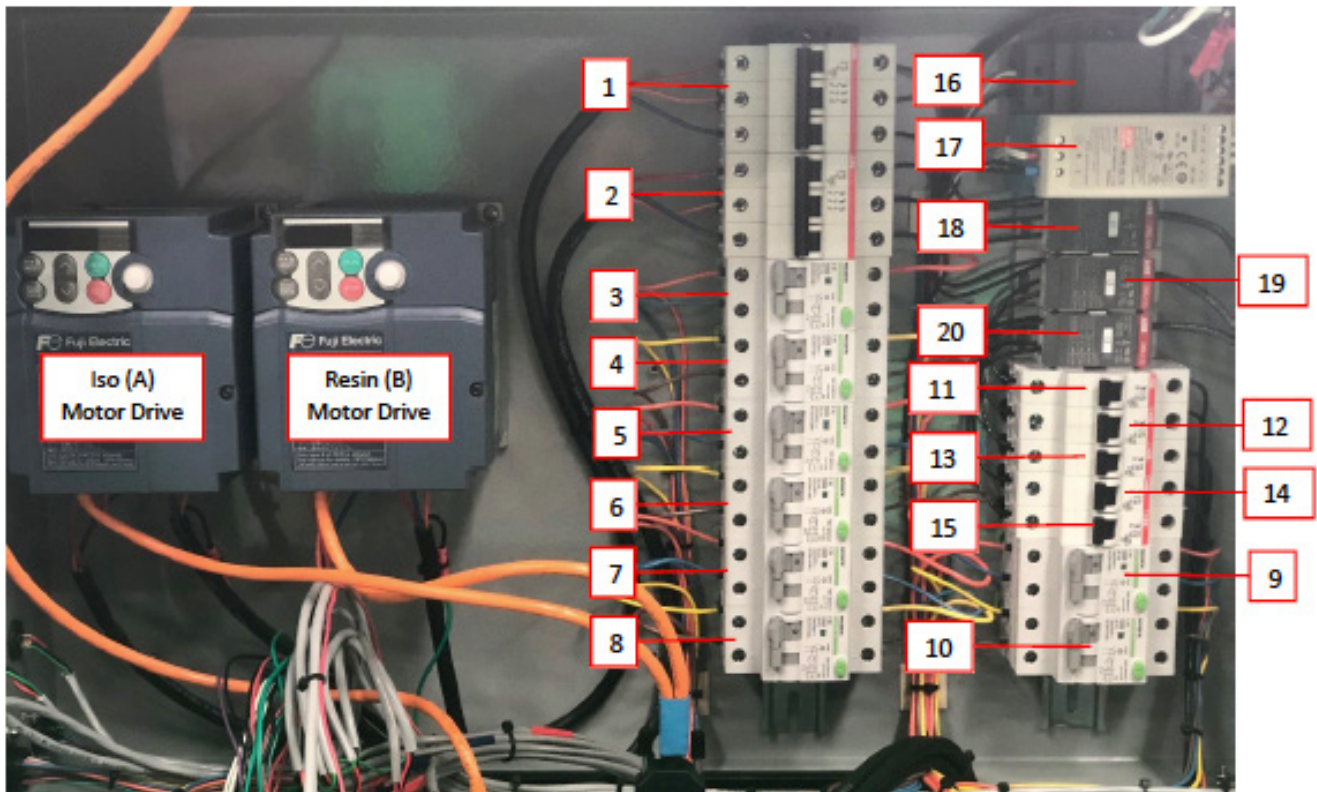


Figure 1. Breaker Diagram



- | | | |
|----------------------------------|---------------------------------------|---|
| 1. ISO (A) Drive | 8. Section 4 Resin (B) Hose Heat | 15. Resin Closed Cell Heater (Heater C) |
| 2. Resin (B) Drive | 9. Section 3 ISO (A) Hose Heat | 16. 5V Power Supply |
| 3. Section 1 ISO (A) Hose Heat | 10. Section 3 Resin (B) Heat | 17. 12V Power Supply |
| 4. Section 1 Resin (B) Hose Heat | 11. ISO (A) Master Hose Heat | 18. L1 Power Distribution Blocks |
| 5. Section 2 ISO (A) Hose Heat | 12. Resin (B) Master Hose Heat | 19. L2 Power Distribution Blocks |
| 6. Section 2 Resin (B) Hose Heat | 13. ISO (A) Heater (Heater A) | 20. L3 Power Distribution Blocks |
| 7. Section 4 ISO (A) Hose Heat | 14. Resin Open Cell Heater (Heater B) | |

Breakers 9 and 10 are only present for 250 & 300 ft Hoses

Breaker 12 also controls power to transfer pumps with single proportioner and single tanks. If dual proportioner Hose Heat Only

*Remember: Red is Hot, Green is Not on GFCI (3-10)



Bringing Up a New Proportioner

When bringing up a new proportioner, the general process is as follows:

1. Initial configuration
2. Sensor check
3. Transfer pump check
4. Fill heaters
5. Fill lines
6. Hose diagnostics
7. Test spray

Initial Configuration

The first step is to set up the software for the rig configuration. Press the Akurate Logo in the top left corner of the main screen (figure 2).

This will take you to the raw value screen.

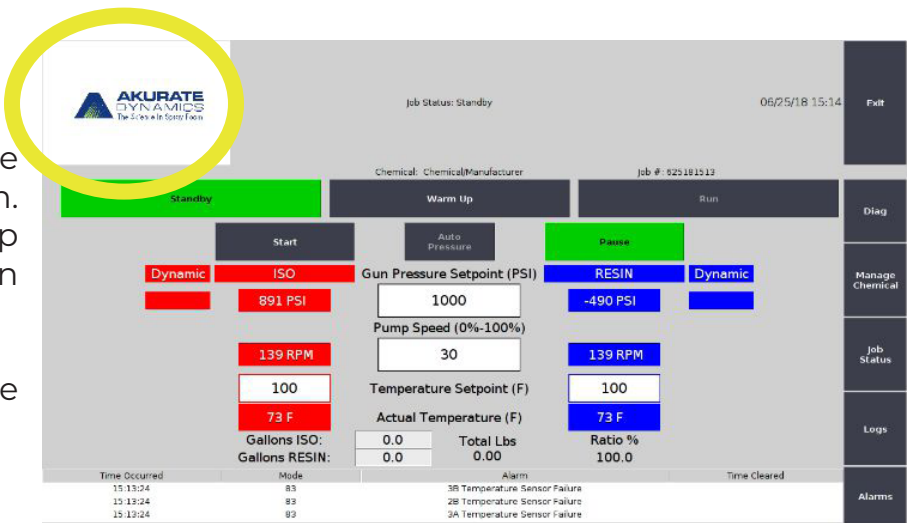


Figure 2

RAW INPUT REGISTER VALUES (0-1023)							
Raw A 0	571	Raw A 12	567	Raw A 24	567	Raw A 36	0
Raw A 1	0	Raw A 13	0	Raw A 25	4	Raw A 37	0
Raw A 2	0	Raw A 14	567	Raw A 26	3	Raw A 38	0
Raw A 3	572	Raw A 15	0	Raw A 27	3	Raw A 39	0
Raw A 4	566	Raw A 16	566	Raw A 28	563	Raw A 40	0
Raw A 5	0	Raw A 17	0	Raw A 29	3	Raw A 41	0
Raw A 6	0	Raw A 18	0	Raw A 30	3	Raw A 42	0
Raw A 7	571	Raw A 19	0	Raw A 31	3	Raw A 43	0
Raw A 8	569	Raw A 20	0	Raw A 32	22	Raw A 44	0
Raw A 9	569	Raw A 21	0	Raw A 33	0	Raw A 45	0
Raw A 10	0	Raw A 22	576	Raw A 34	0	Raw A 46	0
Raw A 11	563	Raw A 23	567	Raw A 35	0	Raw A 47	0

Figure 3

From the raw value screen you can activate or deactivate Section 2 and 3, if installed. If both sections are present in the hose, make sure the buttons read "Active" (Press the button to toggle inactive/active).

If a Section is not present in the hose, make sure that section reads "Inactive". Next, from this screen, press the button "Control Board Version" in the bottom right corner.

Bringing Up a New Proportioner

On the left side of this screen are several questions that pertain to the equipment and proportioner components. Select the option for each question in the list, seen in Figure 4. If you don't have tank temp and level sensors, make sure "Tank Alarms" are set to off.

Back

How many tanks with level/temp sensors? **TWO** **THREE**

Tank A total volume (Gallons) **110** **165**

Tank B total volume (Gallons) **110** **165**

Tank C total volume (Gallons) **ON**

Which motors are being used? **1 HP** **2 HP**

How many pre-heaters are being used? **TWO** **THREE**

Tank Alarms OFF

Adaptive Setpoint Function ON

Composition Setup

ISO HOSE Warmup (%)				RESIN HOSE Warmup (%)			
Sec 1	Sec 2	Sec 3	Sec 4	Sec 1	Sec 2	Sec 3	Sec 4
75	79	80	80	80	85	85	80
0	0	0	0	0	0	0	0
Run Offsets				Run Offsets			
10	5	0	0	6	3	0	0
90	95	100	100	94	97	100	100
Adaptive Setpoint Toggles:		On/Off	On/Off	Adaptive Setpoint Toggles:		On/Off	On/Off
Adaptive Setpoint Absolute Max Adjustment:		7	7	Adaptive Setpoint Absolute Max Adjustment:		7	7
ISO Heater On-Time		2		RESIN Heater On-Time		20	
ISO Heater Duty Cycle(%)		50		RESIN Heater Duty Cycle(%)		50	
		Gain	Offset	Gal-Lbs Conversion		9.43	
Tank A Level	0.17543	-28.75		Gal-Lbs Toggle		On/Off	
Tank B Level	0.17543	-28.75		Duty Cycle Toggle		On/Off	
Tank Temp	0.09446	30		ISO Warmup Rise Time(deg/min)		10.0	On/Off
Hose Temp	0.30916	-102.97		ISO Warmup Duty Cycle(%)		30	
High Pressure	2.45361	-500		RESIN Warmup Rise Time(deg/min)		5.1	
Low Pressure	0.24536	-50		RESIN Warmup Duty Cycle(%)		40	
				Warmup Duty Cycle Period (sec)		30	

Figure 4

Once you have completed the configuration, press the "Back" button on the screen and the Raw Value Screen and that will take you back to the Main screen. Then move on to Sensor Check.

Sensor Check

The first thing to look for with a new proportioner is that the system is receiving logical values from all sensors. Any largely negative, extremely high, or illogical number (60°F when it's 90°F outside) is a likely indication that there is an issue with the sensor or there is a bad connection somewhere along the way.

Specific examples of known error values are: "-102" which is an indication that the sensor is not plugged in or there is not a sensor there at all and "-495" which indicates a sensor failure. All sensor data can be found between the Diagnostics (Figure 6) and Manage Chemical (Figure 8) screens.

Diagnostics Screen:

- Heater Pressures
- Heater Temperature
- Section Hose Heat



Bringing Up a New Proportioner

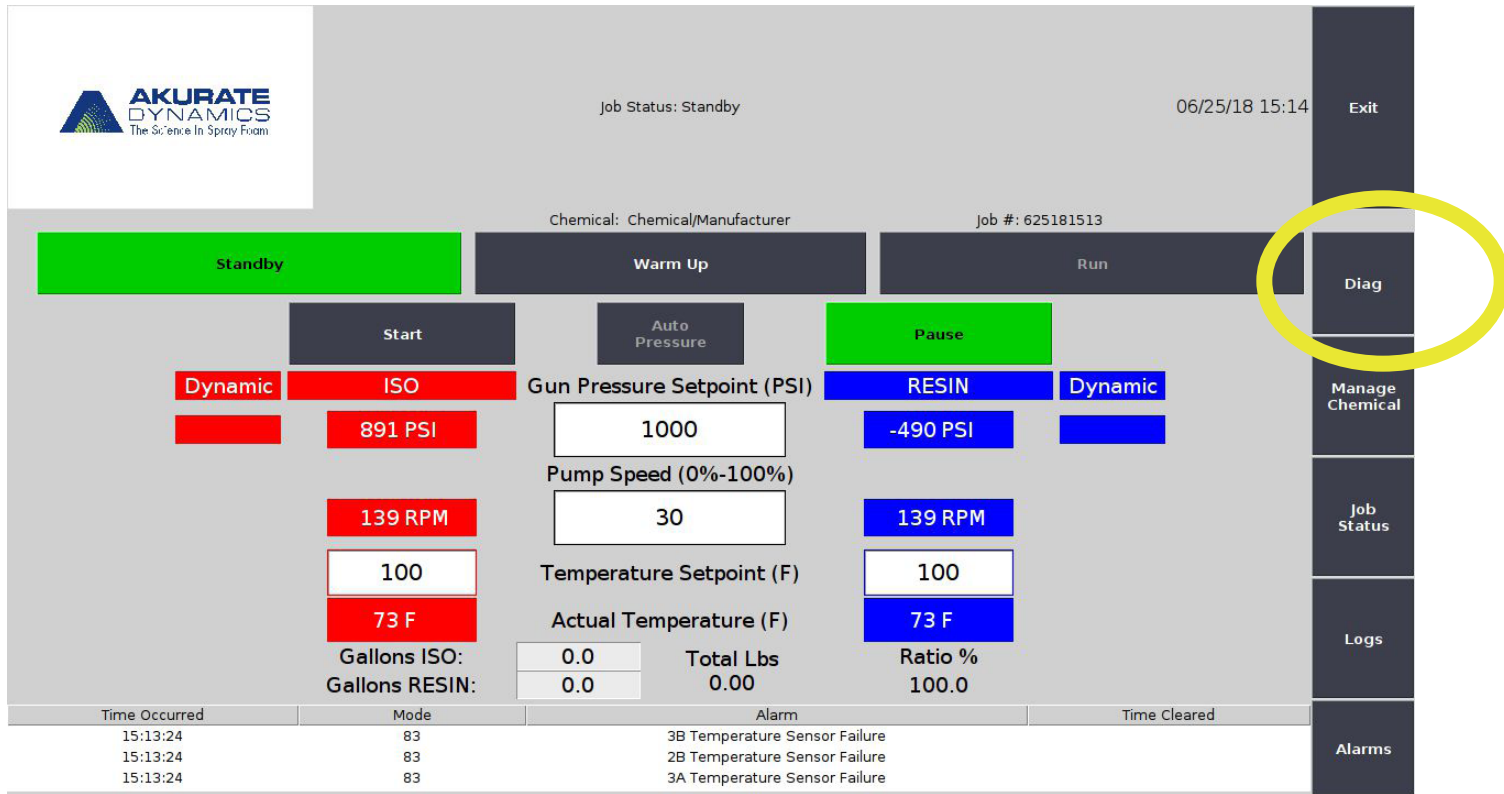


Figure 5

DIAGNOSTICS											
Heat				Gun 1							
Exchanger				Section 1		Section 2		Section 3		Section 4	
HA Pressure:	87	HA Temp:	72	73		-102		-102		73	
Gun Pressure:	888	Status:	Off	Off		Off		Off		Off	
Reset Volume		Reset Gun Offset		BP	None	BP	None	BP	None	BP	None
Gun Pressure:	-490	HB Temp:	72	71		-102		-102		73	
HB Pressure:	-49	Status:	Off	Off		Off		Off		Off	
Tank B Selected		HC Temp:		BP	None	BP	None	BP	None	BP	None
HC Pressure:	91	Status:	Off	BP		BP		BP		BP	

Figure 6

Bringing Up a New Proportioner

Manage Chemical Screen: Tank Levels and Tank Temperatures

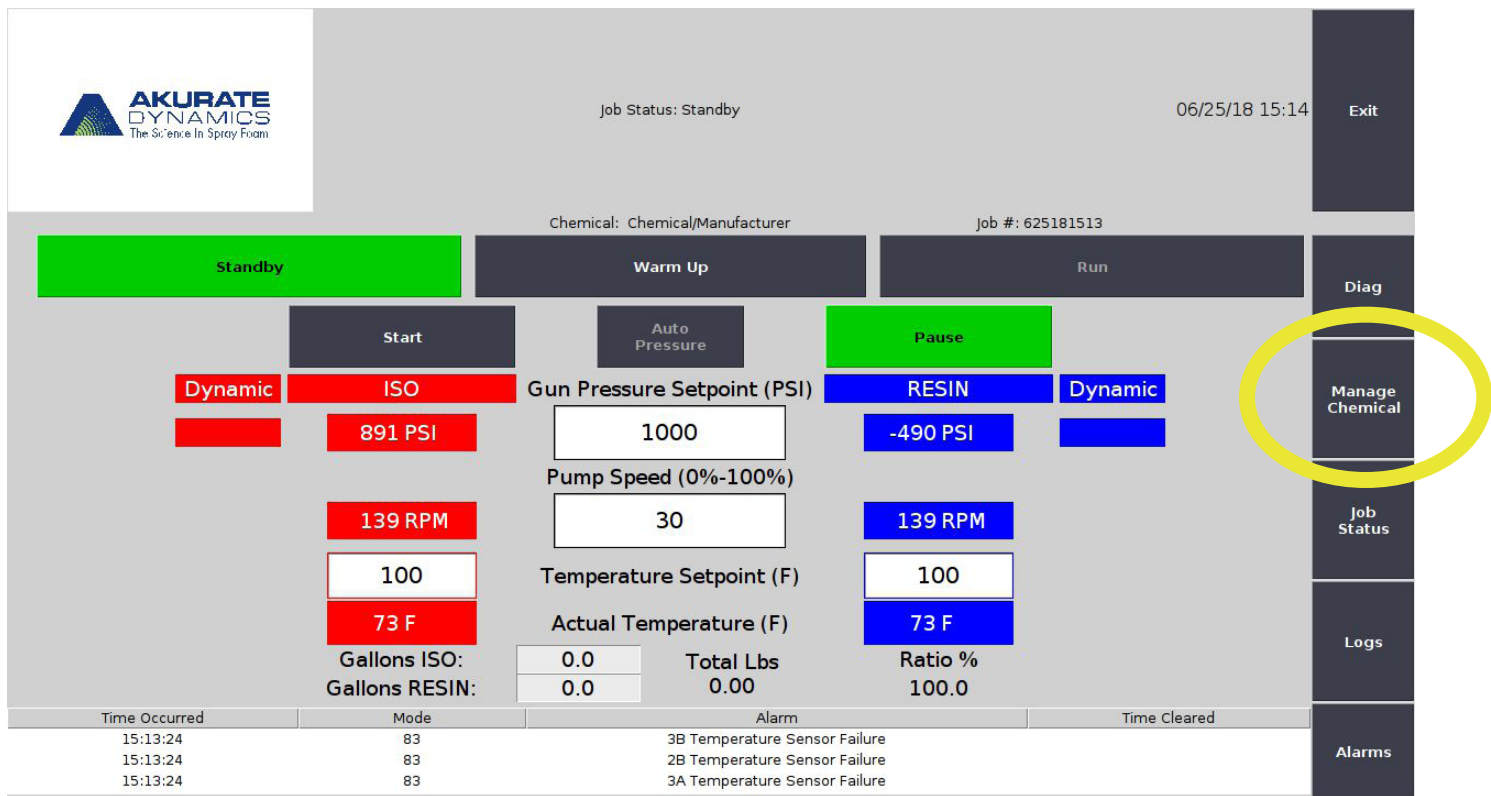


Figure 7

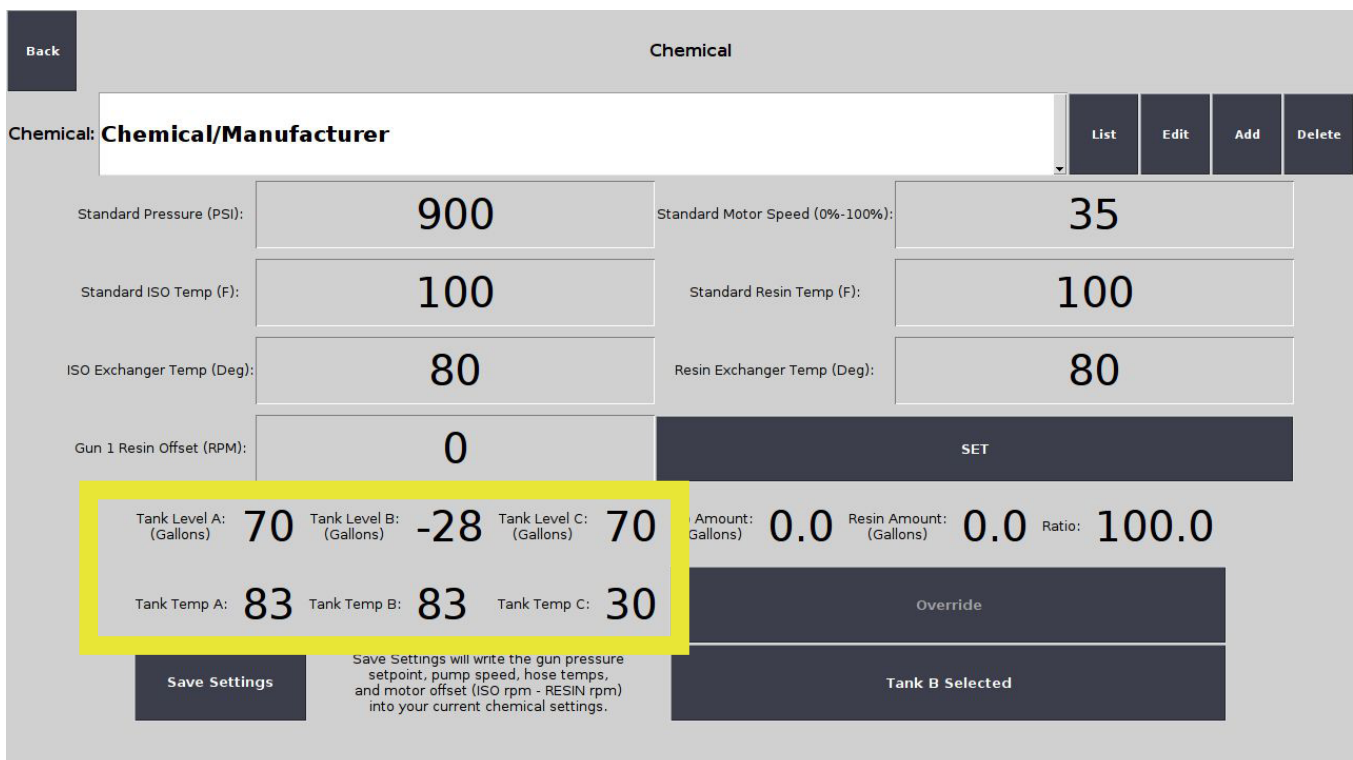


Figure 8

Bringing Up a New Proportioner

Transfer Pump Check

To start this process, turn all breakers off in the control box except for the number 12 shown in Figure 1 and Figure 9.

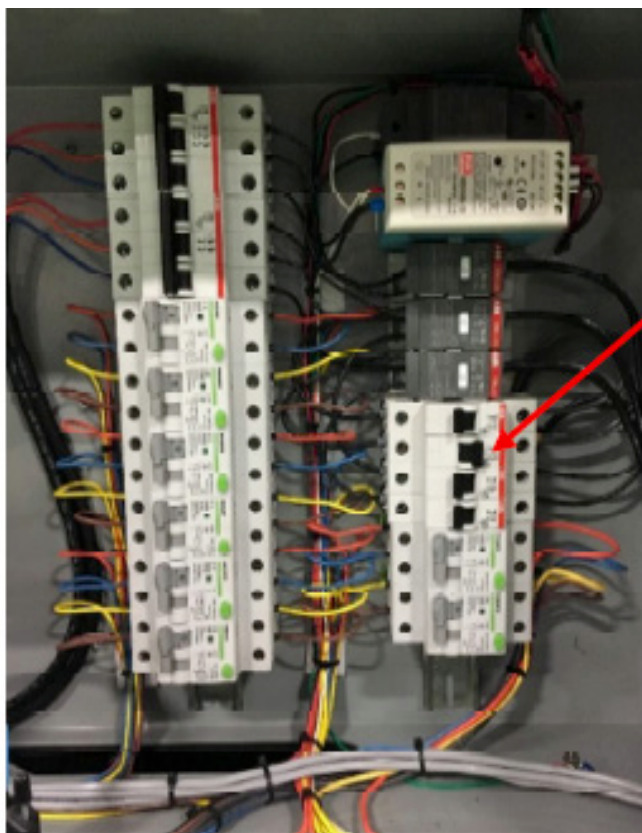


Figure 9



Figure 10

At this point, there is a distinction between a single and dual proportioners in a rig as well as the number of tanks that you have. The transfer pumps are to be controlled either by the proportioner itself or by a switch box located on the wall (depending on where your integrator/builder placed the box, see Figure 10). It is best to test one side at a time in order to diagnose problems should they arise. Also, complete the testing of both pumps on one proportioner then repeat the process on the other should you have 2 proportioners in your rig.

The first step is to set the Gun Pressure Setpoint below 600psi, this is to avoid

an alarm that disables the proportioner. To test the Iso side, unplug the “Transfer Pump B” or “Tank B” connector depending on if you have a switch box or not. See Figure 10, it shows the switch box set up to test an Iso transfer pump.

Before testing, double check all the valves are open between your tanks and proportioner. If one of the valves is closed, you could build pressure and cause a hose failure. Next, you will put the proportioner in “Run” mode. At this point, the transfer pump should be continuously spinning clockwise at the pump face. If this is the case, put the proportioner back in “Standby” mode. There is no need to run



Bringing Up a New Proportioner

this test very long because pressure does not need to be built up yet. After the Iso transfer pump has been successfully tested, move on to the Resin transfer pump.

The same process applies, unplug the “Transfer Pump A” or “Tank A” connector depending on you have a switch box or not. Before testing, double check all the valves are open between your tanks and proportioner. Put the proportioner in “Run” mode and make sure the correct transfer pump is spinning clockwise at the pump face. If you have a third tank, the process is the same but make sure the switch on the switch box is indicating the correct tank.

When going to test Tank C transfer pump, be sure that the toggle switch on the switch box is oriented correctly. The next step is to go to the “Manage Chemical” screen. On this screen, in the bottom right corner you will see a toggle box labeled “Tank B Selected”; touch this button once and it will say “Tank C Selected”. At this point you can proceed with testing Tank C Transfer pump in the same manner as the other two.

IF YOU HAVE TANKS A, B AND C, ALWAYS BE MINDFUL OF WHICH TANK YOU HAVE SELECTED/INDICATED BOTH ON THE PROPORTIONER AND ON THE SWITCH BOX.

***If you have stick pumps refer to operations manual for set up and testing.

Fill Heaters

After transfer pumps have been cleared, the system now needs to be primed by filling the heaters. As mentioned in the previous section, the transfer pumps will kick on while in Run Mode and heater pressure is below 47psi.

This process is best done by doing one side at a time, therefore disconnect the transfer pumps that aren't being used by unplugging the connector from the side of the proportioner (If Single Proportioner, Single Resin Tank) or from the Switch Box (If Dual Proportioner, or Dual Resin Tanks).

Then go into Run Mode (no need to press start) and let the pump fill the heater.

More than likely, there will be air in the line leading up to the heater that you are trying to fill. Open the valve at the bottom of the heater and place a cup at the opening. Once chemical is flowing that means all the air has been pushed out of the way, you can then shut the valve.

Monitor the heater pressure and observe that the transfer pump stops once pressure reaches 47psi. If pressure continues to climb and/or reaches 200 psi, begin troubleshooting this issue (could be bad sensor, crossed connection, or incorrect tank selection).

Repeat this process for the other side by plugging in the cable corresponding to the next transfer pump.



Bringing Up a New Proportioner

Fill the Lines

Filling the lines should also be done one side at a time and **all hose heat and preheater breakers should be off**. See Figure 1.

Turn off the breaker to the proportioner motor that isn't being used (Breaker 1 and 2). For example, if filling the ISO line, turn off the resin motor breaker (2).

1. Set pressure point to 300 PSI (Figure 11)
2. Set the motor speed to 20% (Figure 12)
3. Select Run Mode and press Start
4. Let the proportioner run until you no longer see the air coming out of the gun manifold
5. Once confident that the air is out of the hoses, go to Standby Mode and close the gun manifold.
6. Repeat this process on the next side.

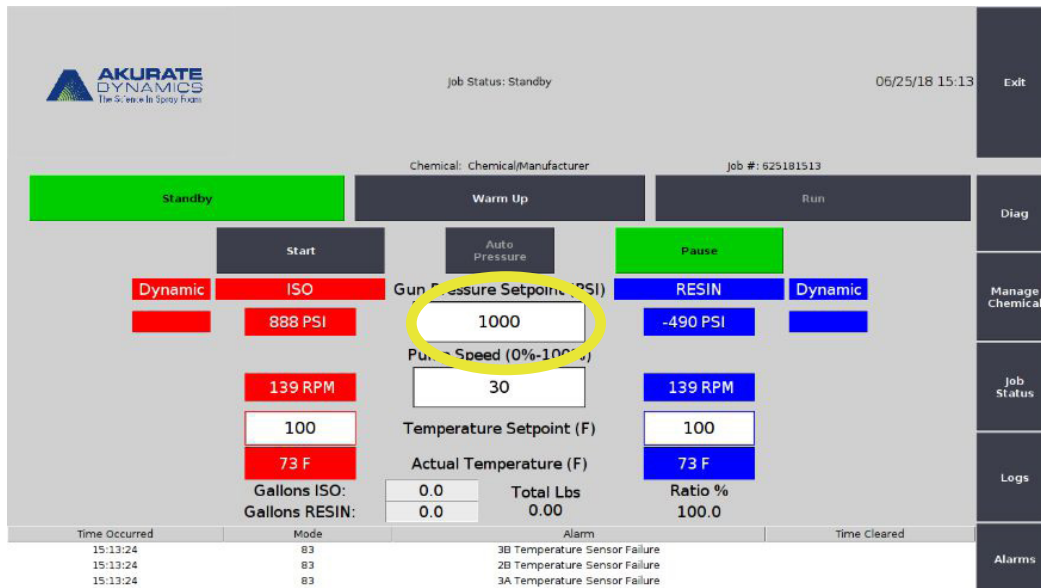


Figure 11

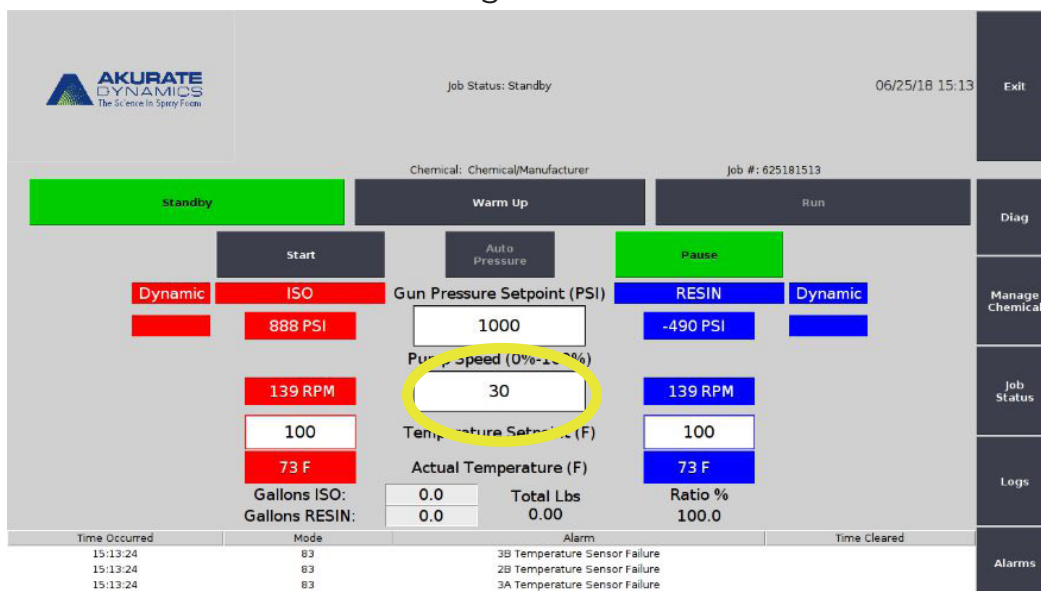


Figure 12

Bringing Up a New Proportioner

Hose Diagnostics

Now that the lines are filled, the hose heat breakers (3-12) and preheater breakers (13-15) should all be flipped to the on positions. Input temperature settings on the Main Screen (as seen in Figure 13) and test the hose heat by going into warm-up or run mode and monitor that hoses heat properly.

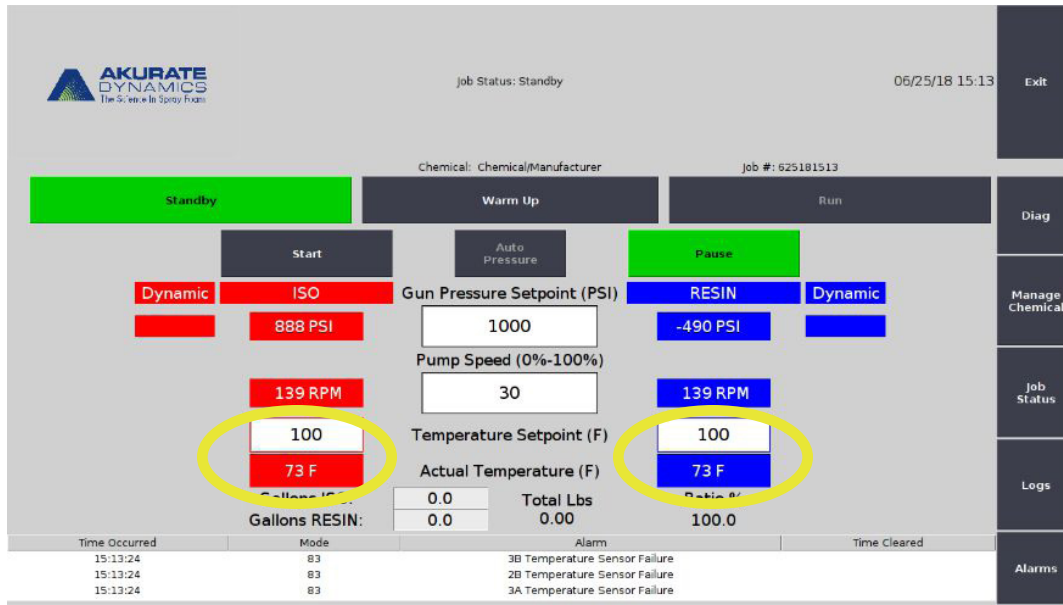


Figure 13

Test Spray

Now that the hoses have reached temperature and have passed the diagnostics testing, input operational settings and perform a test spray. Monitor for proper operation of the system.





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*Need Assistance?
Contact your Regional Manager or or call or
email Akurate Dynamics.*

AkurateDynamics.com

7618 Bluff Point Drive | Houston, Texas | 77095

(832) 672-5665

info@akuratedynamics.com

